WLPP No.	Addendum Report to WLPP Item 1 - 3 November 2020
DA No.	DA-2020/572
Proposal	Residential - multi dwelling housing - demolition of existing warehouse storage facility and construction of 12 x two storey dwellings.
Property	481-485 Princes Highway, WOONONA NSW 2517 Lot 1 DP 86796
Applicant	MMJ Wollongong
Responsible Team	Development Assessment and Certification – City Wide Planning Team (SG)

ADDENDUM REPORT

This report should be read in conjunction with the Council Assessing Officer's report as presented to Wollongong Local Planning Panel on the 3 November 2020 at Attachment 8.

1 BACKGROUND AND EXECUTIVE SUMMARY

Reason for consideration by Local Planning Panel - Determination

The proposal has been referred to the WLPP for **determination** pursuant to part 2 of Schedule 2 of the Local Planning Panels Direction, as the Development Application is considered contentious development, having received more than 10 unique submissions by way of objection.

Background

This matter was reported to the WLPP meeting on 3 November 2020. A copy of the Panel's recommendation is included at Attachment 1. The Panel determined to defer the development application to allow the applicant an opportunity to address the issues raised by the Panel as follows:

- *The Panel has to be satisfied that the proposal is suitable for its use having regard to SEPP 55. At present it is not. Further assessment is required together with a RAP and verification from a site auditor is to be provided.*
- *The turning of visitors' vehicles, both passenger and service vehicles, cannot turn within the site. A turning head/facility is to be provided to minimise vehicles reversing out of the site.*
- *The visitors' spaces appear too narrow and are positioned in locations which prevent manoeuvring of vehicles in a forward gear. These need to be enlarged and relocated. It may result in a reduction in GFA. The Panel considers that locating visitors' spaces and turning facilities in direct proximity to dwellings front doors in undesirable from an amenity and safety perspective.*
- *The waste garbage collection is unresolved. Garbage bins must not be required to be taken through the living areas of the dwellings. This needs to be redesigned.*
- *Any recommendation for approval shall include a condition requiring a construction management plan and dilapidation reports for all adjoining properties both public and private.*

The Panel requires the above information to be provided to Council within twenty-eight (28) days following which a supplementary report will be provided to the Panel for determination. The matter will be determined electronically unless otherwise stated by the Chair.

Proposal

The proposal seeks consent for the demolition of the existing warehouse storage facility and the construction of multi dwelling housing comprising 12 x two (2) storey dwelling houses each with double garages and associated landscaping and infrastructure.

The applicant has amended the proposal in response to the issues raised by the Panel, as well as other matters raised by Council, as detailed in Section 2 of this report.

Permissibility

The site is zoned R2 Low Density Residential pursuant to the Wollongong Local Environmental Plan (WLEP) 2009. The proposal is defined as multi dwelling housing and is permissible on land to which the WLEP 2009 applies. Demolition is ancillary work to facilitate the proposal and is permitted pursuant to Clause 2.7 of the WLEP 2009.

Planning Controls

The following planning controls apply to the proposal:

State Environmental Planning Policies:

- SEPP No. 55 – Remediation of Land
- SEPP (Building Sustainability Index: BASIX) 2004
- SEPP (Koala Habitat Protection) 2020
- SEPP (Infrastructure) 2007

Local Environmental Planning Policies:

- Wollongong Local Environmental Plan (WLEP) 2009

Development Control Plans:

- Wollongong Development Control Plan 2009

Other policies

- Wollongong City Wide Development Contributions Plan 2020
- Wollongong Community Participation Plan 2019

An assessment of the amended proposal against the relevant planning controls is provided at Attachment 4.

For the original assessment refer to Council Assessing Officer's report as presented to the Wollongong Local Planning Panel on the 3 November 2020.

Consultation

The amended proposal was not publicly exhibited due to the minor nature of the amendments.

Details of the amended proposal and additional documentation were referred to Council's Environment and Traffic Officers. Satisfactory referral advice was provided.

Consultation of the proposal as presented to Wollongong Local Planning Panel on the 3 November 2020 is outlined in the Council Assessing Officer's Report.

Conclusion

At the WLPP meeting of 3 November 2020, the Panel determined to defer the development application to allow the applicant an opportunity to address a number of concerns as described in Section 1 of this report.

The applicant has submitted amended plans and additional information in response to the recommendations of the WLPP. Council's Assessing Officer is of the view that the amended proposal has satisfactorily addressed the concerns raised by the WLPP.

It is therefore considered that the proposed development is appropriate given the nature and characteristics of the site and is unlikely to result in significant adverse impacts on the character and amenity of the surrounding area, providing for the orderly development of land in the locality.

Recommendation

DA-2020/572 be approved subject to the conditions provided at Attachment 7.

2 APPLICANT'S RESPONSE TO THE WLPP RECOMMENDATIONS

The applicant has provided amended plans and additional information in response to the concerns raised by the Panel including:

- Letter from MMJ dated 24 December 2020 detailing the applicant's response to WLPP Panel recommendations – see Attachment 2
- Architectural plans – Site, Floor, Elevations and Sections.
- Shadow Diagrams and Shadow Analysis.
- Landscape Plan.
- Additional Swept Paths plans.
- Revised Interim Audit Advice.
- Additional Environmental Assessment Report with further testing.

The amended proposal may be summarised as follows:

- Additional testing details provided in additional assessment report and interim Auditors advice.
- Unit 1 landscaping near garage removed to accommodate motorbike parking.
- Unit 8 entrance further setback and landscaping reconfigured.
- Units 2, 3, 6 and 7 minor internal floor plan modifications to enable waste storage in garages.
- Unit 12 entrance reconfigured to enable additional landscaping between entrance and visitor car parking space 01.
- Turning bay formalised, pergola revised and moved to east, motorbike parking relocated (near Unit 1) and pedestrian path through site identified.
- Visitor car parking spaces dimensions included on plans.
- B85 and B99 vehicle manoeuvring plans submitted for garages, visitor parking and turning bay.
- Waste storage areas for Units 2, 3, 6 and 7 have been amended to include storage in the garages and paths/ gates indicated for waste access for Units 1, 4, 5 and 8 have been indicated.
- Floor space ratio has been reduced slightly from 0.50:1 to 4:98:1 (Maximum 0.5:1).
- Height remains the same 7.6m (Maximum 9m).

3 COUNCIL'S ASSESSING OFFICER'S COMMENTS

Matters Raised by the Panel:

Council's Assessing Officer has reviewed the Panel's recommendations from the 3 November WLPP meeting and the Applicant's response to the issues raised and provides the following comments.

- *The Panel has to be satisfied that the proposal is suitable for its use having regard to SEPP 55. At present it is not. Further assessment is required together with a RAP and verification from a site auditor is to be provided.*

Comment:

The applicant has submitted an Interim Site Auditors Advice prepared by GHD dated 23 December 2020 and an Additional Site Environmental Site Assessment prepared by Environmental Consulting Services Pty Ltd. dated 16 December 2020. Details of the application submission including the Site Auditors Advice and Additional Environmental Assessment were referred to Council's Environment Officer for comment. Councils Environment Officer provided a conditionally satisfactory response noting that further testing has occurred and the site auditor has updated his Interim Advice letter,

stating that as part of the DSI an additional 4 borehole samples were collected within the footprint of the building and, those soil samples were similar to other soil samples. The recommendations in the report have not changed from previous interim advice as a result no conditions of consent have been amended.

It is the Council's Assessing Officer's view that the applicant has addressed the Panel's recommendations.

- *The turning of visitors' vehicles, both passenger and service vehicles, cannot turn within the site. A turning head/facility is to be provided to minimise vehicles reversing out of the site.*

Comment:

The amended proposal includes a formalised turning bay, relocation of the pergola further to the east, relocation of motorbike parking near Unit 1 and pedestrian travel path from the Princes Highway through the site has been indicated on plans.

Visitor car parking space dimensions have been included on plans. Swept Paths for B85 and B99 vehicle manoeuvring have been submitted on additional plans for garages, visitor parking and turning bay. Details of application and additional information were referred to Council's Traffic Officer. Advice received is that access and manoeuvring arrangements are considered acceptable in this circumstance.

It is the Council's Assessing Officer's view that the applicant has addressed the Panel's recommendations.

- *The visitors' spaces appear too narrow and are positioned in locations which prevent manoeuvring of vehicles in a forward gear. These need to be enlarged and relocated. It may result in a reduction in GFA. The Panel considers that locating visitors' spaces and turning facilities in direct proximity to dwellings front doors in undesirable from an amenity and safety perspective.*

Comment:

Visitor car parking space dimensions have been included on plans. Swept Paths for B85 and B99 vehicle manoeuvring have been submitted on additional plans for garages, visitor parking and turning bay. Details of application and additional information were referred to Council's Traffic Officer. Advice received is that access and manoeuvring arrangements are considered acceptable in this circumstance.

- *The waste garbage collection is unresolved. Garbage bins must not be required to be taken through the living areas of the dwellings. This needs to be redesigned.*

Comment:

The amended proposal involves alteration of Unit 2, 3, 6 and 7 to accommodate waste storage area within garages. It is noted garage dimensions for car parking remain compliant with Council's DCP. Additional details regarding gates and access to paths or garden spaces for Units 1, 4, 5 and 8 have been included on plans.

Council is satisfied that the amended proposal is functional and will afford better amenity for any future occupants. It is the Council's Assessing Officer's view that the applicant has addressed the Panel's recommendations.

- *Any recommendation for approval shall include a condition requiring a construction management plan and dilapidation reports for all adjoining properties both public and private.*

Comment:

Condition 41 has been included in the draft conditions of consent as shown at Attachment 7 that requires a construction management plan be prepared to maintain public safety, minimise disruption to pedestrian and vehicular traffic and to protect services and structures during demolition and construction.

It is Council's Assessing Officer's view that this condition addresses matters raised by the panel in this regard.

- *The Panel requires the above information to be provided to Council within twenty-eight (28) days following which a supplementary report will be provided to the Panel for determination. The matter will be determined electronically unless otherwise stated by the Chair.*

Comment:

It is the Council's Assessing Officer's view that the applicant has addressed the Panel's recommendations.

Consultation

Public Notification

The amended proposal was not publicly exhibited due to the minor nature of the amendments.

Details of the amended proposal and additional documentation were referred to Council's Environment and Traffic Officers. Satisfactory referral advice was provided.

Consultation of the proposal as presented to Wollongong Local Planning Panel on the 3 November 2020 is outlined in the Council Assessing Officer's Report.

Internal Referrals

Details of the amended proposal were referred to Council's Environment and Traffic Officers.

Environment Officer

The applicant has submitted an Interim Site Auditors Advice prepared by GHD dated 23 December 2020 and an Additional Site Environmental Site Assessment prepared by Environmental Consulting Services Pty Ltd. dated 16 December 2020.

Details of the application submission including the Site Auditors Advice and Additional Environmental Assessment were referred to Council's Environment Officer for comment.

Councils Environment Officer provided a conditionally satisfactory response noting that further testing has occurred and the site auditor has updated his Interim Advice letter, stating that as part of the DSI an additional 4 borehole samples were collected within the footprint of the building and, those soil samples were similar to other soil samples.

The recommendation in the report have not changed from previous interim advice as a result no conditions of consent have been amended.

Traffic Officer

Council's Traffic Officer has reviewed the amended plans and additional information in relation to the parking/ waste and vehicle manoeuvring matter. The following comments were made:

The swept paths indicate that vehicles are able to enter all car parking spaces, and if necessary, turn at the end of the driveway in no more than 3 turning movements and exit in a forward direction.

All car parking spaces including visitor spaces comply with AS2890.1 minimum dimensions with adequate clearances adjacent to high walls etc.

No objections subject to the previously recommended conditions.

External Referrals

The amended proposal was not referred to Transport for NSW Roads (formerly RMS) as the proposal remains substantially the same development as the original referral to TfNSW.

CONCLUSION

At the WLPP meeting of 3 November 2020, the Panel determined to defer the development application to allow the applicant an opportunity to address a number of concerns as described in Section 1 of this report. Responding to the recommendations of the WLPP the applicant has submitted amended plans and additional information. Council's Assessing Officer is of the view that the amended proposal has satisfactorily addressed the concerns previously raised.

The site is zoned R2 Low Density Residential pursuant to the Wollongong Local Environmental Plan (WLEP) 2009. The proposal is defined as multi dwelling housing and is permissible on land to which the WLEP 2009 applies. Demolition is ancillary work to facilitate the proposal and is permitted pursuant to Clause 2.7 of the WLEP 2009.

All relevant internal and external referrals are conditionally satisfactory and there are no outstanding issues.

Some of the issues raised in submissions though technically unresolved, are considered to be adequately addressed either through design or by way of conditions. Any remaining issues are not considered to be sufficient to refuse the application

It is therefore considered that the proposed development is appropriate given the nature and characteristics of the site and is unlikely to result in significant adverse impacts on the character and amenity of the surrounding area, providing for the orderly development of land in the locality.

RECOMMENDATION

DA-2020/572 be approved subject to the conditions provided at Attachment 7 of this report.

ATTACHMENTS

1 WLPP recommendations from 3 November 2020 meeting.

2 Letter prepared by MMJ dated 24 December 2020 detailing the applicant's response to WLPP Panel recommendations

3 Amended Plans, Landscape Plan, Shadow Diagram and Vehicle Swept Paths.

4 Assessment WDCP 2009 Compliance table

5 Interim Site Auditors Advice prepared by GHD dated 23 December 2020.

6 Additional Site Environmental Site Assessment prepared by Environmental Consulting Services Pty Ltd. dated 16 December 2020.

7 Amended Conditions of Consent.

DETERMINATION AND STATEMENT OF REASONS

WOLLONGONG CITY COUNCIL – WOLLONGONG LOCAL PLANNING PANEL (WLPP)

DATE OF DETERMINATION	3 November 2020
PANEL MEMBERS	Sue Francis (Chair), Larissa Ozog, Robert Montgomery, Trish McBride (Community Representative)

Public meeting held at Wollongong City Council, Level 9 Function Room, 41 Burelli Street, Wollongong on 3 November 2020 opened at 5:00pm and closed at 6:51pm.

MATTER DETERMINED

DA-2020/572 – Lot 1 DP 86796, 481-485 Princes Highway, Woonona (as described in detail in schedule 1).

PUBLIC SUBMISSIONS

The Panel was addressed by two submitters.

The Panel heard from the applicant and their representatives.

PANEL CONSIDERATION AND DECISION

The Panel considered the matters listed at item 7, and the material presented at the meeting and the matters observed at site inspections listed at item 8 in Schedule 1.

The Panel determined to defer the development application as described in Schedule 1 pursuant to section 4.16 of the *Environmental Planning and Assessment Act 1979*.

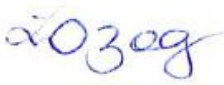
The decision was unanimous.

REASONS FOR THE DECISION

The Panel considered that there are several matters that required resolution before any favourable determination could be made. These are as follows:

- The Panel must be satisfied that the proposal is suitable for its use having regard to SEPP 55. At present it is not. Further assessment is required together with a Remediation Action Plan and verification from a site auditor is to be provided.
- The visitors' vehicles, both passenger and service vehicles, cannot turn within the site. A turning head/facility is to be provided to minimise vehicles reversing out of the site.
- The visitors' spaces appear too narrow and are positioned in locations which prevent manoeuvring of vehicles in a forward gear. These need to be enlarged and relocated and dimensioned It may need reduction in GFA. The Panel also considers that locating visitors' spaces and turning facilities in direct proximity to the front door of dwellings is undesirable from an amenity and safety perspective and so these spaces should be redesigned and relocated.
- The waste garbage collection is unresolved. Garbage bins must not be required to be taken through the living areas of the dwellings. This needs to be redesigned.
- Any recommendation for approval shall include a condition requiring a construction management plan and dilapidation reports for all adjoining properties both public and private

The Panel requires the above information to be provided to Council within twenty-eight (28) days following which a supplementary report will be provided to the Panel for determination. The matter will be determined electronically unless otherwise stated by the Chair.

PANEL MEMBERS	
 Sue Francis (Chair)	 Larissa Ozog
 Robert Montgomery	 Trish McBride (Community Representative)

SCHEDULE 1		
1	DA NO.	DA-2020/572
2	PROPOSED DEVELOPMENT	Residential - multi dwelling housing - demolition of existing warehouse storage facility and construction of 12 x two storey dwellings.
3	STREET ADDRESS	481-485 Princes Highway, Woonona.
4	APPLICANT	MMJ Wollongong
5	REASON FOR REFERRAL	Under Schedule 2 of the Local Planning Panels Direction of 30 June 2020, the proposal is categorised as contentious development under 2(b) of the Schedule as over 10 unique submissions were received
6	RELEVANT MANDATORY CONSIDERATIONS	· Environmental planning instruments: o State Environmental Planning Policy No 55 – Remediation of Land o State Environmental Planning Policy – (Building Sustainability Index: BASIX) 2004 o State Environmental Planning Policy (Infrastructure) 2007 o State Environmental Planning Policy (Koala Habitat Protection) 2019 o Wollongong Local Environment Plan 2009 · Wollongong City Wide Development Contributions Plan 2019 · Development control plans: o Wollongong Development Control Plan 2009 · Provisions of the *Environmental Planning and Assessment Regulation 2000*: o Clause 92 – demolition and provisions of AS2601 · The likely impacts of the development, including environmental impacts on the natural and built environment and social and economic impacts in the locality · The suitability of the site for the development · Any submissions made in accordance with the *Environmental Planning and Assessment Act 1979* or regulations · The public interest, including the principles of ecologically sustainable development
7	MATERIAL CONSIDERED BY THE PANEL	· Council assessment report dated 3 November 2020. · Written submissions during public exhibition: 21 · Verbal submissions at the public meeting: two
8	SITE INSPECTIONS BY THE PANEL	Site inspection 3 November 2020. Attendees: o Panel members: Sue Francis (Chair), Larissa Ozog, Robert Montgomery, Trish McBride (Community Representative) o Council assessment staff: Sharyn Grant, John Wood
9	COUNCIL RECOMMENDATION	Approve
10	DRAFT CONDITIONS	Attached to the council assessment report

24th December 2020

Wollongong City Council
Locked Bag 8821
WOLLONGONG DC NSW 2500
VIA EMAIL: SGrant2@wollongong.nsw.gov.au

Attention: Sharyn Grant

Dear Sharyn,

RE: ADDITIONAL INFORMATION DA-2020-572
PROPOSED DEMOLITION OF AN EXISTING WAREHOUSE STORAGE FACILITY & CONSTRUCTION OF A NEW MULTI DWELLING HOUSING DEVLOPMENT
481-485 PRINCES HIGHWAY, WOONONG

I refer to the above-mentioned DA and Council's correspondence dated 10th November 2020 outlining the additional information requested by WLPP following the public meeting of 3rd November 2020 to be provided. Our clients and the project team have reviewed the matters in detail and provide the following amended plans and supplementary information to support this request.

Responses to the matters raised by the WLPP are outlined below:

Advice 1:
The Panel must be satisfied that the proposal is suitable for its use having regard to SEPP 55. At present it is not. Further assessment is required together with a Remediation Action Plan and verification from a site auditor is to be provided.

Comment:
An additional Environmental Site Assessment has been prepared by Environmental Consulting Services (ECS) to supplement the findings of the original environmental assessment completed

for the property previously. Refer attached for a copy of this assessment. The scope of work undertaken including the drilling of another 4 shallow bore holes and the collection of surface samples from each borehole. This additional investigation has provided more certainty regarding the condition beneath the building, and it is clear that the site will be suitable for the proposed residential development.

To qualify this further, Andrew Kohlrusch of GHD Pty Ltd (site auditor) has reviewed the assessment report prepared by ECS and considered them consistent with the relevant NSW EPA and CLM Act, 1997, guidelines. Refer attached Interim Audit Advice 03. Site Auditor concludes no further assessment or any remediation is necessary and, for the purposes of SEPP 55, the consent authority can be satisfied that the land is not contaminated. Thus confirming, the subject site is suitable for the proposed residential land use.

Advice 2:

The visitors' vehicles, both passenger and service vehicles, cannot turn within the site. A turning head/facility is to be provided to minimise vehicles reversing out of the site.

Comment:

A turning head is already provided for at the western extent of the driveway, adjacent to Townhouse 8. However, in light of the Panel's comments, the turning bay has been amended such that it now also caters for the 99th percentile of vehicles (originally only catered for the 85th percentile vehicle turning movement). Refer to the swept paths provided by TTPA traffic engineers demonstrating this compliance. Specifically template SP19.

To accommodate the slight amendment to accommodate the 99% of vehicle movement within the turning bay, the motor cycle space and the visitor bike space adjacent to Townhouse 9 have been relocated close to the entry to the site, adjoining Townhouse 1. This has required an amended configuration to the stairs of Townhouse 1 resulting in a reduction in floor area for that townhouse. This same amendment was made to Townhouse 8 also resulting in a reduction in floor area for that townhouse. This amendment increased the distance of the rear townhouse door from the turning circle to address the amenity and safety concerns expressed in the advice by the Panel (refer below).

Advice 3:

The visitors' spaces appear too narrow and are positioned in locations which prevent manoeuvring of vehicles in a forward gear. These need to be enlarged and relocated and dimensioned It may need reduction in GFA. The Panel also considers that locating visitors' spaces and turning facilities in direct proximity to the front door of dwellings is undesirable from an amenity and safety perspective and so these spaces should be redesigned and relocated.

Comment:

It is confirmed that the visitor spaces are in fact the correct size to meet compliance with the Australian Standards. Please refer to AR 101 revD and AR151 revC where the spaces are now clearly dimensioned. Reference should also be made to the swept paths provided by TTPA traffic engineers demonstrating this compliance ingress and egress vehicle movements. Specifically the templates SP4,5,6, 7, 17 and 18.

With respect to visitor space 1 the following course of action was undertaken. The entry and private open space to Townhouse 12 was moved further south to enable a greater landscape area buffer between the visitor space and entry (of 2.5m in distance). The visitor space 1 is again dimensioned and referenced in AR 101 revD and AR151 revC, where the space is clearly located at a distance from the entry. Thus, resolving the amenity and safety considerations accordingly.

Advice 4:

The waste garbage collection is unresolved. Garbage bins must not be required to be taken through the living areas of the dwellings. This needs to be redesigned.

Comment:

This was certainly a positive pick up by the Panel, and amendments have been made to Townhouses 2, 3, 6 and 7 to ensure waste bin storage is available from within the garages. Refer to amended Architectural Drawings AR101revD, AR102revB, AR151revC and AR152 revCnwhich demonstrate that no Townhouse requires garbage to be taken through the house now.

Notes have been also provided on architectural drawings clearly identify amendments made. Additionally, the Landscape plan has been amended to correlate with the architectural changes and accompanies this response.

Advice 5:

Any recommendation for approval shall include a condition requiring a construction management plan and dilapidation reports for all adjoining properties both public and private.

Comment:

Noted. We agree conditions to this effect should be provided within the forthcoming development consent.

We trust this information satisfactorily addresses the Panel's deferral correspondence, and that approval can now be forthcoming for the proposed DA. Please feel free to contact the undersign should further information and/or discussion be required.

Yours faithfully,
MARTIN MORRIS & JONES PTY LTD

LUKE ROLLINSON BUrbRegPlan DipArchTech MPIA
DIRECTOR OF TOWN PLANNING & ADVISORY

BASIX NOTES

WATER (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO: AT LEAST ONE OUTDOOR TAP & ALL TOILETS

ENERGY (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

HOT WATER
GAS INSTANTANEOUS 5 STAR ENERGY RATING
HEATING
THE LIVING AREAS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM
COOLING
THE LIVING AREAS MUST NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM

OTHER
A GAS COOKTOP & ELECTRIC OVEN MUST BE INSTALLED IN EACH TOWNHOUSE
A FIXED OUTDOOR CLOTHES DRYING LINE MUST BE INSTALLED FOR EACH TOWNHOUSE

GLAZING

INSULATION

GENERAL NOTES

ACOUSTIC NOTES: Glazing other than those specified in Table 2 may be of standard thickness with a minimum Rw 25.

Table 2 Recommended Window Schedule – Residential Units

Block / Unit / Glazing	Min R_w	Example Glazing Specification
Unit 8		
Living / Dining / Kitchen (all)	**32**	6.38 mm laminated glass
Bedrooms (all)	**29**	5 mm float glass
Unit 9		
Living / Dining / Kitchen (all)	**32**	6.38 mm laminated glass
Bedroom (all)	**32**	6.38 mm laminated glass
Unit 7		
Living / Dining (all)	**32**	6.38 mm laminated glass
Bedrooms (all)	**29**	5 mm float glass
Unit 10		
Living / Dining / Kitchen (all)	**29**	5 mm float glass
Bedrooms (all)	**29**	5 mm float glass
Units 1, 2, 3, 4, 5, 6, 11 & 12		
Living / Dining / Kitchen (all)	**29**	5 mm float glass

All windows and glazed doors in Table 2 should be fitted with acoustic seals comprising foam weather seals (e.g. Q-Lon from Schlegel or similar).

RECOMMENDED CONSTRUCTION

WALLS

EXTERNAL WALLS OF BRICK VENEER OR OTHER MASONRY CONSTRUCTION WILL BE ACCEPTABLE, AND CEMENT COMPOSITE EXTERNAL CLADDING, FOR EXAMPLE HARDIES 'SCYON', 'LINEA', 'STRIA', OR CSR 'CEMENTAL' OR APPROVED EQUIVALENT WITH SIMILAR MINIMUM MASS (MIN 13 KG/M2):-

INTERNAL PLASTERBOARD WALL LINING MAY BE OF 10 MM THICK (MINIMUM) STANDARD PLASTERBOARD CONSTRUCTION WITH THE EXCEPTION OF THE FOLLOWING:-

UNITS 8 AND 9, ALL BEDROOMS SHOULD BE COMPRISE ONE LAYER OF 13 MM THICK (MINIMUM) STANDARD, OR 10 MM THICK SOUND RATED, PLASTERBOARD,

MINIMUM 50 MM THICK GLASSWOOL OR POLYESTER INSULATION IN ALL EXTERNAL WALL CAVITIES (MIN DENSITY 11 KG/M3).

CEILING AND ROOF SYSTEM

CONCRETE TILE OR METAL DECK ROOF WITH 10 MM THICK STANDARD PLASTERBOARD CEILING BELOW, AND MINIMUM 50 MM THICK GLASSWOOL INSULATION (MINIMUM 11 KG/M3) IN THE CEILING CAVITY WILL BE ACCEPTABLE.

LEGEND

DCP PRESCRIBED LANDSCAPING

DCP PRESCRIBED DEEP SOIL PLANTING ZONE

DCP PRESCRIBED 4mx5m PRIVATE OPEN SPACE

MISC. LANDSCAPING NOT INCLUDED IN CALCULATIONS

TPZ ENCROACHMENT

DCP PRESCRIBED STORAGE

EXISTING TREES TO BE REMOVED SHOWN DOTTED

EXISTING STRUCTURE TO BE REMOVED SHOWN DOTTED

EXISTING STRUCTURE TO BE RETAINED

PROPOSED WORKS

AREA SCHEDULE					
TH Number	Groundfloor (m²)	Level 1 (m²)	Total (m²)	External GF (m²)	External L1 (m²)
TH 1	47	69.5	116.5	43.78	1.9
TH 2	46	69.5	115.5	42.31	0
TH 3	46	69.5	115.5	41.98	0
TH 4	47	69.5	116.5	56.91	0
TH 5	47	69.5	116.5	46.34	0
TH 6	46	69.5	115.5	44.91	0
TH 7	46	69.5	115.5	43.9	0
TH 8	45	69.5	114.5	55.91	1.9
TH 9	70.5	50	120.5	61.54	7.6
TH 10	49.5	64	113.5	78.05	11.6
TH 11	70	54	124	76.27	13.9
TH 12	46.5	71	117.5	86	15.2
		Total (m²) :	1401.5		
		Site (m²) :	2939.9		

	Groundfloor (m²)	Level 1 (m²)	Total (m²)
GFA	656.43	809.21	1465.64
		FSR :	0.498533964
Landscaping Total		Total (m²) :	946.65
		% of Total Site	32.20007483
Deepsoil		Total (m²) :	195.86
		% of Total Landscaping	20.68980088
		% of Total Site	6.662131365
		More than 6m width through rear of site	
Landscape behind building line			539.12
		% Site	18.33803871
		% of land scape	56.95029842
Car Parking Resident		@2.0 per + 110sqm dwelling	24
Car Parking Visitor		@0.2 per dwelling	2.4
Total Required			26.4
		Total Provision	
		Resident	12
		Visitor	3
Bike Parking Resident		@1 per 3 dwellings	6
Bike Parking Visitor		@1 per 12 dwellings	2
Communal Open Space		@5m2 per dwelling	60m2

Storage						
TH Number	GF (m²)	L1 (m²)	Total (m²)	GF (m³)	L1 (m³)	Total (m³)
TH 1	0.90	4.10	5	1.00	9.84	10.84
TH 2	0.90	4.10	5	1.00	9.84	10.84
TH 3	0.90	4.10	5	1.00	9.84	10.84
TH 4	0.90	4.10	5	1.00	9.84	10.84
TH 5	0.90	4.10	5	1.00	9.84	10.84
TH 6	0.90	4.10	5	1.00	9.84	10.84
TH 7	0.90	4.10	5	1.00	9.84	10.84
TH 8	0.90	4.10	5	1.00	9.84	10.84
TH 9	1.86	2.70	4.56	4.46	6.48	10.94
TH 10	3.86	1.54	5.4	9.26	3.70	12.96
TH 11	2.65	2.39	5.04	7.91	5.74	13.65
TH 12	2.65	2.40	5.05	4.62	5.76	10.38

D/A

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PROJECT
RESIDENTIAL DEVELOPMENT
481 - 485 PRINCES HIGHWAY WOONONA NSW 2517
FOR
EMERALD PARK ESTATE PTY. LTD.

REVISION

NO.	DATE	AMENDMENT	NO.	DATE	AMENDMENT
01	04.03.20	ISSUED TO CONSULTANTS			
02	23.03.20	ISSUED TO CONSULTANTS			
03	01.04.20	ISSUED TO CONSULTANTS			
04	09.04.20	ISSUED TO CONSULTANTS			
05	17.04.20	PARK ACCESS, BRICK PIER & NOTATION TO REPLACE FENCE ADDED			
A	01.05.20	ISSUED FOR DA			
B	12.08.20	REVISED TO COMMENTS FROM COUNCIL			
C	06.11.20	REVISED AS CLOUDED			
D	11.11.20	REVISED AS CLOUDED			

DRAWING NAME
GROUND FLOOR PLAN O/A

PROJECT NUMBER 20105
SCALE 1:200 @ A1, 1:400 @ A3
NORTH N
DRAWING NUMBER AR 0101
REVISION D

BASIX NOTES

WATER
(NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

FIXTURES
ALL SHOWERHEADS - MINIMUM 3 STAR (>7.5 BUT <= 9L/MIN) WATER RATING
ALL TOILETS - MINIMUM 4 STAR WATER RATING
ALL KITCHEN TAPS - MINIMUM 4 STAR WATER RATING
ALL BATHROOM TAPS - MINIMUM 5 STAR WATER RATING

ALTERNATIVE WATER SOURCE - RAINWATER TANK
THE RAINWATER TANKS MUST MEET, AND BE INSTALLED IN ACCORDANCE WITH, THE REQUIREMENTS OF ALL APPLICABLE REGULATORY AUTHORITIES
TOWNHOUSE 1 TO 8
A 1500 LITRE (MIN) WATER TANK CONFIGURED TO COLLECT RUN-OFF FROM 50M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO: AT LEAST ONE OUTDOOR TAP
TOWNHOUSE 9 TO 12
A 2000 LITRE (MIN) WATER TANK CONFIGURED TO COLLECT RUN-OFF FROM 50M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO: AT LEAST ONE OUTDOOR TAP & ALL TOILETS

ENERGY
(NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

HOT WATER
GAS INSTANTANEOUS 5 STAR ENERGY RATING
HEATING
THE LIVING AREAS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM
COOLING
THE LIVING AREAS MUST NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM
VENTILATION
THE FOLLOWING EXHAUST SYSTEMS MUST BE INSTALLED FOR EACH DWELLING:

BATHROOMS - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF

KITCHEN - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF

LAUNDRY - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF
LIGHTING
THE PRIMARY TYPE OF ARTIFICIAL LIGHTING MUST BE LIGHT EMITTING DIODE (LED) LIGHTING IN ALL ROOMS.
ALTERNATE ENERGY
A PHOTOVOLTAIC SYSTEM WITH THE CAPACITY TO GENERATE AT LEAST 1.4 PEAK KILOWATTS OF ELECTRICITY MUST BE INSTALLED FOR TOWNHOUSE 9, 10, 11 AND 12. THE SYSTEM MUST BE CONNECTED TO THE DEVELOPMENT'S ELECTRICAL SYSTEM. A PHOTOVOLTAIC SYSTEM IS NOT REQUIRED FOR ALL OTHER TOWNHOUSES
OTHER
A GAS COOKTOP & ELECTRIC OVEN MUST BE INSTALLED IN EACH KITCHEN

A FIXED OUTDOOR CLOTHES DRYING LINE MUST BE INSTALLED FOR EACH TOWNHOUSE

GLAZING

TOWNHOUSE 1 AND 8
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-005-03 A DEFAULTS
U-VALUE 4.10 (NOTE: </= U-VALUE)
SHGC 0.47 (NOTE: WITHIN 10% OF SHGC)
GLASS - ARGON FILL, HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-005 GROUP A DG ARGON FILL
ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-006-03 A DEFAULTS
U-VALUE 4.1 (NOTE: </= U-VALUE)
SHGC 0.52 (NOTE: WITHIN 10% OF SHGC)
GLASS - ARGON FILL, HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-006 GROUP B DG ARGON FILL

TOWNHOUSE 2, 3, 4, 5, 6, 7 AND 12
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-01 A DEFAULTS
U-VALUE 6.70 (NOTE: </= U-VALUE)
SHGC 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-01 A DEFAULTS
U-VALUE 6.70 (OR LESS THAN)
SHGC 0.70 (+ OR - 10%)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-002 GROUP B SG

TOWNHOUSE 9 AND 11
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.49 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.58 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-002 GROUP B SG

TOWNHOUSE 10
ALL BEDROOM, ENSUITE, BATH, L'DRY AND P'DER AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-01 A DEFAULTS
U-VALUE 6.70 (NOTE: </= U-VALUE)
SHGC 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL BEDROOM, ENSUITE, BATH, L'DRY AND P'DER FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-01 A DEFAULTS
U-VALUE 6.70 (OR LESS THAN)
SHGC 0.70 (+ OR - 10%)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-002 GROUP B SG
ALL OTHER AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.49 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL OTHER FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.58 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-002 GROUP B SG

INSULATION
(NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE)

EXTERNAL WALLS:
WALLS BETWEEN GARAGES - R4.0
WALLS BETWEEN TOWNHOUSES - R4.0
GARAGE FRONT WALL - NO INSULATION REQUIRED
ALL OTHER EXTERNAL WALLS - R2.7
INTERNAL WALLS:
WALLS BETWEEN GARAGE AND DWELLING - R2.7
TOWNHOUSE 10 - WALL BETWEEN L'DRY AND KITCHEN - R2.7
TOWNHOUSE 10 - WALLS BETWEEN P'DER AND KITCHEN/LIVING/DINING/STAIR - R2.7
ALL OTHER INTERNAL WALLS - NO INSULATION REQUIRED
EXTERNAL FLOORS (GROUND FLOOR) :
TOWNHOUSE 11 - GROUND FLOOR - WAFFLE POD SLAB
ALL OTHER GROUND FLOOR FLOORS - NO INSULATION REQUIRED
INTERNAL CEILINGS/FLOORS
ALL INTERNAL CEILINGS/FLOORS ABOVE GARAGES - R5.0
ALL OTHER INTERNAL CEILINGS/FLOORS - NO INSULATION REQUIRED
EXTERNAL CEILINGS:
TOWNHOUSE 8 - ALL EXTERNAL CEILINGS (I.E BELOW ROOF) - R6.0
ALL OTHER TOWNHOUSES - ALL EXTERNAL CEILINGS (I.E BELOW ROOF) - R5.0

ROOF:
METAL ROOF (TIMBER FRAME CONSTRUCTION) - R1.0 BULK, REFLECTIVE SIDE DOWN (ANTICON/PERMASTOP OR SIMILAR) (NOTE - R5.0 CEILING INSULATION REQUIRED)
DECK FORMING ROOF OVER GROUND FLOOR - NO INSULATION REQUIRED (NOTE - R5.0 CEILING INSULATION REQUIRED)
TILED ROOF - NO INSULATION REQUIRED (NOTE - R5.0 CEILING INSULATION REQUIRED)

GENERAL NOTES

WEATHERSEALS REQUIRED TO ALL EXTERNAL DOORS INCLUDING INTERNAL ACCESS TO GARAGE

INSULATION MUST BE INSTALLED IN ACCORDANCE WITH NCC AND RELEVANT AUSTRALIAN STANDARDS

THE NUMBER OF DOWNLIGHTS THAT HAVE BEEN INPUT TO THE NATHERS THERMAL COMFORT ASSESSMENT TO MODEL CEILING INSULATION LOSS IS AS PER JACK TAYLOR ARCHITECTS MARK-UP DATED 08.04.2020 (TO BE SEALED LED DOWNLIGHTS).

ONE SEALED EXHAUST FAN HAS BEEN INPUT FOR EACH KITCHEN, BATHROOM, LAUNDRY, ENSUITE, P'DER AND WC.

ACOUSTIC NOTES:
Glazing other than those specified in Table 2 may be of standard thickness with a minimum Rw 25.

Table 2 Recommended Window Schedule – Residential Units

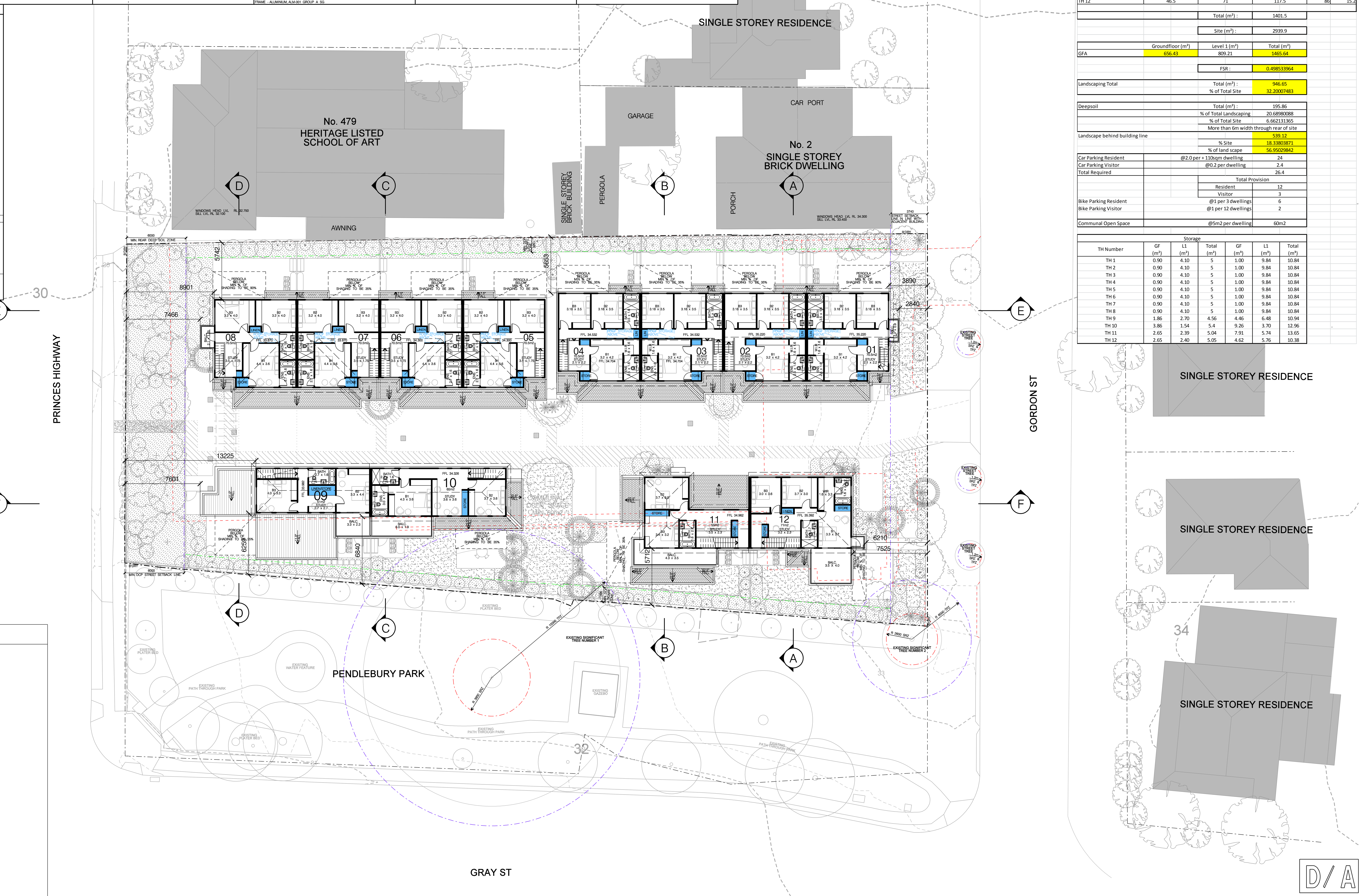
Block / Unit / Glazing	Min R_w	Example Glazing Specification
Unit 8		
Living / Dining / Kitchen (all)	**32**	6.38 mm laminated glass
Bedrooms (all)	**29**	5 mm float glass
Unit 9		
Living / Dining / Kitchen (all)	**32**	6.38 mm laminated glass
Bedroom (all)	**32**	6.38 mm laminated glass
Unit 7		
Living / Dining (all)	**32**	6.38 mm laminated glass
Bedrooms (all)	**29**	5 mm float glass
Unit 10		
Living / Dining / Kitchen (all)	**29**	5 mm float glass
Bedrooms (all)	**29**	5 mm float glass
Units 1, 2, 3, 4, 5, 6, 11 & 12		
Living / Dining / Kitchen (all)	**29**	5 mm float glass

All windows and glazed doors in Table 2 should be fitted with acoustic seals comprising foam weather seals (e.g. Q-Lon from Schlegel or similar).

RECOMMENDED CONSTRUCTION

WALLS
EXTERNAL WALLS OF BRICK VENEER OR OTHER MASONRY CONSTRUCTION WILL BE ACCEPTABLE, AND
CEMENT COMPOSITE EXTERNAL CLADDING, FOR EXAMPLE HARDIES 'SCYON', 'LINEA', 'STRIA', OR CSR 'CEMENTAL' OR APPROVED EQUIVALENT WITH SIMILAR MINIMUM MASS (MIN 13 KG/M2):-
INTERNAL PLASTERBOARD WALL LINING MAY BE OF 10 MM THICK (MINIMUM) STANDARD PLASTERBOARD CONSTRUCTION WITH THE EXCEPTION OF THE FOLLOWING:-
UNITS 8 AND 9, ALL BEDROOMS SHOULD BE COMPRISE ONE LAYER OF 13 MM THICK (MINIMUM) STANDARD, OR 10 MM THICK SOUND RATED, PLASTERBOARD,
MINIMUM 50 MM THICK GLASSWOOL OR POLYESTER INSULATION IN ALL EXTERNAL WALL CAVITIES (MIN DENSITY 11 KG/M3).

CEILING AND ROOF SYSTEM
CONCRETE TILE OR METAL DECK ROOF WITH 10 MM THICK STANDARD PLASTERBOARD CEILING BELOW, AND MINIMUM 50 MM THICK GLASSWOOL INSULATION (MINIMUM 11 KG/M3) IN THE CEILING CAVITY WILL BE ACCEPTABLE.



AREA SCHEDULE

TH Number	Groundfloor (m²)	Level 1 (m²)	Total (m²)	External GF (m²)	External L1 (m²)
TH 1	47	69.5	116.5	43.78	1.9
TH 2	46	69.5	115.5	42.31	0
TH 3	46	69.5	115.5	41.98	0
TH 4	47	69.5	116.5	56.91	0
TH 5	47	69.5	116.5	46.34	0
TH 6	46	69.5	115.5	44.91	0
TH 7	46	69.5	115.5	43.9	0
TH 8	45	69.5	114.5	55.91	1.9
TH 9	70.5	50	120.5	61.54	7.6
TH 10	49.5	64	113.5	78.05	11.6
TH 11	70	54	124	76.27	13.9
TH 12	46.5	71	117.5	86	15.2
		Total (m²) :	1401.5		
		Site (m²) :	2939.9		

	Groundfloor (m²)	Level 1 (m²)	Total (m²)
GFA	656.43	809.21	1465.64
		FSR :	0.498533964

Landscaping Total	Total (m²) :	946.65
	% of Total Site	32.20007483
Deepsoil	Total (m²) :	195.86
	% of Total Landscaping	20.68980088
	% of Total Site	6.662131365
	More than 6m width through rear of site	
Landscape behind building line		539.12
	% Site	18.33803871
	% of land scape	56.95029842
Car Parking Resident	@2.0 per + 110sqm dwelling	24
Car Parking Visitor	@0.2 per dwelling	2.4
Total Required		26.4
	Total Provision	
	Resident	12
	Visitor	3
Bike Parking Resident	@1 per 3 dwellings	6
Bike Parking Visitor	@1 per 12 dwellings	2
Communal Open Space	@5m2 per dwelling	60m2

Storage

TH Number	GF (m²)	L1 (m²)	Total (m²)	GF (m³)	L1 (m³)	Total (m³)
TH 1	0.90	4.10	5	1.00	9.84	10.84
TH 2	0.90	4.10	5	1.00	9.84	10.84
TH 3	0.90	4.10	5	1.00	9.84	10.84
TH 4	0.90	4.10	5	1.00	9.84	10.84
TH 5	0.90	4.10	5	1.00	9.84	10.84
TH 6	0.90	4.10	5	1.00	9.84	10.84
TH 7	0.90	4.10	5	1.00	9.84	10.84
TH 8	0.90	4.10	5	1.00	9.84	10.84
TH 9	1.86	2.70	4.56	4.46	6.48	10.94
TH 10	3.86	1.54	5.4	9.26	3.70	12.96
TH 11	2.65	2.39	5.04	7.91	5.74	13.65
TH 12	2.65	2.40	5.05	4.62	5.76	10.38

LEGEND

- DCP PRESCRIBED LANDSCAPING
- DCP PRESCRIBED DEEP SOIL PLANTING ZONE
- DCP PRESCRIBED 4mx5m PRIVATE OPEN SPACE
- MISC. LANDSCAPING NOT INCLUDED IN CALCULATIONS
- TPZ ENCROACHMENT
- DCP PRESCRIBED STORAGE
- EXISTING TREES TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE RETAINED
- PROPOSED WORKS

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PROJECT
RESIDENTIAL DEVELOPMENT 481 - 485 PRINCES HIGHWAY WOONONA NSW 2517
FOR
EMERALD PARK ESTATE PTY. LTD.

REVISION

NO.	DATE	AMENDMENT	NO.	DATE	AMENDMENT
01	04.03.20	ISSUED TO CONSULTANTS			
02	23.03.20	ISSUED TO CONSULTANTS			
03	01.04.20	ISSUED TO CONSULTANTS			
04	09.04.20	ISSUED TO CONSULTANTS			
A	01.05.20	ISSUED FOR DA			
B	06.11.20	CO-ORDINATED WITH GROUND FLOOR REVISION			

DRAWING NAME
LEVEL 1 PLAN O/A

PROJECT NUMBER 20105
SCALE 1:200 @ A1, 1:400 @ A3
NORTH
DRAWING NUMBER AR 0102
REVISION B

BASIX NOTES

WATER
(NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

FIXTURES
ALL SHOWERHEADS - MINIMUM 3 STAR (>7.5 BUT <= 9L/MIN) WATER RATING
ALL TOILETS - MINIMUM 4 STAR WATER RATING
ALL KITCHEN TAPS - MINIMUM 4 STAR WATER RATING
ALL BATHROOM TAPS - MINIMUM 5 STAR WATER RATING

ALTERNATIVE WATER SOURCE - RAINWATER TANK
THE RAINWATER TANKS MUST MEET, AND BE INSTALLED IN ACCORDANCE WITH, THE REQUIREMENTS OF ALL APPLICABLE REGULATORY AUTHORITIES
TOWNHOUSE 1 TO 8
A 1500 LITRE (MIN) WATER TANK CONFIGURED TO COLLECT RUN-OFF FROM 50M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO: AT LEAST ONE OUTDOOR TAP
TOWNHOUSE 9 TO 12
A 2000 LITRE (MIN) WATER TANK CONFIGURED TO COLLECT RUN-OFF FROM 50M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO: AT LEAST ONE OUTDOOR TAP & ALL TOILETS

ENERGY
(NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

HOT WATER
GAS INSTANTANEOUS 5 STAR ENERGY RATING

HEATING
THE LIVING AREAS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM

COOLING
THE LIVING AREAS MUST NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM

VENTILATION
THE FOLLOWING EXHAUST SYSTEMS MUST BE INSTALLED FOR EACH DWELLING:
BATHROOMS - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF
KITCHEN - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF
LAUNDRY - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF

LIGHTING
THE PRIMARY TYPE OF ARTIFICIAL LIGHTING MUST BE LIGHT EMITTING DIODE (LED) LIGHTING IN ALL ROOMS.

ALTERNATE ENERGY
A PHOTOVOLTAIC SYSTEM WITH THE CAPACITY TO GENERATE AT LEAST 1.4 PEAK KILOWATTS OF ELECTRICITY MUST BE INSTALLED FOR TOWNHOUSE 9, 10, 11 AND 12. THE SYSTEM MUST BE CONNECTED TO THE DEVELOPMENT'S ELECTRICAL SYSTEM. A PHOTOVOLTAIC SYSTEM IS NOT REQUIRED FOR ALL OTHER TOWNHOUSES

OTHER
A GAS COOKTOP & ELECTRIC OVEN MUST BE INSTALLED IN EACH KITCHEN
A FIXED OUTDOOR CLOTHES DRYING LINE MUST BE INSTALLED FOR EACH TOWNHOUSE

GLAZING

TOWNHOUSE 1 AND 8
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-005-03 A DEFAULTS
U-VALUE 4.10 (NOTE: </= U-VALUE)
SHGC 0.47 (NOTE: WITHIN 10% OF SHGC)
GLASS - ARGON FILL, HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-005 GROUP A DG ARGON FILL
ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-006-03 A DEFAULTS
U-VALUE 4.1 (NOTE: </= U-VALUE)
SHGC 0.52 (NOTE: WITHIN 10% OF SHGC)
GLASS - ARGON FILL, HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-006 GROUP B DG ARGON FILL

TOWNHOUSE 2, 3, 4, 5, 6, 7 AND 12
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-01 A DEFAULTS
U-VALUE 6.70 (NOTE: </= U-VALUE)
SHGC 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-01 A DEFAULTS
U-VALUE 6.70 (OR LESS THAN)
SHGC 0.70 (+ OR - 10%)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-002 GROUP B SG

TOWNHOUSE 9 AND 11
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.49 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.58 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-002 GROUP B SG

TOWNHOUSE 10
ALL BEDROOM, ENSUITE, BATH, L'DRY AND P'DER AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-01 A DEFAULTS
U-VALUE 6.70 (NOTE: </= U-VALUE)
SHGC 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL BEDROOM, ENSUITE, BATH, L'DRY AND P'DER FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-01 A DEFAULTS
U-VALUE 6.70 (OR LESS THAN)
SHGC 0.70 (+ OR - 10%)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-002 GROUP B SG
ALL OTHER AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-03 A DEFAULTS
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U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.58 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-002 GROUP B SG

INSULATION
(NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE)

EXTERNAL WALLS:
WALLS BETWEEN GARAGES - R4.0
WALLS BETWEEN TOWNHOUSES - R4.0
GARAGE FRONT WALL - NO INSULATION REQUIRED
ALL OTHER EXTERNAL WALLS - R2.7

INTERNAL WALLS:
WALLS BETWEEN GARAGE AND DWELLING - R2.7
TOWNHOUSE 10 - WALL BETWEEN L'DRY AND KITCHEN - R2.7
TOWNHOUSE 10 - WALLS BETWEEN P'DER AND KITCHEN/LIVING/DINING/STAIR - R2.7
ALL OTHER INTERNAL WALLS - NO INSULATION REQUIRED

EXTERNAL FLOORS (GROUND FLOOR) :
TOWNHOUSE 11 - GROUND FLOOR - WAFFLE POD SLAB
ALL OTHER GROUND FLOOR FLOORS - NO INSULATION REQUIRED

INTERNAL CEILINGS/FLOORS
ALL INTERNAL CEILINGS/FLOORS ABOVE GARAGES - R5.0
ALL OTHER INTERNAL CEILINGS/FLOORS - NO INSULATION REQUIRED

EXTERNAL CEILINGS:
TOWNHOUSE 8 - ALL EXTERNAL CEILINGS (I.E BELOW ROOF) - R6.0
ALL OTHER TOWNHOUSES - ALL EXTERNAL CEILINGS (I.E BELOW ROOF) - R5.0

ROOF:
METAL ROOF (TIMBER FRAME CONSTRUCTION) - R1.0 BULK, REFLECTIVE SIDE DOWN (ANTICON/PERMASTOP OR SIMILAR) (NOTE - R5.0 CEILING INSULATION REQUIRED)
DECK FORMING ROOF OVER GROUND FLOOR - NO INSULATION REQUIRED (NOTE - R5.0 CEILING INSULATION REQUIRED)
TILED ROOF - NO INSULATION REQUIRED (NOTE - R5.0 CEILING INSULATION REQUIRED)

GENERAL NOTES
WEATHERSEALS REQUIRED TO ALL EXTERNAL DOORS INCLUDING INTERNAL ACCESS TO GARAGE

INSULATION MUST BE INSTALLED IN ACCORDANCE WITH NCC AND RELEVANT AUSTRALIAN STANDARDS

THE NUMBER OF DOWNLIGHTS THAT HAVE BEEN INPUT TO THE NATHERS THERMAL COMFORT ASSESSMENT TO MODEL CEILING INSULATION LOSS IS AS PER JACK TAYLOR ARCHITECTS MARK-UP DATED 08.04.2020 (TO BE SEALED LED DOWNLIGHTS).

ONE SEALED EXHAUST FAN HAS BEEN INPUT FOR EACH KITCHEN, BATHROOM, LAUNDRY, ENSUITE, P'DER AND WC.

ACOUSTIC NOTES:
Glazing other than those specified in Table 2 may be of standard thickness with a minimum Rw 25.

Table 2 Recommended Window Schedule – Residential Units

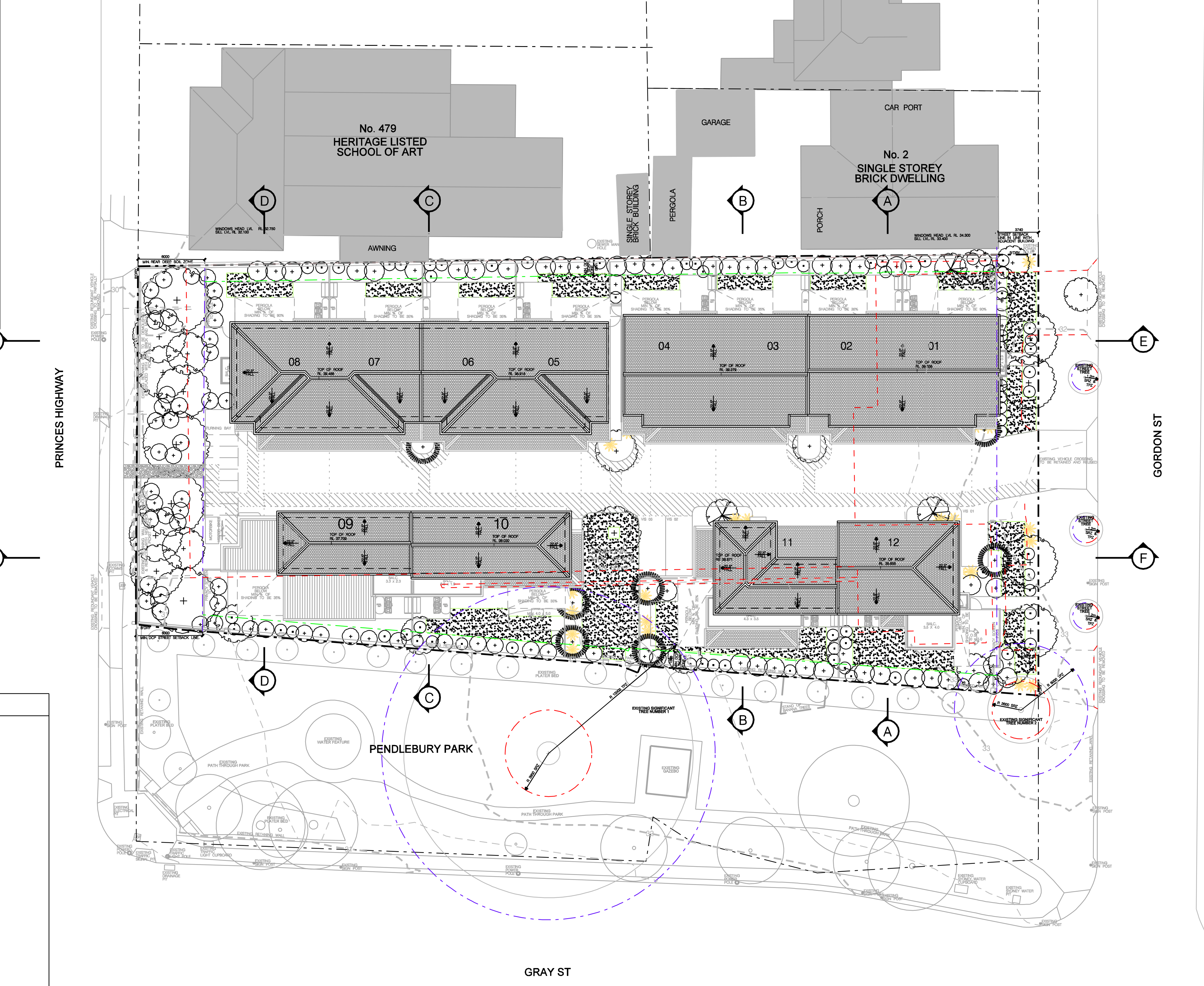
Block / Unit / Glazing	Min R_w	Example Glazing Specification
Unit 8		
Living / Dining / Kitchen (all)	**32**	6.38 mm laminated glass
Bedrooms (all)	**29**	5 mm float glass
Unit 9		
Living / Dining / Kitchen (all)	**32**	6.38 mm laminated glass
Bedroom (all)	**32**	6.38 mm laminated glass
Unit 7		
Living / Dining (all)	**32**	6.38 mm laminated glass
Bedrooms (all)	**29**	5 mm float glass
Unit 10		
Living / Dining / Kitchen (all)	**29**	5 mm float glass
Bedrooms (all)	**29**	5 mm float glass
Units 1, 2, 3, 4, 5, 6, 11 & 12		
Living / Dining / Kitchen (all)	**29**	5 mm float glass

All windows and glazed doors in Table 2 should be fitted with acoustic seals comprising foam weather seals (e.g. Q-Lon from Schlegel or similar).

RECOMMENDED CONSTRUCTION

WALLS
EXTERNAL WALLS OF BRICK VENEER OR OTHER MASONRY CONSTRUCTION WILL BE ACCEPTABLE, AND CEMENT COMPOSITE EXTERNAL CLADDING, FOR EXAMPLE HARDIES 'SCYON', 'LINEA', 'STRIA' OR CSR 'CEMENTAL' OR APPROVED EQUIVALENT WITH SIMILAR MINIMUM MASS (MIN 13 KG/M2):-
INTERNAL PLASTERBOARD WALL LINING MAY BE OF 10 MM THICK (MINIMUM) STANDARD PLASTERBOARD CONSTRUCTION WITH THE EXCEPTION OF THE FOLLOWING:-
UNITS 8 AND 9, ALL BEDROOMS SHOULD BE COMPRISE ONE LAYER OF 13 MM THICK (MINIMUM) STANDARD, OR 10 MM THICK SOUND RATED, PLASTERBOARD,
MINIMUM 50 MM THICK GLASSWOOL OR POLYESTER INSULATION IN ALL EXTERNAL WALL CAVITIES (MIN DENSITY 11 KG/M3).

CEILING AND ROOF SYSTEM
CONCRETE TILE OR METAL DECK ROOF WITH 10 MM THICK STANDARD PLASTERBOARD CEILING BELOW, AND MINIMUM 50 MM THICK GLASSWOOL INSULATION (MINIMUM 11 KG/M3) IN THE CEILING CAVITY WILL BE ACCEPTABLE.



AREA SCHEDULE

TH Number	Groundfloor (m²)	Level 1 (m²)	Total (m²)	External GF (m²)	External L1 (m²)
TH 1	47	69.5	116.5	43.78	1.9
TH 2	46	69.5	115.5	42.31	0
TH 3	46	69.5	115.5	41.98	0
TH 4	47	69.5	116.5	56.91	0
TH 5	47	69.5	116.5	46.34	0
TH 6	46	69.5	115.5	44.91	0
TH 7	46	69.5	115.5	43.9	0
TH 8	45	69.5	114.5	55.91	1.9
TH 9	70.5	50	120.5	61.54	7.6
TH 10	49.5	64	113.5	78.05	11.6
TH 11	70	54	124	76.27	13.9
TH 12	46.5	71	117.5	86	15.2

	Total (m²) :	1401.5
	Site (m²) :	2939.9

	Groundfloor (m²)	Level 1 (m²)	Total (m²)
GFA	657.71	809.21	1466.92
		FSR :	0.498969353

Landscaping Total	Total (m²) :	955.35
	% of Total Site	32.49600327
Deepsoil	Total (m²) :	195.86
	% of Total Landscaping	20.50138693
	% of Total Site	6.662131365
	More than 6m width through rear of site	
Landscape behind building line		543.63
	% Site	18.49144529
	% of land scape	56.90375255
Car Parking Resident	@2.0 per + 110sqm dwelling	24
Car Parking Visitor	@0.2 per dwelling	2.4
Total Required		26.4
	Total Provision	
	Resident	12
	Visitor	3
Bike Parking Resident	@1 per 3 dwellings	6
Bike Parking Visitor	@1 per 12 dwellings	2
Communal Open Space	@5m2 per dwelling	60m2

Storage

TH Number	GF (m²)	L1 (m²)	Total (m²)	GF (m³)	L1 (m³)	Total (m³)
TH 1	0.90	4.10	5	1.00	9.84	10.84
TH 2	0.90	4.10	5	1.00	9.84	10.84
TH 3	0.90	4.10	5	1.00	9.84	10.84
TH 4	0.90	4.10	5	1.00	9.84	10.84
TH 5	0.90	4.10	5	1.00	9.84	10.84
TH 6	0.90	4.10	5	1.00	9.84	10.84
TH 7	0.90	4.10	5	1.00	9.84	10.84
TH 8	0.90	4.10	5	1.00	9.84	10.84
TH 9	1.86	2.70	4.56	4.46	6.48	10.94
TH 10	3.86	1.54	5.4	9.26	3.70	12.96
TH 11	2.65	2.39	5.04	7.91	5.74	13.65
TH 12	2.65	2.40	5.05	4.62	5.76	10.38

LEGEND
- DCP PRESCRIBED LANDSCAPING
- DCP PRESCRIBED DEEP SOIL PLANTING ZONE
- DCP PRESCRIBED 4mx5m PRIVATE OPEN SPACE
- MISC. LANDSCAPING NOT INCLUDED IN CALCULATIONS
- TPZ ENCROACHMENT
- DCP PRESCRIBED STORAGE
- EXISTING TREES TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE RETAINED
- PROPOSED WORKS

D/ A

ARCHITECT
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PROJECT
RESIDENTIAL DEVELOPMENT 481 - 485 PRINCES HIGHWAY WOONONA NSW 2517
FOR
EMERALD PARK ESTATE PTY. LTD.

REVISION

NO.	DATE	AMENDMENT	NO.	DATE	AMENDMENT
01	04.03.20	ISSUED TO CONSULTANTS			
02	01.04.20	ISSUED TO CONSULTANTS			
03	09.04.20	ISSUED TO CONSULTANTS			
A	01.05.20	ISSUED FOR DA			
B	12.08.20	REVISED TO COMMENTS FROM COUNCIL			
C	06.11.20	CO-ORDINATED WITH GROUND FLOOR REVISION			

DRAWING NAME
ROOF PLAN O/A

PROJECT NUMBER 20105
SCALE 1:200 @ A1 1:400 @ A3
DRAWING NUMBER AR 0103
REVISION C
NORTH

AREA SCHEDULE					
TH Number	Groundfloor (m²)	Level 1 (m²)	Total (m²)	External GF (m²)	External L1 (m²)
TH 1	47	69.5	116.5	43.78	1.9
TH 2	46	69.5	115.5	42.31	0
TH 3	46	69.5	115.5	41.98	0
TH 4	47	69.5	116.5	56.91	0
TH 5	47	69.5	116.5	46.34	0
TH 6	46	69.5	115.5	44.91	0
TH 7	46	69.5	115.5	43.9	0
TH 8	45	69.5	114.5	55.91	1.9
TH 9	70.5	50	120.5	61.54	7.6
TH 10	49.5	64	113.5	78.05	11.6
TH 11	70	54	124	76.27	13.9
TH 12	46.5	71	117.5	86	15.2
		Total (m²) :	1401.5		
		Site (m²) :	2939.9		

	Groundfloor (m²)	Level 1 (m²)	Total (m²)
GFA	656.43	809.21	1465.64
		FSR :	0.498533964

Landscaping Total		Total (m²) :	946.65
		% of Total Site	32.20007483
Deepsoil		Total (m²) :	195.86
		% of Total Landscaping	20.68980088
		% of Total Site	6.662131365
		More than 6m width through rear of site	
Landscape behind building line			539.12
		% Site	18.33803871
		% of land scape	56.95029842
Car Parking Resident	@2.0 per + 110sqm dwelling		24
Car Parking Visitor		@0.2 per dwelling	2.4
Total Required			26.4
		Total Provision	
		Resident	12
		Visitor	3
Bike Parking Resident		@1 per 3 dwellings	6
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Communal Open Space		@5m2 per dwelling	60m2

Storage						
TH Number	GF (m²)	L1 (m²)	Total (m²)	GF (m³)	L1 (m³)	Total (m³)
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ACOUSTIC NOTES: Glazing other than those specified in Table 2 may be of standard thickness with a minimum Rw 25.

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All windows and glazed doors in Table 2 should be fitted with acoustic seals comprising foam weather seals (e.g. Q-Lon from Schlegel or similar).

RECOMMENDED CONSTRUCTION

WALLS

EXTERNAL WALLS OF BRICK VENEER OR OTHER MASONRY CONSTRUCTION WILL BE ACCEPTABLE, AND CEMENT COMPOSITE EXTERNAL CLADDING, FOR EXAMPLE HARDIES 'SCYON', 'LINEA', 'STRIA', OR CSR 'CEMENTAL' OR APPROVED EQUIVALENT WITH SIMILAR MINIMUM MASS (MIN 13 KG/M2):-

INTERNAL PLASTERBOARD WALL LINING MAY BE OF 10 MM THICK (MINIMUM) STANDARD PLASTERBOARD CONSTRUCTION WITH THE EXCEPTION OF THE FOLLOWING:-

UNITS 8 AND 9, ALL BEDROOMS SHOULD BE COMPRISE ONE LAYER OF 13 MM THICK (MINIMUM) STANDARD, OR 10 MM THICK SOUND RATED, PLASTERBOARD,

MINIMUM 50 MM THICK GLASSWOOL OR POLYESTER INSULATION IN ALL EXTERNAL WALL CAVITIES (MIN DENSITY 11 KG/M3).

CEILING AND ROOF SYSTEM

CONCRETE TILE OR METAL DECK ROOF WITH 10 MM THICK STANDARD PLASTERBOARD CEILING BELOW, AND MINIMUM 50 MM THICK GLASSWOOL INSULATION (MINIMUM 11 KG/M3) IN THE CEILING CAVITY WILL BE ACCEPTABLE.

LEGEND

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- EXISTING TREES TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE RETAINED
- PROPOSED WORKS

D/A

BASIX NOTES

WATER (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

FIXTURES
ALL SHOWERHEADS - MINIMUM 3 STAR (>7.5 BUT <= 9L/MIN) WATER RATING
ALL TOILETS - MINIMUM 4 STAR WATER RATING
ALL KITCHEN TAPS - MINIMUM 4 STAR WATER RATING
ALL BATHROOM TAPS - MINIMUM 5 STAR WATER RATING

ALTERNATIVE WATER SOURCE - RAINWATER TANK
THE RAINWATER TANKS MUST MEET, AND BE INSTALLED IN ACCORDANCE WITH, THE REQUIREMENTS OF ALL APPLICABLE REGULATORY AUTHORITIES
TOWNHOUSE 1 TO 8
A 1500 LITRE (MIN) WATER TANK CONFIGURED TO COLLECT RUN-OFF FROM 50M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO: AT LEAST ONE OUTDOOR TAP
TOWNHOUSE 9 TO 12
A 2000 LITRE (MIN) WATER TANK CONFIGURED TO COLLECT RUN-OFF FROM 50M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO: AT LEAST ONE OUTDOOR TAP & ALL TOILETS

ENERGY (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

HOT WATER
GAS INSTANTANEOUS 5 STAR ENERGY RATING
HEATING
THE LIVING AREAS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM
COOLING
THE LIVING AREAS MUST NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM
VENTILATION
THE FOLLOWING EXHAUST SYSTEMS MUST BE INSTALLED FOR EACH DWELLING:
BATHROOMS - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF
KITCHEN - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF
LAUNDRY - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF

LIGHTING
THE PRIMARY TYPE OF ARTIFICIAL LIGHTING MUST BE LIGHT EMITTING DIODE (LED) LIGHTING IN ALL ROOMS.
ALTERNATE ENERGY
A PHOTOVOLTAIC SYSTEM WITH THE CAPACITY TO GENERATE AT LEAST 1.4 PEAK KILOWATTS OF ELECTRICITY MUST BE INSTALLED FOR TOWNHOUSE 9, 10, 11 AND 12. THE SYSTEM MUST BE CONNECTED TO THE DEVELOPMENT'S ELECTRICAL SYSTEM. A PHOTOVOLTAIC SYSTEM IS NOT REQUIRED FOR ALL OTHER TOWNHOUSES
OTHER
A GAS COOKTOP & ELECTRIC OVEN MUST BE INSTALLED IN EACH KITCHEN
A FIXED OUTDOOR CLOTHES DRYING LINE MUST BE INSTALLED FOR EACH TOWNHOUSE

GLAZING

TOWNHOUSE 1 AND 8
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-005-03 A DEFAULTS
U-VALUE 4.10 (NOTE: </= U-VALUE)
SHGC 0.47 (NOTE: WITHIN 10% OF SHGC)
GLASS - ARGON FILL, HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-005 GROUP A DG ARGON FILL
ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-006-03 A DEFAULTS
U-VALUE 4.1 (NOTE: </= U-VALUE)
SHGC 0.52 (NOTE: WITHIN 10% OF SHGC)
GLASS - ARGON FILL, HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-006 GROUP B DG ARGON FILL

TOWNHOUSE 2, 3, 4, 5, 6, 7 AND 12
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-01 A DEFAULTS
U-VALUE 6.70 (NOTE: </= U-VALUE)
SHGC 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-01 A DEFAULTS
U-VALUE 6.70 (OR LESS THAN)
SHGC 0.70 (+ OR - 10%)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-002 GROUP B SG

TOWNHOUSE 9 AND 11
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.49 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.58 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-002 GROUP B SG

TOWNHOUSE 10
ALL BEDROOM, ENSUITE, BATH, L'DRY AND P'DER AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-01 A DEFAULTS
U-VALUE 6.70 (NOTE: </= U-VALUE)
SHGC 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL BEDROOM, ENSUITE, BATH, L'DRY AND P'DER FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-01 A DEFAULTS
U-VALUE 6.70 (OR LESS THAN)
SHGC 0.70 (+ OR - 10%)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-002 GROUP B SG
ALL OTHER AWNING WINDOWS AND GLAZED HINGED DOORS
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SHGC 0.58 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-002 GROUP B SG

INSULATION (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE)

EXTERNAL WALLS:
WALLS BETWEEN GARAGES - R4.0
WALLS BETWEEN TOWNHOUSES - R4.0
GARAGE FRONT WALL - NO INSULATION REQUIRED
ALL OTHER EXTERNAL WALLS - R2.7
INTERNAL WALLS:
WALLS BETWEEN GARAGE AND DWELLING - R2.7
TOWNHOUSE 10 - WALL BETWEEN L'DRY AND KITCHEN - R2.7
TOWNHOUSE 10 - WALLS BETWEEN P'DER AND KITCHEN/LIVING/DINING/STAIR - R2.7
ALL OTHER INTERNAL WALLS - NO INSULATION REQUIRED
EXTERNAL FLOORS (GROUND FLOOR) :
TOWNHOUSE 11 - GROUND FLOOR - WAFFLE POD SLAB
ALL OTHER GROUND FLOOR FLOORS - NO INSULATION REQUIRED
INTERNAL CEILINGS/FLOORS
ALL INTERNAL CEILINGS/FLOORS ABOVE GARAGES - R5.0
ALL OTHER INTERNAL CEILINGS/FLOORS - NO INSULATION REQUIRED
EXTERNAL CEILINGS:
TOWNHOUSE 8 - ALL EXTERNAL CEILINGS (I.E BELOW ROOF) - R6.0
ALL OTHER TOWNHOUSES - ALL EXTERNAL CEILINGS (I.E BELOW ROOF) - R5.0

ROOF:
METAL ROOF (TIMBER FRAME CONSTRUCTION) - R1.0 BULK, REFLECTIVE SIDE DOWN (ANTICON/PERMASTOP OR SIMILAR) (NOTE - R5.0 CEILING INSULATION REQUIRED)
DECK FORMING ROOF OVER GROUND FLOOR - NO INSULATION REQUIRED (NOTE - R5.0 CEILING INSULATION REQUIRED)
TILED ROOF - NO INSULATION REQUIRED (NOTE - R5.0 CEILING INSULATION REQUIRED)

GENERAL NOTES

WEATHERSEALS REQUIRED TO ALL EXTERNAL DOORS INCLUDING INTERNAL ACCESS TO GARAGE

INSULATION MUST BE INSTALLED IN ACCORDANCE WITH NCC AND RELEVANT AUSTRALIAN STANDARDS

THE NUMBER OF DOWNLIGHTS THAT HAVE BEEN INPUT TO THE NATHERS THERMAL COMFORT ASSESSMENT TO MODEL CEILING INSULATION LOSS IS AS PER JACK TAYLOR ARCHITECTS MARK-UP DATED 08.04.2020 (TO BE SEALED LED DOWNLIGHTS).

ONE SEALED EXHAUST FAN HAS BEEN INPUT FOR EACH KITCHEN, BATHROOM, LAUNDRY, ENSUITE, P'DER AND WC.

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PROJECT
RESIDENTIAL DEVELOPMENT
481 - 485 PRINCES HIGHWAY
WOONONA NSW 2517

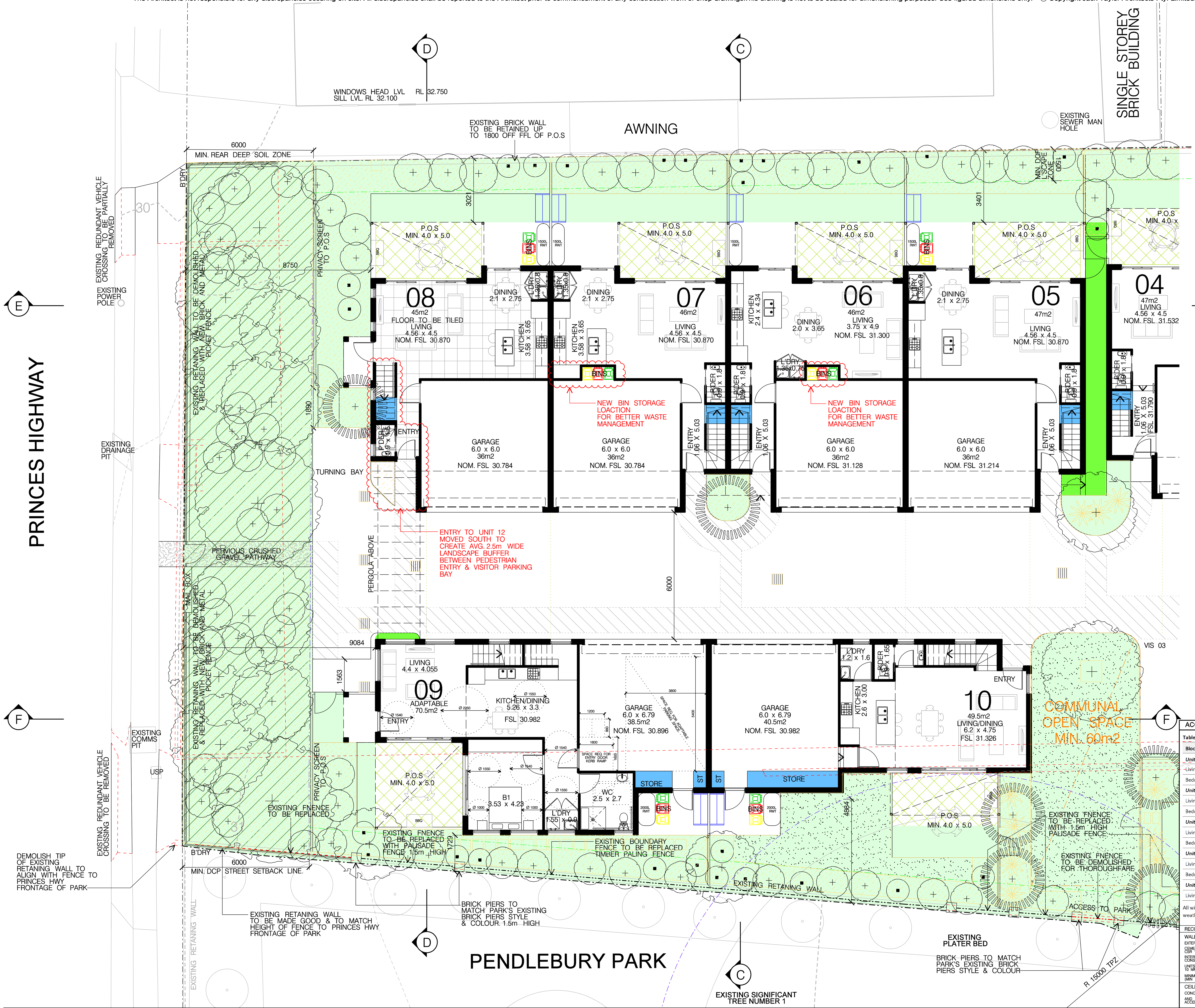
FOR
EMERALD PARK ESTATE PTY. LTD.

REVISION

NO.	DATE	AMENDMENT	NO.	DATE	AMENDMENT
01	09.04.20	ISSUED TO CONSULTANTS			
02	17.04.20	PARK ACCESS, BRICK PIER & NOTATION TO REPLACE FENCE ADDED			
A	01.05.20	ISSUED FOR DA			
B	12.08.20	REVISED TO COMMENTS FROM COUNCIL			
C	06.11.20	REVISED AS CLOUDED			

DRAWING NAME
GROUND FLOOR PLAN EAST

PROJECT NUMBER 20105
SCALE 1:100 @ A1, 1:200 @ A3
DRAWING NUMBER AR 0151
REVISION C
NORTH N



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	% of land scape	56.95029842
Car Parking Resident	@2.0 per + 110sqm dwelling	24
Car Parking Visitor	@0.2 per dwelling	2.4
Total Required		26.4
	Total Provision	
	Resident	12
	Visitor	3
Bike Parking Resident	@1 per 3 dwellings	6
Bike Parking Visitor	@1 per 12 dwellings	2
Communal Open Space	@5m2 per dwelling	60m2

Storage						
TH Number	GF (m²)	L1 (m²)	Total (m²)	GF (m³)	L1 (m³)	Total (m³)
TH 1	0.90	4.10	5	1.00	9.84	10.84
TH 2	0.90	4.10	5	1.00	9.84	10.84
TH 3	0.90	4.10	5	1.00	9.84	10.84
TH 4	0.90	4.10	5	1.00	9.84	10.84
TH 5	0.90	4.10	5	1.00	9.84	10.84
TH 6	0.90	4.10	5	1.00	9.84	10.84
TH 7	0.90	4.10	5	1.00	9.84	10.84
TH 8	0.90	4.10	5	1.00	9.84	10.84
TH 9	1.86	2.70	4.56	4.46	6.48	10.94
TH 10	3.86	1.54	5.4	9.26	3.70	12.96
TH 11	2.65	2.39	5.04	7.91	5.74	13.65
TH 12	2.65	2.40	5.05	4.62	5.76	10.38

ACOUSTIC NOTES:
Glazing other than those specified in Table 2 may be of standard thickness with a minimum Rw 25.

Table 2 Recommended Window Schedule – Residential Units

Block / Unit / Glazing	Min R_w	Example Glazing Specification
Unit 8		
Living / Dining / Kitchen (all)	32	6.38 mm laminated glass
Bedrooms (all)	29	5 mm float glass
Unit 9		
Living / Dining / Kitchen (all)	32	6.38 mm laminated glass
Bedroom (all)	32	6.38 mm laminated glass
Unit 7		
Living / Dining (all)	32	6.38 mm laminated glass
Bedrooms (all)	29	5 mm float glass
Unit 10		
Living / Dining / Kitchen (all)	29	5 mm float glass
Bedrooms (all)	29	5 mm float glass
Units 1, 2, 3, 4, 5, 6, 11 & 12		
Living / Dining / Kitchen (all)	29	5 mm float glass

All windows and glazed doors in Table 2 should be fitted with acoustic seals comprising foam weather seals (e.g. Q-Lon from Schlegel or similar).

RECOMMENDED CONSTRUCTION

WALLS

EXTERNAL WALLS OF BRICK VENEER OR OTHER MASONRY CONSTRUCTION WILL BE ACCEPTABLE, AND CEMENT COMPOSITE EXTERNAL CLADDING, FOR EXAMPLE HARDIES 'SCYON', 'LINEA', 'STRIA', OR CSR 'CEMENTAL' OR APPROVED EQUIVALENT WITH SIMILAR MINIMUM MASS (MIN 13 KG/M2):-

INTERNAL PLASTERBOARD WALL LINING MAY BE OF 10 MM THICK (MINIMUM) STANDARD PLASTERBOARD CONSTRUCTION WITH THE EXCEPTION OF THE FOLLOWING:-

UNITS 8 AND 9, ALL BEDROOMS SHOULD BE COMPRISE ONE LAYER OF 13 MM THICK (MINIMUM) STANDARD, OR 10 MM THICK SOUND RATED, PLASTERBOARD,

MINIMUM 50 MM THICK GLASSWOOL OR POLYESTER INSULATION IN ALL EXTERNAL WALL CAVITIES (MIN DENSITY 11 KG/M3).

CEILING AND ROOF SYSTEM

CONCRETE TILE OR METAL DECK ROOF WITH 10 MM THICK STANDARD PLASTERBOARD CEILING BELOW, AND MINIMUM 50 MM THICK GLASSWOOL INSULATION (MINIMUM 11 KG/M3) IN THE CEILING CAVITY WILL BE ACCEPTABLE.

LEGEND

- DCP PRESCRIBED LANDSCAPING
- DCP PRESCRIBED DEEP SOIL PLANTING ZONE
- DCP PRESCRIBED 4mx5m PRIVATE OPEN SPACE
- MISC. LANDSCAPING NOT INCLUDED IN CALCULATIONS
- TPZ ENCROACHMENT
- DCP PRESCRIBED STORAGE
- EXISTING TREES TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE RETAINED
- PROPOSED WORKS

BASIX NOTES

ROOF:
METAL ROOF (TIMBER FRAME CONSTRUCTION) - R1.0 BULK, REFLECTIVE SIDE DOWN (ANTICON/PERMASTOP OR SIMILAR) (NOTE - R5.0 CEILING INSULATION REQUIRED)
DECK FORMING ROOF OVER GROUND FLOOR - NO INSULATION REQUIRED
(NOTE - R5.0 CEILING INSULATION REQUIRED)
TILED ROOF - NO INSULATION REQUIRED (NOTE - R5.0 CEILING INSULATION REQUIRED)

GENERAL NOTES

WEATHERSEALS REQUIRED TO ALL EXTERNAL DOORS INCLUDING INTERNAL ACCESS TO GARAGE

D/A

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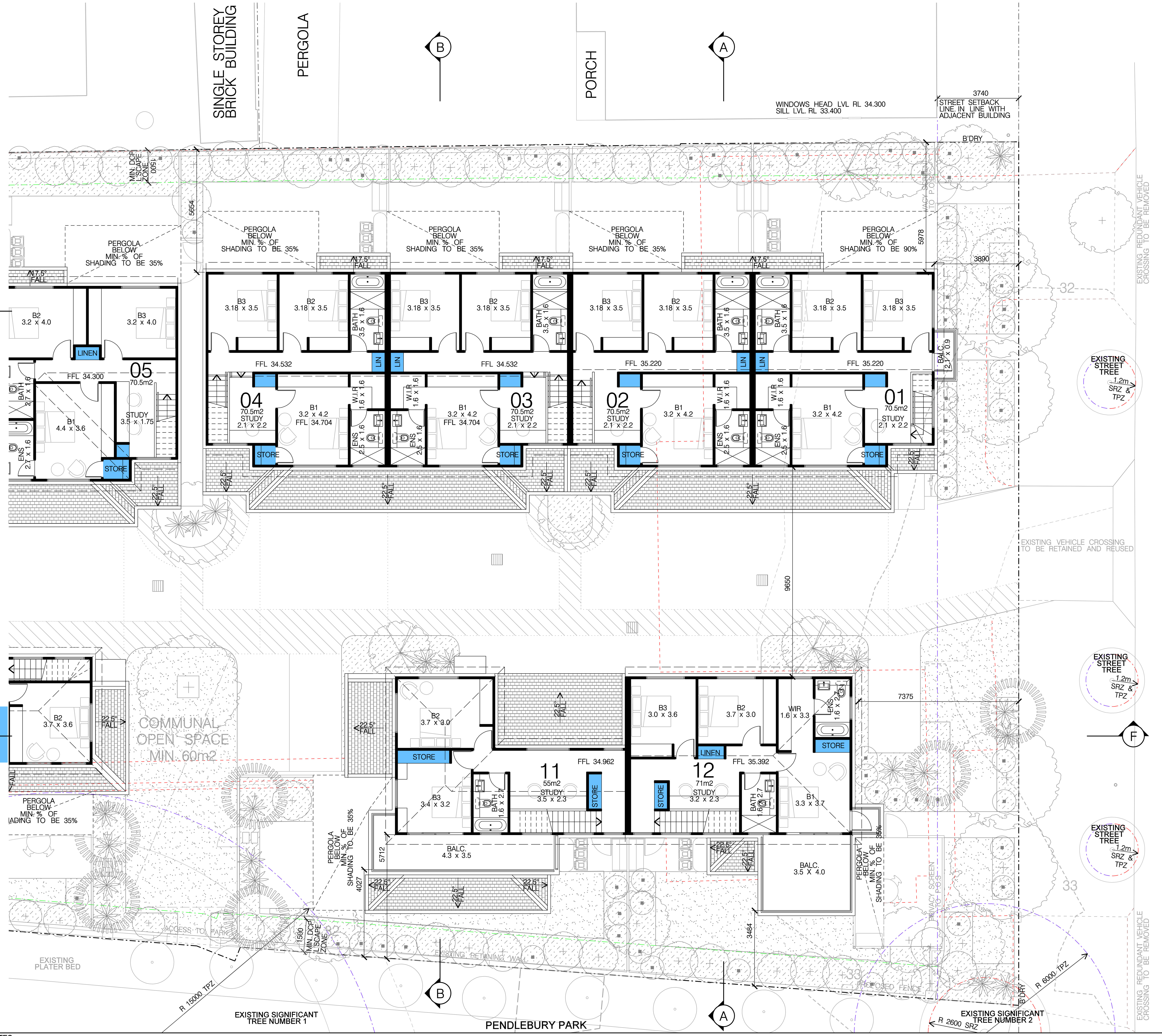
PROJECT
RESIDENTIAL DEVELOPMENT
481 - 485 PRINCES HIGHWAY
WOONONA NSW 2517
FOR
EMERALD PARK ESTATE PTY. LTD.

REVISION

NO.	DATE	AMENDMENT
01	09.04.20	ISSUED TO CONSULTANTS
A	01.05.20	ISSUED FOR DA
B	12.08.20	REVISED TO COMMENTS FROM COUNCIL
C	06.11.20	REVISED AS CLOUDED

DRAWING NAME
GROUND FLOOR PLAN WEST

PROJECT NUMBER 20105
SCALE 1:100 @ A1 1:200 @ A3
DRAWING NUMBER AR 0152
REVISION C
NORTH N



AREA SCHEDULE					
TH Number	Groundfloor (m²)	Level 1 (m²)	Total (m²)	External GF (m²)	External L1 (m²)
TH 1	47	69.5	116.5	43.78	1.9
TH 2	46	69.5	115.5	42.31	0
TH 3	46	69.5	115.5	41.98	0
TH 4	47	69.5	116.5	56.91	0
TH 5	47	69.5	116.5	46.34	0
TH 6	46	69.5	115.5	44.91	0
TH 7	46	69.5	115.5	43.9	0
TH 8	45	69.5	114.5	55.91	1.9
TH 9	70.5	50	120.5	61.54	7.6
TH 10	49.5	64	113.5	78.05	11.6
TH 11	70	54	124	76.27	13.9
TH 12	46.5	71	117.5	86	15.2
		Total (m²) :	1401.5		
		Site (m²) :	2939.9		
	Groundfloor (m²)	Level 1 (m²)	Total (m²)		
GFA	656.43	809.21	1465.64		
		FSR :	0.498533964		

Landscaping Total	Total (m²) :	946.65
	% of Total Site	32.20007483
Deepsoil	Total (m²) :	195.86
	% of Total Landscaping	20.68980088
	% of Total Site	6.662131365
	More than 6m width through rear of site	
Landscape behind building line		539.12
	% Site	18.33803871
	% of land scape	56.95029842
Car Parking Resident	@2.0 per + 110sqm dwelling	24
Car Parking Visitor	@0.2 per dwelling	2.4
Total Required		26.4
	Total Provision	
	Resident	12
	Visitor	3
Bike Parking Resident	@1 per 3 dwellings	6
Bike Parking Visitor	@1 per 12 dwellings	2
Communal Open Space	@5m2 per dwelling	60m2

Storage						
TH Number	GF (m²)	L1 (m²)	Total (m²)	GF (m³)	L1 (m³)	Total (m³)
TH 1	0.90	4.10	5	1.00	9.84	10.84
TH 2	0.90	4.10	5	1.00	9.84	10.84
TH 3	0.90	4.10	5	1.00	9.84	10.84
TH 4	0.90	4.10	5	1.00	9.84	10.84
TH 5	0.90	4.10	5	1.00	9.84	10.84
TH 6	0.90	4.10	5	1.00	9.84	10.84
TH 7	0.90	4.10	5	1.00	9.84	10.84
TH 8	0.90	4.10	5	1.00	9.84	10.84
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TH 12	2.65	2.40	5.05	4.62	5.76	10.38

ACOUSTIC NOTES:

Glazing other than those specified in Table 2 may be of standard thickness with a minimum Rw 25.

Table 2 Recommended Window Schedule – Residential Units

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Bedrooms (all)	29	5 mm float glass
Unit 9		
Living / Dining / Kitchen (all)	32	6.38 mm laminated glass
Bedroom (all)	32	6.38 mm laminated glass
Unit 7		
Living / Dining (all)	32	6.38 mm laminated glass
Bedrooms (all)	29	5 mm float glass
Unit 10		
Living / Dining / Kitchen (all)	29	5 mm float glass
Bedrooms (all)	29	5 mm float glass
Units 1, 2, 3, 4, 5, 6, 11 & 12		
Living / Dining / Kitchen (all)	29	5 mm float glass

All windows and glazed doors in Table 2 should be fitted with acoustic seals comprising foam weather seals (e.g. Q-Lon from Schlegel or similar).

RECOMMENDED CONSTRUCTION

WALLS

EXTERNAL WALLS OF BRICK VENEER OR OTHER MASONRY CONSTRUCTION WILL BE ACCEPTABLE, AND CEMENT COMPOSITE EXTERNAL CLADDING, FOR EXAMPLE HARDIES 'SCYON', 'LINEA', 'STRIA', OR CSR 'CEMENTAL' OR APPROVED EQUIVALENT WITH SIMILAR MINIMUM MASS (MIN 13 KG/M2):-

INTERNAL PLASTERBOARD WALL LINING MAY BE OF 10 MM THICK (MINIMUM) STANDARD PLASTERBOARD CONSTRUCTION WITH THE EXCEPTION OF THE FOLLOWING:-

UNITS 8 AND 9, ALL BEDROOMS SHOULD BE COMPRISE ONE LAYER OF 13 MM THICK (MINIMUM) STANDARD, OR 10 MM THICK SOUND RATED, PLASTERBOARD,

MINIMUM 50 MM THICK GLASSWOOL OR POLYESTER INSULATION IN ALL EXTERNAL WALL CAVITIES (MIN DENSITY 11 KG/M3).

CEILING AND ROOF SYSTEM

CONCRETE TILE OR METAL DECK ROOF WITH 10 MM THICK STANDARD PLASTERBOARD CEILING BELOW, AND MINIMUM 50 MM THICK GLASSWOOL INSULATION (MINIMUM 11 KG/M3) IN THE CEILING CAVITY WILL BE ACCEPTABLE.

LEGEND

- DCP PRESCRIBED LANDSCAPING
- DCP PRESCRIBED DEEP SOIL PLANTING ZONE
- DCP PRESCRIBED 4mx5m PRIVATE OPEN SPACE
- MISC. LANDSCAPING NOT INCLUDED IN CALCULATIONS
- TPZ ENCROACHMENT
- DCP PRESCRIBED STORAGE
- EXISTING TREES TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE RETAINED
- PROPOSED WORKS

D/A

BASIX NOTES

WATER (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

FIXTURES
ALL SHOWERHEADS - MINIMUM 3 STAR (>7.5 BUT <= 9L/MIN) WATER RATING
ALL TOILETS - MINIMUM 4 STAR WATER RATING
ALL KITCHEN TAPS - MINIMUM 4 STAR WATER RATING
ALL BATHROOM TAPS - MINIMUM 5 STAR WATER RATING

ALTERNATIVE WATER SOURCE - RAINWATER TANK
THE RAINWATER TANKS MUST MEET, AND BE INSTALLED IN ACCORDANCE WITH, THE REQUIREMENTS OF ALL APPLICABLE REGULATORY AUTHORITIES
TOWNHOUSE 1 TO 8
A 1500 LITRE (MIN) WATER TANK CONFIGURED TO COLLECT RUN-OFF FROM 50M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO: AT LEAST ONE OUTDOOR TAP
TOWNHOUSE 9 TO 12
A 2000 LITRE (MIN) WATER TANK CONFIGURED TO COLLECT RUN-OFF FROM 50M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO: AT LEAST ONE OUTDOOR TAP & ALL TOILETS

ENERGY (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

HOT WATER
GAS INSTANTANEOUS 5 STAR ENERGY RATING
HEATING
THE LIVING AREAS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM
COOLING
THE LIVING AREAS MUST NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM
VENTILATION
THE FOLLOWING EXHAUST SYSTEMS MUST BE INSTALLED FOR EACH DWELLING:
BATHROOMS - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF
KITCHEN - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF
LAUNDRY - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF

LIGHTING
THE PRIMARY TYPE OF ARTIFICIAL LIGHTING MUST BE LIGHT EMITTING DIODE (LED) LIGHTING IN ALL ROOMS.
ALTERNATE ENERGY
A PHOTOVOLTAIC SYSTEM WITH THE CAPACITY TO GENERATE AT LEAST 1.4 PEAK KILOWATTS OF ELECTRICITY MUST BE INSTALLED FOR TOWNHOUSE 9, 10, 11 AND 12. THE SYSTEM MUST BE CONNECTED TO THE DEVELOPMENT'S ELECTRICAL SYSTEM. A PHOTOVOLTAIC SYSTEM IS NOT REQUIRED FOR ALL OTHER TOWNHOUSES
OTHER
A GAS COOKTOP & ELECTRIC OVEN MUST BE INSTALLED IN EACH KITCHEN
A FIXED OUTDOOR CLOTHES DRYING LINE MUST BE INSTALLED FOR EACH TOWNHOUSE

GLAZING

TOWNHOUSE 1 AND 8
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-005-03 A DEFAULTS
U-VALUE 4.10 (NOTE: </= U-VALUE)
SHGC 0.47 (NOTE: WITHIN 10% OF SHGC)
GLASS - ARGON FILL, HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-005 GROUP A DG ARGON FILL
ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-006-03 A DEFAULTS
U-VALUE 4.1 (NOTE: </= U-VALUE)
SHGC 0.52 (NOTE: WITHIN 10% OF SHGC)
GLASS - ARGON FILL, HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-006 GROUP B DG ARGON FILL

TOWNHOUSE 2, 3, 4, 5, 6, 7 AND 12
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-01 A DEFAULTS
U-VALUE 6.70 (NOTE: </= U-VALUE)
SHGC 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-01 A DEFAULTS
U-VALUE 6.70 (OR LESS THAN)
SHGC 0.70 (+ OR - 10%)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-002 GROUP B SG

TOWNHOUSE 9 AND 11
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.49 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.58 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-002 GROUP B SG

TOWNHOUSE 10
ALL BEDROOM, ENSUITE, BATH, L'DRY AND P'DER AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-01 A DEFAULTS
U-VALUE 6.70 (NOTE: </= U-VALUE)
SHGC 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL BEDROOM, ENSUITE, BATH, L'DRY AND P'DER FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-01 A DEFAULTS
U-VALUE 6.70 (OR LESS THAN)
SHGC 0.70 (+ OR - 10%)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-002 GROUP B SG
ALL OTHER AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.49 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL OTHER FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.58 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-002 GROUP B SG

INSULATION (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE)

EXTERNAL WALLS:
WALLS BETWEEN GARAGES - R4.0
WALLS BETWEEN TOWNHOUSES - R4.0
GARAGE FRONT WALL - NO INSULATION REQUIRED
ALL OTHER EXTERNAL WALLS - R2.7
INTERNAL WALLS:
WALLS BETWEEN GARAGE AND DWELLING - R2.7
TOWNHOUSE 10 - WALL BETWEEN L'DRY AND KITCHEN - R2.7
TOWNHOUSE 10 - WALLS BETWEEN P'DER AND KITCHEN/LIVING/DINING/STAIR - R2.7
ALL OTHER INTERNAL WALLS - NO INSULATION REQUIRED
EXTERNAL FLOORS (GROUND FLOOR) :
TOWNHOUSE 11 - GROUND FLOOR - WAFFLE POD SLAB
ALL OTHER GROUND FLOOR FLOORS - NO INSULATION REQUIRED
INTERNAL CEILINGS/FLOORS
ALL INTERNAL CEILINGS/FLOORS ABOVE GARAGES - R5.0
ALL OTHER INTERNAL CEILINGS/FLOORS - NO INSULATION REQUIRED
EXTERNAL CEILINGS:
TOWNHOUSE 8 - ALL EXTERNAL CEILINGS (I.E BELOW ROOF) - R6.0
ALL OTHER TOWNHOUSES - ALL EXTERNAL CEILINGS (I.E BELOW ROOF) - R5.0

ROOF:
METAL ROOF (TIMBER FRAME CONSTRUCTION) - R1.0 BULK, REFLECTIVE SIDE DOWN (ANTICON/PERMASTOP OR SIMILAR) (NOTE - R5.0 CEILING INSULATION REQUIRED)
DECK FORMING ROOF OVER GROUND FLOOR - NO INSULATION REQUIRED (NOTE - R5.0 CEILING INSULATION REQUIRED)
TILED ROOF - NO INSULATION REQUIRED (NOTE - R5.0 CEILING INSULATION REQUIRED)

GENERAL NOTES

WEATHERSEALS REQUIRED TO ALL EXTERNAL DOORS INCLUDING INTERNAL ACCESS TO GARAGE

INSULATION MUST BE INSTALLED IN ACCORDANCE WITH NCC AND RELEVANT AUSTRALIAN STANDARDS

THE NUMBER OF DOWNLIGHTS THAT HAVE BEEN INPUT TO THE NATHERS THERMAL COMFORT ASSESSMENT TO MODEL CEILING INSULATION LOSS IS AS PER JACK TAYLOR ARCHITECTS MARK-UP DATED 08.04.2020 (TO BE SEALED LED DOWNLIGHTS).

ONE SEALED EXHAUST FAN HAS BEEN INPUT FOR EACH KITCHEN, BATHROOM, LAUNDRY, ENSUITE, P'DER AND WC.

ARCHITECT
urban design
masterplanning
architecture
JACK TAYLOR ARCHITECTS Pty Ltd
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NSW Architects Board Registration # 7042
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AUSTRALIA
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PROJECT
RESIDENTIAL DEVELOPMENT 481 - 485 PRINCES HIGHWAY WOONONA NSW 2517

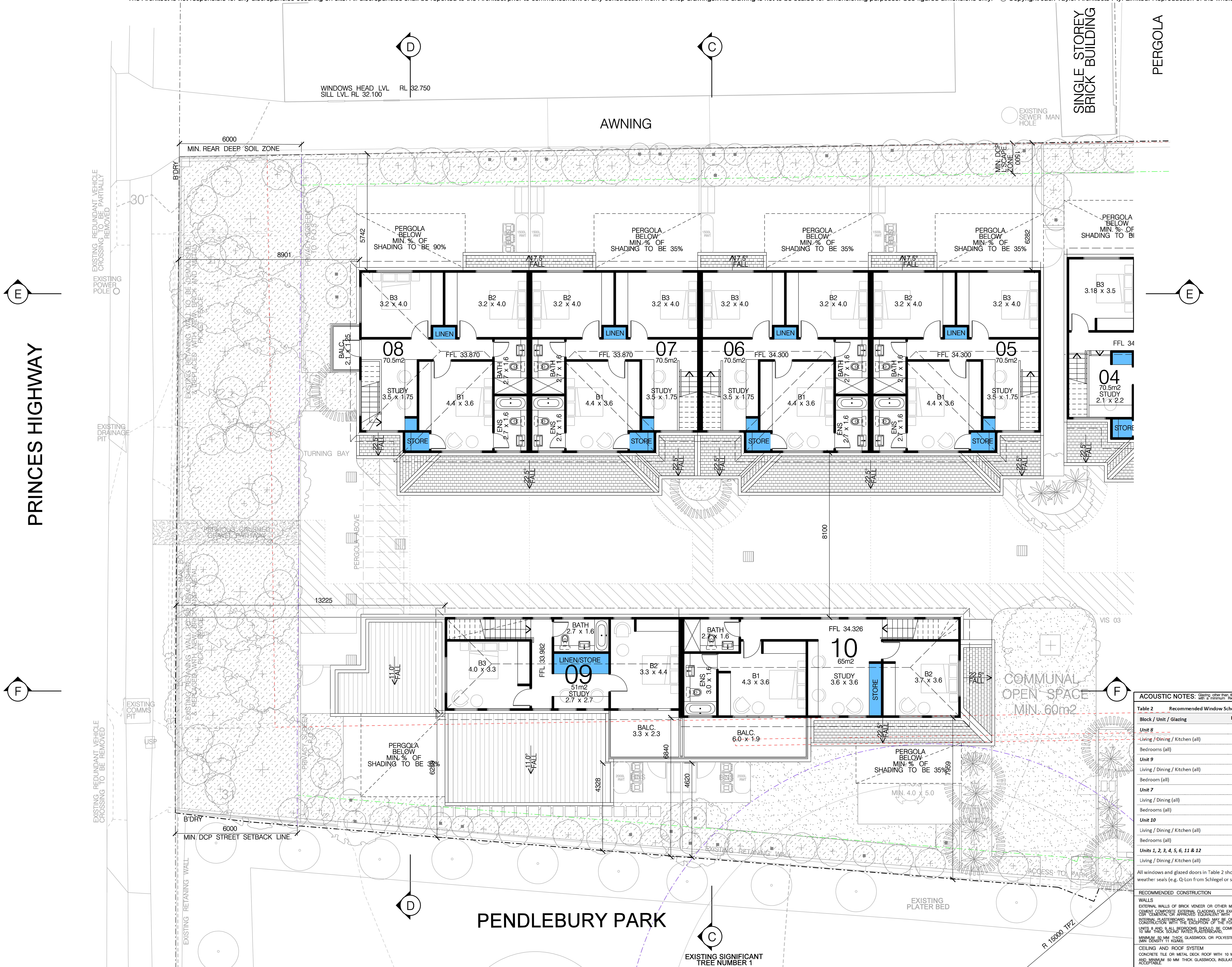
FOR
EMERALD PARK ESTATE PTY. LTD.

REVISION

NO.	DATE	AMENDMENT	NO.	DATE	AMENDMENT
01	09.04.20	ISSUED TO CONSULTANTS			
A	01.05.20	ISSUED FOR DA			
B	12.08.20	REVISED TO COMMENTS FROM COUNCIL			
C	06.11.20	CO-ORDINATED WITH GROUND FLOOR REVISION			

DRAWING NAME
LEVEL 1 PLAN EAST

PROJECT NUMBER 20105
SCALE 1:100 @ A1, 1:200 @ A3
NORTH N
DRAWING NUMBER AR 0153
REVISION C



AREA SCHEDULE					
TH Number	Groundfloor (m²)	Level 1 (m²)	Total (m²)	External GF (m²)	External L1 (m²)
TH 1	47	69.5	116.5	43.78	1.9
TH 2	46	69.5	115.5	42.31	0
TH 3	46	69.5	115.5	41.98	0
TH 4	47	69.5	116.5	56.91	0
TH 5	47	69.5	116.5	46.34	0
TH 6	46	69.5	115.5	44.91	0
TH 7	46	69.5	115.5	43.9	0
TH 8	45	69.5	114.5	55.91	1.9
TH 9	70.5	50	120.5	61.54	7.6
TH 10	49.5	64	113.5	78.05	11.6
TH 11	70	54	124	76.27	13.9
TH 12	46.5	71	117.5	86	15.2
		Total (m²) :	1401.5		
		Site (m²) :	2939.9		

	Groundfloor (m²)	Level 1 (m²)	Total (m²)
GFA	656.43	809.21	1465.64
		FSR :	0.498533964
Landscaping Total		Total (m²) :	946.65
		% of Total Site	32.20007483
Deepsoil		Total (m²) :	195.86
		% of Total Landscaping	20.68980088
		% of Total Site	6.662131365
		More than 6m width through rear of site	
Landscape behind building line			539.12
		% Site	18.33803871
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Car Parking Resident	@2.0 per + 110sqm dwelling		24
Car Parking Visitor	@0.2 per dwelling		2.4
Total Required			26.4
		Total Provision	
		Resident	12
		Visitor	3
Bike Parking Resident	@1 per 3 dwellings		6
Bike Parking Visitor	@1 per 12 dwellings		2
Communal Open Space	@5m2 per dwelling		60m2

Storage						
TH Number	GF (m²)	L1 (m²)	Total (m²)	GF (m³)	L1 (m³)	Total (m³)
TH 1	0.90	4.10	5	1.00	9.84	10.84
TH 2	0.90	4.10	5	1.00	9.84	10.84
TH 3	0.90	4.10	5	1.00	9.84	10.84
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Block / Unit / Glazing	Min R_w	Example Glazing Specification
Unit 8		
Living / Dining / Kitchen (all)	32	6.38 mm laminated glass
Bedrooms (all)	29	5 mm float glass
Unit 9		
Living / Dining / Kitchen (all)	32	6.38 mm laminated glass
Bedroom (all)	32	6.38 mm laminated glass
Unit 7		
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Bedrooms (all)	29	5 mm float glass
Units 1, 2, 3, 4, 5, 6, 11 & 12		
Living / Dining / Kitchen (all)	29	5 mm float glass

All windows and glazed doors in Table 2 should be fitted with acoustic seals comprising foam weather seals (e.g. Q-Lon from Schlegel or similar).

RECOMMENDED CONSTRUCTION

WALLS

EXTERNAL WALLS OF BRICK VENEER OR OTHER MASONRY CONSTRUCTION WILL BE ACCEPTABLE, AND CEMENT COMPOSITE EXTERNAL CLADDING, FOR EXAMPLE HARDIES 'SCYON', 'LINEA', 'STRIA', OR CSR 'CEMENTAL' OR APPROVED EQUIVALENT WITH SIMILAR MINIMUM MASS (MIN 13 KG/M2):-

INTERNAL PLASTERBOARD WALL LINING MAY BE OF 10 MM THICK (MINIMUM) STANDARD PLASTERBOARD CONSTRUCTION WITH THE EXCEPTION OF THE FOLLOWING:-

UNITS 8 AND 9, ALL BEDROOMS SHOULD BE COMPRISE ONE LAYER OF 13 MM THICK (MINIMUM) STANDARD, OR 10 MM THICK SOUND RATED, PLASTERBOARD,

MINIMUM 50 MM THICK GLASSWOOL OR POLYESTER INSULATION IN ALL EXTERNAL WALL CAVITIES (MIN DENSITY 11 KG/M3)

CEILING AND ROOF SYSTEM

CONCRETE TILE OR METAL DECK ROOF WITH 10 MM THICK STANDARD PLASTERBOARD CEILING BELOW, AND MINIMUM 50 MM THICK GLASSWOOL INSULATION (MINIMUM 11 KG/M3) IN THE CEILING CAVITY WILL BE ACCEPTABLE

LEGEND

- DCP PRESCRIBED LANDSCAPING
- DCP PRESCRIBED DEEP SOIL PLANTING ZONE
- DCP PRESCRIBED 4mx5m PRIVATE OPEN SPACE
- MISC. LANDSCAPING NOT INCLUDED IN CALCULATIONS
- TPZ ENCROACHMENT
- DCP PRESCRIBED STORAGE
- EXISTING TREES TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE RETAINED
- PROPOSED WORKS

BASIX NOTES

GENERAL NOTES

D/A

ARCHITECT
urban design masterplanning architecture

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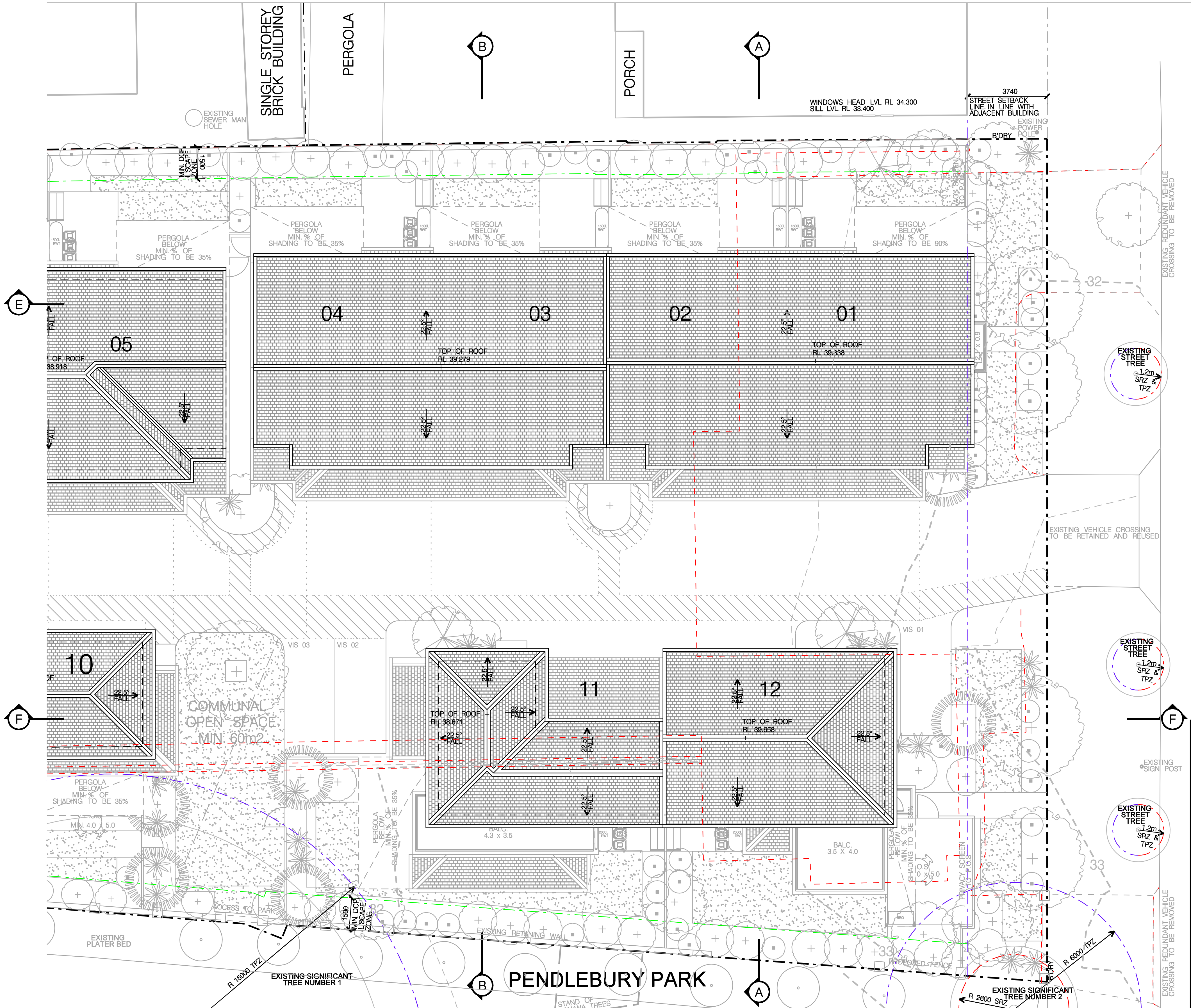
PROJECT
RESIDENTIAL DEVELOPMENT
481 - 485 PRINCES HIGHWAY
WOONONA NSW 2517
FOR
EMERALD PARK ESTATE PTY. LTD.

REVISION NO.	DATE	AMENDMENT
01	09.04.20	ISSUED TO CONSULTANTS
A	01.05.20	ISSUED FOR DA
B	12.08.20	REVISED TO COMMENTS FROM COUNCIL
C	06.11.20	CO-ORDINATED WITH GROUND FLOOR REVISION

DRAWING NAME: LEVEL 1 PLAN WEST

PROJECT NUMBER: 20105
SCALE: 1:100 @ A1, 1:200 @ A3
DRAWING NUMBER: AR 0154
REVISION: C
NORTH



AREA SCHEDULE					
TH Number	Groundfloor (m²)	Level 1 (m²)	Total (m²)	External GF (m²)	External L1 (m²)
TH 1	47	69.5	116.5	43.78	1.9
TH 2	46	69.5	115.5	42.31	0
TH 3	46	69.5	115.5	41.98	0
TH 4	47	69.5	116.5	56.91	0
TH 5	47	69.5	116.5	46.34	0
TH 6	46	69.5	115.5	44.91	0
TH 7	46	69.5	115.5	43.9	0
TH 8	45	69.5	114.5	55.91	1.9
TH 9	70.5	50	120.5	61.54	7.6
TH 10	49.5	64	113.5	78.05	11.6
TH 11	70	54	124	76.27	13.9
TH 12	46.5	71	117.5	86	15.2
		Total (m²) :	1401.5		
		Site (m²) :	2939.9		
	Groundfloor (m²)	Level 1 (m²)	Total (m²)		
GFA	657.71	809.21	1466.92		
		FSR :	0.498969353		
Landscaping Total		Total (m²) :	955.35		
		% of Total Site	32.49600327		
Deepsoil		Total (m²) :	195.86		
		% of Total Landscaping	20.50138693		
		% of Total Site	6.662131365		
		More than 6m width through rear of site			
Landscape behind building line			543.63		
		% Site	18.49144529		
		% of land scape	56.90375255		
Car Parking Resident		@2.0 per + 110sqm dwelling	24		
Car Parking Visitor		@0.2 per dwelling	2.4		
Total Required			26.4		
		Total Provision			
		Resident	12		
		Visitor	3		
Bike Parking Resident		@1 per 3 dwellings	6		
Bike Parking Visitor		@1 per 12 dwellings	2		
Communal Open Space		@5m2 per dwelling	60m2		

Storage						
TH Number	GF (m²)	L1 (m²)	Total (m²)	GF (m³)	L1 (m³)	Total (m³)
TH 1	0.90	4.10	5	1.00	9.84	10.84
TH 2	0.90	4.10	5	1.00	9.84	10.84
TH 3	0.90	4.10	5	1.00	9.84	10.84
TH 4	0.90	4.10	5	1.00	9.84	10.84
TH 5	0.90	4.10	5	1.00	9.84	10.84
TH 6	0.90	4.10	5	1.00	9.84	10.84
TH 7	0.90	4.10	5	1.00	9.84	10.84
TH 8	0.90	4.10	5	1.00	9.84	10.84
TH 9	1.86	2.70	4.56	4.46	6.48	10.94
TH 10	3.86	1.54	5.4	9.26	3.70	12.96
TH 11	2.65	2.39	5.04	7.91	5.74	13.65
TH 12	2.65	2.40	5.05	4.62	5.76	10.38

ACOUSTIC NOTES:
Glazing other than those specified in Table 2 may be of standard thickness with a minimum Rw 25.

Table 2 Recommended Window Schedule – Residential Units

Block / Unit / Glazing	Min R_w	Example Glazing Specification
Unit 8		
Living / Dining / Kitchen (all)	32	6.38 mm laminated glass
Bedrooms (all)	29	5 mm float glass
Unit 9		
Living / Dining / Kitchen (all)	32	6.38 mm laminated glass
Bedroom (all)	32	6.38 mm laminated glass
Unit 7		
Living / Dining (all)	32	6.38 mm laminated glass
Bedrooms (all)	29	5 mm float glass
Unit 10		
Living / Dining / Kitchen (all)	29	5 mm float glass
Bedrooms (all)	29	5 mm float glass
Units 1, 2, 3, 4, 5, 6, 11 & 12		
Living / Dining / Kitchen (all)	29	5 mm float glass

All windows and glazed doors in Table 2 should be fitted with acoustic seals comprising foam weather seals (e.g. Q-Lon from Schlegel or similar).

RECOMMENDED CONSTRUCTION

WALLS
EXTERNAL WALLS OF BRICK VENEER OR OTHER MASONRY CONSTRUCTION WILL BE ACCEPTABLE, AND CEMENT COMPOSITE EXTERNAL CLADDING, FOR EXAMPLE HARDIES 'SCYON', 'LINEA', 'STRIA' OR CSR 'CEMENTAL' OR APPROVED EQUIVALENT WITH SIMILAR MINIMUM MASS (MIN 13 KG/M2):-

INTERNAL PLASTERBOARD WALL LINING MAY BE OF 10 MM THICK (MINIMUM) STANDARD PLASTERBOARD CONSTRUCTION WITH THE EXCEPTION OF THE FOLLOWING:-

UNITS 8 AND 9, ALL BEDROOMS SHOULD BE COMPRISE ONE LAYER OF 13 MM THICK (MINIMUM) STANDARD, OR 10 MM THICK SOUND RATED, PLASTERBOARD,

MINIMUM 50 MM THICK GLASSWOOL OR POLYESTER INSULATION IN ALL EXTERNAL WALL CAVITIES (MIN DENSITY 11 KG/M3).

CEILING AND ROOF SYSTEM
CONCRETE TILE OR METAL DECK ROOF WITH 10 MM THICK STANDARD PLASTERBOARD CEILING BELOW, AND MINIMUM 50 MM THICK GLASSWOOL INSULATION (MINIMUM 11 KG/M3) IN THE CEILING CAVITY WILL BE ACCEPTABLE.

LEGEND
- DCP PRESCRIBED LANDSCAPING
- DCP PRESCRIBED DEEP SOIL PLANTING ZONE
- DCP PRESCRIBED 4mx5m PRIVATE OPEN SPACE
- MISC. LANDSCAPING NOT INCLUDED IN CALCULATIONS
- TPZ ENCROACHMENT
- DCP PRESCRIBED STORAGE
- EXISTING TREES TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE RETAINED
- PROPOSED WORKS

D/A

BASIX NOTES

WATER (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS
FIXTURES
ALL SHOWERHEADS - MINIMUM 3 STAR (>7.5 BUT <= 9L/MIN) WATER RATING
ALL TOILETS - MINIMUM 4 STAR WATER RATING
ALL KITCHEN TAPS - MINIMUM 4 STAR WATER RATING
ALL BATHROOM TAPS - MINIMUM 5 STAR WATER RATING
ALTERNATIVE WATER SOURCE - RAINWATER TANK
THE RAINWATER TANKS MUST MEET, AND BE INSTALLED IN ACCORDANCE WITH, THE REQUIREMENTS OF ALL APPLICABLE REGULATORY AUTHORITIES
TOWNHOUSE 1 TO 8
A 1500 LITRE (MIN) WATER TANK CONFIGURED TO COLLECT RUN-OFF FROM 50M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO: AT LEAST ONE OUTDOOR TAP
TOWNHOUSE 9 TO 12
A 2000 LITRE (MIN) WATER TANK CONFIGURED TO COLLECT RUN-OFF FROM 50M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO: AT LEAST ONE OUTDOOR TAP & ALL TOILETS

ENERGY (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS
HOT WATER
GAS INSTANTANEOUS 5 STAR ENERGY RATING
HEATING
THE LIVING AREAS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM
COOLING
THE LIVING AREAS MUST NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM
VENTILATION
THE FOLLOWING EXHAUST SYSTEMS MUST BE INSTALLED FOR EACH DWELLING:
BATHROOMS - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF
KITCHEN - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF
LAUNDRY - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF

LIGHTING
THE PRIMARY TYPE OF ARTIFICIAL LIGHTING MUST BE LIGHT EMITTING DIODE (LED) LIGHTING IN ALL ROOMS.
ALTERNATE ENERGY
A PHOTOVOLTAIC SYSTEM WITH THE CAPACITY TO GENERATE AT LEAST 1.4 PEAK KILOWATTS OF ELECTRICITY MUST BE INSTALLED FOR TOWNHOUSE 9, 10, 11 AND 12. THE SYSTEM MUST BE CONNECTED TO THE DEVELOPMENT'S ELECTRICAL SYSTEM. A PHOTOVOLTAIC SYSTEM IS NOT REQUIRED FOR ALL OTHER TOWNHOUSES
OTHER
A GAS COOKTOP & ELECTRIC OVEN MUST BE INSTALLED IN EACH KITCHEN
A FIXED OUTDOOR CLOTHES DRYING LINE MUST BE INSTALLED FOR EACH TOWNHOUSE

GLAZING
TOWNHOUSE 1 AND 8
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-005-03 A DEFAULTS
U-VALUE 4.10 (NOTE: </= U-VALUE)
SHGC 0.47 (NOTE: WITHIN 10% OF SHGC)
GLASS - ARGON FILL, HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-005 GROUP A DG ARGON FILL
ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-006-03 A DEFAULTS
U-VALUE 4.1 (NOTE: </= U-VALUE)
SHGC 0.52 (NOTE: WITHIN 10% OF SHGC)
GLASS - ARGON FILL, HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-006 GROUP B DG ARGON FILL
TOWNHOUSE 2, 3, 4, 5, 6, 7 AND 12
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-01 A DEFAULTS
U-VALUE 6.70 (NOTE: </= U-VALUE)
SHGC 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-01 A DEFAULTS
U-VALUE 6.70 (OR LESS THAN)
SHGC 0.70 (+ OR - 10%)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-002 GROUP B SG
TOWNHOUSE 9 AND 11
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.49 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.58 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-002 GROUP B SG
TOWNHOUSE 10
ALL BEDROOM, ENSUITE, BATH, L'DRY AND P'DER AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-01 A DEFAULTS
U-VALUE 6.70 (NOTE: </= U-VALUE)
SHGC 0.67 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL BEDROOM, ENSUITE, BATH, L'DRY AND P'DER FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-01 A DEFAULTS
U-VALUE 6.70 (OR LESS THAN)
SHGC 0.70 (+ OR - 10%)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-002 GROUP B SG
ALL OTHER AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.49 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL OTHER FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.58 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-002 GROUP B SG

INSULATION (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE)
EXTERNAL WALLS:
WALLS BETWEEN GARAGES - R4.0
WALLS BETWEEN TOWNHOUSES - R4.0
GARAGE FRONT WALL - NO INSULATION REQUIRED
ALL OTHER EXTERNAL WALLS - R2.7
INTERNAL WALLS:
WALLS BETWEEN GARAGE AND DWELLING - R2.7
TOWNHOUSE 10 - WALL BETWEEN L'DRY AND KITCHEN - R2.7
TOWNHOUSE 10 - WALLS BETWEEN P'DER AND KITCHEN/LIVING/DINING/STAIR - R2.7
ALL OTHER INTERNAL WALLS - NO INSULATION REQUIRED
EXTERNAL FLOORS (GROUND FLOOR) :
TOWNHOUSE 11 - GROUND FLOOR - WAFFLE POD SLAB
ALL OTHER GROUND FLOOR FLOORS - NO INSULATION REQUIRED
INTERNAL CEILINGS/FLOORS
ALL INTERNAL CEILINGS/FLOORS ABOVE GARAGES - R5.0
ALL OTHER INTERNAL CEILINGS/FLOORS - NO INSULATION REQUIRED
EXTERNAL CEILINGS:
TOWNHOUSE 8 - ALL EXTERNAL CEILINGS (I.E BELOW ROOF) - R6.0
ALL OTHER TOWNHOUSES - ALL EXTERNAL CEILINGS (I.E BELOW ROOF) - R5.0

ROOF:
METAL ROOF (TIMBER FRAME CONSTRUCTION) - R1.0 BULK, REFLECTIVE SIDE DOWN (ANTICON/PERMASTOP OR SIMILAR) (NOTE - R5.0 CEILING INSULATION REQUIRED)
DECK FORMING ROOF OVER GROUND FLOOR - NO INSULATION REQUIRED (NOTE - R5.0 CEILING INSULATION REQUIRED)
TILED ROOF - NO INSULATION REQUIRED (NOTE - R5.0 CEILING INSULATION REQUIRED)

GENERAL NOTES
WEATHERSEALS REQUIRED TO ALL EXTERNAL DOORS INCLUDING INTERNAL ACCESS TO GARAGE

INSULATION MUST BE INSTALLED IN ACCORDANCE WITH NCC AND RELEVANT AUSTRALIAN STANDARDS

THE NUMBER OF DOWNLIGHTS THAT HAVE BEEN INPUT TO THE NATHERS THERMAL COMFORT ASSESSMENT TO MODEL CEILING INSULATION LOSS IS AS PER JACK TAYLOR ARCHITECTS MARK-UP DATED 08.04.2020 (TO BE SEALED LED DOWNLIGHTS).

ONE SEALED EXHAUST FAN HAS BEEN INPUT FOR EACH KITCHEN, BATHROOM, LAUNDRY, ENSUITE, P'DER AND WC.

ARCHITECT
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architecture
JACK TAYLOR ARCHITECTS Pty Ltd
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NSW Architects Board Registration # 7042
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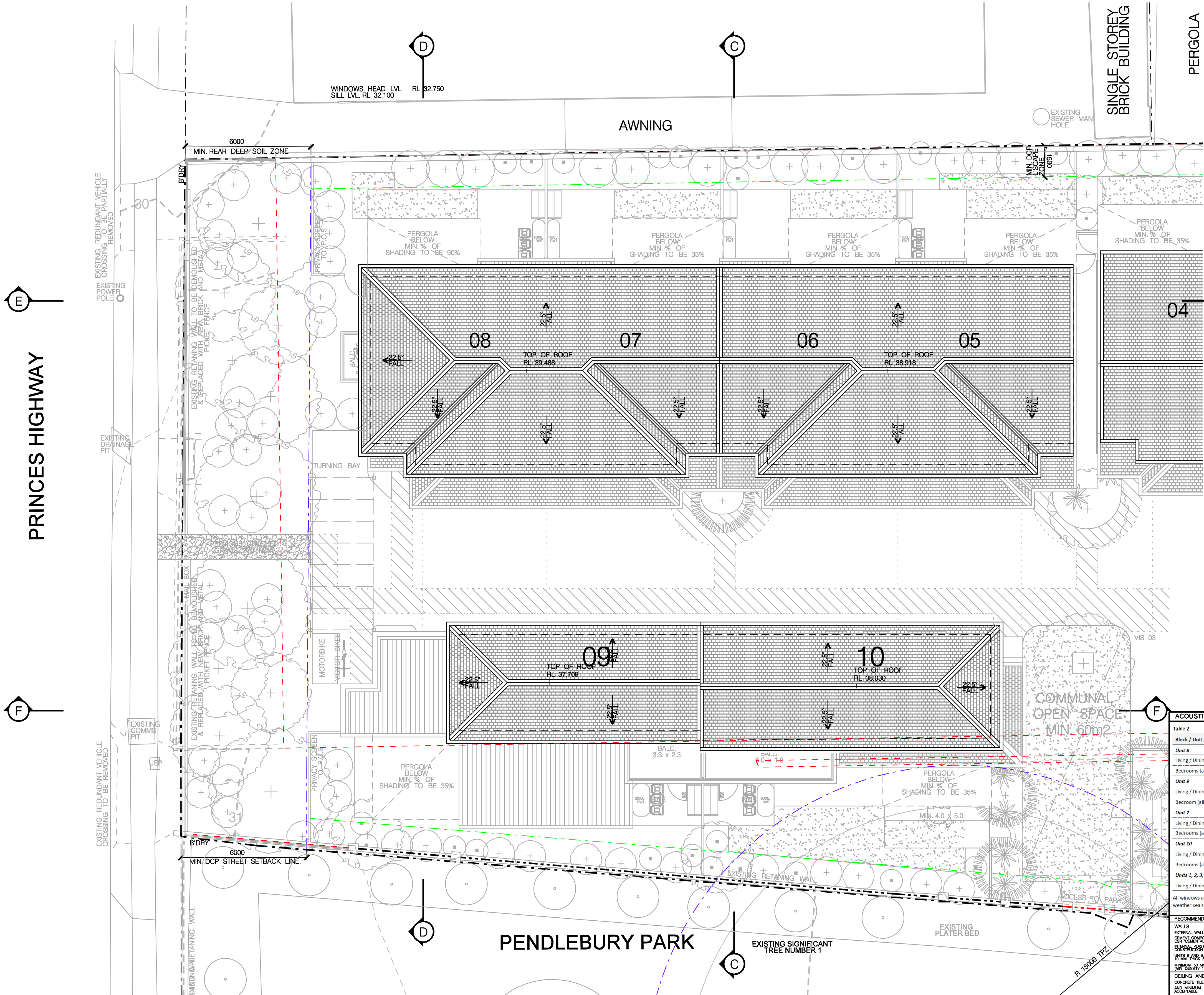
PROJECT
RESIDENTIAL DEVELOPMENT
481 - 485 PRINCES HIGHWAY
WOONONA NSW 2517
FOR
EMERALD PARK ESTATE PTY. LTD.

REVISION

NO.	DATE	AMENDMENT	NO.	DATE	AMENDMENT
01	09.04.20	ISSUED TO CONSULTANTS			
A	01.05.20	ISSUED FOR DA			
B	12.08.20	REVISED TO COMMENTS FROM COUNCIL			
C	06.11.20	CO-ORDINATED WITH GROUND FLOOR REVISION			

DRAWING NAME
ROOF PLAN EAST

PROJECT NUMBER 20105
SCALE 1:100 @ A1 / 1:200 @ A3
NORTH
DRAWING NUMBER AR 0155
REVISION C



AREA SCHEDULE					
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TH 11	70	54	124	76.27	13.9
TH 12	46.5	71	117.5	86	15.2
		Total (m²) :	1401.5		
		Site (m²) :	2939.9		
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GFA	657.71	809.21	1466.92		
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		% of Total Site	32.49600327		
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Total Required			26.4		
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		Visitor	3		
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Communal Open Space		@5m2 per dwelling	60m2		

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TH Number	GF (m²)	L1 (m²)	Total (m²)	GF (m³)	L1 (m³)	Total (m³)
TH 1	0.90	4.10	5	1.00	9.84	10.84
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ACOUSTIC NOTES:

Glazing other than those specified in Table 2 may be of standard thickness with a minimum Rw 25.

Table 2 Recommended Window Schedule – Residential Units

Block / Unit / Glazing	Min R_w	Example Glazing Specification
Unit 8		
Living / Dining / Kitchen (all)	32	6.38 mm laminated glass
Bedrooms (all)	29	5 mm float glass
Unit 9		
Living / Dining / Kitchen (all)	32	6.38 mm laminated glass
Bedroom (all)	32	6.38 mm laminated glass
Unit 7		
Living / Dining (all)	32	6.38 mm laminated glass
Bedrooms (all)	29	5 mm float glass
Unit 10		
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Units 1, 2, 3, 4, 5, 6, 11 & 12		
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All windows and glazed doors in Table 2 should be fitted with acoustic seals comprising foam weather seals (e.g. Q-Lon from Schlegel or similar).

RECOMMENDED CONSTRUCTION

WALLS

EXTERNAL WALLS OF BRICK VENEER OR OTHER MASONRY CONSTRUCTION WILL BE ACCEPTABLE, AND

CEMENT COMPOSITE EXTERNAL CLADDING, FOR EXAMPLE HARDIES 'SCYON', 'LINEA', 'STRIA', OR CSR 'CEMENTAL' OR APPROVED EQUIVALENT WITH SIMILAR MINIMUM MASS (MIN 13 KG/M2):-

INTERNAL PLASTERBOARD WALL LINING MAY BE OF 10 MM THICK (MINIMUM) STANDARD PLASTERBOARD CONSTRUCTION WITH THE EXCEPTION OF THE FOLLOWING:-

UNITS 8 AND 9, ALL BEDROOMS SHOULD BE COMPRISE ONE LAYER OF 13 MM THICK (MINIMUM) STANDARD, OR 10 MM THICK SOUND RATED, PLASTERBOARD,

MINIMUM 50 MM THICK GLASSWOOL OR POLYESTER INSULATION IN ALL EXTERNAL WALL CAVITIES (MIN DENSITY 11 KG/M3).

CEILING AND ROOF SYSTEM

CONCRETE TILE OR METAL DECK ROOF WITH 10 MM THICK STANDARD PLASTERBOARD CEILING BELOW, AND MINIMUM 50 MM THICK GLASSWOOL INSULATION (MINIMUM 11 KG/M3) IN THE CEILING CAVITY WILL BE ACCEPTABLE.

LEGEND

- DCP PRESCRIBED LANDSCAPING
- DCP PRESCRIBED DEEP SOIL PLANTING ZONE
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- MISC. LANDSCAPING NOT INCLUDED IN CALCULATIONS
- TPZ ENCROACHMENT
- DCP PRESCRIBED STORAGE
- EXISTING TREES TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE RETAINED
- PROPOSED WORKS

D/A

BASIX NOTES

WATER (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

FIXTURES
ALL SHOWERHEADS - MINIMUM 3 STAR (>7.5 BUT <= 9L/MIN) WATER RATING
ALL TOILETS - MINIMUM 4 STAR WATER RATING
ALL KITCHEN TAPS - MINIMUM 4 STAR WATER RATING
ALL BATHROOM TAPS - MINIMUM 5 STAR WATER RATING

ALTERNATIVE WATER SOURCE - RAINWATER TANK
THE RAINWATER TANKS MUST MEET, AND BE INSTALLED IN ACCORDANCE WITH, THE REQUIREMENTS OF ALL APPLICABLE REGULATORY AUTHORITIES
TOWNHOUSE 1 TO 8
A 1500 LITRE (MIN) WATER TANK CONFIGURED TO COLLECT RUN-OFF FROM 50M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO: AT LEAST ONE OUTDOOR TAP
TOWNHOUSE 9 TO 12
A 2000 LITRE (MIN) WATER TANK CONFIGURED TO COLLECT RUN-OFF FROM 50M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO: AT LEAST ONE OUTDOOR TAP & ALL TOILETS

ENERGY (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

HOT WATER
GAS INSTANTANEOUS 5 STAR ENERGY RATING
HEATING
THE LIVING AREAS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM
COOLING
THE LIVING AREAS MUST NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM
VENTILATION
THE FOLLOWING EXHAUST SYSTEMS MUST BE INSTALLED FOR EACH DWELLING:
BATHROOMS - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF
KITCHEN - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF
LAUNDRY - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF

LIGHTING
THE PRIMARY TYPE OF ARTIFICIAL LIGHTING MUST BE LIGHT EMITTING DIODE (LED) LIGHTING IN ALL ROOMS.
ALTERNATE ENERGY
A PHOTOVOLTAIC SYSTEM WITH THE CAPACITY TO GENERATE AT LEAST 1.4 PEAK KILOWATTS OF ELECTRICITY MUST BE INSTALLED FOR TOWNHOUSE 9, 10, 11 AND 12. THE SYSTEM MUST BE CONNECTED TO THE DEVELOPMENT'S ELECTRICAL SYSTEM. A PHOTOVOLTAIC SYSTEM IS NOT REQUIRED FOR ALL OTHER TOWNHOUSES
OTHER
A GAS COOKTOP & ELECTRIC OVEN MUST BE INSTALLED IN EACH KITCHEN
A FIXED OUTDOOR CLOTHES DRYING LINE MUST BE INSTALLED FOR EACH TOWNHOUSE

GLAZING

TOWNHOUSE 1 AND 8
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-005-03 A DEFAULTS
U-VALUE 4.10 (NOTE: </= U-VALUE)
SHGC 0.47 (NOTE: WITHIN 10% OF SHGC)
GLASS - ARGON FILL, HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-005 GROUP A DG ARGON FILL

ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-006-03 A DEFAULTS
U-VALUE 4.1 (NOTE: </= U-VALUE)
SHGC 0.52 (NOTE: WITHIN 10% OF SHGC)
GLASS - ARGON FILL, HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-006 GROUP B DG ARGON FILL

TOWNHOUSE 2, 3, 4, 5, 6, 7 AND 12
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-01 A DEFAULTS
U-VALUE 6.70 (NOTE: </= U-VALUE)
SHGC 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-01 A DEFAULTS
U-VALUE 6.70 (OR LESS THAN)
SHGC 0.70 (+ OR - 10%)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-002 GROUP B SG

TOWNHOUSE 9 AND 11
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.49 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.58 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-002 GROUP B SG

TOWNHOUSE 10
ALL BEDROOM, ENSUITE, BATH, L'DRY AND P'DER AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-01 A DEFAULTS
U-VALUE 6.70 (NOTE: </= U-VALUE)
SHGC 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-001 GROUP A SG

ALL BEDROOM, ENSUITE, BATH, L'DRY AND P'DER FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-01 A DEFAULTS
U-VALUE 6.70 (OR LESS THAN)
SHGC 0.70 (+ OR - 10%)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-002 GROUP B SG
ALL OTHER AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.49 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL OTHER FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.58 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-002 GROUP B SG

INSULATION (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE)

EXTERNAL WALLS:
WALLS BETWEEN GARAGES - R4.0
WALLS BETWEEN TOWNHOUSES - R4.0
GARAGE FRONT WALL - NO INSULATION REQUIRED
ALL OTHER EXTERNAL WALLS - R2.7
INTERNAL WALLS:
WALLS BETWEEN GARAGE AND DWELLING - R2.7
TOWNHOUSE 10 - WALL BETWEEN L'DRY AND KITCHEN - R2.7
TOWNHOUSE 10 - WALLS BETWEEN P'DER AND KITCHEN/LIVING/DINING/STAIR - R2.7
ALL OTHER INTERNAL WALLS - NO INSULATION REQUIRED
EXTERNAL FLOORS (GROUND FLOOR) :
TOWNHOUSE 11 - GROUND FLOOR - WAFFLE POD SLAB
ALL OTHER GROUND FLOOR FLOORS - NO INSULATION REQUIRED
INTERNAL CEILINGS/FLOORS
ALL INTERNAL CEILINGS/FLOORS ABOVE GARAGES - R5.0
ALL OTHER INTERNAL CEILINGS/FLOORS - NO INSULATION REQUIRED
EXTERNAL CEILINGS:
TOWNHOUSE 8 - ALL EXTERNAL CEILINGS (I.E BELOW ROOF) - R6.0
ALL OTHER TOWNHOUSES - ALL EXTERNAL CEILINGS (I.E BELOW ROOF) - R5.0

ROOF:
METAL ROOF (TIMBER FRAME CONSTRUCTION) - R1.0 BULK, REFLECTIVE SIDE DOWN (ANTICON/PERMASTOP OR SIMILAR) (NOTE - R5.0 CEILING INSULATION REQUIRED)
DECK FORMING ROOF OVER GROUND FLOOR - NO INSULATION REQUIRED (NOTE - R5.0 CEILING INSULATION REQUIRED)
TILED ROOF - NO INSULATION REQUIRED (NOTE - R5.0 CEILING INSULATION REQUIRED)

GENERAL NOTES

WEATHERSEALS REQUIRED TO ALL EXTERNAL DOORS INCLUDING INTERNAL ACCESS TO GARAGE

INSULATION MUST BE INSTALLED IN ACCORDANCE WITH NCC AND RELEVANT AUSTRALIAN STANDARDS

THE NUMBER OF DOWNLIGHTS THAT HAVE BEEN INPUT TO THE NATHERS THERMAL COMFORT ASSESSMENT TO MODEL CEILING INSULATION LOSS IS AS PER JACK TAYLOR ARCHITECTS MARK-UP DATED 08.04.2020 (TO BE SEALED LED DOWNLIGHTS).

ONE SEALED EXHAUST FAN HAS BEEN INPUT FOR EACH KITCHEN, BATHROOM, LAUNDRY, ENSUITE, P'DER AND WC.

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PROJECT
RESIDENTIAL DEVELOPMENT
481 - 485 PRINCES HIGHWAY WOONONA NSW 2517

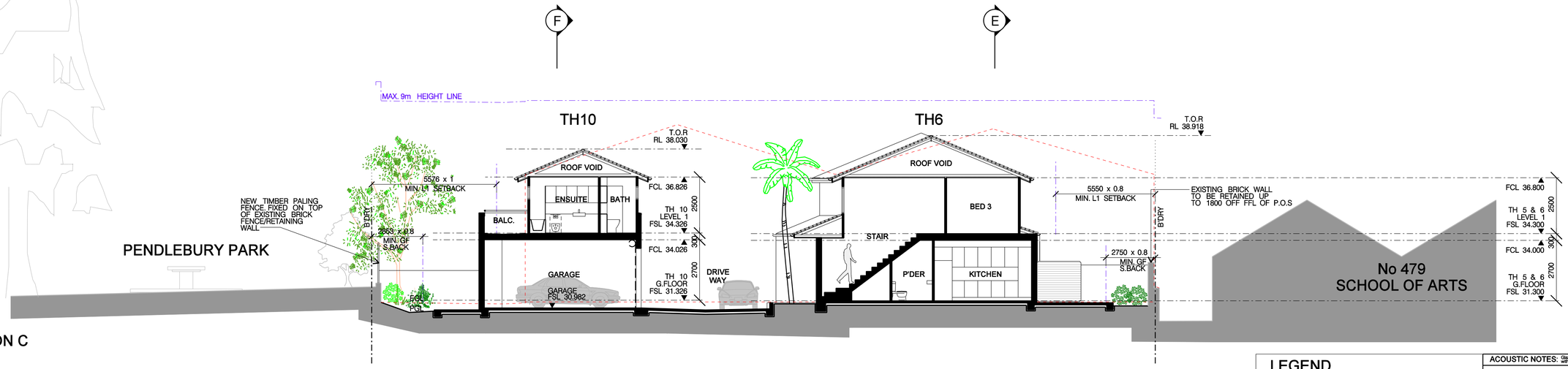
FOR
EMERALD PARK ESTATE PTY. LTD.

REVISION

NO.	DATE	AMENDMENT	NO.	DATE	AMENDMENT
01	09.04.20	ISSUED TO CONSULTANTS			
A	01.05.20	ISSUED FOR DA			
B	12.08.20	REVISED TO COMMENTS FROM COUNCIL			
C	06.11.20	CO-ORDINATED WITH GROUND FLOOR REVISION			

DRAWING NAME
ROOF PLAN WEST

PROJECT NUMBER 20105
SCALE 1:100 @ A1 / 1:200 @ A3
NORTH
DRAWING NUMBER AR 0156
REVISION C



SECTION C

SECTION D

LEGEND

- DCP PRESCRIBED LANDSCAPING
- DCP PRESCRIBED DEEP SOIL PLANTING ZONE
- DCP PRESCRIBED 4mx5m PRIVATE OPEN SPACE
- MISC. LANDSCAPING NOT INCLUDED IN CALCULATIONS
- TPZ ENCROACHMENT
- DCP PRESCRIBED STORAGE
- EXISTING TREES TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE RETAINED
- PROPOSED WORKS

ACOUSTIC NOTES:

Glazing other than those specified in Table 2 may be of standard thickness with a minimum R_w 25.

Table 2 Recommended Window Schedule – Residential Units

Block / Unit / Glazing	Min R_w	Example Glazing Specification
Unit 8		
Living / Dining / Kitchen (all)	32	6.38 mm laminated glass
Bedrooms (all)	29	5 mm float glass
Unit 9		
Living / Dining / Kitchen (all)	32	6.38 mm laminated glass
Bedroom (all)	32	6.38 mm laminated glass
Unit 7		
Living / Dining (all)	32	6.38 mm laminated glass
Bedrooms (all)	29	5 mm float glass
Unit 10		
Living / Dining / Kitchen (all)	29	5 mm float glass
Bedrooms (all)	29	5 mm float glass
Units 1, 2, 3, 4, 5, 6, 11 & 12		
Living / Dining / Kitchen (all)	29	5 mm float glass

All windows and glazed doors in Table 2 should be fitted with acoustic seals comprising foam weather seals (e.g. Q-Lon from Schlegel or similar).

RECOMMENDED CONSTRUCTION

WALLS

EXTERNAL WALLS OF BRICK VENEER OR OTHER MASONRY CONSTRUCTION WILL BE ACCEPTABLE, AND CEMENT COMPOSITE EXTERNAL CLADDING FOR EXAMPLE HARDIES 'SCYON' LINEA' STRIA' OR CSR 'CEMINTAL' OR APPROVED EQUIVALENT WITH MINIMUM MASS (MIN. 13 KG/M2).-

INTERNAL PLASTERBOARD WALL LINING MAY BE OF 10 MM THICK (MINIMUM) STANDARD PLASTERBOARD CONSTRUCTION WITH THE EXCEPTION OF THE FOLLOWING:-

UNITS 8 AND 9 ALL BEDROOMS SHOULD BE COMPRISE ONE LAYER OF 13 MM THICK (MINIMUM) STANDARD, OR 10 MM THICK SOUND RATED PLASTERBOARD.

MINIMUM 50 MM THICK GLASSWOOL OR POLYESTER INSULATION IN ALL EXTERNAL WALL CAVITIES (MIN DENSITY 11 KG/M3).

CEILING AND ROOF SYSTEM

CONCRETE TILE OR METAL DECK ROOF WITH 10 MM THICK STANDARD PLASTERBOARD CEILING BELOW, AND MINIMUM 50 MM THICK GLASSWOOL INSULATION (MINIMUM 11 KG/M3) IN THE CEILING CAVITY WILL BE ACCEPTABLE.

BASIX NOTES

WATER (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

FIXTURES
ALL SHOWERHEADS - MINIMUM 3 STAR (>7.5 BUT <= 9L/MIN) WATER RATING
ALL TOILETS - MINIMUM 4 STAR WATER RATING
ALL KITCHEN TAPS - MINIMUM 4 STAR WATER RATING
ALL BATHROOM TAPS - MINIMUM 5 STAR WATER RATING

ALTERNATIVE WATER SOURCE - RAINWATER TANK
THE RAINWATER TANKS MUST BE INSTALLED IN ACCORDANCE WITH, THE REQUIREMENTS OF ALL APPLICABLE REGULATORY AUTHORITIES

TOWNHOUSE 1 TO 4
A 1500 LITRE (MIN) WATER TANK CONFIGURED TO COLLECT RUN-OFF FROM 50M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO AT LEAST ONE OUTDOOR TAP
TOWNHOUSE 5 TO 10
A 2000 LITRE (MIN) WATER TANK CONFIGURED TO COLLECT RUN-OFF FROM 50M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO AT LEAST ONE OUTDOOR TAP & ALL TOILETS

ENERGY (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

HOT WATER
GAS INSTANTANEOUS 3 STAR) ENERGY RATING

HEATING
THE LIVING AREAS MUST NOT INCORPORATE ANY HEATING SYSTEM,OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY HEATING SYSTEM,OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM

COOLING
THE LIVING AREAS MUST NOT INCORPORATE ANY COOLING SYSTEM,OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY COOLING SYSTEM,OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM

VENTILATION
THE FOLLOWING EXHAUST SYSTEMS MUST BE INSTALLED FOR EACH DWELLING:

BATHROOMS - INDIVIDUAL FAN DUCTED TO FACADE OR ROOF, MANUAL SWITCH ON/OFF

KITCHEN - INDIVIDUAL FAN DUCTED TO FACADE OR ROOF, MANUAL SWITCH ON/OFF

LAUNDRY - INDIVIDUAL FAN DUCTED TO FACADE OR ROOF, MANUAL SWITCH ON/OFF

LIGHTING
THE PRIMARY TYPE OF ARTIFICIAL LIGHTING MUST BE 'LIGHT EMITTING DIODE (LED) LIGHTING' IN ALL ROOMS

ALTERNATIVE ENERGY
A PHOTOVOLTAIC SYSTEM WITH THE CAPACITY TO GENERATE AT LEAST 1.4 PEAK KILOWATTS OF ELECTRICITY MUST BE INSTALLED FOR TOWNHOUSE 8, 10, 11 AND 12.THE SYSTEM MUST BE CONNECTED TO THE DEVELOPMENT'S ELECTRICAL SYSTEM.A PHOTOVOLTAIC SYSTEM IS NOT REQUIRED FOR ALL OTHER TOWNHOUSES

OTHER
A GAS COOKTOP & ELECTRIC OVEN MUST BE INSTALLED IN 'EACH KITCHEN

A FIXED OUTDOOR CLOTHES DRYING LINE MUST BE INSTALLED FOR EACH TOWN-HOUSE

GLAZING

TOWNHOUSE 1 AND 8
ALL AWNING, WINDOWS AND GLAZED HINGED DOORS
ALM-000-03 A DEFAULTS
U-VALUE 4.1 (NOTE: </= U-VALUE)
SHGC 0.62 (NOTE: WITHIN 10% OF SHGC)
GLASS - ARGON FILL,HIGH SOLAR GAIN LOWE
FRAME - ALUMINIUM, ALM-000 GROUP B DG ARGON FILL

ALL FIXED WINDOWS,SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-000-03 A DEFAULTS
U-VALUE 4.1 (NOTE: </= U-VALUE)
SHGC 0.62 (NOTE: WITHIN 10% OF SHGC)
GLASS - ARGON FILL,HIGH SOLAR GAIN LOWE
FRAME - ALUMINIUM, ALM-000 GROUP B DG ARGON FILL

TOWNHOUSE 2, 3, 4, 5, 6, 7 AND 12
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-01 A DEFAULTS
U-VALUE 6.70 (NOTE: </= U-VALUE)
SHGC 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-001 GROUP A SG

ALL FIXED WINDOWS,SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-000-01 A DEFAULTS
U-VALUE 6.70 (OR LESS THAN)
SHGC 0.57 (OR LESS THAN)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-002 GROUP B SG

TOWNHOUSE 9 AND 11
ALL AWNING, WINDOWS AND GLAZED HINGED DOORS
ALM-001-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.49 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOWE
FRAME - ALUMINIUM, ALM-001 GROUP A SG

ALL FIXED WINDOWS,SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-001-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.49 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOWE
FRAME - ALUMINIUM, ALM-001 GROUP A SG

TOWNHOUSE 13
ALL BEDROOM,ENSUITE,BATH,LYDRY AND PDER AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-01 A DEFAULTS
U-VALUE 6.70 (NOTE: </= U-VALUE)
SHGC 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-001 GROUP A SG

ALL BEDROOM,ENSUITE,BATH,LYDRY AND PDER FIXED WINDOWS,SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.58 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOWE
FRAME - ALUMINIUM, ALM-002 GROUP B SG

ALL OTHER AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-002-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.49 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOWE
FRAME - ALUMINIUM, ALM-002 GROUP B SG

ALL OTHER FIXED WINDOWS,SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.58 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOWE
FRAME - ALUMINIUM, ALM-002 GROUP B SG

INSULATION (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE)

EXTERNAL WALLS
WALLS BETWEEN GARAGES - R4.0
WALLS BETWEEN TOWNHOUSES - R4.0
GARAGE FRONT WALL - NO INSULATION REQUIRED
ALL OTHER EXTERNAL WALLS - R2.7

INTERNAL WALLS
WALLS BETWEEN GARAGE AND DWELLING - R2.7
TOWNHOUSE 1 - WALLS BETWEEN LYDRY AND KITCHEN - R2.7
TOWNHOUSE 10 - WALLS BETWEEN PDER AND KITCHEN/LIVING/DINING/STAIR - R2.7
ALL OTHER INTERNAL WALLS - NO INSULATION REQUIRED

EXTERNAL FLOORS (GROUND FLOOR)
TOWNHOUSE 1 - GROUND FLOOR - WAFFLE POD SLAB
ALL OTHER TOWNHOUSES - GROUND FLOORS - NO INSULATION REQUIRED

INTERNAL CEILINGS/FLOORS
ALL INTERNAL CEILINGS/FLOORS ABOVE GARAGES - R6.0
ALL OTHER INTERNAL CEILINGS/FLOORS - NO INSULATION REQUIRED

EXTERNAL CEILINGS
TOWNHOUSE 8 - ALL EXTERNAL CEILINGS (I.E BELOW ROOF) - R6.0
ALL OTHER TOWNHOUSES - ALL EXTERNAL CEILINGS (I.E BELOW ROOF) - R6.0

ROOF
METAL ROOF (TIMBER FRAME CONSTRUCTION) - R1.5 BULK, REFLECTIVE SIDE DOWN (ANTICONDITIONMATOP OR SIMILAR) (NOTE - R5.0 CEILING INSULATION REQUIRED)
DECK FORMING ROOF OVER GROUND FLOOR - NO INSULATION REQUIRED (NOTE - R5.0 CEILING INSULATION REQUIRED)
TL101 ROOF - NO INSULATION REQUIRED (NOTE - R5.0 CEILING INSULATION REQUIRED)

GENERAL NOTES

WEATHERSEALS REQUIRED TO ALL EXTERNAL DOORS INCLUDING INTERNAL ACCESS TO GARAGE

INSULATION MUST BE INSTALLED IN ACCORDANCE WITH NCC AND RELEVANT AUSTRALIAN STANDARDS

THE NUMBER OF DOWNLIGHTS THAT HAVE BEEN INPUT TO THE NATHERS THERMAL COMFORT ASSESSMENT TO MODEL CEILING INSULATION LOSS IS AS PER JACK TAYLOR ARCHITECTS MARK-UP DATED 08.04.2020 (TO BE SEALED LED DOWNLIGHTS).

ONE SEALED EXHAUST FAN HAS BEEN INPUT FOR EACH KITCHEN, BATHROOM, LAUNDRY, ENSUITE, PDER AND WC.

D/A

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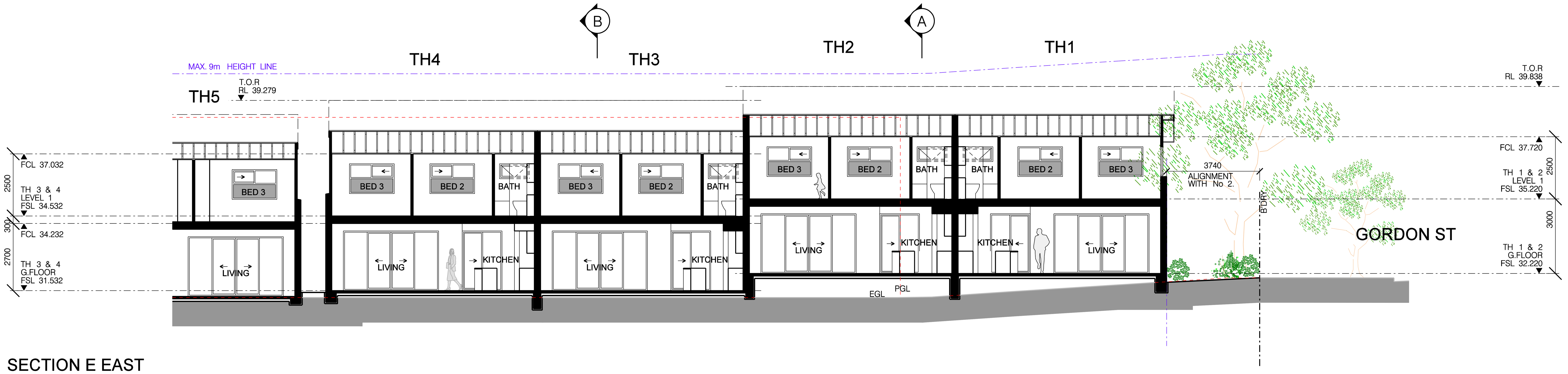
FOR
EMERALD PARK ESTATE PTY. LTD.

REVISION

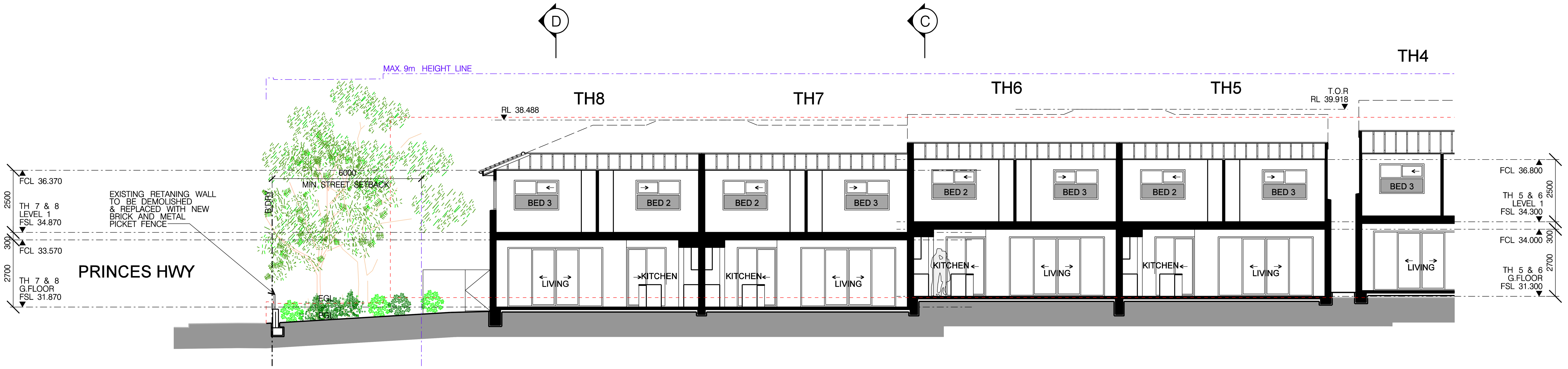
NO.	DATE	AMENDMENT	NO.	DATE	AMENDMENT
01	01.04.20	ISSUED TO CONSULTANTS			
02	09.04.20	ISSUED TO CONSULTANTS			
A	01.05.20	ISSUED FOR DA			
B	12.08.20	REVISED TO COMMENTS FROM COUNCIL			
C	06.11.20	CO-ORDINATED WITH GROUND FLOOR REVISION			

DRAWING NAME
SECTIONS 02
SECTIONS C & D

PROJECT NUMBER 20105
SCALE 1:100 @ A1, 1:200 @ A3
NORTH
DRAWING NUMBER AR 0202
REVISION C



SECTION E EAST



SECTION E WEST

LEGEND

- DCP PRESCRIBED LANDSCAPING
- DCP PRESCRIBED DEEP SOIL PLANTING ZONE
- DCP PRESCRIBED 4mx5m PRIVATE OPEN SPACE
- MISC. LANDSCAPING NOT INCLUDED IN CALCULATIONS
- TPZ ENCROACHMENT
- DCP PRESCRIBED STORAGE
- EXISTING TREES TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE RETAINED
- PROPOSED WORKS

ACOUSTIC NOTES:

Glazing other than those specified in Table 2 may be of standard thickness with a minimum Rw 25.

Table 2 Recommended Window Schedule – Residential Units

Block / Unit / Glazing	Min R_w	Example Glazing Specification
Unit 8		
Living / Dining / Kitchen (all)	**32**	6.38 mm laminated glass
Bedrooms (all)	**29**	5 mm float glass
Unit 9		
Living / Dining / Kitchen (all)	**32**	6.38 mm laminated glass
Bedroom (all)	**32**	6.38 mm laminated glass
Unit 7		
Living / Dining (all)	**32**	6.38 mm laminated glass
Bedrooms (all)	**29**	5 mm float glass
Unit 10		
Living / Dining / Kitchen (all)	**29**	5 mm float glass
Bedrooms (all)	**29**	5 mm float glass
Units 1, 2, 3, 4, 5, 6, 11 & 12		
Living / Dining / Kitchen (all)	**29**	5 mm float glass

All windows and glazed doors in Table 2 should be fitted with acoustic seals comprising foam weather seals (e.g. Q-Lon from Schlegel or similar).

RECOMMENDED CONSTRUCTION

WALLS

EXTERNAL WALLS OF BRICK VENEER OR OTHER MASONRY CONSTRUCTION WILL BE ACCEPTABLE, AND

CEMENT COMPOSITE EXTERNAL CLADDING, FOR EXAMPLE HARDIES 'SCYON', 'LINEA', 'STRIA', OR CSR 'CEMENTAL' OR APPROVED EQUIVALENT WITH SIMILAR MINIMUM MASS (MIN 13 KG/M2):-

INTERNAL PLASTERBOARD WALL LINING MAY BE OF 10 MM THICK (MINIMUM) STANDARD PLASTERBOARD CONSTRUCTION WITH THE EXCEPTION OF THE FOLLOWING:-

UNITS 8 AND 9, ALL BEDROOMS SHOULD BE COMPRISE ONE LAYER OF 13 MM THICK (MINIMUM) STANDARD, OR 10 MM THICK SOUND RATED, PLASTERBOARD,

MINIMUM 50 MM THICK GLASSWOOL OR POLYESTER INSULATION IN ALL EXTERNAL WALL CAVITIES (MIN DENSITY 11 KG/M3).

CEILING AND ROOF SYSTEM

CONCRETE TILE OR METAL DECK ROOF WITH 10 MM THICK STANDARD PLASTERBOARD CEILING BELOW, AND MINIMUM 50 MM THICK GLASSWOOL INSULATION (MINIMUM 11 KG/M3) IN THE CEILING CAVITY WILL BE ACCEPTABLE.

BASIX NOTES

D/A

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FOR

EMERALD PARK ESTATE PTY. LTD.

REVISION

NO.	DATE	AMENDMENT	NO.	DATE	AMENDMENT
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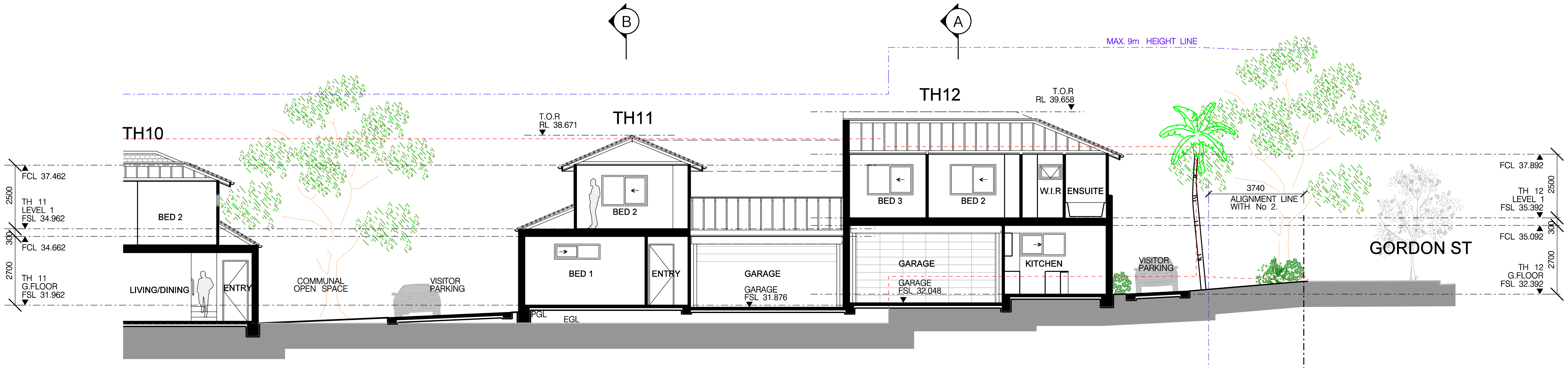
02	09.04.20	ISSUED TO CONSULTANTS			
A	01.05.20	ISSUED FOR DA			
B	12.08.20	REVISED TO COMMENTS FROM COUNCIL			
C	06.11.20	CO-ORDINATED WITH GROUND FLOOR REVISION			

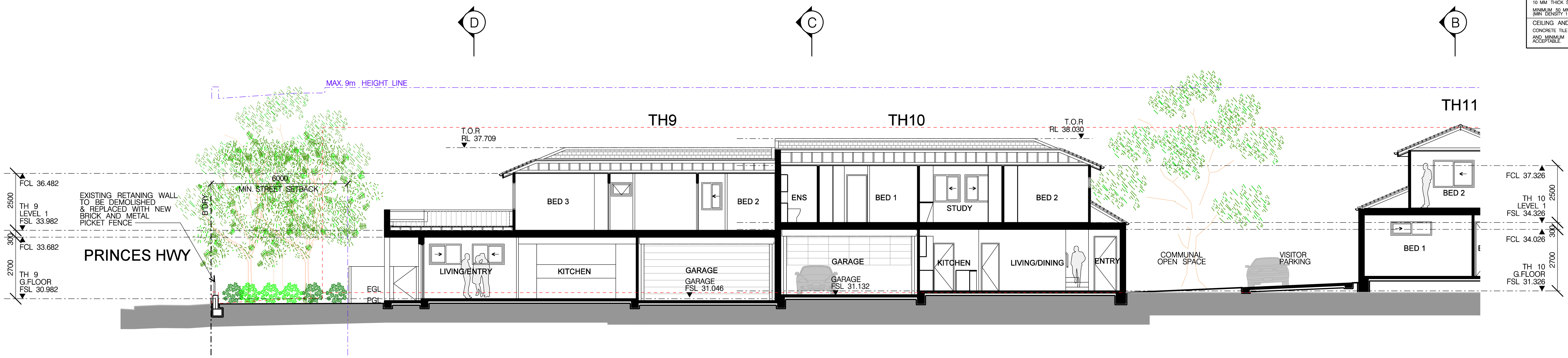
DRAWING NAME

SECTIONS 03
SECTION E
WITH CHANGES NOTES

PROJECT NUMBER: 20105
SCALE: 1:100 @ A1, 1:200 @ A3
DRAWING NUMBER: AR 0203
REVISION: C
NORTH
N



SECTION F EAST



SECTIONFE WEST

LEGEND

- DCP PRESCRIBED LANDSCAPING
- DCP PRESCRIBED DEEP SOIL PLANTING ZONE
- DCP PRESCRIBED 4mx5m PRIVATE OPEN SPACE
- MISC. LANDSCAPING NOT INCLUDED IN CALCULATIONS
- TPZ ENCROACHMENT
- DCP PRESCRIBED STORAGE
- EXISTING TREES TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE RETAINED
- PROPOSED WORKS

ACOUSTIC NOTES:

Glazing other than those specified in Table 2 may be of standard thickness with a minimum Rw 25.

Table 2 Recommended Window Schedule – Residential Units

Block / Unit / Glazing	Min R_w	Example Glazing Specification
Unit 8		
Living / Dining / Kitchen (all)	**32**	6.38 mm laminated glass
Bedrooms (all)	**29**	5 mm float glass
Unit 9		
Living / Dining / Kitchen (all)	**32**	6.38 mm laminated glass
Bedroom (all)	**32**	6.38 mm laminated glass
Unit 7		
Living / Dining (all)	**32**	6.38 mm laminated glass
Bedrooms (all)	**29**	5 mm float glass
Unit 10		
Living / Dining / Kitchen (all)	**29**	5 mm float glass
Bedrooms (all)	**29**	5 mm float glass
Units 1, 2, 3, 4, 5, 6, 11 & 12		
Living / Dining / Kitchen (all)	**29**	5 mm float glass

All windows and glazed doors in Table 2 should be fitted with acoustic seals comprising foam weather seals (e.g. Q-Lon from Schlegel or similar).

RECOMMENDED CONSTRUCTION

WALLS

EXTERNAL WALLS OF BRICK VENEER OR OTHER MASONRY CONSTRUCTION WILL BE ACCEPTABLE, AND

CEMENT COMPOSITE EXTERNAL CLADDING, FOR EXAMPLE HARDIES 'SCYON', 'LINEA', 'STRIA', OR CSR 'CEMENTAL' OR APPROVED EQUIVALENT WITH SIMILAR MINIMUM MASS (MIN 13 KG/M2):-

INTERNAL PLASTERBOARD WALL LINING MAY BE OF 10 MM THICK (MINIMUM) STANDARD PLASTERBOARD CONSTRUCTION WITH THE EXCEPTION OF THE FOLLOWING:-

UNITS 8 AND 9, ALL BEDROOMS SHOULD BE COMPRISE ONE LAYER OF 13 MM THICK (MINIMUM) STANDARD, OR 10 MM THICK SOUND RATED, PLASTERBOARD,

MINIMUM 50 MM THICK GLASSWOOL OR POLYESTER INSULATION IN ALL EXTERNAL WALL CAVITIES (MIN DENSITY 11 KG/M3).

CEILING AND ROOF SYSTEM

CONCRETE TILE OR METAL DECK ROOF WITH 10 MM THICK STANDARD PLASTERBOARD CEILING BELOW, AND MINIMUM 50 MM THICK GLASSWOOL INSULATION (MINIMUM 11 KG/M3) IN THE CEILING CAVITY WILL BE ACCEPTABLE.

BASIX NOTES

WATER (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

FIXTURES
ALL SHOWERHEADS - MINIMUM 3 STAR (>7.5 BUT <= 9L/MIN) WATER RATING
ALL TOILETS - MINIMUM 4 STAR WATER RATING
ALL KITCHEN TAPS - MINIMUM 4 STAR WATER RATING
ALL BATHROOM TAPS - MINIMUM 5 STAR WATER RATING

ALTERNATIVE WATER SOURCE - RAINWATER TANK
THE RAINWATER TANKS MUST MEET, AND BE INSTALLED IN ACCORDANCE WITH, THE REQUIREMENTS OF ALL APPLICABLE REGULATORY AUTHORITIES
TOWNHOUSE 1 TO 8
A 1500 LITRE (MIN) WATER TANK CONFIGURED TO COLLECT RUN-OFF FROM 50M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO: AT LEAST ONE OUTDOOR TAP
TOWNHOUSE 9 TO 12
A 2000 LITRE (MIN) WATER TANK CONFIGURED TO COLLECT RUN-OFF FROM 50M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO: AT LEAST ONE OUTDOOR TAP & ALL TOILETS

ENERGY (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

HOT WATER
GAS INSTANTANEOUS 5 STAR ENERGY RATING

HEATING
THE LIVING AREAS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM

COOLING
THE LIVING AREAS MUST NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM

VENTILATION
THE FOLLOWING EXHAUST SYSTEMS MUST BE INSTALLED FOR EACH DWELLING:
BATHROOMS - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF
KITCHEN - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF
LAUNDRY - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF

LIGHTING
THE PRIMARY TYPE OF ARTIFICIAL LIGHTING MUST BE LIGHT EMITTING DIODE (LED) LIGHTING IN ALL ROOMS.

ALTERNATE ENERGY
A PHOTOVOLTAIC SYSTEM WITH THE CAPACITY TO GENERATE AT LEAST 1.4 PEAK KILOWATTS OF ELECTRICITY MUST BE INSTALLED FOR TOWNHOUSE 9, 10, 11 AND 12. THE SYSTEM MUST BE CONNECTED TO THE DEVELOPMENT'S ELECTRICAL SYSTEM. A PHOTOVOLTAIC SYSTEM IS NOT REQUIRED FOR ALL OTHER TOWNHOUSES

OTHER
A GAS COOKTOP & ELECTRIC OVEN MUST BE INSTALLED IN EACH KITCHEN
A FIXED OUTDOOR CLOTHES DRYING LINE MUST BE INSTALLED FOR EACH TOWNHOUSE

GLAZING

TOWNHOUSE 1 AND 8
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-005-03 A DEFAULTS
U-VALUE 4.10 (NOTE: </= U-VALUE)
SHGC 0.47 (NOTE: WITHIN 10% OF SHGC)
GLASS - ARGON FILL, HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-005 GROUP A DG ARGON FILL

ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-006-03 A DEFAULTS
U-VALUE 4.1 (NOTE: </= U-VALUE)
SHGC 0.52 (NOTE: WITHIN 10% OF SHGC)
GLASS - ARGON FILL, HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-006 GROUP B DG ARGON FILL

TOWNHOUSE 2, 3, 4, 5, 6, 7 AND 12
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-01 A DEFAULTS
U-VALUE 6.70 (NOTE: </= U-VALUE)
SHGC 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-001 GROUP A SG

ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-01 A DEFAULTS
U-VALUE 6.70 (OR LESS THAN)
SHGC 0.70 (+ OR - 10%)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-002 GROUP B SG

TOWNHOUSE 9 AND 11
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.49 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-001 GROUP A SG

ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.58 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-002 GROUP B SG

TOWNHOUSE 10
ALL BEDROOM, ENSUITE, BATH, L'DRY AND P'DER AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-01 A DEFAULTS
U-VALUE 6.70 (NOTE: </= U-VALUE)
SHGC 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-001 GROUP A SG

ALL BEDROOM, ENSUITE, BATH, L'DRY AND P'DER FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-01 A DEFAULTS
U-VALUE 6.70 (OR LESS THAN)
SHGC 0.70 (+ OR - 10%)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-002 GROUP B SG

ALL OTHER AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.49 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-001 GROUP A SG

ALL OTHER FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.58 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-002 GROUP B SG

INSULATION (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE)

EXTERNAL WALLS:
WALLS BETWEEN GARAGES - R4.0
WALLS BETWEEN TOWNHOUSES - R4.0
GARAGE FRONT WALL - NO INSULATION REQUIRED
ALL OTHER EXTERNAL WALLS - R2.7

INTERNAL WALLS:
WALLS BETWEEN GARAGE AND DWELLING - R2.7
TOWNHOUSE 10 - WALL BETWEEN L'DRY AND KITCHEN - R2.7
TOWNHOUSE 10 - WALLS BETWEEN P'DER AND KITCHEN/LIVING/DINING/STAIR - R2.7
ALL OTHER INTERNAL WALLS - NO INSULATION REQUIRED

EXTERNAL FLOORS (GROUND FLOOR) :
TOWNHOUSE 11 - GROUND FLOOR - WAFFLE POD SLAB
ALL OTHER GROUND FLOOR FLOORS - NO INSULATION REQUIRED

INTERNAL CEILINGS/FLOORS
ALL INTERNAL CEILINGS/FLOORS ABOVE GARAGES - R5.0
ALL OTHER INTERNAL CEILINGS/FLOORS - NO INSULATION REQUIRED

EXTERNAL CEILINGS:
TOWNHOUSE 8 - ALL EXTERNAL CEILINGS (I.E BELOW ROOF) - R6.0
ALL OTHER TOWNHOUSES - ALL EXTERNAL CEILINGS (I.E BELOW ROOF) - R5.0

ROOF:
METAL ROOF (TIMBER FRAME CONSTRUCTION) - R1.0 BULK, REFLECTIVE SIDE DOWN (ANTICON/PERMASTOP OR SIMILAR) (NOTE - R5.0 CEILING INSULATION REQUIRED)
DECK FORMING ROOF OVER GROUND FLOOR - NO INSULATION REQUIRED (NOTE - R5.0 CEILING INSULATION REQUIRED)
TILED ROOF - NO INSULATION REQUIRED (NOTE - R5.0 CEILING INSULATION REQUIRED)

GENERAL NOTES

WEATHERSEALS REQUIRED TO ALL EXTERNAL DOORS INCLUDING INTERNAL ACCESS TO GARAGE

INSULATION MUST BE INSTALLED IN ACCORDANCE WITH NCC AND RELEVANT AUSTRALIAN STANDARDS

THE NUMBER OF DOWNLIGHTS THAT HAVE BEEN INPUT TO THE NATHERS THERMAL COMFORT ASSESSMENT TO MODEL CEILING INSULATION LOSS IS AS PER JACK TAYLOR ARCHITECTS MARK-UP DATED 08.04.2020 (TO BE SEALED LED DOWNLIGHTS).

ONE SEALED EXHAUST FAN HAS BEEN INPUT FOR EACH KITCHEN, BATHROOM, LAUNDRY, ENSUITE, P'DER AND WC.

D/A

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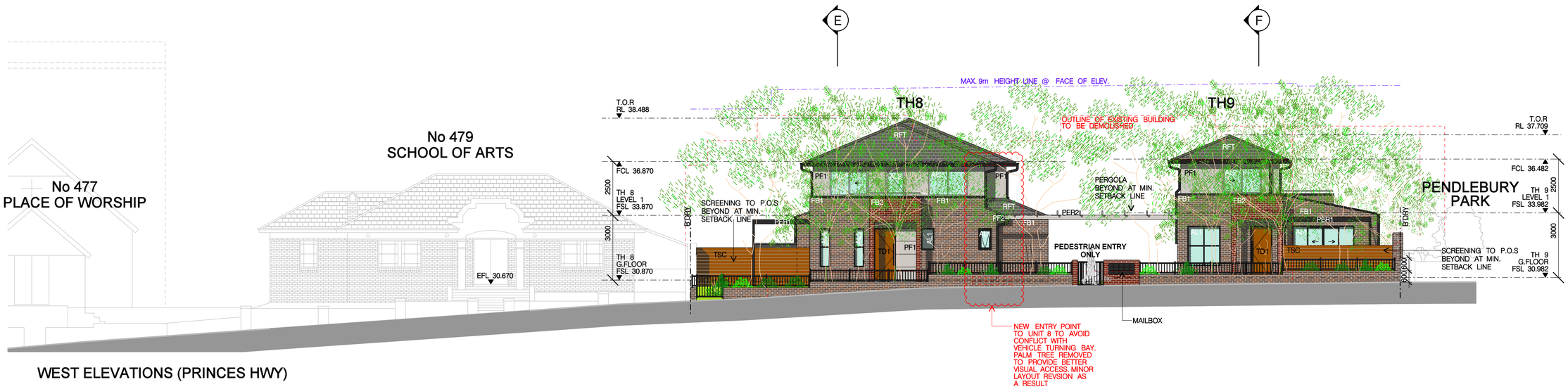
EMERALD PARK ESTATE PTY. LTD.

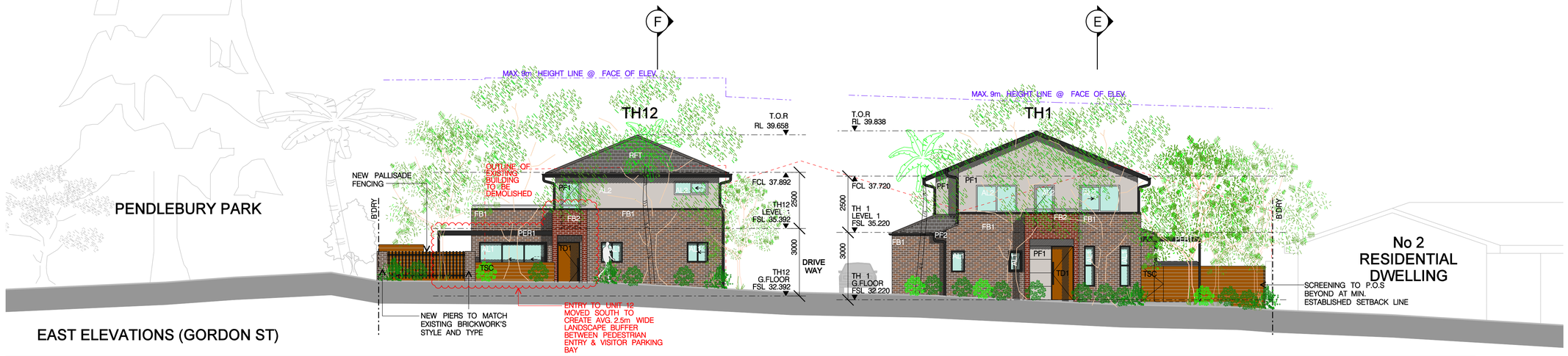
REVISION

NO.	DATE	AMENDMENT	NO.	DATE	AMENDMENT
01	01.04.20	ISSUED TO CONSULTANTS			
02	09.04.20	ISSUED TO CONSULTANTS			
A	01.05.20	ISSUED FOR DA			
B	12.08.20	REVISED TO COMMENTS FROM COUNCIL			
C	06.11.20	CO-ORDINATED WITH GROUND FLOOR REVISION			

DRAWING NAME
SECTIONS 04
SECTION F

PROJECT NUMBER 20105
SCALE 1:100 @ A1 1:200 @ A3
NORTH
DRAWING NUMBER AR 0204
REVISION C





BASIX NOTES

WATER (NOTE THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

FIXTURES
ALL SHOWERHEADS - MINIMUM 3 STAR (>7.5 BUT <= 9L/MIN) WATER RATING
ALL TOILETS - MINIMUM 4 STAR WATER RATING
ALL KITCHEN TAPS - MINIMUM 5 STAR WATER RATING
ALL BATHROOM TAPS - MINIMUM 5 STAR WATER RATING

ALTERNATIVE WATER SOURCE - RAINWATER TANK
THE RAINWATER TANKS MUST MEET AND BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF ALL APPLICABLE REGULATORY AUTHORITIES
TOWNHOUSE 1 TO 8
A 1500 LITRE (MIN) WATER TANK CONFIGURED TO: COLLECT RUN-OFF FROM 60M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANK MUST BE CONNECTED TO AT LEAST ONE OUTDOOR TAP
TOWNHOUSE 9 TO 12
A 2000 LITRE (MIN) WATER TANK CONFIGURED TO: COLLECT RUN-OFF FROM 60M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO AT LEAST ONE OUTDOOR TAP & ALL TOILETS

ENERGY (NOTE THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

HOT WATER
GAS INSTANTANEOUS 3 STAR ENERGY RATING
HEATING
THE LIVING AREAS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM
COOKING
A GAS COOKTOP & ELECTRIC OVEN MUST BE INSTALLED IN EACH KITCHEN
OTHER
A FIXED OUTDOOR CLOTHES DRYING LINE MUST BE INSTALLED FOR EACH TOWNHOUSE
COOLING
THE LIVING AREAS MUST NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM
THE BEDROOMS DOES NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM
VENTILATION
THE FOLLOWING EXHAUST SYSTEMS MUST BE INSTALLED FOR EACH DWELLING:
BATHROOMS - INDIVIDUAL FAN DUCTED TO FACADE OR ROOF, MANUAL SWITCH ON/OFF
KITCHEN - INDIVIDUAL FAN DUCTED TO FACADE OR ROOF, MANUAL SWITCH ON/OFF
LAUNDRY - INDIVIDUAL FAN DUCTED TO FACADE OR ROOF, MANUAL SWITCH ON/OFF

LIGHTING
THE PRIMARY TYPE OF ARTIFICIAL LIGHTING MUST BE LIGHT EMITTING DIODE (LED) LIGHTING IN ALL ROOMS
ALTERNATIVE ENERGY
A PHOTOVOLTAIC SYSTEM WITH THE CAPACITY TO GENERATE AT LEAST 1.4 PEAK KILOWATTS OF ELECTRICITY MUST BE INSTALLED FOR TOWNHOUSE 9,10,11 AND 12. THE SYSTEM MUST BE CONNECTED TO THE DEVELOPMENTS ELECTRICAL SYSTEM A PHOTOVOLTAIC SYSTEM IS NOT REQUIRED FOR ALL OTHER TOWNHOUSES
OTHER
A GAS COOKTOP & ELECTRIC OVEN MUST BE INSTALLED IN EACH KITCHEN
A FIXED OUTDOOR CLOTHES DRYING LINE MUST BE INSTALLED FOR EACH TOWNHOUSE

GLAZING
TOWNHOUSE 1 AND 8
ALL AWNING, WINDOWS AND GLAZED HINGED DOORS
U-VALUE 4.10 (NOTE: +/- U-VALUE)
SHGC 0.47 (NOTE:WITHIN 10% OF SHGC)
GLASS - AWGON FILL HIGH SOLAR GAIN LOWE
FRAME - ALUMINUM ALM-500 GROUP A OR ARGON FILL

ALL FIXED WINDOWS,SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-0405-01 A DEFAULTS
U-VALUE 4.1 (NOTE: +/- U-VALUE)
SHGC 0.48 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOWE
FRAME - ALUMINUM ALM-009 GROUP B DG ARGON FILL

TOWNHOUSE 2,3,4,5,6,7 AND 12
ALL AWNING, WINDOWS AND GLAZED HINGED DOORS
U-VALUE 6.75 (NOTE: +/- U-VALUE)
SHGC 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINUM ALM-001 GROUP A SG

ALL FIXED WINDOWS,SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-0405-01 A DEFAULTS
U-VALUE 6.75 (OR LESS THAN)
SHGC 0.70 (+/- OR - 10%)
GLASS - SINGLE CLEAR
FRAME - ALUMINUM ALM-002 GROUP B SG

TOWNHOUSE 9 AND 11
ALL AWNING, WINDOWS AND GLAZED HINGED DOORS
ALM-0405-01 A DEFAULTS
U-VALUE 4.1 (NOTE: +/- U-VALUE)
SHGC 0.48 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOWE
FRAME - ALUMINUM ALM-009 GROUP B SG

ALL FIXED WINDOWS,SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-0405-01 A DEFAULTS
U-VALUE 4.1 (NOTE: +/- U-VALUE)
SHGC 0.55 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOWE
FRAME - ALUMINUM ALM-002 GROUP B SG

TOWNHOUSE 10
ALL AWNING, WINDOWS AND GLAZED HINGED DOORS
U-VALUE 6.45 (NOTE: +/- U-VALUE)
SHGC 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINUM ALM-001 GROUP A SG

ALL BEDROOM,ENSUITE,BATH,LOBBY AND PDER FIXED WINDOWS,SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-0405-01 A DEFAULTS
U-VALUE 4.1 (NOTE: +/- U-VALUE)
SHGC 0.48 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOWE
FRAME - ALUMINUM ALM-001 GROUP A SG

ALL OTHER AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-0405-01 A DEFAULTS
U-VALUE 4.1 (NOTE: +/- U-VALUE)
SHGC 0.48 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOWE
FRAME - ALUMINUM ALM-001 GROUP A SG

ALL OTHER FIXED WINDOWS,SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-0405-01 A DEFAULTS
U-VALUE 6.45 (NOTE: +/- U-VALUE)
SHGC 0.68 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOWE
FRAME - ALUMINUM ALM-002 GROUP B SG

INSULATION (NOTE THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE)

EXTERNAL WALLS
WALLS BETWEEN GARAGES - R4.0
WALLS BETWEEN TOWNHOUSES - R4.0
GARAGE FRONT WALL - NO INSULATION REQUIRED
ALL OTHER EXTERNAL WALLS - R2.7
SUSPENDED FLOOR
WALLS BETWEEN GARAGE AND DWELLING - R2.7
TOWNHOUSE 10 - WALL BETWEEN LDRY AND KITCHEN - R2.7
TOWNHOUSE 10 - WALLS BETWEEN PDER AND KITCHEN/LIVING/DINING/STAIR - R2.7
ALL OTHER INTERNAL WALLS - NO INSULATION REQUIRED
SLAB ON GROUND FLOOR
TOWNHOUSE 10 - GROUND FLOOR TIMPPLE WOO SLAB
ALL OTHER GROUND FLOOR FLOORS - NO INSULATION REQUIRED
INTERNAL CEILINGS/FLOORS
ALL INTERNAL CEILINGS/FLOORE ABOVE GARAGES - R1.0
ALL OTHER INTERNAL CEILINGS/FLOORS - NO INSULATION REQUIRED
CEILING/ROOF
TOWNHOUSE 8 - ALL EXTERNAL CEILINGS (I.E BELOW ROOF) - R6.0
ALL OTHER TOWNHOUSES - ALL EXTERNAL CEILINGS (I.E BELOW ROOF) - R5.0

ROOF
METAL ROOF (TIMBER FRAME CONSTRUCTION) - R1.0 SULK REFLECTIVE SIDE DOWN
(ANTICONDPRIMATOP OR SIMILAR) (NOTE - R5.0 CEILING INSULATION REQUIRED)
TILED ROOF (TIMBER FRAME CONSTRUCTION - NO INSULATION REQUIRED
NOTE - R5.0 CEILING INSULATION REQUIRED)
TILED ROOF - NO INSULATION REQUIRED (NOTE - R6.0 CEILING INSULATION REQUIRED)

GENERAL NOTES

WEATHERSEALS REQUIRED TO ALL EXTERNAL DOORS INCLUDING INTERNAL ACCESS TO GARAGE

INSULATION MUST BE INSTALLED IN ACCORDANCE WITH NCC AND RELEVANT AUSTRALIAN STANDARDS

THE NUMBER OF DOWNLIGHTS THAT HAVE BEEN INPUT TO THE NATHERS THERMAL COMFORT ASSESSMENT TO MODEL CEILING INSULATION LOSS IS AS PER JACK TAYLOR ARCHITECTS MARK-UP DATED 08.04.2020 (TO BE SEALED LED DOWNLIGHTS).

ONE SEALED EXHAUST FAN HAS BEEN INPUT FOR EACH KITCHEN, BATHROOM, LAUNDRY, ENSUITE, PDER AND WC

EXTERNAL FINISHES

FB1 FACE BRICK TYPE 1. AUSRTRALBRICKS EVERYDAY LIFE: HOLIDAY BLEND

FB2 FACE BRICK TYPE 2. AUSRTRALBRICKS NUBRICK: BURWOOD BLUE

RFT ROOF TILES MONIER CONC. TILES ELBANA BARRAMUNDI

PF1 PAINT FINISH_1 DULUX PAINT S12B2 LINNET

PF2 PAINT FINISH_1 DULUX PAINT TO MATCH CHARCOAL

TD1 TIMBER ENTRY DOOR

TSC ALUM. SCREEN HORIZONTAL SLATS P'DERCOAT TIMBER

CBF COLORBOND FENCE COLORBOND: MONUMENT

ALUM. FRAMED WINDOW P'DERCOAT CHARCOAL

ALUM. FRAMED WINDOW P'DERCOAT WHITE

COLORBOND: MONUMENT GUTTER, FASCIA & DP.

PER1 ALUM. PERGOLA P'DERCOAT CHARCOAL

PER2 ALUM. PERGOLA P'DERCOAT TIMBER

TD2 TIMBER DOOR PAINTED TO MATCH PF1

CBR COLORBOND: MONUMENT METAL ROOF SHEETING

RS1 ROLLER SHUTTER MONIER STYLE 1

RS2 ROLLER SHUTTER MONIER STYLE 2

RS3 ROLLER SHUTTER MONIER STYLE 3

RS4 ROLLER SHUTTER MONIER STYLE 4

LEGEND

EXISTING STRUCTURE TO BE REMOVED SHOWN DOTTED

EXISTING STRUCTURE TO BE RETAINED

PROPOSED WORKS

D/A

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FOR
EMERALD PARK ESTATE PTY. LTD.

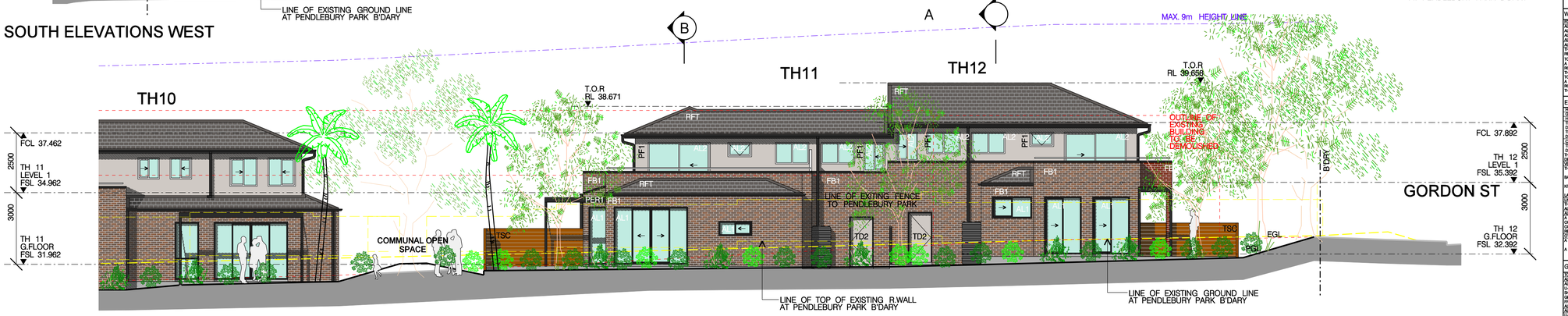
REVISION

NO.	DATE	AMENDMENT	NO.	DATE	AMENDMENT
01	06.03.20	ISSUED FOR CO-ORDINATION			
02	01.04.20	ISSUED TO CONSULTANTS			
03	09.04.20	ISSUED TO CONSULTANTS			
A	01.05.20	ISSUED FOR DA			
B	12.08.20	REVISED TO COMMENTS FROM COUNCIL			
C	06.11.20	REVISED AS CLOUDED			

DRAWING NAME
ELEVATIONS 01
STREET ELEVATIONS

PROJECT NUMBER	SCALE	NORTH
20105	1:100 @ A1 1:200 @ A3	
DRAWING NUMBER	REVISION	
AR 0301	C	

SOUTH ELEVATIONS WEST



SOUTH ELEVATIONS EAST

NORTH ELEVATIONS EAST

NORTH ELEVATIONS WEST

BASIX NOTES

WATER (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

FIXTURES
ALL SHOWERHEADS - MINIMUM 3 STAR (>7.5 BUT <= 9L/MIN) WATER RATING
ALL TOILETS - MINIMUM 4 STAR WATER RATING
ALL KITCHEN TAPS - MINIMUM 4 STAR WATER RATING
ALL BATHROOM TAPS - MINIMUM 5 STAR WATER RATING

ALTERNATIVE WATER SOURCE - RAINWATER TANK
THE RAINWATER TANKS MUST MEET, AND BE INSTALLED IN ACCORDANCE WITH, THE REQUIREMENTS OF ALL APPLICABLE REGULATORY AUTHORITIES
TOWNHOUSE 1 TO 5
A 3000 LITRE (MIN) RAIN WATER TANK CONFIGURED TO COLLECT RUN-OFF FROM 92M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO AT LEAST ONE OUTDOOR TAP
TOWNHOUSE 9 TO 12
A 3000 LITRE (MIN) WATER TANK CONFIGURED TO COLLECT RUN-OFF FROM 92M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO AT LEAST ONE OUTDOOR TAP & ALL TOILETS

ENERGY (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

HOT WATER
GAS INSTANTANEOUS 5 STAR ENERGY RATING

HEATING
THE LIVING AREAS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM

COOLING
THE LIVING AREAS MUST NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM

VENTILATION
THE FOLLOWING EXHAUST SYSTEMS MUST BE INSTALLED FOR EACH DWELLING:

BATHROOMS - INDIVIDUAL FAN DUCTED TO FACADE OR ROOF, MANUAL SWITCH ON/OFF

KITCHEN - INDIVIDUAL FAN DUCTED TO FACADE OR ROOF, MANUAL SWITCH ON/OFF

LAUNDRY - INDIVIDUAL FAN DUCTED TO FACADE OR ROOF, MANUAL SWITCH ON/OFF

LIGHTING
THE PRIMARY TYPE OF ARTIFICIAL LIGHTING MUST BE LIGHT EMITTING DIODE (LED) LIGHTING IN ALL ROOMS

ALTERNATIVE ENERGY
A PHOTOVOLTAIC SYSTEM WITH THE CAPACITY TO GENERATE AT LEAST 1.4 PEAK KILOWATTS OF ELECTRICITY MUST BE INSTALLED FOR EACH TOWNHOUSE 6,10,11 AND 12.THE SYSTEM MUST BE CONNECTED TO THE DWELLING'S MAIN ELECTRICAL SYSTEM.A PHOTOVOLTAIC SYSTEM IS NOT REQUIRED FOR ALL OTHER TOWNHOUSES

OTHER
A GAS COOKTOP & ELECTRIC OVEN MUST BE INSTALLED IN EACH KITCHEN

A FIXED OUTDOOR CLOTHES DRYING LINE MUST BE INSTALLED FOR EACH TOWNHOUSE

GLAZING

TOWNHOUSE 1 AND 5
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-000-00 A DEFAULTS
U-VALUE 6.4 (NOTE: +/- U-VALUE)
SHGC 0.57 (NOTE WITHIN 10% OF SHGC)
GLASS - ARGON FILL,HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-005 GROUP A DG ARGON FILL
ALL FIXED WINDOWS,SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-000-00 A DEFAULTS
U-VALUE 6.70 (OR LESS THAN) (+/- U-VALUE)
SHGC 0.62 (NOTE WITHIN 10% OF SHGC)
GLASS - ARGON FILL,HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-006 GROUP B DG ARGON FILL

TOWNHOUSE 2, 3, 4, 6, 8, 7 AND 12
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-00 A DEFAULTS
U-VALUE 6.40 (NOTE: +/- U-VALUE)
SHGC 0.57 (NOTE WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL FIXED WINDOWS,SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-000-00 A DEFAULTS
U-VALUE 6.70 (OR LESS THAN)
SHGC 0.70 (+ OR - 10%)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-001 GROUP A SG

TOWNHOUSE 10
ALL BEDROOM ENSUITE,BATH, LOBBY AND PDER AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-00 A DEFAULTS
U-VALUE 6.40 (NOTE: +/- U-VALUE)
SHGC 0.57 (NOTE WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL BEDROOM ENSUITE, BATH, LOBBY AND PDER FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-000-00 A DEFAULTS
U-VALUE 6.70 (OR LESS THAN)
SHGC 0.70 (+ OR - 10%)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-002 GROUP B SG
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-00 A DEFAULTS
U-VALUE 6.40 (NOTE: +/- U-VALUE)
SHGC 0.49 (NOTE WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL FIXED WINDOWS,SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-000-00 A DEFAULTS
U-VALUE 5.40 (NOTE: +/- U-VALUE)
SHGC 0.68 (NOTE WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-002 GROUP B SG

INSULATION (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE)

EXTERNAL WALLS
WALLS BETWEEN GARAGES - R4.0
WALLS BETWEEN TOWNHOUSES - R4.0
WALLS BETWEEN GARAGE AND TOWNHOUSE - NO INSULATION REQUIRED
ALL OTHER EXTERNAL WALLS - R2.7
INTERNAL WALLS
WALLS BETWEEN GARAGE AND DWELLING - R2.7
TOWNHOUSE 10 - WALL BETWEEN LOBBY AND KITCHEN - R2.7
TOWNHOUSE 10 - WALLS BETWEEN PDER AND KITCHEN/LIVING/DINING/STAIR - R2.7
ALL OTHER INTERNAL WALLS - NO INSULATION REQUIRED
CEILINGS AND ROOFS - NO INSULATION REQUIRED
TOWNHOUSE 11 - GROUND FLOOR - WAFFLE POD SLAB
ALL OTHER GROUND FLOOR FLOORS - NO INSULATION REQUIRED
INTERNAL CEILINGS/FLOORS
ALL INTERNAL CEILINGS/FLOORS ABOVE GARAGES - R0.5
ALL OTHER INTERNAL CEILINGS/FLOORS - NO INSULATION REQUIRED
EXTERNAL CEILINGS
TOWNHOUSE 8 - ALL EXTERNAL CEILINGS (I.E. BELOW ROOF) - R6.0
ALL OTHER TOWNHOUSES - ALL EXTERNAL CEILINGS (I.E. BELOW ROOF) - R5.0
ROOFS
METAL ROOF (TIMBER FRAME CONSTRUCTION) - R1.0 BULK REFLECTIVE SIDE DOWN (ANTICON/SISALATION OR SIMILAR) (NOTE - R0.0 CEILING INSULATION REQUIRED)
DECK FORMING ROOF OVER GROUND FLOOR - NO INSULATION REQUIRED
(NOTE - R0.0 CEILING INSULATION REQUIRED)
TILED ROOF - NO INSULATION REQUIRED (NOTE - R0.0 CEILING INSULATION REQUIRED)

GENERAL NOTES

WEATHERSEALS REQUIRED TO ALL EXTERNAL DOORS INCLUDING INTERNAL ACCESS TO GARAGE

INSULATION MUST BE INSTALLED IN ACCORDANCE WITH NCC AND RELEVANT AUSTRALIAN STANDARDS

THE NUMBER OF DOWNLIGHTS THAT HAVE BEEN INPUT TO THE NATHERS THERMAL COMFORT ASSESSMENT TO MODEL CEILING INSULATION LOSS IS AS PER JACK TAYLOR ARCHITECTS MARK-UP DATED 08.04.2020 (TO BE SEALED LED DOWNLIGHTS).

ONE SEALED EXHAUST FAN WAS BEEN INPUT FOR EACH KITCHEN, BATHROOM, LAUNDRY, ENSUITE, PDER AND WC.

EXTERNAL FINISHES

- FB1 FACE BRICK TYPE 1. AUSTRALBRICKS EVERYDAY LIFE- HOLIDAY BLEND
- FB2 FACE BRICK TYPE 2. AUSTRALBRICKS NUBRICK- BURWOOD BLUE
- RFT ROOF TILES MONIER CONC. TILES ELBANA BARRAMUNDI
- PF1 PAINT FINISH 1 DULUX PAINT S12B2 LINNET
- PF2 PAINT FINISH 1 DULUX PAINT TO MATCH CHARCOAL
- TD1 TIMBER ENTRY DOOR
- TSC ALUM. SCREEN HORIZONTAL SLATS P'DERCOAT TIMBER
- CBR COLORBOND FENCE COLORBOND: MONUMENT
- ALUM. FRAMED WINDOW P'DERCOAT CHARCOAL
- ALUM. FRAMED WINDOW P'DERCOAT WHITE
- COLORBOND: MONUMENT GUTTER, FASCIA & DP.
- PER1 ALUM. PERGOLA P'DERCOAT CHARCOAL
- PER2 ALUM. PERGOLA P'DERCOAT TIMBER
- TD2 TIMBER DOOR PAINTED TO MATCH PF1
- CBR COLORBOND: MONUMENT METAL ROOF SHEETING
- RS1 ROLLER SHUTTER MONIER STYLE 1
- RS2 ROLLER SHUTTER MONIER STYLE 2
- RS3 ROLLER SHUTTER MONIER STYLE 3
- RS4 ROLLER SHUTTER MONIER STYLE 4

LEGEND

- EXISTING STRUCTURE TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE RETAINED
- PROPOSED WORKS

D/A

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PROJECT
RESIDENTIAL DEVELOPMENT
481 - 485 PRINCES HIGHWAY
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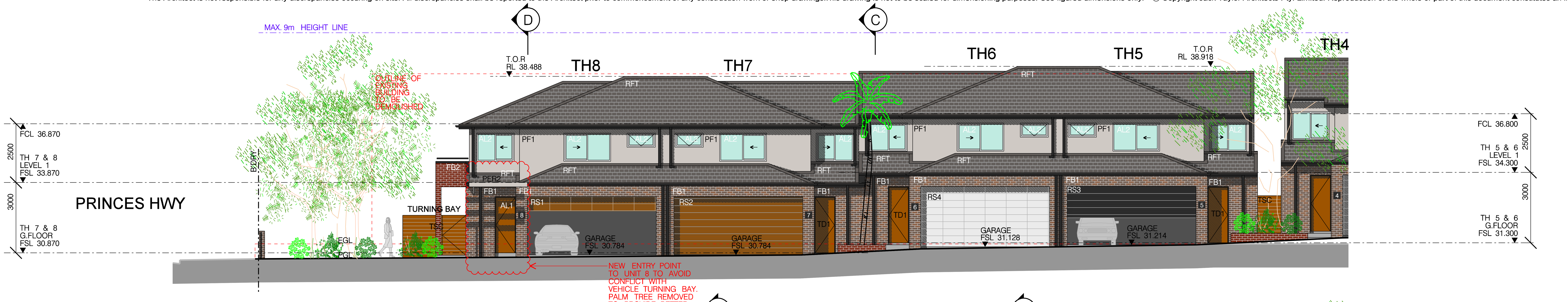
FOR
EMERALD PARK ESTATE PTY. LTD.

REVISION

NO.	DATE	AMENDMENT	NO.	DATE	AMENDMENT
01	06.03.20	ISSUED FOR CO-ORDINATION			
02	01.04.20	ISSUED TO CONSULTANTS			
03	09.04.20	ISSUED TO CONSULTANTS			
A	01.05.20	ISSUED FOR DA			
B	12.08.20	REVISED TO COMMENTS FROM COUNCIL			
C	06.11.20	CO-ORDINATED WITH GROUND FLOOR REVISION			

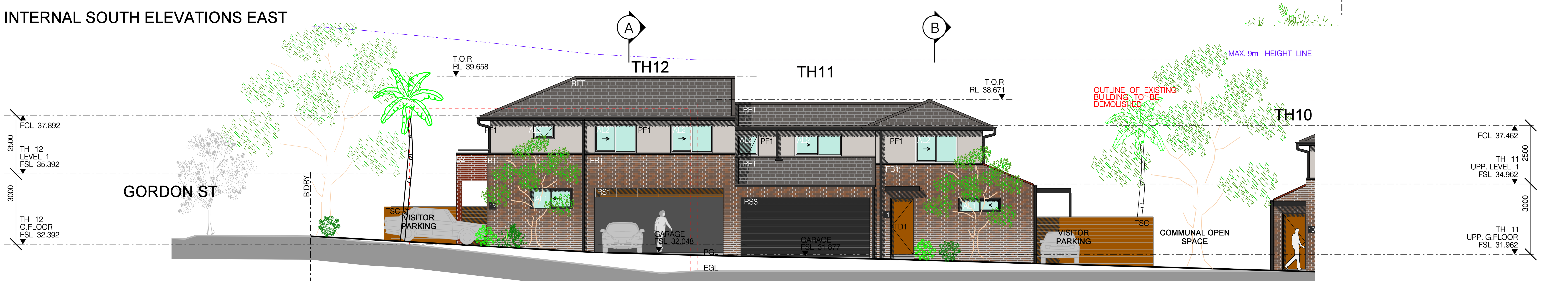
DRAWING NAME
ELEVATIONS 02
LONG ELEVATIONS

PROJECT NUMBER	SCALE	NORTH
20105	1:100 @ A1 1:200 @ A3	
DRAWING NUMBER	REVISION	
AR 0302	C	



INTERNAL SOUTH ELEVATIONS WEST

INTERNAL SOUTH ELEVATIONS EAST



INTERNAL NORTH ELEVATIONS EAST

INTERNAL NORTH ELEVATIONS WEST

BASIX NOTES

WATER (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

FIXTURES
ALL SHOWERHEADS - MINIMUM 3 STAR (>7.5 BUT <= 9L/MIN) WATER RATING
ALL TOILETS - MINIMUM 4 STAR WATER RATING
ALL KITCHEN TAPS - MINIMUM 4 STAR WATER RATING
ALL BATHROOM TAPS - MINIMUM 5 STAR WATER RATING

ALTERNATIVE WATER SOURCE - RAINWATER TANK
THE RAINWATER TANKS MUST MEET, AND BE INSTALLED IN ACCORDANCE WITH, THE REQUIREMENTS OF ALL APPLICABLE REGULATORY AUTHORITIES
TOWNHOUSE 1 TO 8
A 1500 LITRE (MIN) WATER TANK CONFIGURED TO COLLECT RUN-OFF FROM 50M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO: AT LEAST ONE OUTDOOR TAP
TOWNHOUSE 9 TO 12
A 2000 LITRE (MIN) WATER TANK CONFIGURED TO COLLECT RUN-OFF FROM 50M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO: AT LEAST ONE OUTDOOR TAP & ALL TOILETS

ENERGY (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

HOT WATER
GAS INSTANTANEOUS 5 STAR ENERGY RATING
HEATING
THE LIVING AREAS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM
COOLING
THE LIVING AREAS MUST NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM
VENTILATION
THE FOLLOWING EXHAUST SYSTEMS MUST BE INSTALLED FOR EACH DWELLING:
BATHROOMS - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF
KITCHEN - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF
LAUNDRY - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF
LIGHTING
THE PRIMARY TYPE OF ARTIFICIAL LIGHTING MUST BE LIGHT EMITTING DIODE (LED) LIGHTING IN ALL ROOMS.
ALTERNATE ENERGY
A PHOTOVOLTAIC SYSTEM WITH THE CAPACITY TO GENERATE AT LEAST 1.4 PEAK KILOWATTS OF ELECTRICITY MUST BE INSTALLED FOR TOWNHOUSE 9, 10, 11 AND 12. THE SYSTEM MUST BE CONNECTED TO THE DEVELOPMENT'S ELECTRICAL SYSTEM. A PHOTOVOLTAIC SYSTEM IS NOT REQUIRED FOR ALL OTHER TOWNHOUSES
OTHER
A GAS COOKTOP & ELECTRIC OVEN MUST BE INSTALLED IN EACH KITCHEN
A FIXED OUTDOOR CLOTHES DRYING LINE MUST BE INSTALLED FOR EACH TOWNHOUSE

GLAZING

TOWNHOUSE 1 AND 8
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-005-03 A DEFAULTS
U-VALUE 4.10 (NOTE: </= U-VALUE)
SHGC 0.47 (NOTE: WITHIN 10% OF SHGC)
GLASS - ARGON FILL, HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-005 GROUP A DG ARGON FILL
ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-006-03 A DEFAULTS
U-VALUE 4.1 (NOTE: </= U-VALUE)
SHGC 0.52 (NOTE: WITHIN 10% OF SHGC)
GLASS - ARGON FILL, HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-006 GROUP B DG ARGON FILL

TOWNHOUSE 2, 3, 4, 5, 6, 7 AND 12
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-01 A DEFAULTS
U-VALUE 6.70 (NOTE: </= U-VALUE)
SHGC 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-01 A DEFAULTS
U-VALUE 6.70 (OR LESS THAN)
SHGC 0.70 (+ OR - 10%)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-002 GROUP B SG

TOWNHOUSE 9 AND 11
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.49 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.58 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-002 GROUP B SG

TOWNHOUSE 10
ALL BEDROOM, ENSUITE, BATH, L'DRY AND P'DER AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-01 A DEFAULTS
U-VALUE 6.70 (NOTE: </= U-VALUE)
SHGC 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL BEDROOM, ENSUITE, BATH, L'DRY AND P'DER FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-01 A DEFAULTS
U-VALUE 6.70 (OR LESS THAN)
SHGC 0.70 (+ OR - 10%)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-002 GROUP B SG
ALL OTHER AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.49 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL OTHER FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.58 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-002 GROUP B SG

INSULATION (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE)

EXTERNAL WALLS:
WALLS BETWEEN GARAGES - R4.0
WALLS BETWEEN TOWNHOUSES - R4.0
GARAGE FRONT WALL - NO INSULATION REQUIRED
ALL OTHER EXTERNAL WALLS - R2.7
INTERNAL WALLS:
WALLS BETWEEN GARAGE AND DWELLING - R2.7
TOWNHOUSE 10 - WALL BETWEEN L'DRY AND KITCHEN - R2.7
TOWNHOUSE 10 - WALLS BETWEEN P'DER AND KITCHEN/LIVING/DINING/STAIR - R2.7
ALL OTHER INTERNAL WALLS - NO INSULATION REQUIRED
EXTERNAL FLOORS (GROUND FLOOR) :
TOWNHOUSE 11 - GROUND FLOOR - WAFFLE POD SLAB
ALL OTHER GROUND FLOOR FLOORS - NO INSULATION REQUIRED
INTERNAL CEILINGS/FLOORS
ALL INTERNAL CEILINGS/FLOORS ABOVE GARAGES - R5.0
ALL OTHER INTERNAL CEILINGS/FLOORS - NO INSULATION REQUIRED
EXTERNAL CEILINGS:
TOWNHOUSE 8 - ALL EXTERNAL CEILINGS (I.E BELOW ROOF) - R6.0
ALL OTHER TOWNHOUSES - ALL EXTERNAL CEILINGS (I.E BELOW ROOF) - R5.0
ROOF:
METAL ROOF (TIMBER FRAME CONSTRUCTION) - R1.0 BULK, REFLECTIVE SIDE DOWN (ANTICON/PERMASTOP OR SIMILAR) (NOTE - R5.0 CEILING INSULATION REQUIRED)
DECK FORMING ROOF OVER GROUND FLOOR - NO INSULATION REQUIRED (NOTE - R5.0 CEILING INSULATION REQUIRED)
TILED ROOF - NO INSULATION REQUIRED (NOTE - R5.0 CEILING INSULATION REQUIRED)

GENERAL NOTES

WEATHERSEALS REQUIRED TO ALL EXTERNAL DOORS INCLUDING INTERNAL ACCESS TO GARAGE

INSULATION MUST BE INSTALLED IN ACCORDANCE WITH NCC AND RELEVANT AUSTRALIAN STANDARDS

THE NUMBER OF DOWNLIGHTS THAT HAVE BEEN INPUT TO THE NATHERS THERMAL COMFORT ASSESSMENT TO MODEL CEILING INSULATION LOSS IS AS PER JACK TAYLOR ARCHITECTS MARK-UP DATED 08.04.2020 (TO BE SEALED LED DOWNLIGHTS).

ONE SEALED EXHAUST FAN HAS BEEN INPUT FOR EACH KITCHEN, BATHROOM, LAUNDRY, ENSUITE, P'DER AND WC.

EXTERNAL FINISHES

- FB1 — FACE BRICK TYPE 1. AUSTRAL BRICKS EVERYDAY LIFE: HOLIDAY BLEND
- FB2 — FACE BRICK TYPE 2. AUSTRAL BRICKS NUBRICK: BURWOOD BLUE
- RFT — ROOF TILES MONIER CONC. TILES ELBANA BARRAMUNDI
- PF1 — PAINT FINISH 1 DULUX PAINT S12B2 LINNET
- PF2 — PAINT FINISH 1 DULUX PAINT TO MATCH CHARCOAL
- TD1 — TIMBER ENTRY DOOR
- TSC — ALUM. SCREEN HORIZONTAL SLATS P'DERCOAT TIMBER
- CBF — COLORBOND FENCE COLORBOND: MONUMENT
- AL1 — ALUM. FRAMED WINDOW P'DERCOAT CHARCOAL
- AL2 — ALUM. FRAMED WINDOW P'DERCOAT WHITE
- COLORBOND: MONUMENT GUTTER, FASCIA & DP.
- PER1 — ALUM. PERGOLA P'DERCOAT CHARCOAL
- PER2 — ALUM. PERGOLA P'DERCOAT TIMBER
- TD2 — TIMBER DOOR PAINTED TO MATCH PF1
- CBR — COLORBOND: MONUMENT METAL ROOF SHEETING
- RS1 — ROLLER SHUTTER MONIER STYLE 1
- RS2 — ROLLER SHUTTER MONIER STYLE 2
- RS3 — ROLLER SHUTTER MONIER STYLE 3
- RS4 — ROLLER SHUTTER MONIER STYLE 4

LEGEND

- EXISTING STRUCTURE TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE RETAINED
- PROPOSED WORKS

D/A

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481 - 485 PRINCES HIGHWAY
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FOR
EMERALD PARK ESTATE PTY. LTD.

REVISION

NO.	DATE	AMENDMENT	NO.	DATE	AMENDMENT
01	06.03.20	ISSUED FOR CO-ORDINATION			
02	01.04.20	ISSUED TO CONSULTANTS			
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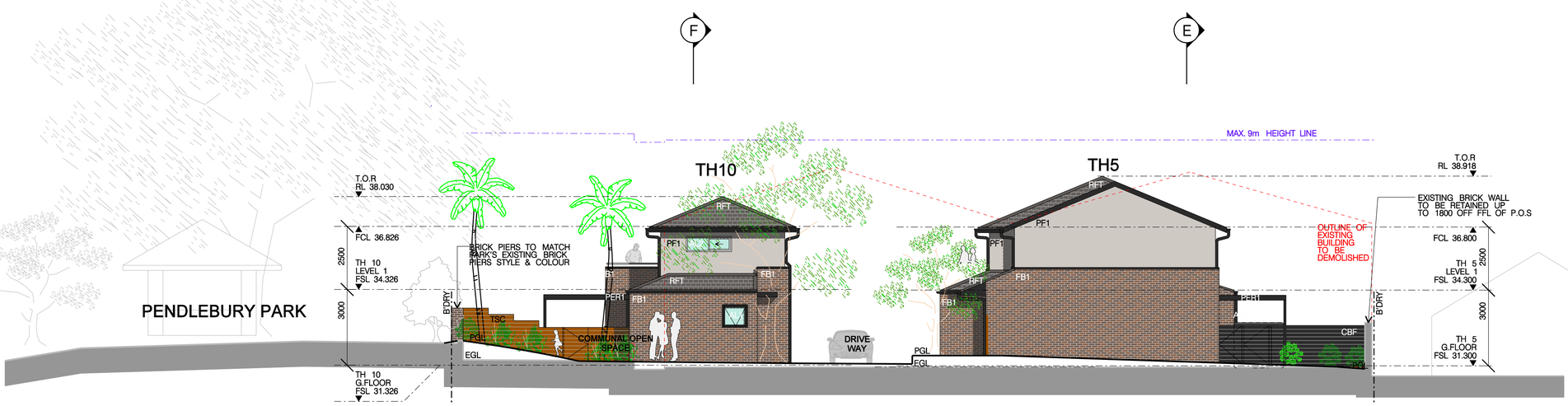
DRAWING NAME
ELEVATIONS 03
INTERNAL LONG ELEVATIONS

PROJECT NUMBER	SCALE	NORTH
20105	1:100 @ A1 1:200 @ A3	
DRAWING NUMBER	REVISION	
AR 0303	C	



EAST ELEVATIONS INTERNAL

WEST ELEVATIONS INTERNAL

EXTERNAL FINISHES

- FB1 FACE BRICK TYPE 1. AUSTRALBRICKS EVERYDAY LIFE: HOLIDAY BLEND
- FB2 FACE BRICK TYPE 2. AUSTRALBRICKS NUBRICK: BURWOOD BLUE
- RFT ROOF TILES MONIER CONC. TILES ELBANA BARRAMUNDI
- PF1 PAINT FINISH 1 DULUX PAINT S12B2 LINNET
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- PER1 ALUM. PERGOLA P'DERCOAT CHARCOAL
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- TD2 TIMBER DOOR PAINTED TO MATCH PF1
- CBR COLORBOND: MONUMENT METAL ROOF SHEETING
- RS1 ROLLER SHUTTER MONIER STYLE 1
- RS2 ROLLER SHUTTER MONIER STYLE 2
- RS3 ROLLER SHUTTER MONIER STYLE 3
- RS4 ROLLER SHUTTER MONIER STYLE 4

LEGEND

- EXISTING STRUCTURE TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE RETAINED
- PROPOSED WORKS

D/A

BASIX NOTES

WATER (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

HOT WATER
ALL SHOWERHEADS - MINIMUM 4 STAR (>7.5 BUT <= 9L/MIN) WATER RATING
ALL TOILETS - MINIMUM 4 STAR WATER RATING
ALL KITCHEN TAPS - MINIMUM 4 STAR WATER RATING
ALL BATHROOM TAPS - MINIMUM 4 STAR WATER RATING
ALTERNATIVE WATER SOURCE - RAINWATER TANK
THE RAINWATER TANKS MUST MEET AND BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF ALL APPLICABLE REGULATORY AUTHORITIES
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THE RAINWATER TANKS MUST BE CONNECTED TO AT LEAST ONE OUTDOOR TAP
TOWNHOUSE 9 TO 12
A 2000 LITRE (MIN) WATER TANK CONFIGURED TO COLLECT RUN-OFF FROM 50M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO AT LEAST ONE OUTDOOR TAP & ALL TOILETS

ENERGY (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

HOT WATER
GAS INSTANTANEOUS 5 STAR ENERGY RATING
HEATING
THE LIVING AREAS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM
COOLING
THE LIVING AREAS MUST NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM
VENTILATION
THE FOLLOWING EXHAUST SYSTEMS MUST BE INSTALLED FOR EACH DWELLING:
BATHROOMS - INDIVIDUAL FAN DUCTED TO FACADE OR ROOF, MANUAL SWITCH ON/OFF
KITCHEN - INDIVIDUAL FAN DUCTED TO FACADE OR ROOF, MANUAL SWITCH ON/OFF
LAUNDRY - INDIVIDUAL FAN DUCTED TO FACADE OR ROOF, MANUAL SWITCH ON/OFF

LIGHTING
THE PRIMARY TYPE OF ARTIFICIAL LIGHTING MUST BE LIGHT EMITTING DIODE (LED) LIGHTING IN ALL ROOMS
NATURAL LIGHTING
A SKYLIGHT/LIGHT TUBE SYSTEM WITH THE CAPACITY TO GENERATE AT LEAST 1.4 PEAK KILOWATTS OF ELECTRICITY MUST BE INSTALLED FOR TOWNHOUSE 9, 10, 11 AND 12.THE SYSTEM MUST BE CONNECTED TO THE DEVELOPMENT'S ELECTRICAL SYSTEM A PHOTOVOLTAIC SYSTEM IS NOT REQUIRED FOR ALL OTHER TOWNHOUSES
OTHER
A GAS COOKTOP & ELECTRIC OVEN MUST BE INSTALLED IN EACH KITCHEN
A FIXED OUTDOOR CLOTHES DRYING LINE MUST BE INSTALLED FOR EACH TOWN-HOUSE

GLAZING
TOWNHOUSE 1 AND 8
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
U-VALUE: 4.0 (NOTE: <= U-VALUE)
SHGC: 0.47 (NOTE: WITHIN 10% OF SHGC)
GLASS - ARGON FILL,HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM ALM-009, GROUP A DG ARGON FILL

ALL FIXED WINDOWS,SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-0040-A DEFAULTS
U-VALUE: 4.1 (NOTE: <= U-VALUE)
SHGC: 0.49 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-009 GROUP B DG ARGON FILL

TOWNHOUSE 2, 3, 4, 5, 6, 7 AND 10
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-0040-A DEFAULTS
U-VALUE: 6.70 (NOTE: <= U-VALUE)
SHGC: 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-002, GROUP A SG
ALL FIXED WINDOWS,SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-0040-A DEFAULTS
U-VALUE: 6.70 (OR LESS THAN)
SHGC: 0.70 (+/- .10%)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-002 GROUP B SG

TOWNHOUSE 9 AND 11
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-03 A DEFAULTS
U-VALUE: 6.40 (NOTE: <= U-VALUE)
SHGC: 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL FIXED WINDOWS,SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-001-03 A DEFAULTS
U-VALUE: 6.40 (NOTE: <= U-VALUE)
SHGC: 0.68 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-004 GROUP B SG
TOWNHOUSE 12
ALL BEDROOM ENSUITE,BATH,LDRY AND PDER FIXED WINDOWS,SLIDING WINDOWS AND GLAZED HINGED DOORS
ALM-001-03 A DEFAULTS
U-VALUE: 6.70 (NOTE: <= U-VALUE)
SHGC: 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-001 GROUP A SG

ALL BEDROOM ENSUITE,BATH,LDRY AND PDER FIXED WINDOWS,SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-0040-A DEFAULTS
U-VALUE: 6.70 (OR LESS THAN)
SHGC: 0.70 (+/- .10%)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-002 GROUP B SG
ALL OTHER FIXED WINDOWS,SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-0040-A DEFAULTS
U-VALUE: 6.70 (NOTE: <= U-VALUE)
SHGC: 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-002 GROUP B SG

INSULATION (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE)

EXTERNAL WALLS
WALLS BETWEEN GARAGES - R4.0
WALLS BETWEEN TOWNHOUSES - R4.0
GARAGE FRONT WALL - NO INSULATION REQUIRED
ALL OTHER EXTERNAL WALLS - R2.7
INTERNAL WALLS
WALLS BETWEEN GARAGE AND DWELLING - R2.7
TOWNHOUSE 10 - WALL BETWEEN LDRY AND KITCHEN - R2.7
TOWNHOUSE 10 - WALLS BETWEEN PDER AND KITCHEN/LIVING/DINING/STAIR - R2.7
ALL OTHER INTERNAL WALLS - NO INSULATION REQUIRED
FLOORS - GROUND FLOOR
TOWNHOUSE 11 - GROUND FLOOR - WAFFLE POD SLAB
ALL OTHER GROUND FLOOR FLOORS - NO INSULATION REQUIRED
INTERNAL CEILINGS/FLOORS
ALL INTERNAL CEILINGS/FLOORS ABOVE GARAGES - R0.0
ALL OTHER INTERNAL CEILINGS/FLOORS - NO INSULATION REQUIRED
CEILINGS - EXTERNAL
TOWNHOUSE 7 - ALL EXTERNAL CEILINGS (I.E BELOW ROOF) - R6.0
ALL OTHER TOWNHOUSES - ALL EXTERNAL CEILINGS (I.E BELOW ROOF) - R5.0

ROOF
METAL ROOF (TIMBER FRAME CONSTRUCTION) - R1.0 BULK REFLECTIVE SIDE DOWN
UNTOUCH/PRIMAXTOP OR SIMILAR) (NOTE - R2.0 CEILING INSULATION REQUIRED)
(NOTE - FOAMING ROOF OVER GROUND FLOOR - NO INSULATION REQUIRED
METAL ROOF - NO INSULATION REQUIRED (NOTE - R2.0 CEILING INSULATION REQUIRED)
TILED ROOF - NO INSULATION REQUIRED (NOTE - R5.0 CEILING INSULATION REQUIRED)

GENERAL NOTES

WEATHERSEALS REQUIRED TO ALL EXTERNAL DOORS INCLUDING INTERNAL ACCESS TO GARAGE

INSULATION MUST BE INSTALLED IN ACCORDANCE WITH NCC AND RELEVANT AUSTRALIAN STANDARDS

THE NUMBER OF DOWNLIGHTS THAT HAVE BEEN INPUT TO THE NATHERS THERMAL COMFORT ASSESSMENT TO MODEL CEILING INSULATION LOSS IS AS PER JACK TAYLOR ARCHITECTS MARK-UP DATED 08.04.2020 (TO BE SEALED LED DOWNLIGHTS).

ONE SEALED EXHAUST FAN HAS BEEN INPUT FOR EACH KITCHEN, BATHROOM, LAUNDRY, ENSUITE, PDER AND WC.

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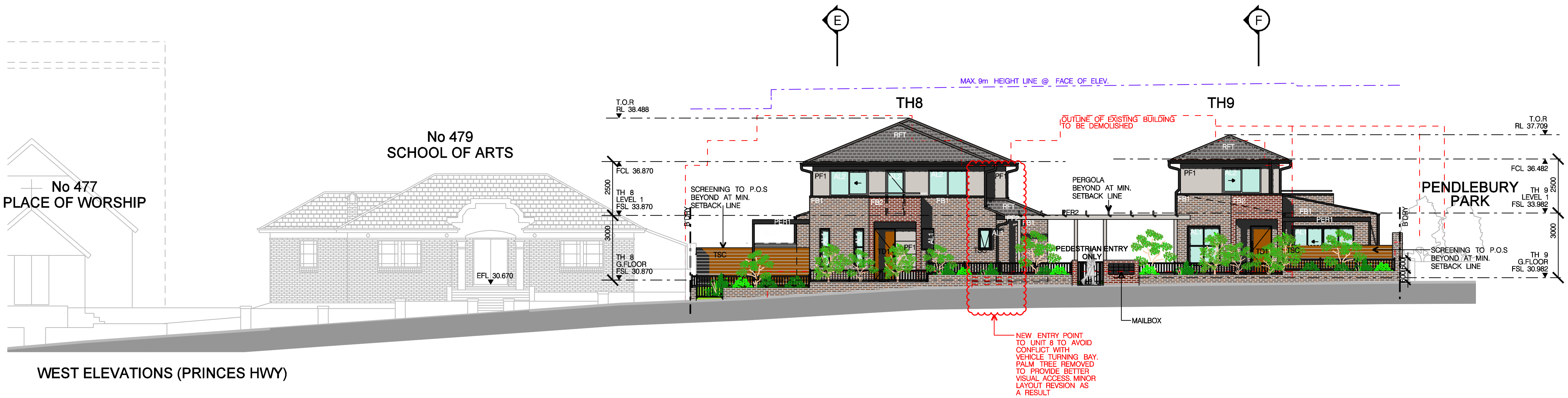
PROJECT
RESIDENTIAL DEVELOPMENT
481 - 485 PRINCES HIGHWAY
WOONONA NSW 2517
FOR
EMERALD PARK ESTATE PTY. LTD.

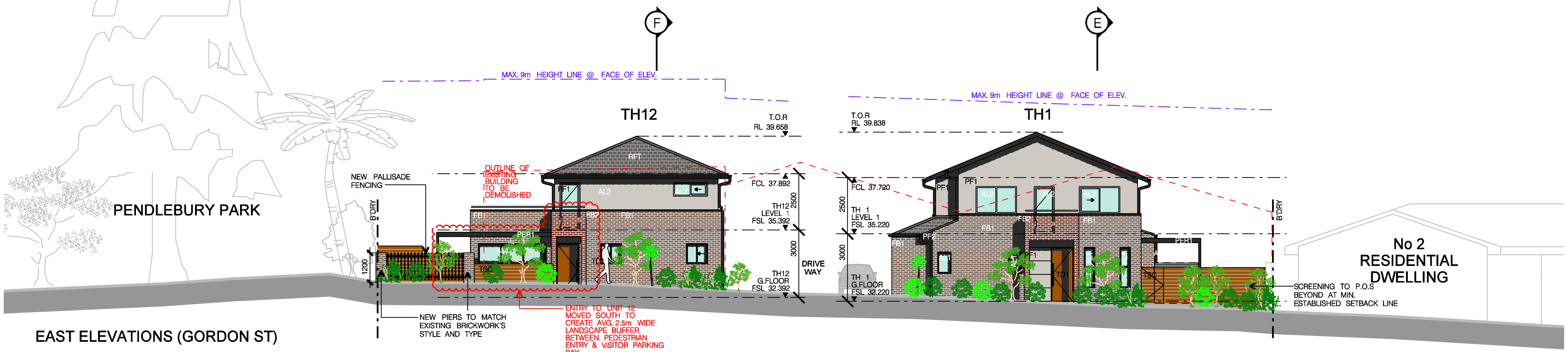
REVISION NO.	DATE	AMENDMENT	NO.	DATE	AMENDMENT
01	06.03.20	ISSUED FOR CO-ORDINATION			
02	01.04.20	ISSUED TO CONSULTANTS			
03	09.04.20	ISSUED TO CONSULTANTS			
04	20.04.20	REVISED AS CLOUDED			
A	01.05.20	ISSUED FOR DA			
B	12.08.20	REVISED TO COMMENTS FROM COUNCIL			
C	06.11.20	CO-ORDINATED WITH GROUND FLOOR REVISION			

DRAWING NAME
ELEVATIONS 04
INTERNAL SHORT ELEVATIONS

PROJECT NUMBER	SCALE	NORTH
20105	1:100 @ A1 1:200 @ A3	
DRAWING NUMBER	REVISION	
AR 0304	C	



WEST ELEVATIONS (PRINCES HWY)



EAST ELEVATIONS (GORDON ST)

EXTERNAL FINISHES

LEGEND

- EXISTING STRUCTURE TO BE REMOVED SHOWN DOTTED
- EXISTING STRUCTURE TO BE RETAINED
- PROPOSED WORKS

D/A

BASIX NOTES

WATER (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

FIXTURES
ALL SHOWERHEADS - MINIMUM 3 STAR (>7.5 BUT <= 9L/MIN) WATER RATING
ALL TOILETS - MINIMUM 4 STAR WATER RATING
ALL KITCHEN TAPS - MINIMUM 4 STAR WATER RATING
ALL BATHROOM TAPS - MINIMUM 5 STAR WATER RATING

ALTERNATIVE WATER SOURCE - RAINWATER TANK
THE RAINWATER TANKS MUST MEET, AND BE INSTALLED IN ACCORDANCE WITH, THE REQUIREMENTS OF ALL APPLICABLE REGULATORY AUTHORITIES
TOWNHOUSE 1 TO 8
A 1500 LITRE (MIN) WATER TANK CONFIGURED TO COLLECT RUN-OFF FROM 50M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO: AT LEAST ONE OUTDOOR TAP
TOWNHOUSE 9 TO 12
A 2000 LITRE (MIN) WATER TANK CONFIGURED TO COLLECT RUN-OFF FROM 50M2 (MIN) OF ROOF AREA MUST BE INSTALLED FOR EACH DWELLING
THE RAINWATER TANKS MUST BE CONNECTED TO: AT LEAST ONE OUTDOOR TAP & ALL TOILETS

ENERGY (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE) - REFER BASIX REPORT FOR FULL DETAILS

HOT WATER
GAS INSTANTANEOUS 5 STAR ENERGY RATING

HEATING
THE LIVING AREAS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY HEATING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A HEATING SYSTEM

COOLING
THE LIVING AREAS MUST NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM
THE BEDROOMS MUST NOT INCORPORATE ANY COOLING SYSTEM, OR ANY DUCTING WHICH IS DESIGNED TO ACCOMMODATE A COOLING SYSTEM

VENTILATION
THE FOLLOWING EXHAUST SYSTEMS MUST BE INSTALLED FOR EACH DWELLING:
BATHROOMS - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF
KITCHEN - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF
LAUNDRY - INDIVIDUAL FAN DUCTED TO FAÇADE OR ROOF, MANUAL SWITCH ON/OFF

LIGHTING
THE PRIMARY TYPE OF ARTIFICIAL LIGHTING MUST BE LIGHT EMITTING DIODE (LED) LIGHTING IN ALL ROOMS.

ALTERNATE ENERGY
A PHOTOVOLTAIC SYSTEM WITH THE CAPACITY TO GENERATE AT LEAST 1.4 PEAK KILOWATTS OF ELECTRICITY MUST BE INSTALLED FOR TOWNHOUSE 9, 10, 11 AND 12. THE SYSTEM MUST BE CONNECTED TO THE DEVELOPMENT'S ELECTRICAL SYSTEM. A PHOTOVOLTAIC SYSTEM IS NOT REQUIRED FOR ALL OTHER TOWNHOUSES

OTHER
A GAS COOKTOP & ELECTRIC OVEN MUST BE INSTALLED IN EACH KITCHEN
A FIXED OUTDOOR CLOTHES DRYING LINE MUST BE INSTALLED FOR EACH TOWNHOUSE

GLAZING

TOWNHOUSE 1 AND 8
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-005-03 A DEFAULTS
U-VALUE 4.10 (NOTE: </= U-VALUE)
SHGC 0.47 (NOTE: WITHIN 10% OF SHGC)
GLASS - ARGON FILL, HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-005 GROUP A DG ARGON FILL

ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-006-03 A DEFAULTS
U-VALUE 4.1 (NOTE: </= U-VALUE)
SHGC 0.62 (NOTE: WITHIN 10% OF SHGC)
GLASS - ARGON FILL, HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-006 GROUP B DG ARGON FILL

TOWNHOUSE 2, 3, 4, 5, 6, 7 AND 12
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-01 A DEFAULTS
U-VALUE 6.70 (NOTE: </= U-VALUE)
SHGC 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-01 A DEFAULTS
U-VALUE 6.70 (OR LESS THAN)
SHGC 0.70 (+ OR - 10%)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-002 GROUP B SG

TOWNHOUSE 9 AND 11
ALL AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.49 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.58 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-002 GROUP B SG

TOWNHOUSE 10
ALL BEDROOM, ENSUITE, BATH, L'DRY AND P'DER AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-01 A DEFAULTS
U-VALUE 6.70 (NOTE: </= U-VALUE)
SHGC 0.57 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL BEDROOM, ENSUITE, BATH, L'DRY AND P'DER FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-01 A DEFAULTS
U-VALUE 6.70 (OR LESS THAN)
SHGC 0.70 (+ OR - 10%)
GLASS - SINGLE CLEAR
FRAME - ALUMINIUM, ALM-002 GROUP B SG
ALL OTHER AWNING WINDOWS AND GLAZED HINGED DOORS
ALM-001-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.49 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-001 GROUP A SG
ALL OTHER FIXED WINDOWS, SLIDING WINDOWS AND GLAZED SLIDING DOORS
ALM-002-03 A DEFAULTS
U-VALUE 5.40 (NOTE: </= U-VALUE)
SHGC 0.58 (NOTE: WITHIN 10% OF SHGC)
GLASS - SINGLE HIGH SOLAR GAIN LOW-E
FRAME - ALUMINIUM, ALM-002 GROUP B SG

INSULATION (NOTE: THE FOLLOWING REQUIREMENTS ARE FOR EACH INDIVIDUAL DWELLING UNLESS NOTED OTHERWISE)

EXTERNAL WALLS:
WALLS BETWEEN GARAGES - R4.0
WALLS BETWEEN TOWNHOUSES - R4.0
GARAGE FRONT WALL - NO INSULATION REQUIRED
ALL OTHER EXTERNAL WALLS - R2.7

INTERNAL WALLS:
WALLS BETWEEN GARAGE AND DWELLING - R2.7
TOWNHOUSE 10 - WALL BETWEEN L'DRY AND KITCHEN - R2.7
TOWNHOUSE 10 - WALLS BETWEEN P'DER AND KITCHEN/LIVING/DINING/STAIR - R2.7
ALL OTHER INTERNAL WALLS - NO INSULATION REQUIRED

EXTERNAL FLOORS (GROUND FLOOR) :
TOWNHOUSE 11 - GROUND FLOOR - WAFFLE POD SLAB
ALL OTHER GROUND FLOOR FLOORS - NO INSULATION REQUIRED

INTERNAL CEILINGS/FLOORS
ALL INTERNAL CEILINGS/FLOORS ABOVE GARAGES - R5.0
ALL OTHER INTERNAL CEILINGS/FLOORS - NO INSULATION REQUIRED

EXTERNAL CEILINGS:
TOWNHOUSE 8 - ALL EXTERNAL CEILINGS (I.E BELOW ROOF) - R6.0
ALL OTHER TOWNHOUSES - ALL EXTERNAL CEILINGS (I.E BELOW ROOF) - R5.0

ROOF:
METAL ROOF (TIMBER FRAME CONSTRUCTION) - R1.0 BULK, REFLECTIVE SIDE DOWN (ANTICON/PERMASTOP OR SIMILAR) (NOTE - R6.0 CEILING INSULATION REQUIRED)
DECK FORMING ROOF OVER GROUND FLOOR - NO INSULATION REQUIRED (NOTE - R5.0 CEILING INSULATION REQUIRED)
TILED ROOF - NO INSULATION REQUIRED (NOTE - R5.0 CEILING INSULATION REQUIRED)

GENERAL NOTES

WEATHERSEALS REQUIRED TO ALL EXTERNAL DOORS INCLUDING INTERNAL ACCESS TO GARAGE

INSULATION MUST BE INSTALLED IN ACCORDANCE WITH NCC AND RELEVANT AUSTRALIAN STANDARDS

THE NUMBER OF DOWNLIGHTS THAT HAVE BEEN INPUT TO THE NATHERS THERMAL COMFORT ASSESSMENT TO MODEL CEILING INSULATION LOSS IS AS PER JACK TAYLOR ARCHITECTS MARK-UP DATED 08.04.2020 (TO BE SEALED LED DOWNLIGHTS).

ONE SEALED EXHAUST FAN HAS BEEN INPUT FOR EACH KITCHEN, BATHROOM, LAUNDRY, ENSUITE, P'DER AND WC.

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PROJECT
RESIDENTIAL DEVELOPMENT
481 - 485 PRINCES HIGHWAY
WOONONA NSW 2517
FOR
EMERALD PARK ESTATE PTY. LTD.

REVISION

NO.	DATE	AMENDMENT	NO.	DATE	AMENDMENT
01	06.03.20	ISSUED FOR CO-ORDINATION			
02	01.04.20	ISSUED TO CONSULTANTS			
03	09.04.20	ISSUED TO CONSULTANTS			
A	01.05.20	ISSUED FOR DA			
B	12.08.20	REVISED TO COMMENTS FROM COUNCIL			
C	06.11.20	REVISED AS CLOUDED			

DRAWING NAME
ELEVATIONS 05
STREET ELEVATIONS
WITH NON MATURE TREES

PROJECT NUMBER	SCALE	NORTH
20105	1:100 @ A1 1:200 @ A3	
DRAWING NUMBER	REVISION	
AR 0305	C	

09:00AM
WINTER SOLSTICE

MIN. 5mx4m PRIVATE OPEN SPACE
DIRECT SUNLIGHT

10:00AM
WINTER SOLSTICE

MIN. 5mx4m PRIVATE OPEN SPACE
DIRECT SUNLIGHT

10:35AM
WINTER SOLSTICE

MIN. 5mx4m PRIVATE OPEN SPACE
DIRECT SUNLIGHT

11:00AM
WINTER SOLSTICE

MIN. 5mx4m PRIVATE OPEN SPACE
DIRECT SUNLIGHT

D/A

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481 - 485 PRINCES HIGHWAY
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FOR
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REVISION

NO.	DATE	AMENDMENT	NO.	DATE	AMENDMENT
01	09.04.20	ISSUED TO CONSULTANTS			
A	01.05.20	ISSUED FOR DA			
B	12.08.20	REVISED TO COMMENTS FROM COUNCIL			
C	11.12.20	CO-ORDINATED WITH CHANGES			

DRAWING NAME
DIRECT SUNLIGHTING STUDY TO P.O.S & C.O.S 01
WINTER SOLISTICE 9AM TO 11AM

PROJECT NUMBER	SCALE	NORTH
20105	1:200 @ A1 1:400 @ A3	N
DRAWING NUMBER	REVISION	
AR 0501	C	

12:00PM
WINTER SOLSTICE

MIN. 5mx4m PRIVATE OPEN SPACE
DIRECT SUNLIGHT

01.00PM
WINTER SOLSTICE

MIN. 5mx4m PRIVATE OPEN SPACE
DIRECT SUNLIGHT

01.35PM
WINTER SOLSTICE

MIN. 5mx4m PRIVATE OPEN SPACE
DIRECT SUNLIGHT

02:00PM
WINTER SOLSTICE

MIN. 5mx4m PRIVATE OPEN SPACE
DIRECT SUNLIGHT

D/A

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PROJECT
RESIDENTIAL DEVELOPMENT
481 - 485 PRINCES HIGHWAY
WOONONA NSW 2517

FOR
EMERALD PARK ESTATE PTY. LTD.

REVISION

NO.	DATE	AMENDMENT	NO.	DATE	AMENDMENT
01	09.04.20	ISSUED TO CONSULTANTS			
A	01.05.20	ISSUED FOR DA			
B	12.08.20	REVISED TO COMMENTS FROM COUNCIL			
C	11.12.20	CO-ORDINATED CHANGES			

DRAWING NAME
DIRECT SUNLIGHTING STUDY TO P.O.S & C.O.S 02
WINTER SOLISTICE 1PM TO 2PM

PROJECT NUMBER	SCALE	NORTH
20105	1:200 @ A1 1:400 @ A3	N
DRAWING NUMBER	REVISION	
AR 0502	C	

03:00PM
WINTER SOLSTICE

MIN. 5mx4m PRIVATE OPEN SPACE
DIRECT SUNLIGHT

SUMMARY
WINTER SOLSTICE

TH1 PRIVATE OPEN SPACE: RECIEVES MIN. 50% DIRECT SUNLIGHT FROM 11AM TO 2PM (3 HOURS TOTAL). COMPLIES

TH2 PRIVATE OPEN SPACE: RECIEVES MIN. 50% DIRECT SUNLIGHT FROM 10:35AM TO 1:35PM (3 HOURS TOTAL). COMPLIES

TH3 PRIVATE OPEN SPACE: RECIEVES MIN. 50% DIRECT SUNLIGHT FROM 10AM TO 1:35PM (>3 HOURS TOTAL). COMPLIES

TH4 PRIVATE OPEN SPACE: RECIEVES MIN. 50% DIRECT SUNLIGHT FROM 10:35AM TO 3PM (3 HOURS TOTAL). COMPLIES

TH5 PRIVATE OPEN SPACE: RECIEVES MIN. 50% DIRECT SUNLIGHT FROM 10:35AM TO 3PM (>3 HOURS TOTAL). COMPLIES

TH6 PRIVATE OPEN SPACE: RECIEVES MIN. 50% DIRECT SUNLIGHT FROM 10:35AM TO 3PM (>3 HOURS TOTAL). COMPLIES

TH7 PRIVATE OPEN SPACE: RECIEVES MIN. 50% DIRECT SUNLIGHT FROM 10:35AM TO 3PM (>3 HOURS TOTAL). COMPLIES

TH8 PRIVATE OPEN SPACE: RECIEVES MIN. 50% DIRECT SUNLIGHT FROM 10:35AM TO 2PM (>3 HOURS TOTAL). COMPLIES

TH9 PRIVATE OPEN SPACE: DOES NOT RECIEVE MIN. 50% DIRECT SUNLIGHT FROM 9AM TO 3PM. DOES NOT COMPLY

TH10 PRIVATE OPEN SPACE: DOES NOT RECIEVE MIN. 50% DIRECT SUNLIGHT FROM 9AM TO 3PM. DOES NOT COMPLY

TH11 PRIVATE OPEN SPACE: RECIEVES MIN. 50% DIRECT SUNLIGHT FROM 11AM TO 2PM (3 HOURS TOTAL). COMPLIES

TH12 PRIVATE OPEN SPACE: DOES NOT RECIEVE MIN. 50% DIRECT SUNLIGHT FROM 9AM TO 3PM. DOES NOT COMPLY

9 OUT OF 12 TOWNHOUSE(75%) P.O.S RECIEVES 50% OR MORE DIRECT SUNLIGHT FOR 3 HOURS OR MORE DURING 9AM TO 3PM ON WINTER SOLSTICE. COMPLIES WITH DCP

COMMUNAL OPEN SPACE: RECIEVES MIN. 50% DIRECT SUNLIGHT FROM 10AM TO 1PM (3 HOURS TOTAL). COMPLIES

COMMUNAL OPEN SPACE RECIEVES 50% OR MORE DIRECT SUNLIGHT FOR 3 HOURS OR MORE DURING 9AM TO 3PM ON WINTER SOLSTICE. COMPLIES WITH DCP

D/A

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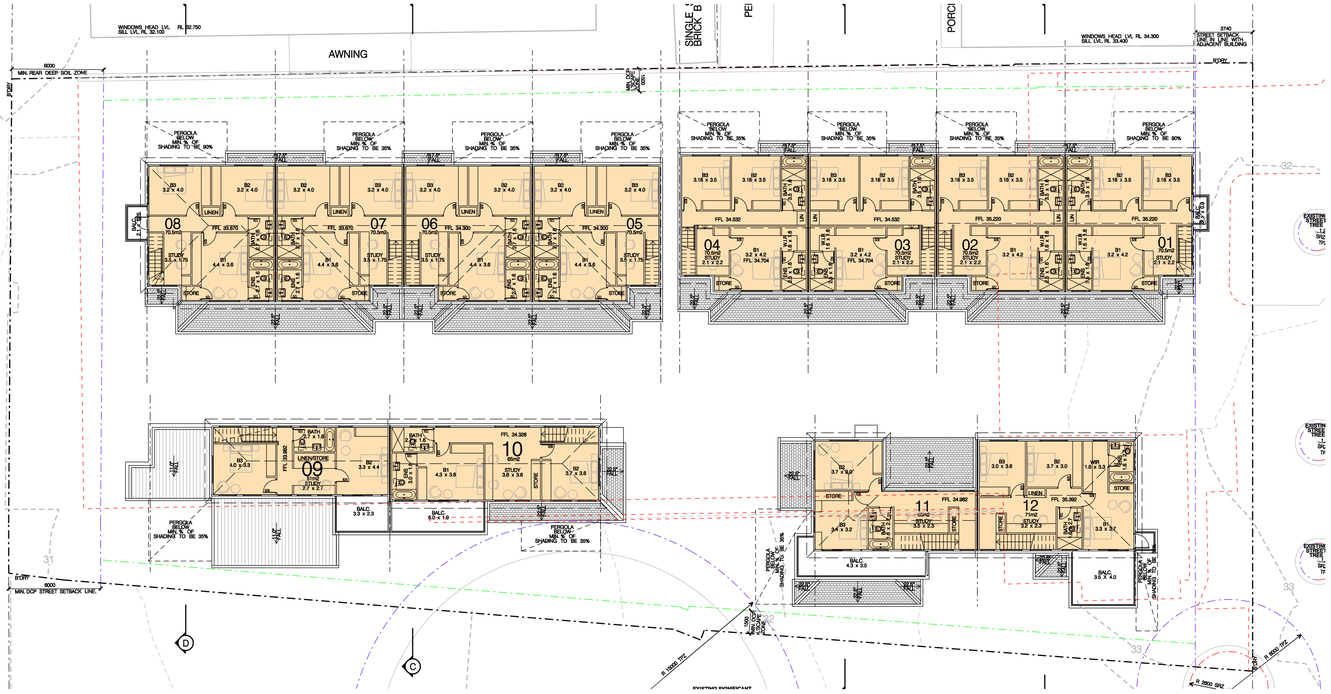
FOR
EMERALD PARK ESTATE PTY. LTD.

REVISION

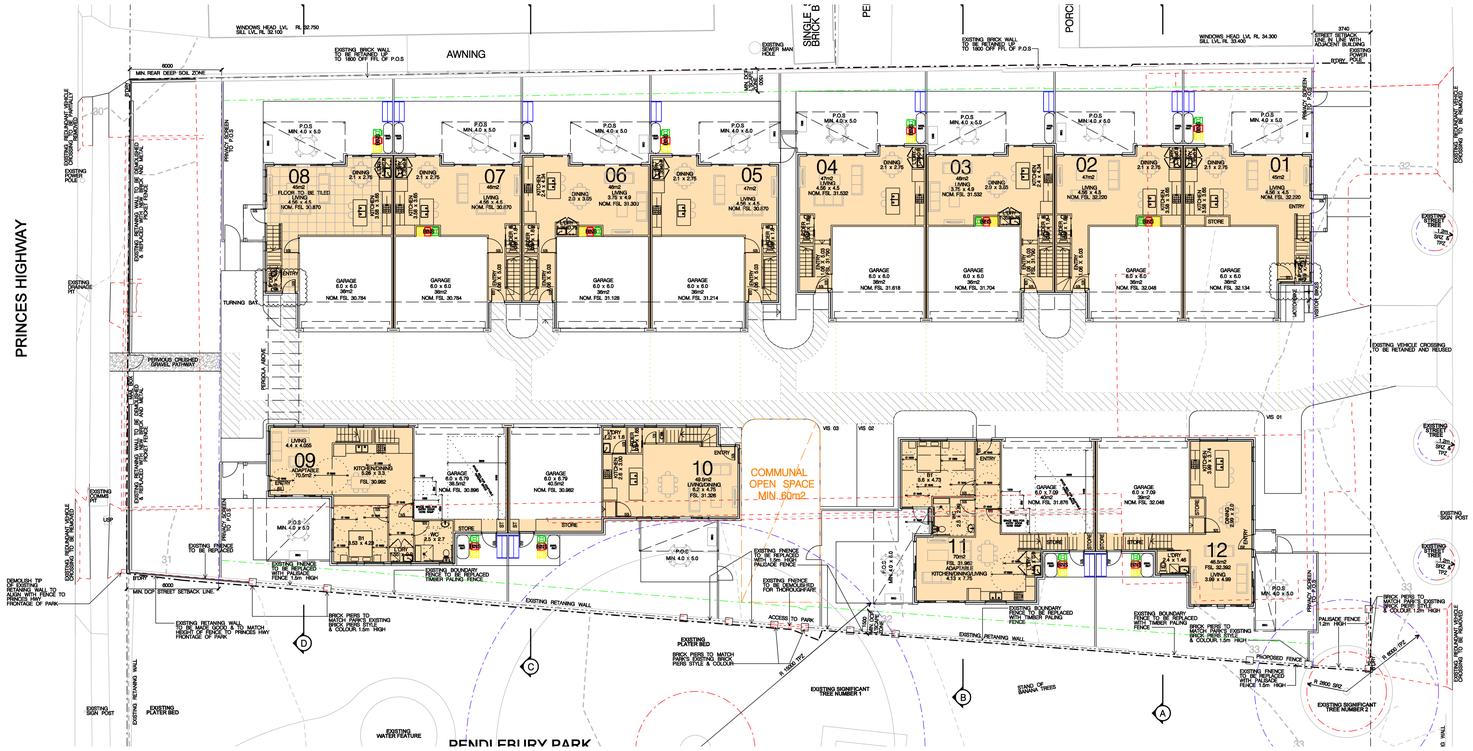
NO.	DATE	AMENDMENT	NO.	DATE	AMENDMENT
01	09.04.20	ISSUED TO CONSULTANTS			
A	01.05.20	ISSUED FOR DA			
B	12.08.20	REVISED TO COMMENTS FROM COUNCIL			
C	11.12.20	C-ORIDNATED WITH CHANGES			

DRAWING NAME
DIRECT SUNLIGHTING STUDY TO P.O.S & C.O.S 03
WINTER SOLISTICE 3PM & SUMMARY

PROJECT NUMBER 20105
SCALE 1:200 @ A1, 1:400 @ A3
DRAWING NUMBER AR 0503
REVISION C
NORTH



L1 GFA = 809.21m2



GF GFA = 656.43m2

LEGEND

GFA

GF = 656.43 m^2

L1 = 809.21 m^2

TOTAL = 1465.64 m^2

D/A

ARCHITECT
urban design masterplanning architecture
JACK TAYLOR ARCHITECTS Pty Ltd
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E jack@tas.com.au

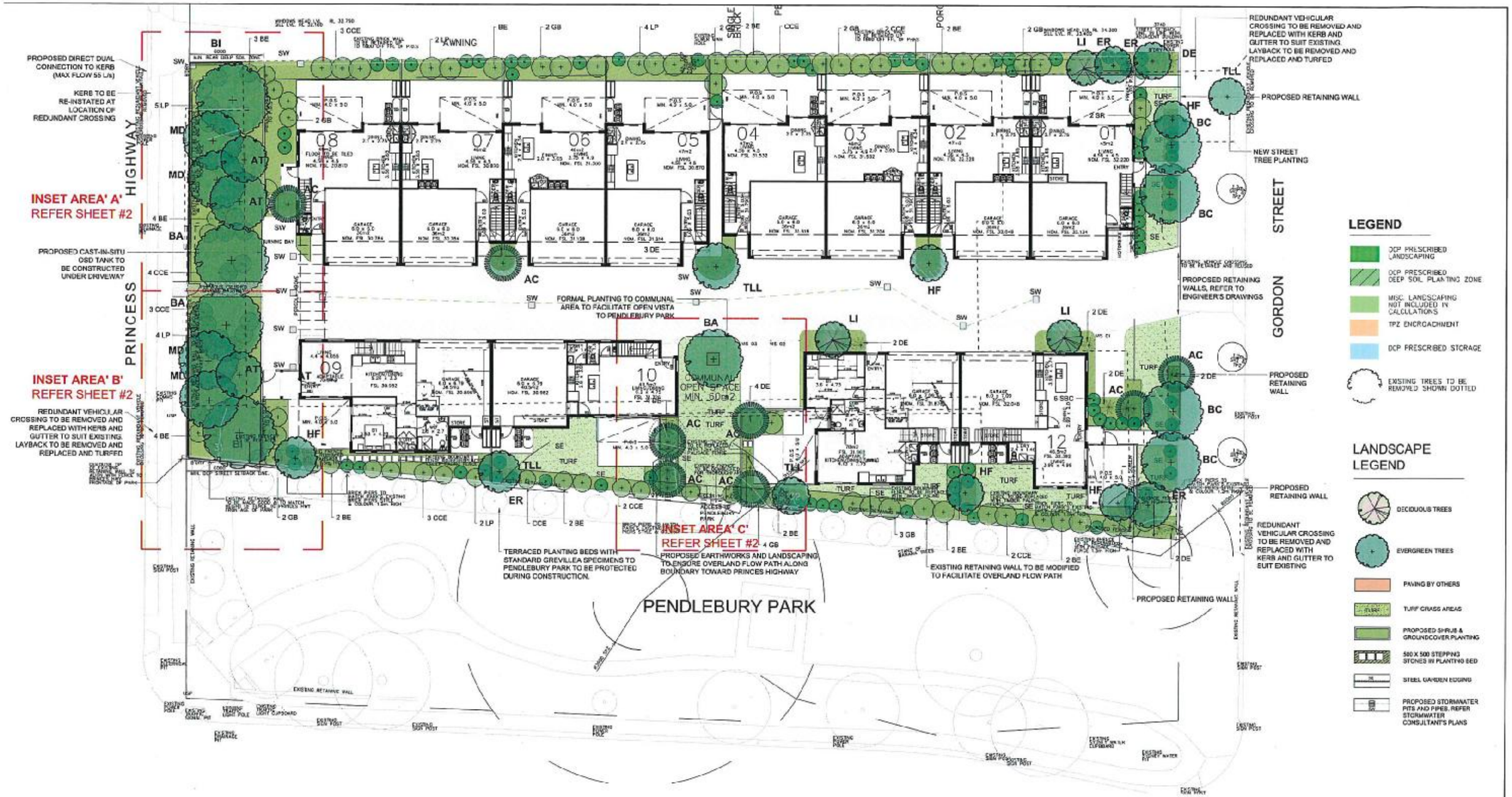
PROJECT
RESIDENTIAL DEVELOPMENT
481 - 485 PRINCES HIGHWAY
WOONONA NSW 2517
FOR
EMERALD PARK ESTATE PTY. LTD.

REVISION

NO.	DATE	AMENDMENT	NO.	DATE	AMENDMENT
01	09.04.20	ISSUED TO CONSULTANTS			
A	01.05.20	ISSUED FOR DA			
B	12.08.20	REVISED TO COMMENTS FROM COUNCIL			
C	06.11.20	GFA REDUCED ON UNIT 1 & 8			

DRAWING NAME
GFA CALCULATION SHEET

PROJECT NUMBER	SCALE	NORTH
20105	1:200 @ A1 1:400 @ A3	N
DRAWING NUMBER	REVISION	
AR 0601	C	



SUMMARY OF LANDSCAPE AREAS

Landscaping Total	Total (m²) :	946.65
	% of Total Site	32.20007483

Deepsoil	Total (m²) :	195.86
	% of Total Landscaping	20.68980083
	% of Total Site	6.662131365
	More than 6m width through rear of site	
Landscape behind building line		539.12
	% Site	18.33803871
	% of land scape	56.95029942

Attachment 3

DA

ARCHITECT
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PROJECT
RESIDENTIAL DEVELOPMENT
481-485 PRINCESS HIGHWAY
WOONONA NSW 2517
FOR
EMERALD PARK ESTATES PTY LTD

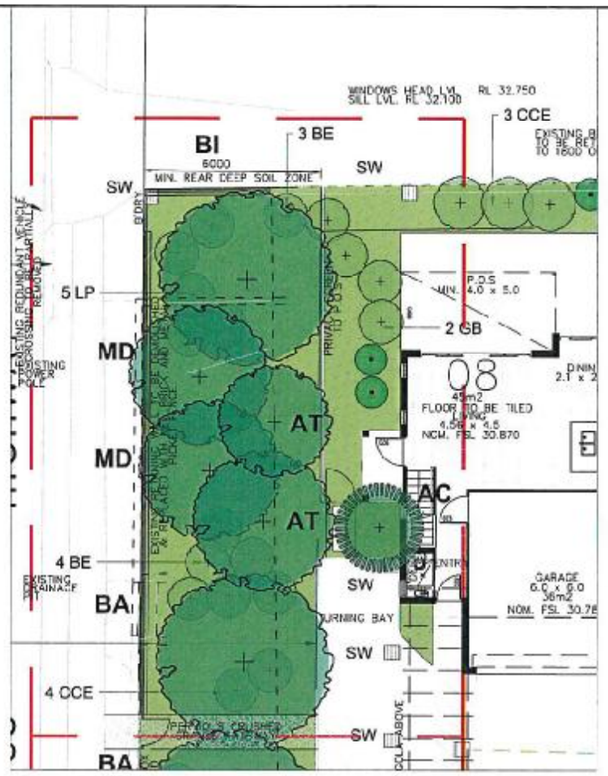
REVISION NO.	DATE	AMENDMENT	NO.	DATE	AMENDMENT
A	14.05.29	DEVELOPMENT APPLICATION			
B	06.11.29	UPDATED LAYOUT DETAILS			

DRAWING NAME
LANDSCAPE CONCEPT PLAN
SHEET 1 OF 2

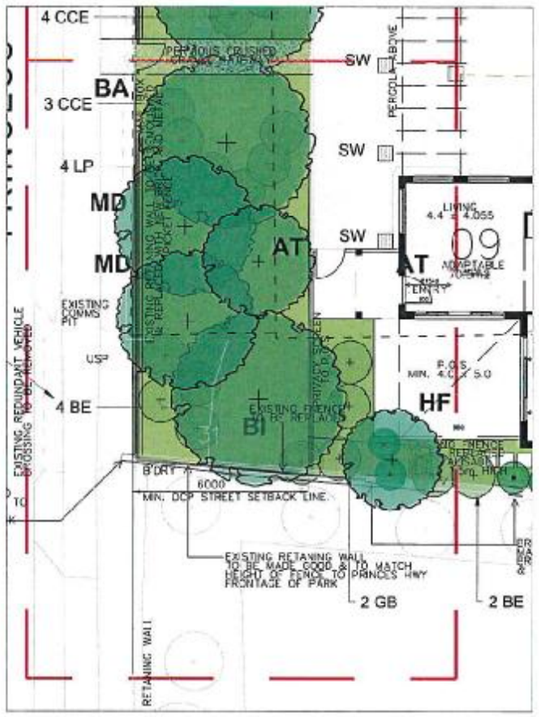
LANDSCAPE CONSULTANT
PETER LAWSON FAILA, MAIH
Registered Landscape Architect, No 893
E: clasp@bigpond.com M :0412711104

PROJECT NUMBER 20105
SCALE 1:150 @ A1, 1:300 @ A3
DRAWING NUMBER DA L01
REVISION B
TRUE NORTH

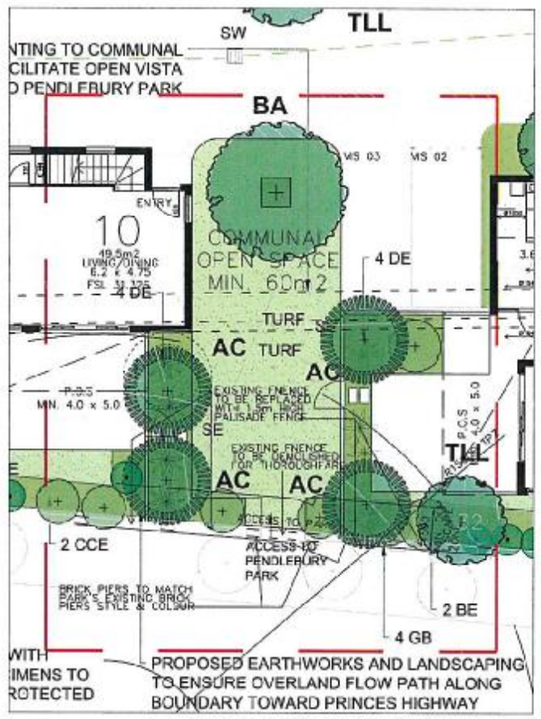
Attachment 3



INSET AREA 'A'
SCALE 1:100



INSET AREA 'B'
SCALE 1:100



INSET AREA 'C'
SCALE 1:100

LEGEND

- DCP PRESCRIBED LANDSCAPING
- DCP PRESCRIBED DEEP SOIL PLANTING ZONE
- MISC. LANDSCAPING NOT INCLUDED IN CALCULATIONS
- TPZ ENCROACHMENT
- DCP PRESCRIBED STORAGE
- EXISTING TREES TO BE REMOVED SHOWN DOTTED

PLANT SCHEDULE

SYMBOL	BOTANICAL NAME	COMMON NAME	EST QTY	POT SIZE (litres)	EST. MATURE HEIGHT (metres)	STAKING
TREES						
AC	Archontophoenix cunninghamiana	Bangalow Palm	9	45.0	8.0	NIL
AT	Allocasuarina torulosa	Forest Oak	3	45.0	6.0	1X38X38X1800 STAKE
BA	Brachychiton acerifolius	Illawarra Flame Tree	3	75.0	8.0	1X38X38X1800 STAKE
BI	Banksia integrifolia	Coast Banksia	2	45.0	8.0	1X38X38X1800 STAKE
BC	Backhousia citriodora	Lemon Myrtle	4	45.0	6.0	1X38X38X1800 STAKE
ER	Elaeocarpus reticulatus	Blueberry Ash	4	45.0	6.0	1X38X38X1800 STAKE
LI	Lagerstroemia indica	Crepe Myrtle	3	45.0	4.0	1X38X38X1800 STAKE
MD	Melaleuca decora	White Feathered Honeymyrtle	4	45.0	6.0	1X38X38X1800 STAKE
HF	Hymenosporum flavum	Native Frangipani	5	45.0	6.0	1X38X38X1800 STAKE
TLL	Tristaniopsis Laurina 'Luscious'	Water Gum(street tree)	4	100.0	7.0	3X2400X50X50 STAKE
SHRUBS AND ACCENT PLANTS						
BE	Banksia ericifolia	Heath Banksia	26	5.0	2.0	NIL
BS	Banksia spinulosa	Hairpin Banksia	30	5.0	1.5	NIL
CCE	Callistemon citrinus 'Endeavour'	Red Bottlebrush	22	5.0	1.6	NIL
DE	Doryanthes excelsa	Gymea Lily	20	5.0	1.5	NIL
GB	Grevillea banksii	Banks Grevillea	20	5.0	2.5	NIL
GFL	Gardenia 'Florida'	White Gardenia	30	5.0	1.0	NIL
LP	Leptospermum polygalifolium	Lemon Scented Tea Tree	25	5.0	3	NIL
WFM	Westringia 'Mundi'	Dwarf Coastal Rosmary	25	5.0	1	NIL
SSC	Syzygium 'Bush Christmas'	Compact Lilly Pilly	35	5.0	1.5	NIL
SR	Syzygium Paniculatum 'Resilience'	Lilly Pilly	20	5.0	2.5	NIL
GROUNDCOVERS						
DB	Dianella caerulea 'Breeze'	Blue Flax Lily	370	150mm	0.7	N/A
DCB	Dianella caerulea 'Cassa Blue'	Flax Lily	230	150mm	0.5	N/A
GR	Gardenia radicans	Prostrate Gardenia	210	200mm	0.4	N/A
LLT	Lomandra longifolia 'Tanika'	Dwarf Mat Rush	340	150mm	0.6	N/A
HS	Hibbertia scandens	Snake Vine	140	150mm	N/A	N/A
PN	Pennisetum 'Nakay'	Foxtail Grass	380	150mm	0.8	N/A
CCI	Casuarina 'Cousin It'	Prostrate Sheoak	90	200mm	0.8	N/A

PLANTING NOTES

1. EXISTING TREES TO BE RETAINED SHALL BE PROTECTED DURING THE CONSTRUCTION PHASE.
2. THE BUILDER SHALL BE RESPONSIBLE FOR SUBGRADE EXCAVATION AND PREPARATION TO ALLOW FOR TOPSOIL AND MULCH DEPTHS.
3. IMPORTED TOPSOIL AS SPECIFIED SHALL BE SPREAD TO THE SITE AS FOLLOWS:
- ON GRADE PLANTING BEDS 300MM DEPTH OF TOPSOIL/COMPOST PLANTING MIX AS SPECIFIED.
- ON GRADE TURF GRASSED AREA 200MM DEPTH SANDY TOPSOIL UNDERLAY AS SPECIFIED.
4. ALL PLANTING BEDS SHALL BE MULCHED TO A DEPTH OF 75MM WITH 15MM HORTICULTURAL GRADE PINEBARK.
5. TREES AND LARGE SHRUBS SHALL BE STAKED AS DETAILED ON THE PLANTING SCHEDULE.
6. REFER TO ARCHITECT'S AND ENGINEER'S SITE PLANS FOR PRECISE INFORMATION REGARDING PAVING, FINISHED LEVELS, ROADWORKS, FENCES, LIGHTING, STRUCTURES AND DRAINAGE DETAILS.
7. A FULLY AUTOMATIC DRIP IRRIGATION SYSTEM SHALL BE INSTALLED TO ALL PLANTING BEDS. IRRIGATION SHALL CONFORM TO AS3500 AND SYDNEY WATER REGULATIONS.
8. PROPOSED TREE PLANTINGS SHALL BE ORDERED UPON TENDER APPROVAL AND SHALL BE CERTIFIED TO HAVE BEEN GROWN ON IN ACCORDANCE WITH NATSPEC ' SPECIFICATION FOR THE SUPPLY OF TREES'.

MAINTENANCE: CONTRACTOR SHALL MAINTAIN SITE FOR A TWELVE MONTH MINIMUM PLANTING ESTABLISHMENT AND MAINTENANCE PERIOD FOLLOWING PRACTICAL COMPLETION. CONTRACTOR SHALL STATE EXACT NUMBER OF DAYS, AND INTERVALS BETWEEN, THAT HAVE BEEN ALLOWED TO MAINTAIN THIS SITE, AND SHALL KEEP A LOG BOOK OF MAINTENANCE WORKS. TIMING OF MAINTENANCE WORKS SHALL BE SPREAD REGULARLY OVER MAINTENANCE PERIOD. DUTIES SHALL INCLUDE, BUT NOT BE LIMITED TO WATERING, REINSTATING MULCH AS NECESSARY TO MAINTAIN SPECIFIED DEPTHS, MOWING, REMOVAL OF ANY WEED GROWTH OR RUBBISH, REPLACING FAILED PLANTS (AT NO ADDITIONAL COST TO CLIENT UNLESS DUE TO VANDALISM OR SOME OTHER REASON BEYOND THE CONTRACTORS CONTROL, AT DISCRETION OF LANDSCAPE ARCHITECT), SPRAYING OF PLANTS AS NECESSARY TO COMBAT INSECTS OR DISEASE AND ADJUSTING STAKING TO PLANTS.

LANDSCAPE LEGEND

- DECIDUOUS TREES
- EVERGREEN TREES
- PAVING BY OTHERS
- TURF GRASS AREAS
- PROPOSED SHRUB & GROUNDCOVER PLANTING
- 500 X 500 STEPPING STONES IN PLANTING BED
- STEEL GARDEN EDGING
- PROPOSED STORMWATER PITS AND PIPES. REFER STORMWATER CONSULTANTS PLANS

DA

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PROJECT
RESIDENTIAL DEVELOPMENT
481-485 PRINCESS HIGHWAY
WOONONA NSW 2517
FOR
EMERALD PARK ESTATES PTY LTD

REVISION NO.	DATE	AMENDMENT	NO.	DATE	AMENDMENT
A	14.05.25	DEVELOPMENT APPLICATION			
B	30.10.25	UPDATED LAYOUT DETAILS			

DRAWING NAME
LANDSCAPE
CONCEPT PLAN
SHEET 2 OF 2

LANDSCAPE CONSULTANT
PETER LAWSON FAILA, MAIH
Registered Landscape Architect, No 693
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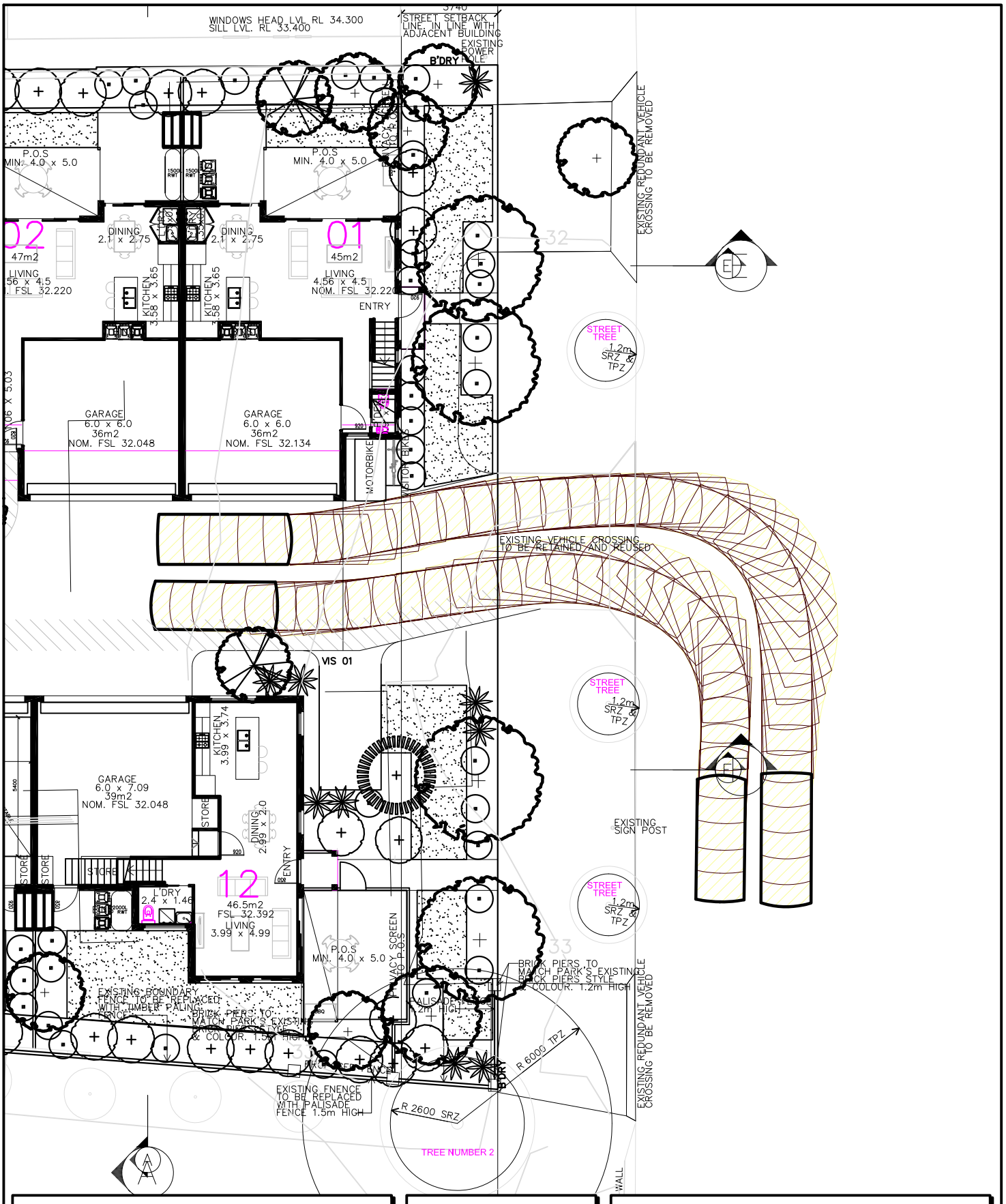
PROJECT NUMBER 20105
SCALE 1:100 @ A1
1:200 @ A3
DRAWING NUMBER DA L02
REVISION B
TRUE NORTH



LEGEND

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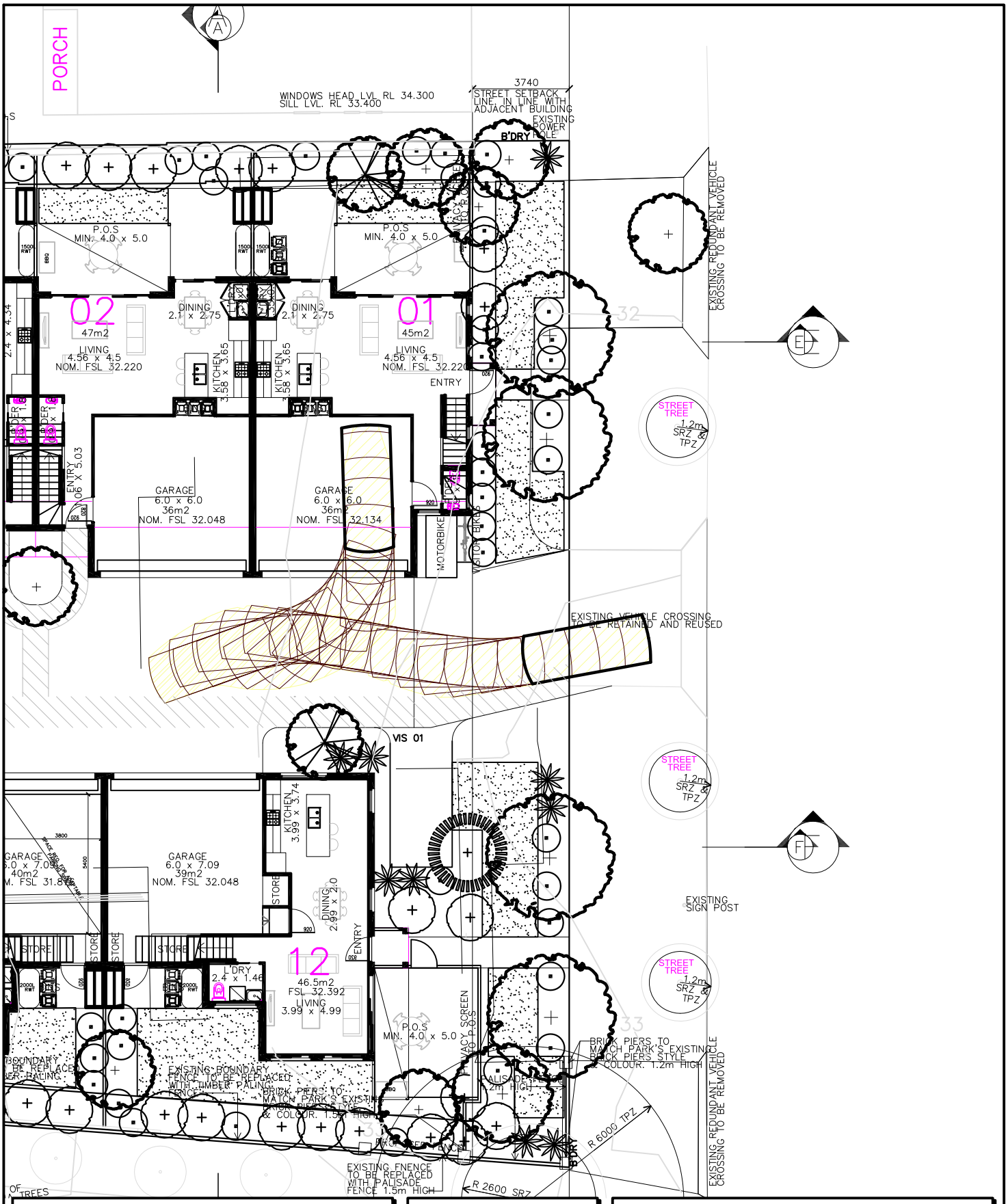
SWEPT PATH ANALYSIS OF AN 85th PERCENTILE VEHICLE ENTERING AND A 99th PERCENTILE VEHICLE EXITING THE SITE

SP 1



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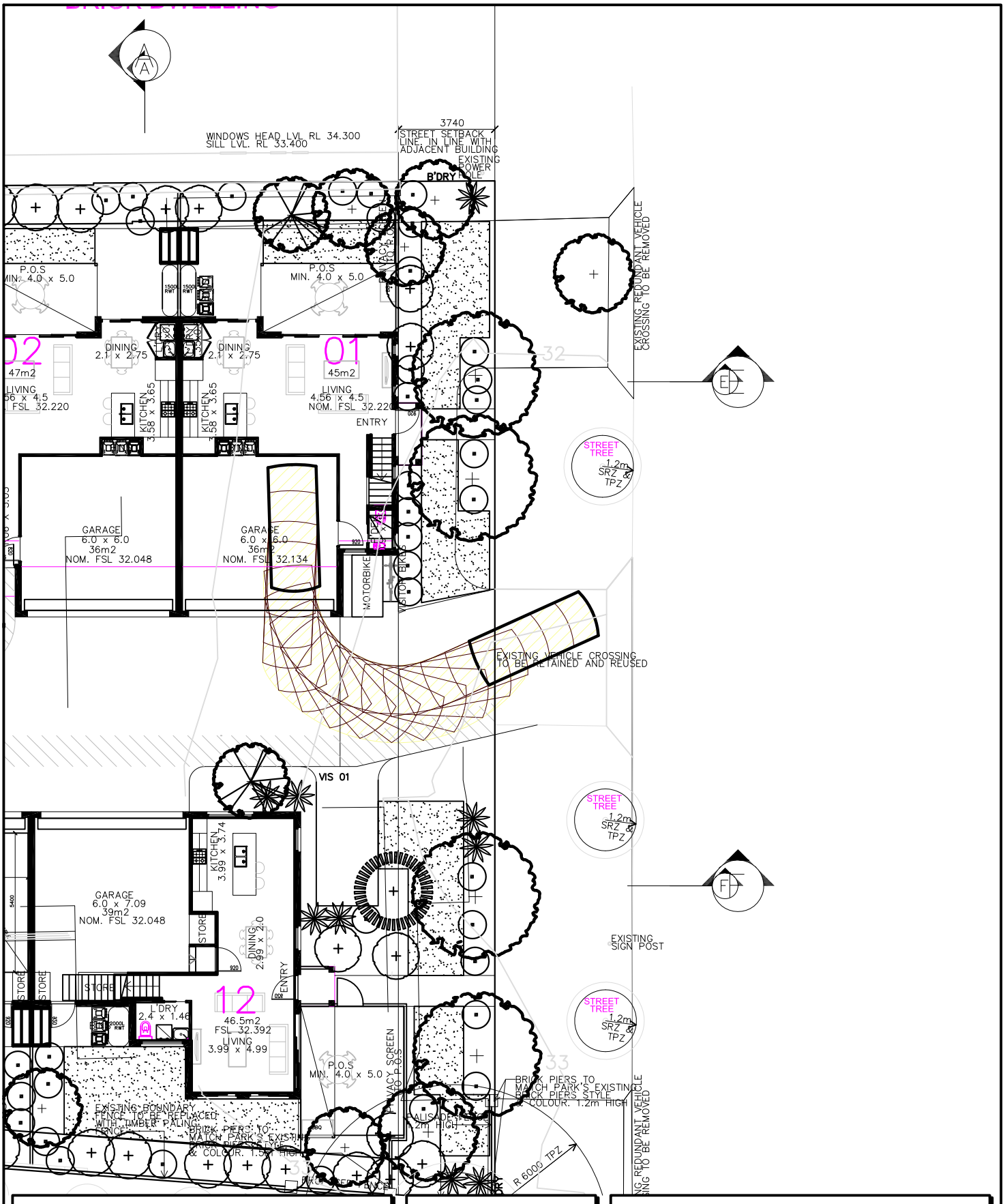
SWEPT PATH ANALYSIS OF AN 85th PERCENTILE VEHICLE ENTERING THE SITE

SP 2



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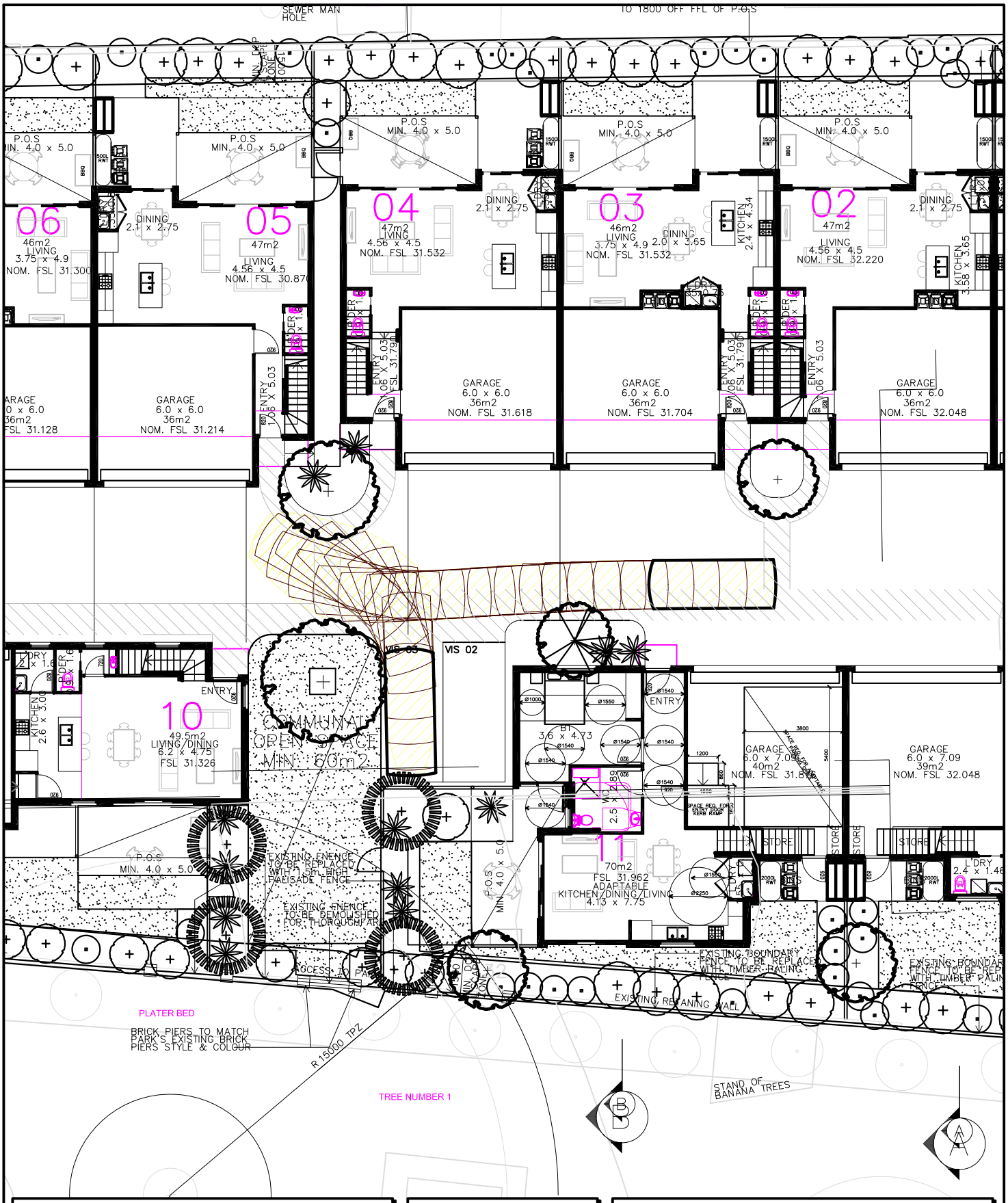
SWEPT PATH ANALYSIS OF AN 85th PERCENTILE VEHICLE EXITING THE SITE

SP 3



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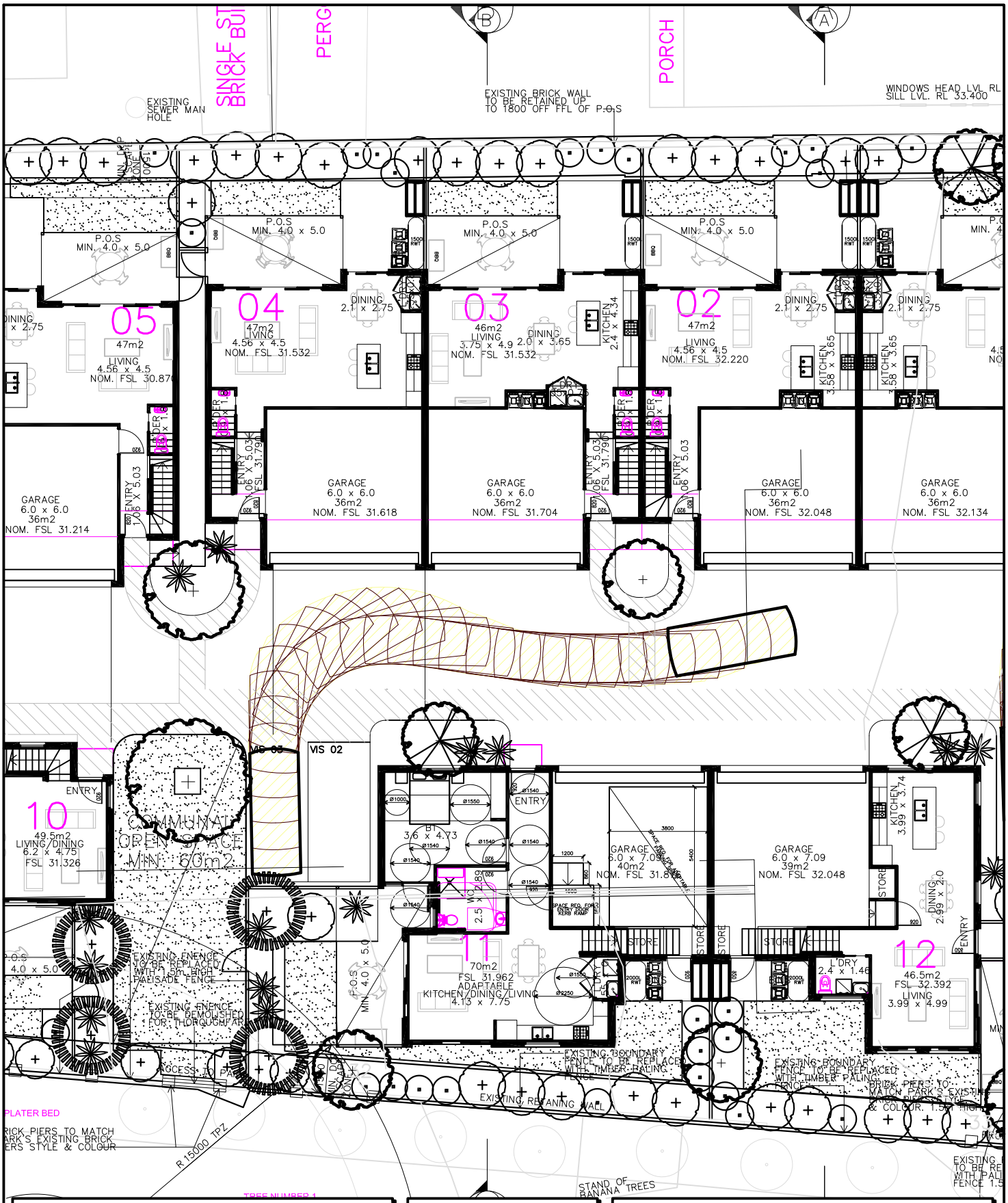
N

SWEPT PATH ANALYSIS OF AN 85th PERCENTILE VEHICLE ENTERING THE SITE

SP 4



LEGEND

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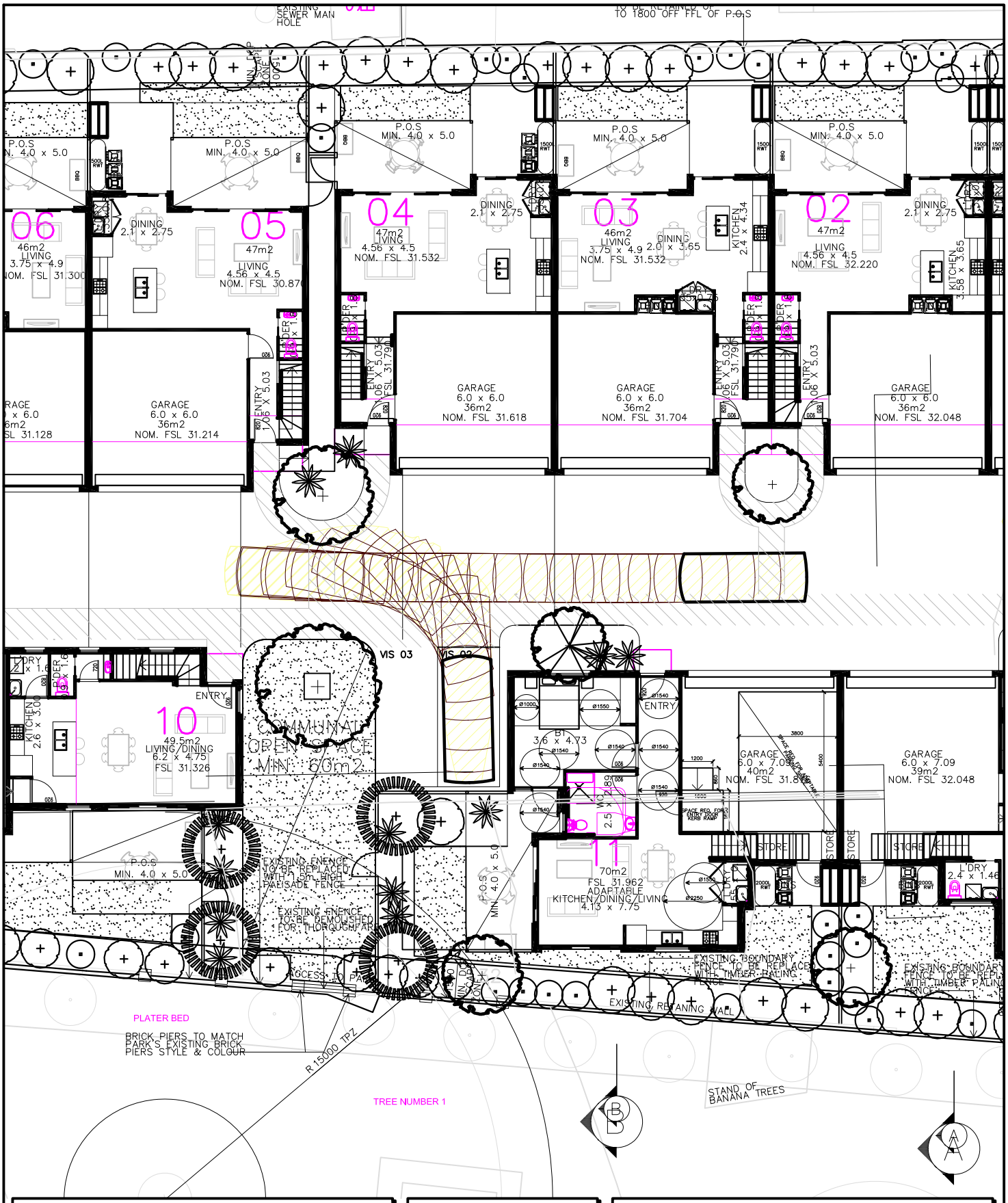
N

SWEPT PATH ANALYSIS OF AN 85th PERCENTILE VEHICLE EXITING THE SITE

SP 5



LEGEND

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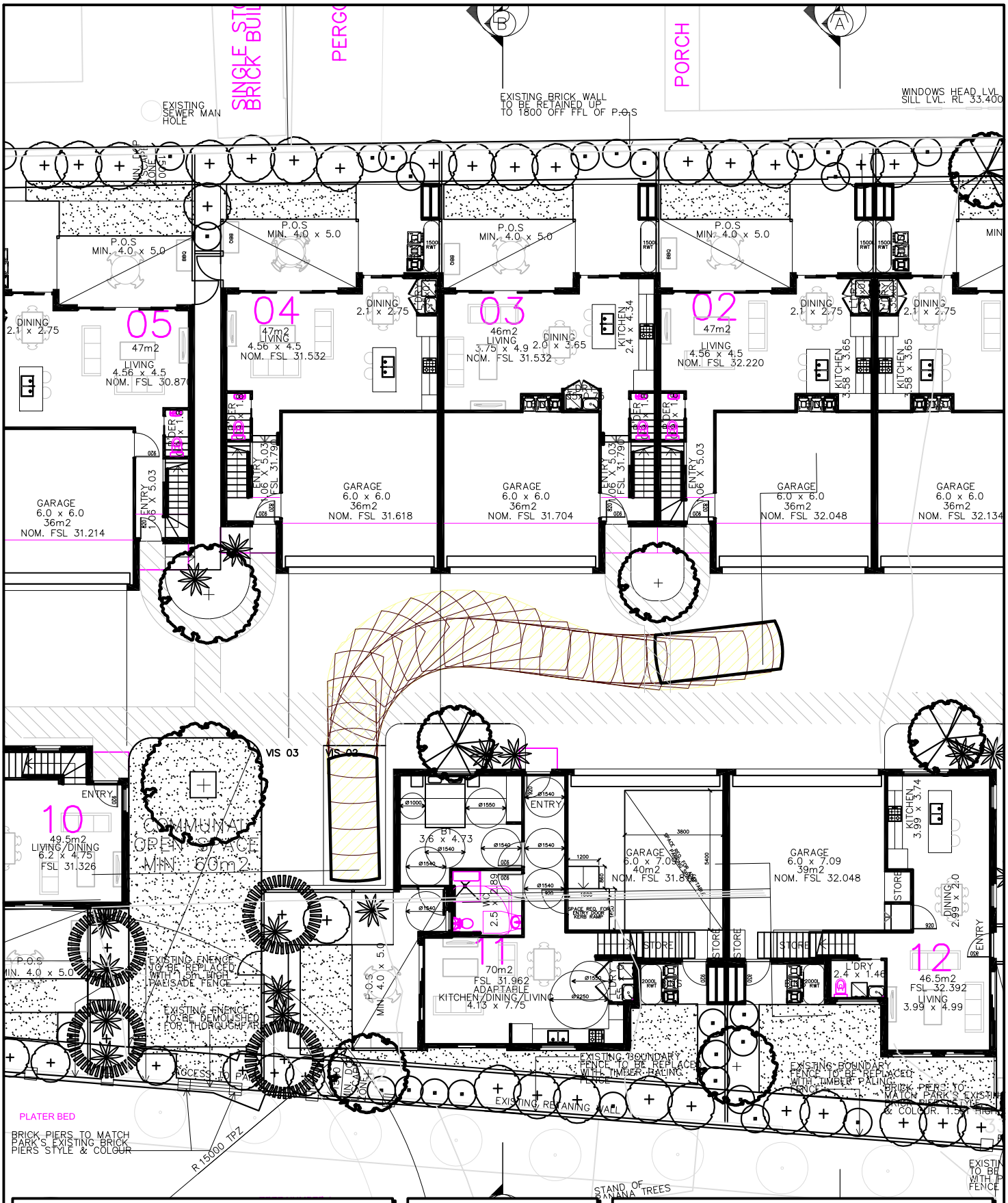
N

SWEPT PATH ANALYSIS OF AN 85th PERCENTILE VEHICLE ENTERING THE SITE

SP 6



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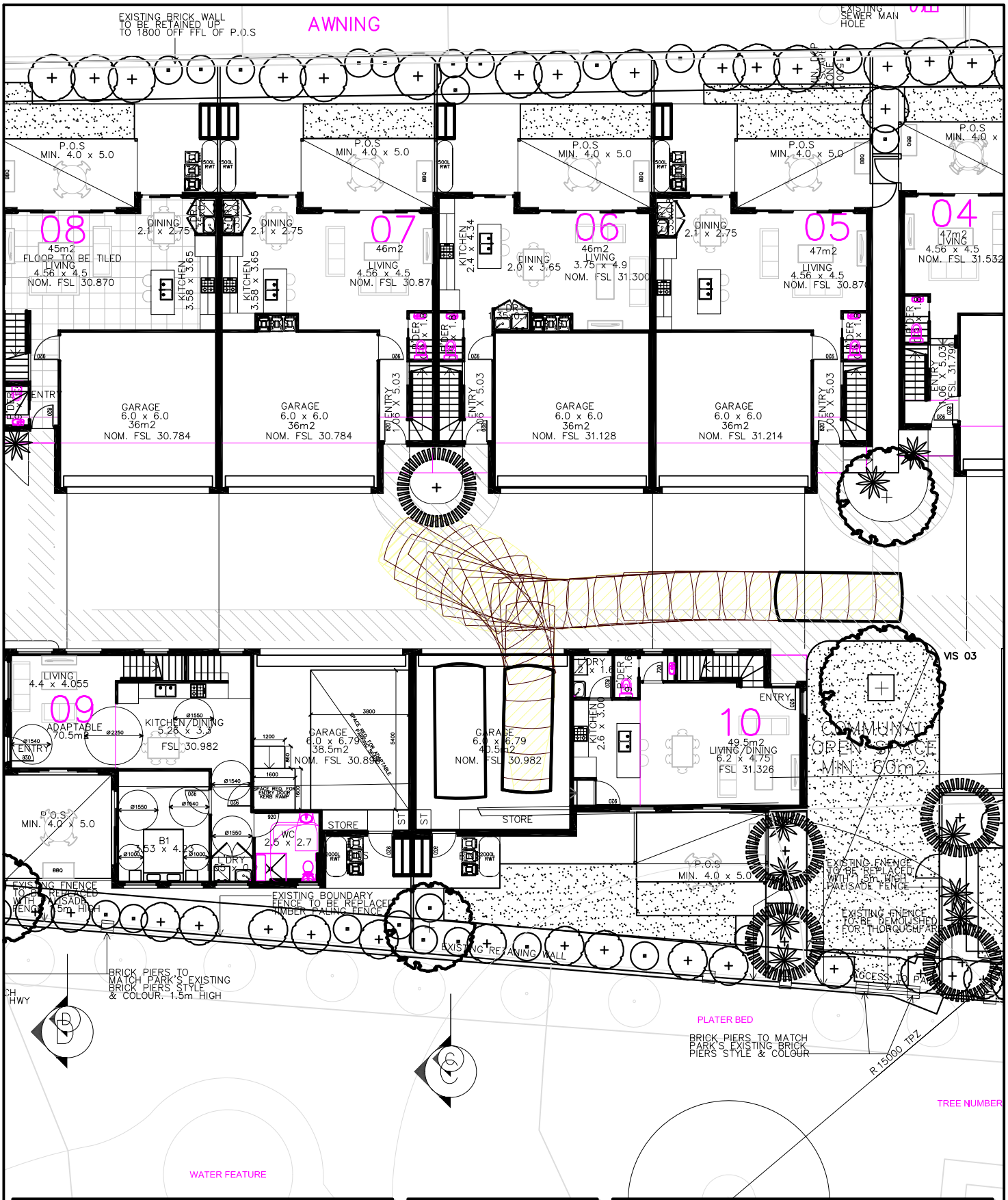
SWEPT PATH ANALYSIS OF AN 85th PERCENTILE VEHICLE EXITING THE SITE

SP 7



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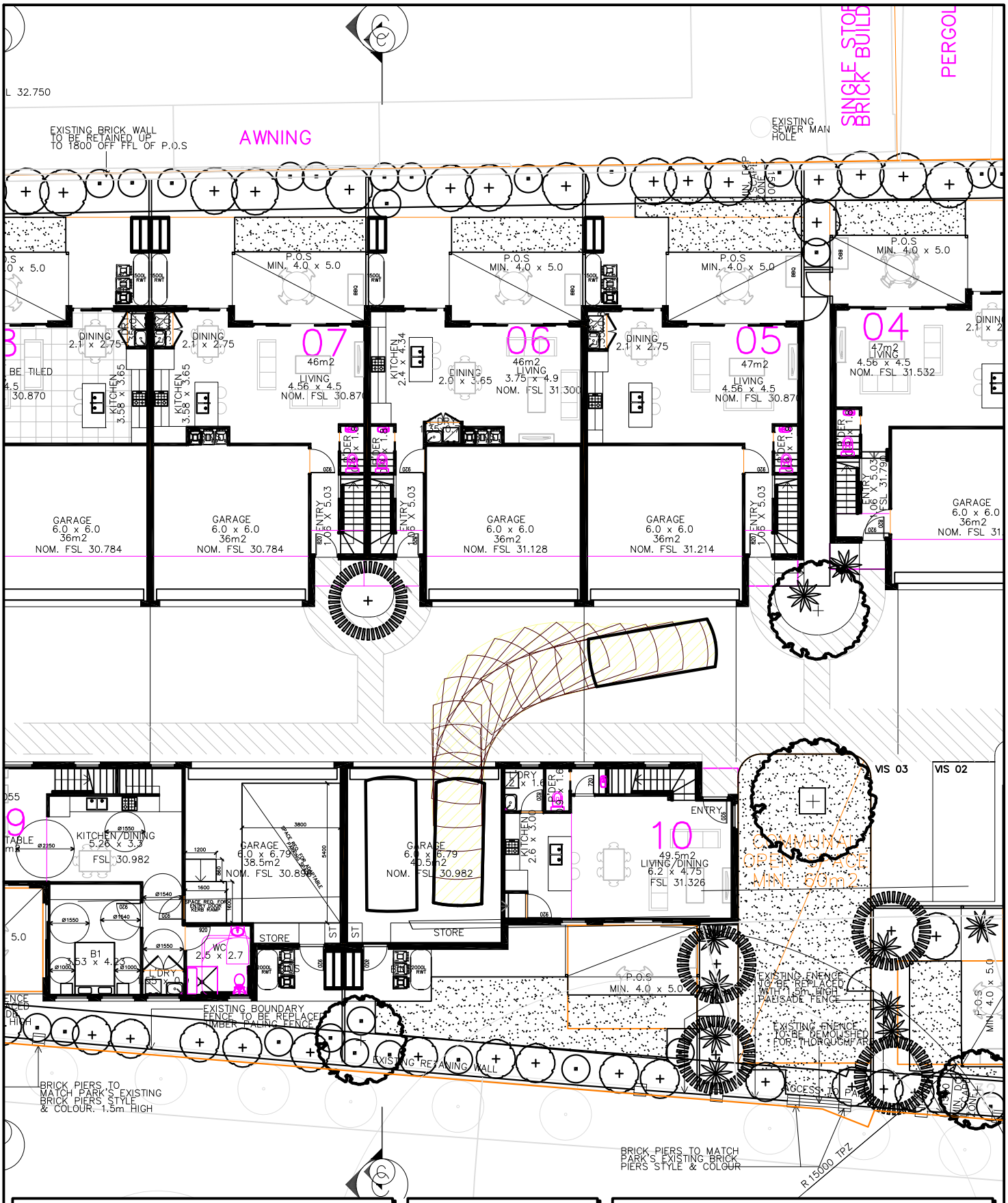
SWEPT PATH ANALYSIS OF AN 85th PERCENTILE VEHICLE ENTERING THE SITE

SP 8



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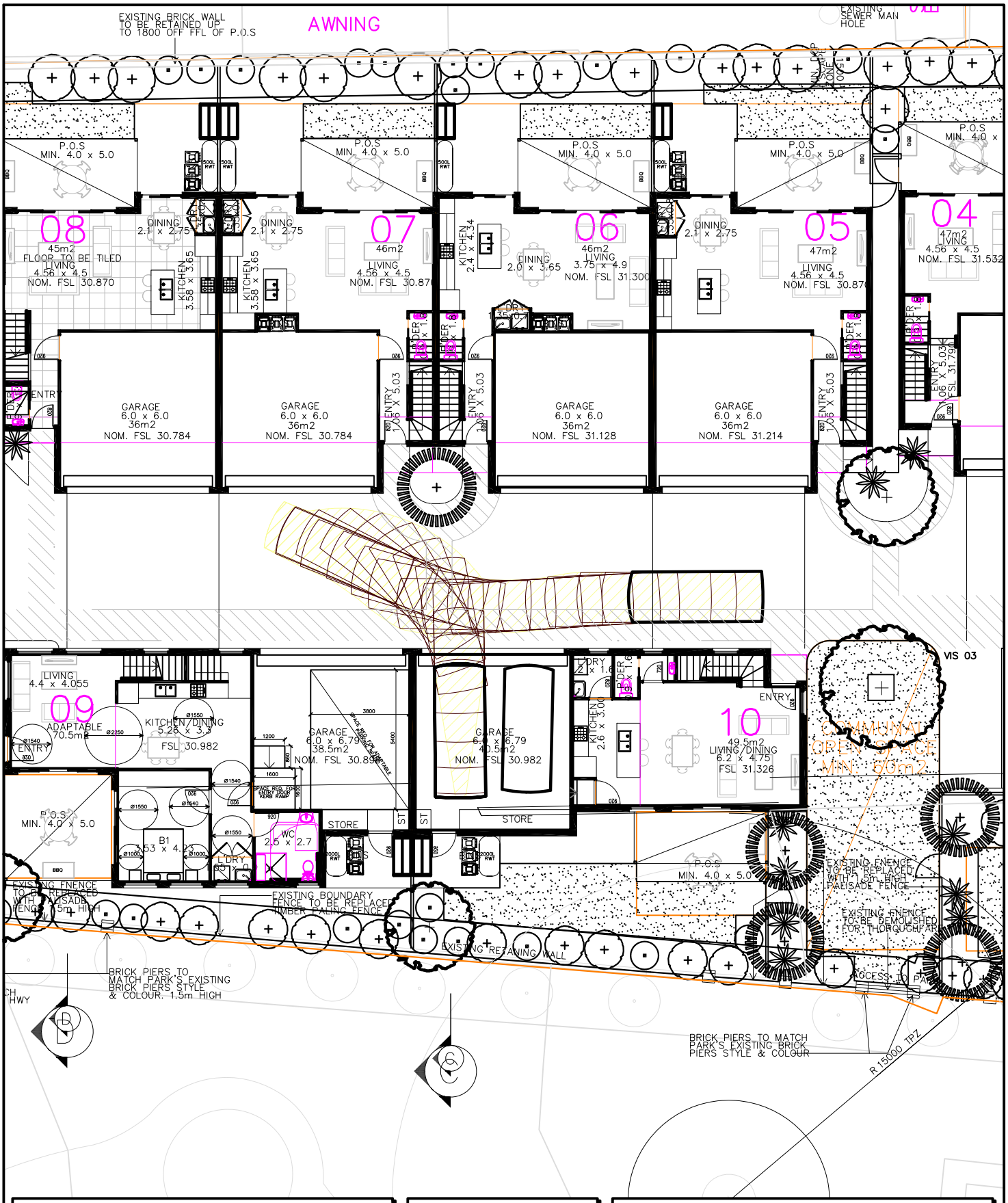
SWEPT PATH ANALYSIS OF AN 85th PERCENTILE VEHICLE EXITING THE SITE

SP 9



LEGEND

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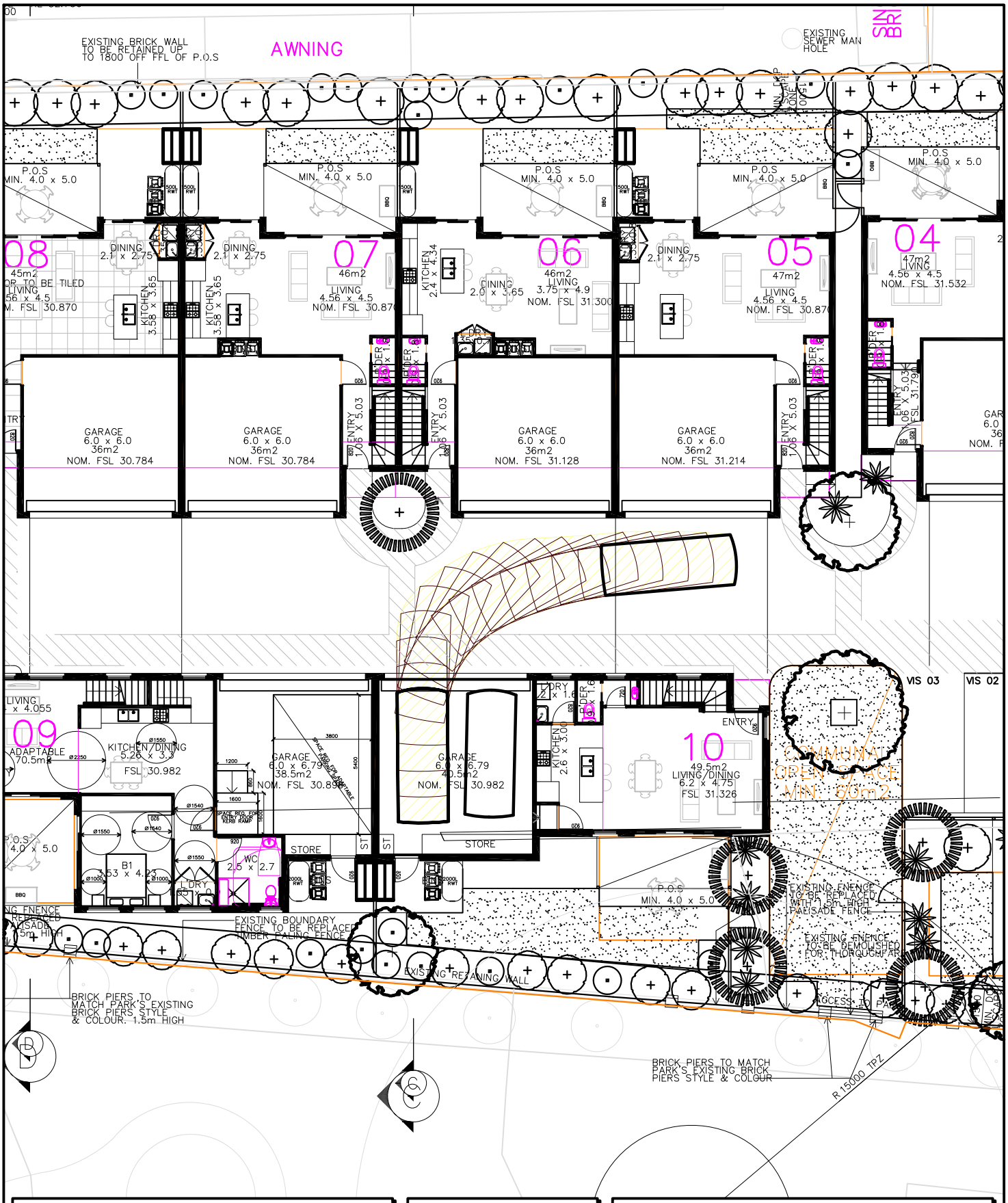
SWEPT PATH ANALYSIS OF A 99th PERCENTILE VEHICLE ENTERING THE SITE

SP 10



LEGEND

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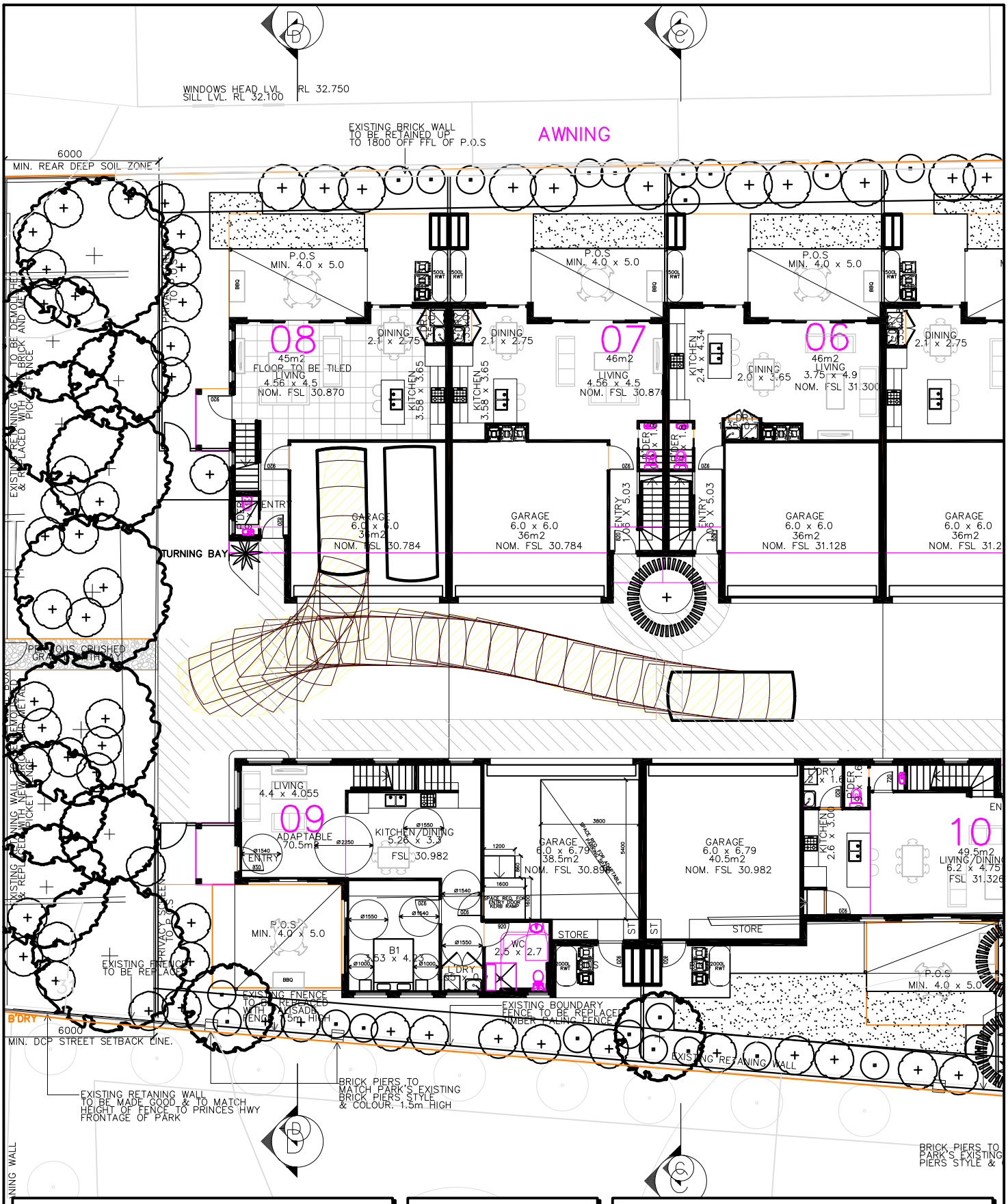
SWEPT PATH ANALYSIS OF A 99th PERCENTILE VEHICLE EXITING THE SITE

SP 11



LEGEND

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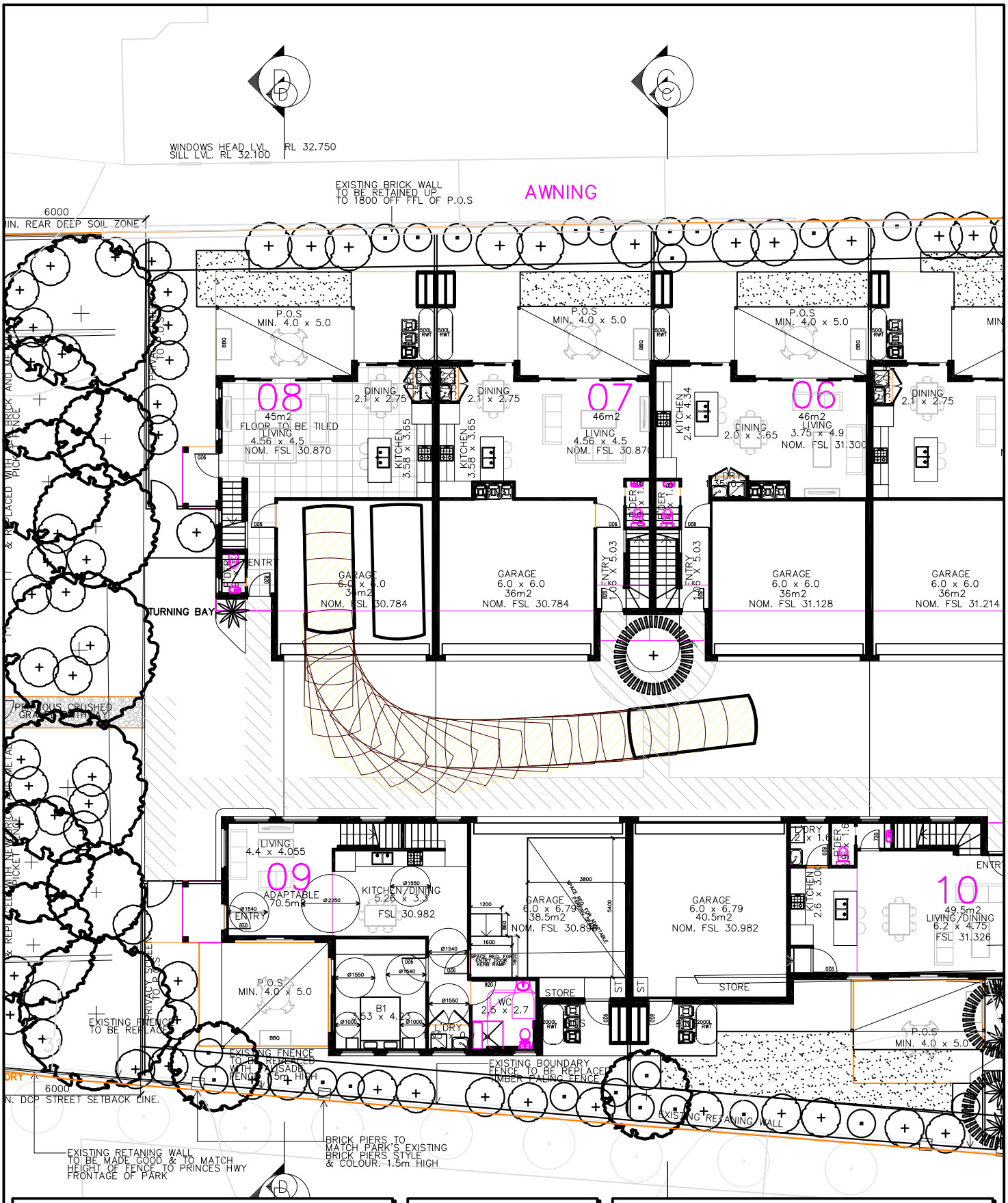
SWEPT PATH ANALYSIS OF AN 85th PERCENTILE VEHICLE ENTERING THE SITE

SP 12



LEGEND

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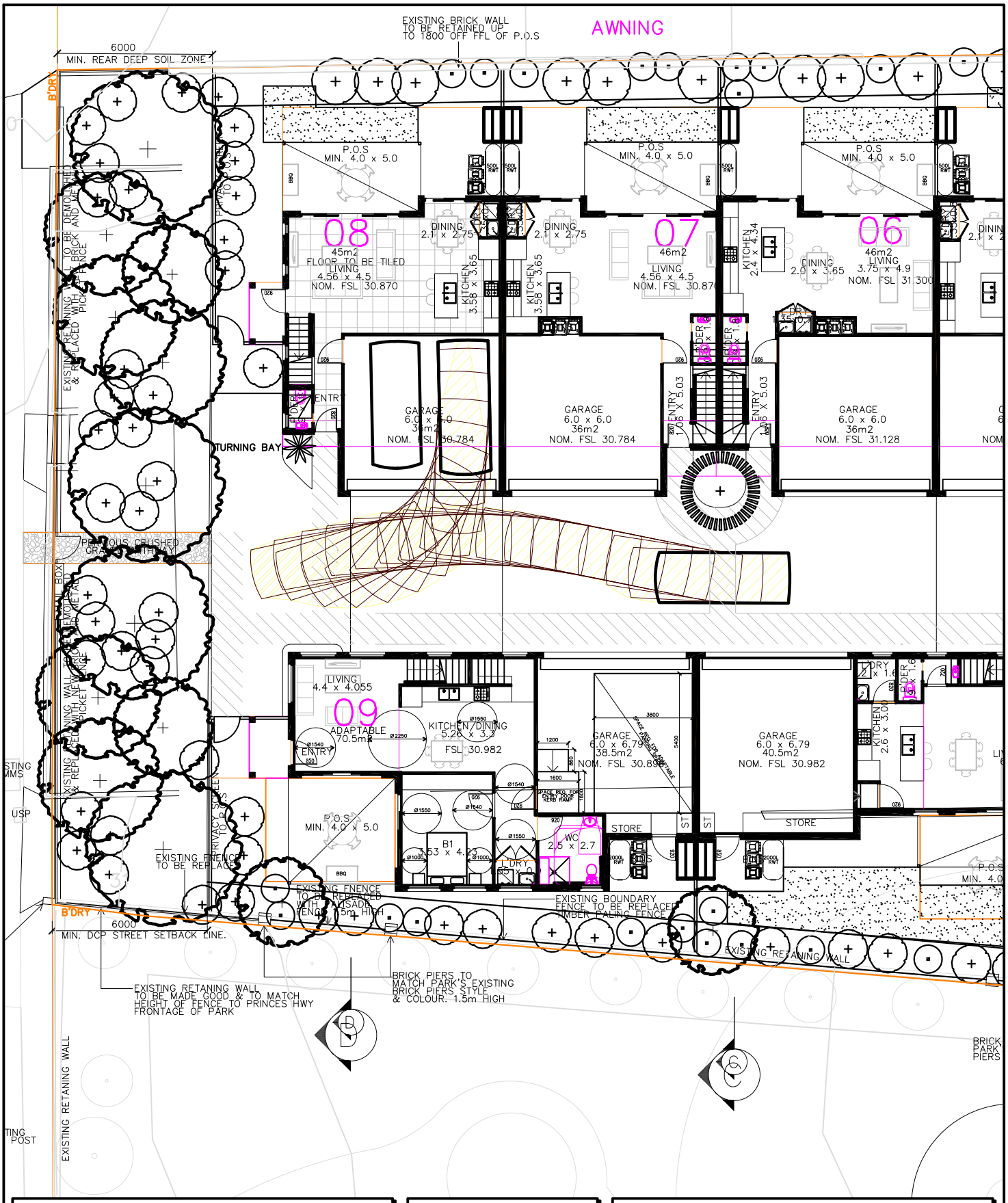
SWEPT PATH ANALYSIS OF AN 85th PERCENTILE VEHICLE EXITING THE SITE

SP 13



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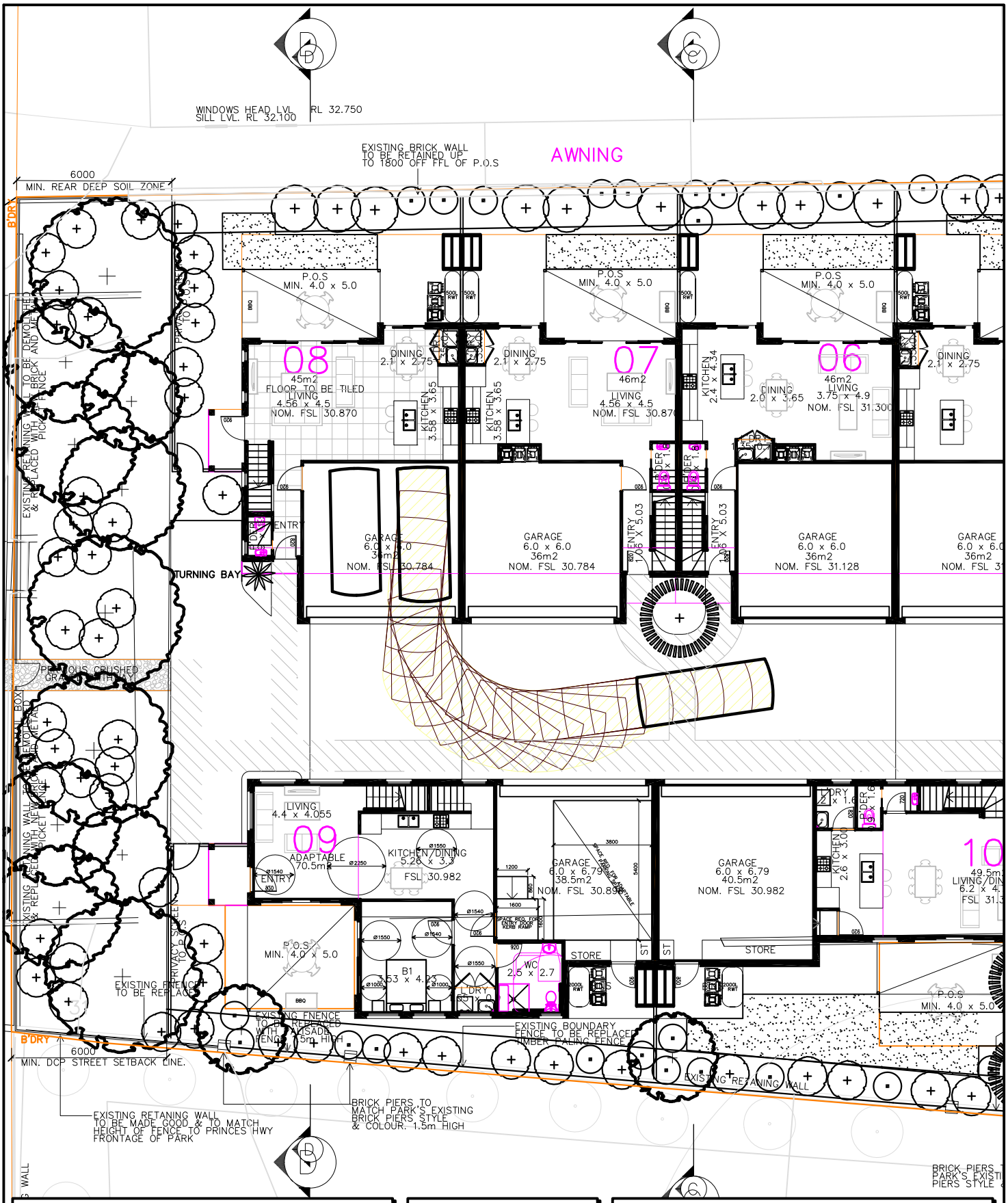
SWEPT PATH ANALYSIS OF A 99th PERCENTILE VEHICLE ENTERING THE SITE

SP 14



LEGEND

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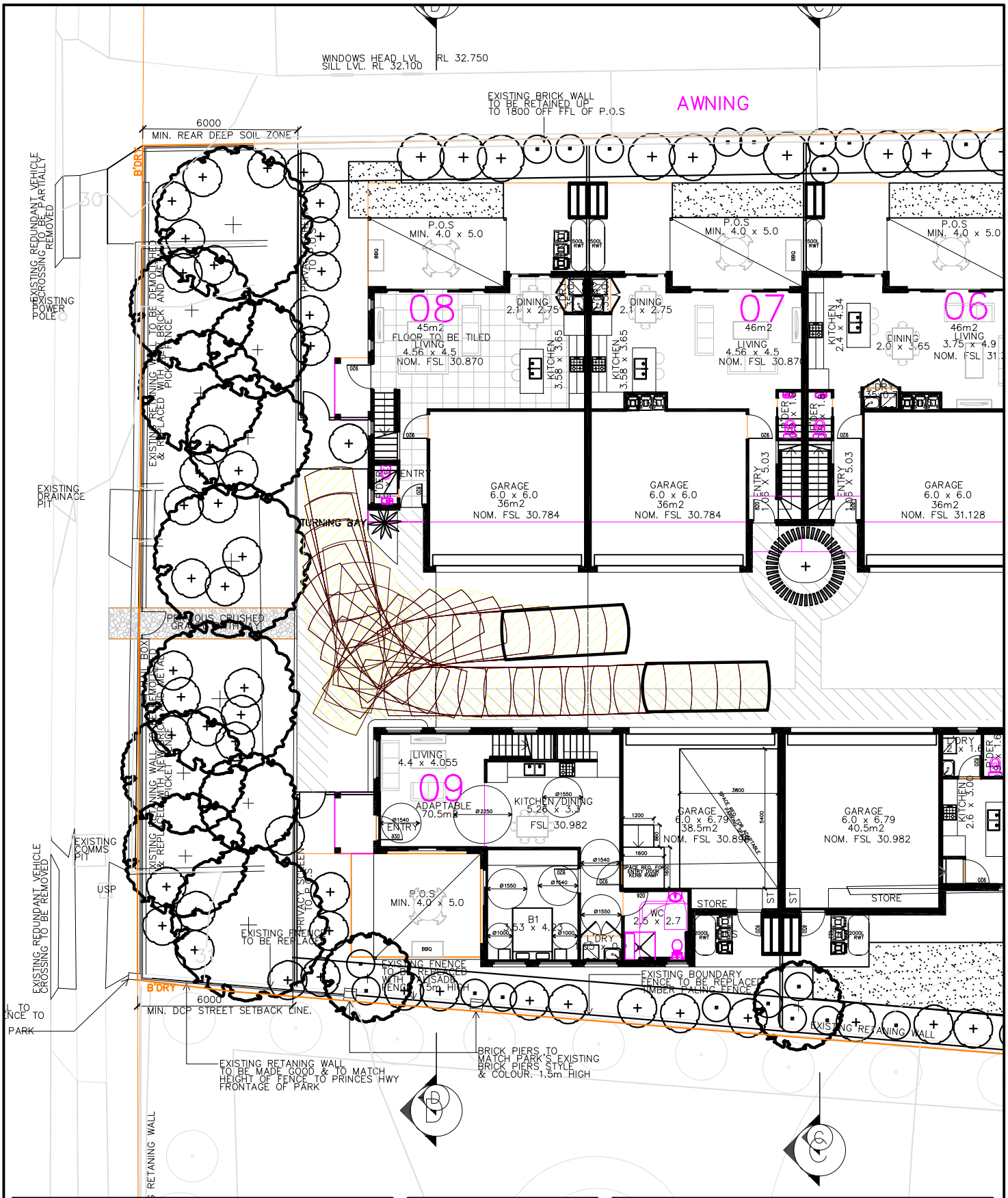
SWEPT PATH ANALYSIS OF A 99th PERCENTILE VEHICLE EXITING THE SITE

SP 15



LEGEND

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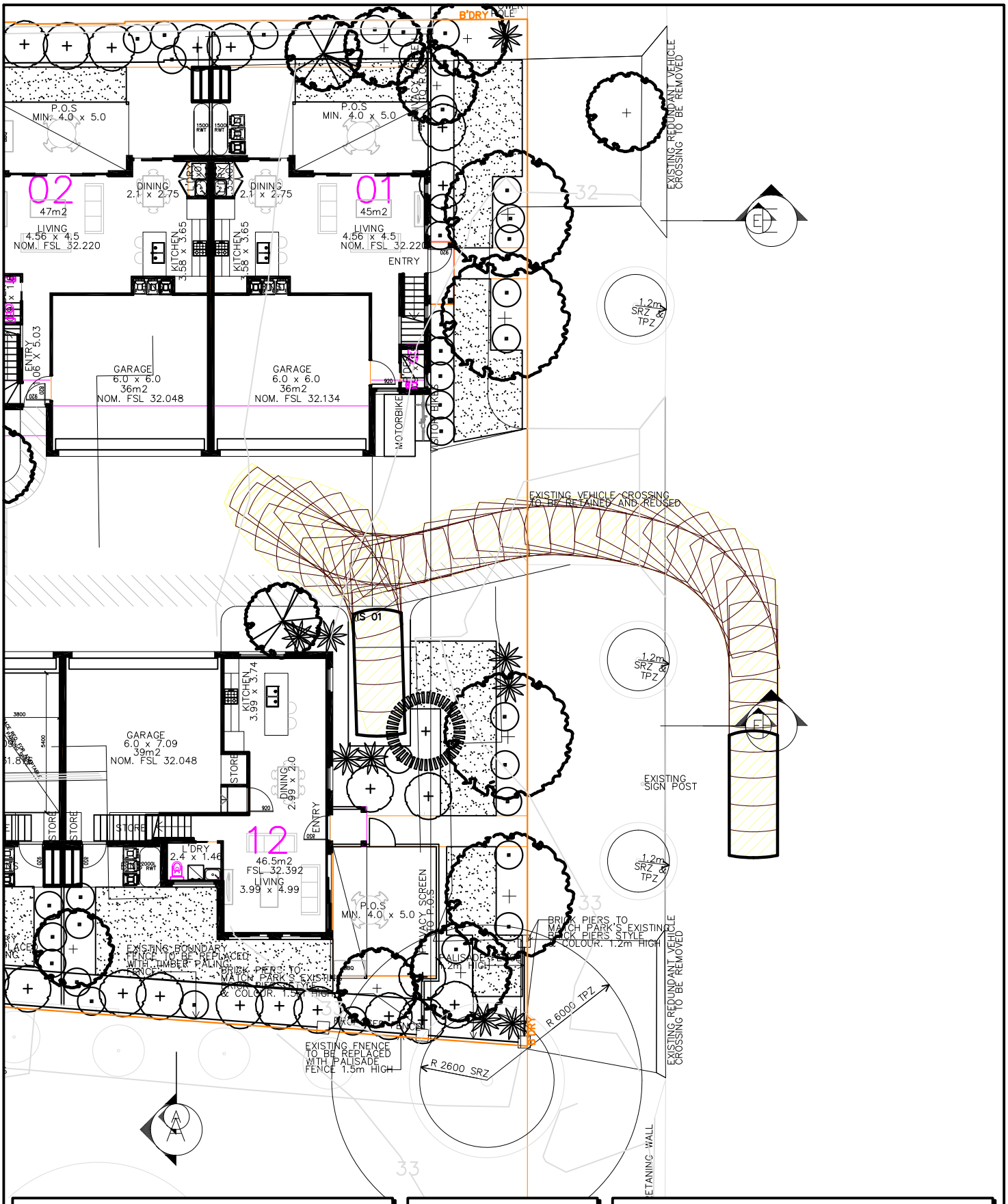
N

SWEPT PATH ANALYSIS OF AN 85th PERCENTILE VEHICLE TURNING

SP 16



LEGEND

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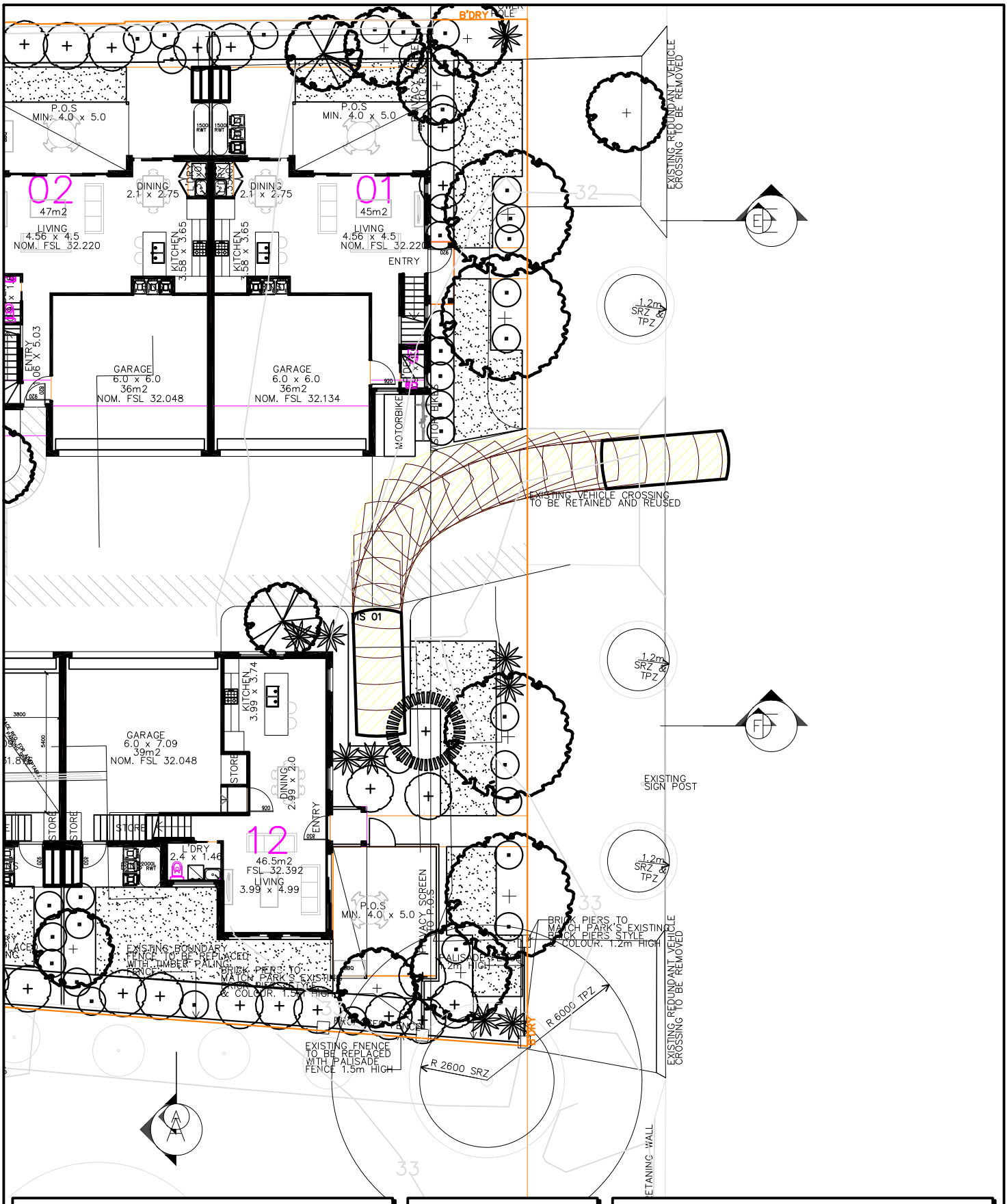
SWEPT PATH ANALYSIS OF AN 85th PERCENTILE VEHICLE ENTERING THE SITE

SP 17



LEGEND

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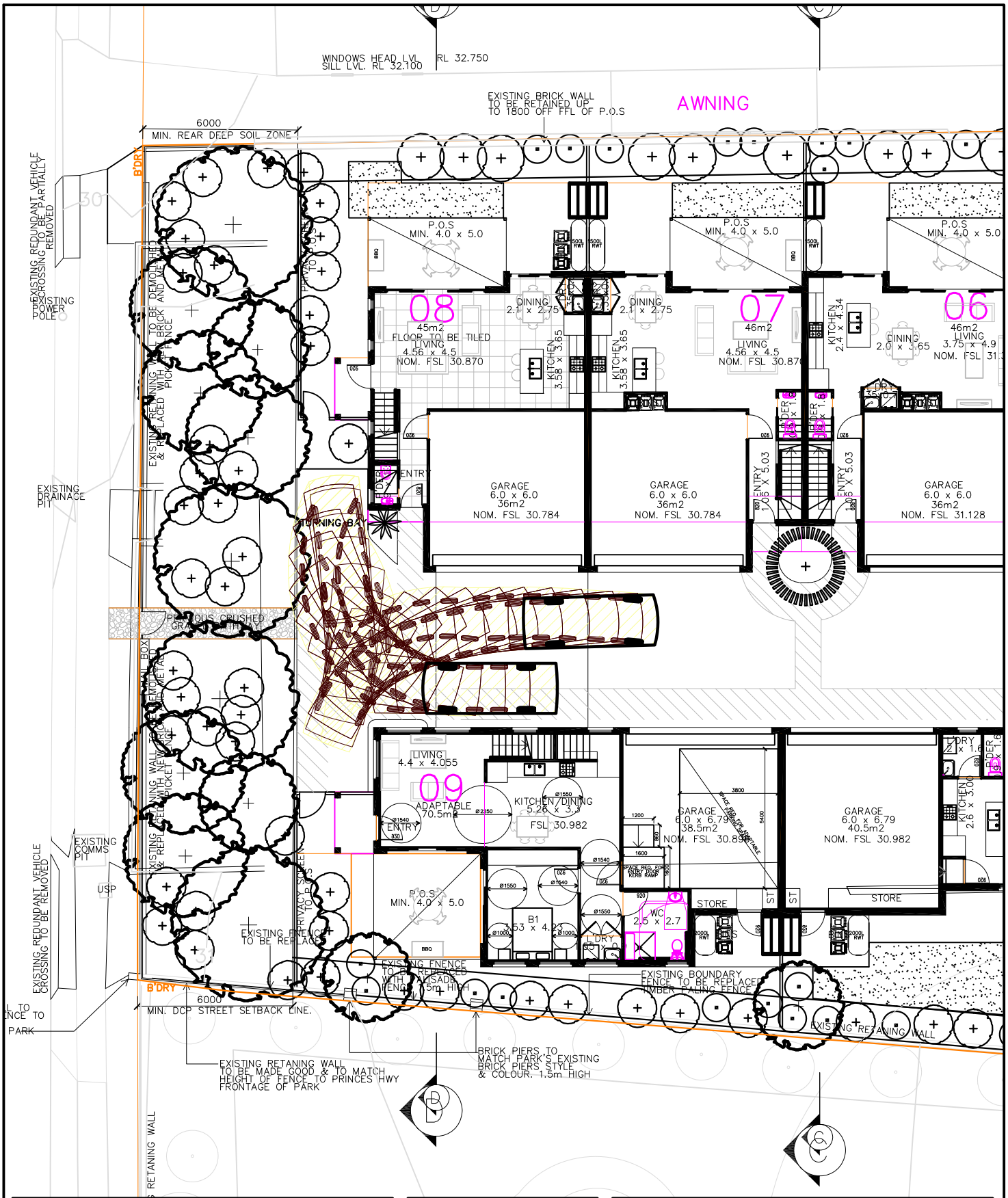
SWEPT PATH ANALYSIS OF AN 85th PERCENTILE VEHICLE EXITING THE SITE

SP 18



LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTrack V5.00a in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.

N

SWEPT PATH ANALYSIS OF A 99th PERCENTILE VEHICLE TURNING

SP 19

ATTACHMENT 4: Assessment Amended Proposal

STATE ENVIRONMENTAL PLANNING POLICY NO. 55 – REMEDIATION OF LAND

7 Contamination and remediation to be considered in determining development application

(1) A consent authority must not consent to the carrying out of any development on land unless:

(a) it has considered whether the land is contaminated, and

(b) if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and

(c) if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.

The applicant has submitted an Interim Site Auditors Advice prepared by GHD dated 23 December 2020 and an Additional Site Environmental Site Assessment prepared by Environmental Consulting Services Pty Ltd. dated 16 December 2020. Details of the application submission including the Site Auditors Advice and Additional Environmental Assessment were referred to Council's Environment Officer for comment. Councils Environment Officer provided a conditionally satisfactory response noting that further testing has occurred and the site auditor has updated his Interim Advice letter, stating that as part of the DSI an additional 4 borehole samples were collected within the footprint of the building and, those soil samples were similar to other soil samples. The recommendations in the report have not changed from previous interim advice as a result no conditions of consent have been amended. As such it is considered Clause 7 matters are satisfied.

STATE ENVIRONMENTAL PLANNING POLICY (INFRASTRUCTURE) 2007

See original Council Assessing Officer Report.

STATE ENVIRONMENTAL PLANNING POLICY (KOALA HABITAT) 2020

The City of Wollongong is identified within Schedule 1 as land to which this Policy applies. Wollongong is located within the South Coast Koala Management Area.

Part of the subject site is mapped as being within the Site Investigation Area for Koala Plans of Management pursuant to the SEPP Maps. This mapping is provided as a tool for Council in developing Koala Plans of Management and does not apply to the development application process. Council does not have an approved Koala Plan of Management for the land at the time of preparing this report, and as such, no further consideration of this SEPP is required.

STATE ENVIRONMENTAL PLANNING POLICY (BUILDING SUSTAINABILITY INDEX: BASIX) 2004

The original BASIX certificate submitted is still considered applicable, see original Council Assessing Officer Report. Minor change to windows and doors locations of unit 8 and 12 noted on plans.

WOLLONGONG LOCAL ENVIRONMENTAL PLAN 2009

Part 1 Preliminary

Clause 1.4 Definitions

Multi dwelling housing means 3 or more dwellings (whether attached or detached) on one lot of land, each with access at ground level, but does not include a residential flat building.

Part 2 Permitted or prohibited development

Clause 2.2 – Zoning of land to which Plan applies

The zoning map identifies the land as being zoned R2 Low Density Residential, as demonstrated by Figure 2 below.

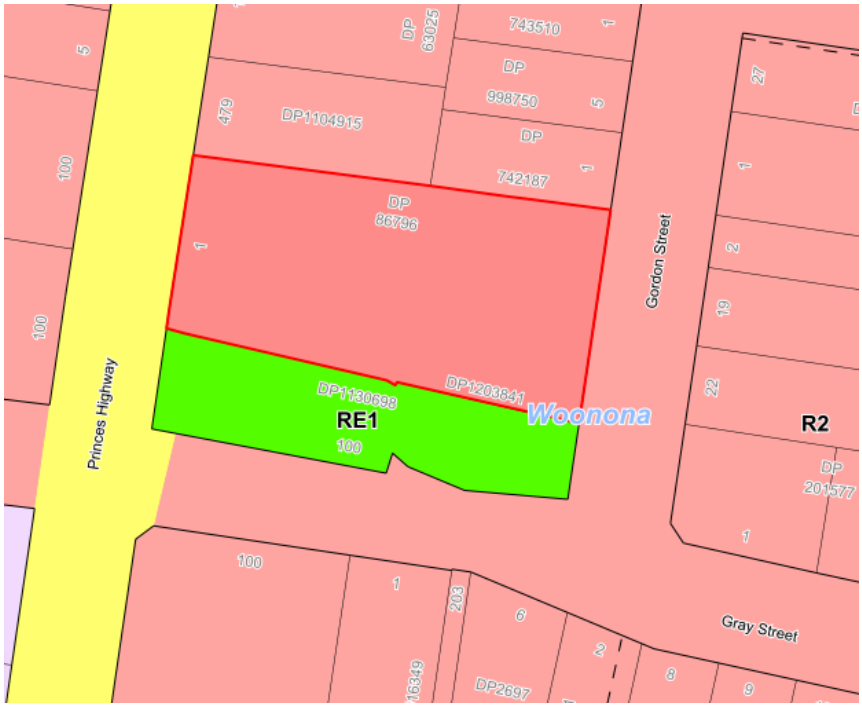


Figure 2: *WLEP 2009 zoning map*

Clause 2.3 – Zone objectives and land use table

The objectives of the zone are as follows:

- *To provide for the housing needs of the community within a low-density residential environment.*
- *To enable other land uses that provide facilities or services to meet the day to day needs of residents.*

The proposal would be considered satisfactory with regard to the above objectives as it would provide for additional housing opportunities in a low-density environment.

The land use table permits the following uses in the zone:

> *Attached dwellings; Bed and breakfast accommodation; Boarding houses; Boat launching ramps; Centre-based child care facilities; Community facilities; Dual occupancies; Dwelling houses; Environmental facilities; Exhibition homes; Exhibition villages; Group homes; Health consulting rooms; Home-based child care; Hospitals; Hostels; Information and education facilities; Jetties;* ***Multi dwelling housing****; Neighbourhood shops; Places of public worship; Recreation areas; Recreation facilities (indoor); Recreation facilities (outdoor); Residential flat buildings; Respite day*

care centres; Roads; Semi-detached dwellings; Seniors housing; Shop top housing; Signage; Veterinary hospitals

The proposal is categorised as ***Multi dwelling housing*** as defined above and is permissible in the R2 zone with development consent.

Clause 2.7 Demolition requires development consent

Consent for the demolition of the existing warehouse storage structures are sought as part of the subject application. Condition 40 has been included in the draft conditions of consent that requires a construction management plan be prepared to maintain public safety, minimise disruption to pedestrian and vehicular traffic and to protect services and structures during demolition and construction. Additionally, condition 46 has been amended to ensure public and private infrastructure and building condition is noted in the Dilapidation Report prior to any site works commencing. Draft conditions are provided at Attachment 7.

Part 4 Principal development standards

Clause 4.3 Height of buildings

No proposed change to the height of the dwellings. The proposed maximum building height of 7.6m does not exceed the maximum of 9m permitted for the site.

Clause 4.4 Floor space ratio

The amended plans indicate a minor reduction is gross floor area from 1470m^2 to 1465.64m^2 . This is a result of the minor plan changes to facilitate waster storage in the garage areas of Unit 2, 3, 6 and 7. In turn the FSR is reduced from 0.50:1 to 0.498:1 considered satisfactory, details indicated below in the table. The maximum FSR for the site is 0.50:1.

Maximum FSR permitted for the zone:	**0.5:1**	
Combined Site area:	2939.9m^2	
Combined gross floor areas:		
Units 1, 2, 3 and 4	Ground floor	194m^2
	First floor	280m^2
Units 5, 6, 7 and 8	Ground floor	194m^2
	First floor	282m^2
Units 9 and 10	Ground floor	129m^2
	First floor	144m^2
Units 11 and 12	Ground floor	128m^2
	First floor	115m^2
Exclusions	36m2 x 12 (garages) = 432m^2	
GFA	1466m^2	
FSR	1466m^2 / 2939.95m^2 **0.498:1**	

Part 5 Miscellaneous provisions

5.11 Heritage Conservation

No proposed regarding heritage impacts from the original assessment. See original Council Assessing Officer Report.

The site is situated between two heritage items to the north is the Woonona Bulli School of Arts and to the south is Pendlebury Park. A heritage report was submitted with the proposal and Council's Heritage Officer previously provided satisfactory comment.

Part 6 Urban release areas

Not applicable.

Part 7 Local provisions – general

Clause 7.1 Public utility infrastructure

No proposed change. See original Council Assessing Officer Report.

Clause 7.5 Acid Sulfate Soils

See original Council Assessing Officer Report.

Clause 7.6 Earthworks

The inclusion of Construction Management Plan, reference condition 41 of draft conditions provided at Attachment 7, requires the plan to detail excavation phases including proposed methods of support for excavations.

Clause 7.14 Minimum site width

See original Council Assessing Officer Report.

WDCP 2009 compliance table

CHAPTER A2: ECOLOGICALLY SUSTAINABLE DEVELOPMENT

Development controls to improve the sustainability of development throughout Wollongong are integrated into the relevant chapters of this DCP.

Generally speaking, the proposal could be considered to be consistent with the principles of Ecologically Sustainable Development.

CHAPTER B1: RESIDENTIAL DEVELOPMENT

This Chapter applies to all land zoned in the LGA as residential. Section 4 provides general residential controls which apply to all dwelling houses, dual occupancies, secondary dwellings, ancillary structures and semi-detached dwellings. Section 5 provides controls that must also be taken into consideration for development for the purposes of Multi-Dwelling Housing.

4. General Residential controls

Controls/objectives	Comment	Compliance
4.11 Storage Facilities	No changes proposed from original application. The proposed development will provide adequate storage with each proposed dwelling. Consisting of 1 x 2 bedroom dwelling and 11 x 3 bedroom dwellings.	Yes

4.12 Site Facilities	No changes proposed from original application. The necessary site facilities have been indicated on plans and are considered satisfactory.	Yes
4.13 Fire Brigade Servicing	No changes proposed from original application. Condition 28 is recommended in this regard, as provided at Attachment 7.	Yes
4.14 Services	No changes proposed from original application. The site currently has access to utility services. Draft conditions are recommended with regard to services.	Yes
4.15 View sharing	No changes proposed from original application. The proposal would not be envisaged to result in any significant impact on existing view corridors, given the context of the site and surrounding area.	Yes
4.16 Retaining walls	No changes proposed from original application. The existing retaining walls situated on the boundary between the site and Pendlebury Park are proposed to be retained with minor alteration of parts included.	Yes

5 Attached dwellings and multi - dwelling housing

Controls/objectives	*Comment*	*Compliance*
5.1 Minimum Site Width Requirement	No changes proposed from original application. The proposal involves multi dwelling housing. The subject site has a variable width of 32m adjoining the Princes Highway and 41m in width adjoining Gordon Street. The existing site width is considered satisfactory.	Yes
5.2 Number of Storeys	No changes proposed from original application. The proposed units are all two (2) storeys and considered satisfactory.	Yes

5.3 Front Setbacks	Minor change to Unit 12. Unit 1 and Unit 12 seek variations to the 6m setback to the property boundary from Gordon Street. Unit 1 seeks a setback of 3.74m in line with the neighbouring property at 2 Gordon St, Woonona. A small porch area is proposed to encroach on this setback. The porch area is approximately 900mm. Unit 12 proposes a setback 7.525m however within this is the POS for Unit 12, setback at 3.4m from the boundary, and a visitor parking space. The street has a variable mix of setbacks. The porch encroachment provides built form articulation and entry presentation to the street. Additional separation from the entrance of Unit 12 and visitor car parking space 01. The variation is considered capable of support.	Variation sought. Considered capable of support. Refer to considerations in original Council Assessing Officer Report.
5.4 Side and Rear Setbacks • 0.8 x ceiling height min	No changes proposed from original application. Proposed side and rear setbacks are generally compliant, as indicated by Table 2 below. Unit 9 has a 43cm encroachment, non-compliance, into the lower level side setback however the objectives are still considered achieved as this area is bounded by the neighbouring park and there are minimal foreseeable impacts as a result.	Yes

	Required setbacks		**Proposed setbacks**	
Unit 1	Ground floor	2.16m	Ground floor	3.15m
	First floor	4.16m	First floor	5.98m
Unit 2	Ground floor	2.16m	Ground floor	3m
	First floor	4.16m	First floor	5.8m
Unit 3	Ground floor	2.16m	Ground floor	3m
	First floor	4.16m	First floor	5.8m
Unit 4	Ground floor	2.16m	Ground floor	2.93m
	First floor	4.16m	First floor	5.65m
Unit 5	Ground floor	2.16m	Ground floor	3.4m
	First floor	4.16m	First floor	6.3m

Unit 6	Ground floor	2.16m	Ground floor	3.2m
	First floor	4.16m	First floor	6.1m
Unit 7	Ground floor	2.16m	Ground floor	3.1m
	First floor	4.16m	First floor	6m
Unit 8	Ground floor	2.16m	Ground floor	3.02m
	First floor	4.16m	First floor	5.74m
Unit 9	Ground floor	2.16m	Ground floor	1.73m
	First floor	4.16m	First floor	4.23m to balcony 6.25m to ext. wall
Unit 10	Ground floor	2.16m	Ground floor	4.88m
	First floor	4.16m	First floor	4.6m to balcony 6.84m to ext. wall
Unit 11	Ground floor	2.16m	Ground floor	2.14m
	First floor	4.16m	First floor	4.03m to balcony 5.71m to ext. wall
Unit 12	Ground floor	2.16m	Ground floor	3.23m
	First floor	4.16m	First floor	3.48m to balcony 7.5m to ext. wall

5.5 Building Character and Form	Minor change to the frontage of Unit 12 addressing the Gordon Street frontage. Additional landscape and separation included between entry and visitor car parking space 01. Minor change to the awning to delineate the entrance from the Princes Highway between Units 8 and 9. Considered satisfactory.	YES
5.6 Access/ Driveway Requirements	Plans were revised to include: • Dimension included on plans for visitor parking spaces x 3. Compliant with controls.	Yes

	• Revised swept path diagrams were submitted demonstrating manoeuvring to and from car parking spaces. • The previous turning bay has been revised which included relocating motorbike and bicycle parking. The awning has been shifted 1.5m to the east. • The entrance to Unit 8 has been setback and landscaping removed to avoid any potential turning conflicts. • A pedestrian travel path, through the site, has been indicated on revised plans. Council's Traffic Officer has reviewed the revised plans and supplementary swept paths and provided satisfactory comment.	
5.7 Car Parking Requirements	See comments above in 5.6 for proposed changes to access and parking. Council's Traffic Officer has reviewed the revised plans and supplementary swept paths and provided satisfactory comment.	Yes
5.8 Landscaping Requirements		
	Landscaped Area Proposed: 30%. There is a minor reduction in landscaping of $9m^2$ proposed as a result of the reconfiguration of the turning bay and relocation of the motorbike and bicycle car parking. The landscape is still compliant at 30%. See further discussion at Chapter E6 below.	Yes
5.9 Deep Soil Planting	No changes proposed from original application. A variation was previously ought due to mor encroachments of a fence and path. The proposed development satisfies the objectives of Council's Deep Soil Planting controls and policies.	Variation sought. Capable of being supported. See original Council Assessing Officer Report.
5.10 Communal Open Space	No changes proposed from original application. Communal Opens space is considered satisfactory.	Yes
5.11 Private Open Space	No changes proposed from original application. No proposed changes to the POS areas proposed. Gates for waste bin storage and	Yes

	access area now indicated on plans for Units 1, 4, 5 and 8 of Unit 12.	
5.12 Solar Access Requirements	Revised plans include shadow diagrams which demonstrate that the proposal would not result in unreasonable overshadowing impacts on any adjoining properties.	Yes
5.13 Additional Control for Multi Dwelling Housing - Dwelling Mix and Layout	No changes proposed from original application. The proposal is for a 12 dwelling multi dwelling housing development. The proposal includes 11 x 3-bedroom units and 1 x 2-bedroom unit.	Yes
5.14 Additional Control for Multi Dwelling Housing - Adaptable Housing • Required for greater than six (6) dwellings.	No changes proposed from original application. Units 9 and 11 which have been designed to be capable of adaptation.	Yes
5.15 Additional Control for Multi Dwelling Housing – Crime Prevention through Environmental Design	No changes proposed from original application. See chapter E2 comments below.	Yes

CHAPTER D1: CHARACTER STATEMENTS

The proposal is considered to be consistent with the existing and desired future character for the locality as follows:

- The development would assist in providing an additional mix of housing types, within reasonable walking distance to Woonona Town Centre.
- Adequate landscaped area and deep soil zone areas are proposed as part of the development, as discussed above.
- Heritage impacts on the adjoining buildings and park have been considered and are subject to conditions.

CHAPTER E1: ACCESS FOR PEOPLE WITH A DISABILITY

It is considered that disabled access to the proposed development is acceptable in this circumstance. The submitted Access Consultant's Report has been reviewed and conditions are recommended as provided at Attachment 7.

CHAPTER E2: CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN

No proposed change to previous assessment

Control/objective	*Comment*	*Compliance*
3.1 Lighting	Conditions are recommended with regard to the lighting of entries.	Yes
3.2 Natural surveillance and sightlines	Minor re-design of the front of Unit 12 has improved the separation of visitor parking from the entrance. Unit 1 and 12 have been designed to front Gordon Street units 8 and 9 provide passive surveillance to the Princes Highway. Units 9, 10, 11 and 12 also provide passive surveillance of the adjoining Pendlebury park.	Yes
3.3 Signage	The proposal does not include any signage	N/A
3.4 Building design	The building design minimises areas of concealment or entrapment.	Yes
3.5 Landscaping	Landscaping proposed is considered appropriate and minimises areas of concealment or entrapment.	Yes
3.6 Public open space and parks.	There is no public open space proposed or required. Access to the park is provided via a resident entry gate. This will assist with passive surveillance to the park.	Yes
3.7 Community facilities	There are no community facilities located within the development as proposed. Communal open space provided is satisfactory.	N/A
3.8 Bus stops and taxi ranks	There are a number of bus stops located in the vicinity of the development.	Yes

CHAPTER E3: CAR PARKING, ACCESS, SERVICING/LOADING FACILITIES AND TRAFFIC MANAGEMENT

The plans and swept paths have been reviewed by Council's Traffic Officer who has not raised any concerns subject to conditions of consent.

Multi dwelling housing

Car parking	*Rate*	*Calculation*	*Required*	*Provided*	*Compliant*	*Comment*
Resident:	1 space per dwelling <70sqm 1.5 spaces per dwelling 70-110sqm 2 spaces per dwelling >110sqm	0 0 2 x 12	24	24	Yes	No proposed change.
Visitor:	0.2 per dwelling	0.2 x 12	3 (rounded)	3	Yes	No proposed change. Swept paths provided. Dimensions

						included on plans.
Bicycle Parking:	1 bicycle space per 3 dwellings (residents) and 1 bicycle space per 12 dwellings (visitor)	12/3 12/12	4 (rounded) 1	5	Yes	Relocated toward Unit 1
Motorcycle Parking:	1 motorcycle space per 15 dwellings	12/15	1 (rounded)	1	Yes	Relocated toward Unit 1

Councils Traffic Officer has assessed the revised plans and provided conditionally satisfactory referral advice. Additional information submitted included visitor parking space dimensions, swept paths, a formalised turning bay, in proximity to Units 8 and 9, relocation of visitor bicycle parking and motorbike parking near Unit 1. The awning over the turning bay has been relocated further west and reconfigured. A pedestrian travel path thorough the site from the Princes Highway has been included on plans.

There is no proposed change to the number of resident parking or proposed visitor spaces. A construction management plan has been conditioned as per the recommendation of the WLPP. Condition reference 41 as provided at Attachment 7.

Previous assessment:

Each dwelling is provided with a double garage, and 3 visitors car parking spaces are proposed off the central driveway area, satisfying the provisions of this Chapter.

Waste storage has been revised to be incorporated into the garage areas of units 2, 3, 6 and 7 however garage dimensions remain compliant with Council controls.

CHAPTER E6: LANDSCAPING

Minor changes to the proposed landscape plan were noted upon submission. Landscaping has been reduced by $9m^2$ as a result of the changes to the entrance of Unit 8 and the relocation of visitor bicycle and motorbike parking near Unit 1. Minor changes to the landscaping in front of Unit 12 are noted on the plans to provide more landscaping and a greater setback between the entrance of Unit 12 and visitor car parking space 01. The proposed landscaping is still numerically compliant with Council controls. No formal re-referral was undertaken the previous assessment by Council's Landscape Officer and conditions previously recommended are still considered valid, the plan reference has been amended in condition 7. The revised landscape plan is included at Attachment 3. Revised conditions are provided at Attachment 7.

Previous Assessment:

Overall, Councils Landscape Officer considers the proposal satisfactory, subject to conditions as provided at Attachment 7. The proposed landscaped area, deep soil zone and communal open space areas proposed comply with the WDCP 2009, as discussed within Chapter B1. The proposal is not considered to be inconsistent with the provisions of this Chapter.

CHAPTER E7: WASTE MANAGEMENT

Council's Traffic Officer has assessed the proposal against the requirements of this Chapter. Waste storage has been revised to be incorporated into the garage areas of units 2, 3, 6 and 7 however, garage dimensions remain compliant with Council controls. No proposed change to waste management and collection.

Previous assessment:

A Site Waste Minimisation and Management Plan was submitted with the application and waste servicing arrangements are satisfactory. Waste collection is split between the Princes Highway and Gordon Street.

CHAPTER E11: HERITAGE CONSERVATION

Due to the minor nature of the revisions on the plan no formal re-referral was undertaken to Councils Heritage Officer. The previous assessment by Council's Heritage Officer and conditions recommended previously are still considered valid. The revised plans are included at Attachment 3, Heritage conditions are provided at Attachment 7.

Previous assessment:

Council's Heritage Officer has assessed the proposal against the requirements of this Chapter. A heritage report was submitted with the application and considered to be satisfactory. The site adjoins two heritage items the Woonona/ Bulli School of Arts and Pendlebury Park. Conditions of consent are recommended regarding protection of both sites during demolition and construction works as provided at Attachment 7.

CHAPTER E14: STORMWATER MANAGEMENT

No proposed change to stormwater plans. The previous assessment by Council's Stormwater Officer and conditions recommended previously are still considered valid. The revised plans are included at Attachment 3, conditions are provided at Attachment 7.

CHAPTER E19: EARTHWORKS (LAND RESHAPING WORKS)

As a result of the WLPP meeting held on 3 November 2020 the panel requested a dilapidation report be conditioned for adjoining public and private properties. Previously condition 55 dilapidation report was included but only referred to public infrastructure. This condition has been revised and relocated to condition 46 as provided at Attachment 7.

The proposal will also require a Site Auditors Statement for remediation which has been considered along with the additional information submitted by Council's Environment Officer.

CHAPTER E21: DEMOLITION AND ASBESTOS MANAGEMENT

No proposed change to demolition conditions. A construction management plan has been included as an additional condition, reference condition 41. This condition requires the submission of a plan prior to the issue of the Construction Certificate to protect services, infrastructure and adjoining properties. Conditions are provided at Attachment 7.

CHAPTER E22: SOIL EROSION AND SEDIMENT CONTROL

No proposed change to conditions in this regard, conditions of consent are provided at Attachment 7.

Attachment 5

23 December 2020

Brian Weinert
Emerald Park Estate Pty Ltd
Suite 601/12 Century Circuit
Baulkham Hills NSW 2153

Our ref: 12536991 – IAA03

Your ref:

Dear Brian

481 – 485 Princes Highway, Woonona

Interim audit advice 03 - site contamination assessment

1 Introduction

Andrew Kohlrusch of GHD Pty Ltd (the auditor) was engaged by Emerald Park Estate Pty Ltd to conduct an audit of the environmental investigation works being conducted at 481-485 Princes Highway Woonona (the site). It is understood that this audit is a requirement of Wollongong City Council (WCC) for the development of 12 two-storey residences at the aforementioned site. The audit is being conducted as per the requirements of the *Contaminated Land Management Act* 1997 and will include reviews and commentary on reports based on comparison to requirements of guidelines made or endorsed by the NSW EPA.

It is understood that the following determination (in relation to site contamination) has been made by the Wollongong Local Planning Panel in considering the development application (*Determination and Statement of Reasons* 3 November 2020).

The Panel must be satisfied that the proposal is suitable for its use having regard to SEPP 55. At present it is not. Further assessment is required together with a Remediation Action Plan and verification from a site auditor is to be provided.

2 Site contaminated assessment

The site has been the subject of two environmental site assessments, the results of which were presented in the following report prepared by Environmental Consulting Services (ECS):

- *Environmental Site Assessment 481 – 485 Princes Highway Woonona NSW 2517* (the May 2020 ESA report), and
- *Addition* (sic) *Environmental Site Assessment 481 – 485 Princes Highway Woonona NSW 2517* (the December 2020 ESA report)

2.1 May 2020 ESA report

The May 2020 ESA report indicated that the site was assessed as follows:

- Soil samples were collected from seven boreholes and two test pits distributed across the site.

- Groundwater wells were installed at three of the borehole locations.
- Soil and groundwater samples were tested for a selection of chemicals including heavy metals, hydrocarbon compounds, organochlorine pesticides and asbestos.

The key findings of the assessment were:

- There was a thin layer of sandy fill (levelling sand) across the site. This was underlain by natural, stiff clay.
- Statistical analysis of the soil data set and comparison of the statistical data to NSW EPA investigation levels for residential sites demonstrated that there was no contaminated soil requiring remediation and/or management.

ECS recommended that inspection of the soils underneath the building slab should be conducted following demolition and preparation of a construction environmental management plan (CEMP).

With reference to interim audit advice 01 issued by the auditor on 31 July 2020, the auditor considered that the May 2020 ESA report had been conducted in a manner consistent with NSW EPA made or endorsed guidelines. The data presented in the ESA report demonstrated that the likelihood of contamination from former site activities to be low (consistent with the identified historical information).

2.2 December 2020 ESA report

In response to correspondence issued by the Wollongong Local Planning Panel on 3 November 2020 that it considered further assessment was required, an additional assessment of the site was conducted by ECS in December 2020.

The December 2020 ESA report indicated that the site was assessed as follows:

- Soil samples were collected from four additional boreholes drilled within the footprint of the existing building.
- One soil sample from each of the boreholes was tested for a selection of chemicals including heavy metals, hydrocarbon compounds.

The key findings of the assessment were:

- There was a thin (150mm) layer of sandy fill (levelling sand) recorded at each of the borehole locations. This was underlain by natural, stiff clay. This observation was consistent with the findings presented in the May 2020 ESA report.
- Statistical analysis of the soil data set and comparison of the statistical data to NSW EPA investigation levels for residential sites demonstrated that there was no contaminated soil requiring remediation and/or management. The auditor noted that the range of recorded heavy metal soil concentrations were similar in both the May 2020 ESA report and the December 2020 ESA report. All other analysed chemicals were not detected.

The December 2020 ESA report concluded that there is no longer a need to inspect the site following demolition and that a CEMP is not warranted.

3 Concluding remark

The auditor considers that the assessment reports prepared by ECS have been prepared in a manner consistent with relevant NSW EPA made or endorsed guidelines and the following comments are made:

- The site has been assessed as per relevant NSW EPA guidelines in terms of the number and distribution of sampling locations and the tested chemicals.
- The chemical testing results (or statistical data sets) for both sampling programs were all less than the NSW EPA criteria for the proposed development.
- No further assessment or remediation is necessary.
- For the purposes of SEPP55, the consent authority can be satisfied that the land is not contaminated. On the basis of the information reviewed by the auditor, a site audit statement can be prepared stating that the site is suitable for residential land use.

This letter should be regarded as interim advice to the overall review and site audit process and should not be considered a Site Audit Statement under the *CLM Act, 1997*. This interim audit advice letter will subsequently be referred to and provided as an Annex to the final Site Audit Statement and Site Audit Report.

If you have any further queries, please do not hesitate to contact the undersigned directly on 9239 7187

Sincerely
GHD Pty Ltd

Andrew Kohlrusch
Principal Environmental Scientist

ENVIRONMENTAL CONSULTING SERVICES

Attachment 6

ADDITION ENVIRONMENTAL SITE ASSESSMENT

481 - 485 Princes Highway
Woonona NSW 2517

ENVIRONMENTAL CONSULTING SERVICES PTY LTD
10 FORT STREET, PETERSHAM NSW 2049 | P 0415 225 474 | ABN 75 073 668 425

Disclaimer

Register of Amendments		
Revision	**Date**	**Description**
1	16.12.2020	Issued to clien

Document Approval		
Approved by	**Date**	**Signed**
Simon Caples **Principal Consultant**	16.12.2020	

Environmental Consulting Services Pty Ltd

Address: 10 Fort Street
Petersham NSW 2049

Phone: 0415 225 474
Email: simon@ecsgroup.com.au

Executive Summary

Environmental Consulting Services (ECS) has undertaken additional site assessment activities at 481-485 Princes Highway in Woonona (the Site). The purpose of the additional assessment was to supplement the findings of the environmental assessment completed at the Site through the collection of additional soil samples from under the existing building footprint.

The scope of work undertaken for the additional assessment included the drilling of four shallow and the collection of a surface soil sample from each borehole.

The environmental assessment completed concluded that the Site is considered suitable for the residential development provided the following recommendations are carried out:

- During redevelopment of the Site, following demolition of the existing improvements, the Site surface should be inspected. Any stained areas or deep areas of fill should be characterised from a contamination point of view.
- A Construction Environmental Management Plan (CEMP) should be developed and implemented to mitigate potential exposure risked during the development of the Site and an Unexpected Finds Protocol included in the CEMP.
- Should deep foundations be proposed below the water table, additional sampling and analysis of groundwater is recommended to confirm the groundwater quality.

Following the completion of the additional assessment activities it is now no longer considered necessary to undertake an inspection of the Site following demolition of the building. In addition there is now no requirement for the preparation of a CEMP. However, normal environment health and safety management procedures need to be implemented during construction of the development.

ECS also understands that the proposed development does not require the construction of deep foundations and no additional groundwater assessment will be needed.

This additional assessment report must be read in conjunction with the Environmental Site Assessment (29 May 2020) report for the Site.

TABLE OF CONTENTS

1.0 INTRODUCTION

Environmental Consulting Services (ECS) was engaged by Emerald Park Estate Pty Ltd to undertake an additional environmental assessment activities at 481-485 Princes Highway in Woonona (the Site).

ECS completed an assessment at the Site and presented the findings in the report entitled *Environmental Site Assessment, 481 - 485 Princes Highway, Woonona NSW 2517* (29 May 2020). This assessment concluded that the Site is considered suitable for the residential development provided the following recommendations are carried out:

- During redevelopment of the Site, following demolition of the existing improvements, the Site surface should be inspected. Any stained areas or deep areas of fill should be characterised from a contamination point of view.
- A Construction Environmental Management Plan (CEMP) should be developed and implemented to mitigate potential exposure risked during the development of the Site and an Unexpected Finds Protocol included in the CEMP.
- Should deep foundations be proposed below the water table, additional sampling and analysis of groundwater is recommended to confirm the groundwater quality.

The purpose of this assessment was to evaluate the potential for contamination under the existing building on the Site and verify or dismiss the need for an inspection following the demolition of the building.

This report presenting the findings of the additional assessment must be read in conjunction with the Environmental Site Assessment report.

resulting from past Site activities and to draw conclusions regarding the suitability of the Site for residential use.

1.1 Scope of Work

The objectives of the additional investigation activities was to assess for impact under the building on the Site. To fulfill this objective the following scope of work was completed:

- The drilling of four shallow boreholes with the existing building to give greater sampling density;
- The collection of near surface soil samples from the boreholes;
- The laboratory analysis of the soil samples for common contaminants including heavy metals and petroleum hydrocarbons; and
- The preparation of this addendum report.

2.0 SITE INFORMATION

2.1 Site Identification

The Site is located in a residential area although there are some commercial facilities along the Princes Highway to the south of the Site.

The location of the Site is presented in Figure 2.1 – Site Location Plan with the Site identification details summarised in Table 2.1 – Site Identification.

Figure 2.1 – Site Location Plan (Six Maps)

Table 2.1 – Site Identification

Attribute	Detail
Current Site Owner	Fairlinecorp Pty Ltd
Site Address	481 - 485 Princes Highway, Woonona NSW 2517
Lot & Deposited Plan	Lot 1 in DP 86796
Current Land Use	Commercial
Proposed Land Use	Residential
Local Government Authority	Wollongong City Council
Current Zoning	R2 – Low Density Residential
Site Area (m^2)	2,940
Geographical Location (approximate centre)	Latitude: -34.346007965 Longitude: 150.904670434

A description of the Site and the regional setting is provided in the Environmental Site Assessment report.

3.0 CONCEPTUAL SITE MODEL

The Conceptual Site Model (CSM) is presented in the Environmental Site Assessment report.

The CSM listed the potential Areas of Environmental Concern (AEC) and Contaminants of Potential Concern (CoPC) relevant to the Site which are summarised on Table 3.1 – Contaminants of Concern. Included in this table is an evaluation of the likelihood based on the Site history.

Table 3.1 – Contaminants of Concern

Source/AEC	CoPC	Impacted Medium	Likelihood
Former steel manufacturer/fabricator – The use of the Site for metal fabrication may result in the spillage or leakage of machine oils on the ground surface and impacts from metals wastes.	Heavy metals, TRH and BTEX	Soil and Groundwater	Moderate
Hazardous Building Material – Hazardous building materials may be present as a result of former building and demolition activities. These materials may also be present in the existing buildings/structures on Site and result in impact from weathering.	Asbestos and lead	Soil	Moderate
Fill material – Importation of fill material of unknown origin may have been used to establish Site grades.	Heavy metals, TRH, PAH, OCP, OPP, PCB, and asbestos	Soil	Moderate
Spills and leaks from parked vehicles – Vehicles could spill oil when parked on the carpark at the rear of the Site (as noted on 1984 aerial photograph).	TRH, BTEX, Lead	Soil	Low

Notes: TRH - Total Recoverable Hydrocarbons
BTEX - Benzene, Toluene, Ethyl-Benzene and Xylenes (BTEX)
PAH - Polycyclic Aromatic Hydrocarbons (PAH)
OCP - Organochlorine Pesticides
OPP - Organophosphorus Pesticides
PCB - Polychlorinated Biphenyls

The primary mechanisms for contamination from all AEC/sources was considered to be 'top-down' impacts such as leaching from surficial materials, spills or surface release. The potential contaminated media identified at the Site are surface fill material, natural soils and groundwater. It is considered likely that spills or leaks of contaminants on the Site would impact surface soils or surface fill material and then potentially leach down affecting deeper soils and groundwater.

4.0 DATA QUALITY OBJECTIVES

The Data Quality Objective (DQO) process is a systematic, seven-step process that defines the criteria an investigation should satisfy including; the type, quantity and quality of data required to support decisions relating to the investigation. DQOs for this investigation have been developed based on the seven-step approach in accordance with Schedule B2 to the National Environment Protection (Assessment of Site Contamination) Measure 1999. The DQOs incorporate field quality control and laboratory analysis, methods and information on laboratory quality control data and validate the field and analytical data for this investigation. The DQOs are presented in detail in the following sections.

Step 1 - State the Problem

The additional assessment is intended to provide certainty regarding the soil conditions under the building at the Site. This requires the drilling of additional boreholes and the collection of soil samples.

Step 2 - Identify the Decisions

The additional assessment for soil contamination needs to consider the distribution of sampling locations within the building area and the CSM. The decisions associated with this assessment include:

- Are there impacts associated with the AEC under the building that may preclude the proposed residential land use;
- Is the Site suitable for residential use?

Step 3 - Identify Inputs to the Decision

The inputs required to make the identified decisions include:

- Results from the previous investigation; and
- Additional soil sampling.

Step 4 - Define the Study Boundary

The boundaries for this additional assessment have been identified as follows:

- Spatial boundaries – the building area; and
- Vertical boundaries – depth the top of natural soils.

Step 5 - Develop a Decision Rule

The decision rules for this investigation are:

- If the sampling activities indicate the presence of Site contamination, then further assessment or management must be implemented.

Step 6 - Specify Limits on Decision Errors

The acceptable limits on decision errors to be applied in this assessment and the manner of addressing possible decision errors are limited to the Site setting and sampling analysis results.

The incorrect consideration of analytical results has the potential to conclude that the Site is contaminated when it is not or alternatively, conclude the Site is not contaminated when it actually is. To provide more certainty to the conclusion regarding the contamination status of the Site, both the background information and the analytical results will be jointly evaluated.

The sampling at the Site needs to address the findings of the background data review and needs to include sufficient sampling locations, utilise appropriate field sampling methodologies, implement a suitable quality assessment procedures and incorporate appropriate data evaluation procedures such as the use of 95 percent upper confidence limit calculations.

Step 7 - Optimise the Design for Obtaining Data

The data sources for this assessment are additional surface soil samples that are from methodical sampling locations.

5.0 SITE ASSESSMENT PLAN

The site assessment plan was presented in the Environmental Site Assessment report. The assessment for the additional assessment was to undertake in-fill drilling to provide additional data within the building.

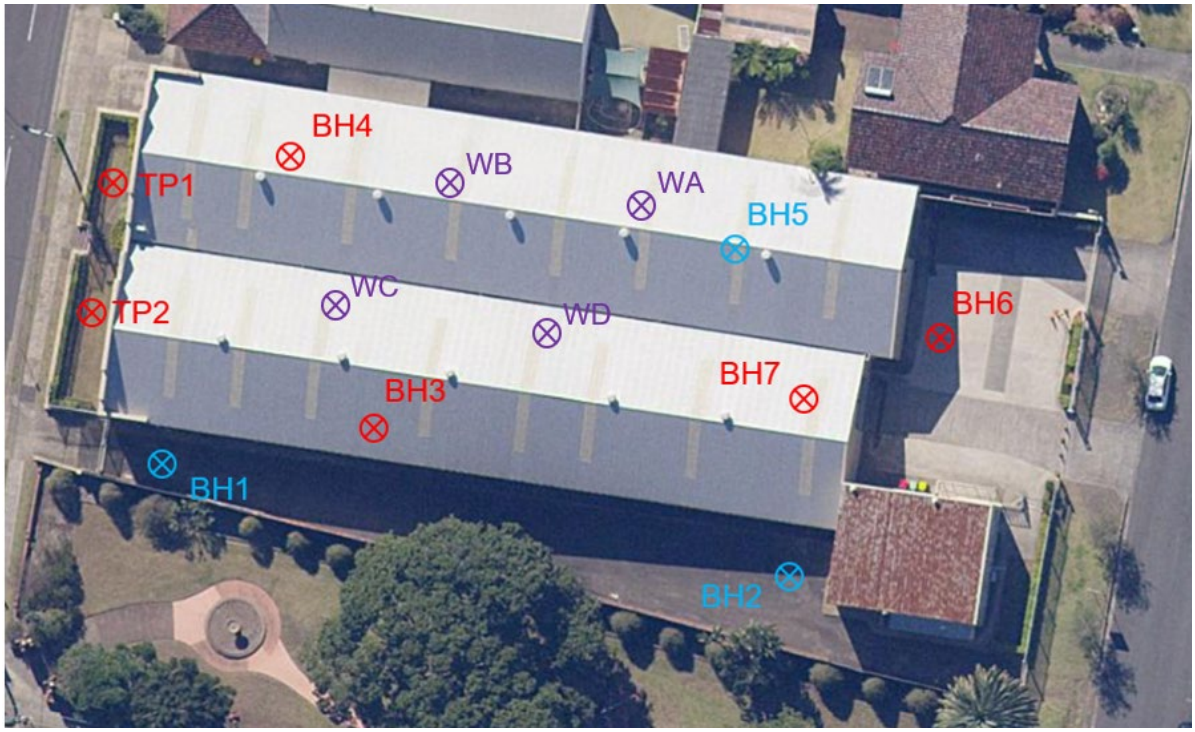
Four boreholes were drilled using a hand auger within the existing building. The placement of boreholes was identified to appropriately characterise potential for contamination between the previous sampling locations.

The rationale for environmental sampling locations was based on the probability that surface soils may be impacted from filling or steel fabrication storage and distribution of materials or other potential commercial activities.

To further characterise the surface soil/fill material within the building area 4 boreholes were drilled using a hand auger. Soil samples were collected from each borehole targeting the observed soil strata.

Boreholes were numbered sequentially WA, WB, WC and WD. Samples were labelled with the borehole number. The locations of the boreholes are presented on Figure 5.1 – Additional Sample Locations. Included on this figure are the boreholes and test pit locations from the previous investigation with locations labelled in blue represent boreholes where monitoring wells were established and those labelled in red are soil bores.

Figure 5.1 – Additional Sampling Locations



The subsurface conditions encountered at each additional borehole are summarised in Table 5.1 – Soil Conditions.

Table 5.1 – Soil Conditions

Borehole Number	Depth (m)	Description	Sample Interval
WA	0 - 0.1	CONCRETE	
	0.1-0.15	SAND – Yellow well graded, no staining or odours	
	0.15 – 0.3	CLAY – Red brown, dense, no staining or odours.	WA & WX
WB	0 - 0.1	CONCRETE	
	0.1 – 0.3	CLAY – Brown, medium dense, no staining or odours.	WB
WC	0 - 0.1	CONCRETE	
	0.1 – 0.2	SAND – Yellow well graded, no staining or odours	
	0.2 – 0.3	CLAY – Red brown, dense, no staining or odours.	WC
WD	0 - 0.1	CONCRETE	
	0.1-0.15	SAND – Yellow well graded, no staining or odours	
	0.15 – 0.3	CLAY – Red brown, dense, no staining or odours.	WD

Note: Sample WX is a duplicate sample collected at location WA

The conditions encountered during this additional investigation consisted of approximately 0.1m of concrete pavement over yellow bedding sand (associated with the construction of the building) at 3 locations. Dense natural clays were encountered directly under the pavement and (where encountered0 bedding sand. There was no indication of uncontrolled fill in the boreholes.

5.1 Quality Plan

The field quality assurance / quality control (QA/QC) procedures adopted during this additional assessment included: field decontamination protocols; sample labelling storage and handling methodologies.

Field decontamination involved rinsing of sampling equipment with potable water. All samples were labelled in the field with the sample location recorded. One duplicate sample was collected at location WA and was labelled WX.

6.0 ASSESSMENT GUIDELINES

The Site Assessment Criteria (SAC) that have been used to evaluate surface soils are based on the National Environment Protection Measure (NEPM) for the Assessment of Site Contamination (NEPM 2013). These criteria are not derived as acceptance criteria for contamination at a site, but as levels above which specific consideration of risk, based on the site use and potential exposure, is required. If a risk is determined present, then remediation and/or management must be undertaken.

The National Environmental Protection Measure (NEPM) provides Health Investigation Levels (HILs) that are concentration levels, which have been tiered (provided in sets based on risk) for various exposure settings pertaining to land uses. The site criteria within the NEPM are based on potential impact to human health and are intentionally conservative.

The HILs have been derived for four (4) generic land use settings. The HILs for the land use type considered in NEPM include:

- HIL A – residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake, (no poultry), also includes children's day care centres, preschools and primary schools

- HIL B – residential with minimal opportunities for soil access includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats
- HIL C – public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. It does not include undeveloped public open space (such as urban bushland and reserves) which should be subject to a site-specific assessment where appropriate
- HIL D – commercial/industrial such as shops, offices, factories and industrial sites.

Health Screening Levels (HSLs) for various petroleum hydrocarbon compounds have also been developed. The HSLs also relate to the land use (consistent with the HILs) and are dependent on soil type and depth.

Ecological investigation levels (EILs) have been developed for selected metals and organic substances and are applicable for assessing risk to terrestrial ecosystems. EILs depend on specific soil physicochemical properties (eg pH and cation exchange capacity - CEC) and land use scenarios and generally apply to the top 2m of soil.

Ecological screening levels (ESLs) have also been developed for selected petroleum hydrocarbon compounds and are applicable for assessing risk to terrestrial ecosystems. ESLs broadly apply to coarse-grained and fine-grained soils. They are generally applicable to the top 2m of soil.

The land use at this Site is proposed to be residential with some opportunity for soil access so the conservative HILs that will be used for this assessment are HIL A levels. Consistent with the HILs, HSLs for residential land use (HSL A & B) with clayey soils have been adopted for the relevant SAC. These criteria are summarised on Table 6.1 – Site Assessment Criteria.

Table 6.1 – Site Assessment Criteria

Contaminant	Site Assessment Criteria (mg/kg)	
	HIL A / HSL A & B	EIL / ESL
Heavy Metals		
Arsenic	100	100
Cadmium	20	
Chromium	100 (VI)	400 (III)
Copper	6 000	190
Lead	300	1100
Mercury	40	
Nickel	400	170
Zinc	7 400	400
Total Recoverable Hydrocarbons (TRH)		
Naphthalene	5[1]	
TRH C6-C10 (F1)	50[1]	180
TRH C10-C16 (F2)	280[1]	120
Monocyclic Aromatic Hydrocarbons		
Benzene	0.7[1]	65
Toluene	480[1]	105
Ethylbenzene	NL[1]	125
Xylene (Total)	110[1]	45
Polycyclic Aromatic Hydrocarbons (PAH)		
Benzo(a)pyrene	3[2]	0.7
Total PAH	300[2]	

Notes: NL – Not Limiting

1. Health screening levels for clay soils over the depth interval 0-1m.
2. Carcinogenic PAHs based on the 8 carcinogenic PAHs.
3. EIL based on ACL using data for Gwynneville soil landscape pH 6.5

7.0 DISCUSSION

Soil conditions encountered underneath the concrete slab inside the existing building during the previous investigation consisted of a thin layer (about 0.1m) of levelling sand (washed sand) over natural clayey soils. The conditions observed during the additional assessment are consistent with the previous investigation.

The results of analysis of soil samples are summarised in Tables 7.1 and the laboratory reports are included in Appendix 1. It is noted that the range of analysis did not include contaminants associated with fill material (as considered in the CSM) as uncontrolled fill was not encountered.

Table 7.1 – Summary of Soil Results

Sample Number	WA	WB	WC	WD	WX	SAC	
						HIL/HSL	EIL/ESL
Heavy Metals							
Arsenic	18	59	29	34	24	100	100
Cadmium	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	20	
Chromium (Total)	70	46	88	**130**	95	100 (VI)	400 (III)
Copper	< 5	15	< 5	8.3	9.2	6 000	190
Lead	29	55	25	44	33	300	1100
Mercury	< 0.1	0.1	< 0.1	< 0.1	< 0.1	40	
Nickel	< 5	12	5.6	< 5	< 5	400	170
Zinc	37	39	7.2	23	45	7 400	400
Total Recoverable Hydrocarbons (TRH)							
Naphthalene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	5	
TRH F1	< 20	< 20	< 20	< 20	< 20	50	180
TRH F2	< 50	< 50	< 50	< 50	< 50	280	120
Monocyclic Aromatic Hydrocarbons							
Benzene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.7	65
Toluene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	480	105
Ethylbenzene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NL	125
Xylene (Total)	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	110	45
Polycyclic Aromatic Hydrocarbons (PAH)							
Benzo(a)pyrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	3	0.7
Total PAH	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	300	

Notes: All measurements in mg/kg
Bold type represents level above SAC (EIL)

The results of analysis generally indicate concentrations of the CoPC below the SAC for soils, with the exception of chromium in sample WD that encountered a concentration of total chromium greater than the criteria for chromium IV. However, it is noted the reported concentration is for total chromium and is likely represent concentrations of both chromium III and chromium IV.

Based on the concentrations of chromium from all surface samples collected within the building area (including the samples from boreholes BH3, BH4, BH5 and BH7 from the previous investigation and the samples from this additional investigation) the 95% upper confidence limit for chromium is 90mg/kg. The 95% upper confidence limit for chromium is below the SAC.

7.1 Data Quality Review

Data Quality Objectives

The purpose of establishing data quality objectives is to ensure the field investigations and analyses are undertaken in a way that enables the collection and reporting of reliable data on which to base the site assessment.

The data quality objectives (DQOs) for sampling techniques and laboratory analysis of collected samples defines the acceptable level of error required for this investigation. The data quality objectives will be assessed by reference to data quality indicators (DQI) as follows:

Data Representativeness

Data representativeness expresses the degree which sample data accurately and precisely represents a characteristic of a population or an environmental condition. Representativeness was achieved by collecting samples at pre-determined locations across the Site and by taking an adequate number of samples to achieve the intended objectives. Consistent and repeatable sampling techniques and methods were utilised throughout the sampling, as described.

Completeness

Completeness is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study. If there is insufficient valid data, as determined by the other data quality indicators, then additional data would be required to be collected.

Completeness also needs to consider the integrity of the samples collected delivered to the laboratory for analysis. The laboratory sample receipt notice summarises the sample integrity on receipt.

Data Comparability

Data comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency for analytical techniques and reporting methods. Reporting of results was done in consistent units and nomenclatures, and comparability was achieved by ensuring that precision and accuracy objectives were met.

Precision

Precision measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is assessed by calculating the Relative Percent Difference (RPD) of duplicate samples. The criteria used for the assessment of RPDs is based on guidelines given in AS4482.1 (1997) and laboratory criteria but has been set by ECS for this assessment. If duplicate results are not within the acceptable RPDs, investigation into the cause is initiated. If a cause cannot be determined the validity of the data is questioned.

The proposed acceptable range for Relative Percent Difference (RPD) for duplicate samples have been set as follows:

%RPD Range result >10 times PQL then maximum RPD 50%
result >5 times PQL then maximum RPD 75%

result >2 times PQL then maximum RPD 100%
result <2 times PQL then no limit.

RPD is calculated as the absolute value of the difference between the initial and repeat result divided by the average value expressed as a percentage. The overall success is based on assessment of the data set as a whole and not on individual acceptance or exceedance within the data set.

A summary of the duplicate soil samples with the calculated RPDs is presented in the Table 7.2. These calculations are limited to metals only as all other contaminant results were below the laboratory Level of Reporting (LOR).

Table 7.2 – Relative Percent Differences Soil

Sample Number	LOR	WA	WX	RPD	Comment
Heavy Metals					
Arsenic	2	18	24	29	Accept
Cadmium	0.4	< 0.4	< 0.4	-	Accept
Chromium	5	70	95	18	Accept
Copper	5	< 5	9.2	59[1]	Accept
Lead	5	29	33	13	Accept
Mercury	0.1	< 0.1	< 0.1	-	Accept
Nickel	5	< 5	< 5	-	Accept
Zinc	5	37	45	25	Accept

Note: 1. The level of reporting has been used to calculate the RPD

The discrepancy in detectable metal concentrations between the primary and samples have acceptable RPDs.

The analytical laboratory QA/QC program included the analysis of one blank sample and one spiked sample with every batch of samples tested, and the repeat analysis of approximately 10% of the samples. Laboratory Quality Assurance and Quality Control procedures are provided in the Final Certificate of Analysis.

This soil data is considered to meet the DQIs and thus be representative and acceptable for the investigation. The groundwater results should be considered indicative only.

8.0 CONCLUSION

The previous investigation considered the Site suitable for the anticipated residential development provided the following recommendations are carried out:

- During redevelopment of the Site, following demolition of the existing improvements, the Site surface should be inspected. Any stained areas or deep areas of fill should be characterised from a contamination point of view.
- A Construction Environmental Management Plan (CEMP) should be developed and implemented to mitigate potential exposure risked during the development of the Site and an Unexpected Finds Protocol included in the CEMP.
- Should deep foundations be proposed below the water table, additional sampling and analysis of groundwater is recommended to confirm the groundwater quality. Excavated waste material should be classified in accordance with the NSW EPA Waste Classification Guidelines and disposed of to an appropriate and licenced facility.

This additional investigation has provided more certainty regarding condition beneath the building. Based on additional assessment activities it is now no longer considered necessary to undertake an inspection of the Site following demolition of the building. In addition there is now no requirement for the preparation of a CEMP. However, normal environment health and safety management procedures need to be implemented during construction of the development.

ECS also understands that the proposed development does not require the construction of deep foundations and no additional groundwater assessment will be needed.

APPENDIX 1

Environmental Consulting Services
10 Fort Street
Petersham
NSW 2049

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Simon Caples**

Report **762838-S**
Project name WOONONA
Received Date Dec 10, 2020

Client Sample ID			**WA**	**WB**	**WC**	**WD**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-De22400**	**S20-De22401**	**S20-De22402**	**S20-De22403**
Date Sampled			**Dec 08, 2020**	**Dec 08, 2020**	**Dec 08, 2020**	**Dec 08, 2020**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	59	71	78	82
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			WA	WB	WC	WD
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-De22400	S20-De22401	S20-De22402	S20-De22403
Date Sampled			Dec 08, 2020	Dec 08, 2020	Dec 08, 2020	Dec 08, 2020
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	101	97	56	100
p-Terphenyl-d14 (surr.)	1	%	102	93	53	103
Heavy Metals						
Arsenic	2	mg/kg	18	59	29	34
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	70	46	88	130
Copper	5	mg/kg	< 5	15	< 5	8.3
Lead	5	mg/kg	29	55	25	44
Mercury	0.1	mg/kg	< 0.1	0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	12	5.6	< 5
Zinc	5	mg/kg	37	39	7.2	23
% Moisture	1	%	25	19	25	26

Client Sample ID			WX
Sample Matrix			Soil
Eurofins Sample No.			S20-De22404
Date Sampled			Dec 08, 2020
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	< 50
TRH C29-C36	50	mg/kg	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	85
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100

Client Sample ID			WX
Sample Matrix			Soil
Eurofins Sample No.			S20-De22404
Date Sampled			Dec 08, 2020
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	100
p-Terphenyl-d14 (surr.)	1	%	104
Heavy Metals			
Arsenic	2	mg/kg	24
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	95
Copper	5	mg/kg	9.2
Lead	5	mg/kg	33
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	< 5
Zinc	5	mg/kg	45
% Moisture	1	%	25

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Dec 11, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Dec 11, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Dec 11, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Dec 11, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Dec 11, 2020	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Dec 11, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Dec 10, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

eurofins | Environment Testing

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Phone : 0800 856 450
IANZ # 1290

Company Name: Environmental Consulting Services
Address: 10 Fort Street
Petersham
NSW 2049

Project Name: WOONONA

Order No.:
Report #: 762838
Phone: 02 9518 1161
Fax:

Received: Dec 10, 2020 3:18 PM
Due: Dec 15, 2020
Priority: 3 Day
Contact Name: Simon Caples

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Moisture Set	Eurofins Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
Mayfield Laboratory							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	WA	Dec 08, 2020		Soil	S20-De22400	X	X
2	WB	Dec 08, 2020		Soil	S20-De22401	X	X
3	WC	Dec 08, 2020		Soil	S20-De22402	X	X
4	WD	Dec 08, 2020		Soil	S20-De22403	X	X
5	WX	Dec 08, 2020		Soil	S20-De22404	X	X
Test Counts						5	5

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	92			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C10-C14	%	98			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	95			70-130	Pass	
Toluene	%	94			70-130	Pass	
Ethylbenzene	%	104			70-130	Pass	
m&p-Xylenes	%	100			70-130	Pass	
o-Xylene	%	103			70-130	Pass	
Xylenes - Total*	%	101			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	119			70-130	Pass	
TRH C6-C10	%	91			70-130	Pass	
TRH >C10-C16	%	97			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	80			70-130	Pass	
Acenaphthylene	%	82			70-130	Pass	
Anthracene	%	81			70-130	Pass	
Benz(a)anthracene	%	71			70-130	Pass	
Benzo(a)pyrene	%	72			70-130	Pass	
Benzo(b&j)fluoranthene	%	75			70-130	Pass	
Benzo(g.h.i)perylene	%	74			70-130	Pass	
Benzo(k)fluoranthene	%	83			70-130	Pass	
Chrysene	%	82			70-130	Pass	
Dibenz(a.h)anthracene	%	77			70-130	Pass	
Fluoranthene	%	83			70-130	Pass	
Fluorene	%	84			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	78			70-130	Pass	
Naphthalene	%	80			70-130	Pass	
Phenanthrene	%	85			70-130	Pass	
Pyrene	%	84			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	96			80-120	Pass	
Cadmium	%	96			80-120	Pass	
Chromium	%	110			80-120	Pass	
Copper	%	109			80-120	Pass	
Lead	%	113			80-120	Pass	
Mercury	%	114			80-120	Pass	
Nickel	%	112			80-120	Pass	
Zinc	%	103			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S20-De28216	NCP	%	85			70-130	Pass	
TRH C10-C14	S20-De17941	NCP	%	89			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S20-De28216	NCP	%	92			70-130	Pass	
Toluene	S20-De28216	NCP	%	96			70-130	Pass	
Ethylbenzene	S20-De28216	NCP	%	101			70-130	Pass	
m&p-Xylenes	S20-De28216	NCP	%	94			70-130	Pass	
o-Xylene	S20-De28216	NCP	%	96			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Xylenes - Total*	S20-De28216	NCP	%	95			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S20-De28216	NCP	%	100			70-130	Pass	
TRH C6-C10	S20-De28216	NCP	%	84			70-130	Pass	
TRH >C10-C16	S20-De17941	NCP	%	89			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S20-De25300	NCP	%	79			70-130	Pass	
Acenaphthylene	S20-De25300	NCP	%	79			70-130	Pass	
Anthracene	S20-De25300	NCP	%	79			70-130	Pass	
Benz(a)anthracene	S20-De25300	NCP	%	73			70-130	Pass	
Benzo(a)pyrene	S20-De25300	NCP	%	69			70-130	Fail	Q08
Benzo(b&j)fluoranthene	S20-De25300	NCP	%	76			70-130	Pass	
Benzo(g.h.i)perylene	S20-De25300	NCP	%	73			70-130	Pass	
Benzo(k)fluoranthene	S20-De25300	NCP	%	73			70-130	Pass	
Chrysene	S20-De25300	NCP	%	79			70-130	Pass	
Dibenz(a.h)anthracene	S20-De25300	NCP	%	79			70-130	Pass	
Fluoranthene	S20-De25300	NCP	%	81			70-130	Pass	
Fluorene	S20-De25300	NCP	%	81			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S20-De25300	NCP	%	78			70-130	Pass	
Naphthalene	S20-De25300	NCP	%	79			70-130	Pass	
Phenanthrene	S20-De25300	NCP	%	80			70-130	Pass	
Pyrene	S20-De25300	NCP	%	80			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S20-De17720	NCP	%	103			75-125	Pass	
Cadmium	S20-De17720	NCP	%	107			75-125	Pass	
Chromium	S20-De17720	NCP	%	113			75-125	Pass	
Copper	S20-De17720	NCP	%	110			75-125	Pass	
Lead	S20-De17720	NCP	%	109			75-125	Pass	
Mercury	S20-De17720	NCP	%	124			75-125	Pass	
Nickel	S20-De17720	NCP	%	117			75-125	Pass	
Zinc	S20-De17720	NCP	%	84			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S20-De17770	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S20-De17834	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S20-De17834	NCP	mg/kg	73	54	30	30%	Pass	
TRH C29-C36	S20-De17834	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S20-De17770	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S20-De17770	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S20-De17770	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S20-De17770	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S20-De17770	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S20-De17770	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S20-De17770	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S20-De17770	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S20-De17834	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S20-De17834	NCP	mg/kg	110	< 100	22	30%	Pass	
TRH >C34-C40	S20-De17834	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S20-De25302	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S20-De25302	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S20-De25302	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S20-De25302	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S20-De25302	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S20-De25302	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S20-De25302	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S20-De25302	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S20-De25302	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S20-De25302	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S20-De25302	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S20-De25302	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S20-De25302	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S20-De25302	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S20-De25302	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S20-De25302	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-De17407	NCP	mg/kg	33	24	30	30%	Pass	
Cadmium	S20-De17407	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-De17407	NCP	mg/kg	69	52	28	30%	Pass	
Copper	S20-De17407	NCP	mg/kg	20	20	<1	30%	Pass	
Lead	S20-De17407	NCP	mg/kg	39	48	20	30%	Pass	
Mercury	S20-De17407	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-De17407	NCP	mg/kg	12	11	16	30%	Pass	
Zinc	S20-De17407	NCP	mg/kg	42	44	4.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S20-De22402	CP	%	25	22	11	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.

Authorised By

Asim Khan	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
John Nguyen	Senior Analyst-Metal (NSW)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

eurofins | Environment Testing

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Phone : 0800 856 450
IANZ # 1290

Sample Receipt Advice

Company name:	Environmental Consulting Services
Contact name:	Simon Caples
Project name:	WOONONA
Project ID:	Not provided
Turnaround time:	3 Day
Date/Time received	Dec 10, 2020 3:18 PM
Eurofins reference	762838

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	Sample Temperature of a random sample selected from the batch as recorded by Eurofins Sample Receipt : 21.3 degrees Celsius.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Elvis Dsouza on phone : or by email: ElvisDsouza@eurofins.com

Results will be delivered electronically via email to Simon Caples - simon@ecsgroup.com.au.

ENVIRONMENTAL CONSULTING SERVICES

Chain of Custody

Project: WOONONA																					
Environmental Consulting Services Pty Ltd						Manager: Simon Caples							Ph: 0415 225 474						Email: simon@ecsgroup.com.au		
Event Number:			Matrix			Analysis															
Lab Number	Sample Number	Sample Date	Soil	Water	Other	BTEX	TRH	PAH	Phenol	Metals	Asbestos	SUITE B7									
	WA	8/12	X									X									
	WB		X									X									
	WC		X									X									
	WD		X									X									
	WX		X									X									
Turn Around Time: 3 DAYS						Comments:															
Relinquished By: SIMON		Signed:				Date: 8/12		Received By: Elvis Dsouza			Signed:			Date: 8/12/20							

10/12 MR

3:18 pm Courier 21.3°C

10.3°C

Report # 762838

ATTACHMENT 7 – Amended Draft Conditions for DA-2020/572

Approved Plans and Specifications

1 The development shall be implemented substantially in accordance with the details and specifications set out on Project No. 20105 Drawing no. AR 0101-D dated 11 November 2020, AR 0102-B, AR 0151-C, AR 0152-C, AR 0153-C, AR 0154-C, AR 0202-C, AR 0203-C, AR 0204-C, AR 301-C, AR 302-C, AR 303-C, AR 304-C, AR 305-C dated 6 November 2020, AR 0112-1 dated 12 August 2020 and AR 0011-A dated 11 May 202 prepared by JACK TAYLOR ARCHITECTS Pty Ltd. and any details on the application form, and with any supporting information received, except as amended by the conditions specified and imposed hereunder.

General Matters

2 **Adjoining structures**
Prior to demolition or site preparation works any structures attached to the existing warehouse building require consultation with property owners prior to being removed. Vegetation and other structures in close proximity to the boundary shall be protected.

3 **Building Work - Compliance with the Building Code of Australia**
All building work must be carried out in compliance with the provisions of the Building Code of Australia.

4 **Construction Certificate**
A Construction Certificate must be obtained from Council or a Registered Certifier prior to work commencing.

A Construction Certificate certifies that the provisions of Clauses 139-147 of the Environmental Planning and Assessment Regulation 2000 have been satisfied, including compliance with all relevant conditions of Development Consent and the Building Code of Australia.

Note: The Certifier must cause notice of its determination to be given to the consent authority, and to the council, by forwarding to it, within two (2) days after the date of the determination, the plans and documentation referred to in clause 142 (2) of the Environmental Planning and Assessment Regulation 2000.

5 **Mailboxes**
The developer must install mailboxes along street frontage of the property boundary in accordance with Australia Post Guidelines. Prominent house numbers are to be displayed, with a minimum number size of 150 mm in height for each number and letter in the alphabet. The developer must install minimum two (2 No.) reflective paint house number on face of kerb along street frontage of the property to assist emergency services/ deliveries/ visitors.

6 **Maintenance of Access to Adjoining Properties**
Access to all properties not the subject of this approval must be maintained at all times and any alteration to access to such properties, temporary or permanent, must not be commenced until such time as written evidence is submitted to Council or the Principal Certifier indicating agreement by the affected property owners.

7 **Tree Management**
The developer shall retain existing trees indicated on Landscape Concept Plan by Jack Taylor Architects Pty Ltd. Dwg. No. Da L01 Issue B dated 16 November 2020 consisting of tree numbered 1, 2, 3, 4, 5 and large Stelitzia Nicholai along southern boundary. Total number: six (6 No.)

Any branch or root pruning which has been given approval, must be carried out by a qualified arborist in accordance with Australian Standard AS4373 (2007).

All tree protection measures are to be installed in accordance with Australian standard AS4970-2009 Protection of Trees on development Sites.

Recommendations in arborist's report dated Feb 2020 by Moore Trees Author Paul Vezgoff to be implemented including and not restricted to: ensuring brick retaining wall along southern boundary is supported by piered not strip footing, establishing Tree Protection Zones (TPZs), project arborist being present during work within Structural Root Zones (SRZs) and supervising work within TPZs, site induction with reference to tree protection, referring matters to project arborist, re-routing of sub surface utilities to avoid TPZs, hand excavation within TPZ near tree roots, remedial tree pruning, deadwooding, fencing and signage, sediment buffer, stem protection, mulching and watering and root hormone application if required. Soil levels within the TPZ must remain the same.

8 **Occupation Certificate**

An Occupation Certificate must be issued by the Principal Certifier prior to occupation or use of the development. In issuing an Occupation Certificate, the Principal Certifier must be satisfied that the requirements of section 6.9 of the Environmental Planning and Assessment Act 1979, have been complied with as well as all of the conditions of the Development Consent.

Prior to the Issue of the Construction Certificate

9 **Site Auditor's Report and Site Auditor's Statement**

Prior to issue of construction certificate, the submission of SAS and SAR is required from a NSW EPA accredited site auditor pursuant to the provisions of Part 4 of the Contaminated Land Management Act 1997 confirming that the site is suitable for the proposed development prior to the issue of the Occupation/ Subdivision Certificate.
The site auditor's report shall verify that:

a the site is not affected by soil and/or groundwater contamination, above the NSW EPA threshold limit criteria; and
b the site is suitable for the proposed development.

These two documents (SAS and SAR) are to be issued by the Auditor direct to Council. No third-party submissions will be accepted.

10 **ISEPP Noise Guidelines**

Implement all acoustic attenuation recommendations stated in the acoustic report prepared by Harwood Acoustics dated 12 May 2020 to ensure the dwelling/s comply with ISEPP Noise Guidelines for internal living. These recommendations shall be indicated on plans prior to the release of the Construction Certificate.

11 **Flows from Adjoining Properties**

Flows from adjoining properties shall be accepted and catered for within the site. Finished ground and top of retaining wall levels on the boundary shall be no higher than the existing upslope adjacent ground levels. The above requirements must be clearly shown on construction certificate plans prior to the release of the Construction Certificate.

12 **Heritage – Interpretation Signage**

The applicant is to prepare interpretative material to be included on a small sign located on development entrance gateway on the boundary fence to Pendlebury Park. The sign should provide a brief history of Pendlebury Park and its significance. Details of the proposed sign should be provided to Council's Heritage Staff for approval prior to release of Construction Certificate.

13 **External Finishes**

External finishes and colours shall be in accordance with approved plans. These requirements must be clearly shown on construction certificate plans prior to the release of the Construction Certificate.

14 **Present Plans to Sydney Water**

Approved plans must be submitted online using Sydney Water Tap, available through www.sydneywater.com.au to determine whether the development will affect Sydney Water's sewer and water mains, stormwater drains and/or easements, and if further requirements need to be met. The Principal Certifier must ensure that Sydney Water has issued an approval receipt prior to the issue of a Construction Certificate.

Visit www.sydneywater.com.au or telephone 13 20 92 for further information.

15 **Endeavour Energy Requirements**
The submission of documentary evidence from Endeavour Energy to the Principal Certifier is required confirming that satisfactory arrangements have been made with Endeavour Energy for the provision of electricity supplies to the development, prior to the release of the Construction Certificate.

Note: Applications should be made to Customer Connections – South Coast, Endeavour Energy PO Box 811 Seven Hills NSW 1730.

16 **Telecommunications**
The submission of documentary evidence from an approved telecommunications carrier to the Principal Certifier confirming that underground telecommunication services are available for this development is required prior to the issue of the Construction Certificate.

17 **Fencing**
The development is to be provided with fencing and screen walls at full cost to the applicant/developer in accordance with approved plans. This requirement is to be reflected on the Construction Certificate plans.

18 **Car Parking and Access**
The development shall make provision for a total of 27 car parking spaces (including 3 visitor car parking spaces and 1 space capable of adaption for people with disabilities), a minimum of 4 secure (Class B) residential bicycle spaces and 1 visitor bicycle space (Class C). This requirement shall be reflected on the Construction Certificate plans. Any change in above parking numbers shown on the approved DA plans shall be dealt with via a section 4.55 modification to the development. The approved car parking spaces shall be maintained to the satisfaction of Council, at all times.

19 The car parking areas shall incorporate 'low impact' floodlighting to ameliorate any light spillage and/or glare impacts upon surrounding properties. The final design details of the proposed floodlighting system shall be reflected on the Construction Certificate plans. The erection of the floodlighting system shall be in accordance with the approved final design.

20 A change in driveway paving is required at the entrance threshold within the property boundary to clearly show motorists they are crossing a pedestrian area. Between the property boundary and the kerb, the developer must construct the driveway pavement in accordance with the conditions, technical specifications and levels to be obtained from Council's Manager Works. This requirement shall be reflected on the Construction Certificate plans and any supporting documentation.

21 **Structures Adjacent to Driveway**
Any proposed structures adjacent to the driveway shall comply with the requirements of the current relevant Australian Standard AS2890.1 (figure 3.2 and 3.3) to provide for adequate pedestrian and vehicle sight distance. This includes, but is not limited to, structures such as signs, letterboxes, retaining walls, dense planting etc. This requirement shall be reflected on the Construction Certificate plans.

22 The depth and location of all services (ie gas, water, sewer, electricity, telephone, traffic lights, etc) must be ascertained and reflected on the Construction Certificate plans and supporting documentation.

23 **Landscaping**
The submission of a final Landscape Plan to the Principal Certifying Authority, prior to the release of the Construction Certificate. The final Landscape Plan shall address the following requirements:

a planting of indigenous plant species typical of the Illawarra Region such as: *Syzygium smithii* (formerly Acmena smithii) Lilly pilly, *Archontophoenix cunninghamiana* Bangalow palm, *Backhousia myrtifolia* Grey myrtle, *Elaeocarpus reticulatus* Blueberry ash, *Glochidion ferdinandii* Cheese tree, *Livistona australis* Cabbage palm tree, B*rachychiton acerifolius* Illawarra Flame Tree.; A further list of suitable suggested species for the Woonona area may be found in Wollongong Development Control Plan 2009 – Chapter E6: Landscaping;

b a schedule of proposed planting, including botanic name, common name, expected mature height and staking requirements as well as number of plants and pot sizes;

c the location of all proposed and existing overhead and underground service lines. The location of such service lines shall be clear of the dripline of existing and proposed trees;

d any proposed hard surface under the canopy of an existing trees shall be permeable and must be laid such that the finished surface levels match the existing level. Paving for Unit 10's Private Open Space to be permeable. Permeable paving is to be installed in accordance with the manufacturer's recommendations;

e the developer shall ensure that proposed planting is child friendly and must **not** include any of the types of plants listed below: **i)** plants known to produce toxins; **ii)** plant with high allergen properties; **vi)** any weed or potential weed species;

f landscaping to utilise some feature fired brickwork to complement adjacent park;

g where turf is proposed adjacent to built structures and garden beds the applicant shall install a 110mm wide brick mowing edge with concrete footing to minimise maintenance;

h structural support for awning on adjacent property utilising boundary brickwork to not be compromised; and;

i any fill material should not cover topsoil. Topsoil shall be removed, stockpiled, ameliorated and replaced over any fill material to a minimum depth of 100mm.

The completion of the landscaping works as per the final approved Landscape Plan is required, prior to the issue of Occupation Certificate or commencement of the development.

24 The submission of certification from a suitably qualified and experienced landscape designer and drainage consultant to the Principal Certifier prior to the release of the Construction Certificate, confirming that the landscape plan and the drainage plan are compatible.

25 The implementation of a landscape maintenance program in accordance with the approved Landscape Plan for a minimum period of 12 months to ensure that all landscape work becomes well established by regular maintenance. Details of the program must be submitted with the Landscape Plan to the Principal Certifier prior to release of the Construction Certificate.

26 **Compensatory Planting**

The developer must make compensatory provision for the vegetation required to be removed as a result of the development. In this regard, one (1 No.) 75 litre container advanced mature plant stock shall be placed within the property boundary of the site in appropriate locations. The suggested species are to be selected from the following list: *Elaeocarpus reticulatus* Blueberry ash, *Livistona australis* Cabbage palm tree, or B*rachychiton acerifolius* Illawarra Flame Tree. A further list of suitable suggested species may be found in Wollongong Development Control Plan 2009 – Chapter E6: Landscaping.

27 **Tree Protection Measures**

The existing trees are to be retained upon the subject property and any trees on adjoining properties shall not be impacted upon during the excavation or construction phases of the development. This will require the installation and maintenance of appropriate tree protection measures, including (but not necessarily limited to) the following:

a Installation of Tree Protection Fencing - Protective fencing shall be 1.8 metre cyclone chainmesh fence, with posts and portable concrete footings. Details and location of protective fencing must be indicated on the architectural and engineering plans to be submitted to the Principal Certifying Authority prior to release of the Construction Certificate.

b Mulch Tree Protection Zone: Areas within a Tree Protection Zone are to be mulched with minimum 75 mm thick 100% recycled hardwood chip/leaf litter mulch.

c Irrigate: Areas within the Tree Protection Zone are to be regularly watered in accordance with the arborist's recommendations.

The submission of a final Site Plan to the Principal Certifying Authority indicating required tree protection fencing is required, prior to the release of the Construction Certificate.

28 **Provision of a Fire Hydrant**

The provision of a fire hydrant in accordance with AS2419.1 (2005) Fire Hydrant Installations and any requirements of the NSW Rural Fire Service and/or NSW Fire Brigades. The final details of the location of the fire hydrant shall be reflected on the Construction Certificate plans prior to the issue of the Construction Certificate.

29 **Engineering Plans and Specifications - Retaining Wall Structures Greater than 1m**

The submission of engineering plans and supporting documentation of all proposed retaining walls greater than 1m to the Principal Certifier for approval prior to the issue of the Construction Certificate. The retaining walls shall be designed by a suitably qualified and experienced civil and/or structural engineer. The required engineering plans and supporting documentation shall include the following:

1 A plan of the wall showing location and proximity to property boundaries;

2 An elevation of the wall showing ground levels, maximum height of the wall, materials to be used and details of the footing design and longitudinal steps that may be required along the length of the wall;

3 Details of fencing or handrails to be erected on top of the wall;

4 Sections of the wall showing wall and footing design, property boundaries, subsoil drainage and backfill material. Sections shall be provided at sufficient intervals to determine the impact of the wall on existing ground levels. The developer shall note that the retaining wall, subsoil drainage and footing structure must be contained wholly within the subject property;

5 The proposed method of subsurface and surface drainage, including water disposal. This is to include subsoil drainage connections to an inter-allotment drainage line or junction pit that discharges to the appropriate receiving system;

6 The assumed loading used by the engineer for the wall design.

7 Flows from adjoining properties shall be accepted and catered for within the site. Finished ground and top of retaining wall levels on the boundary shall be no higher than the existing upslope adjacent ground levels.

30 **Stormwater Connection to Kerb**

Connection across footways shall be by means of one or two (maximum), sewer grade UPVC pipe(s), 100mm diameter pipes with a continuous downslope gradient to the kerb. Connection to the kerb shall be made with a rectangular, hot dipped galvanised mild steel weephole(s) shaped to suit the kerb profile, with each weephole having the capacity equal to a 100mm diameter pipe. Alternatively, a maximum of two 150mm x 100mm hot dipped galvanised steel pipes may be used across footways, with the 150mm dimension being parallel to the road surface to suit the kerb profile.

31 **Bicycle Parking Facilities**

Bicycle parking facilities must have adequate weather protection and provide the appropriate level of security as required by the current relevant Australian Standard AS2890.3 - Bicycle Parking Facilities and Austroads Guide to Traffic Management Part 11: Parking (Commentary 9: C9.2). In the absence of internal bicycle storage areas in private residential garages, the proposed external bicycle spaces are to have adequate weather protection, passive surveillance, and be secured within a lockable enclosure with access via a combination lock or communal key. This requirement shall be reflected on the Construction Certificate plans.

32 **Property Addressing Policy Compliance**

Prior to the issue of any construction certificate, the developer must ensure that any site addressing complies with Council's **Property Addressing Policy** (as amended). Where appropriate, the developer must also lodge a written request to Council's **Infrastructure Systems & Support –**

Property Addressing (propertyaddressing@wollongong.nsw.gov.au), for the site addressing prior to the issue of the construction certificate. Please allow up to 3-5 business days for a reply. Enquiries regarding property addressing may be made by calling 4227 8660.

33 **Footpath Paving**

The developer is responsible for the construction of footpath paving for the entire frontage of Gordon Street. The type of paving for this development is a 1500mm wide, 100mm thick, reinforced, broom finished concrete. A nominal two percent (2%) minimum one percent (1%), maximum two and a half percent (2.5%) cross fall to be provided from property line to back of kerb. Any changes of level, ramps or stairs and associated tactile markers and handrails are to be contained with the property boundary.

The driveway entry threshold from the property boundary line to the face of kerb is to be broom finished concrete to match the footpath and be designed to withstand predicted traffic loadings.

The driveway threshold finish within property boundary line is to contrast with driveway entry.

The footpath and driveway entry on the council property must be installed to the satisfaction of WCC Manager of Works.

34 A Landscape Plan is to be submitted to Council for approval prior to the issue of the Construction Certificate showing proposed paving, footpath design levels, street tree details and location of all services.

35 **Street Trees**

The developer must address the street frontage by installing street tree planting. The number and species for this development is one (1 No.) *Melaleuca viminalis* Weeping Bottlebrush 100 litre container size, in accordance with AS 2303:2018 Tree stock for landscape use. Street trees are to be installed in accordance with Wollongong Development Control Plan 2009 – Chapter E6: Landscaping. 'Dial Before You Dig' must be consulted prior to any excavation on site. Pot holing must be carried out to determine service location. Tree pits must be adequately mulched, plants installed, and staking installed to the satisfaction of WCC Manager of Works. Staking is to consist of min. 3 x 2400 x 50 x 50mm hardwood stakes driven min 600mm into firm ground. Hessian webbing is to be utilised to secure plant stock to industry standard.

These requirements shall be reflected on the Construction Certificate plans and any supporting documentation.

36 **Sizing of Drainage**

All roof gutters, downpipes, pits, and pipelines draining roof areas and other impervious surfaces with no deliberate overflow path to the on-site stormwater detention (OSD) facility, shall be designed to cater for a 1 in 100 year ARI storm event in accordance with AS 3500.3 – Plumbing and Drainage (Stormwater Drainage). Details of gutter/downpipe/pipeline sizes and locations shall be reflected on the Construction Certificate plans.

37 **Stormwater Drainage Design**

A detailed drainage design for the development must be submitted to and approved by the Principal Certifier prior to the release of the Construction Certificate. The detailed drainage design must satisfy the following requirements:

a Be prepared by a suitably qualified civil engineer in accordance with Chapter E14 of Wollongong City Council's Development Control Plan 2009, Subdivision Policy, conditions listed under this consent, and generally in accordance with the The Stormwater Concept Plan, prepared by Land Team, Reference No. 213194-E01, revision D, dated 6/5/ 2020.

b Include details of the method of stormwater disposal. Stormwater from the development must be piped to Council's existing stormwater drainage system.

c Engineering plans and supporting calculations for the stormwater drainage system are to be prepared by a suitably qualified engineer and be designed to ensure that stormwater runoff from upstream properties is conveyed through the site without adverse impact on

the development or adjoining properties. The plan must indicate the method of disposal of all stormwater and must include rainwater tanks, existing ground levels, finished surface levels on all paved areas, estimated flow rates, invert levels and sizes of all pipelines.

d Overflow paths shall be provided to allow for flows of water in excess of the capacity of the pipe/drainage system draining the land, as well as from any detention storage on the land. Blocked pipe situations with 1 in 100 year ARI events shall be incorporated in the design. Overflow paths shall also be provided in low points and depressions. Each overflow path shall be designed to ensure no entry of surface water flows into any building and no concentration of surface water flows onto any adjoining property. Details of each overflow path shall be shown on the detailed drainage design.

38 **On-Site Stormwater Detention (OSD) Design**

The developer must provide on-site stormwater detention (OSD) storage for stormwater runoff from the development. The design and details of the OSD system must be provided in conjunction with the detailed drainage design and approved by the Principal Certifier prior to the release of the Construction Certificate. The OSD design and details must satisfy the following requirements:

a Must be prepared by a suitable qualified engineer in accordance with Chapter E14 of the Wollongong DCP 2009.

b Must include details of the Site Storage Requirement (SSR) and Permissible Site Discharge (PSD) values for the site in accordance with Section 10.2.4 of Chapter E14 of the Wollongong DCP2009.

c The OSD facility must be designed to withstand the maximum loadings occurring from any combination of traffic (with consideration to residential and heavy vehicles), hydrostatic, earth, and buoyancy forces. Details must be provided demonstrating these requirements have been achieved.

d The OSD facility shall incorporate a minimum 600mm x 600mm square lockable grate for access and maintenance purposes, provision for safety, debris control screen, and a suitably graded invert to the outlet to prevent ponding.

e Must include discharge control calculations (i.e. orifice/weir calculations) generally in accordance with Section 10.2.6 and 10.4.4 of Chapter E14 of the Wollongong DCP2009.

f Details of the orifice plate including diameter of orifice and method of fixing shall be provided.

g Must include details of a corrosion resistant identification plaque for location on or close to the OSD facility. The plaque shall include the following information and shall be installed prior to the issue of the occupation certificate:

- The structure is an OSD facility, being part of the stormwater drainage network, and is not to be tampered with.
- Identification number [DA-2020/572];
- Any specialist maintenance requirements.

h Must include a maintenance schedule for the OSD system, generally in accordance with Chapter E14 of the Wollongong DCP2009.

39 **Council Footpath Reserve Works – Driveways and Crossings**

All redundant vehicular crossings and laybacks rendered unnecessary by this development must be reconstructed to normal kerb and gutter or existing edge of carriageway treatment to match the existing. The verge from the back of kerb to the boundary must be restored and the area appropriately graded, topsoiled and turfed in a manner that conforms with adjoining road reserve. The area forward of the front boundary must be kept smooth, even and free from any trip hazards. All alterations of public infrastructure where necessary are at the developer's expense.

All new driveway laybacks and driveway crossings must be designed in accordance with Wollongong City Council Standards. Any redundant line marking such as 'marked parking bays'

are adjusted/removed at the developer's expense by a Council recognised contractor with the relevant insurances. Details and locations are to be shown on the Construction Certificate Plans.

40 **Development Contributions**

Pursuant to Section 4.17 of the Environmental Planning and Assessment Act 1979 and the Wollongong City-Wide Development Contributions Plan (2018), a monetary contribution of $27,300.00 (subject to indexation) must be paid to Council towards the provision of public amenities and services, prior to the release of any associated Construction Certificate.

This amount has been calculated based on the estimated cost of development and the applicable percentage rate.

The contribution amount will be subject to indexation until the date of payment. The formula for indexing the contribution is:

Contribution at time of payment = $C x (CP2/CP1)

Where:

$C is the original contribution as set out in the Consent

CP1 is the Consumer Price Index; All Groups CPI; Sydney at the time the consent was issued

CP2 is the Consumer Price Index; All Groups CPI; Sydney at the time of payment

Details of CP1 and CP2 can be found in the Australian Bureau of Statistics website – Catalogue No. 6401.0 - Consumer Price Index, Australia.

The following payment methods are available:

METHOD	HOW	PAYMENT TYPE
Online	http://www.wollongong.nsw.gov.au/applicationpayments Your Payment Reference: 1234901	• Credit Card
In Person	Wollongong City Council Administration Building - Customer Service Centre Ground Floor 41 Burelli Street, WOLLONGONG	• Cash • Credit Card • Bank Cheque
PLEASE MAKE BANK CHEQUE PAYABLE TO: Wollongong City Council (Personal or company cheques are not accepted)		

A copy of the Wollongong City-Wide Development Contributions Plan (2018) and accompanying Fact Sheet may be inspected or obtained from the Wollongong City Council Administration Building, 41 Burelli Street, Wollongong during business hours or on Council's web site at www.wollongong.nsw.gov.au

41 **Construction Management Plan**

The submission of a Construction Management Plan is to be submitted to the Principal Certifier prior to the issue of the Construction Certificate. This plan shall address what measures will be implemented for the protection of adjoining properties and traffic management of construction vehicles.

This plan is required to maintain public safety, minimise disruption to pedestrian and vehicular traffic within this locality and to protect services, during demolition, excavation and construction phases of the development. This plan shall include the following aspects:

a proposed ingress and egress points for vehicles to/from the construction site;
b proposed pedestrian management whilst vehicles are entering/exiting the construction site;
c proposed measures to be implemented for the protection of all roads and footpath areas surrounding the construction site from building activities, crossings by heavy equipment, plant and materials delivery and static load from cranes, concrete pumps and the like;
d proposed method of loading and unloading excavation machines, building materials formwork and the erection of any part of the structure within the site;
e proposed areas within the site to be used for the storage of excavated material, construction materials and waste containers during the construction period;
f proposed method of support of any excavation, adjacent to adjoining buildings or structures and the road reserve. The proposed method of support is to be certified by an accredited certifier in Civil Engineering; and
g proposed measures to be implemented, in order to ensure that no soil/excavated material is transported on wheels or tracks of vehicles or plant and deposited on the roadway.

Note: Any proposed works or placement of plant and equipment and/or materials within any road reserve will require the separate approval of Council, prior to the commencement of such works, pursuant to the provisions of the Roads Act 1993.

Prior to the Commencement of Works

42 **Appointment of Principal Certifier**

Prior to commencement of work, the person having the benefit of the Development Consent and a Construction Certificate must:

a Appoint a Principal Certifier (PC) and notify Council in writing of the appointment irrespective of whether Council or an accredited private certifier is appointed; and
b Notify Council in writing of their intention to commence work (at least two days' notice is required).

The Principal Certifier must determine when inspections and compliance certificates are required.

43 **Sign – Supervisor Contact Details**

Before commencement of any work, a sign must be erected in a prominent, visible position:

a stating that unauthorised entry to the work site is not permitted;
b showing the name, address and telephone number of the Principal Certifier for the work; and
c showing the name and address of the principal contractor in charge of the work site and a telephone number at which that person can be contacted at any time for business purposes.

This sign shall be maintained while the work is being carried out and removed upon the completion of the construction works.

44 **Temporary Toilet/Closet Facilities**

Toilet facilities are to be provided at or in the vicinity of the work site on which work involved in the erection or demolition of a building is being carried out at the rate of one toilet for every 20 persons or part of 20 persons employed at the site.

Each toilet provided must be:

a a standard flushing toilet; and
b connected to either:
  i the Sydney Water Corporation Ltd sewerage system or
  ii an accredited sewage management facility or
  iii an approved chemical closet.

The toilet facilities shall be provided on-site, prior to the commencement of any works.

45 **Structural Engineer's Details**
Structural engineer's details for all structurally designed building works such as reinforced concrete footings, reinforced concrete slabs and structural steelwork must be submitted to the Principal Certifier, prior to the commencement of any works on the site.

46 **Dilapidation Report**
A dilapidation report shall be submitted to the Principal Certifier prior to the commencement of works or demolition. The dilapidation report shall accurately reflect the condition of existing public and private infrastructure in the adjacent street(s) fronting the lots and adjoining properties.

The report shall outline measures for the protection of existing public and private infrastructure, buildings and structures during the works and include a detailed description of elements and photographic record.

Any damage to infrastructure items and / or property which is caused by the developer shall be repaired to the satisfaction of the Principal Certifier prior to the issue of the Occupation Certificate.

47 **Enclosure of the Site**
The site must be enclosed with a suitable security fence to prohibit unauthorised access, to be approved by the Principal Certifier. No building work is to commence until the fence is erected.

48 **Demolition Works**
The demolition of the existing warehouse shall be carried out in accordance with Australian Standard AS2601 (2001): The Demolition of Structures or any other subsequent relevant Australian Standard and the requirements of the SafeWork NSW.

No demolition materials shall be burnt or buried on-site. The person responsible for the demolition works shall ensure that all vehicles leaving the site carrying demolition materials have their loads covered and do not track soil or waste materials onto the road. Any unforeseen hazardous and/or intractable wastes shall be disposed of to the satisfaction of the Principal Certifier. In the event that the demolition works may involve the obstruction of any road reserve/footpath or other Council owned land, a separate application shall be made to Council to enclose the public place with a hoarding or fence over the footpath or other Council owned land.

49 **Demolition Notification to Surrounding Residents**
Demolition must not commence unless at least 2 days written notice has been given to adjoining residents of the date on which demolition works will commence.

50 **Consultation with SafeWork NSW – Prior to Asbestos Removal**
A licensed asbestos removalist must give written notice to SafeWork NSW at least five (5) days before licensed asbestos removal work is commenced.

51 **Contaminated Roof Dust**
Any existing accumulations of dust in ceiling voids and wall cavities must be removed prior to any demolition work commencing. Removal must take place by the use of an industrial vacuum fitted with a high efficiency particulate air (HEPA) filter.

52 **Waste Management**
The developer must provide an adequate receptacle to store all waste generated by the development pending disposal. The receptacle must be regularly emptied, and waste must not be allowed to lie or accumulate on the property other than in the receptacle. Consideration should be given to the source separation of recyclable and reusable materials.

53 **Temporary Sediment Fences**
Temporary sediment fences (e.g. haybales or geotextile fabric) must be installed on the site, prior to the commencement of any excavation, demolition or construction works in accordance with Council's guidelines. Upon completion of the development, sediment fencing is to remain until the site is grassed or alternatively, a two (2) metre strip of turf is provided along the perimeter of the site, particularly lower boundary areas.

54 **Tree Protection Implementation**

The existing trees are to be retained upon the subject property and any trees on adjoining properties shall not be impacted upon during the excavation or construction phases of the development. This will require the installation and maintenance of appropriate tree protection measures, including (but not necessarily limited to) the following:

a Installation of Tree Protection Fencing - Protective fencing shall be 1.8 m cyclone chainmesh fence, with posts and portable concrete footings;

b Mulch Tree Protection Zone: Areas within a Tree Protection Zone are to be mulched with minimum 75 mm thick 100% recycled hardwood chip/leaf litter mulch;

c Irrigate: Areas within the Tree Protection Zone are to be regularly watered in accordance with the arborist's recommendations.

The tree protection fencing shall be installed prior to the commencement of any demolition, excavation or construction works and shall be maintained throughout the entire construction phases of the development.

55 **Supervising Arborist – Tree Inspection and Installation of Tree Protection Measures**

Prior to the commencement of any demolition, excavation or construction works, the supervising arborist must certify in writing that tree protection measures have been inspected and installed in accordance with the arborist's recommendations and relevant conditions of this consent.

56 **Notification to Council of any Damage to Council's Infrastructure**

Council must be notified in the event of any existing damage to any of Council's infrastructure including, but not limited to the road, kerb and gutter, road shoulder, footpath, drainage structures and street trees fronting the development prior to the commencement of work. Adequate protection must be provided to Council infrastructure prior to work commencing and during the construction period. Any damage to Council's assets shall be restored in a satisfactory manner prior to the issue of the Occupation Certificate.

57 **Works in Road Reserve - Minor Works**

Approval, under Section 138 of the Roads Act must be obtained from Wollongong City Council's Development Engineering Team prior to any works commencing or any proposed interruption to pedestrian and/or vehicular traffic within the road reserve caused by the construction of this development.

The application form for Works within the Road Reserve – Section 138 Roads Act can be found on Council's website. The form outlines the requirements to be submitted with the application, to give approval to commence works under the roads act. It is advised that all applications are submitted, and fees paid, 5 days prior to the works within the road reserve are intended to commence. The Applicant is responsible for the restoration of all Council assets within the road reserve which are impacted by the works/occupation. Restoration must be in accordance with the following requirements:

a All restorations are at the cost of the Applicant and must be undertaken in accordance with Council's standard document, "Specification for work within Council's Road reserve".

b Any existing damage within the immediate work area or caused as a result of the work/ occupation, must also be restored with the final works.

58 **Protection of Public Places**

If the work involved in the erection or demolition of a building involves the enclosure of a public place or is likely to cause pedestrian/vehicular traffic in a public place to be obstructed or rendered inconvenient:

1. A hoarding or fence must be erected between the work site and the public place;
2. An awning is to be erected, sufficient to prevent any substance from, or in connection with, the work falling into the public place;
3. The work site must be kept lit between sunset and sunrise if it is likely to be hazardous to persons in a public place;
4. Safe pedestrian access must be maintained at all times;

5. Any such hoarding, fence or awning is to be removed when the work has been completed.

59 **Protection of Public Infrastructure**

Council must be notified in the event of any existing damage to any of its infrastructure such as the road, kerb and gutter, road shoulder, footpath, drainage structures and street trees fronting the development site, prior to commencement of any work.

Adequate protection must be provided for Council infrastructure prior to work commencing and during building operations.

Any damage to Council's assets shall be made good, prior to the issue of any Occupation Certificate or commencement of the operation.

60 **Tree Protection**

Prior to commencement of any work on the site, including any demolition, all trees not approved for removal as part of this consent that may be subjected to impacts of this approved development must be protected in accordance with Section 4 of the Australian Standard Protection of Trees on Development Sites (AS 4970-2009).

Tree protection zones must be established prior to the commencement of any work associated with this approved development.

No excavation, construction activity, grade changes, storage of materials stockpiling, siting of works sheds, preparation of mixes or cleaning of tools is permitted within Tree Protection Zones.

During Demolition, Excavation or Construction

61 **Acoustic Glazing to Comply with the SEPP Infrastructure 2007**

Implement all the recommendations stated section 5 of acoustic assessment report prepared by Harwood Acoustic dated 12 May 2020 for building noise compliance. The following LAeq levels are not exceeded:

- in any bedroom in the building: 35dB(A) at any time between 10pm and 7am
- anywhere else in the building (other than a garage, kitchen, bathroom or hallway): 40dB(A) at any time between 10pm and 7am.
- All mechanical plans must be satisfactorily attenuated to levels complying with noise emission criteria through appropriate location and (if necessary) standard acoustic treatments such as noise screens, enclosures, in-duct treatments (silencers/lined ducting) or similar.

62 **Flows from Adjoining Properties**

Flows from adjoining properties shall be accepted and catered for within the site. Finished ground and top of retaining wall levels on the boundary shall be no higher than the existing upslope adjacent ground levels.

63 **Heritage - Unexpected Finds**

Relics are protected in NSW under the Heritage Act 1977. Relics cannot be disturbed except with a permit or exception/exemption notification. Should unanticipated relics not skeletal in nature be discovered during the course of the project, work in the vicinity must cease and an archaeologist contacted to make a preliminary assessment of the find. The Heritage Council will require notification if the find is assessed as a relic.

64 **Acid Sulfate Soils**

The Wollongong Local Environmental Plan 2009 Acid Sulfate Soils Map has identified that this property may be affected by classes 3, 4 or 5 Acid Sulfate Soils. Acid Sulfate Soils contain iron sulfides which, when exposed to air due to drainage or disturbance, may produce sulfuric acid and release toxic quantities of iron, aluminium and heavy metals. The Acid Sulfate Soils Map is an indication only and you are advised that you may encounter acid sulfate soils during the excavation for the proposed development.

Any spoil material extracted or excavated from the foundations must be neutralised with commercial lime (calcium bicarbonate) be the addition of 10 kilograms of lime per 1 cubic metre of spoil material before it is disposed of or re-used on-site. Lime is to be added by evenly

distributing over all exposed surface areas, drilled piers and footing trenches on the site, prior to pouring concrete.
Council suggests the applicant refer to the Acid Sulfate Soils Assessment Guidelines contained in the Acid Sulfate Soils Manual, prepared by NSW Acid Sulfate Management Advisory Committee, August 1998 for further information.

65 **Supervision of Engineering Works**
All engineering works associated with the development are to be carried out under the supervision of a practicing engineer and/or registered surveyor.

66 **Piping of Stormwater to Existing Stormwater Drainage System**
Stormwater for the land must be piped to Council's street kerb and gutter.

67 **No Adverse Run-off Impacts on Adjoining Properties**
The design and construction of the development shall ensure there are no adverse effects to adjoining properties, as a result of flood or stormwater run-off. Attention must be paid to ensure adequate protection for buildings against the ingress of surface run-off.

Allowance must be made for surface run-off from adjoining properties. Any redirection or treatment of that run-off must not adversely affect any other property.

68 **Protection of Public Places**
If the work involved in the erection or demolition of a building involves the enclosure of a public place or is likely to cause pedestrian/vehicular traffic in a public place to be obstructed or rendered inconvenient, or have the potential for conflict between pedestrians and vehicles:

a A hoarding or fence must be erected between the work site and the public place;
b an awning is to be erected, sufficient to prevent any substance from, or in connection with, the work falling into the public place;
c the work site must be kept lit between sunset and sunrise if it is likely to be hazardous to persons in a public place;
d safe pedestrian access must be maintained at all times;
e any such hoarding, fence or awning is to be removed when the work has been completed.

69 **Front Fence Height and Style**
All fencing on the land fronting the street must be in accordance with approved plans.

70 **Copy of Consent to be in Possession of Person carrying out Tree Removal**
The applicant must ensure that any person carrying out tree removal is in possession of this development consent and the approved landscape plan, in respect to the vegetation which has been given approval to be removed in accordance with this consent.

71 **Restricted Hours of Construction Work**
The developer must not carry out any work, other than emergency procedures, to control dust or sediment laden runoff outside the normal working hours, namely, 7.00 am to 5.00 pm, Monday to Saturday, without the prior written consent of the Principal Certifier and Council. No work is permitted on public holidays or Sundays.

Any request to vary these hours shall be submitted to the **Council** in writing detailing:

a the variation in hours required (length of duration);
b the reason for that variation (scope of works);
c the type of work and machinery to be used;
d method of neighbour notification;
e supervisor contact number;
f any proposed measures required to mitigate the impacts of the works.

The construction works noise shall comply with the Australian Standard AS 2436-2010 "Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites" and any other requirements as specified by Council or the NSW Environment Protection Authority.

Note: The developer is advised that other legislation may control the activities for which Council has granted consent, including but not limited to, the Protection of the Environment Operations Act 1997.

72 Vehicle access is to be controlled so as to prevent tracking of sediment onto adjoining roadways, particularly during wet weather or when the site has been affected by wet weather.

73 Drains, gutters, access ways and roadways must be maintained free of sediment and any other material. Gutters and roadways must be swept/scraped regularly to maintain them in a clean state.

74 Building operations such as brick cutting, the washing of tools or paint brushes, or other equipment and the mixing of mortar must not be carried out on the roadway or public footpath or any other locations which could lead to the discharge of materials into the stormwater drainage system or natural watercourse.

75 **Dust Suppression Measures**
Activities occurring during the construction phase of the development must be carried out in a manner that will minimise the generation of dust.

76 Trucks which are entering and leaving the premises and carrying loads must be sealed or covered at all times, except during loading and unloading.

77 **Asbestos – Removal, Handling and Disposal Measures/Requirements Asbestos Removal by a Licensed Asbestos Removalist**
The removal of any asbestos material must be carried out by a licensed asbestos removalist if over 10 square metres in area of non-friable asbestos, or if any type of friable asbestos in strict accordance with SafeWork NSW requirements (<http://www.safework.nsw.gov.au>).

78 **Asbestos Waste Collection, Transportation and Disposal**
Asbestos waste must be prepared, contained, transported and disposed of in accordance with SafeWork NSW and NSW Environment Protection Authority requirements. Asbestos waste must only be disposed of at a landfill site that can lawfully receive this this type of waste. A receipt must be retained and submitted to the Principal Certifier, and a copy submitted to Council (in the event that Council is not the Principal Certifier), prior to commencement of the construction works.

79 **Provision of Waste Receptacle**
The developer must provide an adequate receptacle to store all waste generated by the development, pending disposal. The receptacle must be regularly emptied, and waste must not be allowed to lie or accumulate on the property other than in the receptacle. Consideration should be given to the source separation of recyclable and re-usable materials.

80 **BASIX**
All the commitments listed in each relevant BASIX Certificate for the development must be fulfilled in accordance with Clause 97A(2) of the Environmental Planning & Assessment Regulation 2000.

A relevant BASIX Certificate means:

- A BASIX Certificate that was applicable to the development when this development consent was granted (or, if the development consent is modified under section 4.55 of the Environmental Planning & Assessment Act 1979, a BASIX Certificate that is applicable to the development when this development consent is modified); or
- if a replacement BASIX Certificate accompanies any subsequent application for a construction certificate, the replacement BASIX Certificate; and
- BASIX Certificate has the meaning given to that term in the Environmental Planning & Assessment Regulation 2000."

81 **Provision of Taps/Irrigation System**
The provision of common taps and/or an irrigation system is required to guarantee that all landscape works are adequately watered. The location of common taps and/or irrigation system must be implemented in accordance with the approved Landscape Plan.

82 **Screen planting**

To mitigate impact to adjoining dwelling a continuous hedge is to be established along southern boundary for the length of property boundary. Recommended species: *Callistemon viminalis 'Slim'*, *Photinia glabra Rubens, Viburnum tinus, Syzygium australe Aussie Southern, Syzygium, 'Resiliance', Viburnum odoratissimum Dense Fence or Waterhousea floribunda Sweeper.* Minimum spacing 1000mm. Minimum pot size 5 lt.

A further list of suitable suggested species may be found in Wollongong Development Control Plan 2009 – Chapter E6: Landscaping.

Prior to the Issue of the Occupation Certificate

83 **Acoustic to Comply with the SEPP Infrastructure 2007**

Prior to Occupation Certificate submit an acoustic compliance report to Principal Certifier prepared by a consultant who is a member of the Australian Acoustic Society (AAS) or the Associated of Australian Acoustic Consultants (AAAC). The report shall state that the dwelling internal noise levels are complying with the SEPP Inf 2007 noise guidelines.

84 **Heritage Interpretation Sign**

Prior to the release of the occupation certificate, the developer is to install the small interpretative sign in the approved location.

85 A Section 73 Certificate must be submitted to the Principal Certifier prior to occupation of the development/release of the plan of subdivision.

86 **Drainage**

The developer must obtain a certificate of Hydraulic Compliance (using Council's M19 form) from a suitably qualified civil engineer, to confirm that all stormwater drainage and on-site detention works have been constructed in accordance with the approved plans. In addition, full works-as-executed plans, prepared and signed by a Registered Surveyor must be submitted. These plans and certification must satisfy all the stormwater requirements stated in Chapter E14 of the Wollongong DCP2009. This information must be submitted to the Principal Certifier prior to the issue of the final Occupation Certificate.

87 **Restriction on use – On-site Detention System**

The applicant must create a restriction on use under the Conveyancing Act 1919 over the on-site detention system. The following terms must be included in an appropriate instrument created under the Conveyancing Act 1919 for approval of Council:

"The registered proprietor of the lot burdened must not make or permit or suffer the making of any alterations to any on-site stormwater detention system on the lot(s) burdened without the prior consent in writing of the authority benefited. The expression 'on-site stormwater detention system' shall include all ancillary gutters, pipes, drains, walls, kerb, pits, grates, tanks, chambers, basins and surfaces designed to temporarily detain stormwater as well as all surfaces graded to direct stormwater to those structures.

Name of the authority having the power to release, vary or modify the restriction referred to is Wollongong City Council."

The instrument, showing the restriction, must be submitted to the Principal Certifier for endorsement prior to the issue of the Occupation Certificate and the use of the development.

88 **Access Certification**

Prior to the occupation of the building, the Principal Certifier must ensure that a certificate from an "accredited access consultant" has been issued certifying that the building complies with the requirements of AS 1428.1.

89 **Retaining Wall Certification**

The submission of a certificate from a suitably qualified and experienced structural engineer or civil engineer to the Principal Certifier is required, prior to the issue of the Occupation Certificate or commencement of the use. This certification is required to verify the structural adequacy of the

retaining walls and that the retaining walls have been constructed in accordance with plans approved by the Principal Certifier.

90 **BASIX**

An Occupation Certificate must not be issued unless accompanied by the BASIX Certificate applicable to the development. The Principal Certifier must not issue the final occupation certificate unless satisfied that selected commitments have been complied with as specified in the relevant BASIX Certificate. NOTE: Clause 154B of the Environmental Planning and Assessment Regulation 2000 provides for independent verification of compliance in relation to certain BASIX commitments.

91 **Positive Covenant – On-Site Detention Maintenance Schedule**

A positive covenant shall be created under the Conveyancing Act 1919, requiring the property owner(s) to undertake maintenance in accordance with the Construction Certificate approved On-Site Stormwater Detention System and Maintenance Schedule (application number to be referenced).

The instrument, showing the positive covenant must be submitted to the Principal Certifier for endorsement prior to the issue of the Occupation Certificate and the use of the development.

92 **On-Site Detention – Structural Certification**

The submission of a certificate from a suitably qualified practising civil and/or structural engineer to the Principal Certifier is required prior to the issue of the Occupation Certificate. This certification is required to verify the structural adequacy of the on-site detention facility and that the facility has been constructed in accordance with the approved Construction Certificate plans.

93 **Completion of Landscape Works on Council Owned or Controlled Land**

The Developer must complete all landscape works required within Council's road reserve, or other Council owned or controlled land, in accordance with the conditions of this consent. The total cost of all such landscape works shall be fully borne by the Developer and any damage to Council's assets shall be the subject of restoration works sufficient to restore the asset to its previous state and configuration previous to the commencement of works. Evidence that this requirement has been met must be satisfied prior to the issue of the Occupation Certificate.

94 **Arborist Verification – Street Tree Installation**

Prior to the issue of Occupation Certificate, the developer must supply certification in the form of a report, including photographic evidence, from an AQF Level 5 Arborist to the Principal Certifier and Wollongong City Council to verify:

- The tree stock complies with AS 2203:2018 Tree Stock for Landscape Use
- The tree pits have been constructed and the trees installed in accordance with the requirements of the Wollongong City Council City Centre Public Domain Technical Manual and Arboricultural best practice.

Operational Phases of the Development/Use of the Site

95 **Gate to Pendlebury Park**

The gate to Pendlebury Park shall be maintained in good condition. There shall be no impediment of fencing or the gate onto the park.

96 **Fire Safety Measures**

All new and existing fire safety measures shall be maintained in working condition, at all times.

97 **Loading/Unloading Operations/Activities**

All loading/unloading operations are to take place at all times wholly within the confines of the site or within the road reserve under an approved traffic control plan.

98 **Street Tree Establishment Period**

The Developer must comply with the terms of an approved landscape maintenance program for a minimum period of 12 months to ensure that all landscape works within Council's road reserve or

Council owned or controlled land becomes well established by regular maintenance. The Street Tree Establishment Period shall commence from the issue of the Occupation Certificate.

The program must include the following elements: watering, weeding, litter removal, mulching, fertilising, tree guard and grate maintenance, and pest and disease control.

Details of the proposed program must be submitted with the Landscape Plan to the Principal Certifier for approval prior to release of the Construction Certificate.

Reasons

The reasons for the imposition of the conditions are:

1 To minimise any likely adverse environmental impact of the proposed development.

2 To ensure the protection of the amenity and character of land adjoining and in the locality.

3 To ensure the proposed development complies with the provisions of Environmental Planning Instruments and Council's Codes and Policies.

4 To ensure the development does not conflict with the public interest.