

Appendix 4 Environmental Noise Assessment



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Environmental Noise Assessment

**McDonalds Restaurant and Drive-Through
Lot 2242 Cnr Marmion Ave & Hawkins Drive
Alkimos**

Reference: 21066468-01A

**Prepared for:
McDonalds Australia Ltd**

Report: 21066468-01A

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Date:	Rev	Description	Prepared By	Verified
26-Oct-21	0	Issued to Client	Matt Moyle	Terry George
18-Nov-21	A	Updated with finalised DA plans	Matt Moyle	Terry George

Table of Contents

1	INTRODUCTION	1
2	CRITERIA	2
3	METHODOLOGY	6
3.1	Meteorological Information	6
3.2	Topographical Data	7
3.3	Ground Absorption	7
3.4	Source Sound Levels	7
4	RESULTS & ASSESSMENT	11
4.1	Scenario 1: Predicted Noise Night L_{A10}	11
4.2	Scenario 2: Predicted Noise Night L_{A1}	13
4.3	Scenario 3: Predicted Noise Sunday L_{A10}	15
4.4	Scenario 4: Predicted Noise Night L_{Amax}	17
5	CONCLUSION	19

List of Tables

Table 2-1	Adjustments Where Characteristics Cannot Be Removed	3
Table 2-2	Baseline Assigned Noise Levels	3
Table 2-3	Influencing Factor – Noise Sensitive (within 100m of Marmion Ave)	4
Table 2-4	Influencing Factor – Noise Sensitive (more than 100m from Marmion Ave)	4
Table 2-5	Assigned Noise Levels	5
Table 3-1	Modelling Meteorological Conditions	6
Table 3-2	Source Sound Power Levels, dB	8
Table 4-1	Predicted Night Noise Levels, dB L_{A10}	11
Table 4-2	Predicted Night Noise Levels, dB L_{A1}	13
Table 4-3	Predicted Sunday Day Noise Levels, dB L_{A10}	15
Table 4-4	Predicted Night Noise Levels, dB L_{Amax}	17

List of Figures

Figure 1-1 Subject Site Locality _____ 1

Figure 1-2 Overall Site Plan (From Development Application) _____ 2

Figure 3-1 Noise Wall requirement for Drive-Thru _____ 7

Figure 3-2 2D Image of Noise Model _____ 10

Figure 4-1 Noise Contour Plot Scenario 1: Night L_{A10} _____ 12

Figure 4-2 Noise Contour Plot Scenario 2: Night L_{A1} _____ 14

Figure 4-3 Noise Contour Plot Scenario 3: Sunday Day L_{A10} _____ 16

Figure 4-4 Noise Contour Plot Scenario 4: Night L_{Amax} _____ 18

Appendices

- A Site Plans
- B Terminology

1 INTRODUCTION

Lloyd George Acoustics was commissioned by McDonalds Australia to undertake a noise assessment for a proposed restaurant development at Lot 2242 Corner of Marmion Avenue & Hawkins Drive, Alkimos (subject site) – refer *Figure 1-1*. The restaurant is part of a commercial development which includes a service station on the adjacent site

While other commercial aspects are planned in the future (refer site plan in *Figure 1-2*), the assessment addresses the noise aspects of the McDonald's Restaurant only. Indicative buildings for other future commercial sites were included in the model.

The most critical noise sensitive premises identified in this assessment are existing and future residences to the east, south and north.

Noise sources considered were those associated with mechanical plant, delivery vehicles, vehicle noise in the drive-through and parking areas as well as the speaker associated with the ordering system. Noise from this equipment was assessed against the prescribed standards of the *Environmental Protection (Noise) Regulations 1997* by way of noise modelling.

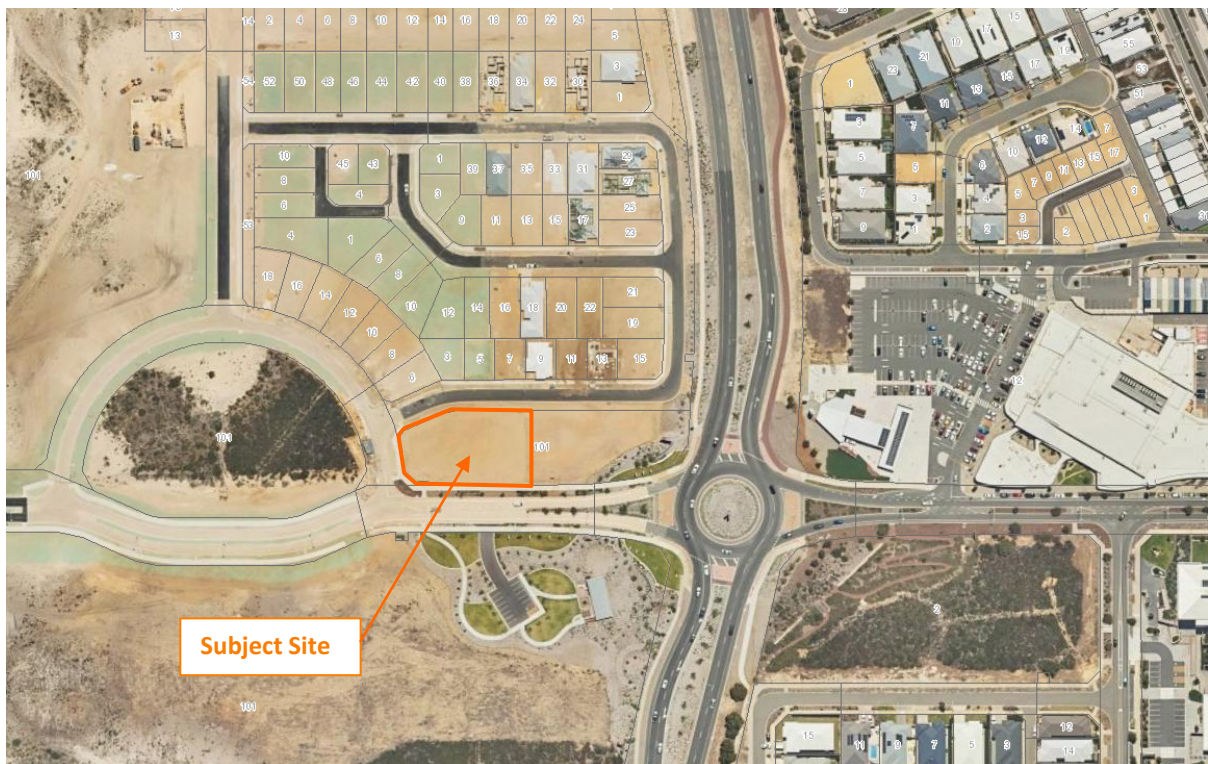


Figure 1-1 Subject Site Locality

Appendix B contains a description of some of the terminology used throughout this report.

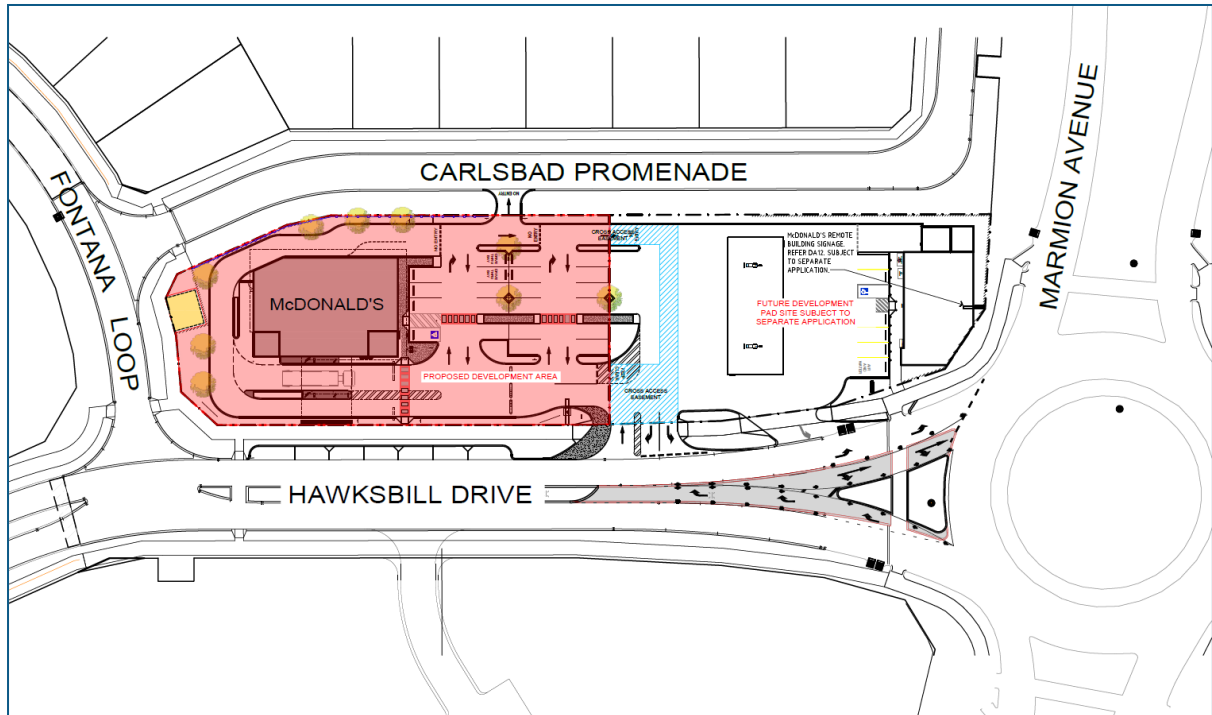


Figure 1-2 Overall Site Plan (From Development Application)

2 CRITERIA

Environmental noise in Western Australia is governed by the *Environmental Protection Act 1986*, through the *Environmental Protection (Noise) Regulations 1997* (the Regulations).

Regulation 7 defines the prescribed standard for noise emissions as follows:

- “7. (1) Noise emitted from any premises or public place when received at other premises –
- (a) Must not cause or significantly contribute to, a level of noise which exceeds the assigned level in respect of noise received at premises of that kind; and
 - (b) Must be free of –
 - i. tonality;
 - ii. impulsiveness; and
 - iii. modulation,
 when assessed under regulation 9”

A “...noise emission is taken to significantly contribute to a level of noise if the noise emission ... exceeds a value which is 5 dB below the assigned level...”

Tonality, impulsiveness and modulation are defined in Regulation 9. Noise is to be taken to be free of these characteristics if:

- (a) The characteristics cannot be reasonably and practicably removed by techniques other than attenuating the overall level of noise emission; and

- (b) The noise emission complies with the standard prescribed under regulation 7 after the adjustments of *Table 2-1* are made to the noise emission as measured at the point of reception.

Table 2-1 Adjustments Where Characteristics Cannot Be Removed

Where Noise Emission is Not Music			Where Noise Emission is Music	
Tonality	Modulation	Impulsiveness	No Impulsiveness	Impulsiveness
+ 5 dB	+ 5 dB	+ 10 dB	+ 10 dB	+ 15 dB

Note: The above are cumulative to a maximum of 15dB.

The baseline assigned levels (prescribed standards) are specified in Regulation 8 and are shown in *Table 2-2*.

Table 2-2 Baseline Assigned Noise Levels

Premises Receiving Noise	Time Of Day	Assigned Level (dB)		
		L _{A10}	L _{A1}	L _{Amax}
Noise sensitive premises: highly sensitive area ¹	0700 to 1900 hours Monday to Saturday (Day)	45 + influencing factor	55 + influencing factor	65 + influencing factor
	0900 to 1900 hours Sunday and public holidays (Sunday)	40 + influencing factor	50 + influencing factor	65 + influencing factor
	1900 to 2200 hours all days (Evening)	40 + influencing factor	50 + influencing factor	55 + influencing factor
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays (Night)	35 + influencing factor	45 + influencing factor	55 + influencing factor
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80
Commercial	All hours	60	75	80

1. **highly sensitive area** means that area (if any) of noise sensitive premises comprising —

- (a) a building, or a part of a building, on the premises that is used for a noise sensitive purpose; and
- (b) any other part of the premises within 15 metres of that building or that part of the building.

The influencing factor was calculated for the nearest noise sensitive premises, shown on *Figure 3-2*, being a recent aerial image of the subject area. As per the local structure plan, the subject site is amongst a commercial zoned area with mixed uses nominated to the south east. The remaining areas are noted to be residential use or public open space. It is noted that residential and commercial premises are planned to the south as part of the local structure plan and these have been included as such in the assessment.

An influencing factor of between 3 dB and 7 dB has been calculated for the nearest noise sensitive premises, based on a transport factor of 2 and 6 dB for premises within 450m or 100m of Marmion Avenue (Major Road with 23,100 vpd in 2018 – Main Roads WA Count Site 51834). Furthermore, 1 dB has been determined applicable from nearby commercial land uses – refer *Table 2-3* and *Table 2-4*.

Table 2-3 Influencing Factor – Noise Sensitive (within 100m of Marmion Ave)

Description	Within 100 metre Radius	Within 450 metre Radius	Total
Commercial Land	0.7 dB (14%)	0.2 dB (4%)	1 dB
Major Road	6 dB	-	6 dB
Total			7 dB

Table 2-4 Influencing Factor – Noise Sensitive (more than 100m from Marmion Ave)

Description	Within 100 metre Radius	Within 450 metre Radius	Total
Commercial Land	0.7 dB (14%)	0.2 dB (4%)	1 dB
Major Road	-	2 dB	2 dB
Total			3 dB

Table 2-5 shows the assigned noise levels including the influencing factor at the receiving locations. The receiving noise sensitive premises are identified in *Figure 3-2*. The restaurant is proposed to operate 24-hours a day, 7-days a week.

Table 2-5 Assigned Noise Levels

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L _{A10}	L _{A1}	L _{Amax}
Residences within 100m of Marmion Ave	0700 to 1900 hours Monday to Saturday (Day)	52	62	72
	0900 to 1900 hours Sunday and public holidays (Sunday)	47	57	72
	1900 to 2200 hours all days (Evening)	47	57	62
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays (Night)	42	52	62
Residences more than 100m from Marmion Ave	0700 to 1900 hours Monday to Saturday (Day)	48	58	68
	0900 to 1900 hours Sunday and public holidays (Sunday)	43	53	68
	1900 to 2200 hours all days (Evening)	43	53	58
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays (Night)	38	48	58
Commercial	All hours	60	75	80

1. *highly sensitive area* means that area (if any) of noise sensitive premises comprising —
- (a) a building, or a part of a building, on the premises that is used for a noise sensitive purpose; and
 - (b) any other part of the premises within 15 metres of that building or that part of the building.

It must be noted the assigned noise levels apply outside the receiving premises and at a point at least 3 metres away from any substantial reflecting surfaces.

It is further noted the assigned noise levels are statistical levels and therefore the period over which they are determined is important. The Regulations define the Representative Assessment Period (RAP) as *a period of time of not less than 15 minutes, and not exceeding 4 hours*, which is determined by an *inspector or authorised person* to be appropriate for the assessment of a noise emission, having regard to the type and nature of the noise emission. An *inspector or authorised person* is a person appointed under Sections 87 & 88 of the *Environmental Protection Act 1986* and include Local Government Environmental Health Officers and Officers from the Department of Environment Regulation. Acoustic consultants or other environmental consultants are not appointed as an *inspector or authorised person*. Therefore, whilst this assessment is based on a 4 hour RAP, which is assumed to be appropriate given the nature of the operations, this is to be used for guidance only.

Regulation 3 states the following with regards to vehicles:

- (1) *Nothing in these regulations applies to the following noise emissions —*
- (a) *noise emissions from the propulsion and braking systems of motor vehicles operating on a road.*

Since the development is open to the public, the carpark and associated like areas are considered to be a road and therefore vehicle noise (propulsion and braking) is not strictly assessed. However,

vehicle propulsion noise in the drive-through area has been considered assessable in this report due to the 24-hour nature of the restaurant and the nature of the lanes being solely for food ordering purposes and not road access. Vehicle door closing noise is also assessable in any parts of the car park, as this does not form part of the 'propulsion or braking' systems.

Regulation 14A provides requirements for the collection of waste stating that this activity can also be exempt from having to comply with regulation 7 prescribed standards provided it is undertaken between 7am and 7pm Mondays to Saturdays and undertaken in the quietest reasonable manner.

3 METHODOLOGY

Computer modelling has been used to predict the noise emissions from the site. The software used was *SoundPLAN 8.2* with the ISO 9613 algorithms (ISO 17354 compliant) selected. These algorithms have been selected as they include the influence of wind and atmospheric stability. Input data required in the model are:

- Meteorological Information;
- Topographical data;
- Ground Absorption; and
- Source sound power levels.

3.1 Meteorological Information

Meteorological information utilised is provided in *Table 3-1* and is considered to represent worst-case conditions for noise propagation. At wind speeds greater than those shown, sound propagation may be further enhanced, however background noise from the wind itself and from local vegetation is likely to be elevated and dominate the ambient noise levels.

Table 3-1 Modelling Meteorological Conditions

Parameter	Night (1900-0700)	Day (0700-1900)
Temperature (°C)	15	20
Humidity (%)	50	50
Wind Speed (m/s)	Up to 5m/s	Up to 5m/s
Wind Direction*	All	All

* Note that the modelling package used allows for all wind directions to be modelled simultaneously.

It is generally considered that compliance with the assigned noise levels needs to be demonstrated for 98% of the time, during the day and night periods, for the month of the year in which the worst-case weather conditions prevail. In most cases, the above conditions occur for more than 2% of the time and therefore must be satisfied.

3.2 Topographical Data

Topographical data was adapted from *Google* and proposed plans. Existing and future buildings have also been included as these can provide barrier attenuation when located between a source and receiver as well as reflection paths. Parapets are assumed to be atop the restaurant building and between 1.2-2.0 metres higher than the roof. A 1.6m high solid fence (relative to retaining wall top) was deemed required along the northern drive-thru lane to mitigate vehicle noise to sensitive receptors – refer *Figure 3-1* and Appendix A.

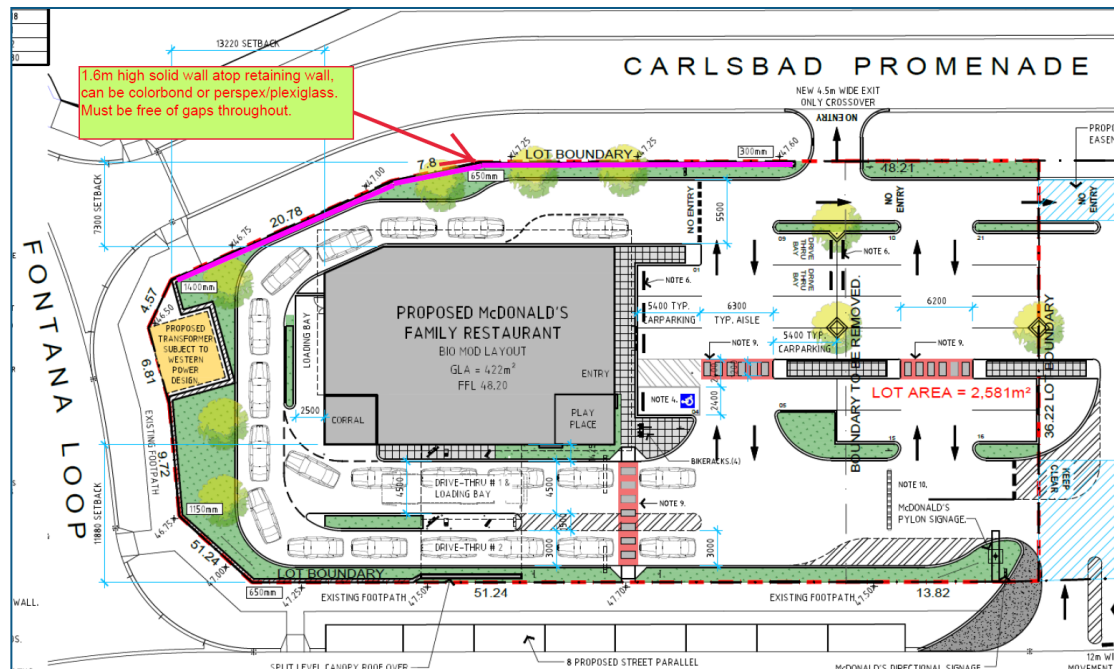


Figure 3-1 Noise Wall requirement for Drive-Thru

3.3 Ground Absorption

Ground absorption varies from a value of 0 to 1, with 0 being for an acoustically reflective ground (e.g. water or bitumen) and 1 for acoustically absorbent ground (e.g. grass). In this instance, a value 0.0 has been used for all road and car park areas and 0.6 for all other areas.

3.4 Source Sound Levels

Table 3-2 shows the sound power levels used in the modelling. The spectrum and overall levels are for individual point sources within the model. The general list of noise emissions considered in the assessment are:

- Mechanical Services (Air conditioning, ventilation systems, and refrigeration plant);
- Drive-through speaker noise;
- Vehicles (including deliveries) idling in drive through areas; and
- Car doors closing in parking bays.

Table 3-2 Source Sound Power Levels, dB

Description	Octave Band Centre Frequency (Hz)								Overall dB(A)
	63	125	250	500	1k	2k	4k	8k	
Condenser Package MAC90RP – L _{A10}	88	87	85	81	76	70	64	59	82
AC-1 Actron PKY960T Low Speed – L _{A10}	-	84	78	75	73	69	60	54	78
AC-1 Actron PKY960T High Speed – L _{A10}	-	89	83	80	78	74	64	60	83
AC-2 and AC-3 Actron PCG340 Package Low Speed – L _{A10}	-	75	74	73	71	67	65	60	76
AC-2 and AC-3 Actron PCG340 Package Unit High Speed – L _{A10}	-	78	78	77	75	71	69	64	80
AC-4 Actron PCA233U Package Unit Low Speed – L _{A10}	-	71	71	70	67	62	61	56	69
AC-4 Actron PCA233U Package Unit High Speed – L _{A10}	-	76	75	74	71	66	65	60	71
Fan 1 Fantech TCE354, Toilet – L _{A10}	80	78	74	71	62	64	63	53	73
Fan 2 Fantech CGD354, Fry EF – L _{A10}	80	78	74	71	62	64	63	53	73
Fan 3 Fantech CGD354, Fillet EF – L _{A10}	80	78	74	71	62	64	63	53	73
Fan 4 Fantech CGD404, Grille EF – L _{A10}	83	81	77	74	65	67	66	56	76
Fan 5 Fantech CE192V, Wash-up EF – L _{A10}	78	77	68	65	60	58	56	52	68
Fan 6 Fantech CE406D, IT Room EF – L _{A10}	78	77	68	65	60	58	56	52	68
Refrigerated Truck delivery – L _{A1}	100	91	87	88	83	81	79	75	90
Drive-Through Speaker – L _{A1}	62	64	66	77	80	73	57	42	82
Car Idling – L _{A10}	81	78	74	72	74	74	67	64	79
Car Door Closing – L _{Amax}	71	74	77	81	80	78	72	61	84

Modelled noise sources were based on file data and manufacturer specifications provided by McDonald's Restaurants. The locations of the noise sources are based on general locations on the site plan (refer *Appendix A*) noting the following:

- Mechanical plant are to be roof mounted at 1.0m above building height in the noise model;
- For night time scenarios, mechanical plant is modelled with low speed noise levels as per *Table 3-2*;
- Car door and all engine sources are modelled at 0.5m above ground;
- 8 to 18 vehicles are modelled idling in the Drive-Through queuing, ordering and waiting areas, depending on the calculation scenario (see following page).

Given the proposed hours of operation, the night-time scenario is most critical for noise sensitive premises and the daytime scenario is most critical for commercial premises. Noise modelling scenarios are:

1. Night L_{A10} – Consists of all mechanical plant operating on low speed mode and 8 vehicles idling in the drive-through areas;
2. Night L_{A1} – Consists of drive-through speaker noise, 18 vehicles idling, and low speed mechanical equipment, small delivery truck in designated bay;
3. Sunday Day L_{A10} – Includes all mechanical plant (at high speed). Also includes 18 vehicles idling in the drive-through areas including the waiting bay; and
4. Night L_{Amax} – Includes all mechanical plant described for the night scenario, and car door closures at parking bays.

A 2-D overview image of the noise model showing receivers and sources is included in *Figure 3-2*.

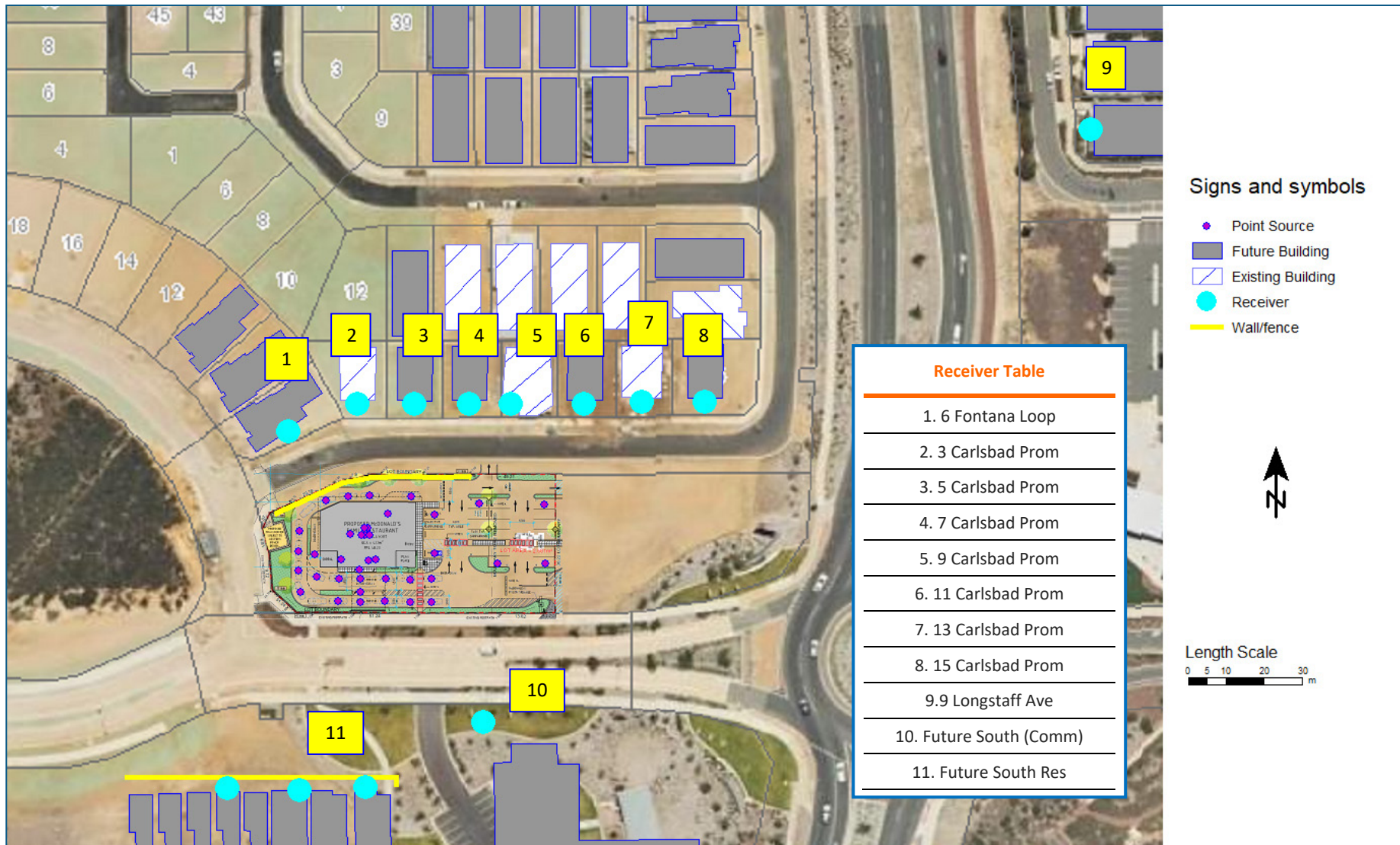


Figure 3-2 2D Image of Noise Model

4 RESULTS & ASSESSMENT

4.1 Scenario 1: Predicted Noise Night L_{A10}

The results of the L_{A10} Night scenario noise modelling are shown as a noise level contour plot in *Figure 4-1* and summarised below in *Table 4-1*. Refer to *Figure 3-2* for receiver locations positioned within the noise model.

Table 4-1 Predicted Night Noise Levels, dB L_{A10}

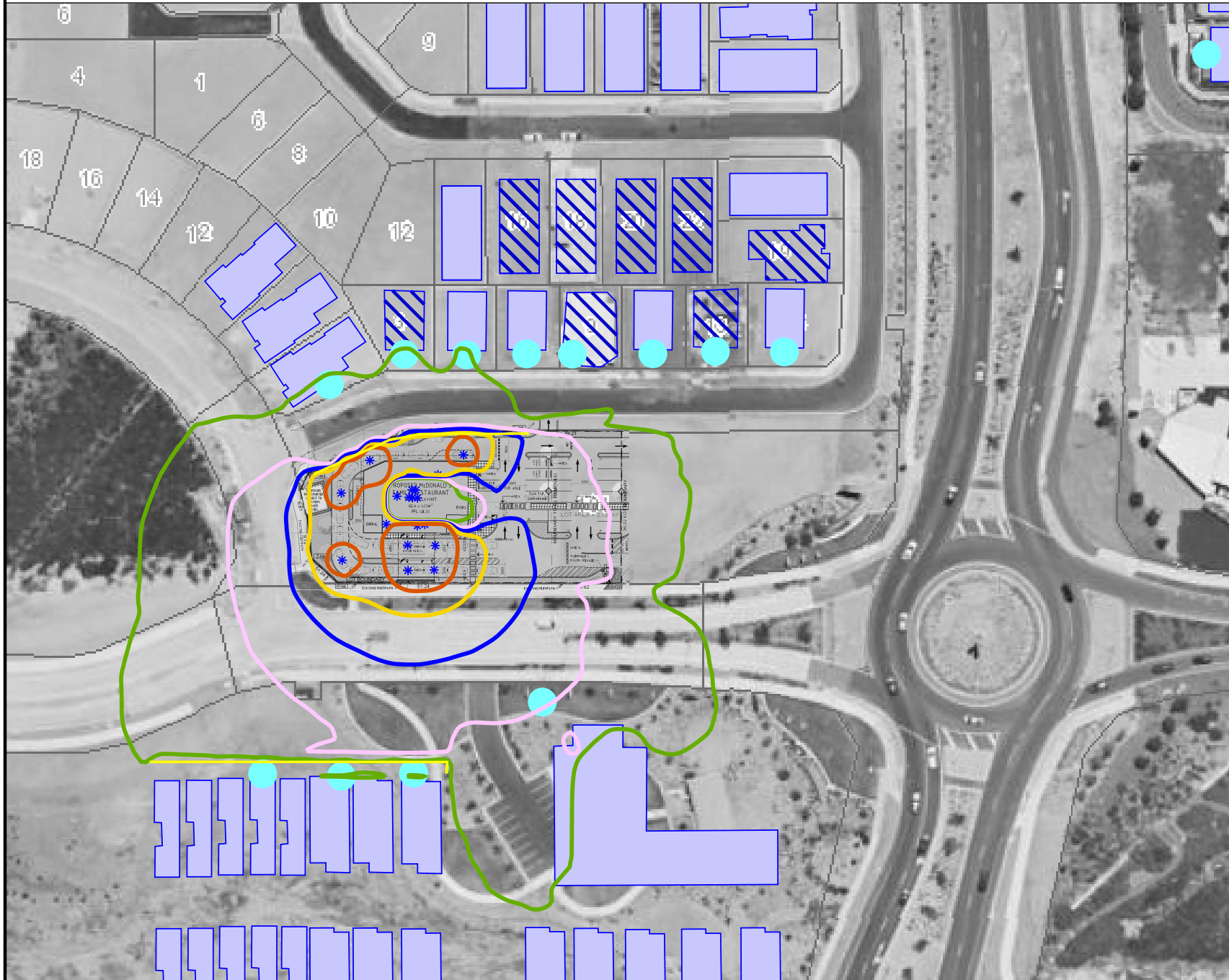
Location	Mechanical Plant	8 Drive-Through Vehicles	Combined	Critical Assigned Level, dB L_{A10}	Exceedence Amount
1. 6 Fontana Loop	30	36	37	38	Complies
2. 3 Carlsbad Prom	31	35	36	38	Complies
3. 5 Carlsbad Prom	31	34	36	38	Complies
4. 7 Carlsbad Prom	30	33	35	42	Complies
5. 9 Carlsbad Prom	31	32	34	42	Complies
6. 11 Carlsbad Prom	27	31	32	42	Complies
7. 13 Carlsbad Prom	26	30	31	42	Complies
8. 15 Carlsbad Prom	25	30	31	42	Complies
9.9 Longstaff Ave	18	17	21	42	Complies
10. Future South (Comm)	28	43	43	60	Complies
11. Future South Res	26	36	36	38	Complies

Noise is most critical at residences to the north, across Carlsbad Promenade. A worst case combined level of 37 dB L_{A10} is predicted with drive-through vehicles contributing the most to overall noise.

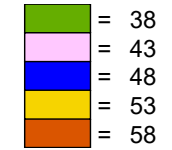
The noise from vehicles alone would not be considered tonal due to the number of vehicles and variation in engine sounds over a representative period, or when combined with mechanical plant noise, therefore no adjustments have been applied.

Summary Scenario 1: Compliance achieved at all receivers by at least 1 dB

Figure 4-1 Scenario 1, Night Time Noise, dB L_{A10}



Predicted Noise level



Legend

- Existing Building
- Future building
- Receiver
- Fence



Scale 1:1300



Project No: 21066468
 Consultant: MM
 Date: 25/10/2021
 Algorithm: ISO 9613
 SoundPLAN Version: 8.1



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4.2 Scenario 2: Predicted Noise Night L_{A1}

The results of the Night L_{A1} scenario noise modelling are shown as a noise level contour plot in Figure 4-2 and summarised below in Table 4-2.

Table 4-2 Predicted Night Noise Levels, dB L_{A1}

Location	Truck Delivery	Drive-Through Speaker	18 Drive-Through Vehicles	Combined ¹	Critical Assigned Level, dB L _{A1}	Exceedence Amount
1. 6 Fontana Loop	36	14	39	41	48	Complies
2. 3 Carlsbad Prom	25	11	39	39	48	Complies
3. 5 Carlsbad Prom	24	11	39	39	48	Complies
4. 7 Carlsbad Prom	24	12	38	38	52	Complies
5. 9 Carlsbad Prom	22	13	39	40	52	Complies
6. 11 Carlsbad Prom	20	16	36	36	52	Complies
7. 13 Carlsbad Prom	18	18	35	35	52	Complies
8. 15 Carlsbad Prom	17	21	34	35	52	Complies
9.9 Longstaff Ave	10	8	23	23	52	Complies
10. Future South (Comm)	35	39	46	47	75	Complies
11. Future South Res	38	30	39	41	48	Complies

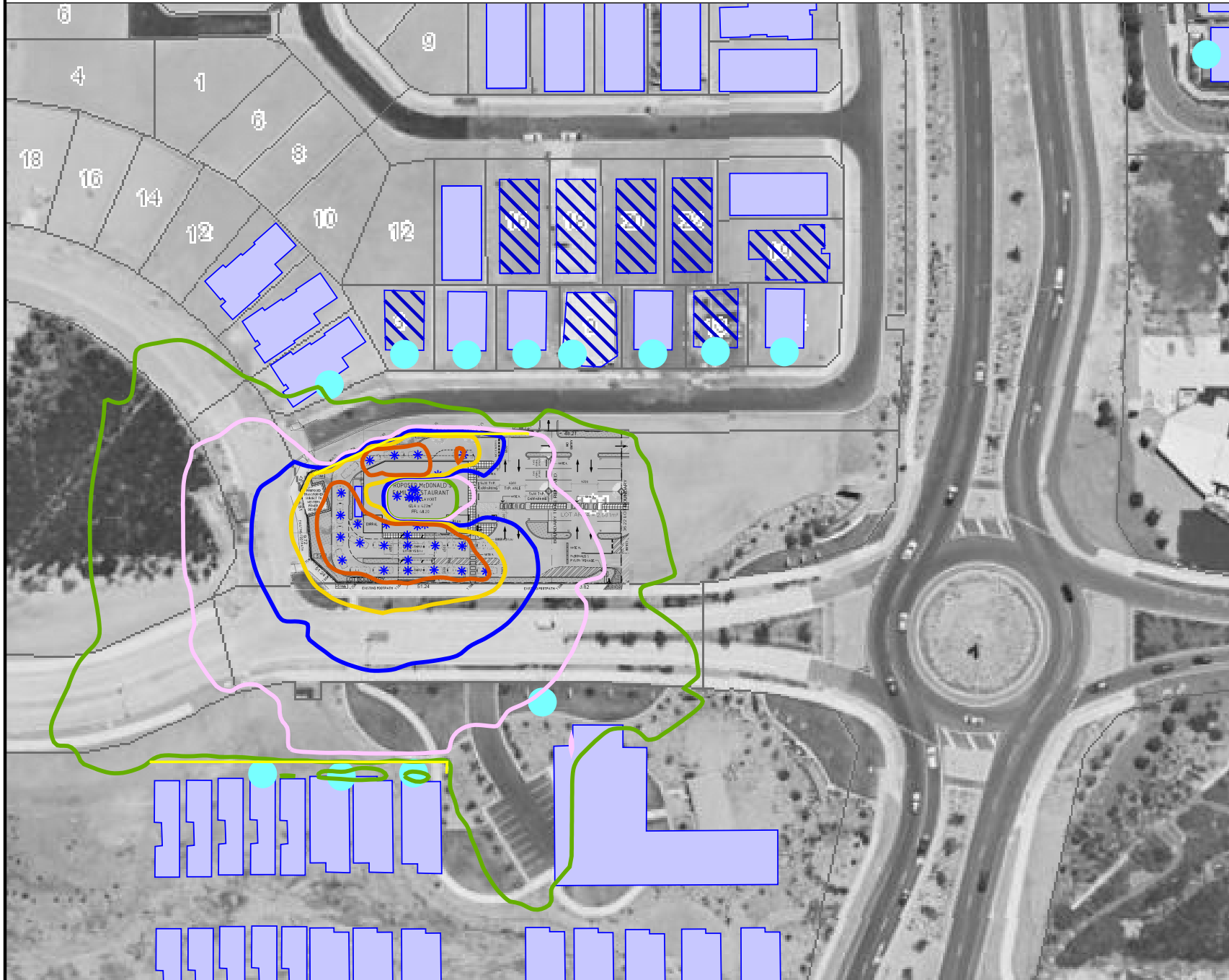
1. Combined level also includes the mechanical plant sources.

The worst-case calculated noise level for assessment purposes is 41 dB L_{A1} at 6 Fontana Loop. This noise level is predominantly from vehicles idling in the drive-through area and delivery truck noise, though it also includes mechanical plant noise. The noise level complies for all locations.

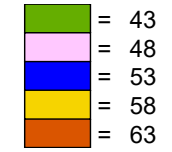
Note that the delivery truck is included in this scenario, being considered applicable to the L_{A1} assessment as the nature of the delivery is short term for a small-scale restaurant (as opposed to a supermarket which would have lengthier and more frequent deliveries). It assumes that a delivery is going on during a full drive-through of cars, which is a conservative worst case scenario. The noise is not considered to contain tonal characteristics when assessed over a representative period.

Summary Scenario 2: Compliance achieved at all receivers by at least 7 dB.





Figure 4-2 Scenario 2, Night Time Noise, dB L_{A1}



Predicted Noise level



Legend

-  Existing Building
-  Future building
-  Receiver
-  Fence



Scale 1:1300



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 Date: 25/10/2021
 Algorithm: ISO 9613
 SoundPLAN Version: 8.1



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4.3 Scenario 3: Predicted Noise Sunday L_{A10}

The Sunday day time period includes a full drive-through area with eighteen (18) cars in total (all in queuing positions and one at waiting bay). Mechanical plant are operating at high speeds, however assigned levels are higher for noise sensitive premises at this time, compared to during the night. The results of the Sunday day L_{A10} scenario noise modelling are shown as a noise level contour plot in Figure 4-3 and summarised in Table 4-3.

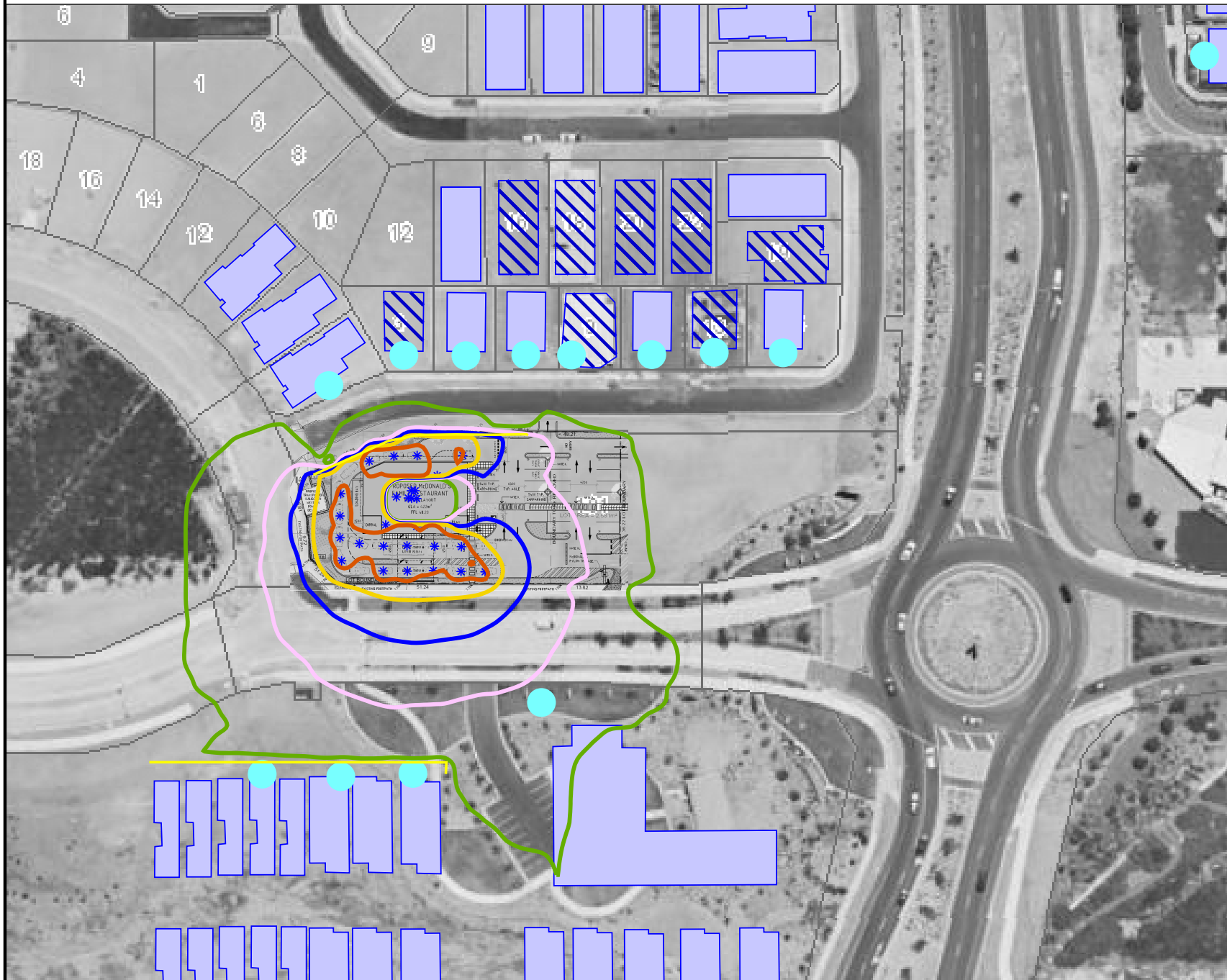
Table 4-3 Predicted Sunday Day Noise Levels, dB L_{A10}

Location	18 Drive-Through Vehicles	Mechanical Plant	Combined	Critical Assigned Level, dB L_{A10}	Exceedence Amount
1. 6 Fontana Loop	39	33	40	43	Complies
2. 3 Carlsbad Prom	38	34	39	43	Complies
3. 5 Carlsbad Prom	38	34	39	43	Complies
4. 7 Carlsbad Prom	38	33	39	47	Complies
5. 9 Carlsbad Prom	39	34	40	47	Complies
6. 11 Carlsbad Prom	36	30	37	47	Complies
7. 13 Carlsbad Prom	34	29	35	47	Complies
8. 15 Carlsbad Prom	34	28	35	47	Complies
9.9 Longstaff Ave	21	21	24	47	Complies
10. Future South (Comm)	46	31	46	60	Complies
11. Future South Res	39	29	39	43	Complies

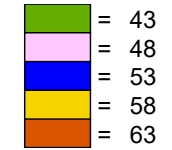
As with the Night L_{A10} assessment, noise from vehicles is dominant for most receivers. The Sunday day time scenario includes 18 drive-thru cars and mechanical plant on high speed mode, thus leading to increased combined levels. This combined noise level with mechanical plant, yields a worst case level of 40 dB L_{A10} at 6 Fontana Loop to the north. Again, noise would not be considered tonal given the idling vehicles are dominant and would all be idling at different speeds. The Sunday time period is compliant at all receivers with its assigned level of 43 or 47 dB L_{A10} .

Summary Scenario 3: Compliance achieved at all receivers by at least 3 dB.

Figure 4-3 Scenario 3, Sunday Noise, dB LA10



Predicted Noise level



Legend

- Existing Building
- Future building
- Receiver
- Fence



Scale 1:1300



Project No: 21066468
 Consultant: MM
 Date: 25/10/2021
 Algorithm: ISO 9613
 SoundPLAN Version: 8.1



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4.4 Scenario 4: Predicted Noise Night L_{Amax}

The results of the Night L_{Amax} scenario noise modelling are shown below in *Table 4-4*. The noise from car doors (non-cumulative) is shown graphically in *Figure 4-4*. Noise levels in this case are adjusted by + 10 dB for potential impulsive characteristics.

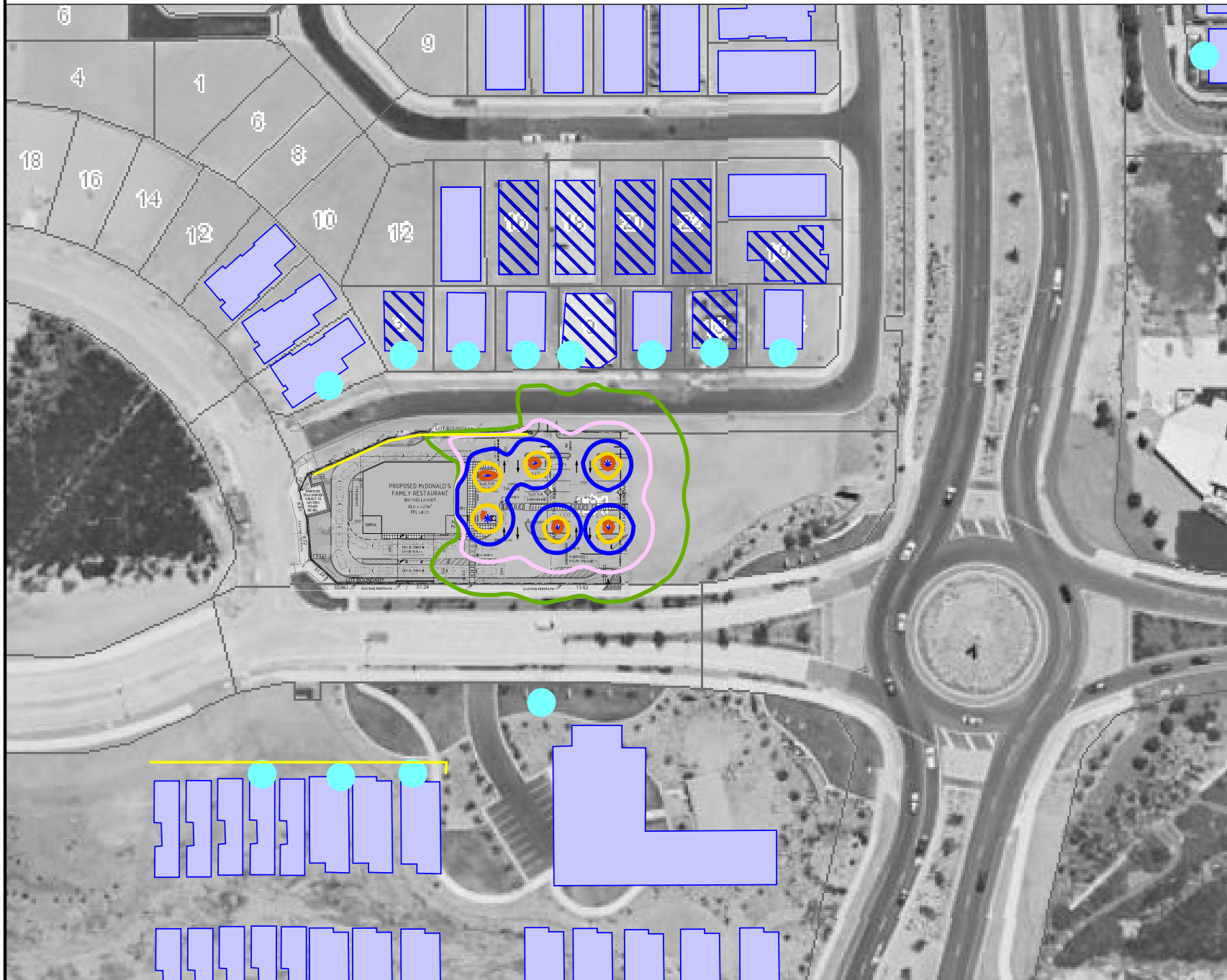
Table 4-4 Predicted Night Noise Levels, dB L_{Amax}

Location	Car Doors	Adjusted	Critical Assigned Level, dB L_{Amax}	Exceedence Amount
1. 6 Fontana Loop	34	44	58	Complies
2. 3 Carlsbad Prom	36	46	58	Complies
3. 5 Carlsbad Prom	39	49	58	Complies
4. 7 Carlsbad Prom	43	53	62	Complies
5. 9 Carlsbad Prom	43	53	62	Complies
6. 11 Carlsbad Prom	42	52	62	Complies
7. 13 Carlsbad Prom	40	50	62	Complies
8. 15 Carlsbad Prom	38	48	62	Complies
9.9 Longstaff Ave	27	37	62	Complies
10. Future South (Comm)	40	50	80	Complies
11. Future South Res	30	40	58	Complies

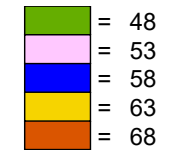
Vehicle door noise is predicted to be up to an adjusted level of 53 dB L_{Amax} at the worst case receivers to the north, being residential premises across Carlsbad Promenade. This is 9 dB below the most critical noise sensitive assigned level of 62 dB L_{Amax} and therefore compliant for all time periods.

Summary Scenario 4: Compliance achieved at all receivers by at least 9 dB.

Figure 4-4 Scenario 4, Car Park Noise, dB L_{Amax}



Predicted Noise level



Legend

- Existing Building
- Future building
- Receiver
- Fence



Scale 1:1300



Project No: 21066468
 Consultant: MM
 Date: 25/10/2021
 Algorithm: ISO 9613
 SoundPLAN Version: 8.1



Lloyd George Acoustics
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 HILLARYS WA 6923
 (08) 9401 7770

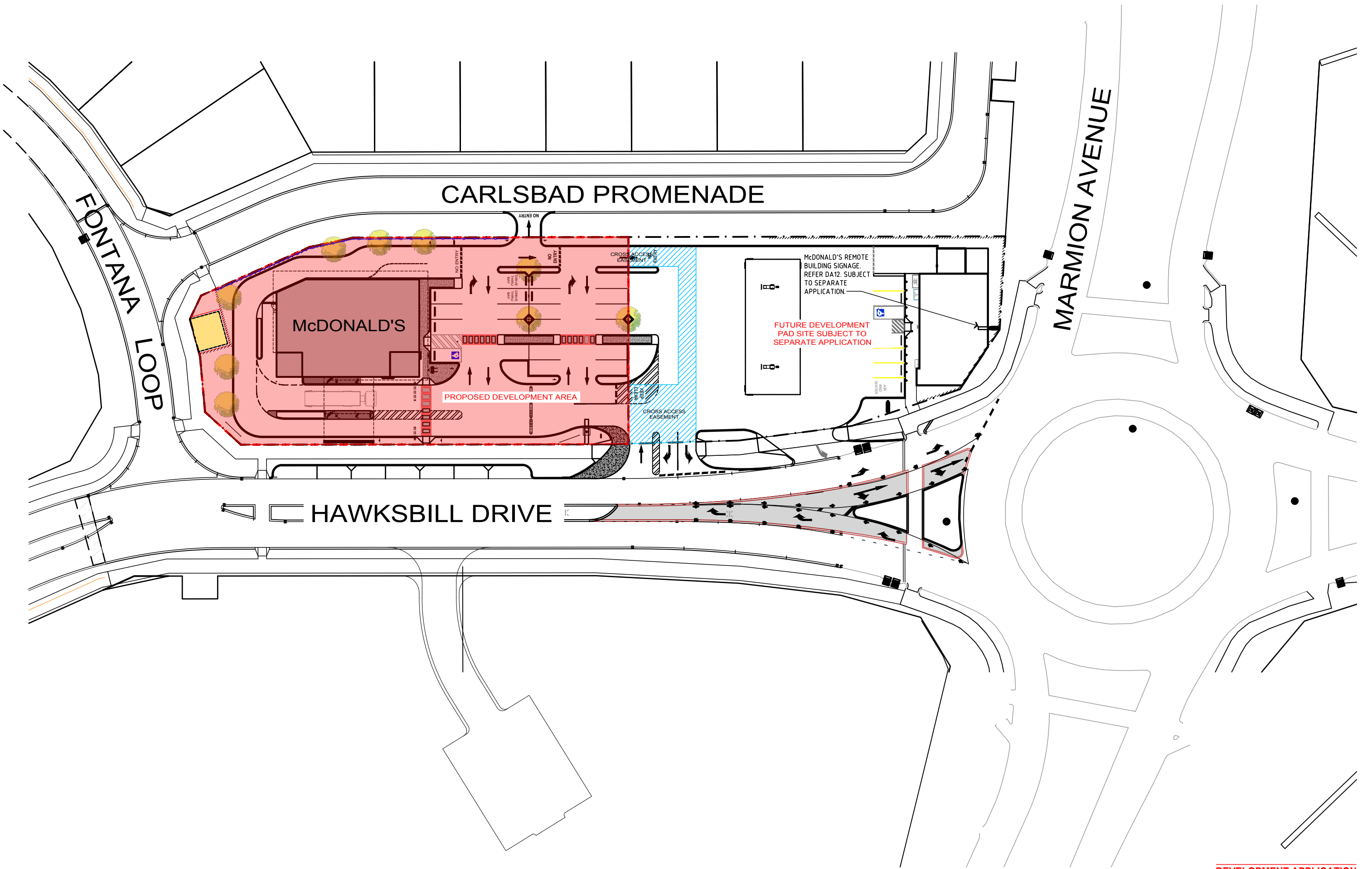
5 CONCLUSION

The potential noise impacts resulting from the proposed McDonald's Restaurant development at Lot 2242 Corner of Marmion Avenue & Hawkins Drive, Alkimos have been assessed against the *Environmental Protection (Noise) Regulations 1997*. Compliance with the assigned levels has been demonstrated for all time periods for the surrounding land uses, therefore no further noise mitigation measures are necessary.

Regulation 14A provides requirements for the collection of waste stating that this activity can also be exempt from having to comply with regulation 7 prescribed standards provided it is undertaken between 7am and 7pm Mondays to Saturdays and undertaken in the quietest reasonable manner. Collection outside of these hours will require a separate noise management plan.

Appendix A

Site Plans



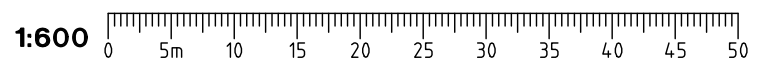
DEVELOPMENT APPLICATION

Revisions

General Notes

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Drawing Notes



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Project
PROPOSED McDONALD'S RESTAURANT ALKIMOS
Location
LOT 2242 CNR MARMION AVENUE & HAWKSBILL DRIVE
ALKIMOS, WA 6038

Scale 1:600 @ A3	Series MOD_BIO
Drawing OVERALL SITE PLAN	
Project Number 0772	Drawing Number DA01
Issue -	

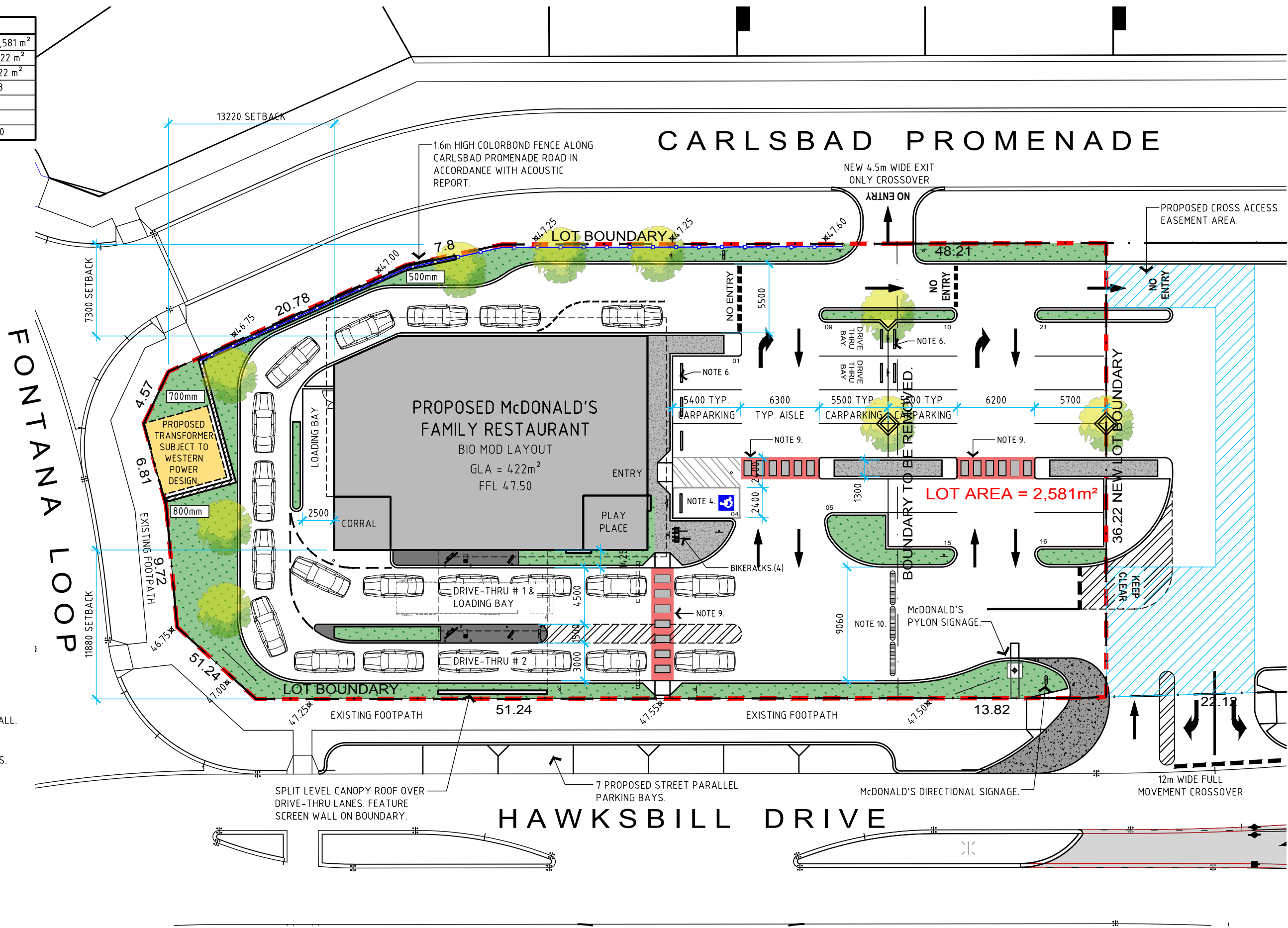
TABLE 1: McDONALD'S ALKIMOS	
PAD SITE AREA	2,581 m ²
BUILDING AREA	422 m ²
DINING ROOM AREA	122 m ²
STANDARD CAR BAYS	18
ACCESSIBLE CAR BAYS	1
DRIVE-THRU WAIT BAYS	2
DINING SEATING NUMBERS	80

NOTES

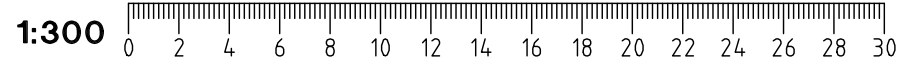
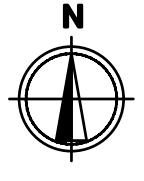
1. ALL PAVEMENT LINEMARKINGS SHALL BE WHITE EXCEPT WHERE NOTED. DO NOT PROVIDE A CONTINUOUS BORDER AROUND THE PERIMETER OF CHEVRON MARKING.
2. ANGLED LINEMARKING SHALL BE ADOPTED TO PEDESTRIAN WALKWAYS BETWEEN CAR SPACES AND WHERE SHOWN ON PLAN.
3. PERPENDICULAR LINEMARKING SHALL BE ADOPTED FOR PEDESTRIAN CROSSINGS.
4. THE ACCESSIBLE PARKING SPACE SHALL BE DELINEATED WITH A LINEMARKED PERIMETER AND THE INTERNATIONAL SYMBOL IN ACCORDANCE WITH AS1428.1 AND AS SPECIFIED.
5. THE TOP AND VERTICAL FACE OF KERBS SHALL BE PAINTED YELLOW IN ALL AREAS WHICH COULD BE TRAFFICKED BY PEDESTRIANS. THE DRIVE THRU LANE MAY BE EXCLUDED IF APPROPRIATE SIGNAGE IS PROVIDED. REFER TO SIGNAGE SCHEDULE.
6. WHEELSTOPS SHALL BE AVOIDED AND ONLY INSTALLED ON COMPLETION OF A RISK ASSESSMENT AND WHERE ALTERNATIVE PROTECTION DEVICES ARE UNSUITABLE. WHEELSTOPS SHALL BE PAINTED YELLOW, CENTRED ON THE CAR SPACE AND INSTALLED IN ACCORDANCE WITH AS2890.1.
7. WHEELSTOP SPACING SHALL BE 620 FROM FACE OF KERB (INCREASE TO 820 AGAINST HIGH KERBS OR WALLS). WHEELSTOPS SHALL BE 1650 LONG.
8. CAR PARK ENTRY AND EXITS SHALL BE DESIGNED IN ACCORDANCE WITH LOCAL AUTHORITY REQUIREMENTS AND AS2890.1.
9. COLOURED PEDESTRIAN CROSSING WITH WHITE LINEMARKING.
10. SPEED HUMP AS SPECIFIED. INSTALL SPEED HUMPS AS FOLLOWS: BEFORE PEDESTRIAN WALKWAYS, BEFORE INTERSECTIONS WITH LIMITED SIGHT DISTANCE, AT A MAX. SPACING OF 50 METRES BETWEEN SPEED HUMPS. REFER TO CIVIL DRAWINGS FOR DETAILS.

LEGEND

- B • BOLLARD.
- PROPOSED RETAINING WALL.
- SOFT LANDSCAPING BEDS.
- CONCRETE FOOTPATHS.
- EXISTING SPOT LEVEL.
- HEIGHT OF PROPOSED RETAINING WALL ABOVE FOOTPATH LEVEL.

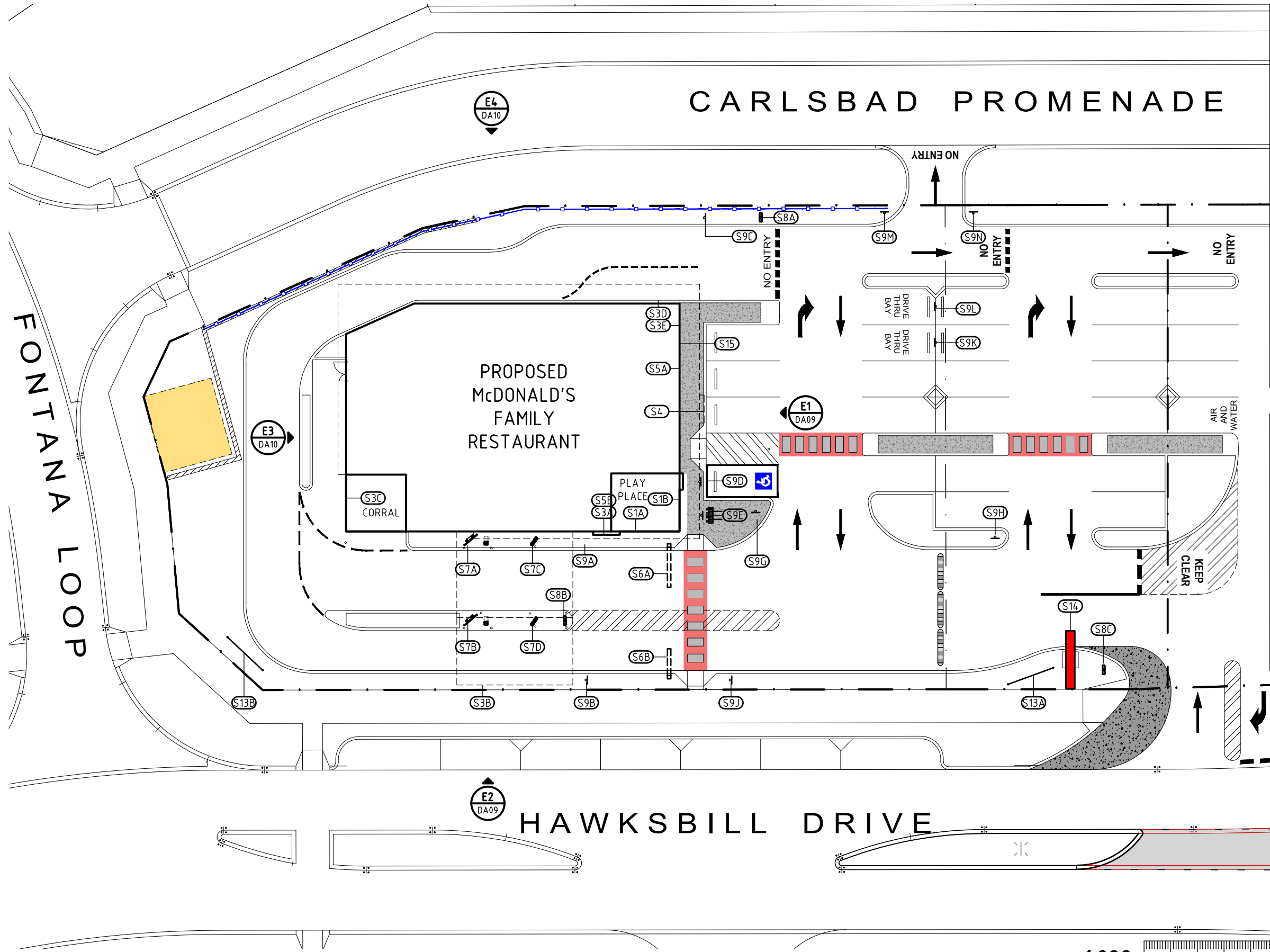


Revisions	General Notes	Drawing Notes
	Do not scale this drawing. The drawing shows design intent only. All dimensions to be checked on site prior to construction or production. Construction details to be confirmed by contractor/manufacturer. This is a computer generated drawing. Do not amend by hand. Figure dimensions are to be used. Contact architect for clarification if dimensions are not clear. All dimensions are in millimeters. All discrepancies and omissions on site must be reported to the architect for their comments or approval prior to commencing work.	



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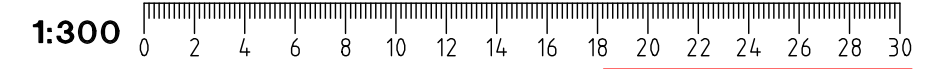
DEVELOPMENT APPLICATION



ILLUMINATED SIGNAGE:	
TAG	DESCRIPTION
S1A, S1B	WALL SIGN. 2.40x0.69m HIGH "PLAY PLACE" LOGO.
S3A, S3B, S3C, S3D, S3E.	WALL + BLADE SIGN. 1.37m X 1.2m "M" LOGO.
S4	ENTRY FASCIA SIGN. 1.9m X 0.23m WORDING: "McDONALD'S".
S5A	WALL BUTTON SIGN. 1.20φ WORDING: "McCAFE"
S5B	WALL BLADE SIGN. 1.42m x 0.70m HIGH WORDING: "McCAFE"
S6A, S6B	HEIGHT CLEARANCE GANTRY. (EXTENDED ROTATING HEIGHT CLEARANCE GANTRY).
S7A, S7B	DIGITAL MENUBOARD (DOUBLE SIZE).
S7C, S7D	DIGITAL PRESELL MENUBOARD (SINGLE SIZE).
S8A, S8B, S8C.	DIRECTIONAL SIGN. 0.7 X 2.3m HIGH. DOUBLE SIDED. WORDING VARIES. REFER TO DA13.
S14	PYLON SIGN. REFER DA12 FOR HEIGHT.
S15	McDELIVERY WALL SIGN 0.4m X 0.4m

NON-ILLUMINATED SIGNAGE:	
TAG	DESCRIPTION
S9A, S9B, S9C	SINGLE SIDED: "NO PEDESTRIAN ACCESS".
S9D	ACCESSIBLE PARKING BAY
S9E	DOUBLE SIDED: BIKE RACK
S9F	WORDING: "10km/HR ". SINGLE SIDED.
S9G, S9H, S9I, S9J	PEDESTRIAN CROSSING : DOUBLE SIDED.
S9K, S9L	WORDING: "DRIVE-THRU WAIT ". SINGLE SIDED.
S9M, S9N	WORDING: "NO ENTRY ". SINGLE SIDED.
S13A, S13B	BANNER SIGN.

REFER DA01 AND DA12 FOR McDONALD'S REMOTE BUILDING SIGNAGE. SUBJECT TO SEPARATE APPLICATION.



DEVELOPMENT APPLICATION

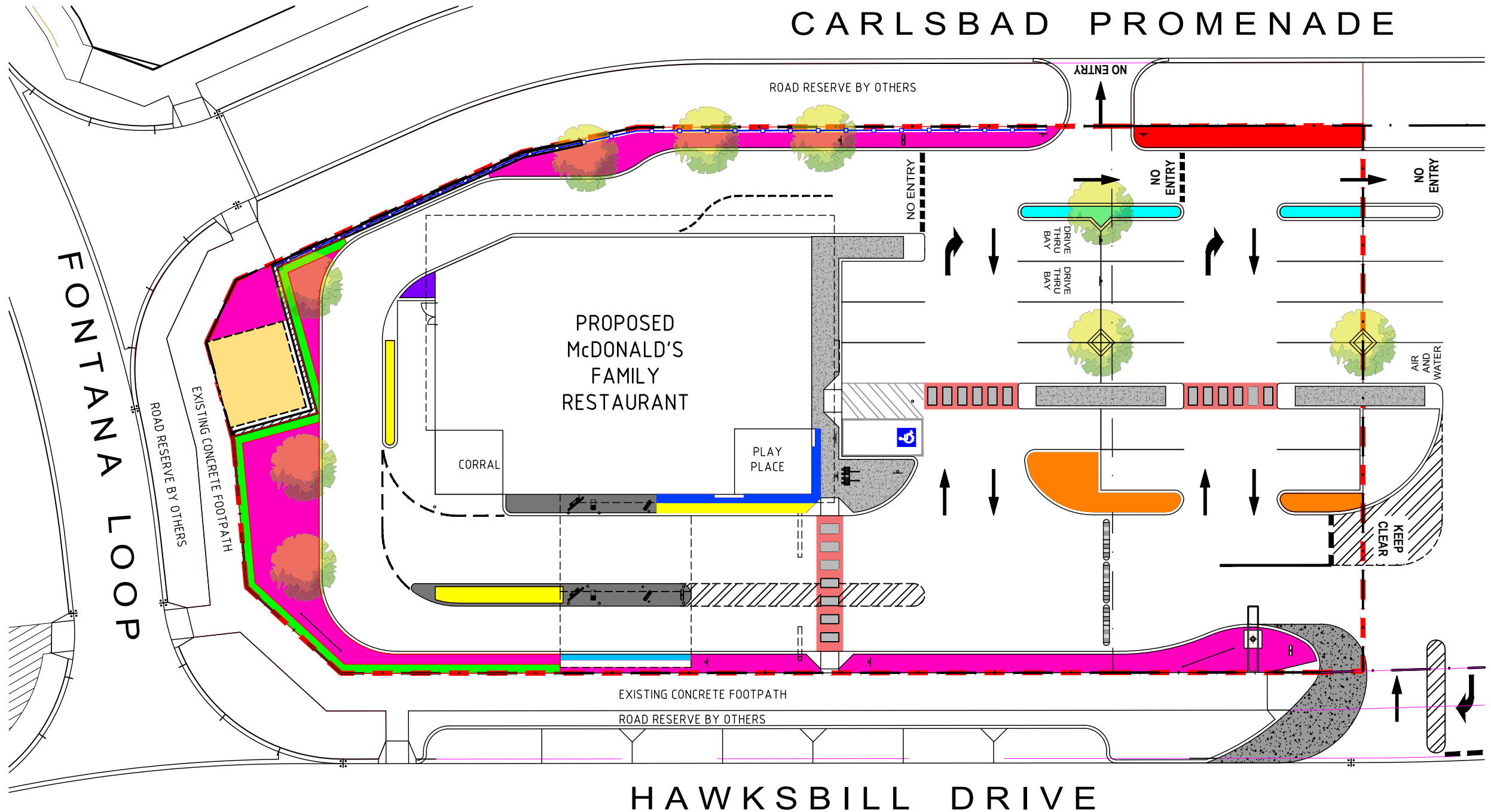
Revisions

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Drawing Notes

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CARLSBAD PROMENADE



PLANT LEGEND: RADERMACHERA "SUMMERSCENT" INDIAN HAWTHORN FORMED AS HEDGE. SYZYGIUM RESILIENCE "LILLY PILLY" HIBBERTIA "SNAKE VINE". MASS PLANTING OF AGAVE. MIX OF KANGAROO PAW AND HIBBERTIA "SNAKE VINE". VIBURNUM TINUS - FORMED AS HEDGE. SHORE JUNIPER GREVILLEA JUMPERINA.			TREE LEGEND: AGONIS FLEXUOSA. 9 IN TOTAL.	GENERAL NOTES: 1. BUILDER TO ENSURE DRIPPER FED RETICULATION TO ALL NEW LANDSCAPING 2. ALL LANDSCAPED BED WILL BE MULCHED TO A DEPTH OF 75mm WITH AN ORGANIC MULCH. 3. PLANTING BEDS WILL HAVE A MINIMUM DEPTH OF 400mm OF CLEAN TOP SOIL (SUITABLE FOR HORTICULTURAL QUALITY). PLEASE ENSURE NO CONTAMINANTS ARE PRESENT. 4. ALL PLANTS EXCEEDING 900mm SHALL BE STAKED AND SECURED. 5. ALL PLANTS WILL BE FERTILIZED DURING PLANTING WITH A SLOW RELEASE FERTILIZER WITH A MIN NPK RATIO OF 18:2:6:10. 6. LANDSCAPING AREA = 318 m ² . LOT AREA = 2,581 m ² LANDSCAPING % = 12.3%
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DEVELOPMENT APPLICATION

Revisions

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Drawing Notes

N

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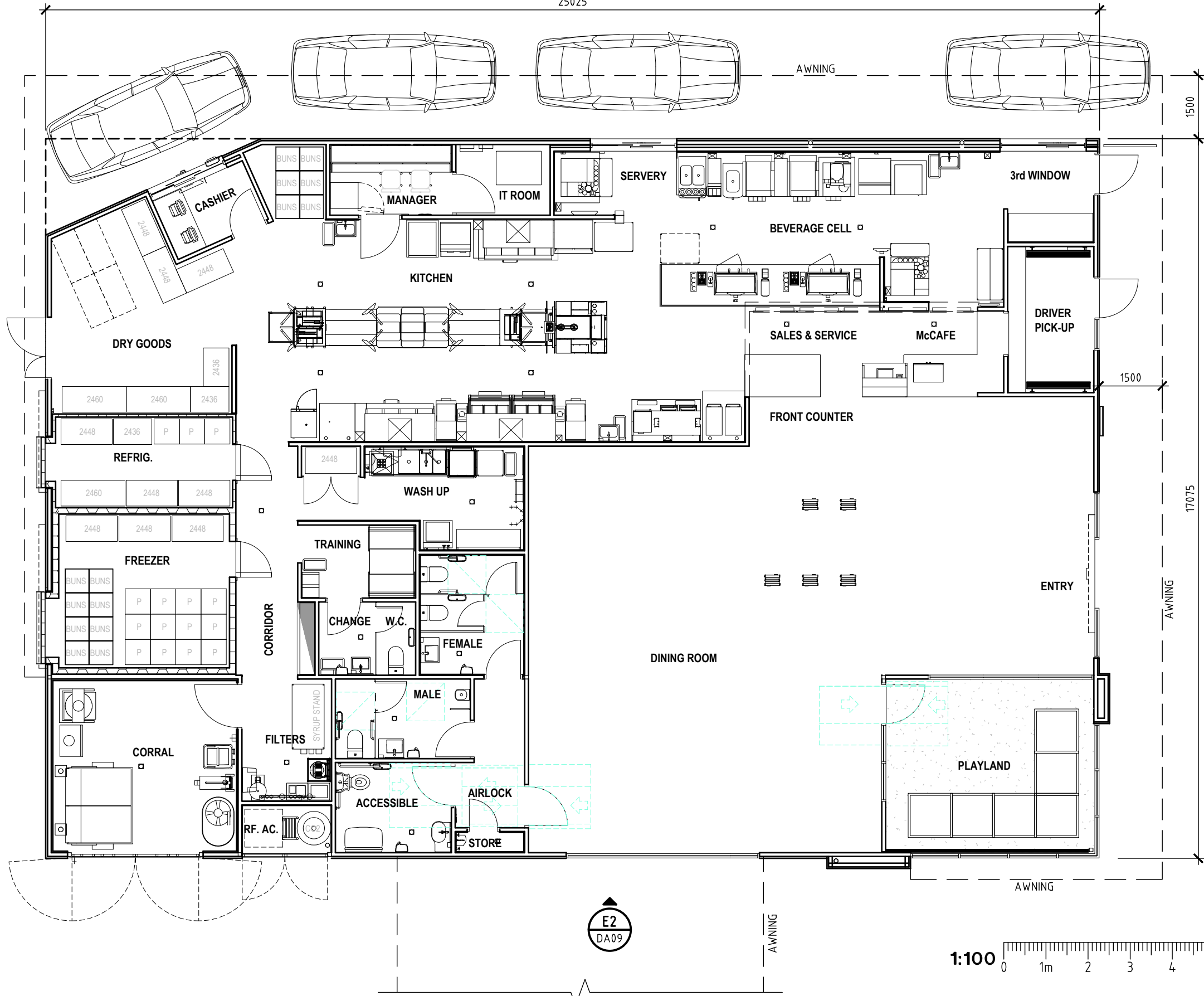
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Project
PROPOSED McDONALD'S RESTAURANT ALKIMOS
 Location
 LOT 2242 CNR MARMION AVENUE & HAWKSBILL DRIVE
 ALKIMOS, WA 6038

Scale
 1:300 @ A3
 Drawing
LANDSCAPE PLAN
 Project Number
0772
 Series
 MOD_BIO
 Drawing Number
DA04
 Issue
 -

E3
DA10

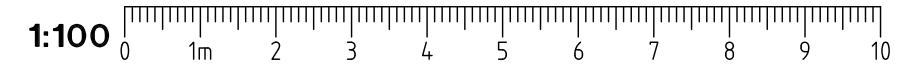
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E4
DA10

E1
DA09

E2
DA09



DEVELOPMENT APPLICATION

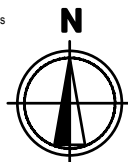
REFER DA06 FOR CONTINUATION.

Revisions

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Project

**PROPOSED McDONALD'S
 RESTAURANT ALKIMOS**

Location

LOT 2242 CNR MARMION AVENUE &
 HAWKSBILL DRIVE
 ALKIMOS, WA 6038

Scale

1:100 @ A3

Drawing

PROPOSED FLOOR PLAN

Project Number

0772

Series

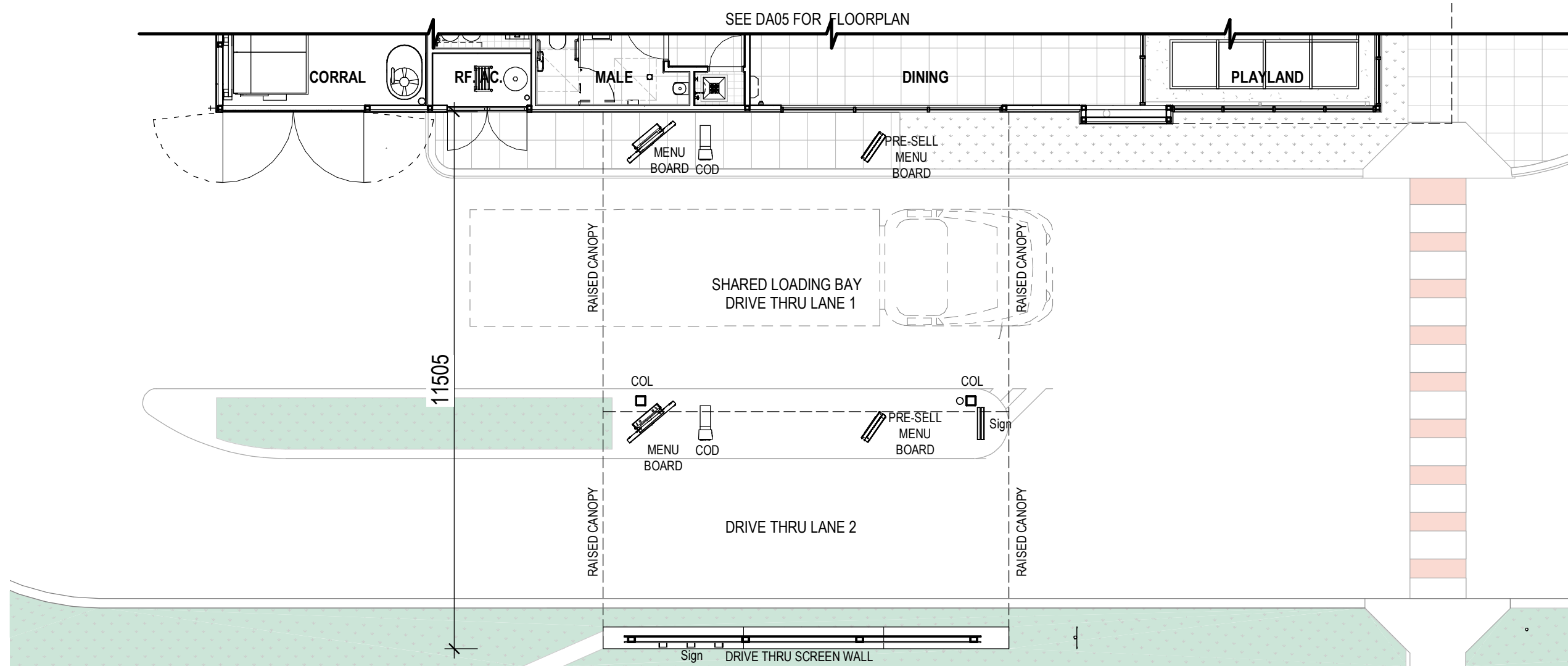
MOD_BIO

Drawing

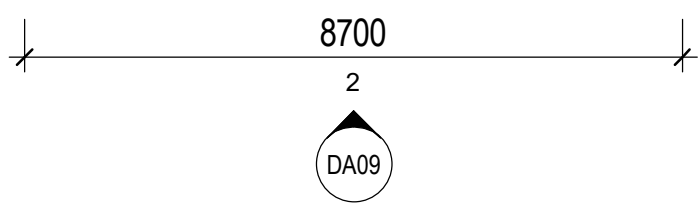
DA05

Issue

-



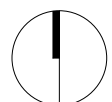
1 FLOOR PLAN DRIVE THRU
DA09 1:100



Revisions	Date	Chk	Int
DEVELOPMENT APPLICATION	16.11.2022	AU	RCP
IssueDescription			

General Notes
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Drawing Notes



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Project
MCDONALDS FAMILY RESTAURANT ALKIMOS
 Location
 LOT 2242 CNR MARMION AVE & HAWKINS DRIVE
 ALKIMOS, WA 6038

DEVELOPMENT APPLICATION

Scale	Series	
1:100 @ A3	BIO_MOD	
Drawing		
FLOOR PLAN DRIVE THRU		
Project Number	Drawing Number	Issue
0772	DA06	-

SOLAR SWITCHBOARD SUPPLIED & INSTALLED BY ELECTRICAL CONTRACTOR

SOLAR PANEL INVERTERS

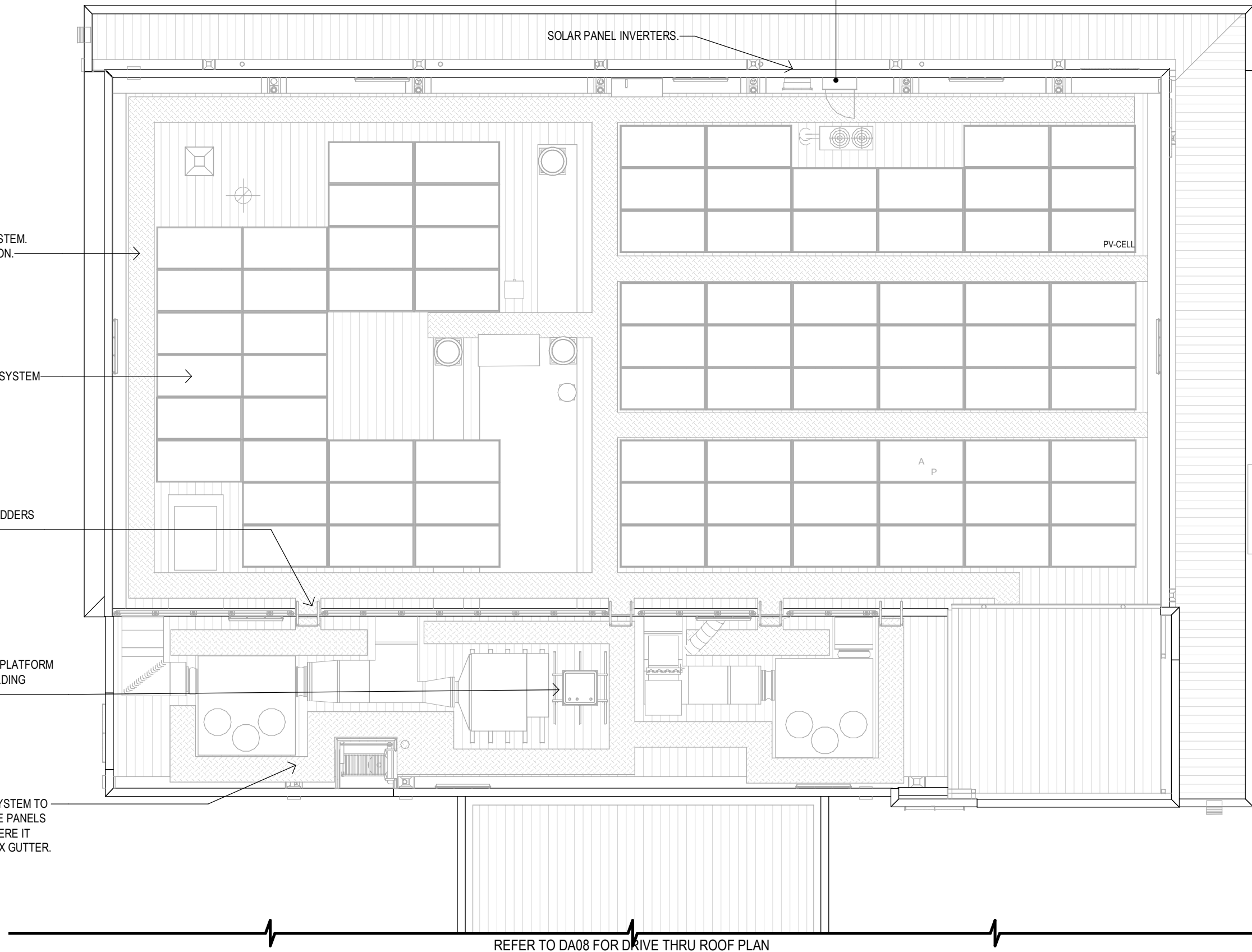
ROOF WALKWAY SYSTEM. REFER SPECIFICATION.

30kW SOLAR PANEL SYSTEM

VERTICAL ROOF LADDERS TO AS 1657.

AIR CONDITIONING PLATFORM SCREENED BY BUILDING PARAPET

ROOF WALKWAY SYSTEM TO HAVE REMOVEABLE PANELS FOR CLEANING WHERE IT OVERLAPS THE BOX GUTTER.

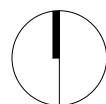


REFER TO DA08 FOR DRIVE THRU ROOF PLAN

Revisions	Date	Chk	Int
DEVELOPMENT APPLICATION	16.11.2022	AU	ROP
Issue/Description			

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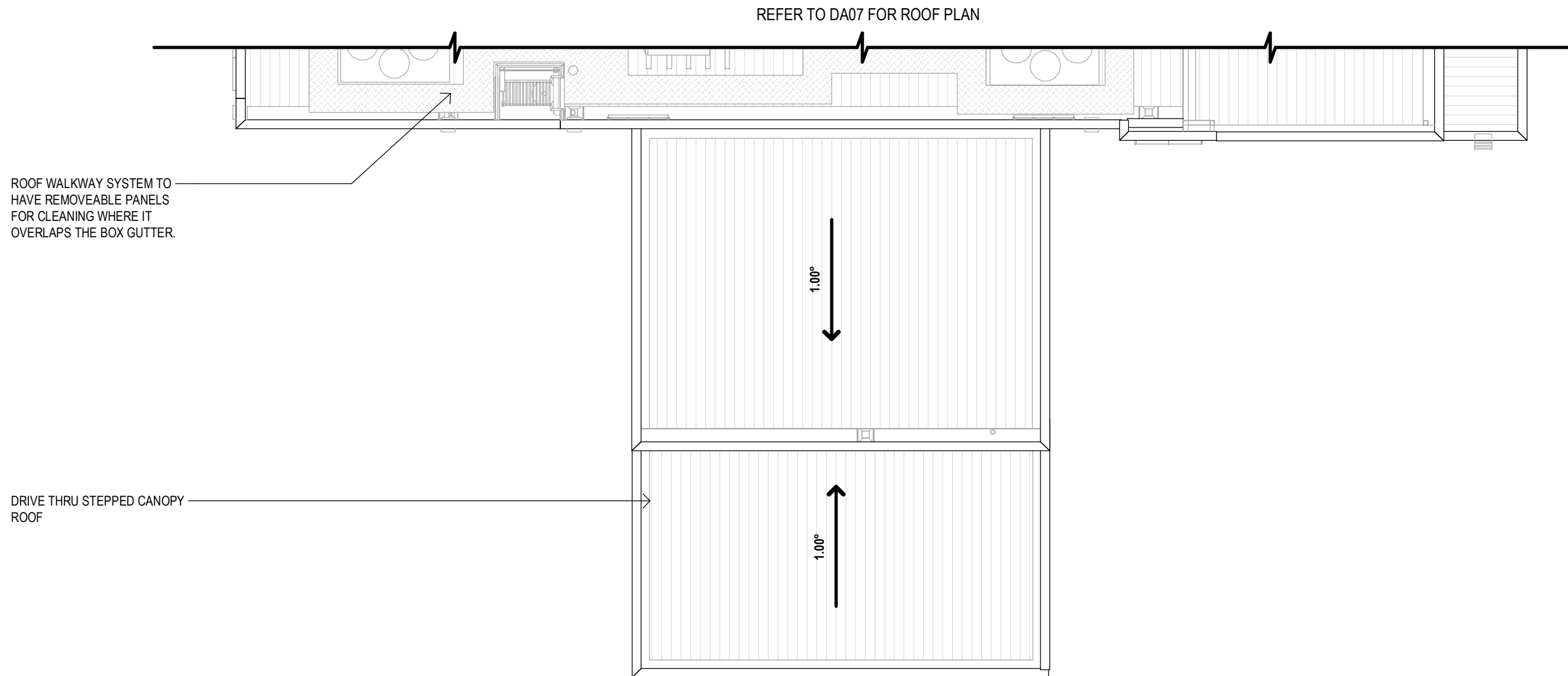

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Project
MCDONALDS FAMILY RESTAURANT ALKIMOS
 Location
 LOT 2242 CNR MARMION AVE & HAWKINS DRIVE
 ALKIMOS, WA 6038

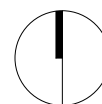
DEVELOPMENT APPLICATION

Scale 1:100 @ A3	Series BIO_MOD
Drawing ROOF PLAN	
Project Number 0772	Drawing Number DA07
Issue -	



1 ROOF PLAN DRIVE THRU
 DA09 1:100

Revisions	General Notes	Drawing Notes
DEVELOPMENT APPLICATION IssueDescription	Do not scale this drawing. The drawing shows design intent only. All dimensions to be checked on site prior to construction or production. Construction details to be confirmed by contractor/manufacture. This is a computer generated drawing. Do not amend by hand. Figure dimensions are to be used. Contact architect for clarification if dimensions are not clear. All dimensions are in millimeters. All discrepancies and omissions on site must be reported to the architect for their comments or approval prior to commencing work.	
16.11.2022 AU RCP Date Chk Int		



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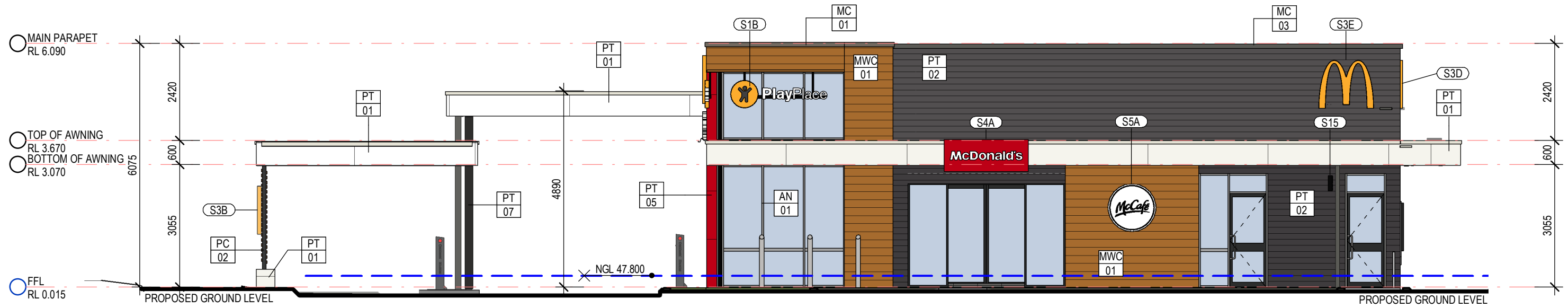
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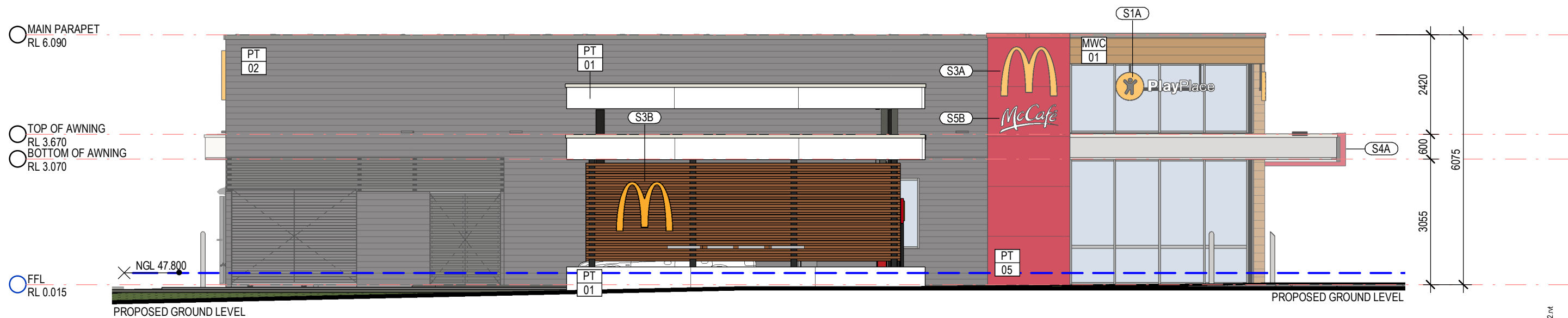
Project
MCDONALDS FAMILY RESTAURANT ALKIMOS
 Location
 LOT 2242 CNR MARMION AVE & HAWKINS DRIVE
 ALKIMOS, WA 6038

DEVELOPMENT APPLICATION

Scale	Series
1:100 @ A3	BIO_MOD
Drawing	ROOF PLAN - DRIVE THRU
Project Number	Drawing Number
0772	DA08
	Issue
	-



1 FRONT ELEVATION - EAST
DA05 1:100



2 SIDE ELEVATION - SOUTH
DA06 1:100

Revisions	General Notes	Drawing Notes
IssueDescription	Date Chk Int	
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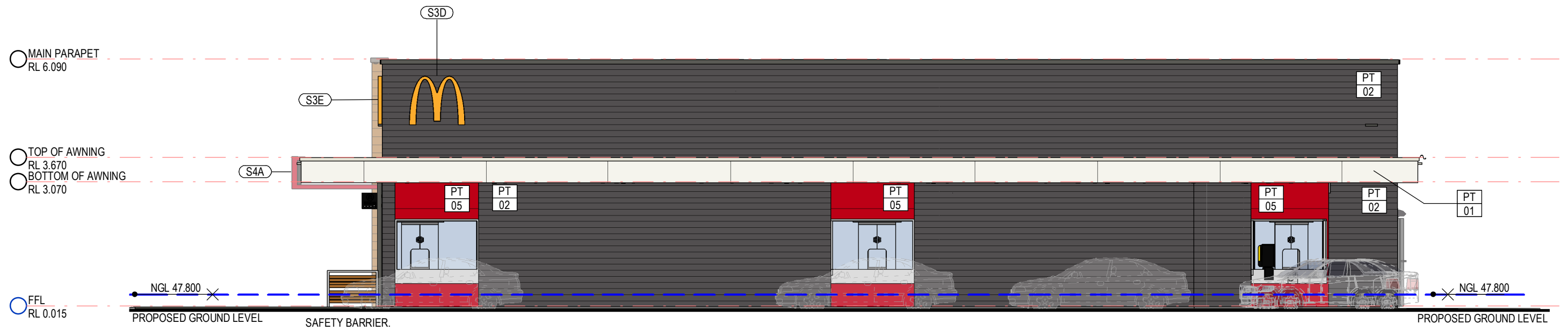

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Project
McDONALDS FAMILY RESTAURANT ALKIMOS
 Location
 LOT 2242 CNR MARMION AVE & HAWKINS DRIVE
 ALKIMOS, WA 6038

DEVELOPMENT APPLICATION

Scale	Series
1:100 @ A3	BIO_MOD
Drawing	FRONT & SIDE BUILDING ELEVATIONS
Project Number	Drawing Number
0772	DA09
Issue	-



3 DRIVE THRU WINDOWS - NORTH
DA05 1:100



4 REAR ELEVATION - WEST
DA05 1:100

Revisions		General Notes	
DEVELOPMENT APPLICATION	16.11.202 AU RCP	Do not scale this drawing. The drawing shows design intent only. All dimensions to be checked on site prior to construction or production. Construction details to be confirmed by contractor/manufacturer. This is a computer generated drawing. Do not amend by hand. Figure dimensions are to be used. Contact architect for clarification if dimensions are not clear. All dimensions are in millimeters. All discrepancies and omissions on site must be reported to the architect for their comments or approval prior to commencing work.	
Issue/Description	Date Chk Int		

Drawing Notes
1. REFER TO MASTER LEGENDS ON DA021, FINISHES LEGENDS ON DA205. SIGNAGE PLAN ON DA801

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DEVELOPMENT APPLICATION

Scale	Series
1:100 @ A3	BIO_MOD
Drawing	DRIVE THRU & REAR ELEVATIONS
Project Number	Drawing Number
0772	DA10
	Issue
	-



EXTERNAL FINISHES SCHEDULE

CODE	No.	AREA	DESCRIPTION	MANUFACTURER	COLOUR	IMAGE
AN	01	ALUMINIUM WINDOWS & DOOR FRAMES	PREFABRICATED ALUMINIUM FRAMING	CAPRAL	Black Satin (Night Sky) 19268	
MC	01	PARAPET CAPPING	METAL CAPPING / FLASHING	ZINCALUME - PAINTED	DULUX GUITAR	
MC	02	PARAPET CAPPING	METAL CAPPING / FLASHING	ZINCALUME - PAINTED	DULUX VIVID WHITE	
MC	03	PARAPET CAPPING	METAL CAPPING / FLASHING	ZINCALUME - PAINTED	DULUX WAYWARD GREY	
MC	04	PARAPET CAPPING	PREFINISHED METAL CAPPING / FLASHING	COLORBOND	HOT LIPS	
MWC	01	PLAYPLACE & PARAPETS	TIMBER LOOK ALUMINIUM CLADDING SYSTEM USING KNOTWOOD 200mm CLADDING PROFILE	KNOTWOOD	LIGHT OAK	
MWC	02	ROOF WELL (INTERNAL PARAPET LINING)	CUSTOM ORB CORRUGATED STEEL RIVET FIXED VERTICALLY TO FRAMES	LYSAGHT	ZINCALUME	
MWC	03	ROOF WELL (PLAYPLACE WALL LINING)	CUSTOM ORB CORRUGATED STEEL RIVET FIXED VERTICALLY TO FRAMES	LYSAGHT	WOODLAND GREY	

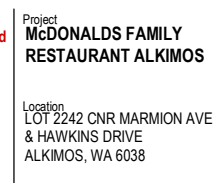
EXTERNAL FINISHES SCHEDULE

CODE	No.	AREA	DESCRIPTION	MANUFACTURER	COLOUR	IMAGE
PC	01	CORRAL BATTENS & ROOF ACCESS, ELEC. ROOM DOORS	POWDERCOAT FINISH	DULUX DURALLOY	MONUMENT SATIN (COLORBOND)	
PT	01	FASCIAS (RIBBON)	PAINT FINISH. REFER SPECIFICATION FOR DETAILS ON PAINT TYPE & APPLICATION	DULUX	VIVID WHITE PW1H9	
PT	02			DULUX		
PT	05	BLADE WALL & DRIVETHRU WINDOWS	PAINT FINISH. REFER SPECIFICATION FOR DETAILS ON PAINT TYPE & APPLICATION	DULUX	McDONALDS RED DULUX "HOT LIPS".	
STN	01	DRIVETHRU WINDOW SILL & SURROUND	RECONSTITUTED STONE. REFER TO DECOR DOCUMENTS	REFER DECOR	REFER DECOR	

Revisions	General Notes	Drawing Notes
DEVELOPMENT APPLICATION 16.11.2022 AU ROP 1 Date Chk Int	Do not scale this drawing. The drawing shows design intent only. All dimensions to be checked on site prior to construction or production. Construction details to be confirmed by contractor/manufacturer. This is a computer generated drawing. Do not amend by hand. Figure dimensions are to be used. Contact architect for clarification if dimensions are not clear. All dimensions are in millimeters. All discrepancies and omissions on site must be reported to the architect for their comments or approval prior to commencing work.	1. FOR BUILDING ELEVATIONS REFER A201-A203

Client	Architect	Project
 McDonald's Australia Limited ABN. 43 008 496 928 02 9875 6666 devgroup-aust@au.mcd.com	 Hindley and Associates Pty Ltd Building Designers Unit 4/166 Stirling Highway Nedlands WA 6009 PO Box 199 Nedlands WA 6909 08 9386 6699 www.hindley.com.au	McDONALDS FAMILY RESTAURANT ALKIMOS Location LOT 2242 CNR MARMION AVE & HAWKINS DRIVE ALKIMOS, WA 6038

Scale	Series
NTS	BIO_MOD
Drawing	
FINISHES SCHEDULE	
Project Number	Drawing Number Issue
0772	DA11 -



DEVELOPMENT APPLICATION

Scale	Series
NTS	BIO_MOD
Drawing	
FINISHES SCHEDULE	
Project Number	Drawing Number Issue
0772	DA11 -

Appendix B

Terminology

The following is an explanation of the terminology used throughout this report.

Decibel (dB)

The decibel is the unit that describes the sound pressure and sound power levels of a noise source. It is a logarithmic scale referenced to the threshold of hearing.

A-Weighting

An A-weighted noise level has been filtered in such a way as to represent the way in which the human ear perceives sound. This weighting reflects the fact that the human ear is not as sensitive to lower frequencies as it is to higher frequencies. An A-weighted sound level is described as L_A dB.

Sound Power Level (L_w)

Under normal conditions, a given sound source will radiate the same amount of energy, irrespective of its surroundings, being the sound power level. This is similar to a 1kW electric heater always radiating 1kW of heat. The sound power level of a noise source cannot be directly measured using a sound level meter but is calculated based on measured sound pressure levels at known distances. Noise modelling incorporates source sound power levels as part of the input data.

Sound Pressure Level (L_p)

The sound pressure level of a noise source is dependent upon its surroundings, being influenced by distance, ground absorption, topography, meteorological conditions etc and is what the human ear actually hears. Using the electric heater analogy above, the heat will vary depending upon where the heater is located, just as the sound pressure level will vary depending on the surroundings. Noise modelling predicts the sound pressure level from the sound power levels taking into account ground absorption, barrier effects, distance etc.

L_{ASlow}

This is the noise level in decibels, obtained using the A frequency weighting and the S (Slow) time weighting as specified in IEC 61672-1:2002. Unless assessing modulation, all measurements use the slow time weighting characteristic.

L_{AFast}

This is the noise level in decibels, obtained using the A frequency weighting and the F (Fast) time weighting as specified in IEC 61672-1:2002. This is used when assessing the presence of modulation only.

L_{APeak}

This is the greatest absolute instantaneous sound pressure in decibels using the A frequency weighting as specified in IEC 61672-1:2002.

L_{Amax}

An L_{Amax} level is the maximum A-weighted noise level during a particular measurement.

L_{A1}

An L_{A1} level is the A-weighted noise level which is exceeded for one percent of the measurement period and is considered to represent the average of the maximum noise levels measured.

L_{A10}

An L_{A10} level is the A-weighted noise level which is exceeded for 10 percent of the measurement period and is considered to represent the "intrusive" noise level.

L_{Aeq}

The equivalent steady state A-weighted sound level (“equal energy”) in decibels which, in a specified time period, contains the same acoustic energy as the time-varying level during the same period. It is considered to represent the “average” noise level.

L_{A90}

An L_{A90} level is the A-weighted noise level which is exceeded for 90 percent of the measurement period and is considered to represent the “background” noise level.

One-Third-Octave Band

Means a band of frequencies spanning one-third of an octave and having a centre frequency between 25 Hz and 20 000 Hz inclusive.

L_{Amax} assigned level

Means an assigned level which, measured as a $L_{A\ Slow}$ value, is not to be exceeded at any time.

L_{A1} assigned level

Means an assigned level which, measured as a $L_{A\ Slow}$ value, is not to be exceeded for more than 1% of the representative assessment period.

L_{A10} assigned level

Means an assigned level which, measured as a $L_{A\ Slow}$ value, is not to be exceeded for more than 10% of the representative assessment period.

Tonal Noise

A tonal noise source can be described as a source that has a distinctive noise emission in one or more frequencies. An example would be whining or droning. The quantitative definition of tonality is:

the presence in the noise emission of tonal characteristics where the difference between -

- (a) the A-weighted sound pressure level in any one-third octave band; and
- (b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,

is greater than 3 dB when the sound pressure levels are determined as $L_{Aeq,T}$ levels where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as $L_{A\ Slow}$ levels.

This is relatively common in most noise sources.

Modulating Noise

A modulating source is regular, cyclic and audible and is present for at least 10% of the measurement period. The quantitative definition of modulation is:

a variation in the emission of noise that —

- (a) is more than 3 dB $L_{A\ Fast}$ or is more than 3 dB $L_{A\ Fast}$ in any one-third octave band;
- (b) is present for at least 10% of the representative.

Impulsive Noise

An impulsive noise source has a short-term banging, clunking or explosive sound. The quantitative definition of impulsiveness is:

a variation in the emission of a noise where the difference between $L_{A\ peak}$ and $L_{A\ Max\ slow}$ is more than 15 dB when determined for a single representative event;

Major Road

Is a road with an estimated average daily traffic count of more than 15,000 vehicles.

Secondary / Minor Road

Is a road with an estimated average daily traffic count of between 6,000 and 15,000 vehicles.

Influencing Factor (IF)

$$= \frac{1}{10} (\% \text{ Type A}_{100} + \% \text{ Type A}_{450}) + \frac{1}{20} (\% \text{ Type B}_{100} + \% \text{ Type B}_{450})$$

where :

% Type A₁₀₀ = the percentage of industrial land within
a 100m radius of the premises receiving the noise

%TypeA₄₅₀ = the percentage of industrial land within
a 450m radius of the premises receiving the noise

% Type B₁₀₀ = the percentage of commercial land within
a 100m radius of the premises receiving the noise

%TypeB₄₅₀ = the percentage of commercial land within
a 450m radius of the premises receiving the noise

+ Traffic Factor (maximum of 6 dB)

= 2 for each secondary road within 100m

= 2 for each major road within 450m

= 6 for each major road within 100m

Representative Assessment Period

Means a period of time not less than 15 minutes, and not exceeding four hours, determined by an inspector or authorised person to be appropriate for the assessment of a noise emission, having regard to the type and nature of the noise emission.

Background Noise

Background noise or residual noise is the noise level from sources other than the source of concern. When measuring environmental noise, residual sound is often a problem. One reason is that regulations often require that the noise from different types of sources be dealt with separately. This separation, e.g. of traffic noise from industrial noise, is often difficult to accomplish in practice. Another reason is that the measurements are normally carried out outdoors. Wind-induced noise, directly on the microphone and indirectly on trees, buildings, etc., may also affect the result. The character of these noise sources can make it difficult or even impossible to carry out any corrections.

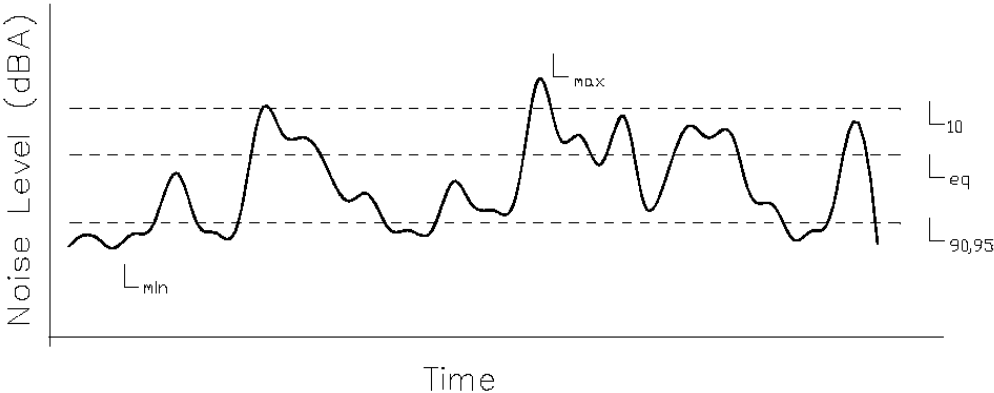
Ambient Noise

Means the level of noise from all sources, including background noise from near and far and the source of interest.

Specific Noise

Relates to the component of the ambient noise that is of interest. This can be referred to as the noise of concern or the noise of interest.

Chart of Noise Level Descriptors



Typical Noise Levels

