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February 8th, 2022

Mr Sean Mostyn
Director
Mostyn Copper Group
Suite 1 Level 8
9 Hunter Street
Sydney NSW 2000

Dear Sean,

Child Care Centre – 727 Warringah Road, Forestville NSW
Further Acoustic Assessment for Modification Application Mod2021/0859

1 BACKGROUND

The Mostyn Copper Group, on behalf of its client Warringah Rd Developments, is involved in the development of a new purpose-built childcare centre at 727 Warringah Road, Forestville NSW.

The development has been approved by Northern Beaches Council, the local government consent authority at interest.

Minto Town Planning Services has lodged a Modification Application with Council, seeking approval for some aspects of the approved development.

One aspect involves the installation of AC condenser units in alcoves on the eastern and western sides of Level 2 of the proposed childcare centre building, adjacent to the adjoining eastern and western residential boundaries.

Council requires an appropriate acoustic assessment of the proposed AC unit installations, to determine compliance (or otherwise) with the Noise Policy for Industry (2017); the Protection of the Environment Operations Act 1997 and the current Warringah DCP.

NG Child & Associates has been engaged to undertake the acoustic assessment required.

This report describes that assessment and presents its findings.

2 ACOUSTIC ASSESSMENT REPORT

The Warringah Road development was the subject of the following acoustic assessment, which formed part of the successful Development Application (DA) submission:

Acoustic Assessment Report Proposed Child Care Centre 723/727 Warringah Road Forestville NSW (Version 2; April 30th, 2018)

Background sound data and other acoustic data and calculations presented in that original acoustic report have been used as a basis for this acoustic compliance assessment.

3 ATTACHMENTS

The following diagrams and technical data have been attached for reference purposes as follows:

Attachment 1 Level 2 Mechanical Services Layout Showing AC Condenser Unit Locations

Attachment 2 AC Condenser Alcove Detail

Attachment 3 Distances from Warringah Road

Attachment 4 AC Condenser Unit Specifications

4 REQUIREMENT

In its Environmental Health Response of December 8th, 2021, Northern Beaches Council indicated that further acoustic assessment is required in relation to the proposed modification application, as follows:

> The proposal for modifications to be made to the approved structure includes air conditioning units to be installed in the second level alcove on both the western and eastern sides of the building. Because the alcoves are residential-facing, and, the noise impact of mechanical plant / air conditioning units has not been included in previous assessments, we require a noise impact assessment of the installation, to determine the compliance with Noise Policy for Industry (2017), Protection of Environment Operations Act 1997 and the current Warringah DCP.

This report provides the additional acoustic assessment required by Council.

5 ACOUSTIC ASSESSMENT

5.1 Measured Background Sound Levels

The background sound levels measured and reported in the April 2018 acoustic report are repeated for convenient reference in Table 5.1, below.

Figure 5.1 - Background Noise Levels at Varying Site Depths

Acoustic Parameter	Warringah Road	Background Noise Estimates at Distances from Warringah Road		
		30 Metres	50 Metres	70 Metres
LAeq dBA	67	63	59	57
LA90 dBA	62	59	54	53

These background sound levels have been calculated based on continuous monitoring at the site at distances of 30. 50 and 70 metres from Warringah Road. It is noted that road traffic on Warringah Road is the primary external noise source relevant to the development.

Attachment 3 confirms that the actual distances from Warringah Road of the alcoves that will contain the AC condenser units subject to the acoustic assessment are 83 metres on the western side, and 64 metres on the eastern side.

Background noise levels at these distances from Warringah Road have been calculated based on the data provided in the April 2018 acoustic report, and are presented in Table 5.2, below.

Figure 5.2 – Background Noise Levels at Location of the AC Units

Acoustic Parameter	Warringah Road	Background Noise Estimates at Distances from Warringah Road	
		64 metres	83 metres
LAeq dBA	67	56	55
LA90 dBA	62	53	52

From the point of view of assessing acoustic compliance with th the Noise Policy for Industry (2017); the Protection of the Environment Operations Act 1997 and the current Warringah DCP. The key acoustic parameter is the LA90 (daytime) measure, as this is the background sound measure that must not ne exceeded by more than 5 dBA at any affected residential boundary.

Full details and rationale for this requirement are provided in the original acoustic report, but the key compliance criterion is the acoustic amenity requirement set out in the Noise Policy for Industry (2017), and reflected in the current Warringah DCP

5.2 Noise Emission Levels from AC Condenser Units

The six AC condenser units proposed for installation in the alcoves on Level 2 of the Warringah Road childcare centre development are as follows:

- CU-L2-1: FDYQN200LCV1/RZQ200MY1
- CU-L2-2: FDYAN100AV1/RZA100CY1
- CU-L2-3: FDYAN160AV1/RZA160CY1
- CU-L2-4: FDYAN100AV1/RZA100CY1
- CU-L2-5: FDYQN180LCV1/RZQ180MY1
- CU-L2-6: FDYAN160AV1/RZA160CY1

Technical specifications including acoustic characteristics and performance are provided in Attachment 4.

Noise emissions from the AC condenser units are between 55 dBA and 59 dBA. Taking worse case noise emission assumptions and allowing for the presence of three units in each alcove, the maximum cumulative noise emissions from each alcove are assessed at 60 dBA.

5.3 Acoustic Impacts at Residential Boundaries

The maximum cumulative noise emissions identified in 5.2 above apply at a distance of one metre from the condensers. Attenuation of or reduction in these noise levels is provided by the distance of the units from the respective residential boundaries, and the acoustic protection (20 – 25 dBA based on the March 2018 acoustic report) provided by the 1800 mm lap and cap timber boundary fences proposed.

Noise reduction due to distance is calculated using the following equation:

$$SPL_2 = SPL_1 - 20 \log (d_2/d_1)$$

where:

SPL_2	=	sound level a distance “2” from the source in metres (predicted)
SPL_1	=	sound level a distance “1” from the source in metres (measured)
d_2	=	distance in metres to location 2 from the source
d_1	=	distance in metres to location 1 from the source

The acoustic impacts of the AC condensers on the residential side of the boundary fences, which is the key criterion in assessing acoustic compliance, are summarised in Table 5.3, below:

Table 5.3 – Acoustic Impacts at Residential Boundaries

	Cumulative Noise @ 1-metre	Reduction due to Distance	Reduction due to Acoustic Fence	Acoustic Impact at Residential Boundary
Western Boundary	60 dBA	(3 dBA)	(10 dBA)	47 dBA
Eastern Boundary	60 dBA	(3 dBA)	(10 dBA)	47 dBA

Note that the nominal acoustic attenuation performance of the boundary fence has been reduced by 50% to 10 dBA to ensure a conservative and safe assessment.

5.4 Acoustic Compliance

Acoustic compliance is assessed in table 5.4, below:

Table 5.4 – Acoustic Compliance Assessment

Outdoor Area	Noise Level (dBA)	Total Attenuation (dBA)	Impact at Boundary (dBA)	Allowable Impact (RBL + 5 dBA)	Comply
Level 2					
AC Condenser Units - West	60	(13)	47	52 + 5 + 57	YES
AC Condenser Units - West	60	(13)	47	53 + 5 + 58	YES

The acoustic impact of the three AC condenser units externally mounted in alcoves on Level 2 of the proposed childcare centre at adjoining residential property boundaries is shown to comply with the requirements of the Noise Policy for Industry (2017) and other relevant guidelines and regulations.

6 FINDINGS

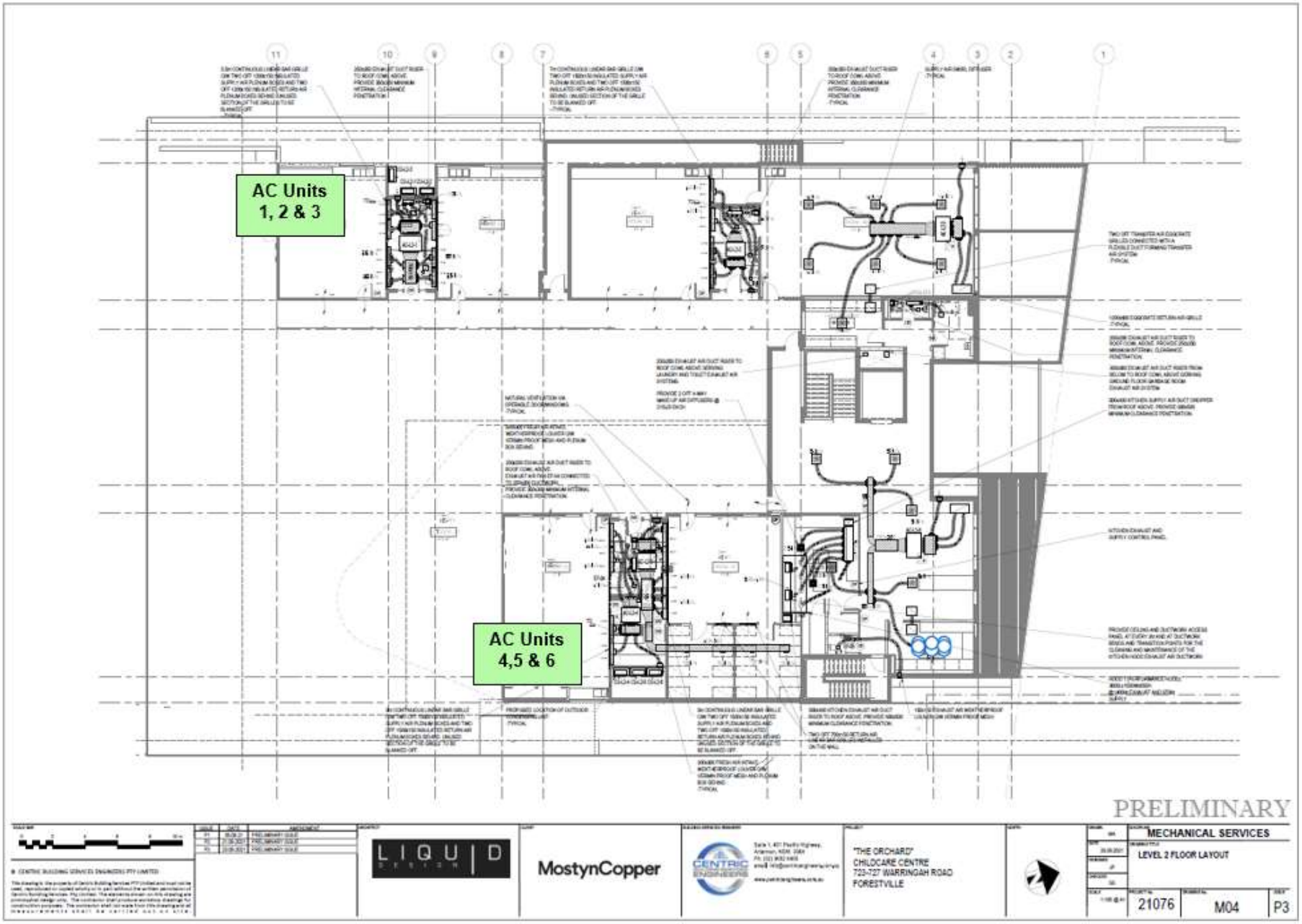
This assessment has confirmed that the operation of the six AC condenser units proposed for Level 2 of the childcare centre at 727 Warringah Road, Forestville NSW (three on the western side, and three on the eastern side) are assessed as having an acoustic imp[act no greater than 47 dBA at the adjacent residential boundaries, and will accordingly comply with relevant acoustic guidelines, and regulations.

Please contact me at any time if you require any further or more detailed information.

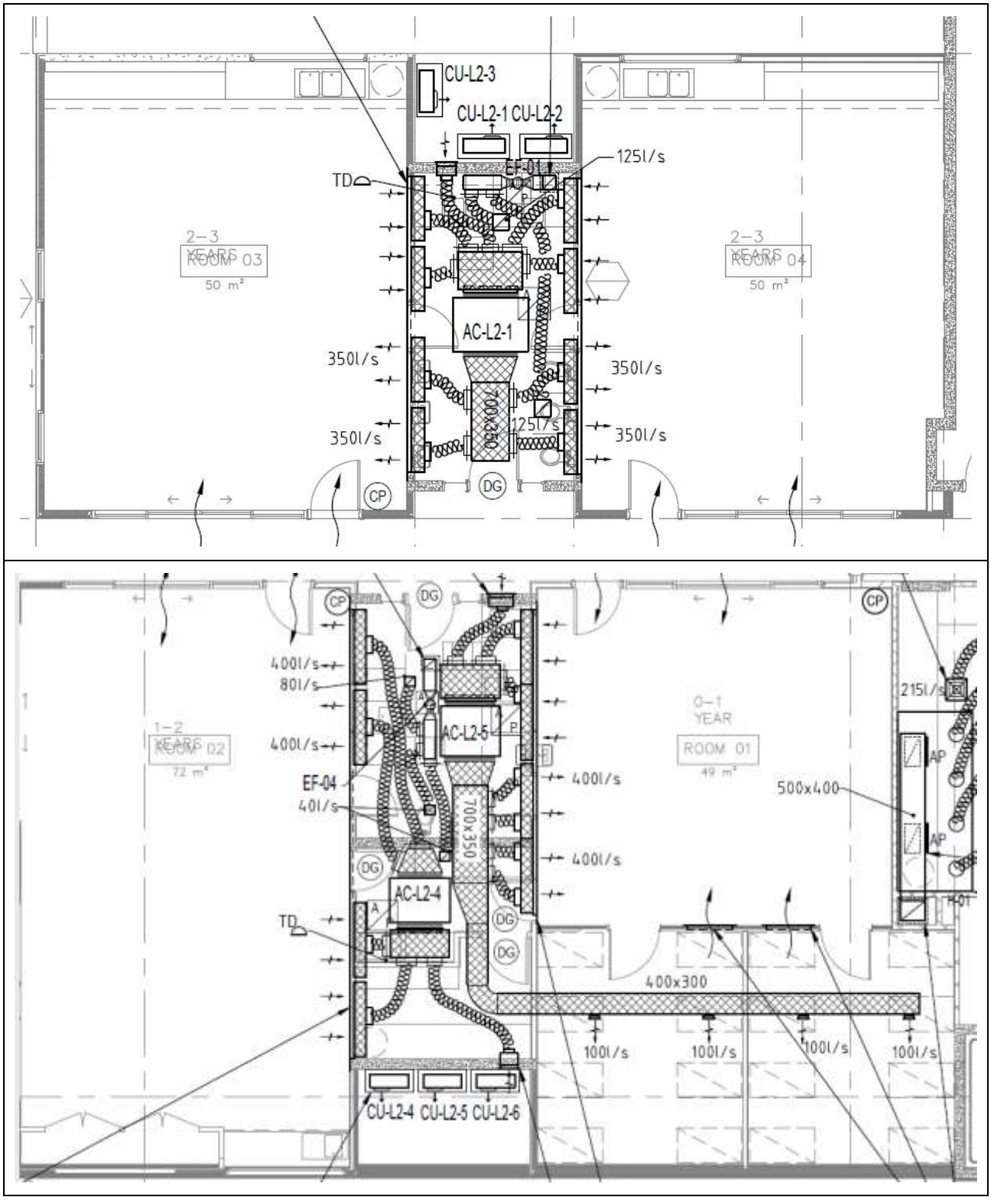
Yours Very Truly

Noel Child BSc Environmental (Hons), EIANZ
Principal, NG Child & Associates
8 February 2022

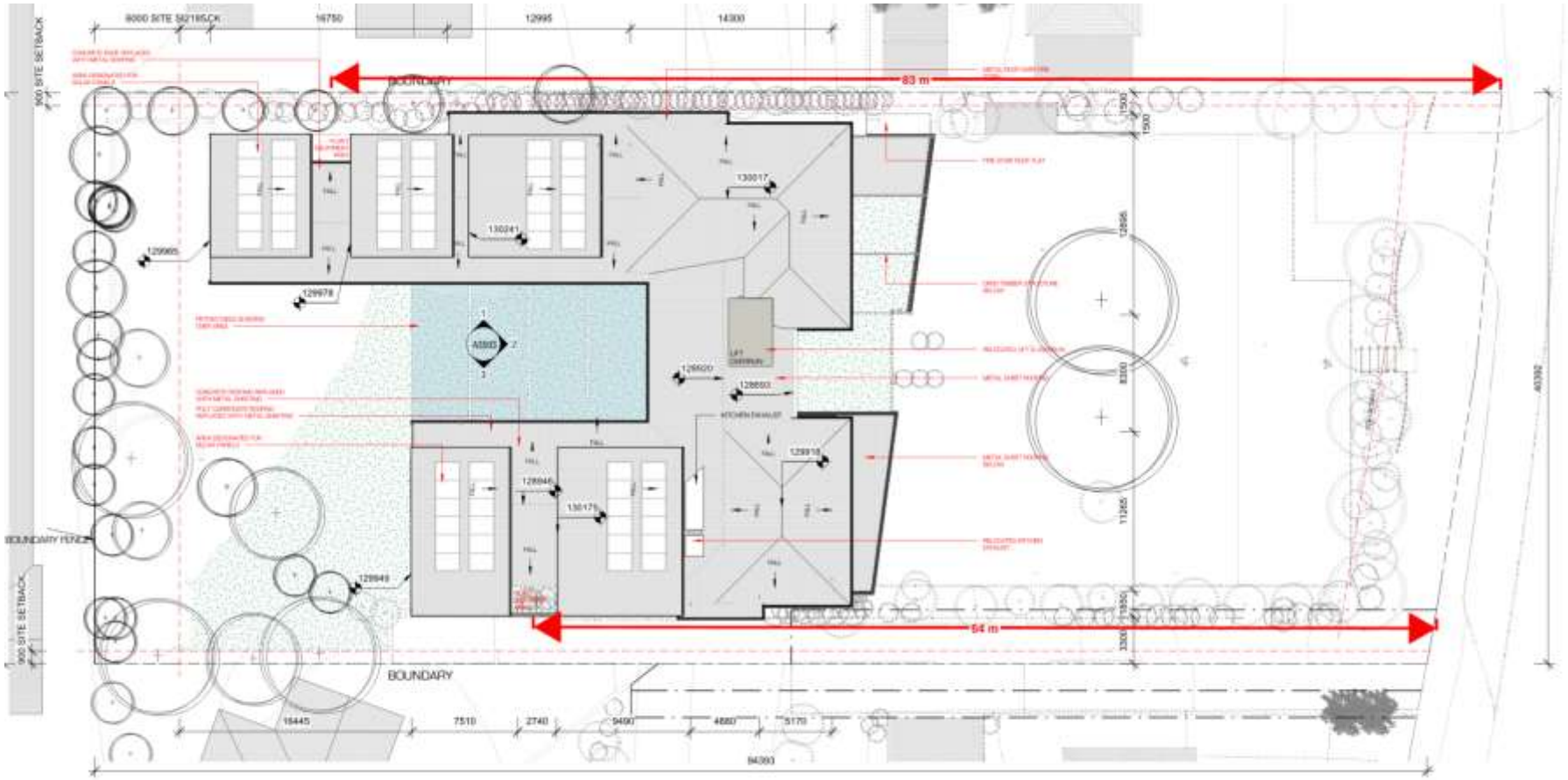
Attachments



Attachment 1 – Level 2 Mechanical Services Layout Showing AC Condenser Unit Locations



Attachment 2 – AC Condenser Alcove Detail



Attachment 3 – Distances from Warringah Road

Description | Additional information | Reviews (0) | Specifications

Indoor Unit		FDYAN71AV1	FDYAN85AV1	FDYAN100AV1	FDYAN125AV1	FDYAN140AV1	FDYAN160AV1	FDYQN180LCV1	FDY
Outdoor Unit		RZA71CY1	RZA85CY1	RZA100CY1	RZA125CY1	RZA140CY1	RZA160CY1	RZQ180MY1	RZC
Rated Capacity	Cool (kW)	7.1	8.5	10.0	12.5	14.0	15.5	18.0	19.5
	Heat (kW)	7.5	10.0	12.5	15.0	16.5	18.0	20.0	22.4
Capacity Range	Cool (kW)	3.2-8.0	3.2-10.0	3.2-11.2	4.0-14.0	5.0-16.0	7.0-16.3	9.0-18.0	10.1
	Heat (kW)	3.5-9.0	3.5-11.2	3.5-14.0	4.1-16.0	5.1-18.0	7.3-18.2	10.0-20.0	11.2
Power Input (Rated)	Cool (kW)	2.20	2.53	3.10	3.94	4.30	4.95	5.82	6.11
	Heat (kW)	1.93	2.80	3.35	4.00	4.50	4.90	6.11	6.85
E.E.R/C.O.P	C/H	3.23/3.89	3.36/3.57	3.23/3.73	3.17/3.75	3.26/3.67	3.13/3.67	3.09/3.27	3.19
TCSPF (Residential)	Hot/Average/Cold	4.44/3.92/4.00	4.29/3.85/3.90	4.26/3.88/3.97	4.26/3.91/4.02	4.19/3.87/3.97	4.05/3.76/3.87	3.61/3.15/3.13	3.57
HSPF (Residential)	Hot/Average/Cold	4.17/3.90/3.55	3.97/3.67/3.32	3.85/3.48/3.04	4.31/3.31/2.77	3.90/3.51/3.05	3.87/3.53/3.12	3.23/2.95/2.61	3.25
Airflow Rate (Nominal/Max)	l/s	425/566	580/600	680/800	755/840	900/1000	950/1120	1160/1200	140
Indoor Sound Level (H) @ 1.5m	dBA (C/H)	37.3/40.5	42.0/42.4	43.5/45.8	44.2/45.5	46.6/47.9	47.9/50.7	45.0/45.0	46.0
Piping Length	m	50							
Indoor Fan Speeds		H/M/L							
Dimensions (HxWxD)	Indoor (mm)	300x1210x900			360x1520x935			470x1200x997	470
	Outdoor (mm)	990x940x320				1430x940x320			
Weight	Indoor (kg)	40	40	45	55	55	56	70	85
	Outdoor (kg)	69	69	69	78	93	99	138	138
Power Supply	V/Hz	1 Phase, 380-415V, 50Hz							
Compressor Type		Hermetically Sealed Swing Type						Hermetically Sealed Scr	
Refrigerant		R32						R410A	
Pipe Sizes	Liquid (mm)	9.5 (Flare)						9.5 (Brazed)	
	Gas (mm)	15.9 (Flare)						19.1 (Brazed)	
	Drain (mm)	ID 25/OD 32						BSP 3/4 inch Internal Th	
Supply Air Opening	mm (HxW, Flange)	186x852			245x1152			350x916	350
Return Air Opening	mm	1x400 (Oval)		2x350 (Oval)	2x400 (Oval)			393x916 (Flange)	393 (Fla
Outdoor Operating Range	Cool (°CDB)	-5 to 46						-5 to 43	
	Heat (°CWB)	-15 to 16						-20 to 16	
EPA Sound Power Level	dBA	67	70	71	72	73	75	72	74
Outdoor Sound Level (H) @ 1m	Pressure dBA (C/H)	48/50	51/54	52/54	53/56	54/56	56/58	57/58	58/

Attachment 4 – AC Condenser Unit Specifications

		FDYAN71AV1	FDYAN85AV1	FDYAN100AV1	FDYAN125AV1	FDYAN140AV1	FDYAN160AV1	FDYQN180LCV1	FDYQN200LCV
Unit		RZA71CY1	RZA85CY1	RZA100CY1	RZA125CY1	RZA140CY1	RZA160CY1	RZQ180MY1	RZQ200MY1
acity	Cool (kW)	7.1	8.5	10.0	12.5	14.0	15.5	18.0	19.5
	Heat (kW)	7.5	10.0	12.5	15.0	16.5	18.0	20.0	22.4
ange	Cool (kW)	3.2-8.0	3.2-10.0	3.2-11.2	4.0-14.0	5.0-16.0	7.0-16.2	9.0-18.0	10.1-19.5
	Heat (kW)	3.5-9.0	3.5-11.2	3.5-14.0	4.1-16.0	5.1-18.0	7.0-16.2	10.0-20.0	11.2-22.4
ut (Rated)	Cool (kW)	2.20	2.53	3.10	3.94	4.30	4.95	5.82	6.11
	Heat (kW)	1.93	2.80	3.35	4.00	4.50	4.90	6.11	6.85
P	C/H	3.23/3.89	3.16/3.57	3.23/3.73	3.17/3.75	3.26/3.67	3.13/3.67	3.09/3.27	3.19/3.27
sidential)	Hot/Average/Cold	4.44/3.92/4.00	4.29/3.85/3.90	4.28/3.86/3.97	4.26/3.91/4.02	4.19/3.87/3.97	4.05/3.76/3.87	3.61/3.15/3.13	3.57/3.14/3.11
dential)	Hot/Average/Cold	4.17/3.90/3.55	3.97/3.67/3.32	3.85/3.48/3.04	4.31/3.31/2.77	3.90/3.51/3.05	3.87/3.53/3.12	3.23/2.95/2.61	3.25/2.97/2.63
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nd Level (H) @ 1.5m	dBA (C/H)	37.3/40.5	42.0/42.4	43.5/45.8	44.2/45.5	46.6/47.9	47.9/50.7	45.0/45.0	46.0/46.0
gth	m	50							
Speeds		H/M/L							
s (HxWxD)	Indoor (mm)	300x1210x900			360x1520x935			470x1200x997	470x1400x997
	Outdoor (mm)	990x940x320				1430x940x320			
	Indoor (kg)	40	40	45	55	55	56	70	85
	Outdoor (kg)	69	69	69	78	93	99	138	138
pply	V/Hz	3 Phase, 380-415V, 50Hz							
or Type		Hermetically Sealed Swing Type						Hermetically Sealed Scroll Type	
t		R32						R410A	
	Liquid (mm)	9.5 (Flare)						9.5 (Brazed)	
	Gas (mm)	15.9 (Flare)						19.1 (Brazed)	
	Drain (mm)	ID 25/OD 32						BSP 3/4 Inch Internal Thread	
Opening	mm (HxW, Flange)	185x852			245x1152			350x918	350x1118
Opening	mm	1x400 (Oval)		2x350 (Oval)	2x400 (Oval)			393x918 (Flange)	393x1118 (Flange)
perating Range	Cool (°CDB)	-5 to 46						-5 to 43	
	Heat (°CWB)	-15 to 16						-20 to 16	
Power Level	dBA	67	70	71	72	73	75	72	74
und Level (H) @ 1m	Pressure dBA (C/H)	48/50	51/54	52/54	53/56	54/56	56/58	57/58	58/59

Attachment 4 – AC Condenser Unit Specifications (continued)