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File: 20200007 Bondi Junction RSL Club Development - Mechanical Roof Plant

3rd February 2021

Capital Corporation Bondi Pty Ltd

c/o Aoyuan Property Group (Australia) Pty Ltd

Suite 30.02, Level 30

420 George Street

Sydney NSW 2000

Attn: **Lucy Ford**

Re: **Mechanical Roof Plant**

Bondi Junction RSL Club Development

1-9 Gray Street

Bondi Junction NSW 2022

Dear Lucy,

This letter is to provide a brief summary regarding the proposed mechanical services air conditioning systems and justifying why the proposed water-cooled solution for the RSL club and one VRF/VRV invertor condenser per apartment is the most suitable and economical option due the tenant usage for different building classifications of the project.

The mechanical systems on the roof top in the Development Application submission were concept only. During the design development phase, it has become apparent that the roof plant space was inadequate, and the current proposed roof top plant is required to conceal all mechanical services for the building.

Mechanical Services Air conditioning Systems Options Proposed:

The below table nominates the required cooling capacity for 2-storey RSL Club and cooling capacity required for a typical apartment based on the load calculations. The load calculations are based on a nominal heat load check figures as per AIRAH Technical Handbook.

Levels	Space	Required Total Cooling capacity
Ground and Level 1	RSL Club	425 kW
Levels 2 to 9	For a typical three bedroom apartment	13.7 kW

Based on the above required capacities and considering the building usage the following are the type of air conditioning options considered:

RSL Club : Water Cooled Solution

The type of cooling tower serving the RSL Club is low profile closed circuit cooling tower. The water cooled VRF/VRV units are connected to condenser water reticulation and are located on level 1 plantrooms which do not require openings/ventilation through façade, as the heat is rejected through water/cooling tower (Where air-cooled VRF/VRV units require open space and require good air circulation).

Closed-circuit cooling tower systems completely isolate the process cooling fluid from the atmosphere. This is accomplished by combining the heat rejection equipment with a heat exchanger in a closed circuit tower. A closed

loop system protects the quality of the process fluid, reduces system maintenance and also extend the life of the equipment.

Having one main system on the roof for heat rejection will help to reduce the plant space on the roof and also limit the maintenance/replacement costs. Whereas, with an Air cooled VRF/VRV option, the number of the condensing required are approximately twelve (i.e. bigger footprint compared to water cooled condensing units). With the RSL club long operating hours, the twelve VRF/VRV units will require regular maintenance to ensure optimal level of performance. Also, a refrigerant leak can be a serious concern that can pose a danger or be harmful to the atmosphere.

Apartments: One VRF/VRV invertor condenser per apartment

Each apartment will be served by a dedicated horizontal discharge air-cooled condensing unit instead of having one main plant on roof. The advantage of this is if one invertor condenser fails all the other apartments will not be affected with this arrangement and there is no need to have propriety control that would be required to account for individual apartment usage and apportion power costs accordingly (which can be complicated).
Also, with one main plant on the roof, the cooling tower down-turn ratio is limited to 50% only which means 50% of apartments must be kept operating even when there is no requirement for cooling.

Based on the above, it is our strong recommendation that the water cooled solution for RSL club and VRF/VRV for residential apartments is the most suitable and economical option due the tenant usage for different classifications of the project. It minimises plant space requirements and maximises operation efficiency thereby reducing energy consumption to the development.

Regards,

Teja Kshatri

Senior Mechanical Engineer – NSW Building Services

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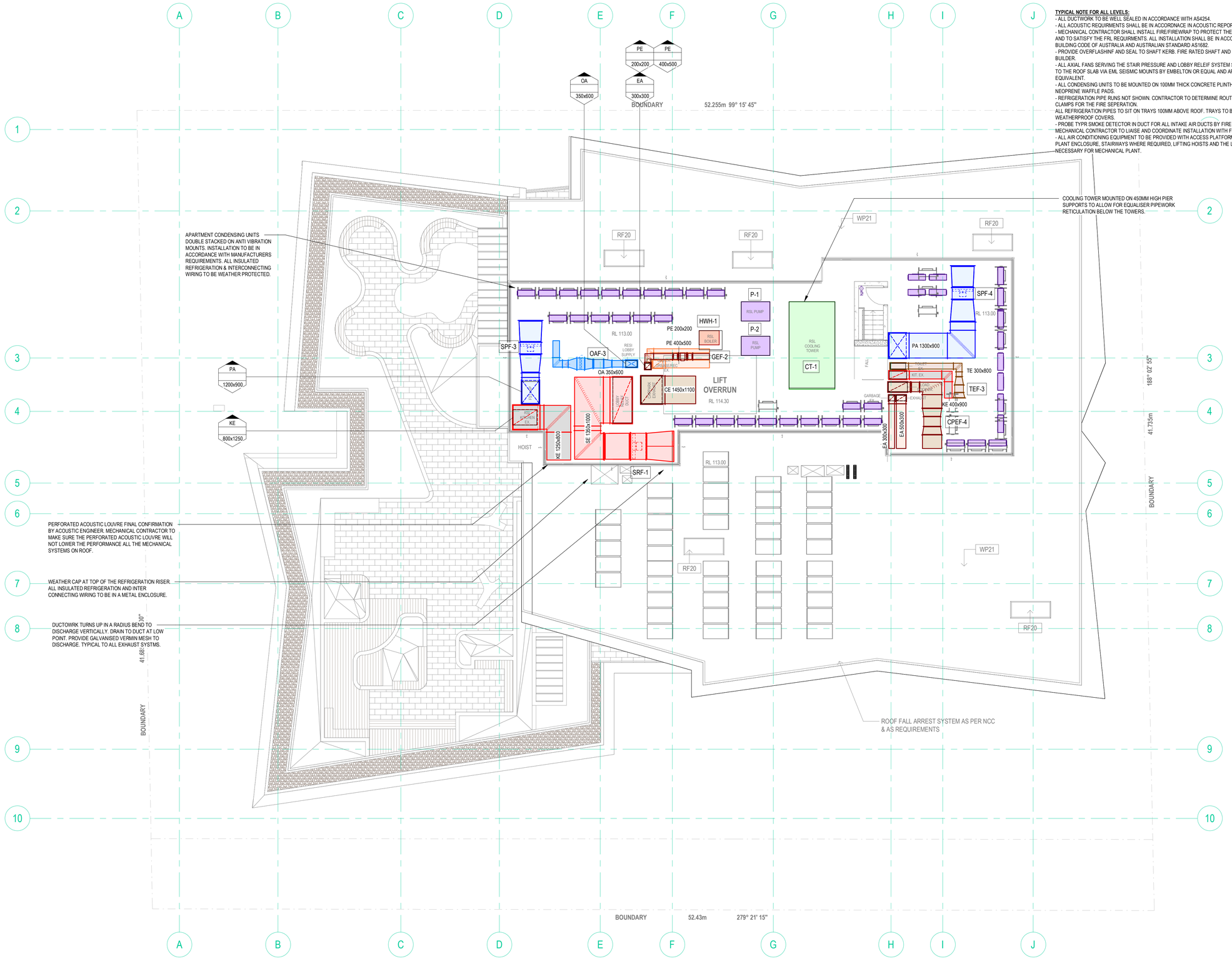

TYPICAL NOTE FOR ALL LEVELS:

- ALL DUCTWORK TO BE WELL SEALED IN ACCORDANCE WITH AS4254.
- ALL ACOUSTIC REQUIRMENTS SHALL BE IN ACCORDNACE IN ACOUSTIC REPORT.
- MECHANICAL CONTRACTOR SHALL INSTALL FIRE/FIREWRAP TO PROTECT THE PENETRATION AND TO SATISFY THE FRL REQUIRMENTS. ALL INSTALLATION SHALL BE IN ACCORDANCE WITH BUILDING CODE OF AUSTRALIA AND AUSTRALIAN STANDARD AS1682.
- PROVIDE OVERFLASHINF AND SEAL TO SHAFT KERB. FIRE RATED SHAFT AND KERB BY BUILDER.
- ALL AXIAL FANS SERVING THE STAIR PRESSURE AND LOBBY RELEIF SYSTEM SHALL BE FIXED TO THE ROOF SLAB VIA EML SEISMIC MOUNTS BY EMBELTON OR EQUAL AND APPROVED EQUIVALENT.
- ALL CONDENSING UNITS TO BE MOUNTED ON 100MM THICK CONCRETE PLINTH VIA 18MM THICH NEOPRENE WAFFLE PADS.
- REFRIGERATION PIPE RUNS NOT SHOWN. CONTRACTOR TO DETERMINE ROUTES. ALLOW FIRE CLAMPS FOR THE FIRE SEPERATION.

ALL REFRIGERATION PIPES TO SIT ON TRAYS 100MM ABOVE ROOF. TRAYS TO BE PROVIDED WITH WEATHERPROOF COVERS.

- PROBE TYPR SMOKE DETECTOR IN DUCT FOR ALL INTAKE AIR DUCTS BY FIRE CONTRACTOR. MECHANICAL CONTRACTOR TO LIAISE AND COORDINATE INSTALLATION WITH FIRE CONTRACTOR.
- ALL AIR CONDITIONING EQUIPMENT TO BE PROVIDED WITH ACCESS PLATFORMS, DOORS TO PLANT ENCLOSURE, STAIRWAYS WHERE REQUIRED, LIFTING HOISTS AND THE LIKE AS NECESSARY FOR MECHANICAL PLANT.

NOT FOR CONSTRUCTION

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VIC I NSW I SA I QLD

NOTE: SYMBOLS ARE DRAWN IN THE CORRECT POSITION BUT ARE NOT SHOWN TO SCALE.

Client:
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Architect:
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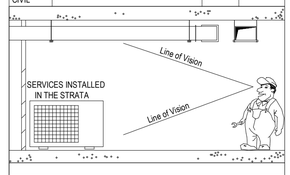
MECHANICAL SERVICES

Issue	Date	Amendment	Int.	App.
1	06/03/20	PRELIMINARY ISSUE	TK	MV
2	26/11/20	FOR COORDINATION	TK	MV
3	18/12/20	PRE-TENDER ISSUE	TK	BL
4	05/02/21	D&C TENDER ISSUE	TK	TK

COORDINATED REFERENCE DRAWINGS

SERVICE	DRAWING NUMBER	ISSUE	DATE
ARCH			
MECH			
STRUCT			
ELEC			
CIVIL			



Project:
BONDI JUNCTION RSL GRAY STREET, BONDI JUNCTION

Drawing Title:
ROOF LEVEL AIR CONDITIONING & VENTILATION LAYOUT

North Point:

ISO 9001:2015 Quality Management

Job No: 20200007
Scale: (A1) 1 : 100
Dwg No: M-110
Issue: 4