

SPECIFICATION FOR
THE
MECHANICAL SERVICES

for

BOX HILL AQUALINK

BRT Consulting Pty Ltd
159 Victoria Parade
Collingwood VIC 3066
T 03 9417 2971 F 03 9417 5851
E melb@brt.com.au



MECHANICAL SERVICES

1.1 SCOPE

Supply and install the complete Mechanical Services installation and associated services for the new installation including but not limited to the following.

This specification is generally written in the plural. Where only one item is scheduled, then the singular shall be inferred.

- air-conditioning systems including ductwork, diffusers, grilles and pipe work;
- chilled water system
- hydronic heating system including boiler, pumps and floor coil reticulation;
- exhaust systems;
- ceiling fans;
- gas reticulation to all equipment
- gas and flue connections to cogen plant
- automatic controls;
- electrical work;
- commissioning, testing and putting into service;
- as-built drawings and maintenance manuals;
- routine maintenance during defects liability period.

1.2 REGULATIONS

Supply and install all works described for this project in accordance with all the relevant authorities having jurisdiction over the works including the following:-

- Building Code of Australia
- Relevant current Australian Standards including where appropriate:
- Environment Protection Authority.
- Local Water Supply Authority.
- Local Electricity Supply Authority.
- All Local Authorities having jurisdiction over the work.

1.2.1 Air Handling

- AS 1668.1 - The use of mechanical ventilation and airconditioning in buildings - Fire and Smoke Control.
- AS 1668.2 - The use of ventilation and airconditioning in buildings - Part 2: Ventilation design for indoor air contaminant control (excluding requirements for the health aspects of tobacco smoke exposure).
- AS 1688.2 Supplement 1 - The use of mechanical ventilation and airconditioning in buildings - Mechanical ventilation for acceptable indoor-air quality - Commentary (Supplement to AS 1668.2).
- AS/NZS 3666.1: Air handling and water systems of buildings - Microbial control - Design, installation and commissioning.
- AS/NZS 3666.2: Air handling and water systems of buildings - Microbial control - Operation and maintenance.
- AS 4254 - Ductwork for air handling systems in buildings.

1.2.2 Airconditioning

- AS 1277 - Measurement procedures for ducted silencers.
- AS 1324.1 - Air filters for use in general ventilation and airconditioning - Application, performance and construction.
- AS 1324.2 - Air filters for use in general ventilation and airconditioning - Methods of test.
- AS 1861.2 - Airconditioning units - Methods of assessing and rating performance - Refrigerated package airconditioners.
- AS 2913 - Evaporative airconditioning equipment.
- AS 1677 - Refrigerating Systems - Parts 1 & 2
- AS1432 - Copper tubes for plumbers, gas fitting and drainage application.
- AS 4508 - Thermal resistance of insulation for ductwork used in building Air Conditioning.
- AS 4426 - Thermal insulation of pipework, ductwork and equipment - selection, installation and finish.

MECHANICAL SERVICES

Fan Coil	: FC.1	: FC.2	: FC.8	: FC.9
Designation	: RF1A & 1B	: RF2A & 2B	: RF 8A,B,C,D	: RF 9
Manufacture	: EMB Papst	: EMB Papst	: EMB Papst	: EMB Papst
Mounting	: Duct - Spider Mount	: Duct - Spider Mount	: Floor – Foot Mount	: Floor – Foot Mount
No. Required	: 2	: 2	: 4	: 1
Type	: Backward Curve	: Backward Curve	: Backward Curve	: Backward Curve
Air Quantity (l/sec)	: 2500	: 2000	: 4000	: 2300
Air Resistance (Pa)	: 300	: 300	: 300	: 300
Min. Motor Power (kW)	: 3	: 3	: 5	: 5
Max. Fan Speed (rps)	: 20	: 20	: 30	: 30
Max. noise level @ 1m (dBA)	: 65	: 65	: 84	: 84
Air control required (Y/N)	: Yes	: Yes	: Yes	: Yes
Control type	: EC Plug Fan	: EC Plug Fan	: EC Plug Fan	: EC Plug Fan
Stages	: Fully Variable	: Fully Variable	: Fully Variable	: Fully Variable
Phases	: 3	: 3	: 3	: 3

Fan Coil	:
Designation	: SF 3
Manufacture	: Fantec
Mounting	: Duct Mount
No. Required	: 1
Model	: TD-800/200N
Air Quantity (l/sec)	: 180
Air Resistance (Pa)	: 100
Min. Motor Power (kW)	: 0.07
Max. Fan Speed (rps)	: 45
Max. noise level @ 1m (dBA)	: 48
Air control required (Y/N)	: Yes
Control type	: VAR
Stages	: Fully Variable
Phases	: 1

1.23 HEAT RECOVERY UNIT

Supply and install a complete air to air heat recovery unit where shown and/or as scheduled on the drawings.

Rotary Regenerative Air to Air Heat Exchangers shall be supplied to transfer heat between the fresh make up air stream and the exhaust air stream.

The Heat Exchangers shall be of Australian manufacture supplied by Rotary Heat Exchangers Pty Ltd.

The Heat Exchange media shall be Polyethylene - terephthalate film (Dupont trade name Mylar) wound on an aluminium hub between aluminium spokes and separated with aluminium spacers.

The heat exchange matrix shall be assembled to give smooth parallel passages for minimum pressure drop and maximum heat transfer as theoretically predicted for a maximum ratio of Stanton number to Friction Factor.

Each rotor shall be mounted on sealed self aligning ball bearings of ample capacity.

The Heat Exchangers shall be fitted with diametral and circumferential seals and replaceable seal strips shall be fitted to each spoke member.

The units will operate at a fixed speed between 15 RPM to 18 RPM and shall be driven with a 3 phase geared motor through belts and pulleys to the central shaft.

MECHANICAL SERVICES

The unit shall be supplied complete with heat exchangers, condensate trays and drains, frame and base to ensure proper and airtight operation.

The unit shall be capable of operating up to the airflows as scheduled and also capable of withstanding forces across the medium without damage should airflow on one path stop for any reason.

The motors shall be supplied and installed using a soft start/stop controller such as CMG Microstarter rated for the supplied motor current draw or approved equivalent

MECHANICAL SERVICES**1.23.1 Schedule of Performance**

Fan Coil 8 - The heat exchangers for Fan Coil 8 are two heat exchangers that have been removed from the existing building and are currently being stored by Council. The contractor shall obtain the units from Council, have them refurbished by Rotary Heat Exchanger Pty Ltd and install them into the new heat exchanger FC.8

Existing Model No. 2 x RHE2750S426

Designation	FC 1	FC 2	FC 9
Manufacture	Rotary	Rotary	Rotary
Model No.	RHE2540S426	RHE1780S426	RHE1980S426
Air Quantity, (l/Sec.)	5000	2000	2300
Efficiency	87%	87%	97%
Max H/E pressure drop (Pa)	135	132	97
Max. Motor speed (rps)	24	24	24
Speed Controller	VSD via BMS	VSD via BMS	VSD via BMS
Phases	3	3	3
Max. noise level @ 1m (dBA)	48	48	48
Filter Y/N	Yes	Yes	Yes
Filter Type	Deep Bed	Deep Bed	Deep Bed
External Units (Y/N)	Y	Y	Y

Air On:

- Supply (DB°C/RH%) 4\3
- Exhaust (DB°C/RH%) 29\60

1.24 PACKAGED FAN-COIL UNITS

Supply and install fan-coil units where and as shown on the drawings and/or as scheduled. The units shall be suitable for external installation and shall be internally insulated with minimum 75mm insulation.

The units shall be provided with fan and heating and/or cooling coil sections.

The coils shall have copper tubes with aluminium fins and shall be fabricated in galvanized steel or brass frames.

Where a cooling coil is fitted, units shall be provided with condensate pans which must be readily accessible for cleaning and graded for positive draining to avoid collecting dirt.

Run a 20mm rigid PVC trapped drain run to stormwater or sewer.

Drains from condensing units shall discharge to places that will not cause inconvenience or safety issues such as garden beds, roofs, stormwater drains or absorption pits in the ground filled with aggregate.

The casing shall be fabricated from galvanized sheet steel and shall be internal insulated with scrim or foil covered semi-rigid fibreglass insulation at least 75mm thick.

Units shall be isolated from the structure with 'Embleton' combined spring and neoprene mounts in either pad or hanging type whichever is most suitable with minimum 20mm static deflection

Fans shall be dynamically balanced. Those with vibration shall have their fans rebalanced or rectified as necessary to remove the vibration.

All units shall be external units and shall be of weatherproof construction so that they can be installed unprotected outside without leaks or corrosion.

The units shall be of the manufacture as scheduled or other approved manufacture with at least equal performance in all categories.