



ERBAS & ASSOCIATES Pty. Ltd.



MECHANICAL SERVICES RETURN BRIEF FOR CROWN STREET PROJECT WOLLONGONG

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| Issue | Comment | Date | Job Number |
|--------------|----------------|-------------------------------|-------------------|
| A | DA Issue | 15 th January 2007 | 0941 |
| B | Revised Issue | 02 nd August 2007 | EA0941 |
| | | | |

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1. INTRODUCTION

This return brief describes the proposed mechanical services for the Crown Street Project located at the corner of Crown and Corrimal Streets, Wollongong NSW.

The development consists of two parts situated both sides of Corrimal Street: Oxford Tavern and Dwyers.

Oxford Tavern

The development consists of four (4) basement car park levels, podium levels of retail, tavern and office tenancies with two towers above. The northern tower is an 11-storey residential tower, and the southern tower an 8-storey office tower. The mechanical design also includes all areas associated with the development.

Deleted: a ten-level residential apartment tower over

Dwyers

This is similar to the Oxford Tavern but with a much larger floor plate. The development consists of a 4 level basement car park, 4-storey podium and 8-storey Hotel tower. The podium levels will consist of speciality retails, restaurants, mini major stores, supermarkets, major store tenancies and cinemas. The tower will consist of a 8 storey hotel with a restaurant on the top floor.

Deleted: , and six (6) levels of serviced-type bedrooms

2. CODES AND AUTHORITIES

The whole of the works will be designed in accordance with the following:

- Building Code of Australia.
- AS 1668.1 and AS 1668.2.
- AS 3666.
- AS 3000.
- All other relevant Australian Standards.
- All Authorities having jurisdiction.
- NSW Fire Brigade's requirements.

3. AIR CONDITIONING SYSTEMS

3.1 Retails, Tavern, Restaurants, Mini Major Stores and Associated Areas:

The Systems:

Reverse cycle type water-cooled air conditioning systems are proposed. The systems comprise:

- Cooling towers, gas-fired boilers, heat exchangers, pumps and associated accessories located at the plant areas on the podium roof levels.
- Condenser water pipework with individual valved supply and return connections in each tenancy for later connection by the tenants.
- Reverse cycle type water-cooled packaged units complete with ductwork to be installed by the tenants.
- Outdoor air to be ducted to each tenancy complete with volume control dampers for later connection by the tenants.

Discussions:

The provision has the following advantages

- Individual controls of temperature and operation by the tenants are achieved.
- Operating cost of the air conditioning systems can be charged to the relevant tenants if each tenancy is provided with separate electrical board.
- The tenants have greater flexibility in selecting the air conditioning units to suit their particular requirements.
- Future tenancy alterations can be carried out with minimal disturbance to others.
- Abortive works between the base building provision and the tenancy fitout are avoided.

3.2 Offices:

The Base Building Systems:

The offices on levels 2, 3 and part of level 4 in the Oxford Tavern will be air-conditioned by a chilled / heating water system comprising:

- Air-cooled chillers, gas-fired boilers, pumps and associated equipment located at the roof plant area on level 5.
- Chilled / heating water reticulation to serve air handling units (AHUs) located in the floor by floor plant rooms.
- Variable air volume (VAV) type AHUs.
- Rigid sheet metal and flexible ductwork with variable air volume boxes located in the ceiling space.
- Economy cycle to provide free cooling when the ambient conditions are suitable.
- Outdoor air ducts to each floor plant room.

The provision allows for:

- Zone controls of supply air to suit the office layout and orientations.
- Noisy equipment not in occupied area.
- No water pipes in occupied area.
- Major plant services in plant rooms.

Office Tenancy Supplementary Systems:

The base building systems will be supplemented by the provision of tenants' condenser water supply and outdoor air systems as follows:

- Cooling towers, pumps and accessories on level 5 plant area.
- Condenser water reticulation terminated at valved connections inside each floor plant room for subsequent connection by tenants.
- Supplementary outdoor air to each floor plant room.

3.3 Supermarkets and Major Stores:

- These areas on the podium levels of Dwyers will be served by separate stand-alone air conditioning systems in accordance with the tenancy design brief and guidelines.

3.4 Cinemas:

A separate chilled and heating water system located on level 5 plant area and AHUs in a dedicated plant room of Dwyers will serve the cinemas in accordance with the cinema operator's requirements.

3.5 Residential Units (Oxford Tavern)

The System:

The residential apartments including all communal areas will be served by a reverse cycle type water-cooled system consisting of:

- Cooling towers, boilers, heat exchangers, pumps and associated accessories located on the roof level of the tower.
- Distribution condenser water pipework complete with water-cooled packaged units, ductwork and supply air outlets.
- Ceiling space mounted type or floor mounted type (within riser shaft) air conditioning unit to serve each apartment.
- Outdoor air to each apartment by infiltration due to mechanical exhaust of bath rooms.

Discussions:

The provision allows for:

- Operating cost of each apartment air conditioning system is charged separately.
- Major components of the systems are located on the roof plant area. This results in a better control of noise generated and aesthetics of the building.

3.6 **Hotel and Top Level Restaurant (Dwyers):**

**Deleted: Serviced Type
Bedrooms**

A chilled water and heating water plant located on the roof level of the tower will serve the restaurant and the bedrooms. Various fan coil units located in the restaurant ceiling space will serve the restaurant. Fan coil units serving the bedrooms will be located in each bathroom ceiling of the room.

Outdoor air will be ducted to each fan coil units.

4. MECHANICAL VENTILATION

4.1 Car Park Ventilation:

The four (4) car park levels at both developments are below the natural ground level and will be mechanically ventilated.

Make-up air will be naturally provided via perforated roller shutter at basement 1 entry ramp and will be mechanically supplied to the centres of other basement levels. Exhaust air is extracted towards the grilles located on the north and south end plenum walls. Exhaust fans located in each floor by floor fan room will extract and discharge the fume at louvres above both north and south end staircase on podium roof level 5.

This floor by floor fan room arrangement in addition to the installation of time switches and atmospheric contaminant monitoring system will significantly save the operating cost of the system.

Mechanical exhaust system will continue to run in the event of fire while the supply air system shuts down. Fire Brigade operation of the fans will be provided at the fire fan control panel (FFCP) by the fire protection contractor.

4.2 Stair Pressurisation Systems:

All basement car park fire-isolated stairways serving more than 2 below ground levels will be provided with automatic stair pressurisation systems.

All enclosed fire-isolated stairways serving the residential tower will be provided with automatic stair pressurisation and relief air systems.

4.3 Toilet and Bathroom Exhaust Systems: Podium Levels

Various exhaust systems will be provided to serve the toilets at the retails and office levels. Exhaust air will be ducted to discharge at the level 5 roof areas.

Residential Towers

Various bathroom exhaust systems comprising roof mounted exhaust fans, duct risers and grilles will be provided to serve all internal bathrooms where natural ventilation is not possible.

Supermarkets and Major Stores

Exhaust systems in accordance with the Lessors' Specifications will be provided.

4.4 Loading Dock:

Mechanical exhaust system will be provided where required by Code.

4.5 Kitchen Ventilation:

All systems will shut down in the event of fire. The fire protection contractor will provide fire fan control panels (FFCP) for fire brigade to manually operate these systems.

Tavern

Kitchen exhaust and supply air systems are required to serve the Tavern on level 1 of Oxford Tavern. Supply air where required will be filtered.

If the detailed tenancy fitout is available at the base building design period, complete installation consisting of fans, ductwork, power and controls including hood connections (supply and installation of hoods including connection to ductwork will be part of the tenancy fitout and it will be done by the tenant) will be provided.

If the tenancy fitout requirements are not known, only external louvres and ductwork with optimal sizes will be provided. The supply and installation of the whole system will be the tenant's responsibility.

Restaurants

The restaurants at the podium levels and top tower level of Dwyers will be provided with various kitchen ventilation systems similar to those for the Tavern.

Supermarkets

Kitchen and/or bakery area etc will be ventilated in accordance with the Lessors' Specification.

Residential Units

General exhaust of the cooking fumes consisting of hoods, duct risers and fans can be provided to the apartments. However, this is not a statutory requirement.

Retails

Kitchen exhaust and supply air systems will be designed as a base building provisions. This will allow for future tenancy alterations at the retails on level 1 of Oxford Tavern.

The systems will consist of fans with variable speed drives, ductwork complete with external louvres, volume control dampers and blanking plates for future connection. The number of systems will depend on the locality of the retails.

4.6 General Ventilation Systems

Miscellaneous exhaust and / or supply systems will be provided to various services rooms and areas such as swimming pools etc where required by Code.

4.7 Supplementary General Exhaust Systems at Offices:

General exhaust systems will be provided to all plant rooms on the office levels. Ductwork complete with volume control dampers and blanking plates inside the plant rooms will be for future tenancy connection.

5. SMOKE MANAGEMENT SYSTEMS

All podium levels including the retails and offices will be provided with smoke management systems to BCA requirements.

6. DESIGN CRITERIA

6.1 Air Conditioning Systems

The design of the systems will comply with the following conditions:

External Conditions

Summer: 30° CDB, 23° CWB
Winter: 7° C

Internal Conditions

- General Areas:

Summer: 22.5° C \pm 1.5° C
40 – 60% RH – Targeted but not controlled
Winter: 21° C

- Supermarkets, Major Stores and Cinemas:

The systems will be designed to the Lessors' Specification and the Cinema Operators' requirements.

Internal Loads

The systems will be designed to maintain the above conditions for the following maximum loads:

- Occupancy (m²/person):

| | |
|------------------------------|--------------------------------|
| Retails: | 5 |
| Restaurants: | 1.5 |
| Offices: | 10 |
| Mini Major Stores: | 5 |
| Supermarkets / Major Stores: | Lessors' Specifications |
| Cinemas: | Cinema Operators' requirements |

- Outdoor air (l/s/person):

| | |
|------------------------------|--------------------------------|
| Retails: | 10 |
| Restaurants: | 15 |
| Offices: | 10 |
| Mini Major Stores: | 10 |
| Supermarkets / Major Stores: | Lessors' specifications |
| Cinemas: | Cinema operators' requirements |

- Lighting load (W/m²):

| | |
|------------------------------|--------------------------------|
| Retails: | 50 |
| Restaurants: | 30 |
| Offices: | 15 |
| Mini Stores: | 20 |
| Supermarkets / Major Stores: | Lessors' specifications |
| Cinemas: | Cinema operators' requirements |

- Equipment load (W/m²):

| | |
|------------------------------|--------------------------------|
| Retails: | 10 |
| Restaurants: | 20 |
| Offices: | 15 |
| Mini Stores: | 20 |
| Supermarkets / Major Stores: | Lessors' specifications |
| Cinemas: | Cinema operators' requirements |

- Noise Levels (dBA):

| | |
|------------------------------|--------------------------------|
| Retails: | NR45 |
| Restaurants: | NR45 |
| Offices: | NR40 |
| Mini Stores: | NR45 |
| Supermarkets / Major Stores: | Lessors' specifications |
| Cinemas: | Cinema operators' requirements |

6.2 Supplementary Air conditioning Systems for Offices:

Provision for installation of future supplementary air conditioning systems is part of the base building installation, by means of provision of capped off outdoor air risers and valved condenser water connections in office plant rooms.

- Supplementary outdoor airflow rate: 0.2 l/s/m²
- Supplementary condenser water rate: 25 W/m² cooling

6.3 Mechanical Ventilation:

General

All ventilation systems as mentioned in Section 4 will be designed to comply with the Codes.

Supplementary Office Exhaust Systems

The general exhaust provision at office tenancies will be designed at a rate of 0.2 l/s/m².

