

Royal Australian Historical Society
History House
Building Services DA Report

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This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 247851

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Contents

	Page
1 Introduction	1
1.1 DA Drawings	2
2 Mechanical Services	3
2.1 Existing Systems	3
2.2 Proposed Upgrades	4
3 Electrical Services	6
3.1 Existing Systems	6
3.1 Proposed Upgrades	6
4 Hydraulic Services	8
4.1 Existing Systems	8
4.2 Proposed Upgrades	8
5 Fire Services	9
5.1 Existing Systems	9
5.2 Proposed Upgrades	9

1 Introduction

History House is an existing heritage building owned by the Royal Australian Historical Society (RAHS) on Macquarie St, Sydney. The building currently consists of three above ground storeys (primarily office use) plus a mezzanine, in addition to an underground basement level. It has a rise in storeys in 5 under the BCA definition. The Macquarie Street side of the building is heritage listed, however the rear of the building was built in the 1970's.

This building is to be redeveloped and expanded to accommodate increased office space.

Arup have been commissioned to review the proposed development and advise on the building services requirements. Building services include:

- Mechanical Services
- Electrical Services
- Hydraulic Services
- Fire Services

Arup have reviewed the proposed architectural DA drawings listed below. This report describes the design approach for the building services.

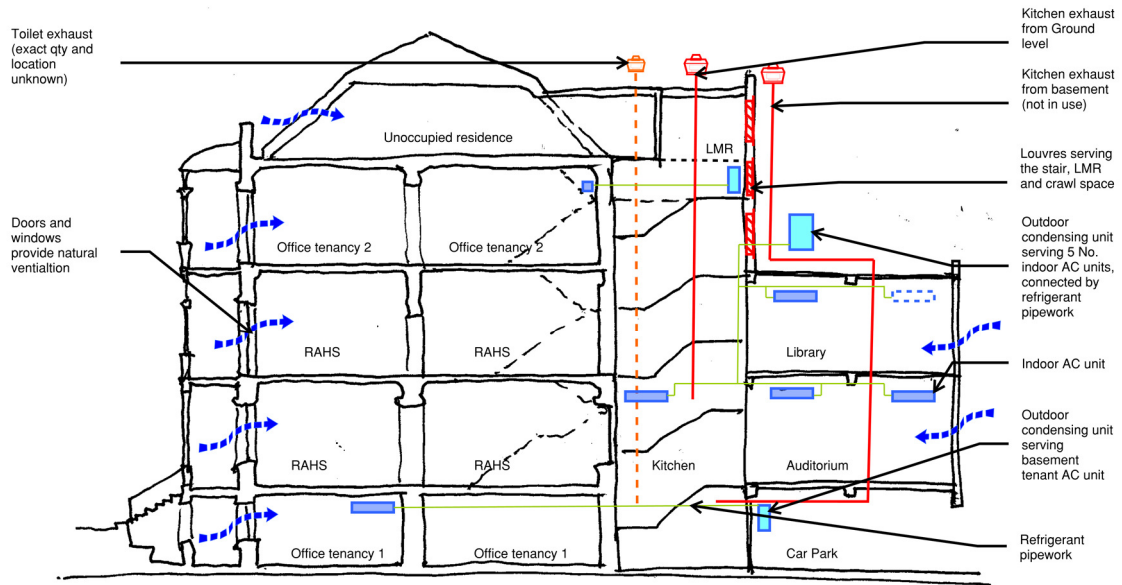
1.1 DA Drawings

DA 1000	A	LOCATION PLAN AND DRAWING SCHEDULE
DA 1001	A	SITE PLAN
DA 1002	A	LEVEL 1 DEMOLITION PLAN
DA 1003	A	LEVEL 1 FLOOR PLAN (PHILLIP LANE)
DA 1004	A	LEVEL 2 DEMOLITION PLAN
DA 1005	A	LEVEL 2 FLOOR PLAN (MACQUARIE STREET)
DA 1006	A	LEVEL 3 DEMOLITION PLAN
DA 1007	A	LEVEL 3 FLOOR PLAN
DA 1008	A	LEVEL 4 DEMOLITION PLAN
DA 1009	A	LEVEL 4 FLOOR PLAN
DA 1010	A	LEVEL 5 DEMOLITION PLAN
DA 1011	A	LEVEL 5 FLOOR PLAN
DA 1012	A	LEVEL 6 DEMOLITION PLAN
DA 1013	A	LEVEL 6 FLOOR PLAN
DA 1014	A	LEVEL 7 FLOOR PLAN
DA 1015	A	EAST AND WEST ELEVATIONS (MACQUARIE STREET AND PHILLIP LANE)
DA 1016	A	NORTH ELEVATION
DA 1017	A	SOUTH ELEVATION
DA 1018	A	SECTION AA
DA 1019	A	SECTION BB
DA 1020	A	PHOTOMONTAGE
DA 1021	A	PERSPECTIVES
DA 1022	A	SAMPLE BOARD EXTERNAL FINISHES
DA 1023	A	PHILLIP LANE - INTERPRETATION
DA 1024	A	SHADOW DIAGRAMS (21 JUNE)

2 Mechanical Services

2.1 Existing Systems

The following sketch describes the mechanical systems within the existing building.



History House Mechanical Systems

2.1.1 Ventilation

The following summarises the ventilation systems in the building:

- The building and its 1970's extension is naturally ventilated.
- The toilets and amenity areas have mechanical extract
- There is a commercial kitchen hood on level 1
- There is a kitchen exhaust duct running to the roof from the basement which used to serve a café. This is not in use currently.
- The lift motor room is naturally ventilated by louvres in the façade
- The exit stair has louvered ventilation openings at the roof terrace.

2.1.2 Air-conditioning

There are 3 separate air conditioning systems in the building. They are all DX split systems.

A direct expansion 'DX' split system consists of an indoor conditioning unit which is connected to an outdoor condensing unit via refrigerant pipes. The outdoor condensing unit rejects heat to atmosphere. A single condensing unit can be capable of serving multiple indoor units. They can operate in heating and cooling mode if they are reverse cycle units.

The air-conditioning systems in the building are as follows:

1. Single unit Daikin system serving the office tenancy in the basement. The outdoor condensing units located in the car park,
2. RAHS system: multi-unit Mitsubishi system serving the library, auditorium, reception, and a small office area adjacent the library. The outdoor condensing unit is located on the roof terrace area. There is existing installation documentation for this system (attached for reference).
3. Single unit system serving the office tenancy on level 2. The outdoor condensing unit is located behind louvres in the crawl space under the lift motor room

2.2 Proposed Upgrades

The design approach for the new office floors will be similar to the existing condition. The mechanical services for the existing building will be retained as far as practicable.

The new extension will be naturally ventilated where possible. Areas that cannot achieve natural ventilation will be mechanically ventilated to suit the requirements of the BCA section F and AS1668.

The new amenities will be mechanically ventilated in accordance with AS1668.

The new office spaces will be air conditioned by split DX air conditioning units. The outdoor condensers will be located discretely on the new roof structure.

Riser provisions have been made for reticulation of new ductwork, power and refrigerant pipework.

The existing outdoor condensing units (serving systems 2 and 3 as described in the previous section) which are currently located on the roof terrace will be relocated to the new roof and/or potentially combined with the new condensing units (to be developed further in detailed design).

2.2.1 Standards and Regulations

The new mechanical services will be designed to comply with the requirements of the following codes and standards:

- Australian Standards;
- NCC 2016;
- EPA;
- Worksafe;
- BCA/Building Surveyor requirements;
- Manufacturer's Guidelines;

- AGA and Jemena requirements;
- Fire Rescue NSW regulations;
- Electrical Supply Authorities;
- Fire Engineered Solution as applicable.

3 Electrical Services

3.1 Existing Systems

The following summarises the systems in the building:

- A 400V incoming electrical supply to the building, located under the stairs at ground floor, assumed to be rated at 100A;
- Utility metering panel located under the stairs at ground floor;
- Main switchboard located in an electrical cupboard at ground floor;
- Mix of traditional and modern lighting;
- LED emergency exit signage system;
- Security system with keypad and motion detection, monitored by an external company;
- Incoming multi pair copper to the building at basement, routed to MDF located at Level 1 office / reception and level 2 office;
- New client communications rack, located at level 1 reception/office;
- Existing tenant communications equipment within the level 2 space.

3.1 Proposed Upgrades

The incoming electrical supply capacity will be upgraded to allow for the increase in the building load imposed by the extension. This has been concluded from an electrical load monitoring survey undertaken on the existing building, and calculations undertaken on the proposed additional building area.

A new incoming supply, utility switchboard and tenant metering board will be installed in accordance with code, relocated in order to make compliant space allowances and fire rating provisions.

A new main switchboard and resulting electrical distribution system will be installed to accommodate the new incoming electrical supply arrangement.

In order to integrate with the new electrical distribution system final circuits will be brought in line with code, which may require circuit breaker replacement and re-wiring.

New lighting and lighting controls will be provided for new areas. The lighting design approach for the new areas will be similar to the existing installation with additional control to achieve compliance.

The heritage consultant is to advise whether the existing lighting and lighting control arrangements for the existing areas need to be brought in line with code.

New emergency lighting will be provided to new areas.

The emergency lighting strategy across the existing building will be retained as far as practicable. The emergency lighting testing system will require augmentation and upgrade to allow for the distribution system upgrade.

Alterations to the existing communications installation are not code driven, and need to be fully determined through consultation with the client. It is recommended that the existing communications rack is enclosed within a secure space, provided with battery back-up and mechanical cooling. Relocation of the existing communications rack will lead to re-wiring all the communication outlets.

4 Hydraulic Services

4.1 Existing Systems

The project is currently provided with the following hydraulic services;

- Domestic cold water
- Domestic Hot water
- Gravity Sewerage system
- Stormwater drainage system
- Grease arrestor

From visual inspections these systems appear to be in good condition and compliant to current plumbing codes/standards.

4.2 Proposed Upgrades

It is intended that the existing hydraulic services be reused where suitable. Where these services are made redundant they'll be decommissioned in accordance with statutory codes.

The new roofs will be provided with stormwater drainage in accordance with the building code of Australia. This will connect to the existing stormwater system, which is not expected to require any amplification as the site's catchment is not increasing.

4.2.1 Standards and Regulations

The new hydraulic services will be designed to comply with the requirements of the following codes and standards:

- NCC 2016 Volume 1 and volume 3;
- AS3500 (all parts)
- AS5601.1
- EPA;
- Worksafe;
- Manufacturer's Guidelines;
- Fire Rescue NSW regulations;
- Fire Engineered Solution as applicable.

5 Fire Services

5.1 Existing Systems

The project is currently provided with the following fire services;

- Fire extinguishers
- Fire detection system
- Building Occupant Warning system

The project does not have;

- Fire hydrants
- Fire sprinklers
- Fire hose reels

5.2 Proposed Upgrades

The existing fire services will be modified and upgraded where required by conditions of consent, building code of Australia and fire engineering solutions.

It is likely that a hydrant system, hose reel system and sprinkler system will be added to the building to meet current Building Code requirements.

5.2.1 Standards and Regulations

The new fire services will be designed to comply with the requirements of the following codes and standards:

- NCC 2016 Volume 1;
- Australian standards as applicable
- EPA;
- Worksafe;
- Manufacturer's Guidelines;
- Fire Rescue NSW regulations;
- Fire Engineered Solution as applicable.