JONES NICHOLSON PTY LTD
CONSULTING ENGINEERS

ESD REPORT

7-9 Gibbons Street Redfern

For Lawson Square Pty Ltd

Prepared in co-ordination with Candalepas Architects

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1.0 INTRODUCTION

Jones Nicholson Pty Ltd have been engaged to assess the ESD principles proposed for the commercial and residential development at 7-9 Gibbons St, Redfern.

The building comprises of:

- 8 levels of basement,
- Ground floor comprising of retail tenancies and a loading dock
- A supermarket on level 1
- Level 2 – commercial tenancies
- Level s 3 to 17 – residential apartments

As part of the Director Generals Requirements (DGR) the Environmental Assessment for the project must address the following policies;

- *SEPP (Building Sustainability Index: BASIX) 2004*
- *SEPP 65 Design Quality of Residential Flat Development*
- *Redfern-Waterloo Built Environment Plan (Stage One) August 2006 (BEP)*

The following sections of this report addresses the above policies and also Section 8 of the Director Generals Requirements on Ecologically Sustainable Development.

2.0 *SEPP (Building Sustainability Index: BASIX) 2004*

The SEPP (Building Sustainability Index: BASIX) 2004 applies to the proposed commercial and residential development at 7-9 Gibbons St, Redfern.

The following summarises the ESD principles to satisfy the BASIX requirements (see BASIX Certificate for further information);

2.1 WATER

Fixtures and Appliances - each apartment will be supplied and fitted with;
Showerheads – 3 star
Toilets – 3 star
Kitchen Taps – 5 star
Bathrooms Taps – 5 star
Clothes Washer – 5 stars (water rating)
Dishwasher – 5 stars (water rating)

Rainwater tank - Roof drainage and downpipes shall discharge to the stormwater drainage system reuse tank with the remaining areas connected to the detention tank. A rainwater harvesting of 40m³ in capacity shall be provided on basement level complete with dual variable speed pump set to supply water for toilet flushing and irrigation purposes.

Fire Sprinkler System - 1 fire sprinkler system. The fire sprinkler test water will not be contained in a closed system.

Water Score Achieved = 47% (Pass)

2.2 ENERGY

Lifts
2 gearless traction type lifts to serve 26 levels including the basement levels.
1 gearless traction type lifts to serve 11 levels including the basement levels.

Common Area Ventilation
Carpark – mechanical supply and exhaust ventilation with carbon monoxide monitoring and VSD fans.
Plant rooms basement level 1– mechanical supply ventilation. Fans run continuously.
Substation - mechanical supply ventilation with thermostatic control.
Fire Control Room ground level– mechanical supply ventilation with thermostatic control.
Garbage room – mechanical exhaust ventilation. Fans run continuously.
Garbage Chute rooms – mechanical exhaust ventilation. Fans run continuously.
Ground Floor Lobby – mechanical supply ventilation. Time clock control.
Lobby Levels 3-17 – natural ventilation

Common Area Lighting
The carpark shall have fluorescent lighting with time clock control and motion sensors.
The basement level 1 plant rooms, substation, fire control room, garbage room, garbage chute rooms, ground floor lobby, and the lobby shall have fluorescent lighting and motion sensors.
The lift cars shall have fluorescent lighting controlled by lift call button.

Hot Water
Each apartment to have an individual gas instantaneous hot water heater (6 star rating)

Ventilation
All laundry, toilet and kitchens shall have separate exhaust fans ducted to façade or roof. The laundry and kitchen fans shall have a manual on/off switch. The toilet fan shall be interlocked with the light.

Air Conditioning
Each apartment will have air conditioning units; reverse cycle 1 phase – 4 star rating for cooling and heating. The air conditioning will be day-night zoned between bedroom and living areas.

Lighting
Each apartment shall have fluorescent or LED lighting in the kitchen, toilets, laundries and halls.

Appliances
Each apartment will be supplied and fitted with a;
Dishwasher – 4 star (energy rating)
Clothes washer – 5 star (energy rating)
Clothes Dryer – 4.5 stars

Other
Each apartment will have an indoor or sheltered clothes drying line.
Each apartment will have a gas cook top and electric oven.
Each apartment will have a well ventilated fridge space.

Energy Score Achieved = 22% Pass

2.3 THERMAL COMFORT

Glazing
The glazing has been modelled as per the following;

Double glazed medium tint al frame - U-Value 4.07, SHGC 0.46;
- Western Facade in all units on levels 3-17,
- North and south facing glazing in Units 09 and 10 on levels 3-16,
- South facing glazing in Units 17.07

Single glazed al frame - U-Value 6.46, SHGC 0.76;
- All other glazing to the above

The above glazing is sufficient to satisfy the requirements of the BASIX Assessment; acoustic requirements may require a higher performance glass than the above.

Floor Coverings
Covering - Living/Dining - Tiled
Covering – Kitchen - Tiled
Covering – Toilets/Laundries - Tiled
Covering - Bedrooms - Carpet

Building Fabric
External Walls and walls into lobby area– Concrete plus R2.0 insulation
Common wall between apartments– concrete with no insulation
Ceiling (below neighbouring apartment) – plasterboard with no insulation
Ceiling (below roof or terrace) – plasterboard plus R3.0 insulation
Floor – concrete with no insulation
Roof – concrete with no insulation
External walls finishes to be light colour.
Roof finishes to be medium colour

Thermal Comfort Score Achieved = Pass

3.0 SEPP 65 DESIGN QUALITY OF RESIDENTIAL FLAT DEVELOPMENT

The ESD related section of SEPP 65 is summarized below;

13 Principle 5: Resource, energy and water efficiency
Good design makes efficient use of natural resources, energy and water throughout its full life cycle, including construction.

Sustainability is integral to the design process. Aspects include demolition of existing structures, recycling of materials, selection of appropriate and sustainable materials, adaptability and reuse of buildings, layouts and built form, passive solar design principles, efficient appliances and mechanical services, soil zones for vegetation and reuse of water.

The following sections list how the development at 7-9 Gibbons St Redfern will respond to the requirements of SEPP 65.

3.1 DEMOLITION OF EXISTING STRUCTURES

The contractor shall implement a Waste Management Plan for the construction works and 60% (by mass) of waste shall be reused or recycled.

3.2 RECYCLING OF MATERIALS

At least 1% of all of the buildings value will be represented by reused materials or products with post consumer recycled content of at least 20%.

3.3 SUSTAINABLE MATERIALS

Concrete - At least 30% of concrete in the building will substitute portland cement for an industrial waste product or oversized aggregate.

Steel - At least 60% of all steel used in the building will have a 50% post consumer recycled content.

Timber - At least 95% of the proposed total cost of timber products shall be reused or post consumer recycled or Forestry Stewardship Council (FCS) certified timber.

3.4 ADAPTABILITY

At least 50% of the roofing system shall be designed for disassembly**.**

3.5 BUILT FORM AND LAYOUT

The residential component of the development has been designed so that all apartments have a northern aspect, with each unit obtaining a minimum of three hours of sunlight to the living spaces in mid winter. The units are on a single loaded corridor which allows for cross ventilation.

3.6 PASSIVE SOLAR DESIGN PRINCIPLES

The following passive design principles have been implemented into the design;

Thermal Mass – the building construction is of a high thermal mass including concrete slab and tilt up concrete walls.

Insulation – all external walls shall have an additional R2.0 insulation. The roof shall have an additional R3.0 insulation.

Glazing – the majority of all glazing shall be high performance double glazing. Most of the clear glass is only in areas not in direct sunlight (ie south facing or rooms facing into the lobby).

The glazing has been modelled as per the following;
Double glazed medium tint al frame - U-Value 4.07, SHGC 0.46;
- Western Facade in all units on levels 3-17,
- North and south facing glazing in Units 09 and 10 on levels 3-16,
- South facing glazing in Units 17.07

Single glazed al frame - U-Value 6.46, SHGC 0.76;
- All other glazing to the above

Shading – all northwest facing glazing shall have deep overhangs and reveals which will allow northern solar gain but block western solar gain.

3.7 SOIL ZONES FOR VEGETATION

The site is located in an urban precinct with no deep soil landscaping provided on the site.

3.8 WATER REUSE

Roof drainage and downpipes shall discharge to the stormwater drainage system reuse tank with the remaining areas connected to the detention tank. A rainwater harvesting of 40m³ in capacity shall be provided on basement level complete with dual variable speed pump set to supply water for toilet flushing and irrigation purposes.

No greywater reuse has been incorporated into the development. Greywater reuse is not considered appropriate for this type and size of building and is more suitable for a small scale project or a residential dwelling. The additional pipework required is not only extremely costly but would also increase the embodied energy consumption of the development in the construction phase. The development has achieved a high level of water conservation through other techniques including rainwater harvesting and reuse for landscaping and toilet flushing and highly efficient fixtures and appliances.

4.0 REDFERN-WATERLOO BUILT ENVIRONMENT PLAN (STAGE ONE) AUGUST 2006 (BEP)

Development on Redfern Waterloo Authority (RWA) strategic sites will be required to contribute to the implementation of and Ecologically Sustainable Development Strategy.

The following initiatives will be implemented in the development at 7-9 Gibbons St Redfern to achieve the RWA ESD Strategy;

4.1 ENERGY EFFICIENCY, CONSERVATION AND REDUCTION OF GREENHOUSE GAS

Energy efficiency, conservation and reduction of greenhouse gas has been achieved by the implementation of the following;

Thermal Comfort – achieved through passive design techniques as listed in section 3.6. The residential apartments have achieved an average MJ/m^2 of 44% less than the BASIX benchmark.

Air Conditioning - Reverse cycle 1 phase – 4 stars for cooling and heating for all apartments. Highly efficient 3 phase Variable Refrigerant Volume (VRV) reverse cycle air conditioning for the retail and commercial areas.

Carpark Ventilation - mechanical supply and exhaust ventilation with carbon monoxide monitoring and VSD fans

Domestic Hot Water - each apartment to have an individual gas instantaneous hot water heater (6 star rating)

Lighting - each apartment shall have fluorescent or LED lighting in the kitchen, toilets, laundries and halls.

Appliances - each apartment will be supplied and fitted with a;
Dishwasher – 4 star (energy rating)
Clothes washer – 5 star (energy rating)
Clothes Dryer – 4.5 stars

4.2 WATER CONSERVATION

Water conservation has been achieved through the following;

Fixtures - each apartment will be supplied and fitted with;
Showerheads – 3 star
Toilets – 3 star
Kitchen Taps – 5 star
Bathrooms Taps – 5 star
Clothes Washer – 5 stars (water rating)
Dishwasher – 5 stars (water rating)

Rainwater tank - Roof drainage and downpipes shall discharge to the stormwater drainage system reuse tank with the remaining areas connected to the detention tank. A rainwater harvesting of 40m³ in capacity shall be provided on basement level complete with dual variable speed pump set to supply water for toilet flushing and irrigation purposes.

4.3 GREYWATER RESUSE

No greywater reuse has been incorporated into the development. Greywater reuse is not considered appropriate for this type and size of building and is more suitable for a small scale project or a residential dwelling. The additional pipework required is not only extremely costly but would also increase the embodied energy consumption of the development in the construction phase. The development has achieved a high level of water conservation through other techniques including rainwater harvesting and reuse for landscaping and toilet flushing and highly efficient fixtures and appliances.

4.4 WASTE MANAGEMENT

Construction - the contractor shall implement a Waste Management Plan for the construction works and 60% (by mass) of waste shall be reused or recycled.

Operational – there shall be a dedicated storage area for separation, collection and recycling of all waste generated. Provide a Waste and Recycling Management Plan for the retail premises.

4.5 REDUCED CAR DEPENDANCE

The depandance on the use of cars for the occupants shall be reduced by providing 1 secure bicycle rack per apartment. There is a train station and bus service within close proximity to the development which run a regular service to reduce the car dependence for the occupants.