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# Proposed Addition and Alteration

# 1 Lawson Square Redfern

# Thermal Comfort Assessment

Report Number 610.11623-R5

11 September 2015

Lawson Square Pty Ltd
c/- Candalepas Associates
Level 9, 219 Castlereagh Street
SYDNEY NSW 2000

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# Thermal Comfort Assessment

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# 1 INTRODUCTION

SLR Consulting Australia Pty Ltd (SLR) has been engaged by Lawson Square Pty Ltd to conduct thermal comfort assessment for compliance with BASIX of the proposed alterations and additions to the two existing office towers at 1 Lawson Square, Redfern. The assessment forms part of the Development Application to the Sydney City Council and to accompany the Environmental Impact Statement (EIS).

## 1.1 Development Site

The proposed development site is at 1 Lawson Square, Redfern. The site is bounded by Lawson Square to the north, Redfern Street Laneway (pedestrian link) to the south, Regent Street to the east and Gibbon Street to the west. The site currently accommodates two towers commercial development (12 levels in height) with basement. Minor landscaping is provided along the footpath of Lawson Square and at ground level between the towers.

**Figure 1 Site Location**


## 1.2 Proposed Alterations and Additions

The proposed development comprises an 18 storey mixed use development with commercial/retail use provided at the ground floor level over one (1) level of basement car park. The western tower (Tower 1) proposes residential apartments from Levels 1 to 17. The eastern tower (Tower 2) proposes commercial space from Level 1 to 4; levels 5 to 17 will be residential.

At ground level the building provides a landscaped plaza space recessed under the towers. This configuration accommodates active retail uses that have sheltered areas adjoining the publicly accessible circulation spaces. This configuration of the plaza provides public access for use by the occupants and general public. The space, while publicly accessible, will remain part of the site.

# 2 ECOLOGICAL SUSTAINABLE DEVELOPMENT

## 2.1 BERS Pro

### 2.1.1 Background

BERS Pro software is a tool designed by Solar Logic that uses CSIRO thermal simulation AccuRate engine to assess the thermal performance of residential apartments, townhouses and houses. BERS Pro computer simulation is an officially recognised computer energy rating system by the Department of Planning NSW.

Residential units were assessed for projected thermal performance by the BERS Pro software (Version 4.2), by undertaking the analysis of a representative sample of apartments which encompass all unit types. The total heating and cooling load for an apartment is calculated and then compared to the maximum heating and cooling loads in BASIX. The software has been used to undertake a comparative energy use analysis of the dwelling components of the development to assist in design optimisation for energy efficiency.

### 2.1.2 BERS Pro Modelling Assumptions

Information supplied by Candalepas Associates and the architectural drawings have been utilised in the energy modelling. **Table 1** lists the construction materials used in the assessment of all dwellings within the development.

While every endeavour has been made to provide a realistic energy rating for the proposed development, we note that the energy calculating process using computer program simulation is not a reflection of the actual operational heating and cooling energy use of the development. The energy efficiency of any building is determined not only by the design but also by the energy consumption requirements and practices of the occupants. Actual energy consumption cannot be determined until a building is occupied and operational.

**Table 1 BERS Pro Modelling Assumptions**

| Element | Material Type | Detail |
|---|---|---|
| External walls | Precast Concrete | Light colour |
| Internal walls | Plasterboard on studs | Intra-tenancy walls |
| | Hebel Power Panel | Inter-tenancy walls |
| Windows | Single glazed Clear Aluminium Frame | NFRC Glazing System (Glass+Frame) values:<br>$\Rightarrow$ U ≤ 6.57 and SHGC = 0.74 ±10%<br>Weather stripping fitted on windows<br>External screen as per drawings |
| Floor | Concrete slab | Tile (all Bathrooms and Laundries)<br>Carpet (Bedrooms, living area) |
| Roof | Concrete | R3.0 ceiling insulation |

## 2.2 Thermal Comfort Results

BASIX thermal comfort requirements for developments in Zone 56 are as follow:

- Individual maximum heating and cooling loads of 66 MJ/m²/yr and 59 MJ/m²/yr respectively; and
- The whole development must have a maximum heating and cooling loads of 51 MJ/m²/yr and 45 MJ/m²/yr respectively.

The results of the thermal modelling of individual apartments are summarised in **Table 2.** The thermal comfort result complies with BASIX requirements for development in climate zone 56.

**Table 2 Individual Area Adjusted Heating and Cooling Loads**

| Unit name | Similar units | Star Rating | Heating Load (MJ/m²/yr) | Cooling Load (MJ/m²/yr) |
|---|---|---|---|---|
| **Tower 2** | | | | |
| T2-5.01 | 6.01 to 16.01 | 7 | 21.1 | 17.8 |
| T2-5.02 | 6.02 to 16.02 | 7 | 20.8 | 17.1 |
| T2-5.03 | 6.03 to 16.03 | 7 | 20.8 | 17.1 |
| T2-5.04 | 6.04 to 16.04 | 6.5 | 25.5 | 17.5 |
| T2-5.05 | 6.05 to 16.05 | 5 | 43.4 | 14.9 |
| T2-5.06 | 6.06 to 16.06 | 4.5 | 53.2 | 14.5 |
| T2-17.01 | | 6 | 30.6 | 19 |
| T2-17.02 | | 6 | 30.4 | 19.3 |
| T2-17.03 | | 6 | 30.4 | 19.3 |
| T2-17.04 | | 5.5 | 34.9 | 18.6 |
| T2-17.05 | | 4.5 | 51.2 | 15.9 |
| T2-17.06 | | 4 | 61.6 | 15.1 |
| **Tower 1** | | | | |
| T1-1.01 | 2.01 to 13.01 | 5 | 43.1 | 18.1 |
| T1-1.02 | 2.02 to 16.02 | 5.5 | 44.1 | 11.2 |
| T1-1.03 | 2.03 to 16.03 | 6.5 | 23.3 | 17.3 |
| T1-1.04 | 2.04 to 13.04 | 4.5 | 58 | 14.8 |
| T1-1.05 | 2.05 to 16.05 | 5 | 41.3 | 18.5 |
| T1-14.01 | | 4.5 | 51.1 | 20 |
| T1-17.02 | | 5 | 52.1 | 12 |
| T1-17.03 | | 6.5 | 33 | 19.2 |
| T1-14.04 | | 4 | 65.3 | 17.3 |
| T1-17.05 | | 4.5 | 48.9 | 20.1 |

# 3 CONCLUSION

The glazing requirement is single clear glazing U-values and SHGC values as per **Table 1**. It is noted that the above glazing allowances are the minimum glazing requirements that should be considered to meet thermal comfort needs at this DA/planning stage of the development.

The roof/ceiling insulation is to be R 3.0 ceiling insulation as specified in **Table 1**. .

The U-value and SHGC value for the glazing and the R value for the insulation must be noted on drawings for DA submission.

Implementation of the modelling specifications noted in **Table 1** and will allow the ABSA and BASIX specifications to be achieved.