Mark Monk

6 Carlton St Freshwater

BASIX Assessment Report

ESD Synergy Pty Ltd
Contact No: +61 497 979 868
+61 413 591 688
Email: info@esdsynergy.com
Web: www.esdsynergy.com

Attention	Mark Monk
Client	Mark Monk
Author	Henky Mantophani
Reviewer	Adriana Segovia
Date	21/06/2024
Revision	00
Subject	6 Carlton St Freshwater – BASIX Assessment Report

1. SITE APPRECIATION

The proposed development is located at 6 Carlton St Freshwater and consists of:

- 2 level single dwelling

2. BASIX WATER SECTION

The proposed development will meet the mandatory BASIX water target of 40 as long as the water commitments detailed in Table 1 are installed. For details of the requirements necessary to achieve this target, please refer to the BASIX Certificate No. 1752598S.

Table 1: BASIX Water Commitments

BASIX Water Commitments	
Area of Landscaping & Indigenous or low water species	• **See Appendix B**
Rainwater collection	• 7,200L rainwater tank • Roof collection area – minimum 200m^2 • Rainwater to be used for garden & lawn irrigation
Fixtures	• 4-star (Water Rating) showerheads with a flow rate > 6.0L/min & ≤ 7.5L/min • 4-star (Water Rating) toilets • 5-star (Water Rating) kitchen taps • 5-star (Water Rating) bathroom taps

Outdoor swimming pool & Spa	• **Outdoor Pool:**
	  • **Max size is 6,500L (6.5 kL)**
	  • **Pool Shading: None**
	  • **Pool Cover: YES (must be installed)**
	• **No Spa**

3. BASIX THERMAL COMFORT SECTION

The thermal performance of the development has been evaluated using BERS Pro 2nd Generation software. The BERS Pro computer simulation of residential developments forms part of the Nationwide House Energy Rating Scheme, and is used to assess the potential of a residential development to have low heating and cooling energy requirements once operational.

3.1 MODELLING ASSUMPTIONS

The "base-case" building fabric and glazing and associated thermal performance specifications are described in Table 2 below as these assumptions are based on the nominated preferred construction materials indicated by the architect.

Note: Table 2 must be read in conjunction with Table 3. Table 3 outlines additional thermal enhancements / treatments to meet the mandatory thermal load targets to achieve compliance.

Table 2: Base Case Assumptions on Construction and Fabric

Element	*Material*	*Detail*
External walls	Cavity Brick	**Insulation: R1.1 Bulk Insulation (inc Garage Ext Wall)**
		Light colour: absorptance< 0.475
		Studs: Timber
Internal walls	Plasterboard on Studs & AFS with PB on Studs (for Load Bearing Internal wall only)	**Insulation: R2.0 Bulk Insulation (75mm Bulk Insulation)**
Party walls	None	Not Applicable
Windows	**Type 1 (for All Windows & Sliding Doors except below))**	Total Window System Properties **U-value 2.0 & SHGC 0.31 for sliding doors, sliding & fixed windows** **And** Total Window System Properties **U-value 2.0 & SHGC 0.25 for awning windows**
	Type 2 (for Louvred Windows of Ensuites, bathrooms and Laundry & Glass door Only)	Total Window System Properties **U-value 5.4 & SHGC 0.58 Louvred windows** **And** Total Window System Properties **U-value 5.4 & SHGC 0.49 for Glass doors**
	Type 3 (for Other Louvred Windows)	Total Window System Properties **U-value 3.1 & SHGC 0.44 Louvred windows** (EBS-003-005)
	Note: Only a ±5% SHGC tolerance to the value stated above & U-value can be NO greater than or equal to the value stated above[1]	
	Window Operability	Balcony windows: **as per plans & elevations** Bedroom windows: **as per plans & elevations**

[1] As per BASIX Thermal Performance Protocol 4.14.2

Element	*Material*	*Detail*
		All other non-balcony windows: **as per plans & elevations**
	Vertical shading device	Balcony windows: **As per plans & elevations** Non-balcony windows: **As per plans & elevations**
	Horizontal shading device	Sun hoods: **As per plans & elevations** Awning: **As per plans & elevations** Eaves: **As per plans & elevations**
Skylight	**Type 1**	**Total System U-value 2.6 & SHGC 0.24**
Roof	Concrete	**Insulation: R1.8 Bulk Insulation (Dow Roofmate)**
		Light colour: absorptance< 0.475
Ceilings	Plasterboard	**Insulation: R3.5 Bulk Insulation to all exposed areas**
		Cavity: Unventilated Cavity
Floors	Concrete	**Insulation: See Table 3**
		Tiles: Wet areas only
		Carpet: Bedrooms & Upstairs Hallway
		Timber: Elsewhere
Recessed downlights assessed		No. No lighting plan provided. Project will be updated once lighting plan is available. **All assumed to be sealed**
Exhaust fans (kitchens, bathrooms, laundry)		**All assumed to be sealed**

3.2 BERS PRO RESULTS (THERMAL COMFORT)

The simulated heating and cooling loads per dwelling are summarized in Table 3 below. Where the dwellings have failed to meet the thermal load targets additional thermal enhancements / treatments are provided. This is typically in the form of bulk insulation. These additional thermal treatments are required to pass the BASIX Thermal performance requirements.

Table 3: BERS Pro Thermal Loads

Additional Treatments Required to Table 2	*Heating Load (MJ/m².yr)*	*Cooling Load (MJ/m².yr)*	*Stars*	*Pass/Fail*
None	18.2	11.1	7.1	Pass

3.3 NCC 2022 ABCB HOUSING PROVISIONS PART 13.2.2: BUILDING FABRIC THERMAL INSULATION

All insulation must be installed as per Part 13.2.2. For relevant clauses, please see Appendix C.

3.4 NCC 2022 ABCB HOUSING PROVISIONS PART 13.4: BUILDING SEALING

For the following components, all sealing requirements will be installed as per Part 13.4:

- 13.4.2 Chimneys & flues
- 13.4.3 Roof lights
- 13.4.4 External windows & doors
- 13.4.5 Exhaust fans
- 13.4.6 Construction of ceilings, walls and floors

- 13.4.7 Evaporative coolers

For relevant clauses, please see Appendix D.

4. BASIX ENERGY SECTION

The proposed development will meet the mandatory BASIX Energy target of 72 as long as the energy commitments detailed in Table 4 are installed.

Table 4: BASIX Energy Commitments

Component	*Commitment*
Hot Water System	• Gas Instantaneous with 6 Stars Rating
Ventilation	• Kitchen Exhaust: Individual fan, ducted to façade or roof, with manual on/off switch • Bathroom & Laundry Exhaust: Individual fan, ducted to façade or roof, with manual on/off switch
Heating & Cooling	• Living Areas: Heating & Cooling to use individual 1-phase air-conditioning (Ducted) with 4 Stars Rating (Average Zone) • Bedrooms: Heating & Cooling to use individual 1 phase air-conditioning (Non-ducted) with 4 Stars Rating (Average Zone)
Lighting	• At least 80% of light fittings (including the main light fitting) in all hallways, laundries, bathrooms, kitchens, bedrooms and living areas to use Fluorescent or LED lights with dedicated fittings[2]
Outdoor swimming pool & Spa	• Pool Heating System: Solar Only • Pool Pump must be controlled by timer • Pool pump type: Not Specified
Other	• Induction cook top and electric oven
Alternative Energy Supply	• **Minimum total of 7.0 kW (Peak) PV System must be installed** • **PV Panels are to be installed facing North with panel slope of between 25 to 35 Degrees**

4.1 NCC 2022 ABCB HOUSING PROVISION PART 13.7: SERVICES

The design, location and insulation of all services must be installed as per Part 13.7. For relevant clauses, please see Appendix E.

5. CONCLUSION

The proposed development has been assessed to optimise its thermal performance (passive and fabric design) using the Nationwide House Energy Rating scheme (NatHERS) and also been assessed in terms of its ability to conserve water and minimise energy consumption through BASIX Tool.

With the commitment recommendations contained within this report the proposed development is able to meet BASIX requirements and is BASIX compliant.

For further details, please refer to the BASIX Certificate No. 1752598S provided.

[2] Definition of dedicated fittings is a light fitting that is only capable of accepting fluorescent or LED (Light Emitting Diode) lamps. It will not accept incandescent, halogen or any other non-fluorescent or non-LED lamps.

APPENDIX A - ARCHITECTURAL DRAWINGS

The building sustainability performance assessment carried out in this report was based on the following architectural drawings supplied by HELM received on 21 June 2024.

DRAWING LEGEND	
DA.01	COVER SHEET
DA.02	NOTES
DA.03	LOCALITY PLAN
DA.04	SITE PLAN ANALYSIS
DA.05	GROUND LEVEL PLAN
DA.06	LEVEL 1 PLAN
DA.07	ROOF LEVEL PLAN
DA.08	ELEVATIONS 1
DA.09	ELEVATIONS 2
DA.10	SECTION A
DA.11	SECTION B
DA.12	SECTION C
DA.13	PERSPECTIVES 1
DA.14	PERSPECTIVES 2
DA.15	LANDSCAPE CALC
DA.16	SUN STUDY SHADOWS - DEC 21
DA.17	SUN STUDY SHADOWS - SEPT 21
DA.18	SUN STUDY SHADOWS - JUNE 21
DA.19	SUN STUDY ELEVATION - 2 CARLTON ST
DA.20	MATERIALS & FINISHES
DA.21	CONSTRUCTION MANAGEMENT
DA.22	DEMOLITION PLAN

APPENDIX B – LANDSCAPING AREAS

WATER - LANDSCAPE

Please fill out mandatory fields marked in a *

		Notes for assessor
Area of lawn (m²) *	37.6	
Area of garden (excluding lawn) (m²) *	207.4	Total Garden Area is 207.4m2. 90m2 of that will be indigenous species.
Area of indigenous species (m²) *	90	

APPENDIX C – NCC 2022 ABCB Housing Provisions PART 13.2.2: BUILDING FABRIC THERMAL INSULATION CLAUSES

Part 13.2 – BUILDING FABRIC		
Clause		***BCA DTS Section J Recommendations & Compliance***
13.2.2 Building fabric thermal insulation	(1) Where required, insulation must comply with AS/NZS 4859.1 and be installed so that it— (a) abuts or overlaps adjoining insulation other than at supporting members such as columns, studs, noggings, joists, furring channels and the like where the insulation must butt against the member; and (b) forms a continuous barrier with ceilings, walls, bulkheads, floors or the like that inherently contribute to the thermal barrier; and (c) does not affect the safe or effective operation of a domestic service or fitting. (2) Where required, reflective insulation must be installed with— (a) the necessary airspace, to achieve the required R-Value between a reflective side of the reflective insulation and a building lining or cladding; and (b) the reflective insulation closely fitted against any penetration, door or window opening; and (c) the reflective insulation adequately supported by framing members; and (d) each adjoining sheet of roll membrane being— (i) overlapped greater than or equal to 150 mm; or (ii) taped together. (3) Where required, bulk insulation must be installed so that— (a) it maintains its position and thickness, other than where it crosses roof battens, water pipes, electrical cabling or the like; and (b) in a ceiling, where there is no bulk insulation or reflective insulation in the external wall beneath, it overlaps the external wall by greater than or equal to 50 mm.	Developer intends to comply

APPENDIX D – NCC 2022 ABCB Housing Provisions PART 13.4: BUILDING SEALING CLAUSES

Part 13.4 – BUILDING SEALING		
	Clause	***BCA DTS Section J Recommendations & Compliance***
13.4.1 Application of Part	(1) This Part applies to— (a) a Class 1 building; and (b) a Class 10a building with a conditioned space. (2) The provisions of (1) do not apply to the following: (a) Existing buildings being relocated. (b) Parts of buildings that cannot be fully enclosed. (c) A building in climate zones 2 and 5 where the only means of air-conditioning is by using an evaporative cooler. (d) A permanent building ventilation opening that is necessary for the safe operation of a gas appliance.	Developer intends to comply
13.4.2 Chimneys and flues	The chimney or flue of an open solid-fuel burning appliance must be provided with a damper or flap that can be closed to seal the chimney or flue.	Developer intends to comply
13.4.3 Roof lights	(1) A roof light must be sealed, or capable of being sealed, when serving— (a) a conditioned space; or (b) a habitable room in climate zones 4, 5, 6, 7 and 8. (2) A roof light required by (1) to be sealed, or capable of being sealed, must be constructed with— (a) an imperforate ceiling diffuser or the like installed at the ceiling or internal lining level; or (b) a weatherproof seal; or (c) a shutter system readily operated either manually, mechanically or electronically by the occupant.	Developer intends to comply
13.4.4 External windows & doors	(1) An external door, internal door between a Class 1 building and an unconditioned Class 10a building, openable window and other such opening must be sealed when serving— (a) a conditioned space; or (b) a habitable room in climate zones 4, 5, 6, 7 and 8. (2) A seal to restrict air infiltration— (a) for the bottom edge of a door, must be a draft protection device; and (b) for the other edges of a door or the edges of an openable window or other such opening, may be a foam or rubber compressible strip, fibrous seal or the like. (3) A window complying with the maximum air infiltration rates specified in AS 2047 need not comply with (2)(b).	Developer intends to comply

13.4.5 Exhaust fans	An exhaust fan must be fitted with a sealing device such as a self-closing damper, filter or the like when serving— (a) a conditioned space; or (b) a habitable room in climate zones 4, 5, 6, 7 and 8.	Developer intends to comply
13.4.6 Construction of ceilings, walls and floors	(1) Ceilings, walls, floors and any opening such as a window frame, door frame, roof light frame or the like must be constructed to minimise air leakage in accordance with (2) when forming part of the external fabric of— (a) a conditioned space; or (b) a habitable room in climate zones 4, 5, 6, 7 and 8. (2) Construction required by (1) must be— (a) enclosed by internal lining systems that are close fitting at ceiling, wall and floor junctions; or (b) sealed at junctions and penetrations with— (i) close-fitting architrave, skirting or cornice; or (ii) expanding foam, rubber compressive strip, caulking or the like.	Developer intends to comply
13.4.7 Evaporative coolers	An evaporative cooler must be fitted with a self-closing damper or the like when serving— (a) a heated space; or (b) a habitable room in climate zones 4, 5, 6, 7 or 8.	Developer intends to comply

APPENDIX E – NCC 2022 ABCB Housing Provisions PART 13.7: SERVICES CLAUSES

Part 3.12.5 – SERVICES		
	Clause	***BCA DTS Section J Recommendations & Compliance***
13.7.1 Application of Part	(1) This Part applies to— (a) a Class 1 building; and (b) a Class 10a building. (2) The provisions of (1) do not apply to existing services associated with existing buildings being relocated.	Developer intends to comply
13.7.2 Insulation of services	Thermal insulation for central heating water piping and heating and cooling ductwork must— (a) be protected against the effects of weather and sunlight; and (b) be able to withstand the temperatures within the piping or ductwork; and (c) use thermal insulation material in accordance with AS/NZS 4859.1.	Developer intends to comply
13.7.3 Central heating water piping	(1) Central heating water piping that is not within a conditioned space must be thermally insulated to achieve the minimum material R-Values as set out in (2) to (6). (2) Internal piping including— (a) flow and return piping that is— (i) within an unventilated wall space; or (ii) within an internal floor between storeys; or (iii) between ceiling insulation and a ceiling; and (b) heated water piping encased within a concrete floor slab (except that which is part of a floor heating system), must, in all climate zones, have a minimum material R-Value of 0.4. (3) Piping located within a ventilated wall space, an enclosed building subfloor or a roof space, including— (a) flow and return piping; and (b) cold water supply piping within 500 mm of the connection to the central water heating system; and (c) relief valve piping within 500 mm of the connection to the central water heating system, must have a minimum material R-Value in accordance with (5). (4) Piping located outside the building or in an unenclosed building subfloor or roof space, including— (a) flow and return piping; and (b) cold water supply piping within 500 mm of the	Developer intends to comply

	connection to the central water heating system; and (c) relief valve piping within 500 mm of the connection to the central water heating system, must have a minimum material R-Value in accordance with (6). (5) Piping referred to in (3) must have a minimum material R-Value of— (a) in climate zones 1, 2, 3 and 5 — 0.6; and (b) in climate zones 4, 6 and 7 — 0.9; and (c) in climate zone 8 — 1.3. (6) Piping referred to in (4) must have a minimum material R-Value of— (a) in climate zones 1, 2, 3 and 5 — 0.6; and (b) in climate zones 4, 6 and 7 — 1.3; and (c) in climate zone 8 — 1.3.	
13.7.4 Heating and cooling ductwork	(1) Heating and cooling ductwork and fittings must— (a) achieve the material R-Value in (4); and (b) be sealed against air loss— (i) by closing all openings in the surface, joints and seams of ductwork with adhesives, mastics, sealants or gaskets in accordance with AS 4254.1 and AS 4254.2 for a Class C seal; or (ii) for flexible ductwork, with a draw band in conjunction with a sealant or adhesive tape. (2) Duct insulation must— (a) abut adjoining duct insulation to form a continuous barrier; and (b) be installed so that it maintains its position and thickness, other than at flanges and supports; and (c) where located outside the building, under a suspended floor, in an attached Class 10a building or in a roof space— (i) be protected by an outer sleeve of protective sheeting to prevent the insulation becoming damp; and (ii) have the outer protective sleeve sealed with adhesive tape not less than 48 mm wide creating an airtight and waterproof seal. (3) The requirements of (1) do not apply to heating and cooling ductwork and fittings located within the insulated building envelope including a service riser within the conditioned space, internal floors between storeys and the like. (4) The material R-Value required by (1)(a) must be determined in accordance with the following: (a) In a heating-only system or cooling-only system including an evaporative cooling system— (i) ductwork must have a minimum	Developer intends to comply

	material R-Value of— (A) in climate zones 1 to 7 — 1.0; and (B) in climate zone 8 — 1.5; and (ii) fittings must have a minimum material R-Value of 0.4. (b) In a combined heating and refrigerated cooling system— (i) ductwork must have a minimum material R-Value of— (A) in climate zones 1, 3, 4, 6 and 7 — 1.5; and (B) in climate zones 2 and 5 — 1.0; and (C) in climate zone 8 — 1.5; and (ii) fittings must have a minimum material R-Value of 0.4. (c) For the purposes of (b)(i), the minimum material R-Value required for ductwork may be reduced by 0.5 for combined heating and refrigerated cooling systems in climate zones 1, 3, 4, 6 and 7 if the ducts are— (i) under a suspended floor with an enclosed perimeter; or (ii) in a roof space that has an insulation of greater than or equal to R0.5 directly beneath the roofing.	