



BCA Section J DTS

Eastern Creek Quarter Stage 2

Rooty Hill Rd, Eastern Creek NSW 2766

REPORT

PREPARED FOR

Frasers Property Australia
Building C
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Rhodes NSW 2138

Tel: 02 9767 2000

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BCA SECTION J DTS

Activity Schedule

Date	Revision	Issue	Prepared By	Approved By
09.10.2018	1	Preliminary Issue	A.Sim	E.Chan

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1. SUMMARY

Northrop Consulting Engineers have been engaged to conduct a BCA Section J Deemed-to-Satisfy (DTS) assessment according to National Construction Code (NCC) 2016, Sections J1 & J2. This summary report provides minimum compliance requirements for Building Fabric (J1) and Glazing (J2). This summary report outlines the minimum compliance requirements for the building envelope for the proposed retail development at Eastern Creek Quarter Stage 2.

The table below outlines compliance requirements for J1 and J2;

Table 1: Insulation requirements for the main building elements

Building Fabrics	Required total R-value	Equivalent Insulation/ Glazing Requirements
Roof and Ceiling	R3.2 (with solar absorptance ≤ 0.4)	100mm R2.3 Fletcher Permastop Building Blanket Insulation
External Walls	R2.8	90mm R2.5HD Fletcher Pink Batts Insulation
Insulated Partition Walls	R1.8	65mm R1.5 Fletcher Pink Batts Insulation
Floors – Slab on Ground	N/A	N/A
Glazing (Whole of window including frame)*	N/A	U-Value: 4.5 & SHGC: 0.63

*

Refer to Table 3 for individual glazing requirements

Should the requirements listed above be deemed unfeasible, it is recommend that the project team should proceed with a JV3 performance based solution. This approach is more flexible as it offers a holistic assessment of the building performance, rather than individual components.

2. REPORT LIMITATIONS

Due care and skill has been exercised in the preparation of this report.

This report is intended as a guide to illustrate the potential BCA section J compliance methods to be considered in the development. It should be read in conjunction with the other design documentation and specific applications may vary during the development of the project. Any products specified or used for the project are to be verified by the contractor as being safe and appropriate for use. Northrop do not take any responsibility for the use of unsafe products.

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3. DTS ASSESSMENT

3.1 Referenced Documents

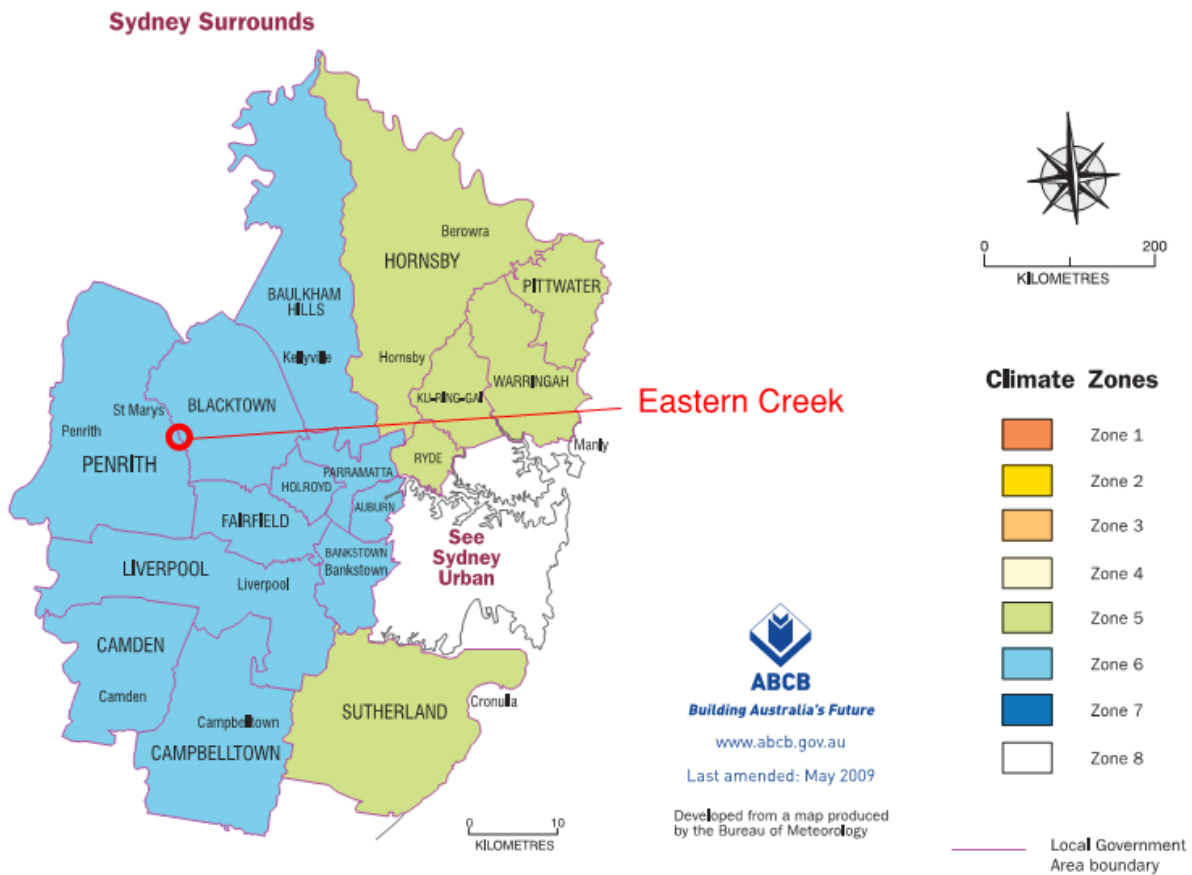
Drawing No.	Rev	Date	Title
DA04	A	09.10.2018	Proposed Site Plan – Stage 2
DA06	-	04.03.2017	Elevations – Stage 2
DA07	-	28.09.2018	Elevations 2 – Stage 2
2017-164_LOT%201	-	-	3D Cad Model

*Assessment are made based on measurement from the 3D Cad Model.

3.2 Building Classification

Eastern Creek Quarter Stage 2 development is classified as Class 6 shop or other building for the sale of goods by retail being within Climate Zone 6 of the ABCB Climate Zone map as shown in Figure 1 below.

Figure 1 Sydney Urban Climate Zone Map



3.3 J1 Building Fabric

Building fabric thermal insulation requirements apply to the building fabric enclosing habitable and conditioned spaces forming part of the thermal boundary of the site (building envelope). A marked-up floor plan of the drawing in Appendix B to this advice demonstrating the examined thermal envelope.

The tables below outline typical compliance requirements;

a) R3.2 Metal Deck Roof and Ceiling construction example

Item Description	R-Value	
Outdoor Air Film (7m/s)	0.04	
Metal Deck Roof	0.00	
R2.3 Insulation(with a layer of foil)*	2.3	
26mm Reflective Airspace (Unventilated)	0.74	
13mm Plasterboard/Ceiling Tiles	0.08	
Indoor Air Film	0.16	Required
Total R-Value:	3.32	3.2

*Equates to 100mm Fletcher R2.3 Permastop Building Blanket Insulation

A roof that has metal sheet roofing fixed to metal purlins, metal rafters or metal battens; and does not have a ceiling lining or has a ceiling lining fixed directly to those metal purlins, metal rafters or metal battens, must have a thermal break, consisting of material with an R-Value of not less than R0.2, installed between the metal sheet roofing and its supporting metal purlins, metal rafters or metal battens.

a) R2.8 External Walls (Metal Clad) construction example

Item Description	R-Value	
Outdoor Air Film	0.04	
Metal Cladding	0.00	
R2.7 Insulation*	2.7	
13mm Plasterboard	0.08	
Indoor Air Film	0.12	Required
Total R-Value:	2.94	2.8

* Equates to 90mm R2.7HD Wall Pink Batts Insulation

b) R2.8 External Walls (Concrete) construction example

Item Description	R-Value	
Outdoor Air Film	0.04	
Concrete Tilt Wall	0.10	
PIR Board (50mm)*	2.5	
Indoor Air Film	0.12	Required
Total R-Value:	2.76	2.8

*Equates to 50mm Kooltherm K5 External Wall Board

A wall that has lightweight external cladding such as weatherboards, fibre-cement or metal sheeting fixed to a metal frame; and does not have a wall lining or has a wall lining that is fixed directly to the same metal frame, must have a thermal break, consisting of a material with an R-Value of not less than R0.2, installed between the external cladding and the metal frame.

c) Insulated partition construction example

Item Description	R-Value	
Indoor Air Film	0.12	
13mm Plasterboard	0.08	
R1.5 Insulation*	1.5	
13mm Plasterboard	0.08	
Indoor Air Film	0.12	Required
Total R-Value:	1.9	1.8

*Equates to 70mm R1.5 Fletcher Pink Batts Wall Insulation

3.4 J2 Glazing

Glazing requirement in terms of U-value and Solar Heat Gain Coefficient (SHGC) as well as indicative glazing type are listed below. The DTS glazing calculator assess the glazing on different orientations independently, thus the below provides different glazing requirement on different orientation and example of equivalent glazing product;

Table 3: Glazing requirements for each orientation

Ground Floor

Orientation	U-Value	SHGC	Equivalent Glazing
North	6.3	0.75	6mm Clear Single Glazed in Capral 150mm 419 Flushline
West	6.3	0.75	6mm Clear Single Glazed in Capral 150mm 419 Flushline

Southwest	6.3	0.75	6mm Clear Single Glazed in Capral 150mm 419 Flushline
Northwest	4.5	0.63	6.38mm Comfort Plus Clear Single Glazed in Capral 150mm 419 Flushline
Southeast	6.3	0.75	6mm Clear Single Glazed in Capral 150mm 419 Flushline
Internal	6.0	0.69	6mm Clear Single Glazed in Capral Urban 584 Sliding Door

Should one glazing product be sought for the development, the following DTS complaint solution will apply;

Table 4: Glazing requirements for a uniform solution

U-Value	SHGC	Equivalent Glazing (whole of window including frame)
4.5	0.63	6.38mm Comfort Plus Clear Single Glazed in Capral 150mm 419 Flushline

As identified in Table 4, a uniform glazing solution (including door at Major 1) requires the installation of glazing and frame system equivalent to U-value of 4.5Wm²K and SHGC of 0.63.

If alternative glazing type is preferred for the door at Major 1 (refer Appendix A, Glazing Calculator, ID no. 4), a 6mm clear float glazing with frame can be specified as long as the U-value and SHGC comply with 6.2W/m²K (max) and 0.79 (min) respectively.

4. APPENDIX A GLAZING CALCULATOR(S)

Non-Uniform Solution

NCC VOLUME ONE GLAZING CALCULATOR (first issued with NCC 2014) HELP

Building name/description: **Eastern Creek Quarter Stage 2** Application: **shop display** Climate zone: **6**

Storey: **1**

Facade areas	N	NE	E	SE	S	SW	W	NW	internal
Option A	450m ²			166m ²		727m ²	#####	66m ²	186m ²
Option B									n/a
Glazing area (A)	88m ²			36m ²		227m ²	376m ²	23m ²	57m ²

Number of rows preferred in table below: **28** (as currently displayed)

GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS							SHADING		CALCULATED OUTCOMES OK (if inputs are valid)						
ID	Description (optional)	Facing sector	Size			Performance		P&H or device		Shading		Multipliers		Area used (m ²)	Outcomes
			Option A facades	Option B facades	Height (m)	Width (m)	Area (m ²)	System U-Value (AFRC)	Total SHGC (AFRC)	P (m)	H (m)	P/H	G (m)		
1	Major 1	N			87.61	6.3	0.75					1.00	1.00	87.61	100% of 72%
2	Major 1	W	9.80	2.76		6.3	0.75	6.552	9.800	0.67	0.00	0.60	0.58	27.05	7% of 87%
3	Major 1 (adj to sports	W	6.90	1.80		6.3	0.75	4.463	6.900	0.65	0.00	0.61	0.59	12.42	3% of 87%
4	Major 1 (airlock ent)	internal	6.90	8.22		6.0	0.69			2.00	0.00	0.55	0.55	56.71	100% of 100%
5	Tenant 2 (1)	SW	4.14	2.40		6.3	0.75	1.623	4.141	0.39	0.00	0.81	0.75	9.94	4% of 92%
6	Tenant 2 (2)	SW	5.10	4.80		6.3	0.75	1.974	5.100	0.39	0.00	0.82	0.75	24.48	11% of 92%
7	Tenant 2 (3)	SW	5.74	4.80		6.3	0.75	2.519	5.735	0.44	0.00	0.79	0.72	27.53	12% of 92%
8	Tenant 2 (4)	SW	3.60	6.65		6.3	0.75	3.040	3.600	0.84	0.00	0.61	0.56	23.93	11% of 92%
9	Tenant 2 (5)	SW	7.15	2.35		6.3	0.75	3.760	7.150	0.53	0.00	0.75	0.68	16.80	7% of 92%
10	Tenant 3 (1)	W	7.13	2.35		6.3	0.75	3.300	7.128	0.46	0.00	0.74	0.69	16.75	4% of 87%
11	Tenant 3 (2)	W	6.48	3.60		6.3	0.75	3.014	6.480	0.47	0.00	0.73	0.68	23.33	6% of 87%
12	Tenant 3 (3)	W	5.78	3.60		6.3	0.75	2.734	5.783	0.47	0.00	0.73	0.68	20.82	5% of 87%
13	Tenant 3 (4)	W	4.80	3.60		6.3	0.75	2.472	4.800	0.52	0.00	0.70	0.66	17.28	4% of 87%
14	Tenant 3 (5)	W	4.86	3.60		6.3	0.75				0.00	1.00	1.00	17.48	5% of 87%
15	Tenant 4 (1)	W	6.34	2.40		6.3	0.75	2.883	6.340	0.45	0.00	0.74	0.69	15.21	4% of 87%
16	Tenant 4 (2)	W	6.40	3.60		6.3	0.75	3.180	6.400	0.50	0.00	0.71	0.67	23.04	6% of 87%
17	Tenant 4 (3)	W	5.80	2.40		6.3	0.75	2.900	5.800	0.50	0.00	0.71	0.67	13.92	3% of 87%
18	Tenant 4 (4)	W			40.49	6.3	0.75				0.00	1.00	1.00	40.49	12% of 87%
19	Tenant 5 (1)	W			34.05	6.3	0.75				0.00	1.00	1.00	34.05	10% of 87%
20	Tenant 5 (2)	W	7.10	2.28		6.3	0.75	2.110	7.100	0.30	0.00	0.85	0.80	16.19	4% of 87%
21	Tenant 5 (3)	W	7.40	1.14		6.3	0.75	3.600	7.400	0.49	0.00	0.72	0.67	8.44	2% of 87%
22	Tenant 5 (4)	W			24.36	6.3	0.75				0.00	1.00	1.00	24.36	7% of 87%
23	Café (1)	W	6.22	6.29		6.3	0.75	8.196	8.600	0.00	2.39	1.00	1.00	39.06	11% of 87%
24	Café (2)	W	5.07	2.58		6.3	0.75	9.900	8.000	0.00	2.93	1.00	1.00	13.08	4% of 87%
25	Major 2 (1)	W	3.55	3.60		6.3	0.75	8.400	7.000	0.00	3.45	1.00	1.00	12.78	4% of 87%
26	Major 2 (2)	NW	3.55	6.50		4.5	0.63	9.700	7.800	0.00	4.25	1.00	1.00	23.08	100% of 96%
27	Major 2 (3)	SW			124.63	6.3	0.75				0.00	1.00	1.00	#####	54% of 92%
28	Major 2 (4)	SE			35.79	6.3	0.75				0.00	1.00	1.00	35.79	100% of 67%

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if inputs are valid

Uniform Solution

NCC VOLUME ONE GLAZING CALCULATOR (first issued with NCC 2014) HELP

Building name/description: **Eastern Creek Quarter Stage 2** Application: **shop display** Climate zone: **6**

Storey: **1**

Facade areas		N	NE	E	SE	S	SW	W	NW	internal
Option A		450m ²			166m ²		727m ²	1242m ²	65.5m ²	186m ²
Option B										n/a
Glazing area (A)		87.6m ²			35.8m ²		227m ²	376m ²	23.1m ²	57m ²

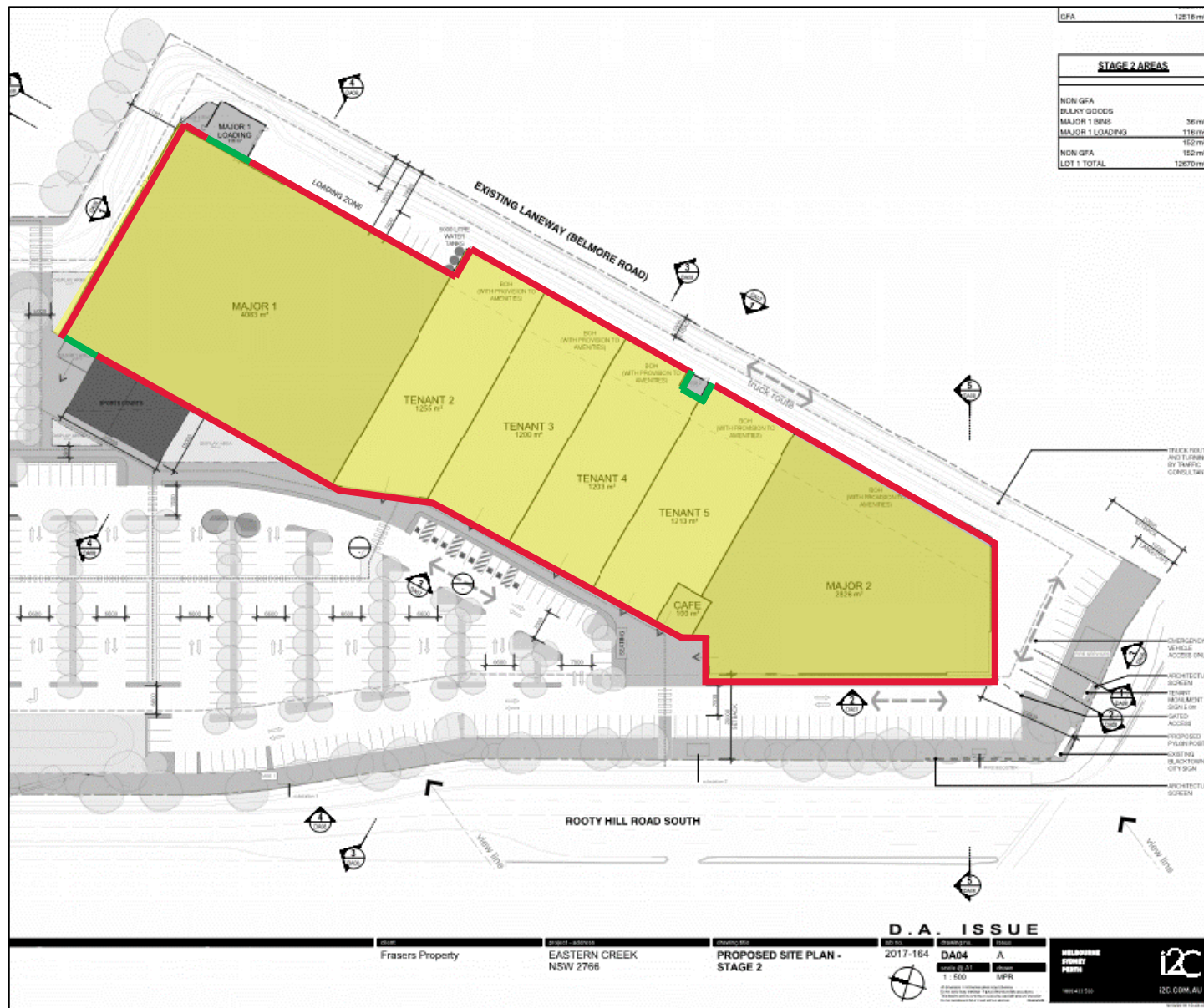
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ID	Description (optional)	Facing sector		Size			Performance		P&H or device		Shading		Multipliers		Size	Outcomes
		Option A facades	Option B facades	Height (m)	Width (m)	Area (m ²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S _w)	Cooling (S _c)	Area used (m ²)	Element share of % of allowance used
1	Major 1	N				87.61	4.5	0.63				0.00	1.00	1.00	87.61	100% of 61%
2	Major 1	W		9.80	2.76		4.5	0.63	6.552	9.800	0.67	0.00	0.60	0.58	27.05	7% of 64%
3	Major 1 (adj to sports co	W		6.90	1.80		4.5	0.63	4.463	6.900	0.65	0.00	0.61	0.59	12.42	3% of 64%
4	Major 1 (airlock ent)	internal		6.90	8.22		4.5	0.63			2.00	0.00	0.55	0.55	56.71	100% of 71%
5	Tenant 2 (1)	SW		4.14	2.40		4.5	0.63	1.623	4.141	0.39	0.00	0.81	0.75	9.94	4% of 63%
6	Tenant 2 (2)	SW		5.10	4.80		4.5	0.63	1.974	5.100	0.39	0.00	0.82	0.75	24.48	11% of 63%
7	Tenant 2 (3)	SW		5.74	4.80		4.5	0.63	2.519	5.735	0.44	0.00	0.79	0.72	27.53	12% of 63%
8	Tenant 2 (4)	SW		3.60	6.65		4.5	0.63	3.040	3.600	0.84	0.00	0.61	0.56	23.93	11% of 63%
9	Tenant 2 (5)	SW		7.15	2.35		4.5	0.63	3.760	7.150	0.53	0.00	0.75	0.68	16.80	7% of 63%
10	Tenant 3 (1)	W		7.13	2.35		4.5	0.63	3.300	7.128	0.46	0.00	0.74	0.69	16.75	4% of 64%
11	Tenant 3 (2)	W		6.48	3.60		4.5	0.63	3.014	6.480	0.47	0.00	0.73	0.68	23.33	6% of 64%
12	Tenant 3 (3)	W		5.78	3.60		4.5	0.63	2.734	5.783	0.47	0.00	0.73	0.68	20.82	5% of 64%
13	Tenant 3 (4)	W		4.80	3.60		4.5	0.63	2.472	4.800	0.52	0.00	0.70	0.66	17.28	4% of 64%
14	Tenant 3 (5)	W		4.86	3.60		4.5	0.63				0.00	1.00	1.00	17.48	5% of 64%
15	Tenant 4 (1)	W		6.34	2.40		4.5	0.63	2.883	6.340	0.45	0.00	0.74	0.69	15.21	4% of 64%
16	Tenant 4 (2)	W		6.40	3.60		4.5	0.63	3.180	6.400	0.50	0.00	0.71	0.67	23.04	6% of 64%
17	Tenant 4 (3)	W		5.80	2.40		4.5	0.63	2.900	5.800	0.50	0.00	0.71	0.67	13.92	3% of 64%
18	Tenant 4 (4)	W				40.49	4.5	0.63				0.00	1.00	1.00	40.49	12% of 64%
19	Tenant 5 (1)	W				34.05	4.5	0.63				0.00	1.00	1.00	34.05	10% of 64%
20	Tenant 5 (2)	W		7.10	2.28		4.5	0.63	2.110	7.100	0.30	0.00	0.85	0.80	16.19	4% of 64%
21	Tenant 5 (3)	W		7.40	1.14		4.5	0.63	3.600	7.400	0.49	0.00	0.72	0.67	8.44	2% of 64%
22	Tenant 5 (4)	W				24.36	4.5	0.63				0.00	1.00	1.00	24.36	7% of 64%
23	Café (1)	W		6.22	6.29		4.5	0.63	8.196	8.600	0.00	2.39	1.00	1.00	39.06	11% of 64%
24	Café (2)	W		5.07	2.58		4.5	0.63	9.900	8.000	0.00	2.93	1.00	1.00	13.08	4% of 64%
25	Major 2 (1)	W		3.55	3.60		4.5	0.63	8.400	7.000	0.00	3.45	1.00	1.00	12.78	4% of 64%
26	Major 2 (2)	NW		3.55	6.50		4.5	0.63	9.700	7.800	0.00	4.25	1.00	1.00	23.08	100% of 96%
27	Major 2 (3)	SW				124.63	4.5	0.63				0.00	1.00	1.00	#####	54% of 63%
28	Major 2 (4)	SE				35.79	4.5	0.63				0.00	1.00	1.00	35.79	100% of 48%

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if inputs are valid

5. APPENDIX B BUILDING THERMAL BOUNDARY MARKUP



Legend:

- Roof & Ceiling with total R-value of R3.2
- External Walls with total R-value of R2.8
- Insulated Internal Walls between conditioned and non-conditioned space with total R-value of R1.8