07 – Section J Report

07

NSW Department of Education

NCC Section J Compliance Assessment

Waitara Public School

Revision A

October 2017

Executive summary

This report provides an assessment of compliance of the proposed Waitara Public School, in accordance with the Energy Efficiency requirements of Section J of the NCC (National Construction Code) 2016.

A clause-by-clause analysis is provided to identify how compliance is achieved for each of the relevant Deemed to Satisfy sections of the NCC 2016. In cases where the design is not yet compliant or sufficient information is not yet available, recommendations to meet the standards are given.

The proposed design of the building will comply with the applicable Deemed to Satisfy provisions of Section J of the NCC 2016, subject to the recommendations noted being implemented, and as such will meet performance requirements JP1 and JP2 and JP3 of the NCC 2016.

There are no non-compliances.

Some elements of the design are still to be completed, and in such cases the compliant criteria is described in this report

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Appendices

1. Introduction

GHD has been engaged to undertake an assessment of compliance with the NCC 2016 Section J Energy Efficiency requirements of the proposed Waitara Public School.

This report provides a clause-by-clause analysis of the proposed building design in conjunction with the requirements of Section J of the NCC 2016. Where the design has been documented, it has been assessed against each clause for compliance. Any sections of the design that were not complete at the time of assessment are listed and guidelines given for compliance.

1.1 Referenced standards

This report has been undertaken with reference to the following:

- The National Construction Code 2016
- The Australian Building Codes Board Glazing Calculator (Version 4.0)

1.2 Referenced site information

The report has been undertaken with reference to the following for information:

Drawings .

ARCHITECTURAL-SD
21-26108 WA SD-AR-0000 COVER SHEET & LOCATION PLAN
21-26108 WA SD-AR-0001 LOCATION / SITE PLAN
21-26108 WA SD-AR-0006 BUILDING FABRIC AND FINISHES SCHEDULE
21-26108 WA SD-AR-0300 STAGING PLAN - LEVEL 1
21-26108 WA SD-AR-1000 SITE PLAN SETOUT PLAN
21-26108 WA SD-AR-2000 GENERAL ARRANGEMENT - LEVEL 1
21-26108 WA SD-AR-2001 GENERAL ARRANGEMENT - LEVEL 2
21-26108 WA SD-AR-2002 GENERAL ARRANGEMENT - LEVEL 3
21-26108 WA SD-AR-2003 GENERAL ARRANGEMENT - LEVEL 4
21-26108 WA SD-AR-2004 GENERAL ARRANGEMENT - ROOF
21-26108 WA SD-AR-2100 WALL SET OUT PLAN - LEVEL 1
21-26108 WA SD-AR-2101 WALL SET OUT PLAN - LEVEL 2
21-26108 WA SD-AR-2102 WALL SET OUT PLAN - LEVEL 3
21-26108 WA SD-AR-2103 WALL SET OUT PLAN - LEVEL 4
21-26108 WA SD-AR-2200 CONCRETE PROFILE PLAN - LEVEL 1
21-26108 WA SD-AR-2201 CONCRETE PROFILE PLAN - LEVEL 2
21-26108 WA SD-AR-2202 CONCRETE PROFILE PLAN - LEVEL 3
21-26108 WA SD-AR-2203 CONCRETE PROFILE PLAN - LEVEL 4
21-26108 WA SD-AR-2300 FLOOR FINISHES PLAN - LEVEL 1
21-26108 WA SD-AR-2301 FLOOR FINISHES PLAN - LEVEL 2
21-26108 WA SD-AR-2302 FLOOR FINISHES PLAN - LEVEL 3
21-26108 WA SD-AR-2303 FLOOR FINISHES PLAN - LEVEL 4
21-26108 WA SD-AR-2304 WALL FINISH PLAN -LEVEL 1
21-26108 WA SD-AR-2305 WALL FINISH PLAN - LEVEL 2
21-26108 WA SD-AR-2306 WALL FINISH PLAN - LEVEL 3
21-26108 WA SD-AR-2307 WALL FINISH PLAN - LEVEL 4
21-26108 WA SD-AR-2400 FF&E PLAN - LEVEL 1
21-26108 WA SD-AR-2401 FF&E PLAN - LEVEL 2
21-26108 WA SD-AR-2402 FF&E PLAN - LEVEL 3
21-26108 WA SD-AR-2403 FF&E PLAN - LEVEL 4
21-26108 WA SD-AR-2500 REFLECTED CEILING PLAN - LEVEL 1
21-26108 WA SD-AR-2501 REFLECTED CEILING PLAN - LEVEL 2
21-26108 WA SD-AR-2502 REFLECTED CEILING PLAN - LEVEL 3
21-26108 WA SD-AR-2503 REFLECTED CEILING PLAN - LEVEL 4
21-26108 WA SD-AR-3000 BUILDING ELEVATIONS
21-26108 WA SD-AR-3001 BUILDING ELEVATIONS

21-26108 WA SD-AR-3100 BUILDING SECTIONS
21-26108 WA SD-AR-3101 BUILDING SECTIONS
21-26108 WA SD-AR-4000 DETAIL WALL SECTIONS - SHEET 1
21-26108 WA SD-AR-4001 DETAIL WALL SECTIONS - SHEET 2
21-26108 WA SD-AR-4100 PRECAST DETAIL - SHEET 1
21-26108 WA SD-AR-4200 FACADE AND CLADDING DETAIL - SHEET 1
21-26108 WA SD-AR-4300 CURTAIN WALL AND GLAZING DETAIL - SHEET 1
21-26108 WA SD-AR-4400 CANOPY & SCREEN DETAIL - SHEET 1
21-26108 WA SD-AR-4500 STAIRS, RAMPS, LIFTS & CIRCULATION DETAIL
21-26108 WA SD-AR-4501 STAIRS, RAMPS, LIFTS & CIRCULATION DETAIL
21-26108 WA SD-AR-4502 STAIRS, RAMPS, LIFTS & CIRCULATION DETAIL
21-26108 WA SD-AR-4503 STAIRS, RAMPS, LIFTS & CIRCULATION DETAIL
21-26108 WA SD-AR-4600 DETAIL AREA PLANS
21-26108 WA SD-AR-5000 BUILDING FABRIC & FINISHES SCHEDULE
21-26108 WA SD-AR-5050 FACADE DETAILS SECTION
21-26108 WA SD-AR-5100 WINDOW & LOUVER SCHEDULE
21-26108 WA SD-AR-5101 WINDOW TYPE LEGEND
21-26108 WA SD-AR-5200 FACADE WINDOW & LOUVRE DETAILS - SHEET 1
21-26108 WA SD-AR-5300 DOOR SCHEDULE - SHEET 1 OF 3
21-26108 WA SD-AR-5301 DOOR SCHEDULE - SHEET 2 OF 3
21-26108 WA SD-AR-5302 DOOR SCHEDULE SHEET 3 OF 3
21-26108 WA SD-AR-5303 DOOR TYPE LEGEND
21-26108 WA SD-AR-5400 FACADE DOOR DETAIL - SHEET 1
21-26108 WA SD-AR-5500 ROOF DETAIL - SHEET 1
21-26108 WA SD-AR-5600 EXTENSION CANOPIES, SCREENS, METAL WORKS & SEC.STEEL DETAIL
21-26108 WA SD-AR-6000 PARTITION DETAILS - SHEET 1
21-26108 WA SD-AR-6001 PARTITION DETAILS - SHEET 2
21-26108 WA SD-AR-6100 PARTITIONS - WINDOWS AND GLAZING DETAIL - SHEET 1
21-26108 WA SD-AR-6200 PARTITIONS - DOOR DETAIL - SHEET 1
21-26108 WA SD-AR-6300 CEILING DETAIL
21-26108 WA SD-AR-6400 FINISHES DETAIL - FLOOR/WALLS
21-26108 WA SD-AR-6500 INTERNAL-PROTECTION & METALWORK DET.
21-26108 WA SD-AR-7000 INTERNAL - FF&FE SCHEDULE
21-26108 WA SD-AR-7100 SANITARY FIXTURES AND FITTINGS SCHEDULE
21-26108 WA SD-AR-7200 ROOM LAYOUT - TYPICAL HOME BASE
21-26108 WA SD-AR-7201 ROOM LAYOUT
21-26108 WA SD-AR-7202 ROOM LAYOUT
21-26108 WA SD-AR-7300 CIRCULATION AREAS
21-26108 WA SD-AR-7400 UTILITY AND WET AREAS
21-26108 WA SD-AR-7401 UTILITY AND WET AREAS
21-26108 WA SD-AR-7402 UTILITY AND WET AREAS
21-26108 WA SD-AR-8000 JOINERY FITOUT - SHEET 1
21-26108 WA SD-AR-8001 JOINERY FITOUT - SHEET 2
21-26108 WA SD-AR-8002 JOINERY FITOUT - SHEET 3
21-26108 WA SD-AR-8003 JOINERY FITOUT - SHEET 4
21-26108 WA SD-AR-8004 JOINERY FITOUT - SHEET 5
21-26108 WA SD-AR-8005 JOINERY FITOUT - SHEET 6
21-26108 WA SD-AR-8006 JOINERY FITOUT - SHEET 7
21-26108 WA SD-AR-8050 JOINERY DETAIL - SHEET 1
21-26108 WA SD-AR-8100 WORKSTATION FITOUT - SHEET 1
21-26108 WA SD-AR-8150 WORKSTATION DETAIL - SHEET 1
21-26108 WA SD-AR-8200 FITTINGS & FIXTURES FITOUT - SHEET 1
21-26108 WA SD-AR-8250 FITTINGS & FIXTURES DETAILS - SHEET 1
21-26108 WA SD-AR-8700 SIGNAGE FITOUT - SHEET 1
21-26108 WA SD-AR-8750 SIGNAGE DETAIL - SHEET 1
21-26108 WA SD-AR-9000 SHADOW ANALYSIS - MARCH 20
21-26108 WA SD-AR-9001 SHADOW ANALYSIS - JUNE 22
21-26108 WA SD-AR-9002 SHADOW ANALYSIS - SEPTEMBER 22
21-26108 WA SD-AR-9003 SHADOW ANALYSIS - DECEMBER 22

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1.3 Purpose of Report

This report is intended to provide an analysis of the documented design in terms of its compliance with our interpretation of Section J of the NCC.

1.4 Scope and limitations

This report has been prepared by GHD for NSW Department of Education and may only be used and relied on by NSW Department of Education for the purpose agreed between GHD and NSW Department of Education as set out in Section 1.3 of this report.

GHD otherwise disclaims responsibility to any person other than NSW Department of Education arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

2. Definitions

NCC classifications

The proposed building is classified as Class 9b. The site is in Climate Zone 5.

Thermal envelope

This refers to the building fabric separating a conditioned space (a space likely, due to its intended use, to have its temperature controlled by air conditioning) or habitable room from the exterior of the building or an unconditioned space. Note that even though at the current stage of design it is intended that the majority of the spaces will be naturally ventilated only, they must still comply with the BCA as if they were an air conditioned space.

3. Clause by clause analysis

3.1 J0 – Energy efficiency

3.1.1 J0.0 – Deemed to satisfy provisions

The building may comply with deemed to satisfy provisions by meeting performance requirements JP1 and JP3 and complying with the relevant Section J clauses within the NCC.

3.1.2 J0.1 – Application of section J

The building may satisfy the performance requirements of JP1 and JP3 by complying with the relevant clauses below:

- Reduction of heating and cooling: Clause J1, J2, J3

- Air conditioning and ventilation: Clause J5
- Artificial lighting and power: Clause J6
- Heated water supply: Clause J7
- Facilities for maintenance and monitoring: Clause J8

3.1.3 J0.2 – Heating and cooling loads of sole-occupancy units of a class 2 building or a class 4 part of a building

Not applicable for this class of building.

3.1.4 J0.3 – Ceiling fans

Not applicable for this class of building. (Note in some instances ceiling fans have been provided, but there are no compliance issues within Section J that are applicable)

3.2 J1 – Building fabric

3.2.1 J1.1 – Application of part

The deemed to satisfy provisions of this part apply to the thermal envelope of the building.

3.2.2 J.1.2 – Thermal construction general

The building is provided with insulation where required, complying with AS/NZS 4859.1 and installed with the appropriate overlaps, airspaces and positioning to ensure it performs at the stated R-Value.

3.2.3 J1.3 – Roof and ceiling construction

Roof construction as documented is required to meet a minimum total R value of R3.2 downwards for the low absorptance roof sheeted areas of the thermal envelope. For sustainability reasons the roof has been designed to an R value of 3.7, to exceed the minimum requirements of the BCA.

3.2.4 J1.4 – Roof lights

This clause is not applicable as there are no roof lights forming part of the thermal envelope. The skylights in the roof over are considered to be clerestory windows and assessed against Section J2 of the BCA.

3.2.5 J1.5 – Walls

External walls of the thermal envelope are required to meet a minimum thermal performance of R2.8. This can be reduced by R0.5 for walls with a surface density of greater than 200 kg/m^2 and an additional R0.5 for walls facing the south orientation.

For sustainability reasons the walls have been designed to exceed the minimum requirements of the BCA with a U value of 0.31 W/m^2K (R 3.22).

Internal walls that are part of the thermal envelope must meet a minimum insulation value of R1.8 as these walls border a space with ventilation greater than 1.5 air changes per hour during occupied hours.

3.2.6 J1.6 – Floors

The floors are required to meet a performance of R1.0 (on the basis that no in-slab heating/cooling is to be incorporated), or R2.0 if the space beneath the floor is either not

enclosed or is mechanically ventilated by more than 1.5 air changes per hour. For sustainability reasons the floors have been designed to exceed the minimum requirements of the BCA Document insulation requirements on architectural drawings.

3.3 J2 – External glazing

3.3.1 J2.1 – Application of part

The deemed to satisfy provisions of this part apply to all glazing on walls forming the thermal envelope of the building. A mark-up showing numbered windows is provided in Appendix A

3.3.2 J2.4 – Glazing

The proposed glazing design details were entered into the Australian Building Codes Board Glazing Calculator (Version 4.0) to ascertain compliance with the requirements of this assessment method. Appendix B contains the glazing calculators used.

3.3.1 J2.5 – Shading

Shading used in calculations assessing compliance for Clause J2.4 meets the shading design requirements of J2.5.

3.4 J3 – Building sealing

3.4.1 J3.1 – Application of part

The deemed to satisfy provisions of this part apply to the thermal envelope of the building.

3.4.2 J3.2 – Chimneys and flues

The thermal envelope does not contain any open, solid-fuel burning appliances and as such this clause does not apply.

3.4.3 J3.3 – Roof lights

The roof plan does not show the inclusion of roof lights (note that in the vernacular of the NCC a roof light is a skylight or window at an angle between 0 and 70 degrees to the horizontal), and as such this clause is not applicable.

3.4.4 J3.4 – Windows and doors

This clause requires a seal to restrict air infiltration to be fitted to each edge of all doors, openable windows and the like between the thermal envelope and outdoors or a non-conditioned space. This must consist of a foam or rubber compressible strip, fibrous seal or equivalent to achieve compliance, and for the bottom edge of an external swing door must be a draft stop.

Entry doors from outside to the conditioned spaces must also feature an air lock, revolving door, self-closing mechanism, automatic control or the like to ensure doors are not left open.

These requirements do not extend to fire or smoke doors, roller shutter doors, roller shutter grilles or other security doors or devices installed only for out of hours use. Windows complying with AS2047 are also exempt from compliance.

Compliance will be achieved if all relevant requirements of this clause are met.

3.4.5 J3.4 – Exhaust fans

Miscellaneous exhaust fans must be fitted with a sealing device such as a self-closing damper if serving a conditioned space or habitable room. This should be documented in mechanical drawings.

3.4.6 J3.5 – Construction of roof, walls and floors

The building fabric forming part of the thermal envelope or external fabric of a habitable room must be adequately sealed using caulking, skirting and cornices to minimise air leakage. Alternatively, the space may be enclosed by an internal lining system fitting closely at the ceiling, wall and floor junctions. This does not apply to openings, grilles or similar needed for smoke management. This should be documented in architectural drawings.

3.4.7 J3.6 – Evaporative coolers

This clause is not applicable as there are no evaporative coolers in the system.

3.5 J5 - Air conditioning and ventilation systems

3.5.1 J5.2 – Air conditioning systems

This clause requires systems to be able to be deactivated when not in use, avoid un-necessary heating/cooling, avoid un-necessarily high air flows, and to take advantage of the efficiency benefits of an outside air economy cycle where needed. The required dampers must be included for preventing unwanted infiltration, and systems cannot impact on smoke hazard management or ventilation.

Insulation and sealing of ductwork and refrigerant lines must be compliant with requirements of this clause, energy efficiency ratios and fan power appropriate to the system design must be adhered to, and time switches capable of controlling operation of plant must be installed.

The building is being designed to be naturally ventilated only, but provisions are also being made that air conditioning may be installed at a later date.

Section J5.2 should be reviewed and considered as and when mechanical design is progressed.

3.5.2 J5.3 – Mechanical ventilation systems

Mechanical ventilation systems used must be able to be deactivated when the part of the building they serve is not in use. If serving a conditioned space, they cannot exceed the minimum outdoor air requirement by more than 20% unless this is used to balance process exhaust, supply free cooling, balance required mechanical ventilation, or where an energy reclaim ventilator preconditions all outside air.. These requirements must not impact on smoke hazard management or ventilation requirements.

Fans must comply with the requirements of Section J5.2. If mechanical ventilation systems with an air flow rate greater than 1000 L/s are used, they must operate on a time switch in accordance with Specification J6 unless the ventilation is required for 24 hour occupancy.

3.5.3 J5.4 – Miscellaneous exhaust systems

Miscellaneous exhaust systems with air flow rates of greater than 1000 L/s, when associate with equipment that has variable demand, must be able to stop operation of its motor and feature a variable speed fan or similar. This is not applicable in cases where additional exhaust ventilation is required to balance the necessary outside air.

3.6 J6 - Artificial lighting and power

3.6.1 J6.2 – Artificial lighting

Illumination power density requirements will be met, the specific lighting design will occur after this stage of design and subsequent reports will include completed calculators.

3.6.2 J6.3 – Interior artificial lighting and power control

Adequate and code compliant control of lights using motion detection, PE cells and time clocks will be provided as required by this clause.

3.6.3 J6.3 – Interior decorative and display lighting

It is expected that this clause will not be applicable, as no decorative lighting is expected to be used or is shown.

3.6.4 J6.5 – Artificial lighting around the perimeter of a building

The perimeter lighting will be controlled by a daylight sensor as required by this clause, and will be documented to be able to operate only between sunset and sunrise as required.

3.6.5 J6.6 - Boiling water and chilled water storage units

If any boiling water or chilled water storage units are to be installed, their power supply must be controlled by a time switch capable of operating at variable pre-programmed times and variable pre-programmed days. The time switch must be able to be over-ridden by manual switch or system that senses the presence of a person. This over-ride period can last a maximum of 2 hours, beyond which the system switches back to time switch control unless further occupancy is detected.

These requirements should be documented on electrical drawings if these units are fitted.

3.7 J7 – Heated water supply and swimming pool and spa plant

3.7.1 J7.2 - Heated water supply

Heated water supply systems for food preparation (e.g. kitchen use) and sanitary purposes (e.g. amenities basins) must be designed and installed in accordance with Part B2 of NCC Volume three – Plumbing Code of Australia.

3.7.2 J7.3 – Swimming pool heating and pumping

This clause is not applicable as there is no swimming pool.

3.7.3 J7.4 – Spa pool heating and pumping

This clause is not applicable as there is no spa pool.

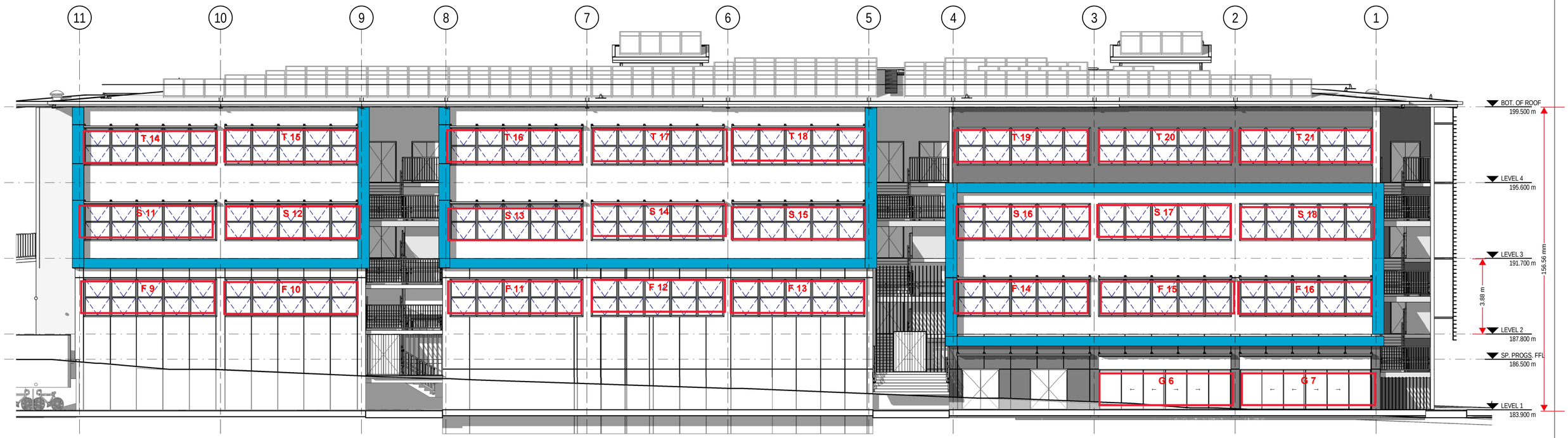
3.8 J8 - Facilities for energy monitoring

3.8.1 J8.3 – Facilities for energy monitoring

The building must have facilities to record gas and electricity consumption.

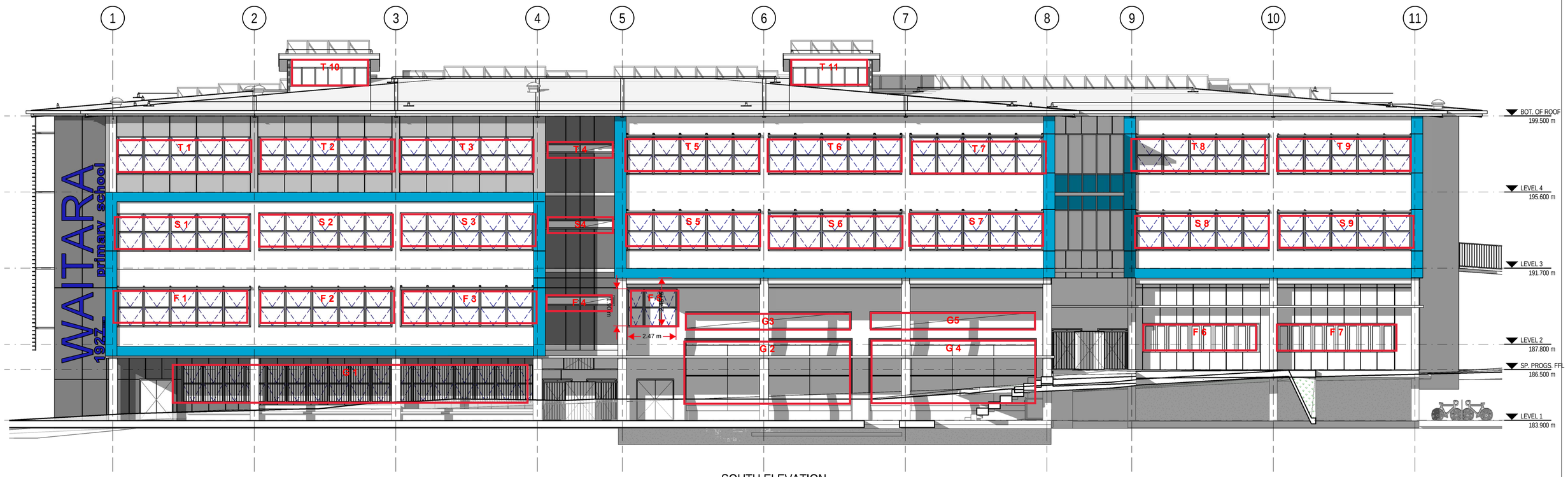
Appendices

Appendix A – Glazing numbering



NORTH ELEVATION

SCALE 1 : 100



SOUTH ELEVATION

SCALE 1 : 100

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
A	ISSUED FOR SCHEME DESIGN		RA			21.09.2017

NSW GOVERNMENT Education

TSA MANAGEMENT

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Drawn	R. AMANTE	Designer	S. BUZGAN
Drafting Check		Design Check	
Approved (Project Director)			
Nominated / Responsible Architect	A. MILLER		
Scale	1 : 100	This Drawing must not be used for Construction unless signed as Approved	

Client **NSW DEPARTMENT OF EDUCATION**

Project **WAITARA PUBLIC SCHOOL REDEVELOPMENT**

Title **BUILDING ELEVATIONS**

Original Size **A1**

Drawing No: **21-26108 -WA- SD-AR-3000** **Rev:** **A**

Plot Date: 6/10/2017 5:51:02 PM

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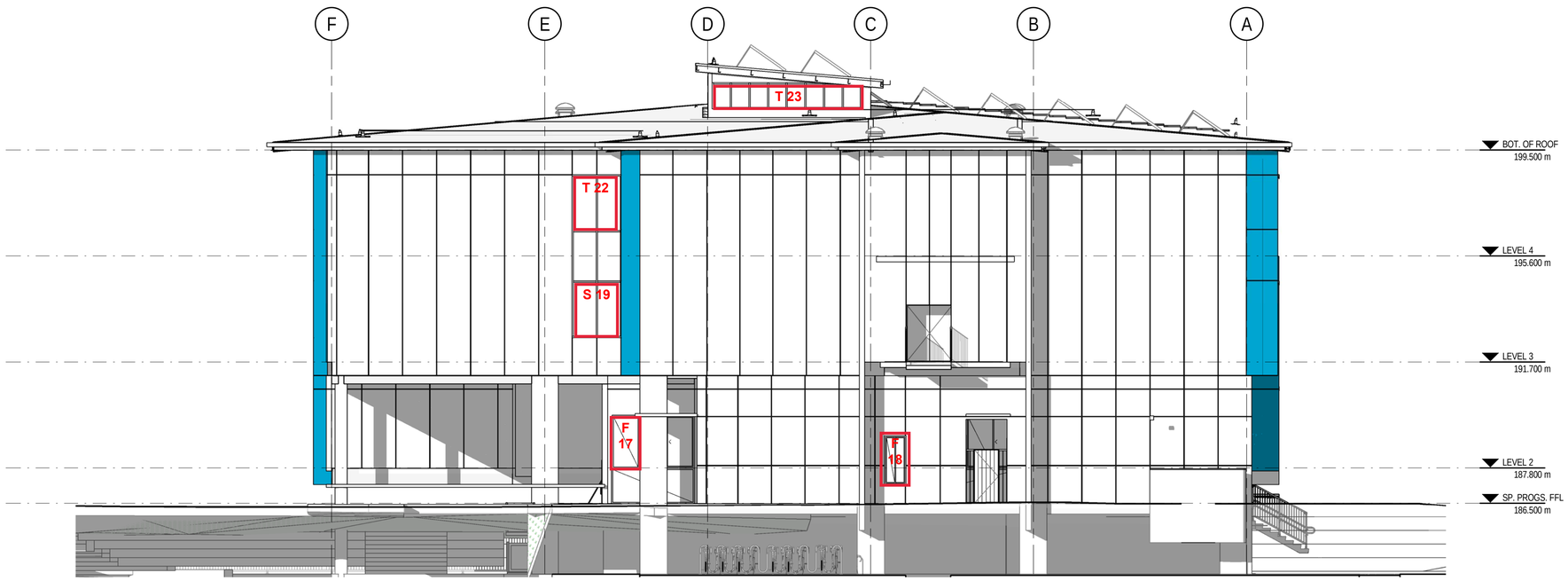
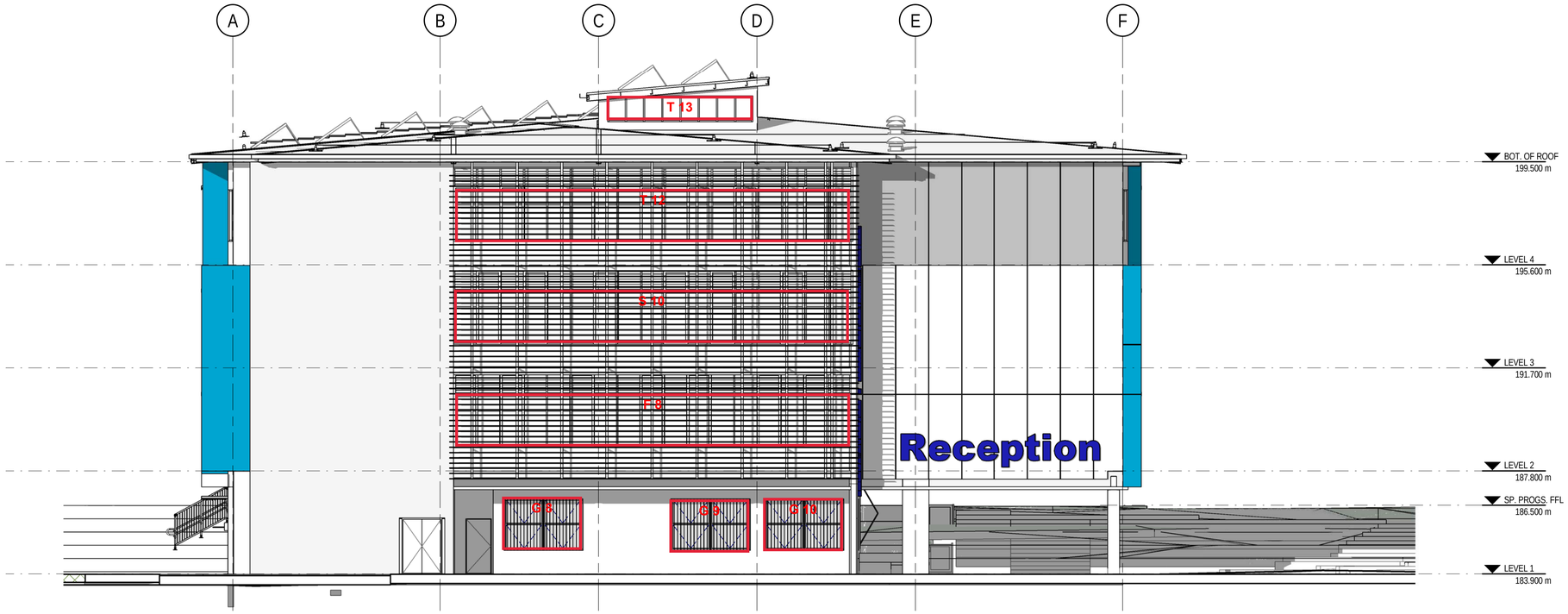


EAST ELEVATION

SCALE 1 : 100



WEST ELEVATION

SCALE 1 : 100

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
A	ISSUED FOR SCHEME DESIGN		RA			21.09.2017

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Drafting Check		Design Check	
Approved (Project Director)			
Nominated / Responsible Architect	A. MILLER		
Scale	1 : 100	This Drawing must not be used for Construction unless signed as Approved	

Client **NSW DEPARTMENT OF EDUCATION**

Project **WAITARA PUBLIC SCHOOL REDEVELOPMENT**

Title **BUILDING ELEVATIONS**

Original Size **A1**

Drawing No: 21-26108 -WA- SD-AR-3001 **Rev: A**

Plot Date: 6/10/2017 5:54:03 PM

Cad File No: C:\Users\rqromero\Documents\2126108-WA-AR New Building_rqromero.rvt

Appendix B – Glazing calculators

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

Building name/description: **Waitara School**

Application: **other**

Climate zone: **5**

Storey: **Level 1**

Facade areas

	N	NE	E	SE	S	SW	W	NW	internal
Option A	90.5m²				190m²		47.6m²		
Option B									n/a
Glazing area (A)	*27m²*				*116m²*		*15.5m²*		

Number of rows preferred in table below: **10** *(as currently displayed)*

GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS									SHADING		CALCULATED OUTCOMES OK (if inputs are valid)					
Glazing element		Facing sector		Size			Performance		P&H or device		Shading		Multipliers		Size	Outcomes
ID	Description (optional)	Option A facades	Option B facades	Height (m)	Width (m)	Area (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S_H)	Cooling (S_C)	Area used (m²)	Element share of % of allowance used
1	G1	S		1.83	18.00		4.50	0.45	10.00	2.60	3.85	0.77	0.77	0.68	32.94	28% of 100%
2	G2	S		4.10	8.46		4.50	0.45	11.25	6.10	0.00	2.00	1.00	1.00	34.69	30% of 100%
3	G3	S		0.81	8.46		4.50	0.45	11.25	1.45	7.76	0.64	0.77	0.68	6.85	6% of 100%
4	G4	S		4.10	8.46		4.50	0.45	11.25	6.10	0.00	2.00	1.00	1.00	34.69	30% of 100%
5	G5	S		0.81	8.46		4.50	0.45	11.25	1.45	7.76	0.64	0.77	0.68	6.85	6% of 100%
6	G6	N		2.02	6.69		6.00	0.65	1.00	0.66	1.53	-1.36	0.00	0.21	13.48	50% of 14%
7	G7	N		2.02	6.69		6.00	0.65	1.00	0.66	1.53	-1.36	0.00	0.21	13.48	50% of 14%
8	G8	W		1.83	2.83		6.00	0.65	3.08	2.60	1.18	0.77	0.78	0.67	5.18	33% of 87%
9	G9	W		1.83	2.83		6.00	0.65	3.08	2.60	1.18	0.77	0.78	0.67	5.18	33% of 87%
10	G10	W		1.83	2.83		6.00	0.65	3.08	2.60	1.18	0.77	0.78	0.67	5.18	33% of 87%

if inputs are valid

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

Building name/description: **Waitara School**

Application: **other**

Climate zone: **5**

Storey: **Level 2**

Facade areas

	N	NE	E	SE	S	SW	W	NW	internal
Option A	168m²		85.5m²		151m²		53.7m²		
Option B									n/a
Glazing area (A)	*98.1m²*		*8.24m²*		*68.4m²*		*27.6m²*		

Number of rows preferred in table below: **20** *(as currently displayed)*

GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS									SHADING		CALCULATED OUTCOMES OK (if inputs are valid)					
Glazing element		Facing sector		Size			Performance		P&H or device		Shading		Multipliers		Size	Outcomes
ID	Description (optional)	Option A facades	Option B facades	Height (m)	Width (m)	Area (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S_H)	Cooling (S_C)	Area used (m²)	Element share of % of allowance used
1	F1	S		1.83	6.69		4.5	0.55	0.5	1.83	0.27	0.00	0.91	0.87	12.24	18% of 71%
2	F2	S		1.83	6.69		4.5	0.55	0.5	1.83	0.27	0.00	0.91	0.87	12.24	18% of 71%
3	F3	S		1.83	6.69		4.5	0.55	0.5	1.83	0.27	0.00	0.91	0.87	12.24	18% of 71%
4	F4	S		0.34	4		4.5	0.55	6.8	1.5	4.53	1.16	0.77	0.68	1.36	2% of 71%
5	F5	S		1.9	2.47		4.5	0.55	12	2.46	4.88	0.56	0.77	0.68	4.69	7% of 71%
6	F6	S		2.25	5.7		4.5	0.55	2.136	3.45	0.62	1.20	0.95	0.91	12.83	19% of 71%
7	F7	S		2.25	5.7		4.5	0.55	2.136	3.45	0.62	1.20	0.95	0.91	12.83	19% of 71%
8	F8	W		1.845	14.934		4.5	0.45	1	1.845	0.54	0.00	0.70	0.63	27.55	100% of 96%
9	F9	N		1.83	8.8		6.0	0.65	1000	1.83	####	0.00	0.00	0.19	16.10	16% of 21%
10	F10	N		1.83	4.6		6.0	0.65	1000	1.83	####	0.00	0.00	0.19	8.42	9% of 21%
11	F11	N		1.83	6.7		6.0	0.65	1000	1.83	####	0.00	0.00	0.19	12.26	13% of 21%
12	F12	N		1.83	6.7		6.0	0.65	1000	1.83	####	0.00	0.00	0.19	12.26	13% of 21%
13	F13	N		1.83	6.7		6.0	0.65	1000	1.83	####	0.00	0.00	0.19	12.26	13% of 21%
14	F14	N		1.83	6.7		6.0	0.65	1000	1.83	####	0.00	0.00	0.19	12.26	13% of 21%
15	F15	N		1.83	6.7		6.0	0.65	1000	1.83	####	0.00	0.00	0.19	12.26	13% of 21%
16	F16	N		1.83	6.7		6.0	0.65	1000	1.83	####	0.00	0.00	0.19	12.26	13% of 21%
17	F17	E		2.8	2.485		6.0	0.65				0.00	1.00	1.00	6.96	84% of 41%
18	F18	E		1.8	0.71		6.0	0.65				0.00	1.00	1.00	1.28	16% of 41%
19																
20																

if inputs are valid

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

Building name/description: **Waitara School**

Application: **other**

Climate zone: **5**

Storey: **Level 3**

Facade areas

	N	NE	E	SE	S	SW	W	NW	internal
Option A	229m²		28.3m²		233m²		53.7m²		
Option B									n/a
Glazing area (A)	*98.2m²*		*14.7m²*		*99.3m²*		*27.6m²*		

Number of rows preferred in table below: **20** *(as currently displayed)*

GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS									SHADING		CALCULATED OUTCOMES OK (if inputs are valid)					
Glazing element		Facing sector		Size			Performance		P&H or device		Shading		Multipliers		Size	Outcomes
ID	Description (optional)	Option A facades	Option B facades	Height (m)	Width (m)	Area (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S_H)	Cooling (S_C)	Area used (m²)	Element share of % of allowance used
1	S1	S		1.83	6.69		6.0	0.35	0.5	1.835	0.27	0.01	0.91	0.87	12.24	12% of 96%
2	S2	S		1.83	6.69		6.0	0.35	0.5	1.835	0.27	0.01	0.91	0.87	12.24	12% of 96%
3	S3	S		1.83	6.69		6.0	0.35	0.5	1.835	0.27	0.01	0.91	0.87	12.24	12% of 96%
4	S4	S		0.34	4		6.0	0.35				0.00	1.00	1.00	1.36	1% of 96%
5	S5	S		1.83	6.69		6.0	0.35	0.5	1.835	0.27	0.01	0.91	0.87	12.24	12% of 96%
6	S6	S		1.83	6.69		6.0	0.35	0.5	1.835	0.27	0.01	0.91	0.87	12.24	12% of 96%
7	S7	S		1.83	6.69		6.0	0.35	0.5	1.835	0.27	0.01	0.91	0.87	12.24	12% of 96%
8	S8	S		1.83	6.69		6.0	0.35	0.5	1.835	0.27	0.01	0.91	0.87	12.24	12% of 96%
9	S9	S		1.83	6.69		6.0	0.35	0.5	1.835	0.27	0.01	0.91	0.87	12.24	12% of 96%
10	S10	W		1.845	14.934		6.0	0.35	1	1.9	0.53	0.06	0.71	0.64	27.55	100% of 90%
11	S11	N		1.83	6.711		6.0	0.65	1	1.83	0.55	0.00	0.71	0.50	12.28	13% of 81%
12	S12	N		1.83	6.711		6.0	0.65	1	1.83	0.55	0.00	0.71	0.50	12.28	13% of 81%
13	S13	N		1.83	6.711		6.0	0.65	1	1.83	0.55	0.00	0.71	0.50	12.28	13% of 81%
14	S14	N		1.83	6.711		6.0	0.65	1	1.83	0.55	0.00	0.71	0.50	12.28	13% of 81%
15	S15	N		1.83	6.711		6.0	0.65	1	1.83	0.55	0.00	0.71	0.50	12.28	13% of 81%
16	S16	N		1.83	6.711		6.0	0.65	1	1.83	0.55	0.00	0.71	0.50	12.28	13% of 81%
17	S17	N		1.83	6.711		6.0	0.65	1	1.83	0.55	0.00	0.71	0.50	12.28	13% of 81%
18	S18	N		1.83	6.711		6.0	0.65	1	1.83	0.55	0.00	0.71	0.50	12.28	13% of 81%
19	S19	E		2	7.325		4.5	0.35	0.5	2	0.25	0.00	0.89	0.83	14.65	100% of 98%
20																

if inputs are valid

IMPORTANT NOTICE AND DISCLAIMER IN RESPECT OF THE GLAZING CALCULATOR

The Glazing Calculator has been developed by the ABCB to assist in developing a better understanding of glazing energy efficiency parameters.
While the ABCB believes that the Glazing Calculator, if used correctly, will produce accurate results, it is provided "as is" and without any representation or warranty of any kind, including that it is fit for any purpose or of merchantable quality, or functions as intended or at all.
Your use of the Glazing Calculator is entirely at your own risk and the ABCB accepts no liability of any kind.

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

Building name/description: **Waitara School**

Application: **other**

Climate zone: **5**

Storey: **Level 4**

Facade areas

	N	NE	E	SE	S	SW	W	NW	internal
Option A	229m²		43.6m²		233m²		69m²		
Option B									n/a
Glazing area (A)	*98.2m²*	.....	*26.4m²*	.....	*108m²*	.....	*40.8m²*		

Number of rows preferred in table below: **25** *(as currently displayed)*

GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS									SHADING		CALCULATED OUTCOMES OK (if inputs are valid)					
Glazing element		Facing sector		Size			Performance		P&H or device		Shading		Multipliers		Size	Outcomes
ID	Description (optional)	Option A facades	Option B facades	Height (m)	Width (m)	Area (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S_H)	Cooling (S_C)	Area used (m²)	Element share of % of allowance used
1	S1	S		1.830	6.690		6.0	0.60	0.500	1.835	0.27	0.01	0.91	0.87	12.24	11% of 100%
2	S2	S		1.830	6.690		6.0	0.60	0.500	1.835	0.27	0.01	0.91	0.87	12.24	11% of 100%
3	S3	S		1.830	6.690		6.0	0.60	0.500	1.835	0.27	0.01	0.91	0.87	12.24	11% of 100%
4	S4	S		0.340	4.000		6.0	0.60				0.00	1.00	1.00	1.36	1% of 100%
5	S5	S		1.830	6.690		6.0	0.60	0.500	1.835	0.27	0.01	0.91	0.87	12.24	11% of 100%
6	S6	S		1.830	6.690		6.0	0.60	0.500	1.835	0.27	0.01	0.91	0.87	12.24	11% of 100%
7	S7	S		1.830	6.690		6.0	0.60	0.500	1.835	0.27	0.01	0.91	0.87	12.24	11% of 100%
8	S8	S		1.830	6.690		6.0	0.60	0.500	1.835	0.27	0.01	0.91	0.87	12.24	11% of 100%
9	S9	S		1.830	6.690		6.0	0.60	0.500	1.835	0.27	0.01	0.91	0.87	12.24	11% of 100%
10	T10	S		0.760	5.962		6.0	0.60	0.900	1.235	0.73	0.48	0.85	0.78	4.53	4% of 100%
11	T11	S		0.760	5.962		6.0	0.60	0.900	1.235	0.73	0.48	0.85	0.78	4.53	4% of 100%
12	T12	W		1.845	14.934		4.5	0.35	1.000	1.900	0.53	0.06	0.71	0.64	27.55	68% of 93%
13	T13a	W		0.870	7.600		4.5	0.35	0.900	1.150	0.78	0.28	0.76	0.65	6.61	16% of 93%
14	T14	N		1.830	6.711		6.0	0.65	1.000	1.830	0.55	0.00	0.71	0.50	12.28	13% of 81%
15	T15	N		1.830	6.711		6.0	0.65	1.000	1.830	0.55	0.00	0.71	0.50	12.28	13% of 81%
16	T16	N		1.830	6.711		6.0	0.65	1.000	1.830	0.55	0.00	0.71	0.50	12.28	13% of 81%
17	T17	N		1.830	6.711		6.0	0.65	1.000	1.830	0.55	0.00	0.71	0.50	12.28	13% of 81%
18	T18	N		1.830	6.711		6.0	0.65	1.000	1.830	0.55	0.00	0.71	0.50	12.28	13% of 81%
19	T19	N		1.830	6.711		6.0	0.65	1.000	1.830	0.55	0.00	0.71	0.50	12.28	13% of 81%
20	T20	N		1.830	6.711		6.0	0.65	1.000	1.830	0.55	0.00	0.71	0.50	12.28	13% of 81%
21	T21	N		1.830	6.711		6.0	0.65	1.000	1.830	0.55	0.00	0.71	0.50	12.28	13% of 81%
22	T22	E		2.000	7.325		3.0	0.35	0.500	2.000	0.25	0.00	0.89	0.83	14.65	69% of 92%
23	T23a	E		0.870		5.85	3.0	0.35	0.900	0.970	0.93	0.10	0.30	0.45	5.85	16% of 92%
24	T23b	E		0.870		5.85	3.0	0.35	0.900	0.970	0.93	0.10	0.30	0.45	5.85	16% of 92%
	T13b	W		0.870	7.600		4.5	0.35	0.900	1.150	0.78	0.28	0.76	0.65	6.61	16% of 93%

if inputs are valid

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