CONSULTANT ADVICE NOTICE

PROJECT:	**DUNDAS PUBLIC SCHOOL UPGRADE**			**CAN NO:**	**G-002[1.1]**
Date:	**11 March 2025**	**Project No:**	**41152 - 001**	**Pages:**	**5 + Appendices**

PRELIMINARY ENERGY MODELLING ASSESSMENT

PREAMBLE

PROPONENT

The NSW Department of Education (DoE) is the proponent and determining authority pursuant to Section 5.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

LANDOWNER

The Minister for Education and Early Learning is the landowner.

BACKGROUND INFORMATION

The project is seeking approval for a Development Without Consent (REF) application under Part 5 of the EP&A Act.

INTRODUCTION

This Sustainable Development Plan (this is equivalent to an ESD report) has been prepared to support a Review of Environmental Factors (REF) for the NSW Department of Education (DoE) for Dundas Public School upgrade (the activity).

The purpose of the REF is to assess the potential environmental impacts of the activity prescribed by State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&I SEPP) as "development permitted without consent" on land carried out by or on behalf of a public authority under Part 5 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The activity is to be undertaken pursuant to Chapter 3, Part 3.4, Section 3.37 of the T&I SEPP.

This document has been prepared in accordance with the Guidelines for Division 5.1 assessments (the Guidelines) by the Department of Planning, Housing and Infrastructure (DPHI) as well as the Addendum Division 5.1 guidelines for schools. The purpose of this report is to identify all the sustainability initiatives that are proposed and under consideration for the activity.

SITE DESCRIPTION

DPS is located at 85 Kissing Point Road, Dundas. The school site is bound by Kissing Point Road to the north and Calder Road to the south. Kenworthy Street is located parallel to the site to the east as is Saint Andrews Street to the west. The site has an area of 1.99 ha and comprises 1 allotment legally known as Lot 3 DP 610.

The site currently comprises an existing co-education primary (K-6) public school with 9 permanent buildings, 6 demountable structures (1 demountable includes 2 classrooms), interconnected covered walkways, play areas, on-grade parking, sports court and green spaces with mature trees.

Majority of the buildings are 1 storey with only one 2-storey building being Building A (Admin/staff hub and amenities building). Buildings are clustered to the north of the site, with the southern part comprising of a large play area/informal sports oval and a sports court.

PROPOSED ACTIVITY DESCRIPTION

The proposed activity involves upgrades to the existing DPS, including the following:

- Creation of 6 new teaching spaces and 2 learning commons in a single-story building
- Installation of covered walkways connecting the new building to the existing school network
- Landscaping and external works around the new building and eastern entry
- Upgrades to site infrastructure and services to support the new building.

The intent of the activity is to increase the number of permanent teaching spaces (PTS) from 9 to 15 and students from 331 to 391.

MITIGATION MEASURES

None

EVALUATION OF ENVIRONMENTAL IMPACTS

None

ENERGY MODELLING ASSESSMENT

This consultant advice notice summarises the preliminary results of the energy modelling assessment of Dundas Public School building. The purpose of this summary is to report the preliminary performance of the building in accordance with The Department of Education's Educational Facilities Standards and Guidelines (EFSG).

The following provides an overview of the modelling inputs and assumptions made for details of the building which are yet to be detailed in the design.* This advice note has been prepared to provide an indication of compliance against the relevant EFSG mandatory requirements using Green Star buildings v1 Credit 22 methodology. The project is currently at Schematic Design phase, therefore this assessment should be considered high-level indicative results only. Updated modelling is required in future stages to confirm actual compliance. **

**Note that whilst the building has been designed the level of detailed at Schematic Design stage requires assumptions to be made. For example systems may be designed, but specific products will not have been selected (e.g. HVAC equipment, glazing, lighting fixtures, pumps etc.) and as such conservative assumptions have to be made.*

*** Note that it is standard and expected that future modelling updates occur as further detail is added, and to capture any changes that may be proposed by the contractor or design team during detailed design and construction phases. (this is specified in the Sustainability Specification). Final compliance can by definition only be confirmed through As-built modelling, which must reflect the actual state and details of the final building, which cannot be confirmed at Schematic Design.*

SUMMARY

INFORMATION SOURCES

The assessment is based on the following:

- EFSG (Education Facilities Standard and Guidelines) v2.0
- Green Star Buildings v1 Rev C
- Architectural information:
    - Fulton Trotter architectural drawing set REV P4 (18/10/2024)

The proposed building design has been created within the energy simulation software, IESVE, and simulated across a representative meteorological year (RMY) for Paramatta, NSW in accordance with the modelling protocol for credit 22 under Green Star Buildings v1.

TABLE 1 RESULTS SUMMARY

ENERGY END-USE SUMMARY	REFERENCE BUILDING ENERGY	PROPOSED BUILDING ENERGY	PROPOSED BUILDING ENERGY WITH PV
Total Energy Consumption (kWh/annum)	75,391	48,885	22,041
Energy Improvement over Reference (%)	**35.2%**		**70.8%***

**Note – Small power not included. This is including laptops/comms equipment/plug in appliances and is not captured in high level modelling.*

PROJECT REQUIREMENTS

Under the EFSG requirements, it is a mandatory *that* all new facilities must be designed and built so that energy consumption is predicted to be at least **10% lower** than if build to minimum compliance with National Construction Code requirements.

The percentage reduction is based upon the total energy consumption of the modelled reference and proposed buildings, which include end uses that cannot be quantified during the early stages of the design. These include:

- Internal and external lighting
- Miscellaneous ventilation (i.e. exhaust fans, toilet fans)

The preliminary modelling results presented herein cover the following design systems that have been approximated:

- Building fabric performance
- Air conditioning and air handling systems specifications
- Unitary plant

Figure 1 illustrates the proportion of greenhouse gas emissions for the project by end use.

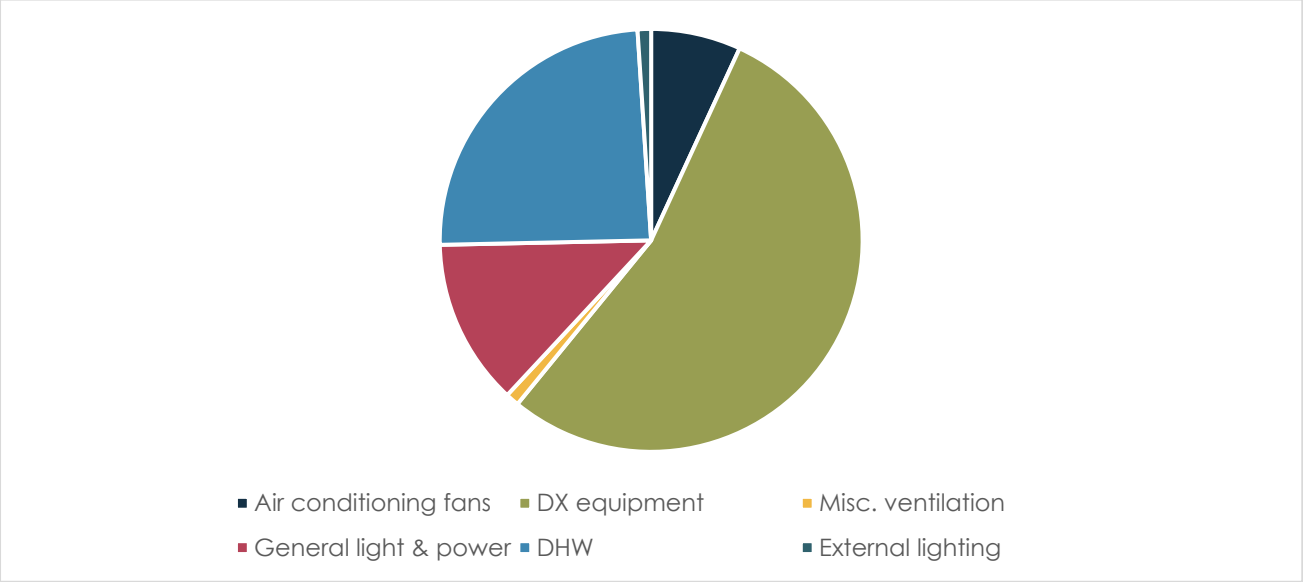

FIGURE 1: PROPOSED BUILDING ENERGY CONSUMPTIONS

GEOMETRY

Figure 2 below is taken from the modelling software and depicts the geometry of the model used.

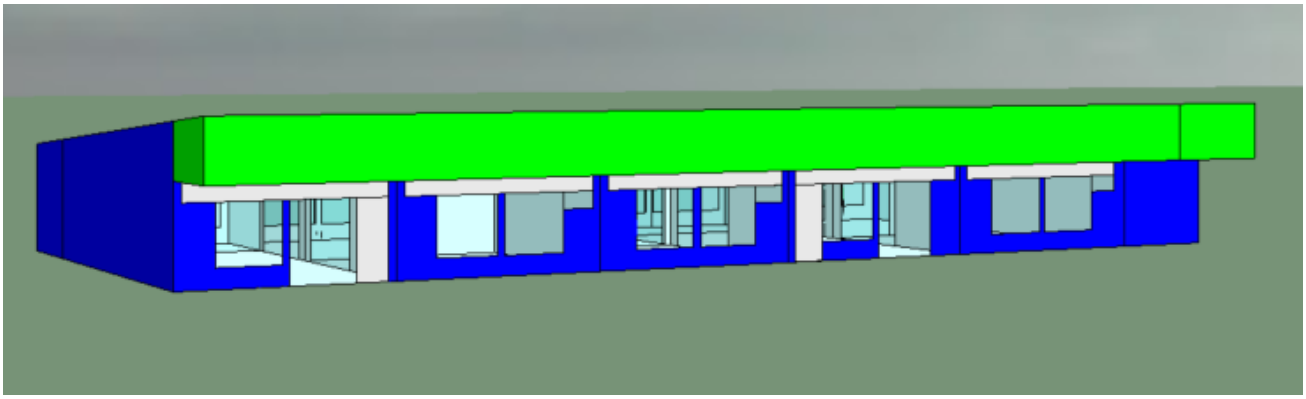

FIGURE 2: BUILDING GEOMETRY AS REPRESENTED WITHIN THE IES SOFTWARE

BUILDING FABRIC AND GLAZING

Refer to the table below for the minimum building fabric thermal performance requirements for NCC Section J compliance used within the reference building and the proposed recommended thermal performance.

All R-values noted are **total system values inclusive of thermal bridging**, to be calculated in accordance with NCC 2022 Clause J4D3(5). Refer to the table below for the minimum glazing performance requirements for NCC Section J compliance, based on uniform glazing throughout the building.

ELEMENT	NCC 2022 MINIMUM REQUIREMENTS	PROPOSED
Ceiling/Roof	R3.2 minimum Maximum solar absorptance of upper surface ≤ 0.45	R4.0 minimum Maximum solar absorptance of upper surface ≤ 0.45
Floor – Ground Contract	No insulation required*	No insulation required*
Walls	R1.4 minimum**	R1.4 minimum**
Glazing	U5.8** SHGC 0.48**	U4.0** SHGC 0.50**

**This is based on the entire ground floor being in contact with the ground and that there is no in-slab heating provided. In accordance with NCC Specification J4D7(2), the contribution of the soil in contact with floor has been accounted for.*

*** It is typical that the Architect, façade consultant or similar confirm the specific glazing performance during Detailed Design, when specific products / manufacturers are procured. This performance requirement sets the minimum thermal requirements that must be achieved. This cannot be confirmed until a supplier and product is selected, which does not occur at Schematic Design.*

Notes:

- The extent of shading is as per the listed architectural drawings. Changes to shading will require the façade calculation to be updated and may affect thermal performance requirements.
- The shading fins provided to the West Façade have not been included in the Deemed to Satisfy assessment
- Envelope wall requirements are based on the ratio of wall to window areas. As such, any changes in the window area may affect the required performance of both the glazing and the solid walls.
- All glazing values presented are system values (inclusive of both glazed and framing elements).
- Higher performance glazing has U-Values and SHGC values closer to zero. The manufacturer's total glazing system U-value and SHGC value must be equal to or less than the values stated.

HVAC SERVICES

Dundas Public School building compose of three types of rooms: General learning spaces, Common learning and Multipurpose. Each room is equipped with a fan coil unit (FCU) connected to VRF system. The FCUs on each level are connected to two VRF units, with total of five VRF units for the building with a COP of 3.1. All three space types are equipped with high level operable louvers to allow for mixed mode operations. The mechanical system is designed to be a mix mode system with a 'traffic light' indication system to notify building occupants to open windows during favourable outdoor air temperature. It has been assumed that building occupants will turn off the AC and open the windows when the indicator panels indicate that the outdoor conditions are suitable. All controls for the mixed mode system have been modelled in accordance with Green Star calculation guide.

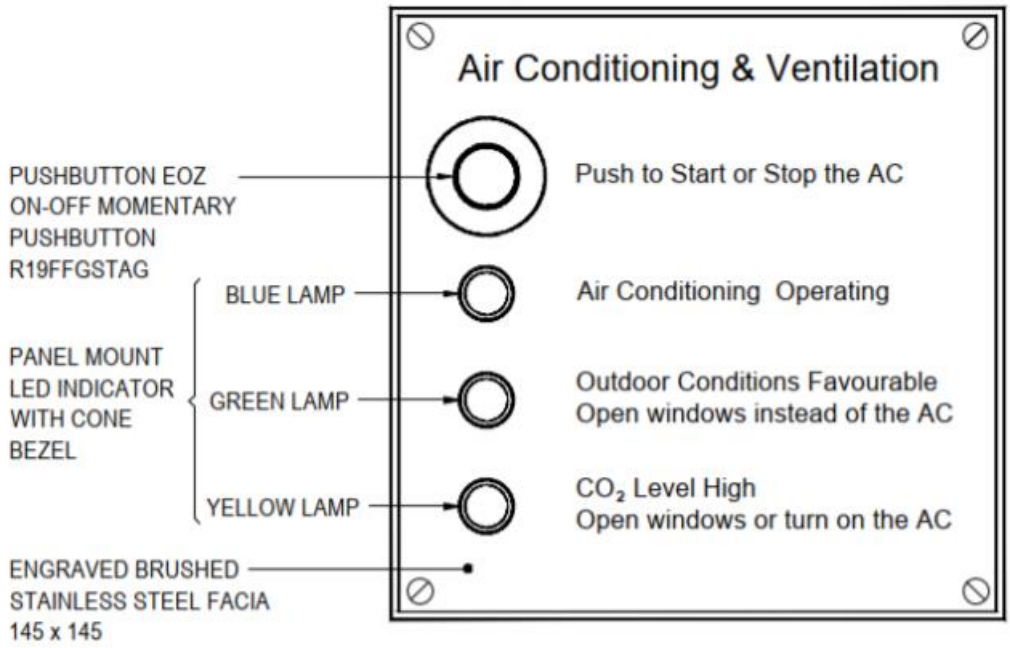

FIGURE 3: INDICATOR PANELS OF AIR CONDITIONING OPERATION

RESULTS

The following tables provide the summary of the energy simulation results for the Green Star Greenhouse Gas Emissions credit for the mechanical system and fabric changes. Note that other end uses are not provided at this time.

TABLE 1: ENERGY CONSUMPTION IMPROVEMENT

ENERGY END-USE SUMMARY	REFERENCE BUILDING	PROPOSED BUILDING
DX Equipment (kWh/annum)	41,103	26,411
Air Conditioning Fans (kWh/annum)	5,775	3,361
Interior Lighting (kWh/annum)	8,353	6,226
External Lighting (kWh/annum)	190	504
DHW (kWh/annum)	19,428	11,882
Total Energy Consumption excluding PV (kWh/annum)	75,391	48,885
Total Energy Consumption excluding PV (kWh/annum)	-	22,041
Energy Improvement over Reference excluding PV (%)	**35.2%**	
ENERGY IMPROVEMENT OVER REFERENCE INCLUDING PV (%)	**70.8%***	

**Note – Small power not included. This is including laptops/comms equipment/plug in appliances and is not captured in high level modelling.*

LIMITATIONS

NDY will not be held liable for building energy performance estimates, nor for the reliance by any party on those results, for any purpose. Building energy performance models are necessarily simplified and idealised representations of actual buildings, and are imperfect in the way they simulate these, and in particular the air conditioning systems and controls. Assumptions have been made on a wide range of input parameters, such as building occupancy, equipment usage and the like. Calculations are based on Test Reference Year weather data (or similar), which will not be equivalent to any given year's actual weather. Consequently, the results presented are only one possible representation of a building's potential energy performance.

Actual performance of the constructed building is dependent on many interrelated factors including the quality of construction, the quality of commissioning, and the ongoing management of the building. Significant differences between modelled and actual building energy performance can result.

Norman Disney & Young takes all reasonable professional care in the preparation of building energy performance estimates. However, we stress that significant variation can occur in actual building energy performance due to circumstances beyond our control, and due consideration of this fact should be taken before relying on these estimates for any purpose.

NDY, A Tetra Tech Company

Matt Werner | Sustainability Engineer
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APPENDIX A: THERMAL ENVELOPE MARK-UP

M THE BOUNDRY

MECH PLANT

D-R-110

GLS

LC

D-101

BCR

D-104

AIRLOCK

CLN

AMBULANT

AMBULANT

ACCESSIBLE

WALKWAY

VERANDAH

TENNIS COURTS

9,000

9,000

6,100

34.900

34.430

7,500 7,500 7,500 7,500 7,500 3,716

PLAN LEGEND

- D101 — DOOR LABEL
- W101 — WINDOW LABEL
- E00 — EXTERNAL WALL TYPE LABEL
- I00 — INTERNAL WALL TYPE LABEL

FLOOR PLAN MATERIAL LEGEND

MA - BRICKWORK

FLOOR PLAN FINISHES LEGEND

GENERAL

FABRIC CONDUCTIVE THERMAL PERFORMANCE REQUIREMENTS

NDY A TETRA TECH COMPANY

R-values: Minimum values unless noted otherwise.
U-values: Maximum values unless noted otherwise
U-values and R-values: Thermally-bridged system values unless stated otherwise. Calculated in accordance with NCC 2022 clause J4D3(5). One is the inverse of the other (i.e. 1/U = R and 1/R = U).
Ground-contact floors: The allowable contribution under Specification J4D7 has already been accounted for.
Thermal construction quality: Comply with NCC 2022 clauses J4D3(1), (2) and (3).

- HORIZONTAL SURFACE (LOOKING DOWN): R3.2 [UPWARD HEAT FLOW]
- HORIZONTAL SURFACE (LOOKING DOWN): R2.0 [DOWNWARD HEAT FLOW]
- OVERALL WALLS - R1.4

1 PLAN
PROPOSED GROUND FLOOR PLAN
SCALE: 1:100

50 100 150mm @ A1

plot date: Friday, 20 September 2024 10:35 AM file location: BIMcloud: FTA-SYD-BIM26 - BIMcloud Basic for Archicad 26/7068DU01 Dundas Public School

REV.	DESCRIPTION	DATE	INIT.
P1	FOR INFORMATION	20/09/2024	AK

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PHASE **SKETCH DESIGN**
CLIENT SCHOOL INFRASTRUCTURE NSW
PROJECT DUNDAS PUBLIC SCHOOL
ADDRESS **Street, Suburb, State

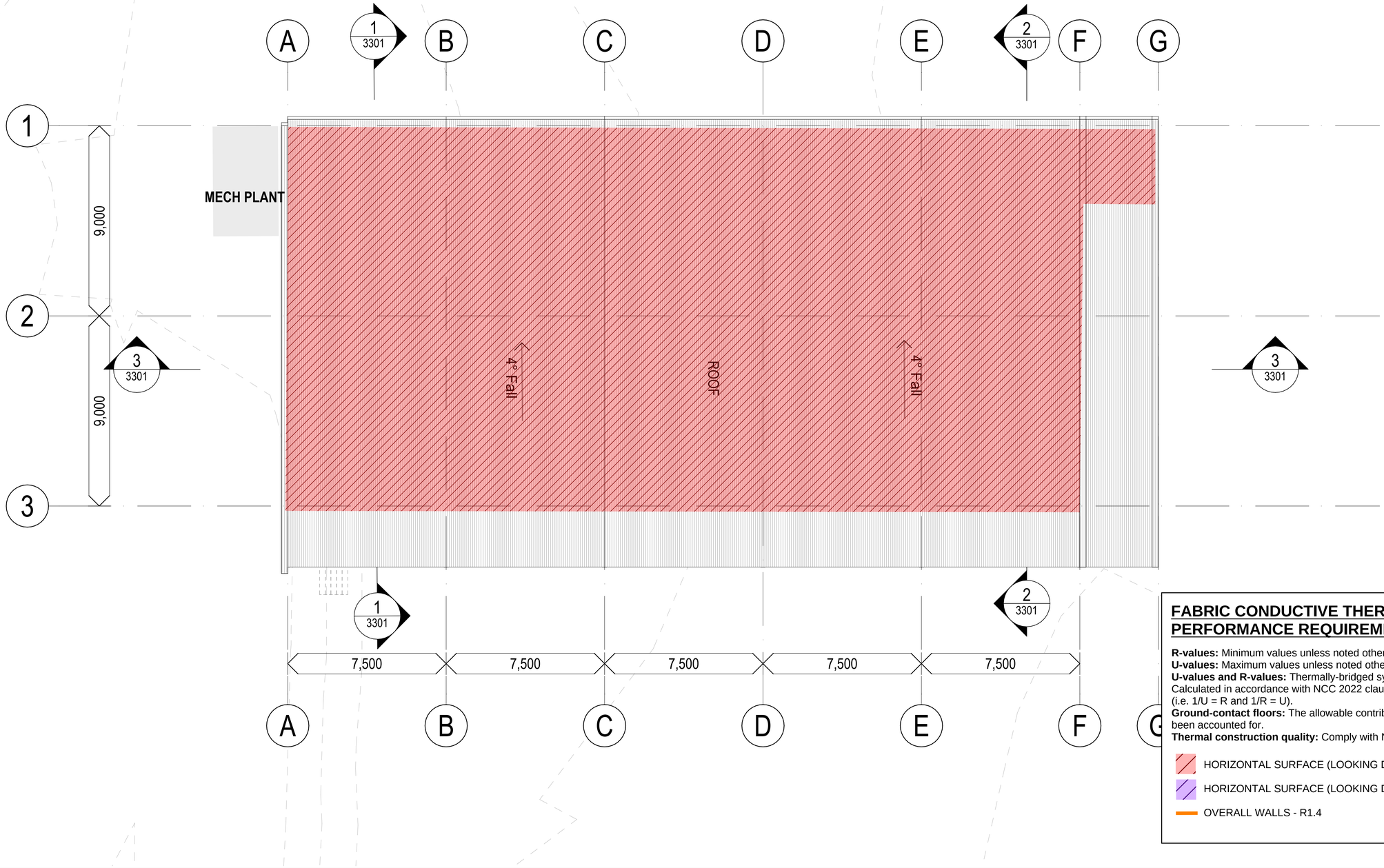
DRAWING **PROPOSED GROUND FLOOR PLAN**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

N

PROJECT NUMBER	DIRECTOR	CHECKED
7068DU01	JW	

DRAWING NUMBER	REVISION
DUPS-FTA-B00L-GF-DR-A-2101	P1



ROOF PLAN LEGEND

ROOF LABEL

ROOF 1 ← ROOF NUMBER
XX00 : XX00 ← FINISH CODE (REFER TO FINISHES LEGEND)
MATERIAL CODE (REFER TO MATERIAL LEGEND)
FALL 5°
FALL IN ROOF

ROOF MATERIAL LEGEND

ROOF FINISHES LEGEND

FABRIC CONDUCTIVE THERMAL PERFORMANCE REQUIREMENTS

NDY
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OVERALL WALLS - R1.4

1 PLAN
PROPOSED ROOF PLAN
SCALE: 1:100

REV.	DESCRIPTION	DATE	INIT.
P1	FOR INFORMATION	20/09/2024	AK

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PHASE **SKETCH DESIGN**
CLIENT SCHOOL INFRASTRUCTURE NSW
PROJECT DUNDAS PUBLIC SCHOOL
ADDRESS **Street, Suburb, State

DRAWING **PROPOSED ROOF PLAN**

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N

PROJECT NUMBER **7068DU01**
DIRECTOR **JW**
CHECKED
DRAWING NUMBER **DUPS-FTA-B00L-LR-DR-A-2102**
REVISION **P1**

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