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8 October 2018

Dear Hannah

Australian Museum – Section J1 and J2

This letter provides confirmation of compliance against Section J1 and J2 (building envelope) of the BCA 2016 for the new entrance works to the Australian Museum.

In summary, the proposed works have been shown to comply with the intent of Section J1 and J2 of the BCA 2016, using an alternative method of compliance.

This assessment has been carried out at the pre-DA stage and so the information contained here-in provides checks against the proposed design intent for compliance rather than final confirmation of compliance. As such, it should not be used for obtaining the Construction Certificate.

The new entrance consists of an extension of the glazed ticketing lobby (the crystal hall) with a new associated glazed bridge link to the main building. While there will be breakthrough works to the existing building, no new works will be undertaken. Hence, this memo looks at the crystal hall only.

The crystal hall is rectangular oriented with its main, fully glazed, façade to the north. The eastern façade is partially glazed on the northern side, the west has the self-shaded glazed entrance, and the south façade is fully glazed. The new bridge link is solid on both sides, on the east and west. The facade area of the crystal hall above the new bridge link is also glazed.

Methodology

The assessment of the building envelope performance has been carried out in line with the JV3 methodology. This method uses the comparison between a Reference building (with minimum compliance envelope elements) and the Proposed building.

For both the Reference and Proposed building models, the following opaque elements materials and insulation have been used;

Element	R-Value Reference model	R-Value Proposed model
Roof	4.2	5.2
Floor	2.0	4.2
External walls	2.8	2.8

Table 1: envelope performance

Glazing has been modelled for the Reference building in line with the glazing calculator appended at the back of this document and as summarised below:

Glazing Orientation	U-Value	SHGC
5.8	5.8	0.2
E	5.8	0.73
S	4.4	0.87
W	4.1	0.27

Table 2: Reference building glass

Proposed façade system performance has been modelled as follows:

Glazing Orientation	U-Value	SHGC
N	5.0	0.33
E	4.0	0.45
S	5.0	0.33
W	4.0	0.45

Table 3: Proposed building glass

A building has been modelled using ‘Room’ Software. Room is a dynamic thermal analysis software tool developed by Arup. The building energy assessment is based on thermal loads through the course of the year. The loads for both heating and cooling have been summated to assess annual energy demand. The summation shows absolute energy demand, without any adjustment from plant efficiencies (e.g. cooling plant coefficient of performance). This has been done as it represents energy demand comparison assuming consistent mechanical plant and hence only the building envelope is assessed.

The effect of the surrounding structures has been accounted for.

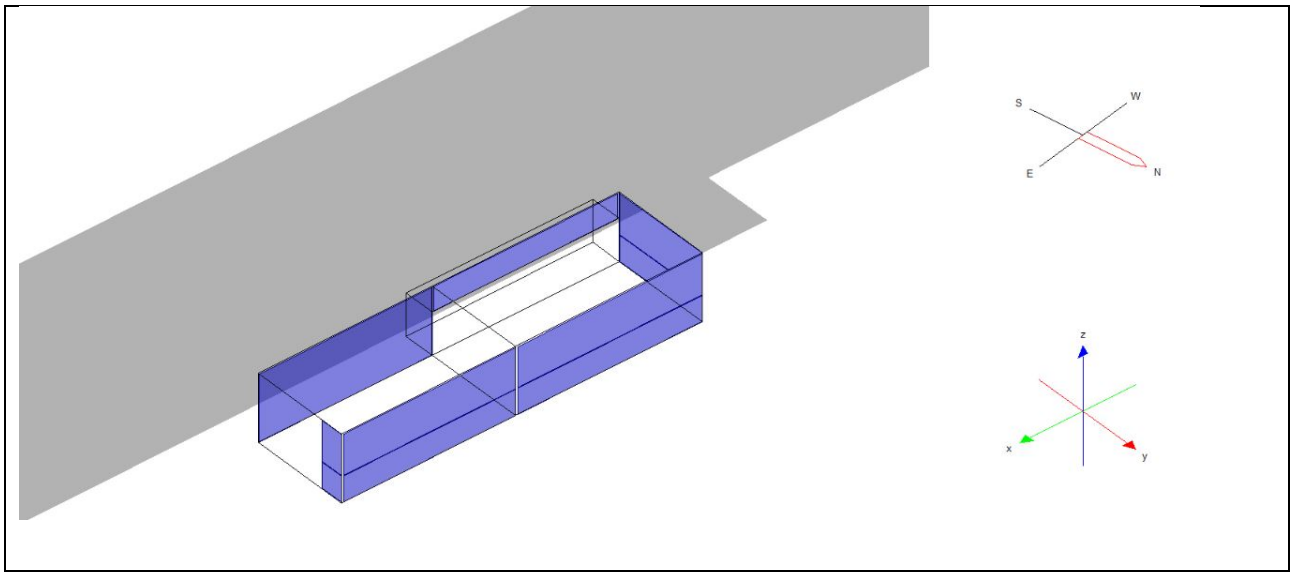

Figure 1: modelling geometry

Results

Model	Annual heating load (Wh/m2)	Annual cooling load (Wh/m2)	Total demand	Improvement
DTS	8,320	83,057	91,377	-
Proposed	8,357	80,266	88,623	Hannah Slater Neeson Murcutt Architects Pty Ltd L2 9 Roslyn Street Potts Point NSW 2011 3%

Table 4: building energy performance

The above results demonstrate that the proposed envelope performance will exceed the performance of a Deem to Satisfy envelope and hence are compliant with part J1 and J2 of the BCA 2016.

Yours sincerely

Petunia Huang
Engineer

cc Haico Schepers, Arup