



0431 Cladding - Combined

Document version: 2.0

Published date: 30/11/2022

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00 Design principles

0.01 Main considerations

It is a requirement to undertake the [00 PLANNING AND DESIGN/0001R - DESIGN REFERENCE](#) and [GLOSSARY OF TERMS](#) information into all aspects of design, detailing and delivery when developing the content here within. Clear demonstration of adherence to these requirements is part of the services and will be called upon at key points in the project and during at the discretion of the Department of Education (DoE).

The fabric of a building is the general term to describe the external façade, that provides protection from the environment, as well as the main internal dividing walls.

This section of the design guide provides information on the important criteria that should be considered in the design of the building fabric and the selection of appropriate materials.

0.02 General

A Whole of Life approach is to be used in the selection of the appropriate materials to the individual fabric elements, to ensure that the most appropriate Value for Money material is used.

Refer to [00 PLANNING AND DESIGN/0001C DESIGN CHECKLIST - SUSTAINABILITY](#) and [00 PLANNING AND DESIGN/0001C DESIGN CHECKLIST – SAFETY](#).

0.03 Design and detailing

Refer to [00 PLANNING AND DESIGN/0001C DESIGN CHECKLIST - FINISH](#) and [00 PLANNING AND DESIGN/0001C DESIGN CHECKLIST - SAFETY](#) and [00 PLANNING AND DESIGN/0001C DESIGN CHECKLIST - BIRD NUISANCE](#) and [00 PLANNING AND DESIGN/0001C DESIGN CHECKLIST - CIRCULATION](#).

Detailing of the design should be undertaken, appropriate to the location and individual situation. Generally, the following criteria will need to be considered:

- Design should use traditional construction techniques and where possible “off-the-shelf” materials and standard colours that are tried and proven, representing building best practice.

- Detailing should allow for differential movement, thermal stress, ultraviolet degradation, trade tolerances and robust use, in simple uncomplicated format. Excessive complicated detailing is often misunderstood by general construction staff, which will lead to poor execution and excessive costs.
- Water tightness is an essential criterion and must be guaranteed. Reliance on silicone sealant at junctions between structure and metal sheeting is unacceptable as over time and because of inevitable differential movement, joints will fail.
- Air Tightness is an important design element that leads to better building performance. An appropriately detailed airtight façade in conjunction with adequately designed and operated controlled ventilation will lead to improved ventilation, lower rates of heat loss, greater thermal comfort and reduced energy consumption
- Building forms and elements that rely on highly detailed steelwork to achieve user comfort conditions or decoration, such as sun and weather screens, to achieve user comfort conditions or decoration, have generally been found to represent poor value for money and are to be avoided.
- Increasing the thermal performance beyond the minimum requirements of BCA Section J to improve thermal comfort and reduce energy consumption is encouraged and should be considered as part of the Whole of Life analysis of heating/cooling options.
- Use materials with a high Solar Reflectance Index (SRI) to reduce heat loss/gain and to reduce the heat island effect (unless local glare issues dictate otherwise).

0.04 External finishes and surfaces

Key considerations in materials selection and detailing are:

- High durability, impact resistance & low maintenance materials are required at levels accessible to pupils.
- Pre-finished materials are preferred to minimise future maintenance.
- Concrete structural elements, walls and soffits to be unpainted.
- Steelwork below 2100mm above the ground should not be painted so as reduce maintenance requirements.
- Within 3km of the ocean, 1km from bays or in highly industrialised areas with corrosive atmospheres, avoid unnecessary use of steelwork. Where use of steel is considered necessary, design for the location, considering maintenance provisions.

Refer to [00 PLANNING AND DESIGN/0001C DESIGN CHECKLIST - STRUCTURE](#)

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- Termite resistant materials are to be used.
 - Bird Nuisance: Avoid structural struts or ledges in details that could provide bird perches.
 - Glare: is a major issue in schools, particularly from paving and roofs. Select materials, finishes/textures and colours to address this.
 - Paving: Ensure surfaces comply with access requirements of the relevant AS.

Safety

Avoid the following:

- Structural struts which can be swung or climbed on.
- Structures or protruding features below 2100mm above ground level, such as walkway beams or sun shades Toxic or hazardous materials.
- Toxic or hazardous materials.
- Surfaces with sharp edges below 2100mm in height.

Walls

External materials and finishes should be chosen from a “Whole of Life” perspective using a select range of preferably sustainable materials designed to provide:

- Value for Money
- Aesthetic appeal
- Long term durability
- Low maintenance costs
- Functionality, including an appropriate level of insulation for acoustic and thermal purposes

Specifically:

- Use products with a long-life span.
- Avoid products or materials that require frequent and costly maintenance.
- Use products with recycling potential on disposal, and/or include recycled content.

Selection of appropriate surface finishes must proceed with a knowledge of the activities to be conducted in the area. Visible surfaces should be capable of being easily cleaned and repaired if damaged.

External walls should be of impact resistant materials, generally masonry, to a minimum height above ground level of 2100mm (door head height). Masonry can continue beyond this height however; lightweight cladding is an acceptable alternative.

Externally, pre-finished surfaces should be used. External painting should be minimised and restricted to secure areas.

Avoid articulated forms that significantly increase wall areas.

Where corrugated steel wall sheeting is used run ribs vertically to minimise dirt collection.

Building regulations such as the BCA will require that some external walls to have fire rated characteristics, which are to be complied with.

Specification

01 General

As per current NATSPEC except as follows:

1.7 Thermal break

A metal framed building with external cladding attached to the metal frame, must have a thermal break installed between the metal frame and the external cladding; and consisting of a material with an R –Value of not less than 0.2.

02 Product

As per current NATSPEC except as follows:

2.3 AAC Cladding

GUIDE NOTE: AAC Cladding is not to be used in school projects.

2.4 Hardboard planks

GUIDE NOTE: Hardboard Planks are not to be used in School Projects.

2.6 Timber weatherboards

GUIDE NOTE: TIMBER WEATHERBOARDS are NOT to be USED IN SCHOOL PROJECTS.

2.9 Fibre cement cladding

Eaves and soffit lining:

GUIDE NOTE: Add the following subclause to NATSPEC Building Template/Work section. "Fibre Cement Cladding"

Installation:

- Fixing: Refer to the manufacturer's printed fixing instructions for correct fasteners and fixing procedure to substrate.
- Fasteners must not be overdriven as this can reduce the holding capacity of the sheet.

2.13 Plastic cladding

GUIDE NOTE: Plastic cladding is not to be used in school projects.

03 Execution

GUIDE NOTE: Do not specify urea formaldehyde foam cavity insulation

04 Selections

As per current NATSPEC.

Performance Criteria

Cladding system selections should be based on the following performance criteria:

- Offer value for money in a Whole of Life framework.
- Be readily available commercial proprietary systems.

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- Have appropriate aesthetic appeal and preferably be pre-finished.
 - Offer long life span with high durability and robustness were in student contact zones.
 - Have low maintenance requirements and costs.
 - Remain intact and waterproof under the local climatic conditions.
 - Provide adequate means of dealing with vapour pressure, condensation, corrosion and thermal movement.
 - Provide appropriate corrosion resistance for:
 - Atmospheric exposure conditions.
 - Service conditions due to the nature of nearby activities taking place in the installation.
 - Contact with other materials or contact with water washing off other materials.
 - Support sustainability by having recycling potential at the end of usable life, and/or include recycled content.