Cladding, Canopies and External Screens: A Facade Inspector's Guide

Cladding inspection singapore — practical guidance for building owners and managers

Facade Inspection Singapore — BCA-Approved Competent Person

Cladding, Canopies and External Screens: A Facade Inspector's Guide

How a BCA Competent Person carries out cladding inspection in Singapore — ACP, stone, GRC and metal cladding, canopy and external-screen defects, fixings and remedies.

When an aluminium composite panel (ACP) detaches from a 20-storey facade, it tends to do so quietly until the moment it doesn't. Cladding is non-structural by design, but a non-structural panel is still a heavy, sharp object travelling at terminal velocity by the time it reaches a pedestrian. A proper cladding inspection in Singapore — covering panels, fixings, canopies and external screens — is what the BCA periodic facade inspection regime exists to enforce.

This guide is structured around how a BCA Competent Person actually inspects cladding systems: what each cladding type is made of, how it fails, and which defects the inspector cannot afford to miss.

What cladding is, and why it fails

Cladding is an extra non-structural skin added to a building for thermal insulation, weather resistance, acoustic control, fire compartmentation, privacy and aesthetics. Because it isn't holding the building up, it tends to be neglected — until something falls. The Singapore inventory of facade cladding includes aluminium (solid and composite), stainless and enamel steel, stone (natural and manufactured), glass-fibre reinforced concrete (GRC), uPVC, timber and weatherboard.

A cladding system has four parts the inspector must individually assess:

1. The panel itself (material and finish) 2. The sub-frame and fixings (steel support, brackets, anchors) 3. The weather seal (sealant, gasket or open joint with WRB behind) 4. Insulation and any concealed accessories

Aluminium cladding — solid and composite

Aluminium is the most common cladding in Singapore because it is light (about a third of steel density), corrosion-resistant, formable and recyclable. Solid aluminium panels are typically 2–6 mm thick and finished with one of:

- PVDF (Polyvinylidene fluoride) — fluorocarbon coating with excellent fade and abrasion resistance; recommended for external use
- Powder coat — durable but not UV-stable for harsh exposure
- Anodised — electro-chemical finish, highly durable, low maintenance

ACP cladding inspection — what to check

Conventional ACP is a polyethylene (PE) core sandwiched between two aluminium skins. The panel is light, flat, weather-resistant and available in extensive colours and shapes. The catch is fire performance: ACP with a 100% PE core does not meet SCDF's fire rating requirements, which is why fire-retardant ACP with a mineral core (predominantly magnesium oxide and aluminium hydroxide, achieving Class A2 to EN 13501) has become the specification of choice. Inspectors increasingly need to verify what's actually on the wall and whether the panel composition meets the Fire Code that applied at the time of installation.

Beyond the panel itself, an ACP inspection covers:

- Vertical and horizontal joint detailing — face seal versus open joint
- Sub-frame steel for corrosion at fixings
- Bracket condition — particularly behind concealed joints
- Sealant or gasket performance at every panel-to-panel interface

Sealants and gaskets — where weather seal lives or dies

The weather seal is almost always where ageing cladding starts to fail. Common gasket materials include santoprene, silicone, EPDM and neoprene; common sealants include silicone, polyurethane, polysulphide and acrylic. Silicone is generally the best performer for external use — durable beyond 20 years and largely unaffected by UV.

A Singapore facade cladding inspection should treat the following as red flags:

- Visible aging, hardening or chalking of sealant
- Cohesive failure (crack/breakage within the body of the sealant)
- Adhesion failure (sealant lifting from substrate)
- Substrate failure at the bond line
- Three-sided adhesion (sealant bonded to back of joint, indicating missing backer rod)
- Improper width-to-depth ratio — recommended thickness over depth (T/D) of 2 with minimum depth of 6 mm

Most sealant failures trace back to one of seven causes: aging beyond service life, wrong sealant for the substrate, inadequate surface preparation, excessive joint movement, early movement during cure, improper application, or sealant–substrate incompatibility.

Stone cladding — pin, kerf and undercut anchors

Stone cladding is the most expensive facade and the most punishing to inspect. Natural stone (granite, limestone, sandstone, marble, slate) and manufactured stone veneer are typically attached using one of four fixing methods: dowel/pin, kerf, undercut anchoring or direct fixing. Panel thickness is dictated by stone strength, panel size, wind loading, fixing location in the stone and fixing type.

The defect set on stone cladding includes cracks across panels, misalignment of panels (a sign of detached or missing fixings), spalling at pin locations, signs of epoxy where mechanical anchorage was specified, and corroded fixings or brackets behind the panel. A borescope is the inspector's best friend here — it lets you see the bracket without removing the panel.

Canopies, roof eaves and external soffits

Canopies are single-storey shelters, free-standing or tied back; awnings are attached to the building. Eaves and external soffits — typically wood, gypsum, vinyl, fibre cement, aluminium honeycomb or mineral fibre — sit at the boundary between facade and roof and trap moisture in ways the inspector must look for. Roof materials in scope range from metal (aluminium, stainless, zinc, zincalume, copper, titanium) to clay/cement tiles to polycarbonate, PVC and acrylic.

A canopy inspection should specifically verify: anchor bolt and base plate condition (corrosion at washers and brackets is a recurring finding), bracket replacement compatibility (bi-metallic galvanic corrosion at mismatched fasteners), and the integrity of any back-of-canopy waterproofing.

External screens and green walls

External screens — mesh, perforated metal, woven wire, louvres — are mounted on metal sub-frames bolted into the structural wall. The defects to look for are loose or corroded fixings, dented or torn screens, and bracket fatigue. For green walls, the trio of soil, fertiliser and continuous moisture is aggressive on metal, so stainless steel is the right structural support material; carbon-steel frames will accelerate to corrosion much faster than the rest of the cladding around them. A Professional Engineer must verify the substrate's loading capacity before any green-wall planting starts, and the documentation must be available at the periodic facade inspection.

Common defects and red flags

- ACP panels with non-fire-retardant PE core in fire-rated zones
- Hardened, cracked or debonded sealant at panel joints
- EPDM or silicone gaskets that have lost compression
- Corroded sub-frame, brackets or fixings behind cladding
- Stone panels misaligned, cracked or spalled at pin locations
- Open joints where the WRB behind has aged and is letting water through
- Galvanic corrosion at mismatched fasteners
- Loose, dangling or rusted external screens and louvres
- Canopy anchor bolts with rusted washers or base plates

- Green-wall frames with chloride/fertiliser-driven corrosion

Singapore regulatory context

External cladding sits inside three regulatory perimeters: the BCA periodic facade inspection regime under the Building Control Act (defects, fixings and falling-object risk); the SCDF Fire Code 2023 for combustibility, flame spread (BS 476 Pt 7) and fire propagation (BS 476 Pt 6); and the Workplace Safety and Health Act for any access work at height. Class 1 or 2 fire rating is the requirement most projects specify; ACP composition must meet the Code in force at design.

What to do next

If your building's facade includes ACP, stone or metal cladding, get the original specification on the table before the inspection — it will save days of back-and-forth on whether a panel meets the Fire Code. From there, a competent person can plan the visual sweep, flag the high-risk panels, and scope the close-range tactile inspection where it matters most.

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Sources & references

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• Ministry of Manpower (MOM) — Workplace Safety and Health Act 2006 and subsidiary regulations including WSH (Risk Management), WSH (Work at Heights), and WSH (Scaffolds) Regulations. www.mom.gov.sg

• Singapore Civil Defence Force (SCDF) — Code of Practice for Fire Precautions in Buildings 2023 Edition (effective 1 March 2024). www.scdf.gov.sg