

Façades

The building facade is a critical engineering component that regulates energy efficiency, acoustic performance, and light transmission (Kaluarachchi et al., 2005). In modern construction, the facade can represent 15% to 40% of the total building budget, yet the cost of maintenance over its life cycle can be five to ten times the initial installation cost (Kaluarachchi et al., 2005). Furthermore, in complex structures, mechanical and electrical services integrated into the envelope can account for an additional 30% to 40% of the budget (Kaluarachchi et al., 2005). Because building systems are frequently interconnected, for instance a roof leak directly impacting the façade. Maintenance must be part of a larger strategic exterior plan to prevent component failure and preserve aesthetic value (Dare et al., 2022).

Methodology for Maintenance Planning

To move away from reactive, high-cost emergency repairs, a structured three-step methodology is recommended: detailed inspection, post-inspection remedial actions, and proactive maintenance planning (Madureira et al., 2017).

- **Detailed Inspection:** This involves identifying all "maintenance-source elements" (MSE), such as claddings, openings, and seals, and recording detected anomalies using photography and condition assessments (Madureira et al., 2017).
- **Prioritization:** Anomalies are prioritized based on environmental exposure (e.g., coastal vs. urban), the extent of the defect, the consequences of not intervening, and non-compliance with safety requirements (Madureira et al., 2017).
- **Proactive Planning:** This step establishes a 50-year horizon for maintenance operations, aiming to optimize global costs while fulfilling user satisfaction (Madureira et al., 2017).

Maintenance Schedule

A successful maintenance plan must be dynamic. While a general systematic schedule should be performed every six months by technical units (Dare et al., 2022), specialized tasks follow specific intervals based on the material type. Early inspections, occurring within two years of construction, are vital to detect design or execution errors before they lead to major financial loss (Madureira et al., 2017).

Facade Element	Maintenance Task	Interval
General Facade	Systematic maintenance review and cleaning by technical staff	Every 6 months

Integrated Systems	Inspect external AC units for water discharge and facade dampness	Every 6 months
Painted Rendering	Surface visual check for humidity stains, dirt, and adhesion loss	Biennial (Every 2 years)
Stone Tiling	Specialized technical inspection for cracks, gaps, and fasteners	Every 5 years
Ceramic Tiling	Cleaning with damp sponge and detergent for deep stains	Every 10 years
Painted Rendering	Finishing replacement (Full repainting)	Every 8 years
Stone Tiling	Water jet cleaning and neutral detergent brushing	Every 15 years
Joints & Seals	Complete replacement of seals and gaskets	Every 10 years
Stone Tiling	Major intervention (Replacement of broken/missing elements)	Every 30 years

References

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