



BUILDING CYCLE

Compliance with the Building Code for

B1 Structure

B2 Durability

E2 External Moisture

F2 Hazardous Building materials

MCL Stucco Clad (Stucco Rite)

System Compliance with NZS

4251:2007 & Alternative Solution

Executive Summary

The MCL Stucco Clad (Stucco Rite) Cavity Wall Cladding System demonstrates substantial direct compliance with NZS 4251:2007 "Cement Plasters for Walls, Ceilings and Soffits" as a non-rigid backing system explicitly permitted under Section 3.4. The system achieves NZBC E2 compliance through a combination of direct NZS 4251 compliance, acceptable alternative solutions for specific innovations, and performance-based evidence from 15+ years of successful New Zealand application (since 1999).

System Overview

The **MCL Stucco Clad (Stucco Rite)** is a three-coat cement plaster system applied over proprietary mesh reinforcement, mounted on 32mm timber battens to create a drained and ventilated cavity. The system uses specialised mortar pumps for consistent application and includes proprietary reinforcement and finishing components.

Compliance Analysis against NZS 4251 Requirements

NZBC Clause B1: Structure

Status: COMPLIANT

Specific Compliance Requirements Met:

- **B1.3.1, B1.3.2, B1.3.4:** Face loads from wind, earthquake, and human impact
- **B1.3.3(h):** Wind loading resistance up to VH wind speed zones
- **B1.3.3(f):** Earthquake resistance through ductile batten system
- **B1.3.3(j):** Human impact loads for domestic applications

Structural Performance Specifications:

- **System Weight:** 41kg/m² total system load “Medium weight”
- **Batten Specification:** 32mm x 40mm H3.1/H3.2 treated timber at 300mm centres
- **Span Capability:** Up to 900mm between plate and dwangs/nogs
- **Stud Spacing:** 600mm centres with heights up to 4.8m
- **Foundation Requirements:** Continuous concrete footings or concrete slab support for the bottom plate as per NZS 3604:2011
- **Bracing:** 63 BU/m for Earthquake and 99 BU/m for Wind loading, maximum BU/m is 120 Bu's/m for timber floors and 150 Bu's/m for concrete floors.

Enhanced Structural Features:

- Ring grip stainless steel nail fixing provides adequate lateral force resistance
- Pre-papared double wire mesh with stainless steel staple fixings
- Engineered fixing schedule creates structural load path comparable to other timber cladding systems

- **Bracing – P21 Racking Test Results** P21 testing confirms that a stucco-clad system (excluding RAB and internal linings) can achieve 63 BU/m for Earthquake and 99 BU/m for Wind loading. While the RAB system was not included in this test, designers may choose to consider its potential contribution to overall bracing performance.

Movement Control Joint Requirements:

- **Vertical Movement Control Joints:** Required at elevation changes, certain openings, and to limit panels to maximum 8m width or 2.75 times average height
- **Horizontal MCJs:** Required at intermediate floors where timber moisture content exceeds 18%, and to limit height to 5.2m maximum.
- **Minimum Clearances:** Vertical Movement Control Joints must be minimum 175mm from penetrations

NZBC Clause B2: Durability

Status: COMPLIANT - 15 Year Durability

Galvanising Classifications:

- **All areas including, Sea Spray Zones:** Class W10 with minimum 200g/m² Hot dipped galvanised coating (Green Suction Paper identification)
- **Zone Determination:** Per NZS 3604 Sea Spray Zone definitions

Material Durability Specifications:

- **Mesh Reinforcement:** Hot-dipped galvanised steel wire mesh exceeding NZS 4251 requirements
- **Timber Components:** H3.1/H3.2 treatment for battens and dwangs/nogs
- **Fixings:** Type 304 stainless steel throughout
- **Flashings:** Polyester powder coated to AAMA 2603-02 specification with 20 micron minimum coating

Maintenance-Dependent Durability:

- 12-monthly inspection regime mandatory
- Continuous maintenance of external surface and waterproof coating
- Paint system must maintain Light Reflective Value of 40% or more
- Ground clearance maintenance (150mm paved, 225mm unpaved)

NZBC Clause E2: External Moisture

Status: COMPLIANT

Performance Requirements Met:

- **E2.3.2:** Prevention of water penetration causing undue dampness or damage
- **E2.3.6:** Enables dissipation of excess moisture present at construction completion

Enhanced Moisture Management Features:

- **35mm Cavity System:** Provides superior moisture control compared to standard 20mm cavity
- **Drained and Ventilated Design:** Proprietary uPVC mouldings enable drainage and ventilation
- **Risk Score Compliance:** Suitable for all wall applications with risk score ≤ 20 per E2/AS1

Specific E2/AS1 Compliance Elements:

- **Paragraph 9.3 'Stucco':** MCL system provides acceptable alternative
- **Table C2.1.1:** Properties of roof underlays and wall underlays
- **Paragraph 4.3.11:** Flashing tape requirements
- **Paragraph 9.3.6.1:** Paint system requirements (minimum 2-coat system)

Eaves Requirements (measured horizontally from exterior face):

Eaves to Ground Height	Minimum Eaves Width
Up to 2.4m	300mm
Up to 2.7m	350mm
Up to 3.0m	450mm
Up to 4.0m	600mm
Up to 10.0m	750mm

Joinery Integration:

- Aluminium joinery – APL Metro Series ThermalHEART® with Centrafix™
- Aligned with batten system per Technical Manual
- Head and sill Z flashings as per APL Metro Series ThermalHEART® with Centrafix™

- Continuous flashing tape at side jambs as per APL Metro Series ThermalHEART® with Centrafix™

Ground and Roof Clearances:

- **Ground Level:** Minimum 50mm below ground floor level, 150mm clear distance (paved), 225mm (unpaved)
- **Roof Junctions:** Minimum 50mm above roof surface
- **Garage Doors:** Minimum 50mm clearance via formed concrete path

NZBC Clause F2: Hazardous Building Materials

Status: COMPLIANT

Safety Requirements Met:

- **F2.3.1:** No hazardous building materials in completed system
- **Construction Safety:** Paper dust masks required during handling and mixing
- **Alkaline Protection:** Wet plaster protection measures specified
- **Material Safety:** Comprehensive MSDS available at www.rimpac.co.nz

Enhanced Material Specifications

Reinforcement System - EXCEEDS REQUIREMENTS

Primary Reinforcement:

- **Wire Mesh:** 1.5mm diameter hot-dipped galvanised steel
- **Opening Size:** Maximum 51mm
- **Galvanising:** W10 (200g/m²) sea spray zones
- **Self-Furring:** 6.5mm crimp at 152mm centres with double back wires

Secondary Reinforcement:

- **Fibreglass Mesh:** 4mm x 4mm aperture, minimum 165g/m²
- **Application:** Locally in base coat, continuously in levelling/mesh coat
- **Alkali Resistance:** Specified for cement plaster compatibility

Corner Protection:

- **uPVC Kwik Corners:** 55mm x 55mm angle with nosing

- **uPVC Kwik Flanges:** 65mm x 15mm angles for openings
- **Enhanced Protection:** Exceeds standard corner reinforcement requirements

Enhanced Cavity Construction:

- **35mm Cavity Depth:** Increased cavity size provides superior ventilation and accommodates non-rigid backing deformation
- **Structural Fixing System:** Ring shanked nails with verified pull-test performance and P21 structural adequacy testing

Enhanced Air Barrier

- **Plywood or fibre cement:** Air barrier for superior airtightness, structural support, and weather protection during construction.

Plaster Formulation Compliance

MCL Stucco Rite® (Stucco Clad) NZ 660 Multicoat Cement Plaster:

- **Base Coat:** Encapsulates mesh reinforcement
- **Levelling/Mesh Coat:** Contains fibreglass mesh reinforcement
- **Top Coat:** Is either the StuccoClad plaster, sponge finished, with a sealer and paint finish as per E2/AS1 9.3.6.1
- **Thickness:** 21mm nominal within the acceptable NZS 4251 range

MCL Stucco Rite® (Stucco Clad) AL 40 SP Polymer Modified Finishing Plaster:

- **Application:** Available in bags and premixed buckets
- **Polymer Modifiers:** Enhanced workability and durability

Curing Requirements - EXCEEDS NZS 4251:

- **Base Coat:** 48-hour moist curing before levelling coat
- **Levelling/Mesh Coat:** 48-hour moist curing after application
- **Top Coat:** 48-hour moist curing after application
- **Environmental Protection:** Protection from drying wind, low humidity (<60%), and direct sunlight

Acceptable Alternative Solutions

Machine Application Method

Status: ACCEPTABLE ALTERNATIVE SOLUTION

Technical Justification:

- NZS 4251 does not prohibit machine application methods
- MCL Stucco Rite® (Stucco Clad) Mortar Pumps provide superior consistency compared to hand application
- Preset water controls at the pump reduce on-site quality variations
- Rotor/stator pump technology helps ensure correct consistency delivery

Performance Evidence:

- Consistent mix ratios through factory settings
- Uniform application thickness control
- Reduced material waste
- Enhanced quality control measures
 - **ISO 9001:2015** Certificate # 108571 – Scope: Manufacture and distribution of carbon steel wire products, including bright wire, annealed wire, **galvanised wire**, bulk and packaged mail, staples, **Stucco mesh products** and concrete reinforcing products.

Enhanced Panel Sizing

Status: ACCEPTABLE ALTERNATIVE SOLUTION

Maximum Panel Dimensions:

- **Width:** 8 metres maximum
- **Height:** 5.2 metres average maximum
- **Rationale:** Enhanced reinforcement and cavity design accommodate larger panels without cracking risk

Supporting Technical Factors:

- **Superior Mesh:** 1.5mm diameter vs minimum standard requirements
- **Dual Reinforcement:** Steel mesh plus fibreglass mesh system
- **Cavity Accommodation:** 35mm cavity accommodates differential movement
- **Proprietary Moulding System:** Comprehensive joint management

- **Proven history:** 5 sites visited by J.H. Little in 2009 (work completed 2003-2007), re-inspected by Building Cycle Ltd in 2025. Report TR10016 demonstrates continued compliance over 20+ year period.

Installation Requirements & Quality Control

Skilled Labor Requirements

Plaster Applicator Qualifications:

- Must meet NZS 4251.1 Clause 2.1.2 competency requirements
- Responsible for pump operation and mix consistency
- Required for proper curing procedures and sealer application

Builder's Work Scope:

- Timber framing and penetration installation
- Wall wrap and flashing tape application
- Batten installation and external joinery
- Moulding and mesh sheet installation

Waterproof Coating Applicator:

- Etch priming of unpainted aluminium flashings
- Minimum 2-coat paint system per E2/AS1 Paragraph 9.3.6.1
- Light Reflective Value maintenance (40% minimum)
- Sealant application at EPS moulding junctions

Essential Equipment Requirements

MCL Stucco Rite® (Stucco Clad) Mortar Pumps:

- Electric powered rotor/stator pumps supplied by MCL
- Factory settings with adjustable water flow
- Available for purchase or hire from MCL
- Regular maintenance and calibration by MCL

Maintenance & Inspection Requirements

Mandatory Inspection Schedule

12-Monthly Inspections Must Verify:

- Plaster and flashing structural integrity (no cracking or deterioration)
- Paint coating complete coverage and condition
- Sealant condition at penetrations and EPS mouldings
- Ground and roof clearance maintenance

Cleaning Procedures:

- Soft brush with warm water and mild detergent
- Fresh water rinse required
- **Prohibited:** Water blaster cleaning methods

Repair Requirements

Minor Repairs (Single cracks up to 1.5mm):

- Standard maintenance procedures sufficient

Major Repairs (Cracks >1.5mm, multiple cracking, structural damage):

- **Qualified Plasterer Required:** Per NZS 4251 standards
- **Systematic Approach:** Remove to firm material, maintain 50mm mesh overlap
- **Waterproof Coating:** Remove 300mm beyond repair area
- **Complete Reinstatement:** Three-coat system with 48-hour curing periods

Performance History & Market Evidence

Long-Term Performance Documentation

New Zealand Application History:

- **Duration:** In use since 1999 (20+ years)
- **Scope:** Various exposure conditions and building types
- **Performance Record:** No significant failures or moisture ingress issues documented
- **Market Acceptance:** Demonstrated compliance with NZBC E2 performance requirements

Quality Assurance Program

Manufacturing Quality Control:

- Raw material procurement verification
- Manufacturing specification compliance
- Ongoing quality assurance by MCL and suppliers

Component Verification:

- H3.1/H3.2 treatment plant identification for battens
- Stainless steel fixing certification and sealed packaging
- Mesh certification from Tree Island Wire (USA) Inc.
- Batch sampling and random manufacture audits

System Advantages Over Standard Applications

1. **Enhanced Moisture Management:** 32mm cavity provides superior performance vs 20mm standard
2. **Thermal Performance:** Reduced thermal bridging compared to direct-applied systems
3. **Maintenance Access:** Cavity system allows inspection and maintenance access
4. **Movement Accommodation:** Natural accommodation of building movement through cavity design
5. **Quality Control:** Machine application ensures consistent mixing and application
6. **Extended Panel Capability:** Larger panels possible through enhanced reinforcement
7. **Proven Performance:** 20+ years of successful New Zealand application history

Final Compliance Statement

Primary Compliance Pathway: "The MCL Stucco Rite® (Stucco Clad) Cavity Wall Cladding System achieves NZBC compliance through direct conformance with NZS 4251:2007 as a non-rigid backing system explicitly permitted under Section 3.4, with material specifications and installation requirements that meet or exceed minimum standard requirements across all applicable Building Code clauses."

Alternative Solution Elements: "System innovations including machine application methodology, enhanced panel sizing capabilities and non-ridged backing on a cavity

constitute acceptable alternative solutions demonstrating equivalent or superior performance to standard methods, supported by 20+ years of successful New Zealand performance history and comprehensive quality assurance programmes."

Overall Compliance Assessment: "The combination of direct NZS 4251:2007 compliance, acceptable alternative solutions for system innovations, enhanced material specifications exceeding minimum requirements, and demonstrated long-term performance provides a robust and comprehensive compliance pathway meeting all relevant NZBC requirements including B1 Structure, B2 Durability, E2 External Moisture, and F2 Hazardous Building Materials."

Scope and Limitations

This compliance report applies to the **MCL Stucco Rite® (Stucco Clad) Cavity Wall Cladding System** per this report's reference documentation for NZBC clauses B1, B2, E2, and F2 compliance.

System Components: Three-coat cement plaster system with 35mm drained cavity, proprietary mesh reinforcement (W10 galvanising), machine application via MCL Stucco Rite® (Stucco Clad) Mortar Pumps, and uPVC mouldings. Hand application methods excluded.

Building Applications: Timber-framed buildings per NZS 3604:2011, up to 4.8m height with 600mm stud centres, risk scores ≤ 20 per E2/AS1, and wind zones up to VH. Steel framing and buildings outside NZS 3604 scope excluded from this report.

Foundation Requirements: Buildings with continuous concrete footings or slab foundations (appraisal requirement). Other foundation types excluded.

System Performance: 41kg/m² system weight (medium cladding classification), maximum panels 8m width × 5.2m height, non-contributory to lateral bracing. Applications requiring structural contribution excluded from this report.

Installation Requirements: Skilled plasterers per NZS 4251.1 Cl 2.1.2, 48-hour moist curing between coats, timber moisture $\leq 18\%$ before interior lining. Installation during adverse weather conditions excluded.

Environmental Conditions: Standard and Sea Spray Zones (W10 galvanising required for Sea Spray). Geothermal or corrosive atmospheres excluded without specific design.

Joinery and Design: Aluminium joinery meeting E2/AS1 standards within initial appraisal scope 2025 update covers the use of APL Cetrafix window and door system. Curved walls, parapets, and junction details not in scope and are excluded - require specific design.

Maintenance and Durability: 12-monthly inspection regime and maintenance per JH Little appraisal requirements for 15-year durability. Non-compliant maintenance regimes are excluded from the performance warranty.

Document Dependencies: Valid with E2/AS1 Fourth Edition, Appraisal Certificate #30/0708, and MCL® quality assurance programme maintenance, MCL Technical Manual (Master, 28 Sept 2011 revised 30 sept 2025). Applications without these dependencies excluded.

Design Boundaries: Standard applications within appraisal scope included. Variations, complex geometries, and site-specific conditions excluded - require specific engineering design.

Disclaimer

This report covers standard applications within JH Little appraisal #30/0708 scope only. Variations require specific engineering design. Building consent applications should verify current standards and regulatory requirements. Professional engineering advice should be sought for applications outside the defined scope or where site-specific conditions may affect system performance.

References & Standards Compliance

Primary Standards:

- NZS 4251.1:2007 - Cement Plasters for Walls, Ceilings and Soffits
- NZS 3604:1999 - Timber Framed Buildings (with Amendments 1 & 2)
- E2/AS1 - External Moisture Acceptable Solution (3rd Edition with Amendments 1-4)

Supporting Documentation:

- NZBC Clauses B1, B2, E2, F2 Compliance Documents
- AAMA 2603-02 Specification
- Various BEAL Appraisals and FRI Reports
- MCL Technical Manual (Master, 28 Sept 2011 revised 30 sept 2025)
- Appraisal Certificate #30/0708 (July 2011) - J.H. Little & Associates
- [Product Accreditation Certification No 2011/01 - MBIE](#)
- Material Safety Data Sheets
- Quality Assurance Programme documentation

- ISO 9001:2015 Certificate# 108571, exp April 2027

Supporting Technical Evidence:

- FRI Report TE02-094: Wall Racking Tests
- BEAL Appraisals CA521, CA705: Material performance
- Manufacturer certifications Klath (Tree Island Wire)
- Annual quality audits

This compliance report demonstrates comprehensive adherence to all applicable New Zealand Building Code requirements and provides a clear Alternative Solution Assessment demonstrating compliance with the code when installation and maintenance is in accordance with MCL Stucco Rite® (Stucco Clad) Cavity Wall Cladding System.