

Paint Failures & Fixes: Best Practices for Durable Coating Systems

This presentation will explore the root causes of common exterior paint failures and provide actionable guidance on surface preparation, application techniques, and troubleshooting methods. Drawing on MPI standards and real-world examples from MPDA's inspection work, this presentation will help consultants, contractors, and suppliers deliver more reliable paint performance on both new and repaint projects.

Prepared for the **British Columbia Building Envelope Council (BCBEC)** - June 18, 2025

Master Painters and Decorators Association





About Us

Master Painters and Decorators Association (MPDA)

A not-for-profit association enhancing the painting and decorating industry through:

- Development of comprehensive professional standards
- Specialized industry training programs
- Strong advocacy for professional painting contractors

MPDA Specification Services Inc. (MPDA SSI)

An independent **Paint Quality Assurance** agency that:

- Delivers services aligned with MPI Industry Standards
- Verifies specification compliance throughout project lifecycles





Workshop Agenda & Learning Outcomes

1

Understanding Quality Standards

Learn how MPI and MPDA establish industry benchmarks for paint performance.

2

Identifying Paint Failures

Recognize indicators of adhesion problems, blistering, and premature coating deterioration.

3

Mastering Troubleshooting

Apply systematic diagnostic approaches to determine root causes of paint deficiencies.

4

Implementing Prevention

Develop expertise in surface preparation that prevents common failures.

Meet Your Presenters



Mark Swiderski, Lead Inspector

MPI Certified Inspector #00204 with 25 years of experience in commercial painting. Mark holds multiple industry certifications including ACT, ACS, MCS, PQA, and MCACI.



Rob Akimow, Executive Director MPDA

Joined the MPDA in January 2024, bringing extensive experience in Sales & Marketing Leadership and 15 years with the Chamber movement.

Understanding Paint Specifications & Standards



Durability & Protection

Well-defined specifications ensure coating systems deliver appropriate protection, extending service life.



Cost-Benefit Analysis

Understanding specifications helps balance initial investment against long-term performance.



System Integration

Proper specifications ensure compatibility with adjacent building materials and exposure conditions.



Quality Assurance Framework


Specifications establish measurable standards for application, inspection, and compliance verification.



Reach Out for Guidance

Consult with an MPDA inspector for expert advice on specification interpretation and implementation challenges.





Surface Preparation Standards



Surface Cleaning

Remove all contaminants before application. Structural steel requires anywhere from SSPC-SP1 solvent cleaning to SP5 white metal blast standards.



Primer Selection

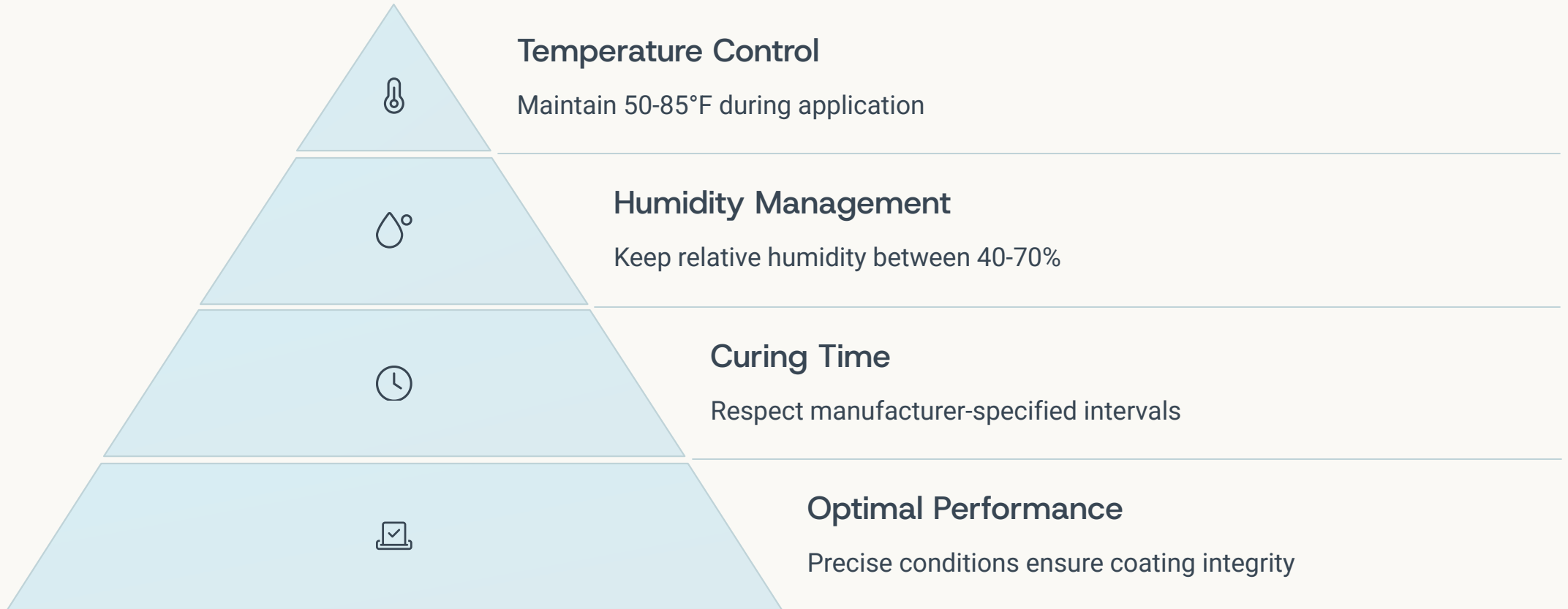
Use substrate-appropriate primers. Galvanized metal requires specialized primers for proper adhesion.



Moisture Control

Confirm surfaces meet moisture requirements. Allow concrete to cure for at least 28 days.

Environmental Controls



Proper environmental controls serve as the critical link between application techniques and preventing coating failures. Controlling these factors significantly reduces the risk of adhesion problems and other paint defects.

Application Methods

Technique Selection

Select appropriate brush, roller, or spray equipment based on coating specifications and surface type.



Coverage Patterns

Apply coatings using systematic patterns to ensure complete, uniform coverage without streaking.

Film Thickness Control

Monitor wet and dry film thickness using calibrated gauges to maintain manufacturer specifications.

Paint Failures: From Categories to Examples

Understanding the patterns and causes of coating degradation

Preventable Failures (85%)

Most paint failures can be prevented with proper preparation and application.

Moisture-Related Issues (28%)

Nearly one-third of all paint failures are caused by moisture issues.

Cost Multiplier (3X)

Remediation typically costs three times more than proper initial application.

Paint failure analysis



Understanding Paint Failures

From Theory to Practice

Now that we've covered the key principles, let's examine common paint failures you may encounter in the field.

Understanding these categories enhances your ability to diagnose issues across different project types.

Expert Resources

Our certified inspectors can provide additional guidance on complex paint failures.

Understanding Paint Failure Categories

Before examining specific examples, let's categorize the common types of paint failures you may encounter on your projects:

Category	Examples	Primary Causes
Adhesion Issues	Peeling, flaking, delamination	Poor surface preparation, incompatible primers
Moisture Problems	Blistering, efflorescence, mildew	High humidity, water infiltration, inadequate ventilation
Application Defects	Runs, sags, wrinkling, poor hiding	Improper technique, wrong tools, environmental conditions
Material Failures	Chalking, fading, yellowing	Low-quality paint, UV exposure, chemical exposure
Substrate Issues	Cracking, nail head rust, tannin bleed	Structural movement, material defects, chemical reactions

Next, we'll examine specific examples and their prevention strategies.



Alligatoring

A cracking pattern that resembles alligator skin, caused by improper application or aging of paint.



Cause: Application Issues

Applying a hard coating over a flexible coating



Cause: Aging

Natural deterioration of paint over time



Cause: Environmental Factors

Exposure to extreme temperatures and weather conditions



Solution

Remove all affected paint, properly prepare the surface, and apply compatible primer and paint systems



Adhesion Testing & MPI Benchmarks



ASTM D3359 X-cut Test

Standard method to assess coating adhesion by making an X-cut and applying tape to measure peeling.



Rating Scale

5A: No peeling; 4A: Trace peeling; 3A: Jagged removal; 2A: Moderate removal; 1A: Significant removal; 0A: Complete removal.



Field Application

Test multiple areas to verify surface preparation quality and coating performance over time.



Documentation

Record results with photographs and specific locations to track performance and identify problem areas.



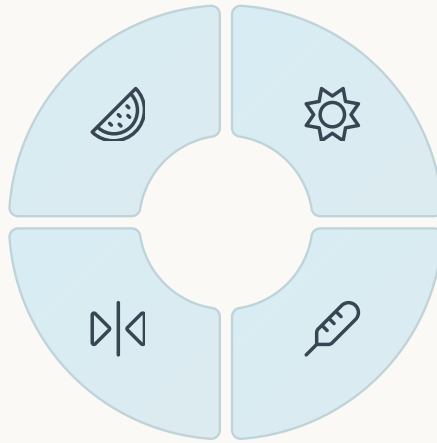
Blistering and Bubbling

Trapped Moisture

Water vapor pushing through coating

Solution

Remove affected areas, address moisture source, ensure proper drying

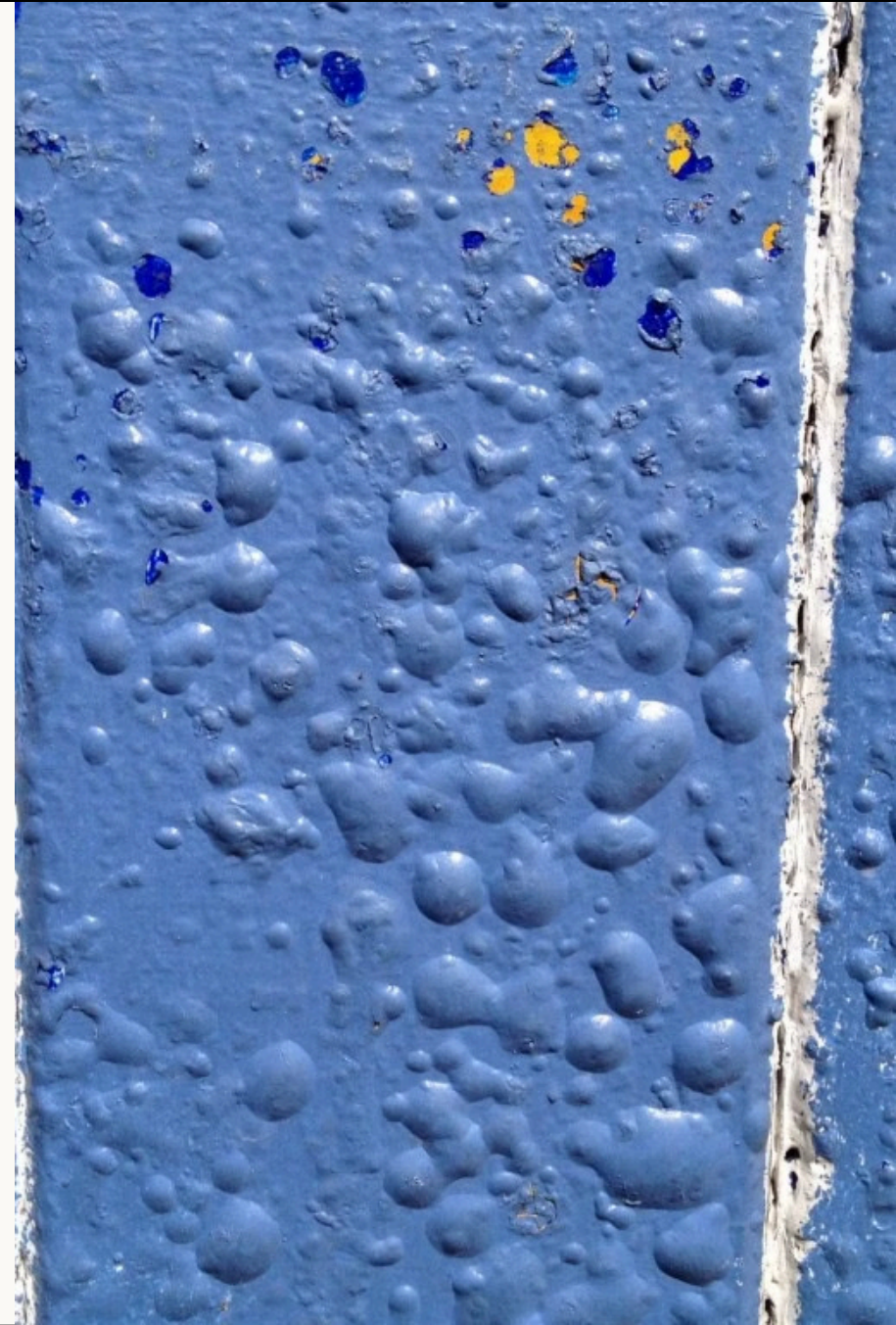


Rapid Drying

Surface dries before solvents can evaporate

Heat Exposure

High temperatures causing expansion



Efflorescence

What Is Efflorescence?

White powdery deposits appearing on masonry surfaces when water-soluble salts migrate to the surface.

Often mistaken for paint failure but actually indicates moisture problems in the substrate.

Prevention & Treatment

- Address all moisture sources
- Clean deposits with diluted phosphoric acid
- Apply alkali-resistant primer
- Use breathable coating systems
- Install proper drainage and flashing



Chalking, Cracking, and Fading

Chalking



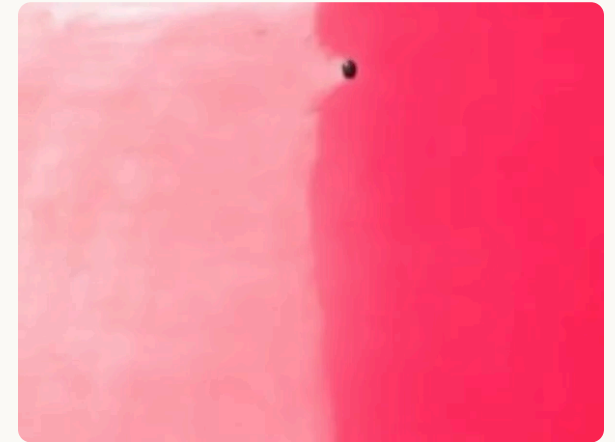
- Powdery residue on surface
- Caused by paint binder breakdown
- Common in exterior alkyd paints
- Worsens with UV exposure

Cracking



- Hairline fractures in paint film
- Results from inflexible paint
- Occurs with age or poor application
- Can lead to substrate damage

Fading



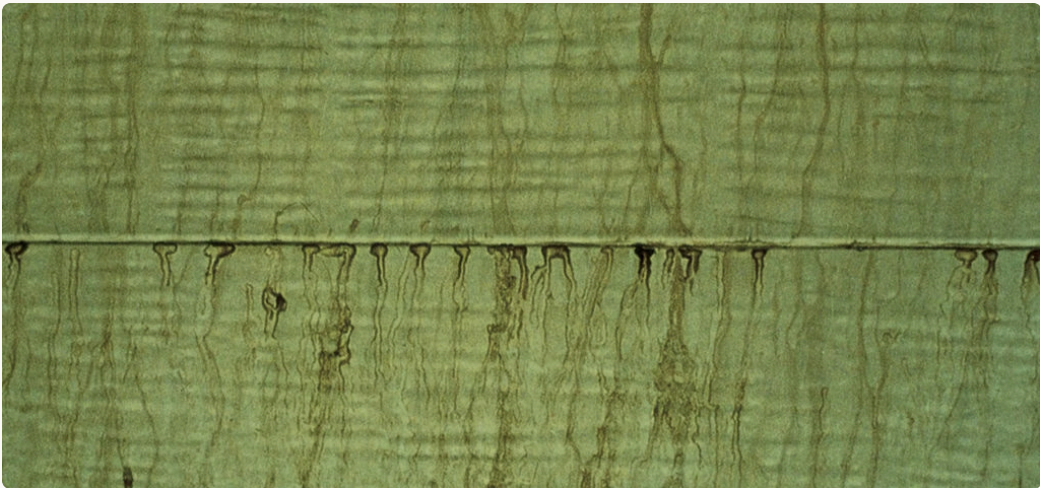
- Color loss over time
- Primarily UV damage
- Affects darker colors more severely
- Preventable with UV-resistant formulas

Mildew and Surfactant Leaching



Mildew

- Black or green spotted growth
- Common in humid, shaded areas
- Often mistaken for dirt
- Can grow through paint film



Surfactant Leaching

- Sticky brown or amber spots
- Appears in high humidity conditions
- Water-soluble components migrate to surface
- Usually occurs early after application

Prevention

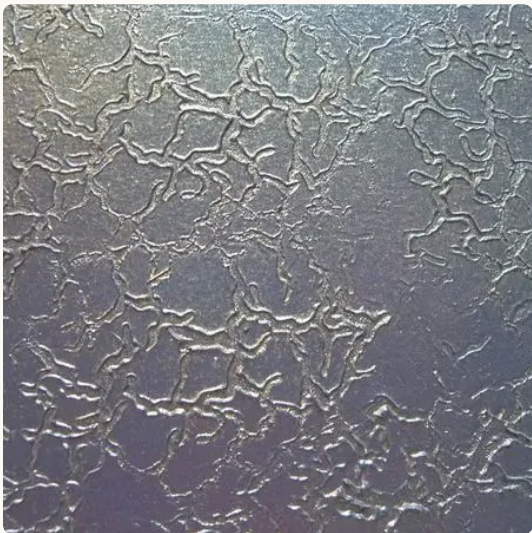
- Use mildew-resistant paint
- Apply in proper conditions
- Ensure adequate ventilation
- Allow proper drying between coats

Peeling and Wrinkling



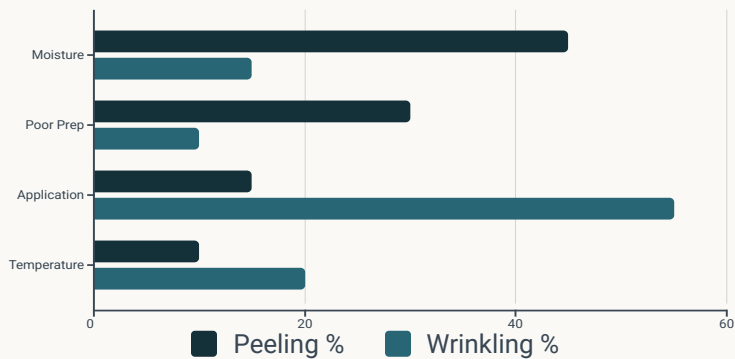
Paint Peeling

Loss of adhesion causing paint film to detach from surface



Paint Wrinkling

Uneven drying causing ripples and distortion in paint film



Key Differences

Peeling occurs when paint loses adhesion to the substrate, often due to moisture or poor preparation.

Wrinkling happens during application when paint doesn't dry uniformly, typically from heavy application or improper drying conditions.

Both require complete removal of affected areas before repainting with proper technique.

Nail Head Rust and Tannin Bleed

Nail Head Rust

Occurs with non-galvanized nails in moist conditions. Rust bleeds through paint film creating distinctive spots.



Tannin Bleed

Wood acids from cedar or redwood leach through paint. Creates yellowish-brown discoloration even through multiple coats.



Solutions

- ☐ Use galvanized nails for exterior work
- ☐ Apply specialized stain-blocking primers designed to seal tannins in wood substrates



Troubleshooting Paint Deficiencies



Identify Defect

Analyze coating failures with precise documentation



Document Conditions

Record substrate moisture levels and temperature variations



Consult MPI Standards

Reference specifications for diagnostic guidance



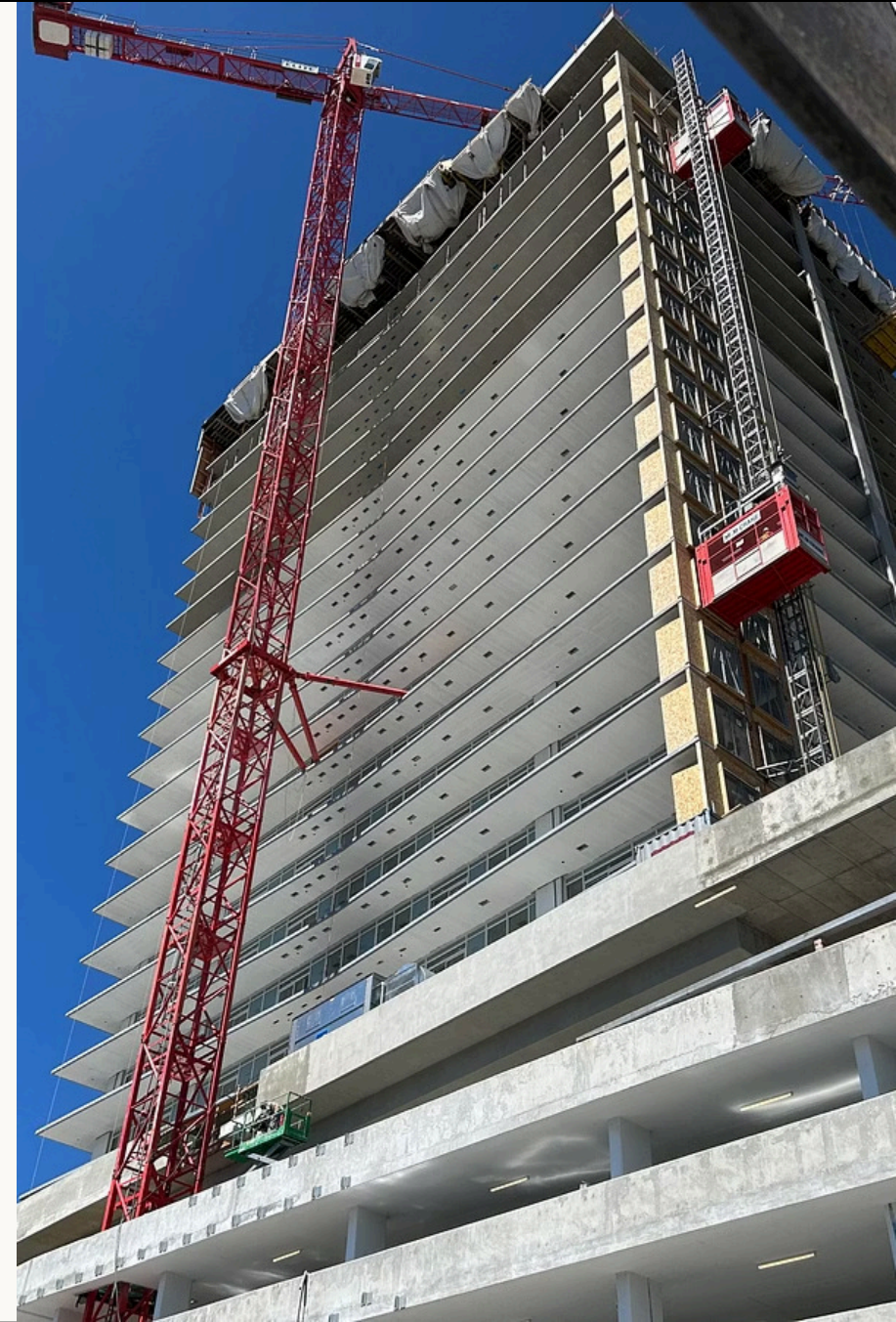
Implement Correction

Execute remediation techniques addressing root causes



Verify Solution

Conduct performance testing to ensure resolution





Key Takeaways



Follow Industry Standards

Adhering to MPI specifications ensures compliance, durability, and optimal performance.



Prevention is Critical

Proper surface preparation and environmental controls prevent most paint failures, saving resources.



Document Thoroughly

Maintain detailed records to build institutional knowledge and improve future projects.



Leverage Expert Guidance

Consult with MPDA specialists at 604-298-3875 or admin@mpda.net for complex paint issues requiring assessment.