Surface Solutions Consulting

Performance Standards
Polished Concrete
Commercial Flooring Performance & Specification Reference

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This document is intended to provide performance guidance and specification support based on field experience and industry standards. Final system selection and design decisions remain the responsibility of the design team and project stakeholders.

Polished Concrete At a Glance

Category	Performance Profile
Best For	Retail, office, education
Avoid In	Commercial kitchens, wash down areas
Initial Cost	Moderate
Lifecycle Cost	Low to Moderate
Moisture Tolerance	Moderate
Slip Engineering	Limited
Chemical Resistance	Low
Aesthetic Variation	High
Maintenance Intensity	Low

1. System Definition & Baseline

Polished concrete is a mechanically refined concrete surface achieved through progressive grinding with industrial diamond abrasives, chemical densification, and note-controlled refinement to achieve defined clarity and reflectivity.

Polished concrete is not a finish applied to concrete.
It is the result of working with the concrete that already exists.

Performance is directly dependent on slab design, mix composition, placement quality, curing methodology, and environmental exposure.

Design Implication:
Polished concrete does not conceal slab defects. It reveals them. Slab quality determines finish quality.

2. Slab Quality Reality & Field Conditions

Polished concrete is a slab-driven system.

Whether new or existing, most slabs are not placed with polishing as the primary design intent. Even when specified, execution often varies from design.

For new construction:

- Floor Flatness (FF) should exceed 40
- Lower FF values may require additional grinding to achieve acceptable results
- Additional grinding may increase aggregate exposure and open surface voids (pinholes) requiring grouting

For existing slabs:

- Previous floor coverings may create visible “ghosting” patterns
- Prior trenching, patching, and repairs will remain visible
- Color variation between pours is permanent
- Surface inconsistencies cannot be fully corrected through polishing

These conditions are typically not visible until initial grinding begins.

Design Implication:
Polished concrete reflects slab history, not just design intent. Final appearance is

governed by existing slab conditions.

3. Performance Characteristics

Surface Hardness

Achieved through densifier application reacting with free lime to form additional calcium silicate hydrate, increasing abrasion resistance.

Abrasion Resistance

Dependent on aggregate hardness and cement paste integrity. Soft aggregates will polish differently and wear differently.

Reflectivity

Measured using gloss meter readings, typically at 60 degrees. Gloss is not a measure of slip resistance.

Permeability

Polished concrete remains vapor-permeable unless topical guard systems are applied.

Crack Behavior

Polishing does not prevent shrinkage cracking. Cracks remain visible and may telegraph over time.

Design Implication:
Polished concrete is durable, but it remains concrete.

4. Aggregate Exposure & Finish Classification

Aggregate exposure should be defined as a **target range**, not a fixed requirement.

While initial grinding depth can influence exposure, final results are dependent on:

- Slab hardness
- Aggregate distribution
- Surface flatness

• Required corrective grinding

“Salt and pepper” exposure is the most commonly specified and the least consistently achievable across large slabs.

High areas will expose more aggregate during flattening.
Low areas will expose less.

Uniform exposure across the full floor cannot be guaranteed.

Design Implication:
Rigid exposure specifications increase risk of inconsistent appearance and owner dissatisfaction.

5. Slip & Traction Performance

Slip resistance in polished concrete is influenced by:

• Micro texture created during refinement
• Surface contamination
• Maintenance chemistry
• Entryway moisture control

High gloss does not inherently mean low traction.

Continuous wet environments increase slip risk. Polished concrete is not appropriate for commercial kitchens or wash down zones without additional traction strategy.

Design Implication:
Gloss is aesthetic. Traction is environmental.

Polished concrete surfaces routinely meet or exceed ANSI A326.3 DCOF standards, even at higher grit levels.

Gloss level is not an indicator of slip resistance.

Enhanced traction can be achieved through specialized treatments where required for specific environments (e.g., grocery wet rack zones).

Design Implication:
Slip performance should be evaluated based on environmental conditions, not

visual appearance.

6. Moisture Considerations

Polished concrete is vapor-permeable and generally tolerant of slab moisture.

However:

• Excessive vapor emission may affect guard systems
• Moisture-related staining may occur
• Efflorescence may appear over time

Early moisture testing is recommended when topical protectants are specified.

Polished concrete should not be assumed to “solve” slab moisture conditions.

7. Field Quality Control Protocol

To reduce disputes:

• Require a representative mockup installed in permanent area
• Define exposure level and gloss range in writing
• Approve joint treatment method
• Clarify crack treatment expectations
• Conduct pre-install coordination meeting

Acceptance should be based on approved mockup, not subjective opinion.

Mockups should be installed in representative slab areas that reflect actual project conditions.

Mockups should define:

• Aggregate exposure range
• Gloss level
• Joint treatment
• Crack repair expectations

Final acceptance should be based on the approved mockup, not subjective interpretation after installation.

Design Implication:
Mockups are critical for aligning expectations in systems with inherent variability.

8. Inherent Characteristics & Expectation Alignment

The following conditions are inherent to polished concrete and should not be considered defects:

- Patch visibility (color and texture variation)
- Ghosting from previous flooring systems
- Aggregate inconsistency
- Color variation between slab placements
- Surface shadowing
- Curling at joints

Attempts to eliminate these characteristics may require alternative systems such as overlays.

Design Implication:
If visual uniformity is a primary design goal, polished concrete may not be the appropriate system.

9. Observed Field Conditions

Based on field experience across commercial installations, the following conditions are frequently encountered:

- Pinholes revealed during initial grinding
- Curing compounds interfering with diamond tooling
- Inconsistent slab flatness affecting gloss uniformity
- Residual adhesives requiring removal
- Variability between slab pours

Pinholes are particularly common and cannot be predicted prior to grinding. Grouting may be required as an additional scope item.

Design Implication:
Final scope and cost may be influenced by conditions only revealed during installation.

10. Failure Modes & Risk Factors

Common field issues include:

• Guard delamination due to moisture
• Uneven gloss from slab variation
• Staining from improper maintenance
• Joint filler separation
• Surface dulling from acidic cleaners

Most failures are caused by:

Improper slab design
Improper maintenance
Unrealistic aesthetic expectations

Not the polishing process itself.

Many performance issues attributed to polished concrete are not installation failures, but result from:

• Improper or incomplete specifications
• Slab design misalignment
• Skipped grinding steps by installers
• Over-reliance on topical guards to conceal defects

Inconsistent scratch patterns are a common result of incomplete grinding processes.

Design Implication:
Process discipline is critical to achieving consistent results.

11. Lifecycle & Maintenance Alignment

Polished concrete is low maintenance, not maintenance-free.

Required maintenance includes:

• Routine cleaning with neutral cleaners only
• Periodic burnishing to restore clarity
• Reapplication of guard systems in high-traffic areas

Failure to follow maintenance protocols results in:

- Surface dulling
- Reduced reflectivity
- Increased staining risk

Acidic cleaners and solvents can damage the surface and degrade protective treatments.

Design Implication:
Maintenance expectations should be clearly defined in project specifications and owner documentation.

12. Specification Baseline Requirements

A polished concrete specification should include:

- Aggregate exposure classification
- Gloss range
- Mockup requirement
- Joint fill specification
- Crack treatment language
- Maintenance documentation
- Acceptance criteria

Generic language increases risk of bid ambiguity and performance disputes.

Common specification gaps include:

- Undefined grit level or finish classification
- Confusion between polished concrete and grind & seal systems
- Missing joint treatment requirements
- Lack of mockup requirements
- Undefined crack repair expectations

These gaps frequently result in:

- Bid inconsistency
- RFIs during construction
- Cost escalation
- Misaligned expectations

Design Implication:
Performance-based specifications reduce ambiguity and improve project outcomes.

13. When Polished Concrete Is Not Appropriate

Polished concrete is not recommended for:

- Commercial kitchens
- Continuous washdown areas
- Sloped wet zones
- Areas with grease saturation
- Heavy chemical exposure

Alternative systems should be considered in these conditions.

14. Early Design Consultation

Surface Solutions provides:

- Pre-spec coordination
- Slab condition review
- Division 03 / 09 coordination
- Mockup strategy development
- Risk assessment

Early engagement reduces schedule conflict and cost escalation.

15. Sustainability & Environmental Considerations

Polished concrete is frequently selected in sustainable design environments due to its reliance on the existing structural slab.

Material Efficiency

Polished concrete utilizes the existing substrate rather than adding applied finish layers, reducing material consumption.

VOC Impact

Mechanical polishing systems produce minimal VOC emissions compared to applied coating systems when no topical sealers are used.

Light Reflectivity

Increased surface reflectivity may contribute to improved ambient light distribution, potentially reducing lighting demand.

Lifecycle Waste Reduction

Unlike applied floor coverings that require replacement, polished concrete can be re-refined rather than removed and replaced.

Design Implication:
Polished concrete supports long-term durability and material efficiency, but it does not automatically guarantee LEED points. Documentation alignment is required.

16. Cost Category & Lifecycle Performance Matrix

Initial Installation Cost Category

Moderate
Typically lower than resinous broadcast systems and terrazzo.
Higher than basic sealers or minimal surface prep.

Lifecycle Cost Category

Low to Moderate
Minimal material replacement required when maintained correctly.

Maintenance Intensity

Low to Moderate
Routine cleaning required. No waxing or stripping cycles typical.

Repair Cost Risk

Moderate
Localized slab defects remain visible and cannot be concealed without aesthetic compromise.

Failure Risk Drivers

- Slab inconsistency
- Unrealistic aesthetic expectations
- Improper maintenance chemicals
- Environmental misuse

Design Implication:
Polished concrete offers strong lifecycle value when slab quality is aligned with design intent. It is not a cosmetic fix for poor concrete.

Primary cost drivers include:

- Required level of aggregate exposure
- Final grit level
- Surface preparation requirements
- Slab flatness and condition
- Project phasing and access
- Schedule compression

Additional scope items such as glue removal, crack repair, and grouting are often not fully defined in early specifications.

Design Implication:
Clear scope definition reduces bid variability and protects project budgets.

Bid variability in polished concrete is typically driven by:

- Undefined surface preparation scope
- Assumptions regarding adhesive removal
- Omission of crack repair and grouting
- Differences in process rigor between contractors

Lower bids often exclude necessary steps rather than reflect equivalent scope.

Design Implication:
Bid comparison should evaluate scope completeness, not cost alone.

17. Comparative Performance Matrix

Performance Factor	Polished Concrete	Resinous Flooring	Grind & Seal
Vapor Permeability	High	Low	Moderate
Chemical Resistance	Low	High	Low
Slip Engineering	Limited	High	Limited
Maintenance Complexity	Low	Moderate	Moderate
Aesthetic Variation	High	Controlled	Moderate
Lifespan Potential	Long	Long	Moderate
Moisture Tolerance	Moderate	Low without mitigation	Moderate

Design Implication:
System selection should be driven by environmental exposure and performance expectations, not aesthetic preference alone.

18. Technical References & Industry Standards

Polished concrete performance intersects with the following standards:

- ASTM F2170 – In-Situ Relative Humidity Testing
- ASTM C779 – Abrasion Resistance of Horizontal Concrete Surfaces
- ICRI Concrete Surface Profile Guidelines
- ANSI A326.3 – Dynamic Coefficient of Friction
- ACI 302.1R – Guide for Concrete Floor and Slab Construction

These standards influence substrate evaluation, moisture coordination, and performance expectations.

Design Implication:
Polished concrete is not an isolated finish. It is governed by concrete performance standards.

19. Aesthetic Expectation & Owner Alignment Framework

Polished concrete is a performance system with inherent aesthetic variability.

The following must be discussed during design phase:

- Aggregate exposure unpredictability
- Crack visibility
- Color shifts between slab placements
- Patch visibility
- Edge darkening at joints
- Variation between pours

Architect Responsibility:

If polished concrete is selected for aesthetic minimalism, the design team must educate ownership that variation is not defect.

Mockups should be installed in representative slab conditions and approved prior to full installation.

Design Implication:
Expectation alignment early prevents warranty disputes later.

20. Bid Clarity & Scope Definition

Ambiguous specifications are the primary driver of bid spread in polished concrete.

Common issues include:

- Undefined performance criteria

• Incomplete scope descriptions
• Missing remediation responsibilities

Lower bids may exclude necessary scope items such as:

• Surface preparation
• Adhesive removal
• Crack repair
• Grouting

Design Implication:
Incomplete specifications shift risk to the construction phase and often result in change orders.

21. Early Phase Consultation & Risk Assessment

Polished concrete is most successful when engaged during design phase.

Surface Solutions supports:

• Slab condition assessment
• Exposure expectation alignment
• Division 03 coordination review
• Maintenance strategy development
• Risk mitigation consultation

Engagement prior to final specification reduces bid ambiguity and performance disputes.

22. Common Specification Mistakes

Polished concrete specifications frequently include language that creates ambiguity, cost escalation, or misaligned expectations.

Common issues include:

• Specifying “salt and pepper” exposure as a fixed requirement
• Confusing polished concrete with grind & seal systems
• Omitting grit level or finish classification
• Failing to define joint treatment methodology
• Not requiring a mockup in representative slab conditions

- Assuming uniform appearance across variable slabs

These issues often result in:

- Bid spread volatility
- RFIs during construction
- Change orders
- Owner dissatisfaction

Design Implication:
Clear, performance-based specifications reduce risk and improve project outcomes.