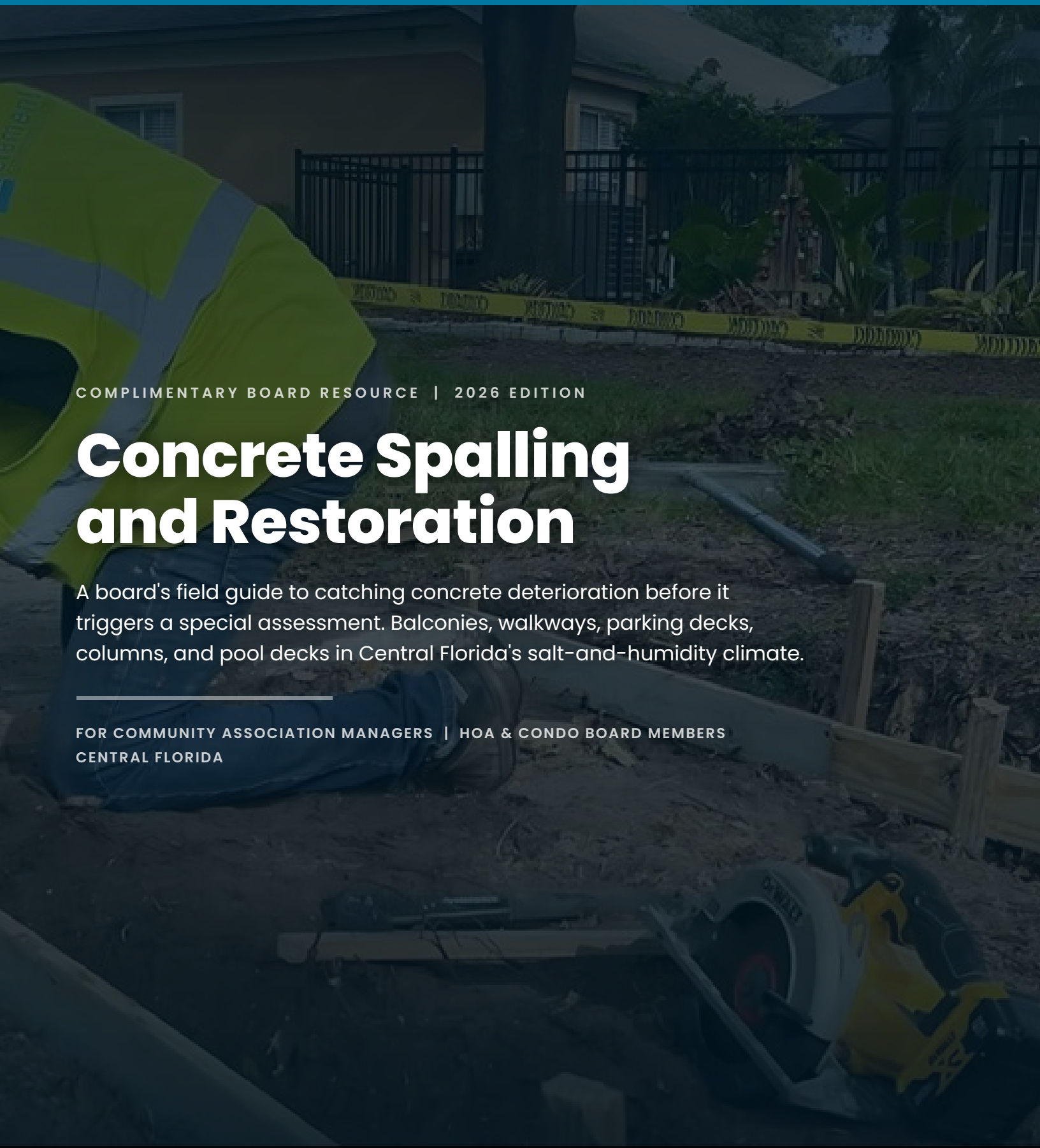


COMPLIMENTARY BOARD RESOURCE | 2026 EDITION

Concrete Spalling and Restoration

A board's field guide to catching concrete deterioration before it triggers a special assessment. Balconies, walkways, parking decks, columns, and pool decks in Central Florida's salt-and-humidity climate.

FOR COMMUNITY ASSOCIATION MANAGERS | HOA & CONDO BOARD MEMBERS
CENTRAL FLORIDA

This guide is a general educational resource for Florida condominium and cooperative association boards and community association managers. It does not constitute legal, engineering, or financial advice. Always consult a licensed Florida professional engineer for structural assessments and a qualified attorney for legal obligations specific to your association.

Gavin Sederopoulos
Vice President of Sales
Office (407) 744-9122
elementbiz.com

COMPLIMENTARY BOARD RESOURCE

What's Inside This Guide

Nine plain-English sections plus six ready-to-use board tools, written for the CAMs and board members who have to find concrete problems early and make good repair decisions before costs multiply.

1 **Why Concrete Fails in Central Florida**
Chloride infiltration, carbonation, rebar corrosion, and the spalling cycle

2 **The Warning Signs Boards Miss**
Cracks, rust staining, hollow spots, efflorescence, exposed rebar

3 **Where It Shows Up**
Balconies, walkways, parking decks, columns, pool decks

4 **Inspection and Assessment**
Visual, sounding, core testing, engineers, and milestone links

5 **How Proper Repair Works**
ACI 546: remove to sound substrate, treat rebar, restore, seal

6 **Cost and the Deferral Curve**
Early intervention vs. full restoration and real cost ranges

7 **A Central Florida Case Story**
What deferred concrete repair actually cost one association

8 **A Preventive Program**
Sealing, drainage, joint maintenance, and an annual calendar

9 **How ESS Fits and What to Do Next**
ESS self-performs concrete restoration and a complimentary on-site inspection offer

A **Appendix: Eight Board Tools**
Checklist, severity guide, spec language, contractor questions, worksheet, calendar, decision tree, defect log

Three Actions to Take This Month

- Walk every balcony, covered walkway, and exposed parking deck in your community this month with a flashlight and a rubber mallet. If you hear hollow or drum-like sounds tapping a surface that should be solid, flag that location for engineering review. Early detection is everything.
- Pull your last structural engineer's report. Confirm every finding has a written status: funded, under contract, completed, or deferred with a documented reason. Any deferred item that involves water infiltration, exposed rebar, or spalling concrete should be escalated to your next board meeting.
- Confirm your Structural Integrity Reserve Study has accounted for concrete restoration components. If reserves for concrete are below 50% funded, put a reserve contribution increase on the agenda before the next budget cycle to avoid a larger special assessment later.

DISCLAIMER

This guide is a general educational resource. It does not constitute legal, engineering, financial, or professional advice. Cost ranges, repair specifications, and regulatory requirements are subject to change. Always consult a licensed Florida professional engineer for structural assessments specific to your property and a qualified attorney for legal obligations before taking action.

SECTION ONE

Why Concrete Fails in Central Florida

01

The chemistry of chloride infiltration, carbonation, and rebar corrosion, and why Florida's salt air and humidity accelerate every stage.

Concrete Is Not Waterproof

Most board members treat concrete as permanent. It is not. Concrete is porous, and in Florida's climate, that porosity works against the structure from the day it is placed. Understanding how deterioration starts helps a board recognize the early signs and act before the damage compounds.

Stage 1: Chloride Infiltration

Salt enters concrete in two ways: from direct water contact (rain, irrigation, pool splash, ocean spray) and from salt-laden humid air absorbed through the surface. Once inside the concrete matrix, chloride ions migrate toward the embedded reinforcing steel. Florida's coastal proximity, year-round humidity above 70%, and frequent rainfall make this migration faster than in nearly any other region of the country.

Stage 2: Carbonation

Fresh concrete has a high alkaline pH (around 12 to 13), which creates a passive protective film on the rebar surface. Over decades, carbon dioxide from the atmosphere reacts with the concrete and lowers that pH in a process called carbonation. When the carbonation front reaches the rebar depth, the passive film breaks down, and corrosion becomes possible even without chlorides.

Stage 3: Rebar Corrosion

Once chlorides reach the rebar (or once carbonation removes the passive film), the steel begins to corrode. Corrosion products, what we call rust, occupy 2 to 6 times the original volume of the steel bar. That expansion creates enormous internal pressure. The concrete, which has virtually no tensile strength, cracks from within.

Stage 4: The Spalling Cycle

Cracked concrete allows more water and chloride to reach the now-corroding rebar faster. The corrosion accelerates. More cracks form. The surface concrete delaminates and pops off in chunks. What began as an invisible chemical process inside the slab is now a visible structural hazard on the surface. By the time boards notice it, the damage has typically been progressing for years.

CENTRAL FLORIDA IS NOT IMMUNE

Many boards assume severe concrete deterioration is a coastal high-rise problem. Central Florida's interior communities are not immune. Salt from Orlando International Airport's nearby salt storage, irrigation with mineral-laden well water, pool splash, and the region's high humidity all drive chloride loading. Distance from the ocean reduces but does not eliminate the risk.

2 to 6x
Volume expansion of corroding rebar relative to original steel, creating the internal pressure that fractures concrete

30 to 40
Years at which many concrete structures in humid Florida environments begin showing active corrosion-driven deterioration

$9.1M → $16M
A Surfside condominium's 2018 engineering repair estimate, re-estimated at $16M by 2021 as conditions worsened. See Section 7

Why Deferral Multiplies Cost

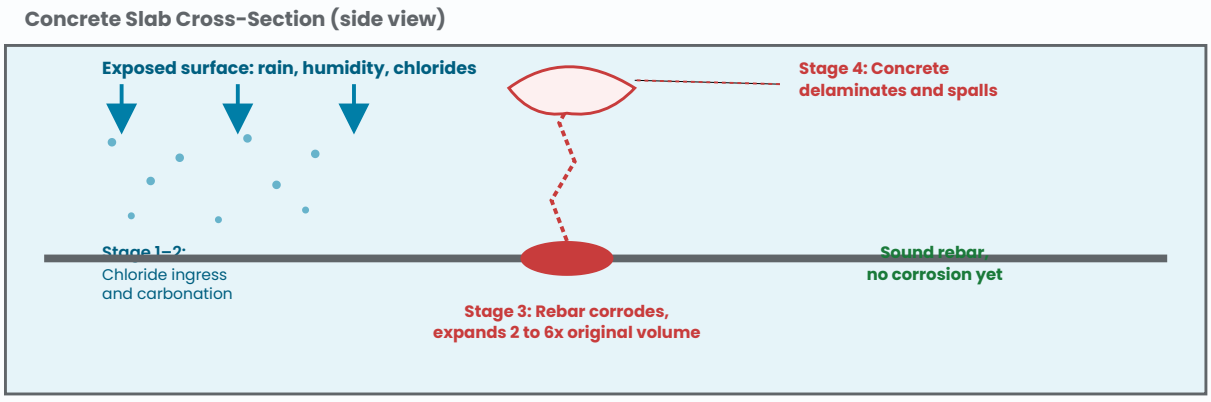
Concrete deterioration does not plateau. It accelerates. A surface crack that costs hundreds of dollars to route and seal can, within a few years without treatment, open to allow water infiltration, corrode an inch of rebar, and generate a repair costing tens of thousands of dollars per location. There is no single clean industry multiplier for how much deferral adds to a concrete repair bill; the honest answer is "it depends on how far the damage progresses before someone acts." But there is a documented, real-world before-and-after on a single building that shows the pattern at full scale: a 2018 engineering report on a Surfside, Florida condominium estimated $9.1 million in repairs, and by 2021, as conditions worsened, that estimate had grown to $16 million. Section 7 walks through that record in detail.

The Structural Integrity Reserve Study now required by Florida law for buildings of three or more habitable stories was designed specifically to break this cycle by requiring funded reserves for the concrete and waterproofing components most prone to this pattern. But the reserve study funds future replacement, not early intervention maintenance. That gap is where most special assessments are born: the board funds the big replacement but does not maintain the sealers and patches that would have delayed it by a decade.

What This Means for Your Board

A board that understands the spalling cycle can get ahead of it. The goal is not to wait for visible spalling and then repair it, but to identify the pre-spalling signs (surface cracking, rust staining, hollow sounds on tapping) and address them at the earliest, least expensive intervention stage. This guide gives you the vocabulary and tools to do exactly that.

The diagram below shows the four stages described on the previous pages in cross-section: how chloride moves through sound concrete, reaches the rebar, and how the resulting corrosion cracks and pops the concrete surface from the inside out.



Left to right: sound concrete progressing toward an active spall as chloride reaches the rebar and corrosion expands

Chloride ingress path | Reinforcing steel (rebar) | Active corrosion and cracking | Sound, uncorroded zone

Illustrative diagram, not an engineering drawing. Confirm site-specific conditions with a licensed Florida professional engineer.

1. Chloride ingress is **invisible** from the surface for years before any crack appears.
2. Corrosion products occupy **2 to 6 times** the volume of the original steel, which is what fractures the concrete.
3. By the time a spall is visible, the corrosion driving it has typically been active for **years**.

SECTION TWO

The Warning Signs Boards Miss

02

Five visible indicators of concrete deterioration that boards and CAMs can observe without engineering credentials, and what each one tells you about the stage of damage.

Most concrete problems are visible before they become structural; the challenge is knowing what you are looking at. These five indicators are the ones boards most often overlook until they escalate.

1. Hairline Cracks and Crack Patterns

Not all cracks are structural. Shrinkage cracks in a slab are common and usually harmless if sealed promptly. The cracks to flag are those that are **growing over time**, wider than 1/16 inch, running parallel to embedded rebar, or accompanied by rust staining. Parallel-to-rebar cracks are particularly telling: they often trace the path of a corroding bar below the surface.

2. Rust Staining

Brown or orange streaking on a concrete surface is one of the most reliable early indicators of active rebar corrosion. The rust is leaching out through cracks or pores. By the time rust staining is visible on the surface, the underlying rebar has been corroding for months or years. Do not treat rust staining as cosmetic. It is a structural signal.

3. Delamination and Hollow Sound

Concrete that has separated from the substrate behind it produces a hollow or drum-like sound when tapped with a rubber mallet. This is called delamination. It means the bond between layers has broken, usually because corrosion products have built up pressure underneath. Delaminated concrete is loose, and loose concrete over occupied spaces is a liability.

4. Efflorescence

White, powdery deposits form when water carries dissolved salts to the surface and they crystallize as it evaporates. Efflorescence is not structural damage itself, but it is a reliable sign that water is moving through the concrete, and in Florida that water is carrying chlorides with it. Treat it as a waterproofing signal.

5. Exposed or "Rebar Pop" Spalling

The most advanced visible stage: chunks of concrete have fallen away, revealing the reinforcing steel beneath. The steel is typically rusty and the bar may be visibly reduced in cross-section. At this point the structural capacity of that member is compromised. Exposed rebar requires immediate engineering review and prompt repair. It is not a deferred-maintenance item.

ONE WARNING SIGN BENEATH THE SURFACE

Post-tensioned slabs (common in Florida parking structures and some balconies built after the 1970s) can fail with little visible warning. A broken tendon can cause sudden, catastrophic loss of slab capacity. If your structure has post-tensioned elements and you are seeing any surface cracking or rust staining, engage a structural engineer before any saw-cutting or coring.



ESS crew performing balcony concrete restoration. Rust staining along the balcony soffit led to discovery of extensive rebar corrosion beneath the surface.



Surface preparation before patching. Concrete that sounds hollow on tapping must be removed to the sound substrate before any patch material is applied.

Red Flags That Require Immediate Engineering Review

- Exposed reinforcing steel on any balcony, walkway soffit, parking deck soffit, or column face
- Concrete chunks that have fallen or are visibly loose overhead in any occupied or trafficked area
- Active water leakage or dripping through a structural slab (not a surface drain) after rainfall
- Rust staining combined with crack widths greater than 1/8 inch on any structural member
- Any evidence of movement at construction joints, expansion joints, or bearing pads
- Sudden increase in crack widths observed over a period of weeks, not months

What This Means for Your Board

Create a simple log: one sheet per building element (each balcony tier, each walkway segment, each parking level). Record the date, the observer, and what was found at each quarterly walk. Comparing observations over time tells you whether conditions are stable or advancing. A photo with a date stamp next to a crack is worth more than a written description. This log becomes the basis for your next engineer's assessment and gives the engineer a deterioration timeline they would not otherwise have.

SECTION THREE

Where It Shows Up

03

The five concrete elements most vulnerable to spalling and deterioration on Central Florida community association properties, and why each one carries unique risk.

Element	Why It Is Vulnerable	What to Look For	Special Risk in Florida
Balcony Slabs	Exposed on three sides, poor drainage slope, tile or coating that traps moisture; often post-tensioned	Soffit rust staining, cracked or lifted tile, hollow sound, edge delamination	South and west faces take the most rain and UV; rapid wet-dry cycling
Walkways and Catwalks	Constant foot traffic, open breezeways, minimal concrete cover on older slabs	Lengthwise cracks, soffit rust streaks, edge spalling, hollow taps underneath	1970s and 1980s catwalks may have under one inch of cover over rebar
Parking Decks	Vehicle loads, waterproofing membrane failures, deteriorating expansion joints, tracked-in pool chemicals	Soffit rust staining, traffic-lane delamination, wet spots on the level below, failing joints	Membrane failure is the biggest driver; decks near pools are most at risk
Columns and Beams	Thinnest cover at corners; load-bearing, so section loss is structural, not cosmetic	Corner spalling, vertical rust staining, cracks tracing rebar, visible bar loss	Corner spalling spreads to full-face delamination faster than mid-face damage
Pool Decks	Constant chlorine splash, wet-dry cycling that drives chlorides deep, slope toward the building	Crazing, pop-outs, coping rust staining, joint failures, efflorescence	Chronic ponding plus chlorine splash is the fastest-loading combination on any horizontal slab

Approximate guidance for board-level observation. A licensed engineer must assess structural significance.

SECTION FOUR

Inspection and Assessment

04

From board-level visual observation to licensed engineering assessment: what each level tells you, when to escalate, and how this connects to Florida's milestone inspection requirements.

Three Levels of Concrete Assessment

Level 1 | Board and CAM Visual Observation (Non-Engineering)

Who does it: Board members, CAM, or property manager during routine property walks.

What it covers: Visual observation of surface conditions. Rust staining, visible cracking, efflorescence, exposed rebar, loose or fallen material, joint failure. Document with dated photos and a written log.

Limitations: Cannot assess below-surface conditions, rebar cross-section loss, or structural capacity. Cannot substitute for engineering assessment. Its value is in creating a deterioration timeline and triggering Level 2 review before conditions worsen.

Frequency: Quarterly walk of all exposed concrete elements. After any significant storm or seismic event.

Level 2 | Engineering Visual and Sounding Survey

Who does it: A licensed professional engineer or qualified inspector under engineering direction.

What it covers: Systematic chain-drag and hammer-sounding to map delaminated areas; visual crack mapping; rust staining pattern analysis; joint condition review; preliminary scope of repair estimate.

When to trigger it: Any red-flag condition identified in Level 1, any item from a prior engineer's report approaching the deferral period, or any pre-planned maintenance cycle every 3 to 5 years for structures over 20 years old.

Level 3 | Invasive Engineering Investigation

Who does it: Licensed professional engineer with materials testing laboratory support.

What it covers: Concrete cores for petrography and chloride profiling; carbonation depth testing; rebar cross-section measurement at exposed locations; half-cell potential mapping for active corrosion; post-tension tendon inspection if applicable. Required when Level 2 findings suggest significant structural compromise or when a Florida milestone inspection Phase 1 triggers a Phase 2 investigation.

FLORIDA MILESTONE INSPECTION CONNECTION

Florida FS 553.899 requires buildings of three or more habitable stories to undergo a Phase 1 milestone inspection at 30 years old (25 years if the local building official determines the building's environmental conditions, such as coastal proximity, warrant the earlier trigger; there is no fixed mileage line). If the Phase 1 engineer finds signs of substantial structural deterioration, a Phase 2 investigation (invasive, equivalent to Level 3 above) is triggered. Repairs must begin within 365 days of the Phase 2 report. Concrete spalling and rebar corrosion are the most common Phase 2 triggers. **This requirement applies to condominiums and cooperatives (Chapters 718/719); standalone-home HOAs under Chapter 720 are not subject to it** unless a specific building in the community is itself legally a condominium.

What This Means for Your Board

Most boards only ever commission Level 2 or Level 3 assessment reactively, after Level 1 observation flags a concern. Building a Level 2 survey into your maintenance cycle every 3 to 5 years on structures over 20 years old catches deterioration while it is still in the early intervention cost range described in Section 6, rather than waiting for a milestone inspection to force the issue.

SECTION FIVE

How Proper Repair Works

05

The ACI 546 standard for concrete repair: why shortcuts fail, what sound-substrate removal means, how rebar is treated, and the sealer and coating choices that determine durability.

ACI 546 is short for the American Concrete Institute's "Guide to Concrete Repair" (most recently published as ACI PRC-546-23), the industry standard that governs how a proper concrete repair is performed, from removal boundaries to rebar treatment to final coating. A contractor who cannot reference it by name when you ask about their repair methodology is worth scrutinizing carefully.

The Five Steps of a Code-Compliant Concrete Repair

STEP 1: REMOVE TO SOUND SUBSTRATE

All delaminated, cracked, and chloride-contaminated concrete is removed by jackhammer, chipping hammer, or hydrodemolition until only sound, intact concrete remains. This is the step most shortcuts skip. Patching over delaminated concrete traps moisture and accelerates further deterioration. A patch applied over unsound concrete will fail faster than the original concrete did.

STEP 2: REBAR CLEANING AND TREATMENT

Exposed rebar is mechanically cleaned (typically by wire brushing or abrasive blasting) to remove rust and restore a clean steel surface. The engineer determines whether the rebar has lost enough cross-section to require splicing or replacement. A rebar corrosion inhibitor primer is applied to slow future corrosion. On chloride-exposed structures, migratory corrosion inhibitors may also be applied to the surrounding concrete to reduce ongoing chloride activity.

STEP 3: PROFILE THE REPAIR AREA

The repair boundary is saw-cut to a clean, square edge. Feathered edges fail. The depth of removal must achieve the minimum bond area required by the repair mortar manufacturer, typically 3/4 inch minimum depth. The existing concrete surface is prepared to the engineer's specified surface profile.

STEP 4: APPLY REPAIR MORTAR OR CONCRETE

Repair mortar (Portland-cement-based, polymer-modified, or epoxy-based depending on the application) is mixed and placed per the manufacturer's and engineer's specification. The mix design matters: a mortar with excessive shrinkage will crack within months. Curing is critical in Florida's heat: premature drying causes surface crazing and bond failure.

STEP 5: SEAL AND COAT

A penetrating silane or siloxane sealer is applied to the repaired and surrounding concrete to reduce future water and chloride absorption. On horizontal surfaces (balcony slabs, parking decks, pool decks), a waterproofing membrane or traffic coating is the final layer. The coating is the primary defense against moisture re-entry and must be maintained on a regular cycle.



ESS crew placing repair mortar in a saw-cut, properly profiled repair boundary. Correct edge preparation is critical to long-term patch bond.



Drainage correction is often part of a concrete repair program. Water that pools at a foundation or deck edge will re-enter the slab regardless of how well the concrete patch is applied.

The Shortcuts That Cause Repairs to Fail

WHAT SHORTCUTS LOOK LIKE	WHY THEY FAIL (AND WHAT IT COSTS)
Patching over delaminated concrete without removing it	Patch debonds within 1 to 3 years; re-do cost equals the original repair
Feathered patch edges (no saw-cut boundary)	Feathered edge is first to crack; moisture re-enters, corrosion resumes
Skipping rebar cleaning and applying patch over rusted steel	Residual rust continues to expand; patch fails faster than original concrete
Using ready-mix concrete instead of an engineered repair mortar	Wrong shrinkage characteristics; new cracks appear at patch boundary
No sealer or topcoat applied after patching	Moisture re-enters at patch boundary within the first rain season
No engineer review of rebar cross-section loss	Structurally inadequate rebar left in place; liability exposure unresolved

POST-TENSION CAUTION

If your parking deck, pool deck, or elevated slab was built with post-tensioned tendons (common in Florida buildings constructed from the 1970s onward), no saw-cutting, coring, or concrete removal should occur without engineering approval of the saw-cut locations. A cut tendon is a catastrophic event. Require the contractor to have the post-tension drawings on site and the engineer of record to mark safe cut locations before any demolition begins.

SECTION 5 Choosing the Right Repair Method

ACI 546 covers the general repair sequence, but the specific method your engineer specifies depends on how deep the damage runs and how much of the structure is affected. These are the four methods most commonly specified on Central Florida community association concrete.

Method	When It Is Used	Relative Cost Tier	Limits
Partial-Depth Patch	Localized spalling or delamination that does not go through the full slab or member thickness; rebar exposed but not significantly section-lost	**Lowest**	Only sound as the substrate it bonds to. Will not address rebar loss beyond minor surface corrosion. Fails fast if removal boundary is not saw-cut and hollow areas are not fully removed.
Form-and-Pour (Full-Depth)	Damage extends through the full slab or member thickness, or affected area is too large for a hand-applied patch to hold reliably	**Moderate**	Requires formwork and often shoring during cure. Longer schedule and access requirements than a surface patch. Structural engineer must specify rebar splicing or replacement before pour.
Epoxy Injection	Structural cracks that are not actively corroding but need to be restored to structural continuity, typically on non-spalled but cracked members	**Moderate**	Does not address active corrosion or section loss. Wrong choice for a crack with rust staining or exposed rebar; the engineer must confirm the crack is dormant, not active, before specifying injection.
Cathodic Protection	Large-scale, chronic chloride contamination across an entire structural element where patch-by-patch repair would be endless (parking decks, pool decks with widespread contamination)	**Highest**	Specialized system design, installation, and monitoring; typically reserved for structures where full replacement is not economically or logistically feasible. Requires an engineer experienced in corrosion-control systems, not a general concrete contractor.

Method selection is always the engineer of record's determination based on the specific condition assessment. This table is for board-level orientation only, so you can follow the conversation and ask informed questions.

What This Means for Your Board

If a contractor proposes the same method (usually partial-depth patching, because it is the cheapest and fastest) for every condition on your property regardless of severity, ask why. A property with both Tier 1 surface cracking and Tier 3 exposed rebar (see Tool 2 in the Appendix) should not get one uniform repair approach. The method should follow the engineering assessment, not the other way around.

DO NOT PROCEED WITH REPAIR DESIGN WITHOUT A LICENSED FLORIDA PE IF ANY OF THESE APPLY

- Exposed reinforcing steel anywhere, or any rebar showing visible section loss
- The structure has post-tensioned tendons and any saw-cutting, coring, or demolition is planned
- Delamination or hollow sounding covers more than a small, isolated area of a structural member
- The repair is being specified in connection with a Florida milestone inspection (FS 553.899) Phase 2 report
- The repair is a Structural Integrity Reserve Study line item involving a load-bearing component
- Any crack shows evidence of ongoing movement, not just static width
- The repair involves a column, beam, or other primary structural member rather than non-structural flatwork
- Rebar cross-section loss appears to exceed roughly 20 percent at any location, based on visual assessment

Contractors, including ESS, can identify these conditions and recommend engineering review, but the repair design itself, including removal boundaries, rebar splice or replacement decisions, and repair mortar specification for structural members, must originate from the engineer of record, not the contractor.

Coatings and Sealers: What They Do and Do Not Do

PENETRATING SEALER (SILANE/SILOXANE)	TRAFFIC COATING / WATERPROOFING MEMBRANE
Reacts chemically within the concrete pores; does not form a surface film	Forms a continuous surface film or membrane; provides a visible, monitorable wear layer
Reduces water and chloride absorption; does not change surface appearance	Primary defense against water re-entry on parking decks, balconies, and pool decks
Will not trap existing moisture; safe on slabs with some residual moisture	Can trap moisture if applied over a slab with unresolved moisture issues; verify with engineer first
Reapplication interval: typically every 3 to 5 years on exposed horizontal surfaces	Reapplication interval: manufacturer-specified, commonly 8 to 12 years depending on traffic and UV exposure
Best fit: preventive maintenance on sound concrete, and as the final step after a structural repair	Best fit: horizontal trafficked surfaces needing both waterproofing and a wearable finish

Topical acrylic or urethane coatings that are marketed as "sealers" but form a surface film belong in the traffic-coating category above, not the penetrating-sealer category. Confirm which type is being proposed before approving a maintenance contract.

SECTION SIX

Cost and the Deferral Curve

06

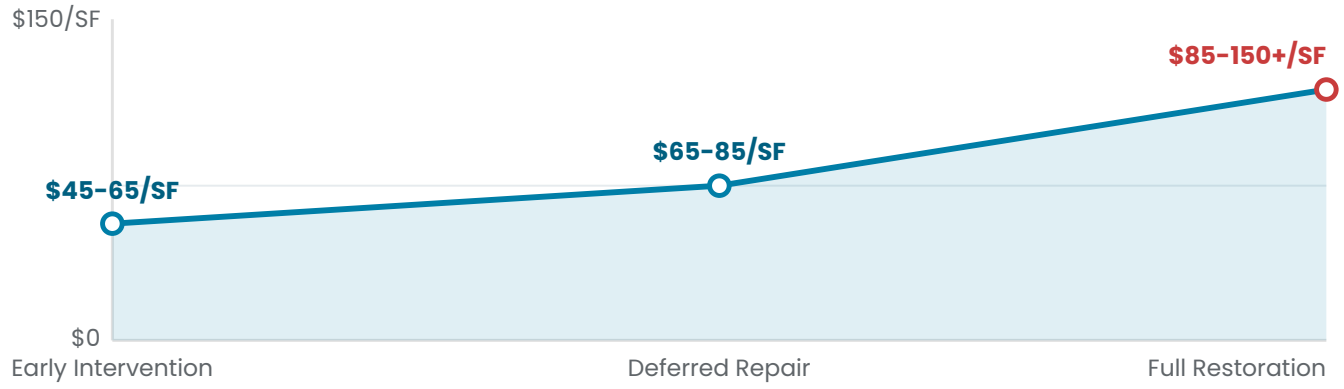
What concrete repair actually costs by intervention stage, what deferral multiplies those costs to, and real cost ranges by component type for Central Florida planning purposes.

The most important cost variable in concrete restoration is not which contractor you hire. It is when you act. The same square foot of deteriorated concrete costs dramatically less to repair at the surface-spalling stage than at the full structural restoration stage.

1. Early intervention runs roughly **$45 to 65/SF**; full structural restoration runs **$85 to 150/SF** or more.
2. Acting early can cut the per-square-foot cost by roughly **50 to 60 percent** on the same affected area.
3. Always carry a **15 to 20 percent** contingency; hidden damage is common once removal starts.

The Cost of Waiting: Repair Cost by Intervention Stage

Midpoint cost per square foot at each stage of deferral (Restoration Systems commercial concrete repair data, 2024).



Midpoints plotted for each stage; actual cost varies by access, material spec, and scope. Source: Restoration Systems commercial concrete repair cost data (2024).

WHAT THIS CHART SHOWS

Three intervention stages, three very different cost bands. Early intervention (surface patching, sealers, minor spalling before rebar is exposed) typically runs $45 to 65 per square foot. Deferred repair (moderate damage, rebar exposed and requiring treatment, wider removal areas) runs $65 to 85 per square foot. Full structural restoration (full-depth removal, rebar replacement or splicing, structural mortar, full recoat) typically runs $85 to 150 per square foot or more in complex or restricted-access locations. The chart midpoints are displayed; actual costs vary by access, material spec, and scope.

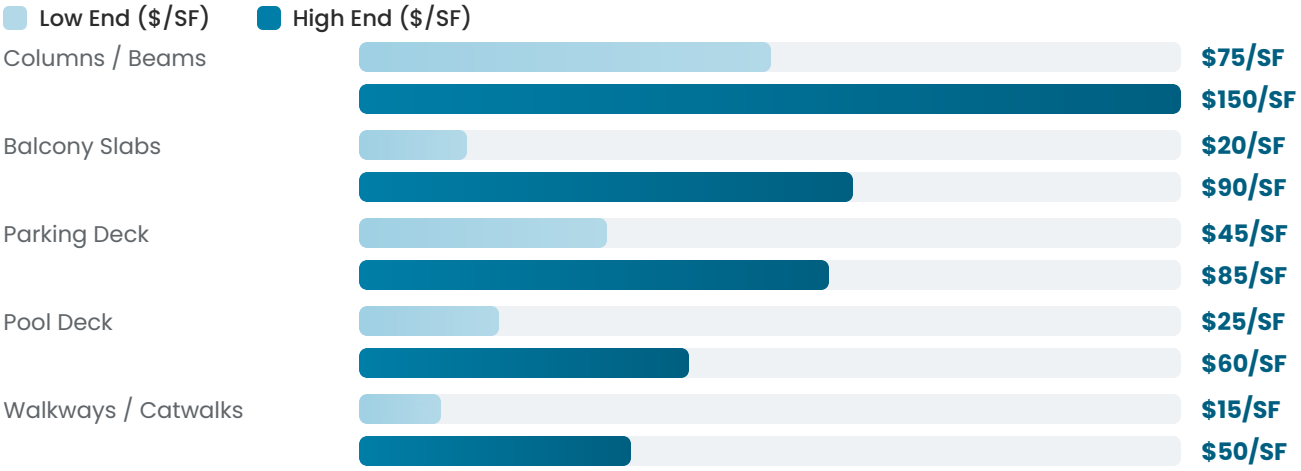
The takeaway: acting at the early intervention stage rather than waiting for full restoration can reduce the per-square-foot cost by roughly 50 to 60 percent on the same affected area. Source: Restoration Systems commercial concrete repair cost data (2024).

Typical Cost Ranges by Building Component

The following ranges represent typical concrete restoration costs per square foot for community association properties in Florida. They reflect material and labor costs at the time of research and are intended for planning and budgeting reference, not project-specific estimating. Actual costs depend on access, extent of rebar damage, material specifications, and site conditions.

Typical Restoration Cost Range by Building Component

Low end and high end, dollars per square foot.



Widths scaled to $150/SF maximum. Sources: Estimate Florida Consulting balcony repair data; Restoration Systems parking deck cost guide (2024); industry composite for columns, pool decks, and walkways.

WHAT THIS CHART SHOWS

Light bars show the low end of the typical range; dark teal shows the high end. Columns and beams carry the widest range because corner spalling and structural compromise can require formwork, shoring, and rebar replacement work that is significantly more complex than slab patching. Pool decks and walkways have the narrowest ranges because they are typically horizontal flatwork without load-path complexity. Balcony slabs span a wide range depending on the presence of post-tension systems, waterproofing membrane replacement, and tile restoration. Sources: Estimate Florida Consulting balcony repair data; Restoration Systems parking deck cost guide (2024); industry composite for columns, pool decks, and walkways.

Budget note: always carry a 15 to 20 percent contingency on concrete restoration budgets for hidden damage discovered during the removal phase. The surface rarely tells the full story.

What This Means for Your Board

When building your annual maintenance budget or updating your Structural Integrity Reserve Study, use the high end of the applicable range for reserve funding purposes. Reserves funded at the low end of the range leave the association exposed to a shortfall if actual conditions are more severe than surface appearance suggests. Use specific proposals from licensed contractors for procurement, not the ranges above.

SECTION SEVEN

A Case Story: When Deferral Has a Dollar Amount

07

A Central Florida condominium's own Structural Integrity Reserve Study revealed an $8.5 million repair project and a funding gap the reserve fund could not absorb.

CASE STORY | ORLANDO, FLORIDA | DOCUMENTED PUBLIC RECORD

Regency Gardens: An $8.5 Million Repair Project the Reserve Study Uncovered

Regency Gardens is a 386-unit condominium community in Orlando. When the association completed the Structural Integrity Reserve Study now required under Florida law, the study identified an $8.5 million repair project and a reserve funding shortfall of more than $17 million against the concrete, waterproofing, and structural components the study covers.

The board's response was a special assessment ranging from $11,148 to $22,105 per owner depending on unit size, on top of a monthly dues increase of roughly $900. Residents pushed back. A recall petition against the board gathered 235 signatures.

Regency Gardens did not have a Surfside-scale structural failure. What it had was decades of a reserve fund that did not keep pace with the true cost of concrete and structural maintenance, a gap the new SIRS requirement was written to surface before it becomes a catastrophic risk rather than after. The bill still landed on unit owners, all at once, the same year the reserve study was completed.

Sources: FOX35 Orlando (2024); WFTV (2024); ClickOrlando (May 3, 2024).

Regency Gardens shows what an underfunded reserve costs a board that acted on the SIRS finding. The most-documented example of what happens when a known repair is deferred entirely comes from a different Florida property: Champlain Towers South in Surfside.

Champlain Towers South: The Same Repair, Re-Estimated

One documented building, one repair scope, three years apart.



Heights scaled to $16M maximum. Source: NBC Miami; NBC News reporting on the Morabito Consultants engineering report for Champlain Towers South, Surfside.

WHAT THIS CHART SHOWS

In October 2018, a structural engineer's report on the Champlain Towers South condominium in Surfside estimated the cost of full remediation, centered on a chronically water-ponding pool deck slab, at approximately $9.1 million. By 2021, as the documented conditions continued to worsen without the repair being made, that estimate had grown to $16 million. This is not a modeled projection: the same property, the same repair scope, re-estimated three years apart as the underlying corrosion continued to progress. On June 24, 2021, before the repair work had commenced, the building partially collapsed, killing 98 people. NIST's investigation identified the pool deck as the most likely collapse origin point.

The takeaway: a documented before-and-after on a single building, not a hypothetical curve. Chloride-driven corrosion left unaddressed while conditions advance is the same mechanism operating, in varying degrees, on aging concrete structures throughout Florida, Surfside included but not Surfside alone.

"An $8.5 million repair project surfaced by a reserve study, and a $9.1 million estimate that grew to $16 million while it waited. Two different Florida properties, one lesson: the bill does not shrink while you wait."

What This Means for Your Board

Neither case story is cited here as a worst-case scare tactic. Regency Gardens shows the outcome of an underfunded reserve once the SIRS surfaces the true number. Surfside shows what happens when a known, documented repair need is deferred without funding at all. The mechanism is the same whether the number is $8.5 million, $9.1 million, or $90,000: concrete that is not repaired at the early intervention stage costs more at the next stage, and the next. The question for your board is not whether to repair, but when.

1. Regency Gardens: **$8.5M** repair project surfaced by its SIRS, plus a **$17M+** reserve funding gap.
2. Surfside: a **$9.1M** estimate grew to **$16M** in three years of deferral.
3. Both bills landed on unit owners **all at once**, the outcome a funded reserve and early action are built to prevent.

SECTION EIGHT

A Preventive Program

08

The four maintenance practices that extend concrete service life and reduce the frequency and cost of restoration: sealing, drainage, joint maintenance, and annual observation.

1. Penetrating Concrete Sealers

A penetrating silane or siloxane sealer applied to all exposed horizontal concrete surfaces is the most cost-effective concrete maintenance investment available to a community association. Penetrating sealers do not form a surface film; they react chemically within the concrete pores and reduce water and chloride absorption by 60 to 90 percent. They do not change the appearance of the concrete and do not trap moisture already in the slab.

Application frequency: Every 3 to 5 years on horizontal exposed surfaces. More frequently on pool decks and walkways with heavy foot traffic.

What to watch out for: Topical acrylic or urethane coatings look like sealers but can trap moisture and accelerate delamination on slabs with residual moisture. Have the product selection reviewed by your engineer if there is any question about existing moisture levels.

2. Drainage Correction

Water that ponds on a concrete surface, even briefly after rain, is continuously driving chlorides into the slab. Slope corrections, drain clearing, and scupper maintenance are not cosmetic work. They are structural maintenance. Ponded water at a balcony edge or pool deck corner is accelerating the corrosion of the rebar beneath it every hour it sits there.

3. Expansion and Control Joint Maintenance

Concrete joints exist to allow movement without cracking. When the sealant in those joints fails (shrinks, cracks, debonds, or is mechanically damaged), they become water entry points that are wider than any surface crack. Joint re-sealing is a low-cost maintenance item that significantly reduces water infiltration at the boundaries where it is most likely to occur.

Frequency: Inspect all joints during each quarterly walk. Re-seal any joint showing visible sealant failure. Budget for a full joint re-seal program every 7 to 10 years on aging structures.

4. Pressure Washing Considerations

Pressure washing removes biological growth and surface deposits but can also dislodge aged sealers and open surface pores if done at excessive pressure. After pressure washing, allow the concrete to dry completely before sealer re-application. Pressure washing that leaves bare, unsealed concrete through a Florida rainy season defeats the purpose.

THE LOWEST-COST INTERVENTION OF ALL

A properly sloped, drained, sealed, and joint-maintained concrete surface costs a fraction of a cent per square foot per year to protect. The same square foot, deteriorated to full structural restoration, costs $85 to 150 or more to repair. Preventive maintenance is not a nice-to-have budget item. It is the line item that prevents the special assessment.

SECTION NINE

How ESS Fits and What to Do Next

09

Element Service Solutions self-performs concrete restoration, waterproofing, and structural repair for Central Florida community associations. Here is how we work.

What ESS Self-Performs

- Concrete demolition and removal to sound substrate
- Rebar cleaning, treatment, and replacement or splicing
- Structural repair mortar placement and finishing
- Penetrating sealer and traffic coating application
- Expansion joint re-sealing and drainage slope correction

ESS self-performs nearly all structural trades in house: the people who scope and estimate your job are the same people doing the work, with no unvetted concrete subcontractors.

Who We Serve

Condominium associations, HOA communities, and management companies across Central Florida: Orlando, Sanford, and the Seminole, Orange, Lake, and Volusia County communities in between.

How the Complimentary On-Site Inspection Works

We visit your property and walk the concrete elements you have identified as concerns. We provide a written observation summary of visible conditions and a specific proposal with a real number for any repair scope we recommend. There is no obligation and no pressure.

The inspection is complimentary because a board that understands what it has makes better decisions for its community, whether we end up doing the work or not. Have any existing engineering reports, your observation log, reserve-study line items, and condition photos ready if you have them.

Schedule Your Complimentary On-Site Inspection

We walk your property, review the concrete conditions, and give you a specific proposal with a real number for any scope we identify. No generic quotes, no pressure, no obligation.



Gavin Sederopoulos
Vice President of Sales
FL Certified General Contractor CGC1533292
Office (407) 744-9122 | elementbiz.com
Element Service Solutions | Central Florida

APPENDIX

Eight Board Tools

Ready-to-use tools for Central Florida CAMs and board members: a concrete condition checklist, a spalling severity guide, sample repair spec language, contractor questions, a reserve cost worksheet, a preventive maintenance calendar, a repair-vs-replace decision tree, and a defect tracking log.

A

These tools are designed to be printed and used. They are not a substitute for engineering assessment or legal counsel; they are structured starting points that help your board ask better questions and keep better records.

Tool	Name	Use When
Tool 1	Concrete Condition Self-Assessment Checklist	Quarterly property walks by board or CAM. Documents visible conditions element by element.
Tool 2	Spalling Severity Guide	Classifying observed damage into severity tiers to help prioritize engineering review and repair urgency.
Tool 3	Sample Repair Scope and Specification Language (ACI 546)	Reviewing or writing a contractor scope of work. Provides ACI-referenced language with fill-in brackets for your specific conditions.
Tool 4	Contractor Questions Checklist	Evaluating concrete restoration bids. Eight questions to ask every bidder before you award.
Tool 5	Reserve and Cost Impact Worksheet	Estimating the reserve funding impact of a deferred concrete item. Includes a worked example and blank rows for your property.
Tool 6	Preventive Maintenance Calendar	Building your annual concrete maintenance schedule. Monthly and quarterly action items by element type.
Tool 7	Repair-vs-Replace Decision Tree	Working through whether an element is a patch-repair candidate or has crossed into replacement territory.
Tool 8	Defect Log and Tracking Sheet	Recording every flagged condition by location, date, severity tier, photo reference, and status through to resolution.

CAVEAT ON ALL APPENDIX TOOLS

These tools support board-level observation and planning. They are not engineering assessments, legal advice, or substitute for a licensed professional engineer's evaluation of your specific property. Any structural observation that raises concern should be referred to a licensed Florida PE before action is taken or deferred. Cost figures in the worksheet are planning references only; obtain specific proposals from licensed contractors for project budgeting.

Tool 1 | Concrete Condition Self-Assessment Checklist

How to use this: Walk each concrete element quarterly. Check each item observed. Add dates and photo references. Any checked item in Section B triggers engineering review before the next board meeting.

Property: _____ **Element inspected:** _____ **Date:** _____ **Inspector:** _____

Section A: Surface Conditions (Observation, Document and Monitor)

- ☐ Hairline cracks (less than 1/16 inch wide) with no rust staining
- ☐ Efflorescence (white powdery deposits) on surface or at joints
- ☐ Joint sealant cracked, shrunk, or missing at any location
- ☐ Water ponding on any horizontal surface after rain (note location)
- ☐ Surface crazing or minor pop-outs with no rust staining
- ☐ Staining or discoloration of unknown origin

Section B: Elevated Concern (Engineering Review Triggered)

- ☐ Cracks wider than 1/16 inch OR cracks running parallel to rebar direction
- ☐ Any rust staining on surface, soffit, or vertical face
- ☐ Hollow or drum-like sound on tapping any surface that should be solid
- ☐ Concrete chunk or piece that has fallen or is visibly loose
- ☐ Visible reinforcing steel (rebar) anywhere on surface or soffit
- ☐ Active water dripping through slab (not through a drain) after rain
- ☐ Any crack that has measurably widened since the prior quarterly inspection
- ☐ Any condition on a post-tensioned structure that has changed since last inspection

Section B items found: _____ **Locations noted:**

_____

Photos taken (reference numbers): _____

Engineering review triggered: Yes / No **Engineer notified:**

_____

> This checklist documents visible surface observations only. It does not assess structural capacity, rebar cross-section, or below-surface conditions. Any Section B finding should be referred to a licensed Florida professional engineer before board action or deferral. Retain completed checklists as part of your association's maintenance records.

Tool 2 | Spalling Severity Guide

How to use this: Classify each observed spalling location into a severity tier to help prioritize engineering review and budget discussion. This is a communication tool, not a structural assessment.

Tier	What You See	Typical Implication	Suggested Response
Tier 1 (Monitor)	Surface crazing, hairline cracks, mild efflorescence, no rust staining	Early-stage moisture infiltration; no active corrosion confirmed	Document, apply sealer at next maintenance cycle, re-inspect quarterly
Tier 2 (Schedule)	Rust staining, cracks wider than 1/16 inch, hollow sound on tapping, joint failure	Active corrosion likely below surface; patch and seal at the early intervention cost tier	Engineering assessment within 60 days, repair within 6 months
Tier 3 (Urgent)	Visible delamination, fallen or loose concrete, exposed rebar, active water through slab	Structural integrity compromised at that location; liability and safety risk	Engineering review within 14 days; area access restriction if overhead; repair commenced within 30 days of engineering approval

Tier classification is a board-level communication tool. Only a licensed engineer can assess structural adequacy. Tier 3 conditions require engineering review before any deferral decision is made.

Tool 3 | Sample Repair Scope Language (ACI 546)

How to use this: Review or compare against contractor scope language. Bracketed items are fill-ins for your specific project. Have your engineer of record review before use in a contract.

"Contractor shall remove all delaminated, cracked, and deteriorated concrete at [identified locations] by [pneumatic chipping / hydrodemolition] to a minimum depth of [3/4 inch] and to sound substrate as determined by hammer sounding per ACI PRC-546-23. All saw-cuts at repair boundaries shall be perpendicular to the concrete surface at a minimum depth of [3/4 inch]. Reinforcing steel exposed during removal shall be cleaned to a [SSPC-SP 2 / SSPC-SP 6] surface profile and treated with [approved corrosion inhibitor primer per manufacturer]. Where rebar cross-section loss exceeds [20%], the engineer of record shall determine whether splicing or replacement is required prior to mortar placement. Repair mortar shall be [polymer-modified Portland-cement mortar / approved equal] meeting [ASTM C928] with a maximum shrinkage of [0.04%] at 28 days. After curing, a penetrating [silane / siloxane] sealer shall be applied to all repaired and surrounding concrete surfaces at a rate specified by the manufacturer. [Traffic coating / waterproofing membrane] shall be applied to horizontal surfaces per [manufacturer specification]."

This is illustrative language only. All scope and specification language must be written or reviewed by the licensed engineer of record for your specific project. Do not use this language as a substitute for engineered specifications.

Tool 4 | Contractor Questions Checklist for Concrete Restoration

How to use this: Ask each of these eight questions to every bidder before awarding a concrete restoration contract. A contractor unwilling or unable to answer these questions is telling you something important about how they work.

Licensing and Credentials

- ☐ **What is your Florida contractor license type and number?** Verify it is Current, Active, and Certified at myfloridalicense.com before the board vote. For multi-story or structural concrete work, it should be a Certified General Contractor (CGC).
- ☐ **Do you carry workers' compensation coverage for all employees on this project?** Request the certificate of insurance directly from the insurer and confirm your association is named as additional insured on the general liability policy.

Repair Method

- ☐ **Are you familiar with ACI PRC-546-23 (Guide to Concrete Repair)?** A contractor performing structural concrete restoration should reference this standard without hesitation. If they cannot, ask how they determine removal boundaries and rebar treatment requirements.
- ☐ **How do you determine the removal boundary?** The correct answer: hammer sounding to identify all delaminated areas plus a saw-cut boundary. Patching over delaminated concrete is a shortcut that will fail.
- ☐ **What is your rebar treatment protocol?** They should describe mechanical cleaning (wire brushing or abrasive blasting) and application of a corrosion-inhibitor primer. Ask what happens if rebar cross-section loss is significant.
- ☐ **What repair mortar do you specify and why?** They should name a specific product with an ASTM designation and be able to explain why it is appropriate for the exposure conditions at your property.

Experience and References

- ☐ **Can you provide three references from similar concrete restoration projects on community association properties in the past two years?** References should be comparable in scope (structural concrete, rebar treatment), building type (condo or HOA), and project value. Call them before ranking bidders.
- ☐ **Is your scope of work detailed with quantities and unit costs?** Any contractor unwilling to provide a detailed scope on a structural restoration project should be treated as a material red flag. You cannot compare bids or manage change orders without a line-item breakdown.

> Do not accept verbal answers to these questions at a pre-bid walk. Request written responses as part of the bid submission. Retain all responses in the bid file for board review before award.

Tool 5 | Reserve and Cost Impact Worksheet

How to use this: Estimate the reserve funding gap and potential special assessment impact for a concrete restoration item. The worked example uses planning-reference cost figures. Replace with your specific contractor proposals for actual budget use.

Worked Example (Planning Reference Only)

Total concrete restoration scope (estimated SF)	**4,500 SF**	*From engineer's survey or board observation log*
Repair cost per SF (early intervention stage)	**$55 / SF**	*Midpoint of $45 to $65 early-stage range*
Estimated repair cost (early intervention)	**$247,500**	*SF x $/SF*
Contingency (15%)	**$37,125**	*For hidden damage found during removal*
Total early-intervention project estimate	**$284,625**	
Same scope if deferred to full restoration stage ($115 / SF)	**$517,500**	*Plus contingency: $594,750*
Reserve fund balance designated for concrete	**$85,000**	*From your SIRS or reserve study*
Funding gap (early intervention)	**$199,625**	*Total estimate minus reserve balance*
Number of units	**120**	
Special assessment per unit if acted now	**$1,664**	*vs. $4,248 per unit if deferred to full restoration*

Your Property Worksheet

Total concrete scope (SF)	_____	*Engineer survey or board observation*
Repair cost per SF (stage)	_____	*See Section 6 ranges*
Estimated repair cost	_____	*SF x $/SF*
Contingency (15%)	_____	
Total project estimate	_____	
Reserve balance designated for concrete	_____	*From SIRS*
Funding gap	_____	
Per-unit assessment estimate	_____	*Gap divided by number of units*

All figures in the worked example use planning-reference cost data and are illustrative only. Obtain specific proposals from licensed contractors for actual budget decisions. Reserve fund balances and funding gaps should be confirmed with your reserve specialist.

Tool 6 | Preventive Concrete Maintenance Calendar

How to use this: Build this into your annual operations calendar. Monthly and quarterly items require a person assigned and a completion date. Annual items require a budget line. Attach completed checklists (Tool 1) to each quarterly inspection entry.

Monthly (Year-Round)

- [ ] Clear all drains, scuppers, and downspouts of debris. Confirm water does not pond anywhere on a horizontal concrete surface after a rain event.
- [ ] Walk pool deck perimeter after each pressure-wash cycle. Confirm sealer has not been stripped. Document any new cracking, pop-outs, or joint failures.

Quarterly (January, April, July, October)

- [ ] Complete Tool 1 Concrete Condition Checklist for all balconies (each tier), all covered walkways and catwalks, parking deck surface and soffit, all exposed columns and beam faces, and pool deck surround.
- [ ] Tap all soffit and underside areas with rubber mallet. Document any hollow sounds by location and photo.
- [ ] Inspect all expansion and control joints. Flag any sealant that is cracked, pulled away, or missing for repair scheduling.
- [ ] Review prior quarter's checklist and confirm whether any flagged conditions have advanced. Advancing conditions in Section B require engineering contact within 30 days.

Annual

- [ ] Re-apply penetrating silane or siloxane sealer to all horizontal exposed concrete per manufacturer's recommended interval (typically every 3 to 5 years; annual application may be warranted in heavy-exposure areas such as pool decks).
- [ ] Re-seal all failed expansion and control joints as part of a single-mobilization joint program.
- [ ] Review concrete reserve line items in your budget against current cost ranges and any new engineering findings. Adjust contributions if needed to maintain funded status.
- [ ] Compile the year's Tool 1 checklists and photo log for engineering review if any Section B conditions were noted during the year. Provide the full log to your engineer of record.

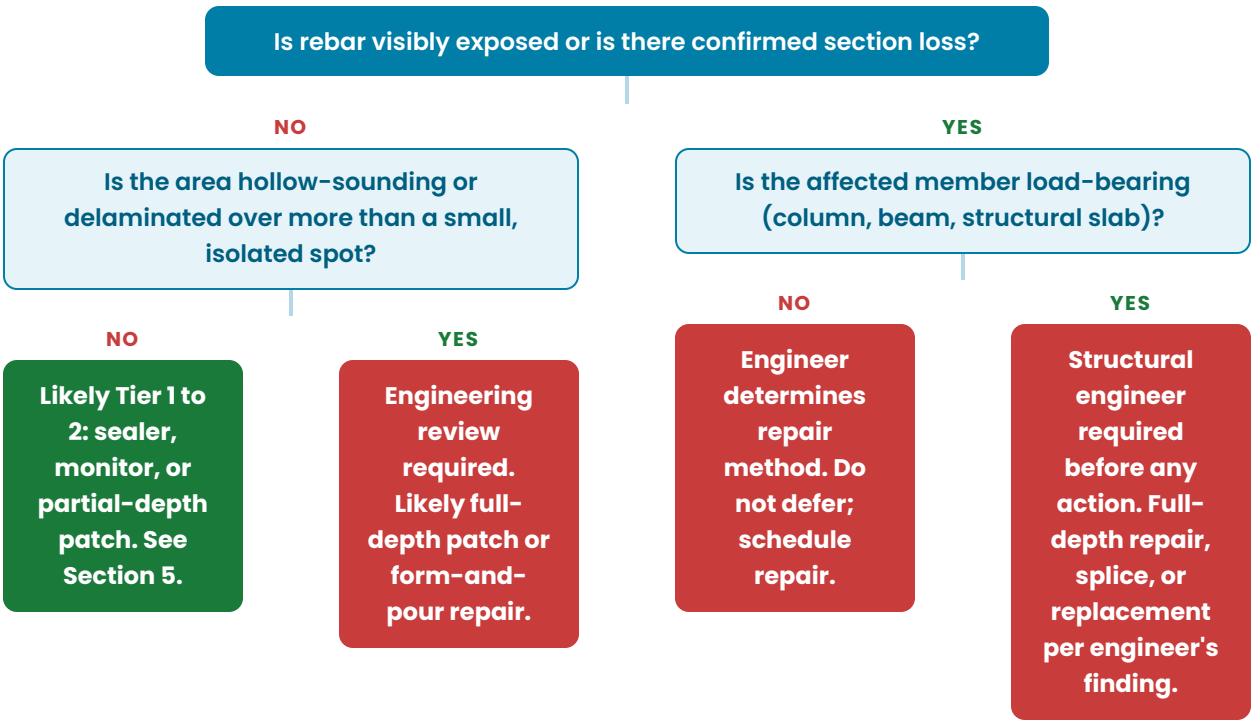
Every 3 to 5 Years

- [ ] Commission a Level 2 engineering sounding survey of all elevated concrete elements. Use the results to update your reserve study and repair priority list.
- [ ] Conduct full traffic coating or waterproofing membrane inspection on all parking deck and balcony surfaces. Replace membrane where waterproofing integrity cannot be confirmed.

> A maintenance calendar is only as effective as its follow-through. Assign each item to a named person with a deadline. The most common preventive maintenance failure is not ignorance of what to do, but lack of accountability for doing it.

Tool 7 | Repair-vs-Replace Decision Tree

How to use this: Walk through this tree for any flagged concrete element to frame the conversation with your engineer. This is a board-level orientation tool, not an engineering determination; the engineer of record makes the final call.



"Replace" in this context nearly always means replacing the affected concrete element or section, not the entire building system. Full replacement of a slab, deck, or major structural component is rare and is always an engineer's determination based on the extent of contamination and the cost-effectiveness of repair versus reconstruction. This tree is a conversation-starter, not a substitute for the engineering assessment described in Section 4.

Tool 8 | Defect Log and Tracking Sheet

How to use this: Log every condition flagged during a Tool 1 checklist walk here, one row per defect. Update the Status column as each item moves through engineering review and repair. This log is what turns scattered observations into a record your engineer and your board can both act on.

Location	Date Found	Tier	Photo Ref.	Status	Engineer Notified	Repair Completed
Bldg 3, Balcony 3B, soffit	2/14	2	IMG_0142	Engineering scheduled	Yes, 2/16	
Pool deck, NE corner	3/02	3	IMG_0201	Repair in progress	Yes, 3/03	

Tier column references Tool 2's Spalling Severity Guide (1 = Monitor, 2 = Schedule, 3 = Urgent). The two filled rows above are a worked example; the blank rows are for your property.

> A defect stays on this log from the day it is first observed until the repair is completed and verified, not until the engineer is notified. Board turnover is the most common reason a flagged condition gets lost; a maintained log survives a board transition even when institutional memory does not.

RELATED GUIDES IN THIS SERIES

For the milestone inspection and Structural Integrity Reserve Study requirements that often surface the concrete deterioration this guide covers, see **Milestone Inspection & SIRS: What the Engineer's Report Really Means**. For the water intrusion and building-envelope failures that frequently accompany concrete deterioration, see **Waterproofing and Building Envelope**. For vetting the contractor who will perform the repair, see **Contractor Vetting**.

Every job below was self-performed by ESS crews. The same people who give you the estimate and write the scope are the ones on your property doing the work.



Concrete forming and placement self-performed by ESS crews. No unvetted concrete subcontractors on our jobs.



Concrete flatwork, edging, and walkway repair: ESS in-house on Central Florida HOA and condo properties.



Balcony concrete restoration and stocco work. Rust staining on the soffit was the entry point; full rebar treatment and re-coat followed.



Drainage correction is part of the concrete solution. Water that cannot leave a slab will re-enter it regardless of how well the patch is placed.

SERVICE AREA

Element Service Solutions serves community associations throughout Central Florida, including Orlando, Sanford, and the Seminole, Orange, Lake, and Volusia County communities in between. Our crews are local, our license is Florida-issued, and our focus stays on the associations we can reach, inspect in person, and stand behind with our own people.

ELEMENT SERVICE SOLUTIONS

Florida Certified General Contractor CGC1533292 • elementbiz.com • (407) 744-9122

Disclaimer

This guide is a general educational resource for Florida community association boards and community association managers. It does not constitute legal, engineering, financial, or professional advice. Florida building codes, milestone inspection requirements, reserve study obligations, and related statutes are subject to legislative change. Cost ranges and repair specifications in this guide are planning references only and should not be relied upon as project-specific estimates or engineering determinations. Always consult a licensed Florida professional engineer for structural assessments and a qualified attorney for legal obligations specific to your association before taking or deferring action on any concrete repair item. Element Service Solutions makes no warranty regarding the accuracy or completeness of information provided herein.

Key Sources

Regency Gardens (Orlando): FOX35 Orlando (2024); WFTV (2024); ClickOrlando (May 3, 2024): 386-unit Orlando condominium, SIRS-driven $8.5 million repair project, reserve funding gap, per-owner special assessment of $11,148 to $22,105, and a resident recall petition.

Champlain Towers South / Surfside: WLRN (June 27, 2021) citing structural engineer Frank Morabito's October 2018 report estimating $9.1 million in repairs. NBC Miami and NBC News reporting on the 2021 re-estimate of $16 million as conditions worsened. NIST preliminary findings (2024) identifying the pool deck as the likely collapse origin point. 98 fatalities per NIST and all cited sources.

ACI 546: American Concrete Institute, ACI PRC-546-23, "Concrete Repair, Guide Reported by ACI Committee 546" (December 2023, supersedes ACI 546R-14). ACI PRC-546-23 Preview, concrete.org.

Concrete Repair Cost Data: Restoration Systems, "Parking Garage Repair vs Replace: ROI Analysis and Cost Guide" (restorationsystems.net, 2024): minor repairs $45 to 65/SF, partial-depth $65 to 85/SF, full-depth $85 to 150/SF. Estimate Florida Consulting, "What is the cost of concrete balcony repair?" and "Restoration Cost for Concrete Structures" (estimatorflorida.com): balcony range $20 to 90/SF. Industry-composite ranges for columns, pool decks, and walkways reflect published contractor and estimating service data.

Rebar Corrosion Volume Expansion: ScienceDirect, "Corrosion of steel rebar in concrete induced by chloride ions under natural environments" (2023). Corrosion products occupy 2 to 6.5 times the volume of the original steel bar.

Florida Milestone Inspection: Florida Statutes Section 553.899 (applies to condominiums and cooperatives, Chapters 718/719; the 25-year coastal trigger is a local building official's discretionary determination, not a fixed mileage line). Florida Statutes Section 718.112(2)(g) on Structural Integrity Reserve Studies.

Post-Tension Caution: ACI PRC-546-23 Section on post-tensioned concrete repair; PTI (Post-Tensioning Institute) field guidance on safe saw-cut locations.

© 2026 Element Service Solutions. All rights reserved. This guide may be shared with association boards and community association managers for educational purposes only. Reproduction for commercial purposes or redistribution without written permission is prohibited.