Commercial flooring projects live or die on the subfloor, even when the visible surface looks flawless on day one. In the field, I have seen “pretty good” concrete turn into hollow-sounding tile, and I have watched luxury vinyl planks telegraph every minor ridge because the floor was cleaned, but not actually prepared. The difference is rarely the product. It is almost always the substrate: moisture, flatness, soundness, and compatibility with the chosen floor system.

Subfloor preparation is not one task. It is a sequence of decisions. Some steps are universal, like inspection and cleaning. Others depend on the structure, the flooring type, and the tolerance level the manufacturer expects. When you treat preparation like a checklist instead of a set of engineering problems, you end up paying twice.

Below is a practical, step-by-step overview for commercial settings, with the judgment calls that keep projects moving and keep installed flooring from failing early.

Start with a real site assessment, not a quick walk-through

Before anyone mixes a compound or orders grinding equipment, take time to understand what you are working with. In commercial buildings, “the subfloor” might mean a slab, a wood deck, a metal joist system, sleepers over concrete, or a patchwork of repairs from previous tenants.

A proper assessment includes these basics, done in the open air of the jobsite:

- Identify the subfloor type and the flooring system. Tile has different tolerance and bond requirements than resilient flooring. Epoxy patches behave differently than cementitious patch.
- Look for ongoing moisture sources. HVAC leaks, exterior wall seepage, plumbing penetrations, and roof drainage show up as damp edges, efflorescence, or repeated patch failures.
- Evaluate flatness and level, not just “it seems smooth.” Flatness is what the flooring feels. Level is where the building looks straight. Many failures are caused by localized ridges, dips, and transitions you cannot see until the new flooring is down.
- Check soundness and surface condition. Old coatings, paint, curing compounds, residual adhesive, and laitance all interfere with bonding or leveling compound performance.

On a recent tenant build-out, we spent an extra hour measuring high spots and low spots instead of starting right away. It delayed production by a small amount, but it prevented a compound overbuild that would have required more labor later to correct. The subfloor will always win if you ignore it.

Gather manufacturer requirements early, then match the plan

Commercial projects often run on tight schedules, and it is tempting to assume the same preparation method for every job. Resist that urge. Manufacturers specify performance expectations, including subfloor flatness tolerance, moisture limits, and adhesive or patch compatibility.

In practice, you want answers to a few core questions before you decide on grinding, patching, or leveling:

- What flatness tolerance is required for the flooring type and installation method?
- What moisture testing method is required, and what are the allowable results?
- Does the manufacturer require a primer over certain patch products?
- If the installation uses adhesives, are you required to use a specific adhesive or to avoid certain substrates?

If you do not have these requirements in hand, you will end up reworking surfaces after the fact. That is expensive because preparation is labor-intensive, and because corrections often require re-mobilizing equipment, protecting the area, and reconditioning the floor environment.

Control the jobsite environment before you test or patch

Moisture behavior is influenced by temperature and relative humidity. Even where the slab is not actively leaking, seasonal swings and HVAC cycles can change test results. For commercial interiors, you also have construction traffic, open doors, and variable air conditioning that can skew the readings you take.

A sensible approach is to stabilize conditions to the extent your project allows:

- Bring the building to the intended operating temperature range before moisture testing, when possible.
- Use dehumidification or temporary HVAC in problem areas rather than chasing random readings.
- Avoid testing immediately after wet cleaning or after a large concrete area has been exposed to rain or condensation.

This is one of those steps people skip because it feels bureaucratic. It is not. It directly affects whether your moisture readings reflect the “normal” state under which the floor will live.

Inspect and map the surface: high spots, low spots, and bonds

A subfloor can fail for three different reasons: it is too rough to bond, too uneven to perform, or too compromised to support the floor system.

To map the floor realistically, plan for measurement tools that fit the scale of the job. A long straightedge reveals obvious high spots and dips, while a more robust flatness measurement tool helps for larger commercial areas. The goal is not perfection at all costs. The goal is to meet the flooring system tolerance without wasting material.

Surface mapping also helps you avoid unnecessary grinding. Grinding every inch is rarely the most economical plan. Often, you can spot-treat high ridges, then use a patch or skim coat only where needed.

While mapping, look for:

- Existing floor coatings, paints, or densifiers that can prevent adhesion.
- Spalls, crumbling edges, and delamination patches from prior repairs.
- Cracks that are active versus those that are stable. Some cracks are cosmetic. Others move under load.

If you find a repeating pattern of failed patches, do not just patch again. Find out why the failures happened. Sometimes the issue is moisture migration. Sometimes it is poor prep around edges. Sometimes the prior patch product was not compatible with the current installation.

Moisture testing: treat it as a decision tool, not a formality

Moisture testing in commercial work is often misunderstood. Tests do not “solve” moisture. They tell you whether the slab is likely to meet the moisture conditions assumed by the flooring system.

You typically choose a method based on the flooring requirements and the project constraints. Common industry methods include those that measure surface moisture emission rates or those that evaluate in-situ moisture conditions. The manufacturer’s allowed limits and required method matter more than what you would prefer for convenience.

Also, remember that a slab can be uneven in moisture behavior. On large buildings, you may have one wing that tests fine and another wing that does not, because of soil conditions, plumbing locations, and construction sequencing. That is why mapping is not just about flatness.

If results show moisture beyond limits, your options usually fall into three categories: correct the source, install a suitable moisture mitigation system designed for the flooring, or adjust the flooring plan. The worst option is to ignore the readings and proceed with a "hope it works" mindset.

Concrete preparation: remove contaminants, open the surface, and control dust

For concrete subfloors, the "prepping" part is usually about three things: adhesion, profile, and cleanliness. Concrete that looks clean can still be covered with a film that blocks bonding, like curing compounds or prior sealers.

Common preparation methods include grinding, scarifying, shot blasting, or chemical removal depending on the existing condition. In commercial work, mechanical methods are often preferred because they provide consistent surface removal and a predictable profile.

A practical, on-the-job approach usually looks like this:

- Remove paint, sealers, adhesive residue, and any non-concrete coverings that will interfere with bonding.
- Grind high spots and reshape ridges so leveling and patching compounds can feather properly.
- Clean thoroughly after surface removal. Dust is not a minor issue. It interferes with primer adhesion and weakens mortar systems.

Dust control is not just a comfort issue. It can affect bond strength. If you are cleaning with vacuums, make sure they actually capture fine dust. If you are wiping, use methods compatible with the products being applied and avoid introducing surface moisture that can interfere with curing.

Wood subfloors: fasteners, squeaks, and panel stability matter as much as moisture

Wood decks and underlayments introduce a different set of risks. The primary concerns are panel movement, squeaks, inadequate stiffness, and moisture-related dimensional change.

Before installing over wood, address:

- Panel flatness: crowns and dips can create ridges that resilient floors will exaggerate.
- Fastener condition: loose screws, corroded nails, and insufficient fastening can allow movement.
- Underlayment integrity: delaminated layers, broken panels, and soft spots need repair, not just patching.
- Moisture condition: wood that is too wet, or that repeatedly gets wet due to HVAC or plumbing issues, will move after installation.

If the deck moves, adhesives can lose bond, and click-lock systems can fail at seams. For commercial projects, movement might come from foot traffic patterns, door openings, and vibration. It is not theoretical. The floor will feel it.

In one office renovation, we discovered that the source of squeaks was not loose boards in the open area, but floors for commercial spaces rather a blocked joist area concealed under old carpeting. Once corrected, the new

flooring behaved as expected. That is the value of doing repairs based on what the structure is telling you, not only what you see on top.

Patching and leveling: build the surface the product expects

Once you have a sound, clean substrate, patching and leveling become the bridge between the existing floor and the installed flooring system. This is where quality control matters most, because compounds are not interchangeable, and because the timing and thickness rules can make or break performance.

Key principles that keep projects out of trouble:

- Use the right material for the job conditions. Some cementitious patch products are intended for feather finish. Some are designed for deeper fills. Some require a primer.
- Respect thickness limits. Overbuilding a thick layer can cause shrinkage, cracking, and extended cure times. Underbuilding can leave ridges or create telegraphing.
- Follow mixing and application instructions closely. Commercial timelines tempt crews to “mix it a bit thicker” to save a pass. That usually costs you later in curing and durability.
- Plan transitions. Doorways, changes in room use, and equipment pads often require careful ramping or edge detailing. Most installation complaints are really transition complaints.

I have watched a project lose a full day because a leveling compound was applied without allowing appropriate cure and recoat windows. The flooring installer arrived ready to work, and the substrate was still too unstable for acceptance. That is avoidable when preparation and scheduling are treated as a coordinated workflow.

A short checklist crews actually use

Here is a compact acceptance-style checklist for patching and leveling work, based on the reality of how failures happen:

- Confirm the patch or leveling compound is compatible with the existing substrate and the installation system.
- Prime where required, and do not skip primer just because the surface “looks uniform.”
- Grind or reshape high spots so feather edges can work instead of fighting hard ridges.
- Measure flatness after patching, before the next trade coats the area over.
- Protect the surface from foot traffic and contamination until it is ready for the flooring installation.

That last item is more important than people think. A freshly leveled area can become contaminated quickly in a commercial environment, especially if the space is open to other trades.

Primers, adhesives, and compatibility: the quiet cause of many call-backs

In commercial flooring, compatibility issues are some of the hardest to diagnose because the installed product can look correct while the bond is failing behind the scenes.

Common compatibility issues include:

- Using a patch product that requires a primer, then skipping the primer because the surface looks dry.
- Applying adhesives on a surface that is too dusty or not profiled.

- Switching adhesive types mid-project due to procurement changes, without checking whether the adhesive is still appropriate for the substrate.
- Installing resilient flooring over a surface that has not been prepared to the manufacturer's required bond profile.

Adhesives are not all designed for all substrate conditions. Even when two materials share a similar name, they may not share performance. This is one reason to keep a log during preparation. If a failure occurs later, the log can show what was used where and why.

Transitions, edges, and corners: where "almost flat" becomes a visible problem

Even when the main field is properly leveled, trouble shows up at edges and transitions. Door thresholds create movement and concentrated stress. Floor-to-wall lines can reveal slight ridges. Columns and equipment bases can demand tolerances that are tighter than the rest of the space.

Corner prep matters because many flooring systems behave differently at edges. For example, a semi-flexible resilient floor can telegraph a ridge if the perimeter is not detailed well. Tile and stone can crack if edges are unsupported or if substrate movement is not addressed.

When you plan edge conditions, think about the whole assembly: substrate, underlayment, transition strips, and the method used to terminate or protect edges. If the building has frequent wheeled traffic, edges can wear faster. That is not fixed by better installation technique alone.

Acceptance criteria: verify, then document

A commercial floor system is only as good as what happens before acceptance. Verification should include more than visual inspection.

At minimum, you want to confirm:

- Flatness meets the tolerances required for the finished flooring.
- Moisture is within the allowable limits or mitigation measures are in place and documented.
- The surface is clean, free of loose material, and ready for the next installation step.
- Any repairs are complete, cured, and compatible with the installation plan.

Documentation is not paperwork for paperwork's sake. It is how you protect the project team when disputes come later. If a moisture test falls outside tolerance in one area, you need evidence of what was measured and when, plus what actions were taken afterward.

In my experience, good documentation prevents a lot of finger-pointing. It keeps everyone focused on solutions instead of arguments.

A second short list for the finish line

When the subfloor is ready for flooring installation, a quick "go or no-go" review can prevent expensive surprises:

- Confirm flatness in the main field and at key transitions.
- Recheck cleanliness after any grinding, patching, or grinding dust control work.
- Verify cure and recoat windows for primers and patch systems.

- Ensure moisture mitigation steps, if used, are installed per the flooring plan.
- Capture photos of repairs and representative areas for the project file.

Common edge cases that demand extra judgment

Not every problem fits neatly into standard steps. Commercial sites have quirks, and preparation work is where you earn trust by making the right call.

Old adhesive residue that will not come off cleanly

Sometimes residue is stubborn because it is a mixture of old adhesive, embedded dust, and degraded polymers. In these cases, aggressive scraping can damage the substrate. Over-grinding can create uneven profile that makes leveling more difficult. The judgment call is choosing a method that removes enough to achieve proper bond and profile without destroying the surrounding concrete.

Hairline cracks that may move

Hairline cracks can be stable, but movement changes everything. If the cracking is active, patching alone can lead to reflection in the finish. Sometimes a crack isolation or other structural treatment is required before the flooring. That decision should be based on site conditions and the flooring system requirements, not just how the crack looks on a calm day.

Areas with repeated “spot failures”

If the floor above has failed before, the reasons are rarely random. Repeated failures in the same zone suggest an underlying issue such as moisture migration, poor prior prep, inadequate thickness of leveling compound, or contamination that returns during construction. You need to correct the root cause, or the new finish is likely to fail again.

Scheduling and workflow: preparation has to fit the job, not the other way around

Commercial work is a chain. If one link is delayed, everything downstream gets stressed. Preparation is often underestimated in scheduling because it depends on cure times, environmental stabilization, and coordination with other trades.

A practical workflow mindset is to treat subfloor prep as a series of “controlled windows”:

- Surface removal should be planned around available equipment, dust control, and access.
- Patching and leveling needs enough cure time for safe next steps. This affects both the ability to walk on the surface and the compatibility for primers and adhesives.
- Moisture testing often requires stabilized HVAC conditions and repeat testing if results are borderline.

When crews do not control workflow, you see rushed decisions: installing before cure, priming on contaminated surfaces, or patching over dust. Those errors do not always show up immediately, which is why they can be so damaging.

What “good preparation” looks like on the day the flooring goes in

When the subfloor prep is done right, the installation process feels smoother. Layout goes faster because the floor is flat. Adhesive spread is consistent because the substrate absorbs or bonds predictably. Seams and transitions behave as designed, and installers spend less time fighting edges or rework due to ridges.

More importantly, the finished floor performs. It resists hollow spots, does not lift at seams prematurely, and holds up under normal commercial abuse, like chairs, frequent cleaning, and traffic patterns that change week by week.

Good prep also reduces the drama during closeout. When something goes wrong, you can usually point to a controlled preparation record: the substrate was measured, the moisture condition was verified, repairs were made with compatible materials, and the system was installed within the required parameters.

Final thought: treat preparation as part of the flooring system

It is common to talk about flooring products, adhesives, and installation methods as if those are the whole story. They matter, but they do not override subfloor realities. Preparation is not a pre-install chore, it is the foundation of the performance guarantee.

When you approach subfloor prep with the right level of rigor, you are not just making the surface look good. You are aligning moisture behavior, bond conditions, and flatness tolerance with the flooring system that will take the daily wear.

That is why the best commercial projects are rarely the ones with the most impressive materials. They are the ones where the subfloor was treated like a system, not a surface.