



Terrazzo Compared to VCT for Schools

Case Study: Prototype Green Schools with Terrazzo

Guilford Park High School

Introduction

When choosing the appropriate flooring for a school, several essential factors are considered: durability, maintenance costs, repairs and replacements, life-cycle costs, environmental impact, and design flexibility. Terrazzo flooring is an environmentally sustainable and cost-effective option for schools. It offers several advantages over less expensive options such as Vinyl Composition Tile (VCT). This white paper focuses on those advantages, as illustrated in Maryland Howard County Green schools. It also highlights how terrazzo floors help reduce operating costs, among other benefits.



Case Study: Green & Net Zero Prototype Schools with Terrazzo

Wild Lake Middle School

Robyn Toth of TCA Architects in Crownsville led the specification of terrazzo in all three schools. She specializes in the design of sustainable public K-12 educational facilities in Maryland. In the past 28 years, she has completed over 88 school projects and numerous feasibility and site acquisition studies across the state. She has also successfully collaborated with public school planning committees to design facilities under the constraints of tight budgets and fixed schedules.

Ms. Toth worked with HCPSS to make a compelling case for optimal life cycle savings and to demonstrate terrazzo's long-term cost advantage. Facing rapid population growth, HCPSS looks to standardize its facilities while exercising unimpeachable fiscal responsibility. Decision makers conducted extensive analysis of flooring options, carefully considering the initial, long-term operations, and energy costs, and selected terrazzo as an alternative to VCT.

"Terrazzo offers many assets that are both fiscally and environmentally friendly," Ms. Toth explained. "Terrazzo " is the smarter choice, but people feel it looks too expensive. It can be hard to get buy-in." HCPSS strongly supports environmental sustainability and appreciates terrazzo's energy efficiency and long-term economy. "If you can get the owner to really evaluate the life cycle, terrazzo offers so many benefits over VCT, the current competitor," she added.



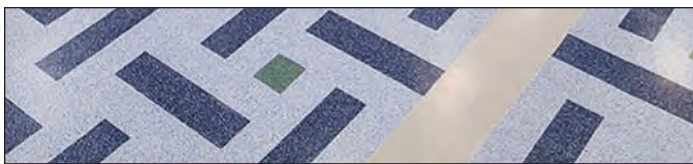
Among terrazzo's main selling points for Howard County were its durability and value as a permanent floor compared to flooring that has to be replaced after 20 years or less. "I think of terrazzo as a timeless finish: it will last longer than the rest of the building," said Ms. Toth.

The new Guilford High School was designed to accommodate 1,658 students; its 42-acre campus is the largest in the county. It is the fourth adaptation of the county's design prototype. The 64,200-square-foot terrazzo floor's modern pinwheel pattern symbolizes the weaving of many cultures represented in the students attending the school to create the community fabric and provides direction along corridors. The terrazzo contractor on the project, Roman Mosaic & Tile Company of Linthicum, Maryland, was presented a 2024 National Terrazzo & Mosaic Association Honor Award for the installation.

Investment in Terrazzo: Optimal Life Cycle Savings

“Owners can get caught up in first costs,” Ms. Toth explained. “Walk them through 20 years and terrazzo becomes a much stronger candidate.” The bulk of the savings comes from maintenance costs that are drastically lower than for VCT and eliminating flooring replacements for the life of the facility. Terrazzo’s cost benefits have made it the preferred flooring of many public schools, state universities, and post offices.

While terrazzo’s installation costs and lead time are generally higher than VCT, the initial costs more than pay for themselves over time, the total costs breaking even with VCT at around 12.5 years and continuing to offer more significant long-term benefits. The 40-year lifecycle cost comparison per square foot includes initial cost, replacement, and maintenance costs, showing terrazzo, which will not need to be replaced, at \$30 compared to VCT at \$50. Terrazzo’s nominal maintenance costs begin right away to balance the lower installation costs of VCT in the first year. In Year 30, the total accumulated costs for VCT have risen to \$43.64 per square foot, while terrazzo has leveled off at \$29.89. These figures do not take into account the probable replacement of the VCT floor as early as seven years.



Maintenance Benefits

Guilford Park was the school district’s first high school to specify terrazzo, and the decision depended heavily on energy use. “What’s nice about terrazzo is that the maintenance is significantly less than for less durable finishes. With the amount of foot traffic, that means significant cost benefits down the road,” Ms. Toth noted.

For HCPSS, replacing VCT’s twice-yearly stripping and buffing with terrazzo’s minimal, cost-saving maintenance schedule was a compelling advantage,

Terrazzo: Durable Sustainability

Terrazzo’s energy efficiency and environmental sustainability are compatible with green building projects. Net-zero-energy school Wild Lake was a base bid design and the recipient of a Net Zero Schools Initiative Grant provided by the Maryland Energy Administration, which contributed ten percent of the project to reach the net zero energy goal. Serving 752 students— 49 percent more than the school it replaced—the facility consumes less than half the energy of the old facility. At the time, it was the most energy-efficient school in the nation, achieving an ultra-low Energy Use Intensity of 13.8 kBtu/sf/year. The 18,140-square-foot epoxy terrazzo pattern in four colors reflects the natural elements of earth, wind, fire, and water with vibrant starburst patterns.

Terrazzo is a hard, seamless flooring with a permanent finish that lasts and conserves resources long term. The resilient finish is impervious to moisture and microbial growth, and is low-VOC in installation and maintenance for healthy indoor air quality.

Furthermore, it provides options that minimize construction waste and avoid contributing to landfills. With nominal substrate correction, it can be installed over different floor systems, including existing cementitious or epoxy terrazzo, brick pavers, tile, or wood, thus avoiding the considerable costs, waste, and mess of demolition. Terrazzo systems can also easily integrate recycled content and local materials.

conserving water, cleaning supplies and equipment, labor, and energy during out-of-school hours.

Terrazzo is a resistant, nonporous surface without grout joints, resisting microbial growth and moisture accumulation. An integral cove base around walls and columns provides a tough, protective transition to vertical surfaces and prevents dirt build-up.

Maintenance costs are a major budget item in a large, high-traffic facility. FLOOR Trends and Installation magazine states, “Over 90 percent of a floor’s lifecycle cost is spent on long-term cleaning and maintenance.” As schools face continuous budget

cuts and labor shortages, investing in maintenance is critical for the longevity of the floor and for the health and safety of the students and employees. However, floor maintenance is a line item where schools can save money on a floor with significantly lower requirements.

Maintenance savings begin to balance out the initial costs as soon as it's installed. The Life Cycle Cost Analysis Calculator gives national averages showing that maintenance per year for terrazzo is \$.56 per square foot versus \$1.35 for VCT. For a 100,000-square-foot terrazzo floor, the annual

maintenance is \$56,000, with a 30-year total cost of \$2.9M. For VCT, maintenance is estimated at \$135,000 annually and a total 30-year expenditure of \$4.3M.

FLOOR Trends and Installation's Life Cycle Cost Analysis Calculator shows the installation costs of terrazzo and VCT breaking even at around 12.5 years, around the end of a typical VCT floor's usefulness. It is from the point when a VCT requires replacement that a terrazzo floor's true savings accelerate and continue the longer a terrazzo floor is retained, which can be at least 40 years.

Repair Not Replace

Lifecycle costs for a permanent, seamless, custom-designed, low-maintenance terrazzo floor are leveled with just one carpet or vinyl replacement. With a permanent terrazzo floor, which will not need to be replaced for the life of the building, a school can avoid the immense costs and downtime associated with floor replacement, even in the highest traffic areas, for the life of the facility. Removal and disposal of flooring that is replaced is another expense and environmental impact to take into consideration. High-traffic environments may have to replace carpet or vinyl as often as every five years, triggering costly planning, disruption, and waste. A material that lasts conserves resources long-term.

Terrazzo can be spot-repaired or replaced in sections between divider strips. Because terrazzo has standard specifications for mixes, repairs can be perfectly matched to existing materials. Getting a good match for replacements can be a challenge with many softer synthetic materials or natural stones.

Ms. Toth reported that her firm has been involved in many successful renovations of 50- to 75-year-old terrazzo that needed only refinishing; the only issue they've encountered is the soundness of the structure below. Countless examples exist of floors still in use after 75 years and more

Design Flexibility and Enduring Appeal

Significant advantages of terrazzo for a designer are its unlimited color options and design versatility. Terrazzo is routinely customized to incorporate school colors and patterns, as seen at all three Howard County schools. In Mother-of-pearl and other aggregates raise light reflectance and create visual interest.

Ms. Toth appreciates the creative designs that she and her team have been able to produce for Howard County schools. "I really like being able to incorporate school colors and wayfinding in a floor

in a very subtle, soft, and sophisticated way that doesn't overwhelm the space but enhances it, and in a way that would be difficult with other finishes with limited color options," she explained.

At Guilford Park, the winsome epoxy terrazzo design in six colors brightens the main three-story gathering spaces and spans the length of each corridor and all main areas. Along the corridors, the terrazzo designs employ a different pattern for each lane of student traffic.



Hanover Hills Elementary School

Terrazzo's ability to easily match any paint color or existing finish facilitates designing a cohesive interior and simplifies long-term maintenance. Advantages include the opportunity to permanently build in school colors and enhance a school's interior design on the floor rather than at eye level. At Hanover Hills, the terrazzo design incorporated inspiring elements of nature into the 18,140-square-foot installation in five colors.

Solid-surface terrazzo flooring maintains its condition and keeps looking good longer than softer synthetic materials. Colors, patterns, and terrazzo's variegated texture can also help camouflage dirt and scuffs, sustaining a presentable appearance.

Conclusion

Design-flexible terrazzo is a sustainable and cost-effective flooring solution for schools. It provides a quality finished product that's easy to maintain in high-traffic and high-visibility zones. With its long lifecycle, terrazzo can provide significant savings over time, with durability to last the life of the structure without replacements.

The smooth surface makes mobility devices or wheeled carts easy to maneuver. Terrazzo can also be applied as an extremely hard-wearing surface to walls, ceilings, stairs, curbs, panels, and countertops.

"VCT provides challenges during installation," Ms. Toth added. "When the contractor misses a bump in the concrete, once the floor is waxed and the lights are turned on, the bump is extremely visible. Then when the floor is burnished, there are burn marks in that location. These problems would never happen with terrazzo."



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