The many shades of green

Top Green Projects reflect the multifaceted nature of design and materials that contribute to sustainable-building objectives.

A first glance, it may appear that it’s fairly easy to be green—or at least fairly straightforward. Evidence supporting a verdict of “green” might take the form of a LEED certification for a building project or third-party documentation that a product contributes to indoor air quality by emitting no VOCs or other harmful substances.

But a look at the following entries in JAC’s Top Green Coatings Projects shows that it can be a bit more complicated than that.

Yes, “LEED” or “low-emitting paint” is clearly stamped on the green-building package label of many of the projects described in this special “Top Green Projects” report.

But the overall range and scope of the projects featured here reflect an important aspect of the green- and sustainable-design universe—that the definition of this much-debated term “green” can and must take into account the multifaceted nature of design, construction, and materials content and specification.

No question, green means low-emitting materials. But it also means a reduced carbon footprint, and takes into account—or should—product and building lifecycle, performance, and contribution to service life, as is inferred in many interpretations of sustainability. It takes into consideration the impact on resource use—for the creation of virgin building materials, for example, or as a result of restoration/reuse alternatives to the philosophy of disposable building design and its part in the decidedly un-green generation of construction detritus.

Thus, in the following green-building narratives, we see significant attention given to materials that reduce energy demand due to solar-reflectance properties or contributions to building-envelope air-tightness, alongside innovative products that are solvent- and VOC-free. And we hear about the use of materials based on renewable resources such as soybean-derived chemistries, and materials that, thanks to a combination of performance characteristics, deliver on multiple counts. Example: one interesting project entry where a zero-VOC, 100% solids, liquid-applied membrane material can make a claim to a high-performance profile while playing a pivotal role in a green-roof installation. At the same time, the building where the product is used is of some historical significance, and is given new, useful life thanks to a practical application of adaptive reuse.

Does it get any greener than that? The answer, of course, is open to interpretation. The following listing of JAC’s Top Green Coatings Projects reflects our take on this interpretation. Certainly, other views may result in quite different conclusions. But then, it wouldn’t be much fun if being—or evaluating—green were that easy.

The Top Pick:
Project: Burke, Hogue & Mills Associates Inc. offices
Lake Mary, FL
Submitted by: Textured Coatings of America

The exterior of the Burke, Hogue & Mills building, a LEED Silver project, was coated with Textured Coatings’ COOLWALL® IR heat-reflective system. Burke, Hogue & Mills Associates is an...
architecture firm that places a premium on environmentally responsible design, and says it embraced such a philosophy “before it was given a title or organization to monitor and grade a building’s performance.”

The exterior coatings products used are the COOLWALL Textured Primer, a high-build, 100% acrylic textured primer with VOC content of less than 100 grams per liter, and COOLWALL SUPER-COTE™ 100% acrylic, heat-reflective exterior coating, with VOC content of less than 50 g/L. The company says the coating system can earn LEED rating points in four categories, and can reduce cooling-energy demand by as much as 20%. Other properties include a high degree of resistance to salt spray, moisture, and mildew; and long-term color retention and ease of cleaning.

The building’s design incorporates a number of green/sustainable features, including solar-reflective roofing; sun shades and light shelves for reduction of solar heat gain and glare; thermomass-insulated tilt wall concrete system for enhanced energy efficiency; waterless urinals and low-flow faucets; a rainwater-cistern collection system and use of collected water in the building; and other energy-saving and low-emitting designs and materials.

Green/sustainable points for: Contribution to reduced cooling-energy demand; low-VOC materials.

Close behind, the rest of the Top Five…

Project: Frank Lloyd Wright’s Fallingwater
Mill Run, PA
Submitted by: PPG Industries Inc.
PPG’s Pittsburgh Paints brand worked with the Western Pennsylvania Conservancy and the managers of the Fallingwater site to develop a program to repaint Frank Lloyd Wright’s masterpiece in Mill Run, PA. The company developed a number of custom colors for the building’s exterior to match original colors chosen by Wright when Fallingwater was built in the 1930s. The colors were based on an in-depth analysis conducted by representatives of Fallingwater, color experts, and Pittsburgh Paints. The majority of the exterior has been repainted, with some minor work to complete the job scheduled for this summer. Fallingwater was voted “the best all-time work of American architecture” in a 1991 poll of AIA members. A major program to restore and stabilize the site was initiated in recent years, due to significant cracking and sagging of portions of the cantilevered structure. Paints and coatings specified for

Future growth market: Bio-based content seen as planting the seed for new coatings chemistries

Several different coating and stain products from New Century Coatings, which produces a line of products based in large part on soy ester technology, are showcased in a stucco home in Phoenix, AZ. New Century President Tom Rauls says the technology represents a significant advance in the use of bio-based materials, but concedes that more work is needed before such materials make major inroads as an alternative to materials derived from petrochemicals.

The exterior stucco walls were painted with DuroSoy™ and two different colors of SoyCrete™ Architectural Concrete Stain. Two coats of a sealer, AcriSoy™, were then applied. For the wood kitchen cabinets, the stain used was TimberSoy™, followed by two coats of AcriSoy sealer. A paint, stain, and sealer combination was used on the garage door, and two coats of AcriSoy satin were applied to the gazebo. The garage floor received three different stain colors and two coats of sealer. TimberSoy and AcriSoy were also applied to wood portions of the gazebo.

The soy ester technology is derived from a byproduct of Vitamin E production—soy methyl ester, Rauls says. The raw material is purified and chemically modified, then is incorporated into an emulsion with a surfactant content of less than 2%. “The technology allows us to disperse the ester into water,” says Rauls.

The soy ester is combined with acrylic resins, natural oil polymers based on alkyd chemistry, and urethane chemistry, depending on the product. These polymeric components facilitate cure of the coatings and stains, crucial to development of performance properties.

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“What we do is make considerable use of a renewable resource with recycling of a soybean byproduct. This contributes to a reduction in the use of petrochemical content. That’s sustainability,” Rauls says. “And we offer a true, penetrating water-based stain product, due to the soy ester technology. Essentially, it forms a molecular bond with the substrate.”

Rauls says the soy ester technology facilitates penetration of porous surfaces such as concrete, wood, stucco, and other substrates. “Soy ester gives you better adhesion, and when you get better adhesion, you get better performance.”

For stain products, New Century Coatings makes its own colorant line, composed of conventional pigments dispersed in soy ester. In paint and coatings products, color is provided by standard water-borne products that are used in conventional paints and coatings.

“It represents a significant advance in technology, with at least 25% and as much as 70% bio-based content,” Rauls says of the product line.

SoyCrete™ Architectural Concrete Stain is a semitransparent decorative stain that is 60% soy ester, with plant-based pigments and water making up the remainder of the formulation. The result is a “virtually odorless” penetrating stain reported to produce the variegated appearance of acid stains, but with a high degree of color consistency, control, and safety, the company says. The stain is acid-free, nonhazardous, non-flammable, noncorrosive, and very low in VOCs at less than 25 g/L. It can be used in interior or exterior applications including concrete floors and countertops; masonry, stucco, and plaster walls; primed drywall; precast concrete; and fiber-cement walls.

Durasoy™ One Ultra Premium Multi-dusting, marring, and stains. The composition is approximately 20% bio-based content, with VOCs of less than 20 g/L. It can be used on a range of surfaces, including wood, concrete, masonry, stucco, plaster, and others. The sealer is breathable, allowing moisture to escape without causing blistering or other degradation of the sealant.

The all-acrylic primer is reported to offer high-performance stain-blocking and sealing properties, and to seal and protect the topcoat from “hot alkali” present in plaster, masonry, and cement. It can also be used for interior and exterior above-grade wood and wallboard surfaces, and provides blocking of stains from water, smoke, ink, markers, and tannins, the company says.

The topcoat product is based on a “self-crosslinking” acrylic resin chemistry that can be compared to high-performance, two-component coatings, the company says. Performance properties are reported to include high film build; crack bridging; a high degree of hide; low-temperature application capabilities; and a high degree of resistance to fade, chalking, moisture, tannin staining, and mildew and algae. VOC content is low, at 80 g/L.

For the interior, Pittsburgh Paints’ zero-VOC coating, PPG Pure Performance, is being used in a long-term repainting program that is expected to continue during the site’s winter off-seasons.

Two colors were custom tinted to match original shades chosen by Wright: Fallingwater Ochre for the main body of the exterior building and interior walls, and Cherokee Red, used as an accent color on trimwork, door handles, and other elements. Fallingwater Ochre is said to evoke the color of the drying leaves of the rhododendron tree, which is quite prevalent in the wooded area where the site is located.

The exterior concrete was first primed with Perma-Crete®, an alkali-resistant acrylic product. The topcoat used was Manor Hall Timeless, described as a “super-premium” all-acrylic exterior paint. The red accent color, a bold vermillion, complements the ochre.

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Kelly-Moore Paints vs. National Brand

Better Stain Resistance

Test Method: RD-058
This test objective evaluates the ability of the paint film to resist a variety of household stains. Nine typical stains were applied to the paint; cleaning was attempted by applying Formula 409 and then wiped with a sponge. Results were then visually evaluated, rated on a 45 point scale and ranked.

Enviro Coat line of premium grade interior paint is formulated without VOCs (Volatile Organic Compounds) providing a virtually odorless and environmentally friendly coating system, with great performance on the wall. Another example of Kelly-Moore’s commitment to “Earth First” paint systems.

1500 Enviro Coat Flat Wall Paint
- MPI Approved Product Category: #53 & #143
- Conforms to Green Seal Paints GS-11 Criteria
- Green Wise Certified

1510 Enviro Coat Eggshell Enamel
- MPI Approved Product Category: #52 & #145
- Conforms to Green Seal Paints GS-11 Criteria
- Green Wise Certified

1520 Enviro Coat Semi-Gloss Enamel
- MPI Approved Product Category: #54 & #147
- Conforms to Green Seal Paints GS-11 Criteria
- Green Wise Certified
Inside, a vapor-barrier coating, PermSealer, is being applied to perimeter walls and ceiling areas to prevent the migration of moisture into the exterior concrete. The water-borne product is low in VOCs at 9 grams per liter, and is recommended for use on interior walls where a non-breathing, vapor-barrier primer-sealer is needed. The vapor-barrier coating was developed in conjunction with the Fallingwater repainting program, and is based on acrylic and styrene butadiene resins.

Also being used are the Perma-Crete primer and the Pure Performance zero-VOC all-acrylic latex, in a flat and eggshell finish.

**Green/sustainable points for:** Low-VOC and zero-VOC coatings

**Project:** Sherman Hospital

**Elgin, IL**

**Submitted by:** Tremco Commercial Sealants & Waterproofing

The installation of an air and vapor barrier served the energy-efficiency and green-building objectives of Sherman Hospital when the institution made the decision to build a new, replacement facility in Elgin, a northwestern suburb of Chicago. The busy hospital traces its origins back 121 years, but has outgrown its existing, six-story, 353-bed facility despite a series of expansions over the years. The new hospital is scheduled for completion in 2010.

Green and sustainable design features at the new building site include a 15-acre geothermal lake that will function as a heating and cooling source and the planting of native prairie grasses around the lake, where a walking path also was built. The hospital says the geothermal lake will be one of the largest lake loop heat-pump systems in the world, and is projected to reduce utility costs by nearly $1 million annually.

The architectural engineering firm Shepley Bulfinch Richardson & Abbott specified the installation of a air and vapor barrier to protect the building envelope from air and moisture infiltration/exfiltration and to contribute to energy efficiency and cost savings.

The air- and vapor-barrier system specified was the Tremco ExoAir 120 fluid-applied barrier membrane, combined with the ExoAir 110 Self-Adhered Air & Vapor Barrier Membrane for detailing at transition areas around windows and other wall-assembly elements. Such transitions between aid/vapor barriers and window and wall systems are frequently the source of problems that can lead to air and moisture infiltration, causing greater consumption of heating and cooling energy and deterioration of building-envelope components, rusting and degradation of structural supports, and damage to exterior finishes.

A key to successful installation of the air/vapor barrier system was the use of Tremco’s Proglaze® ETA Engineered Transition Assembly, which ensured a continuous, durable, compatible seal in areas where extensive vertical gaps existed between the window units and wall assembly. The assembly system consists of self-adhered air and vapor barrier membrane and silicone rubber extrusions as the primary air and vapor seal between the air/vapor barrier and curtain wall system. The system also includes a high-movement, ultra-low-modulus, one-part, moisture-curing silicone sealant. The transition assembly is billed as providing a continuous, durable building-envelope assembly that allows flexibility and the capability to withstand differences in air pressure on both sides of the wall.

The Sherman Hospital project was audited by the Air Barrier Association of America (ABAA), and testing was done at various phases of construction to ensure critical specifications were met.

**Green/sustainable points for:** Contribution to energy efficiency, building sustainability

**Project:** Innovative Cold Storage Enterprises (ICE)

**San Diego, CA**

**Submitted by:** United Coatings

Innovative Cold Storage Enterprises has submitted its design for a new, 7.5-million cubic-foot cold-storage facility for LEED Gold certification. The designation would reportedly be the first for such facilities.

United Coatings’ Kymax, a waterborne coating based on fluoropolymer resin technology, was applied as a solar-reflective topcoat to the building’s roof. Green and sustainable design features of the building include a closed-loop rainwater-recycling system that supplies water for the building’s refrigeration and irrigation systems; a roof-mounted solar panel system that supplies more than half of the power needed to operate the facility; and an energy-conserving “cool roof” with an insulation value of R-42 and a solar reflectance index (SRI) of 110 for reduced heat transfer into the building, resulting in lower refrigeration energy loads.

The roofing system of the 130,000-square-foot low-slope roof consists of 2 inches of spray polyurethane foam on top of 6 inches of rigid polystyrene insulation covering a 1½-inch-high fluted steel deck. The system is reported to produce a ther-
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Growing back green: In tornado’s wake, sustainable design takes root in Greensburg

Following the devastation wreaked by the F5 tornado that struck Greensburg, KS, in May 2007, the town vowed to rebuild as the nation’s first planned totally green community, with the objective of designing buildings to LEED Platinum standards. The town’s commitment to green building has been recognized by President Obama, and will be the subject of a Discovery Channel “Planet Green” program in June.

Vicky Baker Corp./Final Touches, a contractor based in Fort Worth, TX, installed a polished concrete floor in the BTI John Deere dealership, rebuilt following the tornado. The owners of the dealership are seeking LEED Platinum certification, in the spirit of the town’s objective of rebuilding with green and sustainable design as a priority.

The design of the rebuilt dealership includes tubular skylights for daylighting, radiant floor heating, an energy-efficient wall system, a waste oil boiler, a CO2 demand-controlled ventilation system, recycled-steel support beams, wind turbines (which the business now sells in the shop), and landscaping with native plant species.

Project: BTI John Deere dealership, Greensburg, KS
Submitted by: Westcoat Specialty Coating Systems/ Final Touches of Fort Worth

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Primary coloring of the polished concrete floor was provided by Westcoat’s SC-36 Fast Stain, a zero-VOC material. The stain is described as a penetrating, fast-drying product that is soluble in acetone, a VOC-exempt solvent.

Concrete polishing, a process in which special chemical hardeners—also called densifiers—are applied to a machine-prepared concrete surface, has received positive reviews in terms of its contribution to sustainable design. Companies involved in technology say it offers a combination of low-VOC materials and functionality that contributes to the concrete floor’s reflectivity, durability, and performance.

The technology also has received positive reviews from BuildingGreen.com, an independent company that researches and reports on green design and building methods and materials. BuildingGreen.com says the densifying/polishing process’s attributes include floor durability, UV resistance, ease of maintenance, and “structure as finish” condition, with no additional application or installation of overlays, toppings, or coverings required.

Green/sustainable points for: Sustainability of concrete floors; energy savings; indoor air quality; waste minimization

Mal insulation value of R-42. A polyurea vapor barrier was applied on top of the SPF, followed by an acrylic base coating and a white Kymax fluoropolymer topcoat on all exposed roof areas.

The Kymax product is a thin-build elastomeric coating reported to provide high initial and aged solar reflectance, color stability, and weather resistance over new or existing roof surfaces. The field-applied, ambient-cure coating is available with a 20-year warranty, and is based on Kynar Aquatec®, a water-based, low-VOC, PVDF fluoropolymer technology developed by Arkema Inc. to deliver durability and performance comparable to factory-applied coatings based on Kynar 500® PVDF resins.

Green/sustainable points for: Reflective roof coating that contributes to reduced cooling-energy demand; high-performance coating technology for extended service life

Completing the Top Ten…

Project: NRG Systems
Hinesburg, VT
Submitted by: L&M Construction Chemicals Inc.
L&M Construction Chemicals’ FGS Permashine polished-concrete system was used in the expansion of NRG Systems’ office and manufacturing facility. NRG Systems is a manufacturer of wind-energy equipment, and green/sustainable design and construction were a priority in the project.

The polished-concrete floors replaced epoxy-coated floors in the original building, and polished concrete and the incorpora-
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tion of color with the application of dyes was employed in the office areas, where acid stains and topical sealers had originally been applied. Green/sustainable features in the facility include radiant heat and water-conservation measures. The polished-concrete floors contribute to the facility’s warm, vibrant atmosphere. The technology supports green building and design objectives in several ways, including increased sustainability of concrete floors; reduced energy consumption in the building; and the environmentally friendly profile of the materials and processes employed in terms of waste minimization and indoor air quality.

Green/sustainable points for:
- Sustainability of concrete floors; energy savings; indoor air quality; waste minimization.

Project: Art Center College of Design South Campus
Pasadena, CA
Submitted by: Gaco Western
A green roof (sometimes called garden or vegetative roof) was installed on this building, acquired by the College of Design in 2000 and adapted from former use as Cal Tech’s World War II-era jet propulsion laboratory. The building, which serves as the college’s South Campus, has earned LEED certification from the U.S. Green Building Council.

Gaco Western supplied a liquid-applied 100% solids, seamless polyurethane waterproofing membrane for the green-roof installation. The product, GacoFlex LM-60, contains no VOCs, and is NSF 61 approved for use in waterproofing of potable-water tanks. The high-performance product is designed for use on horizontal and low-slope surfaces in a between-slab or below-grade application, and can also be used in vertical waterproofing applications. Recommended uses include plazas, roofs, rooftop decks, and as a waterproofing membrane under rooftop gardens.

The concrete roof deck was primed with a water-based, two-component epoxy primer—Gaco’s E-5320. For flashing at roof transitions to vertical walls, Gaco’s NF-620 neoprene sheeting was applied. The liquid waterproofing membrane was initially applied at a thickness of 100 mils, with an additional 20 mils applied later to repair any impact from traffic during continuing construction work on the building. The green-roof installation included drainage course, installation of pavers and soil layer, and planting of various drought-tolerant grasses native to the Southern California region. The installation conveys the impression of the area’s natural landscape.

Green/sustainable points for:
- Zero VOC content; role in performance of green-roof installation and adaptive reuse of existing building; high-performance waterproofing characteristics.

Project: Suvarnabhumi International Airport
Bangkok, Thailand
Submitted by: Industrial Nanotech Inc.
Industrial Nanotech supplied Nansulate® Translucent PT, a clear coating reported to offer anticorrosion and insulating properties, for coating airway-bridge panels at Suvarnabhumi International Airport in Bangkok. The product was used as a clear topcoat on 11,530 square meters of aluminum and steel wall panels painted with a fluoropolymer-based coating. The panels were used as roof and soffit claddings for the airport terminal’s aero-bridges.

The waterborne acrylic clear coating employs a proprietary nanomaterial characterized by a low thermal conductivity to inhibit heat transfer even at thin film builds. The coatings also are mold and moisture resistant and low in VOCs at 100 grams per liter, the company says. The coatings are offered in a clear, matte finish and a white, semigloss version, and are reported to offer strong adhesion to a variety of surfaces including wood, brick, drywall, stucco, glass, and concrete.

Green/sustainable points for: Low VOC content; insulating properties/reduced building energy demand.

Project: Learning Gate Community School
Lutz, FL
Submitted by: Extreme Seal Inc./Simix Solutions
The pool at Learning Gate School serves double duty—swimming and fire protection, as the school is located some dis-
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tance from fire hydrants. The school, reported to be seeking LEED Platinum certification, sought environmentally friendly materials for all buildings and facilities, including coatings and products needed to deter the growth of mold and mildew in a site located in a heavily wooded area in the humid subtropical climate of Florida. Salt water is used in the pool as an alternative to chemical treatment.

For the pavers in the pool area, Simix Solutions’ zero-VOC potassium silicate coating with nanoparticle titanium dioxide (TiO₂) was applied following cleaning with a non-chlorine product. The coating is reported to react with moisture and UV light to break down hydrocarbons and biological organisms, with rainwater washing away debris and leaving the surface clean and free of mold or mildew. The coating is also reported to provide waterproofing and protective properties, and can be applied over painted surfaces such as roofs to increase resistance to fading and chalking. Extreme Seal Inc. served as distributor and application contractor.

Green and sustainable design and operations rank as priorities at the school, and include collection of rainwater for watering of plants and flushing of toilets; growing of organic vegetables; trash recycling; the use of soy-based foam insulation in the building; and classroom lights that dim automatically. A zero-VOC, all-acrylic paint—ICI’s Dulux® LifeMaster™—was applied in the building interior, in flat and satin sheens.

Green/sustainable points for:
- Zero-VOC coatings and construction products;
- Green/sustainable cleaning and maintenance processes and materials; antifungal functionality without toxicity

Superior Products International II
Project: McDade Independent School District
McDade, TX
Protective Coatings and Construction Inc. was contracted to retrofit the roof, side-walls, windows, and HVAC system at a school built in the 1940s. Energy conservation figured prominently in the work to be done.

Protective Coatings and Construction replaced the facility’s existing tar and gravel roof with spray polyurethane foam from BaySystems North America Inc. The roof was topcoated with SuperTherm® insulating coatings from Superior Products International II. Custom-tinted versions of the coatings were also applied to exterior walls, soffit, and fascia. The project also included installation of new, high-efficiency windows.

The waterborne, acrylic/urethane coating is described as a combination of high-performance aliphatic urethane and elastomeric acrylic resins and resin additives, and is designed to block heat, moisture penetration, and air infiltration. The formula incorporates four different ceramic-type materials that are said to block 95% of solar radiant heat.

Protective Coatings and Construction conducted an energy simulation in compliance with ASHRAE, IECC, and DOE guidelines. The results showed that the factory was able to reduce the amount of air-conditioning tonnage required from 23 tons (pre-retrofit) to 10 tons (post-retrofit), even with an increased occupancy rate.

Green/sustainable points for: Reduced cooling-energy demand due to solar-reflective, insulating coatings

Also of note...
Project: Bank of America, multiple locations
Southern California
Submitted by: Meyer Coatings Inc./Dunn-Edwards Corp.
Under a contract with Bank of America, Meyer Coatings Inc., Orange, CA, redecorated 32 bank branches in Southern California in a project requiring work to be done with no interruption to bank functions and services. The scope of work included removal of all existing wallcoverings, restoration of walls to like-new condition, and application of primer and paint to walls, trim, some doors, and some ceilings. Priorities for coatings product selection included performance, absence of VOCs, and minimal odor.

Following Meyer Coatings’ evaluation of products from four manufacturers, Dunn-Edwards Corp.’s Eco-Shield zero-VOC paint was selected for the project. Dunn-Edwards custom formulated the paints to meet color and sheen requirements specified by Bank of America. The paints used were a primer, a low-sheen version for walls, a semigloss for trim areas, and a flat for ceilings. The products all are based on acrylic resins and contain no solvents. The company says it uses no ethylene glycol as a coalescing additive for film formation in any of its waterborne paints and coatings. Ethylene glycol is a toxic air contaminant under California state law and a hazardous air pollutant under federal law.

Green/sustainable points for: Zero-VOC, low-odor materials (indoor air quality)
Fallingwater is on Smithsonian magazine’s Life List of 28 places “to visit before ... it’s too late.”

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Pure Performance® — a low-odor, zero-VOC interior latex paint — superior performing and gentle on the environment.

Manor Hall® Timeless® Exterior is a low-odor, low-VOC, self-priming paint that covers in one coat and comes with a lifetime guarantee.

Perma-Crete® Interior/Exterior Alkali-Resistant Primer is a high-performance primer providing maximum protection against the damaging effects of alkali and efflorescence.

Fallingwater is considered Frank Lloyd Wright’s masterpiece house. When Western Pennsylvania Conservancy embarked on its restoration, they looked for paints that would achieve harmony between beauty and performance and meet strict environmental requirements. They chose PPG Pittsburgh® Paints.

Exclusively from PPG Pittsburgh Paints: The Fallingwater Inspired Color Collection, featuring Frank Lloyd Wright’s signature color, Cherokee Red.

For more info, return Reader Inquiry Card
of heat, sunlight, and rain. Rather than replace the roof, the facility manager at the school decided to restore the roof using acrylic coatings. The project called for the use of National Coatings Corp.’s ARM Acrylic Roof Maintenance System using the Acrystone A502 primer and A500 reflective topcoat system. In addition to being waterborne, the coating system does not require a corrosive pretreatment that is normally used to achieve adequate adhesion to EPDM, according to National Coatings. The project for called for reinforcing of seams and application of 24 mils of coating.

The primer, introduced in the last five years, is designed to adhere to thermoplastic and thermoset roof materials, such as TPO, PVC, and EPDM. The primer differs from rinsible adhesion promoters that react with the rubber and must be applied and then removed by flushing. Such adhesion promoters are characterized by a highly alkaline pH level that is corrosive and possibly harmful to the adjacent environment, the company says.

The VOC content of both the primer and topcoat was approximately 7 grams per liter. Application of the topcoat results in initial solar reactivity of about .83, well above the ENERGY STAR threshold of .65, the .70 required to qualify for LEED rating-system points, and the minimum required under California Title 24.

**Green/sustainable points for:**
Sustainability of existing roof; reduced waste generation and disposal (no roof tear-off), waterborne, low-VOC coatings and pretreatment product

**Project: Hillcrest Baptist Medical Center**
**Waco, Texas**
**Submitted by: Garland Company Inc.**
Garland Company supplied SBS-modified roofing and solar-reflective coatings to restore a number of seriously deteriorated roof surfaces at the Hillcrest Baptist Medical Center. Garland’s StressPly® SA FR Mineral membrane, a fire-retardant, mineral-coated, SBS-modified membrane was installed, followed by application of a white, solar-reflective coating. The SBS-modified membrane offers improved self-adhesion properties, the company says.

Replacement of the roofs was needed due to the condition of the roofs.

Key criteria for the project included absence of fumes and odors due to the location of roofing above a cancer-treatment center and a children’s unit. Air-conditioning units could easily transfer fumes into the areas. Major challenges included difficult access to multiple roofs at different levels for the 39,000 square feet of roofing involved.

A 450-ton, 11-story crane was needed to load materials onto the various roofs, all done in one day to minimize interruption of traffic on the only workable staging area—the street.

The roofing membrane is described as an environmentally friendly system with no requirement for open-flame torches, hot kettles, or cold-applied solvents. Installers position the membranes on the roof surface, remove the release-film backing, and press the membrane into place. The system provides a multi-ply, redundant, high-tensile membrane assembly, the company says.

The project required removal of the existing single-ply roofing, installation of half-inch insulation board, and application of the new membrane. The membrane and base flashings were coated with Garland’s Pyramic® reflective white acrylic elastomeric coating, an ENERGY STAR® qualified solution that reduces energy requirements. Raised parapet walls were sided with Garland’s R-Mer™ Lite metal through-fastened wall panels.

**Green/sustainable points for:** Low-VOC, low-odor roofing and roof coatings; solar-reflective roof surface for reduced cooling-energy demand.

**Project: St. Gabriel’s Church Toronto, Ontario**
**Submitted by: Southwall Technologies**
St. Gabriel’s Passionist Church in Toronto, certified LEED Gold, was designed to incorporate environmental priorities into the architecture of the church and the worship experience. Instead of stained glass, windows are clear glass, in part to take advantage of passive solar energy in the winter and in part to unite the interior sacred space with the equally sacred space of the outside world. Only skylight glass is colored in shades ranging from brilliant yellow to deep crimsons and azure blues, which shine on the walls of exposed con-
The church is reported to be the first religious building to be certified LEED Gold in Canada.

Energy-saving materials include Heat Mirror multi-cavity insulating glass, used for exterior glass applications. The glass is produced using a polyester film onto which a specialized nanoparticle proprietary coating has been applied to significantly enhance solar reflectivity and reduce emissivity. The film is processed in a vacuum deposition chamber, in which the coating is applied in an extremely thin layer.

Much of the site’s former church has been reused in the new church, completed in 2007, including pews and images of the Passion salvaged from the front doors of the original church. Parking is underground to allow the surrounding site to be landscaped to pre-settlement, indigenous ecosystems. Preferential parking spaces are provided for car pools or hybrid or alternative fuel vehicles. The church is located close to public transportation.

Green construction methods and materials included the recycling of existing materials; use of low-VOC interior paint; installation of carpeting made from beets and corn stalks; heat-absorbing concrete floors and stucco; sensor-activated lighting; and insulating glass from Southwall Technologies.

Green/sustainable points for: Energy savings due to high reflectivity, low emissivity glass coating

Project: Fontana Library and Resource Technology Center
Fontana, CA
Submitted by: Pacific Polymers Inc.
Pacific Polymers Inc.’s Elasto-Deck 6500 PT polyurea pedestrian deck coating was applied to 40,000 square feet of the mechanical rooms of the Fontana Library and Resource Technology Center. The building received a LEED Silver designation. The liquid-applied, two-component polyurea product is flexible, low in odor,
and 100% solids, with zero VOCs. Recommended uses include waterproofing for pedestrian traffic, including walking decks, balconies, plazas, and roof decks. Application substrates can include concrete, plywood, metal, and polyurethane foam.

Green/sustainable points for: Zero-VOC content (indoor air quality).

Project: Innovative Design Offerings
Indianapolis, IN
Submitted by: The Sherwin-Williams Company
Innovative Design Offerings (I.d.o), based in Indianapolis, IN, used Sherwin-Williams’ Harmony® zero-VOC interior paint throughout the firm’s new, 5,000-square-foot office building. A palette of shades of sky blue, apple green, and sienna was chosen for the color combinations.

Contributing LEED points were a number of components, including facilities that encourage alternative transportation in the form of bicycles; desk chairs with a high percentage of recycled plastics content; carpeting that incorporates mineral residuals from paper recycling; recycled wood and reclaimed wood products; vases made of recycled beverage bottles; and the use of bins at all workstations and the kitchen area for recycled paper, glass, and plastic.

Green/sustainable points for: Zero-VOC content (indoor air quality)

Project: Armstrong World Industries Corporate Headquarters Building
Lancaster, PA
Submitted by: Wausau Window and Wall Systems/Linetec
from the U.S. Green Building Council under the LEED® Green Building Rating System™ for existing buildings (LEED-EB). The three-story, 126,000-square-foot structure is only the sixth existing building—and the first outside of California—to receive this highest level of certification.

Green/sustainable design features include daylight in 75% workspaces, 90% with views to the Pennsylvania countryside, Wausau engineered and fabricated multiple curtainwall systems plus sun shades, light shelves, and decorative panels. Finishing included factory-applied high-performance coatings and anodize.

Linetec finished the curtainwall systems’ aluminum framing members, sun shades, light shelves, and decorative panels. The interior surfaces were finished in clear anodize. On the exterior, a classic black high-performance fluoropolymer coating was used on the west wing curtain wall, and a silver gray fluoropolymer coating was used on the curtain wall’s east wing as well as on the exterior panels. The sun shades, decorative panels, and light shelves reduce artificial illumination by controlling natural, solar light. Fluoropolymer coatings are characterized by long-term durability and a high degree of resistance to fade and color loss in harsh, UV-intensive environments.

Green/sustainable points for: Contribution of coatings technologies to energy efficiency, sustainability (performance/lifecycle), and enhanced natural lighting

Project: CNL corporate aircraft hangar
Orlando, FL
Submitted by: Tennant Company
Tennant Company’s Eco-HPS® 100, a high-performance polyurethane coating formulated to meet the most stringent VOC limits in the nation, was applied to the floor of the CNL corporate hangar as part of a coating project that also included application of Tennant’s Eco-CEP™ epoxy primer. The VOC content of both coatings products meets or exceeds the VOC limit for industrial maintenance coatings set by California’s South Coast Air Quality Management District.

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Republic Powdered Metals’ GEOGARD® high-performance polyurethane coating system was applied in a restoration of the 16,200-square-foot concrete roof of One Boston Place, a 41-story downtown commercial building. The building has earned a LEED Gold certification under the USGBC’s LEED for Existing Buildings (LEED-EB) Operations & Maintenance (O&M) rating system. The restoration-coating system includes a single-component, waterproofing polyurethane base coat and single-component, aliphatic polyurethane, white, solar-reflective finish coat.

Green/sustainable points for:
- Cooling-energy reduction due to solar reflectivity
- Specification/use of high-performance materials
- Sustainability of existing roof

Project: One Boston Place
Boston, MA
Submitted by: Republic Powdered Metals Inc.
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