



Milwaukee Historic Preservation Commission Staff Report

LIVING WITH HISTORY

HPC meeting date: 9/4/2018
Ald. Milele Coggs District: 6
Staff reviewer: Tim Askin
PTS #114604 CCF #1180688

Property	1830 N. 2ND ST.	Brewers Hill HD
Owner/Applicant	DANIEL OLSON MARGARET OLSON 1830 N 2ND ST MILWAUKEE WI 53212	Daniel Olson 1830 N 2nd St Milwaukee, WI 53212 Phone: (414) 418-1014
Proposal	Coat house with Rhinoshield "paint."	

The following is adapted from the application narrative:

Rhino Shield is water-based (latex) paint that has eliminated many filler components common in other paints.

This formulation uses only the limited additives - 100% acrylic resin, titanium dioxide, and 3M ceramic microspheres. The product is 80% solids by weight vs. 40% for standard paint. A material specification of the product (included in attachment) shows that it contains many of the same components of other high-end paints and primers. It is by definition "an acrylic-urethane-elastomeric primer and paint."

Contractor states that Rhino Shield is fully vapor permeable yet is highly resistant to water penetration. Houses are allowed to fully breathe, reducing moisture buildup and mold/rot issues. Its elastomeric properties allow it to flex and stretch with the expansion and contraction of wood-framed structures (which can cause the detachment of standard paint which is inflexible). It also exceeds federal wind-driven rain specifications and reflects UV rays. All of which standard paint does not. Rhino Shield's unique features have been independently tested and verified by BASF and other labs (included in attachment).

"Despite marketing statements to the effect, Rhino Shield is not actually a 'permanent' coating. Rhino Shield of Wisconsin confirms that the product can be removed without damage to the substrate but admits that the process is much more difficult than regular paint. The reason it is difficult is the same reason the product is so good at protecting historic materials, its adhesion qualities. Easily removable paint does not protect in adverse conditions, which is the reason for the project in the first place. Rhino Shield can be repainted with traditional paint or another coat of Rhino Shield if color changes are desired later, with no reduction in protection."

Process

Rhino Shield is applied with a 12-step process:

1. Thorough Inspection - this is done to determine that all surfaces and conditions are appropriate for the process (This has been completed and the trim and siding of the home is in excellent condition, also, no lead was detected on any part of the structure)
2. Trenching – N/A. If necessary, a trench is dug and the foundation waterproofed to prevent moisture wicking from the ground that might damage wood. (The home in this project has a raised foundation and siding is several feet off the ground making this step unnecessary)
3. Cleaning and Washing - the entire surface of the home will be cleaned using the most appropriate process for the material in place. This will include scraping and washing only as applicable and allowed by state statutes (max of 1,000 PSI according to the State Historical Office). Historical foundations will be fully protected when washing is performed at the bottom of the clapboard.
4. Patch and Repair - All cracks, holes, chips and breaks on the home are filled and sealed. (The inspection indicated only a few areas where small repair was needed and would be done with duplicate materials as to those in place).
5. Sanding and scraping - All loose paint on wood surfaces is removed by scraping and remaining paint is sanded by hand or machine, if allowed, to leave a smooth surface to coat.
6. Caulking - Once wood surfaces have been scraped and sanded, cracks and small holes around all windows and door casings are filled with long-lasting, flexible sealant to prevent moisture from invading the paint through these areas.
7. Masking - All areas which are not to be coated are carefully masked and covered.
8. Priming - A solid coat of Rhino Shield Adhesive Primer Sealer is applied to make the finish coat stay on the house without cracking or peeling.
9. Apply the finish Coat - One or two coats of ceramic infused top-coat paint is applied as necessary and applicable to the project. The top-coat is sprayed at a rate of 100 square feet per gallon or greater to achieve the optimal mil-thickness. Brushing or rolling is then used on wood siding to ensure all detail and grain are clearly visible and leaves a finish indistinguishable from homes painted with multiple coats of standard paint. (Depending on the level of detail of the area of the home being painted, one coat, hand applied will ensure no dulling of architectural features. One coat of Rhino Shield is similar in thickness to two coats of standard latex paint).
10. Detail touch up - After the finish coat is applied, the exterior is hand detailed around windows, awnings, etc.
11. Clean up job site - complete cleanup of the job site is performed to ensure no paint chips or residue are left behind.
12. Final inspection - the job is not considered complete nor is payment transferred until the customer is fully satisfied in the quality and completeness of the work performed.

Staff comments

Applicant's concerns about uneven weathering of the property are valid, but not unusual. The environmental toll on buildings varies by elevation. The claims of UV resistance, weatherproofing, 25+-year product life are certainly attractive. They are not necessarily substantiated on wood-sided buildings and may have harmful side effects because of the manner of application.

SHPO Staff Opinions

Both of Wisconsin's historic preservation tax credit reviewers (Jen Davel and Mark Buechel, telephone 8/29/18) will not approve the product. The Oregon tax credit reviewer said, "It doesn't meet the Standards!" Michigan, Tennessee, and Arkansas also disapprove. Indiana SHPO also disapproves as of 2010, notwithstanding the City of Indianapolis's one-time, test-case approval.

Local Commissions

There is certainly a history of various local Commissions throughout the country approving the product. Staff could not find any evidence of Rhinoshield ever being approved in a state or federal historic preservation tax credit project for a wood-sided building or any other building. As noted in the file and confirmed by staff conversation with Indianapolis staff, it was approved over staff objection in Indianapolis. The video of the hearing revealed that Rhinoshield was approved in this one instance on a trial basis. Indianapolis staff declined to provide any follow-up information beyond the outcome of the case.

The Columbus, Georgia quote on the "Preserving Historical Homes" brochure is tempered by commentary and research noted in the Indianapolis staff report, "Rhino Shield was applied to the shutters and cornice of a historic masonry building in March 2010. The product was selected because an area donor was willing to pay for the coating system to be applied and there were no approvals required from any local architectural review board." It is notable that the product was not applied to the entire building or to any siding. It is also not a scope of work that the Milwaukee HPC would approve. Its use on masonry violates the guidelines for every locally designated property.

Preparation Work

Staff cannot recommend the pressure washing as proposed. Staff never approves PSI over 800 and prefers not to exceed 600 PSI. Applicants may indeed be correct about WHS approving up to 1000 PSI, but HPC staff do not believe that level of pressure to be wise in any situation. Traditional applications of Rhinoshield recommend 3000 PSI (Martin Weaver, *Conserving Buildings*, rev. 1997).

Reversibility and Permeability

Staff agrees that paint itself is arguably removable and the manufacturer has demonstrated that it can be re-applied over itself and that it is likely to be compatible with typical latex paints. The reversibility of the primer is highly suspect. The primer dries clear and so it may be impossible to tell if the primer has been fully removed without microscopic analysis. Reversibility is a key principle of the Secretary of the Interior's Standards for Treatments of Historic Properties, Milwaukee's Historic Preservation ordinance and the Brewers Hill Historic District Guidelines.

Staff disputes the claim and meaning of the product being "fully vapor permeable." The permeability of the paint and primer are in question. The product is likely appropriate for new construction applications with full insulation and vapor barriers. Historic homes are not built in this way and need higher permeability. Permeability of the product is also not the sole issue with this product. The extensive caulking also causes a reduction in permeability of the wall surface. They are built as a system to work with paint products that are more similar to what was available at the time of their construction. Latex and particularly oil paints are substantially more similar to traditional 19th century paints. The product may well be appropriate for modern construction techniques with substantially tighter building envelopes. Staff would not object to this product on most new construction buildings or on a metal surface.

According to a 2014 report completed for the Association for Preservation Technology International and published by the National Center for Preservation Technology and Training, a branch of the National Park Service:

Historic wood structures often suffer from a lack of regular maintenance, and exterior coatings, meant to protect the wood substrate, often fail before additional coatings are applied. Failure to protect the wood on the exterior of a structure contributes to the lack of durability and premature failure of exterior wood elements. Effective maintenance relies on using best practices for selecting and applying coatings. In today's mass market economy, exterior wood coatings are marketed for the durability and performance of the coating itself rather than its ability to protect the wood it covers. This is a critical distinction between modern and traditional exterior wood coatings. Traditional exterior wood coatings typically served as a sacrificial layer that functioned to protect the wood and, as such, performed in a symbiotic manner with the physical properties of the wood substrate.

Other factors that significantly affect the serviceability of exterior wood coatings that are not typically taken into consideration include: 1) the type of wood (species), the cut of the wood (e.g. plain sawn vs. quarter sawn), and quality of the wood being coated, 2) the condition of the wood being coated (new or properly prepared wood substrates vs. weathered wood), 3) the design and use of the structure, 4) the composition and quality of the coating, 5) the method(s) in which the coating is applied and maintained, and 6) the climatic conditions of exposure. Without proper consideration of these factors, any protective coating, whether traditional or modern, will generally not perform as intended or desired.

This quote is not meant to denigrate the maintenance and upkeep of the recent owners of the property, but to indicate that there are other factors at work in paint failure than just climatic concerns.

Similarity of Materials

The thickness of the Rhinoshield product is higher than typical paint products and has been found to cause the appearance of sharp lines to disappear in architectural features. While it is possible to use a thinner hand-painted layer in selected areas such as windows and trim this is not practical for the whole of the siding. The sharp definition, thickness, and shadow lines of wood boards have been consistently established by the Commission as character-defining features of wood-clad buildings. It is because of this detail that cement board siding has been consistently denied on primary buildings. This would not make the effects similar to standard paint in architectural appearance or scale. Further, staff would argue that paint and coating treatments do not constitute repairs and would be better classified as maintenance.

Recommendation

Recommend HPC Denial.

Staff's recommendation would be strip the wall of concern to bare wood, evaluate the wood for problems, and then proceed with a flat paint in a light color on that elevation to maximize UV resistance and durability.

Conditions

If the Commission chooses to approve, staff recommends only allowing only the problematic wall to be treated with the Rhinoshield product. Other walls should be done with standard paint and primer.

If the Commission approves any use of the Rhinoshield product , the following conditions should apply:

1. Power washing, if any, is limited to ≤ 600 psi, minimum 18" distance from the wall surface with 36" preferred, fan tip, and no abrasives.
2. Protect masonry from pressure-washing
3. Do not waterproof masonry
4. Use most permeable primer available. As of 2010, this primer was called RBS.
5. Not set precedent, this would be a one-time experimental approval to be monitored as a new product in Wisconsin historic districts.

Previous HPC action

Previous Council action