

Frank Lloyd Wright
Usonian Colored Concrete Floor Mat

October 2012

HISTORY • REPLACEMENT • REPAIR • PREPARATION • COLOR • PROTECTION

BRIEF HISTORY

Frank Lloyd Wright originally designed the Jacobs House ca 1936 without colored concrete. A written correspondence from Mrs. Jacobs stated the floor being "too ordinary".¹

FLLW tried custom color pigments for the Hanna House ca 1936 and specified - Lamp Black, Red Oxide etc. This first attempt was unsuccessful and resulted in many problems leading to the house being carpeted for sixty years until restored it in 2005. Tarantino Architect repaired the damaged concrete and recreated the original color to maintain the historically accurate floor.²

FLLW contacts A.C. Horn in 1938 and discovers the quintessential commercial product called "Colorundum", which was widely used in movie theaters beginning in the 1920's. FLLW begins using a standard color from that product line for most subsequent Usonian houses. This standard off-the-shelf color from A.C. Horn was "Tile Red" as specified on FLLW drawings.³ There were a few exceptions when a client requested otherwise, as in the Reisley House where used Alaskan Brown.⁴ A.C. Horn also produced a color matched protective sealer named "Homlux" later replaced by a matching colored sealer.

The term "Cherokee Red" typically refers to the color of painted metal and is not a floor color.

A.C. Horn was a subsidiary of Tamms (Euclid) a LaPorte Construction Chemical Company along with Specco and Scofield produced Color Hardener and other concrete products with the mineral pigment color: Tile Red # 1117 obtained through Davis Color / Rockwood Pigment. Scofield still produces the product and is the most reliable source with distribution throughout the USA. They are the leading manufacturer / supplier of "shake-on" colored concrete hardener, mostly used today for stamped pattern concrete (fake pavers). The brand name is "Lithochrome". It produces a rich vibrant color while also hardening the surface. It is the same product as A.C. Horn "Colorundum". It should be used for repairs, replacing Unit Modules. If executed properly it matches A.C. Horn perfectly.⁵

¹ Frank Lloyd Wright Foundation Archives - 1993 Penny Fowler & John Eifler

² Frank Lloyd Wright Hanna House (Stanford U)
Concrete Mat Finish Analysis (Part 1-3) - 2003-04 Tarantino Architect

³ Frank Lloyd Wright Richardson House & Bachman Wilson House - Specification (concrete and finishes)

⁴ Frank Lloyd Wright Reisley House - 2012 Roland Reisley

⁵ Frank Lloyd Wright Building Conservancy Bulletin – Vol 2 Issue No. 8 & 9 / Vol 3 Issue No.1
Building Maintenance: Usonian Colored Concrete Mat, by Lawrence Tarantino, AIA
A.C. Horn – 1993 Victor Weber, Senior Technical Advisor for 40 years

Frank Lloyd Wright
Usonian Colored Concrete Floor Mat

October 2012

REPLACEMENT OF CONCRETE MAT MODULES

An experience professional is recommended.

Consider mix, slump, psi and pea stone aggregate as opposed to broken stone. Fiber reinforced concrete may also have benefits. Expansion joints, construction joints and grid control joints are also important to consider. With regard to the Richardson House, Tarantino had special deep joint tools made to ensure the stress cracks no longer pass through the hexagons, but pass around them.

Many of the FLLW floors investigated through a cross-section prove not to have been placed as per the FLLW Drawings. Instead of a 3 1/2" thick Mat many have a thick base slab with a 1 1/2" topping. The slab was executed this way because of the complexity involving the hydronic heating system and for a small crew to control the residential application of the Colorundum System. There were other reasons as well - like whether the heating pipes should be placed on top of the stone base as drawn or embedded in the concrete.

Color must be applied by 'shake-on' method as instructed. Adding the color into the entire mix produces a pale pinkish pastel result, and also wastes too much of the product. Though Scofield produces a "Tile Red" on their current color chart, it is NOT the same as the original A.C. Horn "Tile Red". Tarantino has made samples of all three (3) Scofield Reds. The matching color to A.C. Horn "Tile Red" is Scofield A-27 DARK RED. This product has been used on several projects with success. Even when replacing and retaining some adjacent original units as in the Richardson House, an indistinguishable match to new and old was attained.

PATCH AND REPAIR

Blend and add liquid pigment color to repair mortars but sample carefully before use. The colored hardeners are too coarse with aggregate and do not work well for small repairs. Tarantino uses many different techniques for various conditions. The coarse aggregate in the hardener can also be sieved-out and placed on top of the patch in order to achieve the best color match.

There are also many concrete liquid color pigments available for adding to patch material, some now available a local home improvement centers.

PREPARATION

If the floor has been painted, Peel-A-Way should be considered for removal back to the original surface. Prosoco also provides a line of many professional products for stripping and prepping the surface for etching the surface to accept and absorb stain color. Remember to test the pH and treat the surface as required by the manufacturer.

Frank Lloyd Wright
Usonian Colored Concrete Floor Mat

October 2012

COLOR APPLICATION

Scofield provides a companion product to the color hardener called "Tintura" which is a water-based concrete stain. After the Lithochrome color hardener sets, Tarantino uses this product for color leveling to unify and enhance the color with a specific technique. Though this product still exists, A-27 DARK RED is no longer shown on the Tintura color chart. Scofield makes it for us as a special order and as a custom color in the case of the Hanna House.

Though Prosoco provides stains as well 'Gemtone Stain', they do not offer the correct FLLW Usonian Colorundum match, so it is suggested to stick to their concrete preparation products and use Scofield A-27 Dark Red to get the 'Wright' color.

Each House requires thorough evaluation, investigation and specific sample methods, which usually results in a different approach than the last. Each floor must experiment optional products considered must remain flexible in the solution to what is most appropriate and effective. The Bachman-Wilson House and Auldbass Plantation for instance used a special coating from Delta Products due to particular circumstances.

PROTECTION

Finally, use several coats of a non-slip clear Sealer in a Matte or Low Gloss Finish. The clear sealer is the wear surface intended to protect the colored concrete.

High gloss finishes are not recommended because they are too reflective, glaring and inappropriate for what Wright intended for the aesthetic of the Usonian House.

Colored waxes can be a slip hazard, collect dust, dirt, stain socks, off gas or chip off as with the Hanna House library room. Also colored wax applications are limited to indoor surfaces and were never specified. FLLW did specify A.C. Horn "HornLux" liquid sealer used to unify and protect.³ Wax as a color coat was a homeowner choice and Windsor Wax in #56 RED hard past wax was historically preferred and still available.

"Frank Lloyd Wright Standard Specification - 1954:

Over all concrete floor areas provide and apply "Hornlux" as manufactured by AC Horn. After concrete has thoroughly dried, apply as directed by the manufacturer and allow to dry overnight. Provide and apply one coat Johnson Paste Traffic Wax as directed by manufacturer and buff."³

This application is relevant to the period and assumes that the concrete floors are installed properly and turn out as intended.

³ Frank Lloyd Wright Richardson House & Bachman Wilson House - Specification (concrete and finishes)

Frank Lloyd Wright
Usonian Colored Concrete Floor Mat

October 2012

PRODUCT LIST

The companies listed overlap in offering products for similar purposes. The categories as they are listed below are what work best for Frank Lloyd Wright Usonian Concrete Mats.

Generally speaking, carefully follow manufacturers instructions for each product. For the application of the Scofield Stain and Sealer however, Tarantino has developed a hand-applied technique, which allows control of the final results and provides the most Natural appearance.

SURFACE PREPARATION

PEEL-A-WAY

PROSOCO

SAFSTRIP - multi-layer paint & coating remover for concrete

SAFETCH - non-fuming cleaner and surface-prep for concrete

CURE AND SEAL REMOVER - high-powered surface prep cleaner

CLEANER/DEGREASER - commercial strength detergent

REPAIR / MORTARS

CONPROCO

CONPRO START - consolidates and strengthens base material

CONPRO SET - polymer modified repair mortar

BASF Thoro Acryl 60 - liquid admixture

Sonolastic NP 1 - polyurethane joint sealant (RED)

3M Fire Barrier Sealant - CP 25 WB+ (RED) in a pinch

COLOR FINISH

SCOFIELD

Lithochrome - color hardener (shake-on) – A-27 Dark Red

Lithochrome Tintura Stain - water-based stain for coloring concrete – A-27 Dark Red

PROSOCO

(Gordon House) Custom Color

PROTECTIVE COATINGS

SELECT SEAL 'W' - low gloss sealer

JOHNSON Wax Professional / Diversey Carefree

matte low gloss floor finish / acrylic polymer

traffic coating - ADA compliant slip resistant finish

SIKA – Sikagard Natural Look – clear sealer

Note: Experience matters. Each project presents different challenges with unique conditions circumstances and issues requiring deviation from the rules and experimentation with these products.

2012 © Tarantino Architect

Lawrence Tarantino

AIA • LEED AP • PP