

Wood Paver Alley, Chicago, 2015



Wood Paver Alley, Circa 1909

Exterior End Grain Wood Pavers

Revised April 13, 2023

Exterior Wood Block Pavers have stood the test of time.....

End Grain wood blocks for exterior paving was never a trend; but a time tested, beautiful, and simple solution that was here hundreds of years ago, has now returned, and will be here tomorrow. Wood block pavers combine strength, comfort, and sound absorption, with beauty. When used with our flexible and permeable joint fillers and optional bedding, end grain blocks will be an exclusive choice for your exterior project. There was no other use for the buggy whip, but we've preserved the tradition of a useful, reliable, and renewable wood product. We've re-exposed the beauty that was always there, and transformed it into the most beautiful exterior paving available.

Historian David O. Whitten, former professor at Auburn University once wrote, "*Wood blocks for street paving was not intended as an all purpose paving material, but rather as a special substance for selected streets*". And, we believe end grain pavers remain a special substance even now.

We knew wood blocks were once used as street pavers, but never had we produced or installed our blocks out of doors. That is, until 2008 when a city official from Chicago called us and advised us of an existing street in Chicago, between State and Astor, known as Wood Paver Alley on the national historic register, and paved with wood blocks (see above photo) since 1909. The blocks were 4" in depth, creosote treated, and we believed them to be a Norway Pine from Minnesota. The city determined it was time to replace the existing blocks with new blocks, but new creosote treated blocks

were not a consideration. After city research it was decided that black locust blocks should be used because of their superior rot resistance, without the need for chemical treatment, even in ground contact.

Since their installation at Wood Paver Alley Black locust has become our most popular specie. Black Locust is a medium-sized deciduous tree, extremely hard, with moderate expansion and contraction. When used out of doors black locust pavers will develop a silver gray patina, one of the special and desirable properties of black locust. Once "weathered" gray, the pavers will remain unaltered in appearance for years. Soil type and climate both influence the composition of a tree, which means that each wood block paver can be unique as well. Slight deviations in color, structure, density, and general appearance is absolutely normal. Black locust is native to the central-eastern United States, from Pennsylvania along the Appalachian Mountains, to western Arkansas, southern Missouri, and to northern Georgia and Alabama. The greatest production is actually in Tennessee, Kentucky, West Virginia, and Virginia.



Squeegee Machine application of hot coal tar pitch on a wood block street, circa 1900

Chicago city officials advised their preference for tight joints, or essentially no spaces between blocks. How to do that with a product that will expand when wetted? It was determined and agreed that new blocks should be installed wet, presumably at their largest size possible, so that there could be no issues of expansion after installation. Since the blocks would become wet from rain and snow anyway, we all determined it would be effective to install them wet. Then, our only concern at the time was possible issues from shrinkage. We were concerned that loose blocks might develop from shrinkage, and so we offered the city a tongue and groove block connection. However, city engineers determined it not necessary, and they were right! In 2011 we were favored with a 5,000 sq. ft. order of black locust blocks, 4" depth x 4" x 6", 4" x 8", and 4" x 10" face size. After delivery and left in loose piles to allow rain to keep them wetted, the blocks were placed side by side over a new sand bed with effective drainage, (pictures on request), and with no surface finish ever applied.

In addition to individual blocks, and blocks with tongue and groove connection, we also offer blocks on metal or plastic mesh with desired spacing between pieces. Metal mesh or plastic backed panels with uniform spacing, maximum 1/2" ADA compliant, provides a clean, evenly jointed pattern, either a tile pattern or running bond pattern. Blocks on mesh can easily be removed for custom fitting in corners and around obstacles. The block surface can be sanded smoother before grouting. For large areas, grouting should be done with Romex Rompox Flex-Joint mortar, especially areas over 1,000 sq ft. In addition to the classic Rompox-Easy, Rompox FLEX-JOINT is a two component jointing mortar, suitable for surfaces with joint widths from 5mm (.2"), and joint depths from 25mm (1"), and medium traffic loads. The jointing mortar is water permeable, self-compacting, and water emulsified. Please see www.romex.us

Granulated cork is also an effective flexible dry joint filler. However, it will require a coating be applied over it to secure it in place. Rompox can be applied over the granulated cork, or a water permeable crushed stone can be effective to keep the granulated cork from blowing away. Keeping the joints filled will always help prevent loose blocks from developing. For very small projects Permachink (permachink.com) flexible filler may be helpful, available in caulking tubes in several colors, to be forced into the joints by stiff rubber edged trowels or putty knives.

INSTALLATION, FILLING/FINISHING, AND MAINTENANCE INSTRUCTIONS FOR EXTERIOR BLACK LOCUST PAVERS

Black Locust Pavers, with optional tongue and groove installation, and on mesh with or without spacing. Other species available for exterior application: Iroko, Mesquite, Redwood and treated Pine.

PLEASE READ THE ENTIRE SPECIFICATION BEFORE STARTING THE INSTALLATION.

EXTERIOR END GRAIN WOOD PAVERS

Most of our installations are made with Black Locust. However we do offer Mesquite, Redwood and Pine for some exterior applications. **Black Locust** is a medium-sized deciduous tree native to the central-eastern United States. Extremely hard, and rot resistant. Black Locust will "weather" in a gray tone. Once "weathered", the pavers will remain unaltered in appearance for years.



Weathered pavers with grooves.

Because of its' superior rot resistance, Black Locust is commonly used for fence posts, boat building, and mine timbers.

SIZES, SHAPES AND PATTERNS

Sizes: Pavers can be cut to most any thickness. We recommend they be 2 1/2" to 4" in depth, with minimum depth of 1 1/2". Standard face sizes: 4" x 4", 4" x 6". Other sizes include 4" x 8", 4" x 10" 5" x 5" and 6" x 6".

Custom face sizes on request.

Shapes: Squares, rectangles, and hexagons (*Mesquite paver shown on right*), with optional polished edges and corners.

Patterns: Running bond or tile pattern



1 1/2 " depth x 4" x 4" Black Locust on gravel with, aluminum spine connection



2" depth x 4" x 6" Black Locust pavers on mesh, in running bond pattern, no spaces



2" depth x 4" x 4" Black Locust pavers on mesh, in tile pattern, with 3/8" spaces.

FORMATS AVAILABLE:

- 1.) Plain pavers: rectangles, squares and hexagons.
- 2.) Pavers with grooves, standard 1/4" deep in two parallel paver sides, 1/8" wide grooves for 1/2" x 1/8" aluminum spline inserts, creating a tongue and groove assembly.

3.) Panelized pavers on plastic or on metal mesh. Panel size approximately 2' x 3', with or without spaces between pavers. They can be ordered with uniform spacing up to ½" in width (ADA compliant)



Pavers on plastic mesh panels.

CONDITIONING

Wood pavers can be fabricated from wet wood. Exterior wood pavers to be installed with no joints should ship at or near 25% moisture content, and we recommend they be significantly wetted again before installation to raise or maintain the moisture content to 25% or above. For a "no joint" installation, the intention is to install the pavers at their largest size possible. Only shrinkage after installation might develop.

EXPANSION VOID

Perimeter expansion joints or voids should not be needed if pavers are placed at their largest size possible. Cork strips, asphaltic fiber strips, or rubber gasket material ½" to 1½" wide should be used against vertical obstructions.

INSTALLATION

- 1.) Pavers can be installed directly over compacted soil, or sand, with proper drainage. We suggest having a geo-technical survey made to determine water flow and drainage. Water must be able to pass through the pavers to below. We recommend pavers be at least 2½" in depth. Tongue and groove spline assembly may prevent pavers from being removed after installation, especially after shrinkage. Be sure surface water can leach into the ground. When installing splines, be sure to leave a spline space every 3' to 6' on each row to allow water to migrate below the splines, to the base.
- 2.) Pavers can be installed dry or glued on to a concrete slab, also with proper drainage or run off. Concrete must be pitched at least two degrees for proper run-off, or holes can be made in the concrete slab for essential drainage. We recommend Synthetic Surfaces, Inc., Scotch Plains, NJ, #34 G Adhesive for exterior gluing.
- 3.) Pavers can also be installed over a drainage pad system like Miradrain to allow water to migrate to below the paver surface.
- 4.) All Black Locust areas should be framed using wood, concrete, or other material to keep pavers in place at their perimeter.



Black Locust installation over sand, no grooves, no mesh.



Black locust pavers street application wet from rain.



2 ½ depth x 4" x 6" rectangular Black Locust pavers with aluminum spline for tongue and groove installation.

MACHINE SANDING (OPTIONAL)

If a smoother surface paver is desired after installation you must first allow some surface drying before machine sanding. Sandpaper will deteriorate rapidly if the pavers are wet.

FILLING VOIDS

When the pavers are placed on mesh backing it is important to fill open joints. Keeping the joints or spaces filled will provide lateral support, preventing loose blocks from developing. Joint filler materials used must remain flexible to allow for wood movement. **For residential or other small projects**, the Perma-chink (permachink.com)

'Energy Seal' flexible filler material can be effective, available and dispensed directly from caulking tubes, or from pails with no mixing. Our flexible granulated cork filler material, sold in 25 lbs bags is commonly used for interior wood block installations. Granulated cork can also be an effective filler for exterior applications. It will require a gravel or other heavy topping spread over the cork joint surface so the cork can not blow away. A thin application of a water base urethane can secure the cork in place as well. Spread the dry cork over the paver surface with booms, allowing it to fill open joints, and (optionally) grind the particles into the spaces using a disc-type buffer/sanding machine. Sweep most all excess from the surface. **For larger areas**, especially commercial projects, we recommend Rompox Permeable grout. Mixing required before application, freely wetting the wood paver surface before pouring, spreading and squeegee applying the Rompox on to the surface and into the joints. See romex.us/products/rompox-flex-joint/ ph: 866.766.3963 . Despite its resilience to the forces of nature, Rompox is highly water permeable, and especially effective when used in conjunction with the Romex Trass Bedding System for below the pavers.

FINISHING

Black locust is the most rot resistant specie we offer, and does not require penetrating oils for longevity. In fact, immediately following paver placement while wet, oils will not penetrate anyway. When pavers begin to dry at the surface, you could effectively use a penetrating oil. We recommend **Woca Exterior Oils**, (see woca.com) available in a multitude of colors. Penetrating oils are not coatings and so if used they must be thoroughly wiped from the surface to remove all excess. Or, re-wet the pavers with water to close the shrinkage cracks and spaces. Displacement of moisture by penetrating oils is preferred, but adding back the lost moisture is a good remedy as well.



Vibrating sand joint filling (optional)

SLIP RESISTANCE DATA

Slip tests were conducted on both wet and dry black locust end grain pavers. The black locust pavers test indicate they are “unquestionably above the Slip Resistance Factor range that is considered non-slip when measured wet or dry”. Request a copy of the full report.

MAINTENANCE

To enjoy the longevity of end grain black locust pavers we strongly recommend they remain wetted to keep them tight to each other. For installations where pavers are spaced, we recommend the joints or spaces between pavers be maintained near 100% filled. Re-filling and possibly re-oiling, if ever done, should be considered annually.

KASWELL PAVERS

Exterior maintenance tips:

- Wipe colored spills promptly.
- Keep joints filled, if possible.
- Apply penetrating exterior oils, if possible.
- Keep a secure perimeter.

CARE FOR EXTERIOR WOOD PAVERS

Black Locust is....

- 100% ecological
- Rot Resistance estimate at 50 years
- Brinell Hardness 46N/MM2

To protect your investment, and to ensure that your Kaswell Exterior Paving System provides years of lasting service, we offer the following:

Maintenance is very important. Keep the pavers free from dirt and abrasive particles by sweeping or vacuuming. Lightly clean the surface as needed with denatured alcohol, mineral spirits, Woca Wood Cleaner, or an oil finish cleaner product such as Woca Commercial Oil Cleaner. Keep joints or spaces filled with flexible fillers. Penetrating oils can be effective when the surface is dry enough to allow penetration. Excess oils must be thoroughly wiped from the surface.

Kaswell suggests an individual block paver moisture content 25% or higher for exterior installations made without spacing between pavers. Unless advised otherwise, Kaswell will not dry the stock before fabrication into individual blocks for exterior installation. For drier locations, pavers could be ordered at 15% or less. For any unique environment such as dry desert areas, unusually high humidity or tropical climates, we suggest consulting with us to better determine the suitability of the product, a recommended moisture content for manufacturing, and best methods for installation.

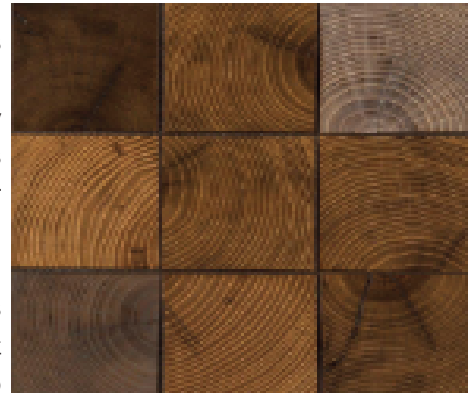


Black Locust on plastic mesh, Harvard University, Cambridge MA

KASWELL END GRAIN PAVERS & SIZE TOLLERANCE

The National Wood Flooring Association does not provide grading information/rules or size tolerance requirements for end grain pavers, as they do for conventional hardwood flooring. And so, we offer the following information, and believe it to be an accurate description of our paving products.

Wood is a natural product, subject to numerous variations in grain, color, hardness, and dimensional stability. Machine tolerances are measured by us during manufacturing only, with a tolerance of +/- .02". Moisture can enter and exit rapidly through the end grain. And, so, after manufacturing, the pavers can gain or lose moisture, thus changing their measurement. Our pavers, as well as other wood items, change in moisture content and dimension during and after fabrication, while awaiting shipment, in transit, and at the jobsite. For this reason, as well as others, it is important that the installer measure and record the moisture content of the pavers at time of delivery. Doing so is necessary to determine the length of acclimation time for your project. The target moisture content for our pavers is 15-20%, with a 5% allowance for pieces outside the range.



Square Pavers, machine sanded with Woca penetrating oils, in colors and in neutral

There is a grading allowance for hardwood flooring shipments of not greater than 5% of the species misgraded or off graded. However, end grain pavers are not graded at all. No description that we can describe, and no sample that we can make, could encompass all possible variations. However, there is an ASTM specification D-1031-86 for industrial pine blocks, which includes block description and size tolerance. The ASTM size tolerance was written as follows: "Permissible variations from the specified dimension shall not exceed 1/16". We recognize that this is for industrial application, and may not be appropriate for high end commercial and residential applications. ASTM does not grade pine block, but they do describe them in detail, and we have adopted their standard for all our end grain species for commercial and residential applications, as follows: "Pavers should be sound and well manufactured, square butted, and square edged, and shall be free from unsound, loose or hollow knots, knot holes, and other defects such as shakes and checks that would be detrimental to their performance". In most cases, normal season checks in end grain blocks are not detrimental to their performance and so we do not consider checks to be a defect.

We can produce pavers in many species that are check-free, sap-free, knot-free, pitch pocket-free, blueing-free, and the number of annual grown rings per inch can even sometimes be a part of a specification. These natural conditions should be addressed when ordering. We encourage you to speak with us about your particular project and specie choice.

Square blocks can go "out of square" after fabrication because radial and tangential expansion and contraction is different. Even rectangular pavers can "go out of rectangle" with a change in moisture content. We recommend our pavers not be installed tightly together side by side.

KASWELL LIMITED WARRANTY

Seller warrants for a period of two (2) years from date of delivery that Kaswell exterior pavers are free from material defects, providing the Kaswell pavers are installed according to the specifications provided by Kaswell in its Exterior Paver Specifications herewith, revised October 2022, and used under normal conditions as outlined in said Exterior Paver Specifications, except as modified herein. It is agreed that if any paver does not comply with this warranty, Seller will either repair the defect, provide replacement paver(s), or refund the purchase price at its sole discretion.

This warranty does not apply to failure of, damage to, or deterioration (including without limitation texture or color change) of the Kaswell exterior pavers from: (i) faulty subsurface preparation; (ii) failure due to settling or degradation of the subsurface; (iii) failure due to standing water or improper drainage; (iv) improper installations or applications not in accordance with Kaswell Exterior Paver Specifications; (v) fading or weathering due to environmental affects; (vi) materials provided by or actions of any person other than Seller; (vii) events of force majeure, including storms, floods, hurricanes, earthquakes, fires, lightning, tornadoes, or other acts of god; (viii) vandalism, civil unrest or other accidental or intentional events; (ix) contact with chemicals not suited for Kaswell exterior pavers, or other contaminants; or (x) normal wear and tear.

In addition, any labor associated with the removal and/or replacement of pavers is not included in this warranty. Any claim must be submitted in writing, along with proof of purchase and continued property ownership, to the Seller at its office located at 60 Pleasant Street, Ashland, Massachusetts 01721, prior to the expiration of the two (2) year warranty period. If Seller determines that the claim is in accordance with this warranty, Seller will either repair the defect, provide replacement paver(s) or refund the purchase price. The choice of remedy is at the sole discretion of the Seller. In the event Seller elects to repair or replace any defective product, the owner shall provide Seller with reasonable access to the product and provide reasonable assistance to the Seller at no charge to the Seller. If the remedy is replacement, Seller will use best efforts to match color, size, and form from Seller's then existing product line.

This Warranty shall be the sole and exclusive remedy for any breach of warranty claim by the owner. Seller shall have no liability to any person for incidental, consequential, or special damages of any kind.

CONDITIONS OF SALE

All pricing is per sq. ft. or surface measure with no milling or cutting waste figured.

All orders are subject to availability of stock for prompt delivery.

Special orders are non-cancelable and non-refundable.

A 15% restocking and handling charge is applicable on all authorized returns.