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H O U S E D E C K R E P A I R

The most common failure of wood decking is due to the fundamental flaw in design.

Normal construction of decks has the planks which form the upper surface placed across and perpendicular to a joist, which may be 2" X 12" on edge (the 12" dimension vertical). This maximizes the stiffness in supporting a deck, which may extend out from the side of a house and have little or no vertical support below.

The planks are screwed or nailed to the joists, puncturing both wooden members. There is, however, a very thin air space between each deck plank and joist because the wood pieces do not fit perfectly. That very thin gap may also open up as the structure moves around a bit with age and changing weather. Rain falls and dew condenses at night, allowing water to collect in these narrow dark spaces. Warmed by the sun, these spaces become a breeding ground for the natural bacteria and fungi which exist everywhere. Over a period of years the wood in these areas is eaten away by this microscopic life. The overall condition is generally called dry rot.

There comes a point at which restoration is no longer practical and replacement must be confronted. It is necessary to define the point at which restoration is impractical. This depends on the amount of strength which the joist may have lost and which practical repairs may be expected to return to the structure.

The following recommendations are based on over twenty years of such type repairs by our customers. We are neither architects nor professional engineers, and we take no responsibility whatsoever for these recommendations. We strongly urge that any structural repair be overseen by a registered architect or structural engineer as appropriate, and done in full conformance with all building codes and existing regulations.

Where the underside of deck planks shows deterioration to a depth of a third the plank thickness or less, then restoration should be feasible. When the top edge of the joist shows deterioration over the full width of the joist and to a depth of perhaps a half inch to an inch it should be feasible to restore the existing joists. When the top edge of the joist shows deterioration extending through no more than a third of the

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thickness of the joist it should be possible to restore the existing joist, but it will be necessary to sister a new structural member onto the existing joist.

Sistering, or the fastening of a new structural member in parallel with an existing weakened one, cannot be done in a piecemeal manner. The new wood and the old wood have different properties and will expand and contract differently. If the repairs are not symmetrical and distributed over the full width of the structure there will be bending, twisting or warping of the deck.

Where a 2 X 12 has severe deterioration along the upper edge, an appropriate repair would have a 2 X 10 glued and screwed to the old 2 X 12 on EACH side, flush with the top edge. The structure is symmetrical side-to-side and therefore would not be expected to bend, twist or warp with age. The new joist strengthening members (sisters) would run the full length of the deck and extend in the adjoining structure if possible. Since the additional supporting structures span the full width of the deck, one would not expect the deck to bend or warp as is the case when only small pieces are sistered to a portion of a joist.

The overall restoration begins with the disassembly of the top of the deck. Each piece of wood which is to be restored is treated in the prescribed manner, and missing portions of wood replaced with filler. Upon reassembly, a high-adhesion synthetic rubber sealant is used to fill all the spaces between planks and joists. This prevents the reoccurrence of the kind of deterioration which damaged the deck in the first place.

In many cases the owner values the aged, weathered appearance of the old deck. It is usually possible to maintain the same appearance by using the same deck planks, and with sufficient artistry in color-matching the filler to the old wood joists the repairs may not appear obvious even from below.

The following procedure is a rough guide for the experienced contractor or the talented amateur. Remember that every situation is different and there is no substitute for looking and seeing and understanding.

1) If the deck planks are screwed down the screw must be removed from above. If the deck planks are nailed, the nails may be removed easily by striking them from below with a dead hammer. Once the deck and joist are slightly separated a wedge may be driven in (below) from the side, or the planks may lift up easily with the dead hammer. It is also often feasible to strike the plank from below, lifting it up a bit, and then hit it from above with the dead hammer. This should be done adjacent to the joist and usually results in the nail standing proud (above the plank). The nail may then be pulled out from above with an appropriate tool.

2) Number the planks on the edge with a pencil to aid reassembly in the same order on the deck.

3) Place the planks upside down on a few sawhorses. Using a wire brush, lightly scrub the area where the plank laid on the joist to remove the loose, badly deteriorated wood.

4) Soak the bottom side of each plank with Clear Penetrating Epoxy Sealer™ (CPES™). If it is important to preserve the weathered appearance of the deck then the planks should be turned over promptly (within perhaps 1/2 hour) and solvent-cleaned with Epoxy Clean-up Solvent™ and paper towels to remove the CPES which has soaked through to the top side. If this is not done before the CPES cures there will be visible patches of epoxy on the top, which may take many months to weather away. It is important to remember that absolute perfection cannot be attained. Restoration is the art of approaching the original, but a sharp eye may see some evidence that repairs were done.

5) Allow the deck planks to dry for at least 48 hours, with the bottom side up. This aids the evaporation of solvents and cure of the CPES.

6) Using a wire brush, lightly scrub the top edges of the joists to remove the soft, badly deteriorated wood. Wood soft enough to be scabbled away with the bare fingers should definitely be removed.

7) Soak the top edge of each joist with CPES. *Ensure that the wood is completely saturated.* Where the nail holes show extensive and prolonged absorption it is usually desirable to ream out the deteriorated wood around each nail hole with a 1/2" drill and then continue the impregnation process. Place something under the joist to catch the CPES runoff (for filtering and recycling) if desired.

8) Allow at least 48 hours for the solvents to evaporate back out of the wood. In case of severe deterioration where deep impregnation has taken place, one to two weeks drying time may be necessary. As a general rule, when the impregnated areas no longer smell strongly the restoration procedure may be continued.

9) Replace missing wood with Fill-It™ epoxy filler. This extremely high-quality filler does not shrink or absorb water. It was made originally for underwater repairs on boats. When cured (usually overnight) it may be sanded or shaped with normal woodworking tools.

10) Sister any joists that may require it. Use substantially clear grain fir with few and small knots, if any. Use Smith's Tropical Hardwood Epoxy™ (it will glue all woods) or 2-Component Polysulfide rubber as the glue and bedding sealant between sisters and the original members. Screws or ring-shank nails are preferable to plain nails. Nail or screw the sisters before the adhesive cures, and ensure their top edge is flush with the top edge of the original joist.

11) When the sealant has cured use a sharp wood

chisel or a serrated knife as appropriate to remove any excess rubber that may have squeezed out on the top edge.

12) The deck planks are now ready to be replaced in their original numbered order. Drill suitable pilot holes for any screws or nails that will need to go into filler. Place each plank in its original position, drill the pilot holes, and then take up the plank. Mix a small portion of Smith's 2-Component Polysulfide rubber and knife it onto the top surface of each joist where the plank rests. Replace the plank and drive the nail or screw through the plank, through the wet sealant and into the joist. Boats are repaired in this manner and the life of the repair may be expected to exceed the life of the deck.

The color of the 2-Component Polysulfide Rubber is somewhat brown to tan, even though when first mixed the color may seem greyish purple. The final color is not easily altered. If location and useage is such that it will be visible, this consideration may need to be addressed.

Color Matching

The color of the Fill-It Epoxy Filler™, when cured, is an off-white that will yellow somewhat on exposure. Should it be desired to match the color of wood this material can easily be changed to match any wood. Natural wood colors range from yellow to red to tan to brown to grey or black. All these shades can be obtained by various combinations of only four color pigments: white, red, yellow and black. Dry powder pigments which are fully compatible with our products (universal liquid color concentrates are not) are available from Smith & Co.

The Fill-It parts A and B should be mixed together as the product instructions recommend. Then, as each pigment is added, color will develop with mixing. Continue mixing until no further color change is seen with continued mixing. Only then add another color pigment.

Add a small amount of dry white pigment, perhaps a tablespoon or two for a mixed quart. Next, a small amount of red or yellow may be added to approximate the red-yellow balance. Then add a little black to darken to the desired color. Then, try a little more red or yellow if needed. Should the mix be too dark, add some more white to lighten the mix. Do this with a small portion of mixed filler at first.

SOME EXPERIMENTATION MAY BE NECESSARY.

All of these materials may be painted when cured. Many paints can be applied directly. With the CPES applied first as an adhesion-promoting primer, all known latex, enamel, epoxy or urethane paints may be applied. Some experimentation with stains will be necessary to see exactly how a finish will look over wood with or without epoxy impregnation or epoxy fillers. Remember also that every piece of wood is different and the appearance of stained wood will vary.