Assessing Water Damage After A Flood

Note: Information herein is intended to provide guidance about the serviceability of wood structural panels after a flood. This piece is not intended to address potential health and indoor air quality concerns that may arise in this circumstance. This type of information is available from the Federal Emergency Management Agency (FEMA) and the American Red Cross. "Repairing Your Flooded Home" is available free from FEMA Publications, P.O. Box 70274, Washington, D.C. 20024. (Extensive damage may require professional services to assess and repair wood construction.)

Wood Construction And Water

Wood construction is durable and will normally be structurally sound after severe water exposure during a flood. Structural plywood and oriented strand board (OSB) used in floors, walls and roofs are made with water-resistant adhesives that retain their strength when wet. Although the panels will be more rough from water exposure, they are still structurally sound. Panels saturated with water will feel less stiff than those in a dry condition. Once the panels are dry, strength typically returns and only minor repairs may be necessary. It should be noted that some plywood panels manufactured prior to about 1972 for interior use may contain adhesives which are not fully water-resistant. These panels can be identified by the term "Interior" in the grademark.

APA Trademark Identification

To tell if your APA plywood has water-resistant adhesives, look for the APA trademark. *APA – The Engineered Wood Association,* formerly the American Plywood Association, is the quality assurance agency that many wood structural panel manufacturers use. Older plywood may bear the DFPA trademark (APA's original name was the Douglas Fir Plywood Association). The trademarks will typically be in black ink printed in one or more places on one side of the panel.

The trademarks on APA plywood with water-resistant adhesives will contain the words "Exposure 1" or "Exterior". OSB is made with water-resistant adhesives and will also say "Exposure 1" (or "Exterior" for siding).

Fungal Decay Prevention

Once flood water recedes, fungal decay organisms are presented with an ideal moisture condition. Therefore, it is important that the wood dry as soon as possible to ensure that the wood decay does not affect structural capacity.

How to preserve sound structures:

1. Clean out all mud and debris in contact with panels, studs, joists and beams. This will allow the wood to dry and permit inspection for structural damage.

2. Remove carpeting, pad and vinyl. This is vital to allow the panels to dry.

3. Remove wet interior finish (such as gypsum wallboard) from walls, remove wet insulation and clean out any mud and debris. This will encourage free air circulation to speed the drying process.

4. Remove wet insulation from crawl spaces (and the attic too, if it is wet).

5. Remove standing water from crawl spaces. Standing water will prevent floors from drying.

6. Open up any other wet cavities to allow air to circulate freely.

7. Finally, make every effort possible to speed the drying process. Drying speed is relative to the thickness of the wood being dried, the humidity, the temperature and the amount of air circulation. Heating the structure, if possible, will greatly speed drying. Use fans and dehumidifiers to help move the air. If heat or dehumidifiers are not available, open all doors and windows to encourage air circulation. Depending on conditions, the drying process can take from a week or two to several months.

How To Tell If The Panels Are Dry

The use of a moisture meter is the easiest way to determine moisture content. Panels are dry when the moisture content is 15 percent or less, and usually safe from the threat of decay when 20 percent or less. Most general contractors and flooring installers have meters. They can also be ordered from a contractor supply or hardware store.

What About Odors?

Mud may contain sewage or micro-organisms. To minimize the possibility of odor problems, hose out all wall cavities and connection joints, such as between wall studs and bottom plates. Other common causes of odor are mold and mildew. To minimize this potential, thoroughly dry all concealed spaces.

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What Will Plywood Or OSB Panels Look Like Once They Are Dry?

They won't look as good as when they were new, but they should be serviceable. Because they are a wood product, both plywood and OSB will swell, especially around the edges, and the surface will become uneven. Localized blistering of plywood may be evident. (Raised or blistered veneer over knotholes and core gaps in the outer veneer of plywood are not delamination. A core gap is an open veneer joint extending partially or completely through the interior of a panel.)

What About Buckling?

Floor panels may have expanded and buckled out of plane between supports. There are two ways your contractor can remedy buckling:

1. First, run a circular saw (set to the panel thickness) along the panel joints. This is called "kerfing," and will help relieve the pressure that causes buckling. If tongue-and-groove edges are cut, they must be blocked from underneath, or a layer of APA underlayment must be installed over the top with the underlayment joints offset from the subfloor joints. However, kerfing and drying may not completely remedy buckling.

2. The second remedy involves installing blocking under the buckled portions of the floor to push the panels flat again:

a. Enter your house's crawlspace or basement.

b. Identify the buckled area from underneath and measure the distance between the two joists that support the buckled floor section.

c. Cut a piece of lumber that is the same dimension as the floor joists (i.e.: a 2x10 joist. Cut a "block" from another 2x10).

d. Nail this support block to joists underneath the swollen panel joint.

e. Go upstairs and "push" the panel flat again by nailing it to the block underneath.

What About A Rough Floor Surface?

It may be possible for your construction professional to sand the panel face and edges with a commercial sander. Installing a layer of APA underlayment over the top usually will correct the problem. Offset all edges and nail to the existing panels with ring-shank nails.

How To Prevent Floor Squeaks

One source of floor squeaks may be a loose space created around nails in the floor panels. This is a result of the swelling and shrinking the panels experience in the wet/dry cycle. To combat floor squeaks, re-nail with ring-shank nails after the panels and lumber are dry. Squeaks may also arise in the cross-blocking or bridging between floor joists and between walls and floors. Precautionary re-nailing at those points may be advisable if they will be inaccessible after the renovation.

How To Tell If Plywood Is Delaminated

Delamination is a separation of the individual "plies" or veneers in plywood. This condition is not common.

Dry delaminated floor panels may feel soft or spongy when stepped on. The face ply may appear wrinkled. If you suspect delamination, walk over the areas of concern, after the plywood is dry. Panels with exceptionally soft spots may need replacement. Localized swelling, or blistering over knotholes and core gaps, is not delamination and does not compromise the structural integrity of the panel. If necessary, blisters over knotholes may be repaired by injecting glue under the affected areas.

Will Plywood Delaminate At Some Future Date?

It is not likely. Subsequent soakings seldom cause additional damage.

Other APA References:

Technical Note X485: *Condensation – Causes and Control*

Technical Note R495: *Controlling Decay in Wood Construction*

Technical Note R465: *Checking in Glued Laminated Timber*

Technical Note D481: *Buckling of Plywood Sheathing*

Technical Note F410: *Buckling of Plywood Panel Siding*

Technical Note J805: *Field Repairs of Plywood*

Technical Note L805: *Mildew Discoloration of Wood Siding*

Research Report Z820: *Plywood in Hostile Environments*

We have field representatives in many major U.S. cities and in Canada who can help answer questions involving APA trademarked products. For additional assistance in specifying engineered wood products, contact us:

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