

# Inspection Checklist for Detecting Structural Decay and Structural Damage

Check the following locations for structural decay and pest damage. Check both visually and by probing with a pointed tool, such as an ice pick. Look for signs of moisture, damaged wood, insect frass, and termite earthen tunnels and/or fecal pellets.

## **Roof, Overhangs, Gutters, Eaves, Trim, Attic**

### **Roof Surface**

Check the roof for cracks, missing shingles, and other openings where moisture might enter. Shingles should extend 3/4 inch or more beyond the edge of the roof and should form a continuous drip line at the eave and end rafters, or at the rake boards that cover the end rafters.

Remove leaves from the roof surface, and replace any missing shingles. Install flashing or an aluminum drip edge under the first course of shingles to divert rainwater from the fascia board and walls of the building.

Be careful not to block eave vents. Install flashing; it should curl over the forward edge of the fascia board about 2 inches and then run about 6 inches beyond a vertical line drawn from the inside face of the wall studs.

Check for the formation of masses of ice on the roof near the gutters, which can lead to water filtration and/or excessive condensation on interior attic walls.

### **Gutters**

Check for poorly sloped, clogged, rotted, or leaking gutters that can lead to eave, overhang, or siding leaks and rots. Remove leaves and twigs that absorb moisture and cause rot. Flush gutters with a hose prior to the rainy season. Install downspout leaf strainers and gutter guards.

### **Attics**

Extra effort is needed to inspect areas difficult to see or reach. Use a good light source and a probe. Search for rain seepage or decay around vent pipes, antennas, wall top plates, skylights, and other vents.

### **Eaves, Overhangs, and Fascia Boards**

Make sure there is at least 18 inches of overhang to allow proper water runoff. Extend short overhangs. Search for soft, tunneled, cracked, or exposed areas. Check areas where algae, moss, lichens, or discoloration occurs; these symptoms may indicate moisture problems and termites.

### **Flashings**

Make sure areas around vents, chimneys, and dormers are flush and well sealed. Rusty or broken nails can cause problems in flashings. Aluminum or galvanized nails are required to prevent electrolysis (a chemical reaction between dissimilar metals that causes the nails to disintegrate). Seal nail head and flashing joints with marine-quality caulk or silicone (tar preparations are cheapest, but they crack after a few years in the sun).

### **Damaged or discolored areas**

Search for exposed areas that are soft, tunneled, cracked, rotted, or blistered. Check for algae, moss, lichens, or discoloration, since these areas indicate potential openings for fungi and/or insects. Locate the sources of moisture and make the necessary repairs.

## **Outside Walls**

### **Rusty Nails**

Check for rusty nails or nail staining, which indicates moisture within the wall and/or the use of non-galvanized nails. Replace nails with aluminum or galvanized nails or screws.

### **Deteriorating Paint**

Look for signs of deteriorating paint such as loss of paint sheen and bubbling and peeling; scrape and sand

the surface and repaint. If the wood seems soft, weak, or spongy, scrape out the spongy parts. If holes are smaller than 1/2 inch in diameter, fill them with caulk. Larger holes can be filled with epoxy wood-filler. If holes are very large, replace the wood.

### **Building Siding That is Stained or Buckled**

Stained or buckled siding (with or without peeling paint) is a symptom of underlying moisture, rot, or insects. Check for moisture caused by splashing rain or lawn sprinklers. If possible, remove the source of the moisture and refinish or replace the damaged wood. Consider using a more durable material, such as aluminum siding. Pressure-treated woods are treated with toxic materials and their use should be minimized.

### **Damaged Wood Junctions**

Moisture and insect problems often occur where wood pieces join or abut, particularly when there is shrinkage, splintering, or settling. Corners, edges of walls, roof-siding intersections, and siding-chimney contacts are particularly vulnerable. Apply water repellent and caulk to these joints, and monitor them regularly for building movement.

### **Weathering of Exposed Lumber/Beam Ends**

Check for expanded, split, or cracked lumber ends, which provide access for moisture and insects. Even previously treated wood is subject to attack if the openings are deep enough. Caulk cracks and monitor for further developments.

### **Loose Stucco or Cracks in Stucco**

Search for cracks, especially stress cracks around windows and doors. These conditions can provide access to moisture, termites, and decay organisms. Caulk cracks. If they are large, consider replacing the old stucco.

### **Moisture Accumulation around Laundry Facilities, Especially Dryer Vents**

Check for signs of moisture accumulation around the vent. Modify the vent to direct exhaust air away from the building.

### **Moisture Associated with Pipes and Ducts**

Check for moisture where ducts pass through wooden parts of a building. Also, check downspouts during heavy rains for leakage and proper drainage. Insulate ducts, install splashguards below downspouts, repair the spouts, and direct water away from buildings.

### **Moist Window Sills, Windows, or Doors**

Check for cracked sills and casings, and poorly fitted windows and doors. Badly fitted doors may indicate warping of the door or its casing from excessive moisture or uneven house settling. Moisture problems can alter door jambs. Warped and cracked sills and poorly fitted windows and doors allow water access which aids decay and provides initial insect habitat.

Caulk cracks and monitor for further development. Warped door thresholds and jambs may need replacement, and casings may need repair if the cracks are too large to caulk effectively.

## **Foundation and Grade**

### **Soil Surface**

Make sure the soil surface slopes away from the school building in order to carry water away from the foundation. Seepage under the foundation will cause it to crack and settle. Add fill to direct the water away from the house but make sure there is at least 8 inches between the top of the fill and the sill. If clearance is small, consider installing foundation “gutters”. Install splash blocks and perforated pipe. Check their performance during rains or test the system with a hose. A sump pump can also be used to move water away from the foundation.

### **Low Foundation Walls and Footings Allowing Wood-to-Soil Contacts**

Check for wood in contact with the soil. Wood should be at least 8 inches, and preferably more, above the soil surface. Low foundation walls or footings often permit wooden structural members to be exposed to the soil, providing access for subterranean termites. Repair these areas or install subgrade concrete “gutters” where the house sills sit too close to ground level. Remove wood that is exposed to the soil and replace it with concrete.

### **Foundation Cracks**

Check for cracks that allow decay organisms access to wood. Cracking may also indicate uneven house settling. Monitor cracked walls for discoloration and seepage during rains. Termites use cracks to gain access to wood hidden from view. If the problem is serious, the foundation may need repair.

### **Brick Veneer or Stucco Applied to the Foundation**

Check the bond between the veneer or stucco and the foundation wall. If it is failing, moisture and termites may have a hidden entrance to wooden portions of the building. Remove the loose covering and explore the extent of the decay.

### **Crawl Space, Basement, and Foundation**

Make sure enclosed crawl spaces are vented to allow moist air to escape. Milder climates are especially vulnerable to dry-rot fungus. In humid climates, the subfloor can be wet from condensation from interior air-conditioning. Shrubbery or other obstacles that block airflow through foundation vents cause air underneath the house to stay warm and moist—an ideal environment for termites.

Clean existing vents of dust, plants, and debris. Foundation vent openings should equal 2 ft<sup>2</sup> of opening for each 25 linear feet of outside wall. An opening should occur within 5 feet of each corner. Add more vents if needed. The top edge of the concrete under all vents should be at least 6 inches above the finished grade to allow sufficient ventilation. Vents located below grade may require wells to prevent surface water from entering subfloor and basement areas. Divert roof drainage away from vents.

### **Corners of the Building**

Check for moisture accumulation and stains at junctions of wood surfaces in these areas. Install additional cellar or crawl space vents.

### **Enclosed Areas**

Check for proper ventilation under staircases, porches, and other enclosed areas, since these are vulnerable to moisture accumulation. Look for decayed, discolored, or stained areas. Adjust or add venting.

### **Vapor Barriers**

Check for condensation on the subfloor and/or sill, which may indicate the need for vapor barriers on the subfloor and on the soil surface in the crawl space. Such barriers can be installed to reduce the moisture resulting from poor soil grading, unexpected seepage, or high rainfall.

Cover the crawl space soil surface with a 6-mil polyethylene vapor barrier. Use polyethylene, not roofing paper, which can rot. A slurry of concrete can be placed over the plastic to protect it from rodents. Where condensation continues, consider installing extra vents or electric-powered vents whose fans and openings are operated automatically. A sump pump can be installed to remove standing water.

### **Wood-to-Stone or Wood-to-Concrete Contacts**

Check to see whether the wood is pressure-treated (look for perforation marks from the chemical injection on the surface of the wood ). Replace untreated wood with rot-resistant or pressure-treated wood. Be sure sealing material is used between the wood and stone or concrete, and place a metal washer between posts and footings.

### **Leaky Pipes or Faucets**

Even small leaks keep the wood or soil underneath continuously moist, thereby setting up ideal conditions for termites. Areas where rain splashes on walls should be protected with rain guards. Do not allow sprinklers to spray the side of the building. Fix all leaks, and change irrigation practices where necessary.

### **Water- or Space-Heating Units**

Check to see whether the heating unit is insulated. If the soil near the flame is kept warm throughout the year due to lack of insulation, microbial and insect development will be accelerated. Insulate the heater and cover the soil with concrete.

### **Paper Collars around Pipes**

Since paper is almost pure cellulose, it is extremely attractive to termites and should be removed and replaced with other insulating materials not capable of being eaten by termites.

### **Miscellaneous Openings**

Meter boxes, bathroom inspection doors, pet doors or openings, milk delivery doors, and air exhaust vents should be checked for water access, cracks, termite pellets, and soft areas.

## **External Areas**

### **Porches**

Check for wooden steps touching the soil, and inspect for possible decay or termite access. The porch surface must slope away from the building to carry rain away quickly. If the porch does not slope away from the building, check siding for moisture and termites. Tongue-and-groove flooring is a water trap. If there is a space between the porch and the building, check for drainage problems.

Caulk and repair cracks. Fill spaces between tongue-and-groove floorboards with caulk or resurface and refinish with wood-sealing compounds and appropriate paint. Another floor can be placed over the first.

### **Earth-Filled Porches**

Soil should be at least 8 inches, (optimally 12 to 18 inches) below the level of any wooden members. Remove the excess soil where possible, regrade to enhance drainage and redesign the porch to eliminate earth/wood contact.

### **Planter Boxes**

Check planter boxes that are built against the building. If they are in direct contact with the building, they allow direct termite access to unprotected veneer, siding, or cracked stucco. One remedy is adding 2 to 3 inches of protective concrete wall between the planter and the building. An air space several inches wide must separate the planter wall from the building and must be kept free of dirt or other debris.

### **Trellises and Fences**

Check for wooden portions of the trellis that touch the soil and are connected to the house, since they provide a direct link to the house for wood-rot and termites. Check fence stringers and posts for decay. Cut off the decay and install a concrete footing for trellises and fence posts. Replace decayed stringers and leave a small gap between the stringers to allow air circulation. Separate wood and concrete with metal washers.

### **Wooden Forms around Drains**

These are sometimes left in place after the concrete foundation is poured and provide termites with access routes to inner walls. Areas and joints around pipes rising from slabs should be sealed with tar or other adhesive to prevent water and termite access. Caulk the holes and monitor them for decay and excess moisture.

### **Gate Posts, Fence Tie-ins, Abutments and Columns**

Inspect these for weakness and rot especially around areas adjacent to the soil. Exposed areas can provide

cracks for termite invasion. If wooden posts go through concrete into the soil below, check the posts for evidence of termite attack. The bottoms of these posts should be cut and replaced with a concrete footing. Cut post tops at an angle to promote runoff and prevent water from penetrating the vulnerable end grain.

### **Balconies and Landings**

Surfaces should be sloped away from the building. Check junction of floor and siding for moisture and insects.

### **Wood Debris under and around Buildings**

Pieces of wood, particularly partially buried tree roots or construction lumber, can help support a termite colony until the population grows large enough to attack the house itself. Since cardboard boxes are very attractive to termites, they should be removed from crawl spaces or basements with earthen floors.

### **Interior Locations**

Areas with water stains or mold growth indicate excessive moisture and should be analyzed for corrective action. Pay special attention to areas listed below.

#### **Kitchen Pipes**

Look for condensation and leaks, especially where pipes enter walls. Repair leaks and insulate pipes where condensation is excessive.

#### **Counter Areas**

Check around and below sink surfaces for moisture and decay. Caulk or otherwise protect wall surfaces from moisture. Subsurface areas damaged by water leaking from above may be tolerated if the surface leaks are repaired.

#### **Exhaust Vents**

Check for moisture leaks from outside. Repair with caulk or water-resistant sealing material, or replace the vent and the rotted wood around it. Use extra flashing to fill the gap.

#### **Toilets**

Check the integrity of the floor around each toilet base by thumping lightly with a hammer. Check the wax seal for leakage at the floor/toilet pedestal intersection. Check the cellar or crawl space beneath the toilets to see whether the leakage has caused damage. Replace the wax seal if necessary and repair the surrounding water damage.

#### **Showers and Sinks**

Check all sinks and showers for a sound caulk seal. Look for splash over on the floors from inadequate water barriers or user carelessness. If moisture is visible from crawl spaces, it may indicate a crack in the floor or in drainage pipes. If moisture is visible in the ceiling, it may indicate cracks in the delivery pipes.

Repair or replace flooring materials, pipes, drains, or sink basins if necessary. Sealing compounds may be useful when leaks are relatively recent and small, especially if termites have not been found; however, regular monitoring is necessary if sealing materials are used.

#### **Tile Walls**

Check for mildew stains. Make sure the grout in tile walls has a silicone coating to prevent water penetration. Clean the walls regularly to remove mildew and improve ventilation.

#### **Ceilings**

Check for blistered areas, since these can indicate moisture leaks in the area above or inadequate installation of a vapor barrier. Repair leaks and faulty vapor barriers.

**Windows**

Check for moisture accumulation and/or water stains on window frames and walls. Search for evidence of decay or insect attack next to glass areas where condensation accumulates, at edges where moldings meet walls and casings, and in window channels and door jams. Gaps between window and door casings may be avenues for hidden moisture and insect access. Check interior walls beneath windows, especially if they are regularly wetted by garden sprinklers.

Open windows when feasible to improve air circulation. Install double- or triple-glazed windows when replacement is necessary. Use aluminum frames if wooden frames are decaying. Adjust or move sprinklers so water does not hit windows.

**Closets**

Check coat and storage closets for dampness. A light bulb left burning continuously in a damp closet will often generate enough heat to dry it out, but make sure the bulb is far enough away from stored materials to avoid creating a fire hazard. Containers of highly absorbent silica gel, activated alumina, or calcium chloride also remove moisture from the air in enclosed spaces. These agents should be placed out-of-reach to avoid accidental exposures. Avoid use of silica gel where children may tamper with the containers. These chemicals can be reused after drying them in the oven. Small exhaust fans can also improve closet ventilation.

**Floors**

Sagging or buckling floors can indicate shrinkage or rot from excessive condensation or water leaks. Gaps between floor and baseboards can indicate wood damage from insects, fungi, or water-triggered swelling and shrinkage.