

Wood Preservation

Introduction

Wood is not a major construction material in most modern institutional buildings, but it is used as blocking, nailers, sleepers, cants and grounds in key assemblies. Wood is also used in site and temporary applications such as walkways, barriers and railings. Wood is utilized primarily for its low cost, ease of field fabrication and ability to hold bolts, screws and nails.

Wood used in interior finishes (floors, doors, wall panels, trim) is generally finished, in a controlled environment and subject to visual observation. When wood is used in construction assemblies it is unfinished and concealed and requires treatment to protect it from fungus, mold and wood destroying insects.

Wood in construction assemblies in contact with concrete and steel may be exposed to condensation or rising dampness (figure 1). Wood in enclosed spaces may be subject to high heat and humidity. Wood used in site and temporary applications may be exposed to the weather and in contact with the ground. All of these conditions can lead to attack by wood-decay fungus or insects which feed on the cellulose in wood and reduce its strength.

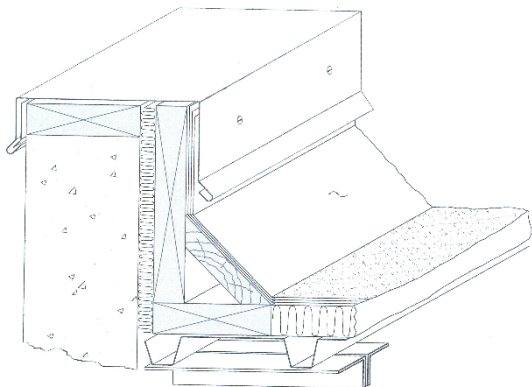


Figure 1: Wood members in a parapet detail

Options for increasing wood durability include using naturally rot resistant species (e.g. redwood and cedar) or thermally modified (torrefied) wood. The most commonly used preservation method for wood in construction assemblies is pressure-treating, where the wood is permeated with insecticides and fungicides.

Pressure-Treated Wood

The American Wood Protection Association (AWPA) is the industry organization which sets standards for pressure-treated wood. The AWPA provides Use Categories to define appropriate applications for specific products¹. Categories typically used in institutional buildings include:

- Category UC1 for interior construction dry
- Category UC2 for interior construction damp, not in contact with the ground

- Category UC3B for exterior construction not in contact with the ground
- Category UC4A for construction in contact with the ground

For many years chromated copper arsenate (CCA) and ammoniacal copper zinc arsenate (ACZA) were industry-standard wood preservatives. Environmental and health concerns has lead to CCA and ACZA being replaced with safer alternatives, including preservatives using copper in lieu of arsenic.

The Environmental Protection Agency (EPA) registers several wood preservatives which have lower toxicity than CCA, ACZA and other older products. An overview can be found in the EPA's Overview of Wood Preservative Chemicals².

Considerations

When detailing with pressure-treated wood assemblies a number of items should be considered, including:

- Some wood preservatives contain metals, including copper, which cause galvanic corrosion when in contact with steel and aluminum. All steel in contact with preserved wood, including bolts and fasteners, should be stainless steel or galvanized. Steel decking, structural steel, aluminum flashing and other components should be separated from preserved wood by a flexible membrane separator.
- Wood preservatives may not be absorbed uniformly throughout a member, so cut ends should be treated with a preservative application.
- Some preservatives, including borates, can leach out of the wood so should not be exposed to flowing water or ground contact.
- Although field-applied preservatives are available and provide a level of protection, they cannot give untreated wood AWPA UC1 performance. Untreated wood which has been installed must be replaced.
- Preserved wood is protected from insects and rot, but will still absorb water and warp, check and split. Wood exposed to weather should be treated with a water repellent and detailed appropriately.
- Due to chemical content, protective equipment may be required when handling wood treated with preservatives. This is in addition to the precautions required when working with sawdust.

Reference:

¹American Wood Protection Association Use Category System: User Specification for Treated Wood

<http://www.awpa.com/standards/U1excerpt.pdf>

²EPA, Overview of Wood Preservative Chemicals

<https://www.epa.gov/ingredients-used-pesticide-products/overview-wood-preservative-chemicals#residential>