

Flood-Damage-Resistant Material Considerations

Introduction

The National Flood Insurance Program (NFIP) defines a Base Flood Elevation (BFE) in special flood hazard areas (SFHAs) based on the expected height of flood water during a flood that has a 1% chance of being equaled or exceeded in any given year (commonly called the 100-year flood). NFIP requires that the lowest floor of a building be above the BFE height. Effectively, all habitable spaces in new construction must be above the BFE. FEMA [Technical Bulletin 2, Flood Damage-Resistant Materials Requirements for Buildings Located in Special Flood Hazard Areas in accordance with the National Flood Insurance Program](#), clarifies that “An unfinished or flood-resistant enclosure that is used solely for parking of vehicles, building access, or storage is not the lowest floor, provided the enclosure is built in compliance with applicable requirements.” All building materials, with a few exceptions like some wiring, used below the BFE are required to be “Flood Damage-Resistant Materials.”

FEMA [Technical Bulletin 2](#) provides additional guidance regarding minimum floor heights relative to the BFE and flood-damage-resistant materials. Additional information can be found in FEMA’s “Home Builder’s Guide to Coastal Construction” which is a compilation of [37 fact sheets](#) providing technical guidance for the construction of coastal residential buildings.

What is a “Flood Damage-Resistant Material”?

The NFIP defines a **flood damage-resistant material** as “any building material capable of withstanding direct and prolonged contact (i.e., at least 72 hours) with floodwaters without sustaining significant damage (i.e., requires more than cosmetic repair).” The cost of cosmetic repair should be less than the cost of replacing building materials. In addition, combinations of otherwise flood-resistant materials that trap water and prevent drying after a flood are not permitted below the BFE.

Unacceptable Wood Materials Below BFE

The following are examples found in [FEMA Technical Bulletin 2](#) of wood materials that are unacceptable below the BFE:

- Hardboard
- Particleboard
- OSB
- I-joists
- Materials that become dimensionally unstable when subject to wetting and drying
- Materials that absorb water excessively or maintain high moisture content after submergence

Acceptable Wood Materials Below BFE

The following are examples found in [FEMA Technical Bulletin 2](#) of wood materials currently considered flood-damage resistant:

- Sawn lumber (untreated, preservative-treated, or naturally durable)
- Plywood (exterior grade, marine grade, or preservative-treated)

Additionally, [FEMA Technical Bulletin 2](#) allows for materials and products not listed to be evaluated for flood damage-resistance requirements using the manufacturers’ literature (i.e., specifications, materials safety data sheets, test reports) or to be used if accepted by the local official.

Many jurisdictions will provide a list of approved flood-resistant materials that can be used in their local coastal environments. Check these lists and include all proposed construction and materials in approved plans.

Trus Joist® Engineered Wood Products (EWP)

Currently there are no standardized performance criteria in place to determine if products, other than those listed in [FEMA Technical Bulletin 2](#), are acceptable as Flood Damage Resistant Materials. Products not included in the document are left up to interpretation. However, a prerequisite for flood damage resistant materials is to have minimal swelling or strength degradation after flooding and re-drying.

All Trus Joist® engineered wood products (EWP) are durable (constructed with exterior grade, waterproof adhesives) and expected to be exposed to moisture during construction. However, EWP may experience permanent swelling and changes in structural properties after exposure to flooding. With an exception for Parallam Plus® PSL, these effects have not been considered in the establishment of design properties for Trus Joist® EWP, therefore, Weyerhaeuser does not recommend these products for use below the BFE.

As stated above, Parallam® Plus PSL has been effectively flooded during the treating process, and the effects of this exposure on product dimensions and strength have been considered in the product manufacturing process and in the establishment of design properties. Based on comparison to acceptable wood materials in [FEMA Technical Bulletin 2](#) and its long history of performance as an outdoor treated wood, Weyerhaeuser believes Parallam® Plus PSL meets the intent of the NFIP for construction below the BFE. For additional information, see the Parallam® Plus PSL Specifier's Guide, [TJ-7102](#).

TABLE 1. FLOOD DAMAGE RESISTANCE OF TRUS JOIST® PRODUCTS.

Product	Flood-Damage-Resistant, Acceptable Below BFE?
Parallam® Plus PSL	Yes
TJI® Joist, TJ Rim®	Not allowed per FEMA Technical Bulletin 2
TimberStrand® LSL, StrandGuard® LSL, Microllam® LVL and Parallam® PSL	Not recommended, effects of flooding have not been considered