

## **FIRE-RETARDANT-TREATED WOOD ROOF SYSTEMS**

In certain unsprinklered one-storey buildings, the NBC permits the use of a roof deck construction system using FRTW that meets the flame-spread performance standard originally developed for non-combustible roof assemblies.

The required fire-resistance rating of the roof assembly can be waived if the deck is constructed of FRTW and the assembly passes the requirements of CAN/ULC S126 *Standard Method of Test for Fire Spread Under Roof-Deck Assemblies*.

A roof deck system of FRTW may be supported by:

- metal and reinforced concrete beams or joists;
- heavy timber supports; and/or,
- FRTW joists or trusses.

When supporting an FRTW roof system, unless the wood members are heavy timber, which has an inherent capacity to withstand fire exposure, they must be fire-retardant treated. Experience shows that both lumber and plywood decking must have a minimum actual thickness of 19 mm and both should be tongue and groove. Plywood decking, if not tongue and groove, must also have unsupported joints solidly backed with FRTW or plywood.

The construction of roof assemblies using FRTW is similar to that of other types of roof assemblies, using a metallic vapor barrier membrane between the decking and the insulation. Usually 0.05 mm aluminum sheeting is attached with an approved adhesive, although steel foil is also acceptable. Galvanized roof nails may be used to fasten the insulation to the vapor barrier which is then stapled to the deck.

FRTW or non-combustible ceilings may be attached to the underside of the system, with the resulting concealed spaces appropriately fire stopped.

FRTW roof assemblies are permitted as an alternative to roof assemblies of non-combustible construction or ordinary wood-frame roof assemblies having a fire-resistance rating of 45 minutes. When used, however, the NBC requires that, except for mercantile or light industrial occupancies, the area of the building be half that which would be permitted if either of the other two types of roof assembly were used.

It is important to note that fire-retardant coated wood is not the same as FRTW, and FRTW is specifically cited in the NBC for this type of roof construction; therefore, fire-retardant coated wood is not permitted to be used under this requirement. However, its use may be accepted via approval of an alternative solution by the Authority-Having-Jurisdiction.

By using FRTW lumber and plywood designers are provided alternative, code-compliant options for the design. In certain situations, FRTW can afford designers the ability to avoid the use of sprinkler systems and allow for a more economical design choice.