

WILDFIRES



Risks to Buildings, Occupant Safety & Environment

- ◆ Damage to, or destruction of buildings
- ◆ Utility service interruption
- ◆ Potential loss of property and personal assets
- ◆ Decreased outdoor and indoor air quality and associated risk to human health
- ◆ Risk of human injury or loss of life through exposure to fire, smoke, and/or decreased air quality

Wildfires pose a serious threat to building safety. Risks occur when the close combustion of natural fuels (e.g. trees, grasses and shrubs) spread to human-made structures. Wildfires at the urban interface are made more complex because combustible building materials compound with out fuel sources. At the wildland-urban interface, fires can start either outside and spread to adjacent structures, or originate inside, then ignite vegetation and spread through the wilderness. Interface fires are projected to increase in severity and magnitude as a result of climate change, and can in turn lead to air quality advisories across the province. This sheet is intended to start conversations about mitigating these risks.

Site Strategies

Strategy	Cost	Impact	Alignment
Identify prevailing wind direction and airshed characteristics to determine direction of potential fires	\$	***	
Conduct a full risk assessment, considering fuel types, building location relative to slope, and the nature of the structure	\$\$	***	
Maintain 10m setback from all combustible materials to create a natural firebreak. Increase this setback for structures or vegetation closest to the forest interface	\$	***	🌳🔥
Install outdoor water fixtures (e.g. taps and sprinklers) connected to a gravity-fed source in a location easily accessible to building occupants	\$	***	🚰🔥🏠🚰

Design Strategies

Strategy	Cost	Impact	Alignment
Include mesh debris screens (3 mm) in gutters, eaves and vents to reduce accumulation of flammable vegetation and limit areas exposed to sparks and embers	\$	*	
Install a chimney spark arrestor to reduce release of sparks and embers to surrounding areas	\$	*	
Select higher performance fire-retardant or -resistant siding materials (e.g. stucco, metal siding, brick, concrete and fibre cement)	\$\$	***	
Select fire-retardant roofing materials, such as metal, asphalt, clay and composite rubber tiles with Class A UL/ASTM rating – avoid green roofs for buildings at the wildland-urban interface	\$\$	***	
Use double-paned tempered windows and frames with an air barrier seal to provide greater air quality protection and heat resistance	\$\$	**	🏠
Ensure building and garage entry doors are fire-rated and sealed with an air barrier	\$	**	🏠
Install high-efficiency air filtration media (MERV 11 or higher) for all outdoor air building ventilation systems to improve indoor air quality	\$\$	***	🏠
Install air cleaners equipped with highest-efficiency particle air (HEPA) filters and activated carbon filters in refuge areas (e.g. amenity spaces)	\$\$\$	***	🏠
Make use of demand-controlled ventilation based on CO2 levels to reduce the introduction of outdoor air beyond required air flow rates.	\$\$\$	**	🏠🌬️
Install mechanical systems such as air source heat pumps that allow for cooling during fire events	\$\$	***	🏠🌬️
Design a common building area to act as a cooling room or clean air refuge	\$	***	🏠🌬️🔥🏠🌬️
Connect cooling and ventilation systems in refuge areas to a source of back-up power.	\$\$	**	🏠🌬️🔌
Ensure a minimum of 72 hours of fuel storage for power to refuge area and key services, including building pumps, fans, emergency lighting, and security systems	\$\$	***	🏠🌬️🔥🏠🌬️
Design building entry and exits that can be operated manually	\$	***	🏠🌬️🔥🏠🌬️

Operations Strategies

Strategy	Cost	Impact	Alignment
Trees should be set back 10m from all buildings and combustible materials	\$	***	🌳🔥
Plant fire-resistant vegetation with moist, supple leaves and low sap or resin production	\$	*	🌳🌱🌬️
Ensure planting groups are a minimum of 6m apart, and trees are a minimum 3m apart	\$	*	🌳🔥
Prune lower branches within 6' (1.8m) of ground	\$	*	🌳🔥
Regularly mow lawn areas and check roof, gutters, and eaves to remove flammable vegetation	\$	*	
Inspect, maintain and replace high-efficiency air filtration media for all outdoor air building ventilation systems	\$	**	🏠
Close building openings to temporarily reduce the intake of outdoor air during extreme events	\$	***	🏠
Plan, rehearse, and identify preparedness procedures necessary to maintain a successful refuge area (e.g. testing equipment, checking shelf life of stored provisions)	\$	*	🏠🌬️🔥🏠🌬️
Provide occupant education on refuge areas, evacuation measures, exit locations, etc.	\$	***	🏠🌬️🔥🏠🌬️
Educate building maintenance staff in firefighting/resistance measures (e.g. operating sprinklers, wetting down surfaces, removing flammables)	\$	***	
Provide sufficient personal protective equipment for building occupants, (e.g. N95 masks or N95 respirators) to minimize exposure to particulate matter	\$	**	🏠
Ensure personal cooling devices are available to building occupants (e.g. cooling blankets)	\$	*	🏠🌬️
Ensure there is adequate means for people who don't have cars or need assistance to evacuate the vicinity (e.g. public transportation or a carpool-evacuation plan)	\$	*	🏠🚗
Ensure alternate egress routes are available and known to building occupants	\$	**	🏠🌬️🔥🏠🌬️

Community Benefits

Consider the following strategies to help improve the resilience of the community overall:

- ◆ Provide access to local outdoor air quality data and indoor CO2 levels via occupant displays
- ◆ Design amenity rooms to act as cooling centres/clean air refuge areas for at-risk community members (e.g. seniors) and a central location for emergency support and services
- ◆ Ensure refuge areas and common spaces are designed to foster social connection, mental health, and overall cultural safety
- ◆ Ensure building connection to community fire response plans (e.g. notification systems)

Potential Design Conflicts

Take care and ensure resilient strategies do not exacerbate vulnerability and other risks

- ◆ Vegetation setbacks may eliminate benefits associated with trees for shading and heat island reduction
- ◆ Consider the durability of siding materials to withstand storms, freeze/thaw and seismic events
- ◆ Consider the impact of roofing materials on the heat island effect
- ◆ Passive ventilation strategies that rely on natural air flow to cool and ventilate a building may exacerbate indoor air quality issues during times of poor air quality (e.g. forest fire smoke). Ensure buildings have back-up cooling and ventilation systems that allow for mechanical ventilation when necessary.

Power Outages & Emergencies
 Air Quality
 Flood Events
 Severe Storms
 Seismic Events
 Heat Waves

Relative Cost/ Cost Premium

Low	Medium	High
\$	\$\$	\$\$\$

Relative Impact

Low	Medium	High
*	**	***

- Additional Resources**
- ◆ Government of BC: Current Air Quality Data Map – Air Quality Health Index
 - ◆ Government of BC: FireSmart Homeowner's Manual
 - ◆ Government of BC: FireSmart Your Property