



Bridges & wildfire event: identifying information gaps in bridge protection in the context of resistance to wildland fire events

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Author: Refai, Razim

Contributor: Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD)

Date: March 2020

Material Type: Research report

Physical Description: 15 p.

Sector: Forest Operations

Field: Sustainable Construction

Research Area: Building Systems

Subject: Bridge
Fire
Protection
Structures
FPI TR
Wildfires

Series Number: Technical Report ; TR 2020 n.14

Language: English

Abstract: The Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) has asked FPInnovations to investigate current information and knowledge for bridge fire impact mitigation opportunities and strategies. The extent of the investigation includes reaching out to domestic and international contacts to find directly applicable information and literature on strategies to mitigate fire impacts to bridge structures. This will include review of academic journals and reports, products and methods, to find

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Bridges & wildfire event: identifying information gaps in bridge protection in the context of resistance to wildland fire events

<https://library.fpinnovations.ca/en/permalink/fpipub8006>

Author: Refai, Razim

Contributor: Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD)

Date: March 2020

Material Type: Research report

Physical Description: 15 p.

Sector: Forest Operations

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Series Number: Technical Report ; TR 2020 n.14

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Development of CLT products with improved fire performance

<https://library.fpinnovations.ca/en/permalink/fpipub7708>

Author: He, Guangbo
Feng, Martin
Roussière, Fabrice

Date: March 2020

Edition: 52984

Material Type: Research report

Physical Description: 17 p.

Sector: Wood Products

Field: Sustainable Construction

Research Area: Advanced Wood Materials

Subject: Fire
Structural composites
Laminate product
Timber
Hardwoods
Testing

Language: English


Abstract: The fire resistance of cross-laminated timber (CLT) could be improved by treating the lamina with fire retardants. The major issues with this technology are the reduced bondability of the treated lamina with commercial adhesives. This study assessed several surface preparation methods that could improve the bondability and bond durability of fire-retardant treated wood with two commercial adhesives. Four surface preparation methods, including moisture/heat/pressure, surface planing, surface chemical treatment, and surface plasma treatment were assessed for their impact on the bondability and bond durability of lodgepole pine lamina. The block shear test results indicated that all surface preparation methods were somewhat effective in improving bond performance of fire-retardant treated wood compared to the untreated control wood samples, depending on the types of fire retardants and wood adhesives applied in the treatment process and bonding process. The selection of surface preparation, fire retardant, and wood adhesive should be considered interactively to obtain the best bond properties and fire performance. It may be possible to effectively bond the treated lamina with PUR adhesive without any additional surface preparation for the fire retardant used in the treatment at FPInnovations.

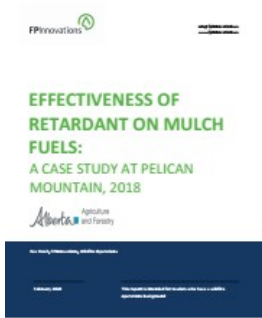
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Effectiveness of retardant on mulch fuels: a case study at Pelican Mountain, 2018

<https://library.fpinnovations.ca/en/permalink/fpipub19843>

Author: Hsieh, Rex
Contributor: Canadian Forest Services (CFS)
Natural Resources Canada (NRC)
Alberta Agriculture and Forestry (AAF)
Date: March 2020
Material Type: Research report
Physical Description: 27 p.
Sector: Forest Operations
Field: Fibre Supply
Research Area: Wildfire Operations
Subject: Fire retardant
Fuel treatment
Mulching
Mulch
FPI TR
Retardant

Series Number: Technical Report ; TR 2020 n.7

Language: English

Abstract: Mulching is a common method of fuel treatment. However, it is not currently listed by the U.S. Forest Service as a fuel type in its recommendations for fire retardant coverage levels. FPInnovations researchers set up plots with different coverage levels of retardant on a mulch fuel bed and collected fire behaviour data when a fire interacted with these plots. The results are intended to help wildfire agencies understand the effectiveness of retardant on mulch fuels in developing better suppression plans.

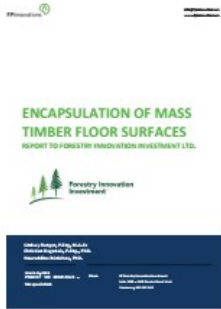
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Encapsulation of mass timber floor surfaces, report to Forestry Innovation Investment Ltd.

<https://library.fpinnovations.ca/en/permalink/fpipub53043>

Author: Ranger, Lindsay
Dagenais, Christian
Bénichou, Nouredine

Contributor: Natural Resources Canada. Canadian Forest Service

Date: March 2020

Material Type: Research report

Physical Description: 55 p.

Sector: Wood Products

Field: Sustainable Construction

Research Area: Building Systems

Subject: Wood
Fire
Design
Building code
Floors
Fire tests
Residential construction

Language: English

Abstract: Currently, mass timber building designs commonly incorporate a concrete floor topping. This can improve building acoustics by increasing the mass of the assembly, reduce floor vibration and create a smooth flat surface to install finish flooring on. The installation of concrete requires formwork, pouring and finishing the concrete and time to cure which adds to project schedules. One way to address this is to use mass timber elements that are prefabricated with concrete toppings preinstalled. Replacing the concrete floor toppings with dry alternatives, such as cement board, may also reduce construction timelines, while still ensuring adequate acoustic and vibration performance. Cement board needs only to be screwed in place and can be walked on immediately after installation; this reduction in construction time may reduce overall project costs and help make wood buildings more cost competitive than other types of construction.

Documents



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Evaluating a selective harvest operation as a forest fuel treatment as a forest fuel treatment. A case study in a mature douglas-fir forest in central interior British Columbia

<https://library.fpinnovations.ca/en/permalink/fpipub53038>

Author: Hvenegaard, Steven
MacKinnon, Brandon

Contributor: City of Quesnel

Date: September 2020

Material Type: Research report

Physical Description: 18 p.

Sector: Forest Operations

Field: Fibre Supply

Research Area: Forestry

Subject: Wildfires
Forestry
Fuel
Black spruce
Alberta
Density
Physical properties
Mulch
Forest fire
Crown fire
Wind
FPI TR
FOP Technical Report

Series Number: Technical Report ; TR 2020 n.34

Location: Quesnel, British Columbia

Language: English

Abstract: The City of Quesnel, B.C. has applied an innovative selective harvesting technique in a mature Douglas-fir forest stand with the objectives of maintaining biodiversity and reducing fuel-load buildup and consequent wildfire threat. FPInnovations researchers monitored and documented the harvesting operations and measured machine productivity to evaluate the cost-effectiveness of the operation. To support the assessment of fuel-load reduction, FPInnovations' Wildfire Operations group conducted pre- and post-harvest fuel-sampling activities to evaluate changes in forest fuel components.

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Flame spread in concealed mass timber spaces, report to Forestry Innovation Investment Ltd.

<https://library.fpinnovations.ca/en/permalink/fpipub53042>

Author: Ranger, Lindsay
Dagenais, Christian

Date: March 2020

Material Type: Research report

Physical Description: 40 p.

Sector: Wood Products

Field: Sustainable Construction

Research Area: Building Systems

Subject: Fire
Doors
Timber
Resistance
Laminate product

Language: English

Abstract: These concealed or void space cases require installation of elements which represent additional material cost and labour. For wood buildings that rely heavily on prefabrication, these steps can have a significant impact on scheduling. Removing dependence on concrete and gypsum board in certain applications could make wood buildings more cost competitive to similar buildings of steel and concrete and could further enhance the benefits of prefabricated construction.

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Foam fire-suppression system for mobile forestry equipment

<https://library.fpinnovations.ca/en/permalink/fpipub39938>

Author: Macey, T.
Date: December 1991
Material Type: Research report
Physical Description: 4 p.
Sector: Forest Operations
Field: Fibre Supply
Research Area: Forestry
Subject: Fire
Safety
Equipment
Forestry
Series Number: Technical Note Wood Harvesting ; TN 175
Language: English
Abstract: CABLE LOGGING
CABLES
Cable life
INSPECTION SYSTEM
ELECTROMEGNETIC WIRE ROPE INSPECTION (EWRI)
Prototype

Documents



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Fuel amendment as a forest fuel removal treatment: exploratory trials in black spruce fuels at the Fort Providence Wildfire Experimental Site

<https://library.fpinnovations.ca/en/permalink/fpipub36410>

Author: Hvenegaard, Steven
Contributor: Northwest Territories Environment and Natural Resources
Date: May 2020
Material Type: Research report
Physical Description: 15 p.
Sector: Forest Operations
Field: Fibre Supply
Research Area: Wildfire Operations
Subject: Fire
Crown fire
Mulch
Treatment
Black spruce
FPI TR
Picea mariana

Series Number: Technical Reports ; TR 2020 n.21
Language: English
Abstract: A fuel amendment treatment is proposed as a technique that can allow prescribed burning in hazardous fuels during low to moderate fire hazard conditions to minimize the risk of fire escape. In August 2017, a fuel amendment technique was applied at the Fort Providence Wildfire Experimental Site. In October 2019, a burn trial was conducted in a plot treated with the fuel amendment technique and fire spread to adjacent fuels was documented. Future documentation at this site will include assessing crown mortality to determine the effectiveness of the treatment.

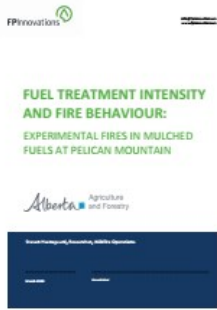
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Fuel treatment intensity and fire behaviour. Experimental fires in mulched fuels at Pelican mountain

<https://library.fpinnovations.ca/en/permalink/fpipub36371>

Author: Hvenegaard, Steven
Contributor: Alberta Agriculture and Forestry (AAF)
Date: March 2020
Material Type: Research report
Physical Description: 15 p.
Sector: Forest Operations
Field: Fibre Supply
Research Area: Forestry
Subject: Wildfires
Forestry
Fuel
Black spruce
Alberta
Density
Physical properties
Mulch
Forest fire
Crown fire
Wind
FPI TR
FOP Technical Report

Series Number: Technical Report ; TR 2020 n.18

Language: English

Abstract: This study investigated the effects of applying three mulch treatment intensities on fuel bed characteristics and the resultant fire behaviour. This is a companion report to a previously published report titled Mulching productivity in black spruce fuels: Productivity as a function of treatment intensity. The findings of these fire behaviour trials, in conjunction with productivity results, can assist fuel management practitioners in developing appropriate cost-effective mulching prescriptions.

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