



Karma Adjusting

May 2, 2022

Our File: 22-01049

Attention: Carolyn Hawthorne
carolyn@karmaadjusting.com

Re: Engineering Report of Fire Damage to a Dwelling

Loss Location: 60 Fleury Street, Aurora, ON
Insured: Ryan & Michelle Panet

Dear Ms. Hawthorne:

Introduction:

T. Smith Engineering Inc. has conducted an independent engineering inspection and assessment of the fire damage to the subject structure located at the above noted address.

We initially attended the site on January 24, 2022 for the purpose of conducting our inspection. We revisited the site on multiple occasions for the purpose of measuring of the dwelling, preparing measured drawings, assessing the extent of damage, sampling for designated substances and core drilling and sampling for combustion by-product particulates (CBP) within existing wall assemblies. We specifically re-inspected the dwelling following the removal of interior finishes to finalize the scope of damage.

We have included drawings of the site specifying the recommended method to repair the structure in conformance with the Ontario Building Code.

We have enclosed photographs within this report to illustrate existing site conditions.

This report shall accompany the repair drawings for the building permit application.

Background:

The subject structure was a detached, two storey, single family dwelling located on the west side of Fleury Street in Aurora, Ontario. For the purpose of directional references within this report the front of the structure will be assumed to face due east.



The footprint of the building included a one storey addition towards the south of the dwelling. The original structure was conventionally wood framed, clad with brick veneer. The one storey addition was conventionally wood framed clad with vinyl siding.

The building was supported on a concrete foundation. The depth of the foundation has not been confirmed.

The roof structure of the main dwelling was constructed in a gable configuration with stick framing supporting panelized roof sheathing and surfaced with asphalt shingles. The roof structure of the addition was constructed in a gable configuration with prefabricated lumber trusses.

Interior finishes consisted primarily of gypsum board. The basement was partially finished with drywall and the basement underneath the addition was finished with fiber batt insulation.



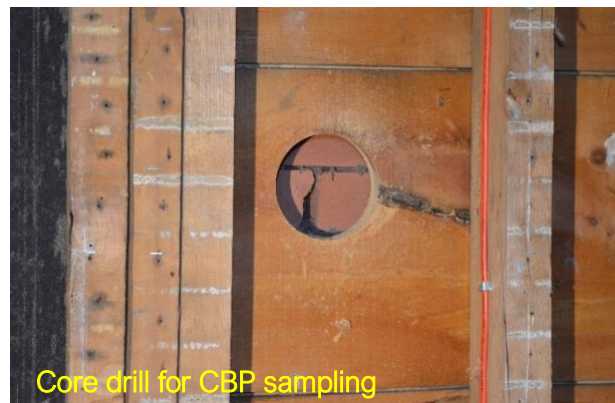
Engineering Inspection and Recommendations:

The building sustained damage as a result of a fire. The fire appeared to originate within the fireplace of the one-storey addition. A visual inspection of the existing condition of the floor frames and walls was completed.

The fire caused structural damage to the building's framing, particularly a portion of the foundation wall in the basement. The roof, walls, and flooring of the one storey addition, on the south side of the dwelling were fire damaged.

Interior finishes within the original dwelling sustained substantial damages as a result of the fire.

To restore the dwelling to pre loss performance, demolition and replacement of a portion of the addition foundation wall and full demolition and replacement of the one storey addition superstructure will be required. The building is to be reconstructed to match the existing footprint and height.



Within the original building reconstructed exterior walls and frames above basement frame will be returned to meet current thermal performance requirements. As the addition superstructure is being replaced in it's entirety we recommend that the thermal performance meet current part 12 requirements.

To remediate soot, smoke and all combustion byproducts, exposed framing within the affected areas must be cleaned. We recommend cleaning using soda blast procedure to the affected surfaces and framing until a visibly clean condition has been achieved. All framing must be dried to below 12% moisture content and sealed with shellac. All exterior assemblies must include a continuous 6 mil polyethylene vapor diffusion retarder and air barrier.

Removed interior finishes within the dwelling must be reinstated to match pre-loss conditions.

For full specifications please refer to the enclosed drawing package.

Following our initial site attendance direction was provided to construct emergency shoring for the first-floor framing towards the north side of the one storey addition, to ensure safe access and to facilitate completion of a cause and origin investigation (by others). The existing temporary support was inspected and approved.

Combustion By-product Particulate (CBP)

Smoke is a collection of solid and liquid particulates and gases generated as a result of incomplete combustion. Ventilation of a building following a fire loss occurrence will generally address most of the gaseous components of smoke, as well as some of the residual airborne particulate components of smoke. High efficiency filtration can assist in removing suspended particulates. Activated charcoal filters can assist in reducing odor.

The particulate component of smoke is referred to as Combustion By-product Particulate (CBP). CBP includes soot, aciniform carbon and char material, a combination of the above falls under the general definition of smoke particulate or CBP. This particulate can be differentiated from most common particulates using a combination of stereo microscopy and polarized light microscopy. Typical processes that produce CBP include combustion of biomass and fossil fuels. This includes fuel-based heating, cooking, use of candles and similar products, operation of internal combustion engines and any other process that includes incomplete combustion. Printer and photocopier toner, as well as many rubber products, are manufactured with high levels of carbon black, which, as a carbon particulate, are morphologically similar (under light microscopy) to CBP and are generally classified as CBP under optical microscopy (using a presumptive analysis). The analysis uses a presumptive method, specifically particulate matching the morphology and appearance of CBP are classified as such unless they can be positively differentiated. Following a fire occurrence, the building surfaces and porous components will be classified as functionally damaged, requiring cleaning, repair or remediation, if elevated levels of CBP are identified.

Post cleaning quantification of CBP at or below normal background levels would indicate cleaning has been successful. Values for lift samples for soot and char quantification are reported on a scale of 1-10, based upon the quantity of subject particulate observed within an average 10 fields of view on a direct lift sample at 200x magnification with 0 representing no detection, 1 representing trace levels and 10 representing high levels of impact.

Where possible, samples are retrieved from several locations within a building, with sampling locations selected to represent areas of varying impact. By analyzing the similarities and differences in samples retrieved from areas of varying exposure to the fire a reasonable background level can be determined.

Heavy smoke penetration was observed into the brick rainscreen cavity of the rear (west) wall of the original dwelling. Coring and testing of surrounding cavities was conducted to determine the extent of smoke penetration into the exterior cavity.

In our experience levels less than 4 would be classified as appropriate background levels for the surfaces tested. A total of seven samples were retrieved from the cavities between the exterior brick veneer and the interior sheathing. Samples taken returned results ranging from 2-6 for combustion by-product. More specifically, three samples returned higher than expected background levels. Upon review of laboratory results, it can be determined that the dwelling was impacted by combustion by-product particulate.

Given the observed and measured smoke penetration we recommend that the brick veneer at the west exterior wall and a section of the north exterior wall of the original dwelling (both floor 1 & 2) be removed and replaced. The smoke observed in the west wall was significant, and replacement of the brick veneer is strongly recommended. It is noted that the smoke observed in the north wall was moderate, and that the affected section of west wall, while containing a previous localized area of brick replacement, was visible from the street concurrent with other elevations. As an alternative to replacement of brick at this wall we recommend consideration be given to replacing the rear wall to the exterior corner, and maintaining the brick veneer at the west wall, while creating an improved air barrier by insulating the exterior walls using 2# closed cell spray applied insulation. In our experience this will effectively prevent any smoke in the rainscreen cavity from adversely affecting the occupied building while minimizing the effect of brick replacement on the street view of the dwelling.

Given the age of the dwelling sampling and analysis was completed for designated substances. Sampling was initially conducted prior to the commencement of demolition. Additional sampling was conducted during the demolition of interior finishes. A copy of the DSS report is appended to this report. Duct insulation tested positive for chrysotile asbestos.

Conclusion

The repairs specified within this report and enclosed drawings by T. Smith Engineering Inc. have been designed in compliance with 11.3 of the current edition of the Ontario Building Code. When conducting basic repair to existing structures, construction may be carried out to maintain the existing performance level of all or part of the existing building, by the reuse, relocation or extension of the same or similar materials or components, to retain the existing character, structural uniqueness, heritage value, or aesthetic appearance of all or part of the building if, the construction will not adversely affect the early warning and evacuation systems, fire separations, the structural adequacy or create an unhealthy environment in the building. When conducting extensive repair where existing interior walls or ceilings or floor assemblies or roof assemblies are substantially removed in an existing building and new interior walls, ceilings, floor assemblies or roof assemblies are installed in the building, structural and fire-resistance elements shall be constructed in compliance with the requirements of the other Parts of the Ontario Building Code.

T. Smith Engineering Inc.

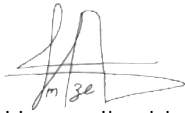
Structural Forensic, Building Science and Environmental Engineering

Should any additional loss related damage be uncovered during remediation efforts, T. Smith Engineering Inc. shall be immediately notified to review.

Closing Remarks:

At this time, we hold our file in abeyance pending permit issuance. Should you have any questions and/or concerns please do not hesitate to contact us.

Sincerely,



Hazem Ibrahim, EIT
22-01049 L1


Terry Smith, P.Eng

cc. Rory Mackinnon
rory@lrgpropertyconsulting.com
LRG Consulting