

Engineering Assessment
Structural Assessment Following a Fire
Date of Loss: 30 November 2021
Location: 323 Daley Avenue, Ottawa
Our File Ref.: DFA21-370C

Prepared for

Jordan Robert Ferraro
336 Cathcart Street
Ottawa, Ontario
K1N 5C4

Prepared by

Hamze Mankal, B.Eng., P.Eng.

14 December 2021



DFA Engineering Services Inc.

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Jordan Robert Ferraro
336 Cathcart Street
Ottawa, Ontario
K1N 5C4

Dear Mr. Ferraro:

Re.: Engineering Assessment
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We are pleased to report our findings concerning our investigation of the above-noted incident.

Introduction

DFA Engineering Services Inc. was retained on 2 December 2021 to provide a structural assessment of the building at the above-noted address, following a recent fire. The content of this report was obtained from examinations, research, and our own independent engineering judgement.

Observations

We attended the site on 7 December 2021 to examine the house and review the extent of the fire damages. The following observations were made:

The subject building is a two-and-a-half storey, detached dwelling, which faces approximately south onto Daley Avenue, in Ottawa, Ontario. The building is a designated heritage structure, and the original building comprises multi-wythe brick exterior walls, rough-sawn timber floors and roof framing, and a stone foundation. The building also features smaller rear and side single-storey additions, constructed in the 2000's with modern construction material. Photographs 1 through 3 illustrate overall views of the exterior of the building. We understand that on the date of loss, a fire originated on the ground floor of the original building.

Our visual inspection of the subject building revealed the second-storey floor framing of the original building to be heavily charred and mostly collapsed, or on the verge of collapse (Photographs 4 through 7). The stairs leading to the second storey were mostly destroyed and there is no safe passage to enter the upper storeys (Photographs 4 and 8). From the exterior, evident fire damages to the roof can be observed (Photographs 1 through 3). Based on our extensive experience with fire-damaged buildings, it is our opinion that the upper levels and roof would be in a similar condition to the second-storey floor framing. It is also likely that the inner wythe of brick and mortar has sustained some level of heat damage, which has affected its strength.

The basement area was less affected than the upper floors. The ground-floor framing (basement ceiling) was partially charred by areas of drop down from the fire (Photograph 9). The rest of the basement area was heavily affected by smoke and water (Photograph 10).

Analysis

The second-storey floor structure is completely compromised and highly unstable. The areas that have not yet collapsed are in a critical state and at risk of collapse. As such, the building is not safe to access, and it is our strong recommendation that it shall not be accessed by any persons at any time. The exception to this would be for necessary fire investigation purposes, with entry of the building done under the direction and supervision of a professional engineer.

As previously noted, it is our opinion that the roof and floor above the second storey are likely heavily compromised, and as such, are at risk of collapse under environmental loading (i.e., snow, wind, etc.).

With the loss of the floor and roof diaphragms, the exterior brick walls have become slender and destabilized, and pose a risk of collapse under environmental loads. In particular, we are concerned that the likely collapse of the roof structure under snow loading would trigger collapse of the exterior wall by an applied thrust, impact to the second-storey floor causing further collapse and movement of the embedded joists, or a combination of both. An uncontrolled collapse poses a safety risk to the nearby property at 325 Daly Avenue/200 Augusta Street and to possible trespassers (squatters) taking shelter in the building.

Based on the above, it is our opinion that the building poses an immediate risk of collapse and should be demolished immediately in a controlled manner. Shoring of the structure is not feasible, and likely cannot be undertaken on the east side due to the proximity of the neighbouring building. The emergency fencing and boarding shall remain in place until the demolition is completed.

Conclusion

DFA Engineering Services Inc. offers the following conclusions based on our independent engineering evaluation:

- In our opinion, the fire damages have destabilized the structure and is at immediate risk of collapse.
- It is also our opinion that demolition is the most feasible and immediate action to address the unsafe conditions.
- Demolition of the house must be undertaken as soon as possible with the use of heavy machinery.
- The building should not be accessed by any persons, including for repairs or hand demolition. The site shall remain fenced off until the structure is stabilized and debris is removed.

This concludes our investigation. Should you have any questions, or wish to discuss our findings further, please advise. In the meantime, we thank you for this opportunity to be of service.

Yours very truly,

DFA Engineering Services Inc.

Prepared by:



Hamze Mankal, B.Eng., P.Eng.



PHOTOGRAPHS



Photograph 1: View of front (south) elevation of 323 Daly Avenue.



Photograph 2: Partial view of the west side elevation of same.



Photograph 3: Partial view of the east elevation of same.



Photograph 4: View of the second-storey floor framing.



Photograph 5: Another view of same.



Photograph 6: Another view of same.



Photograph 7: Another view of same.



Photograph 8: View of second-storey stair structure.



Photograph 9: View of drop down charring of the ground-floor framing.



Photograph 10: View of smoke staining in the basement.