

05 May 2020

**ATTACHMENT 3**

Pasquale Aiello  
Organica Studio Inc  
7-145 Birmingham St  
Etobicoke, ON, M8V 3Z8

Re: Beaverbrook Heritage Home, Vaughan  
Load Review Report

Dear Pasquale:

As requested we have reviewed the loads imposed by the proposed office usage on the existing base building structure. Our review was based on documents/drawings received and our site visits on 14 & 20 February 2020.

Document Review

- The existing building was constructed in 1878. Refer to photo 2.
- No original base building drawings were available at the time of review.
- A previous review report done in 2014 by J.R. Jones Engineering Ltd for the proposed office usage. The previous load review was done in accordance to the 2012 version of the Ontario Building Code which specified Live Load for office areas of 4.8 kPa (100 psf) at the ground floor and 2.4 kPa at the 2<sup>nd</sup> floor.
- The previous review report noted that retrofit to the existing ground floor structure, including replacement of existing steel and temporary posts.

Basement & Ground Floor Review

- The basement floor was observed to be a concrete slab on grade. Refer to photo 3.
- It was observed at the basement that the existing floor structure above was exposed to view. Refer to photo 4.
- It was observed on site that at the basement, the existing floor joist above were typically 2"x10" wood joists spaced at 16" on centre, supported by a centre 10"x10" wood beam. There was also observed a timber posts and several steel posts, and it appeared that concrete footings were previously installed below grade (as per the change in concrete surface immediately around the steel posts). Refer to photos 3-5.
- It was observed that there was standing water and high humidity in the basement.
- It was observed that in certain sections of the basement, the floor joists above were sistered full length. Refer to photo 4.
- It was observed on site that there appeared to be significant corrosion at the base of the steel posts at the basement. Refer to photos 5 & 6.
- At the ground floor there was observed to be cracking in the wall finishes and the ground floor appeared to be visually sagging. Refer to photo 7.

- At the south end of the building there was a single storey area, with the existing roof structure observed to be sloped 2x8 timber rafters.

#### 2<sup>nd</sup> Floor Review

- At the 2<sup>nd</sup> floor, there was observed to be several localized openings in the floor to view the existing structure below. Refer to photo 8.
- It was observed that at the 2<sup>nd</sup> floor that the existing floor structure was typically constructed of 2"x10" timber joists spaced at 16" on centre.
- The 2<sup>nd</sup> floor joists were observed to be supported by timber and masonry load bearing walls below.
- The existing 2<sup>nd</sup> floor walls were observed to be 2"x4" stud walls with plaster and lathe finishing.
- There was cracking observed in the wall finishes at the existing 2<sup>nd</sup> floor. Refer to photo 9.

#### Main Stair Review

- The existing main stair was observed to be a timber framed straight flight that curved at the top. Refer to photo 10 & 11.
- The structure of the existing stair was observed through discrete openings at the underside plaster finish of the stair soffit.
- The lower straight section of the stair was observed to be supported by 2"x4" stud walls on each edge of the stair. At the curved upper portion, the stair was observed to be constructed of a curved centre timber joist.
- The existing stair was observed to be in a poor condition, with noticeable bouncing when walking up and down the stairs.
- We understand that the main stair is a listed heritage component.

#### Rear Stair Review

- The existing rear stair was observed to be a timber framed straight flight stair with a 180 degree turn at the top. Refer to photo 12.
- The stair was observed to be supported at each side by timber framed stud walls.
- The stair was observed to be in good condition, with no noticeable sagging or excessive bounce.

Per the current Ontario Building Code 2019, the design live load is noted as 100 psf for corridors and ground floor office usage, and 50 psf for 2<sup>nd</sup> floor office usage.

We have assumed that the existing structure is in sound condition except where noted above.

Based on the above information, it is our opinion that the base building ground floor structure requires reinforcement for the proposed office usage. The existing floor joists where not sistered are undersized for the proposed live loads or are currently showing signs of wood creep and excessive deflection. We recommend that all the existing floor joists and stair beams be sistered. We also recommend that the existing wooden post is to be replaced by a new steel posts, and the existing damaged steel post bases be removed and repaired. New concrete footings are to be poured atop the existing

slab on grade to give standoff from the standing water, with all new and existing steel coated with a zinc rich paint primer system to protect from further moisture damage.

Based on the above information, it is our opinion that the base building 2<sup>nd</sup> floor structure can safely sustain the loads imposed by the proposed office usage. Once the ground floor structure has been retrofit, all damaged wall finishes, or are to be repaired. The existing finishes are to be monitored for future cracking; if cracking is observed they should be reviewed by a qualified structural consultant.

Based on the above information, it is our opinion that the existing main stair requires significant retrofit to be usable, as replacement may not be an option due to heritage concerns. Retrofit may require installation of curve steel supports and may also require installation of new steel beams and posts at the ground and 2<sup>nd</sup> floor to accommodate the stair retrofit. Alternatively, we recommend that the stair be closed off from pedestrian/egress access and usage.

Based on the above information, it is our opinion that the existing rear stair can safely sustain the loads imposed by the proposed corridor/egress usage without reinforcement.

Retrofit drawings will be issued by our office under a separate cover. Consult with your local jurisdiction's building department for any code/permit requirements to accommodate the proposed work.

Regards,  
Honeycomb Group Inc.



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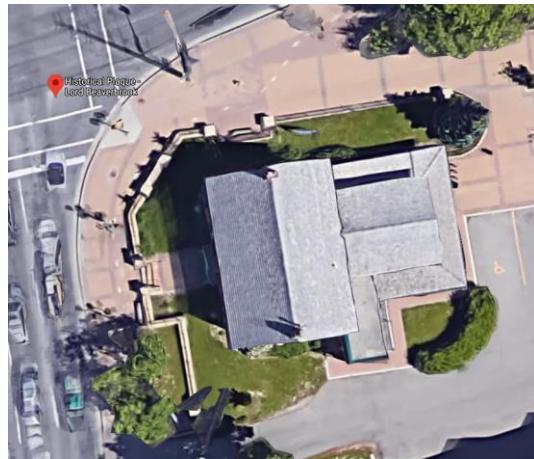


Photo 1- Site Plan



Photo 2- 1878 Dated Plaque

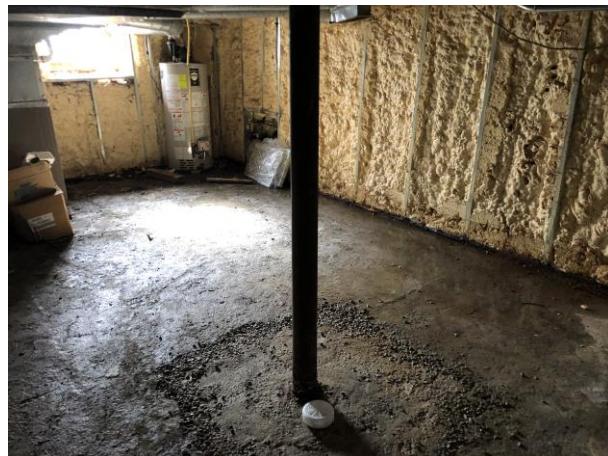


Photo 3- Basement Level



Photo 4- Sistered Basement Joists



Photo 5- Existing Basement Steel Posts



Photo 6- Corrosion at Base of Steel Posts



Photo 7- Ground Floor Wall Finish Cracking



Photo 8- 2<sup>nd</sup> Floor Discrete Opening



Photo 9- 2<sup>nd</sup> Floor Wall Finish Cracking



Photo 10- Main Staircase



Photo 11- Top Landing Main Staircase



Photo 12- Rear Staircase