

March 31, 2010

NS DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Johnston Building
3rd Floor
1672 Granville Street
PO Box 186
Halifax NS B3J 2N2
Attention: Darrell Spencer

Re: *Dennis Building 1740 Granville Street, Halifax, NS. –Assessment of Exterior Wall Condition - Updated*

Introduction:

Kassner /Goodspeed Architects Ltd. was engaged by the NS Department of Transportation & Public Works to update an Original Report dated November 28, 2005 focusing on the exterior walls of the above noted building.

The original review was based on a visual inspection conducted from the ground. The update review was conducted using a Skypower, JLG, 90' manlift which facilitated a close inspection of the exterior wall at the upper levels of the Granville Street façade and a significant amount of the George Street and South facades as well. Due to vehicle access restriction the West façade was reviewed from the ground.

Few noticeable repairs have been made to the exterior of the building in the five year interim since the original review. There appears to have been continued erosion of mortar joints and normal deterioration of the masonry and steel brick lintels due to weathering. There is no apparent change in the condition of the granite stone since the previous review. However, as recommended in the prior report, if the building is to be saved in its current form, the entire wall will need to be reconstructed; both the brick masonry and the granite facades. There are signs that water is easily penetrating the deteriorated brick masonry and washed out stone joints and the freeze thaw cycles continues to cause accelerated deterioration. In the interest of public safety overhead protection scaffold should be erected above the sidewalks and should be maintained in place until the building is repaired or demolished.

Walls:

Currently, the street facades are of 1912 granite facade with backup brick masonry construction exhibiting a carved granite bracketed cornice at the top of the fourth storey. The first four floors of the street faces are constructed of 13.75" high granite blocks of various lengths. There is a heavily detailed bracketed carved granite projecting cornice

at the top of the granite blocks. Above the granite cornice are three floors of brick masonry wall consisting of a repeating pattern of five courses running bond and one header course tying the outer wythe of brick to the backup masonry wall. The windows have flat granite heads and lugsills. A granite string course divides each storey. The upper cornice is a replica of the original granite cornice fabricated from wood and clad in copper. The condition of the wood outriggers supporting the cantilevered cornice is unknown.

The exterior flanking walls, perpendicular to Granville and George Streets, are constructed of freestone and brick masonry in the same five course running bond and one header course pattern – the overall height of five bricks and mortar joints is equivalent to one granite block height and one horizontal joint. The south wall has a cementitious parge coating that exhibits significant cracking and spalling as result of stresses in the substrate and freeze–thaw action during the winter month. On the West face there are several blocked up openings and wall hoods for air handling equipment projecting through the panels. There are also significant areas where masonry repairs have been performed in the past attempting to repair the shear cracks that are observed around virtually every opening through the brick

The outlines of several former adjacent buildings remain on the exterior walls. Former wall and roof flashings and previously altered window openings are visible on these faces.

The walls suffer from years of neglected maintenance and are displaying significant mortar joint deterioration and shear cracking of masonry and stone units. As the horizontal mortar joints have deteriorated, the brick masonry units have shrunk proportionately. The same occurs between the granite blocks but to a lesser extent because there are five courses of brick masonry to one 13.75” granite block course height. This results in significant differential shrinkage and shear cracks. . Many of the cracks have been sealed with caulking, which for the most part has dried and deteriorated with continued movement of the wall.

There is no apparent settlement of the foundations and therefore the seven-storey steel and reinforced concrete structure is likely to be the same length as it was when originally erected in 1912. The shrinking masonry exterior walls are supported on the foundations but they are tied back to the rigid structural frame. This creates internal stresses between the two that are exhibited in the major shear cracks at the corners of the building and around openings through the walls.

These shear cracks and the washed out mortar joints have permitted water infiltration into the wall assembly. Following the path provided by the header courses that tie the wythes of brick together, the water can pass to the interior face of the masonry backing wall.

Refer to Appendix 1 for annotated photographs relating to the exterior walls.

Structural Assessment:

A structural sub-consultant Steve Rajendram of SNC-LAVALIN Inc. was engaged to update his November 28, 2005 Structural Survey of the exterior walls and to provide an opinion regarding the structural integrity of the exterior walls. The structural sub-consultant made a site visit to view and photograph the exterior walls, the basement/foundation walls, granite window lintels and sills. Using Kassner/Goodspeed's photographs this sub-consultant also reviewed the structural issues with the masonry walls at the upper three floors, the leaning cornices, and major shear cracks at building corners.

Following this structural survey of the walls, the sub-consultant has expressed the opinion that the basic structure is sound, however, he has recommended a significant amount of repointing and repair work to masonry walls and granite lintels and sills.

Refer to Appendix 2 - Structural Sub-Consultant Report and photos.

Summary:

The following points summarize the problems observed in the exterior walls:

- There are major shear cracks in the masonry wall above the window heads at the southeast and northeast corners of the building indicating there are structural issues in this area.
- There are shear cracks at the heads of virtually every window in the masonry walls; indicating there are settlement issues in these areas, likely resulting from the loss of mortar in the brick joints.
- Frost action has pushed several bricks forward in the masonry façade - the 5th to 7th floor levels; caulking applied to mortar joints and shear cracks by misguided maintenance staff in the past, instead of repointing mortar, prevents water from draining to the exterior holding it in the joints longer accelerating deterioration of the wall.
- There are a significant number of vertical shear cracks in the Granville Street masonry facade running full floors and occur across the full length of the façade.
- A previously repaired piece of the granite cornice, at the southeast end cornice, exhibits a noticeable sag and There appears to be a new fracture line in the stucco parging at the back of the cornice, running upward and downward cornice for several feet from the seat of the granite cornice. As the bracketed granite cornice above the 4th floor depends on the mass of the masonry walls above it for counterbalance, continued deterioration of the masonry wall will have a serious detrimental effect on its integrity; this indicates continued movement of the stone.
- There are significant vertical shear cracks in the brick masonry on the south side near the southeast corner, above the bracketed granite cornice at the top of the 4th floor; these cracks extend to the top of the masonry wall.
- There is a significant amount of delamination of the stucco on the south façade indicating a continued deterioration of the base masonry behind the stucco.
- There are several fractured granite lintels that span window openings; they have stayed in place possibly due to friction between the rough faces of adjacent pieces of stone; any collapse of these lintels would likely result in consequential

collapse of the wall above. There are some lintels with multiple fractures, which are at a greater risk to fail.

- There is a significant amount of staining on the face of the granite blocks, resulting from both environmental contamination and bitumen leaching from repairs to flashings. This could likely be removed with proper masonry cleaners.
- All windows in the building are wood and are well past their effective service life; water penetrating the frames can get behind the façade and do extensive damage to the masonry. All the windows in the building would need to be replaced to correct this problem.

Conclusion & Recommendations:

The problems with the building appear to be primarily with water penetrating the mortar joints and structural shear cracks in the masonry walls resulting from differential shrinkage between the brick and stone and structural frame. The building joints leak consistently and until the building is repointed, windows replaced, and the structural damage is repaired, they will continue to do so.

There are fairly obvious problems with the exterior masonry walls throughout the building, which are the result of years of neglect, and will require investment of significant financial resources if this building is to be retained in its current form. The lime mortar has leached significantly from the horizontal mortar joints of most of the granite and requires extensive repointing to prevent further shrinkage of the masonry walls. Nothing short of total reconstruction can recover the amount of the shrinkage that has already occurred.

It is recommended that since it has apparently exceeded its reasonable service life, and given the serious structural issues with the facades, the building should be demolished as soon as possible. The granite stones should be salvaged for reuse in a new project for the site that would respect the heritage of the other notable heritage buildings on the adjacent sites.

Respectfully submitted by;

Richard Kassner, Architect, MRAIC, NSAA, AAPEI, CSC
KASSNER/GOODSPEED ARCHITECTS LTD

Appendices:

1. Visual Structural Condition Survey, Prepared by Steve Rajendram, M.Eng., P.Eng. Structural Engineer – SNC LAVALIN Inc. Updated March 08, 2010.