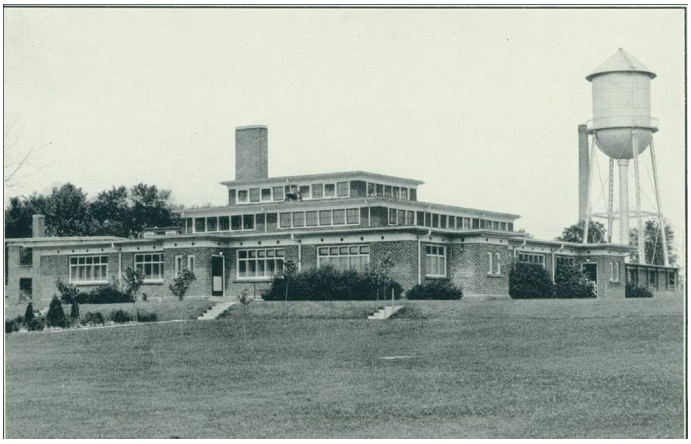
Structural Condition Review

Camp 30 Cafeteria Building

2020 Lambs Road, Municipality of Clarington

The Corporation of the Municipality of Clarington



BBA PROJECT NO. 22092

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PART 1 – INTRODUCTION

1.1 AUTHORIZATION

This structural condition assessment has been undertaken by Barry Bryan Associates, Architects, Engineers, and Project Managers (BBA), for the existing Cafeteria Building at the Camp 30 site in Bowmanville on behalf of the Municipality of Clarington. Authorization to undertake this study was received from Rob Groen, Building and Property Supervisor, from the Municipality of Clarington.

1.2 OBJECTIVES

The objective of the structural assessment for this project was to complete a site visit and assess the structural condition of the Camp 30 Cafeteria Building Located at 2020 Lambs Rd in Bowmanville, ON. The structural assessment report included review of the structural elements and depending on the condition, providing recommendations for remedial work or replacement of the existing structure. Findings are summarized from the structural review within this report.

1.3 REVIEW METHODOLOGY

BBA completed a non-intrusive, non-destructive, visual inspection of the building structure on May 31st, 2022. During the investigation, the structural and non-structural elements were investigated for evidence of varying levels of deterioration, distress, and/or corrosion and any areas of concern were documented.

In brief, the structural assessment included review of the following:

- Corrosion of structural steel framing.
- Deterioration of structural components including, but not limited to concrete, timber studs and joists, bearing walls, slabs, roofing elements.
- Deterioration/cracking of external brick wall systems.
- Excessively deflected structural elements.

Reference drawings of the existing structure were not available at the time of review

1.4 STATEMENT OF LIMITATION

All comments and observations in this report are based on visual observations made during the inspection on May 31st, 2022.

No intrusive or destructive testing or opening of the building system was completed during the inspection. Further, a detailed structural review of the steel connections was not completed.

There are no comments on the components that were not exposed to view.

Any design and/or construction deficiencies not recorded were not evident at the time of the inspection.

PART 2 – BUILDING BACKGROUND AND DESCRIPTION

2.1 BACKGROUND

The Dinning Hall Building is located at the Camp 30 site which is located at 2020 Lambs Road in Bowmanville. The 42.5 ha (105 acre) site was formerly owned by Darch Farm and was donated to the Ontario government in the early 1920s for the purpose of establishing The Boys Training School, later renamed the Ontario Training School for Boys. It is understood that the building originally operated as a cafeteria for the training school, which completed construction in 1925.

The school operated for a few years, however the property was appropriated by the Government of Canada to convert the school into a prisoners of war camp, Camp 30, by 1941. In 1942, there was an uprising at Camp 30, known today as the "Battle of Bowmanville". During this uprising, German officers barricaded themselves within the cafeteria; the uprising had only lasted three days. Occupation of Camp 30 had ended in 1945, with the end of WWII. The site resumed operation as a training school, which continued operation until 1979, when then named Pine Ridge School closed. At the time of closing, neither the municipality nor the province wanted to retain the site due to the high costs of ownership.

In the years to follow, 1983 to 2008, the property was primarily used as different schools by different owners. In 2007, Lambs Road School Property Ltd. purchased the property. However, shortly after, in 2009, the buildings were added to the Municipal Report due to the historic significance of this site. Around this time, a condition survey and structural assessment was completed which concluded that the buildings were still in surprisingly good condition, despite significant vandalism, fires, and exposure to external elements.

It is understood that the Municipality of Clarington had recently gained ownership of the cafeteria building. The building is one of the remaining four structures on the overall Camp 30 Site Plan.

Due to the lack of maintenance and upkeep since closure in 2008, , as well as the rampant vandalism that the site has experienced since the original site assessment in 2009, the building is showing evidence of severe deterioration and defacing of the exterior building elements.

2.2 BUILDING DESCRIPTION

The building is single storey in height with a partial atrium and basement area and approximately 10,000 square feet in building area. The building structure appeared to consist of flat roofs at varying elevations to suit the atrium and changes in the ceiling heights throughout the building. The roof construction appeared to consist of a wood plank decking supported on wood rafters spaced at approximately 24" on centre where exposed. The wood roof rafters appeared to be supported by a combination of the exterior load bearing brick masonry walls and interior structural wood / steel beams that are supported by concrete wrapped structural steel columns.

The interior of the building consisted of interior stud partition walls and perimeter double wythe brick masonry walls. Most of the wood framing on the interior of the building was partially concealed with the original lath and plaster ceiling and wall finish.

The exterior walls consisted of double wythe brick masonry walls. The interior of the walls were finished with lath and plaster. The perimeter walls included multiple window openings which had the original wood window frames in place and the majority covered with plywood hoarding since the glazing units were broken. The perimeter walls appeared to be supported on a multi wythe brick masonry foundation wall system that was observed from the interior of the building in the basement.

The exterior perimeter walls at the clerestory areas consists of what appeared to be wood stud framing and wood siding with an interior lath and plaster ceiling. Windows at these clerestory locations were framed between the wood studs and mostly boarded with plywood since the glazing had been broken.

The ground floor consists of what appeared to be a reinforced concrete floor slab. The concrete slab systems span between a combination of reinforced concrete drop beams and concrete encased steel beams that span 20'-0" between load bearing brick masonry piers and are spaced at approximately 11'-0" on centre.

The basement slab was concealed by dirt and debris at the time of the site visit and could not be reviewed for condition, however, a concrete slab-on-grade system was assumed.

PART 3 – OBSERVATIONS

BBA attended the Camp 30 Cafeteria Building on May 31st, 2022, to visually review the condition of the structural building components and other elements that required attention. A summary of findings are itemized as follows:

1.1 ROOF STRUCTURE

There were three (3) elevations of roof (upper clerestory, mid clerestory, and low roof). Each of the roofs were generally lightly sloped to promote positive drainage away from the building or to a previous collection system. The roofs generally consisted of wood plank decking supported by timber rafters that span between the external wall and internal wood/steel transfer beams. It was observed at the lower roof level that several of the wood rafters had been doubled up, though it could not be confirmed if this was an existing condition or reinforcing. The underside of the rafters were concealed in many areas from a partially collapsed lath and plaster ceiling.

The roof framing at all levels was severely deteriorated at the time of the site visit. We observed the following deterioration:

- The roofing appears from drone footage to be fully comprised in most locations. There was excess water staining observed throughout the building. (Photo 001)
- The wood decking was completely rotted in many locations as a result of prolonged exposure to the exterior elements. (Photo 002)
- The wood roof decking and rafters showed excessive deterioration and/or deflected (sagging) showing evidence of localized failures likely resulting from prolonged exposure to moisture. (Photos 003 & 004)
- The structural steel transfer beams, where exposed, were in poor condition and had evidence of severe surface corrosion resulting from exposure to the exterior elements. (Photos 005 & 006)
- The roof beams were supported by concrete encased structural steel columns. The concrete encasing had locally been removed, however, in general the structural steel columns appeared in fair to good condition. We did not observe any excessive deterioration or evidence of structural distress at the time of the site visit. (Photos 007 & 008)

The roof structure was in poor condition at the time of the site visit, with localized failure observed throughout the building. The structure, in its current condition, is at end of life and collapse under high loading conditions, such as snow, is possible without immediate stabilization or replacement.

1.2 CLERESTORY WALLS

The upper-level framing between the elevation changes in the clerestory's consisted of wood panel exterior façade supported by 2x4 timber stud infill. The stud walls were partially finished with lath and plaster that had failed throughout the interior of the space.

The visible clerestory framing and cladding showed severe deterioration at the time of the site visit. The following observations were made:

- The exterior cladding had fully failed in many locations leaving the interior of the building exposed to the exterior elements. (Photo 009)
- Excessive moisture exposure was observed from the interior of the clerestory walls. Likely a result of water penetration through the open windows, exterior wall cladding, and deteriorated roof. (Photos 001-009)
- The transfer beams supporting the clerestory walls were corroded (rusted) as a result of prolonged exposure to moisture. (Photos 005, 006 & 010)
- The wood window framing and glazing in the clerestory walls appeared deteriorated and had been boarded with plywood. (Photo 011)
- We could not confirm the connection of the top and bottom of the wall, however, it is likely made with nail fasters which have deteriorated with the exposure to prolonged moisture.

The elevated clerestory walls were in poor condition at the time of the site visit. We believe that partial collapse of the wall system is possible with further exposure to the exterior elements and severe weather conditions. Full reinforcing and/or replacement of the wall system is required to structurally stabilize the building structure.

1.3 GROUND LEVEL STRUCTURE

The ground floor consisted of a suspended concrete floor slab supported by concrete encased steel beams and exterior load bearing concrete masonry brick foundation walls and interior brick masonry bearing walls. The suspended concrete slab was reviewed from both above and below. Excessive amounts of debris was observed on the top of the slab. We visually reviewed the underside of the slab for areas of deterioration which included cracking concrete, spalled concrete, and excessive deflections. We have summarized our findings below:

- The suspended concrete slab depth was not able to be confirmed at the time of the visit. We generally observed the underside of the slab from the basement level as the ground floor appeared to have a floor covering with extensive debris covering the top of the slab.
- We observed some areas where notable moisture infiltration on and/or through the slab had occurred where efflorescence accumulation and isolated spalls were located on the underside of the slab. (Photo 012)
- The slab appeared in some areas in fair to good condition; we did not observe any notable spalling or deterioration along the underside of the slab deck at the time of the visit. However, this space is not conditioned any longer and the concrete has been subject to freeze thaw conditions and likely was not originally installed with proper air entrainment. Further testing will be required to confirm the suitability of the concrete for re-use.
- We observed corroded reinforcing steel at several locations on the underside of the slab. The reinforcing steel did not appear to have sufficient clear cover on the concrete and with the exposure to moisture has corroded and cause the slab to spall. (Photo 013)
- There was extensive suspended mechanical equipment in the basement area with hangers and supports that have deteriorated with continued exposure to exterior elements. Full removal is required to prevent further collapse of this suspended equipment.
- The concrete beam and steel encased concrete beams generally appeared in fair to good condition at the time of the visit. However, verification of the structural adequacy (i.e. chloride ion content and compressive resistance) after exposure to the exterior elements will need to be confirmed. Additionally, there are localized repairs that will be required to restore isolated spalling and deterioration observed at areas where prolong exposure to the exterior elements occurred. (Photo 014)
- The interior load bearing brick masonry partitions appeared in fair condition at the time of the site visit. The mortar joints appeared to be locally stepping and open in some locations. The brick masonry wall will likely require a full repointing procedure and localized brick replacements to restore the original condition.
- The top of slab condition could not be properly assessed due to the presence of an unconfirmed top layer material, as well as the large amount of debris. No areas of deflection or failure were observed.

The ground floor slab at the time of the site visit visually appeared in fair condition. There are notable areas of deterioration that require restoration and further intrusive testing and sampling will be required to confirm if the structural system has deteriorated as a result of prolong exposure to the exterior elements. Note: designated substances will need to be reviewed prior to completing an intrusive review work; it is understood that the Municipality of Clarington will undertake this work directly.

1.4 BASEMENT

The basement was filled with large amounts of debris and garbage with most areas not safely accessible at the time of the visit. The basement appears to consist of a concrete slab-on-grade; however, this was difficult to confirm the existing condition and thickness do to the amount of standing debris on the floor system. We have summarized our observations in the basement as follows:

- The basement slab-on-grade was unobservable at the time of visit due to the amount of dirt and debris.
- We did not observe any drainage systems to remove staining water. Please note moisture accumulation and freeze thaw action can cause severe ice accumulation throughout the basement resulting in high stress conditions on supporting walls which can lead to complete structural instability.

The basement level appeared to be in moderate-to-fair condition at the time of the site visit. However, extensive cleaning is required to make good a safe path of travel for further access to areas that could not be reviewed safely and to expose existing conditions that were concealed by dirt, debris, and other items resulting from ongoing deterioration of the overall building superstructure.

1.5 FOUNDATION WALLS

The ground floor multi-wythe brick masonry walls were supported by multi-wythe brick masonry foundation wall system in the basement. The wall appeared to step at grade level to a thicker coursing for the foundations, however this thickness could not be confirmed at the time of the visit. We observed from the interior basement stretcher (tie) courses spaced vertically every six to eight courses. The walls had evidence of prolonged exposure to the exterior elements. We have summarized our observations as follows:

- The foundation walls, as observed from the interior, appeared in moderate condition with varying levels surface wear, likely due to moisture exposure. We observed peeling paint and isolated surface corrosion/ dusting on the brick units in many locations. (Photo 015)
- The masonry brick mortar joints in many areas on the exterior wall were dusting and had deteriorated. We observed localized step cracking at some locations likely resulting from differential movement due to frost action during winter months since the basement is no longer conditioned.
- Not all foundation walls were observable do to access at the time of the site visit, after areas of the basement are cleaned further review may be required.

The basement foundation walls at the time of the site visit generally appeared in fair to reasonable condition based on the limits of our review. Restoration of the masonry including brick repointing using historical procedures, localized brick replacements, and localized wall repairs will be required. Additionally, considerations to address water accumulation should be considered immediately to prevent moisture accumulation that can freeze and cause overstress on the perimeter brick masonry walls or interior partitions resulting in full failure of the structural system. Also, the foundations are subject to frost action since the building is no longer conditions which can lead to differential movement on the foundations and result in localized failures in the perimeter foundation walls.

1.6 EXTERIOR BRICK MASONRY WALLS

The exterior walls of the ground floor consisted of double wythe brick masonry walls finished with an interior lath and plaster finish. The walls appeared constructed with a conventional running bond pattern, we did not observe any stretcher coursings or tie joists between the two (2) wythes of wall during our site visit. The wall is was in poor condition at the time of our site visit with various areas where localized collapse had occurred, fully deteriorated mortar joints, and failing brick masonry units. We have summarized our findings from the site visit below:

- Localized areas of extensive damage were observed where façade is no longer present. (Photos 016 – 018)
- The interior lath and plaster finished was mostly in a failed condition along the interior of the building. There was evidence of severe deterioration, likely due to the moisture exposure through the open windows, exterior wall cladding, and deteriorated roof. The interior space had been vandalised throughout most of the space. (Photos 003 & 004)
- The wood window framing and glazing at the ground level appeared deteriorated and had been boarded with plywood. (Photos 003 & 004)
- Cracking, mortar delamination, and lost mortar observed throughout.

Although large areas of damage were observed in the exterior brick masonry walls, most walls require minimal re-pointing and in the areas of higher concern, the reuse of the existing masonry brick is allowable.

PART 4 – RECOMMENDATIONS

The structural components of the building were reviewed for evidence of damage and deterioration. The comments and observations presented in this report are based on visual observations made during the site investigations completed on May 31st, 2022.

The structure as is at the time of visiting was in poor condition with evidence of localized failures and severe advanced deterioration occurring on various structural elements of the building. It is the opinion of BBA that further collapse of the building structure is probable with further prolonged exposure to the exterior elements and high loading conditions (i.e. wind storms and heavy snow loading).

Additionally, the building was likely originally designed to have a complete building envelope, with a conditioned environment on the interior. The frost action and freeze thaw conditions that are seasonally occurring on the building structure are likely contributing to accelerated deterioration and complete structural in-stability of the building superstore. We have summarized below our recommendations for each of the structural components as follows:

ROOF STRUCTURE:

The roof structure was severely deteriorated at all levels of the building. The decking had evidence of localized failures, with other sections appearing deflected, indicating that the rafters and/or supporting transfer beams were deteriorated resulting in localized deflections. Note that the deflecting of the roof structure allows for ponding water which results in water accumulation on the roof, promoting overloaded structure conditions, increasing the possibility of structural failures. It is the opinion of BBA that the roof structure is at the end of life; it is recommended that the following remedial repair and replacement work be completed:

- Replacement of the deteriorated wood plank decking. Salvage decking in good condition where possible.
- Replacement of the deteriorated wood rafters. Salvage wood rafters where possible.
- Conduct a closeup visual review of the interior structural steel transfer beams. Complete reinforcing as necessary. It is believed that reinforcing will be required on at least 50% of the structural components.
- Installation of a new roof with historic flashings, fascia, and soffits to match the original building condition.

Extensive temporary shoring and a complex demolition program will be required to complete the roof replacement and restoration work.

CLERESTORY WALLS:

The clerestory walls were severely deteriorated. The wood panel exterior appeared rotted and/or damaged due to prolonged exposure to the external elements and the presence of moisture. Localized failure of the stud wall was observed where the wood panel exterior had deteriorated. Due to the extents of the deterioration of the external panelling, it is believed that the moisture buildup in the stud walls will/has compromised the structural integrity of the studs. It is the opinion of BBA that the clerestory is at the end of life and requires the following repair and replacement work:

- Replacement of the deteriorated wood panelling. Salvage panels where possible. Re-introduction of moisture resisting membrane is recommended.
- Replacement of the deteriorated wood studs. Salvage studs where possible.
- Replacement of the deteriorated window frames and installation of new glazing.
- Re-finish internal walls with lath and paster, or similar, to match original building finish.

Extensive temporary shoring of the roof and a complex demolition program will be required to complete the multi-level wall replacement and restoration work.

GROUND LEVEL STRUCTURE:

The ground level structure showed signs of moderate deterioration and damage. The ground floor suspended slab was not observable from above at the time of visit. Vandalism was observed throughout. It is the opinion of BBA that ground level structure was in moderate standing, with the following remedial and replacement work required:

- Conduct a closeup visual review of the suspended slab once exposed. It is believed that the presence of moisture may have had an effect on the top of slab, however, the structural integrity of the slab appears intact. Repair any surface damage present.
- Conduct additional review of concrete encased beams once accessible. Replace and/or repair damaged and deteriorated sections concrete. Reinforce where required. Should more concerns be found upon review, provide shoring and reinforcement where required.
- Conduct additional review of concrete stairs once accessible. Replace and/or repair damaged and deteriorated sections concrete.
- Repair and refinish underside of slab where necessary.

Temporary shoring may be required pending further review. At the time of visit, the slab appeared structurally sounds with minor rehabilitation required.

BASEMENT:

The basement level was in fair condition. Due to the amount of debris and garbage, the slab-on-grade system was not observable. The clay brick walls and concrete encased beams showed signs of moisture staining and minor signs of deterioration. The door and window frames were rotted. Minor spalling, with some rebar exposure, was noted on the underside of the suspended slab. It is the opinion of BBA that the basement level was in fair condition, with the following remedial and replacement work recommended:

- Conduct a closeup visual review of the slab-on-grade once exposed. It is believed that the presence of moisture may have had an effect on the top of slab, however, the structural integrity of the slab appears intact. Repair any surface damage present.
- Consider installation of a sump pit to promote positive drainage from the basement.
- Consider temporary heat to assist with preventing frost action below the basement slab which will crack and cause failure in the slab-on-grade system.

Based on the limits of our review at the time of the site visit it is our opinion that the existing basement structure can be salvaged with the necessary remedial repair work.

FOUNDATION WALLS:

The foundation walls were load bearing multi-wythe clay brick masonry wall system. As the foundation wall was only observable from the interior, further assessment of the external surface is required. The foundation walls showed minor mortar delamination, cracking and surface spalling. It is the opinion of BBA that the foundation wall is in fair condition and that the following remedial and replacement work be conducted:

- Complete further review work of the basement to confirm conditions in areas that could not be safely reviewed.
- Consider temporary heat to assist with preventing frost action in the basement which will cause differential movement.
- Consider moisture mitigation (i.e. sump) pit to ensure that any standing water in removed from the basement prior to cold weather that could cause ice building up in the building and apply stress to the load bearing walls.
- Restore the brick masonry foundation walls on the interior which will include repointing using historic mortar application, localized brick replacements, and possible localized wall re-construction where cracking has occurred.
- Consider an exterior waterproofing membrane and weeping tile along the perimeter of the basement.

It is our opinion that the existing brick masonry foundation walls are in fair condition and can be salvaged with a remedial repair program outlined above.

EXTERIOR BRICK MASONRY WALLS:

The double wythe exterior brick masonry was severely damaged in localized areas with some locations having fully failed. We observed significant cracking, separation of the wall wythes, and displacement of the mortar. It is the opinion of BBA that the exterior clay brick masonry wall is at the end of life in the current condition; it is recommended due to the extensive amounts of failures and unstable conditions of the existing brick masonry walls that the following remedial repair and replacement work be completed:

- Replacement of damaged and deteriorated sections of wall. Salvage clay bricks where possible for re-use in the new construction
- Salvage existing window frames where possible for re-use or to assist with creating replica frames for a re-build.
- Re-construct new load bearing masonry walls to match the existing architectural façade, consider a new structural back up such as metal studs to eliminate one (1) wythe of brick which should allow for the re-claimed bricks to be fully utilized in a re-construction.
- Repoint rebuild with historic mortar procedures.

PART 5 – CONCLUSIONS

A structural condition review was completed on May 31st, 2022, by Barry Bryan Associates, Architects, Engineers, and Project Managers, for the existing Cafeteria Building at the Camp 30 site in Bowmanville on behalf of the Municipality of Clarington. The purpose of this visit was to visually assess the structural condition of the building and provide a summary of the condition with recommendations for remedial repairs.

The structural review focused on areas of the building that were safely accessible at the time of the site which included the following components: roof structure, clerestory walls, ground level structure, basement, foundation walls, and exterior brick masonry walls. All areas of the building at the time of the visit were not safely accessible for closeup visual inspection resulting from excessive debris in the path of travel, unsafe suspended equipment/piping, and blocked paths of travel or possible structurally unstable conditions overhead.

The structure of the existing Cafeteria building is in poor condition with already localized areas of structural collapse occurring. The building must NOT be occupied until a remedial repair and/or stabilization program can be developed.

The existing building is in a poor structural condition. All structural components above the finished ground floor elevation have severely deteriorated from exposure to the exterior elements. Additionally, there are localized areas of collapse in the roofing and exterior walls.

The historic sensitives of this building are understood, and that preservation requires reuse of historic components. Stabilization and/or restoration of these severely deteriorated and failed components will be nearly impossible since most of the existing timber framing is rotted and has evidence of severe deterioration. Additionally, the multi-wythe brick masonry walls have fully separated, locally failed, and severely shifted. We are recommending that the wood roof structure and supporting walls at the clerestory along with exterior brick masonry walls be deconstructed, utilizing a salvaging program for any materials that are found to be in fair to good condition for re-use. The salvaged materials can be utilized into a possible re-construction of the existing building from the ground floor up.

The existing ground floor structure, foundations, and basement slab require a comprehensive cleaning and structural restoration and stabilization of the remaining elements. It is our opinion that the ground floor slab, basement slab, and supporting foundations can be restored for re-use in the re-development or stabilization of the building. However, we recommend that immediate action is taken to prevent further, more advanced, structural deterioration and/or localized collapse of the building structure.

It is understood that the historic nature of this project calls for the salvage and reuse of historic components. However, due to the severe deterioration observed above the ground floor, extensive replacement is recommended, with salvaged material reused where allowable.

BUDGET

The budget for this type of project is extremely difficult to provide, including rough orders of magnitude costs toward due to the unprecedented nature of this type of project. Several considerations must be reviewed when providing a budget estimate:

1. Abatement work required prior to or during any work.
2. Temporary stabilization program to safely access the building (i.e. temporary shoring program).
3. Salvage program with a deconstruction plan is far more complex in comparison to standard demolition since the existing building components must be protected for possible re-use.
4. Salvaged materials need to be inventoried tagged and stored.
5. There is additional intrusive review and testing required to confirm that adequacy of existing elements to remain (i.e. ground floor slab, basement foundations, basement slab, and building structural steel columns and steel beams.

We believe the costs to re-construct a replica building without any salvage considerations will be far more economical in comparison to a partially salvage and restore option. However, we understand the historic requirements for preservations of buildings that are designated as historically significant. We have outlined key

itemized areas of pricing for the project; however, we do not have a precedent to provide budgets against for the work:

1.	Temporary shoring / stabilization	$ 250,000.00
2.	Abatement	(Unknown)
3.	Deconstruct / salvage structure (ground floor up)	$1,000,000.00
4.	Protection of existing columns and structural steel beams	$ 100,000.00
5.	Provide temporary heating	$ 400,000.00
6.	Provide positive drainage (basement sump)	$ 150,000.00
7.	Re-instate power	$ 400,000.00
8.	Restore basement foundation	$ 500,000.00
9.	Basement waterproofing	$ 250,000.00
10.	Restore basement slab	$ 150,000.00
11.	Restore ground floor slab (assuming existing slab properties are suitable)	$ 250,000.00
12.	Reinforce steel beams / columns salvaged in place.	$ 300,000.00
13.	Reinstate mechanical electrical systems	(Unknown)
14.	Re-construct replica from ground floor up	$3,500,000.00

We trust the above information meets your requirements. Should you have any further questions, please do not hesitate to contact our office.

Yours very truly,

BARRY BRYAN ASSOCIATES

Architects, Engineers, Project Managers

Matthew Ficara, EIT

Doug McLaughlin, P. Eng.

APPENDIX

PHOTOGRAPHS

Photo 001 – Visible Water Staining Throughout Structure

Photo 002 – Rotted Decking Viewed from below

Photo 003 – Excessive Deterioration and Local Failure of Rafters (1/2)

Photo 004 – Excessive Deterioration and Local Failure of Rafters (2/2)

Photo 005 – Exposed Transfer Beam with Water Damage Visible

Photo 006 – Corrosion of Exposed Transfer Beam

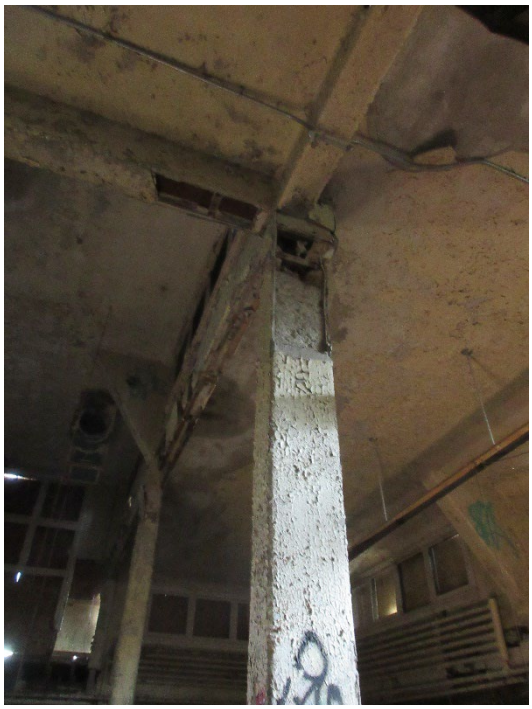

Photo 007 – Ground Floor Concrete Encased Beams and Columns

Photo 008 – Damage to Concrete Encasement

Photo 009 – Failure of Exterior Cladding

Photo 010 – Corrosion of Exposed Transfer Beam Supporting Clerestory

Photo 011 – Boarded Windows of Clerestory

Photo 012 – Moisture Infiltration of Suspended Slab

Photo 013 – Exposed Rebar on Underside of Suspended Slab

Photo 014 – Concrete Encased Beam

Photo 015 – Clay Brick Masonry Foundation Wall

Photo 016 – External Brick Masonry Wall Damage (1/3)

Photo 017 – External Brick Masonry Wall Damage (2/3)

Photo 018 – External Brick Masonry Wall Damage (3/3)