N A ENGINEERING ASSOCIATES INC
Consulting Engineers

File: 17-1079

January 23, 2018

City of Stratford
82 Erie Street
Stratford, Ontario
N5A 2M4

Attention: Mr. Rob Horne, MA, MCIP, RPP, Chief Administrative Officer

Re: Tom Patterson Theatre, 111 Lakeside Drive, 48 Water Street, Stratford

Mr. Horne:

NA Engineering Associates Inc. (NAE) is pleased to provide our comments regarding the existing Tom Patterson Theatre building located at 48 Water Street / 111 Lakeside Drive in Stratford. The Tom Patterson Theatre is part of a larger complex that includes the Kiwanis Community Centre however this letter only addresses the theatre portion of the facility. NAE has been involved with a number of projects that have been completed over the past 20 plus years and has a good understanding of the current condition of the building, upcoming required improvements, as well as ongoing maintenance items.

The original portion of the building at 48 Water Street was constructed prior to 1919 making it now almost 100 years old and would not have been built to any code or standard as the first National Building Code was released in 1967. It was originally constructed as a “casino”, that today would be a dancehall / community centre. The original building is all essentially all wood timber frame construction. The main hall is a timber, barrel roof structure with steel tension tie rods at each timber arch. Timber purlins span between the arches and subsequently support the wood roof deck and finished roofing materials. The underside of the wood deck has subsequently been finished with insulating/ fireproofing material. Structural reviews of the timber frame construction were conducted and subsequently reinforced to accommodate the needs of the theatre. The original wood frame structure has limitations for any additional loading and based on past assessments, would not meet the standards of today’s Ontario Building Code.

The Stratford Festival of Canada has been leasing the facility from the City of Stratford and operated the Tom Patterson Theatre at this location for approximately 40 years. Since the building was originally constructed, there have been at least two sizeable additions. A front lobby addition was constructed as a main entrance to the theatre. Subsequent renovations have modernized some of the patron amenities such as the washrooms. The noted additions are assumed to have met code requirements at the time of construction; however codes have changed since that time period and it may be that they do not meet the most current requirements of the Ontario Building Code. Most recently, a large HVAC upgrade project was completed in 2015 to replace the outdated system with a new heating and cooling system to meet the requirements of today’s code requirements. In addition to the noted additions/ renovations it is understood that regular maintenance programs and required jurisdictional inspections by local authorities (ie. fire department) have been completed.

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Existing building systems and components that may not meet current codes and standards include the buildings structural elements, electrical power distribution, lighting, as well as items not immediately evident such as thermal insulation values of walls and roofs. A detailed building audit would confirm the above. Most of the work done has been completed on an 'as needed' basis and kept the facility adequate in terms of meeting the needs of current users.

The Tom Patterson Theatre is a very well used, public facility. It is understood it does not meet the Accessibility for Ontarians with Disabilities Act (AODA).

The current 100 years old facility has served the community very well and particularly since the Festival has leased the building over the past 40 years as an operating theatre space however it is our opinion that some of the buildings major systems and/or components are at or have exceeded their anticipated serviceable life. There would be considerable effort and associated costs required to bring the existing facility up to current codes and standards. In addition, the age of many of the buildings key components, an example being the near 100 year old structural wood frame in the original section of the building, make upgrades difficult and in some cases impossible to economically construct. As buildings get older, it becomes more and more of an economic challenge to keep them in good condition, in compliance with applicable codes and standards, and comparable in terms of amenities to buildings in the same use.

We have attached some information found in Appendix A pertaining to a buildings life cycle costs, which helps to explain the different stages in a buildings life. This information is helpful in understanding items that need to be considered at the Tom Patterson Theatre.

We trust that you will find our comments helpful. If you have any questions or concerns please feel free to contact the undersigned.

Sincerely,
NA ENGINEERING ASSOCIATES INC.

Nick Aroutzidis, M.ASc., P. Eng.

Appendix A

Supplemental Information-
Building Life Cycle

Building / facilities Life Cycle Rationale

Life cycles are used to understand the various stages that a building goes through in order to better predict and or allocate resources to each major component of the building. This will ensure that the building components will reach their maximum service life without compromising the effectiveness of the overall building.

Table 1 provides a listing of assets and their relative service life. Column 1 and 3 categorize the building elements. Column 2 and 4 indicate the associated service life of each component. Service life is described as the period of time over which an asset and its components provide adequate performance and function. It should be noted that the service lives indicated in Table 1 are based on industry averages, but many assets with proper maintenance may function properly beyond the stated service life.

Uniformat categorizes elements which are major components, common to most buildings that usually perform a given function regardless of the design specification, construction method, or materials used. Examples of elements are foundations, exterior walls, sprinkler systems, and lighting.

The need for an elemental classification is most apparent in the economic evaluation of building alternatives at the design stage.

Table 1.

(1)	(2)	(3)	(4)
Building Elements	**Service Life**	**Building Elements**	**Approximate Service Life**
Standard Foundations	Life of Bldg.	Standpipes	25-40
Slab on Grade	Life of Bldg.	Electrical Service and Distribution	25-40
Floor Construction	Life of Bldg.	Lighting and Branch Wiring	20
Roof Construction	Life of Bldg.	Miscellaneous Electrical Systems	25
Structure Support	Life of Bldg.	Data Communications	15
Stairs	75	Voice Communications	15
Exterior Walls	35-50	Audio-Video Communications	15
Exterior Windows	30	Detection and Alarm	10-15
Exterior Doors	40	Fixed Millwork	15-20
Roof Coverings	20-30	Pedestrian Paving	30
Partitions	75	Facility Power Generation	30
Interior Doors	40	Parking Lots - Flexible Parking Lot Pavement	15
Wall Finishes	5-15	Parking Lots - Parking Lot Curbs and Gutters	15
Stair Finishes	35-50	Pedestrian Plazas and Walkways - Exterior Pedestrian Control Equipment	20-30
Floor Finishes	12-15	Site Development - Wire Fences and	30

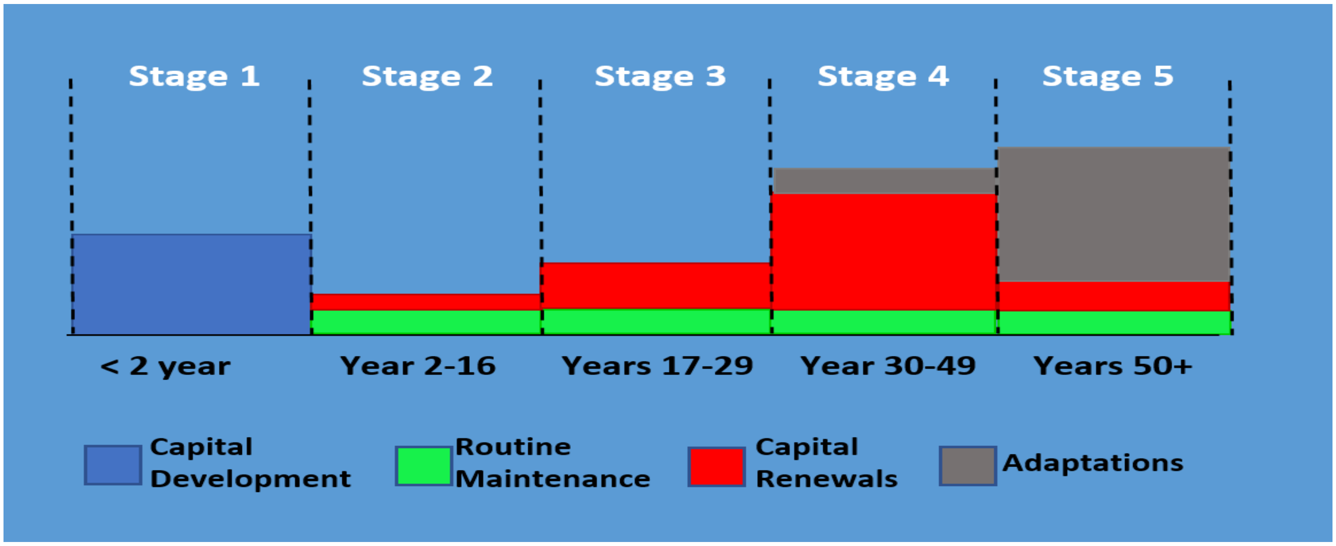
		Gates, Chain link	
Ceiling Finishes	13-25	Site Development - Wood Fences and Gates, Wooden	20
Elevators and Lifts	10-50	Landscaping - Sprinkler Systems	25
Domestic Water Distribution	20-30	Fire Protection - Fire Hydrants, Framework	100
Sanitary Waste	30	Fire Protection - Fire Hydrants, Valves	50
Rain Water Drainage	35	Water Utilities - Water Distribution Equipment	50
General Service Compressed Air	20	Water Utilities - Water Distribution Piping	100
Heat Generating Systems	25	Sanitary Sewerage Structures - Manholes	70
Cooling Generating Systems	20	Storm Drainage Utilities - Manholes	70
Distribution Systems	30	Storm Drainage Utilities - Catch Basins	70
Facility HVAC	20	Storm Drainage Utilities - Storm Drainage Piping	80-100
Ventilation	25	Site Electric Distribution Systems	70
Fire Suppression	25-40	Site Lighting	30

Buildings typically follow a five stage life cycle and are generally categorized by the age of the building.

The first stage is related to the construction stage that requires no maintenance and or capital improvements. The second stage covers years 1 to 16 and should consist of regular maintenance costs and planned future replacement and / or upgrade funds reserved for components for which service lives will expire within the next stage. Stage 3 covers years 17 to 29 and is typically the point that maintenance funding established in the previous stage is not adequate to cover all aging components and is why significant effort is spent on determining existing component condition and replacement cost. Asset projects typical of stage 3 of a building cycle consist of re-roofing, elevator control modernization, boilers, plumbing distribution systems, replacement of exterior sealant, replacement of failed sealed glazing units (IGUs), and overhaul of sump pumps.

The most important stage for a building cycle related to expenditures is stage 4 which covers years 30 to 49. During this period significant funds are required to be reinvested into the building to replace major components. Typical asset replacement projects for stage 4 are exterior cladding / wall systems, fire alarm panels, exterior roadways and interior redecorating. During stage 4 some assets have been replaced during the preceding years which provides management an additional challenge of maintaining assets replacement logs. These logs are important tools used to gather information regarding when the asset was replaced, cost of replacement and future replacement year on a particular asset based on past maintenance procedures. The final stage is stage 5 which covers beyond 50 years. It is important to note that there is no correlation between the age of a building and the building condition. Many building in this stage may be in good condition as a result of owners having replaced assets at the end of their service lives and proper maintenance procedures throughout the asset life. Typical renewal project that fall under stage 5 are glazing assemblies, transformers, sanitary and storm water collection assemblies.

Figure 1.



As illustrated in Figure 1, routine maintenance costs remain relatively constant over the various stages of a building life cycle; whereas capital renewals increase dramatically as building components come to an end of their useful service life. Capital maintenance costs typically peak during stage 4, at which point the buildings major components have been replaced and the building begins its new cycle.