

37 – 22 Seismic Structural Reinforcement Policy

1. BACKGROUND

Haines Junction is in an earthquake zone. The National Building Code (“NBC”) includes seismic design provisions, which depend on the type and location of a building. The NBC seismic design provisions have changed between different versions. There are established NBC Guidelines (Commentary “L”) that outline the factors which would trigger the need for a seismic upgrade pursuant to the NBC. There are buildings in Haines Junction, despite having been designed and constructed according to the NBC, may benefit from seismic structural reinforcements in order to improve the safety of building occupants during an earth or which might require an upgrade pursuant to the NBC.

2. POLICY OBJECTIVES

The purpose of this policy is to identify priorities for the identification, investigation, evaluation and improvement of the structural performance of existing buildings in Haines Junction during a seismic event. This policy only applies to buildings that are owned by the Village of Haines Junction.

This policy is intended to provide guidance to Haines Junction on future decisions so that those decisions consider:

- the minimum acceptable standards for buildings owned by Haines Junction;
- the preferred performance standard during a seismic event for the location, type and occupancy of buildings owned by Haines Junction;
- the scope of the structural reinforcement required to meet the preferred performance standard;
- the available financial resources of Haines Junction and the ability to obtain additional funding such as for grants from other levels of government and organizations;
- reasonable timelines for the different processes involved in the implementation of this policy;
- new technology and advancements in building design and construction techniques that improve structural performance of buildings during seismic events; and
- alternatives to structural reinforcement.

Accordingly, this policy may be revised from time to time as more information is obtained.

3. SEISMIC STRUCTURAL REINFORCEMENT POLICY

Haines Junction is committed to exploring reasonable options for public safety in the event of a seismic event.

1.1 Identification of Buildings

From a completeness standpoint, it is important that Haines Junction have an accurate inventory of buildings to which this policy applies. A prioritization of the inventory is required to match the funding available with buildings that are ranked with the highest consequence to the community should a seismic event damage those buildings. Therefore, Haines Junction will consider opportunities to create an inventory of buildings and to evaluate the priority of the buildings in this inventory.

The priority of the buildings on the inventory may be evaluated on any reasonable criteria determined by staff of the Village of Haines Junction. The priority of the buildings on the inventory may be adjusted or modified from time to time, without any obligation to do so. The priority of the buildings may take into account, among others, the following criteria:

1. Importance of the building

The importance of the building may take into consideration the history of the building and the purpose that it serves to the community. Generally, buildings with higher importance may be considered higher priority for further stages of this policy.

2. Occupation of the building

The occupation of the building may take into account the number or type of occupation of the building. Buildings with low human occupancy may be considered low priority for further stages of this policy. Buildings with high human occupancy or intended to be occupied by persons who may be particularly vulnerable in the event of disaster, such as schools, assisted living facilities, and emergency health centres, may be considered higher priority for further stages of this policy.

3. Age of the building

This policy applies to older buildings have been designed using different or outdated design standards. Buildings that have been constructed under the 2015 version of the NBC are not eligible for further consideration under this policy - they may be excluded from the inventory or marked on the inventory as ineligible.

4. Expected useable life of the building

Where the expected useable life of the building is limited, the building may be considered a low priority for further stages of this policy. Haines Junction may elect to achieve the intended outcomes of this policy in the design of any new buildings intended to replace a building at the end of its useable life. In this case, the building will be marked on the inventory as ineligible for further consideration under this policy.

5. Availability of existing records for the building

The evaluation of buildings with incomplete records requires more destructive and costly investigations. Buildings with unknown histories or incomplete building records may be considered low priority for further consideration under this policy.

6. Location of the building

The impact of a building collapse may cause damage to other buildings or infrastructure. Buildings in higher density locations or with the capacity to impact other significant infrastructure like key transportation routes may be considered higher priority for further consideration under this policy.

1.2 Investigation of Buildings

Subject to further direction from Council of the Village of Haines Junction and available financial and staff resources, the highest priority buildings may be further investigated to assess the current structural performance of the building with regards to seismic events.

A decision on the scope and type of further investigations may take into account, among others, the following criteria:

1. The availability of experts or qualified individuals or company to perform the investigations;
2. Available financial resources, including additional funding additional funding such as for grants from other levels of government and organizations;
3. The impact of the investigations on occupants of the building; and
4. Timing of the investigations.

This stage of the policy may prioritize delaying further investigations in order to have the investigations completed by preferred individuals or companies. The preference for the individuals or companies performing these investigations may take into account their more specific or unique qualifications or experience in regards to any criteria reasonably decided on by Haines Junction, including structural engineering, seismic design, similar retrofitting experience or experience in similar seismically active areas.

1.3 Evaluation of Buildings

Once investigated, buildings in the inventory may be evaluated for their suitability for further seismic structural reinforcement. The findings or recommendations from any investigation does not compel Haines Junction to perform any or all structural reinforcement, even if the investigation makes specific recommendations for reinforcement. Rather, the results of these investigations will allow the Council of Haines Junction the opportunity to evaluate the building, the recommendations and to direct the building be considered under the final stage of this policy.

It is likely that the time frame for a comprehensive program would be of the order of twenty-five years, with more urgent work addressed in the early years of the existence of this policy. This policy is intended to allow Haines Junction the opportunity to investigate and evaluate existing buildings so that an effective program can be developed to achieve long term seismic safety goals, without materially impacting the Village of Haines Junctions' risk. This intention of this stage of the policy is to allow the Council of Haines Junction to identify reasonable opportunities to evaluate the community's priorities with respect to structural reinforcement of existing buildings owned by the Village of Haines Junction.

1.4 Structural Reinforcement of Buildings

Subject to further direction from Council of the Village of Haines Junction and available financial and staff resources, in the final stage of this policy, the Council of the Village of Haines Junction may elect to authorize structural reinforcement of its buildings in accordance with the preferred performance standards for buildings.

Assuming that the building meets the minimum acceptable standards for buildings owned by the Village of Haines Junction and there are no emergency or urgent structural deficiencies identified in the investigations, a decision on authorizing structural reinforcement is solely at the discretion of the Council of the Village of Haines Junction.

4. PREFERRED PERFORMANCE STANDARDS FOR BUILDINGS

Structural reinforcement can be carried out in various ways to achieve different upgrade levels. This policy is intended to allow the opportunity for these options to be explored and to prioritize structural reinforcement methods that generate the highest benefit/cost ratios. In general, if Council elects to authorize structural reinforcement of its building, the preferred performance standard for these structural reinforcements may have regard for the preferred performance standard of the building. The preferred performance standard of the building is at the discretion of Council of the Village of Haines Junction, whose opinion may consider the findings and recommendations of any of the information obtained through this policy or any further reports, studies, investigations or opinions that may be ordered. Generally, the preferred performance standards may include, but are not limited to the following outcomes:

1. **Replacement of existing building:** to replace existing buildings with seismic limitations with a newly designed building that meets the current NBC.
2. **Minimal reinforcement:** to provide additional reinforcement of connections between major structural elements of the building.
3. **Partial Upgrade:** to provide new lateral load resisting elements capable of resisting a prescribed percentage of design level earthquake forces.
4. **Full Upgrade:** to provide new lateral load resisting elements capable of substantially resisting the current code design level earthquake forces.

Reliable costs estimates may be developed for the various structural reinforcement methodologies and building types.

In addition to the direct financial costs of the structural reinforcement method, there are socio-economic costs that may be considered, such as the anticipated disruption costs to occupants and the availability of public facilities on other community programs.

5. MINIMUM ACCEPTABLE STANDARDS

- 5.1 The minimum acceptable standards for buildings owned by Haines Junction is design and construction to the standard required by the applicable building code at the time of construction.
- 5.2 Where the NBC Guidelines (Commentary “L”) triggers the need for a seismic upgrade of an existing building pursuant to the NBC, the building will automatically be considered eligible for structural reinforcement consistent with the requirements of the NBC under stage four of this policy. The timing of the structural reinforcements and the methods of structural reinforcements are subject to further consideration by Council as described above in this policy. Reasonable alternative solutions for safe occupancy in the interim may be considered while buildings are eligible for structural reinforcement, including non-structural modifications or operational restrictions.

Adopted by Resolution 6-22 on the 12 day of January 2022.

Chief Administrative Officer