Client: Bob Andrew on behalf of Gabriola Commons
Client Address: 675 North Road, Gabriola, BC V0R 1X3

Dear Bob,

RE: **Structural Engineering Services - 675 North Road, Gabriola, BC**
Preliminary Structural Condition and Feasibility Assessment

Further to your request, Check Engineering Inc. attended the above-noted address on May 13, 2025 to review the existing condition of the house. The following summarizes our observations and recommendations. Photographs are included in Appendix A for reference. Photos are a representation of the conditions observed and not all conditions have been captured.

Background:

The Client wants a preliminary assessment of the current condition of the existing structure, as well as review the feasibility of changing the occupancy from the existing barn use to an assembly use as a public event space. Only areas that were visible without destructive testing were reviewed. Plans showing the existing structural details were not provided to Check Engineering Inc. for review.

Building Description:

The building is a single-storey, wood-framed barn-style building with a rectangular footprint. Some rooms have been added to the X side of the structure including a small lean-to addition. The roof is pre-engineered trusses with metal roofing and the walls are clad in vertical wood siding. The building has been used historically for agricultural purposes. The Building was constructed in approximately the 1960's. The side of the house with the lean-to and bathroom additions is taken to be East for the purposes of this report.

The Building

Proposed Modifications:

- The Client is proposing to change the occupancy of the structure from Group F, Division 3 (F-3) Major Occupancy (low-hazard agricultural use) to Group A, Division 2 (A-2) (community hall used for community gatherings, concerts, and multipurpose events).
- The Client did not note any other proposed alterations at this time.

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Observations:

General Building:

- The building appears to be in fair overall condition, consistent with the age of construction.
- There is a small addition on the east side with a monoslope roof tied into the east wall of the original structure, which currently houses a bathroom area.
- A small lean-to roof structure is also present at the north-east side, connecting into the original east wall.
- The original occupancy of the building appears to have been agricultural (barn/livestock housing), consistent with its form, sloped wash-out slab, and tall concrete containment walls. Under the current BC Building Code, this would most closely align with an F-3 (low-hazard industrial/agricultural) major occupancy classification.

Roof:

- The roof framing consists of pre-engineered trusses spaced at approximately 24” on centre.
- The roof sheathing appears to be plywood, with no interior drywall at the truss bottom chord.
- The roof sheathing is standing seam metal roofing, screwed directly into the plywood sheathing.
- Overall, the roof framing appears to be in good condition and consistent with the building’s age.
- We noted minor localized panel lift/misalignment of the metal roofing at the eave.
- The roof trusses appear to be anchored to the wall system with hurricane ties at each truss.
- There is a single solar panel on the roof at the south side of the building.

Walls:

- The exterior walls are wood-frame construction bearing on tall, cast-in-place concrete foundation walls.
- At the base, the walls sit on a standard bottom plate anchored into the concrete at approximately 20” spacing.
- Wall studs are 2x4 members at approximately 16” on centre.
- The interior face of the walls is clad with painted plywood sheathing, nailed at approximately 12” spacing.
- At the exposed north wall framing, we observed a lack of true headers above the window openings.
- On the exterior, 2x4 horizontal girts are fixed to the studs to support the vertical cedar siding (removed at the time of review on the North side).
- The remaining exterior wall cladding is in fair to poor condition, with weathering and visible gaps in some areas that expose the purlins and stud framing.
- There is an interior east–west wall bearing on a cast-in-place concrete foundation wall. On the south side of this wall, the floor is raised approximately four steps higher than the larger north space with the sloped floor. This wall does not appear to align with a truss node above.
- Some damage to the wall studs due to rodents was observed at the exposed, north wall framing.

Floor:

- The floor consists of a cast-in-place concrete slab-on-grade. The slab surface is intentionally sloped inward toward the centre, likely for historical agricultural use and wash-out drainage.
- The slab appears to be in generally good condition. Visible at the time of review were

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- remnants of older wood-frame wall anchorage locations at the slab, and a hairline crack along the meeting point of the two sloped surfaces at the centre of the north space.
- At the east side, there is a raised wood-frame platform (formerly used for storage) that was difficult to fully observe due to stored materials.

Foundations:

- The building bears on an 8” wide cast-in-place concrete foundation wall, extending approximately 20” below grade and supported on an 8” deep by 24” wide footing.
- At the perimeter and along the interior east–west wall, the concrete foundation walls extend upwards approximately 70” above the interior floor slab. These appear to have been constructed both for agricultural containment purposes and for retaining conditions at the north wall, where the exterior grade is higher.
- The concrete visible at the time of review appeared to be in generally good condition.
- Some unevenness was observed along the top of the foundation wall.
- A vertical hairline crack was noted in the north foundation wall.
- At the former west side door opening (now enclosed), an area of concrete appeared to be in poor condition. This portion seems to have been placed later, on top of the original opening, possibly to raise the door threshold.

Lean-To:

- The small lean-to structure consists of roof joists spanning from a ledger at the east exterior wall of the main building to a beam supported by posts at the north side, and tying into the south-east addition.
- The beam and posts are constructed of tree trunks and large, rough-sawn lumber.
- The lean-to roof is clad with cedar shingles.

Opinions:

- In our opinion, the existing building is in overall fair condition, with certain elements ranging from good to poor condition. Its condition is consistent with the age of construction and it appears to be performing adequately for its current use.
- The proposed change from agricultural (F-3) to assembly (A-2) occupancy triggers a significant increase in design loads under BCBC 2024. Most notably, the seismic importance factor increases from 0.8 to 1.3, which increases the required seismic resistance. In addition, assembly live loads (4.8 kPa or greater) must be verified along with higher wind and snow load factors. These requirements will likely necessitate upgrades to the lateral system (shear walls/diaphragms), anchorage, and potentially the foundations to ensure compliance.
- Given the proposed change of use to an assembly occupancy, it is our opinion that the building will require substantial upgrades to meet current BC Building Code standards. This is necessary to ensure the safety of occupants in the event of seismic or wind loading, and to provide code-compliant construction. Limited ‘grandfathering’ is not appropriate when the occupancy change involves large public gatherings.
- The current Lateral Force Resisting System (LFRD) that resists the lateral seismic and wind loading consists of the interior plywood sheathed walls, as well as their connection to the roof diaphragm and the foundation. This is an acceptable type of LFRD, but the capacity

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of the existing system does not meet current code requirements and would require upgrades, especially to meet the higher occupancy type. The walls can continue to be sheathed at the interior but connections to the roof and foundation as well as nailing patterns and end post/hold downs would be required to create dedicated shear walls. A geotechnical engineer would be required to confirm the site class of the soils for the design of the upgraded LFRD.

- The existing lean-to structure appears to be performing adequately in its current condition; however, it does not meet current code requirements for structural design or life safety. While it may continue to serve as a basic shelter, any change of use to assembly occupancy would require significant upgrading or reconstruction to bring this portion of the building into compliance.
- The exposed portions of the cast-in-place concrete walls and footings appeared to be in very good condition at the time of review, with no significant signs of deterioration. In our opinion, the concrete is likely adequate for the proposed upgrades; however, if deficiencies are observed during construction or if higher foundation capacity is required for the new lateral system design, additional testing (such as concrete coring) may be warranted to confirm compressive strength and reinforcement. Rebar scanning of the concrete walls may be warranted if significant new anchorage are required, or if the existing walls are to be relied upon as part of the upgraded lateral system. At this time, scanning is not considered essential provided the upgrade design does not depend on the concrete reinforcement; however, it may be recommended during detailed design if anchorage into the walls is required.
- In our opinion, the ungraded lumber of the walls would require grading/verification of the grade in order to proceed with the design of upgrades to meet current code for the new occupancy as there are no observable stamps on the existing lumber.

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Recommendations:

- Existing Condition:
  - We recommend replacing or sistering any wall studs with observed rodent damage. Although the affected areas appear minor, the loss of material reduces the stud's load-carrying capacity and durability and should be replaced to ensure structural reliability.
  - We recommend replacing any cladding that has deteriorated.
  - We recommend ensuring vegetation is cleared away from the structure wood framing to avoid moisture and deterioration.
- Change of Occupancy:
  - We recommend coring the existing slab-on-grade to confirm its thickness and strength, and reviewing further to verify whether it can sustain the higher floor loads associated with assembly occupancy. If the Client intends to install a stage or

other built elements, these should also be considered in the assessment. Levelling of the slab is recommended to provide a suitable surface for the proposed use.
    - We recommend engaging a pre-engineered truss engineer to reproduce the capacity design sheet for the existing trusses. This will establish the current load capacity, which must then be compared to present-day code loading requirements. Consideration should also be given to additional loading from solar panels (either the existing single panel or a potential larger array), as well as any suspended stage equipment or materials. While the existing trusses appear to be performing, without pre-engineered design data we cannot confirm that they meet current code requirements, which is a compliance that is necessary for the proposed change of occupancy. The provided design from the truss engineer will also verify whether the interior wall is required for load-bearing from the roof in order to verify foundation requirements.
    - We recommend verifying the roof plywood sheathing thickness and nailing pattern to ensure the diaphragm is sufficient for transferring the current code shear forces to shear walls.
    - We recommend that engineered wood shear walls be incorporated as the primary lateral force resisting system to meet current code requirements if the occupancy is changed to assembly use.
    - We recommend that the existing wall studs be evaluated by a certified lumber grader to confirm species, grade, and structural capacity. This information will be required to determine whether the studs can be reused under the proposed assembly occupancy.
    - The adequacy of headers and lintels around openings will need to be addressed to meet current code requirements.
    - We recommend having the concrete walls scanned for reinforcement where proposed shearwall anchors will be located. This ensures anchors are set in the right spots, don't damage the existing steel and will perform if the building is exposed to a strong wind or earthquake.
    - Although outside of our structural scope of work, the primary structural frame may require fire-resistance ratings under the proposed A-2 occupancy which could impact requirements.
- General:
    - If any of these items or any other differing or concerning conditions arise during removals, please contact Check Engineering Inc. for further comment.
    - Hidden/localized deterioration and undocumented alterations may increase the scope of work.
    - Nonstructural elements including hanging loads/event rigs will require engineered anchorage if the Client wants to include them if the new occupancy proceeds.

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Limits on Commission:

Services performed and outlined in this report were based upon visual observations of the site. Our opinion cannot be extended to portions of the site that were not reviewed or situations reasonably beyond the control of Check Engineering Inc. If unexpected conditions are encountered at the site, Check Engineering Inc. must be notified in order that we may determine if modifications to the conclusions presented here are necessary. Any conclusions or recommendations presented in this report were determined from the limited information available from the visual review.

This report was prepared with generally accepted engineering practices. No other warranties, expressed or implied, are made as to the professional services provided under the terms of our contract and included in this report. A detailed review of the structural system, including seismic restraint, was not included in the scope of work. Additional structural upgrades beyond those noted here may be required once detailed design and analysis are undertaken to achieve full compliance with the current BC Building Code.

Note that our review only serves to review the condition of the existing structural elements and discuss feasibility for the proposed change of occupancy. Our review does not constitute an approval or certification of the design or construction of any of the existing or proposed structural elements. The recommendations made in this report are for general purposes only and do not constitute a contracted structural repairs guidelines. Additional considerations for detail design may be required and beyond those noted in this preliminary report. Any modifications to the existing structural framing elements would be at the local building authority.

In Closing:

We trust this report meets your requirements at this time. Please contact the undersigned with any questions.

Sincerely,
CHECK ENGINEERING INC.

Check Engineering Inc. [Permit to Practice #1000180]

Encl. Appendix A

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Appendix A: Photographs

 Photo 1	West side of the Building.
 Photo 2	North-east side of the Building showing the lean-to structure.
 Photo 3	South side of the Building showing the taller concrete foundation walls and one solar panel on the roof.

Photo 4	Exposed concrete footing.
Photo 5	Hurricane tie connecting the roof trusses to the exterior wall.

 Photo 6	East addition.
 Photo 7	Existing cladding showing wood girt framing behind.

 Photo 8	Lean-to post with post at grade.
 Photo 9	Lean-to roof structure.

 Photo 10	East side of the Building showing lean-to structure.
 Photo 11	North side of the Building with exposed framing.

Photo 12	Rodent damage to studs.
Photo 13	Existing roof trusses.

 Photo 14	East addition at the interior of the Building.
 Photo 15	Anchorage of the wood-frame wall to the concrete foundation wall.

Photo 16	Sloping of the main area floors.
Photo 17	Hairline crack in the foundation wall.

 Photo 18	East platform.
 Photo 19	The interior of the structure facing east.

Photo 20	Concrete damage at the west door opening.