McElhanney

CANADA BEST MANAGED COMPANIES

North Peace Fall Fairgrounds: Adeline Kelly Building – Occupancy Change Code Review and Cost Estimate

January 28, 2025 | Project #2451-3138-011

Prepared for Peace River Regional District

Prepared by McElhanney Ltd. and Meiklejohn Architectural Design Studio Inc.

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McElhanney

MAD
MEIKLEJOHN ARCHITECTURAL DESIGN STUDIO INC

CANADA BEST MANAGED COMPANIES

Your Challenge.
Our Passion.

January 28, 2025

Peace River Regional District
Submitted via Email
Attention: Bryna Casey, Parks and Rural Recreation Coordinator

North Peace Fall Fairgrounds: Adeline Kelly Building – Occupancy Change Code Review and Cost Estimate

Previously, McElhanney has been involved with the Adeline Kelly project completing a document review of the Adeline Kelly building drawings with a report and presentation in January of 2024. After presentation to the PRRD, the board has requested that a full code review under the supervision of an architect be performed as well as structural calculations and a cost estimate to determine requirements and costs to bring the building up to the 2024 BC Building Code, assembly occupancy. McElhanney has partnered with Meiklejohn Architectural Design (MAD) Studio, to achieve the PRRD's goal of achieving a functional, safe, and code compliant building at the North Peace Fall Fairgrounds.

Sincerely,
McElhanney Ltd.

Structural Engineering Scope by:

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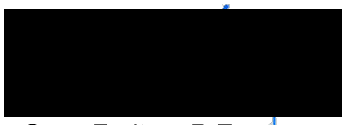

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Appendices

1. Executive Summary

McElhanney Ltd. (McElhanney) and Meiklejohn Architectural Design Studio Inc. (MAD Studio) have completed an occupancy change code review and cost estimate of the Adeline Kelly building at the North Peace Fall Fairgrounds at 15177 Rose Prairie Rd, North Pine, BC. Our task was to review the existing building design and proposed upgrade design requirements to change the building occupancy from a F-2 (Medium-Hazard Industrial) to A-2 (Assembly) for use as a community hall.

The original building should have been designed and constructed to the 2012 BC Building Code (BCBC 2012) and the proposed addition (not constructed) designed to the BCBC 2018. The building code analysis has shown that the proposed change of occupancy requires compliance with the current building code, and that the building is changing from a Part 9 building to a Part 3 building. The analysis has also shown that the existing building does not meet the BCBC 2018 or the BCBC 2012 to which it should have been designed. Even with the proposed washroom addition to the north of the building and other proposed upgrades there are still major deficiencies that do not meet the requirements of BCBC 2018. These deficiencies include: washrooms to serve 300 persons, insulation, heating and ventilation, spatial separations, fire rated wall assemblies, and more. With a Part 3 building, all aspects of engineering disciplines need to be involved that are currently not included. This includes mechanical (HVAC and plumbing) and electrical engineering as well as architectural and structural.

As can be seen in the architectural report, additional deficiencies include: water supply for firefighting, access routes for firefighting, fire separations, exiting, and accessibility

The structural review has shown that the existing building was not designed to the BCBC 2012 structural loads that it should have been designed to. The snow loads and wind load used for the existing building were incorrect on the existing building drawings. Also, the existing drawings are missing important information including; which code the building was designed to, importance factor used, seismic design criteria, and seismic force resisting system. Generally, all structural members in the building would need remedial work except the typical wall posts. The method with which the building has been constructed will lead to a reduced service life.

The cost estimate shows a retrofit cost of between $535k and $778k and between $760k and $1.08M including optional items of insulation and a 1,400 ft^2 kitchen addition. The cost of retrofit works out to $183/$ft^2$ and $190/$ft^2$ including optional items. A kitchen with medium quality finishes and fixtures would expect to be in the range of $150/$ft^2$. This is contrast to a new building of 5,656 ft^2 (including kitchen) costing between $1.85M and $2.38M or $326/$ft^2$ and $420/$ft^2$ is about double the cost of remediation and would ensure a typical building service life. These costs were reviewed with WL Construction, a reputable contractor in Fort St. John, and were deemed appropriate.

2. Provided Documents

The following documents were provided by the PRRD and form the basis for our desktop review. Field review and structural design were not completed as part of this assessment.

1. "Building plans" – Issued for review, December 19, 2013
    a. This is a three-page drawing set with code review, structural design, and building specifications.
2. "BP 14-0013 and application" – Original building permit application, three pages.
3. "Combined application with drawings_Redacted"
    a. This is a 25-page document including; building consent forms, original building permit application, contaminated site declaration forms, Lean-To Addition drawings – Issued for permit November 22, 2021 (architectural and structural drawings), and architectural and structural letters of assurance (Schedules A & B).
4. "Proposed existing building structural upgrade proposal inclusive of washroom facilities Letter (RCA 21137)"
    a. This document is a one-page letter from Richards Consulting and Associates Ltd. issued for review on August 2, 2022 providing estimated construction costs.
5. "Attach - Richards Consulting - Structural Engineering Responses"
    a. This document is a two-page letter from Richards Consulting and Associates Ltd. issued August 3, 2022 responding to questions from the PRRD.
6. "Proposed Upgrade Inclusive of Washroom (RCA 21137)"
    a. This document is a two-page letter from Richards Consulting and Associates Ltd. issued for review on August 30, 2022 confirming the proposed upgrade costs would meet the building code implications of changing occupancy as well as a restricted occupant load of 300 persons.
7. "Structural Inspection Letter (RCA 21137)- REVISED 30AUG2022"
    a. This document is a three-page letter from Richards Consulting and Associates Ltd. issued August 30, 2022 with instructions to correct construction deficiencies, confirmation of construction that upgrades will satisfy change in occupancy code requirements, and code requirement that there need to be 3 male water closets (toilets) and 5 female in the proposed washrooms.
8. "EM BEO to applicant" – PRRD email printout informing building permit applicant of application deficiencies, three pages.
9. "22178- SET 2023-03-29 - R1 – IFC"
    a. This document is a sealed construction drawing set from March 29, 2023 from Richards Consulting for building envelope upgrades.
    b. The building inspector had added notes to this document.
10. "Adeline Kelly Drawing notes"
    a. This document is a single sealed building permit drawing from November 22, 2021 from Richards Consulting for a building addition.

b. The building inspector had added notes to this document.

11. "FCA - Adeline Kelly"
    a. This document is an excerpt from a facility condition assessment, author unknown, dated 11/18/2021.

3. Structural Review

Our structural review consisted of the following elements:

- Review of all documents listed above.
- A detailed current climatic load review and comparison to the building code at time of construction. The current climatic loads were taken from the BC Building Code 2024 (BCBC 2024). The building code used at the time of construction (~2014) would have been the BCBC 2012.
    - This included snow, wind, and seismic loading. Also reviewed is the building importance factor.
- Review of roof trusses.
- Review of wall posts
- Review of opening beams (headers or lintels).
- Review of foundations under typical wall posts and beam supports.
- Review of foundation geotechnical properties found on the existing drawings.

3.1. DOCUMENT REVIEW

The following observations of note were taken from the documents regarding the structural system / capacity of the building:

1. "Building plans" – Issued for review, December 19, 2013
    a. The original structural drawings were submitted for building permit with an Alberta stamp. This would have been caught by the building permit department and was likely rectified on further drawing sets and during construction.

    b. Original drawings state, "Design conforms to all local building codes". This is not a typical practice, usually the exact design codes with year (or edition) are stated.

    c. The climatic design loads used on the original structural drawings were incorrect. This will be reviewed in depth later in the report.

    d. The original drawings show concrete and reinforcement specifications to meet "ACI design code" by the American Concrete Institute. Though concrete construction meeting ACI design codes is generally similar to that meeting the requirements of the CSA-A23 series, only the latter is referenced in the BCBC and should be used.

    e. The original drawings show structural timber notes referencing CSA-O86-94. The code reference is correct but there have been revisions since then. The appropriate edition would be CSA-O86-09.

    f. Though the sheet metal and timber strapping wall assembly is not a common solution in Canadian code for lateral resistance (wind and seismic), there are design guides available

from the United States. This would fall under the category of "alternative solutions" that the structural engineer of record would be taking responsibility for.

2. "BP 14-0013 and application" – Nothing of note.
3. "Combined application with drawings_Redacted"
    a. Addition drawings state, "Design conforms to all local building codes". This is not a typical practice, usually the exact design codes with year (or edition) are stated.

    b. The climatic design loads used on the addition structural drawings were correct but incomplete. The snow loads and wind load were correct, meeting BCBC 2018 requirements. There was no seismic information listed that is required to meet BCBC 2018 requirements. This includes seismic climatic data, the type of seismic force resisting system, and seismic site classification. Neglecting to include seismic design criteria implies that the building was not designed to resist seismic loading. This is a serious concern and is reviewed in depth later in the report.

    c. Addition drawings show structural timber notes referencing CSA-O86-94. The code reference is correct but there have been revisions since then. The appropriate edition would be CSA-O86-14.

4. "Proposed existing building structural upgrade proposal inclusive of washroom facilities Letter (RCA 21137)" – Nothing of note.
5. "Attach - Richards Consulting - Structural Engineering Responses"
    a. This document states "that the trusses will need to be upgraded to suite Group A2 importance level requirements". It is unclear if this suggests that the building was building with a low importance category, or it was designed to a normal importance level and a high importance level was being considered as in Document 7. Importance level is discussed further below.
6. "Proposed Upgrade Inclusive of Washroom (RCA 21137)" – Nothing of note.
7. "Structural Inspection Letter (RCA 21137)- REVISED 30AUG2022"
    a. This document indicates that there were several structural deficiencies present during the inspection. Deficiencies include, but are not limited to; panel stitch screws, missing bracing, inadequate wind uplift resistance hardware, lean-to ledger connection to the building being inadequate. In conversations with the PRRD these deficiencies have been addressed and final letters of assurance have been submitted. We have not seen these documents but take the PRRD as satisfied on this matter.
    b. A "1.15 importance level" is discussed, this is reviewed further below.
    c. Notes that once remedial repairs are completed "the facility will be in condition to safely satisfy the requirement of Group F Div 2 type facility as well as the assembly or A2 facility." This indicates that BCBC 2018 climatic loads would have been met.
8. "EM BEO to applicant" – Nothing of note.
9. "22178- SET 2023-03-29 - R1 – IFC"
    a. Highlights the need for additional work regarding the truss bracing, truss hold down strapping, and hurricane ties.
10. "Adeline Kelly Drawing notes"

a. The building is not strapped on the interior side of the wall. Instead OSB sheathing has been installed to a height of ~8'.
b. The foundation depth is shown as 6' below grade whereas the original drawings call up 5' below grade.
c. The posts are not run through the thickened edge slab, rather the concrete slab stops at a board that runs along the interior face of the posts.

11. "FCA - Adeline Kelly"
    a. Nothing of note.

3.2. CLIMATIC LOADING REVIEW

As mentioned above the design code of the original building should have been the BCBC 2012 and the addition BCBC 2018. Neither code was listed on the design documents. If the building were to be brought up to current standards the BCBC 2024 would need to be used, based on the National Building Code (NBC) 2020. Below is a comparison of snow, wind, and seismic loading between the original drawings, BCBC 2012, and BCBC 2024.

Table 1: Snow Load Comparison

Snow Load Comparison				
	S_s (kPa)	S_r (kPa)	S (kPa)	Difference
Drawings	2.1	0.2	1.88	-
BCBC 2012	2.8	0.1	2.34	+24%
BCBC 2024	2.8	0.1	2.34	0%

*note S above is the final unfactored roof snow load calculated according to BCBC 2012 and BCBC 2024

Table 1 shows that the snow load that should have been used for the original design is 24% higher than what was shown on the original building drawings. It also shows that the design snow loads has not changed since 2012, i.e. a building designed to the BCBC 2012 complies with the BCBC 2024 in terms of snow loads. In Document 7 above, construction details are given with the assurance that once completed the structure would be sufficient to withstand current BCBC 2018 loads. Again the PRRD has reported that these repairs were completed to Mr. Richards' satisfaction.

Table 2: Wind Load Comparison

Wind Load Comparison		
	Q_{50} (kPa)	Difference
Drawings	0.57	-
BCBC 2012	0.39	-32%
BCBC 2024	0.39	0%

Table 2 shows that the wind load that should have been used for the original design is 32% higher than what was shown on the original building drawings. It also shows that the design wind load has not

changed since 2012, i.e. a building designed to the BCBC 2012 complies with the BCBC 2024 in terms of wind loads.

Table 3: Seismic Load Comparison (Other Structures)

Seismic Load Comparison (Other Structures)		
	% of Weight	Difference
Drawings	(not listed)	-
BCBC 2012	12.5	-
BCBC 2024	24.9	+99%

Table 4: Seismic Load Comparison (Nailed Wood Shearwalls)

Seismic Load Comparison (Nailed Wood Shearwall)		
	% of Weight	Difference
Drawings	(not listed)	-
BCBC 2012	1.6	-
BCBC 2024	4.3	+169%

Since there was no seismic information listed on the original drawings, seismic loading is assumed to have been neglected. Information missing includes seismic climatic data, the type of seismic force resisting system (SFRS), and seismic site classification. This would not have met the requirements of BCBC 2012. This is a cause for concern even though design wind loads are high resulting in high lateral design loads, as seismic forces have a slightly different load path through the building with different resistance mechanisms.

There was a major code update in seismic design between the NBC 2015 and NBC 2020, subsequently the BCBC 2018 and BCBC 2024. As such the seismic loading has increased drastically as can be seen in *Tables 3 and 4* above.

The original SFRS falls under the designation of “other structures”. If this classification were to remain, there would be a significant increase in the seismic design forces for upgrades to the BCBC 2024 compared to the design loads in effect at the time of original construction. If the SFRS is changed to “nailed wood shearwalls”, then the seismic design load would be decreased significantly, but still remains higher than not being considered at all (22.0% vs. 4.3%).

Using the BCBC 2024 climatic loading and upgrading to “nailed wood shearwalls”, wind loading would govern the lateral system design but seismic requirements and connection detailing still need to be considered. If the current SFRS is used, then seismic forces would govern over the lateral force resisting system.

3.2.1. IMPORTANCE FACTOR

The purpose of an importance factor is to quantify the likely impact of climatic loading on the building to match the intended use. For example, sheds or agricultural buildings are often designed with a low importance factor as there likely wouldn't be any human occupants in the event of a major climatic event. As such, this can reduce design requirements and construction costs. Post disaster buildings, in contrast, are required by code to survive a major climatic event and be completely functional. Such buildings include fire halls, water treatment plants, and hospitals. These are code mandated to have a post-disaster importance level, above both normal and high importance levels.

There was no importance factor listed on the original drawings to modify the climatic loads. For the original F-2 occupancy a normal importance factor of 1.0 would have been appropriate but it was not stated. Reviewing Documents 5 & 7 it is unclear which importance factors were used in design. It is possible with the location and anticipated use of the building a low importance factor was used. Going from normal to high importance would be a relatively minor change, from low to high would be a significant change.

For some assembly occupancy buildings, a high importance factor is used if the building is intended to be used as shelter following a major disaster. In discussions with the PRRD, considering the remote location and low occupant limit, a normal importance designation is appropriate. In this case increasing the building design importance factor from low to normal would be a moderate change, and remaining normal would be ideal.

3.3. STRUCTURAL SYSTEM REVIEW

To get a picture of the level of effort involved with bringing the building up to modern code standards, the major structural elements were reviewed. All reviews below were completed considering BCBC 2024 climatic loading. No review of the connection design was completed as part of this exercise.

3.3.1. ROOF SYSTEM REVIEW

When reviewing the roof truss system, we considered both the increase in snow load as described above as well as the discussion in the documentation regarding truss retrofitting (Document 7, Acadia Truss). While the drawings do not show any specifics about the design of the trusses, specifying "pre-engineered trusses", there are specific bracing details that do not appear to have been followed. This can be seen from the available pictures as well as the supplied documents.

Discussed further below in the wall system review, the method of roof framing with sheet steel cladding fastened to wood strapping supported by roof trusses is a common framing method for unheated buildings and usually requires diagonal bracing.

Generally, the roof trusses appear to be appropriate, but could not be confirmed from the reviewed documents and pictures. In discussions with Northern Truss, a truss manufacturer in Fort St. John, it would be easier and more cost effective to replace the trusses than to take detailed field measurements

including the connections, carry out a detailed structural assessment, and potentially design and install strengthening.

3.3.2. WALL SYSTEM REVIEW

Select wall posts were reviewed and found to be sufficient. Typical wall posts are indicated to be 4-Ply 2x6 Spruce-Pine-Fir (SPF) #1/2. Posts under the south wall and under the north side of the lean-to beam are 7-Ply 2x6 and posts on either side of large openings in the lean-to are 6-Ply 2x6.

The wall posts are tied together by 2x6 strapping on the exterior side of the wall only, not both sides as indicated on the original structural drawings. The exterior steel sheet metal cladding is fastened directly to the strapping. There is no insulation or sheathing. While this is a popular framing method for pole sheds and agricultural buildings, there is no provision for this type of lateral force resisting system in Canadian codes, specifically CSA-O86 for wood design. Specifically, this is unpopular because the posts, acting as cantilever columns, are the primarily structure resisting lateral load, resulting in little to no redundancy, since the metal cladding offers little support.

There are codes in the US that cover this method of framing and the design would fall under the category of alternative solutions. This would be at the discretion of the Engineer of Record and the building inspector. It would be difficult to analyze and retrofit in the current application to meet seismic loading.

Reviewing the size and length of continuous sections of wall, there is likely sufficient wall space in the east-west direction for lateral resistance, i.e. a large number of wood posts acting as cantilever columns and sharing the load. Continuous wall sections in the north-south direction are limited and may be an issue, both for lateral load (shear) and foundation uplift.

3.3.3. BEAM REVIEW

Select beams were reviewed and found to be sufficient. The beam in the south wall (north side of the lean-to) is indicated as a 5.25”x12.5” 2.0E LVL and in the lean-to open spans to be 5.25”x16” 2.0E LVL. While not specifically checked, the remainder of the beams appear to be appropriate.

3.3.4. FOUNDATION REVIEW

The foundation of the building is indicated to consist of the wall posts extending below grade, bearing on either 24” of 1” minus fractured screened rock or Ø32”x8” thick concrete. In both cases the posts are surrounded by 1” minus fractured screened rock in the post holes. Typically, the wood posts are embedded in 16” diameter x 5’-0” deep holes. While this was shown as 6’ deep on the drawings for the addition, we have checked current loading against the 5’ depth to be conservative. The heavily loaded posts are supported by the concrete pad mentioned above at a depth of 8’-0”.

Foundations were determined to be generally insufficient. The typical wall posts on the north, east, and west sides of the building spaced at 4’-0” under gravity loading conditions were overloaded by up to 266% of capacity (100% is full capacity). The wall posts on the south wall, shared with the north side of the

lean-to, were overloaded by up to 354% of capacity. The heavily loaded posts under the large openings discussed below were overloaded at 142%. Wind and seismic loading were not considered in the review.

Frost depth in the Peace Region is typically 2.5 m - 3.0 m. The post foundations are well above this and as such could be subjected to heaving if water is not properly managed in the vicinity of the building. Differential movement in the form of heaving or settling can be devastating to a building and its finishes. While it would be less of an issue for the building in its current form, differential movement would become much more noticeable if additional internal and external finishes are installed.

The original drawings show the wall posts being integrated into the thickened edge of the slab. This would have been done to help restrain the posts from lateral loading/movement and tie the building together. Currently the slab (as-built dimensions of thickening unknown) is butted up against a board that runs along the interior face of the posts. In terms of the structural system this may be acceptable but there is no indication that this has been considered in the design. In terms of the wall assembly, closure, and heat loss, this will be difficult to remediate.

In terms of durability the original drawings specify the posts need to be treated for the first 8'-0". It is unclear if this treatment was applied to all faces of each 2x6 ply, applied to the post pack after assembly, or applied at all. Considering the non-draining nature of clays in the Peace Region it is highly likely that the post holes will retain moisture for long periods, promoting rot in the timber posts.

3.3.5. GEOTECHNICAL PARAMETER REVIEW

The geotechnical parameters indicated on the drawings show a minimum allowable design bearing pressure of 1500 psf and 550 psf skin friction. This is not an unreasonable assumption for the specified gravel and stiff clays native to Fort St. John and the Peace Region. It is unknown if there was ever a geotechnical investigation completed or geotechnical verification during construction.

3.4. CONCLUSIONS

Generally, the structure appears to be in relatively good condition given the age, use, and noted deficiencies. Going from an F-2 occupancy to A-2 would trigger code upgrades and there have been significant changes from the code of the time to the current BCBC, not considering errors in design loading.

The supplied documentation shows retrofits of several structural elements and connections have been completed to the satisfaction of Mr. Richards and the PRRD. This will help improve the building's long-term performance.

From our analysis, at bare minimum the trusses would need to be remediated, at worst, replaced. The wall posts appear adequate but the wall system would need major remediation. With the lack of reliable, and code compliant, lateral force resisting systems coupled with the need for a competent architectural wall assembly, the cladding would likely need to be removed and the strapping replaced with sheathing. The typical foundations are adequate in terms of gravity loading. Heavily loaded foundations as well as

foundations to resist lateral loading in the north-south direction will need additional remediation. In our cost estimate below we have included provisions for additional foundation and framing work, steel piling and straps to attach to the north-south shearwalls to competent foundations.

The building foundations are badly overloaded when compared to the geotechnical design pressures listed on the drawings. We recommend this be reviewed under the guidance of a geotechnical engineer, based on our experience in the region the design values listed on the drawings are appropriate but the foundations are not.

With the unknown condition of treatment on the timber posts and rock in the timber post holes contained within non-draining clay it is likely that the service life of the building is reduced. We would expect to see timber rot started first at grade, at the interface between the bottom of the wall and top of the rock foundation backfill.

4. Cost Estimate Review

Reviewing the supplied documentation, we found that generally, the estimated construction costs seem low considering the complexity of the tasks and remote location. Structural connection retrofits were estimated to be $14,000 in Document 4. This seems low in our opinion but could be feasible. The author of the cost estimate is much more intimately familiar with the building, type of construction, and local costing.

For a new building of an equivalent size (4,256 ft^2 + 1,400 ft^2 kitchen) with A-2 occupancy, light wood framing and medium finishes, we would expect costs to range from $175/$ft^2$ to $225/$ft^2$. If we include a regional and remote location factor of 1.867 as suggested in Document 11 (the facility condition assessment), the cost would be $327/$ft^2$ to $420/$ft^2$. This also does not include architectural and engineering fees which would typically be in the range of 10% of construction costs.

Our cost estimate review was formed on the basis of a Class D cost estimate (± 50%) per EGBC guidelines. The main considerations and assumptions were:

- Cost of installation of provisions for firefighting are unknown and as such were not included, such systems could be a fire pond with pump and generator or hydrant within 90m.
- Consultant fees are taken as 10% of the construction cost.
- Roof and wall cladding can be removed and salvaged for replacement.
- Large sliding doors can be re-used.
- There is currently no flooring in the lean-to and this will remain unfinished.
- The geotechnical parameters are not confirmed an as such reinforcement has not been included for foundations that are not part of the assumed lateral force resisting system.
- Optional item cost ($/$ft^2$) includes 1,400 ft^2 kitchen addition.

A cost estimate summary and full breakdown of estimated costs can be seen in Appendix C.

5. Conclusions and Recommendations

Following our review including architectural building code analysis, structural design review, and cost estimation review, we have serious concerns that major building code issues have been missed. Servicing and life safety items are lacking in terms of fire fighting access and fire rated assemblies.

To have this be a functioning building for three or four seasons meeting an A-2 occupancy per BCBC 2024 there needs to be appropriate: heating and insulation (4 season only), ventilation, plumbing, and electrical wiring. Also required are washrooms capable of accommodating a 300-person occupancy.

In terms of structural design, the required fixes and upgrades seem achievable but extremely invasive and costly. With removing all the cladding, replacing the roof trusses, and stripping the walls down to posts there wouldn't be much more work to start over. If the geotechnical parameters are confirmed to be severely insufficient the posts would need extensive remedial reinforcement. The limited durability of the wood post foundation would result in a significantly reduced service life of the building, even after the proposed upgrades.

Considering the invasive nature of both architectural and structural remediation as well as the anticipated short service life of the building we recommend that the building be re-purposed to continue its life as an F-2 occupancy and a new building is considered.

6. Closing

McElhanney has enjoyed working with the PRRD on this project and other projects assisting the NPFF. We hope to continue our working relationship in the future. McElhanney has committed to providing the staff, resources, and technical expertise following the EGBC structure and internal Quality Management System (QMS) to execute this project efficiently and accurately. Should you have any questions, or require clarification, please contact the undersigned.

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Building Upgrade Assessment Report

Adeline Kelly Building

14/01/2025

Meiklejohn Architectural Design Studio Inc.
Prepared by Visini Meemaduma
Reviewed by Tom Cerajeski

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1.0 INTRODUCTION

The following is a Building Code Upgrade Assessment Report of the Adeline Kelly Building located in the North Peace Fair Grounds addressed at 15177 Rose Prairie Road, prepared by Meiklejohn Architectural Design Studio Inc. for the Peace River Regional District.

The existing structure is a single storeyed building that is classified under Group F Division 2. The building is constructed of a combination of conventional, combustible wood framing with slab on grade concrete and corrugated high tensile steel for cladding. The building faces a single street – Rose Prairie 259 Road – to the east of the building and contains a gravel pathway to the south of the building.

The purpose of this report is to determine the existing deficiencies and the required building upgrades to change the occupancy to Group A-2 according to the current building code BCBC 2024 that will accommodate a community hall. All discovered deficiencies have been noted in detail in the following pages along with the recommendations to address them. The building upgrades have been assessed under 4 different building uses as explained below.

Option 1a – 3 Season Existing Building without Kitchen

This option does not include the installation of insulation for the community hall area of the building. The public washrooms are proposed as an insulated addition under the existing lean-to portion. This option does not include a kitchen.

Option 1b – 3 Season Existing Building with Kitchen

This option does not include the installation of insulation for the community hall area of the building. The public washrooms and the kitchen are proposed as an insulated addition under the existing lean-to portion.

Option 2 – 3 Season Building with Kitchen

This option does not include the installation of insulation within the existing building. The kitchen and public washrooms are proposed as an insulated separate building structure adjacent to the existing building. The addition will also include a dining hall and storage if required by occupants.

Option 3a – 4 Season Building without Kitchen

This option includes the installation of insulation for the community hall area of the existing building. The public washrooms are proposed as an insulated addition under the existing lean-to portion. This option does not include a kitchen.

Option 3b – 4 Season Building with Kitchen

This option includes the installation of insulation for the community hall area of the existing building. The public washrooms are proposed as an insulated addition under the existing lean-to portion. This option does includes a kitchen.

NOTE 1: This report focuses on the architectural requirements of the BC Building Code with reference to the existing architectural drawings and the McElhanney Report pertaining to their review of the Adeline Kelly Building. Therefore, certain conditions within walls, floors, roof systems or below grade have not been reviewed thus, may not be code compliant.

1.1 CODE APPLICATION TO EXISTING BUILDINGS

"1.1.1.2. Application to Existing Buildings
Where a building is altered, rehabilitated, renovated or repaired, or there is a change in occupancy, the level of life safety and building performance shall not be decreased below a level that already exists. (See Note A-1.1.1.2.(1))"

"Note A-1.1.1.2.(1): Application to Existing Buildings. This Code is most often applied to existing or relocated buildings when an owner wishes to rehabilitate a building, change its use, or build an addition, or when an enforcement authority decrees that a building or class of buildings be altered for reasons of public safety. It is not intended that the British Columbia Building Code be used to enforce the retrospective application of new requirements to existing buildings or existing portions of relocated buildings, unless specifically required by local regulations or bylaws…."

However, it should be noted that the Building Code states in the preceding section the following:

"1.1.1.1. Application of this Code
1) This Code applies to any one or more of the following: h) the correction of an unsafe condition in or about any building,"

The above clause applies to all buildings, including existing buildings. The remainder of this report will discuss the application of the current BC Building Code to this building as if it were a new building.

However, with consideration of the costs imposed, existing building code deficiencies do not need to be upgraded unless there needs to be a correction of an unsafe condition. In our experience, this determination is at the sole discretion of the *Authority Having Jurisdiction*

2.0 BUILDING CODE SUMMARY

The following identifies some of the Project characteristics for the purpose of analyzing the BC Building Code requirements:

Applicable building code section:	Part 3
Building area:	See table 2.0 below
Building height:	1 storey
Sprinklered:	No
Major Occupancy:	Group A-2
Construction Type:	Combustible & Non-combustible

The building areas for each option have been organized in table 2.1 for comparison. The building areas for each option have been determined according to the proposed floor plans as attached to this report.

Building Area (m^2)	3 Seasons		4 Seasons
	Existing Building	Addition	
With Kitchen	300	99	395
Without Kitchen	300	68	364

According to sentence 3.2.2.6.(1) the requirements of the subsection for the most restricted major occupancy contained shall apply to the whole building.

According to sentence 3.2.2.7.(2) if one major occupancy is located above another major occupancy, the fire-resistance rating of the floor assembly between the major occupancies shall be determined on the basis of the requirements of this Subsection for the lower major occupancy.

The building classification that best describes this building is as follows:

Major Occupancy #1:	Group A-2, section 3.2.2.28
Sprinklers required:	No
Building height maximum:	1 storeys
Building area maximum:	**400m² (1 street)**
Combustibility permitted:	Combustible or Non-combustible
Fire separations required:	Floor Assemblies: N/A
	Mezzanines: N/A
	Roofs: N/A
	Load bearing struct.: N/A
	Building Area Limits.: 1 hour

According to sentence 3.2.2.28.(2) provided that the building does not contain a basement, the allowed building area is permitted to be doubled if the building is separated into fire

compartments, each of which do not exceed the area limits specified under sentence 3.2.2.28.(1)(b).

2.1 ACCESS ROUTES

According to sentence 3.2.5.5.(2)(b) & (c) Access routes shall be provided to a *building* so that for a *building* not provided with a fire department connection, a fire department pumper vehicle can be located so that the length of the access route from a hydrant to the vehicle plus the unobstructed path of travel for the firefighter from the vehicle to the *building* is not more than 90 m, and the unobstructed path of travel for the firefighter from the vehicle to the *building* is not more than 45 m.

Access routes shall be designed according to subsection 32.5.6. of the building code.

2.2 WATER SUPPLY

According to sentence 3.2.5.7.(1) every building shall be provided with an adequate water supply for fire fighting.

3.0 FIRE PROTECTION

3.1 FIRE SEPARATIONS

The building contains a single major occupancy only. See also section 2.0 for fire separations required due to the building size and classification.

3.2 SPATIAL SEPARATIONS

Exposing building face areas* for the buildings are listed in the table 3.1 below.

	Existing Adeline Kelly building (m^2)	Option 1 Addition (m^2)	Total
North	112	N/A	N/A
East	N/A	N/A	N/A
South	N/A	57	N/A
West	80	17	79

There appears to be an existing barn structure facing the west face of the Adeline Kelly building that is approximately 40m^2** in exposing building face, located 32.6m apart from the Adeline Kelly Building.

Due to the lack of information on the location and areas of unprotected openings (e.g. windows and doors) in the barn building we have assumed for the most stringent possibility i.e. 100% of the building face being allowed have unprotected openings.

According to sentence 3.2.3.1.(1)(a), thereby table 3.2.3.1.B. of the building code the limiting distances required for the buildings facing each other towards the west of the adeline Kelly building is as listed in the table 3.21 below

Building	Exposing Building Face Area (m^2)	Limiting Distance for 100% Area of Unprotected openings (m)
Adeline Kelly Building	80	10
Addition (Option 1)	17	6
Adeline Kelly + Addition	97	12
Barn	40	8

According to this table the minimum distance allowed between the buildings is 20m (12m + 8m). This is well below the current distance between the existing buildings.

According to sentence 3.2.3.7.(1), thereby table 3.2.3.7. of the building code for 100% of maximum unprotected area allowed, the construction type and cladding type shall be combustible or non combustible. No fire resistance rating is required for the exterior wall.

The limiting distances required between the community hall and the addition are as per the table 3.22 below.

	Exposing Building Face Area (m^2)	Limiting Distance for 100% Area of Unprotected openings (m)	Limiting Distance for 10% Max Area of Unprotected openings (m)
Adeline Kelly Building	112	14	2.5
Addition (Option 1a)	57	9	2

As per the table the minimum spatial separation required to avoid upgrading the exterior wall of the Adeline Kelly building is 14m. Additionally, the minimum distance required to permit combustible construction for the addition is 2m as per table 3.22 above. If the limiting distance of the addition is 2m, the exterior wall will require a 45 minute fire resistance rating and the cladding must be non-combustible. Finally, the total distance recommended between the buildings are 16m.

*Note 1: Building exposing areas have been calculated under the assumption that the spaces will be constructed with a finished ceiling at 8' above the existing floor.

**Note 2: Due to the lack of information on the Barn, the area has been determined as per the McElhaney report.

3.3 NON-FIXED SEATING

According to sentence 2.7.1.5.(1) of the National Fire Code 20202 non-fixed seats provided in the interior of assembly occupancies shall be

1. arranged in rows with an unobstructed passage of 400mm
2. With no more than 7 seats between every seat and the nearest aisle
3. With a clear width of an aisle of the greater of 1100mm or the product of 6.1 and the number of seats served by that aisle
4. Fastened together in a row of not less than 8 seats unless there are fewer seats in a row in which case those shall be fastened together.

3.4 STAGES

According to the BCBC 2024, terms and abbreviations a stage is defined as follows:
"a space that is designed primarily for theatrical performances with provision for quick change scenery and overhead lighting, including environmental control for a wide range of lighting and sound effects and that is traditionally, but not necessarily, separated from the audience by a proscenium wall and curtain opening."

According to Sentence 3.3.2.14.(1), a stage for theatrical performances and ancillary spaces, including workshops, dressing rooms and storage areas, shall be sprinklered.

According to Sentence 3.3.2.14.(2), a fire separation with a fire-resistance rating not less than 1 h shall be provided between a stage for theatrical performances and ancillary spaces, including workshops, dressing rooms and storage areas.

According to Sentence 3.3.2.14.(3), a stage for theatrical performances and ancillary spaces, shall be separated from the seating area by a fire separation having a fire-resistance rating not less than 1 h, except for a proscenium opening protected with either, a sprinkler deluge system conforming to the requirements of NFPA 13, "Installation of Sprinkler Systems," an unframed fire curtain if the opening is not more than 20 m wide, or a semi-rigid fire curtain if the opening is more than 20 m wide.

However, According to Sentence 3.3.2.14.(6), The fire separation referred to above in Sentence 3.3.2.14.(3) is not required between a stage and a seating area in a building that is sprinklered throughout, provided a sprinkler deluge system is installed at the boundary between the stage and the seating area.

According to Sentence 3.3.2.14.(4), a fire curtain required by Sentence (3) shall be of a type acceptable to the authority having jurisdiction and designed to close automatically upon the actuation of the sprinkler system, automatically upon actuation of the fire alarm system, and manually by remote control devices located at the curtain control panel and at each side of the stage.

According to Sentence 3.3.2.14.(5), at least 2 vents for the purpose of venting fire and smoke to the outside of a building shall be provided above a stage designed for theatrical performances and shall have an aggregate area not less than one eighth of the area of the stage behind the proscenium opening, and be arranged to open automatically upon actuation of the sprinkler system.

3.5 JANITORS' ROOMS

According to Sentence 3.3.1.22.(1), a room or space within a floor area for the storage of janitorial supplies shall be separated from the remainder of the building by a fire separation having a fire-resistance rating not less than 1 h.

However, According to Sentence 3.3.1.22.(2), The fire-resistance rating of the fire separation required by Sentence (1) is permitted to be less than 1 h but not less than 45 min provided the fire-resistance rating required by Subsection 3.2.2. is permitted to be less than 1 h for the floor assembly above the floor area, or the floor assembly below the floor area, if there is no floor assembly above.

However, According to Sentence 3.3.1.21.(3), the fire separation required by Sentence (1) is not required to have a fire-resistance rating if the floor area in which the room or space is located is sprinklered throughout

3.6 SERVICE ROOMS

According to Sentence 3.6.2.1.(1) a service room with fuel-fired appliances shall be separated from the remainder of the building by a fire separation have a fire-resistance rating not less than 1 h.

3.7 EXITS

According to Sentence 3.4.4.1.(1), every exit shall be separated from the remainder of the building by a fire separation having a fire-resistance rating not less than that required by Subsection 3.2.2., but not less than 45 min, for either the floor assembly above the storey, or the floor assembly below the storey, if there is no floor assembly above.

According to Sentence 3.4.1.8.(1), glass and transparent panels in an exit shall conform to the appropriate requirements of Article 3.3.1.20. for glass and transparent panels in an access to exit.

According to Sentence 3.4.4.4.(1)(e), a fire separation that separates an exit from the remainder of the building shall have no openings except for wired glass and glass block permitted by Article 3.1.8.16.

According to Sentence 3.4.1.10.(1) combustible glazing is not permitted in wall or ceiling assemblies or in closures used to construct an exit enclosure.

3.8 FIRE STOPS

According to Sentence 3.1.9.1.(1).(a) except as provided in Sentences (2) to (5) and Article 3.1.9.4., penetrations of a fire separations or a membrane forming part of an assembly required to have a fire-resistance rating shall be sealed by a fire stop that when subjected to the fire test method in CAN/ULC-S115, "Fire Test of Firestop Systems," has an F rating not less than the fire-protection rating required for closures in the fire separation in conformance with Table 3.1.8.4.

According to Sentence 3.1.9.1.(2) penetrations of a firewall or horizontal fire separation that is required to have a fire-resistance rating in conformance with Article 3.2.1.2 shall be sealed at the penetration by a fire stop that, when subjected to the fire test method in CAN/ULC-S115, "Fire Tests of Firestop Systems," has an FT rating not less than the fire-resistance rating for the fire separation of the assembly.

3.9 FIRE DAMPERS

According to Sentence 3.1.8.7.(1) except as provided in Article 3.1.8.8., a fire damper having fire-protection rating conforming to Sentence 3.1.8.4.(2) shall be installed in conformance with Article 3.1.8.10. in ducts or air-transfer openings that penetrate an assembly is required to be a fire separation.

3.10 SPRINKLERS

According to our recommendation in section 2.0 of this report the building is not required to be sprinklered.

3.11 FIRE ALARM

According to Sentence 3.2.4.1(1) a building in which a sprinkler system is installed a fire alarm system must also be installed.

According to Sentence 3.2.4.1(3) if the building contains fewer than 9 sprinklers, it need not comply with sentence 3.2.4.1(1).

4.0 EGRESS/EXITING REQUIREMENTS

4.1 TRAVEL DISTANCES

According to Sentence 3.4.2.4.(1), travel distance means the distance from any point in a *floor area* to an *exit* measured along the path of travel to the *exit*.

According to Sentence 3.4.2.5.(1), a 30m maximum travel distance to an *exit* will be required from any point of the *floor area*.

According to Sentence 3.4.2.3.(1), the least distance between two *exits* from a *floor area* is required to be half the maximum diagonal distance of the *floor area*, but need not be less than 9m for a *floor area* not having a *public corridor*.

4.2 EGRESS FROM ROOMS OR SUITES

According to Sentence 3.3.1.5.(1) and Table 3.3.1.5.A, a minimum of two egress doorways located such that one doorway could provide egress from the room or suite if the other doorway becomes inaccessible will be provided from every room or suite intended for an occupant load exceeding 60 persons, and where the area and/or egress distance limits of 150m^2 and 15m are exceeded.

Note egress distance is measured from the most remote location within the room or suite to a corridor or an exit, taking into account permanent fixtures that interfere with the most direct egress path.

4.3 EXIT SIGNS

According to Article 3.4.5.1, exit signs will be provided above or adjacent to every exit and, if necessary, the direction of egress in public corridors and passageways will be indicated with directional exit signs.

According to Article 3.4.5.2, exit signs will consist of the green "Running Man" pictogram image conforming to ISO 7010, "Graphical Symbols – Safety Colors and Safety Signs."

4.4 OCCUPANT LOAD

According to Table 3.1.17.1, occupant loads have been determined using the following occupant load factors where no maximum occupancy is noted.

Table 3.1.17.1
Occupant Load
Forming Part of Article 3.1.17.1

Type of Use of Floor Area or Part Thereof	Area per person, m^2
stages for theatrical performances	0.75

space with non-fixed seats	0.75
space with non-fixed seats and tables	0.95
Kitchens	9..3

The table shown below detail the occupant load calculations the building.
*spaces considered ancillary to community hall when building is being used.
**maximum occupancy allowed based on water closet and urinal count

Room/Use	Area (m^2)	Occupant Load Factor (m^2/person)	Occupant Load (persons)
Community Hall	300	0.95	Maximum 300**
Kitchen*	45	-	-
Dining hall/Storage*	38	-	-
		Subtotal	300
		TOTAL	**300**

Note: If the occupants wish to operate the addition as a separate building while the community hall is not operating, the occupancy load reduces to 15. This space would be ancillary while the community hall is operating. Therefore, the maximum occupancy load that the building should be designed for is 300 for both the community hall and the addition.

4.5 MINIMUM EGRESS AND EXIT WIDTHS

According to Subsection 3.3.1 and Sentence 3.4.3.2.(8), the minimum widths for egress/exit facilities are as follows:

Corridors and passageways: 1100mm
Ramps: 1100mm
Stairs: 1100mm
Doorways: 850mm

According to sentence 3.3.2.7.(1) a door equipped with a latching mechanical in an access to exit from a room or suite of assembly occupancy containing an occupant load more than 100 shall be equipped with a device that extends across not less than one half of the width of the door, releases the latch and allows the door to swing wide open when a force of 38N has been applied provided that it has not been provided with a power door operator.

4.6 DIRECTION OF DOOR SWING

According to Sentence 3.4.6.12.(1), all exit doors will swing on the vertical axis in the direction of exit travel.

According to Sentence 3.3.1.11.(2), a door that opens into a corridor or other facility providing access to exit from a room or suite that is used or intended for an occupant load more than 60 shall swing in the direction of travel.

5.0 REQUIREMENTS FOR ACCESSIBILITY

5.1 ACCESS

According to sentence 3.8.4.5. where an existing building is altered, renovated or where the occupancy is changes access shall be provided in conformance with subsections 3.8.2. and 3.8.3 where providing such access would be practical

According to 3.8.2, access should be provided in the following areas:

- All entrances to an accessible storey of a building
- At the main entrance or a suitably identified alternate exterior accessible entrance via power operated doors
- From the entrance to all public areas of the building and parts of the building where practical
- To each type of public facility
- Service counters
- Accessible washrooms conforming to Sentence 3.8.2.8. and
- An accessible toilet stall conforming to Article 3.8.3.12.
- Universal washrooms

5.2 DOORWAYS

According to Sentence 3.8.3.6.(2), doorways providing access shall have a clear width of at least 850mm.

According to Sentences 3.3.1.13.(11), thresholds shall be provided that are flush or beveled not more than 13mm higher than the finished floor surface, and where it is higher than 6mm, shall be beveled to a slope no steeper than 1 in 2.

According to the criteria outlined in Sentence 3.8.3.6.(11), unless equipped with a power door operator, doorways providing access will be provided with a clear and level space extending the height of the doorway and not less than

(a) 1 500 mm deep by the width of the door assembly plus not less than 600 mm beside the latching jamb of the door on any side of the assembly into which a swinging door swings,

(b) 1 200 mm deep by the width of the door assembly plus not less than 300 mm beside the latching jamb of the door on any side of the assembly into which a swinging door does not swing,

(c) 1 200 mm deep by a width not less than 900 mm, including not less than 50 mm on the latching jamb side where the approach is perpendicular to a sliding door, and

(d) 1 050 mm deep by a width not less than 1 350 mm, including not less than 540 mm on the latching jamb side where the approach is parallel to a sliding door. Furthermore, doorways installed in series will be separated by a minimum of 1220mm plus the width of any door swinging into this separated space.

5.3 PLUMBING FACILITIES

According to Sentence 3.8.2.8.(1), at each location where washrooms are provided in a storey to which an accessible path of travel is required in accordance with Article 3.8.2.3., at least one universal washroom complying with Subsection 3.8.3. shall be provided.

According to Sentence 3.8.2.8.(2), where more than two water closets or a combination of more than one water closet and one urinal are provided in a washroom to which an accessible path of travel is required, at least one water-closet stall shall be accessible in accordance with Subsection 3.8.3

According to Sentence 3.8.2.8.(3), In a building in which water closets are required in accordance with Subsection 3.7.2., at least one universal washroom shall be provided in the entrance storey, unless an accessible path of travel is provided to a universal washroom elsewhere in the building

According to Sentence 3.8.2.8.(4), at least one water-closet stall or enclosure in a washroom required to be accessible shall comply with Subsection 3.8.3.

6.0 WATER CLOSET REQUIREMENTS

According to Table 3.7.2.2.-A which has been reproduced below, the minimum number of water closets required are as follows:

150	Males –	3 water closets **or** 1 water closet + 2 urinals
150	Females –	6 water closets
300	Total –	9 water closets

According to sentence 3.7.2.2.(3) urinals are permitted to be substituted for two thirds of the number of water closets required for males as long as the required water closets are more than 2.

Table 3.7.2.2.-A
Water Closets for an Assembly Occupancy
Forming Part of a Sentence 3.7.2.2.(6)

Number of Persons of Each Sex	Minimum Number of Water Closets	
	Male	Female
1 - 25	1	1
26 - 50	1	2
51 - 75	2	3
76 - 100	2	4
101 - 125	3	5
126 - 150	3	6
151 - 175	4	7

7.0 HEATING & VENTILATION

According to sentence 6.3.1.1.(1). All buildings shall be ventilated.

8.0 BUILDING UPGRADE RECOMMENDATIONS

8.1 ACCESS ROUTES

According to section 2.1 of this report the access routes to a building should be such that the distance from a principal entrance of a building to a fire department pumper vehicle is at most 45m, and the distance from a fire hydrant to a fire department pumper vehicle is at most 45m. This must be verified onsite.

If there are no fire hydrants at close proximity to the site, supplemental water supplies on site must be located on site for fire fighting. The local fire department must also be consulted to discuss any fire fighting provisions required for this site.

8.2 FIRE SEPARATIONS

According to section 3.2 of this report option 1 requires a 1 hour fire resistance rating for the exterior wall of the addition that faces the existing Adeline Kelly building.

8.3 EXITING

The existing doors appear to meet the required height and width clearances according to the sizes noted on the Building Permit Drawings. These sizes must be confirmed onsite and panic hardware must be ensured on all exit doors as noted in section 4.8 of this report.

According to section 4.0 of this report the travel distances for all 5 options appear to meet building code conformance for both the existing buildings and the addition. The exits will require exit signage and emergency lighting.

8.4 FIRE ALARM

According to section 3.10 of this report the fire alarm system is not required as long as the building is not sprinklered.

8.5 SPRINKLERS

According to section 2.0 and 3.9 of this report the building is not required to be sprinklered as long as the building does not require a stage as defined in the code (also mentioned in section 3.4 of this report)

8.6 ACCESSIBILITY

According to section 5.1 of this report, Accessible entrances and paths of travel are required into the assembly hall, kitchen and public bathrooms.

According to section 5.3 of this report, at least one universal washroom is required for the building. Additionally, one of the 6 required water closets in the female washroom is required to be an accessible stall.

8.7 WATERCLOSET REQUIREMENTS

According to section 6.0 of this report, the addition will require 3 water closets for a male washroom and 6 waterclosets for a female washroom. The required 3 waterclosets for the male washroom may be replaced with 1 watercloset and 2 urinals.

9.0 CONCLUSIONS

In conclusion the building requires various upgrades to meet code conformance. Some of the upgrades vary per the options listed in section 1.0 of this report due to the use of the building throughout the year and if a kitchen is included as part of the addition. The upgrades have been summarized under each option below:

Option 1

- Existing Building:
  - Emergency lighting and exit signage and exit hardware required
  - Potential enhanced power requirements
- Proposed Addition:
  - Building to comply with all requirements of the BCBC 2024 (Mechanical, Electrical, Envelope, Servicing: Storm, Sewer, Water, Power)
  - Exterior wall that faces the existing Adeline Kelly building required to be fire rated at 1 hour.

Option 2

Option 2a

- Existing Building:
  - Emergency lighting and exit signage and exit hardware required
  - Potential enhanced power requirements
  - Remove existing overhead door. Infill and replace with new exit door.
- Proposed Addition:
  - Addition to comply with all requirements of the BCBC 2024 (Mechanical, Electrical, Envelope, Servicing: Storm, Sewer, Water, Power)

Option 2b

- Existing Building:
  - Emergency lighting and exit signage and exit hardware required
  - Potential enhanced power requirements
  - Remove existing overhead door. Infill and replace with new exit door.
- Proposed Addition:
  - Addition to comply with all requirements of the BCBC 2024 (Mechanical, Electrical, Envelope, Servicing: Storm, Sewer, Water, Power)

Option 3

Option 3a

- Existing Building:
  - Building to comply with all requirements of the BCBC 2024 (Mechanical, Electrical, Envelope, Servicing: Storm, Sewer, Water, Power)
  - Remove existing overhead door. Infill and replace with new exit door.
- Proposed Addition:
  - Addition to comply with all requirements of the BCBC 2024 (Mechanical, Electrical, Envelope, Servicing: Storm, Sewer, Water, Power)

Option 3b

- Existing Building:
  - Building to comply with all requirements of the BCBC 2024 (Mechanical, Electrical, Envelope, Servicing: Storm, Sewer, Water, Power)
  - Remove existing overhead door. Infill and replace with new exit door.
- Proposed Addition:
  - Addition to comply with all requirements of the BCBC 2024 (Mechanical, Electrical, Envelope, Servicing: Storm, Sewer, Water, Power)

The upgrades that apply to all options have been listed below:

- Ensure a fire hydrant is located at a maximum of 90m away from the principal entrance of the building. Alternatively, a supplemental water source and consulting the local fire department is recommended.
- All spaces within addition and the 4 season existing building require ventilation, heating, cooling and lighting.
- Ensure that the door openings, hardware and thresholds meet accessibility requirements
- If a stage as defined in section 3.4 of this report is proposed, the building requires a sprinkler system.
- Washroom requirements:
  - 3 watercloset or 1 watercloset + 2 urinals for the male washroom
  - 6 watercloset for the female washroom including an accessible stall
  - 1 universal washroom

1 PA301 LEVEL 1 - OPTION 1
3/16" = 1'-0"

LEGEND

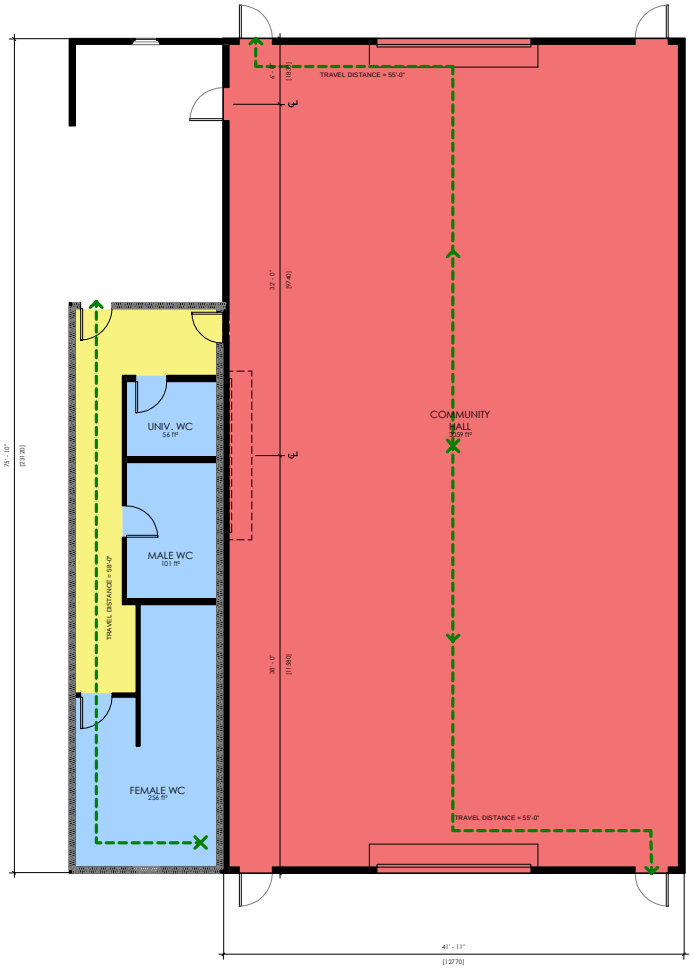
- PRIMARY EXIT ROUTE
- 1 HR F.R.R.
- INSULATION
- COMMUNITY HALL
- KITCHEN/ DINING HALL/ STORAGE
- WASHROOMS
- CIRCULATION

PRELIMINARY NOT FOR CONSTRUCTION

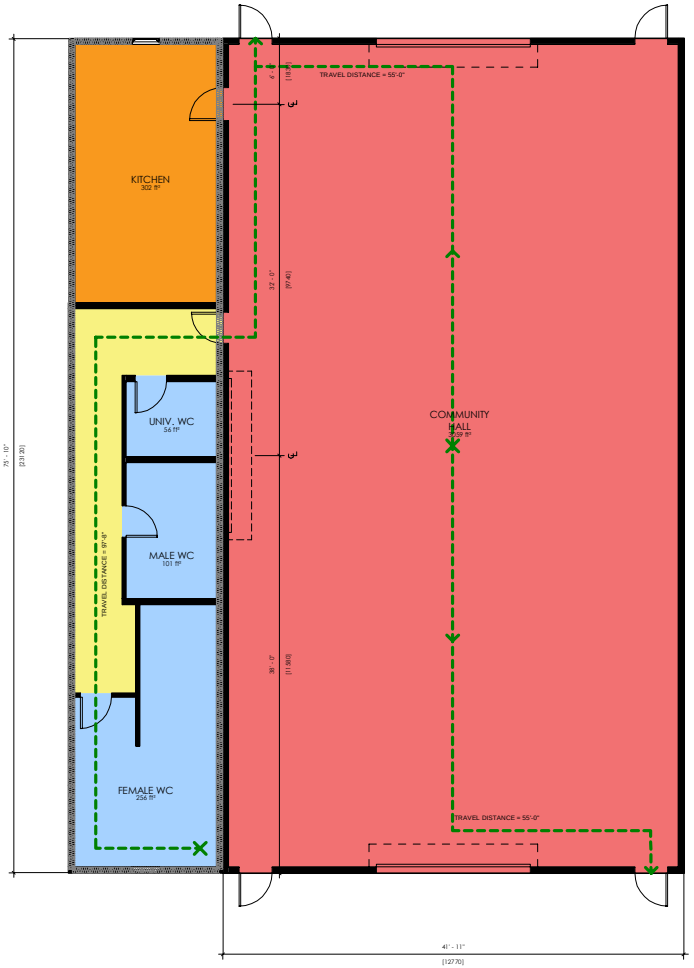
MAD
MEIKLEJOHN ARCHITECTURAL DESIGN STUDIO INC
104 - 259 BACKSTREET BOULEVARD,
PENTICTON, BC., CANADA. V2A 0G4
T: 250-492-3143
W: MADSTUDIO.CA

PROPOSED FLOOR PLANS — DRAWING TITLE
2025-01-13 — DATE
As indicated — HALFSIZE PLOT: REDUCE SCALE BY 50%
PA301 — DRAWING NUMBER
24.287 — PROJECT NUMBER

ADELINE KELLY BUILDING - CODE UPGRADES



1 PA302 LEVEL 1 - OPTION 2A
3/16" = 1'-0"



2 PA302 LEVEL 1 - OPTION 2B
3/16" = 1'-0"

LEGEND

- PRIMARY EXIT ROUTE
- 1 HR F.R.R.
- INSULATION
- COMMUNITY HALL
- KITCHEN/ DINING HALL/ STORAGE
- WASHROOMS
- CIRCULATION

PRELIMINARY NOT FOR CONSTRUCTION

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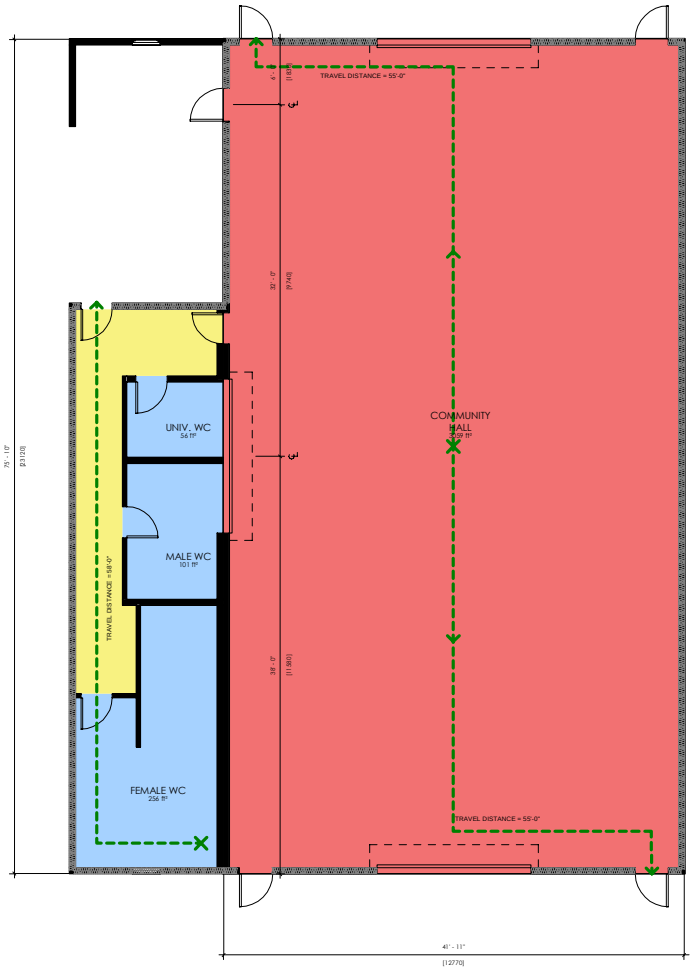
PROPOSED FLOOR PLANS — DRAWING TITLE
2025-01-13 — DATE
As indicated — HALFSIZE PLOT: REDUCE SCALE BY 50%
PA302 — DRAWING NUMBER
24.287 — PROJECT NUMBER

ADELINE KELLY BUILDING - CODE UPGRADES



1 PA303 LEVEL 1 - OPTION 3A
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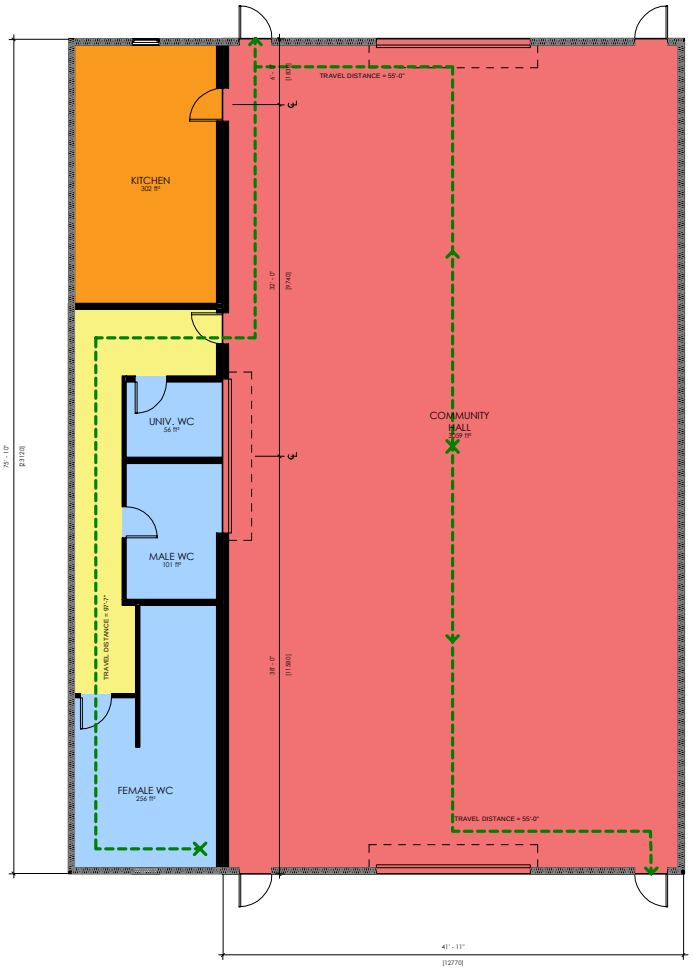

2 PA303 LEVEL 1 - OPTION 3B
3/16" = 1'-0"

LEGEND

- PRIMARY EXIT ROUTE
- 1 HR F.R.R.
- INSULATION
- COMMUNITY HALL
- KITCHEN/ DINING HALL/ STORAGE
- WASHROOMS
- CIRCULATION

PRELIMINARY NOT FOR CONSTRUCTION

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PROPOSED FLOOR PLANS	2025-01-13	As indicated	PA303
DRAWING TITLE	DATE	HALFSIZE PLOT: REDUCE SCALE BY 50%	DRAWING NUMBER

ADELINE KELLY BUILDING - CODE UPGRADES

24.287
PROJECT NUMBER

Client Name:	**Peace River Regional District**	**Date:**	January 28, 2025
Project Name:	**Adeline Kelly Occupancy Change**	**Job #:**	2451-3138-011

McElhanney

Construction Cost Estimate
Class D (± 50%)

#51-3 St. NE, Salmon Arm, BC
Prepared by: Joe Moser, P.Eng.
Reviewed by: Paul Bjorn, P.Eng.

Item	Item Description	Low Estimate	High Estimate	Contingency	Square Feet	$ Per Sq.Ft. (High)
Retrofit	Construction Costs	$ 511,798	$ 741,237	45%	*4256*	*$ 174*
	Soft Costs	$ 23,747	$ 26,247	11%	*4256*	*$ 6*
	Project Total:	**$ 535,545**	**$ 767,484**	43%		***$ 180***
	Optional Item Costs	$ 225,440	$ 296,536	32%	*5656*	*$ 212*
	Project Total:	**$ 760,985**	**$ 1,064,020**	40%	*5656*	***$ 188***
New Building	Equivalent building, wood framed, medium finishes	**$ 1,847,957**	**$ 2,375,944**	29%	*5656*	***$ 420***

Client Name:	**Peace River Regional District**
Project Name:	**Adeline Kelly Occupancy Change**

Date:	January 28, 2025
Job #:	2451-3138-011

Construction Cost Estimate
Class D (± 50%)

McElhanney

#51-3 St. NE, Salmon Arm, BC
Prepared by: Joe Moser, P.Eng.
Reviewed by: Paul Bjorn, P.Eng.

Cost Group	Item Description	Units	$/Unit	Line Subtotal	Uncertainty Percentage	Contingency	Low	High	Notes
Architectural				$ -	25%	$ -	$ -	$ -	
	Framing in new doors	7	$ 500.00	$ 3,500	25%	$ 875	$ 2,625	$ 4,375	
	Glazing	2	$ 300.00	$ 600	15%	$ 90	$ 510	$ 690	
	Drywall (sq.ft.) - Walls	4224	$ 0.50	$ 2,112	25%	$ 528	$ 1,584	$ 2,640	
	Drywall (sq.ft.) - Ceiling	4256	$ 0.60	$ 2,554	25%	$ 638	$ 1,915	$ 3,192	
	Flooring (sq.ft.)	3192	$ 4.00	$ 12,768	25%	$ 3,192	$ 9,576	$ 15,960	
	Painting	8480	$ 2.50	$ 21,200	25%	$ 5,300	$ 15,900	$ 26,500	
	Doors and hardware	4	$ 600.00	$ 2,400	25%	$ 600	$ 1,800	$ 3,000	
	Labour (person hours)	640	$ 90.00	$ 57,600	5%	$ 2,880	$ 54,720	$ 60,480	4 person crew, 4 weeks
Furnishings	Millwork (+ Misc. Carpentry)	1	$ 15,000.00	$ 15,000	10%	$ 1,500	$ 13,500	$ 16,500	
	Washrooms	2	$ 18,000.00	$ 36,000	15%	$ 5,400	$ 30,600	$ 41,400	Public multi-stall washrooms
	Labour (person hours)	320	$ 90.00	$ 28,800	5%	$ 1,440	$ 27,360	$ 30,240	4 person crew, 2 weeks
			Low	High					
	Architectural Sub-total:		$ 160,090.20	$ 204,977.00					
Structural	Remove roof cladding and purlins	4256	$ 2.50	$ 10,640	25%	$ 2,660	$ 7,980	$ 13,300	
	Replace roof trusses	20	$ 450.00	$ 9,000	25%	$ 2,250	$ 6,750	$ 11,250	
	Install sheathing and replace cladding	4256	$ 5.00	$ 21,280	25%	$ 5,320	$ 15,960	$ 26,600	
	Remove wall cladding and strapping	4672	$ 2.50	$ 11,680	25%	$ 2,920	$ 8,760	$ 14,600	
	Install framing between posts	4672	$ 2.50	$ 11,680	25%	$ 2,920	$ 8,760	$ 14,600	
	Install sheathing and replace cladding	4672	$ 5.00	$ 23,360	25%	$ 5,840	$ 17,520	$ 29,200	Assumed full replacement, conservative
	Foundation remediation for N-S lateral loading	12	$ 1,800.00	$ 21,600	25%	$ 5,400	$ 16,200	$ 27,000	
	Foundation remediation for gravity loading	6	$ 1,500.00	$ 9,000	25%	$ 2,250	$ 6,750	$ 11,250	Assume new screw piles installed beside existing columns with bridging beams at grade. Note that piles would need to be installed when cladding is off the walls.
	Labour (person hours)	640	$ 90.00	$ 57,600	5%	$ 2,880	$ 54,720	$ 60,480	4 person crew, 4 weeks
			Low	High					
	Structural Sub-total:		$ 143,400.00	$ 208,280.00					

Client Name:	**Peace River Regional District**	**Date:**	January 28, 2025
Project Name:	**Adeline Kelly Occupancy Change**	**Job #:**	2451-3138-011

Construction Cost Estimate
Class D (± 50%)

McElhanney

#51-3 St. NE, Salmon Arm, BC
Prepared by: Joe Moser, P.Eng.
Reviewed by: Paul Bjorn, P.Eng.

Cost Group	Item Description	Units	$/Unit	Line Subtotal	Uncertainty Percentage	Contingency	Low	High	Notes
Mech / Elec	Mechanical (plumbing)	1	$ 50,000.00	$ 50,000	25%	$ 12,500	$ 37,500	$ 62,500	
	Mechanical (ducting)	1	$ 30,000.00	$ 30,000	25%	$ 7,500	$ 22,500	$ 37,500	
	Mechanical (equipment)	1	$ 15,000.00	$ 15,000	25%	$ 3,750	$ 11,250	$ 18,750	
	Lighting	4256	$ 6.00	$ 25,536	25%	$ 6,384	$ 19,152	$ 31,920	
	Electrical distribution & comms/data cabling	4256	$ 18.00	$ 76,608	25%	$ 19,152	$ 57,456	$ 95,760	
	Phone system, Security, Network hardware	1	$ 20,000.00	$ 20,000	25%	$ 5,000	$ 15,000	$ 25,000	
	Fire alarm system	1	$ 15,000.00	$ 15,000	25%	$ 3,750	$ 11,250	$ 18,750	
	Labour (person hours)	400	$ 90.00	$ 36,000	5%	$ 1,800	$ 34,200	$ 37,800	5 people, 10 days
			Low	High					
	Construction Sub-Total:		$ 208,308.00	$ 327,980.00					
Optional Items	Roof insulation (per R20 sq.ft.)	3192	$ 2.50	$ 7,980	15%	$ 1,197	$ 6,783	$ 9,177	
	Wall insulation (per R20 sq.ft.)	4672	$ 1.50	$ 7,008	15%	$ 1,051	$ 5,957	$ 8,059	
	Kitchen, residential style (1400 sqft)	1400	$ 150.00	$ 210,000	15%	$ 31,500	$ 178,500	$ 241,500	Residential style likely not permitted, small commercial kitchen with exhaust hood.
	Labour (person hours)	400	$ 90.00	$ 36,000	5%	$ 1,800	$ 34,200	$ 37,800	5 people, 10 days
			Low	High					
	Optional Items Sub-total:		$ 225,439.80	$ 296,536.20					
		Percentage of Construction Cost							
Soft Costs	Architectural and Engineering Design	10%		$ 20,830.80	5%	$ 1,042	$ 19,789	$ 21,872	
	Contractor Insurance	2%		$ 4,166.16	5%	$ 208	$ 3,958	$ 4,374	
			Low	High					
			$ 23,747.11	$ 26,246.81					

	Low	High
Low / High Totals	$ 511,798	$ 741,237
Optional Low / High Totals	$ 225,440	$ 296,536
Soft Cost Low / High Totals	$ 23,747	$ 26,247
Project Total:	**$ 760,985**	**$ 1,064,020**

Total Labour Hours 2400 (hours)