Riding Mountain
National Park

Riding Mountain National Park (RMNP)
Visitor Centre (VC)

CONCEPT DESIGN BRIEF– **Riding Mountain is Home**

VERSION 2.0

September 5, 2018

Contents

Introduction

Approach

This Concept Design Brief outlines some of the key decisions in formulating a design direction for the rehabilitation of the Riding Mountain Visitor Centre. It is intended to serve as a summary of the chosen approach based on team feedback received while conducting investigations and analysis including the needs assessment completed in April 2018. The entire project consists of 4 Phases. Phase One – Investigation and Assessment included site visits and the completion of the Riding Mountain Property Condition Assessment report Feb. 2018. Phase Two – Schematic Design & Options Analysis included a needs assessment workshop, generation of the VC functional program, the completion of a precedent study and the provision of schematic design options for rehabilitation, alteration and/or the addition of outbuildings. This phase included the completion of the Riding Mountain National Park VC Feasibility and Needs Analysis Report, March 2018.

Phase Three – Conceptual Design Development is the development of conceptual design for the selected option including a Class D cost estimate. Various scenarios were explored that led to a discussion and synthesis resulting in a preferred approach. The plan considers heritage, structural, mechanical, electrical, fire and life safety concerns and compliance with existing codes. Adaptations of the preferred approach will be investigated to comply with Built Heritage and CRM considerations, as well as with all applicable codes and bylaws.

The methodology taken to facilitate the preparation of this brief was to:

- Meet with Cultural Resource Management and Built Heritage
- Assess the Visitor Centre functional program
- Assess needs and wants of the Field Unit
- Provide plans for 'zoning' of the existing building
- Refine concepts – Riding Mountain is Home
- Produce a preferred plan to move forward into next stages of design development
- Provide the rationale for the preferred approach

Approach Analysis

Needs Identification

"Which scenario ensures the most suitable capacity and size of the project in terms of current/future demand at Riding Mountain National Park Visitor Centre?"

- Do 'minimum' -

  Rehabilitate the existing heritage building utilizing a minimal intervention approach while upgrading the building envelope and ensuring code compliance and meeting occupancy targets (need for increased washroom facilities).

Considerations

- Assume that more people will be coming from the direction of the main parking lot. The parking lot rehabilitation project includes many interventions to increase its use and circulation from the parking lot to the townsite day use areas.
- Identified rehabilitation work required related to heritage character of the property and outlined in the Investigation and Assessment Phase is not detailed in the concept plans but will be included in the scope of work. (summarized in the Condition Assessment report, 2017)

Preliminary Structural Systems Description

General

The Structural system concept has been selected to minimize the impact on heritage character, building energy use, to maximize building sustainability, and be accommodating to maintenance.

Foundation

The perimeter foundation walls consist of cast in place concrete with a masonry veneer dressed to resemble fieldstone masonry with beaded joints. The concrete foundation walls are in good condition with only minor cracks in a few locations, notably at inside corners. The field stone veneer is in fair to good condition with several cracked joints and stones. The field stone veneer does not appear to be at significant risk of short-term deterioration; however, should the deficiencies not be addressed they will progress and will eventually compromise the integrity of the fieldstone veneer.

Foundation Features

The repair of the concrete exit stairs and code compliance is to be addressed as part of the rehabilitation plan for the Visitor Centre building.

Main Structural Frame

Deterioration of log walls is generally the result of exposure to moisture. In severe cases, deterioration of the logs can lead to deficiencies in the building's superstructure. Regular review and maintenance of the log walls is necessary to ensure the continued serviceability of the superstructure.

Ground Floor Structure

Based on a simplified analysis, the ground floor timber structures are likely capable of supporting a live load of 4.8kPa (100psf). The governing factor in determining the floor capacity was the layout of the joists. The calculated load bearing capacity of the floor is consistent with an assembly type occupancy however, there are many factors that were not included in the analysis and may adversely affect the floor structure. A detailed analysis of the floor structures must be completed prior to implementing changes that may alter the occupancy load, the dead load, or the capacity of the floor structure.

Building Envelope Description

General

The Building Envelope concept has been selected to minimize the impact on heritage character, building energy use, to maximize building sustainability, and be accommodating to maintenance. A Building Envelope study has been produced by PCA.

Exterior Walls

The majority of the above grade exterior walls are built with logs exposed inside and outside. In a few rooms the logs are covered with gypsum board.

The log and masonry walls should be rehabilitated and insulated from within where possible, without impacting the heritage character of the walls.

Exterior Doors and Windows

The existing exterior doors are solid wood with ornamental hinges and single pane glazing.

Given the heritage character of the doors they should not be replaced with new insulated doors. In order to reduce infiltration of outdoor air better weather-stripping should be installed on all exterior doors.

The existing windows have wood frames and single pane glazing.

Given the heritage character of the windows they should not be replaced with new more energy efficient windows. Their U-value could be improved by installing additional glazing on the outside of the existing window glazing. The additional glazing could be a single layer of Plexiglas set in a frame, or a double glazed sealed unit set in a frame. The double glazed units should be low-e, argon filled, with warm edge spacers. PCA will be constructing and installing these windows.

Roofs

The existing roof assembly consists of cedar shakes nailed to wood boards supported by roof trusses. The roofs are not insulated. The building heat loss during cold weather and heat gain during hot weather is very high. This increases the cost to heat/ cool the building and significantly reduces the thermal comfort for the occupants.

Figure 1: Log Trusses in Museum

Figure 2: Reception

Figure 3: Attic Above Reception

During the site inspections conducted on a warm sunny day in July 2017, the temperature of the top surface of the roof was measured to be up to 66.7°C, and maximum temperature of the underside of the roof deck ranged between 32.7°C and 42.1°C. The heat from the roof radiates downward to the interior of the building warming the people, furniture, walls and floors. With such high temperatures on the underside of the roof deck, it is almost impossible to cool the interior of the building effectively and make it comfortable for occupants. Even if the air temperature inside the building were cooled to less than 20°C, occupants would experience a warming sensation from the heat radiating down from the roof deck. The effect would be similar to that of sitting in front of a campfire on a cool night where your front feels hot and your back feels cool.

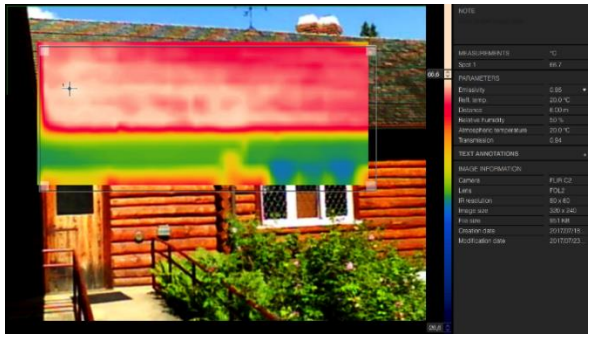

Figure 4: West Facing Roof (max temp 66.7°C)

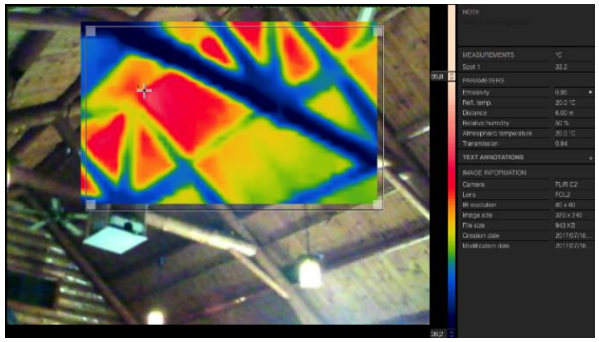

Figure 5: Thermal Image Theatre Ceiling (max temp 33.2°C)

As a means to increase the thermal comfort of the building occupants, reduce the energy bills to heat and cool the building, and reduce the capacity of the HVAC equipment, we recommend that the roof be insulated. In order to not disturb or hide the beautiful character defining varnished wood ceilings it would be best to insulate the roof from above the roof deck. This would entail removing the cedar shakes, some of which are in pretty bad shape, installing a layer of insulation, installing roof sheeting, and installing new cedar shakes nailed to the sheeting.

Proposed Roof Assembly:

- New cedar shakes
- New weather resistant membrane, e.g., stick-on membrane, vapour permeable membrane
- New plywood sheeting
- New insulation, e.g., mineral wool bats, mineral wool boards, wood fibre boards, extruded polystyrene boards (XPS), expanded polystyrene boards (EPS), polyisocyanurate boards, or a combination of these.
- New vapour barrier membrane
- Existing roof sheeting
- Existing varnished wood ceiling and trusses

The thickness of the roof will increase compared to the existing thickness and the final depth will depend on the thickness of insulation that is installed. This will have an impact on the height of the fascia, which needs to be coordinated with CRM and Built Heritage.

At this stage, we expect that the overall effective R-value of the roof could be increased from +/- R-3 to at least R-20 (RSI 3.52), which is half the current minimum code requirement of R-41 for this climate zone per NECB-2017. Achieving an overall effective R-value of R-20 would require approximately 100mm of XPS. This is to be confirmed in the PCA Building Envelope study.

National Energy Code of Canada for Buildings - 2017

Table 3.2.2.2.
Overall Thermal Transmittance of Above-ground Opaque Building Assemblies
Forming Part of Sentences 3.2.2.2.(1) and (2)

Above-ground *Opaque Building Assembly*	Heating Degree-Days of *Building* Location,(1) in Celsius Degree-Days					
	Zone 4:(2) < 3000	Zone 5:(2) 3000 to 3999	Zone 6:(2) 4000 to 4999	Zone 7A:(2) 5000 to 5999	Zone 7B:(2) 6000 to 6999	Zone 8:(2) ≥ 7000
	Maximum *Overall Thermal Transmittance*, W/(m²·K)					
Walls	0.315	0.278	0.247	0.210	0.210	0.183
Roofs	0.193	0.156	0.156	0.138	0.138	0.121
Floors	0.227	0.183	0.183	0.162	0.162	0.142

U roof = 0.138 W/(m2K) / RSI roof = RSI 7.25 (Km2)/W / R roof = R-41 BTU/(hr°Fft2)

As part of a re-roofing project, layers of board insulation would be installed above the roof deck. A few different types of insulation could be used singly or in combination for this purpose, e.g., polyisocyanurate, extruded polystyrene (XPS), expanded polystyrene (EPS), wood fiber, rockwool. The intent would be to minimize the height of the new roof system while providing sufficient insulation value.

Plumbing Systems Description

General

The Plumbing system concept has been selected to minimize the impact on heritage character, building energy use, to maximize building sustainability, and be accommodating to maintenance.

Utilities

Water Supply

From a plumbing perspective, the water service to the building is more than adequate in terms of water pressure and water flow to accommodate the increased number of plumbing fixtures that are proposed to be installed in the Visitor Centre.

Sanitary Sewer

It is assumed that the sanitary sewer for the Visitor Centre is NPS-4 inch, the same size as the building sanitary drain, and is therefore adequately sized for the increased number of plumbing fixtures.

Consideration should be given to hiring a contractor that would do a camera inspection of the sanitary sewer pipe from the building to the closest manhole to determine its condition, e.g., damaged pipe sections, roots, slope, open joints.

It is our understanding that the sanitary sewer pipe may have been installed above frost depth. If this is confirmed, the sanitary sewer pipe shall be removed and a new sewer pipe installed at a greater depth to avoid any risk of freezing in the winter. If this is not feasible due to technical reasons, consideration should be given to insulating the top/ sides of the sewer pipe to prevent its content from freezing.

Storm Sewer

There is no storm sewer system in the Visitor Centre and there is no need to install one.

Plumbing Systems

Design Considerations

- Correct code compliance issues.
- Minimize water consumption of the building.
- Minimize energy consumption of the domestic hot water system.

- Avoid burning fossil fuels and emitting greenhouse gases. Propane fired appliances are not a viable option at this location.
- Minimize maintenance requirements and associated ongoing costs.

Plumbing Fixtures

Most of the plumbing fixtures will be replaced as part of the proposed rehabilitation work. Manitoba regulations are to be reviewed to ensure that the fixture counts are accurate.

The existing toilets, lavatories, and service sink located in the Ground Floor Washroom, Utility Room, and Second Floor Washroom will be demolished. The kitchen sink in the Second Floor Staff Room could remain.

New toilets, lavatories, and sinks will be installed in the Ground Floor Gender Neutral Washroom, Family Washroom, Kitchen, and in the Second Floor Staff Washroom.

The new toilets in the Public Washrooms will be floor mounted, elongated bowl type fixtures. The new toilet in the Staff Washroom on the Second Floor will be floor mounted, elongated bowl type with a pressure assist tank.

The new lavatories in the Public Washrooms will be wall hung with self-closing metered faucets. Tempered water will be supplied to the lavatories via mixing valve(s).

A new drinking fountain with bottle filler tap will be installed inside the gender neutral washroom area.

Location	**Qty**	**Fixture Type**	**Total Hydraulic Load [drainage fixture units]**
Ground floor washrooms	5	toilet c/w flush valve	30
Ground floor washrooms	5	lavatory c/w metered faucet	5
Janitor's closet	1	service sink	3
Kitchen/Servery	1	Double (or triple TBC) compartment sink	2

Second floor washroom	1	toilet c/w pressure assist tank	6
Second floor washroom	1	lavatory	1
Second floor kitchenette	1	sink	1-1/2
Ground floor	1	drinking fountain	1/2
Exterior Wall	1	hose bib	-
Outdoors	1	feature fountain	-
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Sanitary Drainage

Given the new washroom layout, the majority of the sanitary piping will be replaced as part of the proposed rehabilitation work.

The existing sanitary piping in the Basement Mechanical / Electrical room and Crawl Space will be demolished. Sanitary piping up to the Second Floor Washroom and Staff Room could remain.

The NPS-4 inch building sanitary drain in the Basement Mechanical / Electrical room is adequately sized for the increased number of plumbing fixtures and will remain as is.

New sanitary piping will be installed in the Basement Mechanical / Electrical room and Crawl Space to the suit location of new plumbing fixtures. New piping will be PVC instead of ABS. The sanitary vent piping will be modified to suit the new fixture layout. A new fullport backwater valve shall be installed in the building sanitary drain to prevent sewage backups.

Deficiencies with the sump pit in the Basement Mechanical / Electrical room shall be corrected.

Storm Drainage

There is no plumbing storm drainage system in the Visitor Centre and there is no need to install one. The roof eaves troughs will discharge rain water away from the foundation walls via downspout extensions.

Potable Water Systems

The majority of the domestic water piping will be replaced as part of the proposed rehabilitation work.

Most of the existing domestic cold and hot water piping in the Basement Mechanical / Electrical room and Crawl Space will be demolished. Domestic water piping up to the Second Floor Washroom and Staff Room will remain.

The domestic water connection to the water service main in the Basement Mechanical / Electrical room will need to be upsized to meet the water demand for the additional number of plumbing fixtures.

New cold and hot water pipes will be installed in the Basement Mechanical / Electrical room and Crawl Space to suit location of new plumbing fixtures. New piping will be copper. All domestic hot water piping is to be insulated to minimize heat loss. All exposed domestic cold water piping isto be insulated to avoid condensation of humidity on the cold pipes.

Domestic Hot Water Heating Systems

The existing domestic hot water tank is old and will be replaced as part of the proposed rehabilitation work.

The existing electric hot water tank in the Basement Mechanical / Electrical room and Crawl Space will be demolished. The DHW heating system could be replaced with either of the following:

- Electric domestic hot water heater with a seamless polybutene tank.
- Domestic hot water heater piped from the geothermal heating system.

Fire Protection Systems Description

Fire Protection Systems

Automatic Sprinkler Systems

A sprinkler system is required to be installed in the building, in accordance with article 3.2.2.27 of the 2015 NBCC. A sprinkler system is present in the structure. An internal piping condition and obstruction investigation in accordance with Chapter 14 of NFPA 25 (2014 Edition) is to be performed and the dry pendent sprinklers sent to a ULC or UL laboratory and tested for sensitivity and functionality.

Alternatively, a wet pipe sprinkler system will be considered for the heated spaces while a dry pipe system will be considered for the unheated portions of the building (Attic and Crawl Spaces).

Portable Fire Extinguishers

Portable fire extinguishers are installed on every floor of the building and are located along normal paths of travel, including exits as required under the NFCC and in accordance with NFPA 10 "Standard for Portable Fire Extinguishers". The extinguishers can be reused.

Closures in Fire Separations

Fire dampers have been provided and installed where ducts penetrate an assembly required to be a fire separation. Fire rated access hatches have been provided where access is required for servicing in areas separated from the remainder of the building by a fire separation. (i.e. Basement to crawlspaces) These separations are to be reviewed and replaced/repaired or added to ensure that code compliance has been met.

Electrical Systems Description

General

The Electrical system concept has been selected to minimize building energy use, to maximize building sustainability, and be accommodating to maintenance.

Design Considerations

- Correct code compliance issues.
- Minimize energy consumption of the power and lighting systems.
- Minimize maintenance requirements and associated ongoing costs.
- Design is to be coordinated with the exhibit design team to ensure all interpretive needs are met.

Power and Distribution

Electrical Distribution

The main electrical service panel is located in the Basement Mechanical / Electrical room. It is a Westinghouse, 120/240V, 600A, 1 Phase, 3 wire, with six breakers feeding sub-panels and the two electric fan coils units. These panels will remain.

The electrical distribution will need to be modified to suit the new HVAC equipment, new lighting, and new electrical receptacles. Breakers in the electrical panels will need to be replaced to suit. New sub-panel(s) will need to be installed to accommodate additional circuits. This work is to be coordinated with the new interpretive program and components.

Electrical Receptacles

The layout of the existing electrical receptacles will be modified to suit the new Architectural layout and new functional program. Receptacles will be deleted, relocated, and added to suit.

Lighting

Interior Lighting

- Existing interior lighting is composed of a mix of pendant fixtures, track light fixtures, ceiling mounted fixtures, and recessed fixtures, most of which are inefficient and producing a large amount of heat contributing to overheating the space in the summer.

- Interior lighting will be designed to provide a warm and inviting atmosphere, with the lighting designed to reflect the needs of the area they have been installed in. In all areas of the building, consideration will be given to the geometry of the space, its heritage character and the location of visual tasks.
- Generally lighting will be provided with LED bulbs/ fixtures. 120 volt distribution will be utilized.
- The fixtures to be selected will be based on several key factors to include for vandalism, performance and architectural appearance in keeping with the heritage character of the VC. In addition extending the life cycle, reducing maintenance and improving energy performance are key considerations.
- Existing interior lighting to be removed and replaced as required to suit the new lighting design.

Exterior Lighting

- Existing exterior lighting is composed of a mix of wall mounted fixtures and in-ground fixtures.
- Exterior lighting will be designed to create a secure environment and enhance the facilities night appearance with the lowest energy consumption and maintenance methods available. Exterior lighting will be full cut off luminaires designed taking into consideration light pollution requirements and Dark Skies.
- Generally lighting will be provided with LED bulbs/ fixtures.
- The fixtures to be selected will be based on several key factors to include for vandalism, performance and architectural appearance in keeping with the heritage character of the VC. In addition extending the life cycle, reducing maintenance and improving energy performance are key considerations.
- Timer/ light sensor will be installed to shut off lights automatically when not needed.
- Existing external landscaping lighting to be removed and replaced as required by new landscaping concept.

Communication Systems

- The telephone service will be modified to suit the new Architectural layout and functional program.

Fire Alarm System

- A fire alarm system is required by Code and should be maintained in the building as it is sprinklered throughout. The fire alarm system control panel will be replaced with a more modern small scale addressable system. Every attempt shall be made to salvage existing wiring however, the device locations and heights are to be revised to meet CAN/ULC S524-14:AMD1 #Standard for the Installation of Fire Alarm Systems".

Fire signal receiving centres and transmitter systems

- A new fire alarm signal transmitter will be provided in conformance with CAN/ULC-S561, "Installation and Services for Fire Signal Receiving Centres and Systems"

Emergency Lighting/Exit Signs

- The exiting emergency lighting and exit signs are to be upgraded to new LED models complete with green and white graphical symbol meeting the 2015 NBCC.

Security Systems

- A complete Video surveillance or CCTV system will be provided if so desired by the FU to protect the asset and its content.

Wiring Methods

- All exposed wiring will be mechanically protected by being installed in metallic conduits or armored sheeting.

Utilities

Electrical Service

- At this stage we do not foresee any capacity issues with the existing electrical service to the Visitor Centre. Once the Mechanical and Electrical concept designs are agreed upon the designers will be in a position to confirm.

HVAC Systems Description

General

The HVAC system concept has been selected to minimize building energy use, to maximize building sustainability, and be accommodating to maintenance.

Design Objectives

- Design a heating system with enough capacity to heat the building over the winter.
- Design an air conditioning system with enough capacity to maintain comfortable temperature and relative humidity conditions inside the building.
- Minimize energy consumption of the HVAC systems.
- As a means to help meet the above objectives, improve thermal & infiltration performance of the building envelope.
- If possible avoid burning fossil fuels and emitting greenhouse gases.
- Minimize maintenance requirements and associated ongoing costs.
- Correct code compliance issues.

Impacts of Building Envelope Upgrades on HVAC System Design

In order to minimize the capacity of the new heating/ cooling systems, minimize the future recurring cost of energy to heat/ cool the building, and increase the thermal comfort of the building occupants we recommend that some of the building envelope components be upgraded. The first upgrade that should be considered and the one with the most impact would be to insulate the roof. The second upgrade that should be considered would be to add storm windows. Storm windows will be constructed and installed by PCA. Refer to Building Envelope section of this report for more details.

Heating Ventilation and Air Conditioning (HVAC) Systems

The building is currently heated with electric fan coil units ducted to floor registers. This system will be demolished and a new HVAC system installed.

Many different options were investigated to heat/cool and ventilate the Visitor Centre. The following options were selected based on the design objectives.

Heat/ Energy Recovery Unit

Given that the building envelope of the Visitor Centre is likely extremely leaky, we do not foresee the need for mechanical ventilation units, such as a heat recovery ventilator, to introduce outdoor air into the building. Relying on natural ventilation via infiltration through the building envelope should be more than adequate to meet the outdoor air requirements in the building.

Ground Source Heat Pumps + Fan Coil Units

Description

A geothermal heat pump or ground source heat pump (GSHP) is a heating and/or cooling system that transfers heat to or from the ground. It uses the earth as a heat source (in the winter) or a heat sink (in the summer). This design takes advantage of the moderate temperatures in the ground to boost efficiency and reduce the operational costs of heating and cooling systems.

Generally speaking, a ground source heat pump system is made up of three main parts: a loop(s), the heat pump and the distribution system. The loop(s) may either be closed or open: Closed loop(s) circulates a fluid mixture through underground pipes in one well; Open loop circulates water from one well to a second well. Vertical loops are made out of HDPE pipe, which are inserted into holes drilled in the soil. These boreholes are 15–150 m deep, and 10–15 cm around. The heat pumps are typically self-contained units combining a blower, compressor, heat exchanger, and condenser coil in a single cabinet. Heat pumps can be used with forced-air and hydronic heating systems.

We propose that one or more GSHP forced air furnace(s)be installed in the Basement Mechanical Room with ductwork in the Crawl Space, and floor registers in each room. The existing ductwork will likely be undersized and need to be replaced. Additional floor registers or larger floor registers may need to be installed. Wherever possible existing register locations are to be utilized to reduce the impact on heritage character.

Advantages

- No burning of fossil fuel.
- No greenhouse gas emissions since electricity supplied by Manitoba Hydro is more than 99% renewable as it is generated, for the most part, by hydro dams.
- Energy-cost savings compared with electric furnaces or fan coil units are around 65 percent. Even considering the high installation cost due to the expensive drilled well(s), the payback is typically very reasonable, i.e., less than 10 years.
- GSHP can also preheat domestic hot water at a very low cost.
- GSHP with forced air furnaces are able to heat and cool depending on the season. There is no need for a separate cooling system.

- Efficiency is constant all winter as the temperature of the ground remains fairly constant, unlike air to air heat pumps whose efficiency drops with the outside air temperature.
- Requires little maintenance.
- Geothermal heat pumps have life expectancy of about 20 to 25 years. This is higher than for air-source heat pumps because the compressor has less thermal and mechanical stress, and is protected from the environment. Geothermal loops have a life expectancy of more than 50 years.

Disadvantages

- Drilled wells are expensive. One option that is often selected is to undersize the GSHP system to meet 60 to 70% of the peak heating load and rely on inexpensive electric baseboard heaters (the VC does not have a lot of available wall space) to provide supplementary heat when the GSHP system is maxed out. This combination reduces the construction costs substantially as the drilled well(s) are shorter.
- This combination reduces the construction costs substantially as the drilled well(s) are shorter.

Additional Remarks

- It is our understanding that the FU is considering the option of heating & cooling both the Visitor Centre and the neighbouring Administration building with one new geothermal heat pump system, with the intent of reducing construction costs if both projects are built at the same time. In our opinion these savings would be somewhat marginal.
- From a technical perspective, it would be preferable if the two buildings would have their own distinct geothermal heat pump system as opposed to having a combined system. Heat pumps would be located in Mechanical rooms in both buildings and drilled wells would be dedicated to each of the two buildings. The drilled wells would be located in landscaped areas adjacent to each of the two buildings.
- Although there could be procurement challenges with this approach, it may be possible to reduce the drilling contractor mobilisation/demobilisation costs by drilling the wells for both buildings at once. The work in each building could then be phased to avoid having both buildings under construction at the same time. If this approach is selected, the FU would have to ensure that one general contractor remains responsible and liable for all of the work in both buildings. Other options would be to do all of the work in both buildings at once as part of one contract, or split the work in two contracts.
- The quantity and depth of the wells required to heat & cool a building varies depending on the ground conductivity and the ground heat diffusion. Average conductivities of soil materials can be used, but it is advisable to drill a test well to identify the type of soil before designing the whole system. The test well can be done during the preliminary phase of a project, or during the construction. If done during the construction, the driller will then determine the number and

depth of the wells to suit the heating/cooling loads of the building. The only caveat of the later approach is that the final cost of the well field will only be known during the construction phase of the project. This may, or may not, be a problem from a project management point of view. In the bid documents a unitary cost for the wells could be requested, e.g. $/linear meter of well depth, or a reasonable contingency set aside.

New Vestibule

Following are HVAC considerations of adding a vestibule on the South entrance side of the Riding Mountain Visitor Centre.

This vestibule would act as a buffer zone between the inside of the building and the outdoors. It would minimize heat loss and heat gain when people enter/exit the building. It would also minimize migration of dust, water, snow, dead leaves, into the building. In our climate, vestibules are typically heated but seldom air conditioned, nor are they ventilated, i.e. no supply of outdoor air through ductwork.

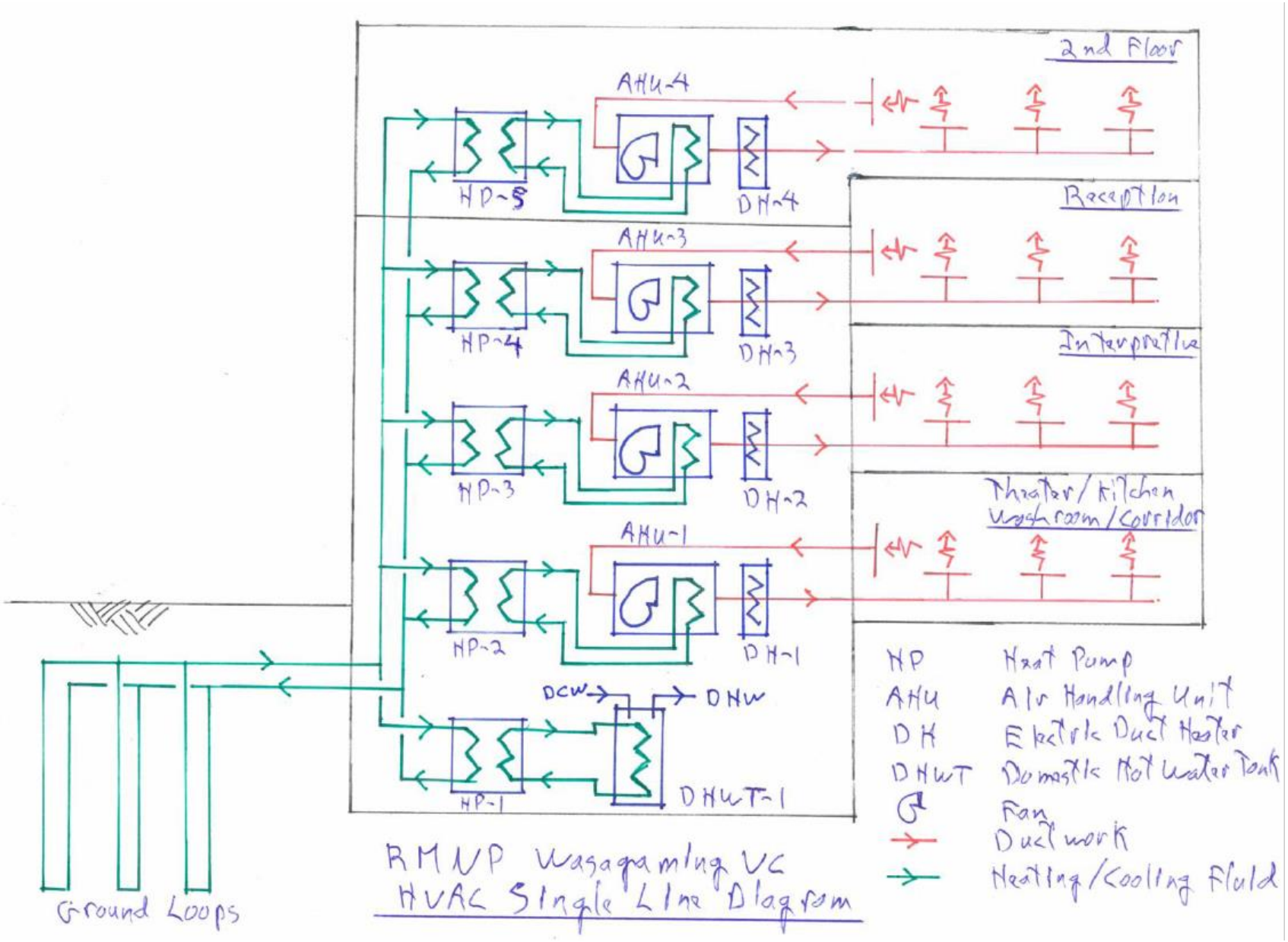
Two options were considered.

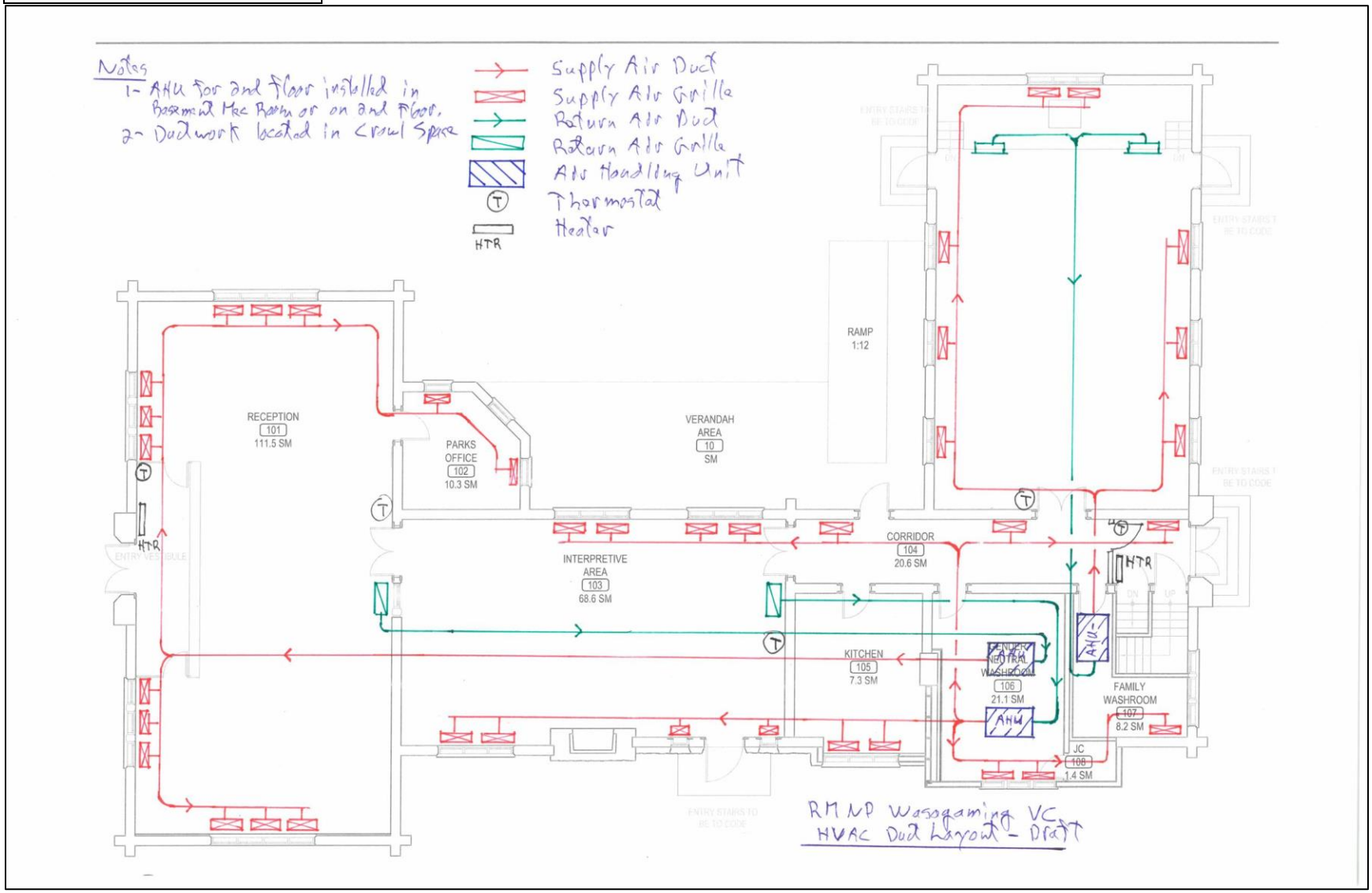
Interior Vestibule

- The interior vestibule would be heated/cooled using the forced-air system for the Reception Area or heated with a dedicated electric radiator.
- The energy required to heat an interior vestibule would be less than for an exterior vestibule.

Exterior Vestibule

- There would be little value in cooling an exterior vestibule, so this will not be considered.
- In order to reduce the risk of overheating the exterior vestibule we recommend that external shading be provided to shade the South facing windows.
- Heating the exterior vestibule using the Reception Area's forced air system would be challenging. If deemed necessary, the exterior vestibule could be heated using an electric radiator.
- The energy required to heat the exterior vestibule would be substantially more than for the interior vestibule, unless the walls/roof of the exterior vestibule are very well insulated.


2nd Floor
AHU-4
HP-5
DH-4
Reception
AHU-3
HP-4
DH-3
Interpretive
AHU-2
HP-3
DH-2
Theater/Kitchen
Washroom/Corridor
AHU-1
HP-2
DH-1
DCW
DHW
HP-1
DHWT-1
Ground Loops
HP Heat Pump
AHU Air Handling Unit
DH Electric Duct Heater
DHWT Domestic Hot Water Tank
Fan
Duct work
Heating/Cooling Fluid
RMNP Wasagaming VC
HVAC Single Line Diagram


Notes
1- AHU for 2nd floor installed in Basement Mec Room or on 2nd floor.
2- Ductwork located in Crawl Space
Supply Air Duct
Supply Air Grille
Return Air Duct
Return Air Grille
Air Handling Unit
Thermostat
Heater
HTR
RECEPTION
101
111.5 SM
PARKS OFFICE
102
10.3 SM
VERANDAH AREA
10
SM
RAMP
1:12
INTERPRETIVE AREA
103
68.6 SM
CORRIDOR
104
20.6 SM
KITCHEN
105
7.3 SM
GENDER NEUTRAL WASHROOM
106
21.1 SM
FAMILY WASHROOM
107
8.2 SM
JC
108
1.4 SM
AHU
RMNP Wasagaming VC
HVAC Duct Layout - Draft

Commissioning

Commissioning of building, mechanical and electrical components and systems will be accomplished to ensure that all equipment works as designed and that all systems work in unison.

Preliminary Planning Information

General

- This report outlines preliminary information for consideration and analysis as to washroom count feasible within the existing building and limitations on occupant load
- Rental uses considered within the structure will require liquor permits issued in Manitoba
- Four washrooms for gender neutral facilities have been provided within the confines of existing interior partitions.
- RMNP considering 80 – 100 persons per event (washroom count may restrict occupancy)

Construction

If the Visitor Centre were to be reconstructed today, if would most likely be done respecting the provision of Article 3.2.2.27 of the 2015 NBCC for an A2 Assembly Occupancy of up to 2 storeys and sprinklered. This will form the baseline for the concept.

Exits

Code compliant exit facilities from the ground floor will be provided. Efforts will be made to separate the required exits from the 2nd floor and the basements from the remainder of the building as required in the NBCC (45 minutes). A protected lobby will be introduced in the North exit area to address the lack of protected exit facility from the 2nd floor and basement. The lobby will be separated from the remainder of the building by a fire separation having a fire resistance rating of 0 hours.

Means of Egress

To achieve an occupant load above 60, the Lecture Hall / Lecture Room (107) main entrance doors are required to swing outward in the direction of exit travel (or be fixed open). Although both exits near the stage meet the separation distance between two exits, the main doors swing inwards and cannot contribute to an overall occupant load above 60. 3.3.1.11.2) Except as permitted by Article 3.3.1.12., 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** or for a high-hazard industrial occupancy **shall swing in the direction of travel to the exit**. That being said, both the doors from 101 to 103 and 109 to 104 are required to swing in the direction of exit travel if the rooms are to be used for more than 60 occupants (or be fixed open).

Fire separations

The floor assembly immediately above a basement shall be constructed as a fire separation having a fire-resistance rating of 45 min.

National Building Code (metric)

- Assembly occupancy – Occupant Load p. 2-36 Div. B. (A2 up to 2 storeys and sprinklered)
- Spaces – space with non-fixed chairs, tables
    - Lecture Hall/Theatre 88.3 sq. m. divided by .95m2 = 92.94 = 92 people
    - Museum 111.5 sw. m. divided by .95 m2 = 117.36 = 117 people
    - Total 209 people
- Washrooms requirements
    - NBC p. 3-158 Div. B Table 3.7.2.2 – A
    - Numbers of persons of each sex

	101 – 125	76-100
	3 male, 5 female	2 male, 4 female

- RMNP wishes to consider occupant load for rentals of 90 total +-

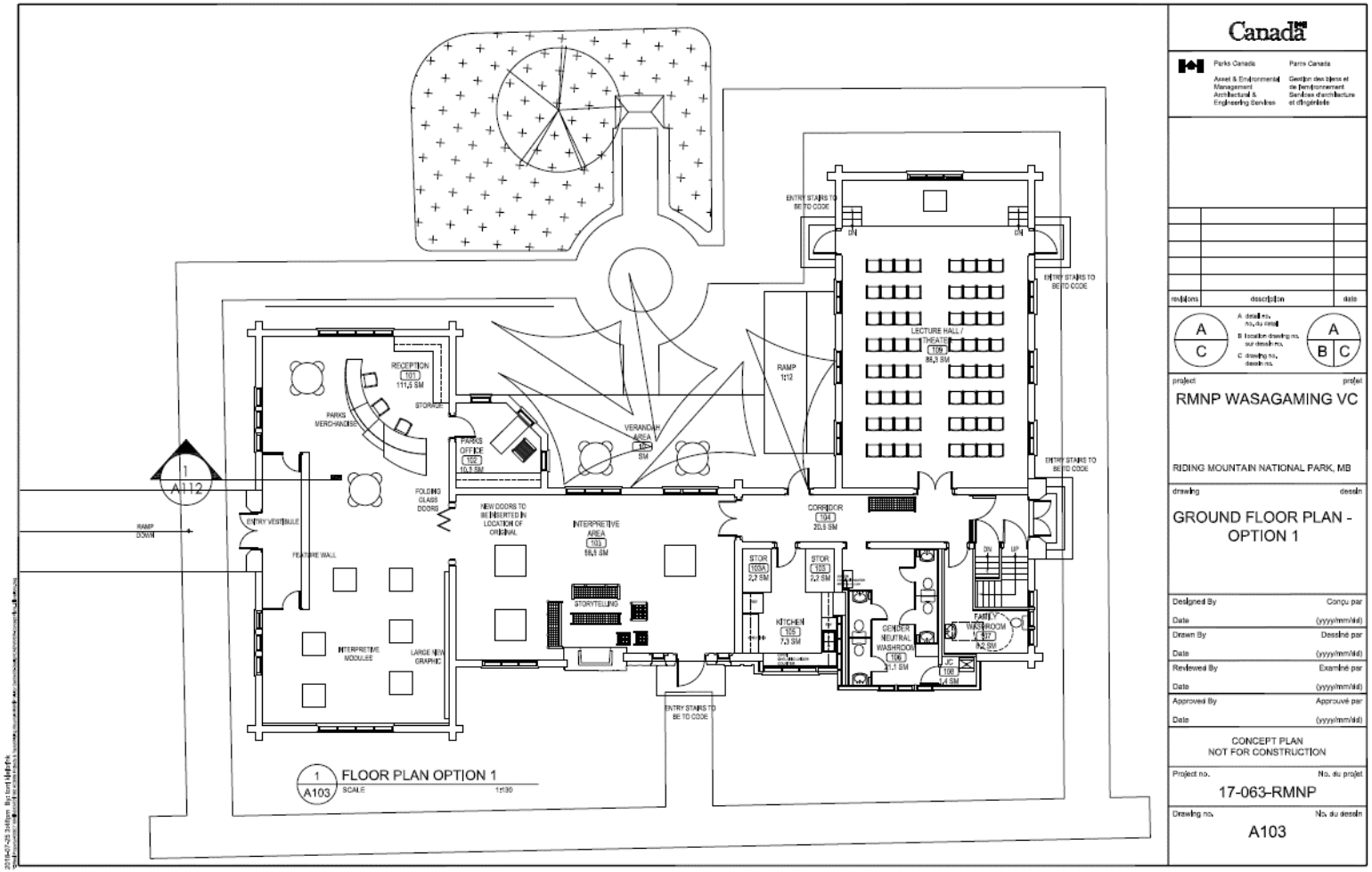
Manitoba Liquor Control Commission (imperial)

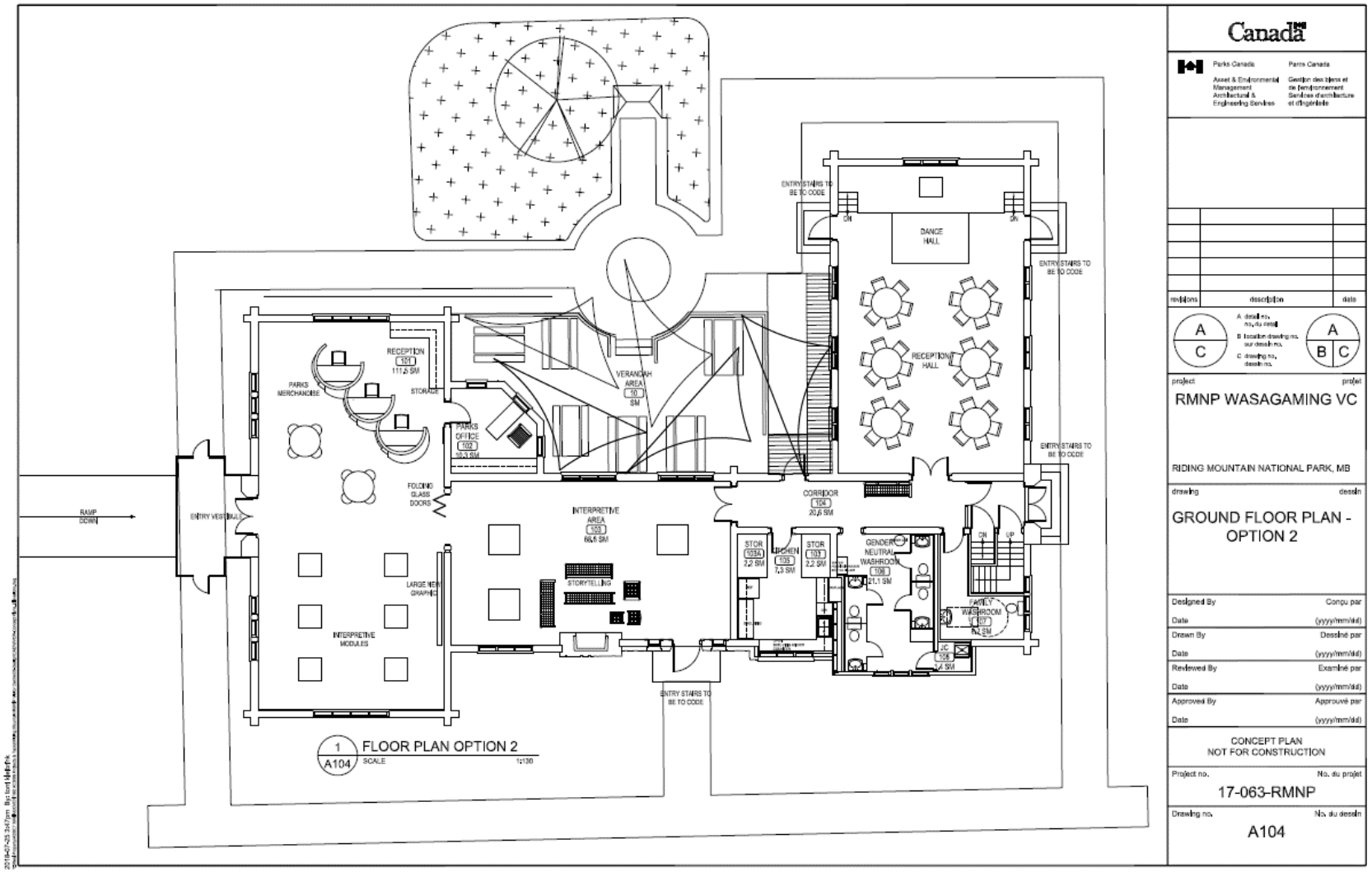
Information is taken from Manitoba Liquor Control Commission Occasional Permit Directive, Section III – Banquet Hall Approval Process, February 2005 page 1. It is the intent that the exterior patio be licensed and all Manitoba Liquor Control Commission regulations are to be followed.

- All washrooms should be provided with:
    - Mechanical ventilation,
    - Ceramic wall tile or equivalent durable material to a height of 4 feet from the floor with washable vinyl wall fabric or good quality paint on the rest of the wall (EXISTING FIELD STONE TO BE REMOVED as it is not washable and restricts exit width)
    - Metal partitions or equivalent around all water closets
    - Hand basins to be recessed in vanities except those provided for handicapped patrons
    - Floors of ceramic tile or commercial grade seamless vinyl flooring
    - Floor drains where practical
- Washroom Requirements
    - VC area – 4200 ft2 – space with non-fixed seats and tables 10 ft2/person = 420 people
    - Common room/theatre – 1860 ft2 divided by 10 ft2/person = 186 people = 4 female, 2 male stalls

Preferred Architectural Approaches

Minimize Impact on Heritage Character




RECEPTION
101
111.8 SM
PARKS MERCHANDISE
STORAGE
PARKS OFFICE
102
10.3 SM
FOLDING GLASS DOORS
VERANDAH AREA
10
SM
ENTRY STAIRS TO BE TO CODE
DANCE HALL
RECEPTION HALL
ENTRY STAIRS TO BE TO CODE
ENTRY STAIRS TO BE TO CODE
RAMP DOWN
ENTRY VESTIBULE
INTERPRETIVE AREA
105
66.8 SM
CORRIDOR
104
20.8 SM
STOR
103A
2.2 SM
KITCHEN
105
7.5 SM
STOR
103
2.2 SM
GENDER NEUTRAL WASHROOM
106
21.1 SM
FAMILY WASHROOM
107
4.2 SM
JC
108
4 SM
DN
UP
LARGE NEW GRAPHIC
STORYTELLING
INTERPRETIVE MODULES
ENTRY STAIRS TO BE TO CODE
1
A104
FLOOR PLAN OPTION 2
SCALE
1:100
Canada
Parks Canada
Parcs Canada
Asset & Environmental Management Architectural & Engineering Services
Gestion des biens et de l'environnement Services d'architecture et d'ingénierie
revisions
description
date
A
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project
projet
RMNP WASAGAMING VC
RIDING MOUNTAIN NATIONAL PARK, MB
drawing
dessin
GROUND FLOOR PLAN - OPTION 2
Designed By
Conçu par
Date
(yyyy/mm/dd)
Drawn By
Dessiné par
Date
(yyyy/mm/dd)
Reviewed By
Examiné par
Date
(yyyy/mm/dd)
Approved By
Approuvé par
Date
(yyyy/mm/dd)
CONCEPT PLAN
NOT FOR CONSTRUCTION
Project no.
No. du projet
17-063-RMNP
Drawing no.
No. du dessin
A104

Circulation Strategy

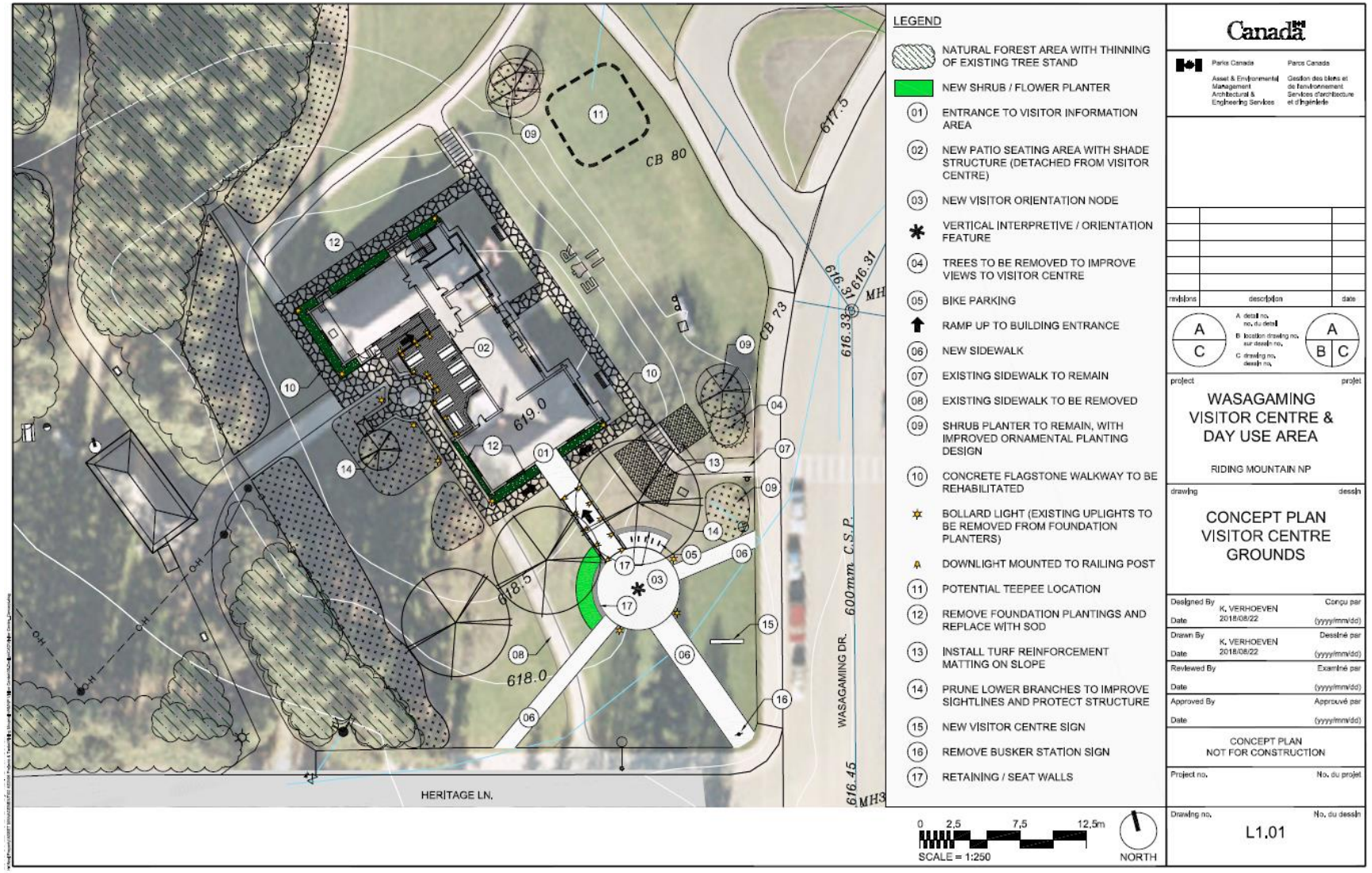
Minimize Impact on Heritage Character

Riding Mountain wishes to contribute to the Visitor Centre's architectural and heritage character by guiding change. A minimal intervention approach was followed in order to ensure that the building's character and viability is maintained and/or enhanced. The VC will be allowed to continue in its present use serving Canadians who wish to travel to see our landscapes and the places within them – Riding Mountain is Home.

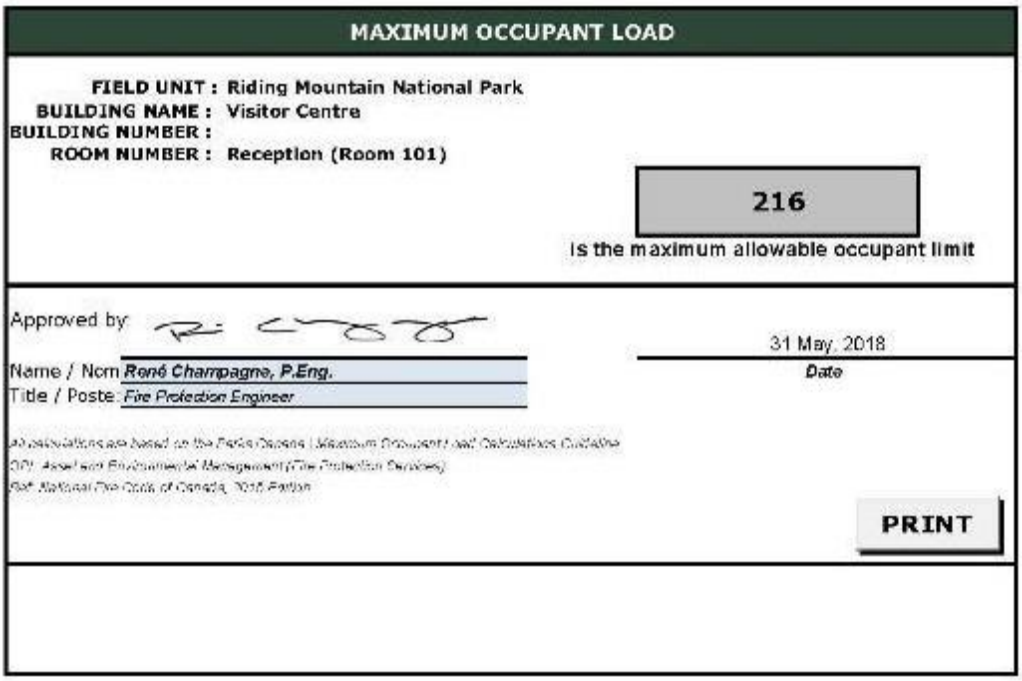
The organization of a building, its sequence of spaces and circulation patterns, is important in conveying the historic context, character, and development of most buildings. Hallways and corridors are generally experienced as one element in a sequence of related spaces, a group that often includes entrance lobbies, stairwells, and elevator lobbies. This sequence of spaces working together provides the circulation artery for a building. Therefore, the retention of existing corridors on all floors when considering rehabilitation is necessary and removal or extensive alterations of these spaces would most certainly cause the loss of historic fabric, which would diminish the historic character and feeling of the building. This approach is what is advocated for the rehabilitation of Riding Mountain Visitor Centre.

Any changes to circulation or access should consider historic patterns related to the movement of pedestrians and vehicles. With the adoption of a minimal intervention approach and minimal exterior additions (if an exterior vestibule is added) and without taking measures to restrict pedestrian usage of the site, the long term patterns of use of the VC are retained.

Grounds Concept Plan



Appendix A – Occupant Load; Floor Plan 1



MAXIMUM OCCUPANT LOAD

FIELD UNIT : Riding Mountain National Park
BUILDING NAME : Visitor Centre
BUILDING NUMBER :
ROOM NUMBER : Reception (Room 101)

216
is the maximum allowable occupant limit

Approved by:

Name / Nom: *René Champagne, P.Eng.*
Title / Poste: *Fire Protection Engineer*

31 May, 2018
Date

All calculations are based on the Parks Canada | Maximum Occupant Load Calculations Guideline
2017, Asset and Environmental Management (Fire Protection Services)
Ref: National Fire Code of Canada, 2015 Edition

PRINT

MAXIMUM OCCUPANT LOAD / NOMBRE DE PERSONNES MAXIMAL

Field Unit / Unité de gestion : Riding Mountain National Park
Building name / Nom du Bâtiment : Visitor Centre
Building Number / Numéro du Bâtiment :
Room Number / Numéro de la Salle. : Reception (Room 101)

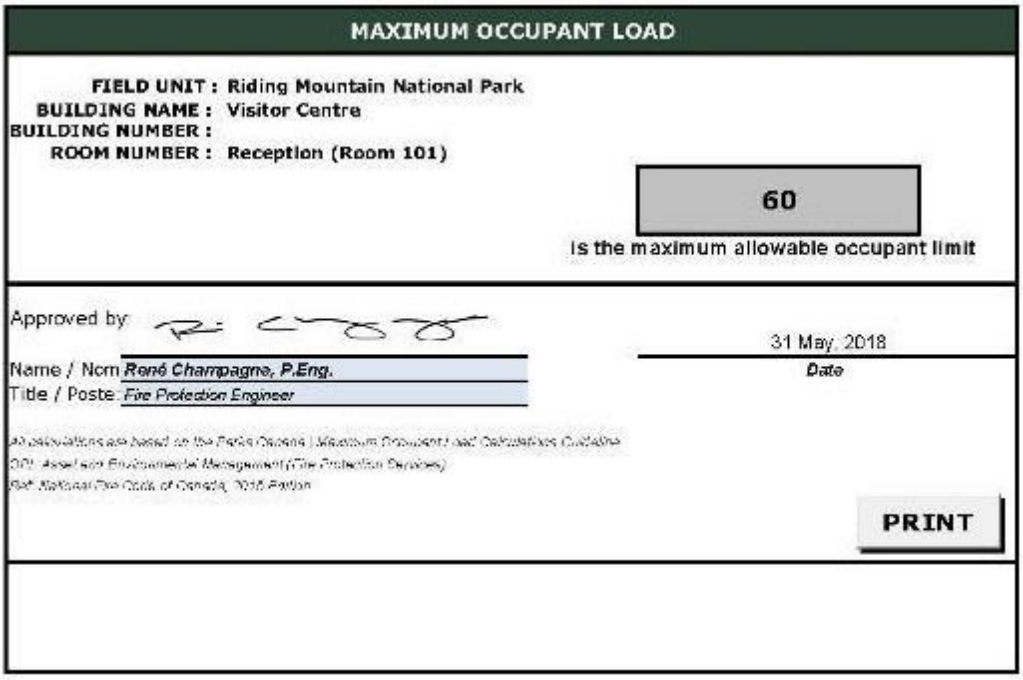
216

Approved by:
Approuvé par:
Name / Nom:
Title / Poste:

René Champagne, P.Eng.
Fire Protection Engineer

31 May, 2018
Date

Appendix B – Occupant Load; Floor Plan 2&3



MAXIMUM OCCUPANT LOAD

FIELD UNIT : Riding Mountain National Park
BUILDING NAME : Visitor Centre
BUILDING NUMBER :
ROOM NUMBER : Reception (Room 101)

60
is the maximum allowable occupant limit

Approved by:

Name / Nom: *René Champagne, P.Eng.*
Title / Poste: *Fire Protection Engineer*

31 May, 2018
Date

All calculations are based on the Parks Canada | Maximum Occupant Load Calculation Guideline
for Asset and Environmental Management (Fire Protection Services)
Ref: National Fire Code of Canada, 2015 Edition

PRINT

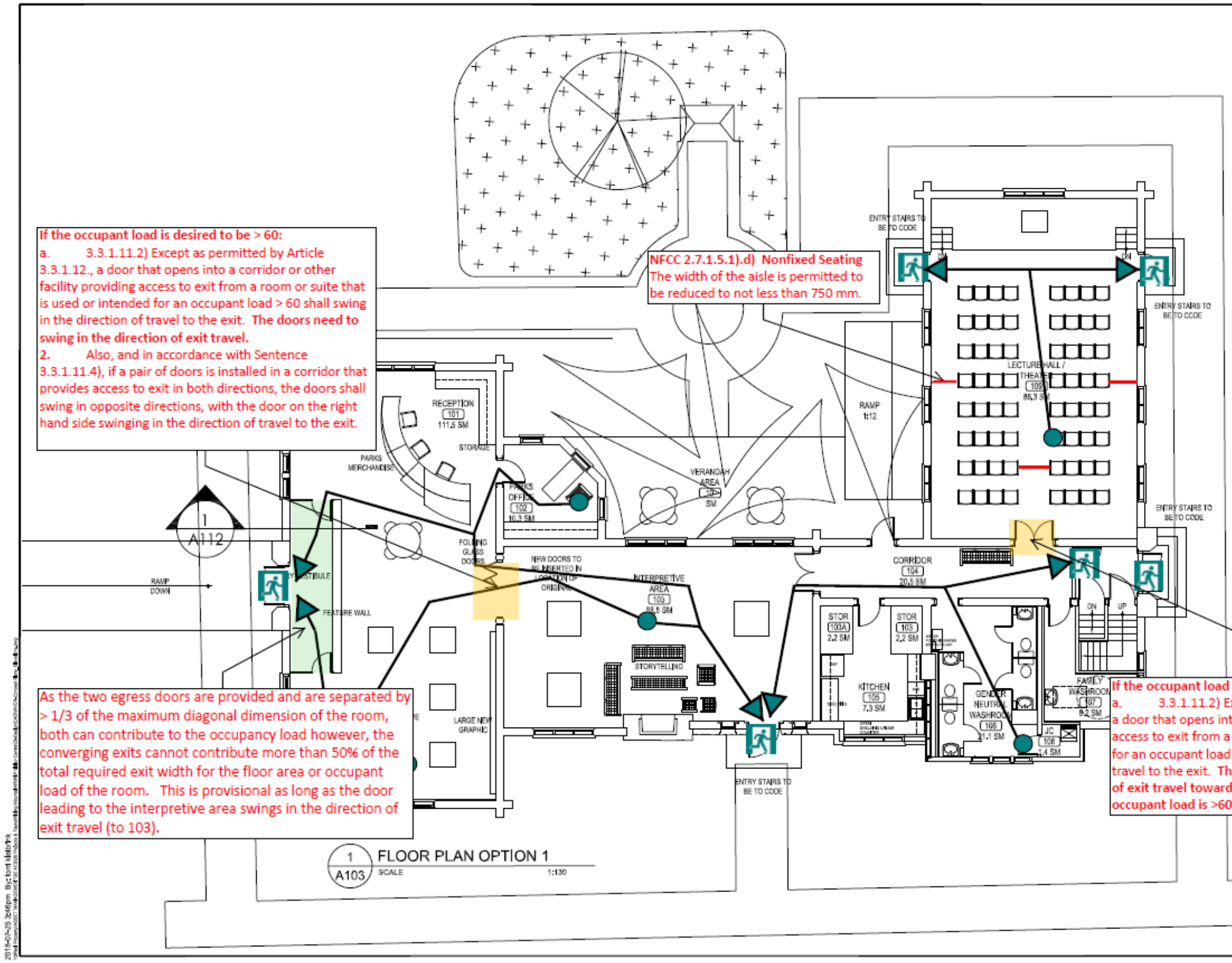
MAXIMUM OCCUPANT LOAD / NOMBRE DE PERSONNES MAXIMAL

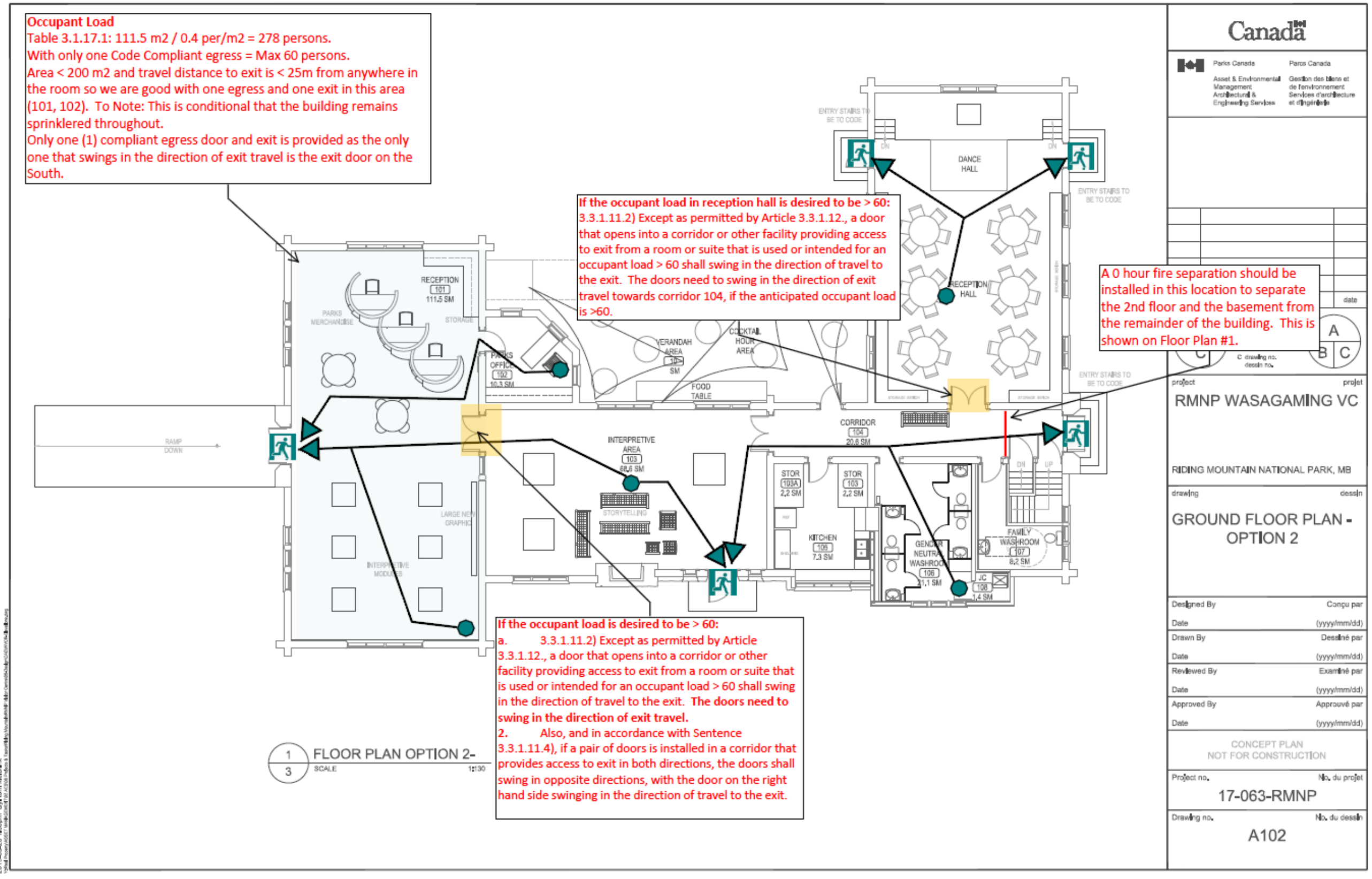
Field Unit / Unité de gestion : Riding Mountain National Park
Building name / Nom du Bâtiment : Visitor Centre
Building Number / Numéro du Bâtiment :
Room Number / Numéro de la Salle. : Reception (Room 101)

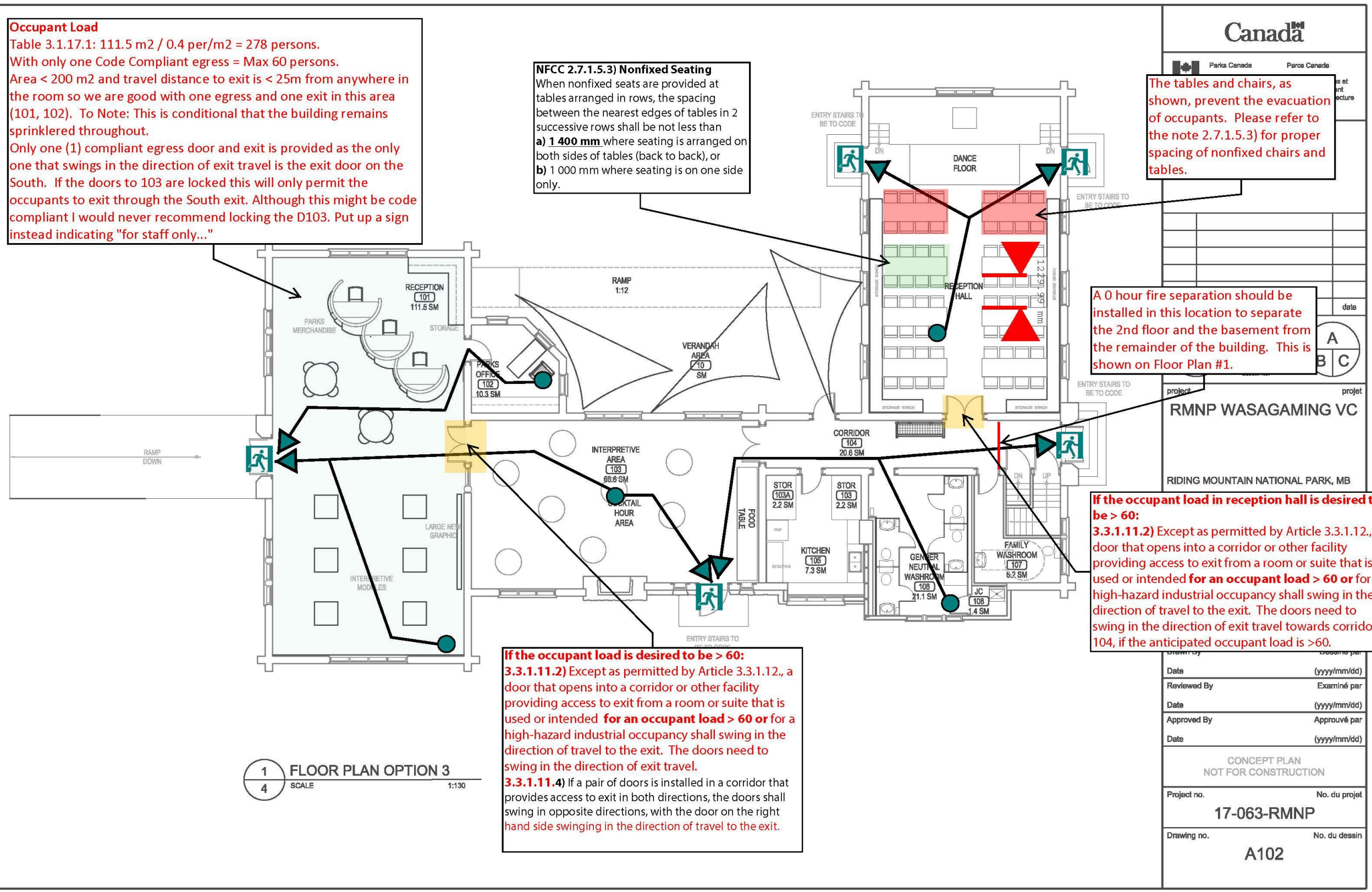
60

Approved by:
Name / Nom: *René Champagne, P.Eng.*
Title / Poste: *Fire Protection Engineer*

31 May, 2018
Date


If the occupant load is desired to be > 60:
a. 3.3.1.11.2) Except as permitted by Article 3.3.1.12., 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 > 60 shall swing in the direction of travel to the exit. The doors need to swing in the direction of exit travel.
2. Also, and in accordance with Sentence 3.3.1.11.4), if a pair of doors is installed in a corridor that provides access to exit in both directions, the doors shall swing in opposite directions, with the door on the right hand side swinging in the direction of travel to the exit.
NFCC 2.7.1.5.1).d) Nonfixed Seating
The width of the aisle is permitted to be reduced to not less than 750 mm.
As the two egress doors are provided and are separated by > 1/3 of the maximum diagonal dimension of the room, both can contribute to the occupancy load however, the converging exits cannot contribute more than 50% of the total required exit width for the floor area or occupant load of the room. This is provisional as long as the door leading to the interpretive area swings in the direction of exit travel (to 103).
If the occupant load in reception hall is desired to be > 60:
a. 3.3.1.11.2) Except as permitted by Article 3.3.1.12., 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 > 60 shall swing in the direction of travel to the exit. The doors need to swing in the direction of exit travel towards corridor 104, if the anticipated occupant load is >60.
RECEPTION 101 111.5 SM
STORAGE
PARKS MERCHANDISE
PARKS OFFICE 102 10.3 SM
VERANDAH AREA 107 SM
FOLDING GLASS DOORS
NEW DOORS TO BE INVERTED IN LOCATION OF ORIGINAL
INTERPRETIVE AREA 109 88.8 SM
STORYTELLING
LARGE NEW GRAPHIC
FEATURE WALL
RAMP DOWN
RAMP 1:12
ENTRY STAIRS TO BE TO CODE
LECTURE HALL / THEATRE 105 85.3 SM
CORRIDOR 104 20.5 SM
STOR 100A 2.2 SM
STOR 103 2.2 SM
KITCHEN 106 7.3 SM
GENDER NEUTRAL WASHROOM 105 11.1 SM
FAMILY WASHROOM 107 9.2 SM
JC 108 1.4 SM
ON
UP
1 A112
1 A103 FLOOR PLAN OPTION 1 SCALE 1:100
Canada
Parks Canada
Asset & Environmental Management Architectural & Engineering Services
Parcs Canada
Gestion des biens et de l'environnement Services d'architecture et d'ingénierie
revisions description date
project RMNP WASAGAMING VC
RIDING MOUNTAIN NATIONAL PARK, MB
drawing GROUND FLOOR PLAN - OPTION 1
Designed By Conçu par
CONCEPT PLAN NOT FOR CONSTRUCTION
Project no. 17-063-RMNP
Drawing no. A103


Occupant Load
Table 3.1.17.1: 111.5 m2 / 0.4 per/m2 = 278 persons.
With only one Code Compliant egress = Max 60 persons.
Area < 200 m2 and travel distance to exit is < 25m from anywhere in the room so we are good with one egress and one exit in this area (101, 102). To Note: This is conditional that the building remains sprinklered throughout.
Only one (1) compliant egress door and exit is provided as the only one that swings in the direction of exit travel is the exit door on the South.
If the occupant load in reception hall is desired to be > 60:
3.3.1.11.2) Except as permitted by Article 3.3.1.12., 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 > 60 shall swing in the direction of travel to the exit. The doors need to swing in the direction of exit travel towards corridor 104, if the anticipated occupant load is >60.
A 0 hour fire separation should be installed in this location to separate the 2nd floor and the basement from the remainder of the building. This is shown on Floor Plan #1.
If the occupant load is desired to be > 60:
a. 3.3.1.11.2) Except as permitted by Article 3.3.1.12., 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 > 60 shall swing in the direction of travel to the exit. The doors need to swing in the direction of exit travel.
2. Also, and in accordance with Sentence 3.3.1.11.4), if a pair of doors is installed in a corridor that provides access to exit in both directions, the doors shall swing in opposite directions, with the door on the right hand side swinging in the direction of travel to the exit.
RECEPTION 101 111.5 SM
PARKS MERCHANDISE
STORAGE
PARKS OFFICE 102 10.3 SM
RAMP DOWN
VERANDAH AREA 104 SM
COCKTAIL HOOK AREA
FOOD TABLE
INTERPRETIVE AREA 103 SM
STORYTELLING
LARGE NEW GRAPHIC
INTERPRETIVE MODULES
DANCE HALL
RECEPTION HALL
ENTRY STAIRS TO BE TO CODE
CORRIDOR 104 20.8 SM
STOR 103A 2.2 SM
STOR 103 2.2 SM
KITCHEN 105 7.3 SM
GENDER NEUTRAL WASHROOM 106 11.1 SM
FAMILY WASHROOM 107 8.2 SM
JC 108 1.4 SM
DN
UP
1 / 3 FLOOR PLAN OPTION 2-
SCALE 1:100
Canada
Parks Canada
Asset & Environmental Management Architectural & Engineering Services
Parcs Canada
Gestion des biens et de l'environnement Services d'architecture et d'ingénierie
date
C drawing no. dessin no.
project projet
RMNP WASAGAMING VC
RIDING MOUNTAIN NATIONAL PARK, MB
drawing dessin
GROUND FLOOR PLAN - OPTION 2
Designed By Conçu par
Date (yyyy/mm/dd)
Drawn By Dessiné par
Date (yyyy/mm/dd)
Reviewed By Examiné par
Date (yyyy/mm/dd)
Approved By Approuvé par
Date (yyyy/mm/dd)
CONCEPT PLAN
NOT FOR CONSTRUCTION
Project no. No. du projet
17-063-RMNP
Drawing no. No. du dessin
A102



Occupant Load
Table 3.1.17.1: 111.5 m2 / 0.4 per/m2 = 278 persons.
With only one Code Compliant egress = Max 60 persons.
Area < 200 m2 and travel distance to exit is < 25m from anywhere in the room so we are good with one egress and one exit in this area (101, 102). To Note: This is conditional that the building remains sprinklered throughout.
Only one (1) compliant egress door and exit is provided as the only one that swings in the direction of exit travel is the exit door on the South. If the doors to 103 are locked this will only permit the occupants to exit through the South exit. Although this might be code compliant I would never recommend locking the D103. Put up a sign instead indicating "for staff only..."

NFCC 2.7.1.5.3) Nonfixed Seating
When nonfixed seats are provided at tables arranged in rows, the spacing between the nearest edges of tables in 2 successive rows shall be not less than
a) 1 400 mm where seating is arranged on both sides of tables (back to back), or
b) 1 000 mm where seating is on one side only.

The tables and chairs, as shown, prevent the evacuation of occupants. Please refer to the note 2.7.1.5.3) for proper spacing of nonfixed chairs and tables.

A 0 hour fire separation should be installed in this location to separate the 2nd floor and the basement from the remainder of the building. This is shown on Floor Plan #1.

If the occupant load in reception hall is desired to be > 60:
3.3.1.11.2) Except as permitted by Article 3.3.1.12., 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 > 60 or** for a high-hazard industrial occupancy shall swing in the direction of travel to the exit. The doors need to swing in the direction of exit travel towards corridor 104, if the anticipated occupant load is >60.

If the occupant load is desired to be > 60:
3.3.1.11.2) Except as permitted by Article 3.3.1.12., 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 > 60 or** for a high-hazard industrial occupancy shall swing in the direction of travel to the exit. The doors need to swing in the direction of exit travel.
3.3.1.11.4) If a pair of doors is installed in a corridor that provides access to exit in both directions, the doors shall swing in opposite directions, with the door on the right hand side swinging in the direction of travel to the exit.

1/4 FLOOR PLAN OPTION 3
SCALE 1:130

Canada
Parks Canada Parcs Canada

project
RMNP WASAGAMING VC
RIDING MOUNTAIN NATIONAL PARK, MB

Drawn By	Dessiné par
Date	(yyyy/mm/dd)
Reviewed By	Examiné par
Date	(yyyy/mm/dd)
Approved By	Approuvé par
Date	(yyyy/mm/dd)

CONCEPT PLAN
NOT FOR CONSTRUCTION

Project no. / No. du projet: 17-063-RMNP
Drawing no. / No. du dessin: A102

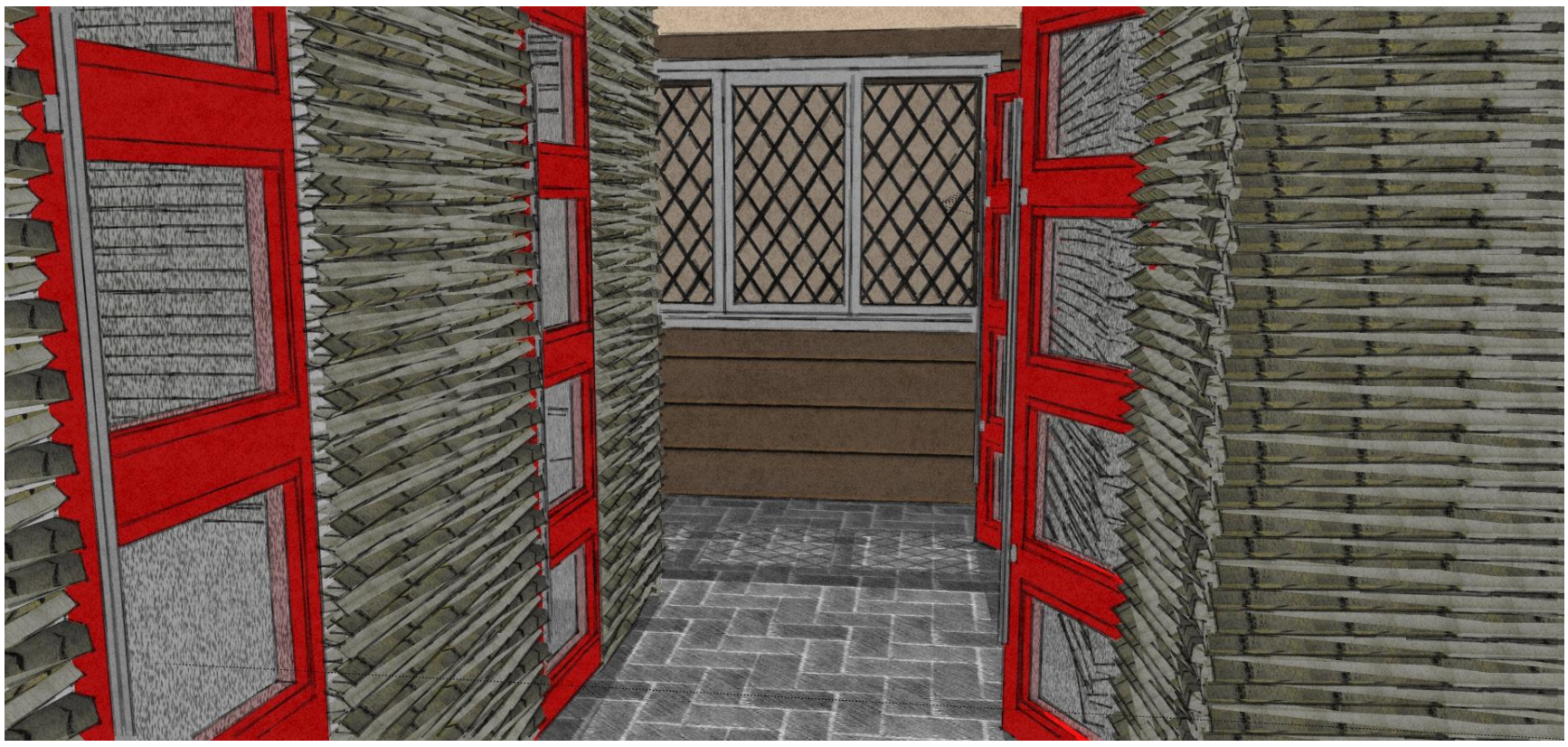
2018-05-29 1:35pm By: tonl Kleibrink

Appendix F – Images

Exterior View Rear Deck with overhead canopies-Option 1

Exterior View Rear Deck with overhead wooden pergola-Option 2

Exterior View Rear Deck with overhead canopy-Option 3



Gender Free Washroom View – wooden slat walls and frosted glazed doors

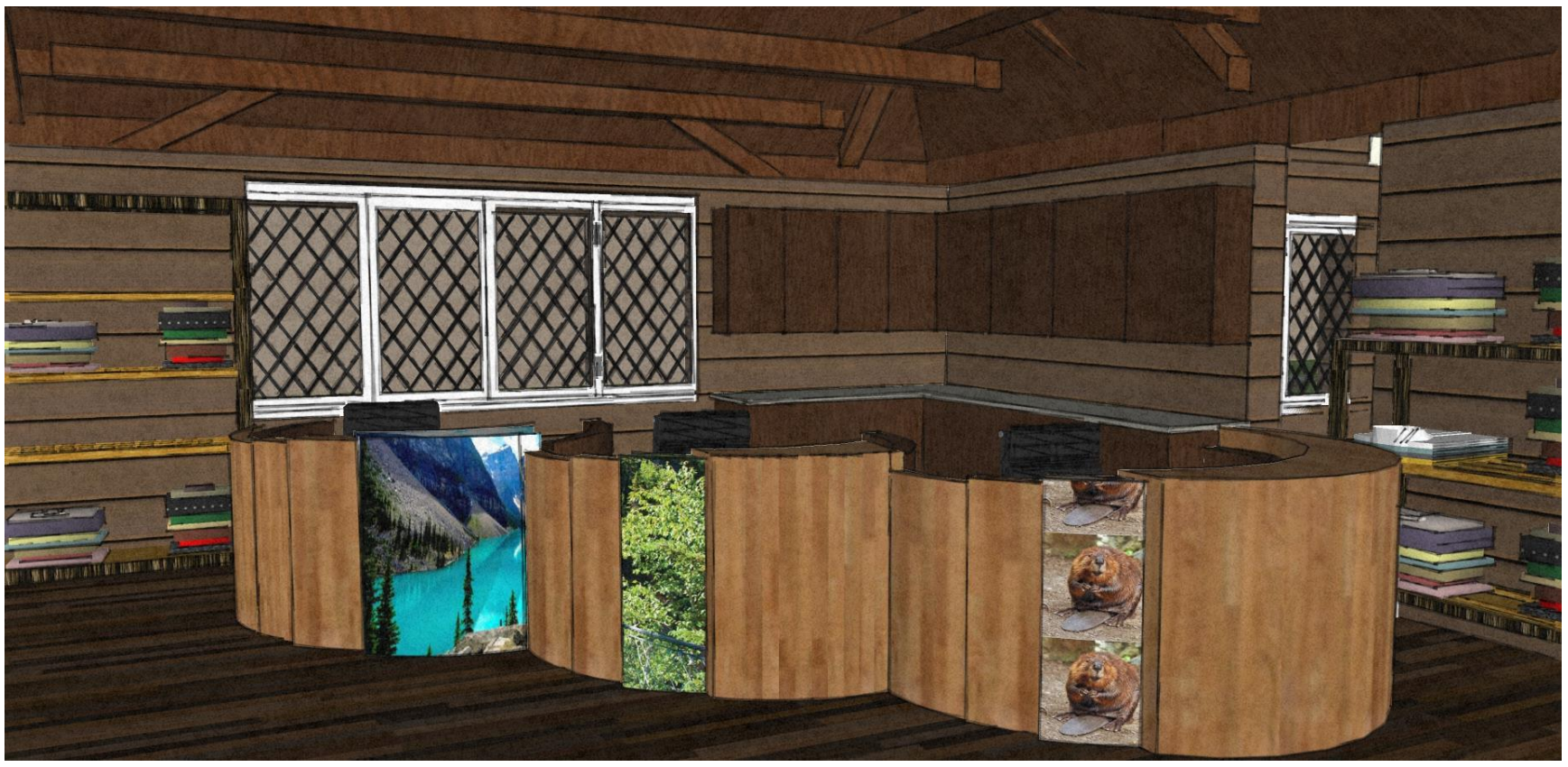
Kitchen View 1with enclosed chair storage at right adjacent fridge

Kitchen View 2 with open shelving over existing fireplace

Kitchen View 3 with long counter below existing window

Wedding Reception Seating Option

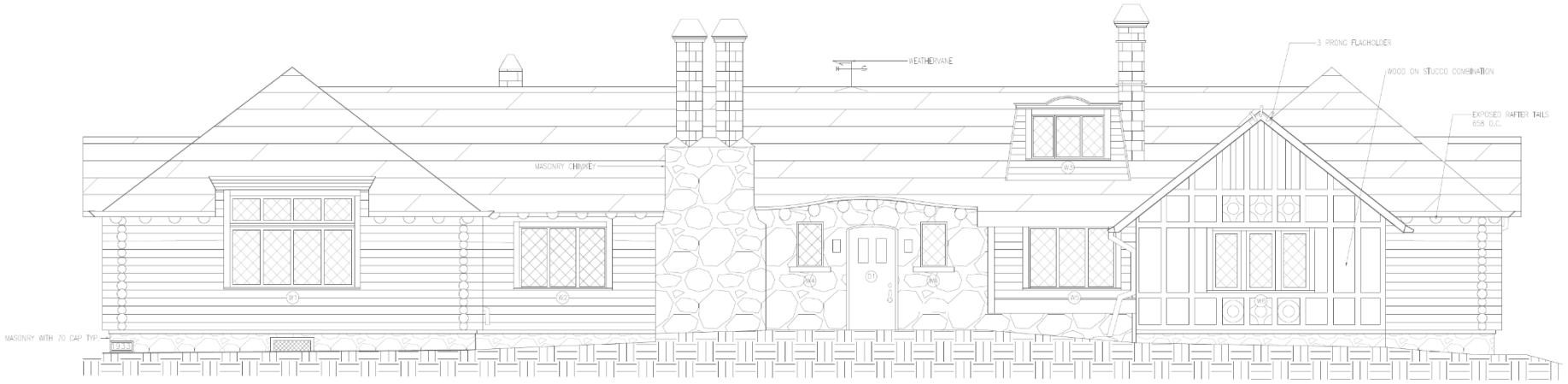
Washroom/Kitchen view from above with water fountain in gender neutral washroom and showing chair storage in kitchen



Reception Desk Option showing modules pushed together

https://www.worthingtondirect.com/chair-and-table-caddies/understage-chair-caddy.htm

Chair/ Table Storage Options



1.1 WEST SIDE ELEVATION
SCALE 1:60

1.2 EAST SIDE ELEVATION
SCALE 1:150

LEGEND:

SPRINKLER OUTLET (S)

BARRIER-FREE ENTRY BUTTON (B)

CIGARETTE BUTT BOX (E)

1	2018-08-23	AS-BUILT DRAWING 2018	ST	

Parks Canada Parcs Canada

RIDING MOUNTAIN NATIONAL PARK
VISITOR CENTER ELEVATIONS

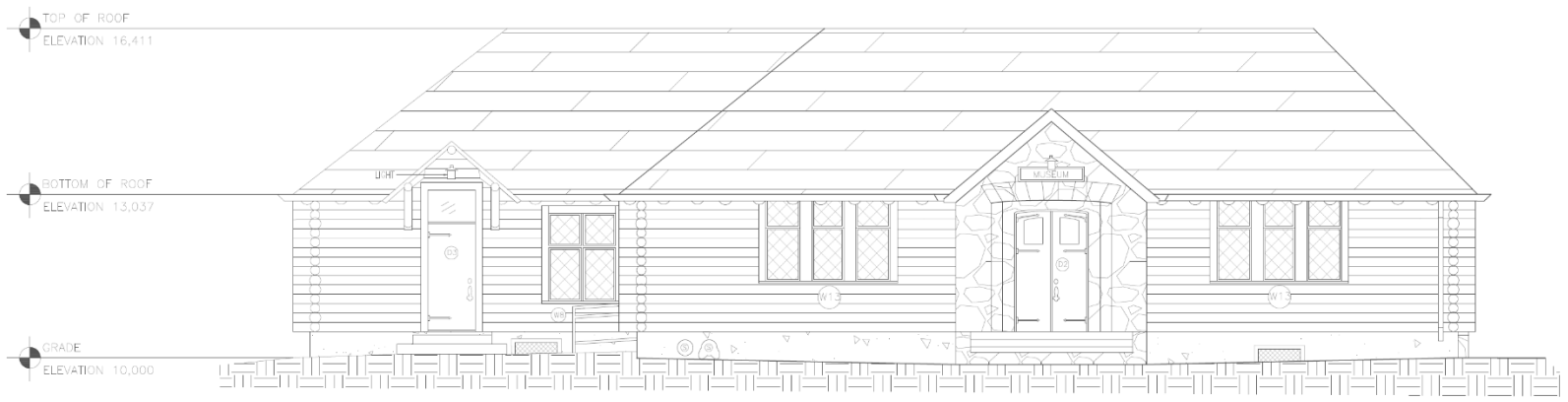
Drawing title / Titre du dessin

EAST AND WEST
ELEVATIONS

Sheet No. / N. de la feuille

1 OF 3

2.1 NORTH SIDE ELEVATION
SCALE 1:60



2.2 SOUTH SIDE ELEVATION
SCALE 1:60

LEGEND:

SPRINKLER OUTLET (S)

BARRIER-FREE ENTRY BUTTON (B)

CIGARETTE BUTT BOX (F)

1	2018-08-23	AS-BUILT DRAWING 2018	ST	

Parks Canada Parcs Canada

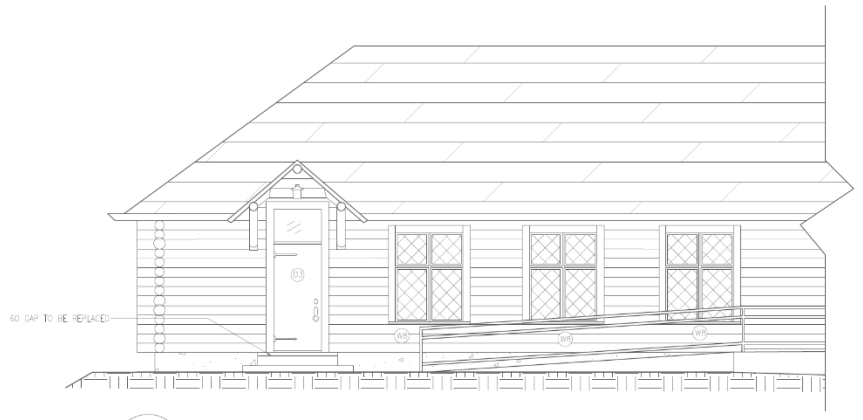
RIDING MOUNTAIN NATIONAL PARK
VISITOR CENTER ELEVATIONS

Drawing title / Titre du dessin

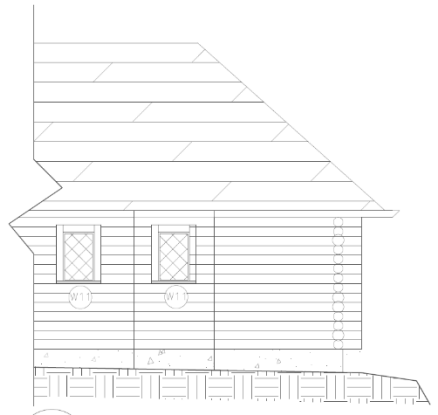
NORTH AND SOUTH
ELEVATIONS

Sheet No. /
N. de la feuille

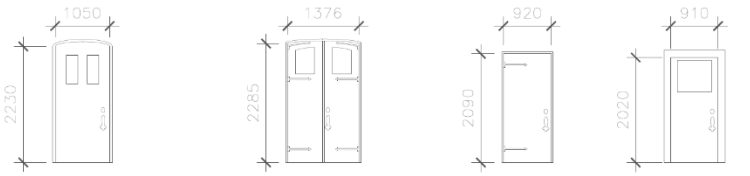
2 OF 3



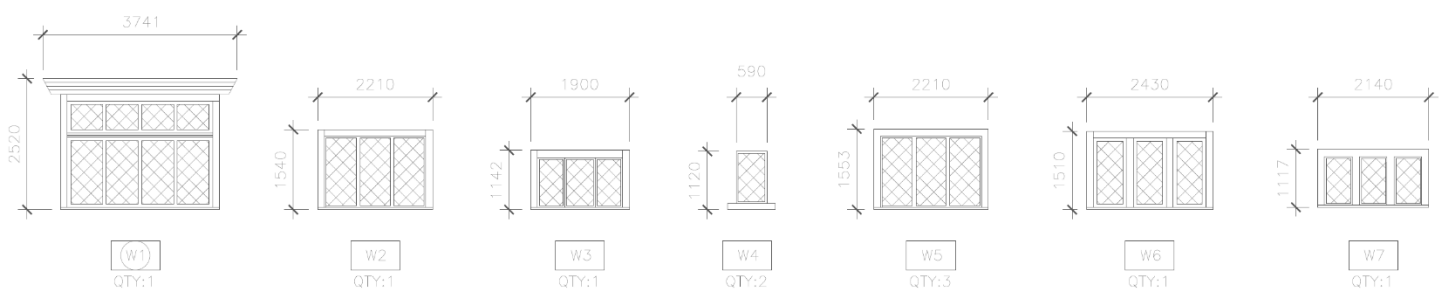
3.1 SOUTH SIDE PARTIAL ELEVATION
SCALE 1:60



3.2 NORTH SIDE PARTIAL ELEVATION
SCALE 1:60



3.3 DOOR SCHEDULE
SCALE 1:60



3.4 WINDOW SCHEDULE
SCALE 1:60

LEGEND:

SPRINKLER OUTLET (S)

BARRIER-FREE ENTRY BUTTON (B)

CIGARETTE BUTT BOX (E)

1	2018-08-23	AS-BUILT DRAWING 2018	ST	

Parks Canada Parcs Canada

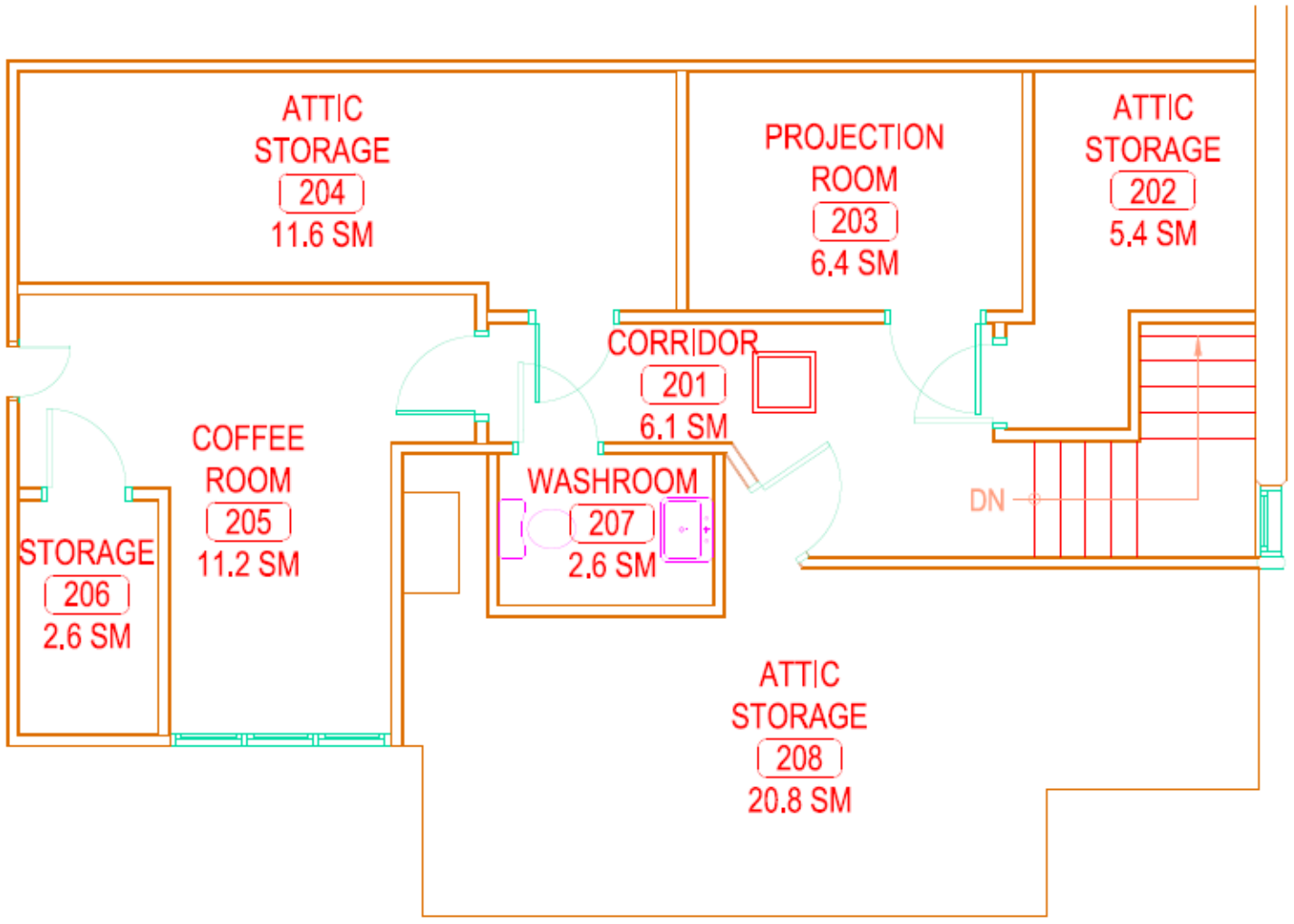
RIDING MOUNTAIN NATIONAL PARK
VISITOR CENTER ELEVATIONS

Drawing title / Titre du dessin

SCHEDULES AND PARTIAL ELEVATIONS

Sheet No. / N. de la feuille

3 OF 3



2ND FLOOR PLAN
SCALE 1:25

LEGEND

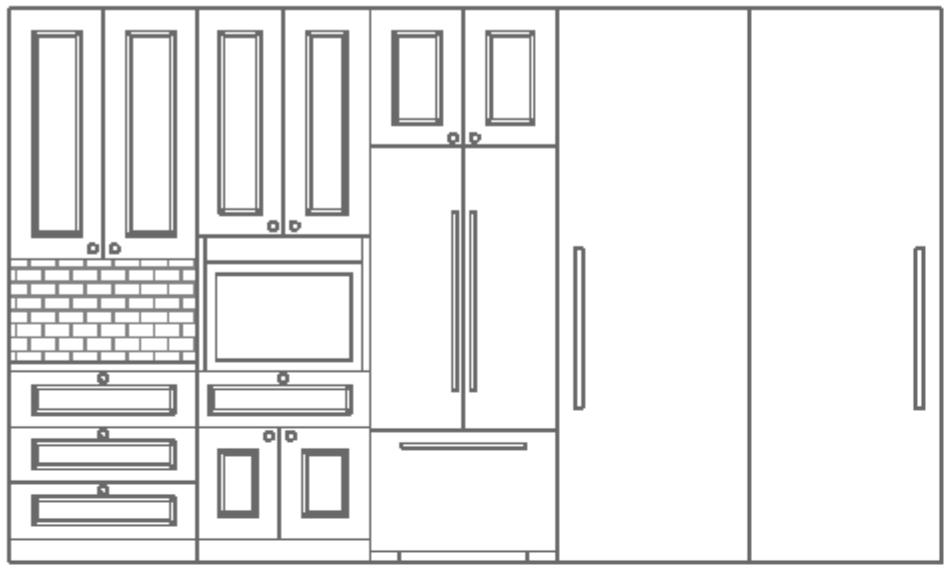
ST

Parks Canada Parcs Canada

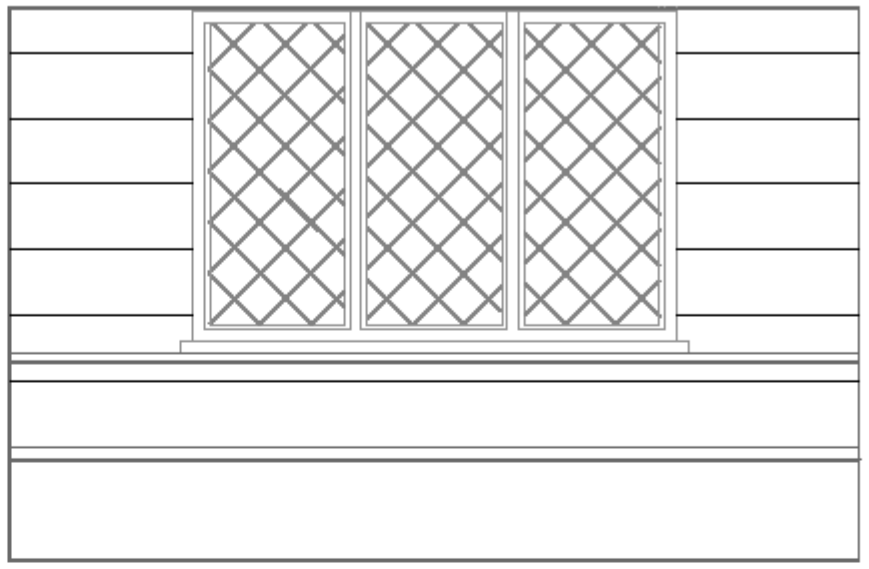
RIDING MOUNTAIN NATIONAL PARK
PROJECT 1279
VISITOR CENTER
REDEVELOPEMENT

VISITOR CENTER
2ND FLOOR PLAN

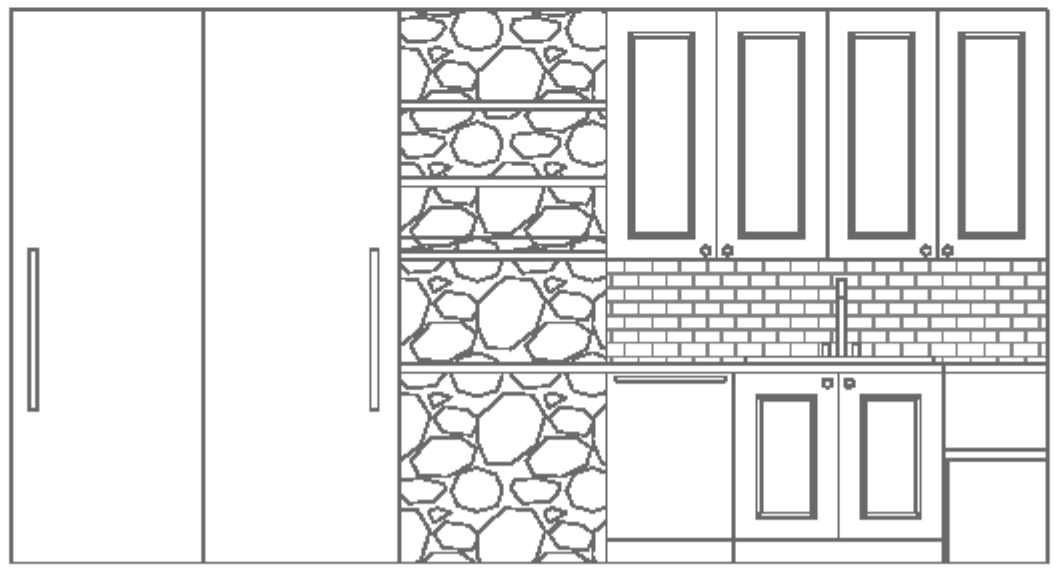
1 of 1



1/4 SOUTH KITCHEN WALL ELEVATION
SCALE 1:25



2/4 EAST KITCHEN WALL ELEVATION
SCALE 1:25



3/4 NORTH KITCHEN WALL ELEVATION
SCALE 1:25

Canada

Parks Canada
Asset & Environmental Management Architecture and Engineering Services

Parcs Canada
Gestion des biens et de l'environnement Services d'architecture et d'ingénierie

numéro	description	date

A: détail no., no. du détail
B: numéro dessin no., no dessin no.
C: dessin no., dessin no.

project / projet
RMNP WASAGAMING VC

RIDING MOUNTAIN NATIONAL PARK, MB

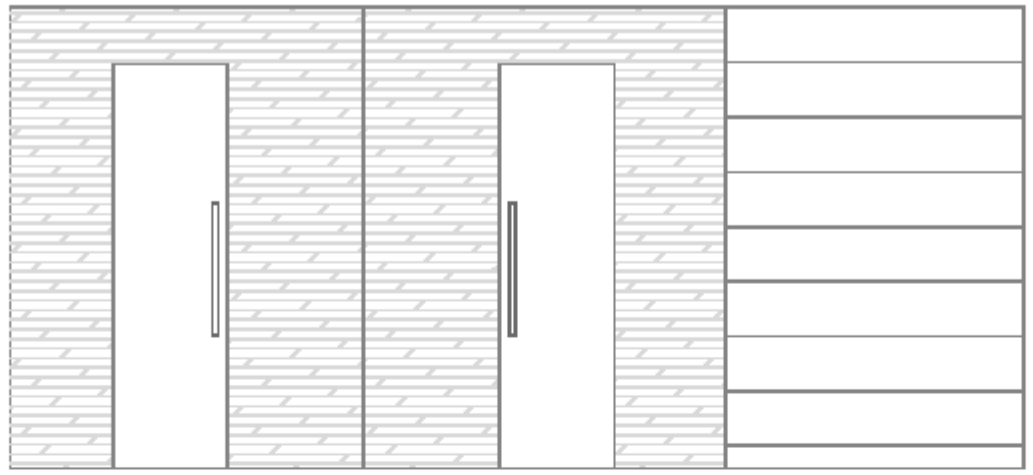
drawing / dessin
GROUND FLOOR PLAN - OPTION 5

Designed By	Design par
Date	(yyyy/mm/dd)
Drawn By	Dessiné par
Date	(yyyy/mm/dd)
Reviewed By	Examiné par
Date	(yyyy/mm/dd)
Approved By	Approuvé par
Date	(yyyy/mm/dd)

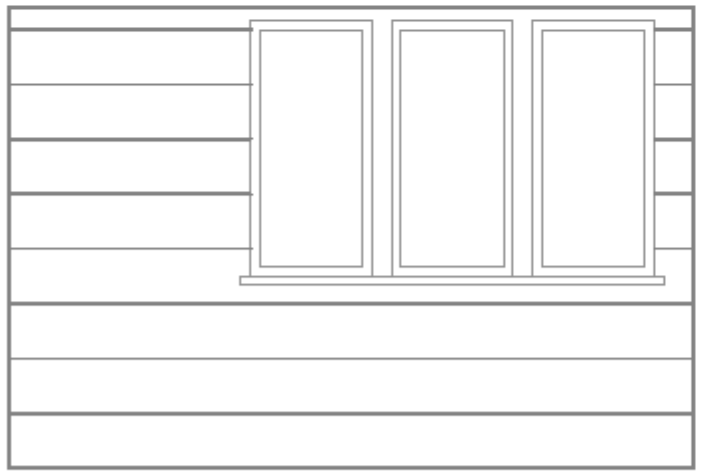
CONCEPT PLAN
NOT FOR CONSTRUCTION

Project no. / No. de projet
17-063-RMNP

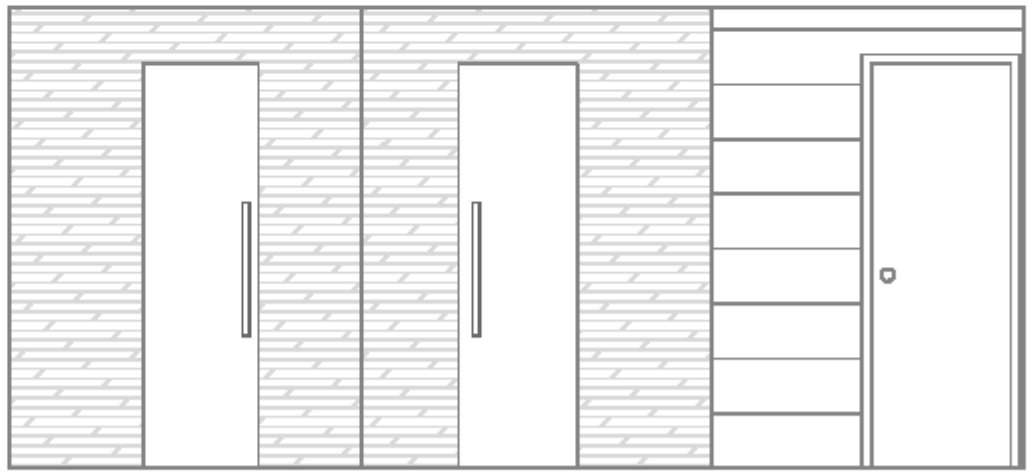
Drawing no. / No. du dessin
A104



1/5 SOUTH BATHROOM WALL ELEVATION
SCALE 1:20



2/5 EAST BATHROOM WALL ELEVATION
SCALE 1:20



3/5 NORTH BATHROOM WALL ELEVATION
SCALE 1:20

Canada

Parks Canada / Parcs Canada
Asset & Environmental Management Architecture and Engineering Services / Gestion des biens et de l'environnement Services d'architecture et d'ingénierie

numéro	description	date

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B: location drawing no. / no. dessin loc.
C: drawing no. / dessin no.

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drawing / dessin
GROUND FLOOR PLAN - OPTION 5

Designed By / Dessiné par	Design per / Dessin par
Date	(yyyy/mm/dd)
Drawn By / Dessiné par	Drawn per / Dessiné par
Date	(yyyy/mm/dd)
Reviewed By / Examiné par	Examined per / Examiné par
Date	(yyyy/mm/dd)
Approved By / Approuvé par	Approved per / Approuvé par
Date	(yyyy/mm/dd)

CONCEPT PLAN
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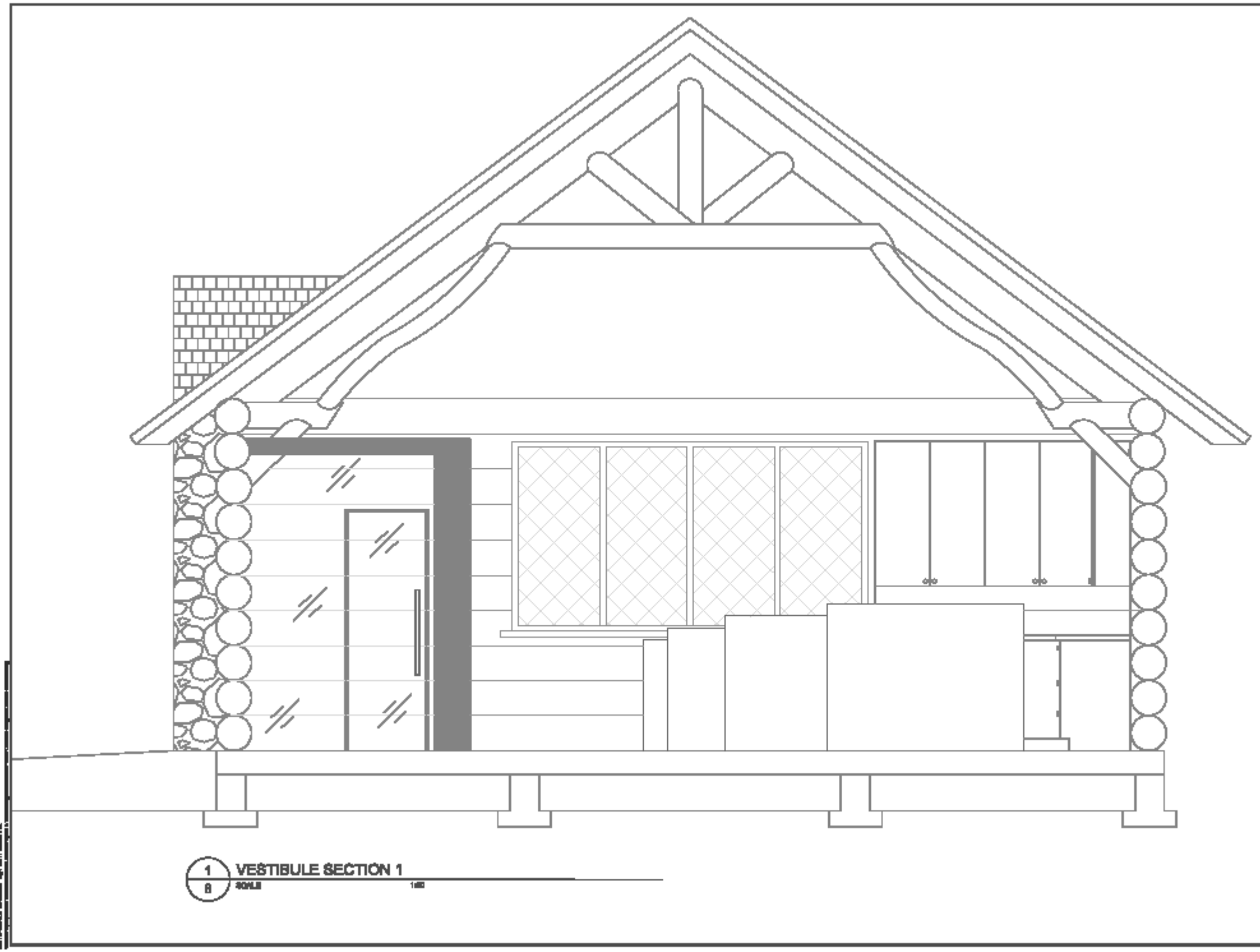
A105



1/8 VESTIBULE SECTION 1

SCALE 1:50

Canada

Parks Canada / Parcs Canada

Asset & Environmental Management Architecture and Engineering Services / Gestion des biens et de l'environnement Services d'architecture et d'ingénierie

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C: drawing no. / dessin no.

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GROUND FLOOR PLAN - OPTION 5

Designed By / Dessiné par	Design per / Dessin par
Date	(yyyy/mm/dd)
Drawn By / Dessiné par	Drawn per / Dessiné par
Date	(yyyy/mm/dd)
Reviewed By / Examiné par	Reviewed per / Examiné par
Date	(yyyy/mm/dd)
Approved By / Approuvé par	Approved per / Approuvé par
Date	(yyyy/mm/dd)

CONCEPT PLAN
NOT FOR CONSTRUCTION

Project no. / No. de projet

17-063-RMNP

Drawing no. / No. du dessin

A106