THE CITY OF DAWSON

COMMITTEE OF THE WHOLE MEETING #CW24-05
DATE: Tuesday June 4, 2024
TIME: 7:00 PM
LOCATION: City of Dawson Council Chambers

Join Zoom Meeting
https://us02web.zoom.us/j/88028339830?pwd=kmpaxuxuLabLP6CLLJ0YsRuclziSvE.1
Meeting ID: **880 2833 9830**
Passcode: **068000**

1. **CALL TO ORDER**

2. **ACCEPTANCE OF ADDENDUM & ADOPTION OF AGENDA**
   1. Committee of the Whole Meeting CW24-05

3. **DELEGATIONS & GUESTS**
   1. Guest Presentation: Rec Board RE: Dawson City Recreation Centre Project-Initial Considerations

4. **MINUTES**
   1. Committee of the Whole Meeting Minutes CW24-04 of May 7, 2024

   BUSINESS ARISING FROM MINUTES

5. **SPECIAL MEETING, COMMITTEE, AND DEPARTMENTAL REPORTS**
   1. Canadian Bank of Commerce Project Restoration Direction
   2. New Recreation Centre Update
   3. Interim Landfill Agreement 2024 Renewal

6. **BYLAWS & POLICIES**
   1. Council Remuneration Bylaw Review

7. **CORRESPONDENCE**
   1. Recreation Board Minutes #24-01-April 2, 2024
   2. Faro Census Report
   3. Heritage Advisory Committee Minutes #24-05 and #24-06
   4. Kim Melton RE: Waste Diversion & Management
   5. RCMP RE: 2024-2025 Annual Policing Priorities
   6. RCMP Monthly Policing Report- January, February & March
   7. Kim Biernaskie RE: Concerns Regarding Agenda Item Targeting Mayor's Septic System
   8. Prospector Road Residents RE: Subdivision Application for Lots 1073-1, 1073-2, 1073-3, & 1073-4, Quad 116B/03
   9. Stephen Johnson RE: Kendrick Property and Licenses of Occupation ("LOO")

   BUSINESS ARISING FROM CORRESPONDENCE

8. **PUBLIC QUESTIONS**

9. **ADJOURNMENT**

City of Dawson Rec Centre design project

Summary of the ‘hopes and concerns’ feedback from the workshop on May 14

The new building needs to be as much a Community Centre as a Recreation Centre, with flexible and multi-use amenities for everyone from 0 to 110 years – kids, teenagers, adults, Elders & seniors.

It’s the first building you’ll see as you enter Dawson, so it shouldn’t look ultra-modern or grey and institutional. It sits in Tr'ondëk Hwëch'in Traditional Territory, so needs to reflect that, e.g. by using wood inside and out.

The foundations need to be good and local knowledge can help avoid mistakes – many people here mine, work in construction and know the land.

Its design should be simple and robust enough so it ‘just works’ with affordable O&M costs, so the City can manage it easily. Any technologies used need to be easy to operate and able to be fixed locally.

The centre should reflect the reality of the needs of a community of 2,000 people – the right size but able to grow as the community grows. Its dry, multi-use spaces need to be big enough for volleyball and basketball, full-size so intra-mural tournaments can be held. Facilities shouldn’t be compartmentalized.

The centre should have places to gather informally (e.g. for Elders to play crib), as well as to show movies, hold events / meetings with AV facilities as well as a commercial kitchen.

It needs to be accessible for those with mobility issues to use it and come to watch others.

There should be lots of storage for all the equipment and kit needed for different sports and activities – some of this storage could be outside the building to save space.

It needs to serve as many needs as it can in every season and especially for the shoulder seasons that are hard to program for kids.

Can we even build it underbudget (e.g. for $55M) and have extra contingency?

Most importantly, we have to actually build it and for it to have a ‘wow factor’, it needs to be a fun place to be – for local people to be excited about it, so it’s not just seen as replacing what we’ve got.

= end of document =

Dawson City Recreation Centre Project – Initial Considerations

Dawson City Recreation Board and Advisors
June 4, 2024

Agenda

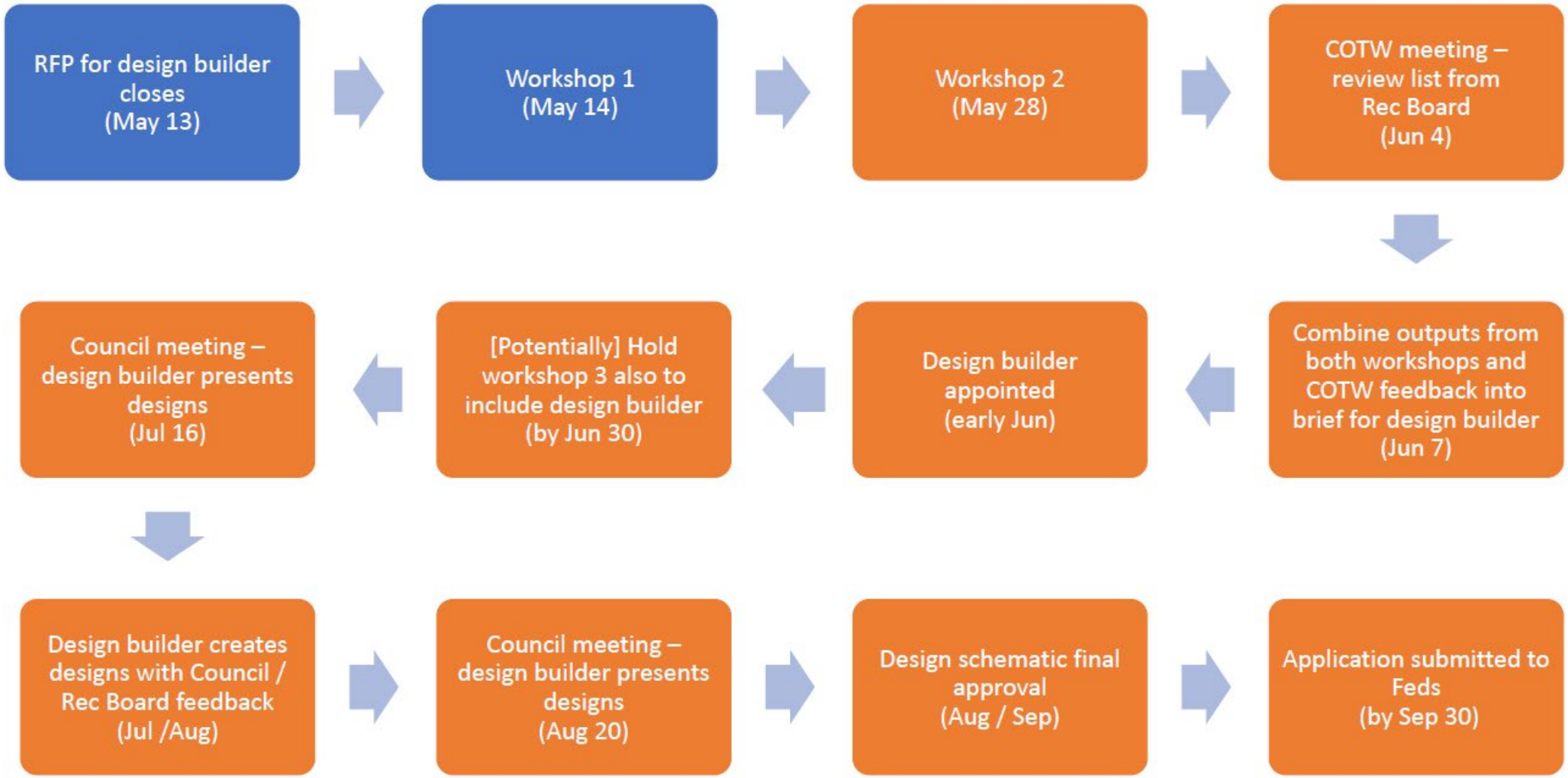
- Introduction
- Objectives
- Process

Who are we and why are we involved?

Objectives

- Seeking and considering informed perspectives from local knowledge holders and experts
- Working collaboratively and cohesively with project managers, City of Dawson administrators and City Council
- Developing recommendations that reflect the needs of the community in a conscientious and financially responsible manner

Timeline


RFP for design builder closes (May 13)
Workshop 1 (May 14)
Workshop 2 (May 28)
COTW meeting – review list from Rec Board (Jun 4)
Combine outputs from both workshops and COTW feedback into brief for design builder (Jun 7)
Design builder appointed (early Jun)
[Potentially] Hold workshop 3 also to include design builder (by Jun 30)
Council meeting – design builder presents designs (Jul 16)
Design builder creates designs with Council / Rec Board feedback (Jul /Aug)
Council meeting – design builder presents designs (Aug 20)
Design schematic final approval (Aug / Sep)
Application submitted to Feds (by Sep 30)

Scope of Considerations

Understood project conditions:

- The facility will be located at the base of the dome
- Selected amenities will require supporting systems

Mähsį cho
Thank you
Merci

MINUTES OF COMMITTEE OF THE WHOLE MEETING CW24-04 of the Council of the City of Dawson held on Tuesday, May 7, 2024 at 7:00 p.m. via City of Dawson Council Chambers

PRESENT:
Mayor Kendrick
Councillor Lister
Councillor Patrik Pikálek
Councillor Somerville
Councillor Spriggs

REGRETS:

ALSO PRESENT:
CAO: David Henderson
MC: Elizabeth Grenon
PDM: Farzad Zarringhalam
PRJM: Owen Kemp-Griffin
A/CFO: Kim McMynn

1 CALL TO ORDER

The Chair, Councillor Somerville, called Committee of the Whole meeting CW24-04 to order at 7:01 p.m..

Disclosure of pecuniary interest by Mayor William Kendrick (see attachment A included with these minutes).

2 ADOPTION OF AGENDA

CW24-04-01
Moved By: Councillor Spriggs
Seconded By: Councillor Lister

That the agenda for Committee of the Whole meeting CW24-04 of May 7, 2024 be adopted as presented.

CARRIED UNANIMOUSLY

3 PUBLIC HEARINGS

3.1 Official Community Plan and Zoning Bylaw Amendments-Dredge Pond II

The Chair called for submissions.

Jim Taggart had a question and concern on where public can find and access information regarding public hearings.

The Chair called for submissions a second time.

The Chair called for submissions a third and final time, and hearing none declared the Public Hearing closed.

3.2 Zoning Bylaw Amendments-Klondike East Bench

The Chair called for submissions.

The Chair called for submissions a second time.

The Chair called for submissions a third and final time, and hearing none declared the Public Hearing closed.

3.3 Zoning Bylaw Amendments-Klondike River Bench

The Chair called for submissions.

Tyler Nichol had questions regarding how it would affect his property.

Simon Williams had questions/comments on if this would affect the rec centre location.

Kim Biernaskie had questions/comments on rec centre location and flood mapping.

The Chair called for submissions a second time.

The Chair called for submissions a third and final time, and hearing none declared the Public Hearing closed.

4 MINUTES

4.1 Committee of the Whole Meeting Minutes CW24-03 of April 2, 2024

CW24-04-02
Moved By: Councillor Pikálek
Seconded By: Councillor Lister

That the minutes of Committee of the Whole Meeting CW24-03 of April 2, 2024 be approved as presented.

CARRIED UNANIMOUSLY

5 ACCOUNTS PAYABLES & FINANCIAL REPORTS

5.1 Fourth Quarter Variance Report

CW24-04-03
Moved By: Councillor Spriggs
Seconded By: Councillor Somerville

That Committee of the Whole receive the Fourth Quarter Variance Report, for informational purposes.

CARRIED UNANIMOUSLY

5.2 Bad Debts

CW24-04-04
Moved By: Councillor Somerville
Seconded By: Councillor Spriggs

That Committee of the Whole forward to Council authorizing Administration to the write-off the prepared listings of accounts (creating a bad debt expense in 2023) of old outstanding cable accounts.

CARRIED UNANIMOUSLY

6 SPECIAL MEETING, COMMITTEE, & DEPARTMENTAL REPORTS

6.1 Canadian Bank of Commerce Project Restoration

CW24-04-05
Moved By: Councillor Somerville
Seconded By: Councillor Spriggs

That Committee of the Whole receives this project update for the CBC project Restoration and recommends to Council to proceed with Phase 2 of the project as described herein, with budgeted CCBF Funding of $1,120,000 as approved in the 2024 Capital Budget.

CARRIED 4-1

6.2 Dawson City Music Festival RE: Bylaw #07-03, Part II 11(1) Incessant Noise-Exemption Request

CW24-04-06
Moved By: Councillor Somerville
Seconded By: Mayor Kendrick

That Committee of the Whole forward the Dawson City Music Festival (DCMF) Property Maintenance and Nuisance Abatement Bylaw (#07-03), Part II 11(1) "Incessant Noise" Exemption Request to Council for approval and direct administration to work with DCMF leadership to draft a Service Agreement for the 2025 festival and present it to Council by March 31, 2025.

CARRIED UNANIMOUSLY

6.3 Land Development Update-City Owned Lots

CW24-04-07
Moved By: Councillor Somerville
Seconded By: Mayor Kendrick

That Committee of the Whole accept the Land Development Update-City Owned Lots report, for informational purposes.

CARRIED UNANIMOUSLY

6.4 Subdivision Application #24-016

CW24-04-08
Moved By: Mayor Kendrick
Seconded By: Councillor Spriggs

That Committee of the Whole accept Subdivision Application #24-016 report, for informational purposes.

CARRIED UNANIMOUSLY

6.5 Heritage Management Plan Review

CW24-04-09
Moved By: Councillor Somerville
Seconded By: Mayor Kendrick

That Committee of the Whole accept the Heritage Management Plan Review report, for informational purposes.

CARRIED UNANIMOUSLY

6.6 CAO Update on Activities

CW24-04-10
Moved By: Councillor Spriggs
Seconded By: Councillor Pikálek

That Council receive the CAO Update on Activities report in Committee of the Whole, for information purposes.

CARRIED UNANIMOUSLY

6.7 CAO Attendance to 2024 CAMA Conference

CW24-04-11
Moved By: Councillor Somerville
Seconded By: Councillor Pikálek

That Committee of the Whole recommend Council approve the CAOs Travel to the 2024 CAMA (Canadian Association of Municipal Administrators) Conference.

CARRIED UNANIMOUSLY

Mayor Kendrick left the meeting due to his conflict of interest.

6.8 Kendrick Property-Original Motion
Moved By: Councillor Somerville
Seconded By: Councillor Lister

That Council, through Committee of the Whole, endorse the requirements outlined in the February 19th letter from the City of Dawson to Mr. William Kendrick, with the understanding that the deadline for compliance will be changed from March 31, 2024 to May 31st, 2024.

6.8.1 Kendrick Property-Amendment

CW24-04-12
Moved By: Councillor Somerville
Seconded By: Councillor Pikálek

That the resolution be amended to remove the phrase "Council through".

CARRIED 4-0

6.8.2 Extend Meeting

CW24-04-13
Moved By: Councillor Spriggs
Seconded By: Councillor Pikálek

That Committee of the Whole Meeting CW24-04 be extended not to exceed one hour. CARRIED 4-0

CW24-04-14	6.8.3	**Recess** **Moved By:** Councillor Spriggs **Seconded By:** Councillor Pikálek That Committee of the Whole take a three-minute recess. CARRIED 4-0
CW24-04-15	6.8.4	**Kendrick Property-Original Motion With Amendment** **Moved By:** Councillor Somerville **Seconded By:** Councillor Lister That Committee of the Whole, endorse the requirements outlined in the February 19th letter from the City of Dawson to Mr. William Kendrick, with the understanding that the deadline for compliance will be changed from March 31, 2024 to May 31, 2024. CARRIED 4-0
		Mayor Kendrick returned to the meeting.
CW24-04-16	6.9	**Motion from Member of Council** **Moved By:** Mayor Kendrick **Seconded By:** Councillor Somerville That the motion be postponed until the next Council meeting. CARRIED 4-1
	7	**BYLAWS & POLICIES**
CW24-04-17	7.1	**2024 Municipal Election Bylaw (2024-09)** **Moved By:** Mayor Kendrick **Seconded By:** Councillor Somerville That Committee of the Whole review the draft 2024 Municipal Election Bylaw (2024-09) and forward to Council for first reading. CARRIED UNANIMOUSLY
CW24-04-18	7.2	**Council Remuneration Bylaw Review** **Moved By:** Mayor Kendrick **Seconded By:** Councillor Somerville That the review of Bylaw #2021-10 be postponed to the next Committee of the Whole meeting. CARRIED UNANIMOUSLY
	8	**CORRESPONDENCE**

8.1 Correspondence-Original Motion
Moved By: Mayor Kendrick
Seconded By: Councillor Somerville

That Committee of the Whole acknowledge receipt of the following correspondence:
1. Moose Hide Campaign Development Society RE: Request for Proclamation- Moose Hide Campaign Day May 16th
2. Recreation Board Minutes #24-01
3. Faro Census Report
4. Heritage Advisory Committee Minutes #24-05 and #24-06
5. Peter Menzies RE: Cable TV
6. Kim Melton RE: Waste Diversion & Management
7. RCMP RE: 2024-2025 Annual Policing Priorities
8. RCMP Monthly Policing Report- January, February & March
9. Kim Biernaskie RE: Concerns Regarding Agenda Item Targeting Mayor's Septic System ,for informational purposes.

8.1.1 Correspondence-Amendment

CW24-04-19
Moved By: Mayor Kendrick
Seconded By: Councillor Somerville

That items 2 to 9 of correspondence be postponed until the next Council meeting.

CARRIED UNANIMOUSLY

8.1.2 Correspondence-Original Motion With Amendment

CW24-04-20
Moved By: Mayor Kendrick
Seconded By: Councillor Somerville

That Committee of the Whole acknowledge receipt of the following correspondence:
1. Moose Hide Campaign Development Society RE: Request for Proclamation- Moose Hide Campaign Day May 16th, for informational purposes.

CARRIED UNANIMOUSLY

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9 PUBLIC QUESTIONS

Diana Andrew had questions regarding the arena concession, variance report, and Downtown Revitalization Fund spending.

Kim Biernaskie had a question regarding timing of getting council meeting packages on the website.

Kim McMynn asked when the current meeting package was added to the website.

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10 ADJOURNMENT

No adjournment was made because the meeting automatically adjourned at 11:00PM.

THE MINUTES OF COMMITTEE OF THE WHOLE MEETING CW24-04 WERE APPROVED BY COMMITTEE OF THE WHOLE RESOLUTION #CW24-05-XX AT COMMITTEE OF THE WHOLE MEETING CW24-05 OF JUNE 4, 2024.

_____ _____

Alexander Somerville, Chair David Henderson, CAO

City of Dawson
Report to Council

Agenda Item	Canadian Bank of Commerce Project Restoration
Prepared By	Asset & Project Manager
Meeting Date	May 21, 2024
References (Bylaws, Policy, Leg.)	
Attachments	CBC NHS Restoration phase 2 drawings Letter from Architect team

X	Council Decision
X	Council Direction
X	Council Information
	Closed Meeting

Recommendation

That Council direct administration to proceed with the proposed restoration plan as described in the report and attached drawings.

Executive Summary

The City of Dawson has been engaging with consultants with the design of the second restoration phase of the Canadian Bank of Commerce National Historic Site. The tender package is currently at the 80% design stage.

Phase 2 of the project will consist of the following restoration aspects:

- Interior renovation & structural timber repairs of: lower main floor, upper floor, and attic levels
- Enhance existing and new structural wood wall framing for the exterior wall and attic.
- Install insulation and vapour barrier to external walls.
- Preparation and placement of new concrete slab at the basement level, which is to incorporate a lift pit.
- Structural framing of elevator shaft from basement to roof
- Structural improvements to roof trusses and the “hanging” floor system.

Background

On December 5th, 2023 – Council directed administration to pursue phase 2 of the Canadian Bank of Commerce Restoration with a proposed budget of $1,120,000 from the CCBF fund.

Some items have been removed from the proposed project in December 2023 including Lead abatement on exterior cladding, exterior cladding heritage restoration and painting. These items were removed from the scope for phase two due to anticipated costs.

Discussion / Analysis

In the previous Committee of the Whole meeting, Council inquired the reasons for the large amount of internal wall separations in this next restoration phase while no end use is envisioned. A question was raised by a member of Council as to the possibility of focusing work on the exterior restoration prior to committing to an interior washroom plan.

The consultant team has been following a restoration plan that may be considered typical for historical restoration projects. The interior washrooms plan has been carefully placed as to leave room for a fully restored interior ceiling on the ground floor while complying with the building codes to allow the proposed building occupancies– the interior building layout has also been used in the structural stabilization of the buildings upper floor. The restoration plan may be changed at this stage and focus on the exterior restoration instead of the upper floor stabilization, insulation and vapour barrier. Another option proposed was to reduce the planned scope of work for this phase and remove the interior wall separations, this option is also viable at this stage as to leave the interior “shell” empty for future planning.

The lead paint abatement was removed from the original scope due to the high estimated price of approximately $350,000. This is now under review and additional methods of abatement are being pursued to reduce this cost.

The restoration of the exterior cladding was removed from the original scope because of the abatement scope removal.

The following items are now being included in the scope of work: Complete repair of the concrete foundation with the elevator pit, complete framing of the elevator shaft, complete structural compliance of the whole building, complete framing of all interior walls.

Without the knowledge of the end use of the building, certain design elements were decided related to occupancy assembly and structural code requirements. The upper floor is restricted to an occupancy of 50 people including the following potential end uses: classrooms/courtrooms, lecture hall (with fixed seats) etc. The main floor will have an occupancy of 100 people including the following potential end uses: Lecture halls, museums, office area, restaurant, community hall, bank etc.

Attached to the report are the 80% drawing sets for phase 2 of the restoration.

A construction management contract (CCDC 5B) will be utilized for this restoration phase. The key roles of the construction manager are as follows.

Scope of Services: The construction manager provides both advisory and management services during the pre-construction phase, and also performs the required construction work during the construction phase.

Compensation: The construction manager is paid a fee for the advisory services during the pre-construction phase and is also compensated for the construction work performed during the construction phase.

Risk Allocation: The risk is more evenly distributed between the owner and the construction manager, as the construction manager is responsible for the construction work.

Subcontractor Selection: The construction manager is responsible for selecting and managing the subcontractors.

Project Delivery: The project can be delivered using a variety of approaches, including design-build, integrated project delivery, or other collaborative models.

In summary, the CCDC 5B contract is a more integrated approach where the construction manager takes on a greater role in both the advisory and construction phases ensuring the project is on budget and delivered.

The other major works left prior to building occupancy are as follows:
- Installation of electrical service
- Installation of water service
- Exterior restoration including: paint abatement and cladding restoration
- Installation of sprinkler system
- Additional interior wall framing
- Restoration of interior ceiling
- Installation of mechanical equipment (including elevator)

Fiscal Impact

The funds for the second phase of the Canadian Bank of Commerce National historic site will be sourced from the CCBF as approved by Council during the 2024 budget process totalling $1,120,000.

Alternatives Considered

- Bid Build contract (CCDC2): This construction approach puts the majority of the risk on the owner and the associated change order costs.
- Restoration of the exterior elements: paint abatement, exterior cladding restoration and exterior painting.

Next Steps

Release of tender documents to procure a construction manager.

Approved by	Name	Position	Date
	David Henderson	CAO	17-May-2024

May 15, 2024 DRAFT (FINAL)

Mayor and Council,

City of Dawson,

Via email,

RE: RESTORATION, CANADIAN BANK OF COMMERCE, DAWSON CITY

We, members of the Architectural team, understand that the time frame and ultimate completion of the building are under discussion and potential review by City Council. As the City owns the bank building, Council's input, as major funders of the project, is welcome and desirable.

The history and current status of the building are well known. Briefly, the bank, constructed ca 1900, served the needs of the City for decades from its prime location on the river front. This location inevitably resulted in seasonal flooding, and the mere fact that it survived is remarkable. It was declared a National Historic Site, eventually ceasing operations in the 1970's. Sold to a private individual, the building was gutted and installed on a preserved wood foundation at the height of its original relation to grade. A restoration plan was commissioned from Keay and Associates Architecture in 2013, and measured drawings were prepared by Technical Arts and Services in 2019.

In 2021 Keay Architecture was retained to develop a code review and restoration plan options that would respect the heritage significance of the building while encouraging its adaptive reuse, and the final version of this was accepted by Council in 2022. Direction from Council stipulated that both floors be accessible, and the building made suitable for year round use. Subsequently, Chris Gower, Architect was retained to commence upgrading and repair of the wood foundations and related work, as completed in 2023.

During this time discussions continued regarding phasing of future work, including:

i. structural review, and upgrading as required
ii. thermal upgrading, insulation and moisture control
iii. exterior preparation and refinishing
iv. inventory, reproduction, installation and painting of missing exterior metal
v. reproduction and installation of windows and exterior doors
vi. internal building services: mechanical, electrical, plumbing, sprinkler system, elevator
vii. external building services: electrical service, sewer and water connections
viii. inventory, reproduction, and installation of main floor metal ceiling
ix. interior finishing: wall and floor finishes, painting, wood finishes,

The program chosen was linear in its approach: completion of structural deficiencies and building systems, and then proceeding to finishes. This approach approximates the normal construction process, moving from coarser building elements to finer, more detailed work.

Currently the program for 2024 includes the structural upgrading, thermal upgrading, and funds set aside for external electrical equipment and installation, for an estimated cost of $1.1M. Any work related to the exterior, or for building services, has been confirmed to be deferred until a later phase.

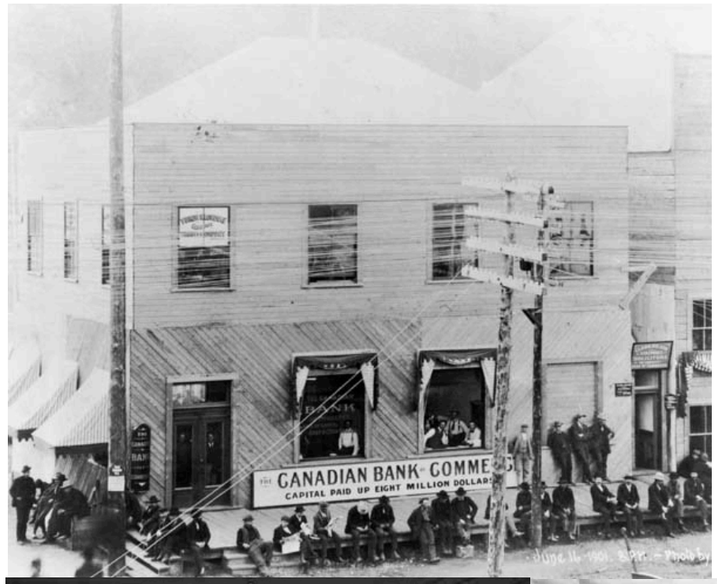
While this approach is logical and has clarity of sequence, it is not essential to proceed in this way. Other phases, for example preparation and painting of exterior surfaces, could be given priority in the schedule. While this would result in some areas requiring further work to allow the installation of new metal elements, it would indicate that work is proceeding on the building, and would give the project a higher visual profile in the community.

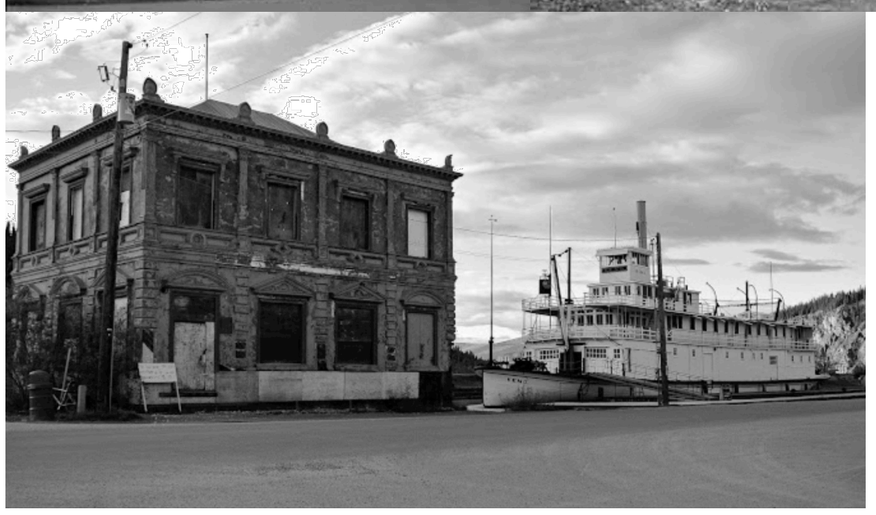
It has been suggested that the bank be completed as a shell, which would then be leased out for completion by a private party. Normally in such arrangements the structure would have to be Code compliant, with all remedial work completed. A well, much of the interior servicing would of necessity be in place, including mechanical systems, base electrical, sprinkler and fire alarm system, and the elevator. Work that a lessee would expect to do would be interior finishes, lighting, plumbing, and so on. Given the nature of the building we think the major interior restoration element, the coffered metal ceiling, would be installed by the City, and that there would be a clear program regarding what would be acceptable for finish design and materials.

We all want this project to be successful, the Bank of Commerce is a significant building in a prime location, unique in its structural system and the extensive use of metal cladding. While a use has not been determined, its location and visual impact will ensure consideration of public or private use, made more likely by a completed restoration project.

Yours truly,

Chris Gower





DRAWING INDEXES:

ARCHITECTURAL
May 08 80% review
Chris Gower, Architect

A 00 Cover Sheet
A 01 Site Plan, Project Notes
A 02 Existing, Demo Plans
A 03 Basement Floor Plan
A 04 Main Floor Plan
A 05 Upper Floor Plan
A 06 Attic Plan, Roof Over
A 07 E + W Elevations
A 08 N + S Elevations
A 09 Building Cross Sections 1
A 10 Building Cross Sections 2
A 11 Wall Section Details 1
A 12 Wall Section Details 2

BUILDING ENVELOPE
April 30 80% review
RDH Building Science

BE-3.01 Wall Details
BE-5.01 Window Details

MECHANICAL
Mechanical in Phase 3, NIC

STRUCTURAL / CIVIL
May 04 80% review
Richard Annett
P.Eng. C.Eng MIStructE MICE
Associated Engineering (B.C.) Ltd.
Suite 301 - 4109 4th Avenue,
Whitehorse, YT Y1A 1H6
Engineering Consultant

S-100 Notes, Structural / Construction
S-101 Basement General Arrangement
S-102 Main Floor Plan, Struct'l / Const'n
S-103 Second Floor Plan, Struct'l / Const'n
S-104 Main Floor Equipment Level
S-106 Lower Roof Level, Struct'l / Const'n
S-301 Section Sheet 1, Struct'l / Const'n
S-302 Section Sheet 2, Struct'l / Const'n
S-303 Section Sheet 3, Struct'l / Const'n
S-501 RC Details , Struct'l / Const'n
S-502 Details Sheet 1, Struct'l / Const'n
S-701 Sketch, Struct'l , Struct'l / Const'n

ELECTRICAL
Electrical in Phase 3, NIC

Note existing temporary electrical service panel in basement

80% PRELIMINARY DRAWING SET (DRAFT)
FOR REVIEW ONLY - NOT FOR CONSTRUCTION

Chris Gower
ARCHITECT
Urban Design Planner
MAIBC FRAIC LEED$_{op}$ MCIP RPP
1210 Monterey Ave.,
Oak Bay, Victoria B.C.
V8S-4VS 778 922-9979
chrisgower@shaw.ca

ENVISIONS
John Keay
Heritage consultant

Notes

ISSUES & REVISIONS

No.	Date	Description
04	May 08 2024	80% Preliminary - drawing set DRAFT
03	Mar 29 2024	60% Preliminary - drawing set DRAFT
02	Mar 25 2024	60% Preliminary - drawing set DRAFT
01	Jan 02 2024	Preliminary - drawing set DRAFT

Project Title
Phase 2
CANADIAN BANK OF COMMERCE NHS
Renovations & Restoration
LOT 1024, FRONT STREET
DAWSON CITY, YUKON

Drawing Title

Scale
Date May 08 2024
Drawn by CG
Proj. No. 2024- 10

A 0.00

National Building Code 2020 Review

(Code Equivalency - preliminary outline - note: additional Code compliance work anticipated in Phase 3)

Table 3.1.2.1.) Major Occupancy Classifications
Primary Occupancy: A2 - Assembly Occupancy not elsewhwere classified in Group A
Potential Secondary Occupancy: D - Business and Personal Services Occupancy

Table 3.1.3.1.) Major Occupancy Fire Separations
A2 / Potential D Occupancy - Fire Separations between major occupancies:
1hr separation to be provided (note sprinklered building).

3.1.17. Occupant Load (Potential Single A2 Occupancy or Mixed A2 / D Mixed Occupancy)

A2 - Assembly Occupancy (potential optional uses):
- space with fixed seats 0.75 M2 / person
- space with non-fixed seats 0.75 M2 / person
- space with non-fixed seats and tables 0.95 M2 / person
- classrooms 1.85 M2 / person
- reading or writting rooms or lounges 1.85 M2 / person
- dining, beverage,and cafeteria space 1.20 M2 / person

D - Business and Personal Services Occupancy (potential optional uses):
- personal services shops 4.60 M2 / person
- offices 9.30 M2 / person

Table 3.3.1.5.-B) Egress in Floor Area Sprinklered Through-out
Occupancy: Group A2 / Maximum Area of Room or Suite: 200 m2 (note constructed floor area is 185M2)
Occupancy: Group D / Maximum Area of Room or Suite: 300 m2 (note constructed floor area is 185M2)

Table 3.4.2.1.-B) Criteria for One Exit (Floor Area Sprinklered Throughout
Occupancy: Group A2 / Maximum Area of Room or Suite: 200 m2 (note constructed floor area is 185M2)
Occupancy: Group D / Maximum Area of Room or Suite: 300 m2 (note constructed floor area is 185M2)

3.4.3.1 Exit Width Based on Occupant Load
1) For the purpose of determining the aggregate width of exits,
the occupant load of every room or floor area shall be determined in conformance wirh Subsection 3.1.17.

Occupied Floor Area (Main Floor) 105 m2 / .75 = 141 persons
Multi Purpose Space: area 105 m2 / .95m2 person = 110 persons
occupant load (posted) : 100
Occupied Floor Area (Upper Floor) 105 m2 / .75 = 141 persons
Possible Council Chambers (or alternate use TBD) 105 m2
occupant load (posted) 50

3.4.3.2 Exit Widths:
8mm per person for a stair consisting of steps
whose rise is not more than 180mm and whose run is not less than 280 mm.
Thus for the main floor 100 persons occupancy posted x 8mm = 800mm required exit width.
Thus for upstairs, 50 persons occupancy posted - x 8mm = 400mm minium required exit width.

Table 3.4.3.2.-A Miniumum width of Exit Corridors, Passageways, Ramps, Stairs and Doorways
Group A, Group D - Exit Corridors and Passageways: 1100mm; Stairs: 1100mm, Doorways: 850mm;

Table 3.7.2.2.-A
Waterclosets for an Assembly Occupancy:
Number of Persons of Each Sex 26-50 Minimum Number of Water Closets: Male: 1; Female: 2

Table 3.7.2.2.-D
Waterclosets for a Business and Prsonal Services Occupancy:
Number of Persons of Each Sex 26-50 Minimum Number of Water Closets: Male: 1; Female: 2

A-3.1.2.1. (1) Major Occupancy Classification: (note potential mixed occupancy: A2 , D)

Group A, Division 2, potential uses in consideration: Art Galleries; Clubs, non-residential; Community Halls; Lecture Halls; Museums; Restaurants; etc as per Code.

Group D, potential uses in consideration: Banks, Dental Offices; Mediacl Offices; Offices; Police Stations without detention quarters; Radio Stations; etc as per Code.

Table 4.1.5.3. Specified Uniformly Distributed Live loads on a Floor Area or Roof / Minimum Specified Load, kPa
Assembly Areas:
a) Lecture Halls, Museums (areas without fixed seats that have backs) -
(Not advised for upstairs in this project)-
- 4.8 kPa

b) Classrooms and Courtrooms (with or without fixed seats) -
(Potential for upstairs in this project)-
- 2.4 kPa

d) Portions of assembly areas with fixed seats that have backs for the following uses:
Churches, Lecture Halls
(Potential for upstairs in this project)
- 2.4 kPa

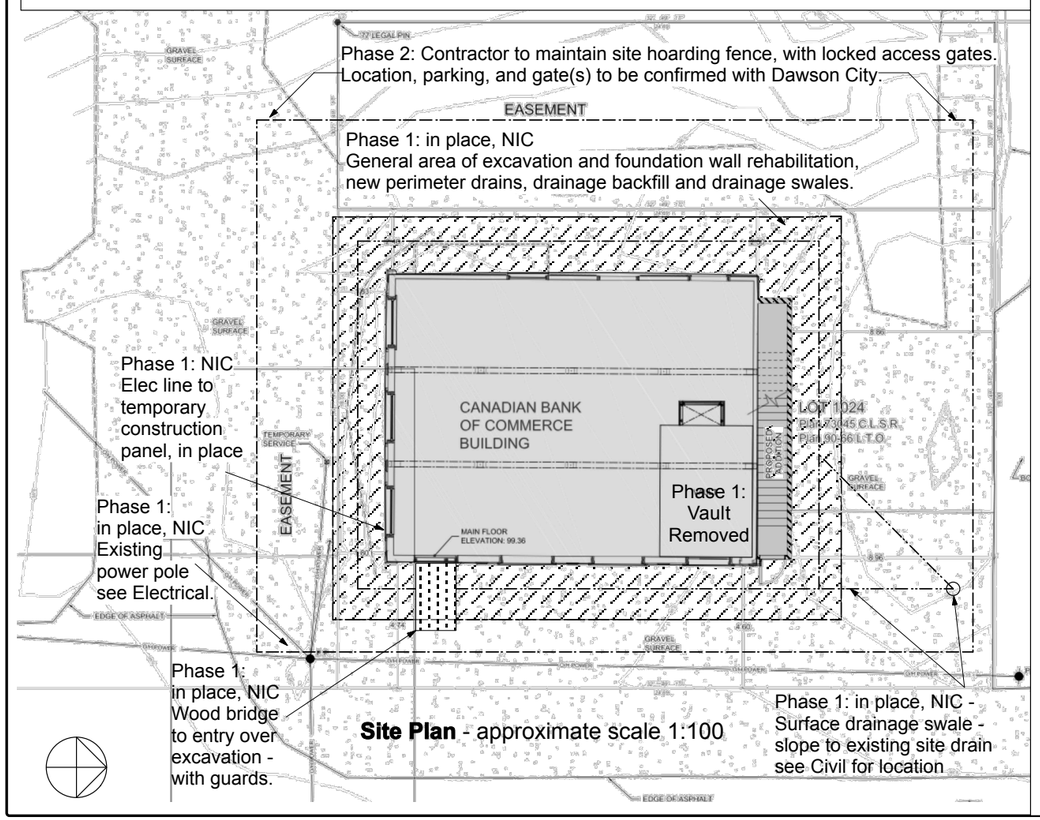
Office Areas (not including record storage and computer rooms) located in:
- Basements and floors with direct access to the exterior at ground level.
(Acceptable on the basement or main floor level only)
- 4.8 kPa

- Other floors
(Acceptable on the upstairs floor level only)
- 2.4 kPa

Retail and Wholesale Areas
(Acceptable on the basement or main floor level only)
- 4.8 kPa

4.1.5.9 Concentrated Loads
Table 4.1.5.9. Specified Concentrated Live loads on an area of Floor or Roof / Minimum Specified Load, kPa
Floors of Classrooms:
(Not advised on upper floor)
- 4.5 kN 750 x 750 mm

PRELIMINARY 80% DRAWING REVIEW SET (DRAFT)
FOR REVIEW ONLY - NOT FOR CONSTRUCTION



Site Plan - approximate scale 1:100

Canadian Bank of Commerce - Renovations and Restoration / Phase 2
City of Dawson, Yukon Territory - Phase 2: Lower, Main, Upper Floor, Attic Level Interior Work
Project Notes / General Conditions - Preliminary 80% Draft for Owner, Consultant, Const. Manager Reviews

1.0 General Project Description, Phase 2: interior renovations & repairs of: lower basement floor, main floor, upper floor, attic levels:
- Phase 2 Scope of Work: enhancing existing and new structural wood framing, exterior wall, attic - insulation & vapour barrier;
- Generally Phase 3 - the exterior of the building: metal siding and original building paper (with HazMat material) are not be disturbed;
- Phase 3 (NIC) work to follow next year including: electrical, mechanical, plumbing, washroom services, lighting, GWB, etc;
- Exterior building paper is to remain carefully undisturbed throughout the project, and all questions reported to the owner;
- Preparation and placement of an area of new concrete slab in the north-east corner of the basement level, see structural;
- Includes; grade seal, new reinforced concrete, level finished to match adjacent concrete basement slab, & elevator pit depression;
- Concrete mix, leveling, and smooth surface finish, fared to match existing basement slab - see structural requirements;
- Placement of radon gas testing tubes or pipes under the new concrete - size and locations to be confirmed on site;
- Framing of basement elevator shaft & adjacent elevator machine rm: 2x4 studs & framing - anchor walls to existing & new slabs;
- Confirm elevator pit location, size, and depth with elevator shop drawings. 1/2" painted plywood to outside of new walls, typ;
- Rough-framed door openings for later elevator supply and installation, and for doorway to elevator machine room, (doors NIC) ;
- Close opening of NE wood-framed main floor - review floor joists, basement & main flr exterior walls, to suit new infill floor:
- New TJI and plywood deck of floor closure to match existing, plywood to be T&G glued & screwed to joists - see structural;
- Framing of elevator shaft, washroom, electrical closet, and mechanical shaft walls, from main floor to upper floor;
- Rough framed door openings for later elevator supply and installation, and for doorways to washrooms & closet, (doors NIC);
- Framed glued and screwed 16mm plywood deck above main flr washrooms & closet with 8' 2438mm washroom headroom;
- 1/2" 12.7mm plywood to exterior of all new walls typ - shaft to be framed between main & upper floor for later mechanical;
- Plywood to interior rear wall of electrical closet for future electrical panel, framed headers for all doors & elevator openings;
- Remove segments of existing plywood sheathing on interior of main floor exterior walls for framing work, in sequence, see struct;
- Exterior wall framing to be remedied or supplemented as per structural requirements, including connections to floors & ceiling;
- Existing temporary ply closures to windows to be removed, window opening framing to be reviewed, repaired or replaced;
- See structural, RDH building envelope, and architectural details for refinishing of window openings: head, jambs, sill, casings;
- Main floor exterior wall framing: ptd preservative & breathing membrane to inside of sheathing, pack with batt insulation, see RJC;
- Wall framing and insulation to be unified to main floor ceiling joists - see structural, envelope, and architectural details;
- New plywood structural interior sheer wall sheathing placed tightly to all exterior wall framing - secure nailing as per structural;
- Joist framing for main floor ceiling, and upper floor deck - to be reviewed on site, with additional joists as per structural;
- Review and carefully jack to level upper floor beams and joists, with glued shimming to faire-out uneven or deflected conditions;
- Supplemental steel plate support to sides of beams, see struct. Intumescent painted, with hanging support rods & connections;
- Framing connections between floor joists & wall studs to be enhanced & blocked - see structural - batt & foam edges see RDH;
- Cut-out area of floor for new upper floor stair flight, support from bathroom wall framing below, see structural, include vap barrier.
- Build-in new steps, regular risers and treds as per details - continuous temporary 2x2 handrails each side to meet handrail in stair;
- Existing ply upper floor deck to be removed - in sequence with application of new T&G plywood deck, glued & screwed to joists;
- Wall vapour barriers to be completely caulked & taped to underside of new upper floor plywood deck see RDH envelope details;
- Existing upper floor ply deck, removed & reused for new ceiling above, glued & nailed to attic joist undersides, see structural;
- Attic joists to be packed with batt insulation, in sequence with ceiling plywood placement, new access hatch to attic in washroom;
- Upper floor to be reviewed & filled for finished T&G plywood flush surface, suited for sheet goods floor finishes in later Phase 3;
- Upper floor bathroom, closet, shaft, & elevator shaft walls to be 2x4 framed tightly to ceiling above, w rough door openings;
- Add an attic access hatch above the upper floor washroom, anticipate mechanical ducting in Phase 3 with suspended ceiling;
- Remove in sequence existing sheathing & metal braces on interior of upper floor exterior walls for framing work, see structural;
- Exterior wall framing to be remedied or supplemented as per structural requirements, including connections to floor & ceiling;
- Existing frame closures to windows to be removed as needed, window opening framing to be reviewed, repaired or replaced;
- See structural, RDH building envelope, and architectural details for refinishing of window openings head, jambs, sill, casings;
- Upper flr exterior wall framing: add preservative & breathing membrane inside of original sheathing, pack w batt insul'n, see RDH;
- Wall framing and insulation to be unified to upper floor ceiling joists - see structural, envelope, and architectural details;
- Attic truss framing and ceiling joists to be enhanced and supplemented - review for general level for ply ceiling- see structural.
- Ceiling support hanging rods & connections to remain, w intumescent paint - add supplemental steel to sides of beams, see struct;
- Move 1/2" 12.7mm plywood upper floor to ceiling under attic joists - screwed and nailed - add portions of new plywood as needed;
- Insulation sleeves and foam to all attic support rods and connections, batt insulation packed in attic joists, and counterlayed over;
- Continuous vapour barrier aherred to the underside of the new ply ceiling, to lap all exterior wall vapor barriers, caulked & taped;
- All vapour barriers and laps to be contractor photographed - and site reviewed & examined by consultants, before covering;
- 2x2 furring @ 400mm to be added to inside of ply sheathing of all exterior walls over VBs - filled with rigid batt insulation, see RDH;
- Stair bay insulation & vapour barriers installed. All project insulation & vap barriers for architect & envelope consultant review.

2.0 Project Construction Contract, prepared for this project work, with named project architect, structural & envelope consultants, to be: CCDC 5B Construction Management Contract, with Construction Manager acting as General Contractor & site administrator.

3.0 Project time frame anticipated to be approximately from June 01 to Sept 30 or October 30 2024 - dates to be confirmed with owner.

4.0 Site and building access - all to be available to the contractor, but with use of building interior only for construction;
- contractor to supply or maintain site hoarding fencing for site & building security, free of public access, locked off hours;
- contractor to establish vehicle access gates as needed - and project trailer as needed, adjacent City WC available;
- contractor to maintain course of construction insurance, with copy of coverage to owner and consultants;
- contractor to organize site visits and project meetings with consultants and owner representative;
- contractor to plan and pre-notify owner, all consultants for primary general architectural meetings and inspections before closing wall & ceiling insulation, & for all vapour barriers. Contractor: detailed project photos to be supplied for owner, consultants.
- contractor to maintain site phone, and office phone, e-mail address for communications.

5.0 Contractor to maintain Yukon WCB registration/ coverage - copied to Dawson City and consultants.

6.0 Materials to be stockpiled to location(s) on site & in building as per Plans, confirmed by Owner, avoid disturbing stored cladding .

7.0 Project pause for consultant site framing inspections, reports, instructions, before new interior insulation, plywood sheathing.

8.0 Site and building security to be maintained by contractor throughout contract period - to include: secure site hoarding pad-locked doorways, interior and site building illumination during dark periods, emergency phones active on site.

9.0 Interior to be maintained for owner & consultant access throughout project, w notifications. Electrical construction panel is on site.

10.0 Project correspondance and invoices as per CCDC 5B Contract requirements (monthly or phased invoices to be in proposal.)

11.0 Invoices to include all taxes and charges - for consultants' reviews - with Holdbacks as per Yukon Lien Legislation.

12.0 Project Inspections, Consultant Instructions and Change Orders, completion reviews, as defined in CCDC 5B Contract.

13.0 Project schedule and proposed completion date to be provided by contractor and updated with notice to Owner.

14.0 Project Contract Proposal Call Submission - by Owner Notice and Invitations - likely issued by late May 2024.

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ENVISIONS architecture
John Keay
Heritage consultant

Notes

ISSUES & REVISIONS

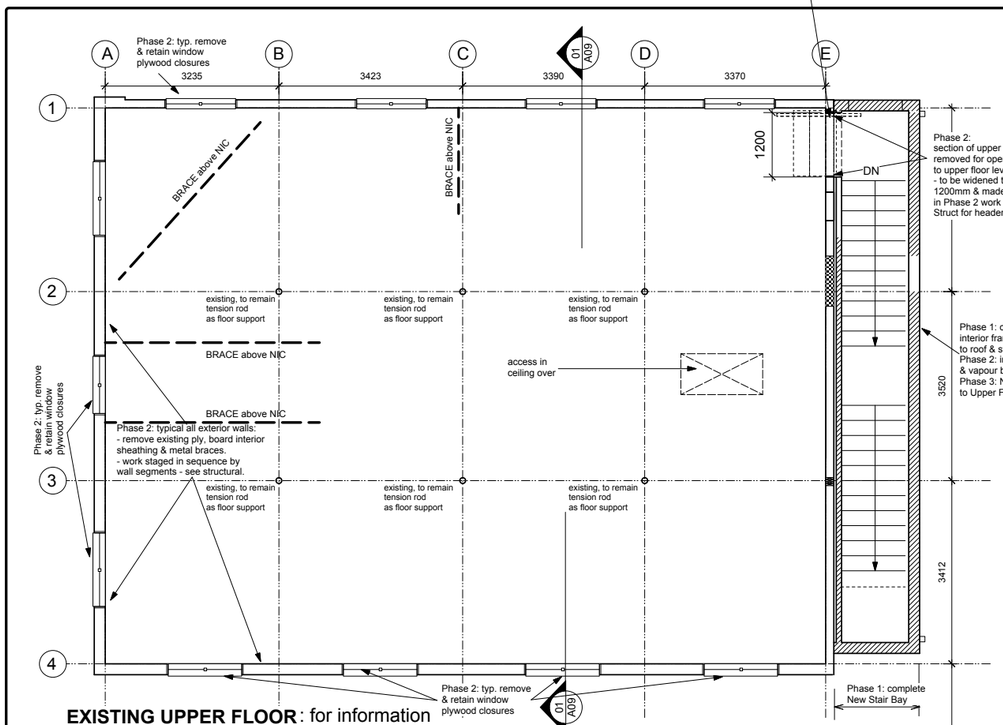
No.	Date	Description
04	May 08 2024	Preliminary - 80% Drawing Review set DRAFT
03	Mar 29 2024	Preliminary - 60% Drawing Review set DRAFT
02	Mar 25 2024	Preliminary - 60% Drawing Review set DRAFT
01	Jan 04 2024	Preliminary - drawing set DRAFT

Project Title
Phase 2
CANADIAN BANK OF COMMERCE NHS
Renovations & Restoration
LOT 1024, FRONT STREET
DAWSON CITY, YUKON

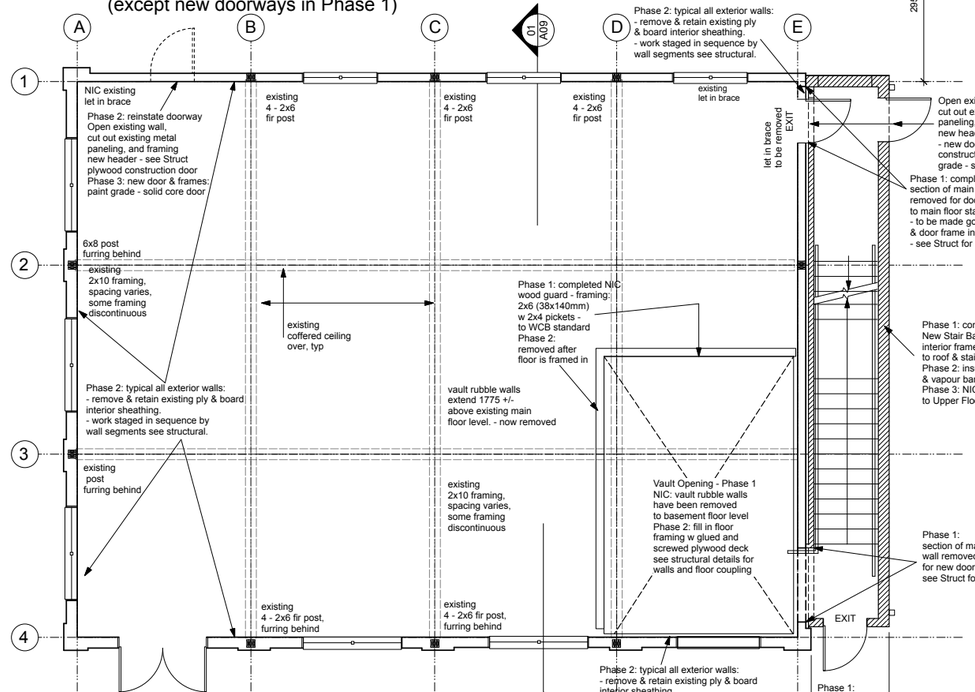
Drawing Title
SITE PLAN
Project Notes & General Conditions

Scale NTS
Date May 08 2024
Drawn by C. G.
Proj. No. 2022- 12

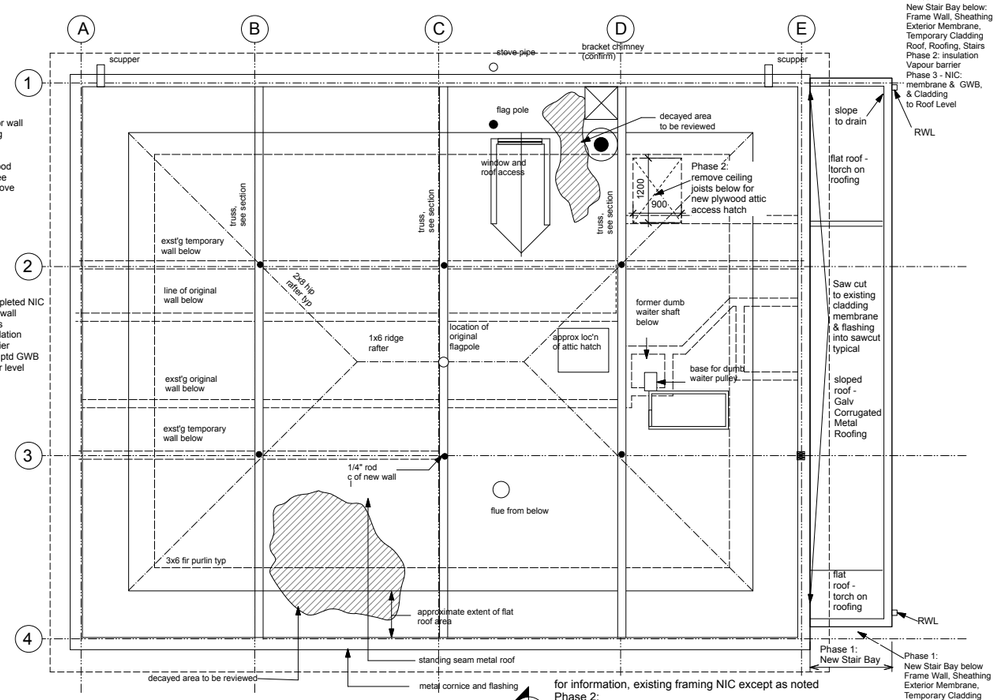
A 1.0



EXISTING UPPER FLOOR: for information
(except new doorways in Phase 1)

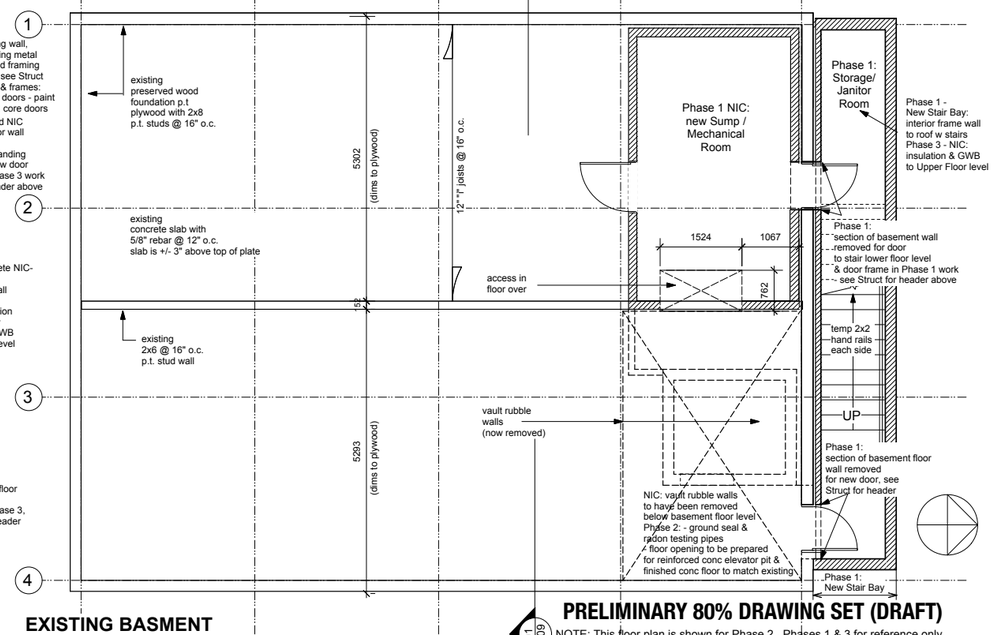


EXISTING MAIN FLOOR
: for information only, NIC
(new mech room doorways & new guard in Phase 1)



EXISTING ATTIC FLOOR:

for information, existing framing NIC except as noted
Phase 2:
- see structural for framing revisions
- insulation, plywood ceiling, vapour barrier



EXISTING BASMENT
: for information only,
(except new doorways in Phase 1)
see drawing A03 for Phase 2 work

PRELIMINARY 80% DRAWING SET (DRAFT)
NOTE: This floor plan is shown for Phase 2 , Phases 1 & 3 for reference only.
Elevator shaft, adjacent washrooms shown for Phase 2 wall framing; finishes Phase 3.
Stair Bay framing completed - with canopy roof cover, in Phase 1 contract.

FOR REVIEW ONLY - NOT FOR CONSTRUCTION

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Notes

ISSUES & REVISIONS

No.	Date	Description
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03	Mar 29 2024	Preliminary - 60% review drawing set DRAFT
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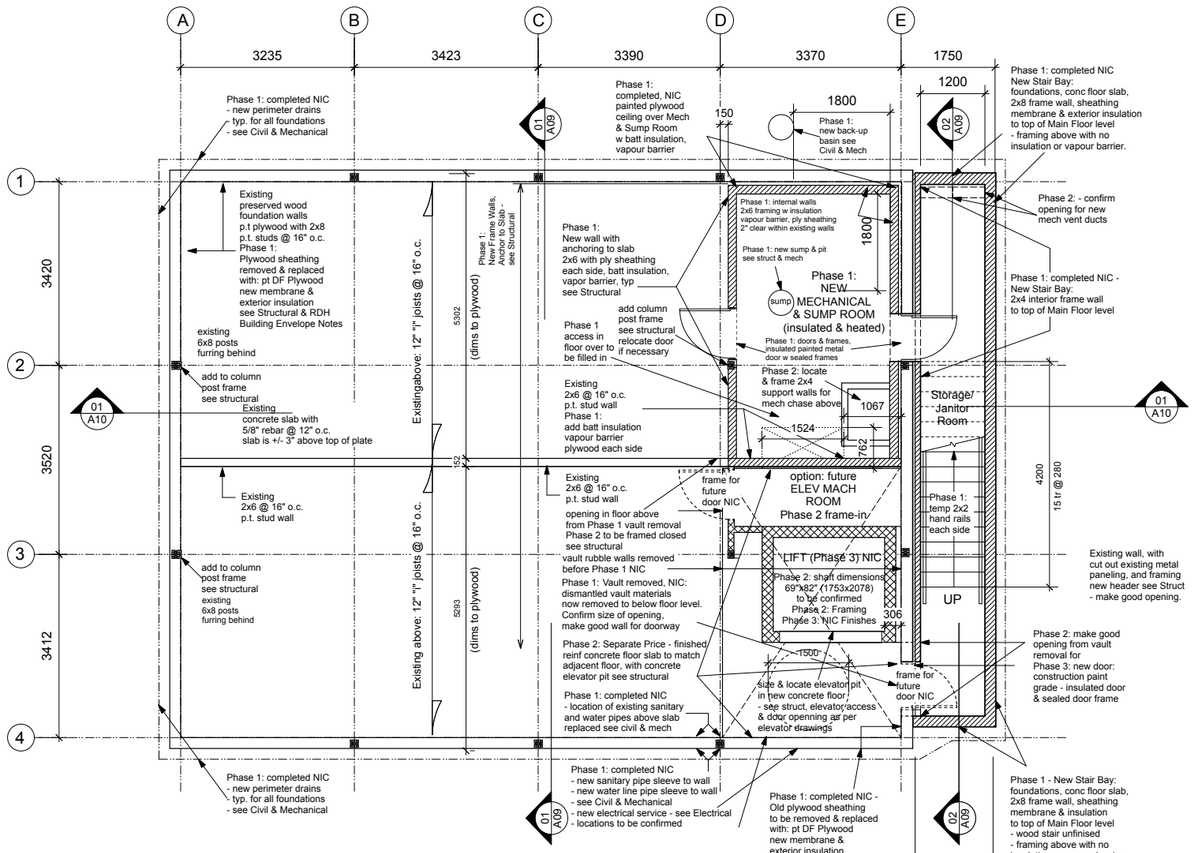
01	Jan 02 2024	Preliminary - 0% review drawing set DRAFT

Project Title
Phase 2
CANADIAN BANK OF COMMERCE NHS
Renovations & Restoration
LOT 1024, FRONT STREET
DAWSON CITY, YUKON

Drawing Title
AS FOUND & DEMOLITION FLOOR PLANS

Scale 1: 50 metric	**A 02**
Date May 08 2024	
Drawn by BK , CG	
Proj. No. 2024- 10	



BASEMENT FLOOR - PHASE 2 (& PHASE 3 NIC)

Shown for information - including future Phase 3 work

Existing Gross Floor Area:	150 m2
Proposed Stair Bay Addition:	15m2
Proposed Total Floor Area:	165m2

Phase 1: walls - in place

Phase 2: new walls - frame, w plywood one side

Phase 3 walls - future NIC

PRELIMINARY 80% DRAWING SET (DRAFT)

NOTE: This floor plan is shown for Phase 2 w Phase 3 work for reference only.
Elevator shaft and adjacent mechanical rooms shown for Phase 2 reference only.
Sump room in Phase 1 contract.

FOR REVIEW ONLY - NOT FOR CONSTRUCTION

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01	Jan 02 2024	Preliminary - 0% review drawing set DRAFT

Project Title

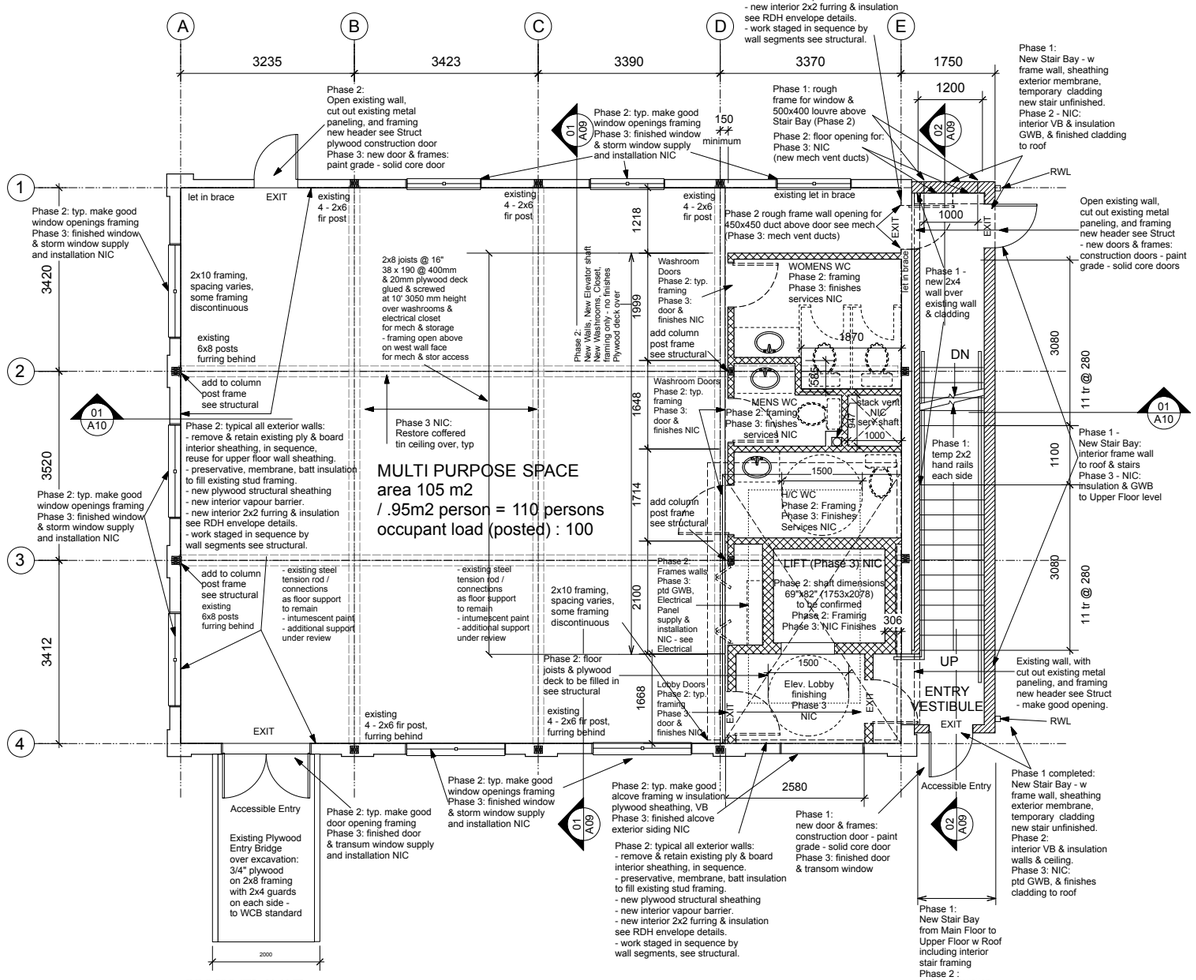
Phase 2
CANADIAN BANK OF COMMERCE NHS
Renovations & Restoration
LOT 1024, FRONT STREET
DAWSON CITY, YUKON

Drawing Title

BASEMENT PLAN

Scale	1: 50 metric
Date	May 08 2024
Drawn by	BK , CG
Proj. No.	2024- 10

A 03



MAIN FLOOR - PHASE 2
(Phase 1 & 3 NIC Shown for information),
to clarify Phase 2 work
Note: Phase 1 included the Stair Bay
Existing Gross Floor Area: 150 m2
Proposed Stair Bay Addition: 15m2
Proposed Total Floor Area: 165m2

Phase 1: walls - framed in place NIC
Phase 2: now require insulation and vapour barriers
Phase 2 walls - new walls framed as noted
w insulation where shown in details.
Phase 3 walls - future, NIC

PRELIMINARY 80% DRAWING SET (DRAFT)

NOTE: This floor plan is shown for Phase 2 , Phases 1 & 3 for reference only.
Elevator shaft and adjacent washrooms shown for Phase 2 wall framing, finishes Phase 3.
Stair Bay framing completed in Phase 1 contract - with canopy roof cover in Phase 1.

FOR REVIEW ONLY - NOT FOR CONSTRUCTION

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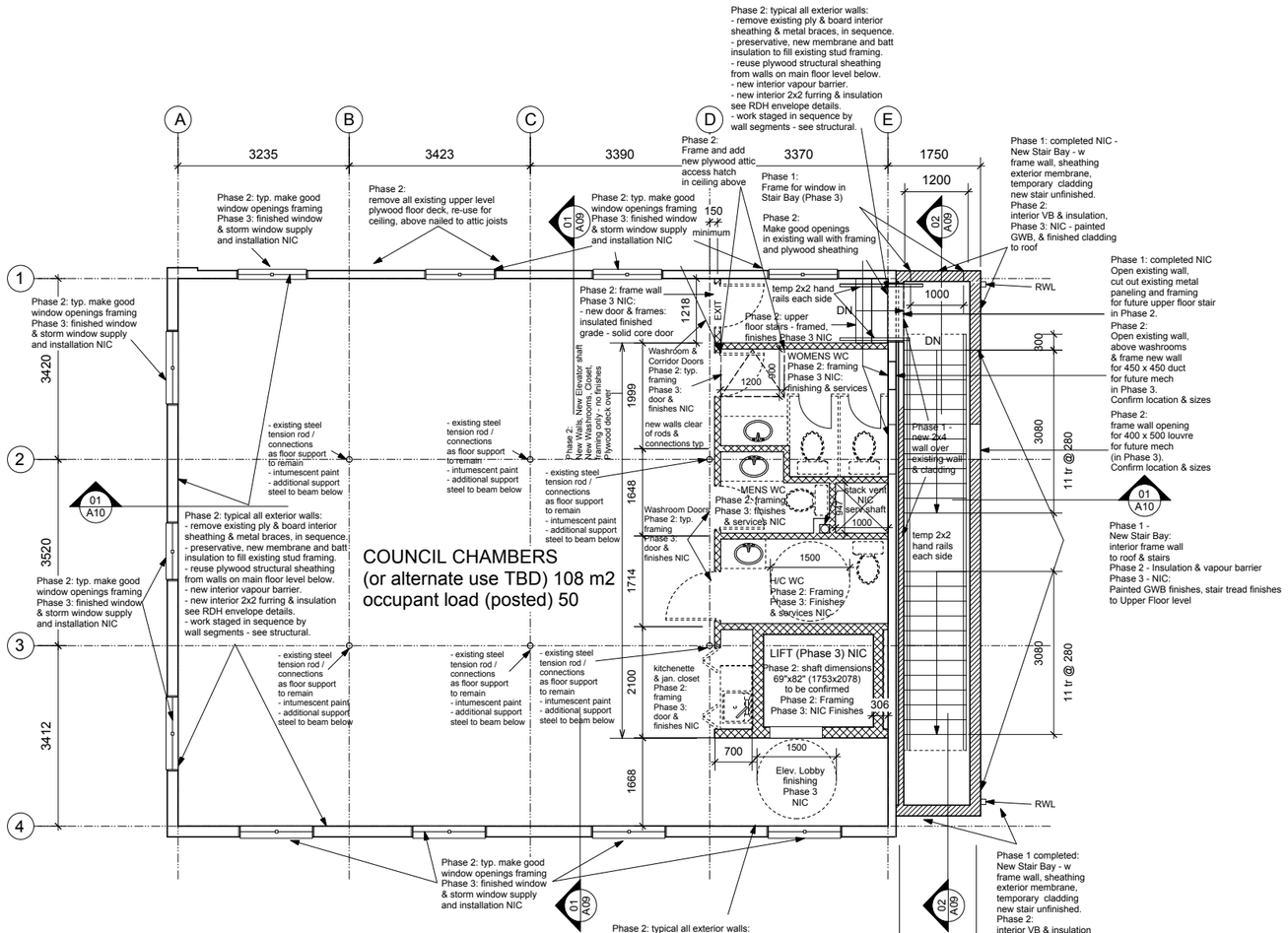
01	Jan 02 2024	Preliminary - 0% review drawing set DRAFT

Project Title
Phase 2
CANADIAN BANK OF COMMERCE NHS
Renovations & Restoration
LOT 1024, FRONT STREET
DAWSON CITY, YUKON

Drawing Title
MAIN FLOOR PLAN

Scale	1:50 metric	**A 04**
Date	May 08 2024	
Drawn by	BK, CG	
Proj. No.	2024- 10	



UPPER FLOOR - PHASE 1(NIC) **& 2**
- future work shown for information
Note: Phase 1 NIC included the Stair Bay
Existing Gross Floor Area: 150 m2
Proposed Stair Bay Addition: 15m2
Proposed Total Floor Area: 165m2

Phase 1: walls - framed in place NIC
Phase 2: now require insulation and vapour barriers
Phase 2 walls - new walls framed as noted w insulation where shown in details.
Phase 3 walls - future, NIC

PRELIMINARY 80% DRAWING SET (DRAFT)

NOTE: This floor plan is shown for Phase 2 , Phases 1 & 3 for reference only.
Elevator shaft and adjacent washrooms shown for Phase 2 wall framing, finishes Phase 3.
Stair Bay framing completed in Phase 1 contract - with canopy roof cover in Phase 1.

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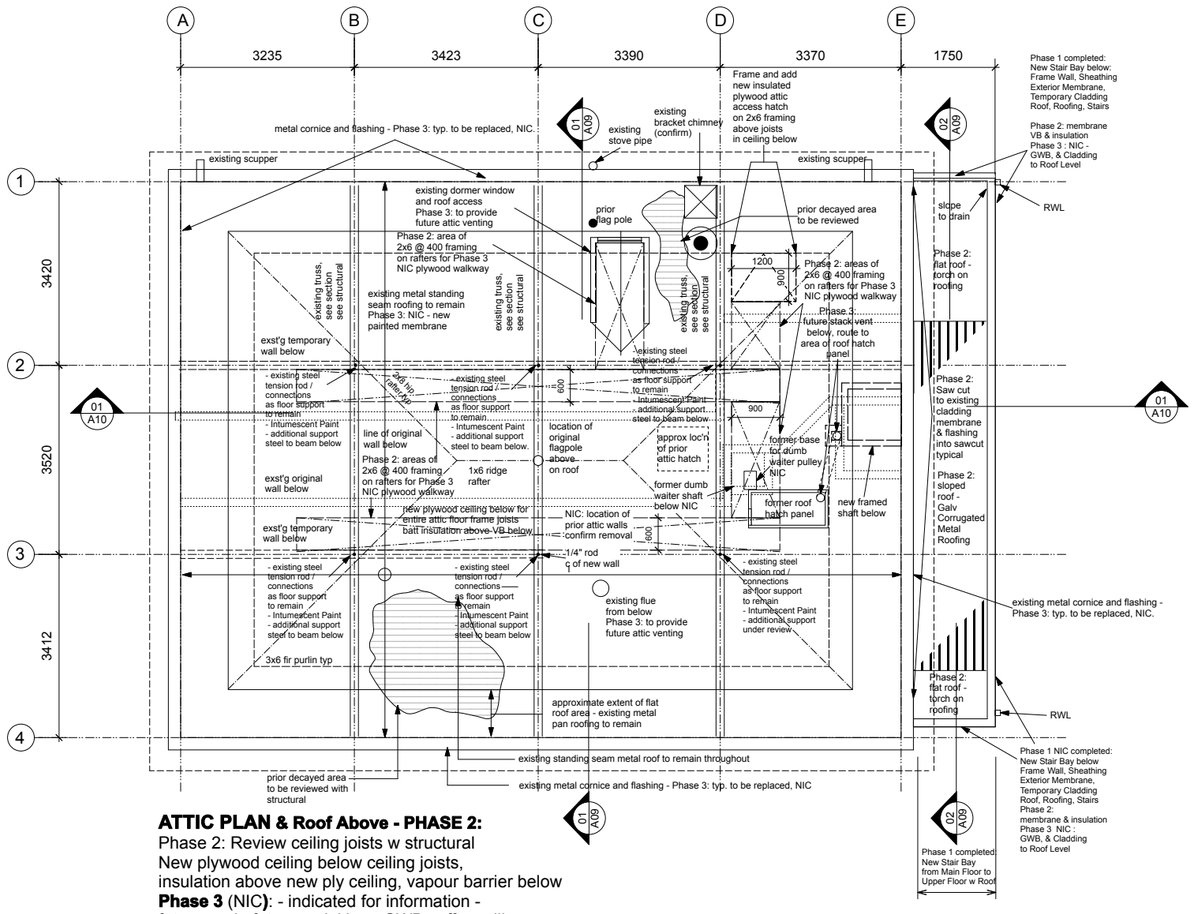
Phase 2
CANADIAN BANK OF COMMERCE NHS
Renovations & Restoration
LOT 1024, FRONT STREET
DAWSON CITY, YUKON

Drawing Title
UPPER FLOOR PLAN

Scale 1:50 metric
Date May 08 2024
Drawn by BK, CG
Proj. No. 2024- 10

A 05



ATTIC PLAN & Roof Above - PHASE 2:
Phase 2: Review ceiling joists w structural
New plywood ceiling below ceiling joists,
insulation above new ply ceiling, vapour barrier below
Phase 3 (NIC)**:** - indicated for information -
future work: future sprinklers, GWB coffer ceiling,
light fixtures for upper floor.
Phase 1: Stair Bay below added - completed (NIC)
Existing Gross Floor Area: 150 m2
Proposed Stair Bay Addition: 15m2
Proposed Total Floor Area: 165m2

Phase 1 walls - in place
Phase 2 walls - new walls as noted
Phase 3 walls - future, NIC

PRELIMINARY 80% DRAWING SET (DRAFT)

NOTE: This floor plan is shown for Phase 2 , Phases 1 & 3 for reference only.
Elevator shaft and adjacent washrooms shown for Phase 2 wall framing, finishes Phase 3.
Stair Bay framing completed in Phase 1 contract - with canopy roof cover in Phase 1.

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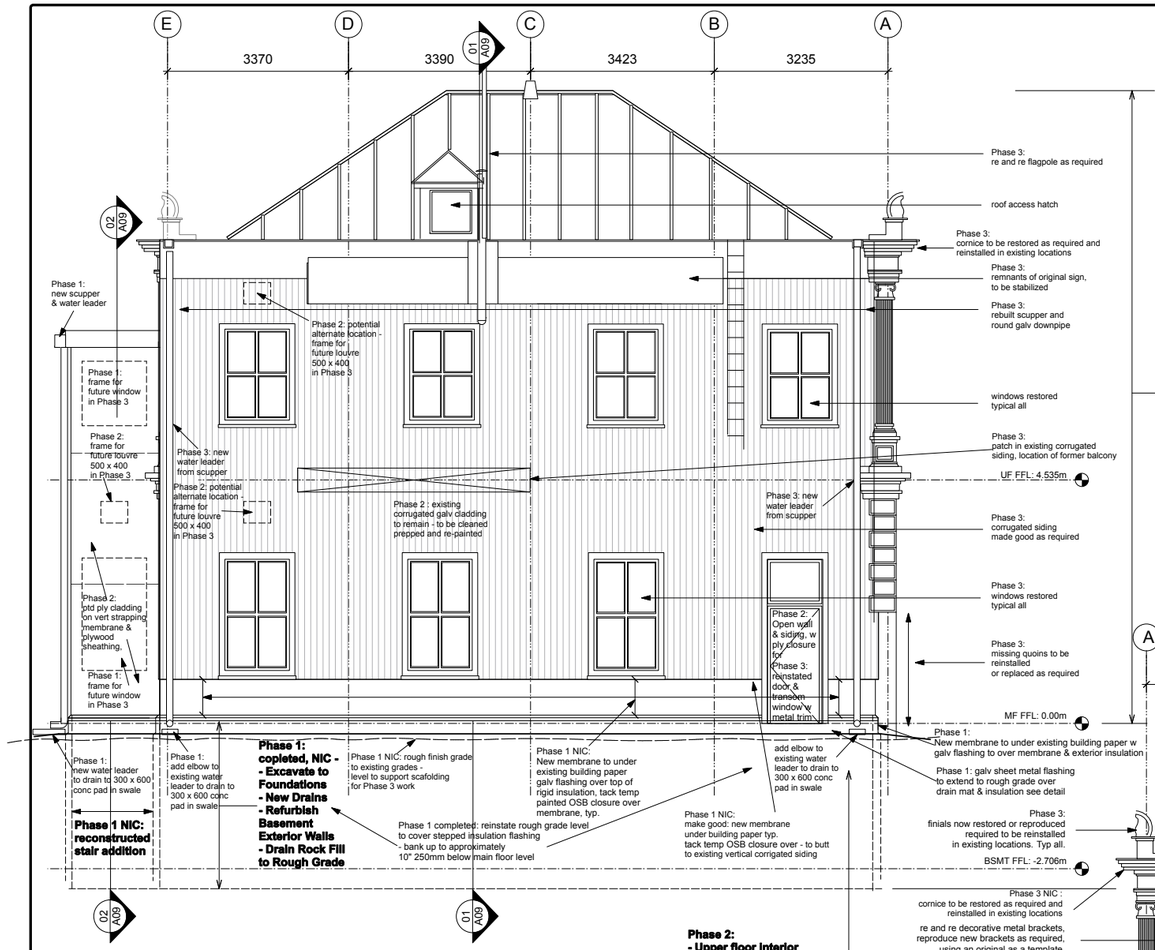
01	Jan 02 2024	Preliminary - 0% review drawing set DRAFT

Project Title
Phase 2
CANADIAN BANK OF COMMERCE NHS
Renovations & Restoration
LOT 1024, FRONT STREET
DAWSON CITY, YUKON

Drawing Title
ATTIC / ROOF PLAN

Scale	1:50 metric
Date	May 08 2024
Drawn by	BK CG
Proj. No.	2024- 10

A 06



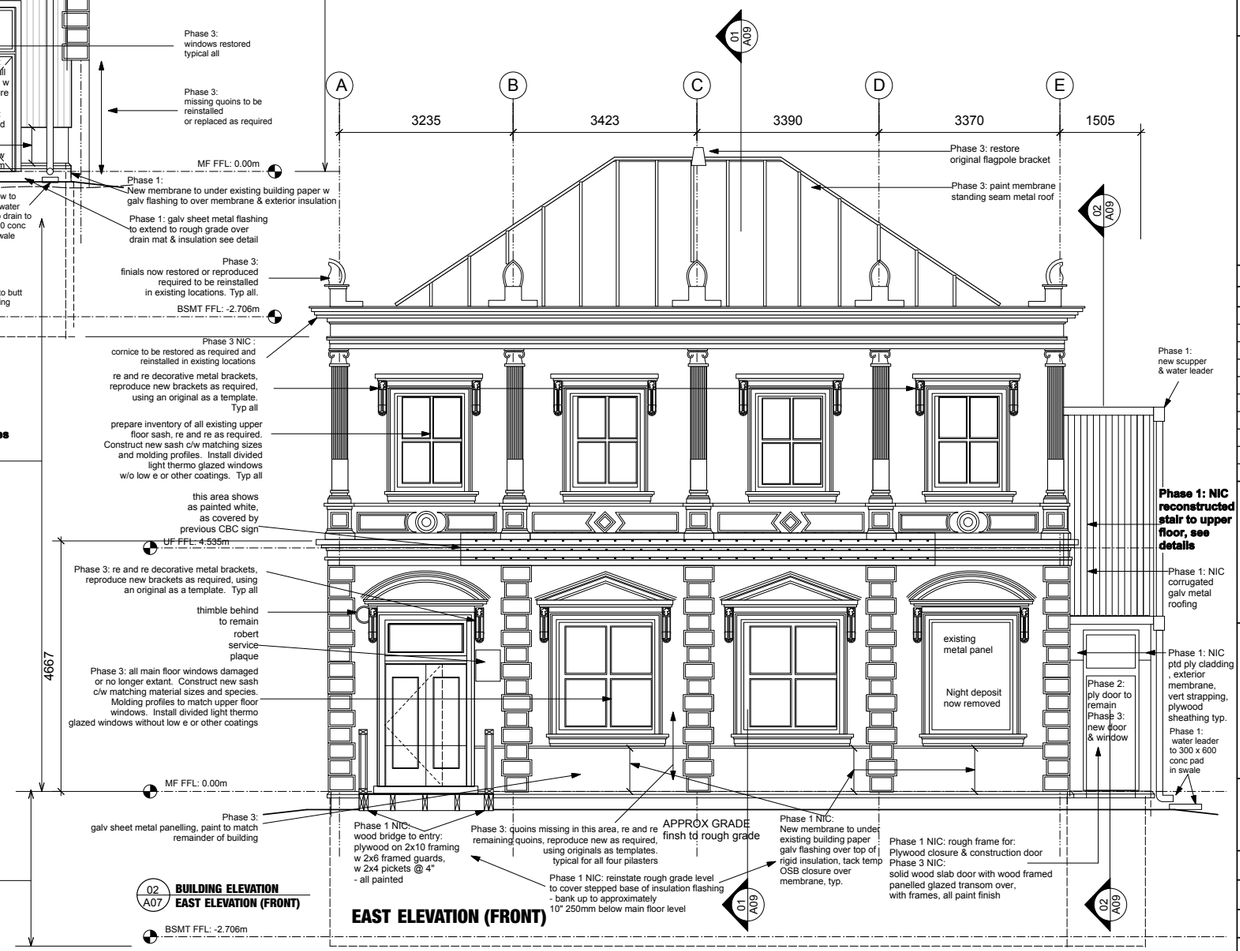
WEST ELEVATION (REAR)

01 A07 **BUILDING ELEVATION**
WEST ELEVATION (REAR)

Phase 2:
- Upper floor interior framing, insulation vapour barriers
- new plywood closures for windows & doors

Phase 3: NIC
- restore elevations,
- repair, make good metal cladding.
- renovate elec,
- mech, finishes for Upper Floors
- new windows throughout

Note in Phase 2:
New Temporary Window & Door Closures
- all existing plywood window closures to be removed for restoration of window openings framing and casing.
- new painted 16mm plywood closures on 2x4 frames to be sized, prepared and installed for all window openings.
- Similarly for all exterior doorways:
- new painted 16mm plywood closures on 2x4 frames to be sized and prepared, with hinges to open, and pad-lock hasps and padlocks to be provided.



02 A07 **BUILDING ELEVATION**
EAST ELEVATION (FRONT)

EAST ELEVATION (FRONT)

Phase 2:
- Upper floor interior framing, insulation vapour barriers
- new plywood closures for windows & doors

Phase 3 NIC :
- restore elevations,
- renovate elec,
- mech, finishes for Upper Floors
- new windows

Phase 1: completed, NIC
- Excavate to Foundations
- New Drains
- Refurbish Basement Exterior Walls
- Drain Rock Fill to Rough Grade

PRELIMINARY: 80% DRAWING SET (DRAFT)

NOTE: These Elevations are generally shown, for reference, for Phase 2 work:
to remove window plywood closures. Exterior cladding to be revised in Phase 3 NIC.
Phase 1 work, generally below the Main Floor, is completed, NIC.

FOR REVIEW ONLY - NOT FOR CONSTRUCTION

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ENVISIONS group of companies

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Heritage consultant

Notes

ISSUES & REVISIONS

No.	Date	Description
04	May 08 2024	Preliminary - 80% review drawing set DRAFT
03	Mar 29 2024	Preliminary - 60% review drawing set DRAFT
02	Mar 23 2024	Preliminary - 60% review drawing set DRAFT
01	Jan 02 2024	Preliminary - 0% review drawing set DRAFT

Project Title
Phase 2
CANADIAN BANK OF COMMERCE NHS
Renovations & Restoration
LOT 1024, FRONT STREET
DAWSON CITY, YUKON

Drawing Title
EAST & WEST ELEVATIONS

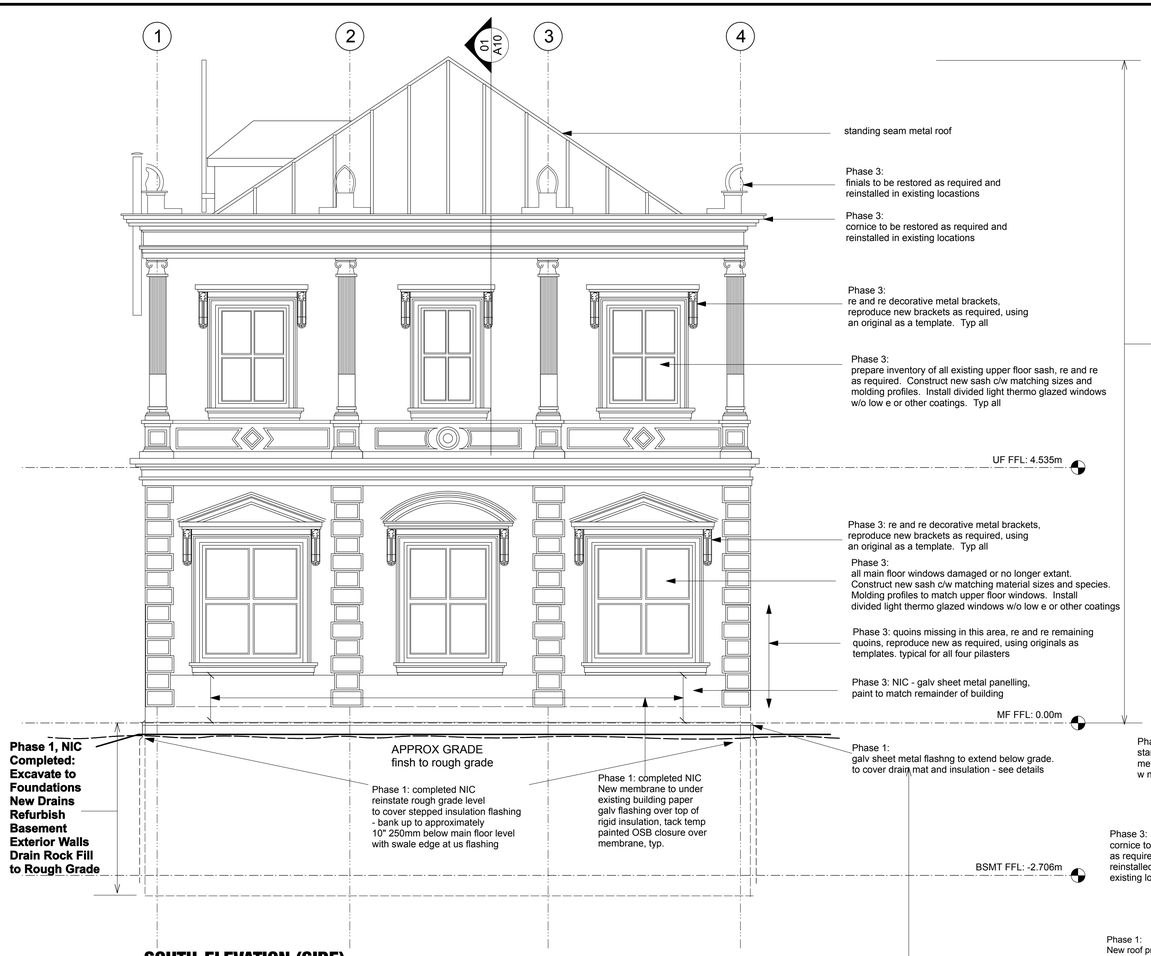
Scale

Date May 08, 2024

Drawn by BK, CG

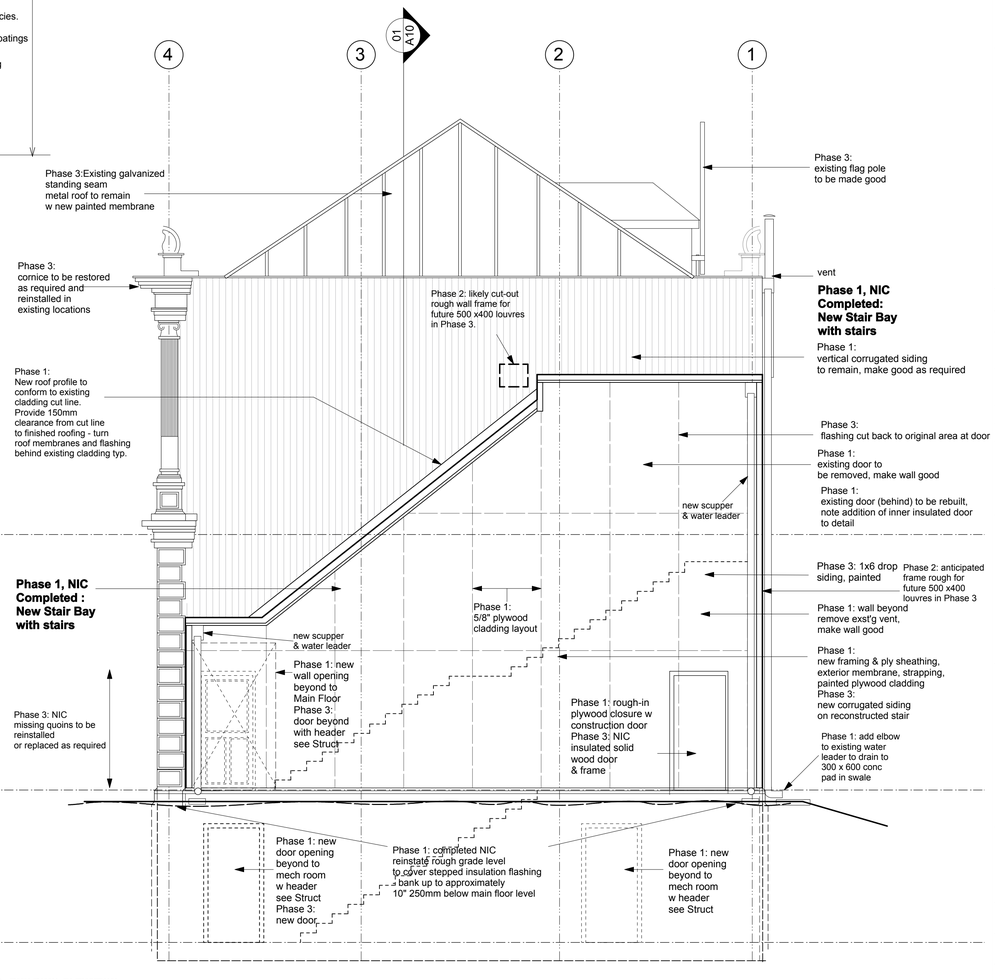
Proj. No. 2024- 10

A 07



SOUTH ELEVATION (SIDE)

01 A08 **BUILDING ELEVATION SOUTH ELEVATION (SIDE)**



02 A08 **BUILDING ELEVATION NORTH ELEVATION (SIDE)**

NORTH ELEVATION (SIDE)

PRELIMINARY: 80% DRAWING SET (DRAFT)

NOTE: These Elevations are generally shown, for reference, for Phase 2 work: to remove window plywood closures. Exterior cladding to be revised in Phase 3 NIC. Phase 1 work, generally below the Main Floor, is completed, NIC.

FOR REVIEW ONLY - NOT FOR CONSTRUCTION

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ENVISIONS architectural

John Keay
Heritage consultant

Notes

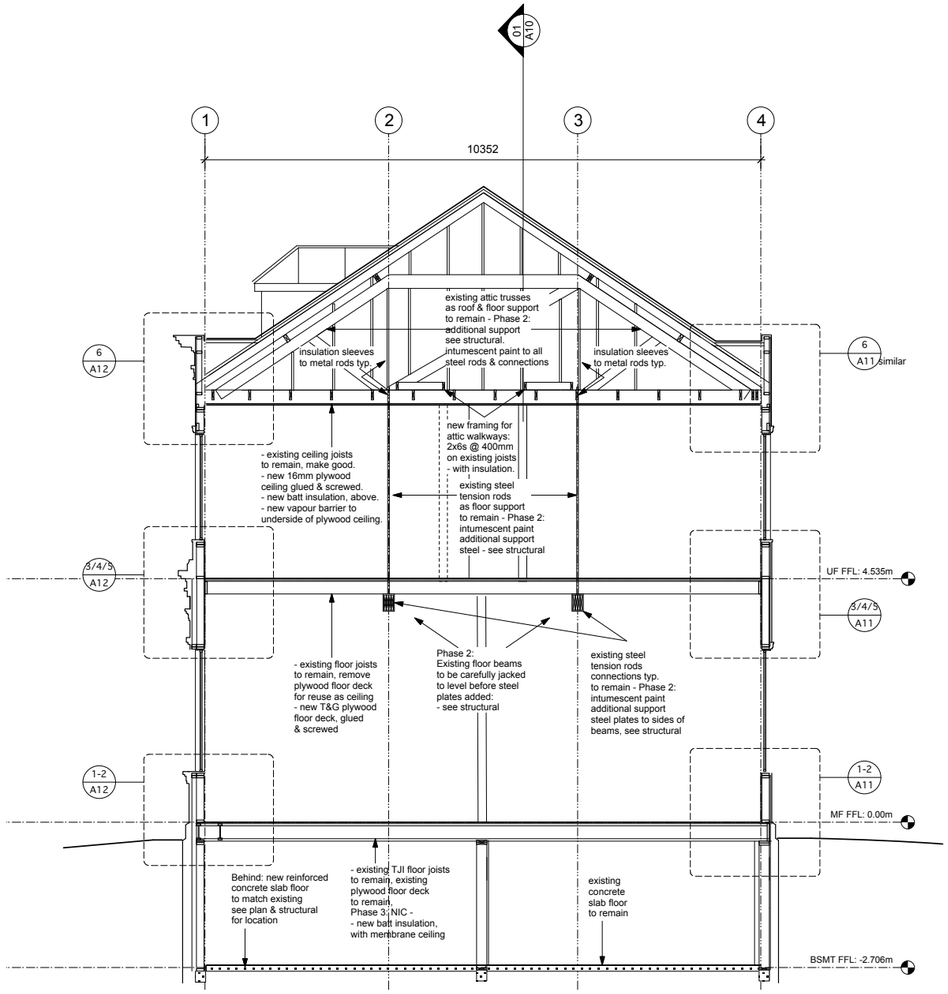
ISSUES & REVISIONS

No.	Date	Description
04	May 08 2024	Preliminary - 80% review drawing set DRAFT
02	Mar 25 2024	Preliminary - 60% review drawing set DRAFT
01	Jan 02 2024	Preliminary - 0% review drawing set DRAFT

Project Title
Phase 2
CANADIAN BANK OF COMMERCE NHS
Renovations & Restoration
LOT 1024, FRONT STREET
DAWSON CITY, YUKON

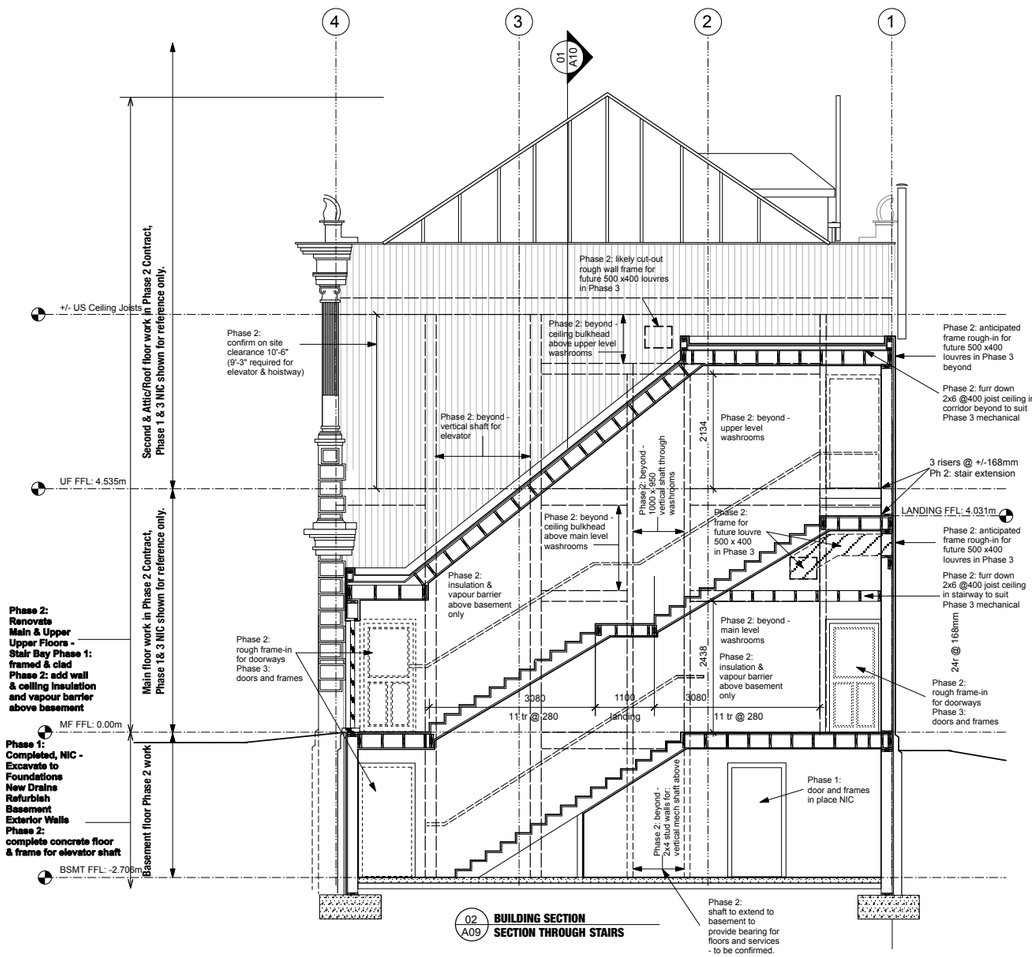
Drawing Title
NORTH & SOUTH ELEVATIONS

Scale	**A 08**
Date May 08, 2024	
Drawn by BK, CG	
Proj. No. 2024- 10	



EAST WEST SECTION

01 A09 **BUILDING SECTION**
SOUTH SECTION (SIDE)



02 A09 **BUILDING SECTION**
SECTION THROUGH STAIRS

80% DRAWING SET (DRAFT)

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02	Mar 25 2024	Preliminary - 60% review drawing set DRAFT
01	Mar 14 2024	Preliminary - 0% review drawing set DRAFT

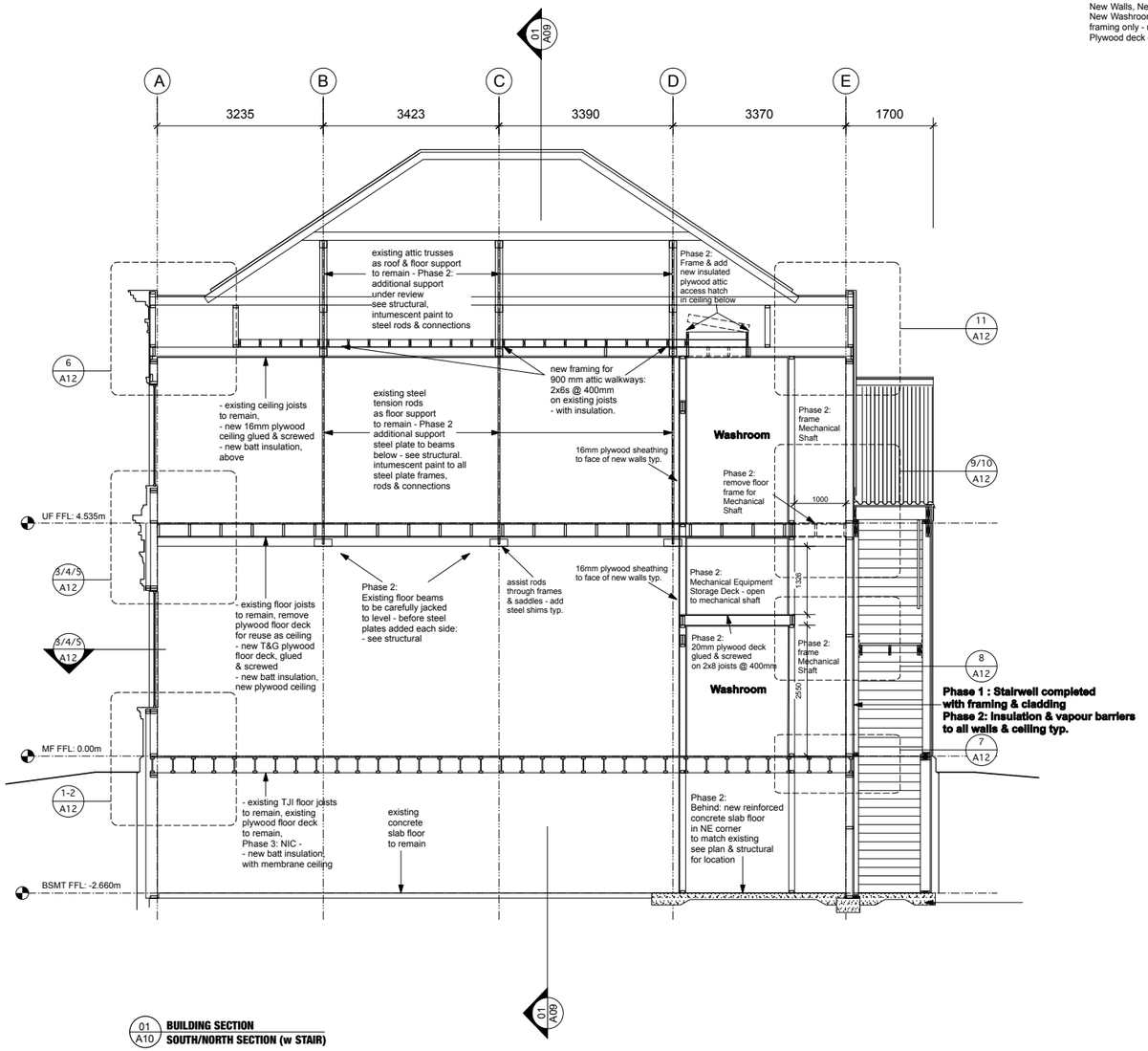
Project Title
CANADIAN BANK OF COMMERCE NHS
LOT 1024, FRONT STREET
DAWSON CITY, YUKON

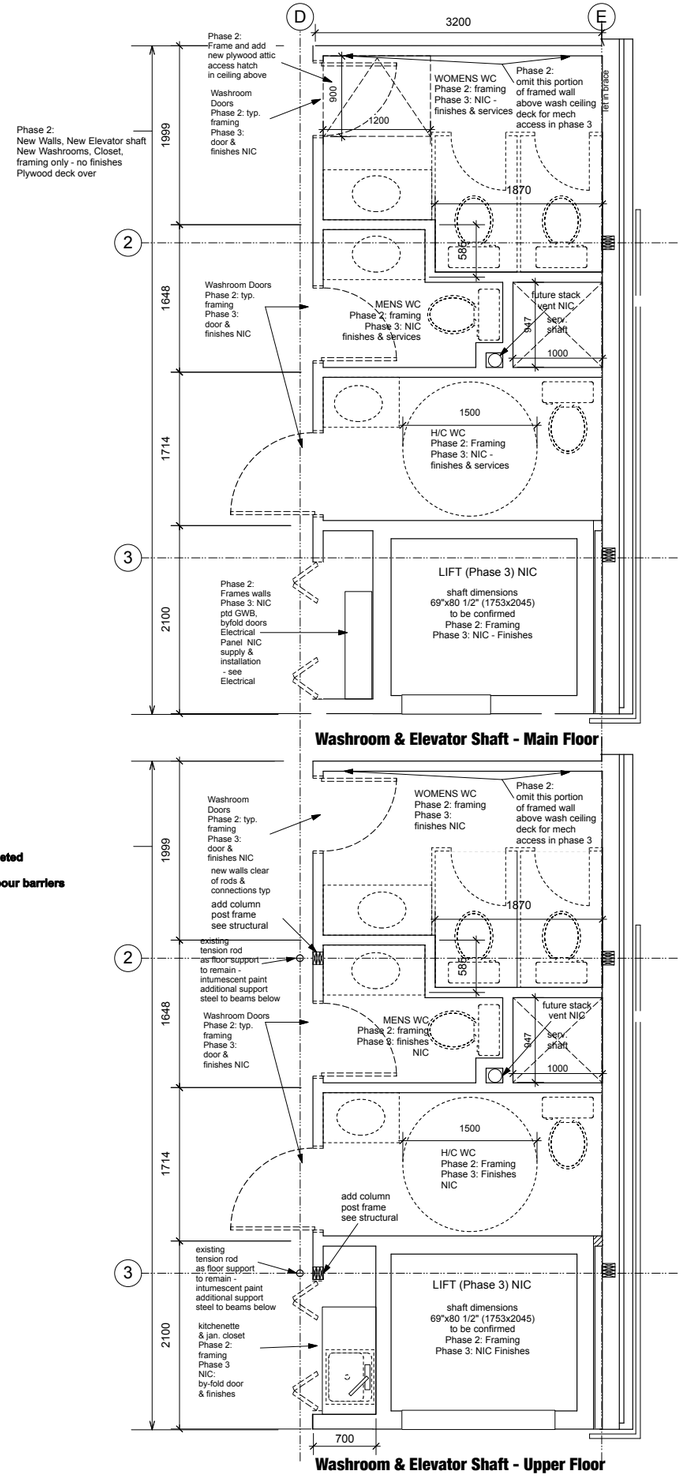
Drawing Title
BUILDING CROSS SECTIONS

Scale
Date May 08, 2024
Drawn by

A 09

Proj. No. 2022- 12





80% DRAWING SET (DRAFT)

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02	Mar 25 2024	Preliminary - 60% review drawing set DRAFT
01	Mar 14 2024	Preliminary - 00% review drawing set DRAFT

Project Title
CANADIAN BANK OF COMMERCE NHS
LOT 1024, FRONT STREET
DAWSON CITY, YUKON

Drawing Title
BUILDING SECTIONS & Washroom Plans

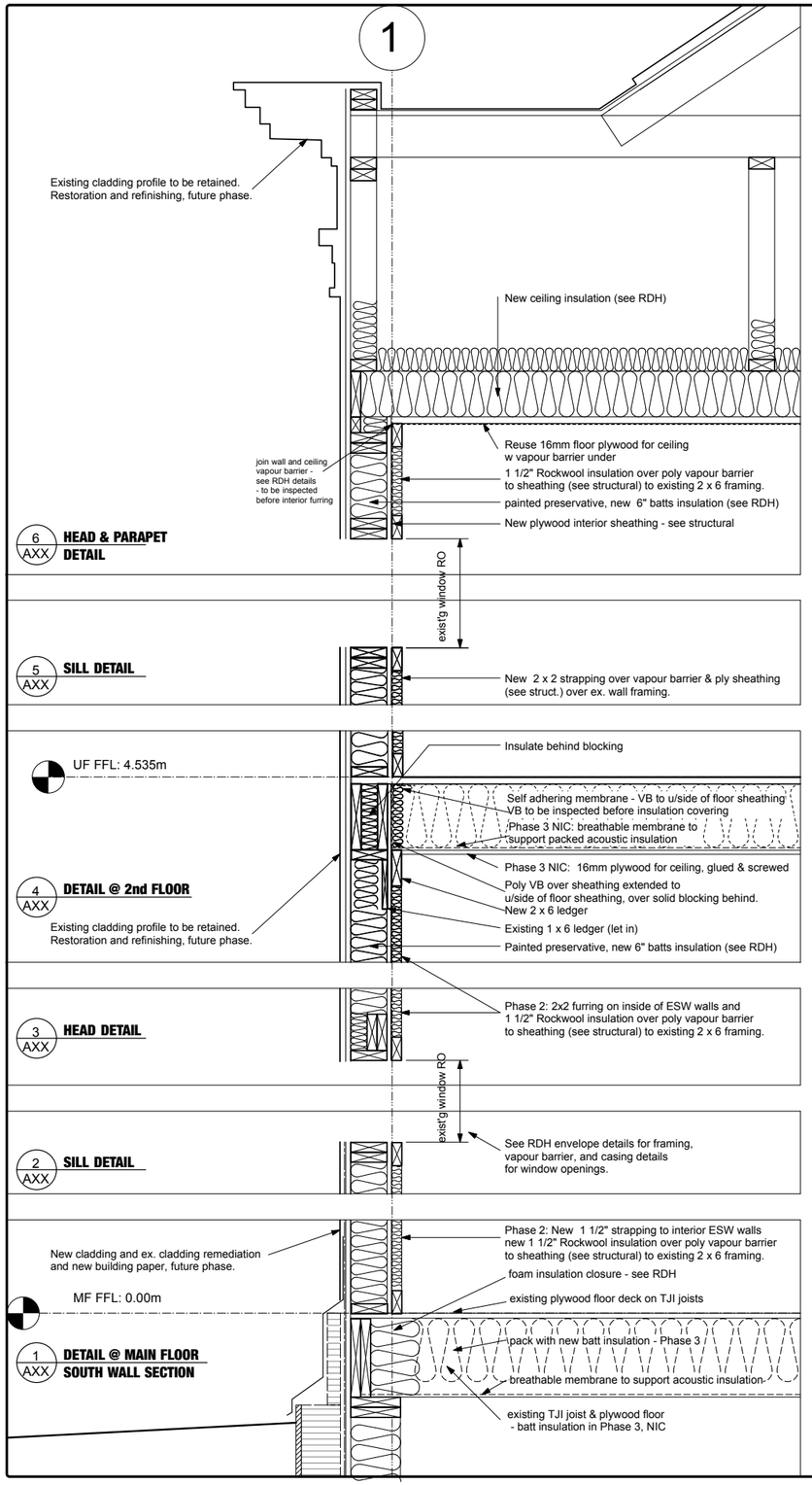
Scale

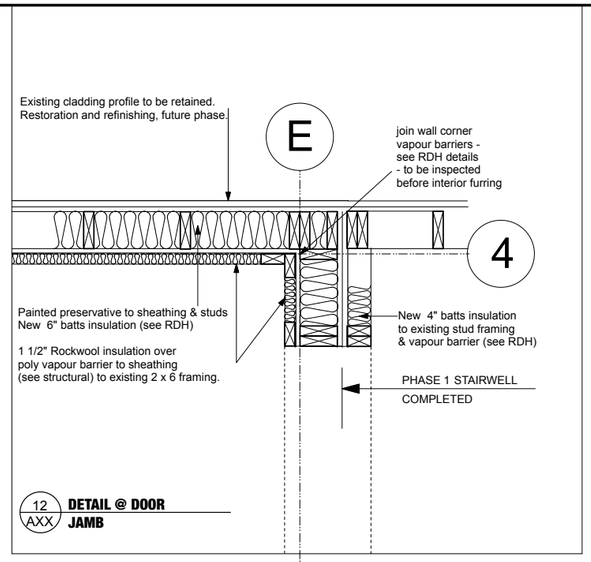
Date May 08, 2024

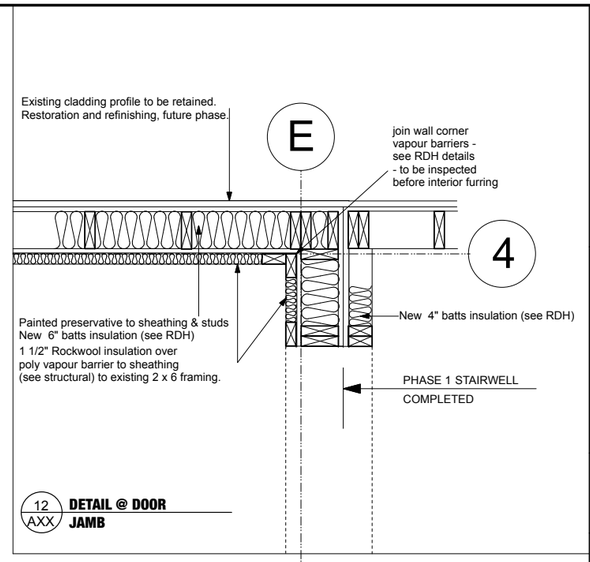
Drawn by

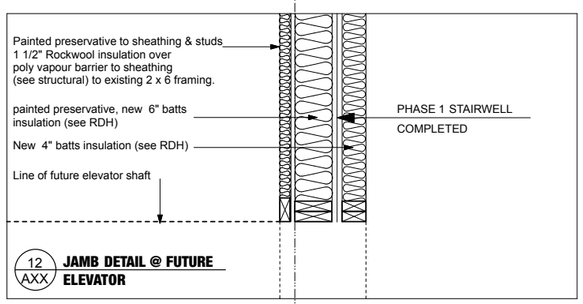
A 10

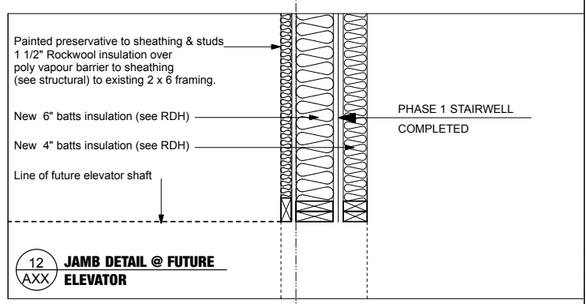
Proj. No. 2022- 12

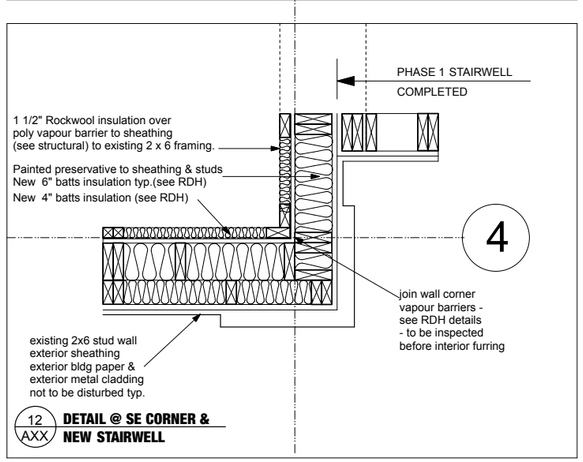


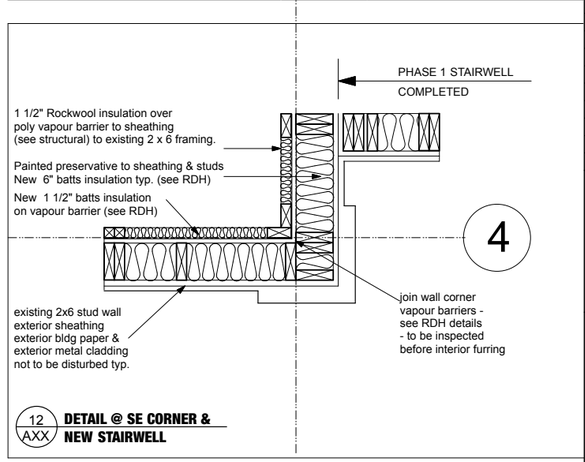












MAIN FLOOR WALL DETAILS

UPPER FLOOR WALL DETAILS

80% DRAWING SET (DRAFT)

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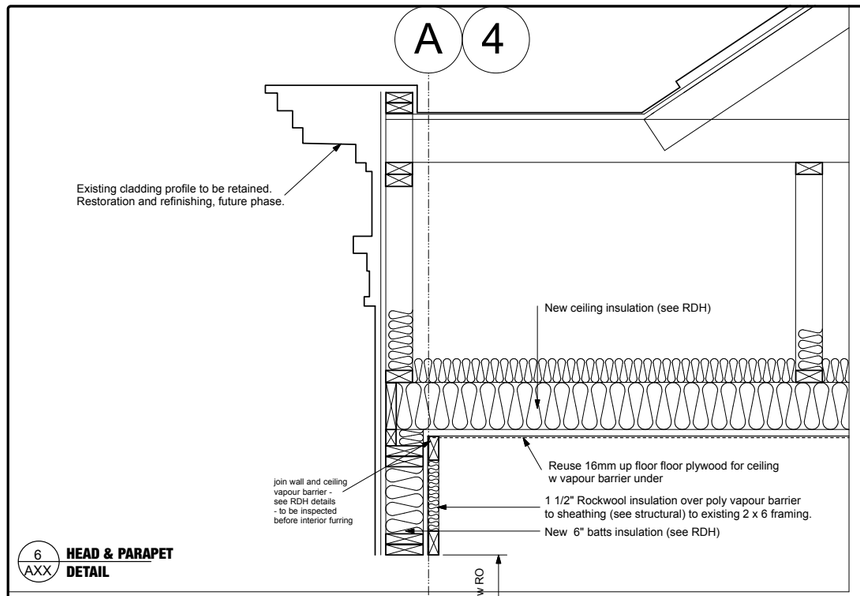
Project Title
CANADIAN BANK OF COMMERCE NHS
LOT 1024, FRONT STREET
DAWSON CITY, YUKON

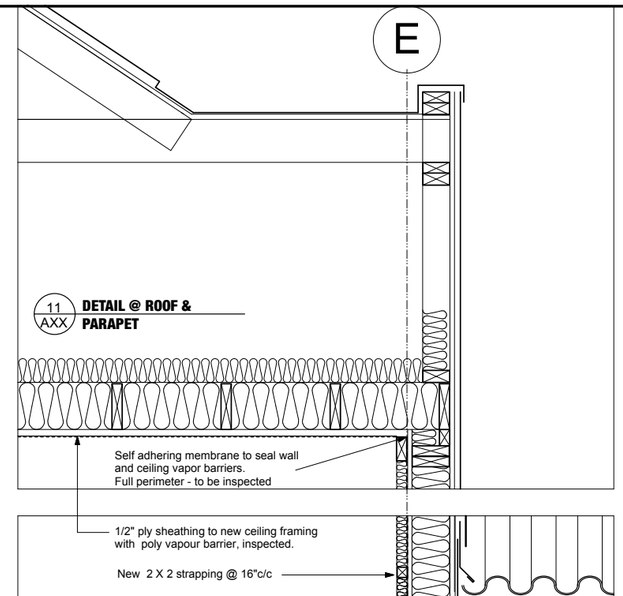
Phase 2

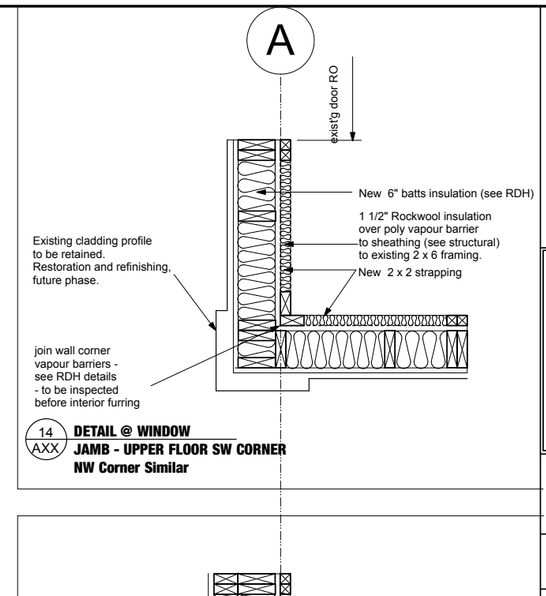
Drawing Title
WALL SECTIONS / DETAILS

Scale	
Date	May 08, 2024
Drawn by	BK CG
Proj. No.	2022- 12

A 11







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Project Title
CANADIAN BANK OF COMMERCE NHS
LOT 1024, FRONT STREET
DAWSON CITY, YUKON

Phase 2A

Drawing Title
WALL SECTIONS / DETAILS

80% DRAWING SET (DRAFT)

NOTE: These sections are generally shown, for reference only, for Phase 2 work. Phase 1 work, generally below the Main Floor, NIC, is noted additionally.

FOR REVIEW ONLY - NOT FOR CONSTRUCTION

Scale	**A 12**
Date May 08, 2024	
Drawn by BK CG	
Proj. No. 2022- 12	

IF NOT 50 mm ADJUST SCALES
50 mm

SCALE(S) SHOWN ARE INTENDED FOR ANSI D (22X34) SIZE DRAWINGS, TABLOID (11X17) SIZE DRAWINGS ARE 1/2 OF SCALE(S) SHOWN UNLESS NOTED OTHERWISE

GENERAL NOTES:

1. THE GENERAL NOTES AND STRUCTURAL STANDARD DETAILS ARE GENERAL AND APPLY TO THE ENTIRE PROJECT EXCEPT WHERE THERE ARE SPECIFIC INDICATIONS TO THE CONTRARY.

2. DESIGN AND CONSTRUCTION TO BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL BUILDING CODE AT TIME OF TENDER. THIS CODE TO GOVERN EXCEPT WHERE OTHER APPLICABLE CODES OR THE FOLLOWING NOTES ARE MORE RESTRICTIVE.

3. STRUCTURAL DIMENSIONS CONTROLLED BY OR RELATED TO PROCESS, MECHANICAL OR ELECTRICAL EQUIPMENT TO BE VERIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION.

4. PROCESS, MECHANICAL, HVAC AND ELECTRICAL EQUIPMENT SUPPORTS, PADS, CURBS, ANCHORAGE'S, OPENINGS, RECESSES AND REVEALS REQUIRED BY OTHER CONTRACT DRAWINGS TO BE COORDINATED AND VERIFIED FOR SIZE AND LOCATION PRIOR TO COMMENCING WORK.

5. PROVIDE ALL REQUIRED TEMPORARY BEARING AND SUPPORTS FOR ALL SLABS, BEAMS, WALLS AND FRAMES. TEMPORARY BRACING AND SUPPORTS MUST BE CAPABLE OF TRANSFERRING ALL IMPOSED CONSTRUCTION AND DEAD LOADS TO THE STRUCTURE WITHOUT EXCEEDING SPECIFIED DESIGN LOADS.

6. OPENINGS LARGER THAN 100mm OR GROUPS OF OPENINGS NOT SHOWN ON STRUCTURAL DRAWINGS ARE TO BE BROUGHT TO THE ENGINEERS ATTENTION AND TO BE REVIEWED PRIOR TO WORK COMMENCING.

7. NO SLEEVES, DUCTS, PIPES OR OTHER OPENINGS SHALL PASS THROUGH JOISTS, BEAMS OR COLUMNS, EXCEPT WHERE DETAILED ON THE DRAWINGS.

8. BUILDING CONTROL LINES, REFERENCE LINES, GRID LINES AND TEMPORARY BENCH MARKS TO BE CLEARLY IDENTIFIED AND MAINTAINED DURING THE ENTIRE CONSTRUCTION PERIOD.

9. THIS SET OF DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE SPECIFICATIONS AND CIVIL, MECHANICAL, ELECTRICAL AND HVAC DRAWINGS. ANY DISCREPANCIES NOTED SHALL BE REPORTED IMMEDIATELY FOR CLARIFICATION.

10. ALL DIMENSIONS, ELEVATIONS AND SLOPES SHALL BE CHECKED AND VERIFIED WITH THE DRAWINGS & EXISTING SITE CONDITIONS PRIOR TO COMMENCING CONSTRUCTION AND MATERIAL FABRICATION. DO NOT SCALE DRAWINGS.

11. CONFIRM THE LOCATION OF ALL SUB-GRADE SERVICES PRIOR TO COMMENCING SITE WORK.

12. DRAWINGS SHOW COMPLETE STRUCTURES ONLY. CONTRACTOR TO DESIGN AND PROVIDE TEMPORARY FALSEWORK AND BRACING FOR CONSTRUCTION LOADING CONDITIONS. CONTRACTOR IS RESPONSIBLE FOR SAFETY ON JOB SITE.

19. SHOP DRAWINGS AS REQ'D SHALL BE SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE YUKON.

20.ALL CODE REFERENCES ARE TO THE LATEST EDITIONS UNO.

PROGRESS PHOTOS:

1. REGULAR PROGRESS PHOTOS ARE TO BE TAKEN. 10MPIX. MIN. TAKEN END OF WEEK FRIDAYS;
2. ADDITIONAL PHOTOS ARE TO BE TAKE AS FOLLOWS AND PLACED IN FOLDERS TO INDICATE WHAT THE PHOTOS ARE ABOUT. USE A TAPE MEASURE WHERE POSSIBLE TO PROVIDE SCALE.

a. SUBGRADE PREPARED
b. BASECOURSE FINISHED
c. INSULATION
d. DAMP PROOF MEMBRANE
e. FORMWORK AND REINFORCEMENT
f. BASE SLABCOMPLETE
g. PIT WALLS AND SLAB CAST
h. LIFT WALLS.
i. MAIN FLOOR INFILL PREPARTION, FOUR SIDES, INFILL TRUSSES AND DECKING.
j. BLOCKING, CLEATS, TIE INS, PLY TO WALLS.

3. PHOTOS ARE TO BE INCORPORATED INTO O&M MANUAL

DESIGN DATA:

1. DESIGN LIVE LOADS (SERVICE):
   NORMAL CATEGORY OF IMPORTANCE
   - GROUND SNOW — SS = 2.9 KPa +10%
   - RAIN LOAD — Sr = 0.1 kPa
   - STEP SNOW LOAD — N/A
   - BASEMENT — 10 KN/m²
   - MAIN FLOOR — 4.8 KN/m², OR 2.4 KN/m² AND 2 KN/m² PARTITIONS
   - SECOND FLOOR — 2.4 KN/m² AND 1 KN/m² PARTITIONS
   - ROOF — 1 KN/m²

2. WIND LOAD:
   - 1:50 YR RETURN — q50 = 0.31 kPa

3. SEISMIC LOADING:
   - SITE CLASS — D;
     MADE GROUND TO DEPTH FROM DREDGED RIVER BED
   - Sa (0.2) — 0.334g
   - Sa (0.5) — 0.258g
   - Sa (1.0) — 0.170g
   - Sa (2.0) — 0.094g
   - Sa (5.0) — 0.033g
   - Sa (10.0) — 0.0012g
   - PGA — 0.154g

4. DEAD LOAD: MAKE NO ALLOWANCE FOR SOLAR PV
   A. ROOF LOADS dl ASSUME 0.6 KN/m2
   B. WALL LOADS 0.5 KN/m2

WOOD FRAMING:

1. WOOD FRAMING CONSTRUCTION SHALL CONFORM TO CSA 086. AND PARTS 9 OF THE NBC.

2. WOOD FRAMING MATERIAL (UNLESS NOTED OTHERWISE):

   INTERIOR NON LOAD BEARING PARTITION WALLS:
   - KILN DRIED: S-P-F STUD GRADE OR BETTER. LOCAL NORTHERN LUMBER AIR DRIED.

   LOAD BEARING STUDS AND PLY COLUMNS/RAFTERS/LINTELS/JOISTS:
   - KILN DRIED: S-P-F #2 VISUAL GRADE OR BETTER;

3. CONNECT ALL NON-LOAD BEARING PARTITIONS TO THE STRUCTURE ABOVE. CONNECTION TO ALLOW FOR VERTICAL DEFLECTION OF THE ROOF STRUCTURE.

4. ALL LUMBER IN DIRECT CONTACT WITH CONCRETE SHALL BE SEPARATED BY 45LB. BUILDING PAPER OR EQUAL.

5. PLYWOOD NAILING REQUIREMENTS (UNLESS NOTED OTHERWISE):
   WALL SHEATHING IS TO BE UNBLOCKED: USE 65*2.77MM NAILS
   - @ PANEL EDGES ; EAVE WALLS; 100MM C/C. GABLE 150MM C/C; DOOR INFILL 75MM C/C
   - @ INTERMEDIATE FRAMING MEMBERS; EAVES WALLS 200MM C/C.: GABLE WALL 300MM C/C; DOOR INFILL 100MM C/C

   ROOF SHEATHING IS TO BE UNBLOCKED: USE 65*2.77MM NAILS; H CLIPS OR T&G
   - @ PANEL EDGES — 150MM O.C.
   - @ INTERMEDIATE FRAMING MEMBERS — 300MM O.C.

6. PLYWOOD; USE EXTERNAL QUALITY DFP 12MM FOR ROOF. OSB; USE 11MM THK FOR WALLS

7. REFER TO PLANS, SECTIONS AND DETAILS FOR ADDITIONAL REQUIREMENTS. IF UNSURE OF DETAIL ASK THE ENGINEER.

8. REFER TO JOIST SUPPLIERS FOR WEB STIFFENERS AND JOIST CRUSH BLOCKING.

9. ENSURE ENGINEER IS GIVEN OPPORTUNITY TO INSPECT ALL WORK PRIOR TO COVER UP WITH FOLLOW ON FINISHES.

10. ANY PWF CUT OR NOTCHED TO BE DOUBLE COATED IN WOOD PRESERVATIVE TO MATCH PRESSURE TREATMENT COLOUR.

11. LADDER TRUSSES TO BE TIED DOWN ON GABLE TRUSSES WITH MITEK LTW12 AT 1200 C/C

STRUCTURAL COMPOSITE LUMBER LVL

1. LVL TIMBER TO CSA STANDARD 086 AND REFERENCED DOCUMENTS.

2. LVL MEMBERS SHALL BE THE FOLLOWING STRESS GRADE:

   BEAMS: 2.0E SCL EQUIVALENT, (REFER TIMBER DESIGN MANUAL); INTERNAL QUALITY. NO FINISH. 15% MAX. MOISTURE CONTENT.

3. SUBMIT SHOP DRAWINGS SHOWING ALL MEMBER LAYOUTS, DETAILS AND MATERIAL SPECIFICATIONS TO THE ENGINEER FOR REVIEW PRIOR TO FABRICATION. SHOP DRAWINGS TO INCLUDE A CERTIFICATE OF CONFORMANCE TO MANUFACTURING STANDARDS.

4. ALL MEMBERS TO HAVE AUTHORIZED LABEL AND MARK NUMBER.

5. USE SPACER BLOCKS TO KEEP LVLS OFF THE GROUND DURING STORAGE. KEEP WRAPPED DURING CONSTRUCTION. PROVIDE HOLES ON UNDERSIDE OF WRAPPING TO MINIMIZE THE BUILD-UP OF CONDENSATION.

EXCAVATION & BACKFILL:

1. REFER TO GEOTECHNICAL REPORT AND FOLLOW UP MEMO PREPARED BY TETRA TECH DATED 7 DECEMBER, 2021, FILE 704-ENG.WARC04126-01 , FOR DETAILS OF EXISTING GROUND CONDITIONS AND GEOTECHNICAL REQUIREMENTS. UNFACTORED ULS AND SLS CAPACITIES FOR EDGE THICKENINGS 400 KN/m2 AND 400 KN/m2. SEISMIC SITE CLASS D; MONOLITHIC SLAB ON GRADES; MODULUS OF SUBGRADE REACTION 0.016 N/MM2/M

2. ENSURE THE BOTTOM OF SUBGRADE EXCAVATION IS LEVELED AND FREE OF ALL LOOSE, SOFT OR ORGANIC MATTER AND IS PROTECTED AND KEPT DRY UNTIL THE CONCRETE IS PLACED. THOROUGHLY COMPACT THE BASE OF THE EXCAVATION PRIOR TO FILL / FOUNDATION CONSTRUCTION, TO DENSIFY THE SOIL LOOSENED BY THE EXCAVATION EQUIPMENT. APPLY NON WOVEN GEOTEXTILE TO EXISTING SUBGRADE PRIOR TO APPLYING BASECOURSE MATERIAL

4. BACKFILLING AROUND BUILDING FOUNDATIONS MAY BE CARRIED OUT AFTER FOUR (4) DAYS IF BACKFILL LAYERS ARE PLACED ALTERNATELY ON BOTH SIDES OF INSTALLED WORK TO EQUALIZE LOADING.

5. THE GEOTECHNICAL ENGINEER SHALL BE NOTIFIED A MINIMUM OF 48 HRS. BEFORE COMMENCEMENT OF EXCAVATION. SOIL CONDITIONS SHALL BE INSPECTED BY THE GEOTECHNICAL ENGINEER DURING EXCAVATION AND PRIOR TO CONSTRUCTION OF FORMWORK FOR FOUNDATIONS.

6. BASECOURSE BACK FILL WITH CRUSH IN ACCORDANCE WITH THE DRAWINGS AND TO THE COMPOSITION, LAYER THICKNESS AND COMPACTION REQUIREMENTS DESCRIBED IN THE GEOTECH REPORT.

7. SAND BLIND SLAB AREAS IF BASECOURSE HAS MINIMAL FINES. COMPACT WITH PLATE COMPACTOR PRIOR TO PLACING FORMWORK, INSULATION, POLYETHYLENE DPM AND REINFORCEMENT. DO NOT DISTURB SURFACE PRIOR TO CASTING.

8. SUBMISSIONS; FILL GRADING ANALYSIS TO SHOW COMPLIANCE WITH GEOTECH REPORT GRADING ENVELOPE; COMPACTION AND RECOMPACTION TEST RESULTS. DEPTH TO COMMENCING SURFACE, (AS A MARKED UP FOUNDATION PLAN). SIGN OFF OF COMMENCING SURFACE.

REINFORCEMENT:

1. REINFORCING STEEL: NEW DEFORMED BARS TO CSA G30.18, "BILLET" STEEL BARS FOR CONCRETE REINFORCEMENT, WITH MIN. YIELD STRENGTH OF 400MPa. WELDED WIRE FABRIC CONFORM TO CSA G30.5 WITH MIN. YIELD STRENGTH OF 450MPa. PLACE REBAR TO CSA-A23.1. STRAIGHT BARS CAN BE 'MST-BAR' FRP REINFORCEMENT OF SIMILAR DIAMETER.

2. PROVIDE CLEAR CONCRETE COVER OVER REBAR AS FOLLOWS U.N.O.:

   CONCRETE THICKENINGS AND SLAB STRIPS AND FOUNDATIONS CAST ON BASECOURSE — 75mm

   CONCRETE THICKENINGS AND SLAB STRIPS AND FOUNDATIONS CAST ON INSULATION — 40mm

   FORMED SURFACES — 40mm

   SLAB AND THICKENINGS — 40mm COVER

   ONLY USE CHAIRS THAT WILL NOT PUNCTURE THE POLYSTYRENE OR POLYETHYLENE. PLACE CHAIRS EVERY 3 BARS OR 4 BARS IN EACH DIRECTION IF CARRY BARS ARE USED. IF REINFORCEMENT SAGS DECREASE SUPPORT CENTRES ACCORDINGLY.

3. REBAR SPLICE LENGTHS (UNLESS NOTED OTHERWISE):
   LENGTHS SHOWN ARE IN mm

BAR SIZE	TENSION SPLICES	
	NORMAL	TOP BARS
10M	350	450
15M	525	700
20M	700	900
25M	1100	1400
30M	1300	1700

TOP BAR SPLICE LENGTHS TO BE USED WHEN HORIZ. SPLICE BARS ARE PLACED SUCH THAT THERE IS MORE THAN 300 OF CONCRETE POURED BELOW THE BAR.

4. LAP WIRE MESH REINFORCING 300MM.

5. DOWELS SHALL BE PLACED BEFORE CONCRETE IS POURED. TEMPLATES SHALL BE USED TO ENSURE CORRECT PLACEMENT OF DOWELS. DOWELS TO MATCH VERTICAL BARS.

6. BEFORE PLACING CONCRETE, ENSURE THAT THE REINFORCING STEEL AND FORMS ARE CLEAN, FREE OF LOOSE SCALE, DIRT AND OTHER FOREIGN MATERIALS WHICH WOULD REDUCE THE BOND BETWEEN THE REINFORCING STEEL AND THE CONCRETE.

7. UNLESS OTHERWISE NOTED, EDGE OF ALL SLABS SHALL HAVE 2-15M CONT. LAPPED 600

8. UNLESS OTHERWISE NOTED, ALL OPENINGS IN SLAB SHALL HAVE 2-15M BARS PARALLEL TO ALL EDGES EXTENDING BEYOND CORNERS 600MM PLUS 2M LONG 15M BARS AT 45° TO SLAB BARS.

9. PLACE REINFORCING BARS SYMMETRICALLY OVER SUPPORTS AND SYMMETRICALLY IN SPANS UNLESS NOTED OTHERWISE.

10. UNLESS OTHERWISE NOTED, SLAB REINFORCING SHALL NOT BE CUT AT PLUMBING OR OTHER OPENINGS. SPREAD REINFORCING AROUND OPENINGS.

11. PROVIDE SUFFICIENT CHAIRS AND SUPPORT BARS TO MAINTAIN CONCRETE COVER AS SPECIFIED AGAINST A HEAVY CREW OF CONCRETE PLACERS JUMPING ALL OVER IT AND CONCRETE PUMP LINES, ETC.

12. NOTIFY THE STRUCTURAL ENGINEER 48 HOURS IN ADVANCE FOR INSPECTION OF REINFORCING BEFORE EACH CONCRETE POUR.

HOLD DOWN REFERENCES:

HD1; MITEK HTT16; 18 NAILS 75MM COMMON NAILS IN 2 PLY STUDS, GALV M16 HD BOLTS 200 PEN TENSION REQUIRED 16.9 KN

HD2; MITEK HTT45; 26 NAILS 75MM COMMON NAILS IN 2 PLY STUDS, BOLT AS ABOVE, 28 KN TENSION REQUIRED

HD3; TWO SETS OF MITEK TD7; 3 M22 BOLTS IN 2 PLY STUDS, 1 GALV M28 BOLT 300 PEN, TOTAL TENSION REQUIRED 35 KN

HD4; MITEK LSTI49; 32 NAILS, 13KN TENSION REQUIRED.

DRAWING LIST

PAGE #	SHEET #	SHEET NAME	SHEET DISCIPLINE	Sheet Revision Description
1	S-100	NOTES	STRUCTURAL	80%
2	S-101	BASEMENT GENERAL ARRANGEMENT	STRUCTURAL	80%
3	S-102	MAIN FLOOR PLAN	STRUCTURAL	80%
4	S-103	SECOND FLOOR	STRUCTURAL	80%
5	S-104	MAIN FLOOR EQUIPMENT LEVEL	STRUCTURAL	80%
6	S-106	LOWER ROOF LEVEL	STRUCTURAL	80%
7	S-301	SECTION SHEET 1	STRUCTURAL	80%
8	S-302	SECTION SHEET 2	STRUCTURAL	80%
9	S-303	SECTION SHEET 3	STRUCTURAL	80%
10	S-501	RC DETAILS	STRUCTURAL	80%
11	S-502	DETAILS SHEET 1	STRUCTURAL	80%
12	S-701	SKETCH	STRUCTURAL	80%

CONCRETE:

1. PERFORM CONCRETING WORK TO CAN/CSA A23.1.

2. TEST CONCRETE IN ACCORDANCE WITH CAN/CSA A23.2.

3. CONCRETE MIXES SHALL BE PROPORTIONED IN ACCORDANCE WITH CSA-A23.2-TO MEET THE FOLLOWING REQUIREMENTS:

LOCATION	28 DAY COMPRESSIVE STRENGTH	CEMENT TYPE	AIR %	FLYASH %	EXP. CLASS
- - INTERIOR CONCRETE. -	30MPa	GUL	0	20-40	N

- WATER/CEMENT RATIO FOR EXPOSURE CLASSES AS PER TABLES 2 CSA-A23.1
- LOWER SLUMP MAY BE REQUIRED FOR BENCHING
- WHERE SPECIFIED STRENGTH EXCEEDS THOSE IMPLIED BY EXPOSURE CLASS, SPECIFIED STRENGTH GOVERNS.
- ALL CONCRETE TO BE NORMAL WEIGHT 23.5 kN/m³
- MIX DESIGNS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW

4. STRENGTH OF CONCRETE TO BE DETERMINED BY FIELD-CURED CYLINDERS. TEST EACH CONCRETE DELIVERY TO SITE; CYLINDER BREAK TESTS AT 7, 28 DAYS AND KEEP A SPARE. IF A DAYS CONCRETE POUR EXCEEDS 25M3 THEN TAKE ADDITIONAL 3 CYLINDERS FOR EACH 25M3 AND TEST AS ABOVE.

5. TEMPORARY FALSEWORK, BRACING AND SHORING SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE TERRITORY OF YUKON.

6. LOCATIONS & DETAILS OF CONSTRUCTION JOINTS NOT SHOWN ON DRAWINGS ARE TO SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.

7. ALL EXPOSED CONCRETE CORNERS TO HAVE 20X20MM CHAMFERS EXCEPT FOR EDGES AND STUB COLUMN EDGES NEXT TO JOINTS.

8. CURING; CURE FOR 3 DAYS KEEPING THE SLAB WET BENEATH 6 MIL POLY OR USING BRUSH OR ROLLER APPLIED CURING MEMBRANE TO ALL SURFACES.

9. CONCRETE SEALANT; SEAL ALL HORIZONTAL CONCRETE SURFACES WITH PROPRIETARY CLEAR SEALANT COMPATIBLE WITH CURING MEMBRANE, IF USED.

10. SUBMISSIONS; MIX DESIGN; CURING MEMBRANE; SEALANT; BREAK RESULTS; COLD WEATHER CONCRETING.

NOTATIONS & ABBREVIATIONS:

ABR.	-	ALTERNATE BAR REVERSE
AGG.	-	AGGREGATE
ALUM.	-	ALUMINUM
BLL.	-	BOTTOM LOWER LAYER
BOTT.	-	BOTTOM
BUL.	-	BOTTOM UPPER LAYER
CONT.	-	CONTINUOUS
CSA	-	CANADIAN STANDARDS ASSOCIATION
C/C	-	CENTRE TO CENTRE
CL	-	CLEAR
C/W	-	COMPLETE WITH
DIA.	-	DIAMETER
DWL(S)	-	DOWEL(S)
EF.	-	EACH FACE
ENG.	-	ENGINEERING (ENGINEER)
EW.	-	EACH WAY
FF.	-	FAR FACE
FRP	-	FIBRE REINFORCED PLASTIC
EXG	-	EXISTING
EXG	-	EXISTING
HORIZ.	-	HORIZONTAL
IL.	-	INSIDE LAYER
LG.	-	LONG
MAX.	-	MAXIMUM
MC	-	MASS CONCRETE
MIN.	-	MINIMUM
MID.	-	MIDDLE
NF.	-	NEAR FACE
NLT.	-	NAIL LAMINATED TIMBER
OL.	-	OUTSIDE LAYER
O/C	-	ON CENTRE
REQD.	-	REQUIRED
RC	-	REINFORCED CONCRETE
SAN.	-	SANITARY
S.O.P.	-	SETTING OUT POINT
STAG.	-	STAGGERED
STD.	-	STANDARD
THK	-	THICK
T & B.	-	TOP AND BOTTOM
TLL.	-	TOP LOWER LAYER
TYP.	-	TYPICAL
TUL.	-	TOP UPPER LAYER
U.N.O.	-	UNLESS NOTED OTHERWISE
VERT.	-	VERTICAL

QUANTITIES:

INFILL SLAB QUANTITIES

COUNT	CATEGORY	TYPE	VOLUME	PLAN AREA
1	Structural Foundations	150mm THK RC FLOOR SLAB	2.03 m³	14 m²
1	Structural Foundations	250mm THK LIFT PIT BASE	1.37 m³	5 m²
			3.41 m³	

LIFT PIT WALLS

COUNT	TYPE	LENGTH	AREA	THICKNESS	AREA	VOLUME
1	152 mm PIT WAL	2.1 m	1 m²	152 mm	0.6 m²	0.09 m³
1	203mm PIT WALL	2.3 m	1 m²	203 mm	0.7 m²	0.14 m³
1	203mm PIT WALL	2.3 m	1 m²	203 mm	0.6 m²	0.13 m³
1	203mm PIT WALL	2.1 m	1 m²	203 mm	0.5 m²	0.11 m³
					2.4 m²	0.46 m³

NOTES; THE QUANTITIES ARE ROUGH, BUT THEY GIVE AN INDICATION OF THE CONCRETE QUANTITIES I.E IF IT IS MODELLED IN 3D, IT SHOULD BE QUANTIFIED. CONTRACTOR IS RESPONSIBLE TO TAKE-OFFS

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B	2024MAY04	R ANNETT	R ANNETT	ISSUED FOR 80%
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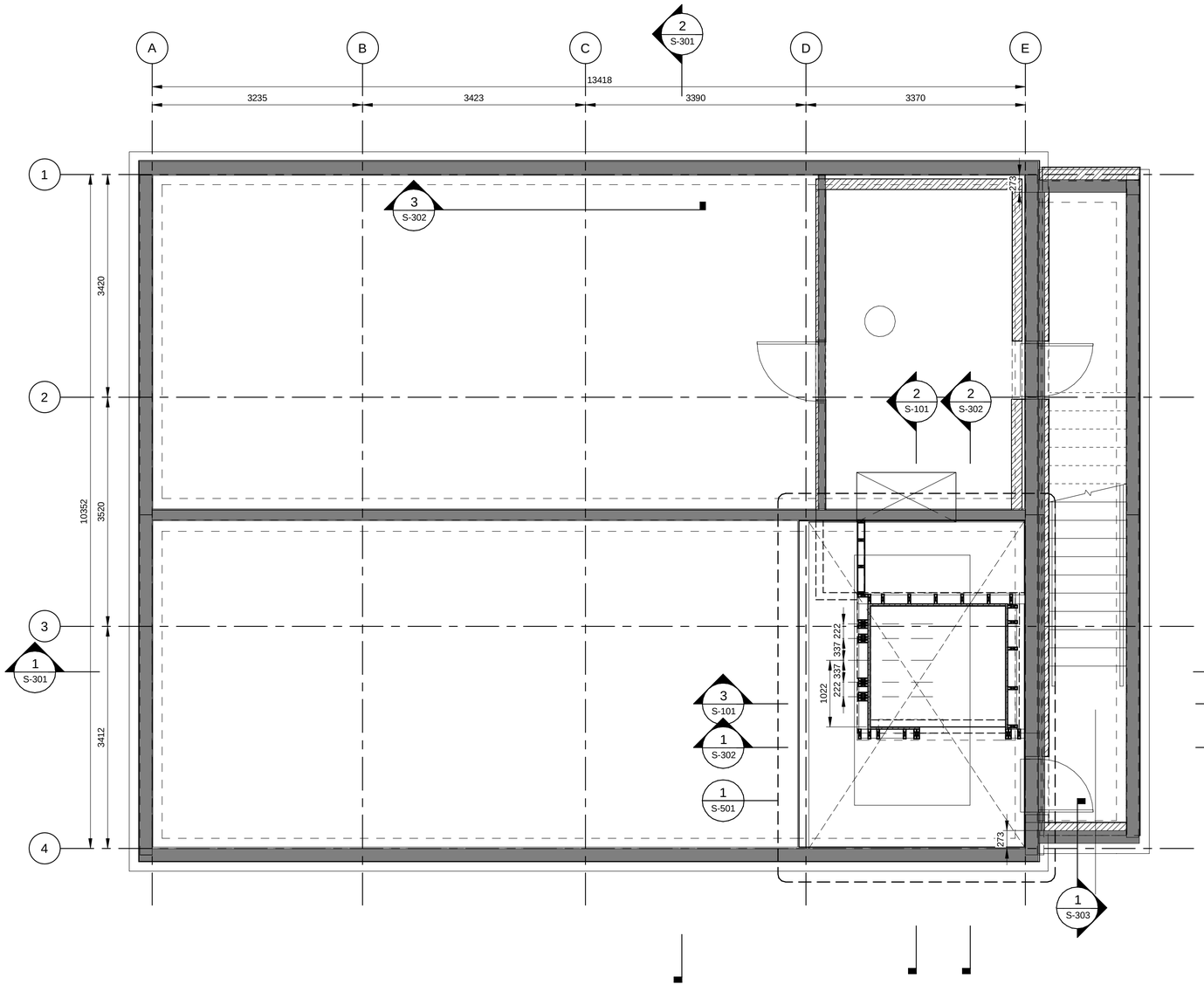
SCALE: AS SHOWN

STRUCTURAL
NOTES

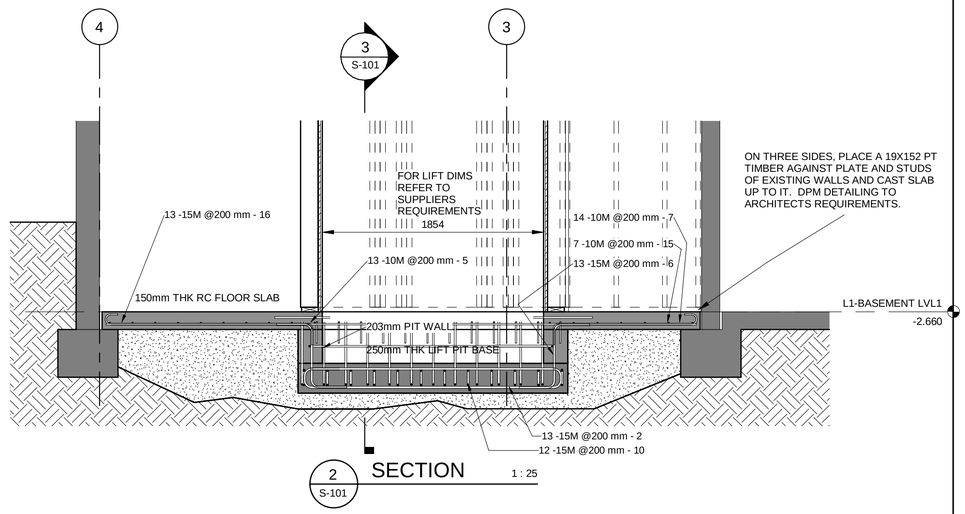
DRAWING	REVISION	SHEET
2924-00S-100	B	1

IF NOT 50 mm ADJUST SCALES
50 mm

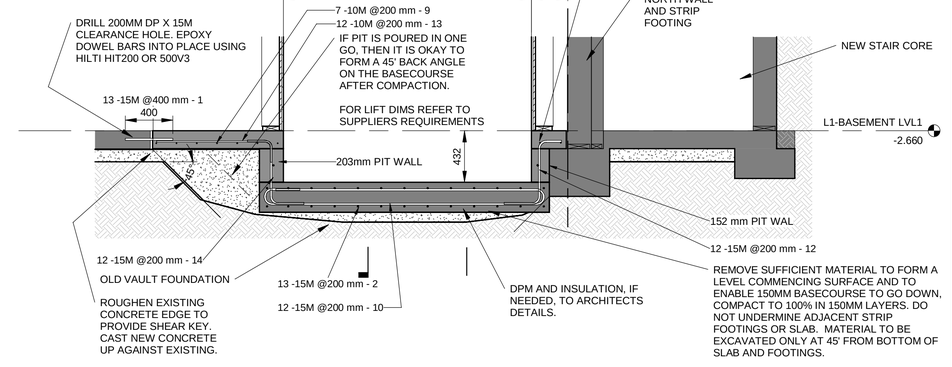
SCALE(S) SHOWN ARE INTENDED FOR ANSI D (22X34) SIZE DRAWINGS, TABLOID (11X17) SIZE DRAWINGS ARE 1/2 OF SCALE(S) SHOWN UNLESS NOTED OTHERWISE



1 S-101 PLAN 1 : 40
L1-BASEMENT LVL1



2 S-101 SECTION 1 : 25



3 S-101 SECTION 1 : 25

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SCALE: AS SHOWN

STRUCTURAL
BASEMENT GENERAL ARRANGEMENT

DRAWING	REVISION	SHEET
2924-00S-101	B	2

IF NOT 50 mm ADJUST SCALES
50 mm

SCALE(S) SHOWN ARE INTENDED FOR ANSI D (22X34) SIZE DRAWINGS, TABLOID (11X17) SIZE DRAWINGS ARE 1/2 OF SCALE(S) SHOWN UNLESS NOTED OTHERWISE

NEW DOORWAY OPENING; INSTALL NEW MAIN STUDS UP TO SECOND FLOOR. INSTALL NEW JACK STUDS. LINTEL TO BE AN INSULATION FILLED BOX BEAM MADE FROM 38X 140 FLANGES AND 38X186 WEBS. NAILS AT 100 C/C TO JOINT WEBS AND FLANGES; TYPICAL. EXISTING OPENING MAY BE PRESENT; NOTIFY ENGINEER.

REMOVE AND REPLACE EXISTING PLY AND REUSE UPSTAIRS. INSTALL NEW 16 mm DFP PLY; NAIL AT 50 mm C/C ON EDGES AND 150 mm INTERNALLY. SEE NOTES BELOW FOR GRID 4.

REMOVE AND REUSE PLY. RENAIL 12 mm DFP PLY AT 75 mm C/C ON EDGES AND 150 mm C/C INTERNALLY. SEE NOTES FOR SEQUENCING ON GRID A

38X89 STUDS AT 407 C/C WITH DELFECTION HEAD CAPABLE OF ACCOMMODATING 25 mm OF VERTICAL MOVEMENT

INSTALL i JOIST TRIMMER AND HANGERS TO TRIM EXISTING JOISTS TO NEW VERTICAL DUCT.

INSTALL TRIMMER TO SERVICE DUCT. THERE IS AN EXISTING INFILLED TRIM HOLE BUT LOCATION RELATIVE TO THIS ONE UNKNOWN

INFILL FLOOR

STUDS BELOW ARE TO LINE UP WITH I JOISTS. STUDS ABOVE ARE TO LINE UP WITH SECOND FLOOR JOISTS.

REMOVE PLANKS TO INSIDE FACE OF WALL UP TO CEILING LEVEL AND REPLACE WITH DFP PLYWOOD AS NOTED ELSEWHERE

BLOCK BETWEEN JOISTS FULL LENGTH OF SPINE WALL. SECURE TO PLATE WITH MITEK AC7 EVERY OTHER BLOCK.

ALLOW FOR LOCALLY REMOVING ROTTEN PLY; 4m²,APPROXIMATELY 4 LOCATIONS; MINIMUM 2 SPAN SECTION LENGTH X 610mm WIDTH

AT THE END OF THE 4 PLY PLATE TO THE NORTH STAIR WALL INSTALL 4 PLY STRUT OVER STAIR CORE AND INTO THE RIM BEAM SYSTEM TO THE SOUTH STAIR WALL. SUPPORT WITH HD88 JOIST HANGERS BY MITEK.

REMOVE AND REPLACE EXISTING PLY AND REUSE UPSTAIRS. INSTALL NEW 19 mm DFP PLY; NAIL AT 50 mm C/C ON EDGES AND 100 mm INTERNALLY. USE 83 mm LONG NAILS. WORK IN SECTIONS, 1/2 A WALL LENGTH AT A TIME; REMOVE, PREPARE, REPAIR, ADD HOLD DOWNS INSULATE AND APPLY NEW PLY. REPEAT.

ALLOW FOR SISTERING 10 NUMBER I JOISTS: TO BE IDENTIFIED DURING CONSTRUCTION. LEAVE 25 mm GAP TO EXISTING JOIST. ENSURE THE OLD JOIST AND THE SIDE OF THE NEW JOIST THAT WILL BE IMPOSSIBLE TO ACCESS ARE TREATED PRIOR TO INSTALLATION.

REMOVE EXISTING PLY TO WALLS AND REUSE UPSTAIRS. INSTALL NEW 16 mm DFP PLY; NAIL AT 50 mm C/C ON EDGES AND 150 mm INTERNALLY. WORK IN SECTIONS, 1/2 A WALL LENGTH AT A TIME; REMOVE, PREPARE, REPAIR, ADD HOLD DOWNS INSULATE AND APPLY NEW PLY. REPEAT.

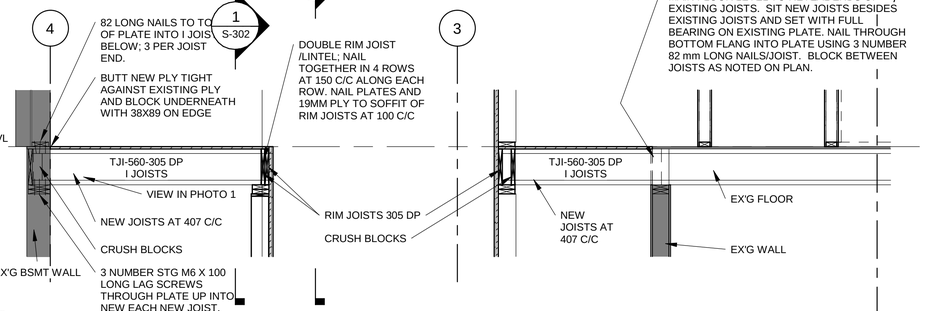
DOUBLE UP JOISTS UNDER PARTITION WALL

THERE ARE SECTION OF I JOIST ALONG EXISTING WALL SUPPORTING THE MAIN FLOOR WALLS. LOCATE NEW JOISTS TO MISS THEM. INSTALL CRUSH BLOCK BEFORE INSTALLING.

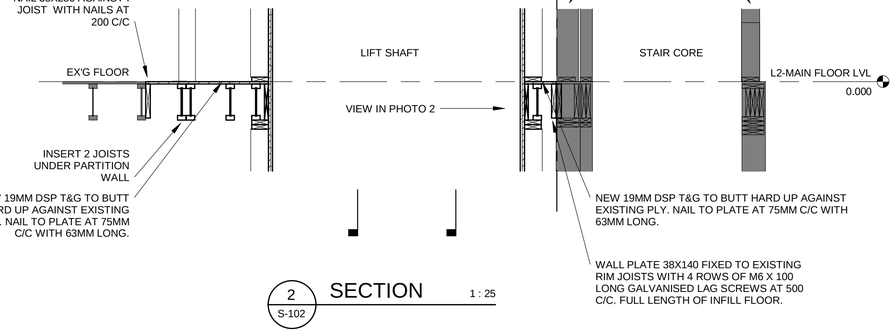
INFILL FLOOR; TJI506 X 305 DP JOISTS AT 407 C/C GENERALLY, WITH 19MM DSP T&G PLY GLUED NAILED WITH 63MM LONG NAILS AT 100 C/C. SEE ALSO SECTION DETAILS FOR ADDITIONAL REQUIREMENTS.

1 S-102 PLAN 1 : 40
L2-MAIN FLOOR LVL

PHOTO 1



3 S-102 SECTION 1 : 25



2 S-102 SECTION 1 : 25

PHOTO 2

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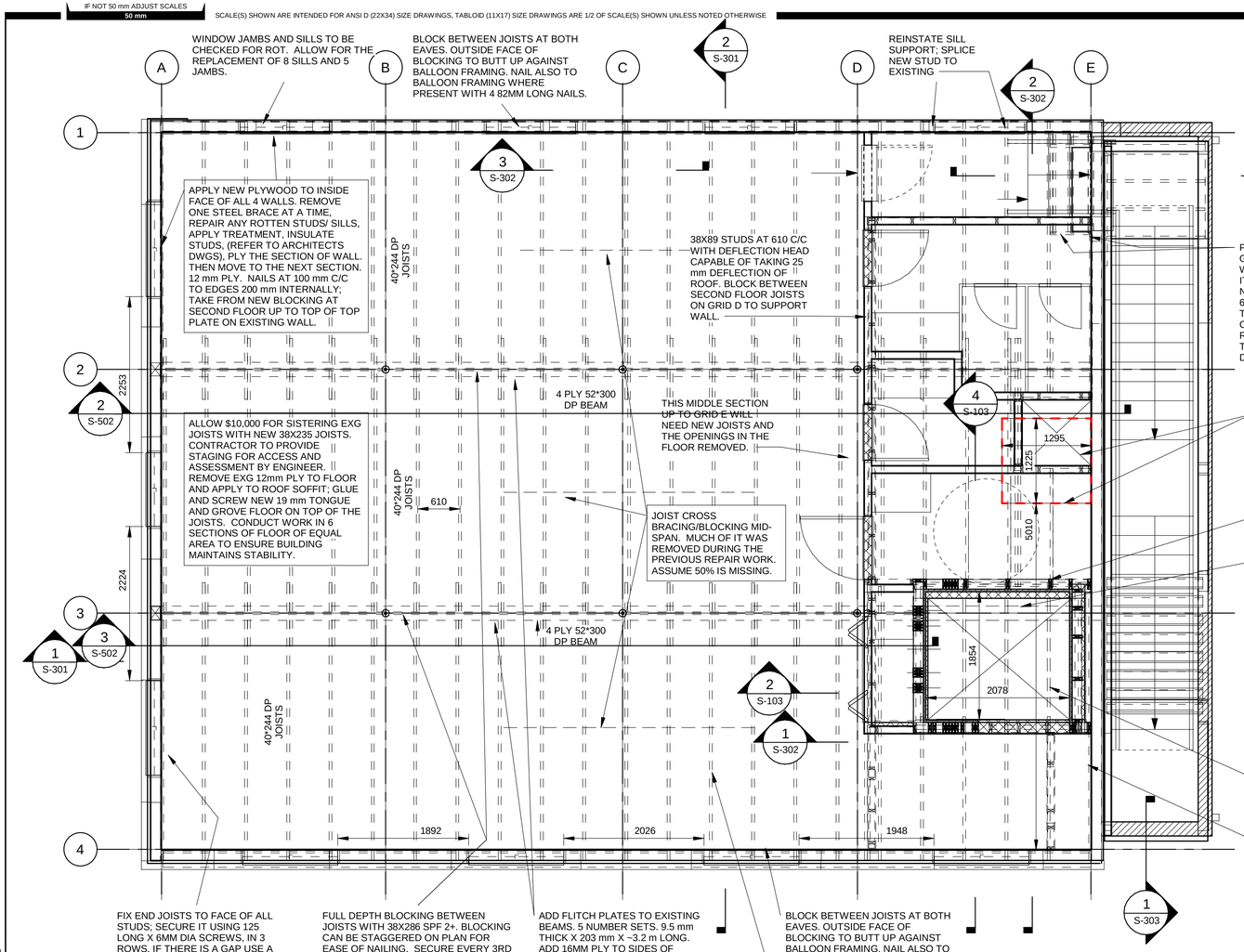
SCALE: AS SHOWN

STRUCTURAL
MAIN FLOOR PLAN

DRAWING	REVISION	SHEET
2924-00S-102	B	3

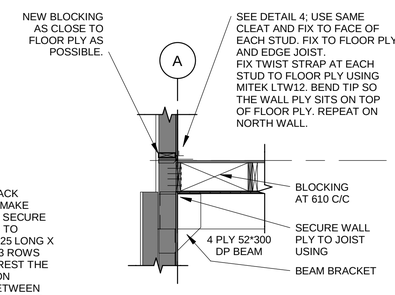
IF NOT 50 mm ADJUST SCALES
50 mm

SCALE(S) SHOWN ARE INTENDED FOR ANSI D (22X34) SIZE DRAWINGS, TABLOID (11X17) SIZE DRAWINGS ARE 1/2 OF SCALE(S) SHOWN UNLESS NOTED OTHERWISE



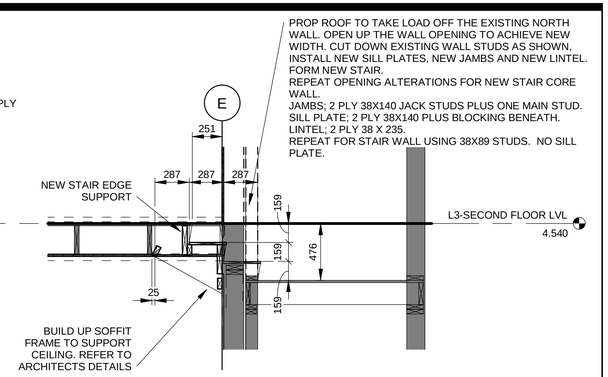
1 PLAN 1 : 40 (S-103)

RELEVELLING SECOND FLOOR: ALLOW FOR FINGER PACKS TO BE PLACED UNDER THE PLATE WASHERS ABOVE THE BOTTOM CHORD OF THE ROOF TRUSSES; FINGER PACKS TO BE AT LEAST AS BIG AS THE CURRENT PLATE WASHERS. RELEVEL THE FLOOR AFTER THE MAIN FLOOR IS REINSTATED AND BEFORE THE FLITCH PLATES ARE ATTACHED. THE FLOOR AT HANGER ROD LOCATIONS ARE TO BE RESET TO BE WITHIN +/- 5MM.

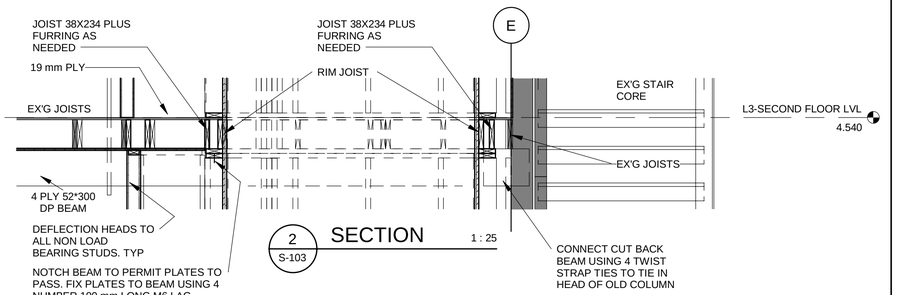


5 DETAIL 1 : 25 (S-301)

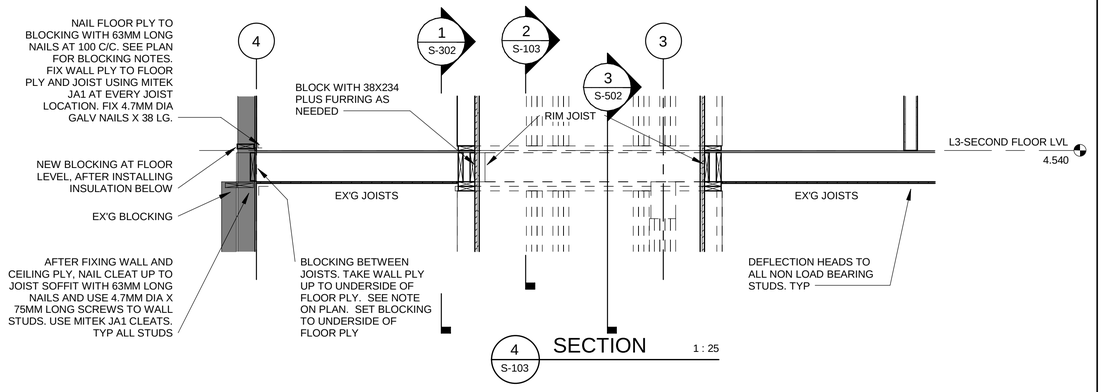
USE DETAIL ON GRIDS A AND E



3 SECTION 1 : 25 (S-103)



2 SECTION 1 : 25 (S-103)



4 SECTION 1 : 25 (S-103)

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SCALE: AS SHOWN

STRUCTURAL
SECOND FLOOR

DRAWING	REVISION	SHEET
2924-00S-103	B	4

IF NOT 50 mm ADJUST SCALES
50 mm

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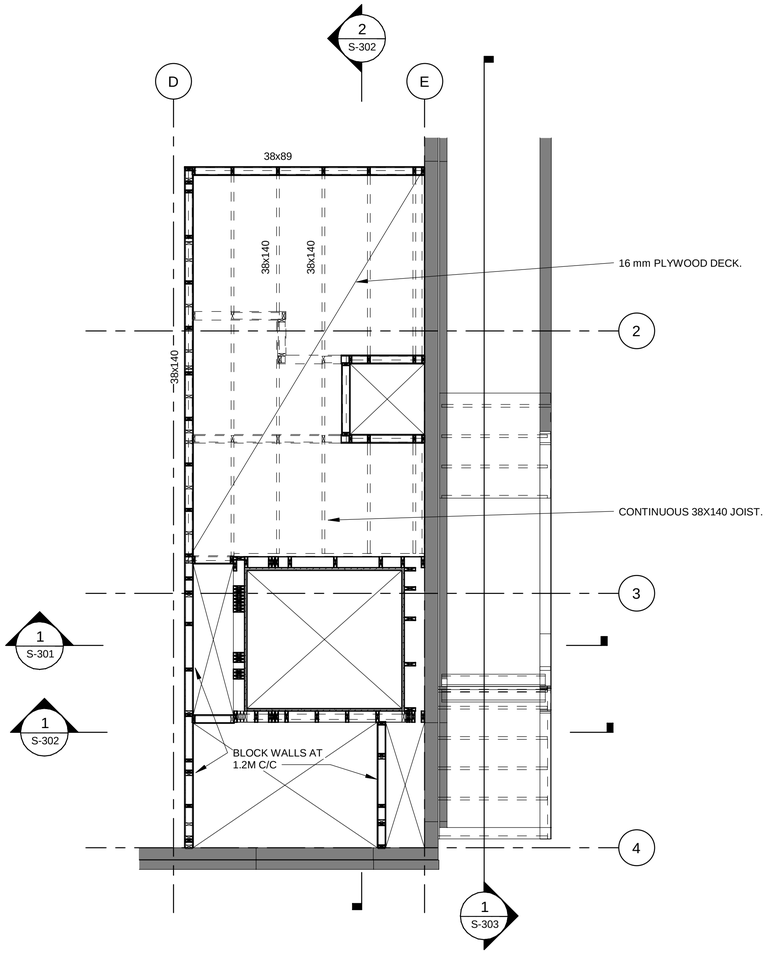

1 S-301 PLAN 1 : 40

L2A-EQUIPMENT PLATFORM

SAVE DATE: 2024-05-6 2:52:25 PM
FILE PATH: Q:\2022\2022-2924-00_Struct\Revit\dwg-RVT\24-2023-2924-Dawson CBC Bdg-PHASE 2.rvt

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SCALE: AS SHOWN

STRUCTURAL
MAIN FLOOR EQUIPMENT LEVEL

DRAWING	REVISION	SHEET
2924-00S-104	B	5

IF NOT 50 mm ADJUST SCALES
50 mm

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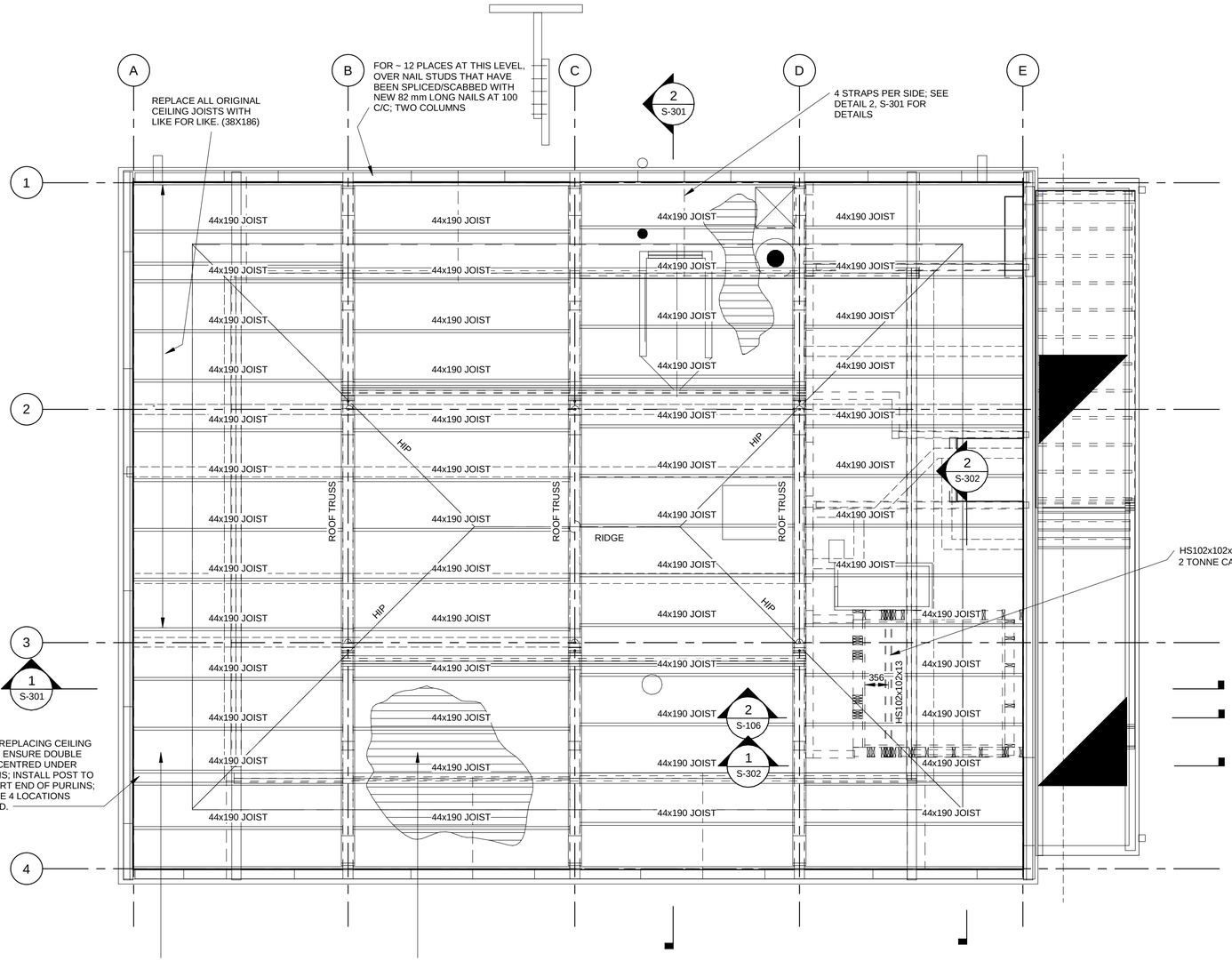
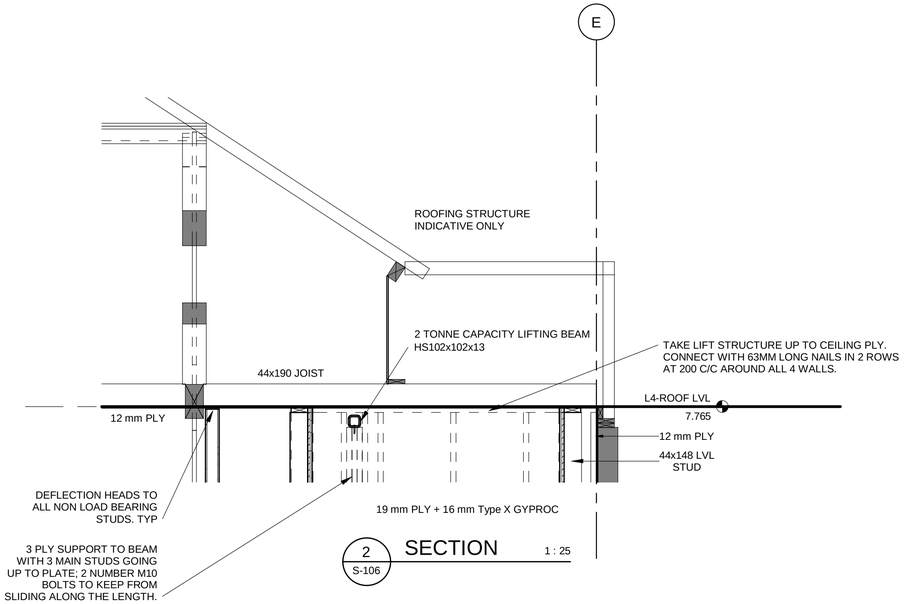


1 S-106 PLAN 1 : 40



2 S-106 SECTION 1 : 25

NOTES:
1. CEILING JOISTS ARE INDICATIVE.
2. ROOF RAFTERS NOT MODELLED
3. INSPECT ALL EXISTING CEILING JOISTS WHERE THEY HAVE NOT ALREADY BEEN EARMARKED FOR REPLACEMENT AND IF IT IS OBVIOUSLY ROTTEN, REPLACE IT. IF NOT SURE COMMUNICATE WITH ENGINEER.
4. BLOCK AT ROOF PLY JOINT LOCATIONS; 38X89 ON EDGE.
5. ONCE THE STRUCTURAL WORK IS COMPLETE AND EVERYTHING IS STILL EXPOSED, TREAT THE TIMBER. THEN INSTALL THE NEW CEILING PLY WHICH CAN REUSE SHEETS OFF THE SECOND FLOOR AND MAIN FLOOR WALLS AFTER CHECKING THEY ARE FIT FOR PURPOSE. USE RIBBED 63MM LONG NAILS OR 63MM LONG DECKING SCREWS.

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SCALE: AS SHOWN

STRUCTURAL
LOWER ROOF LEVEL

DRAWING	REVISION	SHEET
2924-00S-106	B	6

IF NOT 50 mm ADJUST SCALES
50 mm

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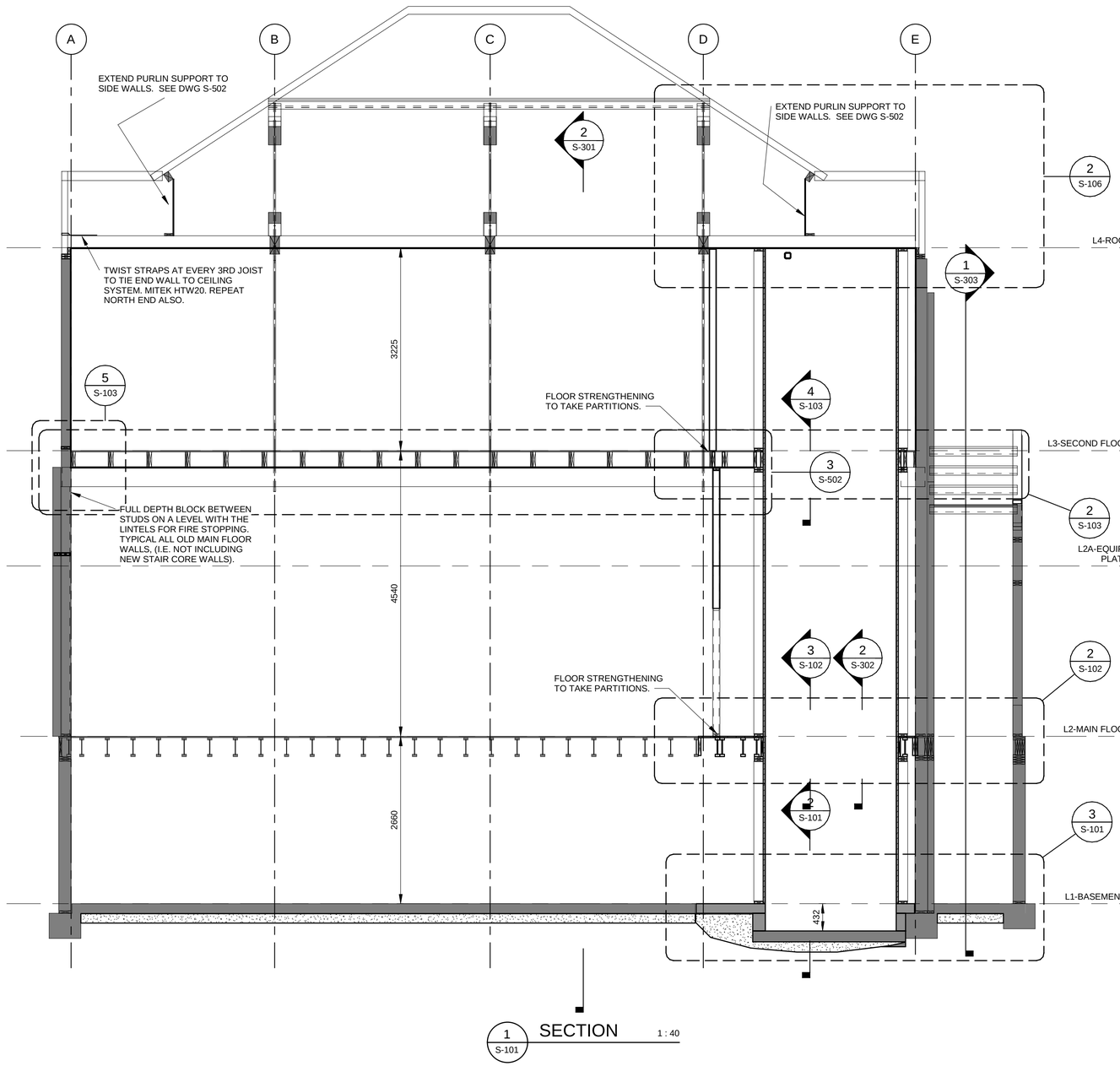
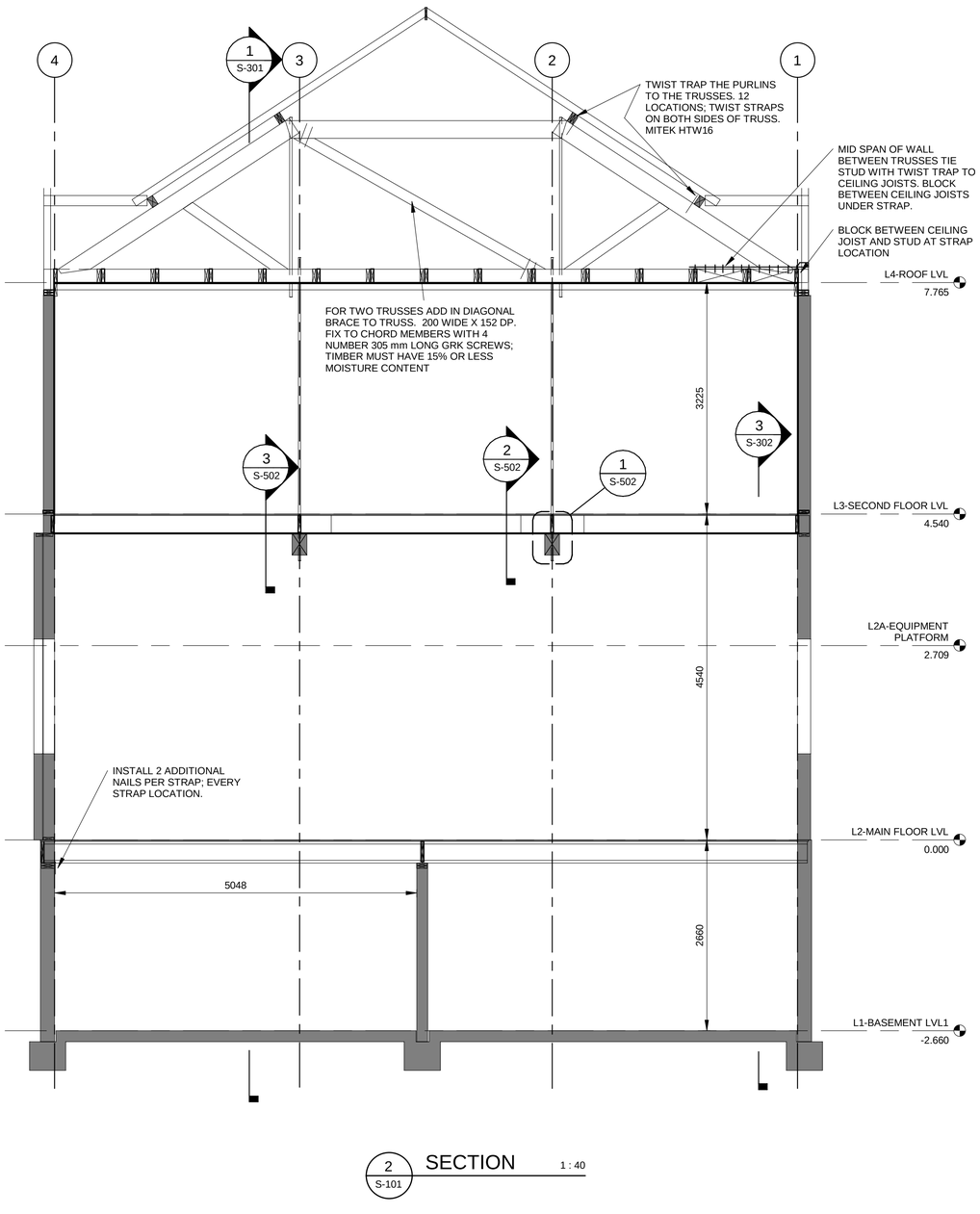


1 S-101 SECTION 1 : 40



2 S-101 SECTION 1 : 40

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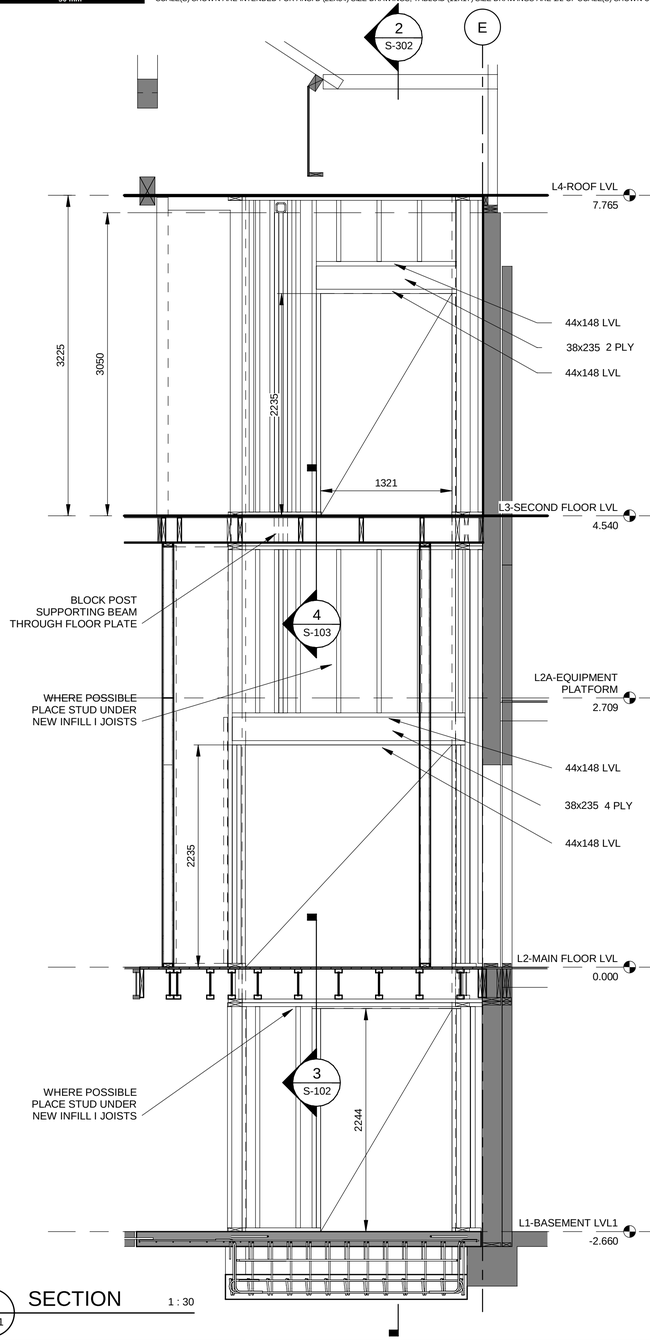
SCALE: AS SHOWN

STRUCTURAL
SECTION SHEET 1

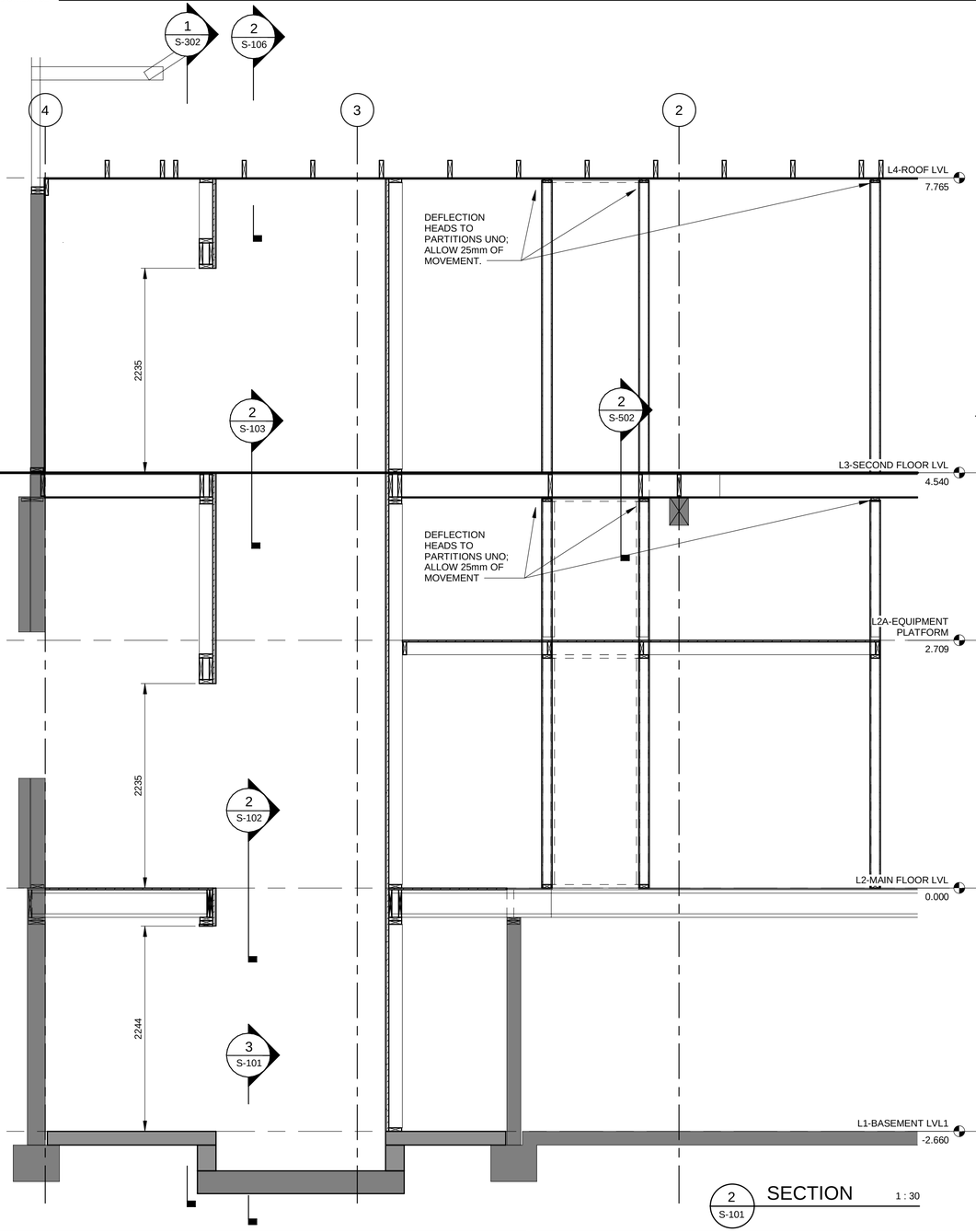
DRAWING	REVISION	SHEET
2924-00S-301	B	7

IF NOT 50 mm ADJUST SCALES
50 mm

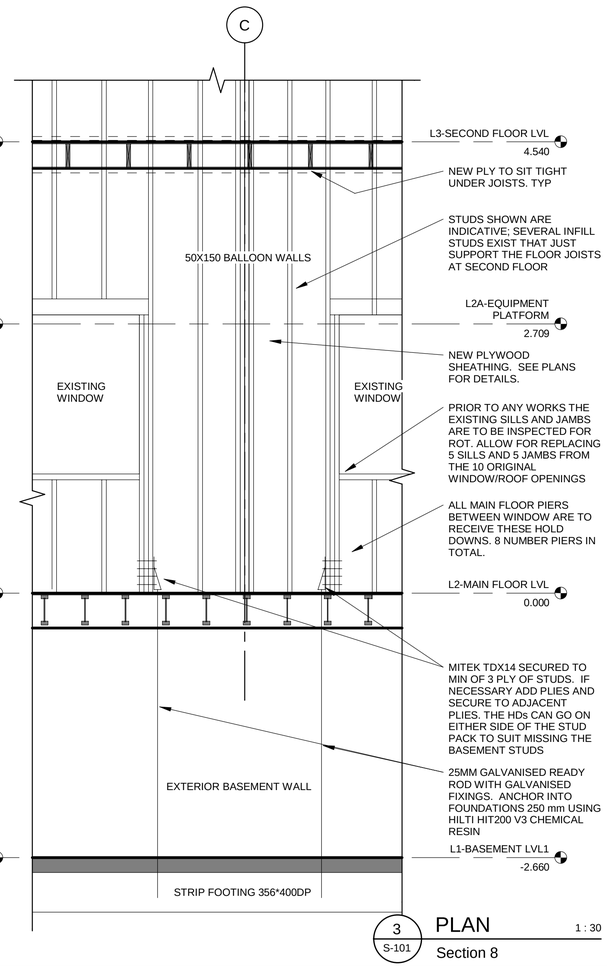
SCALE(S) SHOWN ARE INTENDED FOR ANSI D (22X34) SIZE DRAWINGS, TABLOID (11X17) SIZE DRAWINGS ARE 1/2 OF SCALE(S) SHOWN UNLESS NOTED OTHERWISE



1 S-101 SECTION 1 : 30



2 S-101 SECTION 1 : 30



3 S-101 PLAN 1 : 30
Section 8

SAVE DATE: 2024-05-25 2:29 PM
FILE PATH: Q:\2023-2924-00_Struct\Revit\dwg-RVT24-2023-2924-Dawson CBC Bdg-PHASE 2.rvt

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BEST MANAGED COMPANIES
CANADA
Platinum member

PRELIMINARY/
FOR DISCUSSION
NOT FOR CONSTRUCTION

DRAFT

REV	DATE	DESIGN	DRAWN	DESCRIPTION
B	2024MAY04	R ANNETT	R ANNETT	ISSUED FOR 80%
A	2024MAR27	R ANNETT	R ANNETT	ISSUED FOR 60%

CITY OF DAWSON
CANADIAN BANK OF COMMERCE

RENOVATIONS AND RESTORATION
LOT 1024, FRONT STREET,
CITY OF DAWSON
2023-2924-00

SCALE: AS SHOWN

STRUCTURAL
SECTION SHEET 2

DRAWING	REVISION	SHEET
2924-00S-302	B	8

IF NOT 50 mm ADJUST SCALES
50 mm

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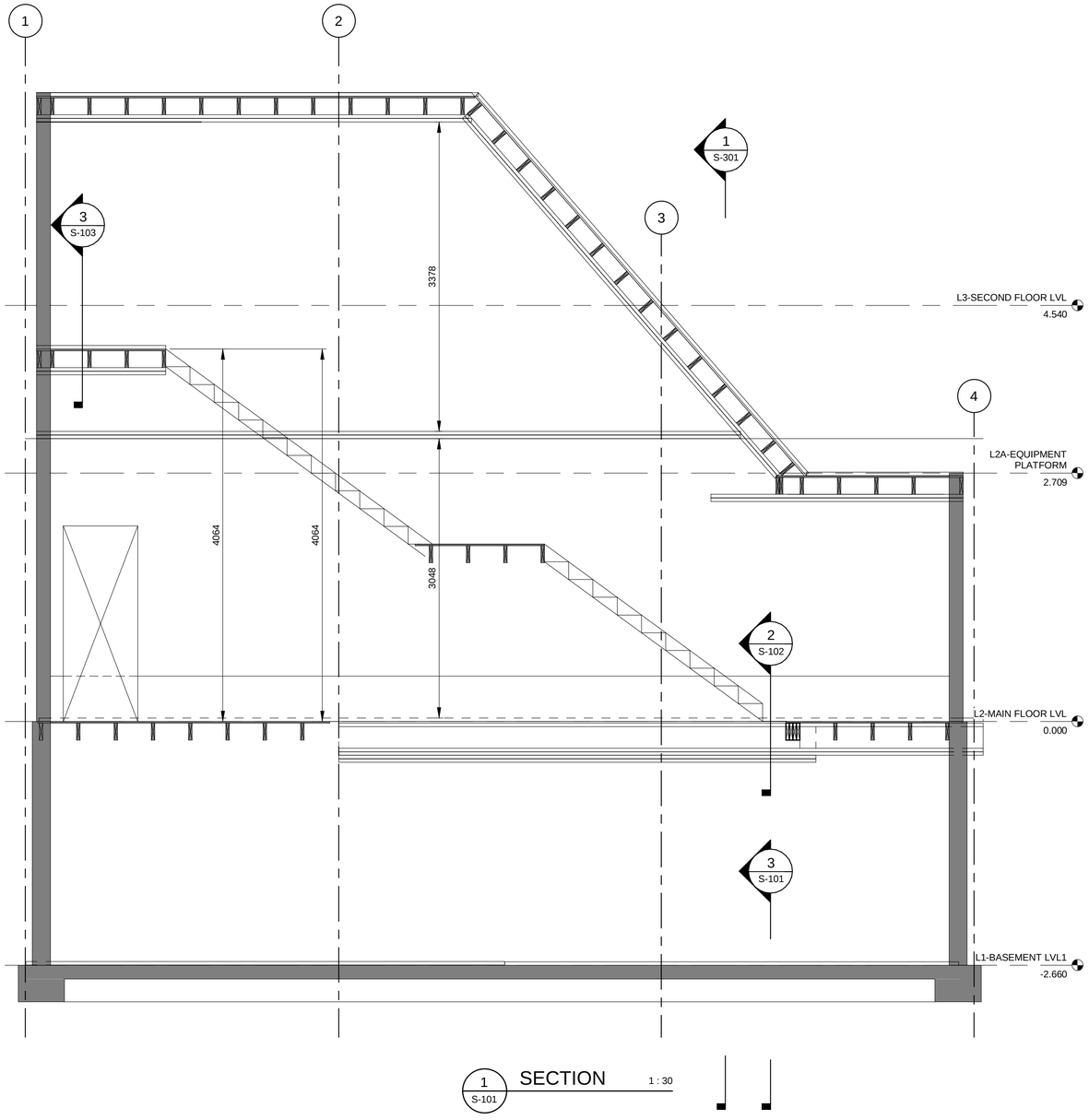

1 S-101 SECTION 1 : 30

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CANADA BEST MANAGED COMPANIES
Platinum member

REV	DATE	DESIGN	DRAWN	DESCRIPTION
A	2024MAY04	R ANNETT	R ANNETT	ISSUED FOR 80%

CITY OF DAWSON
CANADIAN BANK OF COMMERCE

RENOVATIONS AND RESTORATION
LOT 1024, FRONT STREET,
CITY OF DAWSON
2023-2924-00

SCALE: AS SHOWN

STRUCTURAL
SECTION SHEET 3

DRAWING	REVISION	SHEET
2924-00S-303	A	9

IF NOT 50 mm ADJUST SCALES
50 mm

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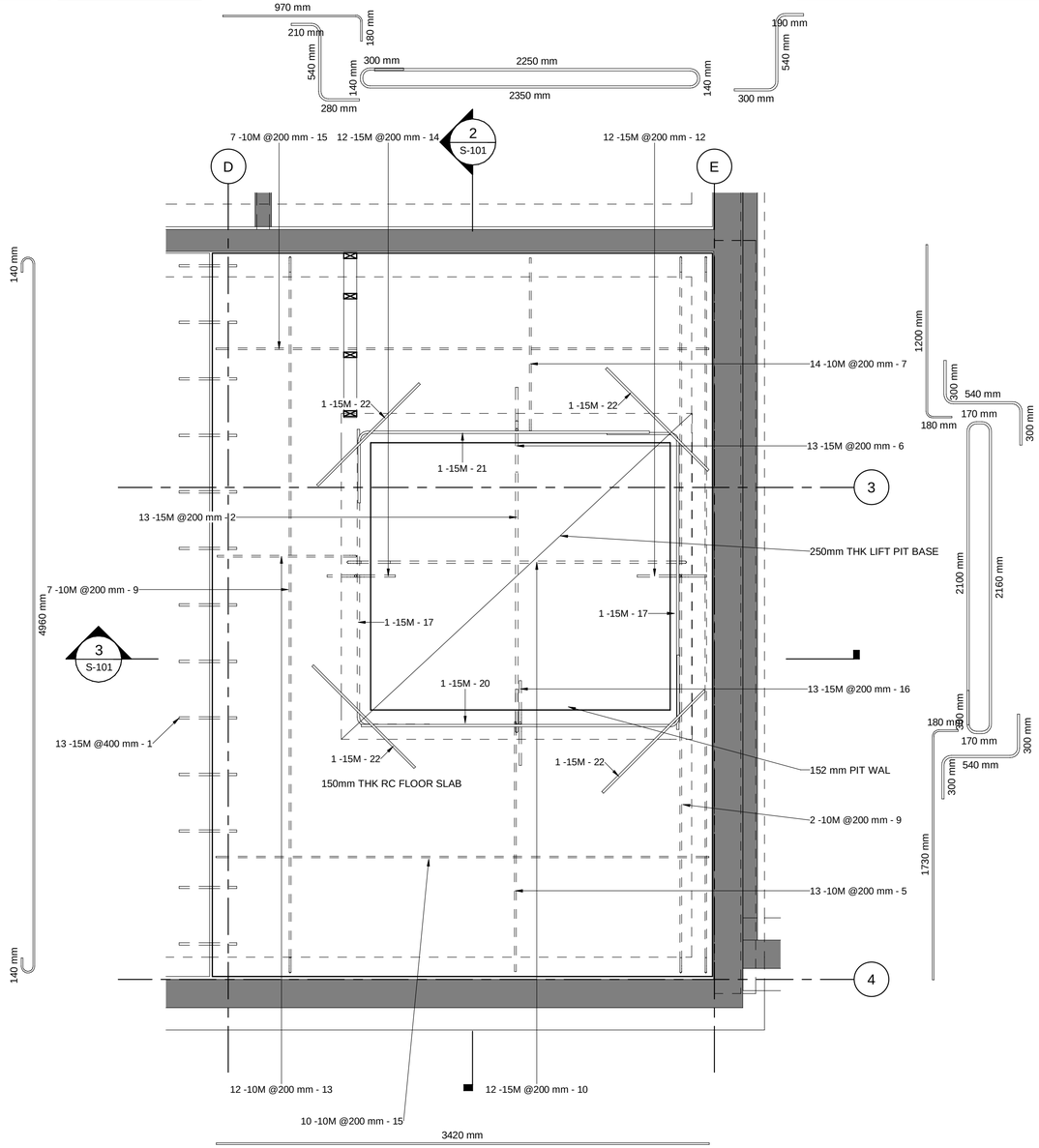

1 S-101 PLAN 1 : 20
RC DETAILS

REBAR SCHEDULE												
BAR NUMBER	TYPE	NUMBER OF BARS	BAR LENGTH	TOTAL LENGTH	A	B	C	D	E	F	G	Bending Detail
1	15M	13	400	5.20 m	0	400	0	0	0	0	0	400 mm
2	15M	13	4,742	61.62 m	2,103	170	2,163	170	300			300 mm 2100 mm; 170 mm; 170 mm; 2160 mm
5	10M	13	1,885	24.44 m	0	1,733	180	0	0	0	0	1730 mm; 180 mm
6	15M	13	1,065	13.91 m	0	302	542	302	0	0	0	300 mm; 540 mm; 300 mm
7	10M	14	1,353	18.90 m	0	1,202	180	0	0	0	0	1200 mm; 180 mm
9	10M	7	5,245	36.68 m	140	4,965	0	0	0	0	140	140 mm 140 mm; 4960 mm
9	10M	2	5,245	10.48 m	140	4,965	0	0	0	0	140	140 mm 140 mm; 4960 mm
10	15M	12	5,018	60.24 m	2,255	136	2,353	140	299			300 mm 2250 mm; 140 mm; 140 mm; 2350 mm
12	15M	12	952	11.40 m	0	304	537	192	0	0	0	300 mm; 540 mm; 190 mm
13	10M	12	1,118	13.44 m	0	967	180	0	0	0	0	970 mm; 180 mm
14	15M	12	947	11.40 m	0	283	540	206	0	0	0	280 mm; 540 mm; 210 mm
15	10M	10	3,418	34.20 m	0	3,418	0	0	0	0	0	3420 mm
15	10M	7	3,418	23.94 m	0	3,418	0	0	0	0	0	3420 mm
16	15M	13	1,063	13.78 m	0	302	540	302	0	0	0	300 mm; 540 mm; 300 mm
17	15M	1	2,521	2.52 m	0	500	2,061	0	0	0	0	500 mm; 2060 mm
17	15M	1	2,519	2.52 m	0	500	2,060	0	0	0	0	500 mm; 2060 mm
20	15M	1	2,661	2.66 m	0	498	2,204	0	0	0	0	500 mm; 2200 mm
21	15M	1	2,477	2.48 m	0	498	2,020	0	0	0	0	500 mm; 2020 mm

REBAR SCHEDULE												
BAR NUMBER	TYPE	NUMBER OF BARS	BAR LENGTH	TOTAL LENGTH	A	B	C	D	E	F	G	Bending Detail
22	15M	1	1,000	1.00 m	0	1,000	0	0	0	0	0	1000 mm
22	15M	1	1,000	1.00 m	0	1,000	0	0	0	0	0	1000 mm
22	15M	1	1,000	1.00 m	0	1,000	0	0	0	0	0	1000 mm
22	15M	1	1,000	1.00 m	0	1,000	0	0	0	0	0	1000 mm
Grand total: 22				353.81 m								

NOTE:
1. ALL STRAIGHT BARS CAN USE MST BAR OF SIMILAR SIZE.
2. WHEN WORKING WITH MST BAR ALWAYS USE GLOVES.
3. STRAIGHT BARS CAN BE CUT TO LENGTH WITH WOOD SAW.

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DRAFT

REV	DATE	DESIGN	DRAWN	DESCRIPTION
B	2024MAY04	R ANNETT	R ANNETT	ISSUED FOR 80%
A	2024MAR27	R ANNETT	R ANNETT	ISSUED FOR 60%

CITY OF DAWSON
CANADIAN BANK OF COMMERCE

RENOVATIONS AND RESTORATION
LOT 1024, FRONT STREET,
CITY OF DAWSON
2023-2924-00

SCALE: AS SHOWN

STRUCTURAL
RC DETAILS

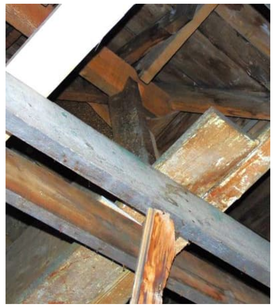
DRAWING	REVISION	SHEET
2924-00S-501	B	10

IF NOT 50 mm ADJUST SCALES
50 mm

SCALE(S) SHOWN ARE INTENDED FOR ANSI D (22X34) SIZE DRAWINGS, TABLOID (11X17) SIZE DRAWINGS ARE 1/2 OF SCALE(S) SHOWN UNLESS NOTED OTHERWISE

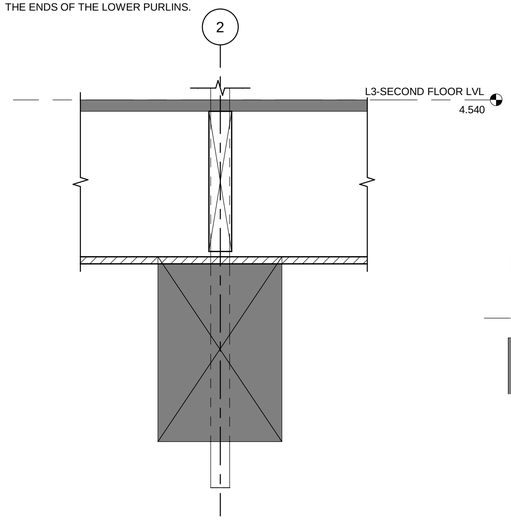
WHEN RE-LEVELLING THE SECOND FLOOR THE HANGER RODS NEED TO BE ADJUSTED. SOME BOLTS MIGHT BE OK TO ADJUST, OTHERS MAY BE LOCKED; ALLOW FOR FINGER PACKS UNDER EXISTING PLATE WASHERS. FINGER PACKS TO BE = OR > THAN EXISTING PLATE WASHERS.

BOTTOM CHORD TO 3 TRUSSES. TOP AND BOTTOM OF THE SPLICES IN THE BOTTOM TENSION CHORD INSTALL MITEK STRAPS LSTA36. ALOOW APPROX 8 PER TRUSS, CENTRED ON SPLICE. FROM THE SIDES, OVER NAIL SIDE MEMBERS AT SPLICE LOCATOINS WITH 2 ROWS OF 82MM LONG NAILS.
INSTALL JOIST HANGERS, MITEK JL24, AT THE ENDS OF ALL CEILING JOISTS. OVER NAIL THE EXISTING 45X100 PLATE TO THE TRUSS CHORD WITH 82MM LONG NAILS AT100 C/C STAGGERED.

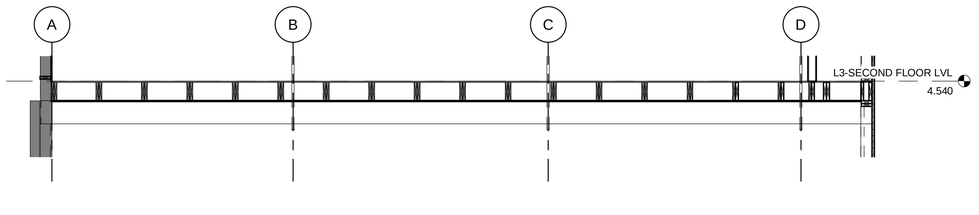


AT 4 LOACTIONS, ENSURE DOUBLE CEILING JOISTS SUPPORT POST THAT INTERNS SUPPORT THE ENDS OF THE LOWER PURLINS.

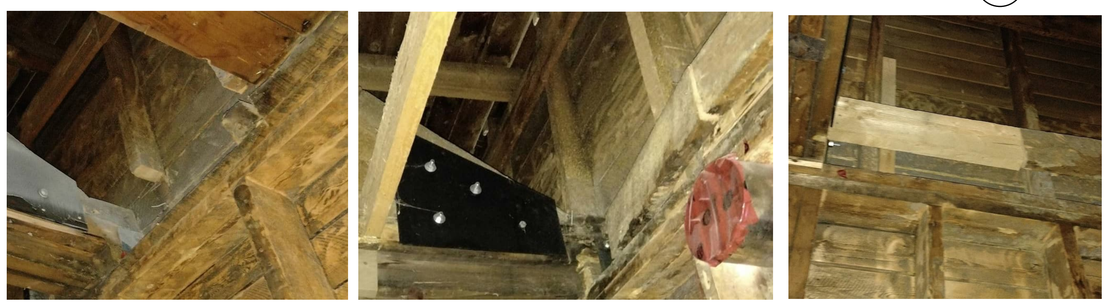
THE TWO END PURLINS, NORTH AND SOUTH WALLS HAVE A PLYWOOD SUPPORT THAT CURRENTLY LOADS THE CEILING JOISTS. EXTEND THESE AT BOTH ENDS SO THEY SIT ON THE EAST AND WEST WALLS. USE 12 mm PLY AND 38X140 STUD FRAMING AT 407 C/C TO CONTINUE THE 'DADO WALL'. BLOCK AT ENDS TO ENSURE LOADS SIT ON THE PLATE. INSTALL A CONTINUOUS STRAP AT THE BASE TIMBER ON THE PLY SIDE, FROM EAST TO WEST WALLS; NO SPLICES; USE RS14-100 COIL. CUT 150MM DIAMETER HOLES 300 mm DOWN FROM THE TOP OF THE PLY AT ~ 610 mm CENTRES FOR VENTILATION.



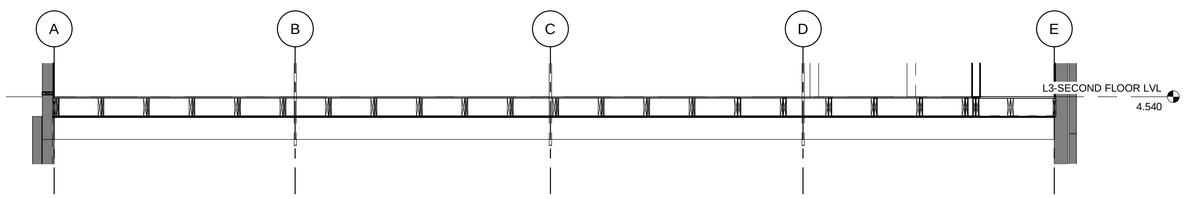
1 S-301 DETAIL 1 : 5



3 S-103 SECTION 1 : 40



AT TRUSS LOCATIONS, SPLICE THE STUDS ABOVE THE PLATE TO ENSURE THEY LOAD THE PLATE. NOMINAL LAP OF 610 mm. THE CEILING JOISTS WERE CUT BACK TO PERMIT THE JOINTS STRENGTHENING IN THE TRUSS TO PROCEED. REPLACE JOIST. USE MITEK JL28 JOIST HANGERS.



2 S-103 SECTION 1 : 40

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DRAFT

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B	2024MAY04	R ANNETT	R ANNETT	ISSUED FOR 80%
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CITY OF DAWSON
CANADIAN BANK OF COMMERCE

RENOVATIONS AND RESTORATION
LOT 1024, FRONT STREET,
CITY OF DAWSON
2023-2924-00

SCALE: AS SHOWN

STRUCTURAL
DETAILS SHEET 1

DRAWING	REVISION	SHEET
2924-00S-502	B	11

IF NOT 50 mm ADJUST SCALES
50 mm

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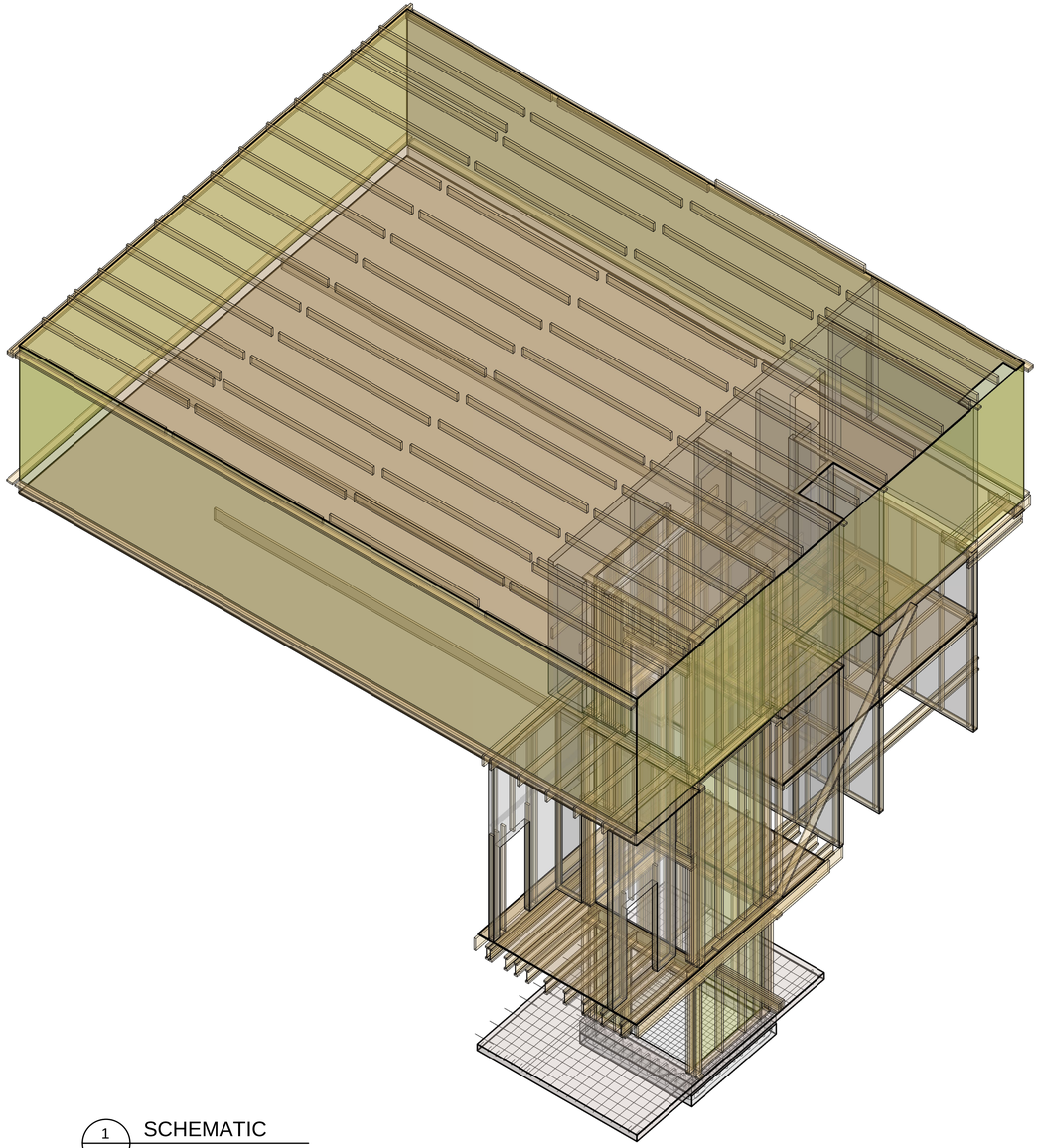
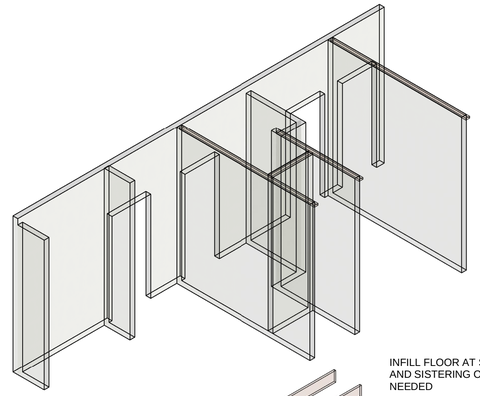
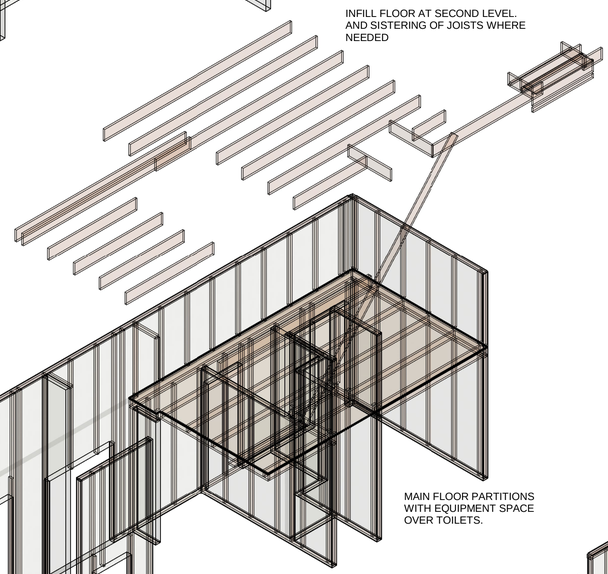


1 SCHEMATIC

NOTE; NOT ALL ELEMENT SHOWN/MODELLED.

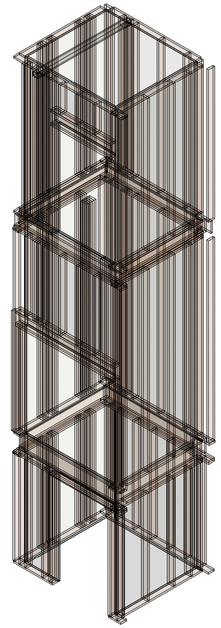


NON LOADBEARING STUDWORK;
38X89 STUDS AT 600 C/C; TYP

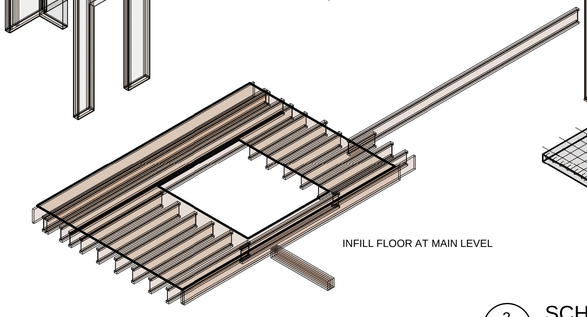


INFILL FLOOR AT SECOND LEVEL.
AND SISTERING OF JOISTS WHERE
NEEDED

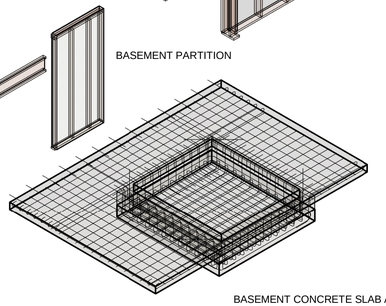
MAIN FLOOR PARTITIONS
WITH EQUIPMENT SPACE
OVER TOILETS.



NEW LIFT SHAFT



INFILL FLOOR AT MAIN LEVEL



BASEMENT PARTITION

BASEMENT CONCRETE SLAB AND LIFT PIT

2 SCHEMATIC
EXPLODED
ELEMENTS

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BEST MANAGED COMPANIES
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CITY OF DAWSON
CANADIAN BANK OF COMMERCE

RENOVATIONS AND RESTORATION
LOT 1024, FRONT STREET,
CITY OF DAWSON
2023-2924-00

SCALE: AS SHOWN

STRUCTURAL
SKETCH

DRAWING	REVISION	SHEET
2924-00S-701	A	12

University of Alaska Anchorage. Archives & Special Collections

SK 1 GENERAL ARCHIVAL PHOTOGRAPHS
EXTERIOR PRESSED METAL DETAILS
CANADIAN BANK OF COMMERCE
DAWSON CITY, YUKON

NOVEMBER 2023

CHRIS GOWER, ARCHITECT
JOHN KEAY, HERITAGE CONSULTANT

original flagpole bracket

standing seam metal roof

restored finials to be reinstalled in existing locations. Typ all.

remove new temporary sloped parapet, install new to detail, typ all

stamped metal rosette: existing rosette as template
Provide 5 for this elevation as shown

re and re decorative metal brackets, install 3 new brackets as required. Refer to the inventory as supplied. Typ all

Construct new sash c/w matching sizes and molding profiles. Install divided light thermo glazed windows w/o low e or other coatings. Typ all

this area shows as painted white, as covered by previous CBC sign

reconstructed stair to upper floor, see finish details

re and re existing metal panels as required, in situ. Reattach, fiill holes and damaged areas as directed

re and re decorative metal brackets, install 8 new brackets as required. Refer to the inventory as supplied. Typ all

all main floor windows damaged or no longer extant. Construct new sash c/w matching material sizes and species. Molding profiles to match upper floor windows. Install divided light thermo glazed windows without low e or other coatings

quoins missing where shaded, re and re remaining quoins, reproduce new as required, using originals as templates. typical for all five pilasters

re and re window sills as required. Confirm need for removal for repair work. Typ all

approx extent of new galv flat sheet metal panelling, texture and paint finish to match remainder of building

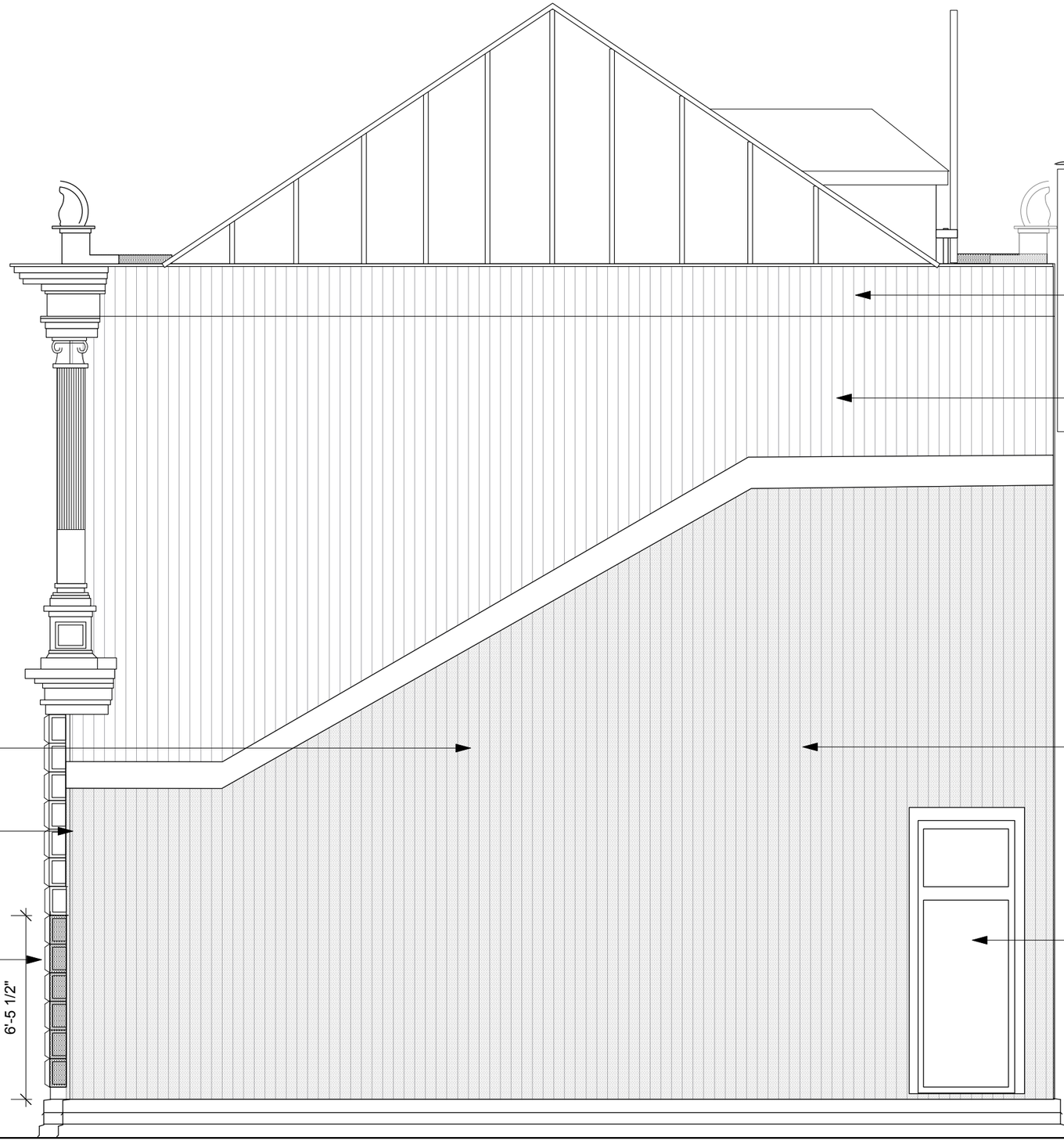
approx grade

solid wood slab door, paint finish, with glazed transom window over

boardwalk elevation per photo

SK 2 EAST ELEVATION

SK 3 SOUTH ELEVATION



SK 4 NORTH ELEVATION

SK 5 WEST ELEVATION

EAST ELEVATION

QUOINS AND EXTERIOR PRESSED METAL

BANK OF COMMERCE, DAWSON CITY, YUKON

NOVEMBER 9 2023

CHRIS GOWER, ARCHITECT AIBC
JOHN KEAY, ARCHITECT RETIRED

SK6

SOUTH ELEVATION

QUOINS AND EXTERIOR PRESSED METAL

BANK OF COMMERCE, DAWSON CITY, YUKON

NOVEMBER 2023

CHRIS GOWER, ARCHITECT AIBC
JOHN KEAY, ARCHITECT RETIRED

SK7

1. south east corner, quoins in typical alternating pattern. The outer corner is a folded joint, then with a mitred soldered joint top and bottom.

2. south east corner, quoins removed below this level. The taped opening for the chimney thimble (top center) could be retained, with a correct metal closure in place

3. east wall, quoins attached with galvanized roofing nails to the flat galvanized metal substrate,They are installed without flanges, although some areas show a metal plate between. The hook is for an early wiring attachment to the building, and could be retained

4. north east corner at new stair. The quoins on the north wall are a consistent length of 7" (178mm), with an existing metal filler between the metalwork and the stair structure.

5. detail of area between existing metalwork and new stair. Detailing will be required for the connection. The open corner on the quoin, where the solder has broken, is typical in many areas

6. rough wood framing is installed
under the metal for attachment and support

7. detal of damaged metalwork and wood substrate.
The new wall will be clad with corrugated metal

8. detail of damaged metalwork, to be made good. A sample of this corner detail should be removed and sent to be copied. Cladding details for the connection to the new constructio will need to be developed

EAST ELEVATION

QUOINS AND EXTERIOR PRESSED METAL

BANK OF COMMERCE, DAWSON CITY, YUKON

NOVEMBER 2023

SK8

CHRIS GOWER, ARCHITECT AIBC
JOHN KEAY, ARCHITECT RETIRED

9. south west corner, typical metalwork, surface nailed to the metal substrate. Some damaged elements will heed to be repaired or replaced

10. Typical small quoin, the surface texture and nailing pattern show clearly. A separate piece of metal is slipped in behind to assist in shedding water

11. the quoin below has been removed, the horizontal transition strips and the condition of typical siding show clearly. Renailing and filling of mail holes and other penetrations will be required

12. west wall, these quoins are all the same length, 12" (305mm) on this face. A typical piece should be removed as a template. This shows the transition to the corrugated metal wall finish, and the wood substrate. Any new backing would be constructed from PT material

13. south west corner, some of the metalwork is damaged, repair would be feasible as this piece will be removed as a sample

14. corner from south, showing backing and temporary plywood wall protection

SOUTH ELEVATION

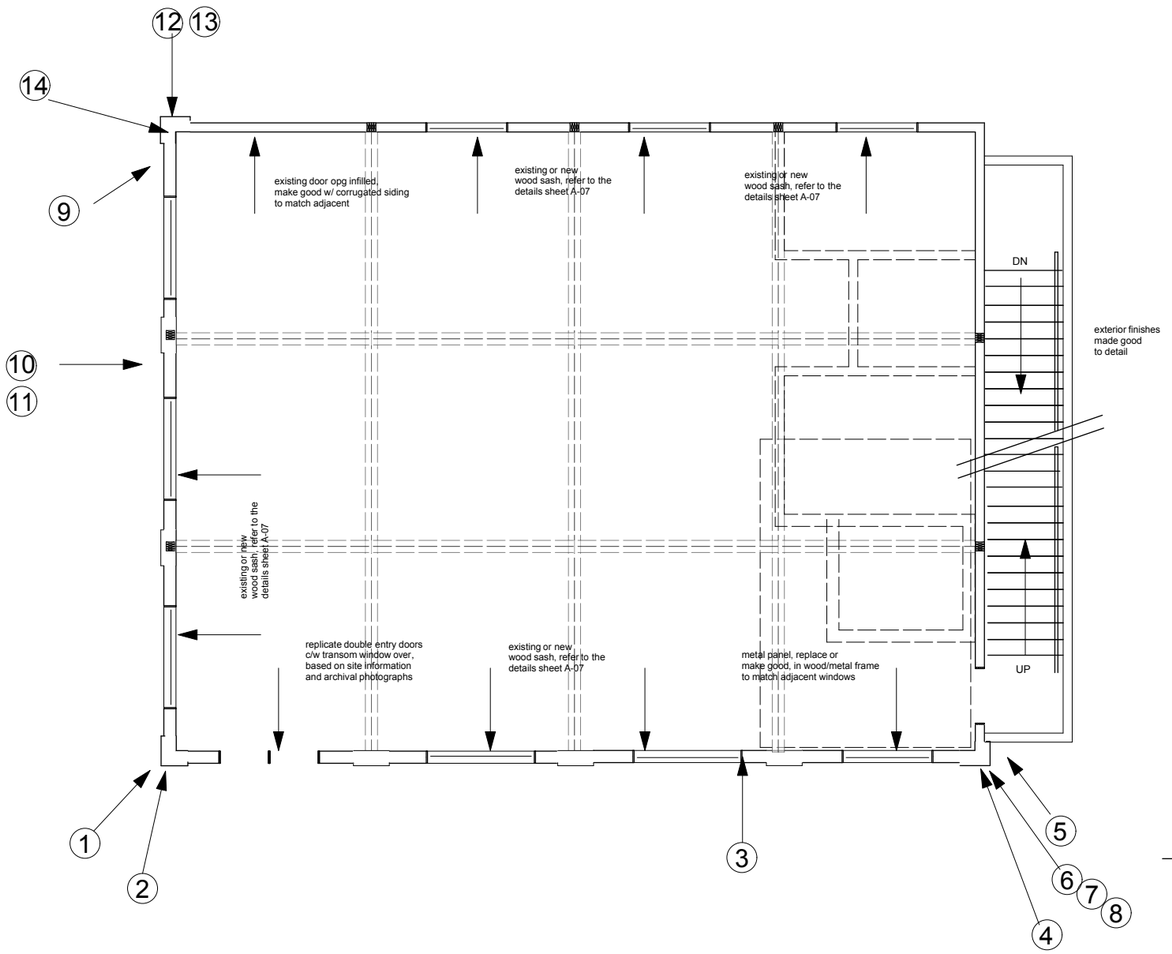
QUOINS AND EXTERIOR PRESSED METAL

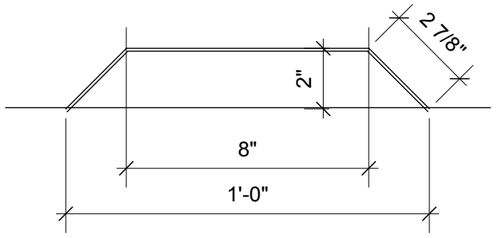
BANK OF COMMERCE, DAWSON CITY, YUKON

NOVEMBER 2023

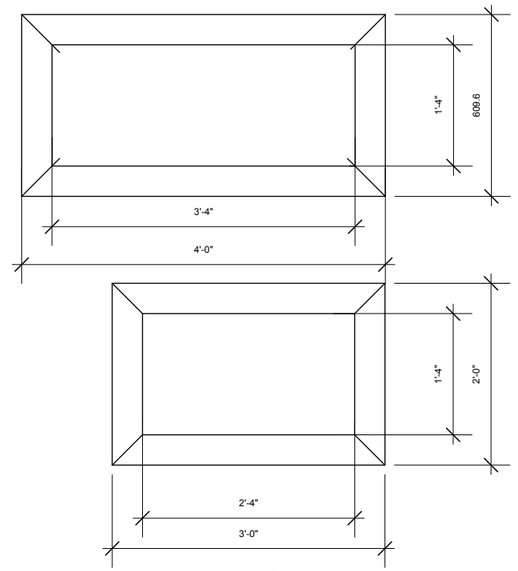
SK9

CHRIS GOWER, ARCHITECT AIBC
JOHN KEAY, ARCHITECT RETIRED

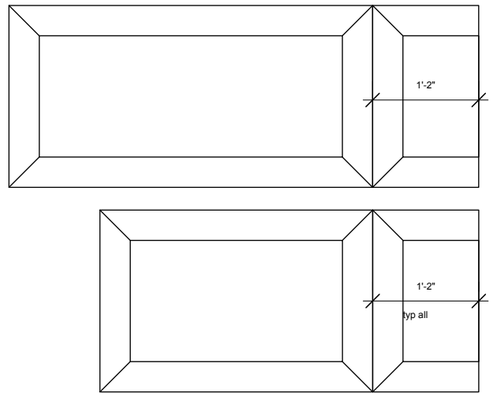




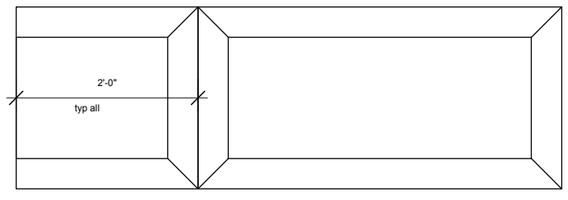
QUOIN SECTION



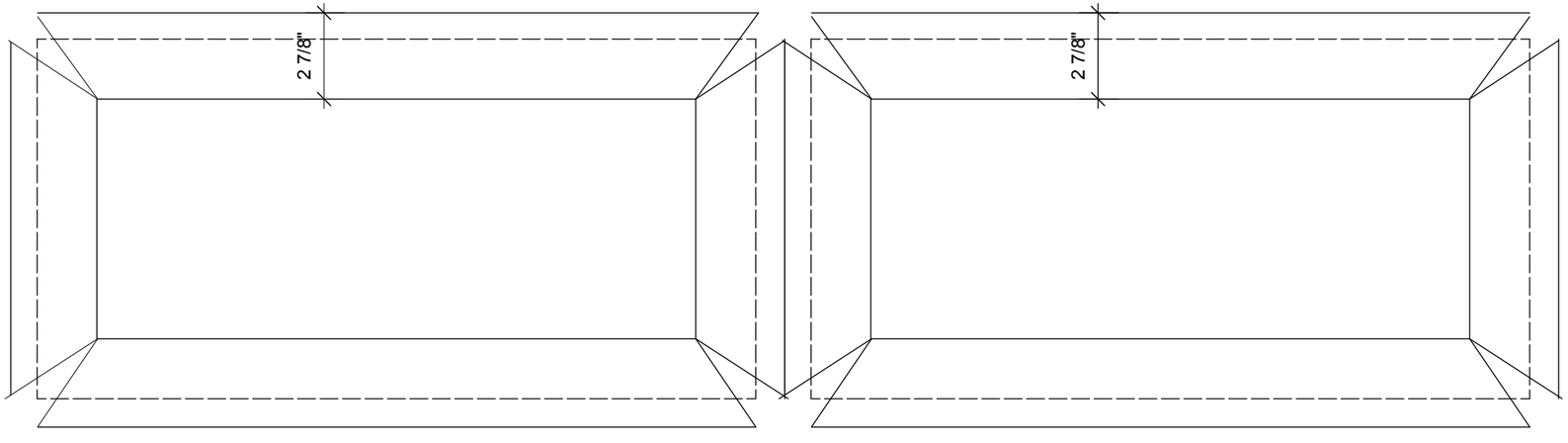
TYPICAL QUOINS



NORTH EAST CORNER



SOUTH WEST CORNER



dotted line denotes finished dimensions

QUOIN ASSEMBLY

SK 10 EXTERIOR PHOTO REFERENCE AND DETAILS

15. upper wall, generally intact, some quoins missing, The original paint color shows where the sign was located

16. wall detail

17. wall detail, north east corner.

18. cornice, north east corner, some of the joinst in the metal have opened, it is recommended that they be repaired in situ

19. east wall, strip view showing new step flashing and extent of quoin replacement, final grade to be confirmed

20. area adjacent to entry door, damaged metal molding for door frame, holes inm metal siding, damaged sill. This also shows the metal filler strip between each quoin

21. the lower windows sills are generally damaged from when the building was raised. Repair or replacement of the sills will require careful disassambly of the adjacent metal siding. Some sills may be repairable in place and resoldered.

22. sill detail

EAST ELEVATION

EXTERIOR PRESSED METAL

BANK OF COMMERCE, DAWSON CITY, YUKON

NOVEMBER 2023

CHRIS GOWER, ARCHITECT AIBC
JOHN KEAY, ARCHITECT RETIRED

SK 11

23. detail at corner, damaged sill and metal siding consisting of overlapping layers, nailed and with numerous penetrations

24. detail of remaining medallion, north west corner. This should be removed and replicated for other locations where missing

25. detail at location of missing medallion, 3 are missing on the north wall, 5 on the east wall

26. detail at window head, metal siding panels to be reattached and repainted

27. damaged sill, repair would likely require removal. Note the assembly with several pieces of overlapping metal. In some areas the sills fit around the siding, in others the siding runs beneath

28. window sill

29. detail of sill and siding

30. damaged sill, consider repair in situ, Typical metal siding panel, with rolled texture, replacement metal should retain this texture.

31. metal window trim and frame, typical

32. window sill and frame, showing overlapping construction details

33. sill and window frame. the decorative sill is covered with metal, which would take up any irregularities in the framing. The wood sash is likely original, fastened with wood pegs

SOUTH ELEVATION

EXTERIOR PRESSED METAL

BANK OF COMMERCE, DAWSON CITY, YUKON

NOVEMBER 2023

CHRIS GOWER, ARCHITECT AIBC
JOHN KEAY, ARCHITECT RETIRED

SK 12

34. west elevation, note changes to framing and the outline of the added stair. The patch below the upper windows indicates the original balcony location and size.

35. corner detail, note new scupper and temporary sloped parapet. Some joints have failed on the capital, and can be repaired in situ.

36. sign and stovepipe. The stovepipe should be retained as a historic element, the sign should be replicated and reinstalled, with the original stored as an artifact

37. typical upper floor window frames, constructed from simple sheet metal forms

38. metal capital, joints have failed, a decision would need to be made whether to remove to repair, or leave in place

39. south west corner, detail of siding and metal capital. The siding on this elevation consists of several smaller panels, retaining these would be part of the restoration process

40. former secondary access door to upper floor. A matching window would be reinstalled in this location, per the original opening

41. window frame, main floor, repair would be straightforward with the metal frame replaced, the chimney thimble would remain

42. lower floor, sill and metal frames to be replaced

43. window frame, main floor, repair would be straightforward, the chimney thimble would remain

44. patch, archival photos show a door in this location which could be reinstated if desired. Typical siding will be scraped, refastened and repainted. The white finish is the suggested restoration color

WEST ELEVATION

EXTERIOR PRESSED METAL

BANK OF COMMERCE, DAWSON CITY, YUKON

CHRIS GOWER, ARCHITECT AIBC
JOHN KEAY, ARCHITECT RETIRED

SK 13

45. general view of reconstructed stair

46. flashing detail

47. connection to the existing building, some flashing and cladding details should be modified to better reflect the original construction

48. general view from Front Street, a new entry door with transom window, based on archival photographs, will be installed. Final grades are to be determined

NORTH ELEVATION

EXTERIOR PRESSED METAL

BANK OF COMMERCE, DAWSON CITY, YUKON

CHRIS GOWER, ARCHITECT AIBC
JOHN KEAY, ARCHITECT RETIRED

SK 14

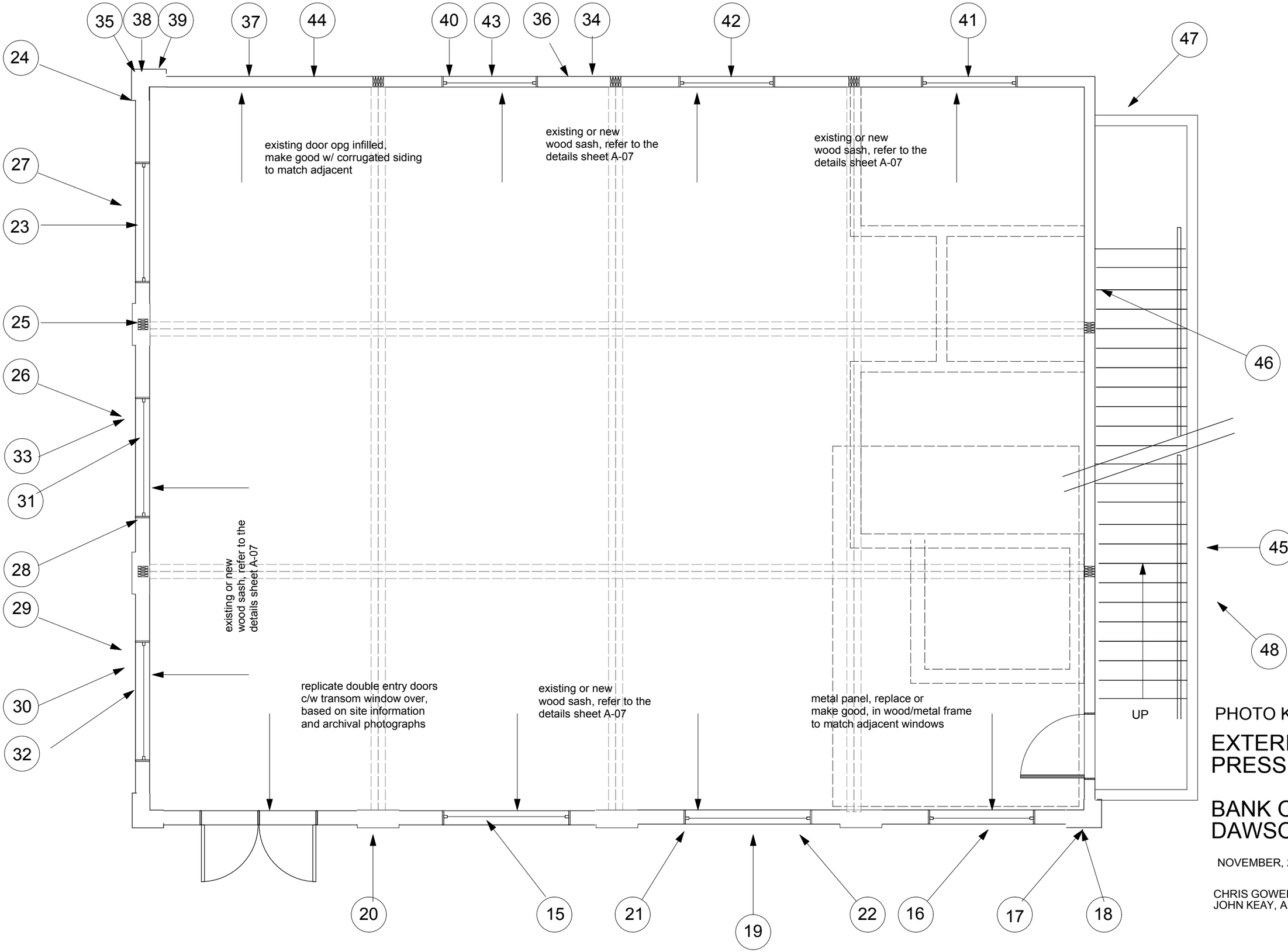


PHOTO KEY PLAN

EXTERIOR PRESSED METAL

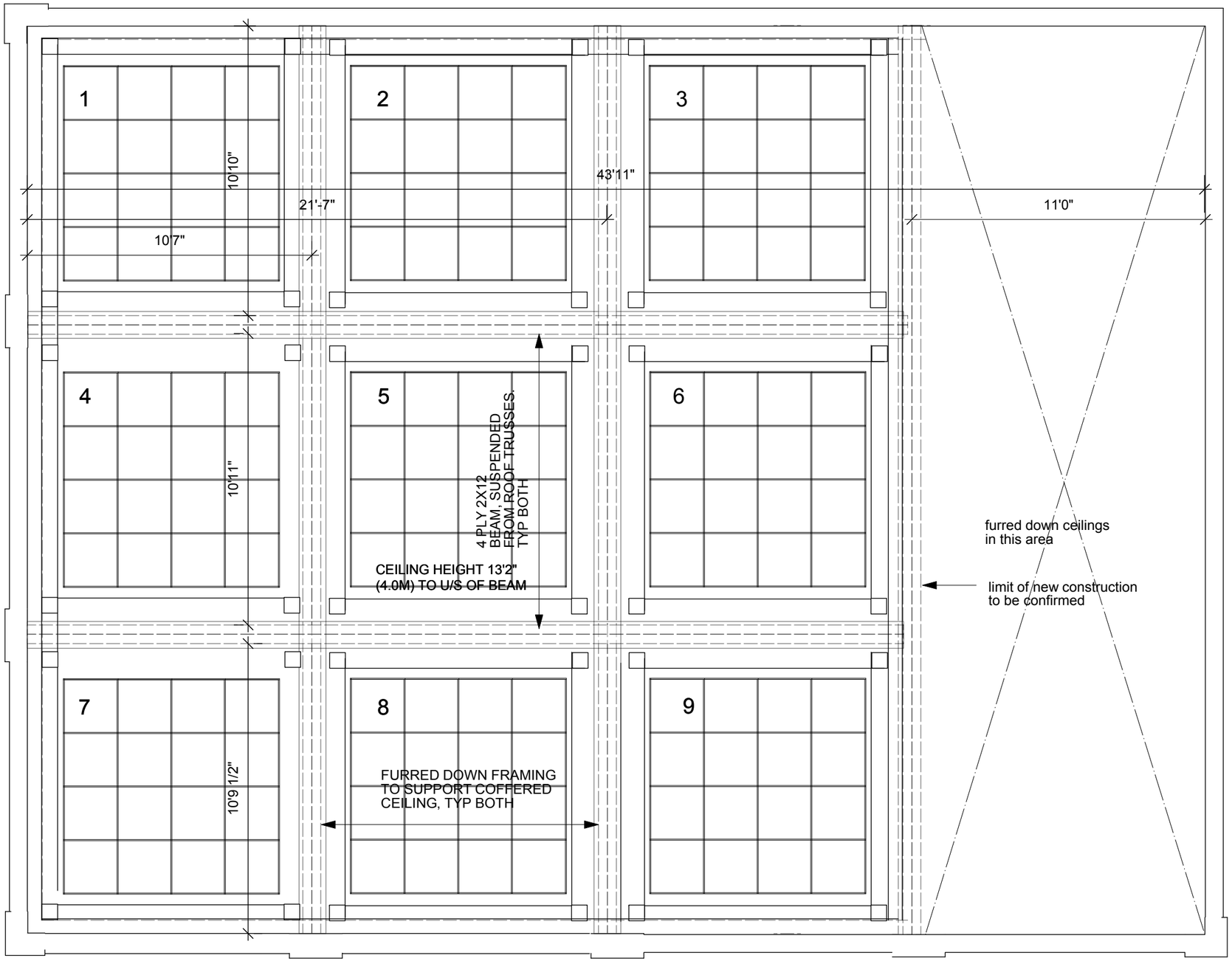
BANK OF COMMERCE, DAWSON CITY, YUKON

NOVEMBER, 2023

CHRIS GOWER, ARCHITECT AIBC
JOHN KEAY, ARCHITECT RETIRED

SK 15

YUKON RIVER

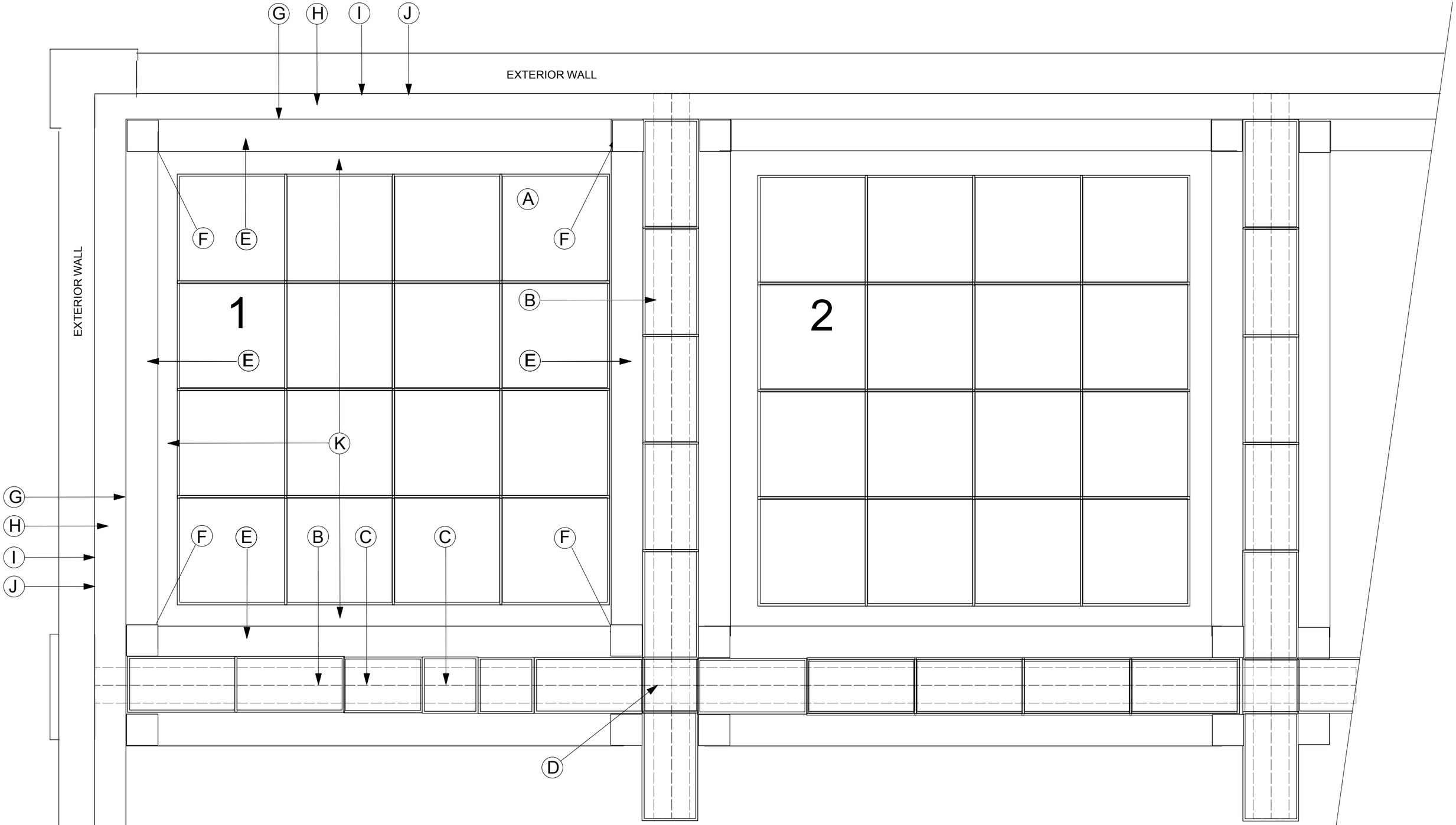


FRONT STREET

SK 2 MAIN FLOOR REFLECTED CEILING PLAN

1:20

DIMENSIONS TAKEN FROM MAY 2019 AS FOUND SURVEY



SK 3 TYPICAL CEILING PANEL ASSEMBLY
SCALE 1:20
NOVEMBER 2023

A. typical ceiling panel, 23 1/2 x 23 1/2 net size, 24 1/2x24 1/2 overall size
total number of panels required: 9x16: 144
panels availble in usable condition: 78
replacement panels required: 66

C. non standard beam panel: 11 1/2 x 17 1/2 net size, 12 1/2 x 18 1/2 overall size
total number of panels required:
panels available in usable condition: 1
replacement panels required: unknown

E. cornice: approx size 11" high x 7" deep, variable lengths
total lineal footage required: approx 324 ft
lengths available in usable condition
62 1/2", 33 of: total length: 172 ft
44/52" 30 of: approx total length: 110 ft
mincellanoous short lengths
replacement length required: 42 ft

B. typical beam panel: 11 1/2 x 23 1/2 net size, 12 1/2 x 24 1/2 overall size
total number of panels required:
panels available in usable condition: 38
replacement panels required:

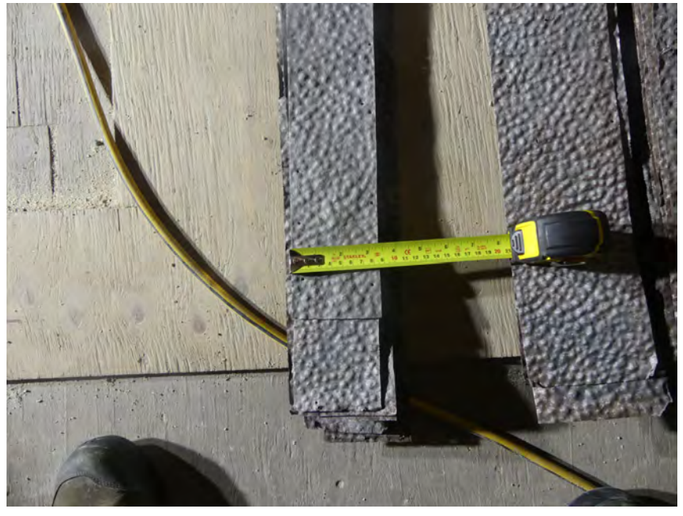
D. intersecting beam panel: 11 1/2 x 11 1/2 net size, 12 1/2 x 12 1/2 overall size
total number of panels required:
panels available in usable condiition
replacement panels required

F. corner cornice piece: approx size 8" x 8"
number required: 36
number available in usable condition: 8
replacement pieces required: 28

SK 4 PRESSED METAL COMPONENTS

G. vertical ledger piece, below cornice at exterior walls
width approx 4 1/2"
all pieces to be replaced, total length:

I. frieze: on wall: approx width 12"
total lineal footage required:
lengths available in usable condition:
96", 11 of: 88 ft
60", 2 of: 10 ft

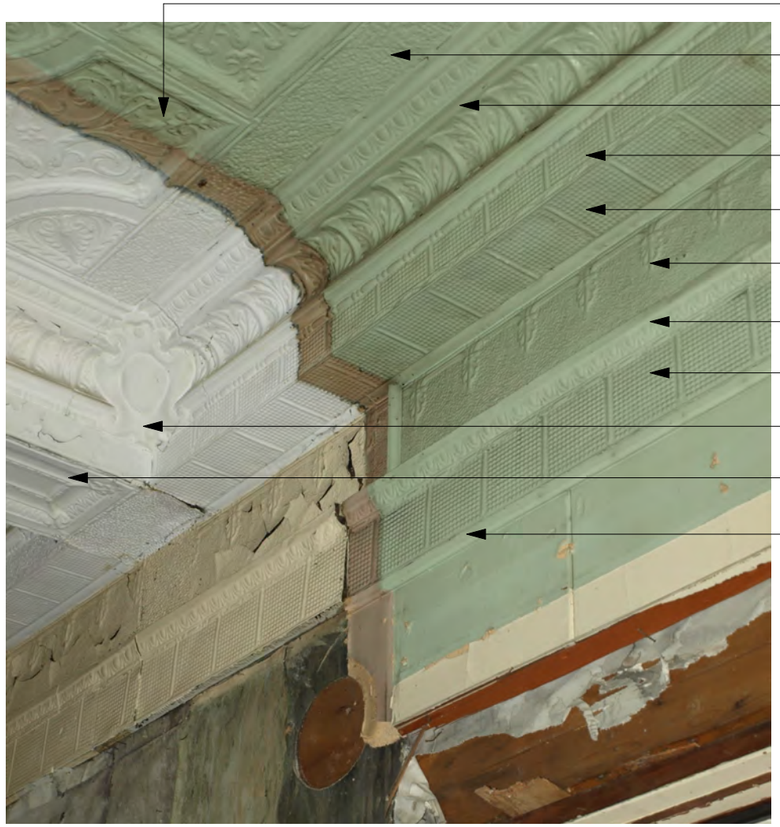


K: horizontal filler peice, between panels and cornice, variable widths and lengths to suit gaps. Virtually all pieces damaged, replace all
replacement length required:

H. horizontal I piece above freize at exterior walls
and vertical on wall below frieze
approx width 7 1/2"
total lineal footage required:
langths available in usable condition:
96", 15 of: 120 ft
48 to 80", 18 of: minimum 72 ft.
replacement length required:

J. egg and dart molding, approx width 3"
total lineal footage required:
all pieces to be replaced

K: other horizontal filler pieces, variable widths
and lengths to suit gaps, replace all



A. ceiling panels, approx 24" square, 16 per coffer

K. horizontal filler piece, width and location vary to take up any irregularities in the ceiling layout

E. cornice molding, comprising shorter lengths joined, refer to the inventory

G. vertical panels for ledger

H. horizontal panels for ledger

I. freize

J. egg and dart molding

H. vertical panels, sim to (H) above

D. cornice corner molding

B. typical beam fascia panel, some sizes vary, to be confirmed

lower trim piece, no remaining samples, construct from wood to detail

All moldings constructed from pressed metal, using existing sample moldings as templates

Moldings are surface nailed to wood backing, refer to the photographs for examples of the previous installation

SK 6 TYPICAL MOLDING ASSEMBLY

EXTERIOR WALL SHOWN

City of Dawson
Report to Council

Agenda Item	Dawson City Recreation Centre – Project Update
Prepared By	Paul Robitaille, Parks and Recreation Manager
Meeting Date	June 4, 2024
References (Bylaws, Policy, Leg.)	
Attachments	*Governance Map Draft*

	Council Decision
	Council Direction
x	Council Information
	Closed Meeting

Recommendation

That this report be accepted in Committee of the Whole for informational purposes.

Executive Summary

The City of Dawson and Yukon Government are working on the construction of a new Recreation Centre at the Dome Road (Lot 1059, Quad 116 B/3) with Yukon Government managing the project, and City of Dawson planned to be the end user.

Yukon Government and the Government of Canada have appropriated $65 million in capital funding to replace our existing recreation centre. Funding is being allocated through *Investing in Canada Infrastructure Program* (ICIP). Funding is contingent on the provision of a conceptual design for the facility by September 30, 2024.

Yukon Government and City of Dawson are in the process of evaluating bids on a progressive-design-build contract for this project, which will initiate a rapid design process to assist us in meeting the September 30th deadline.

The contractor, using a progressive-design-build process will work with Yukon Government and City of Dawson to decide on the amenities, layout, and contents of the conceptual design.

City of Dawson's Recreation Board is being utilized as a local advisory group to the City of Dawson on this project and has begun meeting regularly to discuss the project with the goal of creating a facility that is reflective of the desires of the community, but within the budget allocated to this project.

A service agreement has been drafted that elaborates on the roles and responsibilities of the various agencies involved in this project.

Council is the final decision-making body for the City of Dawson on the amenities and conceptual design for this project and will be required to make resolutions at upcoming Council meetings to formalize these decisions and adhere to our September deadline.

Background

In 2017, City of Dawson Council decided to begin planning for a new recreation facility (C17-29-13).

Administration has worked with Yukon Government's Infrastructure Branch to act as project lead. Work to-date has resulted in a decision on the location of this facility (C-19-13-08) at the intersection of Dome Road and the Klondike Highway (Lot 1059, Quad 116 B/3).

Amenities to be included in this facility have been discussed within the project management team, with council, and through community engagement. A Feasibility Study assisted in providing options for amenities to include, summarized community feedback, and provided six building options for council to discuss. Direction from Council was to pursue the amenities included in Option 1 at Dome Road (C21-19-12), with an opportunity for further expansion or refinement in the future.

At a committee of the Whole meeting on Dec 5, 2023, the schematics of the plan to date and the class C cost estimates were reviewed publicly with Council. Cost estimates were $103 million in capital costs and $1.5 million in operating and maintenance costs. These capital costs were substantially higher than anticipated. As a result of these estimates, Administration and Council discussed this matter at the December 19, 2023, Council Meeting where Council directed administration to develop a strategy to work within the $65 million budget.

Administration returned to Council on January 16, 2024 for meeting C-24-01 to recommend the utilization of a Progressive-Design-Build on this project, and that an advisory body be utilized on this project. Both these recommendations were approved by Council (C-24-01-06). In was further clarified and approved at Committee of the Whole Meeting CW-24-01 on February 6, 2024, that the Recreation Board act as a local advisory group to the City of Dawson on the New Recreation Centre.

Discussion / Analysis

- **Service Agreement/Project Work Plan/Governance Map:** There are two phases to this project. Phase 1 focuses on the design of the building. Phase 2 focuses on the construction of the building. A Service Agreement has been drafted for this project between City of Dawson and Yukon Government. The roles, deliverables, and objectives for all are included in this document. The *Governance Map (*attached) and *Next Steps* below, outline some of the most pertinent information of this document.
- **Tender Process:** Yukon Government initiated a tender process for a progressive-design-build of a new recreation facility which we expect will be awarded in early June. Administration has been involved in the release and evaluation of bids on this tender. Once awarded, the contractor will liaise with Yukon Government and City of Dawson administration, with advice coming from the recreation board, and final decisions on conceptual design coming from Council.
- **Progressive-Design-Build:** A progressive-design-build is being utilized for the design and construction of this facility. This process allows for collaborative decision-making between the client, design team and construction company. This method offer transparency in costing, create a collaborative process throughout the project, reduce contingencies, and allow for value engineering for maximization of budget.
- **Recreation Board:** The Recreation board is being utilized on this project to act as a local advisory body to the City of Dawson. Meetings have been ongoing since April. The Recreation Board has recently added several members, based on a public callout. Several advisors have also been appointed by the recreation board, as is within their purview. There are six regular members, one Tr'ondëk Hwëch'in-appointed member, and one honorary member. These members have voting privileges. Advisors are appointed for one-year periods and have no voting privileges. Currently the group is comprised of the following members:
    - Regular Members (End of term): Peter Menzies – Chairperson (October 31, 2026), Dawn Kisoun (October 31, 2026), Megan Macdougall (October 31, 2024), Brent Macdonald (October 31, 2025), Amélie Morin (October 31, 2025), Ashley Doiron (October 31, 2025)
    - Honourary Member: Monna Sprokkreef – Vice Chair (Lifetime Member)
    - Tr'ondëk Hwëch'in-Appointed Member: Nathan Dewell (October 31, 2025)
    - Advisors: Helen Dewell (April 23, 2025), Diana Andrew (April 23, 2025), Louise Blanchard (April 23, 2025), Ashley Bower-Bramadat (April 23, 2025).

  The Recreation Board has met to discuss the project, with a focus on understanding the upcoming process, challenges we may face, and to create a recommendation for Administration regarding the amenities to include in the building.

Fiscal Impact

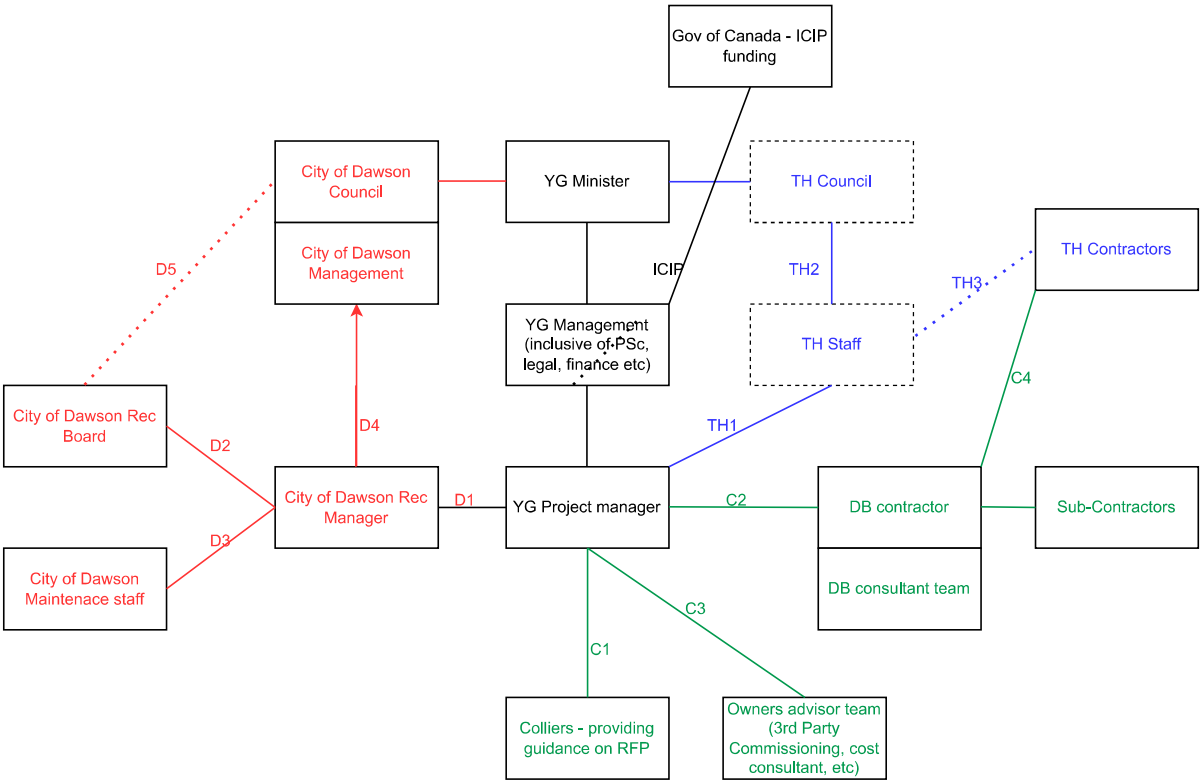
- **Capital Cost**: The Yukon Government has identified a budget of sixty-five million dollars ($65,000,000) to complete this project. Based on best practices, this facility will be designed adhering to a fifty-six million budget ($56,000,000), with a nine-million-dollar ($9,000,000) contingency, to cover other costs associated to the building.
- **Operation and Maintenance Costs**: The operation and maintenance (O+M) costs of this building are critical components that must be considered during the design of this facility. The project team is requiring the contractor to assist in developing a building that will cost $1,000,000 in O+M at a maximum, to be affordable and sustainable by the municipality. Furthermore, the contractor will be tasked with producing a building that is practical for our environment, operable by our staff, and serviceable by local contractors. Forecasting and modelling will be undertaken by the contractor throughout the design and construction, to ensure O+M remains at the forefront of the decision-making process on this facility.

Next Steps

- According to the drafted Service Agreement between Yukon Government and City of Dawson for the New Recreation Centre, the following is outlined:
    - Contract for Progressive-Design-Build services to be awarded (June 2024)
    - Workshop to be held with contractor (June 2024)
    - Draft Conceptual Design to be presented to Council (July 2024)
    - Revised Conceptual Design to be presented to Council (August 2024)
    - ICIP Funding Application Submitted (September 30, 2024)
    - Schematic Design, Design Development and Owner's Statement of Requirements (September 2024-January 2025)
    - Proceed to Phase 2 Service Agreement

Approved by	Signature	Position	Date
	David Henderson	CAO	May 31, 2024

Governance map DRAFT



Link Ref #	Scope of Conversation	When and Frequency
C1	Contract #1-SME advice on the development of the PDB	During procurements - May/June 24
C2	Phase 1 and Phase 2	Atleast weekly - initiation to completion
C3	Owners' Advisor-SME advice/crosscheck DB Team	Atleast weekly - Initiation to completion
C4	DB's relationship with TH Contractors	As required
D1	All communication routed between YG PM and Rec Manager	Atleast weekly - Initiation to completion
D2	Rec Board informs the Rec Manager - design/scope	As required
D3	Maintenance staff informs the Rec Manager - design/scope	As required
D4	Rec Manager informs Dawson Management/Council	As required
D5	Conversations to ensure Rec Board objectice is aligned w/Council	As required
TH1	Project update - YFN participation - questions/concerns	Monthly-Initiation to completion
TH2	Project updates	As required
TH3	Collaboration with contractors	As required
ICIP	Application - Project updates	September App.deadline-Monthly updates

City of Dawson
Report to Council

Agenda Item	Interim Regional Waste Agreement – 2024 Renewal
Prepared By	David Henderson CAO
Meeting Date	May 21, 2024
References (Bylaws, Policy, Leg.)	1999—06 Consolidated Waste Management Bylaw
Attachments	2023 Interim Regional Waste Facility Agmt 2024 Interim Regional Waste Facility Agmt Renewal Solid waste Mgt for Remote and Northern Communities 1999—06 Consolidated Waste Management Bylaw

x	Council Decision
	Council Direction
	Council Information
	Closed Meeting

Recommendation

Recommended that Council authorize the renewal of the Interim Regional Waste Management Facility Agreement for 2024.

Executive Summary

1. The Yukon Government has been pursuing a rationalization of solid waste management across the territory since 2016. The goal is a sustainable model for waste management that attaches a cost to waste production, achieves an equitable cost allocation for solid waste across municipal boundaries, and provides a financial incentive to reduce, reuse and recycle.
2. City Council received and endorsed at Committee a presentation from Acting CAO Dennis Shewfelt and the Association of Yukon Communities in January of 2023 outlining the Interim Waste Agreement whereby the Yukon Government agreed to funding for the municipality to cover the costs of non-resident users of the Quigley landfill site and the assumption of 50% of landfill closure costs. The agreement is conditional on the municipality implementing standardized residential tipping fees at the landfill site and the Yukon Government will assist in the capital costs associated with weigh scales at the site. (municipalities that do not adopt weigh scales will have access to similar capital funds for on site infrastructure such as attendant booth)
3. The agreement is termed interim as several steps related to the landfill site are necessary before a final agreement can be drawn up and consummated - including an updated site permit and subdivision of the appropriate land from YG reserve land.
4. The City of Dawson included tipping fees in the 2023 fees and services charges and budget. Tipping fees implementation was dependent on the hiring of a waste supervisor, a landfill attendant, and the installation of weigh scales, all of which were delayed for various reasons. (YG recognizes that tipping fees by weight is the preferred option but accepts tipping fees by volume where more feasible)
5. The 2023 Interim waste Management agreement was signed off by staff in December of 2023 and was in effect for approx. 10 days, enabling the funding identified in the agreement. The 2023 agreement identifies that the parties have the option of renewing the agreement in 2024 on the same or similar terms leading to the development and consummation of a final regional waste agreement.
6. The 2024 fees and services charges and budgets include tipping fees implementation.
7. A Waste Supervisor has now been hired. Weigh scales are under review and the expectation is that Tipping fees will be implemented in the near future unless Council determines otherwise.

Background

As per the preamble in the Interim Agreements:

The Yukon Government (YG) and the Association of Yukon Communities (AYC) are working to modernize Yukon's management of solid waste in order to reduce risks, liabilities and cost to taxpayers as outlined in the 2016 AYC report Solid Waste Management: Vision for a Sustainable Model, and the 2018 Ministerial Committee on Solid Waste recommendations report.

Interim Regional Agreements are being struck to provide funding for municipalities to work on waste management and to ensure all residents within each regional boundary have access to a Regional Waste Management Facility. These interim agreements will be replaced by Regional Agreements once lease, liability and other operational standards are established at municipal facilities.

City of Dawson Waste Management Bylaw 99-06 Consolidated

The Waste Management Bylaw identifies under 6.00 General Provisions

6.01 All garbage and refuse shall be dumped in accordance with posted directions or in accordance with specific direction as issued by the City Manager from time to time.

The Waste Management Bylaw further identifies under 7.00 Scale of Charges

7.01 Each property owner shall pay the rate, as set out in the Fee Schedule Bylaw, to offset the cost of the general waste management program:

In the 2023 and 2024 fees and services bylaw the following waste rates are identified:

1. The Commercial and Residential Waste Management Fees
2. Tipping fees applicable at the landfill site

Discussion / Analysis

Moving through the Interim agreement stage to the Final Regional Waste Facility Stage is a complicated process and involves multiple steps.

The Key elements of the agreements are that the Municipality must move to the adoption of tipping fees and the Yukon government will in turn provide funding for non resident users and Landfill closure liability. Tipping fees are considered fundamental in these agreements as they ensure that non residents pay a portion of the cost related to the waste they produce and it encourages people and businesses to reuse, reduce, and recycle when there is a cost associated with waste produced.

To accommodate these steps the municipality must set up the tipping fees in the fees and services and budget; receive direction from the City Manager that waste dropped at the landfill must pay a tipping fee, establish the mechanism to administer and collect tipping fees at the landfill site; put in place the manpower and infrastructure to enable the application of tipping fees.

The 2023 and 2024 fees and service bylaws and budgets identified and included tipping fees and the anticipated hiring of attendants plus agreement funding from YG following discussion of the agreements at committee and through the budget processes.

Several steps must be taken to ensure the site is properly set up , subdivided, surveyed, etc .as well.

A revised waste management bylaw that captures all anticipated waste management changes is desirous once the extent of changes is known and proposed. The adoption of tipping fees related to the interim and final regional waste management facility agreements is within the authority of the municipality currently through the existing waste management bylaw and renewal of the interim agreement.

Fiscal Impact

Upon signing the interim agreement renewal for 2024 the Municipality will receive $75,000 in funding from YG based on 50% of the calculation estimating the cost to the municipality due to non resident users.

When tipping fees are up and running the municipality will receive a second payment of $75,000 in funding from YG as the balance of the estimated cost to the municipality due to non resident users .

An attendant will be hired by the City to collect tipping fees. The Cost of the attendant is covered by the above fees. When the attendant is not collecting fees, it is anticipated that he or she will be providing support services at the landfill site .

As part of the agreement process the Yukon Government is continuing its review of infrastructure at the landfill site and has committed to $650,000 in capital to support the installation of weigh scales to enable tipping fees by weight versus volume. The funding was previously identified as $400,000 but has changed to $650,000 as of May 2024

Tipping Fees applicable to non resident residential, commercial, and construction users has been conservatively estimated at $50,000 annually while similar sized communities in the Yukon have received substantially larger tipping fees from the same sources. Residential tipping fees must be universal . Commercial tipping fees may vary between resident and non resident.

The application of tipping fees is expected to encourage reuse, reduce, and recycle which will mean the landfill will fill at a slower pace , extending the life of the landfill and thus the closure costs to municipal taxpayers.

The assumption of 50% of the closure costs by the Yukon Government represents approx. the assumption of $1.4 million in liability from the municipal taxpayer based on the current closure estimate of $2.8 million.

Alternatives Considered

None at this time

Next Steps

With renewal of the agreement the following steps in-process will continue.

1. Payment of funds from YG to the City of Dawson for 50% of 2024
2. Engineering review of site for scales with potential install in 2025
3. Hiring of landfill Attendant
4. Implementation of tipping fees, with a graduated introduction.
5. Site permit / subdivision of site/ lease with YG / development of Final Regional Waste Facility Agreement

Approved by	Name	Position	Date
	David Henderson	CAO	12-May-2024

Interim Regional Waste Management Facility Agreement

This Interim Agreement made in the Yukon Territory

Between

THE TOWN OF THE CITY OF DAWSON,
as represented by its Chief Administrative Officer
("Dawson")

and

GOVERNMENT OF YUKON,
as represented by the Director of Operations and Programs, Community Services
("Yukon")

together with the above referred to as the "Parties"

PREAMBLE

The Yukon Government (YG) and the Association of Yukon Communities (AYC) are working to modernize Yukon's management of solid waste in order to reduce risks, liabilities and cost to taxpayers as outlined in the 2016 AYC report Solid Waste Management: Vision for a Sustainable Model, and the 2018 Ministerial Committee on Solid Waste recommendations report.

Interim Regional Agreements are being struck to provide funding for municipalities to work on waste management and to ensure all residents within each regional boundary have access to a Regional Waste Management Facility. These interim agreements will be replaced by Regional Agreements once lease, liability and other operational standards are established at municipal facilities.

BACKGROUND

A. Dawson possesses a Waste Management Permit (#80-003) to operate a waste disposal facility (the "Facility") and a special waste management facility granted under the Environment Act R.S.Y. 2002, c.76, the Solid Waste Regulations OIC 2000/011, and the Special Waste Regulations, O.I.C. 1995/047 (the "Permit").

B. The Permit expires December 31, 2023.

C. Dawson operates a municipal landfill in accordance with the Permit on Yukon government land set aside for this purpose by Yukon at and as further described on the map attached as Schedule A (the "Regional Waste Management Facility").

D. Yukon wishes to ensure use of the Regional Waste Management Facility by nearby unincorporated users within each Regional Boundary (see Schedule B).

E. The Parties are working together to regularize the use and occupation of the Regional Waste Management Facility by raising title to the land then leasing it (if not already titled) to Dawson and by making a final regional agreement with Dawson about their operating of the Regional Waste Management Facility and the provision of these municipal services to the region.

F. The Parties recognize that the process to subdivide the landfill site from the YG reserve area is a slow process. This interim agreement is intended as a bridge agreement to facilitate the flow of compensation funds from YG Community Services to Dawson.

G. The interim agreement will provide supportive funding for the municipality to facilitate the transition to a Regional Waste Management Facility.

H. For greater clarity the Parties are committed to and in the process of developing overarching regional solid waste management agreements which will include:

a. Gates, staff, and tipping fees at all facilities.

b. Lease agreement.

c. Liability agreement reflecting an equal cost sharing of closure and post closure costs. (50% each)

d. Financial compensation by YG to the municipalities for the acceptance of residential waste from regional residential users.

e. YG assistance with environmental issues that may arise from the operation of a Solid Waste Management Facility.

AGREEMENT

Now therefore, the Parties agree as follows:

1. DEFINITIONS

1.1. In this Interim Agreement;

"**Designated Materials**" means those materials for which Yukon collects a point-of-sale or manufacturing fee in relation to waste disposal or recycling and as further defined under the Environmental Act, specifically the Designated Materials Regulation and the Beverage Container Regulation. These designated materials include tires, electronic waste, and beverage containers.

"**Special Waste**" has the same meaning as found in the Environmental Act and the Special Waste Regulations, and includes residential products such as waste oil accepted under Community Services' Household Hazardous Waste Program.

"**Tipping fees**" means fees charged by the Regional Waste Management Facility to all facility users per unit, or per unit of volume or mass, for waste disposed of at the facility.

2. Regional Waste Management Facility Operations & Permitting

2.1. Tipping Fees

2.1.1. Dawson will work to develop a waste management bylaw that establishes sorting requirements and tipping fees at the Regional Waste Management Facility.

2.1.2. Dawson agrees that all residential users of the Regional Waste Management Facility will be charged the same tipping fees. Some variation from one municipality to the other is expected due to individual operation practices.

2.2. Safe operations

2.2.1. Dawson will carry out the operation and maintenance of the Regional Waste Management Facility safely, in compliance with all relevant legislative and regulatory requirements and with due care to ensure that it does not cause any injury.

2.3. Permits

2.3.1. Dawson is responsible for all permitting and license application requirements associated with the operation and maintenance of the Regional Waste Management Facility and will ensure compliance with relevant legislative requirements;

2.3.1.1. its obligations as a proponent for any environmental assessments;

2.3.1.2. renewal of the Permit; and

2.3.1.3. its obligations under the Workers' Safety and Compensation Act S.Y. 2021, c.11.

2.4. Not a YG operation

2.4.1. Dawson acknowledges that it has sole responsibility for the

operation and maintenance of the Regional Waste Management Facility including controlling access to the site.

3. FUNDING

3.1. Yukon will provide a contribution of $70,000 (based on 50% of the 583 unincorporated users plus 20% x $200pp) to offset the costs associated with providing waste disposal services to residents outside of the municipality of Dawson as per the regional boundary identified in Schedule B and to assist with operation and maintenance costs of the Regional Waste Management Facility. (Note: Municipalities that have already implemented the requirements of fencing, gating, facility attendants, tipping fees, and with the Solid Waste Facility Permit in place will receive 100% of the eligible compensation amount.)

3.2. In the event that this Agreement is extended past December 31, 2023, a review of the eligible regional population will be carried out by AYC and the revised population numbers must be reviewed and agreed to by Community Services and upon consensus, used to calculate the future compensation amount. As there is no reliable source of information on the regional population, AYC will use at least two sources and present an average regional population for each municipality.

3.3. The payment will cover the period from January 1, 2023, to December 31, 2023 (12 months).

3.3.1. This contribution will be paid in one payment within 60 days of signing the agreement.

3.3.2. YG currently reimburses Municipalities for costs associated with the testing of monitoring wells installed in and around the landfill site. The practice will continue until a Regional Waste Management Facility Agreement has been reached. The parties will negotiate the final well monitoring arrangement and include as part of the Regional Waste Management Agreement.

3.4. Yukon will arrange and pay for the pick-up, transport from the Regional Waste Management Facility and processing or disposal of:

3.4.1. any Designated Materials; and

3.4.2. Non-commercial Special Waste including waste oil.

3.5. The obligation of YG to make any payments to under this Interim Agreement is subject to the following:

3.5.1. the Financial Administration Act (Yukon);

3.5.2. money being appropriated by the Legislature for the purpose of this Interim Agreement; and

3.5.3. abiding by the terms and conditions of this Interim Agreement.

4. TERM

4.1. This Interim Agreement is in force from January 1, 2023 to December 31, 2023, and may be extended annually upon agreement by both parties until such time as it is replaced by a Regional Waste Management Agreement.

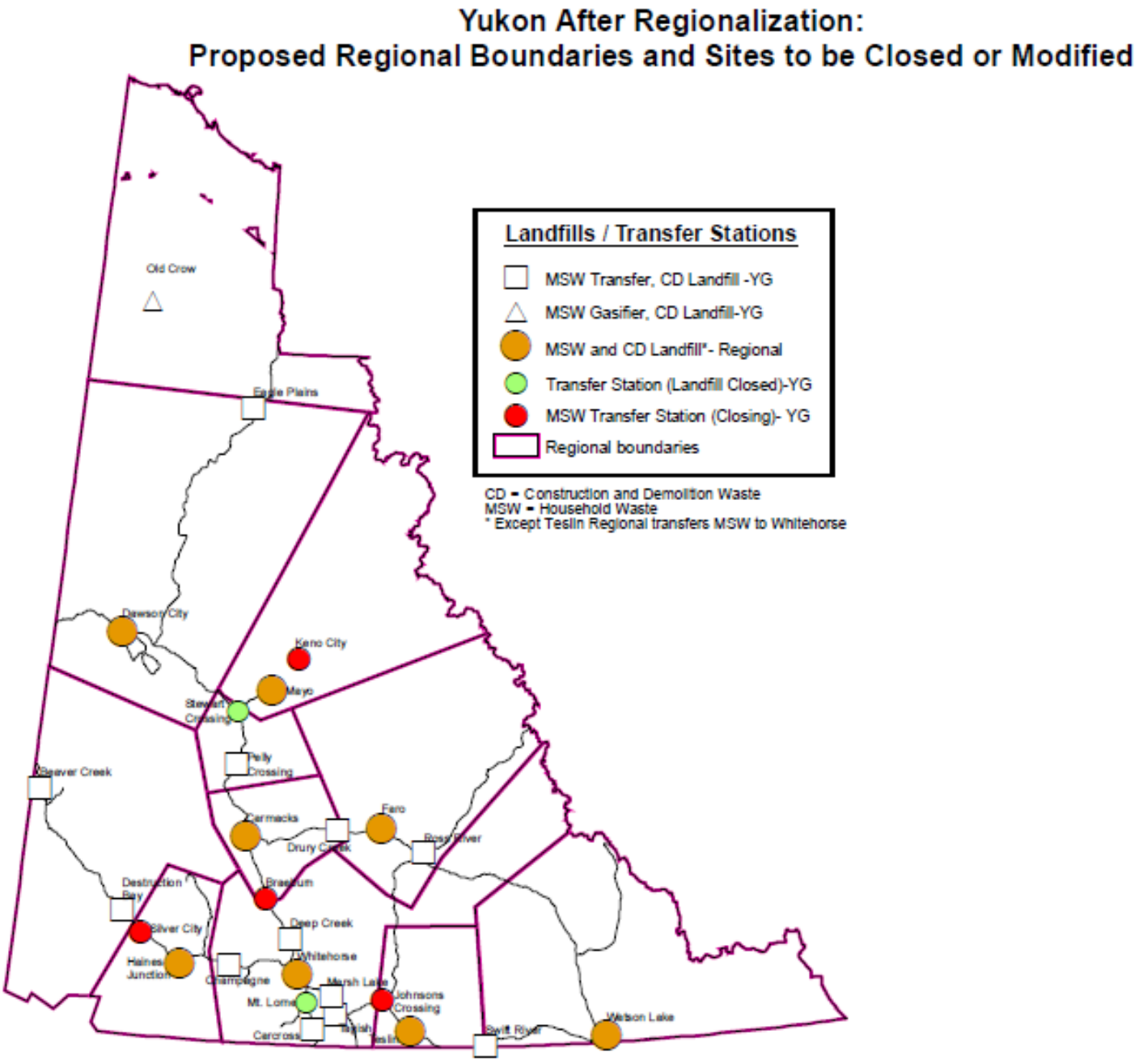
The Parties have executed this Interim Agreement by their Duly Authorized Officials:

GOVERNMENT OF YUKON by the Director of Community Operations:	)	
David Albisser	)	Date Signed
TOWN OF THE CITY OF DAWSON by the Chief Administrative Officer:	)	
~~CAO David Henderson~~ A/CAO, Paul Robitaille	)	Dec 20, 2023 Date Signed

Schedule A

Map of the Location of the Solid Waste Management Facility

Schedule B


Yukon After Regionalization:
Proposed Regional Boundaries and Sites to be Closed or Modified
Landfills / Transfer Stations
MSW Transfer, CD Landfill -YG
MSW Gasifier, CD Landfill-YG
MSW and CD Landfill*- Regional
Transfer Station (Landfill Closed)-YG
MSW Transfer Station (Closing)- YG
Regional boundaries
CD = Construction and Demolition Waste
MSW = Household Waste
* Except Teslin Regional transfers MSW to Whitehorse
Old Crow
Eagle Plains
Dawson City
Keno City
Mayo
Stewart Crossing
Pelly Crossing
Beaver Creek
Carmacks
Faro
Drury Creek
Ross River
Destruction Bay
Braeburn
Silver City
Deep Creek
Haines Junction
Whitehorse
Champagne
Marsh Lake
Mt. Lorne
Johnsons Crossing
Carcross
Teslin
Swift River
Watson Lake

Interim Regional Waste Management Facility Agreement

This Interim Agreement made in the Yukon Territory

Between

THE TOWN OF THE VILLAGE OF DAWSON,
as represented by its Chief Administrative Officer
("Dawson")

and

GOVERNMENT OF YUKON,
as represented by the Director of Operations and Programs, Community Services
("Yukon")

together with the above referred to as the "Parties"

PREAMBLE

The Yukon Government (YG) and the Association of Yukon Communities (AYC) are working to modernize Yukon's management of solid waste in order to reduce risks, liabilities and cost to taxpayers as outlined in the 2016 AYC report Solid Waste Management: Vision for a Sustainable Model, and the 2018 Ministerial Committee on Solid Waste recommendations report.

Interim Regional Agreements are being struck to provide funding for municipalities to work on waste management and to ensure all residents within each regional boundary have access to a Regional Waste Management Facility. These interim agreements will be replaced by Regional Agreements once lease, liability and other operational standards are established at municipal facilities.

BACKGROUND

A. Dawson possesses a Waste Management Permit (#80-003) to operate a waste disposal facility (the "Facility") and a special waste management facility granted under the *Environment Act* R.S.Y. 2002, c.76, the *Solid Waste Regulations* OIC 2000/011, and the *Special Waste Regulations*, O.I.C. 1995/047 (the "Permit").

B. The Permit expired December 31, 2024 (renewal delayed by YESAB).

C. Dawson operates a municipal landfill in accordance with the Permit on Yukon government land set aside for this purpose by Yukon at and as further described on the map attached as Schedule A (the "Regional Waste Management Facility").

D. Yukon wishes to ensure use of the Regional Waste Management Facility by nearby unincorporated users within each Regional Boundary (see Schedule B).

E. The Parties are working together to regularize the use and occupation of the Regional Waste Management Facility by raising title to the land then leasing it (if not already titled) to Dawson and by making a final regional agreement with Dawson about their operating of the Regional Waste Management Facility and the provision of these municipal services to the region.

F. The Parties recognize that the process to subdivide the landfill site from the YG reserve area is a slow process. This interim agreement is intended as a bridge agreement to facilitate the flow of compensation funds from YG Community Services to Dawson.

G. The interim agreement will provide supportive funding for the municipality to facilitate the transition to a Regional Waste Management Facility.

H. For greater clarity the Parties are committed to and in the process of developing overarching regional solid waste management agreements which will include:

a. Gates, staff, and tipping fees at all facilities.

b. Lease agreement.

c. Liability agreement reflecting an equal cost sharing of closure and post closure costs. (50% each)

d. Financial compensation by YG to the municipalities for the acceptance of residential waste from regional residential users.

e. YG assistance with environmental issues that may arise from the operation of a Solid Waste Management Facility.

AGREEMENT

Now therefore, the Parties agree as follows:

1. DEFINITIONS

1.1. In this Interim Agreement;

"**Designated Materials**" means those materials for which Yukon collects a point-of-sale or manufacturing fee in relation to waste disposal or recycling and as further defined under the *Environmental Act*, specifically the *Designated Materials Regulation* and the *Beverage Container Regulation*. These designated materials include tires, electronic waste, and beverage containers.

"**Special Waste**" has the same meaning as found in the *Environmental Act* and the *Special Waste Regulations*, and includes residential products such as waste oil accepted under Community Services' Household Hazardous Waste Program.

"**Tipping fees**" means fees charged by the Regional Waste Management Facility to all facility users per unit, or per unit of volume or mass, for waste disposed of at the facility.

2. Regional Waste Management Facility Operations & Permitting

2.1. Tipping Fees

2.1.1. Dawson will work to develop a waste management bylaw that establishes sorting requirements and tipping fees at the Regional Waste Management Facility.

2.1.2. Dawson agrees that all residential users of the Regional Waste Management Facility will be charged the same tipping fees. Some variation from one municipality to the other is expected due to individual operation practices.

2.2. Safe operations

2.2.1. Dawson will carry out the operation and maintenance of the Regional Waste Management Facility safely, in compliance with all relevant legislative and regulatory requirements and with due care to ensure that it does not cause any injury.

2.3. Permits

2.3.1. Dawson is responsible for all permitting and license application requirements associated with the operation and maintenance of the Regional Waste Management Facility and will ensure compliance with relevant legislative requirements;

2.3.1.1. its obligations as a proponent for any environmental assessments;

2.3.1.2. renewal of the Permit; and

2.3.1.3. its obligations under the Workers' Safety and Compensation Act S.Y. 2021, c.11.

2.4. Not a YG operation

2.4.1. Dawson acknowledges that it has sole responsibility for the

operation and maintenance of the Regional Waste Management Facility including controlling access to the site.

3. FUNDING

3.1. Yukon will provide a contribution of $75,000 (based on the historical Regional Agreement Value – final agreement to be based on 583 Unincorporated Regional Users plus 20% x $200/p) to offset the costs associated with providing waste disposal services to residents outside of the municipality of Dawson as per the regional boundary identified in Schedule B and to assist with operation and maintenance costs of the Regional Waste Management Facility.

3.2. In the event that this Agreement is extended past December 31, 2024, a review of the eligible regional population will be carried out by AYC and the revised population numbers must be reviewed and agreed to by Community Services and upon consensus, used to calculate the future compensation amount. As there is no reliable source of information on the regional population, AYC will use at least two sources and present an average regional population for each municipality.

3.3. The payment will cover the period from January 1, 2024, to December 31, 2024 (12 months).

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The Parties have executed this Interim Agreement by their Duly Authorized Officials:

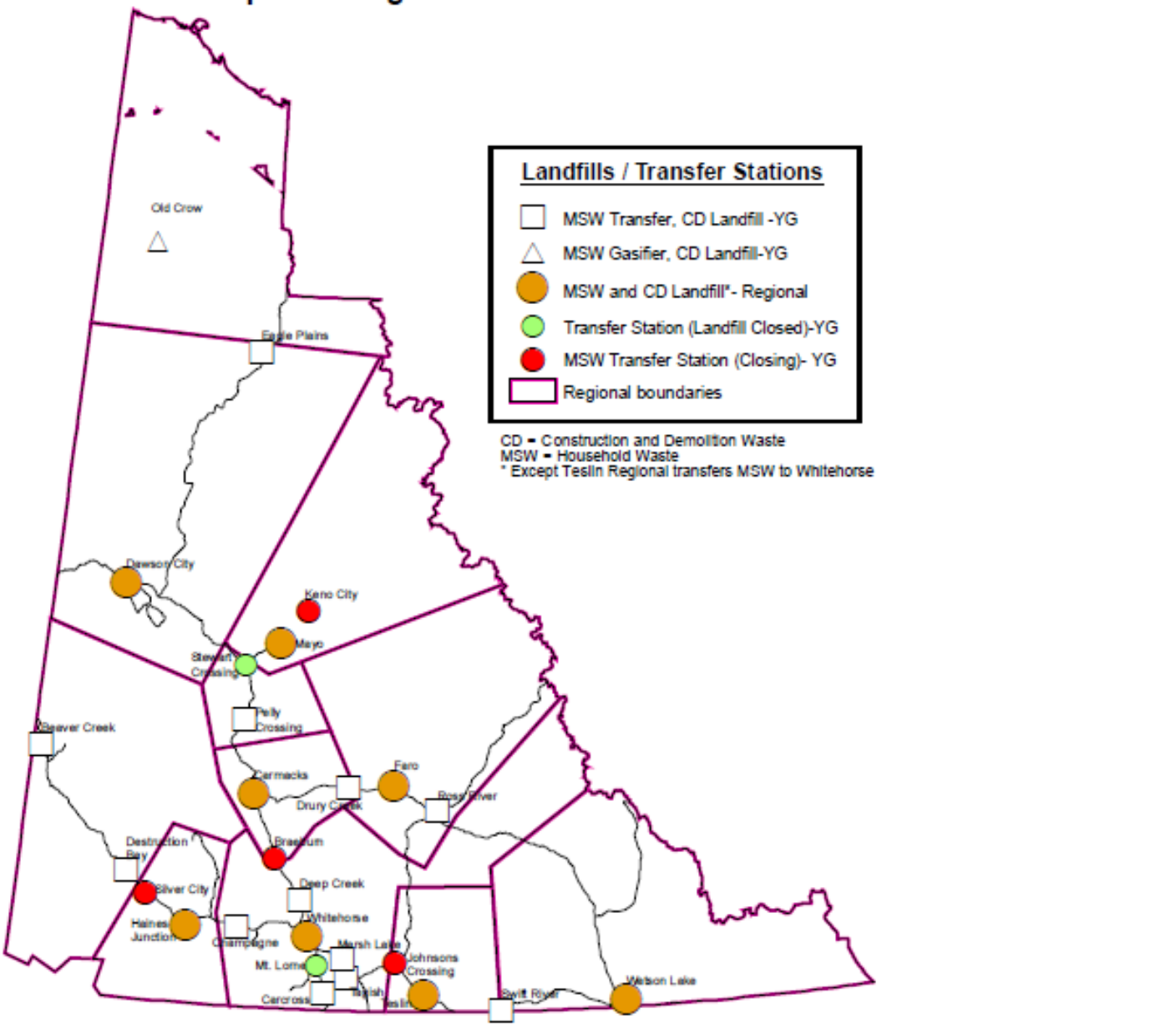
GOVERNMENT OF YUKON by the Director of Community Operations:	)	
_____ David Albisser	)	Date Signed
THE VILLAGE OF DAWSON by the Chief Administrative Officer:	)	
_____ CAO David Henderson	)	Date Signed

Schedule A

Map of the Location of the Solid Waste Management Facility

Schedule B

Yukon After Regionalization:
Proposed Regional Boundaries and Sites to be Closed or Modified



Environment and Climate Change Canada
Environnement et Changement climatique Canada

Solid Waste Management for Northern and Remote Communities

PLANNING AND TECHNICAL GUIDANCE DOCUMENT

MARCH 2017

Canada

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Aussi disponible en français

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ACKNOWLEDGEMENTS

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- Natural Resources Canada: Dr. Sharon Smith

Disclaimer: The content of this document does not necessarily represent the views or endorsement of the individuals and organizations listed here.

ACRONYMS AND ABBREVIATIONS

CCME—Canadian Council of Ministers of the Environment

CEQG—Canadian Environmental Quality Guidelines

CRD Waste—Construction, renovation, and demolition waste

E-waste—Electronic waste

ECCC—Environment and Climate Change Canada

ELV—End-of-life vehicle

EPR—Extended producer responsibility

GHG—Greenhouse gas

ICI Waste—Industrial, commercial, and institutional waste

IUCN—International Union for Conservation of Nature

LFG—Landfill gas

MOLO—Manager of Landfill Operations

MSW—Municipal solid waste

PPE—Personal protective equipment

SARA—Species at Risk Act

SWANA—Solid Waste Association of North America

TDG—Transportation of dangerous goods

VOC—Volatile organic compound

GLOSSARY

Composting—a managed, biological process through which organic matter is degraded under aerobic conditions to a relatively stable, humus-like material called compost.[1]

Construction, Renovation, and Demolition (CRD) Waste—refers to waste generated by construction, renovation and demolition activities (e.g., lumber, drywall, metal, doors, windows, wiring).[2]

Contaminating Lifespan—the period of time during which the landfill contains contaminants which could have an unacceptable impact if released to the environment.

Daily Cover—soil that is spread over compacted waste at the end of each working day.

Disposal—the act or process of getting rid of a product or material indefinitely, typically in a landfill.

Diversion—keeping products or materials away from disposal through reuse, recycling, and composting.

Extended Producer Responsibility—a policy approach in which a producer's responsibility—physical and/or financial—for a product is extended to the post-consumer stage of a product's life cycle.[3]

Freshet—spring discharge from melting ice and snow.

Hazardous and Special Waste—materials or substances that because of their corrosive, inflammable, infectious, reactive, and toxic characteristics, may present real or potential harm to human health or the environment.[4]

Industrial, Commercial, and Institutional (ICI) Waste—the waste generated by non-residential sources in a community.[5]

Landfill Cell—a lined area where residual waste is placed, compacted, and covered.

Landfill Gas—a mixture of gases that results from the decomposition of organic waste in landfills and that is composed primarily of methane, which is a potent greenhouse gas and potential explosion hazard.

Leachate—the liquid that has been in contact with waste (e.g., landfill cell, compost facility) and has undergone chemical or physical changes.

Legacy Waste—piles of waste that result from past waste management practices and that are typically not segregated or depolluted.

Municipal Solid Waste (MSW)—reusables, recyclables, compostables, and residual waste (i.e., garbage) from homes, businesses, schools, and other institutions.

Municipal Solid Waste Facility—a dedicated area designed for storing, processing, and disposing of waste in an environmentally-sound manner.

Natural Attenuation—the reduction of pollutant concentrations through naturally-occurring biological, physical, and chemical processes.

Open Burning—burning waste in landfills, barrels, open pits, outdoor furnaces, woodstoves, or fireplaces.[6]

Permafrost—soil or rock that remains frozen at least two years in a row.[7]

Recycling—a process whereby a material (e.g., metal, paper, plastic, glass) is diverted from disposal and remanufactured into a new product or is used as a substitute for raw materials.[8]

Residential Waste—waste from households, which include single-family and multi-family residences.[9]

Residual Waste—waste that remains after reuse, recycling, composting, and treatment.

Reuse—the use of a product or material more than once, sometimes with a modification from its original purpose (e.g., turning a scrap tire into a swing or planter).[10]

Source Reduction—the act of preventing the generation of waste (e.g., using reusable bags, buying food in bulk).[11]

Stormwater—water that originates during precipitation events and snow and ice melt.

Tipping Fee—a fee charged at the point of reception for treating, handling, and/or disposing of waste materials which is usually applied on a per-tonne basis.[12]

Waste Management Plan—a document that helps the community to take stock of the existing waste management situation, define goals and objectives, identify appropriate strategies, and evaluate the waste management system so as to continuously improve over time.

White Goods—large appliances, such as refrigerators, freezers, and stoves.

ENDNOTES

1 Environment and Climate Change Canada. 2013. Technical Document on Municipal Solid Waste Organics Processing.

2 Statistics Canada. 2013. Waste Management Industry Survey: Business and Government Sectors 2010.

3 Environment and Climate Change Canada. Extended Producer Responsibility Webpage.

4 Environment and Climate Change Canada. Hazardous Waste and Recyclable Material Webpage.

5 Statistics Canada. 2013.

6 Environment and Climate Change Canada. 2010. Open Burning of Garbage.

7 Natural Resources Canada. Permafrost Webpage.

8 Statistics Canada. 2013.

9 Federation of Canadian Municipalities. 2004. Solid Waste as a Resource: Guide for Sustainable Communities.

10 *Ibid.*

11 *Ibid.*

12 Environment and Climate Change Canada. 2013.

1.0 INTRODUCTION

1.1 ABOUT THIS DOCUMENT

The idea for this document first came about several years ago during informal discussions between representatives from Environment and Climate Change Canada (ECCC) and the territorial governments. Since then, ECCC has been working to deepen its understanding of the complex waste management issues faced by northern and remote communities and has developed this planning and technical guidance document with insight, support, and knowledge from territorial governments, key stakeholders, and a variety of experts. Although the focus of the document is on Canada's territories, the best practices are applicable to communities in the northern parts of the provinces, indigenous communities, and other small communities across Canada.

This document provides guidance on best practices for the planning, design, operation, and eventually, closure of existing or new municipal solid waste (MSW) facilities in northern and remote regions. For the purposes of this document, a MSW facility typically includes the following elements:

- Dedicated areas for processing and storing wastes that have been sorted (e.g., hazardous and special waste, electronic waste, organic waste, recyclables);
- An area for residual waste disposal (landfill cell or incinerator) and/or transfer (storage); and
- Associated infrastructure, such as heavy equipment, a shelter for staff, fencing, and signage.

This document was developed with various audiences and purposes in mind:

- To assist regulators, such as environment ministries and natural resource management boards, in setting waste management policies, issuing permits or licences, and overseeing operations;
- To give community infrastructure departments, senior administrative officers, band managers, and other officials tools to develop waste management plans, allocate resources, and engage with consulting firms as well as service and technology providers;
- To support MSW facility operators in making incremental improvements to their operations; and
- To provide governments and other organizations with practical information for developing public outreach and training materials.

The first two sections of the document (Sections 2 and 3) provide guidance on the waste management planning process, while the latter half of the document (Sections 4 through 9) provides technical guidance on MSW facility design, operation, and closure. Specifically:

- **Section 2** discusses the importance of waste management planning, describes the key steps a community can take to continuously improve its waste management system over time, and includes a framework for prioritizing the recommended best practices;
- **Section 3** provides guidance on site evaluation and selection for a new MSW facility or a new sub-component, such as a landfill cell, or on the assessment of an existing MSW facility or landfill cell to identify potential areas for improvement;
- **Section 4** provides guidance on the general operation of the MSW facility, recommends priority actions that apply to the MSW facility as a whole, and provides examples of conceptual layouts;
- **Section 5** provides technical guidance on the design, construction, and operation of a landfill cell for residual waste disposal within a MSW facility and recommends priority actions;

- **Section 6** prioritizes the remaining major waste types (e.g., hazardous and special waste, electronic waste, end-of-life vehicles, bulky waste, scrap tires, construction, renovation, and demolition (CRD) waste, organic waste, reusable items, and recyclables) and presents best practices in terms of design and operations for each;
- **Section 7** provides an overview of considerations for MSW facility performance monitoring and reporting;
- **Section 8** provides an overview of considerations for closure and post-closure activities that apply to an entire MSW facility or to progressive closure of a sub-component, such as a landfill cell; and
- **Section 9** summarizes the key recommended best practices and suggests next steps for improving waste management in northern and remote communities.

References are included as endnotes in each section, and Appendix A provides additional resources on the various topics covered in this document.

1.2 LIMITATIONS OF THIS DOCUMENT

As with other voluntary guidance documents, users of this document should always take into account their specific local conditions and existing requirements. Although great care has been taken to provide accurate and practical guidance, the information contained in this document is not intended to supersede any local, provincial/territorial, or federal regulatory requirements and should not be seen as a substitute for advice from qualified professionals.

Although generating zero waste is a good aspirational goal, the reality is that despite best efforts to reduce, reuse, and recycle, there will always be some materials to be disposed of. ECCC recognizes that northern and remote communities may have more than one disposal option for residual waste, including:

1. Transfer of waste to a regional disposal facility (refer to Appendix A, Regionalization);
2. Disposal of waste in a landfill cell within the community's MSW facility (refer to Section 5); and
3. Incineration of waste and landfilling of ash on-site (refer to Box 5-1 in Section 5).

With respect to disposal options, the focus of this document is on option 2, i.e. managing residual waste in a landfill cell within the community's MSW facility. This option is profiled since it is likely to be the most common and feasible practice for the majority of communities in northern and remote areas of Canada. Although technical guidance for transfer stations is not included in this document, many of the considerations and principles related to siting, waste screening, segregation, and storage are applicable to a waste transfer system scenario (refer to Appendix A, Regionalization).

The document does not include planning or technical guidance on waste collection systems, although Table 2-1 briefly identifies some of the advantages of curbside collection versus drop-off systems. Nor does it provide detailed information on how to engage the community and raise awareness on the importance of proper waste management which are activities that can play a significant role in the success of any waste management system. However, many resources are available on these topics from government and environmental non-governmental organizations (refer to Appendix A, Waste Management Planning and Public Outreach).

For the purposes of assisting communities in prioritizing improvements to waste management, waste types have been categorized as high, medium, and lower-priority using a risk-based approach. The priority level is based on several factors, such as a waste type's relative risk to human health and the environment, as well as its proportion of the total waste stream. As a result, the recommendations outlined in this document complement, but do not necessarily follow, the conventional 3Rs (Reduce, Reuse, Recycle) hierarchy.

1.3 CONTEXT

Communities in northern and remote regions face unique challenges in managing their municipal solid waste (MSW, refer to Box 1-1) due to climate, geology, population size and distribution, socio-economic factors, and access to services and facilities. As a result of these challenges, some existing waste management practices are not sufficiently protective of human health and the environment. While the principles of environmentally sound waste management are well-documented, these best practices need to be adapted to the distinct circumstances of northern and remote communities.

Responsible waste management requires careful planning, prudent investment, and ongoing management and monitoring. As communities grow in population and economic activity, so do the quantities and types of wastes that require management. As such, waste management policies, programs, and infrastructure need to evolve to take into account the community's needs and available resources.

Waste management planning, with meaningful community engagement, is fundamental to a community's success in improving its practices. Through this process, communities can take stock of their current waste management situation, set priorities and goals, identify and evaluate options, develop and implement a waste management plan, and then track their progress and make adjustments over time. To create efficiencies and expand waste management options, partnerships with neighbouring communities, private businesses, educational institutions, and non-profit organizations should be pursued whenever feasible. Among other benefits, a good waste management plan can reduce costs over the long term, create employment opportunities, and reduce environmental risks and future liabilities for the community.

As part of their waste management system, most communities have access to some type of MSW facility, ranging from basic to more advanced infrastructure, where they can store, process, and dispose of their waste. The proper design, operation, monitoring, and eventual closure of part or all of a MSW facility are integral to the health and safety of the community

BOX 1-1: WHAT IS MUNICIPAL SOLID WASTE?

Municipal solid waste (MSW) or simply "solid waste" are terms used by the waste management sector to refer to reusables, recyclables, compostables, and residual waste (i.e., garbage) from homes, businesses, schools, and other institutions. The term MSW can be applied regardless of the type of settlement (e.g., hamlet, village, town, municipality, First Nation). MSW and solid waste are not to be confused with sewage sludge or biosolids.

and to the protection of the surrounding environment. As such, the ongoing support of qualified professionals and trained personnel is required.

In northern and remote communities, competing infrastructure priorities, limited budgets, and the high cost per capita of building and maintaining infrastructure are an ongoing reality. In response, this document is founded on two guiding principles: (1) taking a risk-based approach to waste management, which means prioritizing infrastructure, operational activities, and waste types to reduce the risks to human health and the environment; and (2) committing to continuous improvement to the waste management system over time.

1.4 CURRENT WASTE MANAGEMENT PRACTICES

Although waste management practices vary across northern and remote regions of Canada, many communities dispose of their waste in unlined disposal sites, sometimes referred to by communities as "dumps" or "dumpsites". These sites and some of their associated operational practices, such as open burning of waste, can be a source of pollution. A handful of communities that are connected by road and are relatively close together have transfer stations for temporary storage of their waste and use a regional landfill for waste disposal.

Waste management practices sometimes include segregation of waste types, i.e., hazardous and special waste, electronic waste, etc. It is common for segregated wastes to accumulate in communities until there is an incentive (primarily driven by economics) to transport them to an appropriate treatment or recycling facility or to treat them on-site. If the incentives are not present, the segregated wastes continue to accumulate.[1]

In recent years, some communities have made great strides in waste management while others have chosen not to adopt more protective policies in the face of competing community infrastructure priorities, such as housing, schools, health care facilities, water and wastewater treatment systems, and roads. Using a risk-based approach to prioritizing certain infrastructure improvements, operational activities, and waste types, as proposed in this document, may be of particular interest to these communities.

1.5 A VISION FOR THE FUTURE

In this document, the term "MSW facility" intentionally replaces common terms like "dump", "dumpsite", "solid waste site" or "landfill", although the MSW facility may include a landfill cell for disposal of residual waste (i.e., the waste that is leftover after reuse, recycling, composting, and treatment). Building on traditional respect for nature, waste can be seen as a resource rather than a source of pollution (refer to Box 1-2).

The waste management approach promoted in this document supports the national vision adopted by Canadian environment ministers in 2014 and its objective to, "address the challenges of remote and Northern communities to improving their waste practices". For some northern and remote communities, the path to achieving this objective is an incremental one but the goals are the same:

- Waste will be sorted, processed, and stored temporarily on-site for reuse, recycling, composting, or treatment;

- Hazardous and special waste and hazardous substances will be kept separate and stored temporarily and safely until proper treatment or disposal;
- The open burning of waste will become a thing of the past;
- The quantity of waste requiring disposal will be greatly reduced and any residual waste disposal on-site will be done in an environmentally-sound manner; and
- Community members and the private sector will be actively engaged in sustainable waste diversion activities.

BOX 1-2: TRADITIONAL AND LOCAL KNOWLEDGE AND WASTE MANAGEMENT

Northerners are resourceful people with a long history of conservation and protection of resources. For example, for the Dene, caribou are life. Their flesh is used for food, and historically, their bones for tools, and their fur for insulation and bedding*. The Dene, like many other Indigenous peoples, were the ultimate recyclers. Over the past 75 years, Northerners have experienced significant changes to their way of life. Just like in the rest of Canada, new lifestyles have changed the type and quantity of waste that is generated. That said, people can return to their roots and draw on their traditional and local knowledge to improve waste management through practices such as reuse, recycling, and composting. After all, many Northerners still depend on the land for country food and have a deep understanding of the importance of keeping the land, water, and air clean.

(*Source: Campbell, Daniel. February 2016. Fence Narrows: How an Ingenious Hunting Practice Let the Tlicho Survive in the Harsh North. Up Here Magazine.)

In short, MSW facilities will become more of a staging area for waste diversion than a final resting place. This shift in waste management practices will require human and financial resources, and its full implementation could be phased in over several years. Nevertheless, there are many simple and relatively low-cost, yet effective, changes that MSW facility operators can begin making today and in the near term, such as improving segregation and signage, depolluting wastes that contain hazardous substances, and reusing materials on-site or within the community.

This document is intended to give decision-makers in northern and remote communities the tools needed to take stock of their waste management practices, prioritize their actions based on the risks to human health and the environment (refer to Box 1-3), and take steps to establish modern MSW facilities and continuously improve their operation over time.

BOX 1-3: THE 3RS FOR NORTHERN AND REMOTE COMMUNITIES

This document proposes a new twist on the 3Rs mantra—Reduce, Reuse, Recycle—by applying a risk-based approach to waste management in northern and remote communities:

- **Reduce risks**—keep hazardous substances out of the landfill cell and do not open burn waste;
- **Reuse**—sell or donate reusable household items (e.g., furniture, clothing) and other materials and products (e.g., lumber); and
- **Recycle**—collect products and packaging for recycling and compost food and yard waste.

ENDNOTE

[1] ARKTIS Solutions, Inc. 2012. Foundation Report for a Technical Document on Municipal Solid Waste Landfills in Northern Conditions: Engineering Design, Construction and Operation, p. 24. Prepared for Environment and Climate Change Canada.

2.0 WASTE MANAGEMENT PLANNING AND CONTINUOUS IMPROVEMENT

Developing a waste management system that is successful over the long term in protecting human health and the surrounding environment requires good planning and community engagement. Some northern and remote communities may recognize that their waste management system is not adequate to meet current or future needs, but may feel overwhelmed by the costs and effort required to make improvements. Waste management planning helps a community to:

- Take stock of the existing situation;
- Define goals and priorities;
- Identify appropriate strategies; and
- Develop a plan for implementation, monitoring, and evaluation.

This section identifies key considerations and outlines a step-by-step process for communities to develop and implement a waste management plan, and in turn a MSW facility, that protects human health and the environment and adapts to the evolving needs of the community. Communities are encouraged to retain the services of qualified professionals to assist them as they work through each of the steps.

2.1 KEY CONSIDERATIONS FOR WASTE MANAGEMENT PLANNING

Protecting Human Health and the Environment: There are many ways in which waste management activities can impact human health or become a source of environmental pollution, including the emission of air pollutants from open burning of garbage, the production of greenhouse gas emissions from landfilled organic waste, and the leaching of toxic contaminants from landfills into surface water and groundwater. Handling, storage and disposal of waste require well-planned approaches to avoid immediate and long-term environmental contamination.

Unique Circumstances: Northern and remote communities may require waste management solutions that vary from what is considered conventional in southern regions of Canada. For example, communities without year-round road access may have greater difficulty implementing a recycling program or upgrading a landfill. Additionally, more than half of northern communities have fewer than 500 people[1], which presents a significant financial challenge given the capital and operating costs associated with modern waste management infrastructure. Identifying unique circumstances and taking them into account is an important step in the planning and decision-making process and will help maximize investments and avoid future problems.

Community Engagement and Awareness: "For many communities, the foundation of sustainable community action is working on an issue that reflects a common concern in the community."[2] The success of waste management planning is dependent on whether or not it addresses a common concern in the community. Examples of common concerns related to waste management include clean drinking water, air quality, and children's safety. In addition, establishing a close working relationship with community members and stakeholders in the planning, design, implementation, and operation of a waste management system leads to higher public acceptance, support, and participation.[3]

Youth can also be mobilized to lead change and influence practices in a household. School activities can be a way to identify opportunities to reduce waste and contribute to community goals. More information and tools on fostering sustainable behaviour within the community, such as "community-based social marketing," can be found in Appendix A, Public Outreach.

Partnerships and Synergies: Due to relatively small populations and limited resources, northern and remote communities may find it challenging to provide a comprehensive set of waste management services. Although not practical everywhere, one strategy that some communities have developed to meet this challenge is to regionalize certain services and facilities through the pooling of resources.[4] Partnerships with not-for-profit organizations or the private sector can also be beneficial, as they can be established both within and beyond a community and provide a broader suite of services.

Continuous Improvement: Regardless of the circumstances, the management approach should be to improve the performance of the community's waste management system and MSW facility over time. Communities are encouraged to set improvement goals that reduce risks to human health and the environment. The waste management team should be tasked with: 1) identifying opportunities and ways to improve within the current capital and operating budgets and 2) monitoring and reporting on progress.

Figure 2-1 below summarizes the key steps involved in a continuous improvement approach to waste management planning. These steps are further described in Sections 2.2 through 2.5.

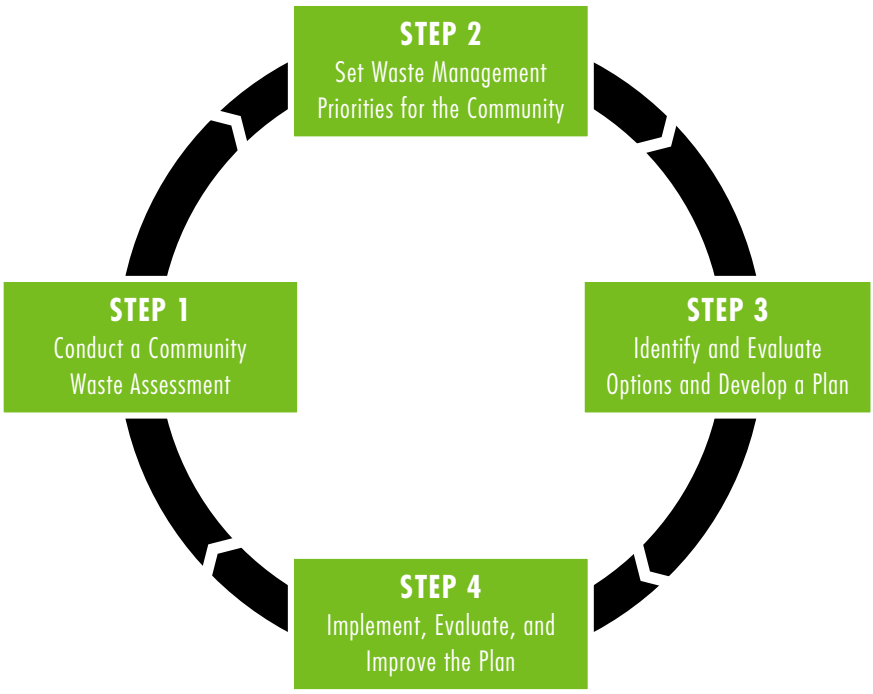
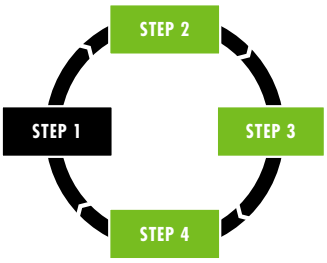


Figure 2-1: Continuous Improvement Approach to Waste Management Planning

2.2 STEP 1: CONDUCT A COMMUNITY WASTE ASSESSMENT



A thorough understanding of the community's waste generation and management processes is essential. A community waste assessment or waste audit should identify basic aspects of the local waste stream, such as quantities, composition, and sources of waste. It should also include an evaluation of current waste management practices and facilities to determine how they can be improved or adapted to meet current and future needs of the community.

2.2.1 CHARACTERIZE THE WASTE STREAM

KEY QUESTIONS:

- What types, quantities, and sources of waste are generated annually?
- How much legacy waste, such as drums, appliances, end-of-life vehicles, and other materials, have accumulated within the community over time and are currently stockpiled?
- What are the longer-term waste generation projections based on population trends and economic factors?

The first task in conducting a community waste assessment is to develop a thorough understanding of the quantities and composition of the waste stream and to develop projections for the waste anticipated over the operating life of the MSW facility (typically 30 years or more). The main waste generators in a community include households and local businesses (i.e., typically excludes industrial activities outside of the community boundaries) and institutions (e.g., schools, hospitals, community centres). The typical residential and industrial, commercial, and institutional (ICI) wastes managed by MSW facilities in northern and remote communities are presented in Sections 5 and 6.

A waste assessment should be conducted for the community to gain the necessary understanding of current and legacy quantities of different types of waste that require management. Given the absence of vehicle weigh scales at the majority of MSW facilities in northern and remote communities, it is recognized that accurate data on the type and quantity of waste entering and leaving the site may not be available. However, several approaches and techniques can be used to produce estimates, including:

- audits of select loads of waste entering and leaving the MSW facility, to establish the type and quantity of waste currently being managed;
- measurements of the footprint and thickness of the existing landfill cell and its age, to estimate the annual residual waste quantity generated and/or annual landfill airspace volume consumed;
- counting or approximating quantities of certain materials already present at a MSW facility (e.g., scrap tires, end-of-life vehicles, bulky waste items) and then estimating annual generation rates; and
- using waste diversion and disposal data from similar communities to produce estimates, such as the data found in Figure 2-2, which presents a typical waste composition for Yukon communities.

Although waste generation data for northern and remote communities is limited, it is known from a recent Statistics Canada survey that Canadians generate an average of about 965 kg of municipal solid waste per year per capita.[5] This figure includes waste that is diverted for reuse, recycling, or composting and waste that is permanently disposed of. Therefore, based on population data for 2015, Canada's territories generate an estimated 114,000 tonnes of waste per year. Table 2-1 presents a breakdown of the waste quantities generated by territory. Please note that these figures do not include large items such as end-of-life vehicles, white goods, and scrap tires.

In terms of waste composition, few waste composition studies have been conducted in northern and remote communities. However, Figure 2-2 presents average disposal data from the City of Whitehorse, Yukon, and a number of surrounding communities. The data are reasonably consistent with those of other waste composition studies carried out in Canada.

TABLE 2-1: WASTE GENERATED IN THE TERRITORIES

	KG/CAPITA (based on 2012 data)	POPULATION (as of July 1, 2015)	ANNUAL WASTE GENERATION (tonnes/year)
Nunavut	965	36,900	35,609
Northwest Territories	965	44,100	42,557
Yukon	965	37,400	36,091
TOTAL		**118,400**	**114,257**

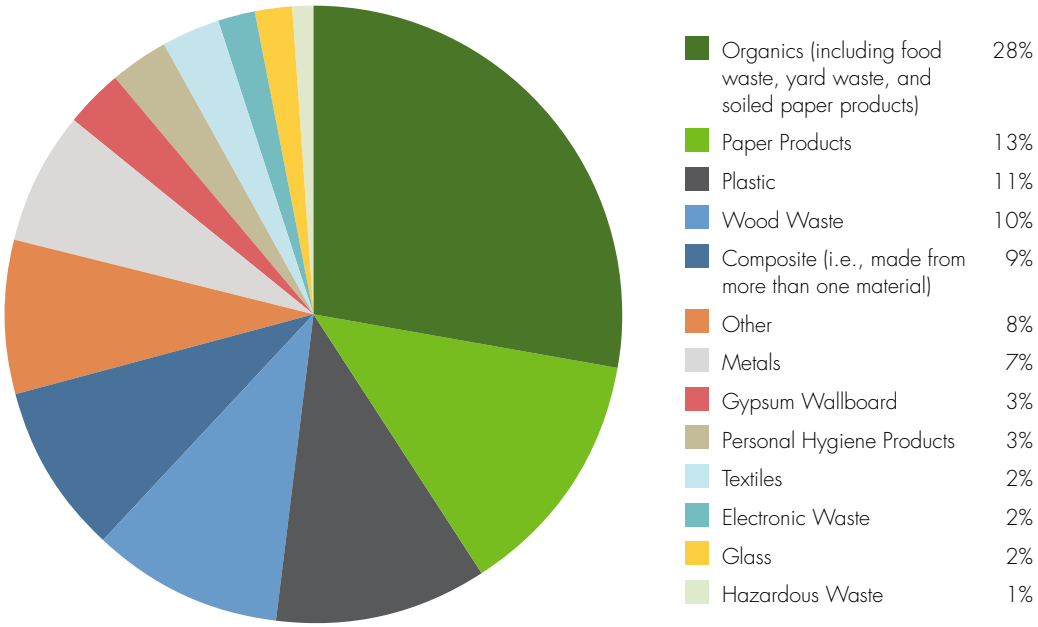


Figure 2-2: Typical Waste Composition in the Yukon[6]

Other sources of waste diversion and disposal data for northern and remote communities could also be consulted, including published research reports, reports from waste management consultants, territorial/provincial authorities and other regulatory bodies. Where vehicle or other types of weigh scales are not available, waste quantities should be converted to tonnage measurements using appropriate conversion factors, as this will facilitate comparisons between waste types and will provide a basis for estimating requirements for off-site transportation of hazardous and special waste, end-of-life vehicles, electronic waste, recyclables, etc. The MSW Management Planning section of Appendix A includes a list of documents that communities may find useful as they undertake a waste audit or estimate waste quantities and composition based on other studies.

Once the waste stream has been characterized (types and quantities), per capita estimates and projections of future waste generation rates should be developed for the expected life of the MSW facility, taking into account the anticipated growth of the community over that time period.

2.2.2 ASSESS THE EXISTING MSW FACILITY AND POTENTIAL NEW SITES

The next task in conducting a community waste assessment is to review the design and operation of the community's existing MSW facility and determine its suitability in meeting current standards and future needs of the community. This should include assessing the current design, operations and performance against applicable legislation and licencing requirements and against the recommended best practices outlined in this document. The information required to complete the assessment may be gathered through a combination of site visits, interviews with current and previous operators, community leaders, elders, and members, and a review of existing documentation on the MSW facility.

KEY QUESTIONS:

- Are there human health (including safety) or environmental concerns associated with the existing MSW facility?
- How do the existing design and operations compare with local regulatory requirements? With the recommendations outlined in this document?
- What materials are segregated and treated/disposed of off-site?
- What materials are disposed of on-site?
- What materials are recycled or composted?
- What is the remaining life of the existing MSW facility in terms of disposal capacity?
- What possibilities exist for upgrading or expanding the existing MSW facility or building a new one?

There are several circumstances in which a community could be required to find a completely new site for its MSW facility, including the following:

- The community does not have an existing MSW facility;
- The existing landfill cell of a MSW facility has already reached its capacity and there is no room for expansion; or
- The existing MSW facility cannot be upgraded.

Details and recommendations for MSW facility siting can be found in Section 3.

2.2.3 IDENTIFY CHALLENGES AND NEEDS

KEY QUESTIONS:

- Based on the waste characterization and MSW facility audit, what are the main challenges?
- What are the current waste management needs of the community? What are the anticipated population growth, economic activities, and waste management needs for the future?

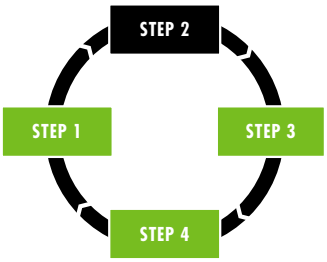
The final task in the community waste assessment is to use the information gathered on the waste streams and current infrastructure and operations (outlined in Sections 2.2.1 and 2.2.2) to identify the specific waste management challenges and needs of the community, including aspects of environmental performance and the management of specific waste types that need to be improved, cost-saving opportunities, capital and operating budget needs, and strategies for enhancing diversion through reuse, recycling, and composting.

The challenges and needs will be different for each community. For example, for one community, it may become apparent that the existing MSW facility does not have sufficient landfill capacity to accommodate the community's waste and that increased diversion and improved operational practices will be required to avoid the siting of a new MSW facility in the near future. For another community, there may be large quantities of legacy wastes (e.g., end-of-life vehicles, drums, white goods, scrap tires) that require off-site transport to an appropriate recycling or disposal facility (refer to Box 2-1). Regardless of their nature or scale, it is important to identify and document all of the community's waste management challenges and needs, to the greatest extent possible.

BOX 2-1: LEGACY WASTE IN THE NORTH

The complex issue of "legacy waste" is a reality for many northern and remote communities. Legacy waste refers to piles of waste, such as end-of-life vehicles, drums, white goods, scrap tires, and other materials, that have been accumulating in and around communities for decades. Some hazardous substances may have unfortunately already leaked out of corroding metals and made their way into the environment. The quantity of legacy waste can be overwhelming for a small community, but the complexity of the undertaking should not be a reason for inaction. Developing a strategy or agreeing on an approach to begin addressing legacy waste is an important step and is essential to any comprehensive waste management plan. For more information, refer to Appendix A, Hazardous and Special Waste.

2.3 STEP 2: SET WASTE MANAGEMENT PRIORITIES FOR THE COMMUNITY



In order to direct resources effectively and develop the needed partnerships, Step 2 of the continuous improvement process is to set waste management priorities for the community based on the challenges and needs identified in Step 1.

To assist decision-makers with prioritization, this document recommends best practices and further categorizes them into high-, medium-, and lower-priority actions using a risk-based approach. The priority actions are focused on reducing risks to human health and safety and preventing the release of hazardous substances to the air, water, and land. Specifically:

- **Section 4** identifies high-, medium-, and lower-priority actions that apply to the general operation of the MSW facility;
- **Section 5** describes high-, medium-, and lower-priority actions that apply to the landfilling of residual waste; and
- **Section 6** identifies high-, medium-, and lower-priority waste types and actions for the remaining waste (e.g., hazardous and special waste, electronic waste, end-of-life vehicles).

Communities should begin to address high priorities in the short term, followed by medium and lower priorities in the longer term, guided by their waste management plan, to continuously improve over time. Throughout the document, the different priority levels are colour-coded: red for high (●●●), yellow for medium (●●), and green for lower priority (●). The framework that ECCC used for prioritizing the recommended best practices is further explained in Table 2-2.

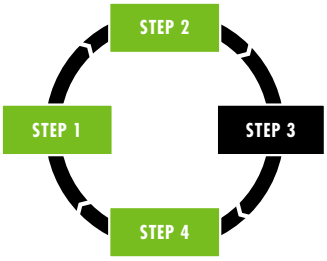
Community engagement and awareness are important components in determining and validating the waste management needs of a community and identifying its priorities. Engagement and awareness initiatives should be undertaken to educate community members, collect information, validate the conclusions, and discuss options. This could take many forms, including outreach materials, public meetings, focus groups, and door-to-door surveys. It is important that responsibilities are clearly assigned to ensure transparent decision making and to support sustained community engagement and awareness.

Impacts on capital and operating budgets are another important consideration in the prioritization exercise. Infrastructure needs to be maintained in order to protect the investment and ensure proper operation.

TABLE 2-2: FRAMEWORK FOR PRIORITIZING THE RECOMMENDED BEST PRACTICES

PRIORITY LEVEL	EXPLANATION
High ●●●	Every MSW facility, regardless of its size and location, should put in place basic infrastructure and implement operational practices necessary to protect the public, facility operators, and wildlife from immediate risks and to prevent the release of toxic substances from the site. High-priority measures include controlled access, trained on-site operators, and segregation and storage of hazardous and special wastes, among others. As a complement to the basic measures, communities may pursue other activities identified in the waste management plan that address important local challenges and needs. The successful implementation of high-priority measures will enable communities to pursue more complex undertakings and longer-term investments.
Medium ●●	Each community faces different circumstances that will determine where efforts should be directed next to further improve protection of the environment, increase resource recovery, and extend the life of the landfill. Medium-priority measures include control of surface and storm water, monitoring of surface and groundwater, further segregation and recycling, and more frequent cover and compaction of the landfill cell. In addition, the waste management plan will identify waste types that are in high quantities or of special concern for the community as well as local environmental risks and partnership opportunities.
Lower ●	Once site security and operational practices are well established and waste diversion and environmental monitoring activities are in place, a community can turn its attention to considering more advanced waste management infrastructure and practices. Lower-priority measures include improving record keeping and reporting, enhancing leachate and landfill gas management, and developing partnerships to improve the economic viability of new diversion and disposal options. These activities will contribute to continuous improvement and benefit long-term objectives.

2.4 STEP 3: IDENTIFY AND EVALUATE OPTIONS AND DEVELOP A PLAN



With validated community needs and priority areas for improvement in hand, it is time to explore options and develop a waste management plan. In fact, in some jurisdictions, the regulators require the development of a waste management plan as part of the permitting or licencing process (e.g., community water licence). Step 3 involves reviewing the findings of Steps 1 and 2, identifying and evaluating options, and developing a waste management plan for the community.

2.4.1 IDENTIFY AND EVALUATE OPTIONS

Based on the identified waste management priorities for the community, the next task will be to identify and evaluate options that can address those priorities. Considerations for these options should include:

- **Meeting existing federal, provincial/territorial, and local regulatory requirements.** Communities should meet the requirements set out in the environmental and other regulations or bylaws that apply to their jurisdiction.
- **Retaining qualified professionals.** Communities should retain the services of qualified professionals to assist in developing feasible options to meet community needs and, if necessary, support the decision-making process. In this case, qualified professionals could include consulting and engineering firms with experience in waste management planning as well as in MSW facility siting, design, construction, operation, and closure.
- **Using appropriate technologies and adopting best practices.** Proven and appropriate infrastructure and waste management technologies should be favoured. For example, communities should check references before hiring consultants or technology suppliers and ask to visit similar waste systems. As others have learned the hard way, if the technology in question is only at the conceptual stage or is only operational on a ship in the middle of the ocean or in some distant city, this may be considered a red flag and communities should proceed with caution.
- **Exploring program and policy tools.** Beyond technical options, there are a variety of waste management program and policy approaches that could be implemented to help address the community-specific challenges and needs that were prioritized in Step 2. Table 2-3 provides some examples that could be considered.
- **Examining funding sources and potential partnerships.** Decision makers should identify funding sources and potential partners for waste management activities. In northern and remote communities, per capita capital and operating costs for all community infrastructure are typically higher than in more populated areas of the south. Facility-level efficiencies and partnerships can create economies of scale and help reduce overall costs. Also, by investing in adequate infrastructure today, communities can avoid costly clean-up and remediation in the future.

  Funding sources to support MSW facility planning, design, construction, and operation may include regional, provincial/territorial, federal, and Indigenous governments as well as non-governmental organizations and the private sector (refer to Appendix A, MSW Management Planning). In addition, tipping fees can be instituted at the MSW facility as a source of revenue (refer to Box 2-2).

TABLE 2-3: POTENTIAL PROGRAM AND POLICY TOOLS FOR ENABLING WASTE MANAGEMENT SUCCESS

TOOL	DESCRIPTION
Capacity Building	• **Operator Training:** Equips operators with the knowledge to safely and effectively operate a MSW facility (e.g., hazardous waste management, spill response). • **Public Outreach:** Promotes adoption of environmentally sound waste management practices (e.g., community litter clean-up days, household hazardous waste collection events, recycling challenges at school). • **Leaders, Champions and Volunteers:** A volunteer waste management committee can be a tremendous asset to a community's waste management system by assisting with diversion programs and public outreach. In communities where there is high turnover, ongoing recruitment of new members can help committees "weather the storm." • **Proposal Writing:** Can help access funding opportunities, more so if broad community support can be demonstrated.
Policies and Bylaws	• **Curbside Collection of Waste:** Improves convenience for residents; collection frequency can be used to shape behaviour and accommodate different budgets; limits public access to the MSW facility and associated liabilities. • **Bag Limits:** Limits number of garbage bags that residents can put out for collection and encourages diversion. • **Tipping Fees:** Charges MSW facility users for disposal of waste and generates revenue for site operations (refer to Box 2-2). • **Landfill Disposal Bans:** Prohibits disposal of certain waste types and encourages diversion. • **Bylaws on Open Burning and Illegal Dumping:** Can help change behaviour if supported by education and enforcement.

BOX 2-2: CONSIDERATIONS FOR TIPPING FEES

A "tipping fee" is a fee usually applied on a per-tonne basis to all wastes delivered to a MSW facility. Different fees may be charged based on the type of waste in a specific load and/or the extent to which waste has been sorted. Since weigh scales are not common in northern communities, fees can be charged by volume instead of by weight. Tipping fees could be applicable to all waste generators, or the community could decide to apply fees to certain generators only, such as businesses. The revenue collected through tipping fees can be used to offset the cost of managing the community's waste, particularly the more complex materials that need to be shipped off-site for proper treatment or disposal.

BOX 2-2: CONSIDERATIONS FOR TIPPING FEES (CONT'D)

However, the transition from being a community that does not charge for waste disposal to one that implements user fees can come with its challenges, at least initially. For example, to help prevent illegal dumping, it may be necessary for the community to develop a bylaw that prohibits disposing of waste in non-designated areas. For the bylaw to be effective, community awareness and enforcement are critical.

Since most illegally dumped waste has some kind of personal information that can be used as an identifier, one community in Canada found a creative solution to its illegal dumping problem. It posted a notice in the lost-and-found section of the local paper whenever illegally dumped waste was found by a bylaw officer, along the lines of: "Mr. Smith, your lost garbage bag was found in the ditch on Old Mine Road. Please come claim it at the Public Works building."

Examples of potential partners and partnership activities include the following:

- There may be opportunities to regionalize services (e.g., waste collection and disposal) and programs (e.g., public education, recycling) and/or share equipment, staff, knowledge, experience, and other resources with nearby communities.[7]
- Community groups may be interested in assisting with operation of a reusable items area (i.e., a free store) at the MSW facility or a thrift store within the community to create employment and generate revenue.
- Community groups may also be interested in conducting public outreach to promote sound waste management practices.
- The community could partner with educational institutions, research institutes, and/or the private sector to explore new programs and technologies not otherwise available due to economies of scale.[8]
- Recyclers may have mobile equipment that can be brought to the MSW facility temporarily and used to facilitate off-site transport of certain wastes (e.g., mobile crushers for end-of-life vehicles).
- Transportation companies may have available capacity and discounted rates for backhauling wastes for recycling or treatment/disposal.

Engaging the community. Through engagement with community members, local businesses, and nearby industries early and often throughout this process, partnerships and available resources may emerge. Community engagement also promotes buy-in for the waste management options.

2.4.2 DEVELOP A WASTE MANAGEMENT PLAN

Once options have been identified and evaluated and decisions have been made with input from the community, the next task is to develop the waste management plan.

The waste management plan should be prepared with assistance from qualified professionals, in consultation with appropriate stakeholders. At a minimum, the plan should:

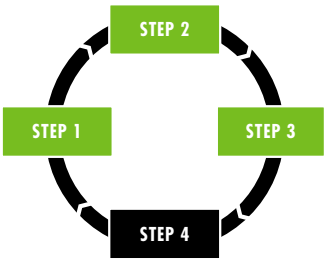
- cover a period of 30 years or more with review and updates every five years, or as appropriate;

- describe the current situation and issues, the steps taken to develop the plan, and any assumptions made;
- include waste characterization data and projections, identify partners, and establish short- and longer-term priorities;
- describe the MSW facility's siting, design, construction, operation, upgrading, and closure and post-closure plans, and demonstrate the connection of those elements to the short- and longer-term priorities;
- demonstrate how the MSW facility will comply with applicable regulations, standards, or bylaws;
- include MSW facility design documents prepared by a licenced professional engineer, with appropriate expertise and experience;
- engage relevant stakeholders (i.e., participation in the planning process); and
- include a communication strategy to foster, support, and sustain community engagement and awareness.

At the end of Step 3, the community should have a formal waste management plan and can proceed with implementation and continuous improvement. In brief, there are many factors that influence the development of a waste management plan (see Figure 2-3).

Figure 2-3: Factors that Influence a Waste Management Plan[9]

2.5 STEP 4: IMPLEMENT, EVALUATE, AND IMPROVE THE PLAN



Although the recommended planning horizon is 30 years or more, reviews and updates every five years (or as appropriate) should be undertaken to allow for continuous improvement and accommodate changes in the needs, goals, priorities, and opportunities of the community. The continuous improvement process should:

- include an evaluation of progress made under the waste management plan;
- compare planned results to actual results;
- revise priorities, if necessary, by working through Steps 1 and 2 of the waste management planning approach;
- develop a revised waste management plan (by following Step 3) to adjust any activities, infrastructure or operational requirements; and
- communicate and implement the revised plan, and restart the continuous improvement process.

For continuous improvement to be successful, all community members and stakeholders need to have access to the waste management plan and the results on an ongoing basis. This provides an opportunity for the community and partners to be kept informed of progress. Examples of measures of success include:

- quantity of hazardous and special waste shipped out for treatment/disposal;
- number of end-of-life vehicles shipped out of the community;
- quantity of compost produced;
- quantity of recyclables shipped out for recycling; and
- number of visits to the free store and current inventory.

Communication, openness, and feedback are critical to the success of a comprehensive waste management plan.

ENDNOTES

1 ARKTIS Solutions Inc. 2012. Foundation Report for a Technical Document on Municipal Solid Waste Landfills in Northern Conditions: Engineering Design, Construction and Operation, p. 3. Prepared for Environment and Climate Change Canada.

2 Carleton University. 2008. The VSP Tool—A Diagnostic and Planning Tool to Support Successful and Sustainable Initiatives.

3 Federation of Canadian Municipalities (FCM). 2009. Getting to 50% and Beyond: Waste Diversion Success Stories from Canadian Municipalities.

4 United States Environmental Protection Agency (US EPA). October 1994. Joining Forces on Solid Waste Management: Regionalization is Working in Rural and Small Communities.

5 Statistics Canada. 2012. Waste Management Industry Survey: Business and Government Sectors.

6 Based on averages from two-season waste composition studies conducted for the City of Whitehorse and surrounding communities in 2010. Prepared by Maura Walker and Associates for the City of Whitehorse, Yukon.

7 Saskatchewan Environment. 2007. Starting a Regional Waste Management System in Saskatchewan.

8 Federation of Canadian Municipalities (FCM). 2009.

9 ARKTIS Solutions Inc. 2012.

3.0 MSW FACILITY SITE SELECTION

MSW facility site evaluation and selection is one of the more challenging and critical activities in the planning process. Northern and remote communities upgrading their MSW facility or preparing a plan for growth will likely face the following choice: expand or retrofit an existing MSW facility at the current location or establish a MSW facility at a new location. In either case, site evaluation and selection should largely be based on the requirements for the residual waste landfill since on-site waste disposal represents the highest risk activity and a potential long-term liability to human health and the environment.

For an existing MSW facility, improvements to the design and operation of the existing landfill should be considered to mitigate these risks and potential liabilities. For a new MSW facility, choosing the best available site will help to mitigate human health and environmental risks.

Sections 3.1 through 3.5 present the recommended best practices when evaluating a current or new MSW facility site and cover the following themes:

- Land;
- Water;
- Wildlife and sensitive ecosystems;
- Transport; and
- Proximity to the community.

It should be noted that minimum setback distances with respect to landfill siting vary greatly from jurisdiction to jurisdiction. Although this document includes a typical range for setback distances where possible, these requirements can be site-specific and will ultimately be determined by local, provincial/territorial, and federal authorities.

3.1 THEME: LAND

There are several key land-related factors to consider when selecting and evaluating a good site for a MSW facility. The first is having **sufficient land area** for various activities and infrastructure, including waste receiving, processing, storage, and disposal areas, internal roads, buildings, as well as surface water and leachate collection and management. It is also important to anticipate community growth rates, duration of storage (i.e., for hazardous and special waste, recyclables, etc.), and desired operating life of the landfill cell. Generally, only sites that have the capacity to accommodate at least 30 years of operation should be considered.

Next, the **topography of the site** and its surrounding area will strongly influence its potential for development as a MSW facility with a landfill cell. Important considerations include site access, drainage/stormwater control, slope stability, potential for soil erosion, visibility of the site from afar, and potential impacts from prevailing winds. Attributes of a good versus a poor site are presented in Table 3-1.

TABLE 3-1: SITE TOPOGRAPHY AND BEST PRACTICES FOR MSW FACILITY SITING

⊗ POOR SITE	⊘ GOOD SITE
• Extreme slopes (typically greater than 5:1), which represent increased soil erosion risk, the need for potentially costly re-grading, and longer-term slope stability concerns. • Gullies or depressions that act as a point of water collection during rainfall events unless ditching or other diversion measures are undertaken.[1]	• Adequate level areas for waste receiving, processing, and storage activities. • An existing gradient that allows surface water runoff away from active portions of the site. • A slope of 2% to 10%.

Other key land-related factors to consider when selecting and evaluating a good site include having **fracture-free bedrock or clay**, being in **geologically stable** areas (i.e., away from steep slopes, faults, low-lying coastal areas), and being **permafrost-free or thaw-stable** (refer to Tables 3-2 through 3-4, and Box 3-1).

TABLE 3-2: LAND STABILITY AND BEST PRACTICES FOR MSW FACILITY SITING

CONSIDERATION	BEST PRACTICES FOR SITE SELECTION AND TYPICAL SETBACK DISTANCE	RATIONALE
Geology	Fracture-free bedrock; unfractured clay or clay till	• Local geology and geomorphology influence site stability and the capability of the geologic environment to limit rapid migration of contaminants. Factors of interest include the type of bedrock, the state of weathering, the extent and distribution of faults, bedding planes and joints, and the presence of karst features. All of these factors influence the permeability of the bedrock strata. • In areas where bedrock is present at surface or in areas of thin overburden where groundwater flow may occur in bedrock, attributes of a good site are ideally represented by fracture-free bedrock; heavily fractured bedrock indicates poor site conditions. • In areas of thick overburden, attributes of a good site include unfractured clay or clay till; more porous materials (e.g., gravel, sand or liquefiable clay) indicate poor site conditions.

TABLE 3-2: LAND STABILITY AND BEST PRACTICES FOR MSW FACILITY SITING (CONT'D)

CONSIDERATION	BEST PRACTICES FOR SITE SELECTION AND TYPICAL SETBACK DISTANCE	RATIONALE
Geologically Unstable Areas	Not impacted by unstable areas (100 m)[2,3,4]	• Landfills should be located at least 100 m from geologically unstable areas, which are defined as locations where natural or man-made features pose a substantial risk to the integrity of the landfill environmental control systems or global stability of the landfill. • Typically, unstable areas include lands directly underlain by karst limestone, areas prone to subsidence caused by previous mining activity, areas with weak or unstable subsoils (e.g., collapsible silts, quick clays, liquefiable sands), and areas prone to slope failure (e.g., landslide scarps, avalanche zones, alluvial fans).
Seismic and Wave Impacts	Not impacted by seismic faults or located on low-lying coastal areas (100 m)[5]	• A landfill should not be sited within or in close proximity to geologically unstable areas, such as seismic faults or low-lying coastal areas that could be affected by storm surges or sea level rise. • A landfill should be located at least 100 m from a known fault line that was active (experienced displacement) during the Holocene. • In areas subject to seismic loadings, landfill slopes and environmental controls should be designed in such a way that the systems can withstand anticipated earthquake loadings without experiencing a failure of the fill or of the environmental control system.

TABLE 3-3: PERMAFROST AND BEST PRACTICES FOR MSW FACILITY SITING

CONSIDERATION	BEST PRACTICES FOR SITE SELECTION	RATIONALE
Permafrost	Located on a permafrost-free area, or on thaw-stable permafrost (e.g., gravel, rock)	• Landfills require structural integrity and stability (base liner, slopes, etc.) to offer optimal containment performance and prevent potential off-site migration of pollutants. Since permafrost is a temperature-based ground condition, the consequences of permafrost thawing on landfill infrastructure vary with respect to site attributes and soil type. • Since climate is the main factor controlling permafrost occurrence and thermal state, permafrost may warm and thaw under a warming climate, and potentially accelerate the rate of consequences in poor sites (refer to Box 3-1). The way in which surface water and leachate are managed can also impact the active layer thickness.

BOX 3-1: PERMAFROST AND WASTE MANAGEMENT

"Permafrost" refers to soil or rock that remains frozen for at least two years in a row. Permafrost is an important feature of Canada's North because it affects hydrology (i.e., the way water moves, how it is distributed, and its quality), the landscape, and ecosystems. The thickness of permafrost varies considerably across the North—from non-existent in some areas to hundreds of metres deep in others. Permafrost is influenced by such factors as climate (e.g., air temperature and snow), vegetation, geology, and human activity (i.e., disturbances).

The warming and thawing of permafrost can make the ground unstable and affect drainage patterns. This has implications for the integrity of MSW facilities, especially landfill cells. As such, permafrost alone should not be relied on to provide long-term containment of pollutants at landfills. Ideal sites for MSW facilities will either be permafrost-free areas or permafrost areas where the rock or soils have a low ice content, reducing the risks of settlement when thawed.

(Source: Natural Resources Canada. 2015. Permafrost; and Government of Northwest Territories, Department of Environment and Natural Resources. Permafrost.)

TABLE 3-4: PERMAFROST AND SITE ATTRIBUTES

⊗ POOR SITE	⊘ GOOD SITE
• Permafrost areas composed of thaw-sensitive soils, such as ice-rich silt and clay. Depending on the percentage of ice contained in the ground, these soils can undergo significant thaw-settlement due to the volume change associated with the phase change of ice to water and drainage of excess water. • Exposed massive ice, ice wedges, and ice lenses can melt out entirely, leaving large voids.	• Permafrost-free areas. • Permafrost areas composed of thaw-stable soils, such as rock, free-draining granular materials, or dry ground (i.e., materials of low ice content) that do not settle much when thawed.

The presence of land-based endangered or threatened species can also affect the siting of a MSW facility (refer to Section 3.3).

3.2 THEME: WATER

Some of the key water-related factors to consider when selecting and evaluating a good site include an appropriate distance from the high water table, drinking water sources, and flood plains and the presence of low permeability soils (refer to Tables 3-5 through 3-10).

TABLE 3-5: WATER TABLE AND BEST PRACTICES FOR MSW FACILITY SITING

CONSIDERATION	BEST PRACTICES FOR SITE SELECTION AND TYPICAL SETBACK DISTANCE	RATIONALE
Depth to Water Table	Developed at an appropriate distance above the seasonal high water table (1.5 m–3 m)[6,7]	• Landfills should be developed at an appropriate distance above the seasonal high water table (i.e., regional or piezometric level in uppermost aquifer). The depth to groundwater that is seasonally perched in shallow surficial soils should not be considered in this evaluation. In permafrost regions, there may be different considerations. • Although liner systems are intended to separate waste from groundwater, the liners have the potential to fail, either during the lifespan of a landfill or post-closure. The deeper the water table, the longer contaminants will have to naturally degrade before they reach groundwater. • As excavation of landfill cover material is a common operational strategy, the depth of such excavations should also be carefully considered in terms of hydrogeologic implications.

TABLE 3-6: DRINKING WATER SOURCES AND BEST PRACTICES FOR MSW FACILITY SITING

CONSIDERATION	BEST PRACTICES FOR SITE SELECTION AND TYPICAL SETBACK DISTANCE	RATIONALE
Drinking Water Sources	Should not be located over or upgradient of a sole source aquifer, or adjacent to or upgradient of a surface water drinking water source (300 m –1,500 m)[8,9,10]	• The contamination of drinking water supply wells and sources by waste management operations is not acceptable. The greater the distance a MSW facility site is from active drinking water sources, the more favourable the site. • An evaluation should be undertaken to identify all existing wells, water supply intakes, and other potential sources of drinking water, such as springs and groundwater discharge areas. Consideration may also be given to the potential for future drinking water extraction from an aquifer. A landfill should not be located upgradient or over an aquifer that represents the source of drinking water for a community.

MSW facilities should be located at an **appropriate setback distance from surface water bodies** such as lakes, streams, marshes, and wetlands. Attributes of a good versus poor site are presented in Table 3-7.

TABLE 3-7: SURFACE WATER BODIES AND BEST PRACTICES FOR MSW FACILITY SITING

⊗ POOR SITE	⊘ GOOD SITE
• Landfills adjacent to surface water that is present year round. This requires significantly more complex design, management, and operation to protect against runoff, washout, and groundwater and surface water contamination. • Landfills located in gullies or depressions that act as points of water collection during rainfall events or the wet season. • The presence of endangered or threatened aquatic species (refer to Table 3-11).	• For non-drinking water sources, an appropriate setback between a landfill and the nearest lake, stream, river, wetland, or marsh (**30 m–100 m**).[11,12] • This is necessary to protect these surface waters from uncontrolled landfill leachate discharges and to provide opportunity for detection and some natural attenuation in the event that an accidental discharge of leachate occurs through surface pathways (e.g., leachate breakouts) or through groundwater seepage. It also protects the landfill from erosion. • Diversion works, interception ditching, and other flow control measures to reroute the surface watercourse to achieve the desired level of separation.

MSW facilities should also be located an **appropriate distance from ocean shorelines and above sea level**. Landfills should be sited as far away as possible from a coastal shoreline (**100 m**)[13] and above sea level to protect the site from erosion (refer to Table 3-8). The effect of climate change and subsequent sea-level rise should be taken into consideration in siting a landfill in any coastal region (refer to Box 3-2 below).

BOX 3-2: WASTE MANAGEMENT AND CLIMATE CHANGE

There are a number of important links between waste management and climate change. For example, climate change has the potential to impact waste management infrastructure, especially in coastal and permafrost areas. Communities located near sea-level should site MSW facilities on higher ground to reduce the potential for a rise in sea-level to flood or erode any areas where waste is stored or disposed of. Also, the warming of permafrost, exacerbated by disturbance to the surface where waste is stored or disposed of, can lead to ground instability and possible thawing and slumping, which can impact the integrity of engineered waste containment systems (refer to Box 3-1). These scenarios underscore the importance of careful siting. In addition, changes to precipitation quantities and patterns could also have implications for surface water management and leachate production.

Furthermore, waste management can have an effect on greenhouse gas emissions, both positive and negative. For example, landfills are a source of methane emissions, a potent greenhouse gas. Therefore, diverting organic waste from landfills through composting reduces greenhouse gas emissions. Recycling also reduces greenhouse gas emissions since producing goods from recovered materials is a lot less energy-intensive than using virgin inputs. Composting and recycling are discussed in greater detail in Section 6.

TABLE 3-8: FLOOD PLAINS AND BEST PRACTICES FOR MSW FACILITY SITING

CONSIDERATION	BEST PRACTICES FOR SITE SELECTION	RATIONALE
Flood Plains	Outside 200-year flood plain; protected by a dyke or other flood controls; landfill engineered to withstand flooding conditions	• Flooding of a MSW facility could lead to the uncontrolled release of leachate and the wash-out of toxic contaminants into the environment, posing a serious risk to human health and ecosystems. • A MSW facility should not be established on a flood plain subject to a risk of flooding greater than 1 in 200 years, unless that flood plain is protected by a dyke structure or other flood controls that reduce the risk of flooding, or the landfill is specifically engineered to withstand these conditions which could increase capital costs.

In terms of **hydrology and hydrogeology**, sites should be located on low permeability soils at appropriate distances and downgradient from hydrological and hydrogeological features. Ensuring protection of surface water and groundwater resources is a primary concern when selecting the site. Pollution of these resources by landfill leachate can result in long-term environmental and human health concerns. A detailed understanding of the site's hydrology (surface water flow) and hydrogeology (groundwater flow) is required to assess the potential risks. Attributes of a good site versus a poor site are presented in Table 3-9.

TABLE 3-9: HYDROLOGY AND HYDROGEOLOGY AND BEST PRACTICES FOR MSW FACILITY SITING

⊗ POOR SITE	⊘ GOOD SITE
• Areas that are considered higher risk or where initial construction is difficult include: – groundwater recharge areas – coastal and estuarine areas – wetlands – areas close to watercourses – areas with a high water table – areas subject to flooding – areas of high soil permeability zones – areas upgradient of a community	• Low permeability soils that will slow the rate of leachate drainage from the landfill and reduce the risk of groundwater contamination. • Dense clay soils are preferred, as their low permeability will allow more time for natural attenuation of leachate to occur.

Communities in areas of high **precipitation** should consider measures to prevent infiltration into the landfill mass (refer to Table 3-10).

TABLE 3-10: PRECIPITATION AND BEST PRACTICES FOR MSW FACILITY SITING

CONSIDERATION	BEST PRACTICES FOR SITE SELECTION	RATIONALE
Precipitation (annual average)	Prevent infiltration of precipitation into the landfill mass	• Landfill leachate is generated primarily from precipitation and thus is influenced by climate conditions such as annual precipitation rates, seasonal temperatures, and evaporation potential. When rainfall falls on a landfill site, it will either be shed from the site as runoff, evaporate, transpire from the landfill surface or infiltrate into the landfill mass to contribute to leachate generation. • The theoretical water balance (precipitation minus evapotranspiration minus runoff) provides a good first approximation of the potential for landfill leachate generation. • In arid and semi-arid climates, leachate may be generated irregularly or only at certain times of the year. • In wet climates, significant quantities of leachate may be produced year round. • Since most of Canada's northern territories typically receive less than 250 mm of precipitation annually,[14] they fall within arid to semi-arid climates and may yield low leachate production. However, it is noted that the spring freshet (i.e., discharge from melting of ice and snow) can represent the majority of the annual precipitation. Other parts of the country, such as northern British Columbia and Ontario, may have higher precipitation levels. • Examples of measures to prevent infiltration of precipitation into the landfill mass include stormwater management, snow clearing, daily cover, and final cover.

3.3 THEME: WILDLIFE AND SENSITIVE ECOSYSTEMS

Some of the key factors related to wildlife and sensitive ecosystems to consider when selecting and evaluating a good site include distance from sensitive species and parks (refer to Table 3-11).

TABLE 3-11: WILDLIFE AND SENSITIVE ECOSYSTEMS AND BEST PRACTICES FOR MSW FACILITY SITING

CONSIDERATION	BEST PRACTICES FOR SITE SELECTION AND TYPICAL SETBACK DISTANCE	RATIONALE
Sensitive Habitat	No sensitive species	• MSW facilities should be located with appropriate or existing prescribed setback distances from areas designated as habitat for sensitive plant and animal species (including threatened or endangered species, such as those identified on the federal *Species at Risk Act* (SARA) List of Wildlife Species at Risk and the International Union for Conservation of Nature (IUCN) Red List of Threatened Species). • Provincial or territorial environment departments can help to identify sensitive and critical habitat. Maps of these areas are generally available from the appropriate provincial/territorial environment offices.
Parks and Protected Areas	Located at an appropriate and respectful distance (100 m)[15]	• Landfills could potentially attract wildlife from sanctuaries, such as provincial, territorial and national parks and other protected areas. Moreover, in some circumstances, noise, dust, and potential odours make operating landfills incompatible with park and protected area use. • Therefore, landfills should be located at an appropriate and respectful distance from park and protected area boundaries.

3.4 THEME: TRANSPORT

Some of the key transport-related factors to consider when selecting and evaluating a good site include the presence of appropriate roads in the vicinity, hauling distances, and being at a safe distance from airports and landing strips (refer to Table 3-12).

TABLE 3-12: TRANSPORT AND BEST PRACTICES FOR MSW FACILITY SITING

CONSIDERATION	BEST PRACTICES FOR SITE SELECTION	RATIONALE AND TYPICAL SETBACK DISTANCE
Roads and Distances	Roads adapted to MSW facility traffic; Short hauling distances	• Hauling distance from the community to the MSW facility could have a significant impact on operating costs. • The same applies to cover material, as accessibility of cover material on a year-round basis may be an issue in remote and northern regions. • Roads leading to the site should be in good condition, constructed to handle the anticipated traffic load, and available in all weather conditions.
Airports and Air Landing Strips	Located in accordance with federal, provincial, territorial, and local airport zoning regulations	• Due to the propensity for landfills to attract birds, a minimum separation distance between airports utilized by turbine powered or piston-type aircraft and landfills containing food wastes should be observed according to federal, provincial, territorial and/or site specific airport zoning regulations (from **3.2 km** with bird control measures to **8 km**).[16,17] • The separation distance may be adjusted depending on effective bird control measures implemented at the MSW facility.

3.5 THEME: PROXIMITY TO THE COMMUNITY

Lastly, a final factor to consider when selecting and evaluating a good site is the distance from other property boundaries, structures, and sites of cultural significance (refer to Table 3-13).

TABLE 3-13: PROXIMITY TO THE COMMUNITY AND BEST PRACTICES FOR MSW FACILITY SITING

CONSIDERATION	BEST PRACTICES FOR SITE SELECTION AND TYPICAL SETBACK DISTANCE	RATIONALE
Property Boundary	Located at an appropriate distance from other property boundaries and public roads; provides visual screen	• A minimal buffer zone between the operational area of the MSW facility and public roadways and highways should be maintained (**100 m**).[18,19] • A minimal buffer zone between the active landfill face and the property boundary should be maintained (**50 m–100 m**).[20] • Ideally, a visual screen (natural or artificial) should be provided around the site so that the site is not visible from the community or public road (**15 m** within the property boundary).[21] • An appropriate distance (**30 m–50 m**) inside the perimeter of the MSW facility should be used for firebreaks, access roads, leachate management, and monitoring works, as required.
Public Areas	Located at a respectful distance from residences, hotels, restaurants, places of worship or other facilities (**300 m–1,600 m**)[22]	• Because of impacts such as noise, birds, traffic, odour and land value, the landfill portion of a MSW facility is generally incompatible with residential, commercial and public areas. • Long-term surrounding property use (e.g., future residential or commercial development) should be considered prior to siting a landfill. • Consultation with elders, community members, and other relevant stakeholders with regard to the official community plan and/or minimum separation distances is recommended so that the MSW facility is compatible with local plans. • The MSW facility should ideally be located downwind of the prevailing wind direction of the community.
Heritage, Cultural, and Archeological Sites	Located at a respectful distance from a heritage, cultural, or archeological site (**100 m**)[23]	• Sites of heritage, cultural, and archeological significance should be taken into account during the siting process.

ENDNOTES

1 British Columbia Ministry of Environment. June 2016. Landfill Criteria for Municipal Solid Waste, Second Edition.

2 Government of Newfoundland and Labrador. 2010. Environmental Standards for Municipal Solid Waste Landfill Sites.

3 Yukon Government. 2014. Construction Requirements for New Public Waste Disposal Facilities.

4 British Columbia Ministry of Environment. June 2016.

5 *Ibid.*

6 Yukon Government. 2014.

7 British Columbia Ministry of Environment. June 2016.

8 EBA Engineering Consultants Ltd. 2009. Comprehensive Solid Waste Study for Yukon Territory Waste Facilities. Prepared for the Government of Yukon.

9 Yukon Government. 2014.

10 British Columbia Ministry of Environment. June 2016.

11 Government of Newfoundland and Labrador. 2010.

12 ARKTIS Solutions, Inc. 2011. Solid Waste Best Management Guide. Prepared for the Government of Nunavut, Community and Government Services.

13 British Columbia Ministry of Environment. June 2016.

14 ARKTIS Solutions Inc. 2012. Foundation Report for a Technical Document on Municipal Solid Waste Landfills in Northern Conditions: Engineering Design, Construction and Operation, p. 4. Prepared for Environment and Climate Change Canada.

15 British Columbia Ministry of Environment. June 2016.

16 Ferguson Simek Clark Engineers & Architects. 2003. Guidelines for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites in the NWT. Prepared for Government of Northwest Territories, Department of Municipal and Community Affairs.

17 Transport Canada. 2010. An Aviation Industry Guide to the Management of Wildlife Hazards, Chapter 8—Solutions—The Airport and Surroundings.

18 Yukon Government. 2014.

19 Government of Newfoundland and Labrador. 2010.

20 *Ibid.*

21 *Ibid.*

22 *Ibid.*

23 British Columbia Ministry of Environment. June 2016.

4.0 GENERAL OPERATION OF THE MSW FACILITY

4.1 INTRODUCTION

The first part of this section outlines the role and responsibilities of facility operators and describes best practices for general operations, including site control and nuisance management, operational activities, waste screening and segregation, shipping waste off-site, health and safety, emergency response, wildlife management, and record keeping. The last part of the section summarizes the priority actions for the general operation of the MSW facility and presents a couple of conceptual layouts to show how a MSW facility could evolve over time as improvements are implemented.

4.2 FACILITY OPERATORS

One of the key components of a modern MSW facility is the requirement for a trained operator on-site, on either a part-time or a full-time basis. In addition to carrying out the operational activities described in this section, facility operators play an important role in public safety by being present to receive waste during operating hours and locking the gate when the facility is closed.

The proper operation and maintenance of a MSW facility requires a trained operator to work on-site and the assistance of other personnel and contractors as needed. The MSW facility operator will conduct and oversee a range of activities on a daily, weekly, monthly, and annual basis (refer to Table 4-1). The MSW facility operation and maintenance activities should be documented in a formal operations plan. Good operational practices will:

- reduce risks of environmental and human health impacts;
- generate efficiencies and savings for operational costs;
- maximize public acceptance and public use of the facility;
- maximize waste diversion through reuse, recycling, and composting efforts; and
- reduce safety risks for workers and the public.

Facility operators should be trained and certified through the Solid Waste Association of North America (SWANA) Manager of Landfill Operations (MOLO) course or similar course offered in each jurisdiction. Other training for facility operators and any other front-line staff may include: emergency and spill response, Workplace Hazardous Materials Information System (WHMIS), hazardous waste management, ozone depletion prevention, transportation of dangerous goods, heavy equipment operation, wildlife safety, health and safety, and first aid. Refer to the MSW Facility Operations and Maintenance section of Appendix A for specific training resources.

The operator and any other workers should be provided with appropriate personal protective equipment. A shelter, such as a mobile work trailer, should also be provided to protect workers from the elements. The shelter should be insulated, heated, and equipped with toilet and hand-cleaning facilities.

4.3 BEST PRACTICES IN GENERAL OPERATIONS

4.3.1 SITE CONTROL AND NUISANCE MANAGEMENT

In the interest of public and worker safety as well as environmental protection, signs should be posted at the MSW facility indicating:[1,2]

- where waste disposal is allowed;
- what items are accepted and prohibited;
- that open burning is prohibited;
- hours of operation;
- safety warnings;
- tipping fees charged (if applicable); and
- emergency contact information.

Fences and gates should be installed around the MSW facility to limit windblown debris from migrating off-site, control public access, and restrict wildlife access.[3,4] These fences should be at least 2 m high and consist of a durable material such as chain link.[5] At sites prone to high winds, a portable litter control fence should be placed adjacent to the active face. Gates should be locked when the MSW facility operator is not on-site.

Depending on the distance between the MSW facility and the community, other nuisance issues that may need to be mitigated are dust from roads, soil stockpiles, and waste, as well as noise from collection vehicles and heavy equipment.

A vehicle weigh scale should be considered for MSW facilities accepting greater than 5,000 tonnes of waste per year to track the types and quantities of incoming and outgoing waste. The weigh scale should be maintained in proper working order and meet the requirements of the federal *Weights and Measures Act*.[6]

4.3.2 OPERATIONAL ACTIVITIES

Table 4-1 provides the recommended general operational activities for the MSW facility on a daily, weekly, monthly, and annual basis. The frequency of some activities may need to be higher for larger MSW facilities and in special circumstances. Specific activities related to the major waste types are described in Sections 5 (residual waste) and 6 (remaining waste types).

TABLE 4-1: RECOMMENDED OPERATIONAL ACTIVITIES

RECOMMENDED OPERATIONAL ACTIVITIES	DAILY*	WEEKLY	MONTHLY	YEARLY
Waste screening	X			
Segregate and process waste as described in Sections 5 and 6	X			
Verify that wastes are managed in the designated areas	X			
Compact waste in the landfill	X			
Cover compacted waste in the landfill	X	X		
Clean up any spills	X			
Clear roads and working areas	X			
Record wildlife incidents	X			
Pick up windblown litter		X		
Test and pump standing water			X	
Grade and maintain roads			as needed	
Complete spring clean-up of MSW facility, compact waste, and place intermediate cover (spring and fall)				X
Review operations and maintenance records to assist in planning for the upcoming year				X
Construct a new landfill cell or waste management areas during the summer months if required for the upcoming year				X
Perform sampling (e.g., surface water, groundwater) in accordance with MSW facility performance monitoring plan (refer to Section 7)				X
Complete Annual Report of operations (and submit to the licencing agency, if required)				X

** Note: Refers to days that the MSW facility receives waste. Special considerations may be required for certain weather and climate conditions.*

It should be noted that open burning of waste is not considered an acceptable operational practice due to health and safety and environmental concerns (refer to Box 4-1). Tips for reducing wildlife attraction and for waste volume reduction are provided in Section 4.3.7 and Sections 5 and 6.

BOX 4-1: THE HAZARDS OF OPEN BURNING

Open burning refers to burning waste in landfills, barrels, open pits, outdoor furnaces, woodstoves, or fireplaces. Open burning is much more harmful to human health and the environment than previously thought. Open burning of waste—even seemingly harmless materials like paper, cardboard, yard waste, and construction waste—may release a hazardous mixture of cancer-causing compounds and other toxic substances.

(Source: Environment and Climate Change Canada. 2010. Open Burning of Garbage.)

4.3.3 WASTE SCREENING AND SEGREGATION

The operator should ensure that the MSW facility accepts only the waste that it has been designed and authorized to manage and that all waste materials are deposited in the respective designated areas. Screening waste before it enters the MSW facility prevents unacceptable waste from becoming the responsibility of the facility and contaminating other waste types. Waste screening can take many forms, but gate control and staff presence are essential. A waste screening protocol should be included in the MSW facility's design and operations plan. The fundamentals of successful waste screening are as follows:

- Know the waste generators and haulers (carriers);
- Develop standard procedures for waste screening at the MSW facility (i.e., which waste types are acceptable and from whom);
- Train MSW facility staff in those procedures;
- Practice random load checking;
- Educate generators and carriers on restrictions; and
- Require movement documents for hazardous and special waste acceptance.

If tipping fees are charged, they would be collected at the time of drop-off (refer to Box 2-2, Section 2.4). Once the waste load has been screened and has entered the site, it should be segregated according to waste type and stored or disposed of in the appropriate designated areas. In cases where unacceptable wastes are identified, the operator could assist in identifying local acceptable waste management alternatives for the generators and/or haulers of the unacceptable waste (refer to Box 6-1 and Section 6.2).

4.3.4 SHIPPING WASTE OFF SITE

Some of the waste generated by the community will need to be recycled, processed, treated, or disposed at a waste management facility outside of the community's MSW facility. As such, it will be important for community officials to work with the MSW facility operator to develop a program or protocol for managing these wastes in a timely and environmentally sound manner. For example, some jurisdictions have limits on the quantity of hazardous and special waste that can be stored at the MSW facility or the length of time that these wastes can be stored. Furthermore, due diligence is necessary to ensure that the wastes are shipped to an authorized facility and that all applicable shipping regulations are followed (refer to Appendix A, Hazardous and Special Waste).

4.3.5 HEALTH AND SAFETY

The health and safety of workers and the public at the MSW facility need to be considered. As discussed in Section 4.2, employers should ensure that their employees are trained in safe work practices for the MSW facility. Employers should also provide employees with the necessary personal protective equipment (PPE) to carry out their jobs in a safe manner, such as CSA-approved safety boots (steel or composite-toe and chemical resistant), eye goggles, gloves, hard hat, respiratory gear with proper situational filters (dust, volatile organic compounds or VOCs, etc.), safety vest, and work coveralls. Employees should also be provided access to an eye wash station, a first aid kit, and a fire extinguisher approved by the fire marshal.

The following safety procedures should be implemented in order to minimize health risks to personnel working in and around the MSW facility:

- Equipment should be kept clean;
- Protective clothing and equipment such as gloves, eye goggles, and safety boots should be worn at all times;
- Work clothes should be kept in a designated change room and employees should change into them when they arrive for work. Work clothes should not be worn home. The community maintenance garage should be equipped with laundry facilities to wash work coveralls off-site;
- Hands should be washed frequently and, at a minimum, before eating and after work; and
- Personnel should receive appropriate vaccinations that comply with workers' safety guidelines and should ensure they are kept up-to-date.

Public safety should also be taken into consideration when operating a MSW facility. All hazardous materials should be stored in a secure location away from public access. At the completion of each working day, the MSW facility should be locked to prevent public access, and facility hours should be clearly posted. Scavenging of waste from the active face of the landfill should be prohibited (refer to Section 6.9 for guidance on managing reusable items).

A no-smoking policy should be implemented on-site to prevent explosions and fires. Smouldering material of any kind should not be accepted due to the risk of fire.

4.3.6 EMERGENCY RESPONSE

All MSW facility staff should be trained and equipped to respond efficiently and effectively to emergencies that may occur at the MSW facility, including, but not limited to, fuel spills, chemical spills, and fires.

Emergency preparedness plans should be developed for the MSW facility. Examples of elements that should be included in emergency preparedness plans are presented in Table 4-2. Personnel should be trained on how to implement the plans. Copies of these plans should be kept in collection (if applicable) and operation vehicles as well as in all common work areas.

TABLE 4-2: EXAMPLES OF ELEMENTS OF EMERGENCY PREPAREDNESS PLANS

TYPE OF PLAN	KEY ELEMENTS
Contact numbers for all types of emergencies	In case of an emergency, the operator should have quick access to the following contact numbers: • Fire department • RCMP detachment • Community first aid/paramedics • Wildlife officer

TABLE 4-2: EXAMPLES OF ELEMENTS OF EMERGENCY PREPAREDNESS PLANS (CONT'D)

TYPE OF PLAN	KEY ELEMENTS
Spill contingency plan	• 24-hour spill response line (specific to region). • A spill contingency plan should be created for activities associated with MSW facility operations, including storage and handling of hazardous materials. • A copy of the plan should always be available at the operator's office and the MSW facility. • Operational personnel should be trained on the plan in order to respond quickly and effectively in the event of a spill.
Fire response plan	• Typically, the community fire department is responsible for creating a contingency plan to deal with fires within the community operation, which will include the MSW facility. Ensure that such a plan exists and record the steps that should be taken by the MSW facility during a fire emergency in accordance with the fire department's plan. • As burning of waste may produce harmful gases, special precautions, such as the use of a respirator, should be taken when responding to fires in and around the MSW facility. • In the event of an uncontrolled fire in the MSW facility, the following steps should be taken: – Immediately evacuate the area; – Keep everyone including operational personnel upwind from the source; and – Contact the fire department.

4.3.7 WILDLIFE MANAGEMENT

Wildlife management at a MSW facility has two main objectives: (1) to keep animals away from the waste for their protection; and (2) to provide a separation between people at the MSW facility and animals that may be attracted to the MSW facility. Wildlife are attracted to MSW facilities because of odours and the potential for a food source. Some waste types attract animals more than others.

Typical wildlife that are attracted to MSW facilities includes:

- **Large predators**—Black, grizzly, and polar bears can become habituated and aggressive toward operators and the public, presenting a safety concern.
- **Smaller predators**—Wolves, coyotes, foxes, wolverines, and stray dogs present a potential danger to the public and operators if they become aggressive; they may also carry rabies.
- **Birds**—Gulls and ravens are mostly a nuisance issue and can create litter issues as they rip apart garbage bags to get at food sources.
- **Rodents**—Burrowing animals such as Arctic ground squirrels and muskrats can cause damage to berms and retention ponds.

There are several mitigation methods to reduce wildlife at MSW facilities. By reducing ease of access to materials that attract wildlife, also known as "attractants" (e.g., food scraps, glycol), the number of wildlife and human encounters can be minimized, thereby mitigating the risk to human and wildlife health and safety. The main methods are:

- Waste separation by type;
- Installation and maintenance of a fence (electrified where possible) around waste types that are or may become animal attractants; and
- Cover landfilled waste and compost piles that present a food source and odour on a frequent basis—the same day the wastes arrive at the site, if possible. In the case of a centralized composting facility, food waste should be covered with a carbon amendment, such as shredded paper or wood chips.

Bears pose the greatest wildlife-related risk to worker safety. It is imperative that all personnel working in and around the MSW facility be properly trained in bear safety. Some wildlife, particularly bears, can become habituated to the MSW facility as a food source. Unfortunately, most often this results in the animal being destroyed.

4.3.8 RECORD KEEPING

There are two main reasons for record keeping:

- It is generally a requirement in MSW facility licences to provide annual reports to the regulator. Record keeping provides the information needed to complete the annual reporting.
- A historical record of the operations, volumes and types of waste managed, investments and costs will provide the foundation for establishing trends to better anticipate future needs of the MSW facility and plan for improvements.

Table 4-3 lists the types of MSW facility records that should be maintained.

TABLE 4-3: RECORDS MANAGEMENT AT MSW FACILITIES

CATEGORY	RECORDS
Activities and events	• Daily, weekly, monthly, and annual activities undertaken at the MSW facility (refer to Table 4-1). • Details of any maintenance undertaken at the MSW facility. • Visits by regulatory authorities. • Wildlife incidents.
Documentation	• Copy of the MSW facility permit or licence. • Copies of all manuals pertaining to the operation and maintenance of the MSW facility (e.g., design and operations plan, spill contingency plan, closure plan).
Reports	• Copies of annual reports submitted to regulatory agencies. • Copies of sampling and analysis reports for surface water, groundwater, leachate, and landfill gas. • Copies of spill reports and related regulations.

TABLE 4-3: RECORDS MANAGEMENT AT MSW FACILITIES (CONT'D)

CATEGORY	RECORDS
Tracking	• Costs associated with operations. • Estimated volume of waste accepted and its generator on a daily, weekly, monthly, and annual basis. Frequency of recording may depend on the size of the operation. A waste generation record should be maintained for each type of waste collected and segregated. Volumes can be estimated using a truck count and recording the truck type. • Estimated volumes of any effluent or liquids discharged to the environment through an accidental spill. • Materials used for construction or maintenance. • Types and quantities of waste transported off-site for recycling, treatment, or disposal.

4.4 PRIORITY ACTIONS

Table 4-4 summarizes recommended best practices that apply to the MSW facility as a whole. They are categorized as high-priority (short-term), medium-priority, and lower-priority (longer-term) actions.

TABLE 4-4: PRIORITY ACTIONS FOR THE GENERAL OPERATION OF THE MSW FACILITY

PRIORITY LEVEL	EXPLANATION
High ●●●	• Ensure operator has appropriate training, personal protective equipment, and a shelter. • Install a fence with a locking gate around the MSW facility. • Limit public access to when the operator is on-site. • Screen incoming loads of waste. • Ensure that waste is segregated and placed in designated areas with clear signage. • Clean up any spills. • Cover wastes that have the potential to generate odours. • Complete maintenance and repairs (e.g., pick-up windblown litter, fix any areas damaged by erosion). • Ensure compliance with regulatory requirements.
Medium ●●	• Control surface/storm water. • Monitor surface water and groundwater (if not already doing so as part of permit or licence). • Install a portable litter control fence.

TABLE 4-4: PRIORITY ACTIONS FOR THE GENERAL OPERATION OF THE MSW FACILITY (CONT'D)

PRIORITY LEVEL	EXPLANATION
Lower ●	• Control and monitor leachate and landfill gas. • Improve operating plans, record-keeping, and reporting. • Implement tipping fees. • Install a weigh scale, where practical.

4.5 CONCEPTUAL LAYOUTS

A properly designed MSW facility maximizes its capacity to accept waste while minimizing its impact on human health and the environment. Each MSW facility may be configured differently, depending on the location, size of the site, quantity of waste expected, and waste management priorities set for the community (refer to Section 2.3).

When planning the layout of a MSW facility, the following general principles should be taken into account. They are based on operational, environmental, and health and safety considerations.

- Waste groupings
  - Managing similar waste types within each priority level together, where common operational practices (receiving, processing and storage or disposal) are required to create operational efficiencies (refer to Table 4-5);
  - Organizing waste types anticipated to be shipped out on a regular basis (e.g., hazardous and special waste, recyclables, metal) in an area suitable for accommodating large ground transport or for organizing sealift operations; and
  - Locating the landfill cell(s) at the back of the MSW facility for visual and odour reasons. If a community selects an off-site disposal option as part of a regional waste management approach, the landfill cell could be replaced by a transfer station, but site access would be an important consideration.
- Safety and convenience
  - Locating the site shelter (e.g., mobile work trailer) close to the MSW facility entrance for oversight;
  - Providing safe and convenient public access to drop-off and pick-up areas (e.g., reusable items); and
  - Restricting public access to higher risk areas (e.g., landfill cell, staging area, hazardous and special waste storage).
- Nuisance
  - Locating organics (feedstock, compost) at the back of the MSW facility for visual and odour aspects, and near the leachate pond (if applicable) to minimize leachate runoff traveling distances for odours and site contamination; and
  - Locating leachate and storm water ponds at the back of the MSW facility for visual, potential odours and discharge location aspects.

TABLE 4-5: WASTE TYPES THAT CAN BE MANAGED TOGETHER

GROUP TYPE	TYPE CHARACTERISTICS	EXAMPLES
Waste with Hazardous Components	• Have special treatment and/or disposal requirements • May require transportation of dangerous goods (TDG) training for transport • Require specialized training for treatment and disposal	• Household hazardous and special waste • Hydrocarbon-containing soils and snow • E-waste • ELVs prior to depollution • Bulky waste prior to depollution
Reusable Items and Recyclables	• Typically does not contain hazardous materials • No odour or nuisance issues	• Reusables • Recyclables
Depolluted Bulky Waste and Other Large-Volume Wastes	• Should not contain hazardous waste • Does not decompose easily • No odours • Potential safety and nuisance issues with tires	• Depolluted ELVs • Depolluted bulky waste • CRD waste • Scrap tires
Organic Waste	• Waste will decompose easily • Potential odour issues • Can be a wildlife attractant • Contributes to landfill leachate and greenhouse gas emissions	• Food waste • Yard waste
Residual Waste, Asbestos-containing Materials, and Animal Carcasses	• Wastes that are not captured through diversion activities	• Mixed garbage from households, businesses, and institutions • Asbestos-containing materials (special considerations) • Animal carcasses (special considerations)

Figures 4-1 and 4-2 present conceptual layouts to illustrate how a MSW facility can integrate the various waste management priorities (refer to Sections 4, 5, and 6) within its boundaries.

Communities facing multiple challenges and needs (refer to Section 2.3) should ideally aim to implement **high-priority actions** for the MSW facility as a whole and for higher risk waste types (refer to Sections 5 and 6). Such actions include:

- controlled access (fence and gate);
- a shelter for staff, such as a mobile work trailer;
- a staging area for bulking hazardous and special waste and depolluting waste (e.g., end-of-life vehicles (ELVs) and white goods);
- a storage area for e-waste and hazardous and special waste;
- a storage area for depolluted bulky waste (alternatively, items like white goods could be marked once depolluted) and depolluted ELVs; and
- a landfill cell to dispose of residual waste and certain hazardous and special wastes (e.g., asbestos-containing materials and animal carcasses).

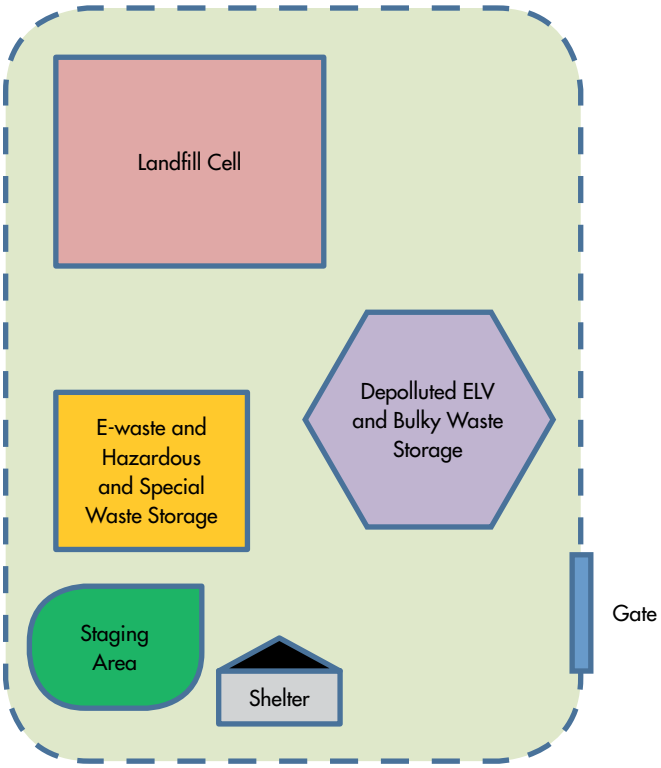


Figure 4-1: Conceptual Layout of a MSW Facility with a Focus on High-Priority Actions (**Note:** not to scale)

Communities already addressing high priorities may want to take **medium-priority actions** for the MSW facility as a whole (refer to Section 4) and for medium-risk waste types (refer to Section 6). Such actions include:

- stormwater management for the whole MSW facility;
- a storage area for reusable items and recyclables; and
- a composting area (can be complemented by backyard composting).

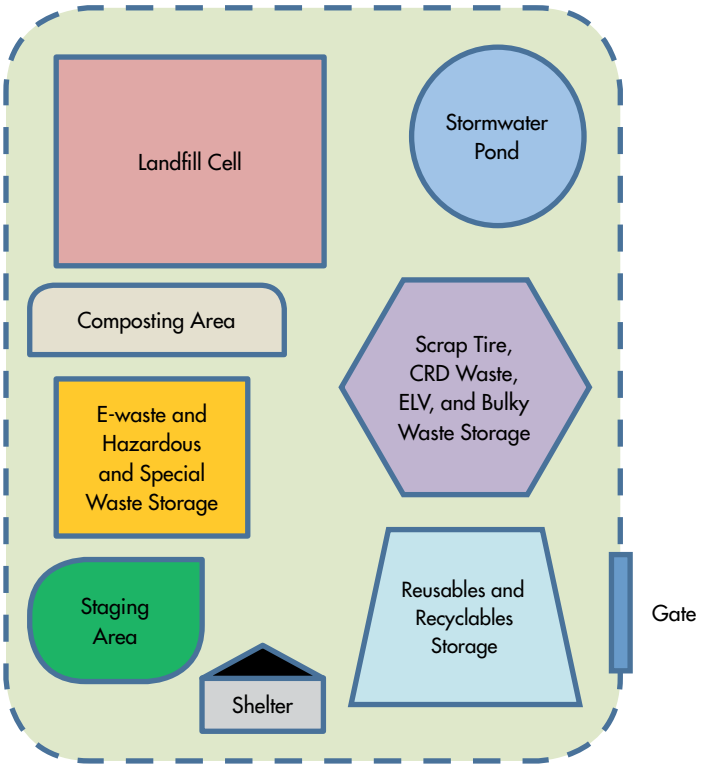


Figure 4-2: Conceptual Layout of a MSW Facility Incorporating Medium-Priority Actions (**Note:** not to scale)

Communities already addressing high and medium priorities may want to take **lower-priority actions** for the MSW facility as a whole and for lower-risk waste types. Such actions include managing and monitoring leachate and landfill gas (if applicable), shipping ELVs and bulky waste off-site for processing/recycling, and accepting additional types and sources of recyclables (includes segregation, storage, and off-site transport). The conceptual layout would remain similar to that presented in Figure 4-2.

ENDNOTES

1 Alaska Department of Environmental Conservation. 2006. Solid Waste Procedures Manual for Municipal Class III Solid Waste Landfills.

2 ARKTIS Solutions Inc. 2011. Solid Waste Best Management Guide. Prepared for Government of Nunavut, Department of Community and Government Services.

3 Alaska Department of Environmental Conservation. 2006.

4 ARKTIS Solutions Inc. 2011.

5 *Ibid.*

6 British Columbia Ministry of Environment. June 2016. Landfill Criteria for Municipal Solid Waste, Second Edition.

5.0 LANDFILL DESIGN AND OPERATIONS

5.1 OVERVIEW OF RESIDUAL WASTE MANAGEMENT

●●● "Residual waste" refers to the waste that remains after reuse, recycling, and composting. The quantity of residual waste to be managed by a community will therefore depend on its efforts and capacity to segregate waste for reuse, recycling, composting, or treatment/disposal off-site.

EXAMPLES	POTENTIAL RISKS
• Waste that remains after segregation and diversion. • For a MSW facility that has limited to no waste segregation and no diversion of reusables, recyclables, and compostables, residual waste will consist of the majority of waste generated in the community (e.g., mixed garbage from households, businesses, and institutions).	**Environmental** • Contamination of groundwater and/or surface water that comes into contact with waste or leachate (i.e., the fluid that forms when liquid percolates through waste). • Air contamination from landfill gas emissions (a combination of methane and other gases generated by landfills), smoke from fires, etc. **Human Health** • Landfill leachate can seep into the ground and/or surface water, which can impact drinking water quality. • Smoke from landfill fires can lead to health impacts in the community. • Landfill gas can migrate into nearby buildings and other structures creating an explosion hazard. • Wildlife may be attracted to this waste. **Other** • Wasted resources, i.e., materials that could be reused, recycled, or composted either within or outside the community are landfilled.

The choice of disposal option for residual waste will have a significant impact on MSW facility site selection, design, and operation. Disposal options include:

- waste transfer to a regional or neighbouring disposal facility;
- landfill disposal in the community's MSW facility (the focus of this section); or
- incineration with disposal of ash in a landfill (refer to Box 5-1).

In all cases, due to the mixed nature of residual waste and its relatively high volume, it is the most costly part of the waste stream to be managed. For example, an engineered landfill requires proper siting, design, construction, operation, closure, and long-term monitoring to prevent adverse impacts to human health and the environment during its contaminating lifespan (i.e., the period of time during which the landfill contains contaminants that could have an unacceptable impact if released to the environment[1]). Therefore, landfill airspace (refer to Section 5.5) is a valuable resource that needs to be conserved to the greatest extent possible.

A community can use the technical guidance contained in this section when designing a new landfill cell, expanding its current landfill cell, or looking for opportunities to improve the operation of its existing landfill cell.

BOX 5-1: INCINERATION—IT'S A COMPLEX UNDERTAKING

Over the decades, some northern and remote communities have looked to incineration (sometimes referred to as thermal treatment, waste-to-energy, and gasification) to help solve their waste management challenges. Waste management infrastructure that relies on some form of incineration technology is a complex undertaking. Incineration is a residual waste management option that requires careful consideration for the reasons outlined below:

- Waste incinerators represent a significant financial investment and require highly skilled operators, extensive maintenance and monitoring, and a well-sorted residual waste that has high energy content and preferably low moisture content;
- When not properly designed and operated, incinerators can be a significant source of air pollutants such as particulate matter, dioxins, furans, and mercury;
- Incinerators should only be used to incinerate the combustible, non-hazardous portion of residual waste (e.g., wood waste, paper, plastics);
- A second disposal system, such as a landfill or an off-site transfer station, is also required to dispose of the ash generated by the incinerator, as well as the non-combustible portion of residual waste (e.g., glass, metals, ceramics);
- If the incinerator ash is deemed to be a hazardous waste (based on laboratory testing), it should be transported to a licenced hazardous waste disposal facility;
- Batch waste systems with energy recovery can lead to the formation of greater quantities of dioxins and furans;
- In many cases, a supplementary fuel, such as oil, may be required to ensure complete combustion of the residual waste leading to higher operational costs; and
- To achieve low moisture content for residual waste, diversion of food waste to another alternative such as composting should be considered.

Based on the above, incineration may not be a practical residual waste disposal solution for many small and/or remote communities. For those communities wishing to consider incineration as part of their waste management system, further guidance can be found in Environment and Climate Change Canada's *Technical Document for Batch Waste Incineration* (refer to Appendix A, Incineration and Open Burning).

(Source: Environment and Climate Change Canada. 2010. Technical Document for Batch Waste Incineration.)

5.2 INTRODUCTION TO LANDFILLS

For the purposes of this document, a landfill consists of an area, referred to as a cell, where residual waste is placed, compacted, and covered, and then closed. For communities opting to operate an engineered landfill within their MSW facility, that is, a disposal site that is engineered to minimize contamination to the surrounding environment, this section presents the objectives of landfills, the types of landfills as defined for the purposes of this document, and their key components.

5.2.1 LANDFILL OBJECTIVES

For existing and new landfills, the primary objective for design and operation should be to contain the waste in a manner that minimizes the risk of off-site contamination by pollutants migrating beyond the limits of the MSW facility's property boundary. Pollutant migration pathways from landfills can include:

- contamination of groundwater and/or surface water that comes into contact with waste or leachate; and
- air emissions, such as landfill gas, smoke from fires, etc.

Off-site contamination risks can be reduced by selecting a good site for the MSW facility (as discussed in Section 3) with characteristics that inhibit migration of leachate off-site, and by designing and operating the landfill to minimize leachate generation and its release to the environment and to minimize and/or control releases of air pollutants.

5.2.2 LANDFILL TYPES

Jurisdictions across Canada have developed different classification systems for landfills. For the purposes of this document, two types of landfill—Class 1 and Class 2—are proposed for northern and remote communities. The two classes are distinguished by the type of base liner and leachate management system as well as the quantity of waste disposed on an annual basis.

- Class 1 Landfills—Engineered with a base liner and leachate collection system to contain and manage any landfill leachate and landfill gas. Generally applicable to MSW facilities accepting greater than 5,000 tonnes of waste per year for disposal (i.e., only applies to a handful of northern and remote communities in Canada with populations of about 5,000 or more).
- Class 2 Landfills—Engineered to ensure the natural attenuation of landfill leachate; may include a basic leachate collection system. "Natural attenuation" refers to the reduction of pollutant concentrations through naturally-occurring biological, physical, and chemical processes. Generally applicable to MSW facilities accepting less than 5,000 tonnes of waste per year for disposal, provided that certain hydrogeological and operational conditions are met.

5.2.3 LANDFILL COMPONENTS

In order to contain the waste and prevent water infiltration into the waste mass, Class 1 and Class 2 Landfills should include the following components:

- Landfill base—Consists of stable soils or rock above the groundwater table and provides the foundation for the construction of the landfill base liner and collection system (where applicable).
- Landfill base liner—A low permeability barrier made up of native soils (e.g., clay) or an engineered system that separates waste from the surrounding soil and groundwater and is designed to minimize or slow leachate releases to the environment.
- Landfill cell—A landfill using the "area method" of landfilling, which is considered a best practice in many regions. It typically consists of a lined area called a "cell" where the waste is placed, compacted, and covered. The cell is then progressively closed to minimize leachate production and, where applicable, landfill gas emissions.[2] Larger landfills may consist of a series of cells.
- Leachate management system—Provides an approach to preventing, collecting, sampling, pumping out, and treating leachate. Works in conjunction with the base liner to prevent leachate from entering the surrounding soils and groundwater.
- Daily and intermediate landfill cover—Application of clean soil or approved alternate material on top of the landfilled material to minimize nuisance factors (such as blowing litter and wildlife attraction), to direct stormwater runoff away from the active area of the landfill cell, and to serve as a firebreak within the landfill.
- Final landfill cover—Usually consists of a series of layers designed to seal the top of the landfill, promote stormwater runoff, and allow for landfill gas venting. Prior to the placement of a final cover, an interim cover should be used and generally has the same goals as the intermediate cover.
- Stormwater management system—Use of berms, ditches, or other methods to direct surface water runoff away from the landfill cell to minimize surface water contact with waste and to minimize erosion.[3]
- Landfill gas management system—Where landfill gas generation rates are a concern, landfill gas management typically includes a passive or active landfill gas collection system, a methane destruction system such as a flare or boiler, and monitoring of landfill gas levels in buildings and at the MSW facility perimeter.

5.3 LANDFILL DESIGN

5.3.1 INITIAL STUDIES

Whether upgrading or expanding an existing landfill or designing a new one, the design should be carried out by a qualified licenced professional engineer. The landfill should have a minimum design life of 30 years. At the outset of the project, an initial geotechnical investigation should be conducted to obtain information on the physical properties of the soil and rock at the site. A geotechnical investigation helps determine the suitability of the site and informs the engineering design. It includes:[4,5]

- site inspection of geotechnical conditions;
- sub-surface drilling investigation; and
- soil sampling and testing.

Prior to construction and operation, pre-development soil conditions should be assessed and detailed to aid in the development of reclamation/revegetation plans, which are part of site closure.[6] Waste volume and soil material balance should be examined to ensure an adequate supply of cover material for operation and closure periods (refer to Tables 5-3 and 5-4 and Box 5-2).[7] For landfills constructed on or near existing grade, which is common in permafrost environments, cover material may need to be brought onto the site, influencing the design as well as operation and closure costs.

In addition, a geotechnical analysis of structures that contribute directly or indirectly to containment of waste and water should be conducted in order to ensure that the engineered structures remain stable throughout the design life, including:[8]

- settlement assessment due to potential for ice thawing in soil pores;
- slope stability assessment in relation to loadings, erosion control, slope failure due to earthquakes, floods, etc.;
- seepage and contaminant transport assessment with consideration given to short- and long-term thermal conditions in the subsurface soils; and
- for permafrost regions, thermal regime assessment (spatially and temporally) with consideration for climate change.

A hydrogeological assessment should also be carried out to better understand the interaction between groundwater and geologic conditions of the site including:[9]

- depth to groundwater;
- flow direction;
- gradients;
- estimated travel times to potential receptors; and
- baseline groundwater quality.

5.3.2 BASE LINERS AND LEACHATE MANAGEMENT SYSTEMS

A landfill's base liner is the primary control measure for the protection of soil, groundwater, and surface water. Base liners can consist of compacted soils, synthetic materials, or a combination of the two that meet recommended permeability and thickness parameters. The base liner is typically constructed above the seasonal high water table to facilitate construction and to help prevent the transport of contaminants from the waste mass through groundwater.

Base liner systems typically go hand-in-hand with leachate management systems. As previously mentioned, "leachate" refers to the liquid that has been in contact with waste in the landfill cell and has undergone chemical or physical changes.[10] Typical constituents of landfill leachate include organic compounds, nitrogen compounds (e.g., ammonia, nitrate), phosphate, metals (e.g., iron, manganese), and dissolved solids (e.g., chloride, calcium, and sodium). Leachate management systems are an important part of landfill design and aim to ensure that surface water and groundwater quality surrounding the landfill site will continue to meet established water quality criteria throughout the active life, landfill closure, and post-closure period.

The landfill leachate management approach should consider:[11]

- prevention;
- composition;
- quantity;
- collection;
- treatment;
- discharge location and criteria; and
- sampling and testing.

Leachate generation should be prevented by keeping groundwater, stormwater, and snow away from waste. For Class 1 Landfills, a leachate collection system typically consists of a stone drainage blanket above the base liner with perforated collector pipes leading to a collection sump.[12] For Class 2 Landfills where the conditions are such that leachate infiltration is expected to be minimal, a basic leachate collection system consisting of a graded surface draining to a leachate sump may be required. Leachate is then periodically tested, pumped out, and treated on- or off-site. Prior to treatment of leachate through a community's wastewater treatment system, the additional volume and contaminant loadings need to be considered. The discharge of landfill leachate directly into surface water is not an acceptable practice.

Tables 5-1 and 5-2 present best practices for designing base liners and leachate collection systems for Class 1 and Class 2 Landfills.

TABLE 5-1: BEST PRACTICES FOR LANDFILL BASE PREPARATION AND BASE LINER DESIGN

PARAMETER	BEST PRACTICES—BASE PREPARATION AND BASE LINER
Landfill Base	• To prepare the landfill base, unconsolidated materials are typically removed to a depth of at least 1 m, to the permafrost line,[13] or to 1.5 m above the seasonal high groundwater table,[14] whichever is encountered first. • Typically, a minimum of 1.5 m separation should be maintained between the seasonal high water table and the lowest point of the landfill liner. Alternatively the hydraulic gradient could be controlled through installation of an appropriate drainage and pumping system. Groundwater lowering systems should provide for positive drainage of the groundwater away from the landfill cell.[15] • Organic overburden should be removed from the landfill cell area, stockpiled, and used in restoration and revegetation during closure.[16,17] Other excavated soils may be stockpiled and used as cover material.[18]

TABLE 5-1: BEST PRACTICES FOR LANDFILL BASE PREPARATION AND BASE LINER DESIGN (CONT'D)

PARAMETER	BEST PRACTICES—BASE PREPARATION AND BASE LINER	
Base Liner	Class 1 Landfills[19,20,21] • Option A: A compacted soil liner with a maximum hydraulic conductivity of 1 x 10^{-7} cm/s and a minimum thickness of 1 m; or • Option B: A composite liner consisting of a compacted soil liner with a maximum hydraulic conductivity of 1 x 10^{-7} cm/s and a minimum thickness of 60 cm, overlaid by an impermeable flexible membrane liner with a minimum thickness of 60 mil, a geotextile, and a 30-cm protective cushion layer (e.g., sandy soil) above the liner to protect it from damage[22] (refer to Table 5-2); or • Option C: If low permeability soil is unavailable, a double liner system consisting of two impermeable flexible membrane liners, each with a minimum thickness of 60 mil.	Class 2 Landfills[23,24,25] • Facility located on a natural or constructed substrate that will support natural attenuation of landfill leachate. • Modeling for the complete landfill design (base liner, cover, etc.) should be conducted to demonstrate that leachate will attenuate to the extent that all contaminants will be below the applicable standards at the points of contact with all relevant receptors. • Other factors that may support the use of natural attenuation include: – hazardous and special waste is diverted from the landfill (some exceptions apply); – landfill is located in an arid and/or semi-arid region or measures are put in place to prevent the infiltration of precipitation into the waste mass; – landfill is located in a permafrost region where biodegradation of solid waste is considered negligible; and – low waste generation rates and small landfill footprint. • Note: If natural attenuation of landfill leachate is not achievable or if modeling is not possible due to site conditions, the landfill should be constructed with a base liner and leachate collection system in accordance with the recommendations for a Class 1 Landfill.

TABLE 5-2: BEST PRACTICES FOR LEACHATE MANAGEMENT

BEST PRACTICES—MANAGING LEACHATE

Class 1 Landfill

- Leachate generation should be prevented as much as possible by:
  - stormwater control and diverting surface water around exposed waste through berms, ditches, and retention ponds;
  - clearing snow out of the waste disposal facility before it melts;
  - not using snow as cover material;
  - burying waste above the groundwater table; and
  - not putting waste into surface water.
- The leachate collection and removal system should:[26]
  - be hydraulically separate from the MSW facility's stormwater system;
  - function year round;
  - function effectively throughout the lifespan of the landfill;
  - be equipped to record instantaneous and total flows;
  - be chemically compatible with the waste and leachate characteristics;
  - provide access for inspection, monitoring flow and head, controlling flow, and cleaning;
  - function effectively under dynamic and static loading events for all development phases;
  - use geosynthetic fabrics specified for leachate generation/flow into post-closure phase;
  - prevent the passage of fines into and any blockage of piping systems; and
  - have minimum hydraulic conductivity of 1×10^{-3} cm/s and maintain less than a 30-cm depth of leachate over the base liner.[27,28,29]
- If a double liner system is used, a leachate collection system should be installed above each liner.[30]
- A protective geotextile should be placed immediately above the leachate collection layer to limit waste intrusion into the drainage system.
- A 2% slope towards the leachate collection point should be maintained to facilitate drainage.[31,32]
- If discharge of leachate to a wastewater treatment system is intended, modeling of the system and testing of the leachate should be conducted to determine the potential for impacts to the wastewater treatment system.[33]

Class 2 Landfill

- Leachate generation should be prevented as much as possible by:[34]
  - stormwater control and diverting surface water around exposed waste through berms, ditches, and retention ponds;
  - clearing snow out of the waste disposal facility before it melts;
  - not using snow as cover material;
  - burying waste above the groundwater table; and
  - not putting waste into surface water.
- Where the site conditions are such that leachate infiltration is expected to occur, a basic leachate collection system, such as a graded surface draining to a collection point (leachate sump), may be required.

Figure 5-1 shows a typical base liner and leachate collection system for a Class 1 Landfill.

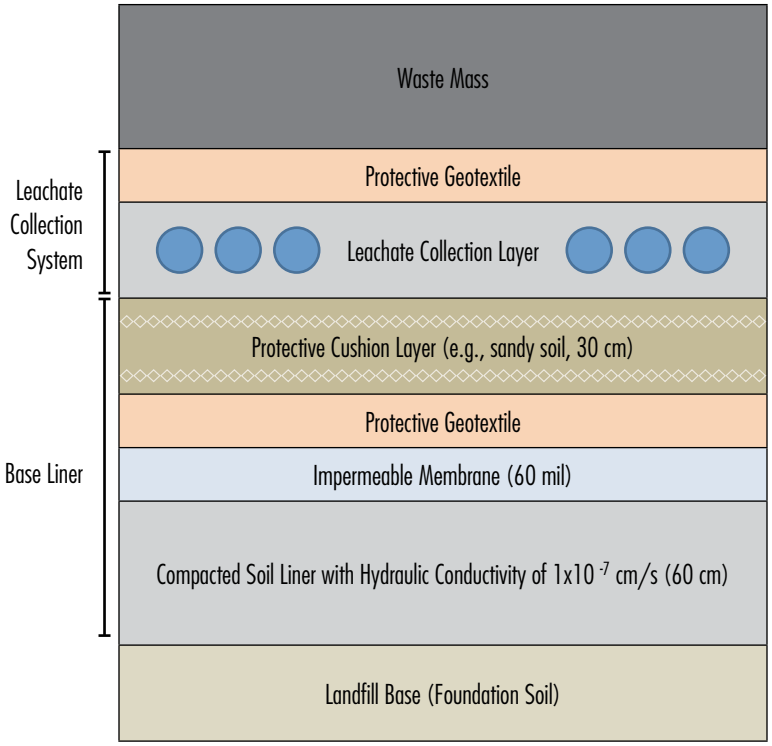


Figure 5-1: Cross-Section of a Typical Base Liner and Leachate Collection System (Option B) for a Class 1 Landfill (**Note:** not to scale)

5.3.3 COVER SYSTEMS

Daily and intermediate cover are integral to the design and operation of both Class 1 and Class 2 Landfills. Among other important functions, cover material serves to contain the waste, prevent water infiltration, reduce wind-blown litter, and prevent wildlife attraction (refer to Box 5-2, Table 5-3, and Figure 5-2).

TABLE 5-3: BEST PRACTICES FOR DAILY AND INTERMEDIATE COVER

PARAMETER	BEST PRACTICES—DAILY AND INTERMEDIATE COVER
Daily cover	• Waste should be properly placed and compacted as it is received and covered on a daily basis (i.e., on the days when the MSW facility receives waste for disposal) with a minimum of 150 mm of soil, or an approved alternate cover material, such that there is no exposed waste (see Figure 5-2 and Box 5-2).[35,36,37] As a general rule, a waste-to-cover ratio of between 3:1 and 4:1 is considered best management practice, that is, for every 3 or 4 truckloads of residual waste, 1 truckload of cover soil is used. • When weather conditions restrict site activity, the waste should be placed and then compacted and covered as soon as possible.[38]
Intermediate cover	• Intermediate soil covering should be completed in spring and fall and should consist of a minimum of 300 mm of soil.[39,40]

Figure 5-2: Rigid Steel Plate Alternate Cover System

BOX 5-2: THE IMPORTANCE OF DAILY COVER MATERIAL

"Daily cover" refers to material (about 150 mm if soil cover is used) that is spread over compacted waste at the end of each working day (i.e., each day the MSW facility receives waste). Some MSW facility operators in northern and remote communities find it challenging to use daily cover in their operations due to weather conditions or because cover material is in limited supply and/or heavy equipment is not always available. However, using daily cover is one of the main elements that sets well-managed landfills apart from open dumps. The purpose of daily cover is to:

- prevent wind-blown litter;
- promote appropriate surface water drainage instead of percolation through the landfill to create leachate;
- prevent release of odours;
- minimize presence of disease vectors (e.g., insects, rodents);
- deter scavenging by birds, bears, and other animals; and
- reduce the risk of fire ignition/spread when landfill is closed and unattended.

Key considerations:

- If using soil, it should be clean, i.e., not contaminated with hydrocarbons and heavy metals. Remediated soil should meet appropriate clean up criteria.
- Alternate daily cover options, such as rigid steel plate systems (refer to Figure 5-2), can reduce the need for soil and maximize the air space used.
- Snow is not an acceptable cover material since it can contribute to leachate production.
- Daily cover can sometimes be scraped off the operational area at the start of the day and reused at the end of the day to preserve cover material and reduce costs.

Once the landfill has reached its final grade, the final cover is installed to:[41]

- cover the waste uniformly and provide acceptable aesthetics;
- control and reduce the infiltration of precipitation and surface water into waste;
- limit erosion by wind and water;
- control release and prevent landfill gas from escaping at other than design points; and
- accommodate settling, freeze thaw cycles, and consolidation of the waste material to avoid ponding of water on the surface.

Best practices for final cover and grading are provided in Table 5-4.

TABLE 5-4: BEST PRACTICES FOR FINAL COVER

BEST PRACTICES—FINAL COVER AND GRADING
• Mounding of waste above the existing grades will increase the life of the landfill without increasing the size of the landfill footprint.[42]
• Final cover slopes should be graded to facilitate stormwater runoff away from the landfill.[43]
• Landfill slopes should not exceed 3H:1V to ensure slope stability, minimize risks of erosion, allow for safe operation of equipment, and minimize cost for cover material.[44]
• An example of a final cover design includes the following elements:[45] – a 60-cm barrier layer with a maximum hydraulic conductivity of 1 x 10^{-7} cm/s (non-arid) or 1 x 10^{-5} cm/s (arid); and – a topsoil layer a minimum of 15 cm in depth seeded with native plants (where applicable) to limit erosion.[46]
• Alternative final cover designs may be suitable in arid and/or semi-arid regions, in permafrost regions where biodegradation of solid waste is considered negligible,[47] or in communities with very low waste generation rates and small landfill footprints.
• For Class 2 Landfills, modeling for the complete landfill design (base liner, final cover, etc.) should be conducted to demonstrate that leachate will attenuate to the extent that all contaminants will be below the applicable standards at the points of contact with all relevant receptors.

5.4 LANDFILL CONSTRUCTION

The following considerations must be taken into account during the construction phase of the landfill.

Pre-construction reports/plans completed by a qualified engineer should include:[48,49]

- final design report(s), i.e., a written record of the project;
- construction drawings, which are detailed design drawings;
- construction specifications, which describe the materials and work required; and
- construction quality assurance/quality control plan which details the inspections and activities that ensure that the design, manufacture, and installation of systems and materials used in the construction and operation of the landfill meet the purposes for which the systems and materials are intended.

Construction of the landfill cell should be carried out:[50,51]

- in accordance with approved engineering design and specifications, that is, the qualitative and quantitative elements used to meet the design objectives;
- following an approved quality assurance and quality control protocol to ensure that the product or structure meets the design objectives;
- under the supervision of a licenced professional engineer (i.e., who have the proper education and qualifications and adhere to a strict code of conduct); and
- in accordance with sound environmental practices for construction activities.

Post-construction reports, plans, and records prepared by a qualified engineer should include:[52,53]

- as-built drawings which revise the original design drawings to account for any changes made in the field;
- project record of addendums, reports, site visit inspections, etc.
- quality control certifications for any liner installation, soil layers, and other required aspects of the landfill; and
- a Certificate of Completion report from the consulting engineer stating that the landfill has been constructed as designed and outlining any deviations from the original design and the rationale for those deviations; the report should include a description of facilities constructed, along with photographic records.

5.5 LANDFILL CELL OPERATIONS

One of the primary goals of landfill operations is to use airspace—i.e., the volume of space available for landfilling—efficiently while minimizing environmental impacts. Compaction significantly reduces the amount of airspace used by maximizing the mass of residual waste that can be placed in a landfill per unit volume. Landfill compaction is a function of the type and weight of the compacting equipment, the thickness of the layers being compacted (known as "lifts"), and the number of passes made. Although smaller landfills generally cannot justify expensive compaction equipment, MSW facility operators can use available heavy equipment to achieve compaction.

To further conserve airspace, it is important to use cover material efficiently. If alternate daily cover systems, such as rigid steel plates, are not available, a waste-to-cover ratio of between 3:1 and 4:1 is considered best management practice; that is, for every 3 or 4 truckloads of residual waste, 1 truckload of cover soil is used. As discussed previously, cover soil can also be reused where practical.

The footprint of the working or active face—the area where residual waste is actively being received for disposal—should be kept as small as practical (typically the width of two garbage trucks side by side) to prevent litter and water infiltration. A summary of best practices for landfill operations with respect to compaction rates, active face sizes, and lift heights are presented in Table 5-5.

TABLE 5-5: BEST PRACTICES FOR LANDFILL CELL OPERATIONS[54]

ANNUAL TONNAGE (TONNES)	TARGET COMPACTION* (TONNES/M3)	ACTIVE FACE WIDTH (M)	ACTIVE FACE LENGTH (M)	LIFT HEIGHT (M)
< 10,000	0.65–0.75	8–10	24–30	1.5–2.0
10,000–20,000	0.75–0.80	10–12	30–36	2.0–2.5
20,000–50,000	0.75–0.85	12–16	36–48	2.5–3.0

** Note: The number of passes to achieve the target compaction will depend on the type and weight of the equipment. This can be calculated with the help of a landfill engineer.*

Figure 5-3 presents an example of a well-defined active face.

Figure 5-3: A Well-Defined Active Face of a Landfill Cell

To reduce environmental impacts, sub-sections of the landfill cell that have reached their design capacity should be progressively closed using interim or final cover.

5.6 STORMWATER MANAGEMENT

Stormwater is water that originates during precipitation events and snow and ice melt. The goal of stormwater management is to keep water away from the landfill to prevent leachate formation. For both Class 1 and Class 2 Landfills, stormwater management controls should incorporate:[55]

- diversion of stormwater from working areas using trenches, culverts, berms and grading;
- prevention of erosion, siltation, and flooding;
- management of runoff from the facility; and
- removal of sediment from stormwater prior to discharge.

The larger of a 1-in-25-year storm event or snowmelt event should be used in the design of berms and/or ditches that prevent surface water from flowing onto or off the active portion of the facility.[56,57]

During the winter months, snow should be cleared and moved off-site, or at a minimum, away from the landfill cell. Operators should avoid blocking culverts and ditches by snow removal operations.[58]

If a stormwater retention pond is part of the stormwater management system, the stormwater needs to be tested and the results compared to appropriate water quality standards before being discharged to the surrounding environment (refer to Section 7).

5.7 LANDFILL GAS MANAGEMENT

Landfill gas results from the decomposition of organic waste in landfills and is composed primarily of methane, a greenhouse gas that contributes to climate change. Landfill gas can also be an explosion hazard. Since biodegradation of solid waste is considered negligible in permafrost regions, landfill gas generation in those regions is also expected to be very low.[59] In addition, the relatively low quantity of total waste generated and, consequently, small landfill footprints contribute to the low quantity of landfill gas typically generated in these regions.

In communities where landfill gas generation rates are expected to be higher (i.e., due to precipitation and/or higher waste volumes), likely at a Class 1 Landfill, a landfill gas generation assessment should be conducted. Landfills determined to be generating enough landfill gas to cause safety or environmental concerns should develop a landfill gas management plan, which may include collecting and destroying landfill gas through flaring (or energy recovery, where feasible).[60] All emissions should meet applicable regulations.[61]

Reducing the quantity of water that infiltrates the waste mass and diverting organic waste, such as food waste, leaf and yard waste, and paper products, from landfills can reduce landfill gas generation rates over the long term, thus further reducing landfill gas management concerns.

5.8 PRIORITY ACTIONS

Table 5-6 summarizes the recommended best practices that apply to landfilling of residual waste.

TABLE 5-6: PRIORITY ACTIONS FOR LANDFILLING RESIDUAL WASTE

PRIORITY	RECOMMENDED BEST PRACTICES
High ●●●	For a MSW facility with an existing landfill cell: • Prohibit open burning of waste; • Prevent accidental landfilling of hazardous and special waste; • Minimize the footprint of the area where waste is actively received for disposal ("active face"); • Compact and cover the waste; and • Divert water and snow from the waste. For a MSW facility building a new landfill cell: • Hire professionals to ensure that the old landfill cell is properly decommissioned and that the new landfill cell is properly sited, designed, constructed, and operated (see above).
Medium ●●	• Increase frequency of compacting and covering the waste; and • Look for further opportunities to segregate and divert waste.
Lower ●	• Look for opportunities to progressively close portions of the landfill cell (i.e., interim and final cover).

ENDNOTES

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6.0 MANAGEMENT OF MAJOR WASTE TYPES

6.1 OVERVIEW OF REMAINING WASTE TYPES

With a comprehensive waste management plan, a community will need to invest time and effort in implementing new practices for managing several waste types that will no longer be destined for disposal. This section describes best practices for the management of the remaining major waste types including:

- ●●● Hazardous and special waste
- ●●● Electronic waste (e-waste)
- ●●●/● End-of-life vehicles (ELVs)
- ●●●/● Bulky waste
- ●●●/●● Construction, renovation, and demolition (CRD) waste
- ●● Organics
- ●● Scrap tires
- ●● Reusable items
- ●●/● Recyclables

These waste types are presented in order of priority based on their potential risk to human health and the environment and the proportion of the total waste stream that they represent.

6.2 HAZARDOUS AND SPECIAL WASTE

●●● Since the terms "hazardous waste" and "special waste" are used interchangeably in many jurisdictions, this document will use the term "hazardous and special waste" to describe wastes that have hazardous properties. Hazardous and special waste management can be considered a **high priority** for northern and remote communities because households, local businesses, and institutions generate a broad range of products and materials that contain hazardous substances or pathogens. Since these wastes can represent a long-term liability for the community if not properly managed, consideration should be given to their appropriate handling, storage, treatment, and transport.

Each community should determine whether they have the licence and procedures in place to accept and manage these wastes, ensure that employees are adequately trained in the handling procedures, and report on the quantities disposed of (if applicable).

EXAMPLES	POTENTIAL RISKS
• Aerosol containers • Animal carcasses • Asbestos-containing materials • Automotive batteries (i.e., lead-acid) • Glycol (antifreeze) • Honey bags • Household cleaners • Hydrocarbon-containing soils and snow (as determined by testing) • Mercury switches from vehicles, thermostats,and appliances • Mercury-containing lamps (e.g., fluorescent light bulbs) • Paints • Propane tanks • Refrigerants (i.e., from appliances and end-of-life vehicles) • Residues from fuel tanks, heating oil tanks, and drums • Solvents (e.g., paint thinners, nail polish remover, degreasers, polishes) • Used oil and other oily wastes (e.g., oily rags, absorbents for spill clean-up) • Waste fuel (e.g., diesel, gas)	Environmental • Hazardous substances and pathogens may be released to the environment, contaminating soil, air, surface water, and/or groundwater. Human Health • Hazardous substances and pathogens may seep into the ground and/or surface water supply, which can impair drinking water quality. • Hazardous substances and pathogens may be discharged to the atmosphere, leading to health impacts in the community. • Hazardous and special waste can be highly combustible and explosive.

Communities should not accept hazardous and special waste from large industrial generators (e.g., mines, oil and gas exploration projects) operating outside the community unless their facility is licenced/permitted and equipped to manage these wastes (refer to Box 6-1). That said, there may be opportunities for communities to partner with some of these companies on backhaul programs.

Unsegregated hazardous and special waste piles may pose an immediate risk to human health and the environment. There are many benefits to segregating and managing hazardous and special waste appropriately. These materials require special treatment or disposal to prevent the contamination of the surrounding environment. Some of the materials may constitute a resource if recycling market opportunities can be accessed.

BOX 6-1: KEEPING WASTE FROM LARGE INDUSTRIAL GENERATORS OUT OF COMMUNITY MSW FACILITIES

An increase in resource development activities near some northern and remote communities has led to more waste from large industrial generators making its way into community MSW facilities. An example of such waste is drill cuttings, which consists of solid material removed from boreholes created during oil and gas and mineral exploration. What is the problem with accepting this type of waste?

- Most MSW facilities are not designed or permitted/licenced to handle these types of waste; and
- Any revenue received in the short term for accepting this type of waste may be cancelled out by the costly landfill space consumed and potential clean-up costs in the future.

If an outside company approaches a MSW facility operator about waste disposal, they should contact the appropriate regulatory agencies for guidance. In most instances, the waste will need to be transported to an authorized treatment/disposal facility. This may come at a higher cost to the company, but will protect the community in the long run.

Tables 6-1 and 6-2 present general design and operation best practices for hazardous and special waste management. In addition, communities should ensure compliance with all applicable regulatory requirements (regulations, standards, guidelines, local bylaws, etc.) governing occupational health and safety and hazardous and special waste storage and shipping, such as the *Transportation of Dangerous Goods Regulations*[1] and the *Interprovincial Movement of Hazardous Waste Regulations*[2].

TABLE 6-1: BEST PRACTICES FOR MANAGING HAZARDOUS AND SPECIAL WASTE—DESIGN

AREA/ACTIVITY	HAZARDOUS AND SPECIAL WASTE—DESIGN
Receiving and Short-Term Storage	• Should be designed for public to safely and conveniently drop-off hazardous and special wastes during operating hours. • Should include: – operator oversight, full- or part-time; – security controls to prevent unauthorized entry (e.g., MSW facility fence); – clear signage identifying hazardous and special waste drop-off areas and safe vehicle access; – emergency response equipment; – a flat impermeable surface (e.g., HDPE liner) with secondary spill containment appropriate to the type of hazardous and special waste; and – grading to direct surface runoff away from the receiving/storage area. • Incompatible substances should be stored separately to prevent contamination, fires, explosions, gaseous emissions, leaching, or other discharge. • Containers should be protected from the elements (see Figure 6-1).

TABLE 6-1: BEST PRACTICES FOR MANAGING HAZARDOUS AND SPECIAL WASTE—DESIGN (CONT'D)

AREA/ACTIVITY	HAZARDOUS AND SPECIAL WASTE—DESIGN
Processing and Longer-Term Storage	• In remote areas, sea cans present a best practice alternative to other protective structures (shelters, buildings, etc.) for hazardous and special waste storage. • The area should be designed for ease of access for loading hazardous and special waste for transport off-site. • Sufficient space should be allowed to segregate waste by type. • The area should be flat, and the surrounding area should be graded to direct runoff to the stormwater management pond. • Hazardous and special waste should be protected from the elements (e.g., a covered storage area, sea cans, storage containers (Figure 6-2)). • Larger solid items (e.g., automotive batteries) can be stored on pallets on an impermeable surface, or in a compatible container. • Storage containers should be: – sealable to prevent release of contents and entry of other substances; – made of material that is compatible with the hazardous and special waste it contains; – of durable construction, corrosion- and weather-resistant, and made to resist damage during handling and transportation; – stored in single file (no stacking) unless the containers are designed for that purpose; and – properly labeled with their contents and hazard type. • Liquids should be stored with secondary spill containment, such as bermed liners adapted for northern conditions, or covered structures equipped with a double floor for drainage.

TABLE 6-2: BEST PRACTICES FOR MANAGING HAZARDOUS AND SPECIAL WASTE—OPERATIONS

AREA/ACTIVITY	HAZARDOUS AND SPECIAL WASTE—OPERATION
Receiving	• MSW facility users should place waste in a designated receiving area during operating hours, and operator should transfer it to storage area (in a different area). • Alternatively, operator could be on-site during operating hours to receive and process all hazardous and special waste. • The operator should keep area organized and clean up any spilled material immediately.

TABLE 6-2: BEST PRACTICES FOR MANAGING HAZARDOUS AND SPECIAL WASTE—OPERATIONS (CONT'D)

AREA/ACTIVITY	HAZARDOUS AND SPECIAL WASTE—OPERATION
Processing	• MSW facility operator should: – receive proper training; – wear proper personal protective equipment; – clean up any spilled material immediately; – consolidate hazardous and special waste into larger storage containers ("bulking"); – store incompatible substances separately to prevent contamination, fires, explosions, gaseous emissions, leaching, or other discharge; – ensure that containers are protected from weather and the ground is protected from spills; – maintain inventory of types and location of chemicals stored on-site; and – ensure that appropriate safety equipment is located nearby (e.g., fire extinguisher, portable eyewash station).
Storage and Off-Site Transport	• The operator should maintain an inventory of the types and locations of hazardous and special waste stored on-site (critical emergency response information). • Storage containers should be: – stored in single file (no stacking) unless the containers are designed for that purpose; – properly labeled (material, hazard type); – closed at all times except when waste is added or removed, and kept free from water contamination; and – inspected regularly. • Store drums on pallets to prevent corrosion, detect leaks, and facilitate moving. • Hazardous and special waste should be transported off-site to an authorized treatment or disposal facility as frequently as practical for road accessible communities. Sealift communities are bound to backhauling schedules; practically, they may have to organize and coordinate off-site transport when hazardous and special waste containment approaches full capacity. (**Note:** some jurisdictions may limit the volume of material that can be stored).

Figure 6-1: Sheltered Receiving Area

Figure 6-2: Containment for Various Waste Types

Table 6-3 presents a list of processing and storage recommendations specific to certain types of hazardous and special wastes commonly generated in northern and remote communities.

TABLE 6-3: PROCESSING AND STORAGE RECOMMENDATIONS FOR HAZARDOUS AND SPECIAL WASTE

WASTE TYPE	PROCESSING AND STORAGE RECOMMENDATIONS
Aerosol Containers	• Store aerosol containers in tightly sealed containers.
Animal Carcasses	• Includes remains of domestic animals (e.g., livestock and pets), wildlife (e.g., game animals and road kill), and other animals. • Proper disposal is important to prevent transmission of disease and to protect the environment. • For domestic animals, preferred disposal options include cremation (i.e., incineration) where services exist or, where permitted, burial on private land. Carcasses of animals that have been euthanized may contain potentially harmful residues. Proper disposal (incineration) is important to prevent death or injury of scavenger animals, including pets and wildlife. • For game animals, hunters should consult local wildlife authorities and hunting regulations for tips on waste reduction and acceptable disposal methods. • If a dead animal is suspected to have been diseased (e.g., anthrax, avian flu, chronic wasting disease), the MSW facility operator should contact local wildlife authorities or a veterinarian for guidance on disposal options. • Any animal carcasses that are to be disposed at the MSW facility should be buried immediately in a dedicated area of the landfill cell with at least 2 m of cover material to control odours and vermin.
Antifreeze	• Store antifreeze (glycol) containers in tightly sealed containers; do not allow mixing of wastes. In some instances, glycol can be reconditioned locally for reuse.
Automotive Batteries	• In receiving areas, automotive batteries can be placed in plastic bins (see Figure 6-3). • For longer-term storage of automotive batteries, place on wooden pallets. Do not stack more than two layers thick. Separate the layers with a thin sheet of plywood or a few sheets of sturdy cardboard. Once full and prior to shipping, shrink wrap, strap to pallet, and set aside for off-site transport.

Figure 6-3: Temporary Storage of Automotive Batteries

TABLE 6-3: PROCESSING AND STORAGE RECOMMENDATIONS FOR HAZARDOUS AND SPECIAL WASTE (CONT'D)

WASTE TYPE	PROCESSING AND STORAGE RECOMMENDATIONS
Asbestos-Containing Materials	• CRD waste, including materials such as roof felt and shingles, vermiculite insulation, stucco, acoustic tiles, pipe insulation, gypsum board, and sheet flooring, is a potential source of asbestos. • Protection of the public, workers, and the environment from airborne exposure to asbestos waste (i.e., through inhalation) is important for preventing lung disease and cancer. • Where services exist, asbestos waste should be disposed of through a registered hazardous waste management company. • If asbestos waste is to be disposed of at the MSW facility, the following three conditions should be met: 1. The MSW facility has permission from regulatory authorities to dispose of asbestos waste; 2. Asbestos waste arrives at the MSW facility either double-bagged in polyethylene bags of at least 0.15 mm (6 mil) thickness or single-bagged and sealed in a puncture-proof container, such as a plastic or metal drum; and 3. Bags and containers are labeled as containing asbestos waste. • Asbestos waste should then be immediately disposed of in a dedicated area of the landfill cell where it will not be disturbed and covered with at least 50 cm of cover material. The location of the asbestos waste should be well signed, marked with a GPS unit and recorded on a site map of the MSW facility for future reference. • Upon closure of the MSW facility, the final cover over the asbestos waste should be at least 1.25 m thick, and permanent signage should be installed to indicate the presence of asbestos waste.
Honey Bags	• The term "honey bag" refers to a plastic bag containing human sewage collected from homes, cottages, or camps that lack indoor plumbing. Proper disposal of honey bags is important for preventing the transmission of disease. • MSW facility and sewage lagoon operators should avoid handling honey bags directly. • Ideally, generators should empty the contents of honey bags at the sewage lagoon. Empty plastic bags can then be landfilled at the MSW facility. A bin should be provided at the sewage lagoon for empty bag disposal.
Household Batteries	• Separate by type (e.g., alkaline (single-use), lithium ion, nickel metal hydride) and store in a plastic container with a lid. Some organizations provide a recycling service through the mail. Some restrictions may apply.
Household Cleaners	• Store household cleaner containers in tightly sealed containers. Do not allow mixing of wastes.

TABLE 6-3: PROCESSING AND STORAGE RECOMMENDATIONS FOR HAZARDOUS AND SPECIAL WASTE (CONT'D)

WASTE TYPE	PROCESSING AND STORAGE RECOMMENDATIONS
Hydrocarbon-Containing Soils and Snow	• Hydrocarbon-containing soils and snow are those contaminated with gasoline, diesel, and/or other petroleum products. • These materials may be considered hazardous if they exceed certain concentrations of contaminants (e.g., benzene, toluene, ethylbenzene, and xylene or BTEX) or exhibit hazardous properties, such as flammability (i.e., flashpoint), which is determined through analytical testing. Proper treatment or disposal of hydrocarbon-containing soils and snow is important for protecting human health and the environment. • Larger quantities of hydrocarbon-containing soils should be managed by a soil treatment facility (a.k.a. landfarm or land treatment facility) or a registered hazardous waste management company. Please consult Environment and Climate Change Canada's *Federal Guidelines for Landfarming Petroleum Hydrocarbon Contaminated Soils* (2013) for more information on the landfarming process. • Smaller quantities of hydrocarbon-containing soils or snow resulting from spills may be stored in sealed and labeled drums at the MSW facility (subject to local requirements and regulations) for proper treatment or disposal off-site with other hazardous and special waste. • Certain treated soils from a soil treatment facility can be considered for use as cover material at the MSW facility's landfill cell. Decision-makers could consider co-locating the MSW facility with a soil treatment facility to save on transportation costs for cover material.
Mercury-Containing Lamps	• Lamps should be packed in a manner that prevents breakage during storage and transit and that provides containment of mercury vapour or airborne mercury-containing particles in the event of breakage. • Lamps that are received loose or unpackaged should be packed in commercially available containers (e.g., 20-litre pails, 205-litre drums) or alternative packaging that prevents breakage in transit. • Containers should be clearly labeled and should contain lamps only. • It is preferred that lamps be kept whole and unbroken during storage and transport in order to minimize potential human exposure to mercury and prevent releases to the environment. However, in some circumstances it may be necessary or practical to store and transport lamps in a crushed state (refer to Box 6-2).
Mercury Switches	• Store mercury switches in closed unbreakable containers in a secondary container to reduce the risk of releases. Keep separate from other waste, in a cool dry place, and mark with a clear warning sign.

TABLE 6-3: PROCESSING AND STORAGE RECOMMENDATIONS FOR HAZARDOUS AND SPECIAL WASTE (CONT'D)

WASTE TYPE	PROCESSING AND STORAGE RECOMMENDATIONS
Paints	• Use original containers when possible and store on a pallet that is accessible to MSW facility users who wish to reuse paints. Containers should be sealed and leak-free. Dry water-based paint can be disposed of at the landfill cell (metal containers may be recyclable).
Propane Tanks	• Where facilities exist, propane tanks can be returned to the retailer. Otherwise, place propane tanks on wooden pallets—do not stack. Once the pallet is full and prior to shipping, shrink wrap it and prepare it for off-site transport. • Alternatively, empty and purged propane tanks can be managed as scrap metal. Any venting or valve removal should be performed by trained staff with extreme caution.
Refrigerants	• Refrigerants should be removed from appliances by a certified technician (refer to Box 6-3). Store refrigerants in approved cylinders that are designed for the different types of refrigerants.
Residues from Fuel Tanks, Heating Oil Tanks, and Drums	• Residues such as liquids and sludges in large, sealed containers may have hazardous properties that are immediately dangerous due to headspace vapours. It is recommended that only tanks and drums that have been emptied by the generator be accepted at the MSW facility for recycling or disposal.
Solvents	• Store solvent containers in tightly sealed containers.
Used Oil and Oily Wastes	• Remove used oil from containers by draining into 205-litre drums. (**Note:** In accordance with the *Transportation of Dangerous Goods Regulations*, use new or reconditioned UN-certified drums for transport of most liquids). Used oil containers can also be stored in a plastic container similar to that in Figure 6-2. • For filter disposal, eliminate as much waste oil as possible, puncture the top of the filter, set the filter in a tray and let it drain for 24 hours. Crush the filter to increase waste oil recovery. Once finished, place the filter in a storage area. Ideally, filters will be put in an area with secondary containment, which could include bulk bags for filter disposal or plastic bins. • From an air emissions standpoint, the recycling of used oil at an authorized facility is the preferred management method. For MSW facilities opting to recover heat from used oil using an approved burner, the unit should be operated in accordance with the manufacturer's specifications and any applicable local guidelines and regulations.
Waste Fuel	• Waste fuel should be removed from fuel tanks and containers in a well-ventilated area and stored outside. Bulk and store waste fuel in 205-litre drums. (**Note:** In accordance with the *Transportation of Dangerous Goods Regulations*, use new or reconditioned UN-certified drums for transport of most liquids). Do not mix different types of fuel and ensure containers are clearly labeled.

BOX 6-2: DRUM-TOP LAMP CRUSHER DEVICES

Mercury is a toxic, naturally occurring chemical element that can cycle between air, water, land, plants and animals for extended periods of time and may be carried over long distances in the atmosphere. Mercury is useful in a variety of commercial and consumer products, including fluorescent lamps, thermometers and thermostats, and some batteries and switches, among others.

Although it is preferred that end-of-life mercury-containing lamps be kept intact during storage and transport, some MSW facilities may choose to use drum-top crusher devices to reduce the volume of lamps before transport. The use of drum-top crushers is a practice allowed by many provincial and territorial jurisdictions. However, it is important that these devices be equipped with mercury particle and vapour capture systems and be used properly by trained staff to minimize potential risks to human health and prevent releases to the environment. More information on managing lamps is available in Environment and Climate Change Canada's *Code of Practice for the Environmentally Sound Management of End-of-life Lamps Containing Mercury* (refer to Appendix A, Hazardous Waste).

(Source: Environment and Climate Change Canada. 2013. About Mercury; and Environment and Climate Change Canada. 2017. Code of Practice for the Environmentally Sound Management of End-of-life Lamps Containing Mercury.)

BOX 6-3: PROTECTING THE OZONE LAYER

Refrigerants are chemicals used in air-conditioning systems of vehicles and in appliances such as refrigerators and freezers. If not properly managed, these substances are released to the atmosphere and contribute to the thinning of the Earth's ozone layer, which protects us from harmful ultraviolet rays. In recent years, severe ozone depletion has been measured over the Arctic. Some refrigerants are also greenhouse gases that, if released, contribute to the emissions that are changing our climate. For these reasons, refrigerants need to be removed by a certified technician and sent to authorized hazardous waste facilities for disposal.

For communities that do not have a certified technician providing refrigerant removal services within their community, they could partner with other communities to contract out this service to an outside provider on a periodic basis. Alternatively, communities could invest in the necessary equipment and training so that their MSW facility operator could safely perform this task. Information on ozone depletion prevention training is available in Appendix A under MSW Facility Operations and Maintenance.

(Source: Environment and Climate Change Canada. 2010. Depletion of the Ozone Layer.)

In addition to not accepting waste from large industrial generators operating outside of the community (refer to Box 6-1), MSW facilities should not accept biomedical wastes (i.e., waste from medical and veterinary clinics), radioactive materials, or explosives. These wastes require special care, can be highly dangerous if improperly handled, and may generate additional environmental liabilities for the community. Communities should contact the local regulatory authorities for further guidance on managing these waste types. More information is provided in Appendix A, Hazardous and Special Waste.

For references and more specific information on hazardous and special waste and its management in northern and remote communities, including the link to a training video entitled *Managing Hazardous Waste in Your Community* that was developed by the Government of the Northwest Territories and Ecology North, please refer to Appendix A, Hazardous and Special Waste.

6.3 ELECTRONIC WASTE

●●● When electronic products are sent to landfills, their potential value at end-of-life is lost. Gold, silver, and other metals are among the valuable materials that can be recovered. Electronic waste (e-waste) can be considered a **high priority**, since when it is mismanaged, there is the potential for hazardous or toxic substances to be released into leachate or surface water. Industry initiatives coupled with extended producer responsibility legislation have resulted in growing capacity across Canada to recycle e-waste in an environmentally responsible manner.

A wide array of electronic products are more accessible than ever to consumers and residents of northern and remote areas. While innovations such as lightweighting of products and multi-function devices have contributed to reduced material needs per unit, consumer demand and equipment lifespan will continue to place this waste type at the top of the list of waste to be diverted and recycled. Table 6-4 presents an overview of design and operation best practices for managing e-waste in northern and remote communities.

EXAMPLES	POTENTIAL RISKS
• Audio and video players and recorders • Cables • Cameras (i.e., web, digital, analog) • Cellular and smart phones • Desktop and laptop computers • Equalizers/(pre)amplifiers • Modems • Handheld computers and tablets • Printers, photocopiers and scanners • Radios • Speakers • Telephones and answering machines • Televisions and monitors • Turntables	**Environmental** • Hazardous substances found in e-waste (e.g., metals, persistent organic pollutants) may leach into the environment, contaminating soil, surface water and/or groundwater. **Human Health** • Hazardous substances found in e-waste may seep into ground and/or surface water, which can impair drinking water quality and lead to health impacts in the community.

TABLE 6-4: BEST PRACTICES FOR MANAGING ELECTRONIC WASTE—DESIGN AND OPERATIONS

DESIGN	OPERATION
Receiving, Processing and Storage Area • A designated drop-off area should be clearly identified for MSW facility users. • E-waste should be protected from the elements and potential damage (e.g., a covered receiving, processing and/or storage area, sea cans, or the same type of weatherproof storage containers as for hazardous waste (Figure 6-2), etc.). • Design could include storage on pallets (Figure 6-4), in bulk bags (i.e., strong fibre bags that are used as containers), etc. • The type and size of storage area will depend on the quantity of e-waste received each year and the duration of the storage period. • The storage area should be located in a flat area, and the surrounding area should be graded to direct runoff to the stormwater management pond. • The area should be designed for ease of access for loading e-waste for transport off-site.	**Receiving and Processing** • MSW facility users should place e-waste in the designated area and the operator should transfer to storage area (if different from drop-off area). • Alternatively, the operator could be on-site during operating hours to receive and process all e-waste. • The operator should receive training and wear proper personal protective equipment. **Storage and Off-Site Transport** • Storage areas should be clean and free from all other forms of waste. • A separate area should be established to store broken or smashed e-waste (ideally in the hazardous and special waste storage area of the MSW facility). • Large items could be placed on designated pallets and small items in bulk bags/containers on pallets. • Full pallets should be wrapped in plastic and moved to a longer-term storage area. • E-waste should be transported off-site to an authorized recycling or disposal facility as frequently as practical for road accessible communities. Sealift communities are bound to backhauling schedules; practically, they may have to stage and coordinate off-site transport when e-waste storage approaches full capacity or before, on an opportunistic basis.

Figure 6-4: Full E-Waste Pallets, Wrapped and Ready for Off-Site Transport

6.4 END-OF-LIFE VEHICLES

●●● /● End-of-life vehicles (ELVs) contain several hazardous materials and toxic substances that may present risks to the operator due to fire or explosion potential, as well as risks of environmental contamination as they may leak onto the ground, into water (ground or surface water), into the air, and into the surrounding environment. As such, depollution of any ELVs can be considered a **high priority**. Once depolluted, the environmental and human health risks associated with these wastes are lower, and so their final management can be considered a **lower priority** until transportation or environmentally sound dismantling can be arranged.

EXAMPLES	POTENTIAL RISKS
• Boats and outboard motors • Construction equipment (e.g., bulldozers, dump trucks, graders) • Personal use all-terrain vehicles (ATVs) and snowmobiles • Road motor vehicles (e.g., cars, sport utility vehicles and light-duty trucks)	**Environmental** • Hazardous substances found in vehicles (e.g., oils, refrigerant gases, lubricants, antifreeze, mercury, lead) may be discharged to the environment, contaminating soil, air, surface water and/or groundwater. **Human Health** • Substances found in ELVs can be highly combustible and explosive (e.g., fuel). • May present a physical hazard if stored incorrectly (e.g., if unsafely stacked). **Other** • Visual appearance and landscape impacts.

This section presents best practices for managing ELVs in northern and remote communities, including:

- an overview of design and operation best practices for managing ELVs (Table 6-5);
- a set of requirements for processing hazardous materials from ELVs (Table 6-6); and
- a list of specialized equipment required for managing ELVs (Table 6-7).

TABLE 6-5: BEST PRACTICES FOR MANAGING END-OF-LIFE VEHICLES—DESIGN AND OPERATIONS

DESIGN	OPERATION
Receiving and Processing Area • The receiving and processing area should be designed to safely and conveniently drop off hauled ELVs to a clearly identified area. • Depollution of ELVs should be conducted in a staging area with an impermeable surface and secondary containment. • The surrounding area should be graded to direct runoff to the stormwater management pond. **Storage Area** • The size of storage area will depend on the number and types of ELVs received each year and the duration of the storage period. • The storage area should be located in a flat area, and the surrounding area should be graded to direct runoff to the stormwater management pond. • ELVs should be stored in a manner that ensures the safety of workers and the public. • The area should be designed for ease of access for unloading and loading ELVs for transport off-site.	**Receiving and Processing** • Hazardous materials should be removed from ELVs prior to storage and transport off-site. • The first step in processing ELVs should be to remove the items listed below, in the order listed: – disconnect and remove the battery; – remove any refrigerants (by a certified professional only); and – remove fuel. • After these three items are removed, the remaining hazardous materials can be removed (refer to Tables 6-3 and 6-6). The order of removal is not as critical, as long as they are removed prior to storing the ELVs. • Process and store removed hazardous materials as described under hazardous and special waste. • Fuel tanks should either be punctured using a non-sparking tool or removed from each ELV, flattened, packaged or baled, and properly identified for transport off-site. • Crushing the depolluted ELVs using a fixed or mobile crusher will facilitate off-site transport. This can be done before placing the ELVs in storage, or at a later date in advance of the off-site transport. **Storage and Off-Site Transport** • Access to the clean ELVs may be open to the community for salvaging spare vehicle parts. • ELVs should be transported off-site to an authorized recycling facility as frequently as practical for road accessible communities. Sealift communities are bound to backhauling schedules; practically, they may stage and coordinate off-site transport of ELVs when either quantities warrant it or when an economic opportunity arises.

There are a number of hazardous materials that should be removed and properly handled prior to storing the ELVs. Table 6-6 provides processing requirements for the remaining hazardous materials in ELVs. The removed hazardous materials should be processed and stored as described in Section 6.2.

TABLE 6-6: REQUIREMENTS FOR PROCESSING HAZARDOUS MATERIALS FROM ELVs

HAZARDOUS MATERIAL	PROCESSING REQUIREMENTS
Antifreeze	Use dedicated hand pump to remove from vehicle.
Battery	Disconnect battery and remove from ELV.
Brake Fluid	Use dedicated hand pump to remove from vehicle.
Differential Fluid*	Use hand pump or drain from vehicle components.
Engine Oil*	Use hand pump or drain from vehicle components.
Fuel (Gasoline/Diesel)	Use a suction system specifically designed for removal of fuel. Do not use the same system for both gasoline and diesel. Separate systems should be used.
Fuel Tank	Remove fuel from tank. Remove empty tank from vehicle and flatten tank using a wheel loader or dozer.
Lead	Remove battery cable ends and wheel weights from vehicles.
Mercury Switches	Use small flathead screwdrivers and wire cutters to remove assemblies from vehicles. Remove metal mercury pellet from assembly if possible.
Oil Filter	Remove from vehicle, puncture the top of the filter, set filter in tray and let it drain for 24 hours. Crush filter to increase waste oil recovery.
Power Steering Fluid*	Use hand pump or drain from vehicle components.
Refrigerants	Use a mobile refrigerant removal unit to prevent discharge of refrigerant into the atmosphere. This should be performed by a certified professional.
Transmission Fluid*	Use hand pump or drain from vehicle components.
Windshield Washer Fluid	Use dedicated hand pump to remove from vehicle.

**** Note:*** *Engine oil, transmission fluid, power steering fluid and differential fluid can all be removed using the same hand pump.*

Specialized equipment that may be required to manage ELVs is described in Table 6-7 below.

For more comprehensive steps for processing ELVs, please refer to the resources in Appendix A, End-of-Life Vehicles.

TABLE 6-7: EQUIPMENT REQUIRED FOR MANAGING ELVs

EQUIPMENT REQUIRED	PURPOSE OF EQUIPMENT	SPECIAL CONSIDERATIONS
Brass Blade	For puncturing the fuel tanks without causing sparks.	
Fork-Lift or Fork Attachment for Front-End Loader or Backhoe	To move ELVs from the staging area to the stockpile area.	
Fuel Evacuation Unit—Diesel	To remove diesel from ELV.	Unit should be specifically designed for removal of diesel due to potential fire/explosion risks. Unit should be dedicated for removal of diesel only. Do not use one unit for both gasoline and diesel.
Fuel Evacuation Unit—Gasoline	To remove gasoline from ELV.	Unit should be specifically designed for removal of gasoline due to potential fire/explosion risks. Unit should be dedicated for removal of gasoline only. Do not use one unit for both gasoline and diesel.
Hand Pumps	For removal of various hazardous fluids.	At least four hand pumps are required: 1. Windshield washer fluid 2. Antifreeze 3. Brake fluid 4. Engine oil, transmission fluid, power steering fluid and differential fluid
Mobile Refrigerant Evacuation Unit	To remove refrigerants from vehicle air-conditioning system.	Refrigerants should be removed by a certified technician trained to operate the refrigerant evacuation unit.
Storage Containers	For collection and storage of various hazardous fluids.	Refer to Tables 6-1 and 6-3 for specific container requirements.
Wheel Loader or Dozer	To flatten removed fuel tanks to prevent build-up of potential vapours.	Flattened tanks can be shipped with non-hazardous ELV hulks to an ELV recycler.
Wheel Ramps	To raise ELV high enough to allow for the removal of hazardous fluids.	Wheel ramps should be designed for use with vehicles that are being processed. Always use appropriate safety precautions when working under vehicles.

6.5 BULKY WASTE

●●● /● Bulky wastes consist of large waste items, such as white goods (appliances), mattresses, furniture, scrap metals, fibreglass tanks and boathulks (i.e., engine removed), etc. Certain bulky wastes contain hazardous substances, such as refrigerants in appliances. Depollution of these wastes can be considered a **high priority**. Once depolluted, the environmental and human health risks associated with these wastes are low, and so their subsequent management and transport can be considered a **lower priority**.

EXAMPLES	POTENTIAL RISKS
• Fibreglass • Furniture and mattresses • Plastics • Scrap metals • White goods (i.e., appliances once the hazardous substances have been removed)	**Environmental** • Hazardous substances found in certain white goods, drums, and tanks may be discharged to the environment. **Human Health** • May present a physical hazard if stored incorrectly (e.g., if unsafely stacked). • May accumulate stagnant water (a source of odours and breeding ground for mosquitoes). **Other** • Visual appearance and landscape impacts if not landfilled. • Disposal increases landfill space requirements. • Landfilling can result in uneven settling in areas around this waste, which can damage the landfill cover.

This section presents best practices for managing bulky waste in northern and remote communities and contains:

- an overview of design and operation best practices for managing bulky waste (Table 6-8); and
- a set of processing and storage practices for recoverable bulky items (Table 6-9).

TABLE 6-8: BEST PRACTICES FOR MANAGING BULKY WASTE—DESIGN AND OPERATIONS

DESIGN	OPERATION
Receiving and Processing Area • Area should be clearly identified for MSW facility users. • Depollution of bulky items, where required (e.g., appliances and boats) should be performed in the hazardous waste processing area. **Storage Area** • The size of area will depend on the number and types of bulky items received each year and the duration of the storage period. • The area should be divided to allow segregated storage for major waste types and materials (metals, white goods, etc.). • The area should have good signage to instruct MSW facility users. • The area should be graded to direct runoff to the stormwater management pond. • The area should be designed for ease of access for unloading and loading bulky items for transport off-site.	**Receiving and Processing** • MSW facility users should be directed to place bulky items in designated sections or general drop-off area. • Signage should be kept clean and current to assist in directing people to the appropriate area. • The operator should verify that wastes are appropriately placed in designated areas. • Alternatively, the operator could be on-site during operating hours to receive, sort and place bulky items in the designated area. • Hazardous substances should be removed from bulky waste items by trained personnel prior to placing in storage. • If not reused, tanks and drums that contained fuel should be cut or punctured (using an approved no-spark device) to prevent buildup of explosive vapours (although it is preferably that drums be purged by the generator prior to disposal). • Waste that is not reusable or recyclable should be disposed in the landfill cell. **Storage** • Storage areas should be clean and free from all other types of waste. • Wastes should be stored in a manner that prevents accumulation of water in and around the wastes. **Off-Site Transport** • Wastes should be transported off-site to an authorized recycling or disposal facility as frequently as practical. Sealift communities are bound to backhauling schedules; practically, they may have to stage and coordinate off-site transport when storage area approaches full capacity.

TABLE 6-9: PROCESSING AND STORAGE PRACTICES FOR RECOVERABLE BULKY ITEMS

WASTE TYPE	PROCESSING	STORAGE
Fibreglass	• Fibreglass tanks should be cut or broken down to prevent the collection of standing water. • Sewage tanks may need to be cleaned of residual sewage. • Fibreglass boat hulks may have motors and hazardous materials that need to be removed (refer to Section 6.4).	• Store the wastes in a designated area to allow for reuse. • **Note:** fibreglass insulation (e.g., from buildings) should be disposed in the landfill or off-site.
Furniture	• Sort into re-usable and non-reusable furniture.	• Store re-usable furniture in a designated area for reuse. • Non-reusable furniture should be disposed in the landfill cell.
Metals	• Sort by type: steel, aluminum, copper. • Steel drums and fuel tanks should be emptied and cleaned of fuel, sludge and vapour to lessen the fire hazard (preferably by the generator prior to disposal at the MSW facility). • Drums that are damaged and of no future use can be crushed (with drum crusher or bulldozer) or cut up to reduce space requirements using an approved no-spark cutter to prevent igniting a fire and/or explosion. • Refer to Table 6-3 for information on proper removal and handling of hazardous waste associated with scrap metals.	• Store each type of metal in a separate area. • Fuel tanks should be stored cut side down to prevent collection of water in the tank halves. • Steel drums that are in good condition, do not leak, and have a tight fitting cover can be reused in some instances. **Note:** Under the *Transportation of Dangerous Goods Regulations*, steel drums generally cannot be reused for transporting liquids unless they have been reconditioned and are UN-certified, refer to Appendix A, Hazardous and Special Waste. • Otherwise, cleaned drums should be stored to prevent collection of water (i.e., on side). • Crushed and/or cut drums can be stored on pallets ready for shipment off-site.
Plastics	• Segregate the waste. • Drain tanks.	• Store cleaned plastics in a designated area for reuse or recycling. • Plastic can be crushed using a bulldozer or other heavy piece of equipment to reduce space requirements. • Store all plastic in a manner that prevents collection of water in the items.

TABLE 6-9: PROCESSING AND STORAGE PRACTICES FOR RECOVERABLE BULKY ITEMS (CONT'D)

WASTE TYPE	PROCESSING	STORAGE
White Goods	Take to processing area and remove hazardous fluids such as: • refrigerants • mercury switches • capacitors • hazardous fluids (compressor oils, etc.) **Note:** Refrigerants should be removed by a trained and certified technician using specialized equipment. A contractor may be required to remove the refrigerants (refer to Box 6-3). Refer to Table 6-3 for information on the proper removal and handling of hazardous materials found in white goods.	• Once all hazardous materials are removed from the white goods, consider removing doors to prevent accidental entrapment. • Store white goods in a designated area. This area may be unlined. • Group similar appliances together (refrigerators, freezers, washers, dryers, etc.) for easier loading when these items will be shipped to a recycling facility.

6.6 SCRAP TIRES

●● Scrap tires can be considered a **medium priority** since they pose potential environmental and human health risks (e.g., combustibility: once on fire they are difficult to extinguish and the smoke from such fires contains hazardous substances). The risk increases as the tires accumulate, so proper storage and periodic removal or shredding is essential. Additionally, good management practices will help to ensure that landfill space is preserved (i.e., by diverting scrap tires to storage and shipping them off-site), minimize visual appearance and landscape impacts, and minimize potential for scrap tires to accumulate standing water that would be a breeding ground for mosquitoes.

EXAMPLES	POTENTIAL RISKS
• Heavy equipment tires • Light truck and passenger vehicle tires • Personal all-terrain vehicle tires	**Environmental** • Tires are combustible and, once on fire, are difficult to extinguish and generate smoke that contains hazardous substances. **Human Health** • Smoke from tire fires may pose a health risk to the community. • May present a physical hazard if stored (piled) incorrectly. • Tires can provide breeding grounds for rodents and may accumulate stagnant water (a source of odours and mosquito breeding). **Other** • Disposal increases landfill space requirements. • Visual appearance and landscape impacts. • Landfilling can lead to uneven settling and a tendency for the tires to rise to the surface, both of which can damage the landfill cover.

Table 6-10 presents an overview of design and operation best practices for managing scrap tires. It should be noted that pile height and setback distances will ultimately be set by local and provincial/territorial authorities.

TABLE 6-10: BEST PRACTICES FOR MANAGING SCRAP TIRES

DESIGN	OPERATION
Receiving, Processing and Storage Area • Storage piles should be limited in area and height (3 m)[3] to reduce risks of collapse. • Storage piles should contain only scrap tires and be separated by a clear space (15 m)[4] from other tire piles. • Scrap tires are flammable and, once on fire, very difficult to extinguish. For safety reasons, piles should be separated by a clear space and located a safe distance (30 m)[5] from buildings/structures, stored items, and any trees or brush in the area. • The size of storage area required will depend on the quantity of scrap tires received each year and the duration of the storage period. • The storage area should be graded to direct runoff to the stormwater management pond. • The area should be designed for ease of access for loading scrap tires for transport off-site.	**Receiving and Processing** • MSW facility users should place scrap tires in designated area. • The operator should separate tires from rims (place rims in metal reuse/recycling area, ensuring that lead wheel weights have been removed) and ensure tires do not contain water, other liquids or debris. **Storage** • Stockpiling method: scrap tires should be laid flat on ground and stacked so that they overlap in a pyramid-like design for greater stability of the pile. • Storage areas should be kept free of combustible ground vegetation. **Off-Site Transport** • Scrap tires should be reused within the community or transported off-site to an authorized facility for recycling. • Off-site transport should be arranged as frequently as practical (stacking scrap tires in a herringbone pattern optimizes space for shipping).

Specialized equipment that may be required includes:

- fire prevention equipment, such as access to the community fire truck and fire suppression equipment; and
- equipment to remove tires from rims, which is normally available in the community public works garage in small communities, or in private sector garages in larger communities.

6.7 CONSTRUCTION, RENOVATION AND DEMOLITION WASTE

●●● /●● Generated by construction, renovation, and demolition (CRD) activities, this waste type is very diverse and can involve large volumes of materials depending on the scale of CRD activities in the community. For this reason, reuse and recycling options for CRD waste should be considered where feasible as a measure to conserve community landfill space. Generally, CRD waste can be considered a **medium priority**. However, some waste materials generated by CRD activities may contain specific toxic or hazardous materials (e.g., asbestos, mercury) that should be managed separately and that can be considered a **high priority** (refer to Sections 6.2 and 6.3).

One approach to reducing the quantity of CRD waste destined for disposal within the community is to require contractors to sort the materials on the job site, and in some cases, arrange for the backhaul of materials for recycling or disposal as part of their contract. In addition, careful deconstruction will maximize the reuse potential for materials.

EXAMPLES	POTENTIAL RISKS
• Wood • Drywall • Asphalt materials • Cement-based materials • Fibreglass insulation • Metals • Plastics and carpet	**Environmental and Human Health** • Contributes to landfill leachate quantity and quality. • Some wood and other organic wastes found in CRD can contribute to landfill gas generation. **Other** • Disposal increases landfill space requirements. • Wasted resources, i.e., materials that may be reusable inside the community (e.g., wood, metals) are landfilled.

This section contains:

- a list of CRD waste material categories and typical alternatives to disposal (Table 6-11);
- an overview of design and operation best practices for managing CRD waste (Table 6-12); and
- further considerations for recoverable CRD waste processing and storage (Table 6-13).

TABLE 6-11: TYPES OF CRD WASTE MATERIAL CATEGORIES AND TYPICAL ALTERNATIVES TO DISPOSAL

WASTE TYPE	SUB-TYPES	EXAMPLES	TYPICAL ALTERNATIVES TO DISPOSAL*
Wood	1. Wood Products	• Doors • Window frames • Wood flooring • Baseboard trim	• Salvage for reuse/resale (depending on condition)
	2. Clean Wood (i.e., solid wood product not treated with paint, stain, chemicals, or glue)	• Wood offcuts from construction and renovation projects • Other sources of clean wood (e.g., pallets, shipping crates)	• Salvage for reuse/resale (depending on condition) • Chip for landscaping • Use as an alternative fuel (where applicable)
	3. Pressure-Treated or Preserved Wood	• Pressure-treated lumber • Wood treated with preservatives	• Salvage for reuse/resale (depending on condition) • Do not chip for landscaping • Do not burn Note: Older treated wood may contain chromium and arsenic, which are toxic
	4. Engineered Wood (i.e., derivative wood products manufactured by binding strands, particles, or fibres together with adhesives)	• Medium-density fibreboard • Composite wood • Plywood • Particleboard • Oriented strand board • Glued veneer/ laminate wood	• Salvage for reuse/resale (depending on condition) • Do not chip for landscaping • Do not burn
	5. Painted, Stained, or Varnished Wood	• All wood types listed above that are painted, stained or varnished	• Salvage for reuse/resale (depending on condition) • Do not chip for landscaping • Do not burn
Drywall		• Wallboard • Plasterboard • Gypsum board	• Salvage for reuse/resale (depending on condition) Note: Older drywall and drywall compounds may contain asbestos, which is toxic

TABLE 6-11: TYPES OF CRD WASTE MATERIAL CATEGORIES AND TYPICAL ALTERNATIVES TO DISPOSAL (CONT'D)

WASTE TYPE	SUB-TYPES	EXAMPLES	TYPICAL ALTERNATIVES TO DISPOSAL*
Asphalt materials	1. Asphalt Roofing Shingles	• Roof shingles from buildings	• Use in reclaimed asphalt paving • Use in road bases
	2. Road Asphalt	• Asphalt removed during road works	• Use in reclaimed asphalt paving • Use in road bases
Cement-based materials	1. Brick	• Walls • Patios • Sidewalks	• Salvage for reuse/resale (depending on condition) • Use as base material/backfill
	2. Concrete	• Concrete slabs • Building foundations • Sidewalks • Columns and pilings	• Use as base material/backfill
	3. Masonry	• Masonry block	• Use as base material/backfill
Fibreglass	1. Fibreglass Products	• Water and sewage tanks • Bath tubs	• Salvage for reuse/resale (depending on condition)
	2. Other Fibreglass Materials	• Piping • Insulation	• None identified
Metals	1. Ferrous Metals (e.g., steel)	• Beams, telecommunication towers, structural steel, re-bar, cleaned oil tanks, etc.	• Sell to metal recyclers
	2. Non-ferrous Metals (e.g., aluminum and copper)	• Building siding, doors, blinds, window and door frames, etc. • Piping, wiring, etc.	• Sell to metal recyclers
Plastics	1. Carpet	• Carpet	• Ship off-site for recycling into products such as plastic lumber, carpet pad, and auto parts
	2. Insulation	• Foam insulation board • Foam spray insulation	• Ship off-site for recycling
	3. Other Plastics	• Varied, including plumbing piping	• Ship off-site for recycling

** **Note:** Some alternatives to disposal are subject to access to equipment and processing facilities as well as legal requirements.*

TABLE 6-12: BEST PRACTICES FOR MANAGING CRD WASTE

DESIGN	OPERATION
Receiving, Processing Area and Storage Area • Each recoverable waste type (metals, wood, etc.) should have a designated storage area with good signage to instruct MSW facility users. • The size of storage area will depend on the types and quantities of CRD waste received each year and the duration of the storage period. • The storage area should be graded to direct runoff to the stormwater management pond. • The storage area should be designed for ease of access for loading recoverable CRD waste for transport off-site. • The area should be open to public with safe, easy access for drop-off and pick–up.	**Receiving and Processing** • MSW facility users should place materials in designated areas. • The operator should verify that materials are placed in designated areas. • Alternatively, the operator could be on-site during operating hours to receive, sort and place materials in the designated areas. • Hazardous and special wastes should be removed from CRD waste prior to placing in disposal or storage. • If not reused, tanks and drums that contained fuel should be cut or punctured (using an approved no-spark device) to prevent buildup of potentially explosive vapours. • Signage should be kept clean and current to assist in directing people to the appropriate area. • Pallets could be left out with representative items to indicate to the public in which area to place their items. **Storage/Disposal** • Storage areas should be clean and free from all other types of waste. • All materials should be stored in a manner that prevents accumulation of water. • Non-recoverable CRD waste should be disposed in the landfill cell. **Off-Site Transport** • Recoverable CRD waste should be reused within the community or transported off-site to an authorized facility for recycling or reuse. • Off-site transport of recoverable materials should be arranged as frequently as practical.

TABLE 6-13: PROCESSING AND STORAGE PRACTICES FOR RECOVERABLE CRD WASTE

CRD WASTE TYPES	PROCESSING	STORAGE
Wood	Sort wood into two sub-types: • Clean—unpainted and untreated; and • Not clean—painted or treated.	• Clean wood can be sorted into two sub-types: 1. Wood that can be reused for building purposes, which should be separated and stored under a cover to prevent damage to the wood. Store clean wood in a designated area for reuse. 2. Wood that can be used as firewood, which can be piled in a separate area. • Painted or treated wood can be reused as lumber; do not burn. • Unusable painted or treated wood should be disposed in the landfill or off-site.
Drywall	• Separate material that can be re-used from damaged material.	• Store reusable material in a protected area from the rain. • Damaged material can be compacted/crushed with a loader or dozer to reduce volume, and disposed in the landfill cell.
Asphalt Materials	• Separate road asphalt from other materials. • Crushed asphalt can be used for cover material or as a surfacing material for access roads and site roads at the MSW facility.	• Store materials separately. • Material can be stockpiled up to 3 m in height. • Asphalt shingles should be disposed of in the landfill or off-site.
Cement-based Materials	• Material that can be used as gravel material should be stockpiled for the operator's use for cover material in the landfill. • Larger material can be broken down if equipment is available to do so. • Separate material that has re-bar from material that does not.	• Store re-usable material separately. • Pile material not higher than 3 m.

TABLE 6-13: PROCESSING AND STORAGE PRACTICES FOR RECOVERABLE CRD WASTE (CONT'D)

CRD WASTE TYPES	PROCESSING	STORAGE
Fibreglass	• Fibreglass tanks should be cut or broken down to prevent the collection of standing water. • Sewage tanks may need to be cleaned of residual sewage.	• Store the wastes in a designated area to allow for reuse. • Fibreglass insulation (e.g., from buildings) should be disposed in the landfill or off-site.
Metals	• Sort by type: steel, aluminum, copper.	• Store each type of metal in separate areas. • Fuel tanks should be stored cut side down to prevent collection of water in the tank halves.
Plastics	• No special processing required.	• Store clean plastics in a designated area for reuse or recycling. • Plastic can be crushed using a bulldozer or other heavy equipment. • Be sure to store all plastics in a manner so as to prevent collection of water.

6.8 ORGANIC WASTE

●● Organic waste includes leaf and yard waste, food waste, and soiled paper products. It typically makes up between one quarter to one third of the waste stream. When organic waste decomposes in an oxygen-starved landfill—a process that occurs more slowly in northern climates—it produces a gas (known as landfill gas) composed primarily of methane, a potent greenhouse gas contributing to climate change. In Canada, methane emissions from landfills account for about 20% of national methane emissions.[6] By diverting food, yard, and other organic wastes through composting, landfill methane emissions are largely avoided.

Composting represents an opportunity for northern and remote communities to:

- reduce leachate quantity and improve leachate quality;
- use a local solution to reducing greenhouse gas emissions;
- preserve landfill disposal capacity; and
- produce compost that can be used by residents or in community projects.

Since managing organics is secondary to diverting hazardous and special waste and other hazardous substances from the landfill cell, it can be considered a **medium priority**. In addition, composting can be a viable option for diverting boxboard and mixed paper in communities where setting up a paper recycling program is not feasible. Since organics management has already been covered extensively in other documents (refer to Annex A, Organic Waste), this

section briefly highlights key considerations for composting and directs the reader to relevant resources.

EXAMPLES	POTENTIAL RISKS
• Boxboard (in lieu of recycling) • Clean wood (i.e., untreated) • Food waste • Leaf and yard waste • Mixed paper (in lieu of recycling) • Soiled paper products (e.g., tissues, paper towels, soiled cardboard)	Environmental and Human Health • Contributes to landfill leachate quantity and quality. • Main contributor to landfill gas generation. • Safety concerns—wildlife is attracted to this waste. Other • Disposal increases landfill space requirements. • Wasted resources, i.e., materials that could be processed in the community to create a useful product (compost) are landfilled.

One of the most important decisions in planning an organics recovery program is the choice of processing technology, which will depend on many factors, such as the size of the community, the sources, composition and quantities of organic material to be processed, and the final compost quality requirements. For smaller communities, the most practical approach will likely be to divert organic waste through household waste diversion measures such as backyard composting and vermicomposting. For communities considering this approach, please consult the City of Yellowknife's *Composting North of 60: A Guide to Home Composting in the Northwest Territories*[7]. It is recommended that meat products be excluded from backyard composting to reduce the potential for wildlife-attracting odours.

For larger communities, a centralized composting operation, such as a static pile or open windrow, should be considered (see Figure 6-5). Such an operation could be limited to leaf and yard waste or it could include food waste and paper products. It is recommended that a qualified professional be retained to assist with the planning of a centralized composting operation. For compost facility operator training opportunities, refer to Appendix A, MSW Facility Operations and Maintenance. Some of the main factors to consider when designing such an operation are:

- regulatory requirements;
- type, quantity, and source of feedstocks, including potential partners;
- choice of technology (e.g., passively or actively aerated);
- site location and capacity of the operation;
- program costs and financing including potential economic benefits (e.g., saving landfill space, sale of compost, avoiding use of costly fertilizers);
- meeting community expectations and addressing concerns (e.g., wildlife management, refer to Section 4.3.7, and odours); and
- compost quality and end-uses of the finished compost.

Figure 6-5: Windrow Composting in the Sub-Arctic (note steam coming from top of pile)

For communities considering centralized composting, please consult Environment and Climate Change Canada's *Technical Document on Municipal Solid Waste Organics Processing* (2013)[8], which provides science-based, objective information on the various aspects of organic waste management processing. The document covers a wide range of topics, from the science and principles of composting and anaerobic digestion, to proven processing technologies, biogas utilization, facility design, odour control, and compost quality, as well as other related issues, such as procurement approaches and system selection. Other resources on composting in northern communities and general composting facility operations are provided in Appendix A, Organic Waste.

6.9 REUSABLE ITEMS

●● There are a few different ways for communities to reduce waste. For example, they can tackle it at the source (i.e. source reduction) by buying goods in bulk, bringing reusable shopping bags to the store, and planning meals ahead of time to reduce food waste. In addition, a wide array of items commonly disposed of could, if segregated, be put to use again. The reuse of household and other items can be considered a **medium priority** because it represents an opportunity to engage the community in a low-cost waste reduction effort to save landfill space. Care should be taken to determine whether the items have hazardous or toxic components, in which case they would require special handling by trained staff and appropriate storage. Reusable items should be placed in a sheltered area to protect them from the elements until a new user is found. This section presents an overview of design and operation best practices for managing reusable items in northern and remote communities (refer to Table 6-14).

EXAMPLES	POTENTIAL RISKS
• Clean drums (plastic and metal) may be reused in some instances. • Clean wood—community can pick up for building projects or firewood. • Concrete may be reused on-site. • Furniture, clothing/textiles, books, dishes, toys and other household products in good condition. • Paint may be used as long as it is not frozen. • Pallets may be reused on-site to store certain waste types (e.g., automotive batteries, drums, paint cans). • Scrap tires may be used on-site for marking out waste storage areas or barriers. • Used motor oil may be reused in approved waste oil furnaces. • Vehicle parts may be reused.	• Disposal increases landfill space requirements. • Wasted resources, i.e., items that are reusable are landfilled. • Missed opportunity to engage the community in low-cost waste reduction efforts.

TABLE 6-14: BEST PRACTICES FOR MANAGING REUSABLE ITEMS

DESIGN	OPERATION
Receiving, Processing and Storage Area • The area should be clearly identified for MSW facility users. • The storage area could be located on- or off-site (e.g., community centre). • The area should be open to public with safe, easy access for drop-off and pick-up (Figure 6-6). • Items should be protected from the elements. • The area should be located in a flat area, and the surrounding area should be graded to direct runoff to the stormwater management pond.	Receiving, Processing and Storage • MSW facility users should place reusable items in the designated storage area. • The facility operator should verify that reusable items are placed in designated areas. • Alternatively, the operator could be on-site during operating hours to receive, sort and place reusable items in the designated area. • The operator should periodically tidy the storage area and remove damaged and unusable items (e.g., wet/damp, broken).

Figure 6-6: Free Store Concept

6.10 RECYCLABLES

●● /● One of the most challenging aspects of establishing a recycling program in a northern or remote community is the high cost of transporting recyclable materials to markets. For this reason, it was suggested in the previous section that some paper products could be included in composting programs until such time that paper recycling programs are more viable. Diverting recyclables preserves landfill space and replaces the need for virgin materials, and in turn, reduces greenhouse gas emissions. For example, recycling 1 tonne of aluminum cans saves about 10 tonnes of greenhouse gases, even when transportation is factored in.[9]

When considering which types of recyclables to begin with, it is recommended that communities focus on those materials that are covered by product stewardship and extended producer responsibility programs or that have the potential to generate the most revenue (e.g., metals), which can in turn be used to help cover program costs and in some instances, subsidize the cost of recycling less lucrative materials (e.g., paper products, plastics, and glass). Communities should also consider the sources of the recyclables (i.e., households versus businesses and institutions) that they wish to start collecting for recycling. In the context of the other waste types to be managed and the relative risks, diversion of recyclables can be considered a **medium to lower priority**. This section presents an overview of best design and operations practices for managing recyclables in northern and remote communities (refer to Table 6-15).

EXAMPLES	POTENTIAL RISKS
• Aluminum cans, foil, pie plates • Boxboard (e.g., cereal boxes, tissue boxes) • Corrugated cardboard • Glass (e.g., bottles and jars) • Mixed paper • Plastics (e.g., containers and bags) • Scrap metals • Steel cans	Environmental and Human Health • Contributes to landfill leachate quantity and quality. • Some materials can contribute to landfill gas generation. Other • Disposal increases landfill space requirements. • Wasted resources, i.e., materials that could be recycled outside the community are landfilled.

TABLE 6-15: BEST PRACTICES FOR MANAGING RECYCLABLES

DESIGN	OPERATION
Receiving and Processing Area • Where curbside pick-up of recyclables is not available, a recycling drop-off centre should be set up; options range from a single drop-off centre located at the MSW facility to a series of smaller drop-off centres located at convenient locations in the community. • The area should provide for safe, easy access by MSW facility users and should allow them to sort their own materials into large labeled bins (see Figure 6-7). • The area should accommodate any required processing steps (ranging from placing materials in bulk bags to more advanced processes, such as baling). **Storage Area** • The size of storage area will depend on the types and quantities of recyclables received each year and the duration of the storage period. • Materials (especially paper and cardboard) should be protected from the weather. • Storage bins should be clearly labelled, designed for easy transfer/transportation, constructed of metal, and of a size suitable for the material collected. • The storage area should be located in a flat area, and the surrounding area should be graded to direct runoff to the stormwater management pond. • The area should be designed for ease of access for loading recyclables for transport off-site.	**Receiving, Processing and Storage** • MSW facility users should place recyclables in designated areas. • The operator should switch out full bins and prepare materials for shipping off-site (which could range from placing in bulk bags or available containers, to more advanced processes such as baling). • The operator should keep the area clean and organized and ensure that materials are properly sorted. • Signs should be clearly labeled for each type of recyclable. **Off-Site Transport** • Recyclables should be transported off-site to an authorized recycling facility as frequently as practical. This may depend on the following variables: – the quantity and types of recyclables generated; – the cost of transportation and market price for materials; – whether the community has year-round road access; and – space limitations at the MSW facility.

Figure 6-7: Metal Bins for Receiving Recyclables from the Public

ENDNOTES

1 Transport Canada. 2015. Transportation of Dangerous Goods Regulations.

2 Environment and Climate Change Canada. 2015. Interprovincial Movement of Hazardous Waste Regulations.

3 Government of Yukon, Environment Yukon. October 2013. Tire Storage.

4 *Ibid.*

5 *Ibid.*

6 Environment and Climate Change Canada. 2014. Municipal Solid Waste and Greenhouse Gases.

7 Government of Northwest Territories. Composting North of 60 - A Guide to Home Composting in the Northwest Territories.

8 Environment and Climate Canada. 2013. Technical Document on Municipal Solid Waste Organics Processing.

9 Environment and Climate Change Canada. 2013. Greenhouse Gas Calculator for Waste Management.

7.0 PERFORMANCE MONITORING AND REPORTING

Monitoring the activities and releases of the MSW facility is essential to ensure that it is working as designed and intended and that it is not contributing to unacceptable chemical, physical and biological impacts to the environment. Sources of possible releases include landfill cells as well as processing and storage areas for hazardous and special waste, e-waste, end-of-life vehicles, and bulky waste, among others. The key parameters to be monitored include groundwater, surface water, leachate, and landfill gas (where applicable). The purpose of developing a monitoring plan is to set objectives, measure any environmental releases, and identify when mitigation measures are required.

A monitoring plan should be developed for the MSW facility that reflects its regulatory and unique site-specific conditions and takes into account federal, provincial/territorial, and municipal environmental regulations, local guidelines, sampling parameters, monitoring and reporting requirements, and targets. Performance monitoring activities should be carried out by trained personnel or qualified professionals.

This section provides general considerations for the monitoring plan and each type of environmental media to be sampled and analyzed. It is intended to complement but not supersede applicable regulations. In general:

- Monitoring programs should be established with the goal of detecting contamination from the MSW facility and should be designed by suitably qualified professionals.[1,2,3]
- Sampling and associated procedures for analysis, storage, shipping, etc. should be completed by people with appropriate training and experience.[4]
- The laboratory analyzing samples should be certified by the Canadian Association for Environmental Analytical Laboratories.[5]
- Groundwater and surface water sample collection should be completed according to the most recent version of *Guidance Manual on Sampling, Analysis and Data Management for Contaminated Sites—Volume 1: Main Report* (CCME, 1993).[6]
- In permafrost regions, deep groundwater monitoring may not be practical or possible, depending on site conditions. However, monitoring of the active layer water is possible with shallow wells. Ground temperature monitoring may also be required depending on the MSW facility design.

It is important to keep accurate records for reporting purposes. Frequency of monitoring and reporting to regulatory authorities should be as follows:

- **Class 1 Landfill (refer to Section 5):** Groundwater, surface water, and leachate at least twice per year, and landfill gas quarterly (where applicable).
- **Class 2 Landfill (refer to Section 5):** Groundwater, surface water, and leachate (where applicable) at least once per year.

Reports should include monitoring results, analysis of the significance of the results, and recommendations for future monitoring[7] and/or corrective action if required.

Table 7-1 and Table 7-2 present best practices for monitoring the key parameters.

TABLE 7-1: BEST PRACTICES FOR GROUNDWATER MONITORING

CONSIDERATIONS	BEST PRACTICES—GROUNDWATER MONITORING
To Monitor or Not to Monitor?	• Monitoring may not be required if the population served is < 1000 and the base liner of the landfill includes a hydraulic barrier greater than 10^6 cm/s and at least 5 m thick.[7] However, monitoring should be conducted if there is a confirmed connection between the landfill and an aquifer, if hazardous and special waste has historically been disposed of in the landfill, or if there are indications of impacts to groundwater beyond the property limits of the MSW facility.[8]
Number and Location of Wells	• The groundwater monitoring program should be site-specific and include an appropriate number and configuration of monitoring wells around the perimeter of the site, both up and down gradient, to allow accurate evaluation of the impact of the operation and assessment of any migration pathways. This should include programs for:[9] – assessing baseline groundwater chemistry; – detecting leachate in the groundwater; – measuring the extent and magnitude of leachate contamination, should it occur; – measuring groundwater levels and general hydrogeological conditions on the site; and – quality assurance and quality control (QA/QC). • Groundwater monitoring well numbers, spacing and depths should be based on the characteristics of the aquifer, groundwater flow rate and direction, site size and type of waste deposited.[10,11] At a minimum: – at Class 1 Landfills (refer to Section 5), there should be sufficient monitoring to represent quality of background water as well as downgradient monitoring at points of compliance;[12] – at Class 2 Landfills (refer to Section 5), there should be a minimum of three groundwater wells (one upgradient for background, two downgradient to assess potential impacts).[13]

TABLE 7-1: BEST PRACTICES FOR GROUNDWATER MONITORING (CONT'D)

CONSIDERATIONS	BEST PRACTICES—GROUNDWATER MONITORING
Design and Installation	• Monitoring wells should be:[14,15] – installed hydraulically above and below the gradient direction of the landfill; – installed to a depth which will span the anticipated high and low water table levels; – located sufficiently close to the active disposal area to allow early detection of contamination and implementation of mitigation measures; – appropriately sized to allow proper well development, purging and sampling; and, – retained throughout the lifespan of the facility (active and post-closure periods); as such, wells should be clearly labeled and identified to prevent damage from heavy equipment (consider a creating a physical barrier made out of repurposed materials). • Specifications for well drilling methods, casing, screens, filter packs, annular space seals, ground surface seals, grout, caps, development and purging should be according to recognized standard protocols.[16]
Sampling and Parameters	• Groundwater monitoring wells should be checked for water levels and sampled at least twice each year at the high and low water points (Class 1) or at least once per year (Class 2).[17,18] • Groundwater samples should be analyzed for, at a minimum, routine water chemistry, dissolved metals, volatile organic compounds and dissolved organic carbon. Additional parameters may be added in consultation with a suitably qualified professional.[19] • Groundwater analysis results should be compared against local groundwater standards (e.g., in the Yukon, the Yukon *Contaminated Sites Regulation*) or against the Canadian Environmental Quality Guidelines (CEQG) if no local standard is available.[20] Results should also be compared against background levels (i.e., upgradient results versus downgradient results) and with predevelopment conditions.[21,22] • If one or more parameters are found to exceed the appropriate standard, the owner/operator should select and implement the corrective measure, establish a corrective action groundwater monitoring program, and take any necessary interim measures.[23,24] • In cases where corrective measures are being undertaken, sampling to ensure the measures' success should be continued until compliance with the groundwater standard has been met for three years.[25]

TABLE 7-2: BEST PRACTICES FOR SURFACE WATER, LEACHATE, AND LANDFILL GAS MONITORING

PARAMETER	BEST PRACTICES—SURFACE WATER, LEACHATE, AND LANDFILL GAS
Surface Water	• Surface water monitoring should include programs for:[26,27] – measuring surface water quality upstream of the site, immediately downstream and in a receiving body; – visually inspecting the landfill for leachate seeps; – detecting and measuring leachate in the surface water; and – quality assurance and quality control (QA/QC). • Surface water samples should be collected at the same time as groundwater samples. • Surface water samples should be analyzed for, at a minimum, routine water chemistry, dissolved metals, volatile organic compounds, and dissolved organic carbon. Additional parameters may be added in consultation with a suitably qualified professional.[28] • Surface water analysis results should be compared against local surface water standards (e.g., in the Yukon, the Yukon *Contaminated Sites Regulation*) or against the Canadian Environmental Quality Guidelines (CEQG) if no local standard is available.[29] Results should also be compared to background levels and predevelopment conditions.[30,31]
Leachate	• Class 1 Landfills (and Class 2 Landfills where applicable) should perform leachate monitoring and compare results with downgradient groundwater monitoring wells and surface water samples.[32] • Leachate sampling should be conducted at the same time as groundwater and surface water sampling, and samples should be analyzed using the same water quality parameters as for groundwater and surface water.[33]
Landfill Gas	• Biodegradation of solid waste is considered negligible in permafrost regions.[34] As such, landfill gas generation in those regions is also expected to be very low. • In regions where landfill gas generation is expected, a routine methane monitoring program should be conducted on a quarterly basis[35] within the most permeable strata between the waste disposal areas and the property boundary and any structures that could accumulate landfill gas.[36] • Limits should be as follows:[37] – In facility structures, the concentration of methane gas should not exceed 20 percent of the lower explosive limit of methane (1 percent by volume) at any time; – At the facility property boundary, the concentration of methane gas should not exceed the lower explosive limit of methane (5 percent by volume). • Monitoring and alarm devices for methane and oxygen should be installed within, beneath, and immediately adjacent to all on-site structures.[38]

ENDNOTES

1 ARKTIS Solutions Inc. 2011. Solid Waste Best Management Guide. Prepared for Government of Nunavut, Department of Community and Government Services.

2 Government of Newfoundland and Labrador. 2010. Environmental Standards for Municipal Solid Waste Landfill Sites.

3 Ferguson Simek Clark Engineers & Architects. 2003. Guidelines for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites in the NWT. Prepared for Government of Northwest Territories, Department of Municipal and Community Affairs.

4 ARKTIS Solutions Inc. 2011.

5 *Ibid.*

6 Ferguson Simek Clark Engineers & Architects. 2003.

7 *Ibid.*

8 *Ibid.*

9 Government of Newfoundland and Labrador. 2010.

10 EBA Engineering Consultants Ltd. 2009. Comprehensive Solid Waste Study for Yukon Territory Waste Facilities. Prepared for the Government of Yukon.

11 Ferguson Simek Clark Engineers & Architects. 2003.

12 EBA Engineering Consultants Ltd. 2009.

13 *Ibid.*

14 Government of Newfoundland and Labrador. 2010.

15 Yukon Government. 2010. Construction Requirements for New Public Waste Disposal Facilities.

16 EBA Engineering Consultants Ltd. 2009.

17 United States Environmental Protection Agency (USEPA). September 2005. RCRA Training Module: Introduction to Municipal Solid Waste Disposal Facility Criteria.

18 Yukon Government. 2010. Construction Requirements for New Public Waste Disposal Facilities.

19 EBA Engineering Consultants Ltd. 2009.

20 Yukon Government. 2010.

21 *Ibid.*

22 *Ibid.*

23 United States Environmental Protection Agency (USEPA). 2005.

24 Alaska Department of Environmental Conservation. 2006. Solid Waste Procedures Manual for Municipal Class III Solid Waste Landfills.

25 United States Environmental Protection Agency (USEPA). 2005.

26 Ferguson Simek Clark Engineers & Architects. 2003.

27 Government of Newfoundland and Labrador. 2010. Environmental Standards for Municipal Solid Waste Landfill Sites.

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29 Yukon Government. 2014. Construction Requirements for New Public Waste Disposal Facilities.

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36 Yukon Government. 2014.

37 British Columbia Ministry of Environment. June 2016. Landfill Criteria for Municipal Solid Waste, Second Edition.

38 Yukon Government. 2014.

8.0 MSW FACILITY CLOSURE AND POST-CLOSURE

The purpose of this section is to briefly describe the activities involved in facility closure and post-closure that apply to several different scenarios:

- progressive closure of an engineered landfill cell;
- decommissioning of a disposal site such as an open dump; and
- decommissioning of an entire MSW facility.

This section also discusses the importance of record keeping and financial assurance.

8.1 PLANNING AND MONITORING

There are two phases to consider at the end of the design life of a landfill cell or MSW facility:

- **Closure:** where the area is decommissioned in a manner that promotes revegetation, minimizes leachate, and ensures that any buried residual waste does not pose a physical hazard to people or animals that may use the site.[1]
- **Post-Closure:** where the area is monitored over the long term for evidence of releases to the surrounding environment and maintained to ensure the integrity of the various engineered systems.

A "closure and post-closure plan" should be developed at the time the landfill cell or MSW facility is designed and should be updated over time to reflect current site operations[2] (refer to Table 8-1). In some jurisdictions, regulators require the development of a closure plan (a.k.a. "closure and reclamation plan") as part of their permitting or licencing process (e.g., community water licence).

As discussed in Section 5, it is recommended that active landfill cells be progressively closed as sub-sections of the cell reach final design capacity. This is generally accomplished through placing interim cover on the area. During the closure phase, a final cover system is constructed over the completed landfill cell. A strategy may also be put in place to collect and treat the leachate from the closed landfill cell. In addition, a landfill gas management system may be necessary to remove landfill gas from beneath the final cover system. In the case of the closure of an entire MSW facility, soil testing may be required in areas where certain waste types were processed and stored (e.g., hazardous and special waste, end-of-life vehicles) to determine whether there was any contamination.

The post-closure phase includes environmental monitoring of such parameters as groundwater, surface water, leachate and landfill gas as well as maintenance of the final cover and other related infrastructure. Additional closure and post-closure best practices are presented in Table 8-2.

8.2 RECORD KEEPING AND FINANCIAL ASSURANCE

Complete records of the landfill cell or MSW facility should be kept for reference in the event of future redevelopment of the site or the land surrounding the site. Records should indicate, at a minimum:[6]

- location and footprint of the landfill cell or the MSW facility;
- types of waste disposed;
- dates of operation; and
- any information related to the design characteristics of the landfill cell or MSW facility.

Financial assurance is recommended for closure, post-closure care, and known corrective actions.[3,4] A closure and post-closure fund should be established at the outset of MSW facility operations and contributions should be made to that fund on a regular basis (e.g., annually) to cover closure and post-closure liabilities as they are incurred.

The required level of funding should be determined by a team of qualified professionals with expertise in engineering of closure systems and municipal finances. The closure fund should be established in a financial institution and should be structured such that it accumulates interest on monies deposited in the fund over time.

The closure reserves should be reviewed on an annual basis and the annual funding contribution should be adjusted as necessary to ensure that there will be sufficient funding to implement closure of each phase when required.

TABLE 8-1: BEST PRACTICES FOR DEVELOPING A MSW FACILITY CLOSURE AND POST-CLOSURE PLAN

BEST PRACTICES—CLOSURE AND POST-CLOSURE PLAN
The closure and post-closure plan should include:[5,6,7,8,9,10,11] • a description of the waste(s) composition, placement, volume and tonnage that will remain in the landfill cell, and scaled drawings showing maximum final height of disposal; • final cover design, including type and source of cover materials, installation, thickness, permeability, drainage layers, topsoil, vegetative cover, and erosion prevention controls; • as-built drawings for all facilities, components and installations, including an accurate plot plan, geographic positioning system coordinates and permanent location markers; • mapping of all disturbed areas, borrow material areas, and site facilities; • final survey to mark designated areas, monitoring wells and surface water monitoring locations; • site regrading to facilitate storm water management; • soil testing in areas where waste was processed or stored (e.g., hazardous and special waste, end-of-life vehicles, bulky waste); • appropriate disposal of any waste stored aboveground at the site (e.g., hazardous and special waste, end-of-life vehicles, bulky waste); • contaminated site remediation, if required, such as removal of contaminated soil from an unlined storage area; • removal of infrastructure and equipment; • post-closure leachate prevention and management; • maintaining and operating groundwater monitoring systems, leachate collection and removal systems, and landfill gas controls; • final cover monitoring for stability, erosion and settlement; • a monitoring plan for groundwater, surface water, and erosion and settlement for a minimum post-closure period of 30 years (**note:** 30 years is the average post-closure period, but this may vary depending on the site condition and issues); • if applicable, a monitoring plan for landfill gas, including plans for means of controlling landfill gas and for the maintenance of monitoring systems; • if applicable, a plan for the continued collection and removal of leachate, including maintenance of leachate collection infrastructure; • environmental monitoring systems for leachate, groundwater, surface water and landfill gas; • post-closure infrastructure requirements; • post-closure operations and maintenance (e.g., cover maintenance, vegetation monitoring, storm water management infrastructure maintenance); • contingency plans for fire, illegal dumping and nuisance control post decommissioning; • implementation schedule; • procedures for notifying the public of the facility closure and alternative disposal facilities; • restricting access to the site once closed and removal of any waste that may have been deposited following closure; • current and projected cost estimates to complete decommissioning, and the corresponding details regarding acceptable financial assurance (bond, surety or cash deposit); • the estimated closure cost to carry out closure and post-closure activities for at least 30 years and how this cost will be covered; and future land use goal.

TABLE 8-2: BEST PRACTICES FOR MSW FACILITY CLOSURE AND POST-CLOSURE

PARAMETER	BEST PRACTICES—CLOSURE AND POST-CLOSURE ACTIVITIES
Closure Activities	• Closure timing should be as follows:[12,13] – In general, closure should begin no later than 30 days after a landfill cell receives the final volume of waste, weather permitting; and – After closure begins, all closure activities should be completed within 180 days, weather permitting. • Closure activities should include the following: – Collecting all wind-blown litter from around the site and placing it in the landfill.[14] All uncovered waste should be consolidated in one place, compacted and covered;[15] – Constructing the final cover on any landfill cells that have not already been closed; – Posting signs to indicate that the MSW facility is closed; other signs should indicate the location of the new waste disposal site to prevent future dumping of waste at the closed site.[16] The location of the landfill should be marked on the ground with permanent markers or monuments to show the boundaries;[17] – For landfills on permafrost, installing thermistors to ensure freeze-back takes place; – Obtaining an independent registered professional engineer's certification that closure has been completed;[18] and – Registering the MSW facility as a solid waste facility on land title documents.[19]
Post-Closure Activities	At a minimum, post -closure activities should include the following: • Preparing a post-closure report to document capping and contouring, revegetation efforts, the final disposition of all wastes at the site, and a final site plan that includes locations of all closed cells and photos of the closed site;[20] • Conducting annual inspection and reporting for a minimum of five years after closure, noting all observations related to erosion, surface water drainage, exposed waste and or concerns related to other elements of the closed landfill infrastructure.[21,22,23,24] After five years of closure, if no significant issues arise, a less frequent inspection frequency could be considered; • Continuing the monitoring and maintenance of the waste containment systems and the monitoring of groundwater following decommissioning to ensure that waste is not escaping and polluting the surrounding environment; • Maintaining the integrity and effectiveness of all final covers, the leachate collection system (if present), groundwater monitoring system, storm water management infrastructure, and methane gas monitoring system (if present);[25,26] • Implementing monitoring programs for groundwater, surface water, leachate and landfill gas, as required;[27] • If any problems are discovered during annual inspections, they should be corrected as soon as possible.

ENDNOTES

1 Yukon Government. 2011. Closure Requirements for Solid Waste Disposal Facilities.

2 ARKTIS Solutions Inc. 2011. Solid Waste Best Management Guide. Prepared for Government of Nunavut, Department of Community and Government Services.

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9.0 SUMMARY AND NEXT STEPS

9.1 RECOMMENDED BEST PRACTICES AND PRIORITIES

This document describes key recommendations and actions for making incremental improvements to waste management in northern and remote communities over time. They include:

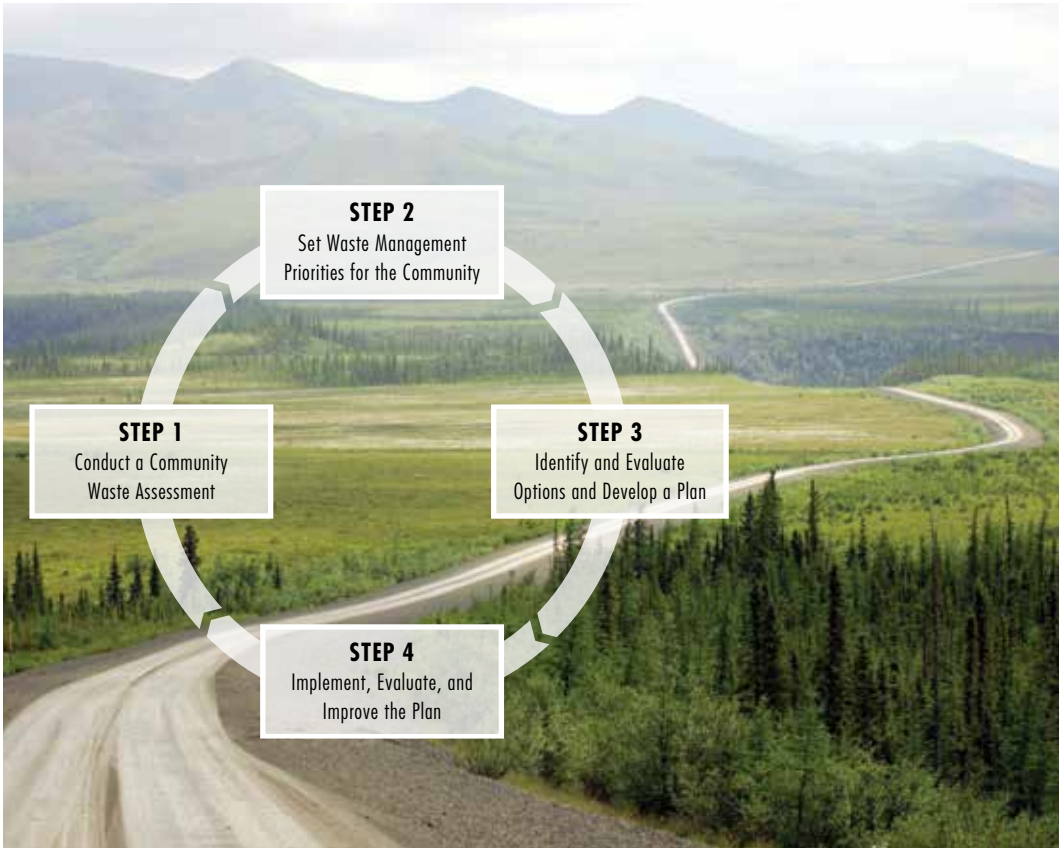
- ✓ engaging the community to raise awareness on the importance of proper waste management and develop a waste management plan i.e., complete a community waste assessment, set priorities, identify and evaluate options, as well as implement, evaluate, and improve the plan;
- ✓ prioritizing infrastructure improvements, operational activities, and waste types to reduce risks to human health and the environment; this approach complements the conventional 3Rs hierarchy of "reduce, reuse, recycle" and provides a starting point for communities that are faced with competing public works priorities, both in terms of budgets and staffing;
- ✓ selecting the most appropriate new site for a MSW facility or making the best of an existing site taking into account various environmental and social considerations;
- ✓ making general improvements to MSW facility infrastructure and operations related to layout, site control, waste screening, managing waste on and off-site, health and safety, emergency response, wildlife management, and record keeping;
- ✓ managing hazardous and special waste, e-waste, end-of-life vehicles, and bulky waste in such a way that optimizes their depollution and temporary storage on-site and facilitates recycling, treatment, or disposal at an authorized facility;
- ✓ managing other waste types such as scrap tires, CRD waste, organic waste, reusable items, and recyclables to take advantage of local reuse and processing options and opportunities for recycling outside the community;
- ✓ in the absence of other disposal options (such as disposal at a regional landfill or through incineration), designing and operating a landfill cell for residual waste disposal that is appropriate for the climate, geology, and size of the community and provides adequate protection of human health and the environment;
- ✓ ensuring compliance with applicable regulations or bylaws within the community and monitoring and reporting to regulators on the performance of the MSW facility, including such parameters as groundwater and surface water, and where applicable, leachate and landfill gas; and
- ✓ during the planning phase, developing a closure and post-closure plan to ensure that human health and the environment are protected over the long term when it comes time to progressively close a landfill cell or to decommission the MSW facility.

9.2 ON THE ROAD TO IMPROVEMENT

As a first step toward improvement, community awareness of the importance of proper waste management could be raised by establishing a volunteer waste working group or organizing community events such as household hazardous waste round-ups, litter clean-up days, and school recycling challenges. Raising awareness of the issues will help with community engagement in the process of developing or updating a waste management plan.

In the **short term**, communities can implement relatively low-cost operational activities such as controlling access to the MSW facility, improving signage, providing staff with training, personal protective equipment and shelter, prohibiting open burning, segregating hazardous and special waste, directing surface water away from waste, and covering and compacting residual waste.

In the **medium to longer term**, communities should increase diversion through reuse, recycling, and composting and invest in capital improvements, designed by qualified professionals, such as base liners, environmental monitoring systems, and other components of engineered landfills and modern MSW facilities. Partnering with nearby communities, businesses, institutions, and not-for-profit organizations can create waste management opportunities that may not otherwise be accessible to smaller communities.



APPENDIX A: ADDITIONAL RESOURCES

Disclaimer: The documents listed in this section are provided for information purposes only and do not constitute an endorsement by Environment and Climate Change Canada.

MSW Management Planning and Continuous Improvement

Waste Management Planning

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- Canadian Council of Ministers of the Environment. April 1996. Waste Audit Users Manual: A Comprehensive Guide to the Waste Audit Process. Available at: www.ccme.ca/en/resources/waste/packaging.html.
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- Zender Environmental Health and Research Group. Various Resources. Available at: www.zendergroup.org/collection.html.

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Operator Training

- BEAHR Environmental Training Opportunities for Aboriginal Communities, Solid Waste Co-ordinator Course: www.eco.ca/beahr/program-options/.
- Compost Council of Canada, Compost Facility Operator Courses: www.compost.org/English/NCOCP.htm.
- Heating, Refrigeration and Air Conditioning Institute of Canada, Environmental Awareness Course: www.hrai.ca/hrai-training.
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- Nunavut Municipal Training Organization, Hazardous Waste Management Course: www.nmto.ca/programs-and-courses/targeted-training.
- Solid Waste Association of North America (SWANA), Northern Lights Chapter Training Courses: swananorthernlights.org/training/courses/.
- Transport Canada. Transportation of Dangerous Goods Training Database: wwwapps.tc.gc.ca/saf-sec-sur/3/train-form/search-eng.aspx.
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- Environment and Climate Change Canada. Who to Call in an Emergency. Available at: www.ec.gc.ca/ee-ue/default.asp?lang=En&n=EED2E58C-1.
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Incineration and Open Burning

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- Government of Nunavut, Department of Environment. 2012. Guideline for Burning and Incineration of Solid Waste. Available at: www.gov.nu.ca/environment/information/documents/195/184.

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General

- Ecology North and Government of Northwest Territories Department of Environment and Natural Resources. Video: Managing Hazardous Waste in Your Community: www.ecologynorth.ca/project/hazardous-waste/.
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  - Guideline for the Management of Waste Antifreeze
  - Guideline for the Management of Waste Asbestos
  - Guideline for the Management of Waste Batteries
  - Guideline for the Management of Waste Lead and Lead Paint
  - Guideline for the Management of Waste Paint
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  - Waste Antifreeze
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  - Waste Paint
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Radioactive Waste

- Canadian Nuclear Safety Commission. Available at: www.nuclearsafety.gc.ca.

Electronic Waste (e-waste) and Household Batteries

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End-of-Life Vehicles (ELVs)

General

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- Statistics Canada. 2013. Motor Vehicle Registrations by Territory. Available at: www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/trade14d-eng.htm.

Bulky Waste

Refer to resources on Hazardous and Special Waste and End-of-Life Vehicles.

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- Zender Environmental Health and Research Group. 2001. A Guide to Closing Solid Waste Disposal Sites in Alaska Villages. Available at: www.zendergroup.org/viewdocs.htm.

www.ec.gc.ca

Additional information can be obtained at:

Environment and Climate Change Canada
Public Inquiries Centre
7th floor, Fontaine Building
200 Sacré-Coeur Boulevard
Gatineau QC K1A 0H3
Telephone: 819-997-2800
Toll free: 1-800-668-6767 (in Canada only)
Email: ec.enviroinfo.ec@canada.ca

THE TOWN OF THE CITY OF DAWSON
BYLAW #99-06
As amended by Bylaw #02-04, #04-06, #04-17, #11-13, & #13-05

A Bylaw to regulate the use of the Waste Management Site.

WHEREAS Section 265 of the Municipal Act, being Chapter 19, Statutes of the Yukon Territory and amendments, authorizes the Council of the Town of the City of Dawson to regulate the collection, removal and disposal of garbage, refuse and ashes,

NOW THEREFORE, pursuant to the provisions of the Municipal Act of the Yukon Territory, the Council of the Town of the City of Dawson, in open meeting assembled, HEREBY ENACTS AS FOLLOWS:

1.00 SHORT TITLE

1.01 This Bylaw may be cited as the **"WASTE MANAGEMENT BYLAW"**.

2.00 DEFINITIONS

2.01 a) **Commercial space** is defined as a principal building or segregated portion of a building in which one or more business activities, including storage of materials, may be conducted but does not include an apartment.

b) **Institutional space** is defined as a principal building in which institutional/ government or crown corporation services are provided or a parcel of land owned by government.

c) **Principal building** is defined as the main building in which an activity or group of activities may take place but does not include ancillary buildings such as garages and warehouses unless they are the only buildings on the lot or group of lots.

d) **Residential unit** is defined as a single-family residence or equivalent (eg. one side of a duplex or one apartment suite) but does not include a Hotel/Motel rental room. A Bed and Breakfast as defined in the City=s Bed and Breakfast Bylaw, shall be considered to be part of a Residential unit.

e) **Vacant lot** is defined as a parcel or parcels of land which has/have been assigned a single roll number and on which there are no assessable improvements.

3.00 PERMITTED USES

3.01 The following shall have use of the Waste Management site, subject to the regulations prescribed in this Bylaw.

a) The contractor engaged by the City to collect and dispose of garbage and refuse.

b) Private residents for the disposal of common household and garden refuse.

c) Commercial enterprises, such as hotels, retail stores, offices, etc. for the disposal of refuse generated by the operation of their respective enterprises.

d) Institutional enterprises such as hospitals, churches, schools, museums, government administrative offices, etc. for the disposal of refuse generated by the operation of their respective enterprises.

4.00 RESTRICTED USES

4.01 The following items shall be deposited only in such quantities as approved by the City Manager;
a) Lumber or other building materials.
b) Brush or other land clearing refuse.

5.00 WASTE DIVERSION

5.01 For the purpose of facilitating waste diversion and recycling activities, effective June 1, 1998 all commercial and institutional users must separate cardboard and other recyclables as identified by Council resolution, prior to placing it out for pick-up or delivering it to the waste management site.

6.00 GENERAL PROVISIONS

6.01 All garbage and refuse shall be dumped in accordance with posted directions or in accordance with specific direction as issued by the City Manager from time to time.

6.02 For the purpose of fire protection and safety, the City Manager may from time to time issue No Burning Orders, and such orders shall be posted at the Waste Management site.

6.03 The City Manager is hereby authorized to establish times of operation for the waste management site.

6.04 No person shall deposit any garbage or refuse at any time on any access road or driveway to the Waste Management site.

7.00 SCALE OF CHARGES

7.01 Each property owner shall pay the rate, as set out in the Fee Schedule Bylaw, to offset the cost of the general waste management program:

8.00 DUE DATES

8.01 A property owner seeking to qualify under Bylaw #99-05 for a water and sewer subsidy must have paid the account in accordance with the following schedule:

a) Government accounts, which are annually billed, are due within 30 days of receipt of invoice.

b) Non government residential accounts, which are billed quarterly with water and sewer, are due on the same due dates as per the Water and Sewer Bylaw# 02-01.

c) Commercial and all other accounts, which are annually billed, are due on August 31.

8.02 Any account unpaid by the respective due dates is subject to a ten percent (10%) penalty. The account, including penalty, shall become a charge against the real property, with said charge to be a special tax to be recovered in a like manner, including but not limited to penalties, interest and liens, as other taxes on real property.

9.00 PENALTIES

9.01 Any person who contravenes any of the provisions of the Bylaw is guilty of an offence and is liable on summary conviction to a penalty not to exceed $500.00 plus costs; or in default of payment of the said fine and cost, to imprisonment for a period not exceeding six months.

9.02 In addition to the penalty provided in this section, the City may request a Court of Justice to assign to a person found guilty of an offence under this Bylaw the cost of repairing or cleaning up any damages suffered by the City as a result of the offence.

10.00 ENACTMENT

10.01 The provisions of this Bylaw shall come into full force and effect on the final passing thereof.

11.00 REPEAL

11.01 Bylaw #98-06 is hereby repealed.

READ A FIRST TIME THIS 29th DAY OF MARCH, 1999.
READ A SECOND TIME THIS 29th DAY OF MARCH, 1999.
READ A THIRD TIME AND FINALLY PASSED THIS 1st DAY OF APRIL , 1999

Originals signed by:
Mayor Glen Everitt
Clerk Jim Kincaid

City of Dawson
Report to Council

Agenda Item	Council Remuneration Bylaw Review
Prepared By	David Henderson, CAO
Meeting Date	May 7, 2024
References (Bylaws, Policy, Leg.)	Council Remuneration Bylaw 2021-10 Travel policy #08-01
Attachments	Council remuneration in other communities Council Remuneration Bylaw 2021-10 Travel Policy #08-1

	Council Decision
x	Council Direction
	Council Information
	Closed Meeting

Recommendation

That Committee of the Whole Review Bylaw 2021-10, being the Council Remuneration Bylaw , and move forward to council for 1st reading .

Executive Summary

As per bylaw 2021-10 , during the final year of Council's term, council shall schedule a review of the bylaw and proceed to amend it as deemed advisable at the time.

Directions from Council at committee will determine if changes are made to the bylaw prior to ist reading.

The Attached spreadsheets identifies the practice in other Yukon communities. The monetary values identified for the other communities were effective 2021. Staff have reached out to the other communities for current information which is not yet available and will be shared when available.

Background

The City of Dawson has a history of revising the remuneration bylaw every three years prior to a municipal election. As Council reviews the bylaw, it is reasonable for Council to consider the cost to the City, the ability to attract elected officials to run for office, and the changing taxation environment.

Discussion / Analysis

The cost of Council remuneration to the City is an important and necessary cost of ensuring good government and perceived as good value for taxpayers' dollars. Cost of living increases are included in the current bylaw, the time commitment involved in being a Councillor has increased over time and with increased funding and regulatory changes federally, territorially, and municipally, it isn't likely that the time commitment will be reduced.

The attached summary of remuneration practices in other Yukon communities provides an idea of how each community compensates members of council. As Noted above, the figures for other communities are for 2021 and are awaiting updated figures.

Dawson currently provides.

- A base remuneration for Mayor and Council which is adjusted annually for inflation, with increases capped at 2.5%
- Plus, a per diem for half or full days a member of council spends either travelling to/from or attending meetings.
- Plus, travel and accommodation for such meetings or events.

Over the current term there has been some discussion regarding :

- What is fair compensation for the Mayors role.
- What are the expectations of the Mayors role within the base compensation?
- What are the expectations of Council with regard to the additional half or whole day pay for members of council .

Fiscal Impact

2024 budgeted expense for Mayor and Council Wages & honoraria & benefits	$76,055
2024 budgeted expense for Mayor and Council Training/Conferences/Travel/Accommodation	$26,138

Alternatives Considered

1. Consider adjusting the Base Remuneration Rate beyond the current rate. The current rate was arrived at through previous comparisons to other communities plus annual CPI related adjustments.
2. Consider increasing the Base Rate and removing per diems.
3. Assign the Mayor a specific annual travel/accommodation budget and the Mayor would be responsible for determining which meetings/events should be attended.

Next Steps

Bylaw must go through three readings of Council . Depending on the position of council the bylaw included in this package will go to Council for 1st reading to effectively introduce it.

Approved by	Name	Position	Date
	David Henderson	CAO	5/31/2024

Mayor and Councillor Renumeration 2021 Review

Village of Carmacks	$ 12,600.00	Mayor - annually	
2012	$ 6,600.00	Deputy Mayor - annually	
	$ 6,600.00	Councillors - annually	
		By resolution may approve payment of travel, meals, accommodation & per diem (at YG rates)	
	$ 100.00	Mayor - per diem, meetings 3 hours or less	
	$ 75.00	Councillors - per diem, meetings 3 hours or less	
	$ 200.00	Mayor - per diem, meetings 3+ hours	
	$ 150.00	Councillors - per diem, meetings 3+ hours	
	$ 200.00	Mayor & Councillors - per diem, meetings in other communities	
	$ 100.00	Mayor & Councillors, per travel day separate from meeting days, 250km or less, within Yukon	
	$ 200.00	Mayor & Councillors, per travel day separate from meeting days, 250km or greater, within Yukon	
	$ 200.00	Mayor & Councillors, per travle day separate from meeting days, outside Yukon	
	$ 600.00	Mayor - annually, meetings with visitors to the community, to be reimbursed upon presentation of receipts	
	$ 25.00	Deputy Mayor - per diem if the mayor is absent and the DM is required to perform Mayor duties	
	$ 50.00	Deputy Mayor - per diem to chair a regular or special meeting of council if the Mayor is absent from the meeting	
City of Dawson	$ 17,500.74	Mayor - annually - adjusted to 2024	
2024	$ 11,667.26	Councillors - annually - adjusted to 2024	
		Adjusted annually by applying a factor equal to the CPI, not to exceed 2.5% in any given year and no adjustment if the CPI is negative	
	$ 150.00	Councillors - per diem, 4 hours or less when representing the City at any training session, event or meeting that has been approved by council	
	$ 200.00	Councillors - per diem, more than 4 hours	
		Travel expenses reimbursed in accordance with the City of Dawson Travel Policy	
Town of Faro	$ 1,818.93	Mayor - monthly (21,827.16 annually as at 2024)	
2024	$ 1,081.59	Councillors - monthly ($12,979.08 annually as at 2024)	
		Adjusted annually based on the CPI	
Village of Haines Junction	$ 14,666.00	Mayor - annually	
2021	$ 11,733.00	Councillors - annually	
		Adjusted annually based on CPI	
		Travel reimbursed on the same basis as YG empolyees on travel status	
Village of Mayo	$ 200.00	Mayor - attendance at regular and joint council meetings	
2024	$ 150.00	Councillors - attendance at regular and joint council meetings	
	$ 150.00	Mayor - attendance at non-council meetings inside community less than 2 hours	
	$ 100.00	Councillors - attendance at non-council meetings inside the community less than 2 hours	
	$ 200.00	Mayor - attendance at non-council meetings inside community more than 2 hours	
	$ 150.00	Councillors - attendance at non-council meetings inside community more than 2 hours	
	$ 250.00	Mayor - full day meeting	
	$ 200.00	Councillors - full day meeting	
	$ 250.00	Mayor - attendance at meeting outside community, per day	
	$ 200.00	Councillors - attendance at meeting outside community, per day	
	$ 40.00	Mayor and Councillors - hourly rate for hours spent travelling to and from meetings outside the community within Yukon	
		For travel to meetings outside Yukon the daily rate will apply (Mayor and Councillors)	
		Travel expenses paid out per Village of Mayo travel expense policy	
		added reimbursment to council member if preapproved for special work at $50/hr	
Village of Teslin	$ 8,000.00	Mayor - annually. $3,750 base and additional $125 per regular or special meeting of Council attended	
2024	$ 7,300.00	Councillors - annually. $3,000 base and additional $125 per regular or special meeting of Council attended	
		per day while attending meetings or performing other duties on behalf of the municipality in capacity of Mayor or Councillor outide of regular or special meetings	
	$ 200.00	of council	
	$ 150.00	half day, as immediately above	
		Mayor and Councillors shall receive an honourarium when appointed as members of committees over and above their council indemnity (amount not specified)	
Town of Watson Lake	$ 15,000.00	Mayor - annually to attend Regular & Special Council Meetings or other meetings called by Mayor & Council	
2024	$ 10,000.00	Councillors - annually to attend Regular & Special Council Meetings or other meetings called by Mayor & Council	
	$ 150.00	Per Diem for Mayor & Council to attend approved meetings, courses, or conventons for 4 hours or less, as required in the course of their duties	
	$ 200.00	Per Diem for Mayor & Council to attend approved meetings, courses, or conventons over 4 hours, as required in the course of their duties	
		Travel expenses reimbursed as set out in the travel expense policy (follow YG Travel rates)	
City of Whitehorse	$ 115,569.69	Mayor - annually (to be adjusted for 2023 CPI)	
2024	$ 41,605.42	Councillors - annually (to be adjusted for 2023 CPI)	
		Adjusted annually based on CPI	
		Mayor - benefit plan including health, dental, life insurance, AD&D, WI/LTD, time off with pay, EAP	
		Councillors - benefit plan, same as Mayor, except for time off with pay, and additionally child care allowance (for care during council meetings)	
	$ 10,500.00	Mayor - annual, to reimburse for expenses incurred while performing duties	
	$ 4,750.00	Councillors - annaul, to reimburse for expenses incurred while perfroming duties	
		Budgeted fund - to reimburse councillors for expenses incurred when an invitation or obligation of the entire council is delegated to one or more of its members.	
	$ 6,000.00	This $6,000 is collective, not $6,000 for each councillor.	
		Travel expenses in accordance with the Travel Expense Administrative Directive.	
		Councillors - daily, when representing City at a business function or event, attending non-regular meetings, or participating in training related to City business, 1-4	
	$ 150.00	hours	
	$ 200.00	Councillors, as above, 4 hours or more	
		Reimbursement for travel/meeting a representative on the AYC board	

THE CITY OF DAWSON

Council Remuneration Bylaw

Bylaw No. 2021-10

WHEREAS section 173 of the *Municipal Act*, RSY 2002, c. 154, and amendments thereto, provides that council may, by bylaw, establish the amount and any criteria in relation to the remuneration of a member of council (including the type of or rate or conditions for remuneration) in relation to

(a) attendance at a council meeting or a council committee meeting;

(b) expenses incurred in the course of attending a council meeting or a council committee meeting; or

(c) any other expenses incurred in the course of performing any duty required to be performed by a member of council.

THEREFORE, pursuant to the provisions of the *Municipal Act* of the Yukon, the council of the City of Dawson, in open meeting assembled, **ENACT AS FOLLOWS**:

PART I - INTERPRETATION

1.00 Short Title

1.01 This bylaw may be cited as the ***Council Remuneration Bylaw***.

2.00 Purpose

2.01 The purpose of this bylaw is to provide for remuneration to be paid to the Mayor and Councillors.

3.00 Definitions

3.01 In this Bylaw:

(a) Unless expressly provided for elsewhere within this bylaw the provisions of the *Interpretations Act (RSY 2002, c. 125)* shall apply;

(b) “city” means the City of Dawson;

(c) “council” means the council of the City of Dawson.

CAO _____ Presiding Officer _____

PART II – APPLICATION

4.00 Annual Remuneration

4.01 The base annual remuneration for the Mayor for the 2021—2024 term of office shall be $17500.74 effective from November 1st, 2021 to October 31, 2024.

4.02 The base annual remuneration for each Councillor during the 2021—2024 term of office shall be $11667.26 effective from November 1st, 2021 to October 31st, 2024.

4.03 (a) on an annual basis, the base annual remuneration shall be adjusted by applying a factor equal to the change in Consumer Price Index (Nov.- Nov.) calculated by Statistics Canada for Whitehorse, subject to the following:

I. annual increase shall not exceed 2.5% in any given year; and

II. where the Consumer Price Index indicates a negative adjustment, no adjustment shall be applied.

(b) the adjusted base annual remuneration shall become effective on January 1st of the following calendar year.

4.04 Annual remuneration shall be paid bi-weekly and, where a member of council fails for any reason to serve in the respective office for a full twelve months, the remuneration shall be prorated on a bi-weekly basis for the period served.

5.00 Remuneration Review

5.01 During the final year of council's term of Office, council shall schedule a review of the *Council Remuneration Bylaw* and proceed to amend it as deemed advisable at that time.

6.00 Additional Payments

6.01 In addition to the annual remuneration provided pursuant to this bylaw, a member of council may be paid a per diem for each day the member of council is engaged in representing the City at any training session, event or meeting where such representation has been approved in advance by council resolution. The per diem shall be prorated as follows:

Representation	Entitlement	Amount
More than 4 hours	Full-Day	$200.00
4 hours or less	½ Day	$150.00

6.02 The per diem provided pursuant to this bylaw shall be paid with respect to such day or days on which a member of council:

(a) represents the City at an approved training session, event or meeting; or

(b) is required to be absent from the municipality for four or more hours for the purpose of travelling to and from an approved training session, event or meeting.

7.00 Expenses

7.01 Prior approval of council is required for funding or reimbursement of expenses incurred in conjunction with the travel of any member of council outside the City of Dawson.

7.02 Members of council shall be reimbursed for travel expenses in accordance with the *City of Dawson Travel Policy*.

PART III – FORCE AND EFFECT

8.00 Severability

8.01 If any section, subsection, sentence, clause or phrase of this bylaw is for any reason held to be invalid by the decision of a court of competent jurisdiction, the invalid portion shall be severed and the part that is invalid shall not affect the validity of the remainder unless the court makes an order to the contrary.

9.00 Bylaw Repealed

9.01 Bylaw 2018-10, and amendments thereto, are hereby repealed.

10.00 Enactment

10.01 This bylaw shall come into force on the day of the passing by council of the third and final reading.

11.00 Bylaw Readings

Readings	Date of Reading
FIRST	**July 13, 2021**
SECOND	**August 3, 2021**
THIRD and FINAL	**August 31, 2021**

Original signed by:

Wayne Potoroka, Mayor
Presiding Officer

Cory Bellmore, CAO
Chief Administrative Officer

Town of the City of Dawson
TRAVEL POLICY
#08-01

1. This travel policy shall apply to Members of Council; Members of City Boards and Committees; and City Employees.

2. Where a conflict exists between this policy and a Bylaw or Statute, the Bylaw or Statue shall have precedence.

3. City of Dawson Travel Policy 06-01 is hereby rescinded.

4. Travel Approval
   a. For travel budgeted for in Council approved budgets, the Chief Administrative Officer (CAO) shall be the approval authority.
   b. For CAO travel, trips within the Yukon where travel budgets exist in Council approved budgets, the Senior Finance Officer may sign travel claim forms.
   c. For CAO travel outside the Yukon, all travel must be approved by Council resolution.
   d. For Mayor or Council travel with in the Yukon not exceeding 5 days, CAO shall be the approval authority
   e. For Mayor or Council travel within the Yukon exceeding 5 days, all travel must be approved by Council Resolution.
   f. For Mayor & Council travel outside the Yukon all travel must be approved by Council Resolution
   g. All travel claims shall be numbered and filed.

5. Responsibilities of Person Traveling
   a. Prior to the trip, a completed “Travel Authorization/Claim Form” attached hereto as Appendix “A”, must be submitted to the appropriate approval authority.
   b. Where more than one person is traveling to the same event, car-pooling shall be used whenever practicable.
   c. Where car-pooling is practicable but declined, travel allowances will be prorated.

7. Responsibilities of Approval Authority
   a. The approval authority shall check that the trip has been budgeted for.
   b. Where the trip has not been budgeted for, the approval authority shall:
      - ensure the trip is necessary for the good of the municipality
      - ensure that enough funds exist in approved budget account.
   c. The approval authority shall approve/not approve trip as appropriate and sign the travel authorization form accordingly. If the trip is not approved, the approval authority shall indicate in writing the reasons for non – approval.

8. Hotels
   Hotels rooms shall be single rooms. Where the person traveling wishes a larger room or travels with a spouse or companion, the difference in rates shall be paid by the person traveling. When a stay exceeds two days a housekeeping room may be requested subject to approval as described in Section 4.

9. Airlines
Where travel is by air, office staff will book the tickets taking advantage of any reduced fares available based on consultation with traveler.

10. Child Care
Child Care will be provided to members of Council and City employees in instances where travel outside the City of Dawson is required.

11. Taxi / Buses
Travel to and from airports and as otherwise required, may be claimed.

12. Rates
As defined in Appendix "A", and consistent with Yukon Territorial Government Rates. Appendix "A" will be amended from time to time to remain consistent with Yukon Territorial Government Rates.

13. Claims
a. Hotels/airlines booked by the office shall be paid for directly by the City through normal City procedures.
b. Travel Claim forms will be processed according to the payable schedule.
c. Except for meals, private accommodation and mileage, no reimbursement will be provided for expenses not accompanied by a receipt.

14. Reporting
After completion of the trip, a summary report must be submitted to Approval Authority, which includes:
- Details of the trip.
- An evaluation of the benefits the travel provided to person traveling, to the City and to the community.
- Any other report upon which approval was contingent;
- Final cost of trip

15. Appendixes
i. Appendix "A" – Travel Authorization & Claim Form

POLICY TITLE: Travel Policy

POLICY #: 08-01

EFFECTIVE DATE: June 17, 2008

ADOPTED BY COUNCIL: Resolution # C08 14-15 on June 17, 2008

AMENDED BY RESOLUTION: C09 12-15 on May 19, 2009

Original signed by:
Mayor, John Steins

CAO, Eldo Enns

MINUTES OF CITY OF DAWSON RECREATION BOARD - R24-01
held on Tuesday, April 2, at 5:15 p.m. at Art and Margaret Fry Recreation Centre.

PRESENT: Monna Sprokkreeff, Brent Mcdonald, Amélie Morin

REGRETS: Ashley Doiron, Peter Menzies, Megan Macdougall, Dawn Kisoun

ALSO PRESENT: Paul Robitaille (Parks and Recreation Manager), Helen Dewell (Guest)

1. Agenda

Amendments made to agenda correct name spelling and a few grammatical errors, and the addition of Helen Dewell as a delegate at the meeting.

R24-01-01

Moved By: *M.Sprokkreeff*
Seconded By: *B. Mcdonald*

That the agenda for Recreation Board Meeting C24-01 of April 2, 2024 be adopted as amended.

CARRIED 3-0

2. Delegations & Guests

a. Helen Dewell RE: Grimshaw, Alberta Multiplex

Helen provided insight on new recreation centre project, and asked several questions as to the status of the project.

3. Overview of Recreation Board

a. Current Members
b. Review Recreation Board Bylaw
c. Review Role of Board
d. Assign Chairperson and Vice-Chairperson

Discussion held on role of Recreation Board and best options for communication, schedule, and to establish positions within the board..

R24-01-02

Moved By*: M.Sprokkreeff*
Seconded By: *A. Morin*

That the Recreation Board appoint Peter Menzies as Chairperson until the first Recreation Board meeting of 2025. That the Recreation Board appoint Monna Sprokkreeff as Vice-Chair until the first Recreation Board meeting of 2025.

CARRIED 3-0

e. Establish Upcoming Meeting Schedule

Recommendations:

- *Attempt should be made to host meetings on the second and fourth Tuesday of the month, with goal of having the meetings prior to City of*

Dawson Council meetings.

- *Meetings should generally start at 5:30pm and end prior to 7:00pm.*
- *Staff should attempt to provide a Zoom option for these meetings, and use City Hall as primary location for meetings.*
- *Next meetings:*
  Tuesday, April 23, 2024- 5:30pm
  Tuesday, May 14, 2023- 5:30pm
  Tuesday, May 28, 2023-5:30pm

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4. New Recreation Centre

a. Background
b. Project Considerations and Recommendations of Administration
c. Role of Recreation Board
d. Other Considerations

Discussion held on New Recreation Centre. Staff provided insight based on prepared City of Dawson Recreation Board -Memo.

Group discussed and recommended the following:

- *Create a Shared Drive that includes upcoming YG Tender for Design/Build, Case Studies from existing recreation facilities, and most recent schematic design.*
- *Consider a Communication plan to be inclusive to public as possible.*
- *Consider advisors who have done research and case studies on recreation facilities, including Helen Dewell and Diana Andrew.*

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5. Upcoming Discussion Items

a. New Recreation Centre-Workshop
b. Community Grants & Recreation Fund Intake
c. Community Grants & Recreation Fund Policy Review
d. Recreation Board Policy & Role Review

Discussion held on upcoming meeting content. Suggestion made to create a workback schedule to help determine next steps in project. Concerns about ensuring facility is a true recreation centre, as opposed to an arena were raised and initial discussion about what amenities to focus on were had.

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6. Round Table

a. Art and Margaret Fry Rec Centre – Concession Use
b. Community Grants & Recreation Fund Policy Review

Round Table (cont.)

Members discussed concerns surrounding the Concession at the Art and Margaret Fry Recreation Centre and its future use. Recommendation was made to make the concession available for business use again.

Members requested that Community Grant and Recreation Fund Policy be added to shared drive.

2024

Town of Faro

SHADOW POPULATION COUNT

TOWN OF FARO

Table of Contents

Objective

In November 2023 the Town of Faro completed an administrative census. The purpose of this census was to give an accurate count of the number of people residing within the borders of the Town of Faro at any given time, regardless of permanent residency status.

Authority

Section 229 of the Statutes of the Yukon Chapter 154, *Municipal Act* states "Council may take a census of the municipality. S.Y. 1998, c.19, s.228."

The Need for a Population Count

Town Council did not believe that the active population of residents, both permanent and non-permanent, is reflected properly by the Yukon Bureau of Statistics. This is important because many grants, especially the Comprehensive Municipal Grant (CMG), are heavily influenced by the population count. As such, in 2023, Council directed Administration to complete a municipal census to calculate the population of Faro as of 2024.

To be fair, the Yukon Bureau of Statistics does their best to estimate the population of a community, based on the addresses of record they can collect from drivers' licenses, medical information, assessment rolls, etc. The problem of course, is that the population of the Town is being heavily influenced by non-resident workers who have a permanent residence somewhere else, but live in the community for cyclical terms. These workers may be here for a few weeks at a time (in and out) and replaced by other workers on an opposite cycle, or they may be here for 3 to 9 months at a time, or even years at a time, depending on their work or contracts.

This 'Shadow Population' places a demand on municipal services but these people are not factored into the grants provided the Town Office to assist in providing these services.

To further complicate the issue, some permanent residents, who live outside the municipal boundary, can accidentally be included in the municipal population estimate from Yukon Bureau of Statistics if these people collect their mail in Faro. These people do not pay for services, like access to waste management or recreation, nor do they pay property taxes to the Town, but they skew the population count.

The 2021 Federal Census Population Estimate

It should be noted that, according to the 2021 Federal Census, Statistics Canada counted 210 'private dwellings occupied by usual residents' in Faro. Statistics Canada also uses the factor of 2.1 persons as possible inhabitants of a livable residence. Therefore, in 2021, they were estimating a population of 440.

It is also important to note that Statistics Canada also recorded there were 423 private dwellings in Faro. At the time of the 2021 census, there were many dwellings NOT occupied whereas, in 2024, many of these dwellings either have been, or are in the process of being, renovated and occupied. As such, with the possibility of 100% occupancy could some day be calculated as 423 * 2.1 = 888 people in Faro. History notes, however, that during peak population in the 1980s, Faro had a population in excess of 2,000.

2023 Yukon Bureau of Statistics Population Estimate

In 2023, the Yukon Bureau of Statistics estimated the population of Faro was 453, which is very close to the estimate by Statistics Canada some 2 years earlier in 2021. Yet it is generally believed that the population of the community has grown substantially in the last few years.

For example, in January 2019, the Town Office issued 197 residential utility invoices. In January 2024, the Town Office now has 274 active residential utility accounts. That's an increase of 40%. If the factor of 2.1 is applied to 274, the population estimate would be 576 for Faro.

Faro Administration proceeds with a Municipal Census

At the recommendation of the Yukon Bureau of Statistics, an administrative count of the shadow population was completed as opposed to a traditional census. Two non-partial locals, who have vast knowledge of the community and residents, were contracted as Census Workers to complete the administrative count.

Methodology

At the recommendation of the Yukon Bureau of Statistics, a similar approach was used as outlined in the "Shadow Populations in Northern Alberta" 2006 Report.

To be as accurate as possible, the Census Workers first utilized the Town's land files and development permits, to create a base list of all properties. Using their knowledge of the community, along with business licence applications, curb stop turn on/shut off forms, and development permits, these Census Workers then determined the number of occupants in each residence at any given time. Where and when required, they contacted local construction companies, who have purchased housing units for staff housing, to confirm the occupancy numbers and cycles of these units.

The Census Workers then followed the general methodology in the Northern Alberta report process. For clarification, the census counted people in the following categories.

Permanent Residents

Permanent Residents are defined as persons who have a main residence in Faro and reside in Faro for more than 6 months of the year. Because a "door-to-door" survey was not completed, an accurate count of permanent residents was not calculated in the "Shadow Population Count". According to the 2023 3Q Population Report from the Yukon Bureau of Statistics, there are 453 people living in the Town of Faro. This is the number used to calculate the total number of permanent residents in Faro.

Seasonal Residents

Seasonal Residents are people who permanently reside elsewhere but have property in Faro and return annually for a period of more than 30 days, but less than 6 months.

These residents count for 0.5 persons in the census count as they are only in Faro for half of the year.

B&Bs, Guest Houses, and Campgrounds

These establishments host tourists, short-term and long-term contractors, and temporary workers. The purpose of this census was not to count tourists, nor contractors, who are in the municipality for less than 30 days annually.

The number of rooms/campsites were counted at these establishments and each room counted for 0.25 of a person. This assumes that a room may not always be filled, and the occupants may not meet the shadow population guideline of residing in Faro for more than 30 days, but less than 6 months.

Corporate Houses

A Corporate House is a residential property which temporarily houses employees that permanently reside outside the community, by providing them a place to live while at work within the community. There are two types of corporate houses: Corporate Houses with Year-Round Employees and Corporate Houses with Seasonal Employees.

Corporate Houses with Year-Round Employees

Corporate Houses with Year-Round Employees have employees who work two to three-week shifts and stay in the house when on shift, then another employee moves in for two-three weeks and lives in the house. Therefore, the room is always occupied.

Since there is always a person living in the house, they are counted as one (1.0) person. The local corporations were contacted to confirm the number of employees saying in the house at any given time.

Corporate Houses with Seasonal Employees

Corporate Houses with Seasonal Employees may have employees living in them from May to October to complete work during the warmer months or may have employees who cycle in and out during the warmer months. Either way, local corporations were contacted, and each room was counted as 0.5 of a person, since the house is only occupied 50% of the year.

Potential Housing

With the large number of previously vacant housing in Faro, many of the residential properties are being renovated and many will be ready for occupancy within the next 6 months. These property owners were contacted and asked how many units/rooms would be available within that six-month time period.

Because there is no way of knowing that all units/rooms would be completed and because some properties may be short-term rentals and not occupied all year, or occupied with tourists, each unit was counted at 0.5 of a person. It also must be noted each unit also has the potential become a family home with four or more permanent residents, or a year-round corporate house with three bedrooms and three employees residing in the unit at any given time.

This number is important to count because it shows Faro's growth, and that Faro will continue to grow. Because Potential Housing units are expected to be ready for occupancy in 2024, this census has been dated 2024, and effective from January 1, 2024.

Results

Chart 1 – Results

Type of Residents	Counted Occupancy	Methodology Applied	Counted Population	Percentage of Total Population
Permanent Residents	393	YBS	453	72%
Seasonal Residence	26	50%	13	2%
B&B / Guest House	46	25%	12	2%
Campsites	21	25%	5	1%
Corporate Houses with Year-Round Employees	88	100%	88	14%
Corporate Houses with Seasonal Employees	35	50%	18	3%
Sub-total			**589**	**94%**
Potential (houses ready for rental within 6 months)	75	50%	38	6%
Total			**627**	**100%**

These results show that the number of residents, used when calculating the population for the Town of Faro by Yukon Bureau of Statistics, is **understated**.

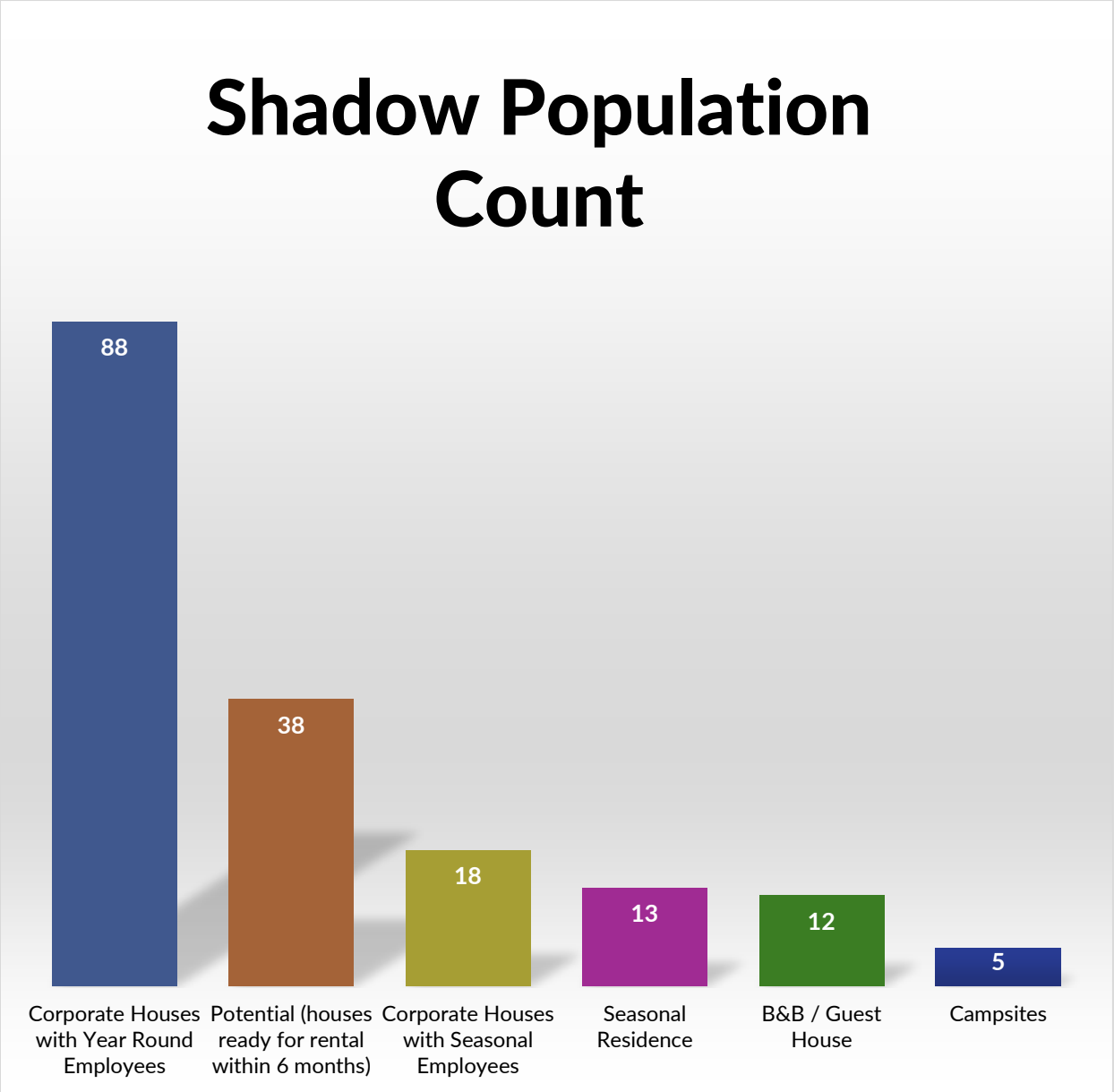
There is a Shadow Population of 136 people not included in the YBS population estimate. Note: Seasonal Residents (13), B&B / Guesthouse (12), Campsites (5), Corp Houses w Year-Round Employees (88), Corp Houses w Seasonal Employees (18) = 136 people

Yukon Bureau of Statistics estimates 453, but the shadow population of 136 should be included making the population **589**. (453 + 136 = 589). That's **30%** more than YBS estimates.

When the Potential Housing population of 38 more people are factored in, that further increases the total to 627 in 2024. That's **38%** more than YBS estimates.

Important Note:
When comparing the Third Quarter YBS population estimate for 2023, compared to the conservative administrative count completed by the Census Workers, there is an approximate difference of 60 people (453 YBS count versus 393 Admin count). This may be due to the residents who live outside Faro Town boundaries but maintain Faro addresses.

Chart 2 – Shadow Population Count



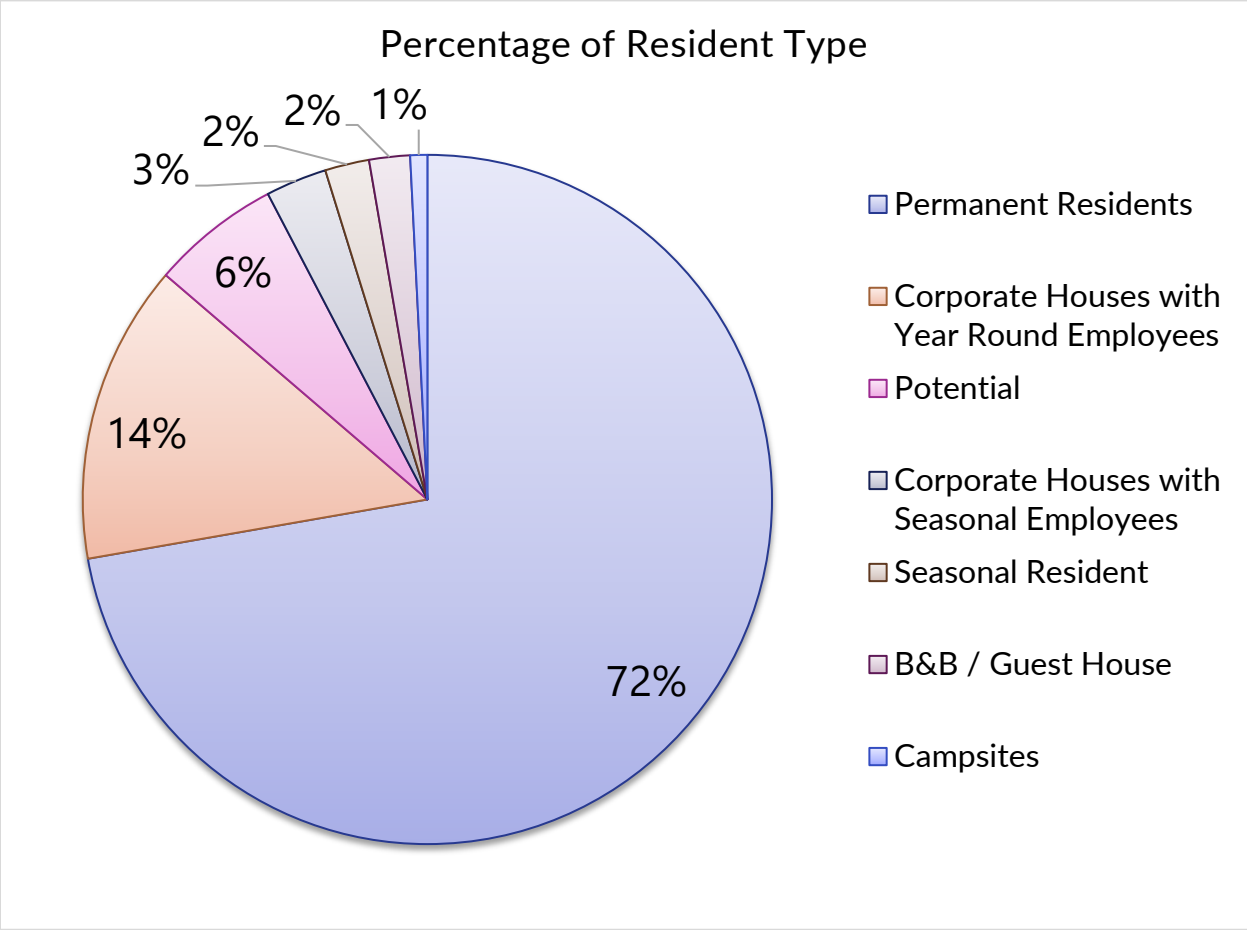
In 2024, Faro has an estimated Shadow Population of about 136 people, without counting the Potential Housing units expected to become available in mid-2024. By year end, those units would increase the Shadow Population count to **174 people**.

In 2025, with the current Potential Housing units completed and many being rented for the full year, that Shadow Population could increase from 174 to potentially 212, bringing Faro's total population to well over 660. That is **45% more** than the current population estimate of 453 by Yukon Bureau of Statistics.

Conclusion

This project was started with the belief that there were an additional 100 (+/-) residents living in the community at any given time. Neither Mayor, Council, nor Administration were expecting that the Shadow Population would make up 174 occupants of the community, or 28% of the population.

Chart 3 – Pie Chart showing Percentage of Resident Type



Permanent Residents

Only 72% of the current population of Faro consists of permanent residents.

Seasonal Residents

Seasonal Residents only account for a small 2% of the Shadow Population within Faro. These Summer Occupants do not cause a large disruption of the Town's resources.

Contractors - Corporate Houses, B&Bs, Guest Houses, and Campgrounds

Corporate Houses in Faro currently account for 106 occupants. This number does not include the contractors staying in B&Bs, Guesthouses, or sites at local campground. Including ALL contractor occupants within Faro, there are additional 136 persons who are accessing and using Faro's services and resources, yet Faro receives no grant funding from YG to offset this additional service expense. YG does, however, receive revenue from the construction and developments taking place OUTSIDE Faro's Town Boundaries.

Potential Housing

There are currently 75 units actively being renovated in Faro. Most of these units are three-bedroom duplexes.

- The Census Workers conservatively estimated those 75 units could have 50% occupancy in 2024 for a total of 38 units by year end. Using the Stats Canada factor of approximately 2.1 residents living in each unit in Faro, that would translate to 80 people (38 * 2.1 = 80) filling those units by 2025. Using the estimate of 589 (see page 6), plus 80 would equal 669. This is not unreasonable to prepare for this level of increase.

- To make the situation more complex, most of these units are owned by corporations who are interested in filling the units with their transient employees. If these corporate units ARE occupied in 2024, with 1 person per **bedroom** (3 persons per unit x 75 units), that could translate to approximately 225 additional residents within 6 months, for a total of 589 +225 = 814.

The Town also realizes that the 75 units that were counted in this Shadow Population count are not the only units actively being renovated.

There are more units that are currently being renovated but did not meet the 6-month completion date when the count was being administered in November 2023. As such, it is more likely that the Town will be looking at an average of 2-3 occupants in each unit, as per the averages from the 2021 Canadian Census, or an additional 150-225 residents. In other words, it is highly possible that the Town of Faro needs to prepare for a population upwards of 800 residents within the next 12 to 36 months.

Alberta Municipal Government Act

Section 604 of the Alberta *Municipal Government Act* provides authority to municipalities to complete their own census and for the Province to respect that information for official population count calculations (grants, etc.)

They recognize the temporary (shadow) population has an impact on the services delivered by a community and in reality, the community is supporting them. For this reason, the Alberta Government is prepared to factor that transient population into the grants and support structure, because that is the population that the community is in reality supporting.

Ministerial Regulations

604 The Minister may make regulations

(a) *defining population for the purposes of this Act;*

(b) *respecting the determination of the population of a municipality or other geographic area and establishing requirements for a municipality to conduct a census and provide information concerning population to the Minister;*

(c) *respecting the administration, operation and management of specialized municipalities;*

(d) *prescribing forms for the purposes of this Act;*

(e) *respecting the content or form of anything required to be done by a municipality under this Act.*

It is difficult for the Yukon Government to provide an accurate community population count (both permanent and non-permanent) for the Yukon communities, Faro questions whether it is time for the Yukon Government to amend the Yukon *Municipal Act* to impower Yukon communities to conduct their own community population counts.

Administrative Note

Town of Faro employees and contractors completed this report. While all these workers have a basic understanding of statistics, none are Statistical Analysts.

The Yukon Bureau of Statistics was asked to help with the methodology. Because this process was largely new to the Town of Faro, and the Yukon in general, the Yukon Bureau of Statistics was only able to provide limited support to the Town's request.

Committee Minutes

Wednesday 6th March, 2024
19:00

Meeting Type: Regular **Meeting:** # HAC 24-05
Facilitators: Pahdee Poolkasem, PDA
Attendees: Megan Gamble (Chair), Aaron Woroniuk, , Mike Ellis, Kayla Goodwin
Regrets: Rebecca Jansen
Meeting Called to order at 7:03

Minutes

Agenda Item: **Agenda Adoption** **Presenter:** Mike Ellis
Resolution: 24-05-01 **Seconder:** Megan Gamble

THAT the Agenda for Heritage Advisory Committee Meeting 24-05 has been adopted as presented.

Discussion: None.

Votes For: 3 Votes Against: 0 Abstained: 0 CARRIED

Agenda Item: Conflict of Interest
Resolution: n/a

Discussion: None.

Agenda Item: Committee of the Whole **Presenter:** Mike Ellis
Resolution: 24-05-02 **Seconder:** Aaron Woroniuk

THAT the Heritage Advisory Committee move into the Committee of the Whole.

Discussion: None
Votes For: 3 Votes Against: 0 Abstained: 0 CARRIED

Agenda Item: Delegations

Discussion:

Sylvia Frisch – DP # 24-005

- HAC suggested that the Design Guidelines be forwarded to the delegate

Agenda Item: Revert to Heritage Advisory Committee **Presenter:** Megan Gamble
Resolution: 24-05-03 **Seconder:** Mike Ellis

THAT the Committee of the Whole revert to the Heritage Advisory Committee.

Discussion: None.

Votes For: 3 Votes Against: 0 Abstained: 0 CARRIED

Agenda Item: Business Arising from Delegations

Discussion:

-

Agenda Item: Adoption of Meeting Minutes **Presenter:** Megan Gamble
Resolution: 24-05-04 **Seconder:** Aaron Woroniuk

THAT the Heritage Advisory Committee APPROVE the minutes from meeting #24-03 as presented.

Discussion: None.

Votes For: 3 Votes Against: 0 Abstained: 0 CARRIED

Agenda Item: Business Arising from the Minutes

None.

Agenda Item: Applications **Presenter:** Aaron Woroniuk
Resolution: 24-05-05 **Seconder:** Megan Gamble

THAT the Heritage Advisory Committee TABLE development permit #24-005.

Discussion:

- HAC requested for window and door schedules, dimensions of trims, and skirting and its material (corrugated metal or wood preferred)

Votes For: 3 Votes Against: 0 Abstained: 0 CARRIED

Agenda Item: New Business
Resolution: N/a

Discussion: None.

Agenda Item: Unfinished Business
Resolution: n/a

Discussion: None.

Agenda Item: Adjournment **Presenter:** Aaron Woroniuk
Resolution: 24-05-06 **Seconder:** Mike Ellis

That Heritage Advisory Committee meeting HAC 24-05 be adjourned at 7:18 on March 6th, 2024.

Votes For: 3 Votes Against: 0 Abstained: 0 CARRIED

Minutes accepted on: 20/03/24

Committee Minutes

Wednesday 6th March, 2024
19:00

Meeting Type: Regular **Meeting:** # HAC 24-06
Facilitators: Pahdee Poolkasem, PDA
Attendees: Megan Gamble (Chair), Aaron Woroniuk, Mike Ellis, Rebecca Jansen, Kayla Goodwin
Regrets:
Meeting Called to order at 7:00PM

Minutes

Agenda Item: **Agenda Adoption** **Presenter:** Mike Ellis
Resolution: 24-06-01 **Seconder:** Megan Gamble

THAT the Agenda for Heritage Advisory Committee Meeting 24-05 has been adopted as presented.

Discussion: None.

Votes For: 3 Votes Against: 0 Abstained: 0 CARRIED

Agenda Item: Conflict of Interest
Resolution: n/a

Discussion: None.

Agenda Item: Committee of the Whole **Presenter:** Mike Ellis
Resolution: 24-06-02 **Seconder:** Aaron Woroniuk

THAT the Heritage Advisory Committee move into the Committee of the Whole.

Discussion: None
Votes For: 3 Votes Against: 0 Abstained: 0 CARRIED

Agenda Item: Delegations

Discussion:
Lindsay Justin Baker – DP #22-089

- HAC inquired about the reasoning behind the asymmetrical nature of the new design
- The delegate stated that the asymmetry was in order to accommodate interior amenities such as additional closet space
- HAC remarked that complete asymmetry would be acceptable but not the current slight asymmetry
- HAC inquired about the mullions on the windows
- The delegate stated that they are faux double 1x1 square on the second floor and 2x1 on the first floor

Mary Ellen Read – DP #24-017

- HAC inquired about the elevation of the building in relation to the streetscape
- The delegate stated that the new development will be the same height as the nearby Denekar Zho building but with a cascaded frontage like the Eliza building in order to conceal its height
- The delegate stated that the siding of the development will be made of wood shiplap and that the trims will also be wooden
- The delegate stated that the left side door will be accordion style in order to be able to merge the indoor and outdoor spaces, however, this has not been finalized and wide double doors may be considered
- HAC remarked how the access ramp component of the development is acceptable, as they are very visible in the area

- The delegate stated that they have not decided on a name for the development

Agenda Item: Revert to Heritage Advisory Committee **Presenter:** Megan Gamble
Resolution: 24-06-03 **Seconder:** Mike Ellis

THAT the Committee of the Whole revert to the Heritage Advisory Committee.

Discussion: None.

Votes For: 3 Votes Against: 0 Abstained: 0 CARRIED

Agenda Item: Business Arising from Delegations

Discussion:

- None

Agenda Item: Adoption of Meeting Minutes **Presenter:** Megan Gamble
Resolution: 24-06-04 **Seconder:** Aaron Woroniuk

THAT the Heritage Advisory Committee APPROVE the minutes from meeting #24-005 as presented.

Discussion: None.

Votes For: 3 Votes Against: 0 Abstained: 0 CARRIED

Agenda Item: Business Arising from the Minutes

None.

Agenda Item: Applications **Presenter:** Aaron Woroniuk
Resolution: 24-06-05 **Seconder:** Megan Gamble

THAT the Heritage Advisory Committee TABLE development permit #22-089 amendment.

Discussion:

- HAC stated that they would prefer a more symmetrical front facade

Votes For: 3 Votes Against: Abstained: 0 CARRIED

Agenda Item: Applications **Presenter:** Mike Ellis
Resolution: 24-06-06 **Seconder:** Megan Gamble

THAT the Heritage Advisory Committee TABLE development permit #24-005.

Discussion:

- HAC requested for a window and door schedule,
- HAC stated that they would prefer a narrow window and gliding muntin
- HAC commented on how the exposed truss flush to the building is rarely seen in dawson
- HAC inquired whether the roof is corrugated tin

Votes For: 3 Votes Against: 0 Abstained: 0 CARRIED

Agenda Item: New Business
Resolution: N/a

Discussion: None.

Agenda Item: Applications **Presenter:** Aaron Woroniuk
Resolution: 24-06-07 **Seconder:** Mike Ellis

THAT the Heritage Advisory Committee TABLE development permit #24-017.

Discussion:
- HAC suggested that canvas be used as the material for awnings
- HAC requested for less utilitarian soffits and cornerboards
- HAC requested for a strong cornice

Votes For: 3 Votes Against: 0 Abstained: 0 CARRIED

Agenda Item: Unfinished Business
Resolution: n/a

Discussion: None.

Agenda Item: Adjournment **Presenter:** Aaron Woroniuk
Resolution: 24-06-08 **Seconder:** Mike Ellis

That Heritage Advisory Committee meeting HAC 24-06 be adjourned at 8:02 on March 20th, 2024.

Votes For: 3 Votes Against: 0 Abstained: 0 CARRIED

Minutes accepted on: 17/04/24

From: Patrik Pikalek
To: CAO Dawson
Cc: Municipal Clerk
Subject: Fw: waste diversion and management
Date: April 4, 2024 10:25:08 AM

Hi David,

This would be to add to the next meeting correspondence.

Thank you!

Patrik

From: Kim <meltonk@gmail.com>
Sent: April 4, 2024 10:19 AM
To: Bill Kendrick; Julia Spriggs; Alexander Somerville; Patrik Pikalek; Brennan Lister
Subject: waste diversion and management

Dear Mayor and councilors,

I'm sorry I was unable to attend the forum last night on waste management, and grateful to hear that it was positive and forward looking. I wanted to provide some input and resources. I think Dawson could be a leading municipality in waste management and diversion, and would be so grateful if our free store was once again a destination for tourists and a meeting ground for residents looking to repurpose and reuse; if the dump was a setting that reflects our collective values of respect for the land we live on and the resources we use; if the recycling depot was clean and organized and a site for art and education.

I used to work at the Mt Lorne Transfer Station and am still inspired by the way the site is maintained to encourage re-use and effective disposal of that which can no longer be re-used. My time there taught me the value of paid staff - all it takes is one or two folks dropping off things without taking the time to sort or dispose of them properly for the whole to become visually disorganised to the extent that others will follow suit. When there are adequate paid staff to maintain a minimum level of order, the majority of people are quick to follow signage and treat the place with care. This applies to reuse as well as recycling and all the various ' waste' categories.

I also lived near Whitehorse when a Japanese plastic-to-oil machine was piloted at P and M recycling and heated the building using waste plastics converted to heating oil for a winter. While funding was cut from the project, it demonstrated proof of concept; I recall hearing that

the units are made at various scales from tabletop to community to city. Similarly, the Yukon is home to the inventor of a machine to separate plastics from compost, and a glass foundry investigating using post-consumer glass to build bricks or other structural components.

All this to say that we don't have to go too far to find people, organisations and resources that could help Dawson become a leader in waste diversion and management. Please invest in people to do this work, and think creatively: funded artists' residences at the free store or recycling depot, using ' waste' wood and cardboard to heat buildings, repair cafes to help folks fix their broken appliances, youth interns to manage the freestore, break down electronics for recycling and improve signage and education about where materials come from and where they go.

I don't imagine these ideas are new to you, or that they weren't among those shared last night. I do want to add my voice to those who fully support you in moving this all forward in a good way.

Thanks kindly for your time,

Kim Melton
Dawson Resident

2024.04.09

Your file Votre référence

Our file Notre référence

Mayor and Council
City of Dawson
Box 308
Dawson City, YT
Y0B 1G0

Dear Chief and Council,

Re: 2024-2025 RCMP Annual Policing Priorities

It is that time of year again and I am reaching out to you to gather formal input with regards to the 2024-2025 Annual Policing Priorities for the Dawson City RCMP Detachment. I would appreciate input with regards to what areas and activities you would like your local RCMP Detachment to focus on in relation to policing in the Dawson City area.

Last year our focus areas that were determined by yourselves and the City of Dawson are as follows:

1. Police and Community Relations – Community Relations / Public Trust
2. Youth Engagement
3. Traffic Safety
4. Substance Abuse

The issues you would like us to focus on can remain the same or be changed in any way to address issues identified by the council. We will consider the issues that you identify, as well as any other stakeholders in the community, Yukon Territorial Government policing priorities and national policing concerns. Once all the feedback has been collected, a unique plan will be developed for Dawson City considering all stakeholder's input. This information is used to develop the Detachment's Annual Performance Plan for 2024-2025, in which we determine the areas that we concentrate our efforts and will measure how well we are working towards successfully addressing your priority issues for policing.

I will be pleased to be available to discuss the matter at any up coming council meeting at your leisure.

If you have any questions or concerns with regards to the above request, please do not hesitate to contact me directly.

Kindest Regards,

Sgt. Dave WALLACE
N. C. O. In Charge
Dawson City RCMP

Box 159
Dawson City, Yukon
Y0B 1G0

/am

RCMP·GRC
ROYAL CANADIAN MOUNTED POLICE • GENDARMERIE ROYALE DU CANADA

MONTHLY POLICING REPORT January, 2024

Dawson City RCMP Detachment "M" Division Yukon

The Dawson City RCMP Detachment responded to a total of 53 calls for service during the month of January, 2024.

OCCURENCES	January, 2024	Year to date 2024	January, 2023	Year to date 2023	Year Total 2023
Assaults (all categories)	3	3	6	6	46
Sexual Assault	1	1	0	0	7
Break and Enter	1	1	0	0	12
Thefts (all categories)	3	3	8	8	92
Drugs (all categories)	0	0	1	1	4
Cause a Disturbance	1	1	1	1	62
Mischief	7	7	5	5	111
Impaired Driving	0	0	0	0	23
Vehicle Collisions	4	4	7	7	67
Mental Health Act	0	0	5	5	49
Assistance to General Public	2	2	6	6	71
Search and Rescue	0	0	0	0	9 Land
Missing Persons	0	0	1	1	8
Wellbeing Checks	3	3	3	3	98
Check Stops (represents the actual number of check stops	0	0	0	0	5
Other Calls for Service	28	28	38	38	738
Total Calls for Service	53	53	81	81	1402
Criminal Code Charges / (CDSA)	No charges	No charges	4 Criminal Code	4 Criminal Code	61 Criminal Code
Liquor Act/MVA/CEMA Charges/Cannabis Act (Can Act)/Campground Act (Camp. Act)	1 Motor Vehicle Act	1 Motor Vehicle Act	1 MVAct	1 MVAct	40 MVA 1 Liquor Act

PLEASE NOTE: The statistic numbers in the report may change monthly as file scoring is added, deleted or changed. This occurs as investigations develops resulting in additional charges or changing the scoring on a file. Numbers as at/corrected to 2024.01.31

	January, 2024	Year to Date 2024 Total	January, 2023	Year Total 2023
Prisoners held locally	2	2	3	64
Prisoners remanded	1	1	0	2
Totals	3	3	3	66

Justice Reports	January, 2024	Year to Date 2024	January, 2023	Year Total 2023
Victim Services Referrals Offered	2	2	6	77
Youth Diversions	0	0	0	0
Adult Diversions	0	0	0	2
Restorative Justice Offered Total	0	0	0	3

Annual Performance Plan (A.P.P.'S) Community Priorities

Community approved priorities are:

(1) Substance Abuse
(2) Road Safety
(3) Youth Initiatives
(4) Attendance at THFN, City of Dawson and Community Events
(5) Restorative Justice

(1) Substance Abuse

- The RCMP continue to see a direct link between crimes against a person and alcohol/drugs. Most are fueled by substance abuse. Targets have been identified and constant checks on prolific offenders are being conducted. For instance, a Dawsonite was released in the community on a strict "Conditional Sentence Order" with conditions to abide by. The Dawson City members have created "Offender Management" occurrences to ensure that those conditions are

respected, as they suspected this individual's involvement into the local drug scene.
- Members continue to conduct bar walks and license premises checks of the Dawson City establishments.

(2) Road Safety

- The Dawson City RCMP members continue to make Road Safety a priority. Two drivers in January had their driving privileges revoked for 24 hours after providing a "WARN" sample into the Approved Screening Device. Members are frequently seen enforcing the speed limit in the school zone, and ensuring drivers abide by the rules of the road and Yukon Motor Vehicle Act.
- The importance of being visible and out on the road has been discussed and also a priority for the Dawson City members.
- There has been an increase of traffic collisions, most likely due to the constant change in road conditions and amount of snow/ice.

(3) Youth Initiatives

- Cst. Jeffery is in touch with RSS Principal to organize a presentation involving multiple emergency services units (Fire Dept, Police, EMS) which will include but not limited to: what is 911 and what is the non-emergency number. In addition to this, the Fire Chief is also going to present safety tips for the spring thaw coming up. Target audience is K-grade 7.
- Cst. Le Gresley and Cst. Tremblay continue coaching hockey (U7, U13/15/17) until the end of March.
- Cst. Premerl has been attending the weekly Badminton/Pickleball classes on Monday nights.
- Cpl. Penk and Sgt. Wallace are regularly seen at RSS for the breakfast club.

(4) Attendance at THFN, City of Dawson and Community Events

- Sgt. Wallace, Cst. Le Gresley and Cst. Jeffery attended TH Hall to help with Bingo.
- Cst. Le Gresley, Cst. Tremblay, Cst. Jeffery and Cpl. Penk partook in the "KHL Hockey Tournament" that was held from January 24th to January 26th here in Dawson City. Members also helped organized the tournament.

(5) Restorative Justice

- There are currently no on-going restorative justice initiative.

Kindest regards,

Cst. Chris LE GRESLEY

for

Sgt. David WALLACE
N. C. O. In Charge - RCMP
Box 159
Dawson City, Yukon
Y0B 1G0

/am

RCMP·GRC
ROYAL CANADIAN MOUNTED POLICE • GENDARMERIE ROYALE DU CANADA

MONTHLY POLICING REPORT February, 2024

Dawson City RCMP Detachment "M" Division Yukon

The Dawson City RCMP Detachment responded to a total of 67 calls for service during the month of February, 2024.

OCCURENCES	February, 2024	Year to date 2024	February, 2023	Year to date 2023	Year Total 2023
Assaults (all categories)	1	6	2	8	46
Sexual Assault	0	2	0	0	7
Break and Enter	0	1	0	0	12
Thefts (all categories)	2	5	2	10	92
Drugs (all categories)	0	0	0	1	4
Cause a Disturbance	0	1	1	2	62
Mischief	9	16	5	10	111
Impaired Driving	0	0	1	1	23
Vehicle Collisions	4	8	5	12	67
Mental Health Act	1	4	2	7	49
Assistance to General Public	2	4	7	13	71
Search and Rescue	0	0	1 Land	1 Land	9 Land
Missing Persons	1	0	0	1	8
Wellbeing Checks	7	10	5	8	98
Check Stops (represents the actual number of check stops	0	0	0	0	5
Other Calls for Service	40	58	33	66	738
Total Calls for Service	67	125	59	140	1402
Criminal Code Charges / (CDSA)	6 Criminal Code	6 Criminal Code	3 Criminal Code	10 Criminal Code	61 Criminal Code
Liquor Act/MVA/CEMA Charges/Cannabis Act (Can Act)/Campground Act (Camp. Act)	5 Motor Vehicle Act	5 Motor Vehicle Act	1 MVAct	1 MVAct	40 MVA 1 Liquor Act

PLEASE NOTE: The statistic numbers in the report may change monthly as file scoring is added, deleted or changed. This occurs as investigations develops resulting in additional charges or changing the scoring on a file. Numbers as at/corrected to 2024.02.29

	February, 2024	Year to Date 2024 Total	February, 2023	Year Total 2023
Prisoners held locally	3	5	3	64
Prisoners remanded	0	1	0	2
Totals	3	6	3	66

Justice Reports	February, 2024	Year to Date 2024	February, 2023	Year Total 2023
Victim Services Referrals Offered	5	8	5	77
Youth Diversions	0	0	0	0
Adult Diversions	0	0	0	2
Restorative Justice Offered Total	0	0	0	3

Annual Performance Plan (A.P.P.'S) Community Priorities

Community approved priorities are:

(1) Substance Abuse
(2) Road Safety
(3) Youth Initiatives
(4) Attendance at THFN, City of Dawson and Community Events
(5) Restorative Justice

(1) Substance Abuse

Slight increase of calls for service in February 2024 vs February 2023. It was noted that calls for service involving alcohol or drugs are stemming from a small group of individuals which are often associated to several occurrences within the month. The Dawson City RCMP continue to encourage the public to ask them rides home if required after bar close.

(2) Road Safety

Members have been increasing their presence on the road which resulted in more violation tickets being issued. An increase in "unregistered motor vehicles", "displaying expired plates" and "driving uninsured motor vehicles" has been noted. The Dawson City RCMP would like to remind the public to ensure that their personal and company vehicles are properly registered and insured prior to using them on a public road. With Spring coming around the corner, the melt and ice roads will result in more traffic collisions. It is important to have the above noted documents up to date.

(3) Youth Initiatives

Cst. Le Gresley continues to coach the U13/U15/U17 hockey team 3x per week.
Cst. Tremblay continues to coach the U7 hockey team 2x per week.
Cst. Jeffery has engaged all youth facilities in town to partake in the "name the puppy" contest which is an annual contest that helps picking the newest dog name for our "Police Dog Service" handlers. Furthermore, RSS staff has agreed to allow Cst. Jeffery to present to their kindergarten class his "how to use 911" presentation.
Cst. Premerl partakes in the weekly badminton at RSS.
Sgt. Wallace and Cpl. Penk are involved with the breakfast program at RSS.

(4) Attendance at THFN, City of Dawson and Community Events

Members attempt to get involved when possible in all community events. They attended the women's hockey jamboree. Sgt. Wallace attended the chief and council meeting. Members are always willing to partake in upcoming events. The baby mammoth event is scheduled for March 1st with both Cpl. Penk and Cst. Jeffery partaking in the event.

(5) Restorative Justice

There are currently no restorative justice initiatives on-going.

Kindest regards,

Cst. Chris LE GRESLEY

for

Sgt. David WALLACE
N. C. O. In Charge - RCMP
Box 159
Dawson City, Yukon
Y0B 1G0

/am

RCMP·GRC
ROYAL CANADIAN MOUNTED POLICE • GENDARMERIE ROYALE DU CANADA

MONTHLY POLICING REPORT March, 2024

Dawson City RCMP Detachment "M" Division Yukon

The Dawson City RCMP Detachment responded to a total of 86 calls for service during the month of March, 2024.

OCCURENCES	March, 2024	Year to date 2024	March, 2023	Year to date 2023	Year Total 2023
Assaults (all categories)	2	6	3	8	46
Sexual Assault	0	2	0	0	7
Break and Enter	2	1	1	0	12
Thefts (all categories)	1	5	10	10	92
Drugs (all categories)	0	0	0	1	4
Cause a Disturbance	1	1	4	2	62
Mischief	6	16	4	10	111
Impaired Driving	3	0	0	1	23
Vehicle Collisions	3	8	5	12	67
Mental Health Act	2	4	6	7	49
Assistance to General Public	2	4	1	13	71
Search and Rescue	1 Land	0	0	1 Land	9 Land
Missing Persons	0	0	1	1	8
Wellbeing Checks	10	10	5	8	98
Check Stops (represents the actual number of check stops	0	0	0	0	5
Other Calls for Service	53	154	57	163	738
Total Calls for Service	86	211	97	237	1402
Criminal Code Charges / (CDSA)	8 CC	14 Criminal Code	2 Criminal Code	12 Criminal Code	61 Criminal Code
Liquor Act/MVA/CEMA Charges/Cannabis Act (Can Act)/Campground Act (Camp. Act)	5 Motor Vehicle Act	10 Motor Vehicle Act	4 MVA	5 MVAct	40 MVA 1 Liquor Act

PLEASE NOTE: The statistic numbers in the report may change monthly as file scoring is added, deleted or changed. This occurs as investigations develops resulting in additional charges or changing the scoring on a file. Numbers as at/corrected to 2024.03.31

	March, 2024	Year to Date 2024 Total	March, 2023	Year Total 2023
Prisoners held locally	4	10	1	64
Prisoners remanded	1	1	0	2
Totals	5	11	1	66

Justice Reports	March, 2024	Year to Date 2024	March, 2023	Year Total 2023
Victim Services Referrals Offered	8	17	3	77
Youth Diversions	0	0	0	0
Adult Diversions	0	0	0	2
Restorative Justice Offered Total	0	0	0	3

Annual Performance Plan (A.P.P.'S) Community Priorities

Community approved priorities are:

(1) Substance Abuse
(2) Road Safety
(3) Youth Initiatives
(4) Attendance at THFN, City of Dawson and Community Events
(5) Restorative Justice

(1) Substance Abuse

The Dawson City RCMP recognize the serious impact substance abuse has on individuals and our community. Alongside enforcement efforts, we prioritize prevention, education and rehabilitation. There has been a slight increase in persons crime. There is a direct correlation between substance abuse and that specific type of crime. The Dawson City RCMP continue to monitor the identified prolific offenders by conducting daily curfew and conditions compliance checks in an attempt to prevent further crimes.

Additionally, a warrant for arrest has been granted against a female who has been actively evading police apprehension. To date, she has not been located and continuous efforts to locate her whereabouts are made by all members.

Lastly, there has been a lot of media attention surrounding the Supreme Court trial held in town during March. The RCMP would like to thank everyone for remaining peaceful and respectful throughout the trial.

(2) Road Safety

Two motorists were arrested and charged with operation of a conveyance while impaired by alcohol. The Dawson City RCMP are persistent in their efforts to remove impaired drivers from the road. Furthermore, regular traffic stops are made to ensure that drivers are properly licensed, and have proper insurance coverage on their motor vehicle. Visibility is a key component to prevent drivers from committing traffic offenses.

(3) Youth Initiatives

Cst. Jeffery presented his usage of 911 presentation to the RSS students.

(4) Attendance at THFN, City of Dawson and Community Events

Sgt. Wallace, Cpl. Penk, Cst. Le Gresley and Cst. Jeffery attended THFN for visits. Sgt. Wallace and Cpl. Penk continue to attend monthly justice meetings and ensures that THFN needs are met and heard.

Cst. Le Gresley and Cst. Tremblay attended the "Thaw-di-Gras" festivities at Minto park and did a radar "operation" for the participants of the sledding compition.

Cst. Jeffery partook in the "Percy De Wolfe Memorial Mail Run" by handing off the mail to the post master in Red Serge

.
Cst. Chantelle Weedmark arrived in Dawson City as our newest member. She was introduced at various businesses/community gatherings by Sgt. Wallace.

(5) Restorative Justice

There are currently no restorative justice initiative.

Kindest regards,

Cst. Chris LE GRESLEY

for

Sgt. David WALLACE
N. C. O. In Charge - RCMP
Box 159
Dawson City, Yukon
Y0B 1G0

/am

From: kim biernaskie <kimbiernaskie@gmail.com>
Sent: April 14, 2024 1:37 PM
To: CAO Dawson; Julia Spriggs; Alexander Somerville; Brennan Lister; Patrik Pikalek
Cc: Bill Kendrick; uffish@northwestel.net
Subject: Concerns Regarding Agenda Item Targeting Mayor's Septic System

Dear David Henderson and Council Members,

I am writing to express my deep concern regarding the recently published agenda item that appears to target the Mayor's septic system, which has been on city property since he purchased it. Many residents within our community also have septic systems, belongings, etc encroaching on city property that requires easements.

My primary concern is the apparent selective targeting of the elected Mayor, especially at this juncture. In a time when our city faces significant challenges such as floods, forest fires, severe housing shortage, the building of a new community center and developing waste management plan. It is disheartening to witness valuable time and resources being allocated towards what appears to be a punitive move towards the Mayor.

I urge the council to reconsider its priorities and focus on addressing pressing municipal issues that affect the entire community. Initiatives such as developing a comprehensive flood mitigation plan, enhancing forest fire preparedness, implementing an effective waste management strategy, and establishing a robust correspondence policy are of paramount importance and demand our immediate attention.

I seek clarity on who is directing city staff regarding this agenda item for transparency and accountability. Additionally, I am deeply concerned about the potential taxpayer money spent on legal proceedings. It's crucial to prioritize community benefit over political pursuits. Furthermore, if similar actions are planned against other residents with comparable property issues, it raises questions about fairness and consistency in our governance.

In conclusion, I implore the council to refocus its efforts on addressing substantive municipal issues and refrain from engaging in what appears to be politically motivated actions against the Mayor. The reputation and effectiveness of our local government are at stake, and it is imperative that we uphold the trust and confidence of the residents we serve.

Thank you for your attention to this matter. I look forward to your response and a constructive dialogue on how we can best serve the interests of our community members.

Sincerely,

Kim Biernaskie

Prospector Road Inhabitants 1073-1, 1073-2, 1073-3 & 1073-4
Dawson City, Yukon
Y0B 1G0

April 25, 2024

Mayor & Council
Box 308
Dawson City, Yukon
Y0B 1G0

RE: Subdivision Application for Lots 1073-1, 1073-2, 1073-3 & 1073-4

We have been trying to re-subdivide our perspective lots in order to come into compliance with Dawson City's by-laws, we are over four years into the process thus far. The original survey pins were buried when the lots were levelled and covered with white Chanel gravel. This in turned caused a host of issues when dwellings were being situated as it turns out they were not on the prospective lots.

Our previous application was denied, please see denial letter attached.

Since then,
1. The bus and RV has been removed.
2. The noncompliant set back has been remedied through a permitted move
3. The dwelling with a noncompliant minimum floor area on Lot 1073-4, has not been rectified as it is currently being purchased by another party.
4. Environmental Health permits have been submitted for all of the above lots.

Lot 1073-4 is currently being purchased by Shelley Brown. She has been made aware of the square footage issue and is not in the position to build an addition at this present time. As the subdivision would effect her property boundaries. Having the subdivision in place may assist her in the planning process so that she can adhere to the proper set backs.

We would like Mayor & Council and the Dawson City Planning department grant permission of our subdivision application with specified conditions. As set out in the City Bylaws section 4.4 Decision Making 1. III.

Thank you for your time and consideration of this complicated situation that we are attempting to rectify.

Sincerely

Simon Vincent | Michel Vincent | Kim Bouzane | Shelley Brown

THE CITY OF DAWSON

P.O BOX 308, DAWSON CITY, YUKON Y0B 1G0
PH: (867) 993-7400, FAX: (867) 993-7434

March 10, 2022

Michel Vincent, Simon Vincent, and Kim Bouzane
Box 548
Dawson City, YT
Y0B 1G0

Re: NOTICE OF DENIED SUBDIVISION APPLICATION #20-096

Dear Michel, Simon, and Kim,

I am writing to inform you of Council's decision regarding your request to adjust the boundary on Lots 1073-1, 1073-2, 1073-3, 1073-4, Quad 116B/03, North Klondike Highway.

At Council Meeting #C22-05 held on March 9, 2022, Council resolved to:

1. Not grant subdivision authority to adjust the boundaries of Lots 1073-1, 1073-2, 1073-3 and 1073-4 Quad 116B/3 on account of compliance issues, as per the Zoning Bylaw.

As per Council's resolution, Subdivision Application #20-096 has been denied on account of the following non-compliance:

- Two mobile homes on Lot 1073-3 are being used as garden suites; however, are not permitted as per S.11.3.1 and S.8.8.3 of the Zoning Bylaw, and do not meet the minimum floor area requirement of garden suites as per S.8.8.7.
- The rear setback of both the bus (a non-compliant use) and the principal dwelling on Lot 1073-3 are non-compliant, as they are both less than 15ft (Table 11-3 of the Zoning Bylaw).
- The main dwelling on Lot 1073-4 does not meet the minimum floor area requirement of 900ft^2 (Table 11-3 of the Zoning Bylaw), as it is only 648 ft^2.
- Two dwelling units on Lot 1073-3 and one dwelling unit on Lot 1073-2 do not have Environmental Health permits as required by S.4.8 of the Zoning Bylaw.

As per S.3.18 of the Subdivision Control Bylaw and S.321 of the Municipal Act, where an application for subdivision is refused, no subsequent unaltered application for approval of a proposed subdivision of land shall be made by the same or another person within six (6) months of the date of the refusal by the approving authority.

Therefore, should you wish to resubmit the application for a boundary adjustment on Lots 1073-1, 1073-2, 1073-3, and 1073-4, please ensure that the non-compliance listed above is remedied bringing each lot into compliance; otherwise, the application would be considered 'unaltered'. Remedies to bring the lots into compliance include:

- The noncompliant dwelling structures (bus and RV) be removed from the properties.
- The noncompliant setbacks be remedied through permitted building moves.
- The dwelling with a noncompliant minimum floor area on lot 1073-4 be brought into compliance.
- The applicant submits Environmental Health sewage disposal system permits for each structure that is plumbed and/or used as a residence, for each lot.

THE CITY OF DAWSON

P.O BOX 308, DAWSON CITY, YUKON Y0B 1G0

PH: (867) 993-7400, FAX: (867) 993-7434

Should you have any further questions, please feel free to contact me using the information listed below.

Sincerely,

Stephani McPhee
Acting Community Development and Planning Officer
Box 308, Dawson City YT Y0B1G0
cdo@cityofdawson.ca
867-993-7400 ext. 438

Kendrick Property and Licences of Occupation ("LOO")

2024.05.09 Thursday

It is the absolute duty of the Town Council of the City of Dawson ("**CoD**") not only to be fair, but must be seen to be fair to anyone who presents themselves before Council.

After reviewing the documents including the LOO's within the agenda for Committee of the Whole meeting CW24-04 held on Tuesday, May 7, 2024 ("**CoW**"), I find there are errors, omissions and unfairness, not only to those taxpayers who OWN their vacant land, but perhaps even to Kendrick.

Unfairness

1 Since Kendrick purchased his property in 2009 (according to his delegation submission at the Council meeting 24-06, March 19, 2024), he has used taxpayer land for his own purpose without paying anything for that use.

The Licence of Occupation titled "***Licence of Occupation: South 25 ft of Lot 4, Block G, Government Addition***" ("**LOO 117**") at page 117 of the **CoW** (upon signing by the parties) grants Kendrick lawful use of that VACANT taxpayer land for $1.00 annually. Council recently passed the 2024 Tax Levy Bylaw which charges a taxpayer for the use of their VACANT residential land $1,720 for 2024. I find that exceedingly unfair. How would the general public view this?

By the way - is the $1,720 based on a 50' x 100' standard sized lot (i.e. $0.344 / ft^2)? If that is the case, should the tax for a 50' x 90' vacant residential lot be $1,548 and $1,032 for a 50' x 60' vacant residential lot? Where is the fairness?

2 **LOO 117** only takes into account the area of the deck ***adjacent to the South 25 ft of lot 4, Block G, Government Addition.*** Is Council granting Kendrick permission to keep the portion of his deck adjacent to northwest part of lot 3 with no compensation? How is that fair to the taxpayers of **CoD**? How is that fair to Kendrick – he only has to demolish the north section of his deck? How would this demolition look in terms of maintaining the historic nature of this house? Is there any fairness in that?

3 It seems to be unfair to the taxpayers of **CoD** and Kendrick that the LOO's have errors and omissions.

Error(s)

1. **LOO 117** title refers to the South 25 ft of lot 4. How on earth can Council approve an LOO for the 25 feet when Kendrick owns the south 12.5 feet of that lot? That is an error and would be found so if the issue were taken to court.

   LOO 117 is

   IN RESPECT OF:

   The east half portion of the road right of way adjacent to the south 25 ft of Lot 4, Block G, Government Addition

LOO 117 refers to something that is entirely different from its title. A court would likely find that confusing.

2. The title of the Licence of Occupation at page 111 ("**LOO 111**") of the same **CoW** is: ***Licence of Occupation: South 25 ft of Lot 4, Block G, Government Addition***.
   So, which LOO is which?

   LOO 111 is

IN RESPECT OF:
The east half portion of the road right of way adjacent to the south 25 ft of Lot 4, Block G, Government Addition

3. The "NOT PERFECTLY TO SCALE" plan at page 115 shows the approximate location of the Septic tank and the approximate location of the Septic field. Why is the Septic Field not included in **LOO 111**? Is Council granting permission for this use on taxpayer land with no compensation for that use?

4. In my view, there should be a box surrounding the areas for the LOO's and described by the use of UTM coordinates. That way the areas are defined correctly.

5. Is it an error to omit the following in **LOO 117**:
   a. Lot 5, Block G?
   b. That portion of the house that lies within the north part of lot 4, Block G?
   c. That portion of the house that lies within the east side of Third Avenue adjacent to lots 3 and 4, Block G?
   d. That portion of the deck that lies within the east side of Third Avenue adjacent to lot 3, Block G?

I implore Council to call a meeting presently and ***stop the instructions*** to Administration to continue as directed with the subject property until such time that any errors or omissions are cleaned up and the LOO's better written.

Best regards,

Stephen Johnson, P.Eng.

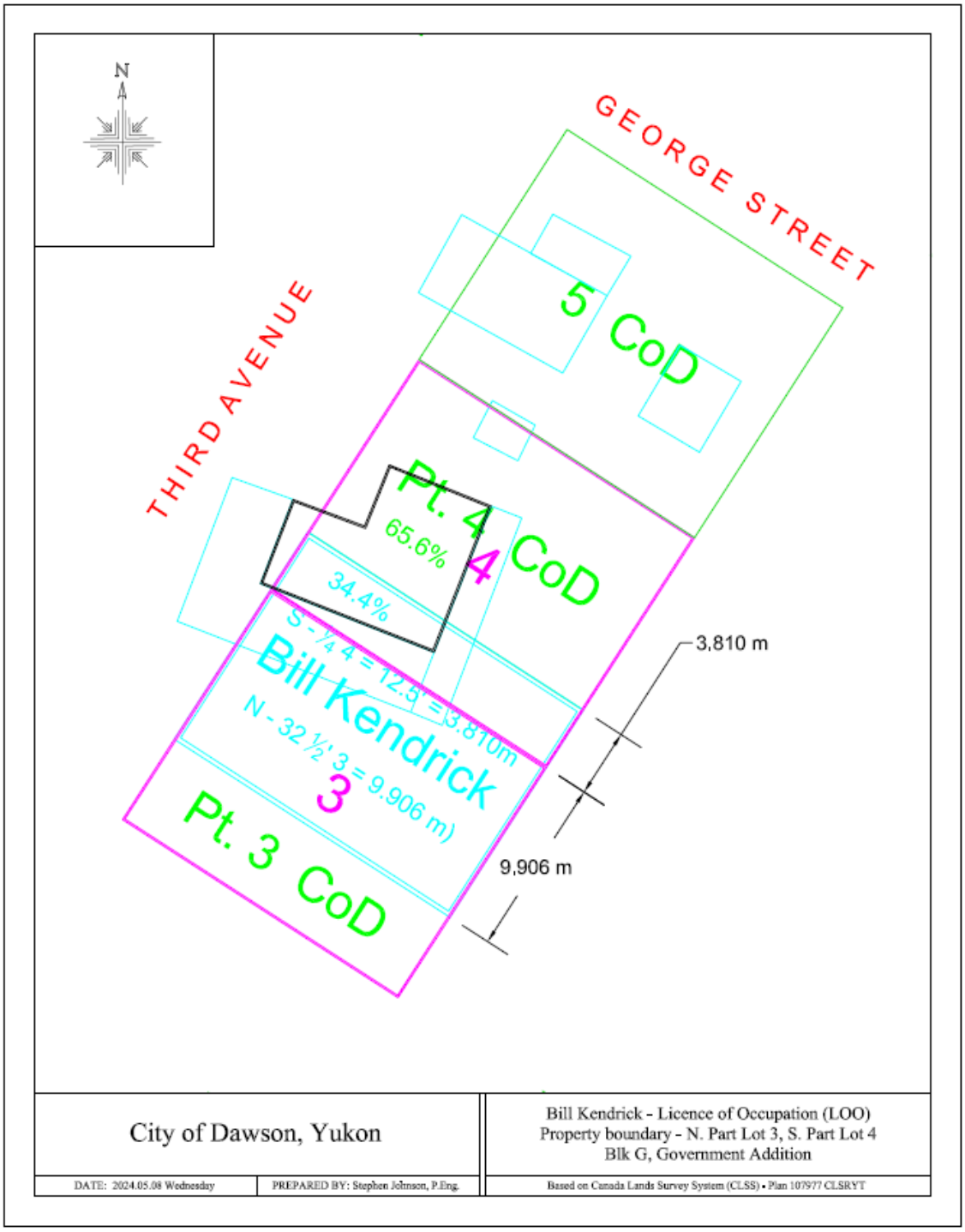
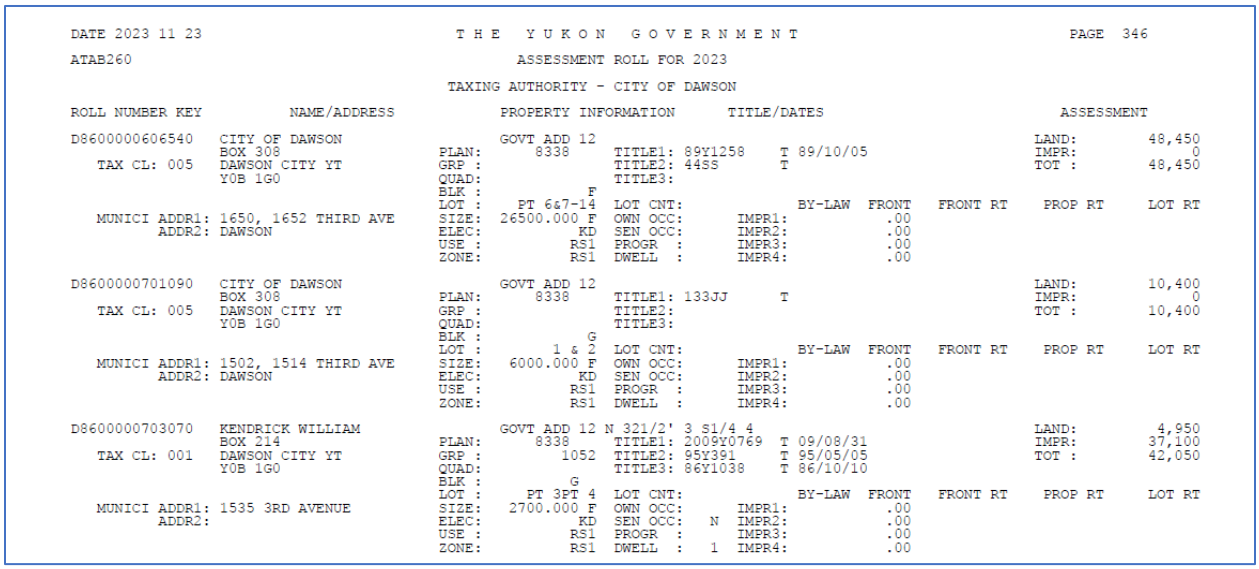


Figure 1: Kendrick Property Boundary



DATE 2023 11 23 — THE YUKON GOVERNMENT — PAGE 346

ATAB260 — ASSESSMENT ROLL FOR 2023

TAXING AUTHORITY - CITY OF DAWSON

ROLL NUMBER KEY	NAME/ADDRESS	PROPERTY INFORMATION	TITLE/DATES	ASSESSMENT
D8600000606540	CITY OF DAWSON BOX 308 TAX CL: 005 DAWSON CITY YT Y0B 1G0 MUNICI ADDR1: 1650, 1652 THIRD AVE ADDR2: DAWSON	GOVT ADD 12 PLAN: 8338 GRP : QUAD: BLK : F LOT : PT 6&7-14 SIZE: 26500.000 F ELEC: KD USE : RS1 ZONE: RS1	TITLE1: 89Y1258 T 89/10/05 TITLE2: 44SS T TITLE3: LOT CNT: BY-LAW FRONT FRONT RT PROP RT LOT RT OWN OCC: IMPR1: .00 SEN OCC: IMPR2: .00 PROGR : IMPR3: .00 DWELL : IMPR4: .00	LAND: 48,450 IMPR: 0 TOT : 48,450
D8600000701090	CITY OF DAWSON BOX 308 TAX CL: 005 DAWSON CITY YT Y0B 1G0 MUNICI ADDR1: 1502, 1514 THIRD AVE ADDR2: DAWSON	GOVT ADD 12 PLAN: 8338 GRP : QUAD: BLK : G LOT : 1 & 2 SIZE: 6000.000 F ELEC: KD USE : RS1 ZONE: RS1	TITLE1: 133JJ T TITLE2: TITLE3: LOT CNT: BY-LAW FRONT FRONT RT PROP RT LOT RT OWN OCC: IMPR1: .00 SEN OCC: IMPR2: .00 PROGR : IMPR3: .00 DWELL : IMPR4: .00	LAND: 10,400 IMPR: 0 TOT : 10,400
D8600000703070	KENDRICK WILLIAM BOX 214 TAX CL: 001 DAWSON CITY YT Y0B 1G0 MUNICI ADDR1: 1535 3RD AVENUE ADDR2:	GOVT ADD 12 N 321/2' 3 S1/4 4 PLAN: 8338 GRP : 1052 QUAD: BLK : G LOT : PT 3PT 4 SIZE: 2700.000 F ELEC: KD USE : RS1 ZONE: RS1	TITLE1: 2009Y0769 T 09/08/31 TITLE2: 95Y391 T 95/05/05 TITLE3: 86Y1038 T 86/10/10 LOT CNT: BY-LAW FRONT FRONT RT PROP RT LOT RT OWN OCC: IMPR1: .00 SEN OCC: N IMPR2: .00 PROGR : IMPR3: .00 DWELL : 1 IMPR4: .00	LAND: 4,950 IMPR: 37,100 TOT : 42,050

Figure 2: Assessment Roll for 2023

Notes:

1. Anything in the above map (Figure 1) coloured in cyan is, apparently, the property of Bill Kendrick.
2. The black polygon shown in lot 4 on the map is the outline of Kendrick's house and is taken from the legal survey (Canada Lands Survey System (CLSS) Plan 107977 CLSRYT).
3. The magenta-coloured rectangles represent the totality of lots 3 and 4, Block G, Government Addition.
4. The description of Kendrick's property boundary is given in Figure 2 above (the last entry on the page).