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TECHNICAL MEMORANDUM

Issue Date:	August 3, 2026	**Reference/Project No.:**	21011656.01
To:	Ben Campbell	**Previous Issue Date:**	2026-07-28
From:	Kienna Baker, P.Eng.		
Client:	Government of Yukon, Land Development Branch		
Project Name:	Lot 77 Mount Sima Subdivision Grading Plan		
Subject:	Design Criteria for Lot 77 Grading Plan		

1 INTRODUCTION

Associated Engineering (B.C.) Ltd. (Associated) was retained by the Government of Yukon Land Development Branch (YG-LDB) to undertake the conceptual grading for Lot 77, on McFadden Way in the Mount Sima Industrial Subdivision, Figure 1-1. The purpose of this memorandum is to define the grading requirements for the future purchaser of Lot 77 on McFadden Way to support light industrial use.



Figure 1-1 Lot 77 Project Site Location

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2 BACKGROUND INFORMATION

The following background information was collected and reviewed to assess the Lot 77 grading.

- City of Whitehorse Official Community Plan (OCP) 2040 (City of Whitehorse, Revised 2025)
- City of Whitehorse Zoning Bylaw 2025-37 (City of Whitehorse, Adopted May 2026)
- City of Whitehorse Commercial and Industrial Land Study (Groundswell Planning, 2020)
- City of Whitehorse Servicing Standards Manual (SSM) (Latest Edition)
- Government of Yukon GeoYukon Website
- Natural Resources Canada (NRCAN) Canada Lands Survey System (CLSS) Website
- Lot 55 Mount Sima Industrial Subdivision Preliminary Geotechnical Assessment, Whitehorse, YT (Golder Associates Ltd., 2022)
- Lot 77 Drainage Plan (CAP Engineering, 2024)

A drainage plan was previously produced by CAP Engineering in 2024 with swales which resulted in two drainage easements. One drainage easement was proposed along the north property line; the second drainage easement was proposed along the west property line (adjacent to Lot 20). YG-LDB and the City of Whitehorse (City) has indicated they would prefer a grading plan that does not required the maintenance of a drainage easement by the adjacent property owner, Lot 20. As a result, Associated was tasked with developing a grading plan that kept all grading and drainage improvements within Lot 77, and would be the responsibility of the future purchaser of Lot 77.

3 EXISTING CONDITIONS

Prior to 2023, Lots 77, 78, 79, and the Road were collectively registered as a single parcel, Lot 55. The 2022 geotechnical assessment report, *Lot 55 Mount Sima Industrial Subdivision, Preliminary Geotechnical Assessment, Whitehorse, YT*, prepared by Golder Associates Ltd. (Golder), evaluated the area in its entirety. Site observations by Golder noted that the property consisted of densely vegetated forest, surface ground cover, inferred bedrock outcrops and boulders, and a prominent deep ravine.

In 2023, Lot 55 was resurveyed and subdivided into Lots 77, 78, 79 and the Road parcel. The deep ravine is now located entirely within Lot 78 and has been identified by the City as a green space that is not intended for development. Lot 79 serves as a buffer between Lots 77 and 78 and the Alaska Highway right-of-way, and the north property boundary of the Road parcel was adjusted as part of the subdivision.

The City of Whitehorse Zoning Bylaw 2025-37 (adopted May 2026) designates Lot 77 as Industrial – Light (ILT). The bylaw states that the purpose of the ILT zone is to accommodate a mix of commercial and industrial uses, including manufacturing, processing, assembly, distribution, service, and repair activities, which may involve outdoor operations or require outdoor storage.

The preliminary geotechnical assessment conducted by Golder in 2022 indicates that, based on the surficial geological mapping, the site is situated within terrain composed of mixed fragments, silts, and sands. During a site visit in

September 2022, Golder observed that the site consisted of silty sand and gravel containing cobbles and boulders, along with densely vegetated areas and a general west-to-east slope trending from McFadden Way toward the Alaska Highway. Based on the 2019 LiDAR survey, Lot 20 was confirmed to drain onto Lot 77 before discharging toward the buffer area on Lot 79.

Associated conducted a subsequent site visit in May 2026 and noted old power poles remained on Lot 77, the overhead lines have been relocated underground. According to the Natural Resources Canada (NRCAN) Canada Lands Survey System (CLSS), an easement for underground Northwestel utilities exists on Lot 77. The easement has been approved but has not yet been registered by the owner. Associated obtained the easement plan and incorporated it into the grading plan drawings for reference. In June 2026, YG-LDB advised that the remaining power poles and site grubbing have been removed.

4 LOT GRADING REQUIREMENTS BY FUTURE PURCHASER

4.1 Preliminary Grading

Based on the preliminary geotechnical assessment, the lot should be fully cleared within the proposed development area. Clearing and stripping will be required to remove unsuitable materials, including topsoil, organics, debris, and boulders, and to facilitate site grading and placement of engineered fill where necessary. Retaining existing trees within areas intended for building, access roads, or grading is not recommended, as it may interfere with the removal of unsuitable materials and construction of the required building pads. Trees outside the development footprint may be retained, subject to the final site layout and grading design.

The preliminary grading plan, included as **Appendix A** to this technical memo, incorporates a berm along the west property line to prevent surface runoff from Lot 20 from impacting Lot 77. To achieve a relatively uniform slope across the site consistent with property boundaries, approximately 3,500 m^3 of additional fill will be required. Where the placement of fill results in steeper slopes, erosion protection measures, such as riprap and/or topsoil and seed, shall be implemented to minimize erosion. Otherwise, retaining walls may be required. The proposed berm may consist of compacted pit run fill, with geotextile and riprap installed on one slope for erosion protection and topsoil and seed applied to the opposite slope for revegetation. An 8 m wide driveway access, including a culvert, is proposed. The purchaser shall confirm the exact locations of existing light standards, power poles and underground shallow utilities through utility locates and survey prior to finalizing the driveway access location. The driveway design must maintain drainage continuity along McFadden Way by conveying flow to the adjacent Road parcel. The grading approach shown on the preliminary plan is conceptual and should be further refined through the development of a detailed final grading plan as part of the permitting process.

The purchaser will be required to obtain a development permit from the City of Whitehorse and incorporate the improvements outlined in this memo, including the berm and driveway access. A final grading plan must also be prepared to ensure that drainage from Lot 77 does not adversely impact adjacent Lot 20. Based on discussions with the City of Whitehorse, site drainage may be directed toward the Road parcel (north), Lot 79 buffer (east), and/or Lot 78 (south). The purchaser must retain a qualified engineer and surveyor to confirm the final grading, driveway access and related design tasks ensure it is designed appropriately for the anticipated development needs.

4.2 Final Grading

As the purchaser and the proposed site development details, including building layout and access, have not yet been established, Associated is unable to prepare a final grading plan at this time. The site should be graded to a minimum slope of 2% and directed away from any future structures. Surface runoff is to be conveyed toward the Road parcel, Lot 78, and Lot 79.

The berm constructed by the purchaser of Lot 77 will be the responsibility of that purchaser to maintain. Should additional grading be required on Lot 20 to mitigate ponding on that property, it will be the responsibility of the Lot 20 owner to complete such work.

5 OPINION OF PROBABLE COST

A Class D (±40%) opinion of probable cost has been developed for the works associated with Lot 77 and presented in Appendix A. The opinion of probable includes improvements at the McFadden Way cul-de-sac to facilitate driveway access, as well as costs for berm construction, clearing, grubbing, stripping, and general site filling.

It should be noted that the opinion of probable cost excludes imported fill required to establish level building areas, as the ultimate site development plans remains undefined. The purchaser should be aware that additional fill, beyond the volume or type of fill included in the estimate, will may be necessary to achieve final site grading suitable for building construction. Refer to Table 5-1 for the opinion of probable cost.

Table 5-1 Class D Opinion of Probable Cost

Siteworks	Quantity	Unit of Measure	Unit Price	Extended Total Price
Clearing	0.65	Ha	$35,000	$22,750
Grubbing, Stripping, and Disposal	0.65	Ha	$25,000	$16,250
Berm Installation c/w Geotextile, Rip Rap, Topsoil & Hydroseed	120	m^3	$70	$8,400
400 mm Culvert c/w Rip Rap End Treatment - Driveway	15	lm	$400	$6,000
Pit Run Granular Sub-base - Driveway	70	m^3	$45	$3,150
20 mm Crushed Gravel Base - Driveway	130	m^2	$25	$3,250

Siteworks	Quantity	Unit of Measure	Unit Price	Extended Total Price
Lot Grading Import	3,500	m^3	$20	$70,000
			Subtotal	$129,800
			Contingency (40%)	$51,920
			Total	$181,720

Notes:

1. *Costs are presented in 2026 dollars and do not include construction inspection or geotechnical testing.*
2. *It is important to note that actual pricing is expected to vary from our opinions of probable cost. There is some level of uncertainty in pricing due to the location of the work, tariffs, and timing of acquiring material and/or labour, and therefore, actual pricing could be higher or lower.*
3. *This opinion of probable cost does not include other engineered fill for building pads, as plan and configuration of development is unknown.*

6 SUMMARY

Lot 77 on McFadden Way, within the Mount Sima Subdivision, is characterized by a west-to-east sloping topography, dense forest vegetation, and areas of exposed bedrock with scattered boulders. The site will require clearing, stripping, and grubbing to remove all organic materials. Imported fill will be necessary to raise the site for building construction and to address low-lying areas prone to ponding. A berm will be required, at minimum, to direct surface runoff from Lot 20 away from Lot 77. In addition, a raised driveway with a culvert will be needed to maintain drainage conveyance from McFadden Way to the adjacent road parcel.

7 CLOSURE

This memo was prepared for Government of Yukon Department of Community Services on behalf of Associated Engineering (B.C.) Ltd. and presents the design of grading for Lot 77, McFadden Way in the Mount Sima Industrial Subdivision. The services provided by Associated Engineering (B.C.) Ltd. in the preparation of this memo were conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions. No other warranty expressed or implied is made.

Respectfully submitted,

Prepared by:



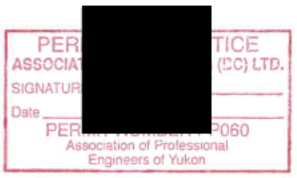
2026-08-03

Kienna Baker, P.Eng.
Civil Engineer

KB/SB

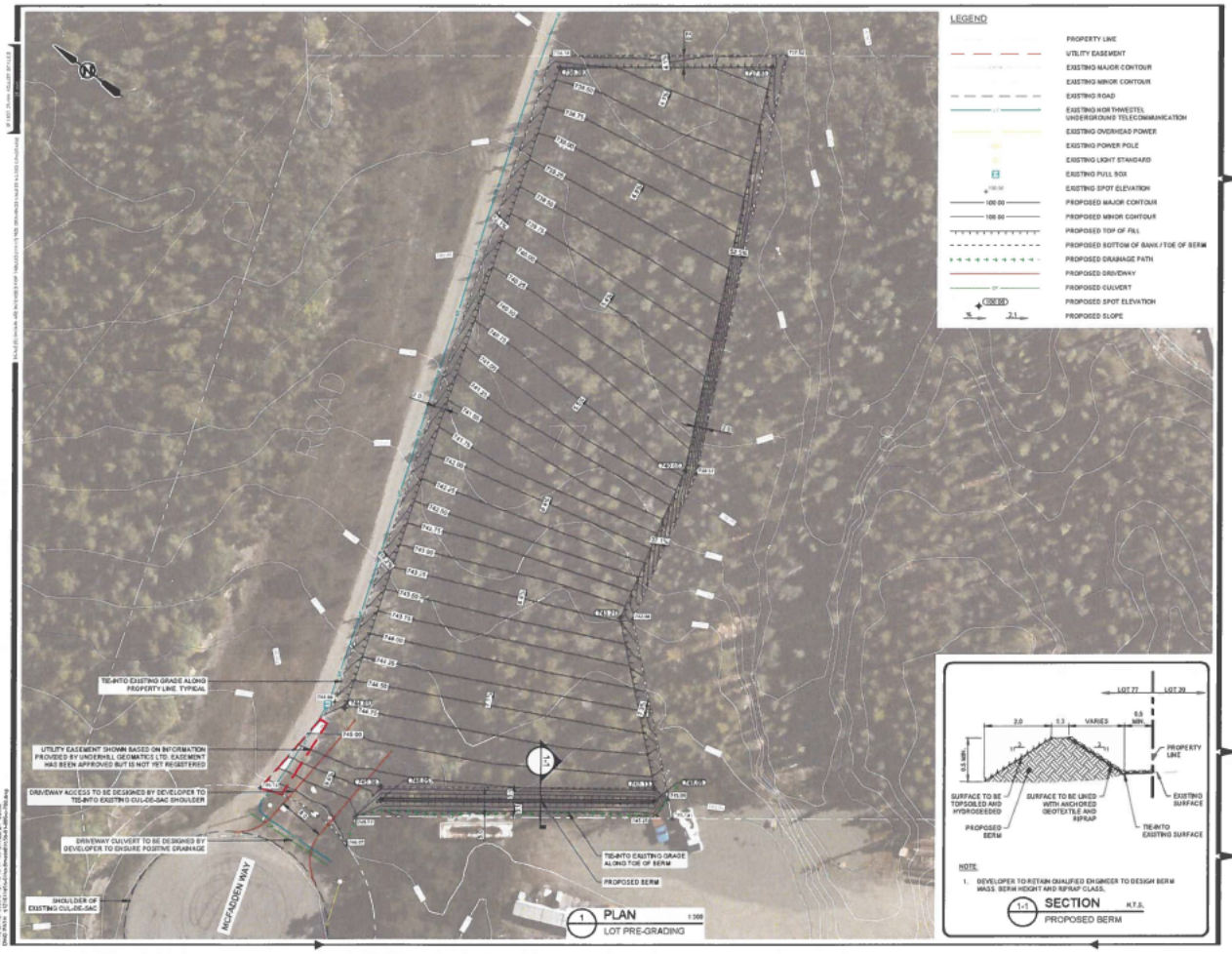
Reviewed by:





Steven Bartsch, P.Eng.
Area Manager, Yukon

Appendix A – Lot 77 Preliminary Grading Plan



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GENERAL NOTES

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METRES UNLESS OTHERWISE INDICATED.
2. EXISTING UTILITIES SHOWN ARE BASED ON INFORMATION PROVIDED TO THE CONSULTANT. LOCATIONS SHALL BE CONFIRMED PRIOR TO CONSTRUCTION.
   2.1 CONTRACTOR SHALL PROTECT AND MAINTAIN ALL EXISTING UTILITIES DURING CONSTRUCTION UNLESS OTHERWISE NOTE REMOVAL, RELOCATION, TEMPORARY SUPPORT, OR ADJUSTMENT OF UTILITIES, IF REQUIRED, SHALL BE COORDINATED WITH AND COMPLETED IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY OWNER.
3. EXISTING GROUND CONTOURS AND SURFACE ARE BASED ON 2019 WHITEHORSE LIDAR DATA. ELEVATIONS ARE BASED ON CGVD28 HT2.
4. ORTHOPHOTO IS BASED ON 2024 AERIAL IMAGERY.
5. ALL PROPOSED ELEVATIONS REPRESENT THE PROPOSED PRE-GRADING SURFACE.
6. GRADING EXTENTS ARE APPROXIMATE AND MAY VARY.

PRELIMINARY/ FOR DISCUSSION NOT FOR CONSTRUCTION

DRAFT

Yukon

FIGURE 1-1

GOVERNMENT OF YUKON
COMMUNITY SERVICES - LAND DEVELOPMENT BRANCH

CIVIL
PRE-GRADING PLAN
LOT 77 MOUNT SIMA SUBDIVISION

AE PROJECT No.	21011656.01.000
SCALE	AS SHOWN
APPROVED	K. BAKER
DATE	2026/JUL/27
REV	1
DESCRIPTION	ISSUED FOR MEMO