



Final Report

Prepared for

Government of Yukon Land
Development Branch

and

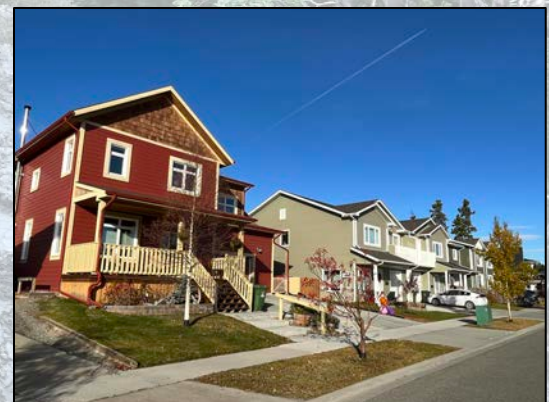
Kwanlin Dün First Nation Department
of Heritage, Lands and Resources
by



GROUNDSWELL
PLANNING

in association with

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Associated Engineering
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Table of Contents

1.0 INTRODUCTION	1
2.0 NEIGHBOURHOOD CONTEXT	2
2.1 LEGAL DESCRIPTION AND SIZE	2
2.2 SITE DESCRIPTION AND USES	2
2.3 SITE CONDITIONS AND VALUES	
2.3.1 Geotechnical	4
2.3.2 Ecological	4
2.3.3 Heritage	5
2.4 DESIGNATION AND ZONING	5
2.5 RELEVANT PLANS AND STUDIES	6
2.5.1 Kwanlin Dün First Nation	6
2.5.2 City of Whitehorse	6
2.6 CITIZEN AND RESIDENT PERSPECTIVES	8
3.0 NEIGHBOURHOOD VISION	10
3.1 GOALS	10
3.2 NEIGHBOURHOOD CONCEPT	11
4.0 LAND USE DESIGNATIONS	13
4.1 LAND USE SUMMARY	13
4.2 RESIDENTIAL LAND USE	13
4.2.1 Housing and population density	13
4.2.2 Housing types	15
4.2.3 Residential policies	16
4.3 PARKS, OPEN SPACE AND TRAILS	17
4.3.1 Park spaces	17
4.3.2 Natural surface trails	18
4.3.3 Buffers and landscaping	18
4.3.4 Placemaking	19
4.3.5 Range Point parks and open space amenities	19
4.3.6 Parks, trails and open space policies	19
4.4 PUBLIC UTILITIES	24
4.4.1 Lift station	24
4.4.2 Stormwater pond	24
4.4.3 Public utilities policies	25
5.0 NEIGHBOURHOOD INFRASTRUCTURE AND SERVICES	27
5.1 TRANSPORTATION NETWORK	27
5.1.1 Automobile travel	27
5.1.2 Active travel modes	28
5.1.3 Transit	29
5.1.4 Parking	29
5.1.5 Recreational motor vehicles	30

5.1.6 Transportation policies	30
5.2 WATER SERVICING	31
5.3 SANITARY SERVICING	31
5.4 STORMWATER	31
5.4.1 Stormwater policies	32
5.5 POWER AND COMMUNICATIONS	32
5.6 GRANULAR MATERIAL	32
5.7 OTHER MUNICIPAL SERVICES	33
5.8 NEIGHBOURHOOD SERVICES	33
6.0 IMPLEMENTATION	34
6.1 REGULATORY AND OTHER PROCESSES	34
6.1.1 Existing survey plan	34
6.1.2 <i>Yukon Environmental and Socioeconomic Assessment Act</i>	35
6.1.3 City of Whitehorse	35
6.2 DEVELOPMENT FINANCING AND SEQUENCING	35
6.2.1 Development sequencing policies	36
6.3 LAND DISPOSITIONS	36
6.3.1 Land disposition policies	36
6.4 NEXT STEPS	37
REFERENCES	38
APPENDIX A. SITE AND CONTEXT PLANS	39
APPENDIX B. NEIGHBOURHOOD CONCEPT DRAWINGS	42
APPENDIX C. RESIDENTIAL DEVELOPMENT RECOMMENDATIONS	51
APPENDIX D. PARKS AND PLACEMAKING CONCEPTS	56
APPENDIX E. RECOMMENDED PLANT LIST	60
APPENDIX F. ENGINEERING TECHNICAL MEMORANDUM	62

List of Tables

Table 1. Plan area land tenure/parcel sizes	1
Table 2. Summary of engagement feedback for the Range Point Master Plan area	8
Table 3. Land use summary	13
Table 4. Gross developable area	13
Table 5. Housing units summary	14
Table 6. Breakdown of housing units and population by land parcel	14
Table 7. Summary of traffic improvement recommendations	28
Table 8. Preliminary implementation workplan	37

List of Figures

Figure 1. Overview of planning area and Range Point neighbourhood	1
Figure 2. Overview of Master Plan site	2
Figure 3. Existing neighbourhood conditions – photo log	3
Figure 4. Range Point zoning	5
Figure 5. Rendering of Range Road linear park	6
Figure 6. Point Park concept	7
Figure 7. Survey promotion	9
Figure 8. Zoom session with KDFN Youth Council	9
Figure 9. Preliminary concepts A, B and C	9
Figure 10. Plan view of conceptual trail corridor treatment	18
Figure 11. Neighbourhood character examples – parks, open space and trails	21
Figure 12. Profile view of stormwater pond landscaping adjacent to trail corridor	25
Figure 13. Plan view of stormwater pond landscaping	25
Figure 14. Neighbourhood character examples – public utilities	26
Figure 15. Motorized multi-use trail routing in Range Point	30

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1.0 Introduction

In 2020, the Government of Yukon (YG) Land Development Branch and Kwanlin Dün First Nation (KDFN) Department of Heritage, Lands and Resources initiated work on a joint master plan for YG's Lot 262-6 and KDFN's Settlement Land parcel C-15B in the Range Point neighbourhood of Whitehorse. Groundswell Planning was retained to lead the planning process in early February 2021. Since that time, the planning team and partner governments have worked with the City of Whitehorse ("the City") through multiple iterations of information gathering, conceptualization and engagement to arrive at the final Range Point Joint Master Plan (RPJMP) concept.

This Master Plan Final Report establishes the framework for this future neighbourhood by articulating:

- The location, configuration and area for residential, parks and open space, and public utility land uses and proposed zoning;
- The types, density and resulting population for residential development;
- Direction for parks and open space programming and efforts;
- The pattern and alignment of a multi-modal transportation network;
- Desired neighbourhood character;
- A conceptual scheme for servicing the development with water, sanitary and power;
- Implementation considerations; and
- Other items pertinent to development.

The Master Plan will be the framework for proceeding with YESAA review, detailed engineering design, and other regulatory obligations such as subdivision and rezoning. The Master Plan will be approved by the plan partners and endorsed by the City.

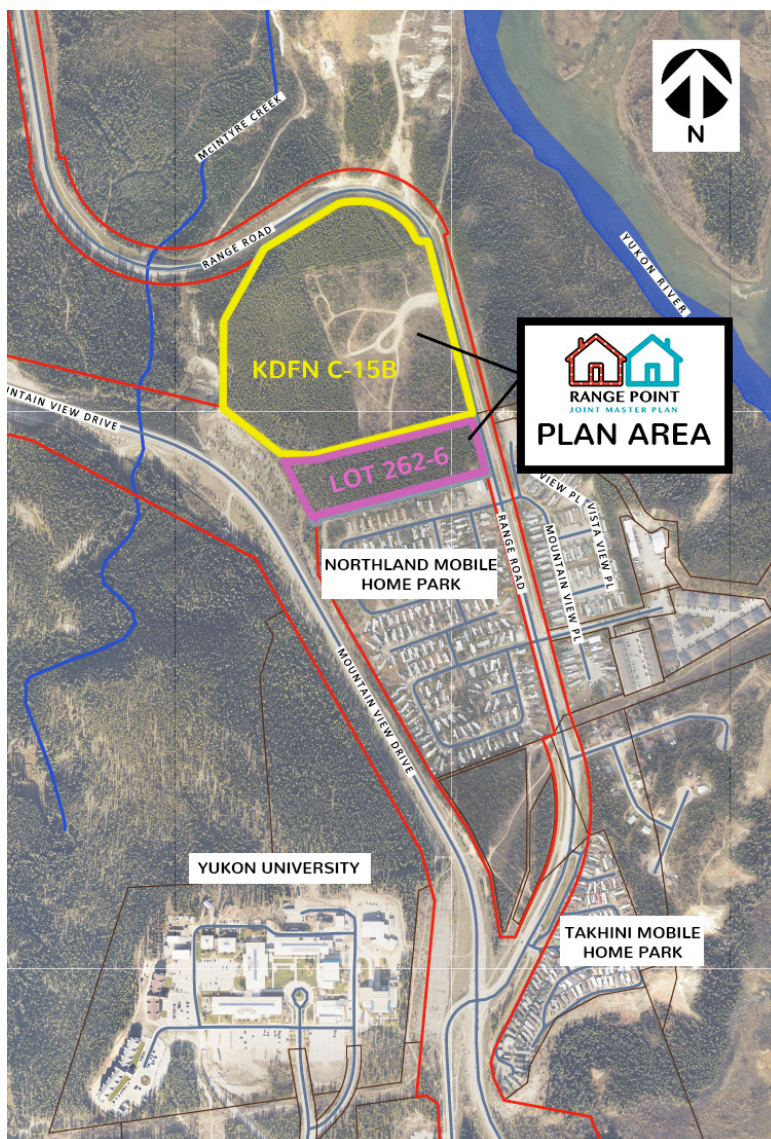


Figure 1. Overview of planning area and Range Point neighbourhood

2.0 Neighbourhood Context

2.1 Legal Description and Size

The Master Plan site consists of two surveyed land parcels and an unsurveyed triangle-shaped area of public land situated between them. Refer to Table 1 and Figure 2.

Table 1. Master Plan site land tenure/parcel sizes

Parcel	Legal Description	Size (ha)
C-15B	LOT 1469 QUAD 105D/14 93163 CLSR YT LTO Plan 2007-0088 YT	14.85
Lot 262-6	LOT 262-6 GROUP 804 71449 CLSR YT LTO Plan 88-109 YT	3.30
Unsurveyed Commissioner's land	n/a	0.30
TOTAL AREA		18.45

For planning purposes (and ease of communication), Lot 262-6 and the adjoining portion of unsurveyed Commissioner's land are considered one parcel and are jointly referred to as Lot 262-6 (unless otherwise noted).

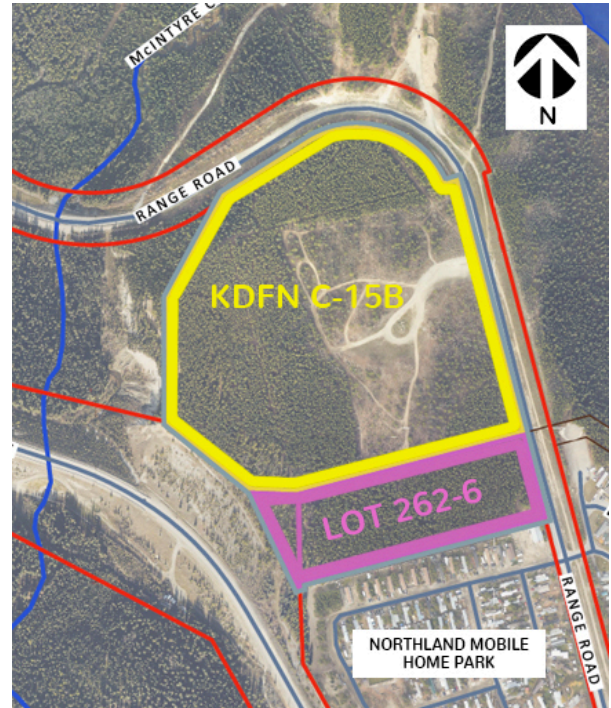


Figure 2. Overview of Master Plan site

2.2 Site Description and Uses

The planning area is situated on the west side of Range Road North and bordered by Chasàn Chuà/McIntyre Creek to the north, Mountain View Drive to the west, and Northland Park to the south. The surrounding neighbourhood of Range Point houses approximately 1240 people (YBS, 2020) in about 560 dwelling units (City of Whitehorse, 2014). Most of the neighbourhood is occupied by private residential or condominium developments, and mobile homes are the dominant housing form. Range Road North, the only road connection to the planning area, is designated a Minor Collector Road with a posted speed of 50 km/h.

The area is mostly vegetated, with lodgepole pine predominant but spruce, poplar, and trembling aspen also present. Most of the eastern portion of C-15B is traversed by several dirt roads branching out from a wide gravel/dirt road loop that connects to Range Road. In addition to this informal network of old roads, there are various trails throughout the site, most notably along the boundary line between the two parcels, directly behind Northland Park, and around the western perimeter/escarpment.

The planning area's proximity to Northland Park and other Range Point development has resulted in heavy use of trails in the planning area by existing residents. The gravel road/loop on C-15B is utilized as a turn-around by the City's Transit Services.

Figure 3. Existing neighbourhood conditions - photo log



Range Road at C-15B (looking south)



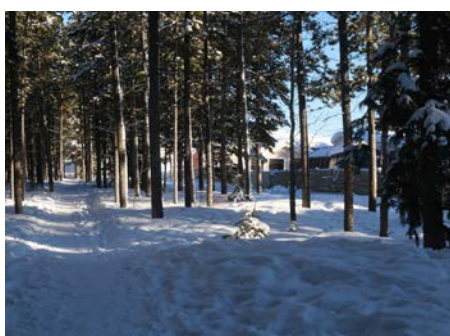
Western escarpment trail



C-15 turn-around/loop



Boundary line between Lot 262-6/C-15B



Well-used trail behind Northland Park



Northland Park



Slope failure by McIntyre Creek



Tilted trees indicating slope creep



The Point entrance



Yukon River view from the Point



Yukon River below the Point



C-15B dirt roads

2.3 Site Conditions and Values

2.3.1 Geotechnical

The planning area is generally flat to gently sloping; however, the western and northern portions of the site consist of a glaciolacustrine escarpment situated about 35 metres above Chasàn Chuà/McIntyre Creek with grades of up to 30%.

KDFN and YG commissioned geotechnical evaluations of their land parcels in 2007 and 2021, respectively. The assessments concluded that, based on the terrain and geotechnical conditions, the potential for conventional subdivision development on this site is very good. Soil conditions are characterized by a thin veneer of organic soil overlying 0.2-1.0 metres of silty sand underlain by glaciolacustrine silt (to undetermined depth). No bedrock, permafrost or groundwater was noted during test pitting. Seepage zones were noted along the bank overlooking Chasàn Chuà/McIntyre Creek, and there was evidence of mass movement processes (e.g., erosion), likely caused by the under-cutting of the toe-of-slope by the creek. The report notes potential for frost susceptible soils on the site and recommended that a development setback of 30 metres be applied to the northern boundary of C-15B and that natural vegetation remain intact throughout the adjacent greenbelt. The Master Plan reflects this guidance.



Lower McIntyre Creek/Yukon River confluence, with planning area in the right/middle ground
(Credit: Alistair Maitland Photography)

2.3.2 Ecological

The development site is adjacent to residential development and situated between two collector roads; as such, its environmental value is assumed to be low. However, KDFN's C-Lands Plan identifies the general Chasàn Chuà/McIntyre Creek area as a significant wildlife area and this watershed is of considerable ecological value.



Range Road dumpsite circa 1960s
(Source: Yukon Archives 85-25-595)

The Chasàn Chuà/McIntyre Creek - Yukon River confluence is dominated by shallow open water, marsh and shrub-dominated wetland ecosystems, alongside white spruce (*Picea glauca*) lowland forest. Previous studies have identified the location as a significant wildlife area due to its aquatic habitat characteristics and connectivity to areas outside the Yukon River corridor. A 350-metre riparian buffer (i.e., 175 metres from each bank) is considered a best practice to mitigate impacts on wildlife. A small portion of the northwestern corner of development falls within this 175-metre setback; however, the very steep slopes separating McIntyre Creek from the development site in this area realistically compromise habitat connectivity here.

The Yukon River island complex, Chasàn Chuà/McIntyre Creek and its riparian forests, and steep slopes have also been identified as highly sensitive areas. Resident wildlife includes avian predators, forest birds, water birds, microtine mammals, ungulates, and fish. The confluence is a spring staging area for a variety of swans and other waterfowl. Most large animal species found in the Whitehorse area can occasionally be found in the Chasàn Chuà/McIntyre Creek area but mostly use the corridor for travel. Six fish species have been documented in the lower portion of the creek, including adult and juvenile Chinook salmon.

2.3.3 Heritage

The lower Chasàn Chuà/McIntyre Creek area is known to have significant tangible and intangible heritage values. The lower reaches of the creek and nearby “Point”, or Dàmäwtän (High Bank), played a key role as a First Nations gathering place, with many people camping there both pre and post-contact. Chasàn Chuà/McIntyre Creek functioned as a major travel route between the Lake Laberge area and Fish Lake, which was an important fishing, hunting, and camping area. The area around the Point was the site of numerous fish camps near the mouth of Chasàn Chuà/McIntyre Creek and across to Croucher Creek. Archaeological remains found on high banks at the mouth of Chasàn Chuà/McIntyre Creek suggest that this was an important prehistoric lookout and hunting site.

During World War II, the Point was utilized by the United States military as a dumpsite. The dump was subsequently re-opened by the City of Whitehorse and operated until 1975, when the Yukon Water Board ordered it closed due to impacts on Chasàn Chuà/McIntyre Creek. C-15B was used as a radio range transmitter site, part of the Northwest Staging Route wartime project; the tower was decommissioned several decades later.

A Heritage Resource Impact Assessment was carried out for C-15B in 2007 and for Lot 262-6 in 2021. No heritage resources were encountered during either investigation, and neither deemed further assessment work necessary. The 2007 report recommended that personnel and contractors be briefed on proper protocols if heritage resources are encountered during site work.

2.4 Designation and Zoning

The recently adopted 2040 City of Whitehorse Official Community Plan (OCP) designates the planning area as Residential – Urban (Lot 262-6) and First Nations Development Land (C-15B).

Section 15 of the OCP establishes the purpose of Residential – Urban lands to “Accommodate a wide range of residential housing forms and compatible uses, located primarily within the Urban Containment Boundary” and allows for all types of municipally serviced residential development, as well as neighbourhood service commercial uses, parks, natural areas, schools, etc.

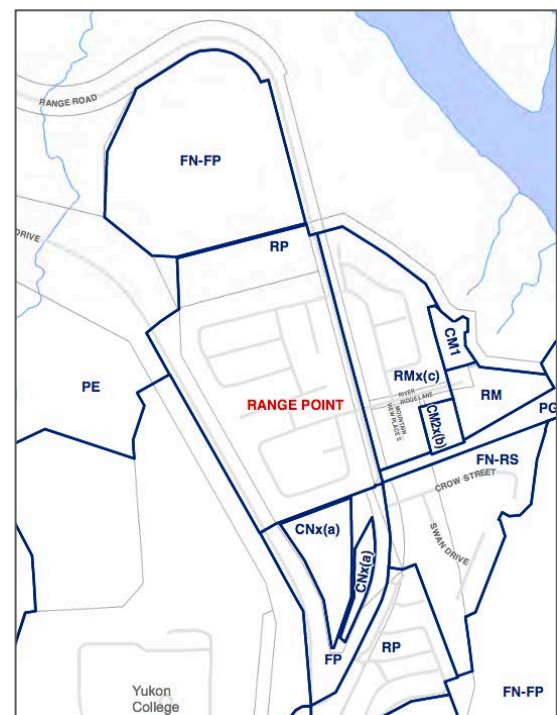


Figure 4. Range Point zoning (Source: City of Whitehorse Zoning Bylaw)

Section 15 of the OCP establishes First Nations Development Land as “Lands where the First Nations may develop consistent with the Self Government Agreements and land planning policies and documents completed by the First Nation to guide development.” This Master Plan fulfills this obligation for C-15B and the OCP designation Residential – Urban will be applied to this parcel.

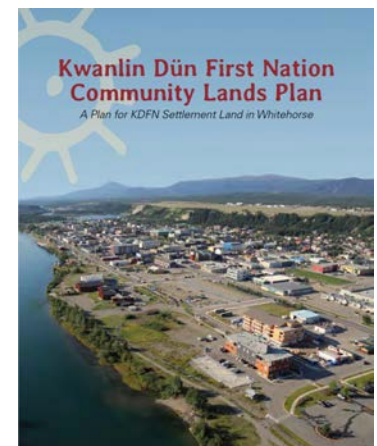
Under the City’s *Zoning Bylaw*, C-15B is zoned FP - First Nation Future Planning, Lot 262-6 is zoned RP – Residential Mobile Home Park, and the unsurveyed area is zoned PE – Environmental Protection. Refer to Figure 3. A zoning amendment for both parcels, will be required to implement the Master Plan.

C-15B is a Type 2 Settlement Land parcel designated for Residential use under the KDFN *Self Government Agreement* (SGA). On Type 2 parcels, KDFN can enact a law in relation to planning, zoning and land development that is consistent with Yukon and City of Whitehorse laws as they pertain to public health or safety.

2.5 Relevant Plans and Studies

2.5.1 Kwanlin Dün First Nation

Overarching guidance for development on C-15B is provided by KDFN’s Traditional Territory Land Vision (2017) and Community Lands Plan (2020). C-15B is associated with all four Land Vision goals (Community Development, Heritage, Wildlife, and Revenue Generation) and their corresponding objectives. The master planning process itself fulfilled much of the relevant policy direction from the Community Lands Plan; however, others are reflected in Master Plan policies in the following sections. C-15B-specific feedback received during the planning process is summarized in Section 2.6.



2.5.2 City of Whitehorse

- *Range Road North Neighbourhood Plan (2014)*

The City undertook the above referenced plan with the broad objectives of making Range Point a complete and successful neighbourhood. Notably, the plan provides guidance to develop Lot 262-6 for residential purposes. Relevant policies and direction from the plan are incorporated into the overarching Master Plan policies.

Figure 5.
Rendering of
Range Road
linear park
(Source: Range
Road North
Neighbourhood
Plan)



- **Range Point/Whistle Bend/Takhini/Porter Creek Trail Plan (2016)**

A Memorandum of Understanding was signed between the City and KDFN in spring 2015 to allow the City to adopt and manage significant trails located on KDFN lands until future development occurs. Trail planning was undertaken for the Range Point/Whistle Bend/Takhini/Porter Creek neighbourhoods in 2016 to identify candidate City trails, their proposed designations (i.e., non-motorized or motorized multi-use), and potential connections and additions to the proposed City network in the area. The Range Point-specific improvements have yet to occur.

Recommendations from that plan are incorporated into the overarching Master Plan policies for Parks, Open Space and Trails in Section 4.3.6.



Boardwalk near McIntyre Creek
(Credit: City of Whitehorse)

- **Point Park Feasibility Study (2016)**

This study came out of a City commitment in the 2014 Range Road Neighbourhood Plan. It concluded that development of a park at the Point would allow the City and its partners to implement management measures, proactively shift behavior away from unwanted uses, and limit the potential effects of a growing residential population. Furthermore, the traditional significance of the site and its high value to First Nations, residents, and stakeholder groups was felt to present a unique opportunity to co-create, interpret, and care for a special place in a manner that reflects both its significant ecological and human-ascribed values. The conceptual plan includes a picnic area with shelters and power, cantilevered lookout, grass field for play and events, interpretive/natural play areas, loop trails, prospective McIntyre Creek bridge crossing, and parking for 20+ vehicles.

No further work has taken place to advance this project. Recommendations from that plan are incorporated into the overarching Master Plan policies for Parks, Open Space and Trails Section 4.3.6.

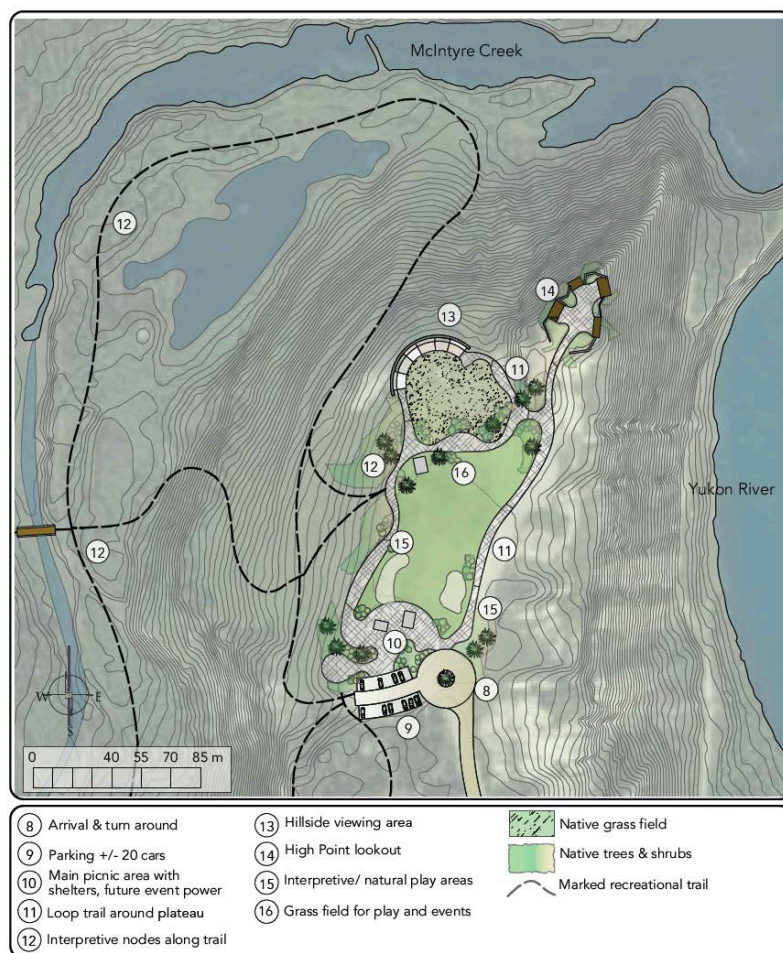


Figure 6. Point Park concept (Source: Jane of all Trades Consulting)

2.6 Citizen and Resident Perspectives

Engagement with KDFN citizens and Range Point residents was carried out in May and November 2021 to inform the master planning process and supplement previous input gathered for the Range Road North Neighbourhood Plan in 2013-14. The overlap of RPJMP timing with the COVID-19 pandemic and accompanying restrictions on in-person gathering resulted in an exclusive focus on online and mail-out surveys and social media. These engagements, and highlights of the most relevant input received during them, are outlined in Table 2. Refer to the two RPJMP “What We Heard” reports (available from YG and KDFN) for full 2021 results.

Table 2. Summary of engagement feedback for Range Point Master Plan area

Year	Project	Target Audiences	Key themes from citizen and resident input
2013-14	Range Road North Neighbourhood Plan (City of Whitehorse)	Range Point residents, stakeholders, landowners	<i>For Lot 262-6</i> • Small, higher quality and affordable housing units in a variety of one, two, and three unit configurations • High quality and street friendly housing design through “comprehensive” zoning • Preservation of key trails, 10m wide greenspace behind Northland, and greenspace on the western perimeter • Preference for RCM3 (for condominium style development) or RCS2 (for individual lot development)
2018	Community Lands Plan (KDFN)	KDFN citizens	• The McIntyre Creek area, including C-15B, has wildlife and heritage values • C-15B is appropriate for community development and revenue generation
May 2021	Range Point Joint Master Plan – Values and Preferences	Range Point residents, KDFN citizens, stakeholders, landowners (Note: some non-citizens participated in survey via KDFN social media promotion)	<i>KDFN citizens</i> • 40% of respondents interested in a lease, with single detached units most desired by a wide margin (duplexes and town homes the next popular) • Housing for different income levels, provision of parks/trails/greenspace and using lease revenues to benefit citizens part of social license • Trails, trail improvements, protection of waterways and education are pre-requisites to respecting and protecting site’s heritage and wildlife values <i>Range Point residents</i> • Strong support for buffer behind Northland Park, perimeter trail, using street-friendly design and diverse, appealing housing types • Concerns about traffic, poor condition of Range Road, greenspace loss
Nov. 2021	Range Point Joint Master Plan – Draft Neighbourhood Concepts		• Concepts A and B were generally better received by citizens and residents • The higher density of Concept C was opposed by citizens and residents • Concept B’s road layout was preferred by citizens and residents • Concept A’s housing concept was preferred by KDFN citizens • There was mixed support for commercial development • General approach to parks, trails, greenspace in all concepts supported but a strong preference for natural surface trails • Stronger support from citizens for a larger, more diverse park space that functions for both gathering and activity (i.e. Concept B). Range Point residents generally opposed all park concepts (preferring open space)



Figure 7. Survey promotion



Figure 8. Zoom session with KDFN Youth Council

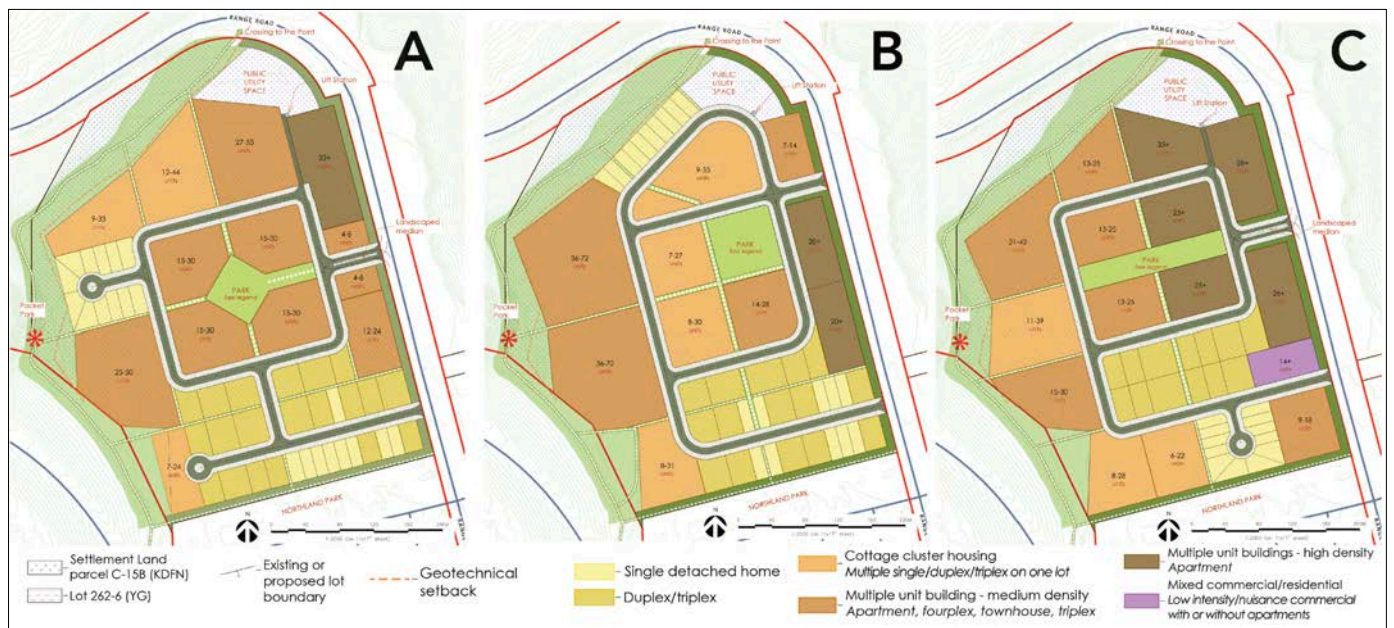
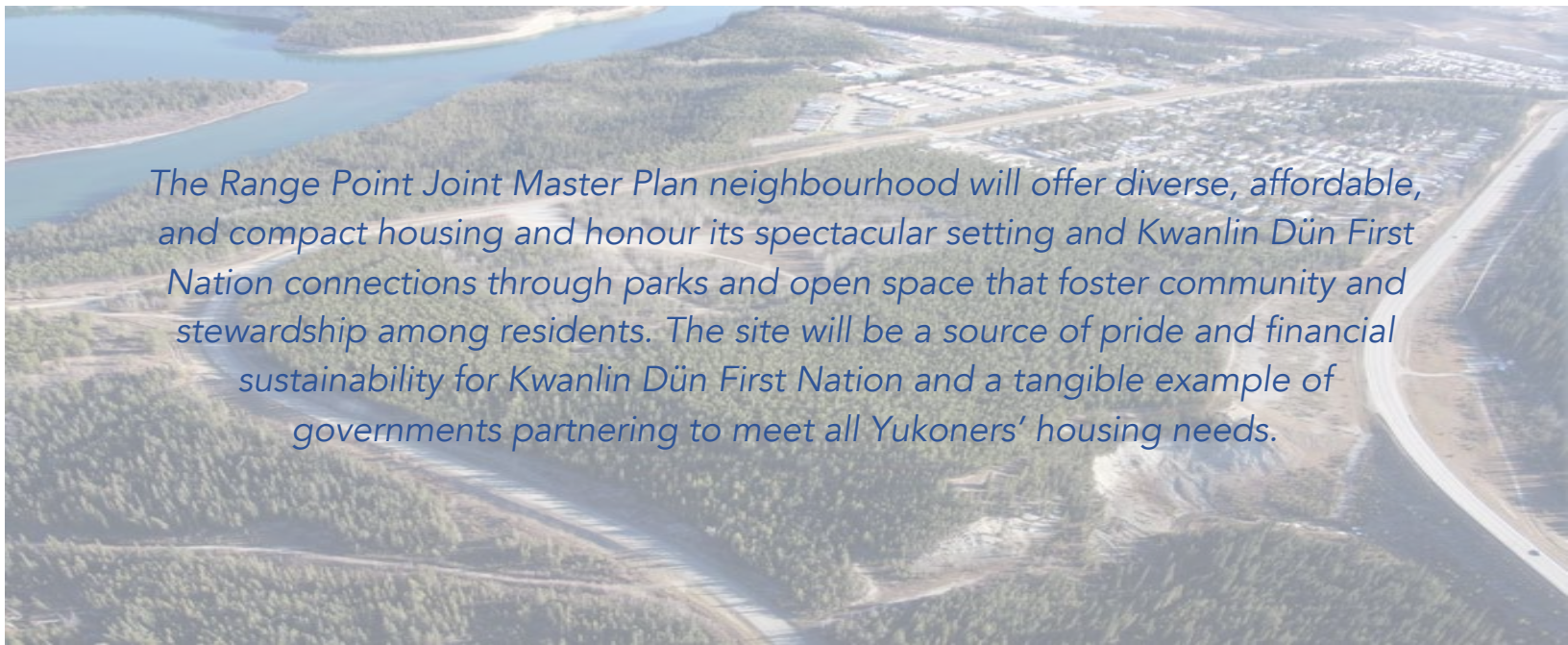


Figure 9. Preliminary concepts A, B and C

3.0 Neighbourhood Vision



The Range Point Joint Master Plan neighbourhood will offer diverse, affordable, and compact housing and honour its spectacular setting and Kwanlin Dün First Nation connections through parks and open space that foster community and stewardship among residents. The site will be a source of pride and financial sustainability for Kwanlin Dün First Nation and a tangible example of governments partnering to meet all Yukoners' housing needs.

3.1 Goals

The objectives for the new development area flow from the overarching vision and include the following:

1. Enhance resident quality of life with convenient access to nature, quality park spaces, and trails.
2. Offer a diversity of housing choices that cater to residents with different life stages, incomes, and lifestyles.
3. Create a compact, walkable neighbourhood and strong connections for all modes of transportation.
4. Protect, honour, and celebrate the site's unique context and values.
5. Foster a sense of community and shared stewardship.
6. Create a positive "brand" for KDFN residential leaseholds and generate revenues for KDFN.
7. Complement and enhance the Range Point neighbourhood and offer amenities for both new and existing residents.

3.2 Neighbourhood Concept

As illustrated in the Neighbourhood Plan contained in Appendix B, the Master Plan articulates its vision and achieves its goals through a variety of design, planning and policy elements, including:

Goal #1. Enhance resident quality of life with convenient access to nature, quality park spaces, and trails.

- A central park space with a variety of active and passive leisure programming serves as the key neighbourhood gateway and connects to natural surface trails via green corridors
- Retention of mature forest around the periphery of the neighbourhood buffers from adjacent development and enhances residents' connectedness to nature
- Protection and enjoyment of Chasàn Chuà/McIntyre Creek viewsapes for all residents and maintenance of Range Road aesthetics
- Place and context-sensitive landscaping that replicates the local ecology to the extent possible

Goal #2. Offer a diversity of housing choices that attract residents with different life stages, incomes, and lifestyles.

- Capacity for approximately 387 housing units and an estimated 889 residents
- A mix of housing choices ranging from traditional single and semi-detached homes to townhomes and apartments within a cohesive and unified residential character
- Facilitation of a variety of housing tenures, including fee simple, leasehold title, strata ownership, and market and non-market rental

Goal #3. Create a compact, walkable neighbourhood and strong connections for all modes of transportation.

- A central block that sets an easily navigable quasi-grid road pattern and creates short, walkable distances between key neighbourhood destinations
- Tree-lined streets, on-street parking and street-oriented development creates a higher quality, safer public realm
- Convenient access to transit, public bicycle storage and active transportation networks

Goal #4. Protect, honour, and celebrate the site's unique context and values.

- Neighbourhood character and placemaking that draw inspiration from nature and Yukon First Nation visual traditions
- Development setbacks from the Chasàn Chuà/McIntyre Creek escarpment and corridor and establishment of trail networks that offer views to but maintain distance from this important wildlife corridor
- Use of language, culture and place names to celebrate the millennia-long occupation of the area by First Nation people and share this legacy with newcomers
- Retention of mature trees to the extent possible and replication of natural site ecology using native plantings

Goal #5. Create a sense of community and shared stewardship.

- Distribution of housing types around the site to encourage social cohesion and mixing
- Small neighbourhood size and strategically located gathering spaces that invite different groups to meet and interact
- Education of residents and visitors about the cultural and ecological values of the Chasàn Chuà/McIntyre Creek area through site interpretation
- Intentional use of participatory placemaking to empower and involve residents in shaping how their neighbourhood evolves
- Gateway landscaping and placemaking features welcome people into the neighbourhood

Goal #6. Create a positive “brand” for KDFN residential leaseholds and generate revenues for KDFN.

- A smaller-scale development that allows KDFN to successfully establish its residential development “brand” and position leaseholds as an appealing housing option for Whitehorse residents
- A variety of multi-family parcels sized and zoned to provide flexibility and choice for private sector builders and partners
- An estimated 322 dwelling units housing an estimated population of 742 residents on C-15B, with associated income tax revenues contributing to financial sustainability for KDFN and its citizens and beneficiaries

Goal #7. Complement and enhance the Range Point neighbourhood and offer new amenities for both new and existing residents.

- Single detached and duplex lots to broaden the spectrum of housing in Range Point
- New active transportation infrastructure to connect the neighbourhood from north to south
- New parks and trails offering a neighbourhood gathering place and focal point
- Potential for neighbourhood commercial services on C-15B (subject to private sector interest)

4.0 Land Use Designations

4.1 Land Use Summary

The Master Plan for the site consists of 10 different land uses. The predominant land use is medium density multiple unit buildings at 28%. Parks, trails, open space, and green buffers/landscaping account for a combined 25% of the site. Roads and road rights-of-way and cottage cluster housing account for 13% each. Single detached and duplex housing account for a combined 14%, whereas medium to high density multiple unit buildings account for 5%. A summary is presented below and illustrated in the Land Use Plan in Appendix B.

Table 3. Land use summary

Land Use	Area (ha)	% of total area
Single detached housing	1.56	8
Duplex housing	1.17	6
Cottage cluster housing	2.36	13
Multiple unit building – medium density	5.15	27
Multiple unit building – medium - high density	0.91	5
Treed buffer or gateway landscaping	0.90	5
Perimeter greenspace	2.62	14
Neighbourhood parks and trails	1.06	6
Roads and road right-of-ways	2.48	13
Utilities	0.57	3
TOTAL	18.77	100

Note that land use areas and percentages are approximate for planning purposes and are based on the usable portions of the site (i.e., at and/or near development grade). Designated areas are subject to some refinement through final site design and engineering at the time of zoning and subdivision.

While the development area is located outside of the City's Urban Core area and the accompanying OCP density minimum requirement of 20 units/hectare, it is still helpful to track density. To aid with that, gross developable area is calculated at 15.88 hectares, factoring in setbacks and land set aside for public utilities. Refer to Table 4.

Table 4. Gross developable area

Original development area	18.45 ha
Development setback area	(2.00) ha
Public utilities	_.57) ha
TOTAL	15.88 ha

4.2 Residential Land Use

4.2.1 Housing and population density

The RPJMP development site is projected to result in approximately 387 new housing units including single detached, duplex, triplex, cottage cluster, and medium and higher density multiple unit dwellings. This intended variety of housing choices is facilitated by the range of zoning and accompanying lot sizes within the development site. The intent of the proposed mix and orientation of housing types is to foster a diverse

community that can accommodate a variety of income groups, household configurations, and age groups, while generally promoting more compact and affordable housing forms.

The RPJMP partners set out to utilize existing City zoning in this new development and specific zoning is assigned to each housing parcel to achieve the desired mix of residential density and forms. The different housing types, intended zoning and associated density requirements, and resulting unit ranges are summarized in Table 5 and illustrated in the Housing Plan and Zoning Plan presented in Appendix B.

Table 5. Housing units summary

Housing Type	Intended Zoning	Density (units per ha)	Area (ha)	Total Units
Single detached home	RCS2	n/a	n/a	29
Duplex	RCS2	n/a	n/a	30
Cottage cluster housing	RCM3	15-55	2.36	35-129
Multiple unit building – medium density	RCM	25-50	5.36	134-267
Multiple unit building – medium - high density	RM	25+	0.91	22-68 ¹
TOTAL HOUSING UNIT COUNTS				250 - 523
HOUSING UNIT AVERAGE				386.5

KDFN's C-15B is anticipated to provide 322.5 of the anticipated 386.5 units on the site, amounting to about 83% of housing. YG's Lot 262-6 is anticipated to contribute 64 units, or 17%. Based on the average housing counts for each parcel and the Yukon's average dwelling size of 2.3 people per household (YBS, 2021), the new neighbourhood is expected to house about 889 people in total (742 on C-15B and 147 on Lot 262-6). Refer to Table 6.

Table 6. Breakdown of housing units and population by land parcel

Housing Type	C-15B					LOT 262-2				
	Area (ha)	Min. # units	Max. # units	Min. pop.	Max. pop.	Area (ha)	Min. # units	Max. # units	Min. pop.	Max. pop.
Single detached home	n/a	15	15	35	35	n/a	14	14	32	32
Duplex	n/a	10	10	23	23	n/a	20	20	46	46
Cottage cluster housing	1.61	24	88	55	202	0.75	11	41	25	94
Multiple unit building – medium density	5.23	131	262	301	603	0.11	3	5	7	12
Multiple unit building – medium - high density	0.91	22	68 ²	51	156 ³	-	-	-	-	-
SUB-TOTALS	7.75	202	443	465	1019	0.86	48	80	110	184
AVERAGES	-	322.5		742		-	64		147	

¹ There is no maximum density for RM zoning; it was assumed to be 3 times minimum.

² See above

³ See above

These estimates represent averages only. If built out to minimum density, the site could accommodate as few as 250 units and 575 people. If built out to maximum density, the site could accommodate as many as 627 units and 1442 people. Neither scenario is considered likely given the challenges of meeting setbacks and other zoning requirements (e.g., parking) and the likely desire of future lessees/builders on multi-unit parcels to balance density and liveability.

Based on the projected average housing count and gross developable area, the anticipated overall density of the development is calculated at 24.3 units/hectare ($386.5 \text{ units} \div 15.9 \text{ gross hectares of developable land}$). This comfortably meets the 2040 OCP Urban Core residential minimum density standard of 20 units/hectare (even though this does not apply to the Range Point neighbourhood).

4.2.2 Housing types

- *Single detached*

The Master Plan provides for 29 single detached housing lots within the southern third of the development site and a portion of the northwest. The lots are oriented almost exclusively north-south along the southern access road, southern segment of the interior road, and the cul-de-sac. Most of the southern lots are roughly on par or slightly larger than the minimum 490 m² requirement in the Comprehensive Residential Single Family (RCS2) zone, while the cul-de-sac lots are slightly larger. The north-south orientation facilitates housing design that maximizes passive solar heating in the winter months. None of the lots are large enough to accommodate duplex development under the zoning; garden and/or living suites could potentially be allowed (subject to other Zoning Bylaw requirements).

- *Duplex/semi-detached*

The Master Plan provides for 30 semi-detached or duplex lots within the southern third of the development site. The lots are oriented north-south along the southern access road, southern segment of the interior road, and a short cul-de-sac. This north-south orientation will help to maximize passive solar gains during the winter months. Most of the duplex lots are slightly larger than the minimum 780 m² combined area requirement in the Comprehensive Residential Single Family (RCS2) zone. None of the lots are large enough to accommodate triplex development under the zoning; however, garden and/or living suites could potentially be allowed (subject to other Zoning Bylaw requirements such as setbacks).

- *Cottage cluster*

The Master Plan provides for 2.46 hectares of cottage cluster housing on two parcels, one located on Lot 262-6 (1.61 ha) and the other on C-15B (0.75 ha). The Cottage Cluster Homes (RCM3) zone allow for the development of multiple ground-oriented single detached, duplex, and triplex housing units on one lot. The siting of the two cottage cluster housing parcels on the western escarpment is intended to facilitate innovative and aesthetically appealing development along this important viewshed.

RCM3 is a relatively uncommon zoning in Whitehorse. To date it has not been applied in a manner that completely fulfils the original spirit and intent of the cottage cluster housing movement. The traditional hallmarks of cottage cluster development include shared amenity space, smaller and more affordable homes (compared to conventional single detached), common buildings and parking areas. This flexibility allows for more efficient use

of land compared to single detached housing, while providing for a sensitive transition from single detached housing (with thoughtful attention to building siting and massing). The RPJMP site creates a new opportunity to nudge Whitehorse residential options further in this direction.

- ***Multiple unit – medium density***

The Master Plan provides for a combined total area of 5.34 hectares of medium density multiple unit residential housing distributed across five lots ranging from 0.11 to 1.92 hectares in size. Four of the lots are located on C-15B; except for a small parcel on the western end of the shared block, lots are in the 1-2 hectare range that Whitehorse-based home builders expressed an interest in during market research undertaken for the Master Plan. Only a small 0.11-hectare medium density multiple unit parcel is located on Lot 262-6.

A variety of medium density housing types – apartment, fourplex, townhouse, and triplex - are permitted by the Comprehensive Residential Multiple Family (RCM) zoning intended for these parcels. Care should be taken to ensure private residential buildings complement and successfully transition to adjacent public spaces, such as the escarpment and central park.

- ***Multiple unit – medium - high density***

The Master Plan provides for a combined total area of 0.91 hectares of medium-to-high density multiple unit residential housing contained on one Range Road-adjacent parcel on C-15B. The Residential Multiple Housing (RM) zoning intended for this parcel allows for any physical arrangement of three or more dwelling units with a minimum 25 unit/ha density but no maximum. A 10-metre treed buffer will provide separation and noise attenuation from Range Road and maintain semi-natural viewsapes along this well-used transportation corridor.

4.2.3 Residential policies

The specific configuration and densities of dwelling units across the neighbourhood will largely be dictated by market conditions, builder preferences, and zoning requirements. The Zoning Bylaw will provide specific guidance for how lots and housing are developed. While respecting the authority of the bylaw and discretion of individual owners and builders, the Master Plan makes suggestions to future lot owners, lessees and builders in fulfilling its vision and intent. These are contained in Appendix C.

4.3 Parks, Open Space and Trails

The new development's proximity to Chasàn Chuà/McIntyre Creek and Yukon River lend it a spectacular natural setting. KDFN citizens indicated high quality parks, open space, and trails as the key criteria for a successful development, while Range Point residents spoke to a strong desire to retain as much of the area's existing natural character as possible. This direction is reflected in an approach that seeks to maintain the area's natural assets and provide a complementary built environment that offers more structured leisure opportunities. Refer to the Parks, Open Space and Trails Plan in Appendix D.

4.3.1 Park spaces

- ***Central park***

The neighbourhood will be oriented around a central 5108 m² park space containing a mix of active and passive programming elements that attract a diversity of users and encourage frequent visitation. The park concept (refer to Appendix C) allows for a phased, people-centered approach to making this vital space reflective of resident values and preferences.

A natural playground, picnic and gathering areas, pathways, and entry features will act as park focal points and are considered priority park elements. The park will provide an appealing gateway from the main neighbourhood access point on C-15B. Banners, seating, and welcome features will invite visitors in and crushed granular pathway "spokes" will provide connections to the street and facilitate internal circulation.

Park spaces not occupied with built features or open lawn areas will be seeded with a native low grass and wildflower mix which will require less frequent maintenance and will provide a more diverse park landscape and improved habitat. A water connection will be provided to the park, including a quick coupling irrigation valve for water access, and standpipe/water tap for a potential future community garden.

Priority programming elements and park landscaping will be developed as part of the initial phase of park development. Phase 2 elements could include a variety of features, including a small bicycle pump track or skills area for children that could integrate with landscaping. There is also sufficient space for another major park element, such as a community garden, outdoor rink, or volleyball court. These latter amenities could be selected through a participatory neighbourhood planning exercise. Native low grass and wildflower would serve as a "placeholder" ground cover serving to create a more aesthetic interim space.

The park will adjoin the central medium density multi-unit residential parcel to the west and south. Care will need to be taken to optimize the Crime Prevention Through Environmental Design benefits of this co-location while still allowing for some degree of privacy for both residents and park users. Thoughtful transitions between public and adjoining private space will help to ensure that both realms are clearly delineated and visually complementary. The planting of trees around these edges is one example; low shrubs and trees with higher canopies are recommended to ensure "eyes on the park." Sight lines into the park from the road should similarly create a sense of increased safety and resident surveillance from unwanted activity.

- **Pocket park**

The western escarpment of the development site offers views of Haeckel Hill and westerly and southerly exposure. A parkette, or “pocket” park, will provide a quiet, contemplative space to enjoy both and will be accessed via a new natural surface trail spoke from the central block, as well as the escarpment trail. The parkette will defer to its natural setting and built features will be limited to benches and interpretive signage. Seating will help to augment the experience of the escarpment trail for Elders and young children. Refer to the detailed parks concept in Appendix D.

4.3.2 Natural surface trails

The plan reflects the strong preference of KDFN citizens and Range Point residents to retain natural surface trails to the extent possible. The well-used escarpment trail that borders the development to the west and north will be retained, along with the trail that straddles the boundary between Northland Park and Lot 262-2. A network of new natural surface trails will allow for circulation between the neighbourhood and these important trails. Refer to Section 5.1.2 for an overview of paved trails.

6-metre wide trail corridor spokes radiate from the center of the neighbourhood in three directions and there is a 3-metre wide corridor at the west end of the cul-de-sac. A new 90-metre segment of trail will be constructed in the vicinity of the stormwater pond. The plan envisions 1.5-metre wide natural surface trails being developed within these corridors to replicate the look, feel, and functioning of the escarpment trail and facilitate use by pedestrians, cyclists and even wheelchairs. To achieve a natural trail experience in these corridors, careful and complementary landscaping treatment may be required where grading activities necessitate the removal of native trees. Refer to Figure 10.

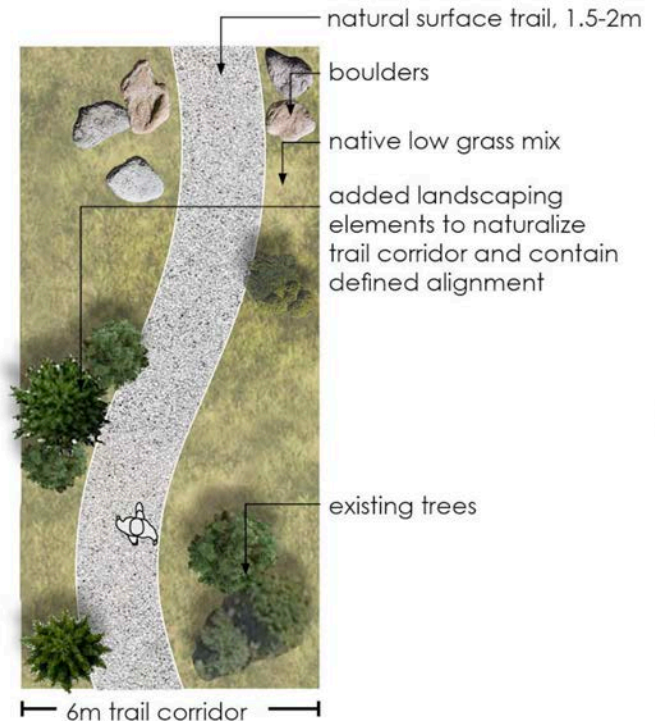


Figure 10. Plan view of conceptual trail corridor treatment

4.3.3 Buffers and landscaping

As committed to in the Range Road North Neighbourhood Plan in 2014, a 10-metre treed buffer will be retained between Northland Park and the new subdivision. The plan extends this green buffer to the eastern edge of the development site as well, allowing for more privacy for residents of the Range Road parcels and a more pleasing, natural Range Road viewscape.

Landscaping treatments will be applied in five key areas: north road access on C-15B; central park space; adjacent to sidewalks (i.e., street trees); trail corridors; and stormwater retention pond.

The extent of landscaping applied in each will depend on the degree of existing site disturbance and the amount of clearing and/or disturbance required for grading and construction. The overlap of the central park space and north road entrance with the cleared portion of the site requires full landscaping treatment. Trail corridors overlap with existing forest cover and will be left as natural as possible, with landscaping applied where clearing is required for site grading. Refer to Sections 4.3.2 and 4.4.2 for examples of trail and pond landscaping.

4.3.4 Placemaking

The parks, trails and open space components offer an opportunity to create a distinct sense of place that will differentiate this new development from others. A unique neighbourhood identity serves to foster belonging and stewardship among residents and competitively position lots in the marketplace. Placemaking efforts will be prioritized in the central and pocket park spaces but could apply to other neighbourhood elements such as trail and street signage and utility boxes. Placemaking should reflect the site's First Nation origins and KDFN citizen and Range Point resident values by emphasizing natural materials and nature and culture-inspired themes. This is an excellent opportunity to engage KDFN artisans and citizens. Refer to Appendix D for initial placemaking concepts.

4.3.5 Prior City parks and open space amenity commitments

The 2014 Range Road North Neighbourhood Plan committed to three major parks and open space actions:

- Establishment of a formal trail network and accompanying signage;
- Exploration of a municipal-level park at the Point; and
- A linear park along Range Road.

A feasibility study for Point Park was completed in 2016 but there has been no further implementation of its recommendations, nor the other committed actions.

These public amenity features were intended to enhance resident quality of life in this relatively dense and underserved neighbourhood. Further, they could add considerable value and appeal to new lots and housing that will be developed on the RPJMP site. There are implementation synergies between the RPJMP development, pending reconstruction of Range Road, and these Range Road North Plan action items. The RPJMP partners should revisit these items as part of development agreement discussions with the City at both administrative and political levels.

4.3.6 Parks, trails, and open space policies

Notwithstanding the landscaping and amenity space requirements set out in the Zoning Bylaw, the following policies are intended to provide reinforcing and/or supplementary guidance to the RPJMP partners and future lot owners/lessees and/or builders in fulfilling the vision and intent of the Plan:

1. Prioritize the retention of existing trees on the site and resulting lots throughout all stages of design and construction, with particular care given to trail corridors.
2. Prioritize high quality, durable, natural materials (such as wood, metal, and stone), and nature-inspired elements in the design of park amenities.

3. Prioritize accessibility for all ages and abilities in the design of central park space elements such as seating and granular pathways.
4. Provide a water connection to the central park space for irrigation.
5. Incorporate First Nation history, heritage, language, legend, stories, and place names into interpretive signage, park names and placemaking features (this is consistent with KDFN Community Lands Plan Heritage Policy #3).
6. Incorporate environmental and stewardship themes into interpretive signage, park names and placemaking features.
7. Utilize native and near native salt tolerant species for street trees adjacent to roads and sidewalks that may be subject to winter clearing and salting.
8. Utilize native low grass and wildflower mix (unmowed) for areas that require low maintenance such as undeveloped areas of the central park space, landscaped boulevards, and the bottom of the stormwater pond.
9. Consider park lighting where it can increase winter use of active park spaces or increase perceptions of safety along important connector trails.
10. Establish an accessible, naturalized network of trails and corridors by:
 - Proactively developing new natural surface trails and accompanying trail corridor landscaping elements as an integrated unit during construction (to anticipate desired routes)
 - Aligning and constructing new natural surface trails to mimic the existing escarpment trail (i.e., slight meanders) and to add interest and a natural feel
 - Constructing trail treads to provide a smooth travel surface with positive drainage
11. Create a participatory neighbourhood planning opportunity to select the Phase 2 elements for the central park, using the RPJMP engagement results as a starting point.
12. Consider opportunities to involve neighbourhood residents in the planning and future stewardship of the Chasàn Chuà/McIntyre Creek Regional Park (this is consistent with KDFN Community Lands Plan Wildlife Policy #2).
13. Work with the City of Whitehorse to develop an implementation plan for Point Park, linear park, and trail network commitments made in the 2014 Range Road North Neighbourhood Plan.
14. Work with the City of Whitehorse to explore options for fulfilling some of the amenity space requirements for multi-family residential developments through contributions to the central park space.

Refer to Figure 11 for neighbourhood character examples for inspiration and guidance in implementing the parks, open space and trails policies. A recommended native plant list is included in Appendix E.

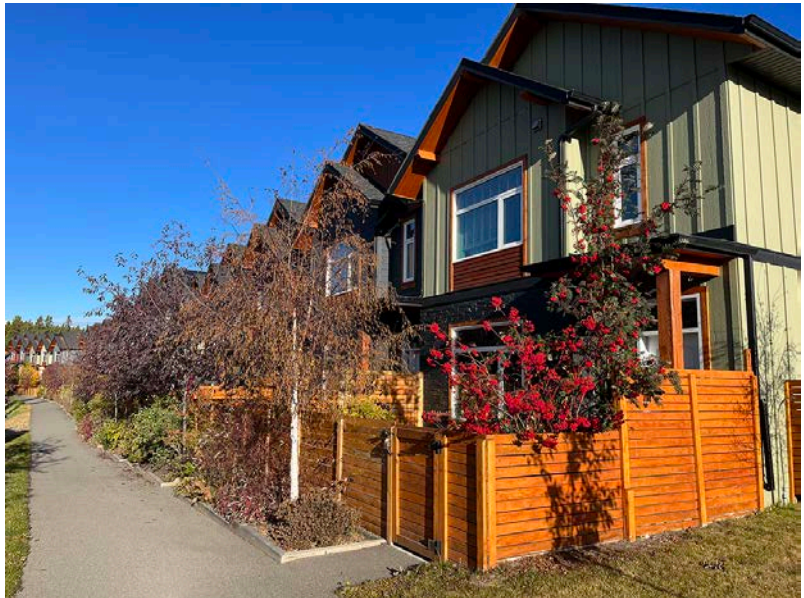
Figure 11. Neighbourhood character examples – parks, open space and trails



Above: samples of native plants
Below: crushed granular pathway and lighting



1.5-2.0m wide natural surface trail on the McIntyre Creek escarpment



Sensitive, semi-transparent transition between public and private spaces



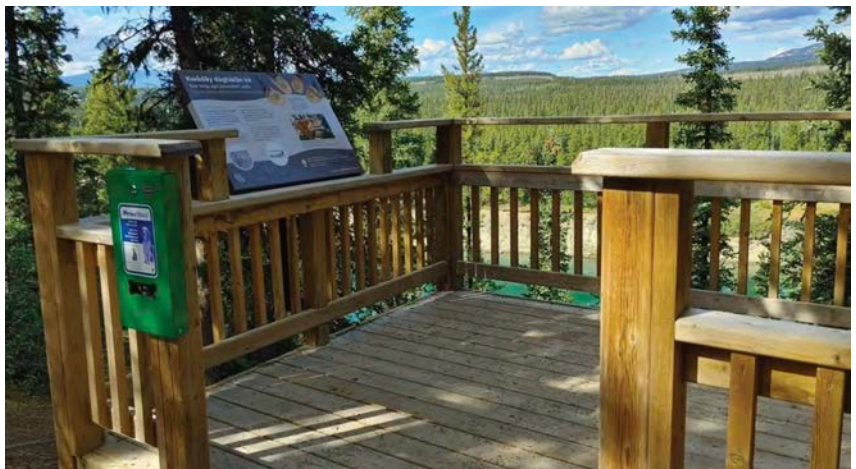
Nature-themed wayfinding



Seating with natural elements



Fire circle and natural seating



Viewing deck and interpretive panel



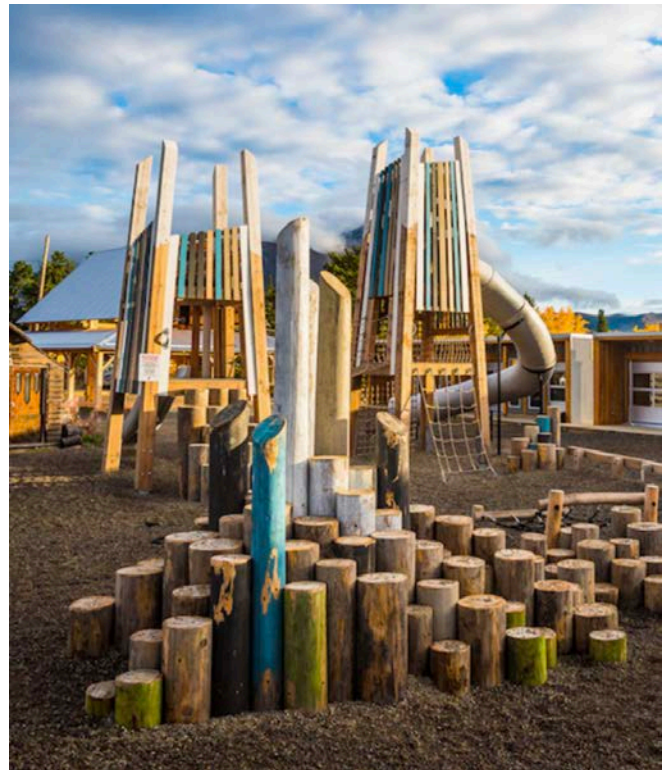
Community garden



Bicycle playground nature-themed features



Bike skills park features



Natural playground inspired by a First Nation creation story

4.4 Public Utilities

0.57 hectares of the new development will be allocated to public utility functions. These are described in the following sections, as well as Section 5.0 and Appendix F.

4.4.1 Lift station

A sanitary lift station, sized approximately 8x10 metres, will be located in the southwestern corner of the development site on Lot 262-6. A generator, pumps and control systems will be located inside the building, while the wet well will be located outside. A 6-metre wide gravel access road (with a 9-metre right-of-way) will connect from the paved road network. A separate, public utility zoned parcel will be created to house the access road and lift station. The property will be fenced and gated. This lift station will be highly visible to escarpment trail users and Mountain View Drive traffic, and negative aesthetic impacts should be avoided to the extent possible.

4.4.2 Stormwater pond

The new RPJMP development will alter the surface drainage regime via introduction of impervious surfaces, grading, and direct drainage routes. Best practice dictates that stormwater should match pre-development discharge conditions (i.e., flow rates, water quality, and discharge locations) to receiving waterbodies. This will be achieved with a dry stormwater management pond (SWMP) in the northeastern corner of the site on C-6B.

The proposed SWMP will limit discharge to the 1-in-5 year pre-development discharge rate and will be sized to temporarily store the difference between the pre-development and post-development flow rates. The pond will be designed to have a maximum depth of 3 metres during the 1:5 year storm event and will include an emergency overflow structure to safeguard the surrounding land parcels. Refer to Section 5.4 for more details on the pond outflow.

The stormwater pond presents a specific landscaping need. The pond will be dry for most of the time, but the bottom will need to be erosion resistant during high water events. The pond's 4:1 sideslopes on its north and eastern edges will lend it the appearance of a gradual slope and crowning plateau ranging from 1-3 feet high from the adjacent trail; residents in the multi-unit residential parcel to the south will see a depression. In both cases, landscaping will be installed to create sensitive transitions between both residential and natural spaces and this engineered earthen feature, as well as avoid the establishment of undesirable invasive species. Refer to Figures 12 and 13 for a conceptual landscaping approach.

Access to the pond for maintenance purposes would ideally be provided from the interior of the development site to avoid the construction of a 6-metre access road (within 9-metre right-of-way) across the perimeter trail corridor connecting the escarpment to the crossing to the Point (and negatively impacting trail user experience in the process). A 9-metre access easement should be registered across the parcel adjoining the pond; this would overlap with the corridor required for access to and maintenance of the northernmost section of storm main (refer to Section 5.4).

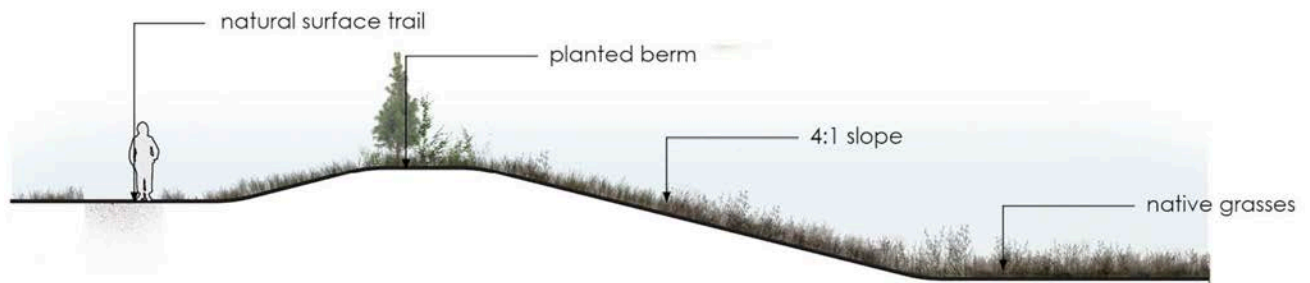


Figure 12. Profile view of stormwater pond landscaping adjacent to trail corridor

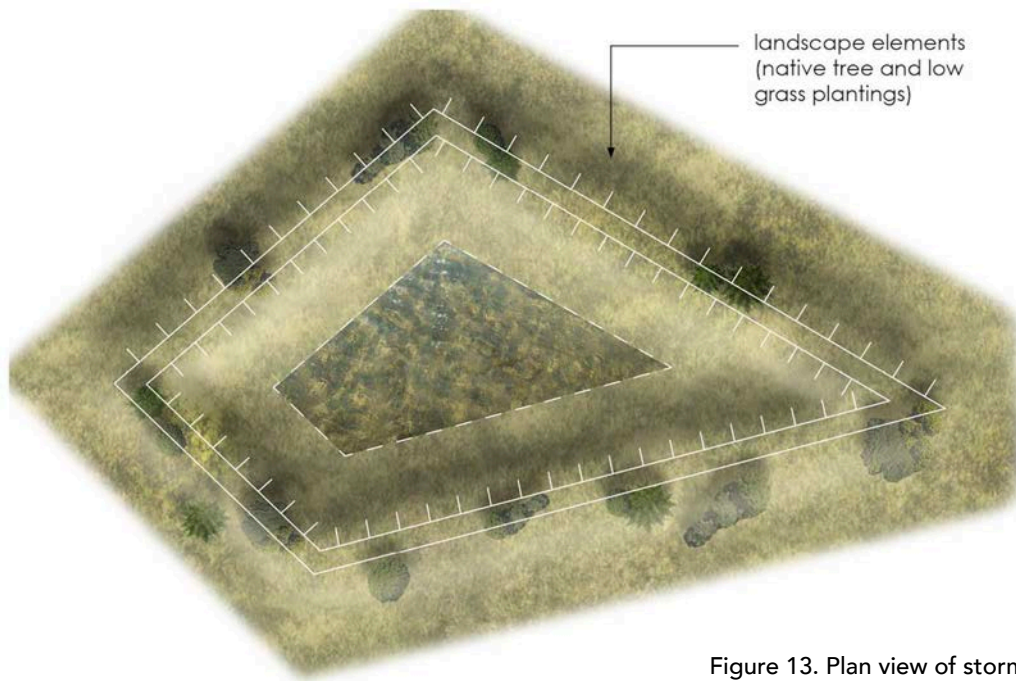


Figure 13. Plan view of stormwater pond landscaping

Refer to Figure 14 for neighbourhood character examples for inspiration and guidance in implementing the public utilities policies.

4.4.3 Public utilities policies

1. Ensure access to the SWMP and connecting mains via an easement through the adjacent parcel.
2. Consider lift station and associated fencing design and material choices that integrate well with the adjacent escarpment landscape.
3. Landscape the stormwater pond using native species to integrate with the adjacent trail corridor and utilize native low grass and wildflower mix (unmowed) for the bottom of the stormwater pond.

Figure 14. Neighbourhood character examples – public utilities



Proposed City of Calgary lift station design using wood and natural design elements



Proposed City of Calgary lift station design for a park space



Vegetated dry stormwater pond

5.0 Neighbourhood Infrastructure and Services

The provision of infrastructure at the level of urban servicing is essential to meet the needs of the new RPJMP development. Infrastructure will aim to be cost effective, respect the environment, and conserve water and energy resources. While identified conceptually in the Master Plan and specific infrastructure requirements will be determined as part of the development agreement with the City and detailed engineering design.

The following section and the Transportation Plan and Utilities Plan in Appendix B offer a general description of infrastructure. More detail is provided in the preliminary engineering designs and accompanying technical memorandum included in Appendix F.

5.1 Transportation Network

5.1.1 Automobile travel

- ***Existing road network***

The new development is situated west of Range Road, a northbound-southbound two-lane undivided Minor Collector Road with a posted speed of 50 km/hr. Mountain View Drive is a northbound-southbound two-lane undivided arterial road that provides major connection between downtown and the neighbourhoods on the north end of the city, primarily Whistle Bend and Porter Creek. Mountain View Drive and Range Road intersect about one kilometre south of the new development. This signalized intersection will serve as the main access point to and from the new development. The alternate access will be the intersection of Whistle Bend Way and Range Road, about 1.5 kilometres to the north.

The southern portion of Range Road North was reconstructed in 2012 and there is a marked cycling lane and separated paved pathway on the west side of the road. The reconstruction ends at Crow Street. The reconstruction of the northern portion of Range Road has been committed to by the City but timing is unconfirmed at this point.

- ***New road network***

The Master Plan sets out a simple road network oriented around the central block and two accesses, a southern entrance on Lot 262-6 and northern entrance on C-15B. The location of new accesses from the development to Range Road follows the Transportation Association of Canada's Geometric Design Guide for Canadian Roads standards for minimum intersection spacing and sight distances. A cul-de-sac spurs off the central block to provide access to the small cluster of single family homes on the western escarpment.

The road right-of-way is 20 metres wide, with two 4.5-metre shared driving lanes designed to accommodate on-street parking. This conforms with the City of Whitehorse's Servicing Standards Manual (SSM) for local roads and is the standard being applied to similar road networks throughout new neighbourhoods such as Whistle Bend. The road network reflects Complete Streets principles by including traffic calming features such as on-street parking and street trees. Additional measures could be taken to maximize safety.

- **Traffic-oriented improvements**

A Traffic Impact Analysis (TIA) conducted for the RPJMP project predicted that 27% of vehicle trips generated by the new development will be northbound, with the remaining 73% southbound. The TIA modeled traffic impacts at the 2032 and 2042 horizon years and made several recommendations for improvements. Refer to Table 7.

Table 7. Summary of traffic improvement recommendations

Year	Traffic Issue	Recommended Improvement
2032	• Eastbound left turn and through movement at Mountain View Drive and Range Road is expected to approach or exceed capacity during the PM peak hour at minimum housing count • Westbound left and right turn movement at the Whistle Bend Way and Range Road is expected to perform with long average delay during PM peak hour at minimum housing count	• New intersection configuration is recommended for Mountain View Drive • Monitoring
2042	• Eastbound left turn and through movement at Mountain View Drive and Range Road is expected to approach or exceed capacity during the PM peak hour at minimum housing count	• Minor adjustments to signal timing

Background traffic conditions – specifically the impacts of continued Whistle Bend build-out on Range Road and Mountain View Drive - are the more significant issue. The TIA noted that, even without the new development, the Mountain View Drive/Range Road intersection is expected to operate at the lowest Level of Service with high delays and volume to capacity ratios by 2032 and cites the improvements recommended in the 2012 TIA for Whistle Bend, which include widening Mountain View Drive to four lanes and signal timing/phasing at Range Road/Mountain View. (Note that the same TIA recommends additional improvements to manage traffic by 2042).

5.1.2 Active travel modes

- **Walking**

The proposed road network meets key requirements for Complete Streets that accommodate all modes of travel safely. Pedestrian traffic will be accommodated with 1.5-metre wide sidewalks buffered from the vehicle lanes by street trees. Multiple internal crosswalks facilitate internal pedestrian circulation. Three marked pedestrian crosswalks are envisioned for Range Road, one at each road access, and another at a proposed new crossing to the north of the development.

The northern crossing is intended as a “compromise” intervention to a potentially problematic situation. Currently, pedestrians cross Range Road in the middle of the curve when traveling between the escarpment trail and the trails and Point Park site east of Range Road. Sight lines are poor in the curve, making this crossing dangerous, although the current volume of pedestrian traffic and vehicle traffic is relatively low. The addition of 890 new residents to this corner of Range Point, combined with a future Point Park and increased traffic along Range Road will likely increase the potential for collisions. Pedestrians are unlikely to detour 220 metres south along Range Road to make the crossing at the road entrance. This northern pedestrian crossing reduces that distance to about 100 metres and is uses an advance warning light for eastbound vehicles. YG and KDFN will work with the City to determine whether the crossing is possible and desirable at that location during detailed design.

One section of 2-metre wide paved pathway is planned for the interior of the neighbourhood, along with a 2-metre paved pathway on the west side of Range Road (see below section). The Plan contemplates an additional east-west trail paved pathway connection to Range Road through the medium-high density (RM zoned) parcel. A trail connection here should be confirmed in the detailed design phase, pending consideration of how a trail could be formalized (i.e., easement, public access trail, or private amenity requirement) and implications to construction costs and development/market implications of creating two parcels (instead of one).

- **Cycling**

A dedicated cycling lane was not deemed necessary and cycling within the development will be accommodated either on the sidewalks or within the shared driving lane. Class 2 bicycle parking (i.e., bike rack) is provided at the central park space. The Zoning Bylaw will provide guidance on bicycle parking for multi-family residential buildings.

A 2-metre paved pathway on the west side of the Range Road right-of-way, planned as part of pending road upgrades, will extend from the southern limit of the subdivision to the planned crossing to future Point Park. The City has indicated some potential for the trail between Northland Park and Lot 262-2 to be incorporated into the preferred routing of a future Whistle Bend connector paved pathway.

5.1.3 Transit

There is currently transit service to the Range Point neighbourhood. While specific future transit routing is unknown, the plan anticipates that the new development will be serviced via two stops situated just south of the two road access points along Range Road. This represents a 375-metre maximum walking distance between residences and transit, which meets the 400-metre standard the City is working to achieve. Depending on routing at the time of build-out, an additional stop could be included along the central road loop and buses could use the neighbourhood as a turn-around point.

5.1.4 Parking

Parking will largely be dictated by the requirements set out in the Zoning Bylaw. For single family and duplex, a minimum of one off-street parking space is required. For multi-family buildings, which may or may not be ground-oriented, the minimum requirement is one off-street space per dwelling unit and one additional space for visitor parking per seven dwelling units. A brief comparative analysis for the TIA determined that this requirement may be insufficient and recommended increases, but this may hinder developer flexibility and increase building costs without an equivalent benefit.

The Zoning Bylaw sets out a minimum of 7.3 metres for an on-street parallel parking space. There are theoretically about 104 linear metres of street available next to the single family and duplex housing in the development⁴. Efforts should be made to maximize the amount of that available on-street space to facilitate parking. The City has encountered challenges with on-street parking with more recent developments in Whistle Bend and the details around on-street parking will need to be confirmed as part of development agreement discussions.

⁴ This assumes that triplexes are built on the two multi-family unit lots and each duplex, single, and triplex unit has a six-metre wide driveway (the maximum under the Zoning Bylaw). It also assumes that both sides of the street are available for on-street parking.

5.1.5 Recreational motor vehicles

The City's Snowmobile Bylaw and All-Terrain Vehicle (ATV) Bylaw establish the rules for recreational motor vehicles within the municipal boundary. ATVs are confined to motorized multiple use (MMU) trails, whereas snowmobile movement is generally less restricted. Both are allowed to use City streets for the purposes of connecting to the nearest MMU trail and/or permitted open space.

Currently the City's MMU trail network includes the portion of the west escarpment trail. The extension of this MMU trail further north does not align with the Master Plan and intended quality of experience along the escarpment trail; in fact, this activity may be better suited for the expansive Range Road corridor. The relocation of this routing away from the escarpment trail should be considered as part of trail network discussions with the City.

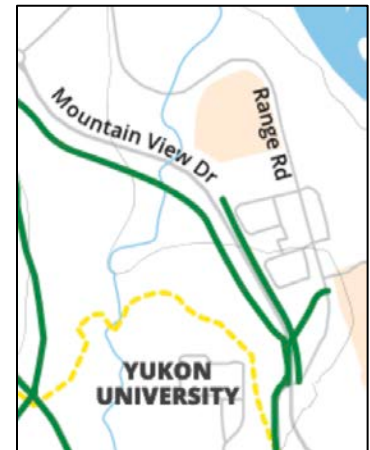


Figure 15. Motorized multi-use trail routing (shown in green) in Range Point (Source: City of Whitehorse)

5.1.6 Transportation policies

Notwithstanding the landscaping and amenity space requirements set out in the Zoning Bylaw, the following policies are intended to provide reinforcing and/or supplementary guidance to the RPJMP partners and builders in fulfilling the vision and intent of the Plan:

1. Ensure the pending reconstruction of the north section of Range Road complements the new development by:
 - Considering traffic calming measures in the detailed design, including the incorporation of the new crosswalks and proposed advance warning signal
 - Coordinating reconstruction with the connection of water mains to minimize disturbances to a newly reconstructed roadway
 - Revisiting the speed limit along Range Road to ensure safety for the pedestrian crossings
 - Creating a well-lit transportation corridor
2. Consider additional traffic calming approaches in final design of the RPJMP site road network by:
 - Considering traffic calming measures such as curb extensions and raised crosswalks in the detailed design
 - Considering reducing the internal road speed limit to 30 km/hr to encourage safety and comfort for pedestrians and cyclists
3. Revisit the potential for and merit of an east-west paved pathway connection through the medium to high density parcel adjoining Range Road during detailed design.
4. Incorporate First Nation language, legend, stories, and place names into road and street signage.
5. Provide winter maintenance to active transportation networks.

6. Increase transit service frequency to Range Road and consider supporting transit enhancement measures such as better transit information and improved transit stops.
7. Examine opportunities to integrate the new development with a paved Whistle Bend to Marwell pathway.
8. Revisit the Range Point snowmobile and ATV routing and confirm access points for the new development.

5.2 Water Servicing

The new subdivision will be serviced from the 450mm ductile iron watermain located within the Range Road right-of-way. Two watermain tie-in connections, each located at the road accesses, will provide more pressure, improved circulation and water quality, and frost protection redundancy in the event of repairs. A water model will be needed during detailed design to determine the required pipe diameters for fire flow and pressure requirements. All lots will be provided with recirculating water service stubbed 3 metres into the property, as per the City's SSM.

5.3 Sanitary Servicing

The Master Plan proposes servicing the development via a new forcemain located within the Mountain View Drive right-of-way along the perimeter of Northland Park and connecting to the Marwell Collection System via the sanitary sewer main just north of the intersection of Mountain View Drive and Range Road. The forcemain will extend from a lift station situated on newly created public utility parcel at the western end of Lot 262-6, accessed via a 6-metre gravel road and fenced for security. The sanitary sewer pipe network will be located within the road right-of-way and all lots will be provided with sanitary services stubbed three metres into the property, as per the SSM.

Refer to Section 4.4.3 for policy guidance on the lift station.

5.4 Stormwater

The new development will alter the surface drainage regime via introduction of impervious surfaces, grading, and direct drainage routes. Best practice dictates that stormwater should match pre-development discharge conditions (i.e., flow rates, water quality, and discharge locations) to receiving waterbodies. This will be achieved through the construction of a dry stormwater management pond (SWMP).

The proposed dry pond will limit discharge to the 1-in-5 year pre-development discharge rate and will be sized to temporarily store the difference between the pre-development and post-development flow rates. The pond will be designed to have a maximum depth of 3 metres during the 1:5 year storm event and will include an emergency overflow structure to safeguard the surrounding land parcels. During significant (i.e., 1:100 year) events, stormwater will be conveyed overland on the roadway to outlets at both the north and south road entrances, where they will discharge into the western Range Road ditch and on to the existing City stormwater conveyance system. Further investigation will be needed for these discharge points during detailed design to confirm whether erosion protection is required.

The routing of the stormwater pond outfall warrants further consideration. The toe-of-slope on the escarpment on the south side of the Chasàn Chuà/McIntyre Creek culvert on Range Road is more vulnerable to mass movement and erosional processes than the north side. While discharge is designed to meet pre-development rates, there may be merit in conveying pond outflow underneath Range Road to run along the north ditch, where it would discharge downstream of the culvert.

Refer to Section 4.4.2 for policies specific to the pond.

5.4.1 Stormwater policies

1. Ensure access to the northernmost section of storm main via a 9-metre easement along the eastern edge of the northeast multi-unit parcel on C-15B.
2. Further investigate the potential geotechnical implications of the two stormwater outfall routing options and determine whether the additional cost of crossing Range Range is warranted.
3. Review the major storm outlets during detailed design to determine if any erosion protection is required.

5.5 Power and Communications

There is currently an overhead three-phase power line and cable Internet (copper coaxial cables) located along the Range Road North corridor. New development will trigger the need to extend fibre optic line from Whistle Bend, which will ultimately benefit the broader neighbourhood. At the time of writing, ATCO Electric staff are reviewing the Master Plan concepts; the expectation (based on previous discussions) is that no offsite upgrades will be required to service the new development.

Street lighting, power and telephone/cable services will run underground following road alignments. Utility easements or right-of-ways must be acquired where services are located outside road limits, and shallow utilities will need to be coordinated to avoid conflicts with water and sanitary servicing to lots.

5.6 Granular Material

Granular material will be required for many aspects of development, including roadway construction, underground utilities installation (i.e., water, sewer, storm, and power and communications lines). Quantity estimates are as follows:

- Pit run – 21,000 m³
- Granular A – 16,000 m³
- Granular B – 16,000 m³

Note that these estimates are very preliminary (50% level of accuracy).

5.7 Other Municipal Services

As per other established neighbourhoods such as Whistle Bend, the Master Plan anticipates that miscellaneous services, such as snow removal and garbage/compost removal, will be arranged for by strata councils on multi-unit developments and snow removal on streets will be provided by the City.

The City has been working towards the consolidation of its snow storage locations throughout Whitehorse. There is currently no municipal snow storage in the Range Point neighbourhood. The plan assumes that the City will transport snow to the nearest storage location.

5.8 Neighbourhood Services

The Master Plan does not explicitly provide for any neighbourhood-serving commercial and/or public/institutional uses. However, a preliminary commercial potential analysis conducted during the background research phase identified some potential, particularly given the current lack of services in the Range Point neighbourhood. Future residents will presumably access services outside of the neighbourhood, the nearest service centre being the future commercial area of Whistle Bend (along Keno Way) or downtown. Two elementary schools (Takhini and the one currently under construction in Whistle Bend) are located within two kilometres of the development site. Porter Creek Senior Secondary School is located about 3.5 kilometres away.

There is also a 3.3-hectare Neighbourhood Commercial zoned parcel at the northeast side of the Range Road and Mountain View Drive intersection that may be developed in the future and would presumably accommodate some of the service demand generated by the new development.

5.8.1 Neighbourhood services policies

1. Consider rezoning, as needed, to allow for mixed use development on the C-15B parcels closer to Range Road.

6.0 Implementation

The Master Plan marks a key milestone in the two years of collaborative partnership between KDFN and YG. Its precedent-setting nature posed new questions along the way. As the plan transitions to implementation, flexibility and innovation will be required from the RPJMP partners and City of Whitehorse. The following section touches on the key tasks and strategic considerations that must be navigated to successfully implement the Master Plan.

6.1 Regulatory and Other Processes

6.1.1 Existing survey plan

The plan for Lot 262-6 was registered in 1988. The current practice in Yukon is to raise title for all parcels created in a survey plan at the time of registration with LTO. Title was not raised for Lot 262-6 in 1988 and City Land and Building Services staff recommended that LTO be consulted to ensure that the pre-existing survey plan and the parcel's untitled status do not pose issues when the new plan of subdivision is prepared and submitted for registration.

6.1.2 *Yukon Environmental and Socioeconomic Assessment Act*

Section 47(2)(b) of the *Yukon Environmental and Socioeconomic Assessment Act* (YESAA) requires an assessment for land development by either YG or KDFN. In addition, the development will trigger numerous activities listed under Schedule 1 of the Act, including:

- Construction, modification, or decommissioning of a public road, including a public road used only in winter (Part 6.10);
- Moving earth or clearing land using a self-propelled power driven machine (Part 13.12); and
- Leveling, grading, clearing, cutting or snow ploughing of the right-of-way of a power line, pipeline, railways line or road (Part 13.13b).

The YESAA assessment is anticipated to be a Designated Office level screening.

6.1.3 City of Whitehorse

Once the master plan is approved by Council, the RPJMP partners can rezone the entire development area (C-15B, Lot 262-6 and the unsurveyed triangle of Commissioner's land) as per the Zoning Plan in Appendix B. Rezoning will in turn facilitate the next step, the negotiation of a development agreement and subdivision approval.

A development agreement will be negotiated and signed between the RPJMP partners and City as a condition of subdivision and eventual transfer of roads, utilities, and public space to the City. The draft plan of subdivision will be reviewed for compliance with the *Subdivision Control Bylaw* in terms of the 10% public lands allocation and the approved draft plan will allow detailed engineering to proceed.

Detailed engineering design will be reviewed by the City for assurance that it meets the SSM. A construction completion certificate will be issued once the infrastructure is developed, followed by a warranty period and final acceptance certificate, which triggers the transfer of the new land and infrastructure by the City.

In addition to the development agreement, the City and KDFN will negotiate a service agreement setting out roles and responsibilities with respect to infrastructure and municipal service provision on C-15B. This agreement will need to respect the principles set out within the SGA. There is already precedent for this with the McIntyre subdivision, and the City's current negotiations with Chu Nii Kwän Development Corporation around the pending Copper Ridge subdivision should provide guidance. Due to KDFN's inability to transfer ownership of Settlement Lands, an alternate arrangement will also need to be captured in the agreement between the two governments.

6.2 Development Financing and Sequencing

The RPJMP partners have engaged in ongoing discussions around how to finance infrastructure development on both parcels in a manner that recognizes the high capital costs involved, KDFN's current financial capacity, and long-term income tax revenues that will transfer from future residents of C-15B to KDFN. The final arrangement may be precedent setting and accordingly require that new policy be developed by YG to ensure a coherent and consistent approach to other First Nations interested in undertaking land development in the future.

Infrastructure costs, whether assumed by YG and/or KDFN, could potentially be eligible for federal and/or other funding, with KDFN potentially eligible for First Nation-specific funding. Financing agreements will need to address cost sharing for the considerable project administration and consulting work that is yet to come, including detailed engineering design. One of the most challenging issues to navigate in this respect is the fair attribution of development costs to each partner. Each partner's respective contributions to parks and utility space that benefit the entire development, as well as housing unit contributions, could be factored in. The Range Road forcemain commitment made by YG as part of the Whistle Bend Yukon Asset and Construction Agreement with KDFN will also factor in.

The RPJMP partners plan to develop the site in one construction phase, pending the outcome of detailed design. The expectation is that YG will tender the work as it would for Whistle Bend or other new land development in Yukon. Construction will start with site grading, road construction, installation of deep utilities (i.e., water, storm and sanitary) and lift station and stormwater pond construction. Road surfacing, curbs and sidewalks, and installation of parks and landscaping will be completed in the final steps.

6.2.1 Development financing and sequencing policies

1. Negotiate a principles-based allocation of development costs based on benefits, provision of public services and amenities, housing densities, density contributions to OCP compliance, and previous funding commitments.
2. Work with the City to time reconstruction of Range Road North to align with the Range Road watermain connection for the new development.
3. Work with the City to cooperatively to integrate Range Point neighbourhood trail planning with trail design and installation of new trail alignments and accompanying signage.

6.3 Land Dispositions

KDFN's *Lands Act* is the enabling legislation for residential leases on C-15B. Residential leases are intended to provide long term tenure. Recent leases have provided a term of 125 years, and include mechanisms to maintain the value of the property, such as clauses on lease renewal. Most residential leases will require that "rent" be paid in full at the beginning of the lease term. With a lease registered in the Land Titles Office, leasehold purchasers may seek a mortgage with a financial institution, just as with a freehold title purchase. KDFN continues to work through policy and operational details associated with residential leasing.

Section 27 of the Act requires that KDFN give Citizens and Beneficiaries the opportunity to apply for an interest in respect of a planned development parcel prior to the general public. This provision will require additional policy and operational work in order to apply it to the Range Point multiple unit parcels. While KDFN has not yet determined the development model for C-15B, it will likely sell multiple unit leases to developers, who will build on them for resale as individual strata leasehold lots.

On most land development projects, YG will retain a third party appraiser to determine market pricing for lots to be made available by land lottery. Services are installed, final survey plans registered at Land Titles, and prepared lots are released to market at the appraised prices.

Given the importance of this neighbourhood in establishing a positive "brand" in the Whitehorse real estate market, the RPJMP partners should consider the issue of competition between the fee simple and leasehold tenures on Lot 262-6 and C-15B. Much of this will depend on KDFN's decision on leasehold pricing; if it adopts differential pricing (which occurs in markets such as Metro Vancouver and the Okanagan), this may be a lesser concern.

6.3.1 Land disposition policies

1. Ensure conformance with the provisions of the KDFN *Lands Act* in disposing of leasehold interests on C-15B.
2. Utilize the Master Plan report as a cornerstone for partner solicitation for the multi-unit parcels on C-15B.
3. Consider mechanisms to avoid inequity between lot offerings on Lot 262-2 and C-15B.

6.4 Next steps

The implementation of this Master Plan is anticipated to occur over the next few years, starting with the document's formal endorsement in 2023 and ending with the release of lots to the marketplace. Refer to Table 8 for an outline of key tasks and responsibilities moving forward. Note that many of these tasks will be undertaken concurrently, with some overlap.

Table 8. Preliminary implementation workplan

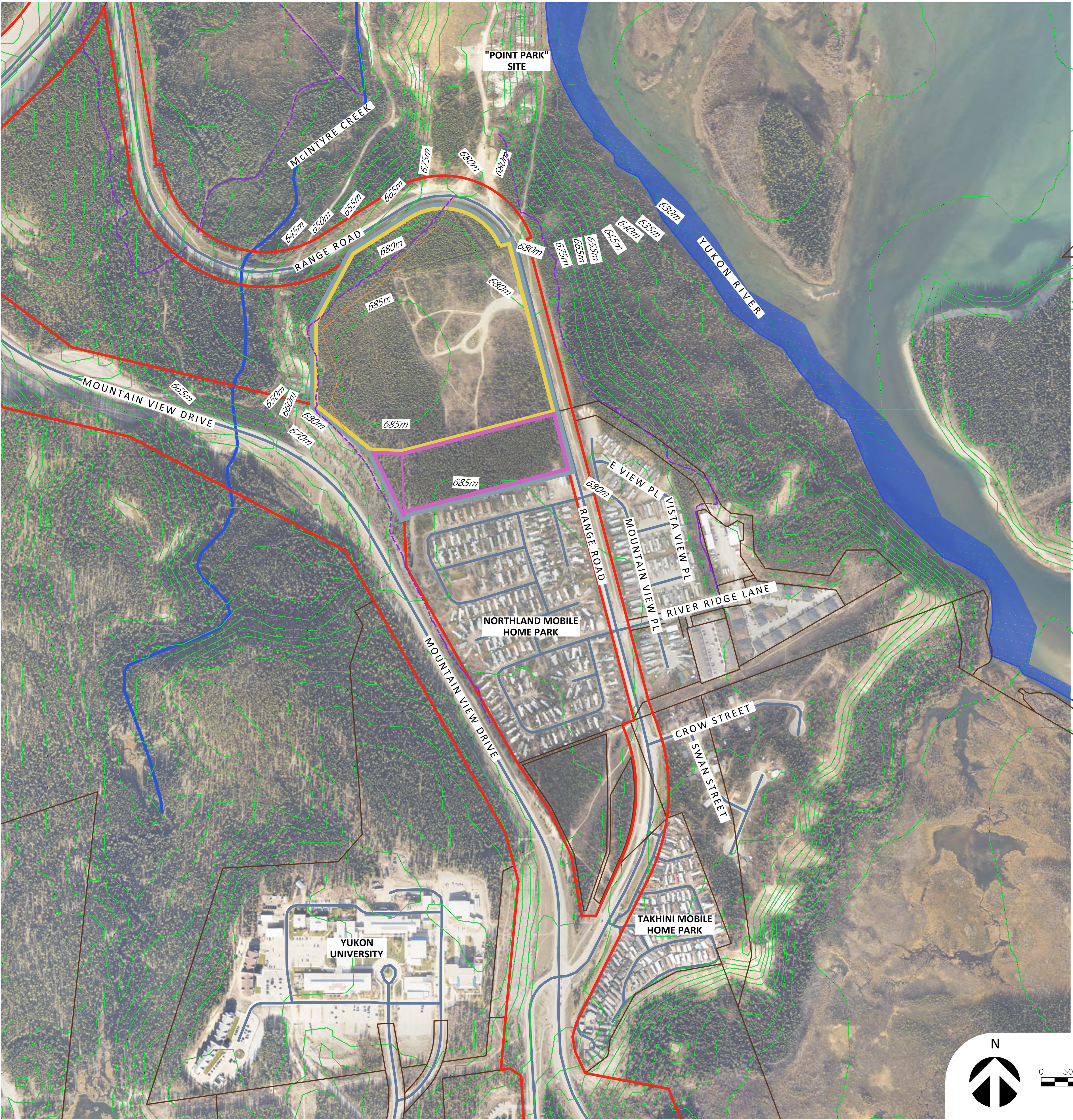
Task	Parties Involved	Anticipated Timeframe
Obtain Council endorsement	City	1-2 months
Initiate/complete YESAA application and review	YG, KDFN, YESAB	3-6 months
Apply for rezoning	YG, KDFN	3 months
Conduct further geotechnical testing	YG, KDFN	1-2 months
Prepare subdivision application	YG, KDFN, City	2-3 months
Prepare detailed engineering design	YG, KDFN	3-6 months
Establish development and service agreements (for subdivision approval)	YG, KDFN, City	3-6 months
Establish development financing agreement	YG, KDFN	2-3 months
Prepare construction tender	YG	3 months
Install infrastructure	YG, KDFN, City	2 years
Install parks and landscaping	YG, KDFN, City	3 months
Transfer assets to City	YG, KDFN, City	Unknown
Prepare land lottery and release of single/duplex/multi-family lots	YG, KDFN	3-6 months

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- Tetra Tech Canada Inc. May 2021. Geotechnical Evaluation – Lot 262-6. Prepared for the Government of Yukon Community Services.
- Vector Research. July 2018. Yukon Government Scoping Analysis for First Nation Settlement Land Development. Prepared for Yukon Land Development and Land Management Branches.
- WSP. 2020. Whistle Bend Future Areas & Town Square: Environmental & Socio-Economic Assessment Report (YESAB Application). Prepared for City of Whitehorse.
- Yukon Bureau of Statistics. 2021. Age, sex at birth and gender, and type of dwelling: Census 2021. Retrieved from: <https://yukon.ca/sites/yukon.ca/files/ybs/fin-age-sex-at-birth-and-gender-and-type-dwelling-census-2021.pdf>

APPENDIX A

Site and Context Maps



LEGEND

- SITE AREA
- KDFN C-15B PARCEL
- LOT 262-6 GROUP 804 PARCEL
- LOT 262-6 / UNSURVEYED CROWN LAND
- CADASTRAL BOUNDARIES
- ARTERIAL ROAD ROWs
- ROADS
- CONTOUR (5m) INTERVALS
- WATER BODIES
- TRAILS
- 30m SET-BACK FROM TOP OF SLOPE

Prime Consultant



GROUNDSWELL
PLANNING

Subconsultants

Across the River Consulting



kobayashi+zedda

LEFS
ASSOCIATES

Landscape Architects
8 Bowser Crescent, Whitehorse, Yukon Territory, Canada T1A 4K3
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Revisions

No.	Date	Status	By
1	FEB. 09, 2021	DRAFT ISSUE	SD
2	FEB. 18, 2021	DRAFT ISSUE	SD
3	MAY 21, 2021	DRAFT ISSUE	SD

DRAWING PROJECTION

nad83(CSRs) / UTM zone 8N or EPSG: 3155 in metres

Client



Yukon

Project



Drawing Title

CONTEXT PLAN

Date
FEBRUARY, 2021

ELAC Project No.
20-539

Scale (On 22 x 34 Inch Sheet)
As Noted

Drawing No.

Drawn By
SD

1.0

Checked
HR/JK



LEGEND

- SITE AREA
- KDFN C-15B PARCEL
- LOT 262-6 GROUP 804 PARCEL
- LOT 262-6 / UNSURVEYED CROWN LAND
- CADASTRAL BOUNDARIES
- ARTERIAL ROAD ROWs
- ROADS
- CONTOUR (1m) INTERVALS
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Across the River Consulting



kobayashi+zedda



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DRAWING PROJECTION
nad83(CRS) / UTM zone 8N or EPSG: 3155 in metres

Client



Project



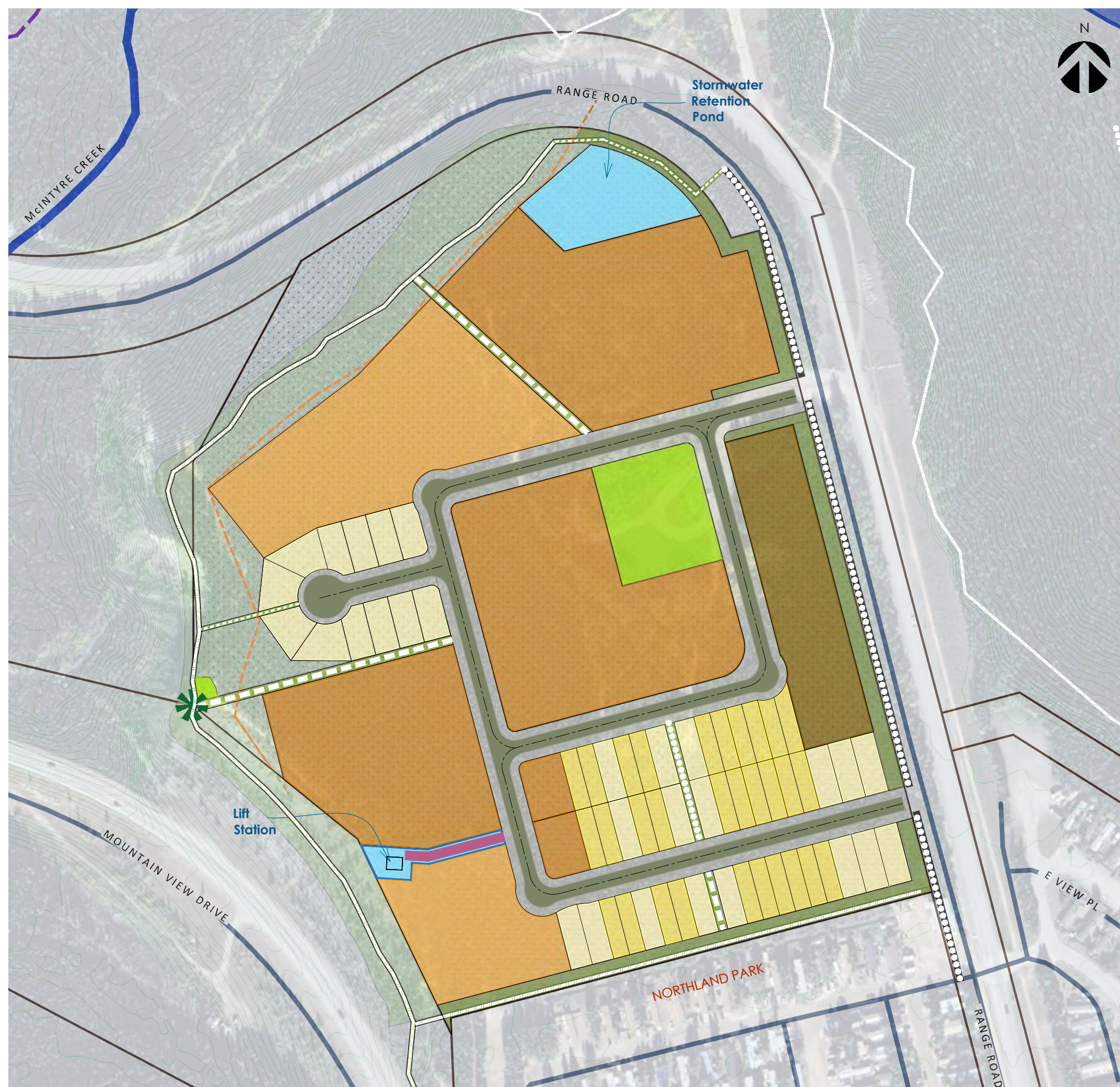
Drawing Title

SITE PLAN

Date FEBRUARY, 2021	ELAC Project No. 20-539
Scale (On 22 x 34 Inch Sheet) 1:1500	Drawing No. 1.1
Drawn By SD	
Checked HR/JK	

APPENDIX B

Neighbourhood Concept Drawings



NEIGHBOURHOOD PLAN

Spring 2023



LEGEND

Housing/Development Type

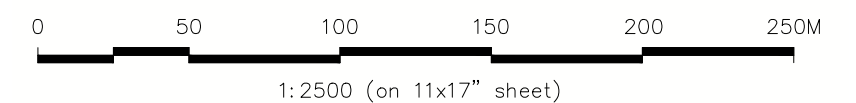
- Single detached home
- Duplex
- Cottage cluster housing
- Multiple unit building - medium density
- Multiple unit buildings - medium to high density

Parks and Trails Features

- Treed buffer/gateway landscaping
- Perimeter greenspace
- Neighbourhood park and trail corridor
- Natural surface trail
- Paved pathway
- Pocket park

Other

- Settlement Land parcel C-15B (KDFN)
- Lot 262-6 (YG)
- Existing or proposed lot boundary
- Road ROW
- Road w/centreline
- Geotechnical setback
- Utility



Clients:



Lead Consultant:



Drafting:

LEES
ASSOCIATES



LAND USE PLAN

Spring 2023



LEGEND

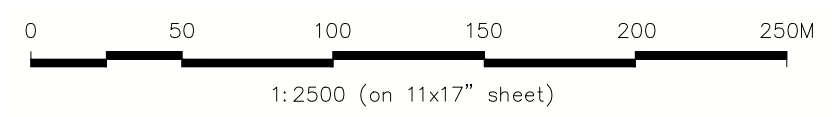
Land Uses

- %8 - Single detached home
- %6 - Duplex
- %13 - Cottage cluster housing
- %27 - Multiple unit building - medium density
- %5 - Multiple unit buildings - medium to high density
- %5 - Treed buffer/gateway landscaping
- %14 - Perimeter greenspace
- %6 - Neighbourhood parks and trails
- %13 - Road and road ROW
- %3 - Utility

Other

- Settlement Land parcel C-15B (KDFN)
- Lot 262-6 (YG)
- Existing or proposed lot boundary
- Geotechnical setback

Note: Percentages are based on the total development area with colour/shading applied.



Clients:	Lead Consultant:	Drafting:
 Yukon	 GROUNDSWELL	 LEES ASSOCIATES



HOUSING PLAN

Spring 2023



LEGEND

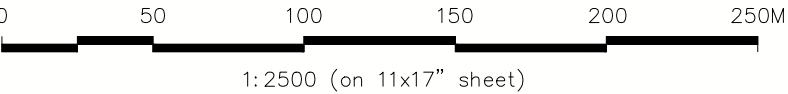
Housing/Development Type	Density (units/10,000m ²)	Total Units
- Single detached home	n/a	29
- Duplex	n/a	30
- Cottage cluster housing <i>(multiple single, duplex, triplex)</i>	15-55	35-129
- Multiple unit building - medium density <i>(apartment, fourplex, townhouse, triplex)</i>	25-50	134-267
- Multiple unit buildings - medium to high density <i>(apartment, fourplex, townhouse, triplex)</i>	25+	22-68*

*A RM zone maximum density of three times minimum was assumed for the purposes of projecting housing unit totals and averages.

TOTALS	250 - 523*
Median Estimate	386.5 units

Other

- Parks, trails and greenspace
- Settlement Land parcel C-15B (KDFN)
- Lot 262-6 (YG)
- Existing or proposed lot boundary
- Road and road ROW
- Geotechnical setback
- Utility



Clients:



Yukon

Lead Consultant:



GROUNDWELL
ST. ANNE-BAY

Drafting:

LEES
ASSOCIATES



ZONING PLAN

Spring 2023



LEGEND

Development Area Zones

- RCS2** – Comprehensive Residential Single Family
- RCM3** – Cottage Cluster Homes
- RCM** – Comprehensive Residential Multiple Family
- PE** – Environmental Protection
- PR** – Parks and Recreation
- RM** – Residential Multiple Housing
- PG** – Greenbelt

Adjacent Area Zones

- RP** – Residential Mobile Home Park
- RMx(c)** – Residential Multiple Housing - special modifications

Other

- Settlement Land parcel C-15B (KDFN)
- Lot 262-6 (YG)
- Existing or proposed lot boundary
- Geotechnical setback

All zones as per City of Whitehorse Zoning Bylaw.



Clients:

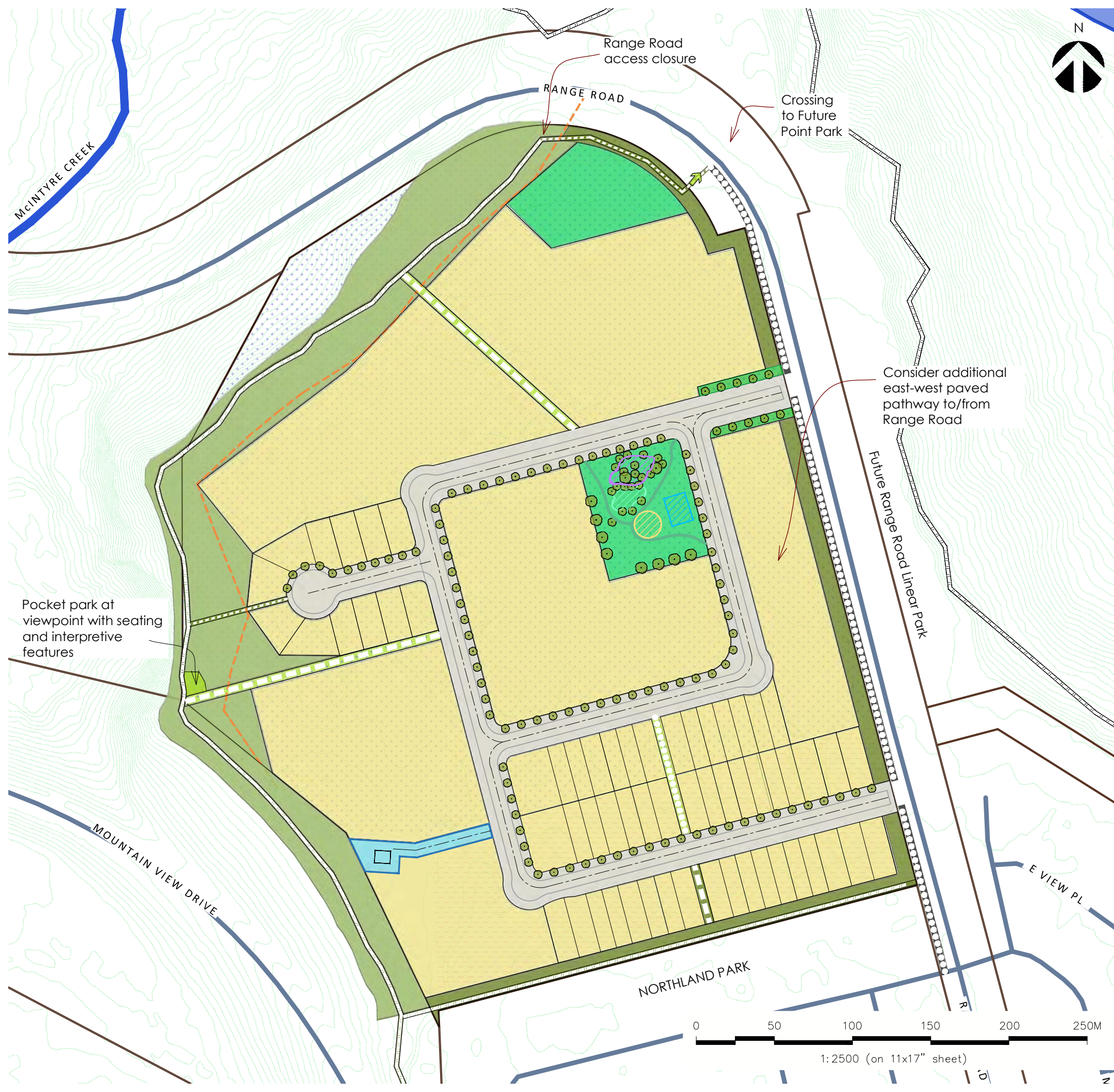


Lead Consultant:



Drafting:

LEES ASSOCIATES



PARKS, TRAILS & GREENSPACE PLAN

Spring 2023



LEGEND

Vegetation/Ground Cover

- Existing trees and forest cover
- Full landscaping
- Partial landscaping and existing trees/forest cover
- Tree plantings

Neighbourhood Trails

- Existing natural surface trail (1.5 m with 3m ROW)
- New natural surface trail (1.5 m with 3m ROW)
- New natural surface trail (1.5 - 2m with 6m ROW)
- Paved pathway (2m)

Park Amenities (see park concepts for further detail)

Priority

- Crushed/granular pathway
- Playground
- Gathering space

Potential Future

- Bike skills park
- Community garden or active recreation amenity (i.e. volleyball court, rink, etc.)

Other

- Housing
- Road and road ROW
- Utility
- Settlement Land parcel C-15B (KDFN)
- Lot 262-6 (YG)
- Existing or proposed lot boundary
- Geotechnical setback

Clients:



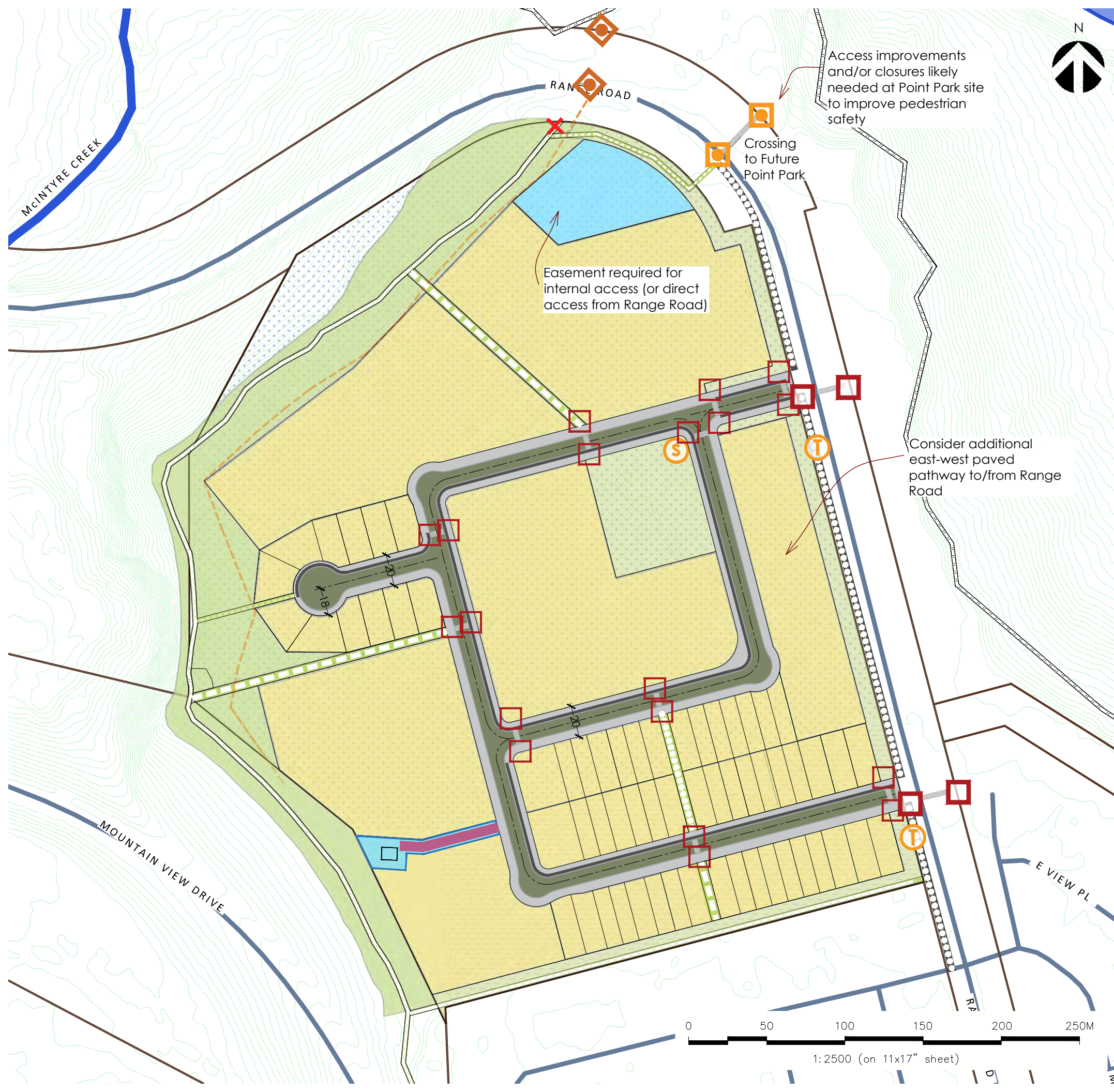
Lead Consultant:



Drafting:



1:2500 (on 11x17" sheet)



TRANSPORTATION PLAN

Spring 2023



LEGEND

Road Network

- Road ROW
- Road w/centreline (9m)
- Gravel road (6m)

Active Transportation Network

- Sidewalk with rolled curb (1.5m)
- Paved pathway (2m)
- Existing natural surface trail
- Natural surface trail (1.5m with 3m ROW)
- Natural surface trail (1.5-2m with 6m ROW)

- Public bike rack

Safety Features

- Signalized crosswalk
- Marked crosswalk
- Marked crosswalk and/or pedestrian enhancements (curb extensions, no landscaping zones, etc.)
- Advanced warning signal or sign
- Range Road access closure

Transit

- Potential transit stop

Other

- Housing
- Utility
- Parks, trails and greenspace
- Settlement Land parcel C-15B (KDFN)
- Lot 262-6 (YG)
- Existing or proposed lot boundary
- Geotechnical setback

Clients:



Lead Consultant:



Drafting:





UTILITIES PLAN

Spring 2023

LEGEND

Water System

- 150mm diameter main
- 200mm diameter main
- 300mm diameter main

Sanitary System

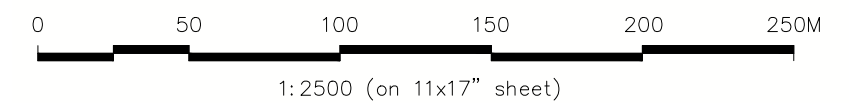
- 200mm diameter main
- Force main (diameter TBD)
- Existing Sewer line

Stormwater System

- 450mm diameter main
- 525mm diameter main
- 600mm diameter main
- 750mm diameter main

Other

- Housing
- Road and road ROW
- Parks, trails and greenspace
- Settlement Land parcel C-15B (KDFN)
- Lot 262-6 (YG)
- Existing or proposed lot boundary
- Geotechnical setback



Clients:



Yukon

Lead Consultant:



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OF ANNA-BAY

Drafting:

LEES
ASSOCIATES

APPENDIX C

Residential Development Recommendations



RESIDENTIAL DEVELOPMENT RECOMMENDATIONS

The specific configuration and densities of dwelling units across the neighbourhood will largely be dictated by market conditions, builder preferences, and zoning requirements. The Zoning Bylaw will provide specific guidance for how lots and housing are developed. While respecting the authority of the bylaw and discretion of individual owners and builders, the Master Plan offers the following suggestions to future lot owners, lessees and builders in fulfilling its vision and intent.

Residential Design

1. Help create an aesthetic, friendly, and walkable neighbourhood by:
 - Orienting the fronts of buildings to address (face) the street
 - Ensuring dwelling fronts have entrances and windows and minimizing the presence of blank walls, garage doors, and parking
 - Locating dwellings closer to the street
 - For multi-unit dwellings, having a strongly defined front/street-facing entry
 - For multi-unit dwellings, providing parking behind buildings where possible, or screening this use through attractive fencing or landscape design
2. Use high quality, durable building materials and finishes to the extent possible.
3. Maximize the use of highly energy efficient/green building and heating/cooling technologies.
4. Optimize solar exposures and passive heating by:
 - Thoughtful siting of building clusters on multi-unit parcels to maximize solar exposure for all
 - Using south and west-facing porches, patios, balconies, and (for multi-unit dwellings) shared amenity spaces
 - Minimizing shading impacts on neighbouring properties and public corridors and spaces
5. Create an interesting, diverse but unified neighbourhood character that reflects the area's heritage and ownership by:
 - Using colours suggestive of nature and/or natural elements (e.g., blue, red, green)
 - Using designs that evoke Yukon First Nation visual arts and heritage
 - Using natural and/or natural looking building materials (i.e., wood and stone)
 - Varying building form, massing, design, and/or finishes to reduce uniformity and/or repetition

Outdoor Spaces and Landscaping

6. Minimize potential conflicts between adjacent developments by using vegetated buffers and adjusting building height or massing that is similar to nearby buildings.
7. Create a visually pleasing and complementary transition between the central block multi-unit residential development and the adjoining central park space, as well as built-in surveillance of the park, by:
 - Using natural cladding materials and/or colours that blend in with the natural/park environment
 - Providing some transparency or visual harmony between the private development and park with fencing materials (e.g., natural materials, lower heights, lattice-style) and/or layering of landscaping elements
 - Providing semi-private landscaped areas like patios and courtyards at grade adjacent to the park
 - Considering elevating units above grade so as to maximize privacy to occupants and passive surveillance of the open space
8. Create a visually pleasing and complementary transition from private developments bordering on the escarpment and the escarpment trail and greenspace by:
 - Using natural cladding materials and/or colours that blend in with natural surroundings
 - Retaining trees along parcel edges to the extent possible
 - Considering elevating units above grade so as to maximize privacy to occupants and passive surveillance of the public open space
9. Where applicable, consider siting the amenity spaces for multi-unit residential developments to maximize contiguous, usable space that integrates with and/or extends public greenspaces.

Refer to pages 3 and 4 for neighbourhood character examples.

Transportation

1. Provide electric vehicle charging capability to multi-unit developments.
2. Exceed current Zoning Bylaw requirements by including Class 1 (e.g., secured indoor) bicycle parking spaces and on-site bicycle maintenance facilities in a designated, secured area.

Neighbourhood character examples – residential land use



Single detached and duplex housing



Street and solar oriented townhouses



Asymmetrical duplex blending in with single detached homes



Asymmetrical duplex with different sized dwellings



Triplex on cottage cluster parcel with shared parking



Triplex on cottage cluster zoned parcel



Turquoise and wood cladding on small single detached home



Ground-level units with distinct entry features



Corner lot duplex with second driveway on other street



Conventional cottage cluster homes oriented around a common space

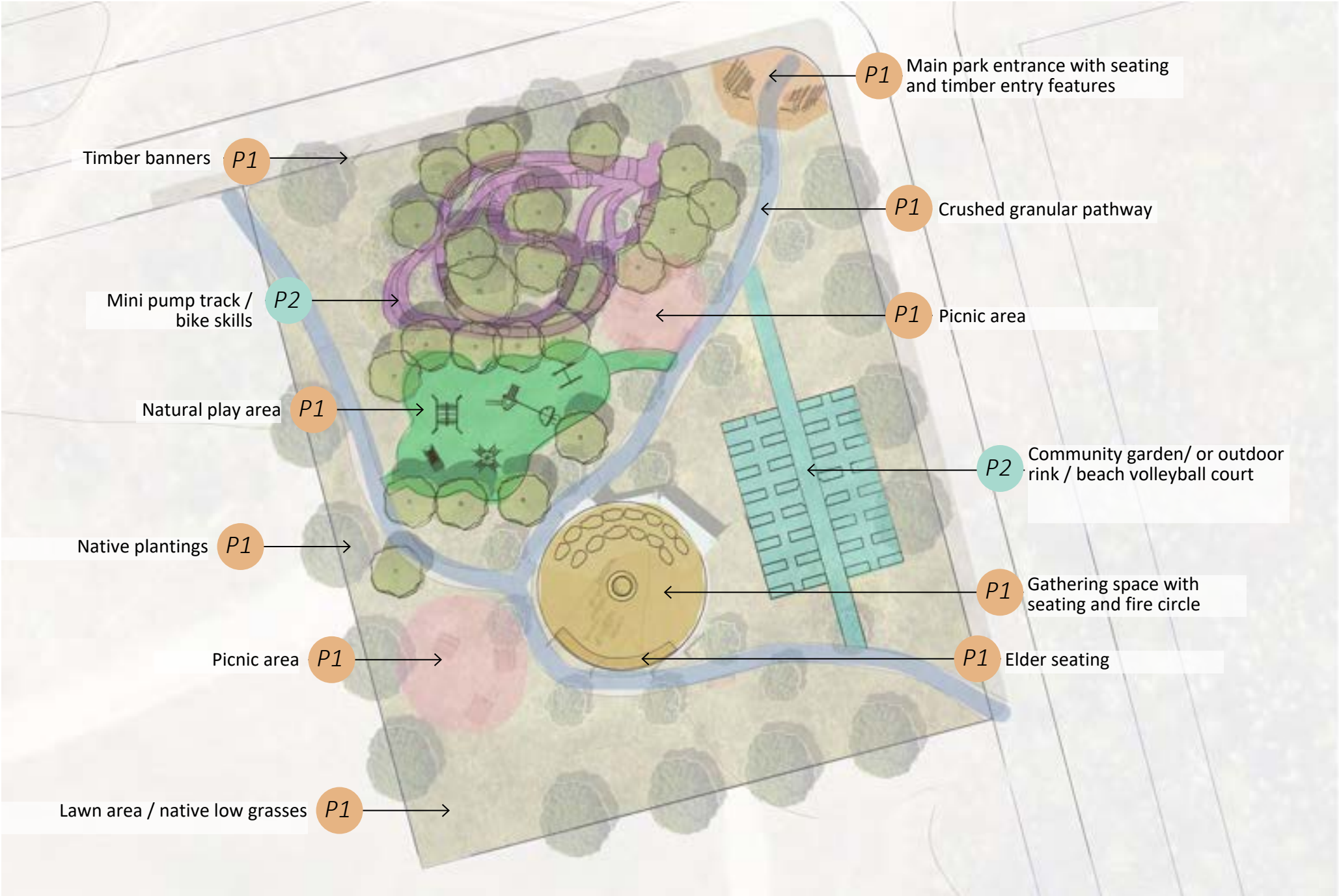


Smaller-scale apartment dwelling with colourful and wooden cladding

APPENDIX D

Parks and Placemaking Concepts

CENTRAL PARK SPACE - RANGE POINT

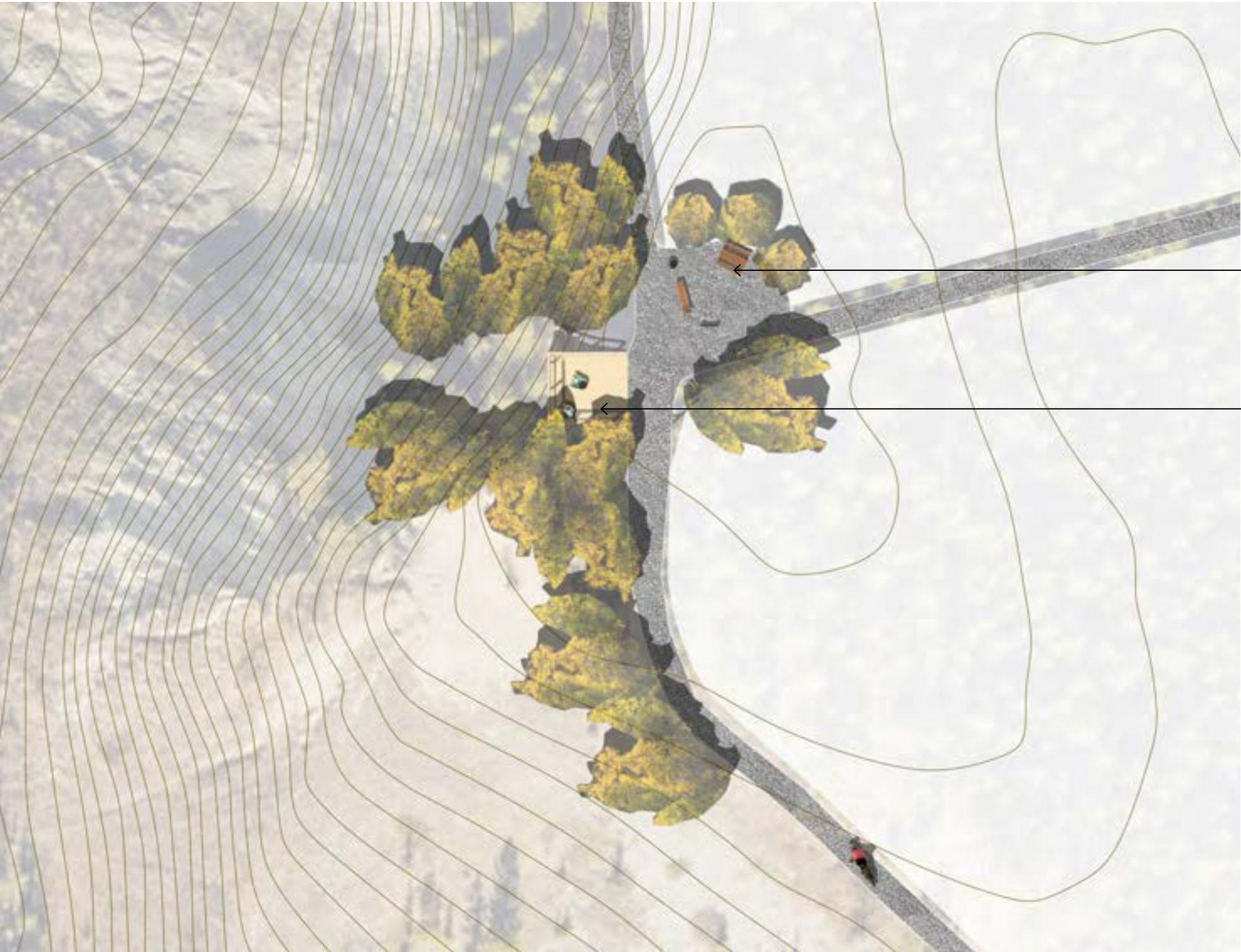


P1 PHASE 1 - PRIORITY ELEMENTS

P2 PHASE 2 - POTENTIAL FUTURE ELEMENTS



POCKET PARK - RANGE POINT



P1 Seating, interpretive signage, picnic area

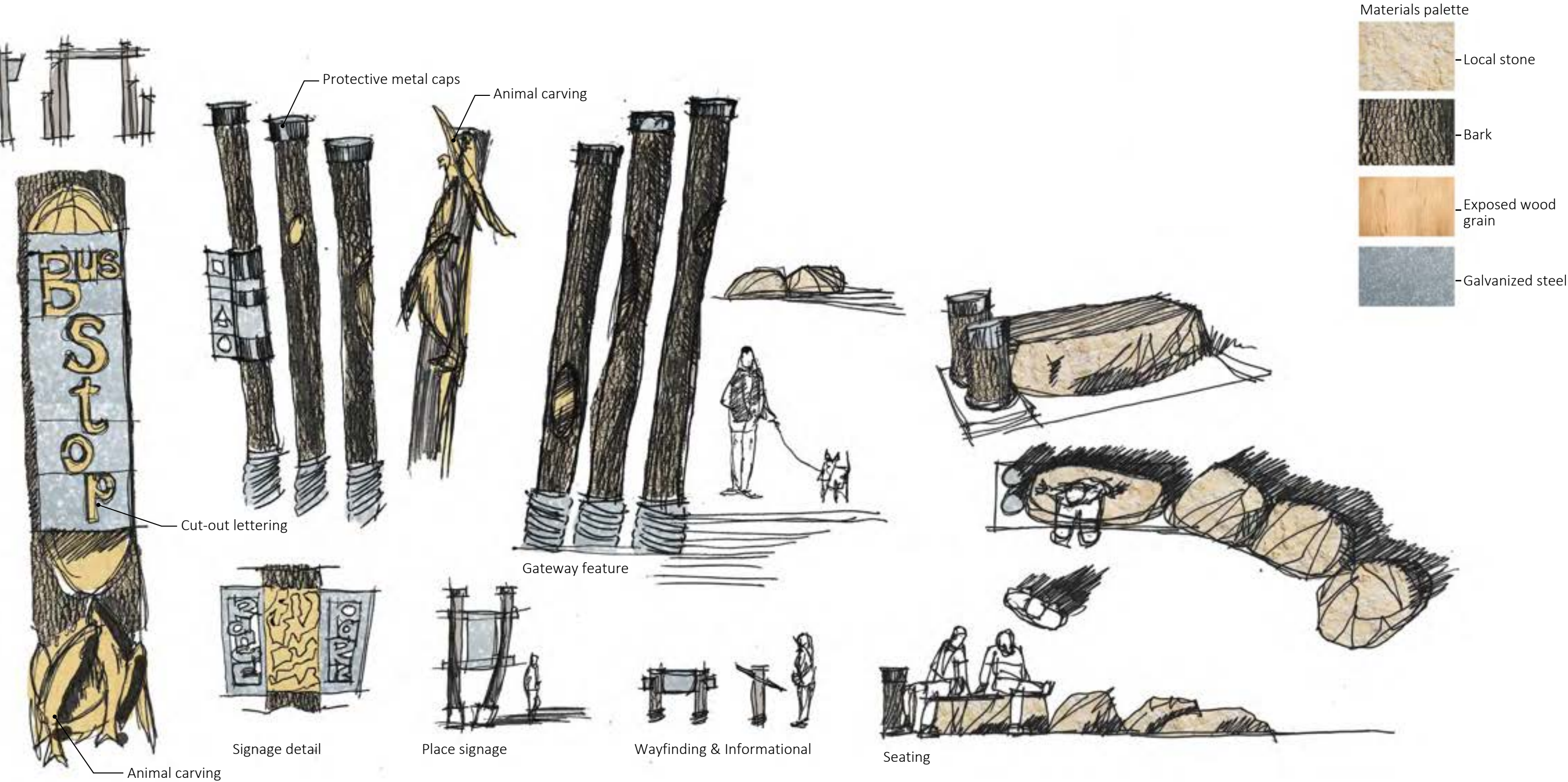
P2 Viewing deck

P1 PHASE 1 - PRIORITY ELEMENTS

P2 PHASE 2 - POTENTIAL FUTURE ELEMENTS



PLACE MAKING - RANGE POINT



PRECEDENT IMAGES



Natural surface trail



Viewing deck

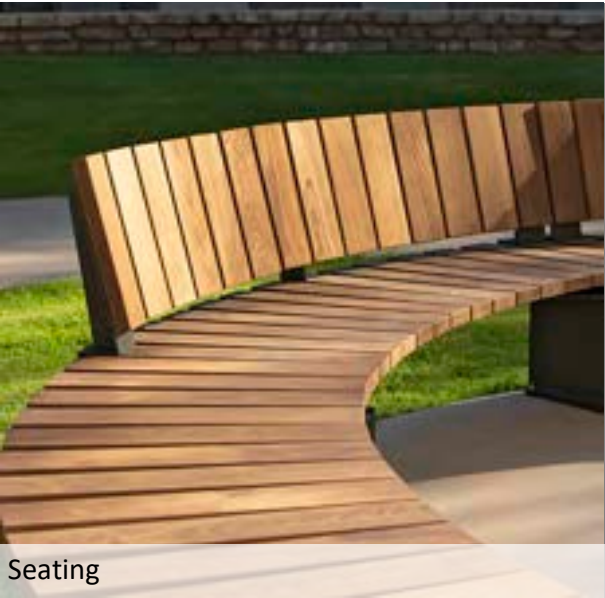


Community garden



Gathering space- fire circle

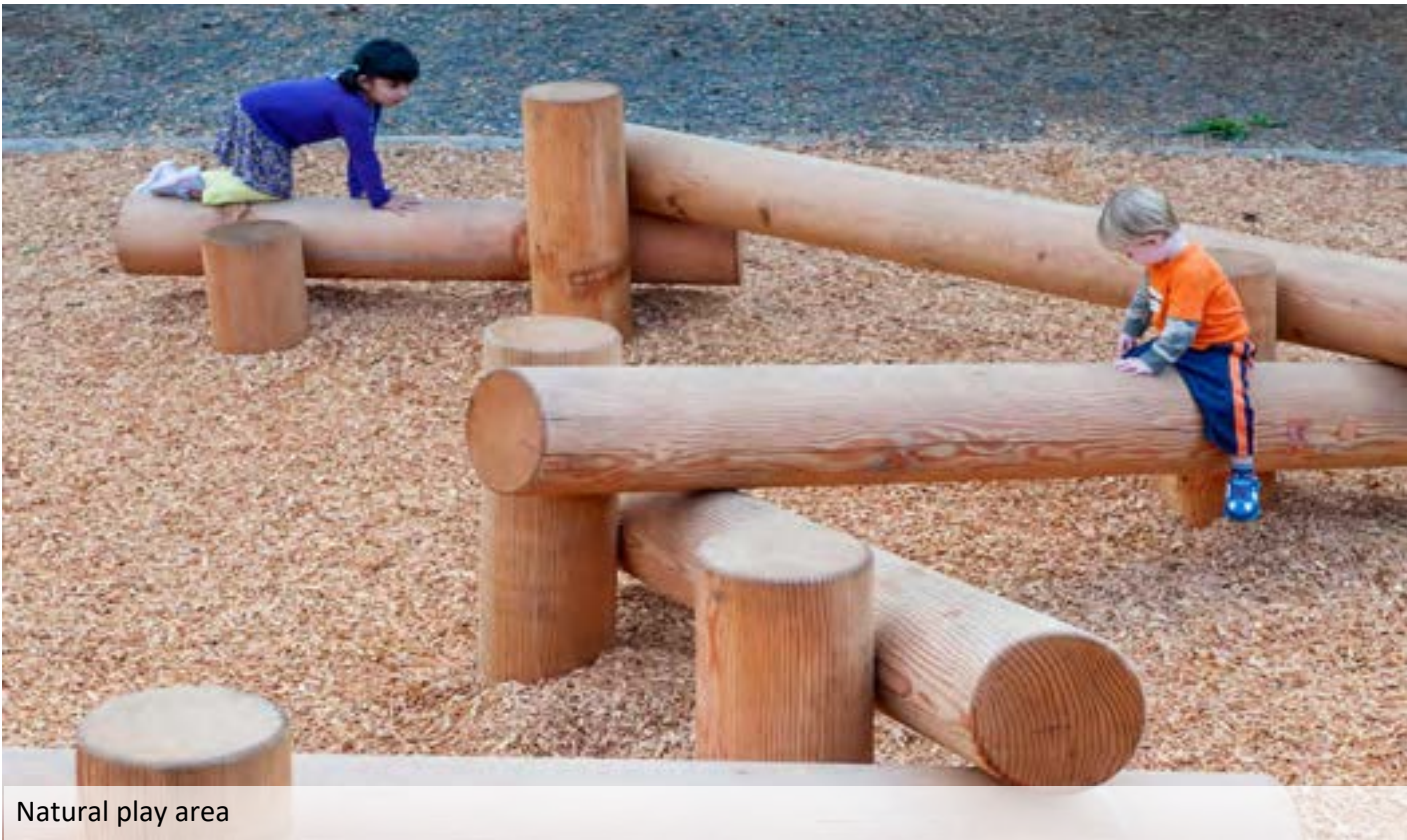
PRECEDENT IMAGES



Seating



Native plants



Natural play area



Interpretive signage in Southern Tutchone

APPENDIX E

Recommended Plant List

RECOMMENDED PLANT LIST FOR RANGE POINT DEVELOPMENT SITE

Key	Common Name	Botanical Name
STREET TREES		
NWP	Northwest Poplar	<i>Populus x jackii 'Northwest'</i>
ASP	Assiniboine Poplar	<i>Populus 'Assiniboine'</i>
AMC	Amur Cherry	<i>Prunus maackii</i>
WEB	Weeping Birch	<i>Betula pendula 'Youngii'</i>
WPB	White Paper Birch	<i>Betula papyrifera</i>
DECIDUOUS TREES		
TRA	Trembling Aspen	<i>Populus tremuloides</i>
BAP	Balsam Poplar	<i>Populus balsamifera</i>
WPB	White Paper Birch	<i>Betula papyrifera</i>
CONIFEROUS TREES		
WHS	White Spruce	<i>Picea glauca</i>
LOP	Lodgepole Pine	<i>Pinus contorta latifolia</i>
SHRUBS		
REC	Red Currant	<i>Ribes triste</i>
LAT	Labrador Tea	<i>Ledum groenlandicum</i>
HBC	High Bush Cranberry	<i>Viburnum trilobum</i>
SOA	Soapberry	<i>Shepherdia canadensis</i>
SHC	Shrubby Cinquefoil	<i>Potentilla fruticosa</i>
PWR	Prickly Wild Rose	<i>Rosa acicularis</i>
ROD	Red Osier Dogwood	<i>Cornus stolonifera</i>
WOW	Wolf Willow	<i>Elaeagnus commutata</i>
GROUNDCOVERS/PERENNIALS		
LIN	Lingonberry	<i>Vaccinium vitis-idaea</i>
COY	Common Yarrow	<i>Achillea millefolium</i>
KIN	Kinnikinnick	<i>Arctostaphylos uva-ursi</i>
CRJ	Creeping Juniper	<i>Juniperus horizontalis</i>
COJ	Common Juniper	<i>Juniperus communis</i>

APPENDIX F

Engineering Technical Memorandum

Issue Date:	May 31, 2023	File No.:	AERIS
To:	Jane Koepke	Previous Issue Date:	N/A
From:	Kirsten Hogan, P. Eng.	Project No.:	2021-2117-00
Client:	Groundswell Planning		
Project Name:	Range Point Joint Master Plan (KDFN and YG)		
Subject:	Conceptual Site Servicing - Design Brief		

1 INTRODUCTION

Associated Engineering (Associated) was retained by Groundswell Planning (GP) to develop a conceptual site servicing plan for the proposed subdivision on Kwanlin Dün First Nation (KDFN) Settlement Parcel C-15B and Government of Yukon (YG) Lot 262-6, located in the Range Point neighbourhood in Whitehorse, Yukon. The conceptual servicing plan was developed based on the proposed lot layout and zoning, design criteria outlined in the City of Whitehorse Servicing Standards Manual (SSM 2020) and best management practices. The purpose of this memo is to summarize the proposed servicing plan. It is important to note that the servicing presented is conceptual and subject to change once the design criteria are confirmed during the detailed design stage. Construction cost estimates have been provided under separate cover.

2 LOT CLEARING AND GRADING

Lot clearing and grading is completed in new developments to ensure that surface water drains from each lot without causing a buildup of water on adjacent lots. The lot clearing and grading plan is designed to work with the existing land contours and to retain as much of the natural vegetation and forest cover as possible.

The existing topography of the development area is generally sloped from the southeast to the northwest towards McIntyre Creek. The area is mostly forested, with a series of trails present. The site is constrained by Northland Park to the south, an escarpment to the west, and Range Road to the north and east. To facilitate drainage, pre-grading of the development area will be required. A conceptual grading plan was developed and is shown in Figure 1-2, attached to this memo. The grading plan was designed to minimize earthworks, tie into the existing elevations surrounding the development area, and minimize tree clearing where possible. Based on the conceptual model created, it is anticipated that the site could potentially be a cut/fill balance. It is expected some imported material will still be required if unsuitable ground conditions are discovered. The cut/fill volumes and ground conditions will be confirmed during the detailed design.

Clearing will be required across most of the development area to facilitate pre-grading work to ensure proper drainage. All road rights-of-way will require clearing a minimum of 5 m into adjacent lots to provide space for lot service pipes and room for equipment to work. Based on experience in the Whistle Bend development, most lots smaller than approximately 800 m² will likely be completely cleared either during development or building construction. The key drivers of lot clearing include:

- Pre-grading for drainage requirements: the City of Whitehorse will likely require that pre-grading efforts bring lots to within 0.3 m of final grade.

Memo To: Jane Koepke, Groundswell Planning
May 31, 2023
Page 2

- Construction requirements: once pre-grading is complete at property boundaries, some lots will have a small stand of trees remaining near the centre of the lot. These trees are often removed for building construction. Some developers choose to remove all trees on small lots during pre-grading to increase efficiency.

Opportunities will likely exist to leave trees in place on the larger high-density multi-family lots, in green spaces, and parks. The actual clearing limits will be determined during detailed design based on the approved grading plan.

If phased development is planned over several years, it is recommended that each phase is cleared within 1 year prior to deep utilities and surface works construction to allow time for an existing ground survey and avoid excessive erosion and material migration. Additional clearing is generally included during construction to facilitate pre-grading and overall stormwater management.

3 WATER DISTRIBUTION SYSTEM

A water distribution system is typical within urban municipalities and is proposed for this development. The system consists of an underground network of pipes and valves providing water to the public that is safe for human consumption. The system water pressures are designed to be adequate for domestic uses and fire protection.

The subdivision water distribution system will be serviced from the existing 450 mm watermain within the Range Road right-of-way. This watermain is anticipated to have sufficient capacity for the subdivision's needs. Two watermain tie-in connection points are proposed to provide more pressure, improved water quality through water re-circulation, and redundancy if a section of the water distribution system requires servicing. The proposed water distribution system for the development will be located in the road right of way and is shown in Figure 1-1 attached to this memo. A water model will be needed during detailed design to determine the required pipe diameters for fire flow and pressure requirements.

4 SANITARY SEWER SYSTEM

The proposed sanitary sewer system consists of a network of underground pipes that collect and carry sewage from bathrooms, sinks, kitchens, and other plumbing components within the development to an offsite location where the wastewater can be properly treated. The pipes are sloped and rely on gravity to convey the flow to a centralized location, before being pumped through an existing piping system to the offsite wastewater treatment facility.

The existing sanitary sewer main near the proposed development is located approximately 550 m to the south of the development area near the intersection of Range Road and Crow Street. Due to topography and the depth of the existing sewer, it is not feasible to tie into this existing main by gravity flow. A sanitary lift station and force main will be required to service the development.

Lift station design can vary depending on the requirements of the operator, and the lift station can be housed in a building, a small enclosure, or primarily underground. The lift station for Range Point will become part of the sanitary system operated by the City of Whitehorse. Based on experience in the Whistle Bend development, the City of Whitehorse generally prefers lift station buildings for cleaning and maintenance purposes.

Memo To: Jane Koepke, Groundswell Planning
May 31, 2023
Page 3

The proposed location of the lift station and alignment of the force main is shown in Figure 1-4, attached to this memo. The proposed alignment of the force main is within the Mountain View Drive right-of-way, following the perimeter of the Northland Park Development. It is anticipated that the force main will be a minimum of 150 mm in diameter. Utilizing the design criteria within the SSM, the estimated peak flow rate into the lift station is 20 L/s; this value will need to be reviewed and confirmed during detailed design. The alignment of the force main should also be reviewed during detailed design to determine if it will affect the tree buffer between Northland Park and Mountain View Drive. An easement approximately 6 m wide will be required for the forcemain.

The development will be serviced by a gravity sewer system to collect and convey wastewater to the proposed lift station, as shown in Figure 1-1 appended to the memo. The sanitary sewer pipe network will be located within the roadway right-of-way, buried a minimum of 2.8 m deep or insulated as required, have a maximum manhole spacing of 110 m, and a minimum pipe diameter of 200 mm. Utilizing the design criteria within the SSM to estimate peak sanitary flow rates and Manning's equation, it is anticipated that pipe diameters greater than 200 mm will not be required.

5 STORMWATER MANAGEMENT

Stormwater management is required to ensure runoff is collected, conveyed, and discharged appropriately to prevent any harmful effects to the development or the surrounding areas. Best practices for managing stormwater focus on matching the pre-development discharge conditions in terms of flow rates, water quality, and discharge locations to ensure downstream properties and watercourses are unaffected by the development. To reduce the risk of erosion and sediment loading downstream of the development, stormwater is proposed to be collected and conveyed through an underground gravity sewer system into a dry pond prior to discharging at the pre-development flow rate. The City of Whitehorse requires that the storm sewer system, including the pond, is designed for a 1:5 year design storm event.

The residential development will introduce impervious surfaces, create more direct drainage routes, and eliminate small depressions that could store water. As a result of these changes, the stormwater discharge rates will be greater post-development. The proposed dry pond will limit discharge to the 1:5 year pre-development discharge rate and will be sized to temporarily store the difference between the pre-development and post-development flow rates. This will ensure that there is no increase in flow rate in the downstream drainage paths as a result of the development. The pond will typically remain dry, however, it will temporarily hold water during storm events due to a control structure restricting outflow. The temporary ponding will provide retention time to allow any sediment that accumulates in stormwater to deposit within the pond instead of being discharged downstream. The pond will be designed to have a maximum depth of 3.0 m during the 1:5 year storm event using the Rational Method and will include an emergency overflow structure to safeguard the parcels of land surrounding the pond. The pond will discharge via a pipe to Range Road, into either the south or north ditch, before continuing overland towards McIntyre Creek. Discharging into the north ditch of Range Road will require additional piping to cross under the road structure. Figure 1-3, appended to this memo, outlines the conceptual pond and discharge location options to service the development.

Stormwater is proposed to be collected and conveyed through an underground gravity sewer system to the stormwater pond, as shown in Figure 1-1 appended to this memo. A geotechnical investigation will be required to confirm ground conditions in the area of the stormwater pond prior to detailed design.

Memo To: Jane Koepke, Groundswell Planning
May 31, 2023
Page 4

The pipe network will be located within the road right-of-way and green space where required. The Rational Method was used to determine conceptual pipe sizes to accommodate minor storms (1:5 year return period) based on the proposed zoning. Major storms (1:100 year return period) will be conveyed overland on the roadway before discharging at the outlets shown on Figure 1-2. The downstream drainage paths of the major storm outlets should be reviewed during detailed design to determine if any erosion protection is required for conveyance of 1:100 year storms. It is important to note that the proposed major storm outlets discharge into the existing City of Whitehorse stormwater conveyance system, including existing ditches and swales.

6 SNOW MANAGEMENT

Snow clearing and removal will be required to provide vehicular and pedestrian accessibility throughout the development in winter months. The City and individual lot owners will share snow clearing and removal responsibilities as per the City's Snow and Ice Control Policy and the Maintenance Bylaw. The City will be responsible for clearing public roadways, pathways and sidewalks, whereas individual lot owners and strata corporations will be responsible for the sidewalk along their lot frontage and snow within their lot including but not limited to private roadways, driveways, paths, and parking lots.

Snow cleared from the public roads and sidewalks will be temporarily stored on City boulevards before conditions warrant removal. No on-site snow storage site will be provided for this development. Snow is anticipated to be hauled to either the City's Kulan Industrial or Two-Mile Hill storage sites when removal is warranted. Lot owners will be responsible for storing snow within their lot and hauling excess snow to the City's Robert Service Snow Site at their own expense. Clearing or stockpiling snow from private lots onto the City streets or boulevards will be strictly prohibited.

7 WATER, SANITARY, & STORMWATER SERVICES

To provide lot owners connection to the water, sewer, and stormwater systems within the development, service pipes will be extended from the mains into the lots. All lots will be provided with recirculating water and sanitary services stubbed up to 1 m into the property, as per the SSM (2020). Stormwater services are proposed to only be supplied to high-density multi-family or commercial, industrial facilities to accommodate discharge from private stormwater systems. The minimum water, sanitary, and stormwater service sizes for the classified lots are provided in Table 7-1 below. The exact service sizes will need to be determined during detailed design based on the expected demand.

Memo To: Jane Koepke, Groundswell Planning
May 31, 2023
Page 5

Table 7-1 Minimum Service Sizes

Lot Type	Water Supply	Water Recirculation	Sanitary	Stormwater
Single/Duplex	25 mm	20 mm	100 mm	-
Medium Density Multi-Family	50 mm	20 mm	150 mm	-
High Density Multi-Family	150 mm	150 mm	150 mm	300 mm
Commercial/Institutional	150 mm	150 mm	150 mm	300 mm

8 ROADWAYS

Roadways will conform to the standard cross sections and right of way widths within the City's SSM based on road classification in order to provide uniformity within the municipality. The roads within the development area are classified as urban local residential. The following right-of-way (ROW) widths have been proposed throughout the Range Point Subdivision:

- Local Roads – 20.0 m
- Paved pathway – 3.0 m

Examples of the proposed road cross-sections and a conceptual signage plan for the development are shown in Figure 1-5 and Figure 1-6, respectively, attached to this memo. The road cross section provides boulevard space for snow storage along one side of the driving surface, and a sidewalk for pedestrian traffic along the opposite. On-street parking is not shown on the conceptual drawings.

The table below summarizes typical road, sidewalk, and trail structures utilized in similar developments within Whitehorse. Based on the available geotechnical information, it is anticipated that similar road structures will be required for this development. Road structures will be confirmed during detailed design based on the site-specific geotechnical information.

Memo To: Jane Koepke, Groundswell Planning
May 31, 2023
Page 6

Table 8-1 Potential Roadway Structures

Item	Structure Details
Local - 20.0 m	1300 mm – pit run gravel sub base 200 mm – 50 mm crushed gravel sub base 150 mm – 20 mm crushed gravel base course 75 mm asphalt
Sidewalk	1400 mm – pit run gravel sub base 200 mm – 20 mm crushed gravel base course 125 mm concrete (175 mm concrete at commercial, lane and private crossings)
Paved trail – 3.0 m	300 mm – pit-run gravel subbase. 200 mm – 50 mm crushed gravel sub base 150 mm – 20 mm crushed gravel base course 50 mm asphalt

9 POWER & TELECOMMUNICATIONS

Shallow utilities, such as power and fibre optic lines, are required to service the development. Street lighting and power services will run underground and be provided by ATCO Electric Yukon, while telephone and cable or fibre optic will be provided by NorthwesTel. The power and telecommunications utilities both follow road alignments. Utility easements or rights-of-way must be acquired when the services are located outside the road limits. The power distribution requires a looped system to ensure no loss of service. Shallow utilities will need to be coordinated to have no conflicts with water and sanitary services to lots.

Memo To: Jane Koepke, Groundswell Planning
May 31, 2023
Page 7

10 CLOSURE

The services provided by Associated Engineering 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,
Associated Engineering

Prepared by:

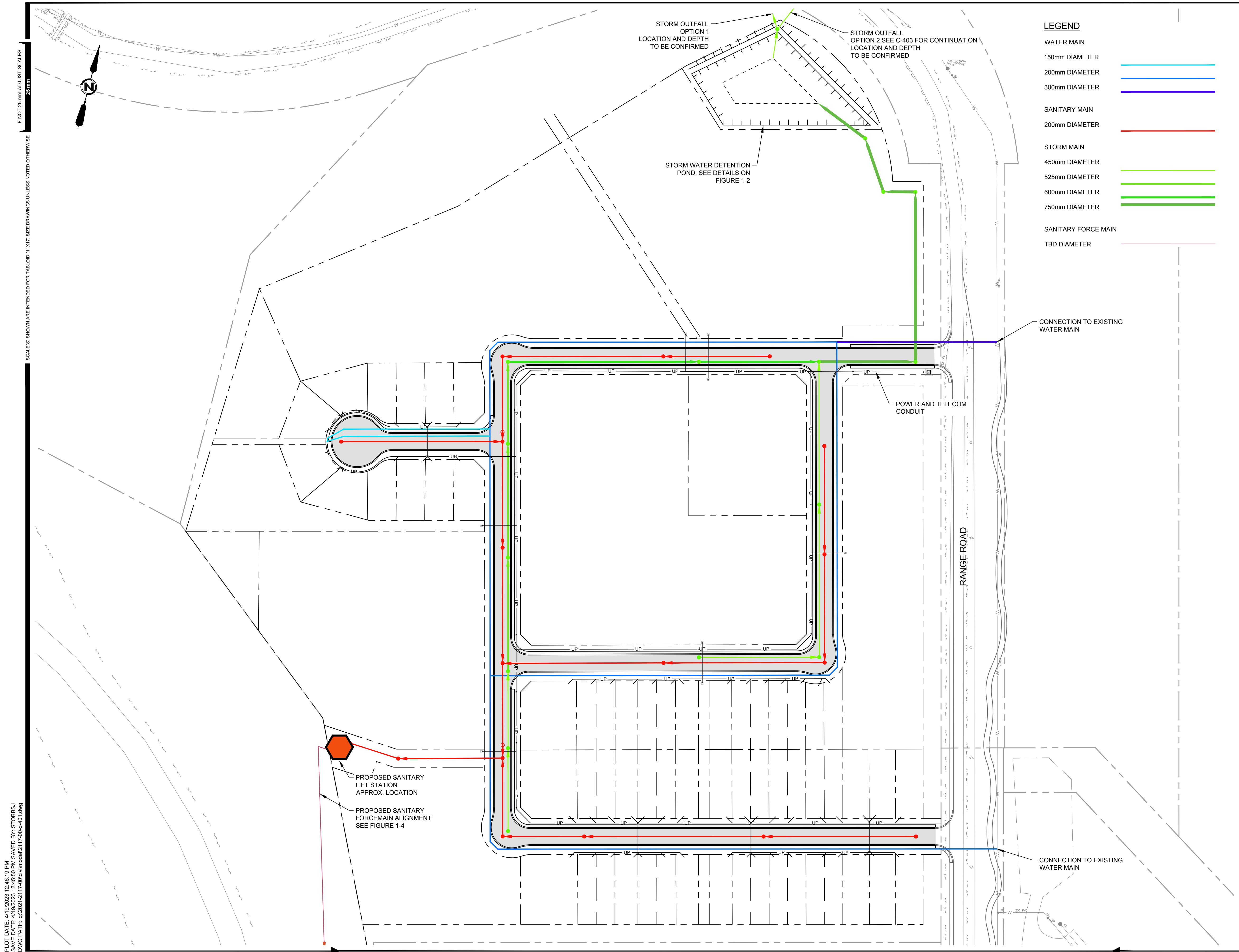


Evan Latos, P. Eng.
Project Engineer

EL/KH

Reviewed by:

Kirsten Hogan, P.Eng.
Project Manager



LEGEND

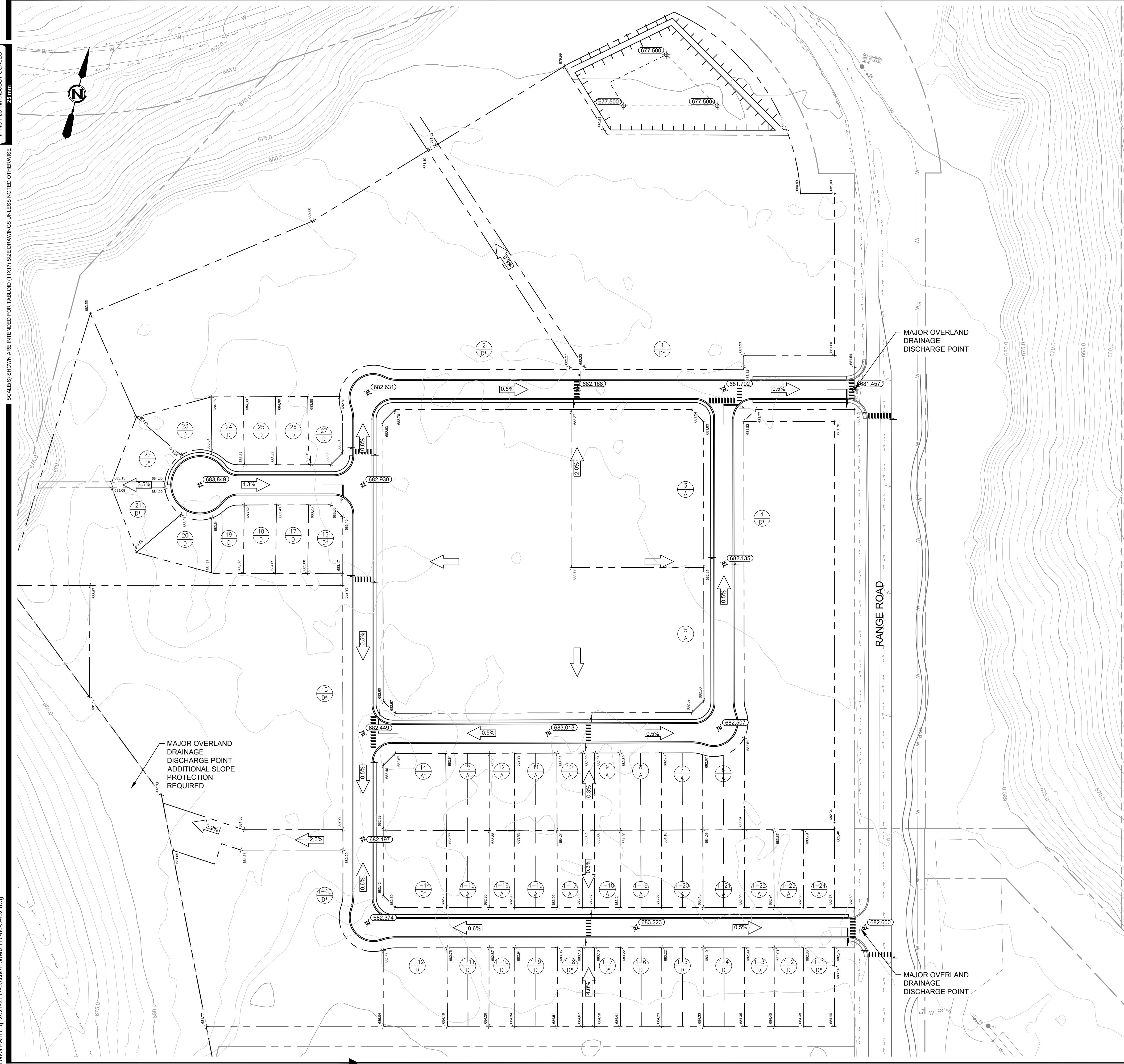
WATER MAIN	
150mm DIAMETER	
200mm DIAMETER	
300mm DIAMETER	
SANITARY MAIN	
200mm DIAMETER	
STORM MAIN	
450mm DIAMETER	
525mm DIAMETER	
600mm DIAMETER	
750mm DIAMETER	
SANITARY FORCE MAIN	
TBD DIAMETER	



PRELIMINARY/
FOR DISCUSSION
NOT FOR CONSTRUCTION

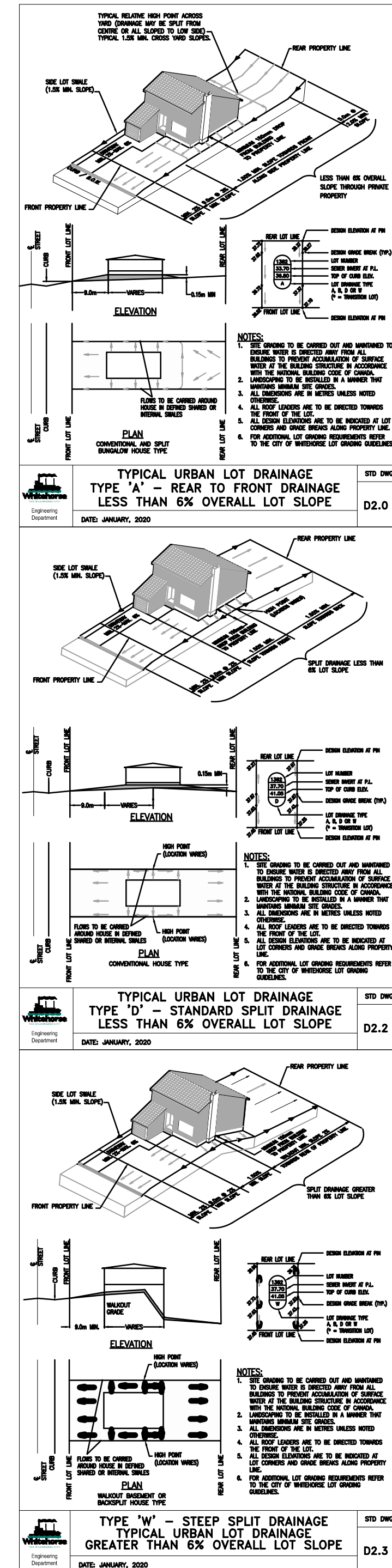
FIGURE 1-1
Kwanlin Dūn First Nation &
YUKON GOVERNMENT
CIVIL
SITE SERVICING

AE PROJECT No.	2021-2117
SCALE	1:1000
APPROVED	K. HOGAN
DATE	2023APR13
REV	0
DESCRIPTION	ISSUED FOR DISCUSSION



LEGEND

- LOT NUMBER
- LOT DRAINAGE TYPE A, B, D OR W
* INDICATES A TRANSITION LOT
- SPOT ELEVATION - MAJOR
- SPOT ELEVATION - MINOR
- OVERLAND FLOW DIRECTION



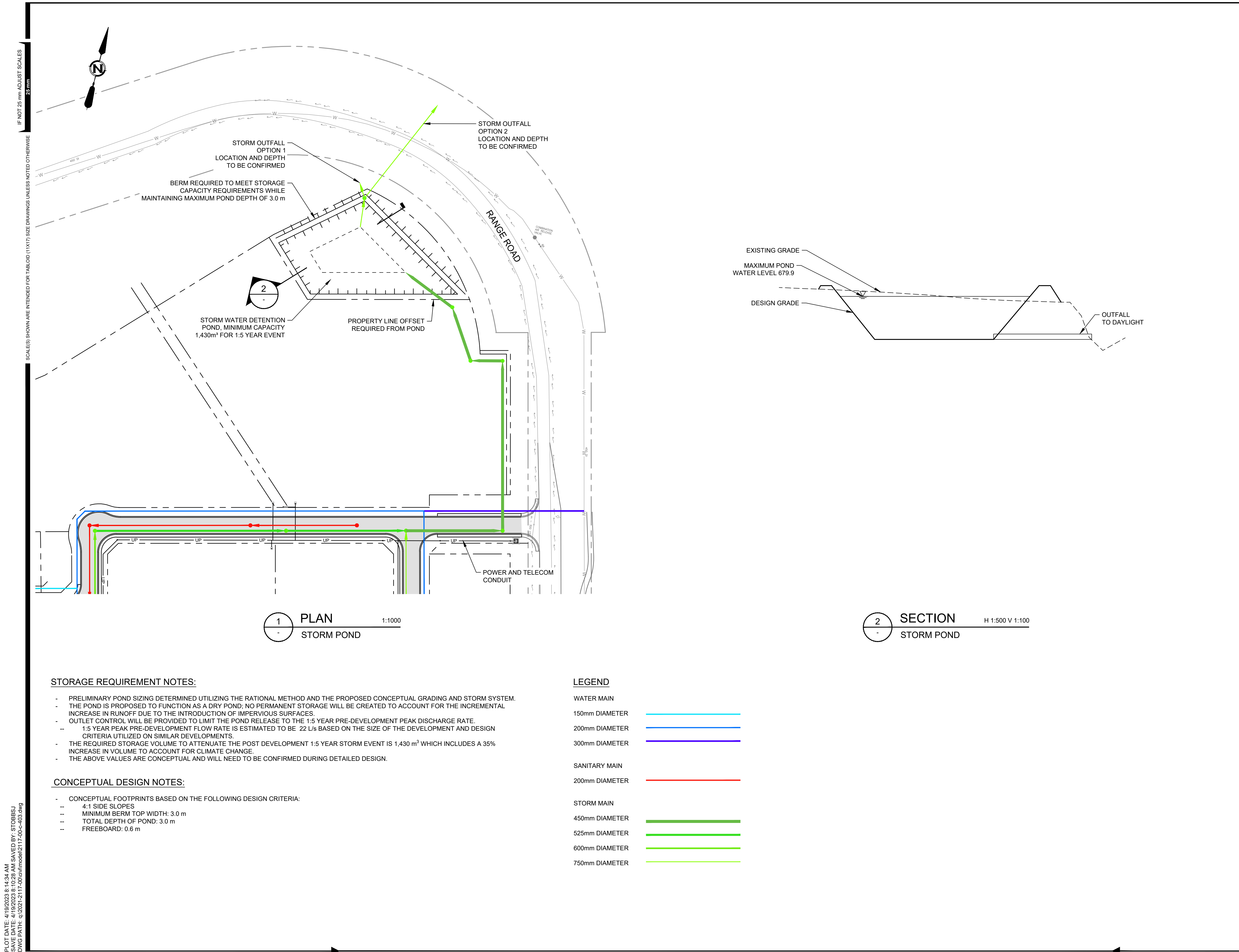
PRELIMINARY/
FOR DISCUSSION
NOT FOR CONSTRUCTION

FIGURE 1-2

Kwanlin Dün First Nation &
YUKON GOVERNMENT

CIVIL
LOT GRADES

AE PROJECT No. 2021-2117
SCALE 1:1000
APPROVED K. HOGAN
DATE 2023APR13
REV 0
DESCRIPTION ISSUED FOR DISCUSSION



Associated Engineering

BEST MANAGED COMPANIES

Platinum member

**PRELIMINARY/
FOR DISCUSSION**
NOT FOR CONSTRUCTION

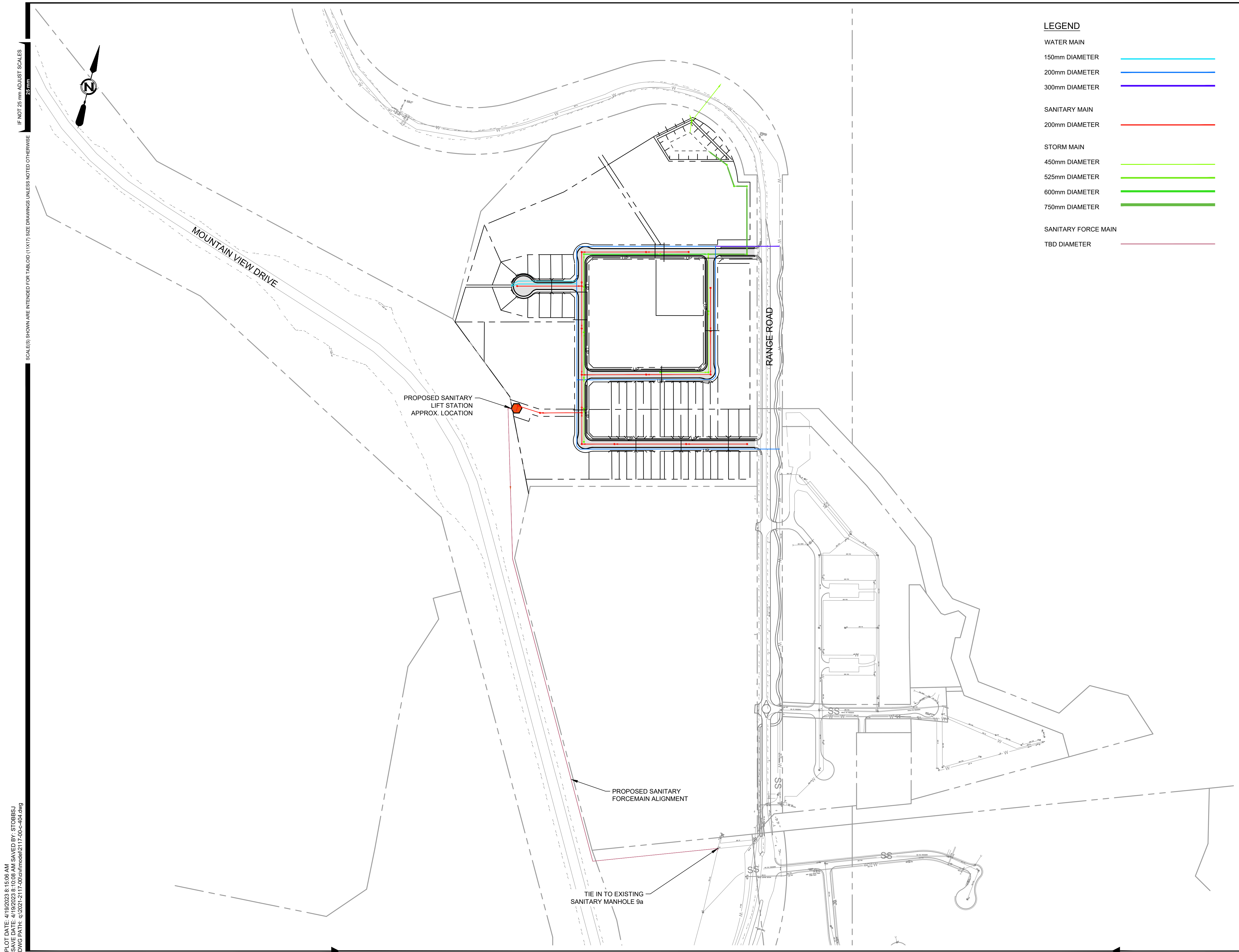
FIGURE 1-3

Kwanlin Dūn First Nation &
YUKON GOVERNMENT

CIVIL
STORM POND DETAILS

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APPROVED	K. HOGAN
DATE	2023APR13
REV	0
DESCRIPTION	ISSUED FOR DISCUSSION

PLOT DATE: 4/19/2023 8:14:34 AM
SAVE DATE: 4/19/2023 8:10:28 AM
DWG PATH: c:\2021-2117-00\civil\model\2117-00-c-403.dwg



PLOT DATE: 4/19/2023 8:15:06 AM
SAVE DATE: 4/19/2023 8:10:08 AM SAVED BY: STOBBSJ
DWG PATH: c:\2021-2117-00\civil\model\2117-00-sc-404.dwg

IF NOT 25 mm ADJUST SCALES
25 mm

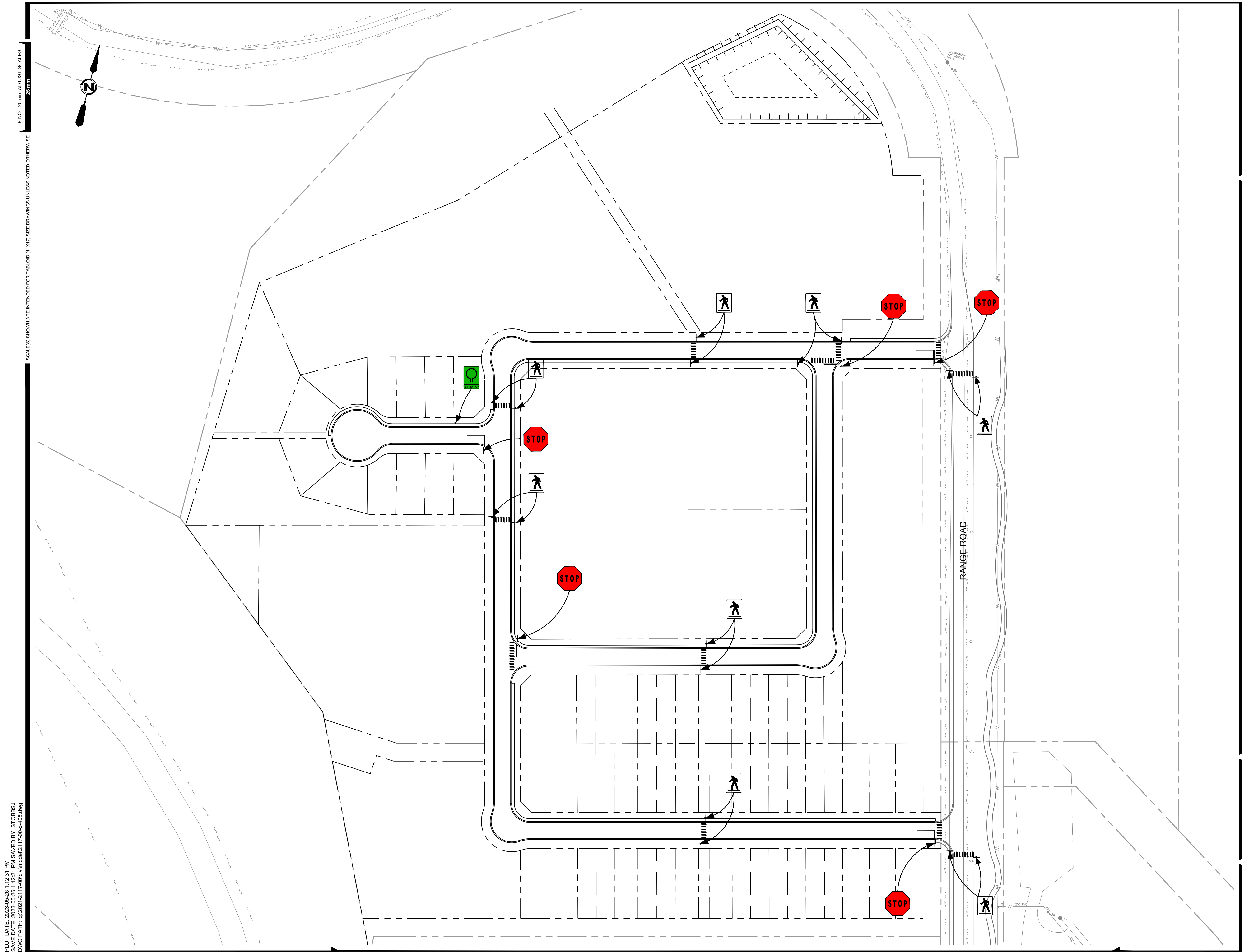
SCALE(S) SHOWN ARE INTENDED FOR TABLOID (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE

LEGEND	
WATER MAIN	
150mm DIAMETER	
200mm DIAMETER	
300mm DIAMETER	
SANITARY MAIN	
200mm DIAMETER	
STORM MAIN	
450mm DIAMETER	
525mm DIAMETER	
600mm DIAMETER	
750mm DIAMETER	
SANITARY FORCE MAIN	
TBD DIAMETER	



PRELIMINARY/
FOR DISCUSSION
NOT FOR CONSTRUCTION

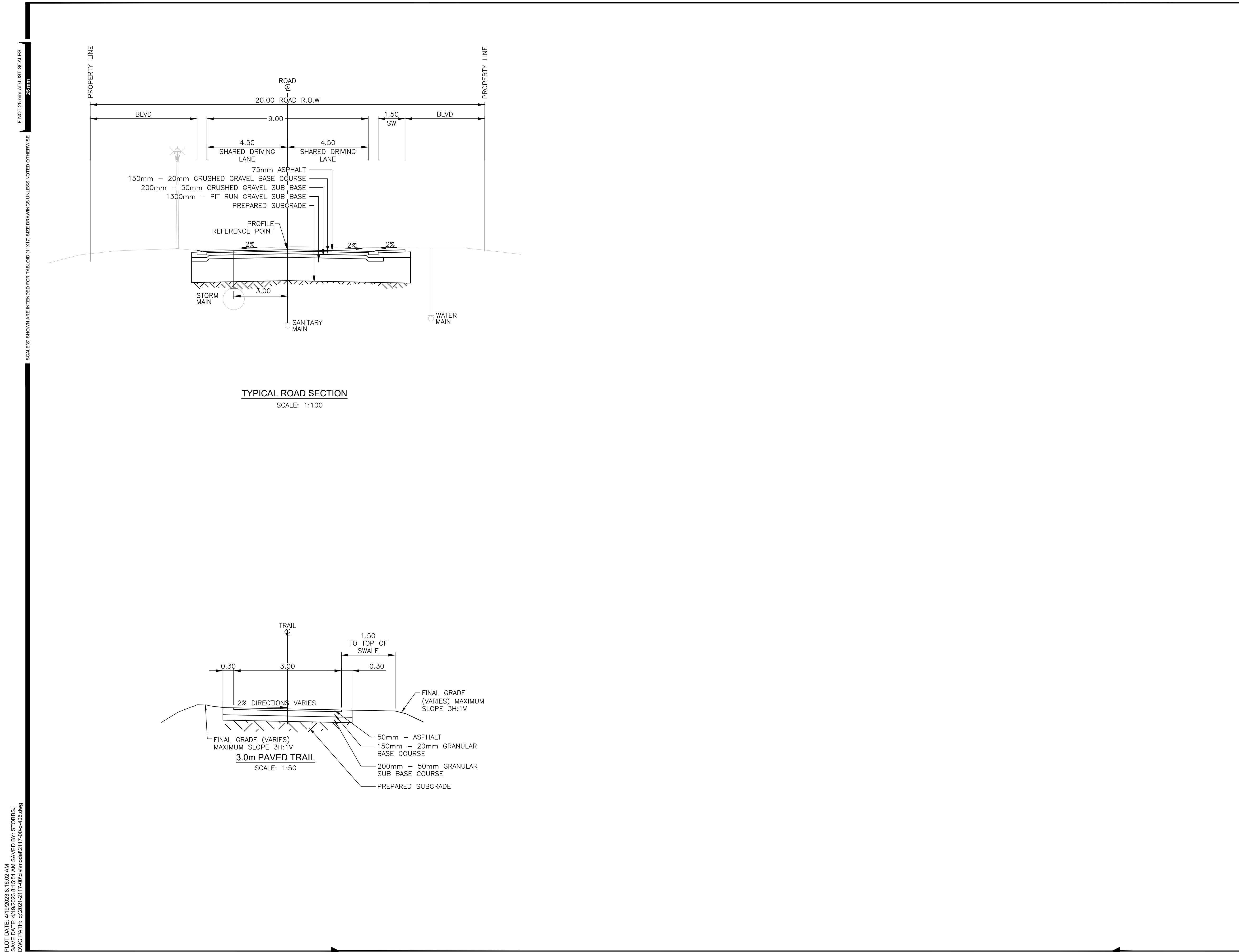
FIGURE 1-4	
Kwanlin Dūn First Nation & YUKON GOVERNMENT	
CIVIL SANITARY FORCEMAIN ALIGNMENT	
AE PROJECT No.	2021-2117
SCALE	1:2500
APPROVED	K. HOGAN
DATE	2023APR13
REV	0
DESCRIPTION	ISSUED FOR DISCUSSION



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FOR DISCUSSION
NOT FOR CONSTRUCTION

FIGURE 1-5
Kwanlin Dūn First Nation &
YUKON GOVERNMENT
CIVIL
TRAFFIC SIGNAGE

AE PROJECT No.	2021-2117
SCALE	1:1000
APPROVED	K. HOGAN
DATE	2022APR13
REV	0
DESCRIPTION	ISSUED FOR DISCUSSION



PRELIMINARY/
FOR DISCUSSION
NOT FOR CONSTRUCTION

FIGURE 1-6

Kwanlin Dūn First Nation &
YUKON GOVERNMENT

CIVIL
TYPICAL CROSS SECTIONS

AE PROJECT No.	2021-2117
SCALE	AS NOTED
APPROVED	K. HOGAN
DATE	2023APR13
REV	0
DESCRIPTION	ISSUED FOR DISCUSSION