

**CITY OF SALMON ARM
LAKESHORE ROAD SLOPE STABILIZATION
CONCEPTUAL ROAD LAYOUT OPTIONS**



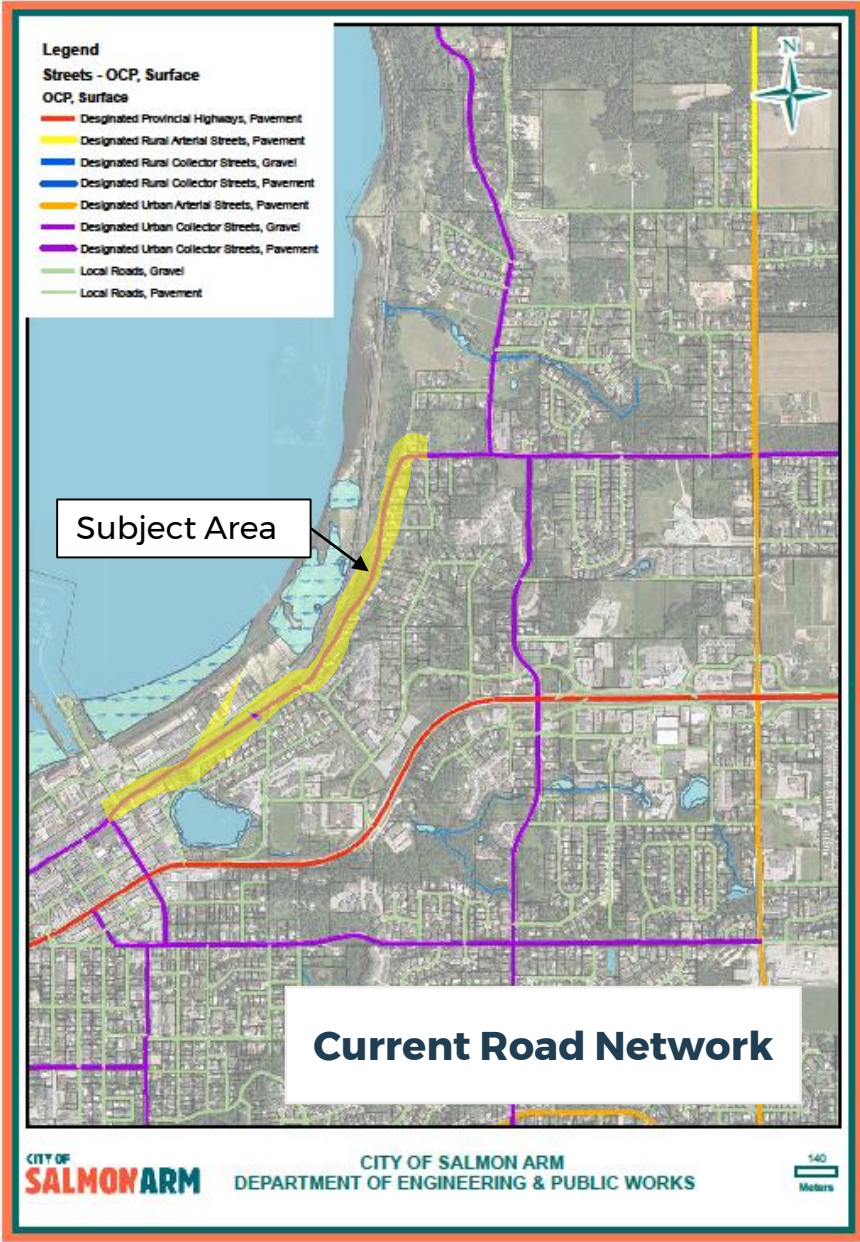
BACKGROUND

- Lakeshore Road between 10 Avenue and 20 Avenue NE has suffered ongoing slope failures throughout several decades due to over-steep slopes.
- The latest geotechnical report commissioned to address multiple substantial failures in 2017 identified high risk areas and identified options for remediation.
- Subsequent evaluation of remediation options indicated that the most cost-effective solution to reduce risk to tolerable levels is to move the roadway east by approximately two (2) meters.
- Various cross-sections for the shifted road layout were investigated at a conceptual level starting from the 2.0m offset; each option offers a different level of service.
- Three options are presented for public feedback.

Lakeshore Road 10 - 20 Avenue NE Conceptual Layout

The three conceptual options are:

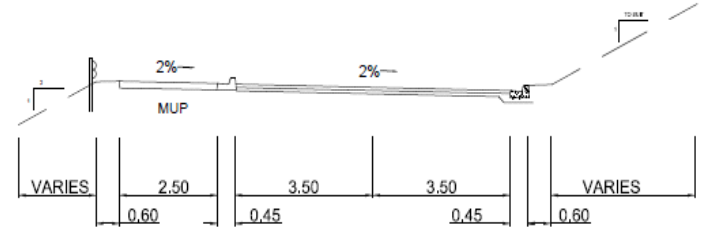
- ✓ Option 1 - Two-way with multi-use path
- ✓ Option 2 - One-way southbound with multi-use path
- ✓ Option 3 - Two-way; no multi-use path



Option #1: Two-way with Multi-use Path Advantages

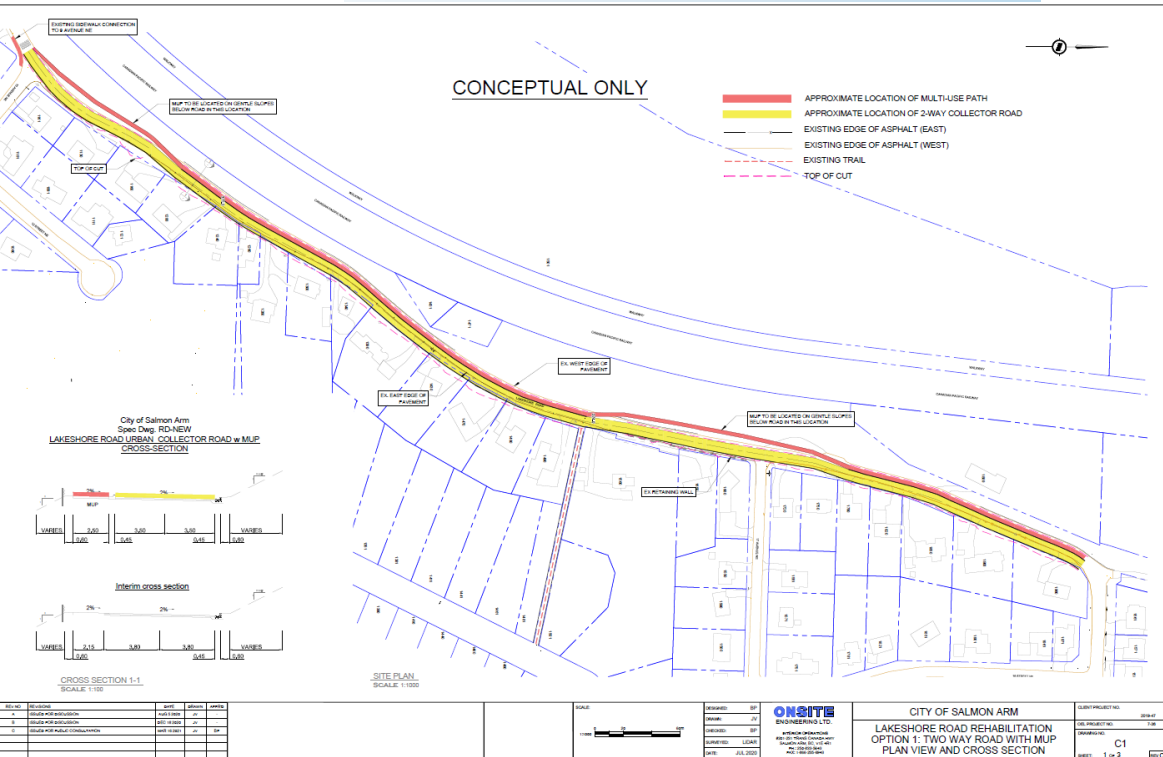
- Maintains existing traffic patterns and OCP designated level of service (Collector Road)
- Adds multi-use path for safe active transportation
- Narrow travel lanes add natural traffic calming reducing speeding
- Keeps redundancy in road network in case of emergencies or road closures
- No anticipated upgrades to surrounding road network
- Safest option overall

City of Salmon Arm
Spec Dwg. RD-NEW
LAKESHORE ROAD URBAN COLLECTOR ROAD w MUP
CROSS-SECTION



Disadvantages

- Highest capital cost
- Widest total cross-section requiring most amount of land acquisition
- Multi-use path has to meander at pinch-points; may have steeper grades than Option 2
- Multi-use path may need to end at 17 Street or further dedication will be required (Alternate route may be available)

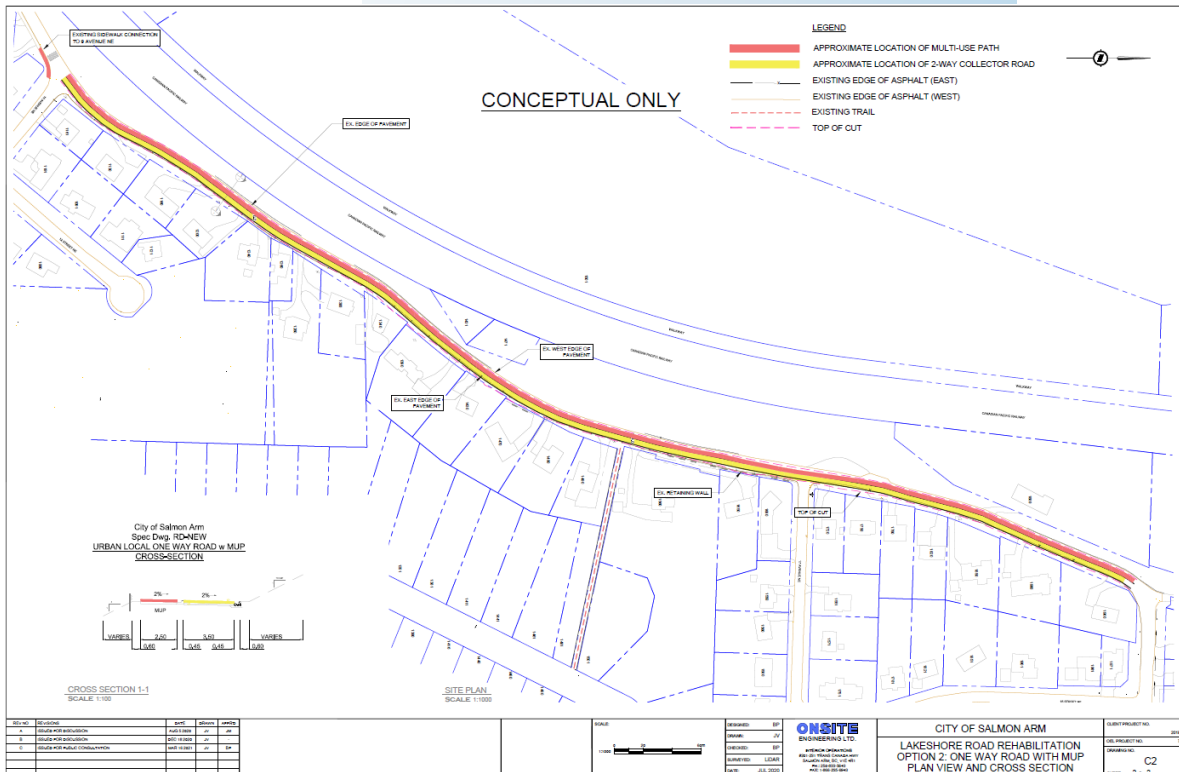
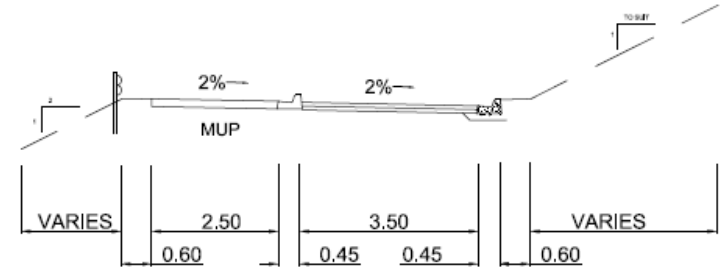


Option #2: One-way Southbound with Multi-use Path

Advantages

- Narrowest cross-section; no anticipated land acquisition
- Adds multi-use path for safe active transportation
- Multi-use path fits within existing road alignment which has gentle grades for the majority of its length
- Lowest capital cost

City of Salmon Arm
Spec Dwg. RD-NEW
URBAN LOCAL ONE WAY ROAD w MUP
CROSS-SECTION



Disadvantages

- reduces redundancy in road network in case of emergencies or road closures
- Likely requires upgrades to roads and intersections outside of the scope of work to accommodate traffic pattern changes
- Significant (3km) detour for residents along the one-way portion of roadway when heading northbound
- Lowers OCP service levels from Collector Road to less than a local road
- Significant safety issues created by one-way roadway

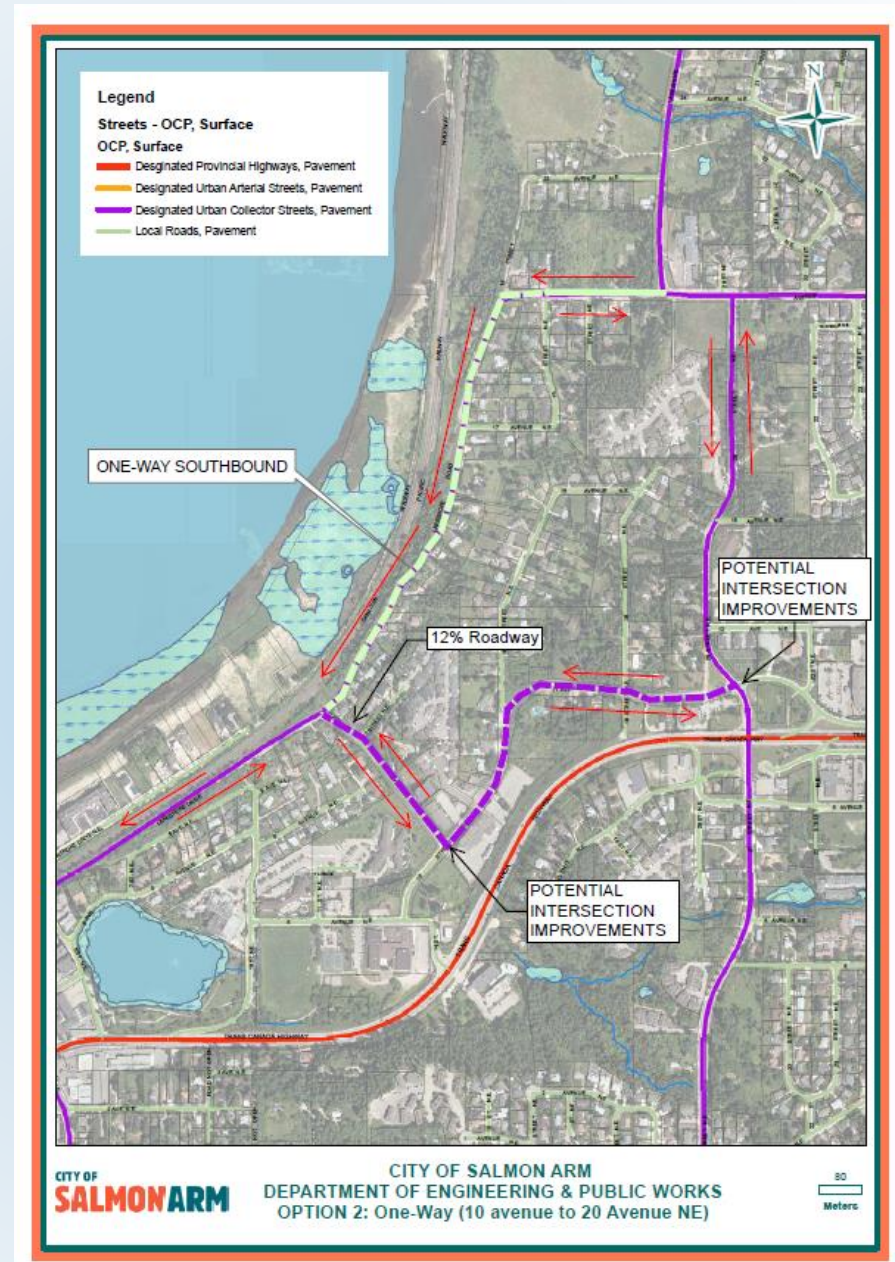
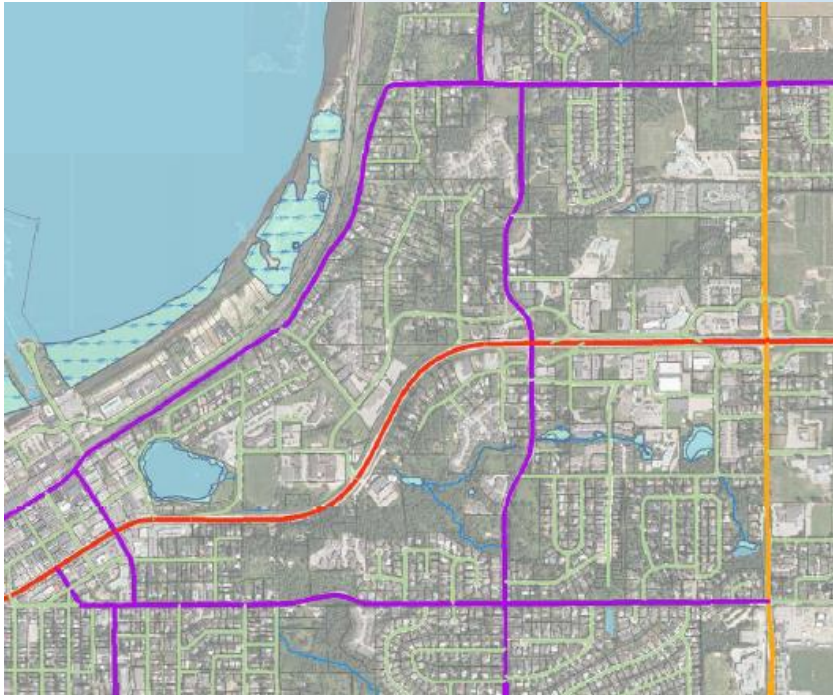
REV	BY	DATE	APP'D	REASON
1	ON SITE ENGINEERING LTD	2023-07-20	JL	ISSUED FOR PERMIT
2	ON SITE ENGINEERING LTD	2023-07-20	JL	ISSUED FOR PERMIT
3	ON SITE ENGINEERING LTD	2023-07-20	JL	ISSUED FOR PERMIT

ON SITE ENGINEERING LTD 1000 WEST BAYVIEW AVENUE SUITE 100 SCARBOROUGH, ONTARIO M1H 3K7 TEL: (416) 291-1111 FAX: (416) 291-1112 WWW.ONSITEENGINEERING.COM	CITY OF SALMON ARM LAKESHORE ROAD REHABILITATION OPTION 2: ONE WAY ROAD WITH MUP PLAN VIEW AND CROSS SECTION	CLIENT PROJECT NO.: 2023-01 CIL PROJECT NO.: 2023-01 DRAWING NO.: C2 SHEET: 2 of 2
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Option #2: One-way Southbound with Multi- use Path

Revised Network
with one-way
Road

Existing Road Network

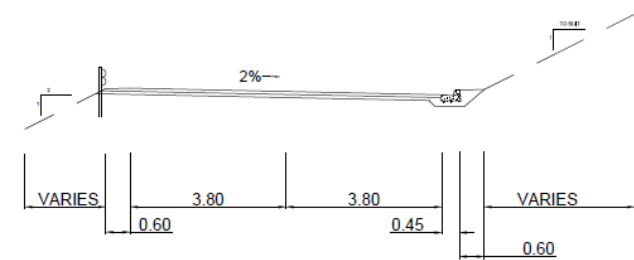


Option #3: Two-way without Multi-use Path

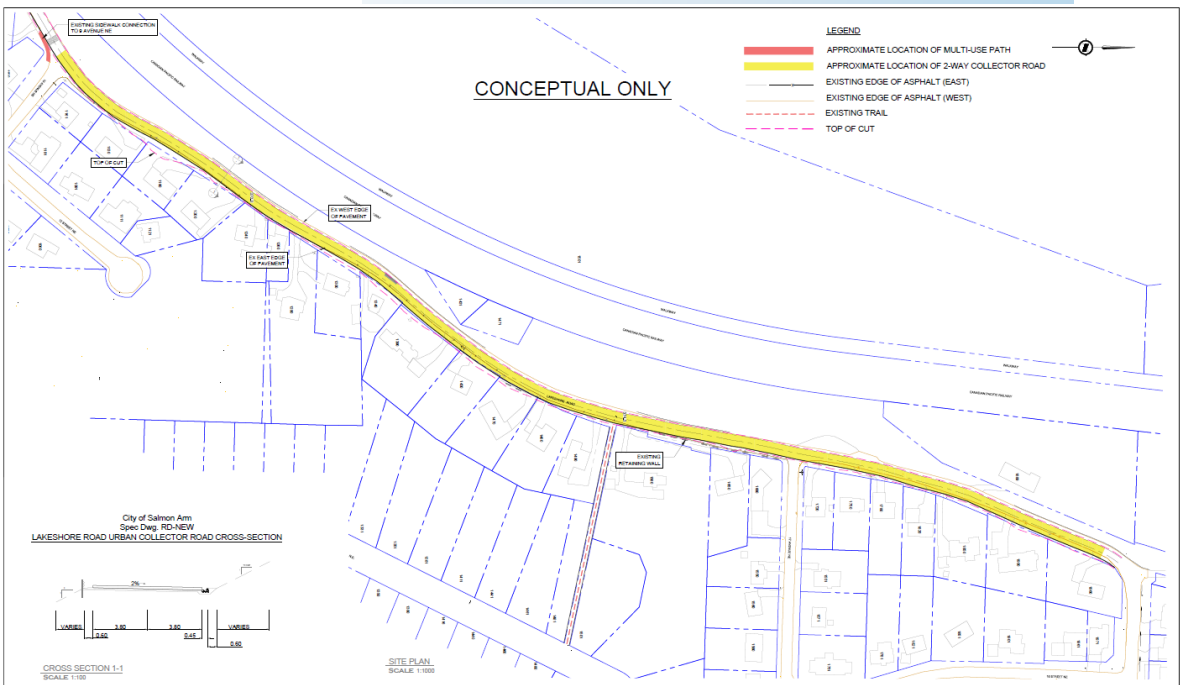
Advantages

- Maintains existing traffic patterns and OCP designated level of service for vehicles (Collector Road)
- Narrow travel lanes add natural traffic calming reducing speeding
- Keeps redundancy in road network in case of emergencies or road closures
- No attributable upgrades to roads outside of the scope of work

City of Salmon Arm
Spec Dwg. RD-NEW
LAKESHORE ROAD URBAN COLLECTOR ROAD CROSS-SECTION



CROSS SECTION 1-1
SCALE 1:100



Disadvantages

- Narrowed lanes make existing unsafe situation worse for active transportations users (bikes, pedestrians, etc.)
- Lowers OCP level of service by removing opportunity for future active transportation route (sidewalk or multi-use path) along this section of Lakeshore
- Lanes are wider than Option 1 and 2 allowing for faster travel speeds
- Land acquisition likely required

REV	DATE	BY	CHKD	APPD	DESC
1	2024-07-10	JV	JV		ISSUED FOR PERMITTING
2	2024-07-10	JV	JV		ISSUED FOR PERMITTING
3	2024-07-10	JV	JV		ISSUED FOR PERMITTING

PROJECT	CITY OF SALMON ARM
CLIENT PROJECT NO.	2024-07-10
PROJECT NO.	2024-07-10
PROJECT NAME	LAKESHORE ROAD REHABILITATION
PROJECT LOCATION	OPTION 3: TWO WAY ROAD
PROJECT DRAWING	PLAN VIEW AND CROSS SECTION
PROJECT SHEET	C3
PROJECT SHEET	3 of 3

COST ESTIMATES

Intended for comparison purposes only.

- Option 1: \$ 2.1 Million
- Option 2: \$ 1.5 Million
- Option 3: \$ 1.8 Million

OTHER NOTES

- All options involve major improvements to drainage and result in comparable factors of safety (geotechnical)
- Ongoing geotechnical monitoring may alter recommendations
- Detailed Design of preferred conceptual layout will likely result in minor alternations
- Cross-sections can be altered to accommodate wider or separated multi-use path; however would require further land acquisition and may not be feasible due to topographical constraints such as driveway tie-ins
- All options reduce risk of failure but do not eliminate it entirely; further stabilization may be required in the future

COMPARISON OF SITE OPTIONS

	#1: Two-way w/ MUP	#2: One-way w/ MUP	#3: Two-way; no MUP
Capital Cost	\$2.1 M	\$1.5 M	\$1.8 M
Additional Costs External to Project Area	No	Yes	No
Vehicular Safety	Good	Fair	Good
Road network Operation	Good	Poor	Good
Active transportation Network (Pedestrian Safety)	Good	Excellent	Poor

NEXT STEPS

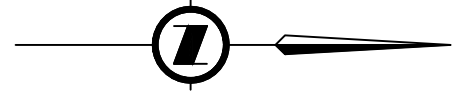
- Obtain community feedback on preferred conceptual layout. Feedback deadline is April 7, 2021.
 - The questionnaire can be submitted online or e-mailed, mailed or dropped off at City Hall using the contact information below.
 - Alternatively feedback can be presented 'in person' by virtually attending the evening Council Session on April 12, 2021. If you wish to attend electronically please send your request to cityhall@salmonarm.ca
- Present findings to Council and hold public input session April 12, 2021.
- Initiate detailed design for preferred conceptual layout.

For more information:

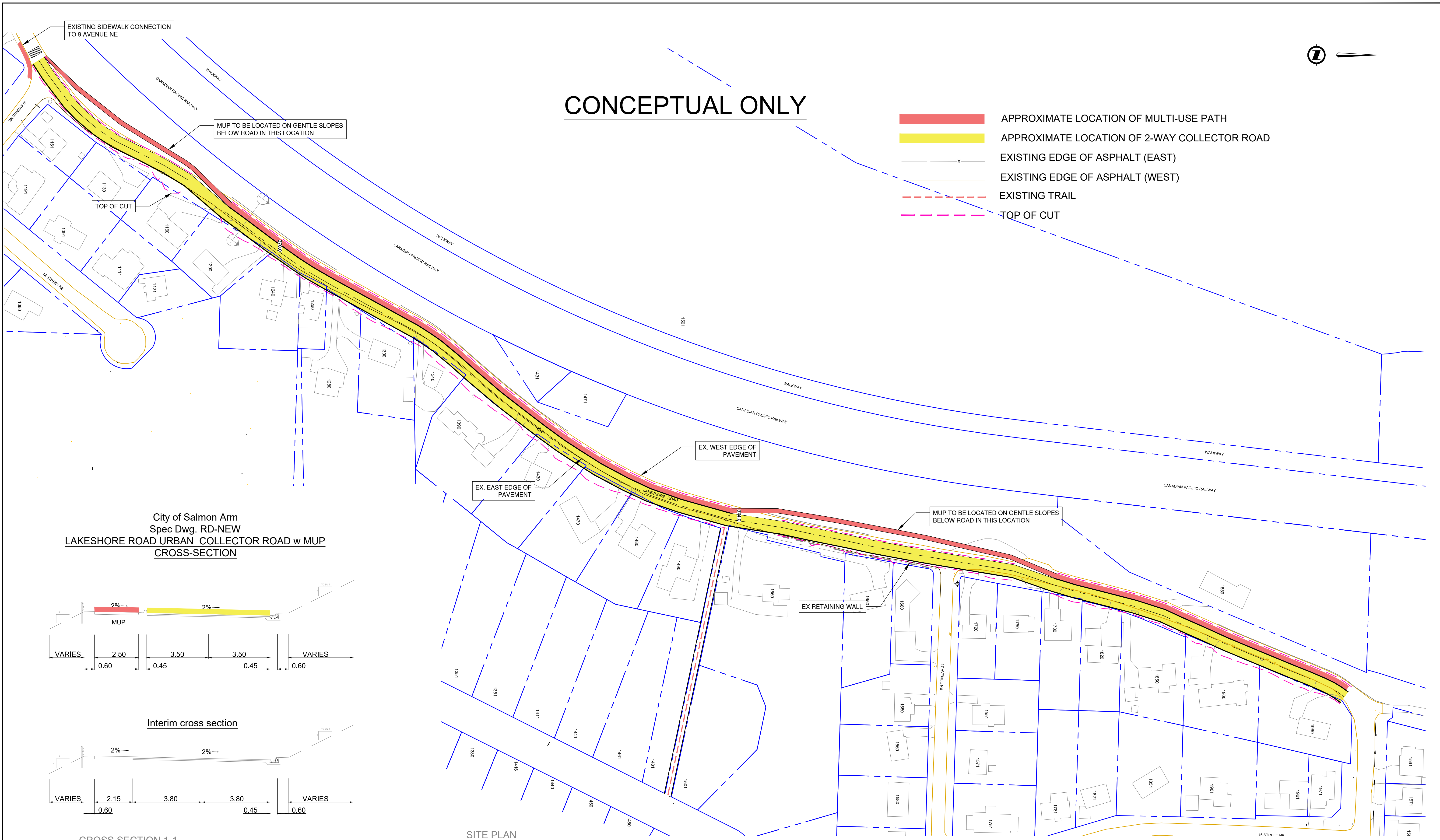
Jenn Wilson, City Engineer,
City of Salmon Arm
Telephone: (250) 803-4018
Email: jwilson@salmonarm.ca



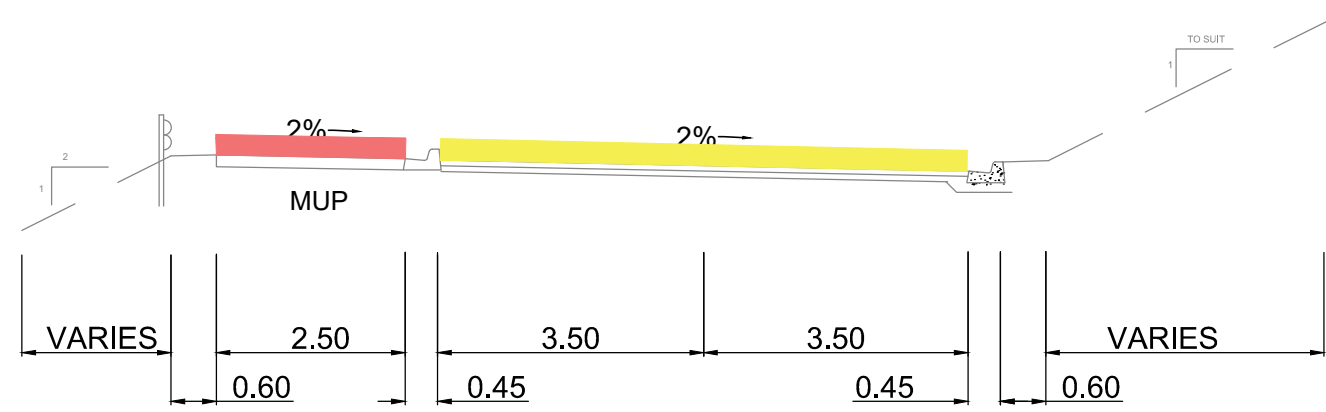
CONCEPTUAL ONLY



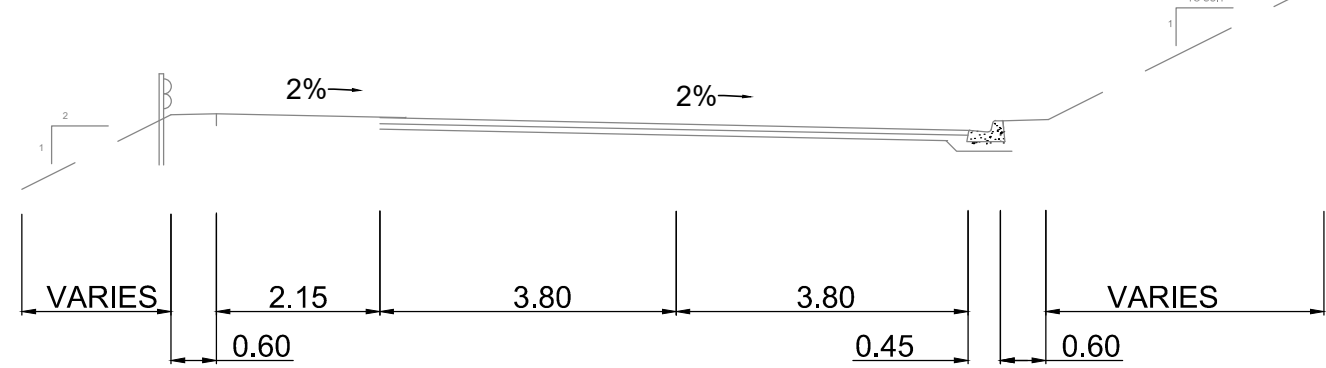
- APPROXIMATE LOCATION OF MULTI-USE PATH
- APPROXIMATE LOCATION OF 2-WAY COLLECTOR ROAD
- EXISTING EDGE OF ASPHALT (EAST)
- EXISTING EDGE OF ASPHALT (WEST)
- EXISTING TRAIL
- TOP OF CUT



City of Salmon Arm
Spec Dwg. RD-NEW
LAKESHORE ROAD URBAN COLLECTOR ROAD w MUP
CROSS-SECTION



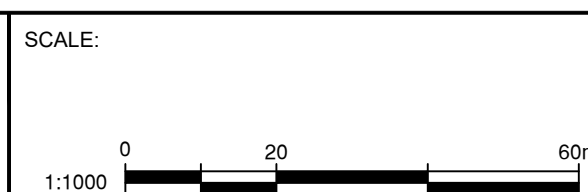
Interim cross section



CROSS SECTION 1-1
SCALE 1:100

SITE PLAN
SCALE 1:1000

REV NO	REVISIONS	DATE	DRAWN	APPRD
A	ISSUED FOR DISCUSSION	AUG 5 2020	JV	-
B	ISSUED FOR DISCUSSION	DEC 18 2020	JV	-
C	ISSUED FOR PUBLIC CONSULTATION	MAR 16 2021	JV	BP



DESIGNED:	BP
DRAWN:	JV
CHECKED:	BP
SURVEYED:	LIDAR
DATE:	JUL 2020

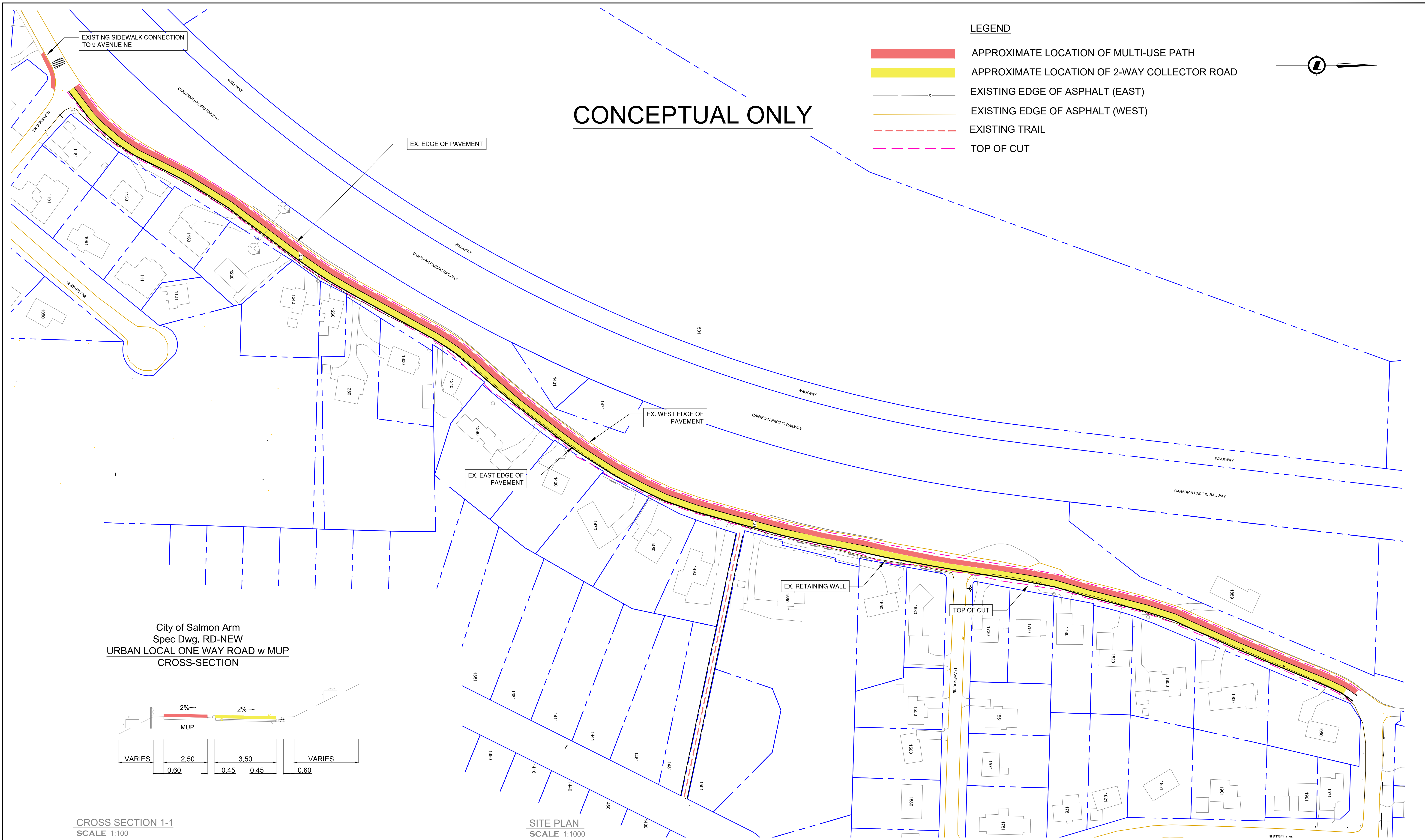
ONSITE
ENGINEERING LTD.

INTERIOR OPERATIONS
#201-231 TRANS CANADA HWY
SALMON ARM, BC, V1E 4R1
PH: 250-833-5649
FAX: 1-866-235-6943

CITY OF SALMON ARM
**LAKESHORE ROAD REHABILITATION
OPTION 1: TWO WAY ROAD WITH MUP
PLAN VIEW AND CROSS SECTION**

CLIENT PROJECT NO.	2019-47
OEL PROJECT NO.	7-36
DRAWING NO.	C1
SHEET:	1 OF 3

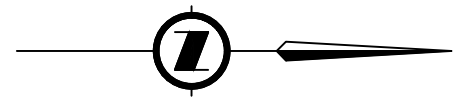
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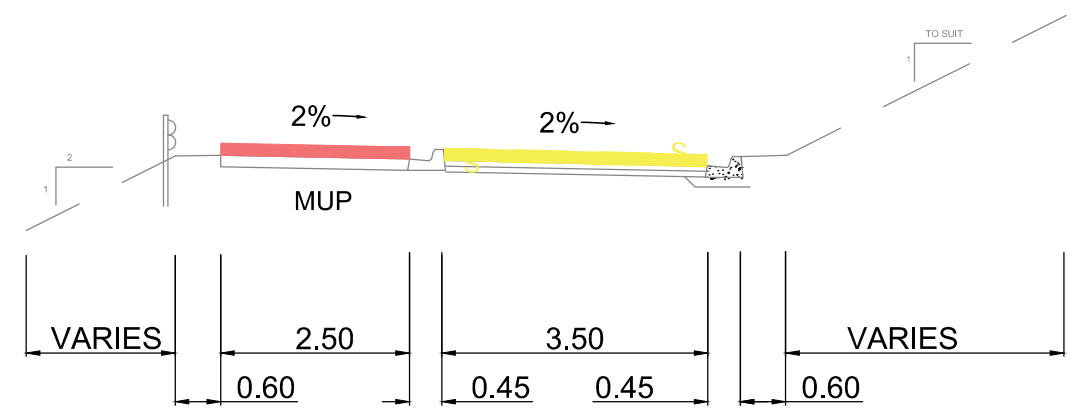
CONCEPTUAL ONLY

LEGEND

- APPROXIMATE LOCATION OF MULTI-USE PATH
- APPROXIMATE LOCATION OF 2-WAY COLLECTOR ROAD
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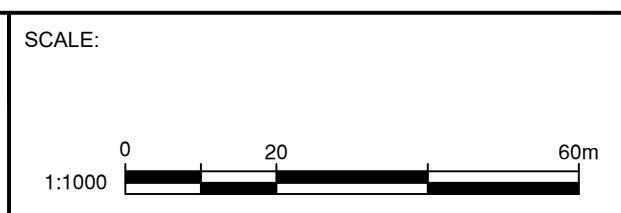
City of Salmon Arm
Spec Dwg. RD-NEW
URBAN LOCAL ONE WAY ROAD w MUP
CROSS-SECTION



CROSS SECTION 1-1
SCALE 1:100

SITE PLAN
SCALE 1:1000

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CITY OF SALMON ARM
LAKESHORE ROAD REHABILITATION
OPTION 2: ONE WAY ROAD WITH MUP
PLAN VIEW AND CROSS SECTION

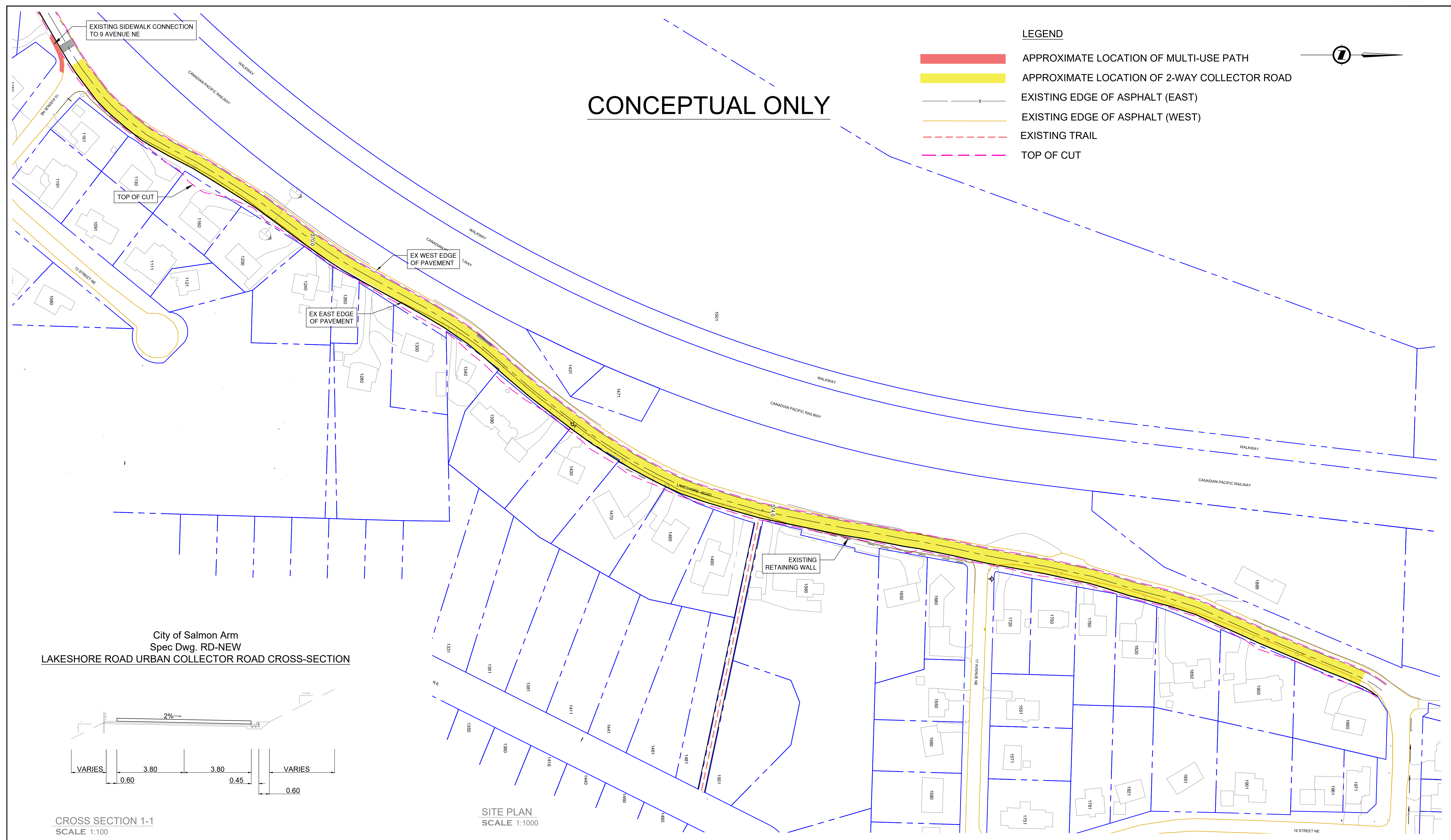
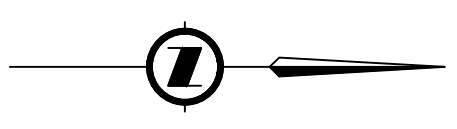
CLIENT PROJECT NO.	2019-47
OEL PROJECT NO.	7-36
DRAWING NO.	C2
SHEET:	2 OF 3

REV C

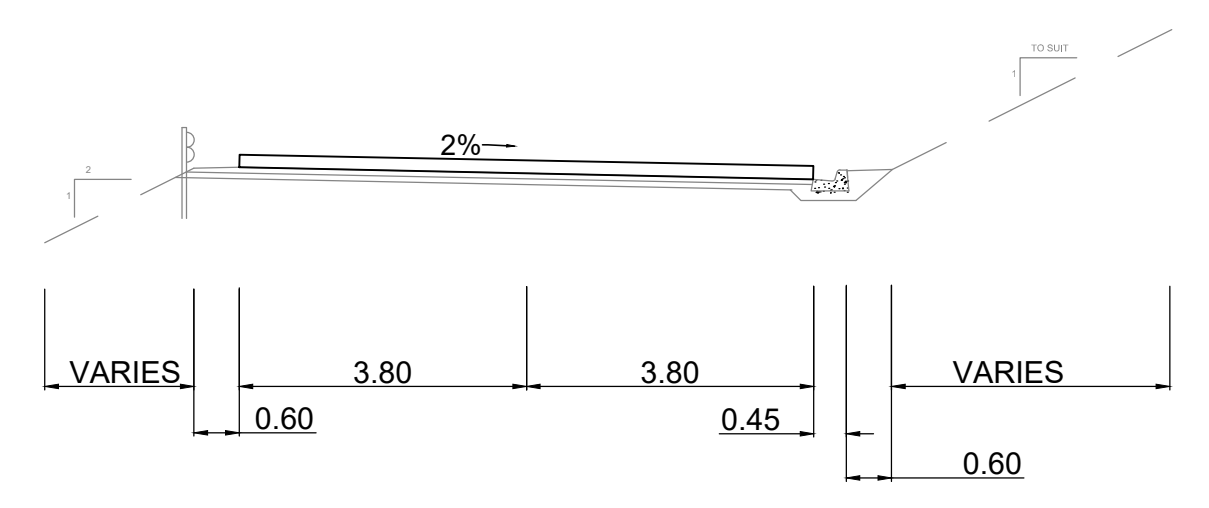
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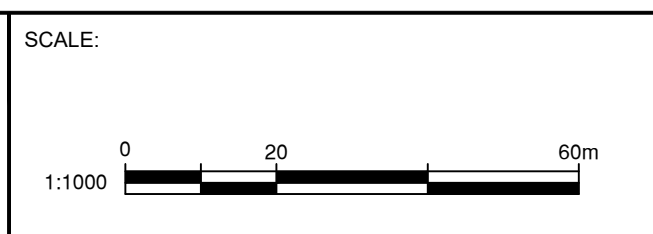
City of Salmon Arm
Spec Dwg. RD-NEW
LAKESHORE ROAD URBAN COLLECTOR ROAD CROSS-SECTION



CROSS SECTION 1-1
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CITY OF SALMON ARM
**LAKESHORE ROAD REHABILITATION
OPTION 3: TWO WAY ROAD
PLAN VIEW AND CROSS SECTION**

CLIENT PROJECT NO.	2019-47
OEL PROJECT NO.	7-36
DRAWING NO.	C3
SHEET:	3 OF 3