CITY OF SALMON ARM

Memorandum from the Engineering and Public Works Department

TO:	Director of Development Services
DATE:	1 October 2024
PREPARED BY:	Mustafa Zakreet, Engineering Assistant
SUBJECT:	**VARIANCE PERMIT APPLICATION FILE NO. VP- 604**
OWNER:	**Broadview Evangelical Free Church, and Shuswap Christian Education Society**, - 350 – 30 Street NE, Salmon Arm, BC V1E 1J2
APPLICANT:	Annie Charbonneau Architect Inc. – #2-1218 Langley Street, Victoria, BC V8W 1W3
LEGAL:	Lot 1, Section 18, Township 20, Range 9, W6M, KDYD, Plan KAP59726
CIVIC:	**350B – 30 Street NE**

Further to the request for variance dated 17 July 2024 the Engineering Department has reviewed the site and offers the following comments and recommendations relative to the requested variance:

The applicant is requesting that Council waive the following requirements of the Subdivision and Development Servicing Bylaw No. 4293 (SDSB).

1. Install Street Lighting

Background:

The SDSB dictates the level of lighting that is required for all categories of road. Currently this section of 30 Street NE and 2 Avenue NE have minimal pole-mounted lights and lighting levels fall well below the required illumination standard (See picture, Figure 1). Moreover, leasing BC Hydro lights comes at a substantial annual cost, prompting the replacement of pole-mounted lights with City-owned lights wherever possible.

The subject property borders sidewalks frequently used by school children, making sufficient lighting crucial for safety reasons. The City has received several complaints about the inadequate illumination in the area, highlighting the need for improvement.

Figure 1- Exisiting Hydro Pole Street Lights

A cost estimate of **$101,875** has been generated by Gentech Engineering (See Appendix #1) to install new street lights. However, the City Engineering Department disagrees with this estimate, as it assumes retaining the existing hydro pole lights and adding new street lights, which is not the standard approach.

If the variance request is denied, the City will request the installation of street lights to comply with the SDSB, ensuring necessary illumination standards are met.

Recommendation:
In the interest of both traffic and pedestrian safety**, the Engineering Department recommends that request to waive the requirement to Install Street Lighting be denied.**

2. Install an offset Multi-Use Path (MUP) on 30 Street NE.

Background:

30 Street NE is an Urban Arterial Road, requiring an offset MUP on both sides of the road to comply with current SDSB standards. One of the key objectives of the MUP is to get cyclists off motorized roads and to separate cyclists and pedestrians from motorists.

This route has been designated as a "Major Priority Project" in the City's Active Transportation Network Plan and is included in the Official Community Plan's "Cycle Network Plan." Its significance lies in its heavy usage by school children, pedestrians, cyclists, and motorists, making it an ideal candidate for Active Transportation (AT) upgrades that prioritize safety.

Figure 2- Existing Sidewalk

The existing sidewalk along the school frontage is substandard, failing to meet both the city's standards and road cross-section requirements (refer to Figure 2). Its deteriorated condition is evident in its age-related cracks, and it lacks essential features such as curbs and gutters, further emphasizing the need for upgrades to ensure safety and accessibility.

The City cross section standard for an urban Arterial road has an ultimate 25.0m road dedication (12.5m on either side of road centerline). The City only requires an Interim total of 20.0m of road dedication (10.0m on either side of road centerline) at this time and available records indicate that no additional road dedication is required. However the City will require a statutory right of way for an additional 2.5m beyond the current road dedication for the construction of a multi-use path to accommodate the construction multi-use-path.

For detailed cost estimates, please refer to Appendix 2.

Recommendation:
The Engineering Department recommends that request to waive the requirement to install an offset Multi-Use Path be denied.
Should Council decide to waive this requirement, it is important that the City still obtains the right of way over the property, as this will be necessary to construct a MUP in the future.

3. **Reduce the requirement to upgrade the existing 150mm watermain on 2 Avenue NE to 200mm along the entire frontage**

Background:

The minimum watermain size for institutional areas is 200mm, as specified in the SDSB. 2 Avenue and 30 Street NE are identified in the 2011 Water Study (Dayton & Knight, 2011) as having inadequate Fire Flows, with rates below the recommended minimum of 150 l/s, dropping below 90 l/s at the east end of the subject property

Figure 3- watermains along the frontage

Before any new development in the area, it is crucial to address the fire coverage and flow deficiencies. Upgrading the existing infrastructure is necessary to ensure adequate fire protection; however, it is unlikely that the required main upgrade on 2 Avenue will result in the necessary fire flows and surrounding areas are designated medium to low density in the OCP requiring only a 150mm watermain

For detailed cost estimates, please refer to Appendix 2.

Recommendation:

The Engineering Department recommends that request to waive the requirement upgrade the existing 150mm watermain on 2 Avenue NE to 200mm along the entire frontage be supported.

4. **Reduce the requirement to meet or exceed 150 l/s fire flows for Institutional Development**

The minimum fire flows required for Institutional Development is 150 l/s. Meeting the required flows would likely require extensive system upgrades as none of the nearby mains achieve this flow. The 2011 Water Master Plan indicates fire flows are between 90 and 149 l/s in the majority of the zone, dropping below 90 l/s at the east side of the subject property.

The Engineering Department would recommend the developer be required to complete a Fire Hydrant Flow Test to confirm the fire flows in the area. If the fire flows required by the bylaw not be achieved, the fire department recommends engaging a fire protection engineer to evaluate the water flow requirements for the proposed development's sprinkler system, ensuring it meets the necessary standards for adequate fire protection.

Recommendation:

The Engineering Department recommends that the request to reduce the requirement to meet or exceed 150 l/s fire flows for Institutional Development be supported subject to:

1. Completion of a fire hydrant flow test.
2. Review and approval by the Fire Department.
3. Adequate fire hydrant spacing.
4. Engagement of a fire protection engineer to evaluate and confirm that the proposed development's sprinkler system meets necessary standards for adequate fire protection, as recommended by the Fire Department.

5. Fire hydrant Installation.

Background:

There is currently large gaps in the fire hydrant coverage for the subject parcel.

- A 64-meter gap exists on the 100mm Zone 4 watermain on 2 Avenue NE
- A 30-meter gap exists on the 200mm and 300mm Zone 4 watermain on 30 Street NE.

Please refer to the adjacent figure, which illustrates the current fire hydrant coverage and spacing requirements for residential and institutional buildings. This visual representation highlights the gaps in coverage and the need for additional hydrants to meet fire protection standards.

For detailed cost estimates, please refer to Appendix 2.

Figure 4- Firehydrant spacing

Recommendation:

The Engineering Department recommends:

- **Deny the request to waive the requirement to install a fire hydrant on 2 Avenue NE, due to the existing 64-meter gap in coverage, which poses a risk to fire protection and public safety.**

- **Approve waiving the installation of a fire hydrant on 30 Street NE, as the 30-meter gap in coverage is relatively shorter and may be addressed through alternative fire protection measures.**

6. Corner Cut Dedication

On arterial streets, a 5.0 meter x 5.0 meter corner cut is mandatory at all intersections. This dedication serves multiple purposes:

- Enhanced Visibility: Creates a clear line of sight for drivers, pedestrians, and cyclists, improving overall safety.
- Reduced Collision Risk: Allows drivers to navigate turns with ease, minimizing the risk of accidents.

Infrastructure Accommodation: Enables the installation of traffic signals, streetlights, and future infrastructure upgrades.

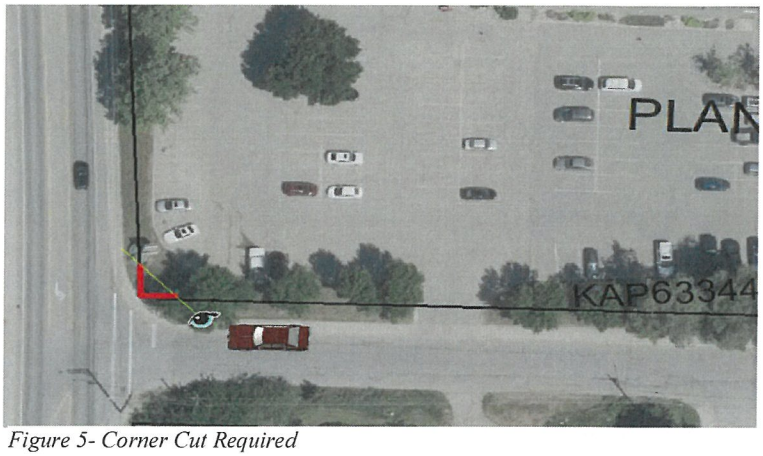


Figure 5- Corner Cut Required

Recommendation:

The Engineering Department strongly advises against waiving the corner cut dedication requirement, as it is essential for ensuring safety, accessibility, and efficient traffic flow. Denial of such requests will help maintain the integrity of our transportation network.

The Engineering Department recognizes that the amount of frontage improvements is out of proportion to the scope of development proposed. While we cannot recommend waiving any of the requirements as they are all important improvements, we note the highest priority items are as follows:

- Adequate fire protection to protect persons and property
- Acquiring dedication and/or ROW to enhance safety and allow for installation of important active transportation infrastructure
- Improving lighting for pedestrian and active transportation user safety

Mustafa Zakreet, EIT
Engineering Assistant

Jenn Wilson P.Eng.,
City Engineer

Appendix 1

2.0	Div. 26	Electrical				
	26 56 01	**Roadway Lighting**				
2.01	1.9.1	**Street Light Conduit RPVC** 32ø, c/w trench excavation, bedding, warning tape, backfill, wiring, connections & permits	Lineal Metre	310	$ 75.00	$ 23,250.00
2.02	1.9.1	**Poles & Fixtures - 9m Davit Street Light**	Each	1	$ 9,500.00	$ 9,500.00
2.03	1.9.1	**Poles & Fixtures - 9m Davit Street Light** c/w power base	Each	1	$ 12,000.00	$ 12,000.00
2.04	1.9.1	**Poles & Fixtures - 5m Post Top Street Light**	Each	4	$ 6,500.00	$ 26,000.00
2.05	1.9.1	**Davit Concrete Pedestal**	Each	2	$ 2,000.00	$ 4,000.00
2.06	1.9.1	**Post Top Concrete Pedestal**	Each	4	$ 1,500.00	$ 6,000.00
2.07	1.9.1	**Junction Box**	Each	1	$ 750.00	$ 750.00
					Subtotal: Division 26 - Electrical	**$ 81,500.00**

$81,500 x 1.25 (Contingency)= **$101,875**

Kings Christian School Upgrades
May 2024
Class C Cost Estimate

Appendix 2

Item No.	*MMCD Ref.*	*Description*	*Unit*	*Quantity*	*Unit Price*	*Amount*
1.0	**Div. 03**	**Concrete**				
	03 30 20	**Concrete Walks, Curb and Gutter**				
1.01	1.4.3, 1.4.4	**Machine Placed or Hand Formed Curb & Gutter** barrier - CGS1	Lineal Metre	130	$ 175.00	$ 22,750.00
1.02	1.4.3, 1.4.4	**Machine Placed or Hand Formed Curb & Gutter** rollover	Lineal Metre	8	$ 150.00	$ 1,200.00
1.03	1.4.3, 1.4.4	**Machine Placed or Hand Formed Curb & Gutter** median curb	Lineal Metre	85	$ 150.00	$ 12,750.00
1.04	1.4.5S	**Concrete Sidewalk, In-fill strips and Walkways** 150mm thickness, broomed finish, c/w ramps	Square Metre	5	$ 325.00	$ 1,625.00
1.05	1.4.5S	**Concrete Sidewalk, In-fill strips and Walkways** 180mm thickness, broomed finish, c/w ramps	Square Metre	6	$ 425.00	$ 2,550.00
	03 40 01	**Pre-Cast Concrete**				
1.06	1.4.3	**Concrete Lock Block Wall** all sizes of blocks	Per Block	180	$ 525.00	$ 94,500.00
					Subtotal: Division 03 - Concrete	**$ 135,375.00**
2.0	**Div. 26**	**Electrical**				
	26 56 01	**Roadway Lighting**				
2.01	1.9.1	**Street Light Conduit RPVC** 32ø, c/w trench excavation, bedding, warning tape, backfill, wiring, connections & permits	Lineal Metre	310	$ 75.00	$ 23,250.00
2.02	1.9.1	**Poles & Fixtures - 9m Davit Street Light**	Each	1	$ 9,500.00	$ 9,500.00
2.03	1.9.1	**Poles & Fixtures - 9m Davit Street Light** c/w power base	Each	1	$ 12,000.00	$ 12,000.00
2.04	1.9.1	**Poles & Fixtures - 5m Post Top Street Light**	Each	4	$ 6,500.00	$ 26,000.00
2.05	1.9.1	**Davit Concrete Pedestal**	Each	2	$ 2,000.00	$ 4,000.00
2.06	1.9.1	**Post Top Concrete Pedestal**	Each	4	$ 1,500.00	$ 6,000.00
2.07	1.9.1	**Junction Box**	Each	1	$ 750.00	$ 750.00
					Subtotal: Division 26 - Electrical	**$ 81,500.00**
3.0	**Div. 31**	**Earthwork**				
	31 11 01	**Clearing and Grubbing**				

Item No.	MMCD Ref.	Description	Unit	Quantity	Unit Price	Amount
3.01	1.4.1, 1.4.2	**Clearing and Grubbing**	Square Metre	1,200	$ 7.50	$ 9,000.00
3.02	1.4.2	**Isolated Tree Clearing and Grubbing**	Each	6	$ 325.00	$ 1,950.00
	31 24 13	**Roadway Excavation, Embankment and Compaction**				
3.03	1.8.4	**Remove Ex. Asphalt or Concrete Pavement, Sidewalks, Utility Strips, Driveways** all thicknesses, c/w off-site disposal	Square Metre	800	$ 12.50	$ 10,000.00
3.04	1.8.4	**Remove Existing Asphalt or Concrete Curbs & Gutters** c/w off-site disposal	Lineal Metre	150	$ 15.00	$ 2,250.00
3.05	1.8.5	**Common Excavation** off-site disposal	Cubic Metre	300	$ 15.00	$ 4,500.00
					Subtotal: Division 31 - Earthwork	**$ 27,700.00**
4.0	**Div. 32**	**Roads and Site Improvements**				
	32 11 16.1	**Granular Sub-Base**				
4.01	1.4.2S	**Granular Sub-Base** variable thickness for roads, sidewalks, and driveways	Cubic Metre	400	$ 95.00	$ 38,000.00
	32 11 23	**Granular Base**				
4.02	1.4.1S	**Granular Base** variable thickness for roads, sidewalks, and driveways	Cubic Metre	115	$ 125.00	$ 14,375.00
	32 12 16	**Hot-Mix Asphalt Concrete Paving**				
4.03	1.5.1S, 1.5.2	**Asphalt Pavement - Lower Course # 1** 50mm thickness	Square Metre	162	$ 35.00	$ 5,670.00
4.04	1.5.1S, 1.5.2	**Asphalt Pavement - Upper Course # 1 (CoSA)** 50mm thickness	Square Metre	630	$ 40.00	$ 25,200.00
4.05	1.5.1S, 1.5.2	**Asphalt Pavement - Upper Course # 2 (CoSA)** 50mm thickness	Square Metre	370	$ 40.00	$ 14,800.00
	32 31 13	**Chain Link Fences and Gates**				
4.06	1.5.1	**Chain Link Fence** 4 foot tall - black	Lineal Metre	90	$ 85.00	$ 7,650.00
	32 91 21	**Topsoil and Finish Grading**				
4.07	1.4.1S	**Imported Topsoil** 150mm thickness	Square Metre	1,450	$ 15.00	$ 21,750.00
	32 92 19	**Hydraulic Seeding**				
4.08	1.8.1	**Hydraulic Seeding**	Square Metre	750	$ 3.00	$ 2,250.00

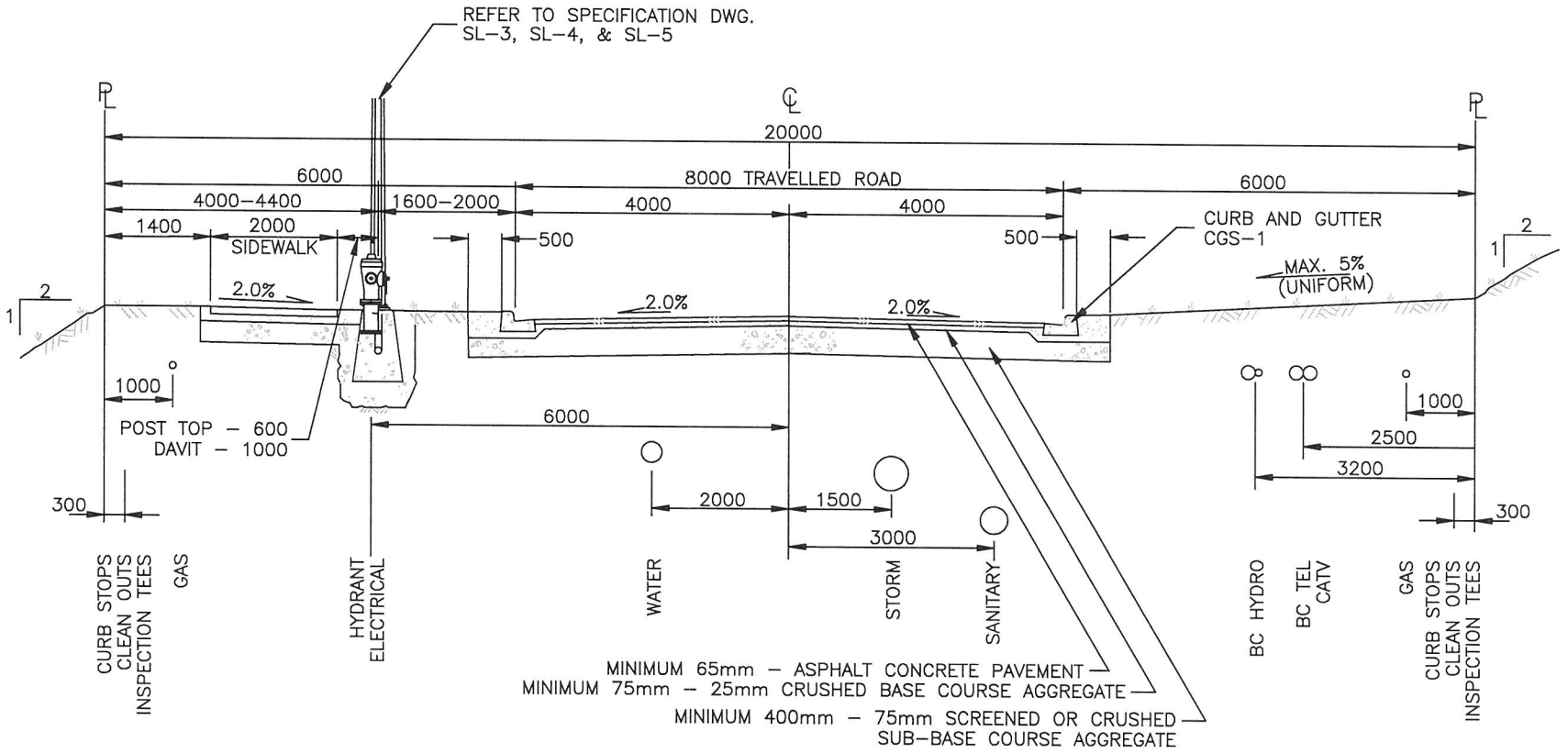
Item No.	MMCD Ref.	Description	Unit	Quantity	Unit Price	Amount
	32 92 23	**Sodding**				
4.09	1.8.2	**Nursery Sod**	Square Metre	700	$ 25.00	$ 17,500.00
					Subtotal: Division 32 - Roads and Site Improvements	**$ 147,195.00**
5.0	**Div. 33**	**Utilities**				
	33 11 01	**Waterworks**				
5.01	1.8.1, 1.8.2	**Watermain PVC C900 DR18** 200ø, all depths, native backfill	Lineal Metre	210	$ 350.00	$ 73,500.00
5.02	1.8.3	**In-Line Gate Valves** 200ø	Each	5	$ 2,950.00	$ 14,750.00
5.03	1.8.3	**Tee** 200ø x 200ø x 150ø, c/w thrust block	Each	4	$ 1,500.00	$ 6,000.00
5.04	1.8.3	**Tee** 200ø x 200ø x 200ø, c/w thrust block	Each	1	$ 1,750.00	$ 1,750.00
5.05	1.8.3	**Bends (11.25°, 22.5°, 45°, 90°)** 200ø, c/w thrust block	Each	2	$ 2,500.00	$ 5,000.00
5.06	1.8.3	**Reducer** 200ø x 150ø, c/w thrust block	Each	1	$ 1,250.00	$ 1,250.00
5.07	1.8.4	**Water Service Connections** 25ø service pipe, c/w tie-in to existing service	Each	5	$ 2,000.00	$ 10,000.00
5.08	1.8.13	**Watermain Tie-In** to existing , c/w couplers	Lump Sum	5	$ 6,000.00	$ 30,000.00
5.09	1.8.14	**Hydrant Assembly** c/w 150ø gate valve & lead, all fully restrained	Each	1	$ 12,500.00	$ 12,500.00
		Other				
5.10		**Utility Sleeve PVC SDR28** 100ø, c/w end caps	Lineal Metre	12	$ 75.00	$ 900.00
					Subtotal: Division 33 - Utilities	**$ 155,650.00**
6.0		**Other**				
6.01		**BC Hydro Civil Works (Allowance)**	Lump Sum	1	$ 75,000.00	$ 75,000.00
6.02		**Telecommunications Civil Works (Allowance)**	Lump Sum	1	$ 45,000.00	$ 45,000.00
					Subtotal: Other	**$ 120,000.00**

Item No.	MMCD Ref.	Description	Unit	Quantity	Unit Price	Amount
Summary of Cost Estimate						
1.0	Div. 03	Concrete				$ 135,375.00
2.0	Div. 26	Electrical				$ 81,500.00
3.0	Div. 31	Earthwork				$ 27,700.00
4.0	Div. 32	Roads and Site Improvements				$ 147,195.00
5.0	Div. 33	Utilities				$ 155,650.00
6.0		Other				$ 120,000.00
					Subtotal: Construction	**$ 667,420.00**
7.0	Class C	Contingency (25%)				$ 166,855.00
					Subtotal: Construction w/ Contingency	**$ 834,275.00**
8.0		Engineering				
		Design (5%)				$ 41,713.75
		Field Services (6%)				$ 50,056.50
		Records (2%)				$ 16,685.50
		Materials Testing (QA) (3%)				$ 25,028.25
		Geotechnical Investigation & Report (Allowance)				$ 25,000.00
					Subtotal: Engineering	**$ 158,484.00**
9.0		Shallow Utility Design Contribution				
		BC Hydro (Allowance)				$ 25,000.00
		Telecommunications (Allowance)				$ 10,000.00
					Subtotal: Shallow Utility Design Contribution	**$ 35,000.00**

Kings Christian School Upgrades
May 2024
Class C Cost Estimate

Item No.	*MMCD Ref.*	*Description*	*Unit*	*Quantity*	*Unit Price*	*Amount*
					Subtotal	**$ 1,027,759.00**
					GST (5%)	$ 51,387.95
					Total	**$ 1,079,146.95**

Cost Estimate Notes:
1) Quantities may vary depending on field revisions and/or conditions encountered at the time of construction, thereby affecting the final cost.
2) Unit Prices are influenced by supply & demand for both contractors and materials at the time of construction, thereby affecting the final cost.
3) Unless noted otherwise, prices do not include BC Hydro, Telecommunications, FortisBC, Legal Survey (BCLS) and property/right-of-way acquisitions.
4) Unless noted otherwise, prices do not include Geotechnical, Environmental and Archaeological studies, reviews, and approvals.
5) Unit Prices are estimated in 2024 Canadian Dollars for similar works and exclude taxes.



NOTES:

1) All utility appurtenances to be set to designed boulevard grade.
2) Boulevards to be graded towards the Roadway (Maximum 5% and Minimum 2%)
3) All materials shall be supplied and placed in accordance with schedule B, Part 3.0 and Schedule D, Approved material list.
4) Grades in excess of 2H:1V shall be recommended by a geotechnical engineer and approved by the City Engineer.

CITY OF SALMONARM

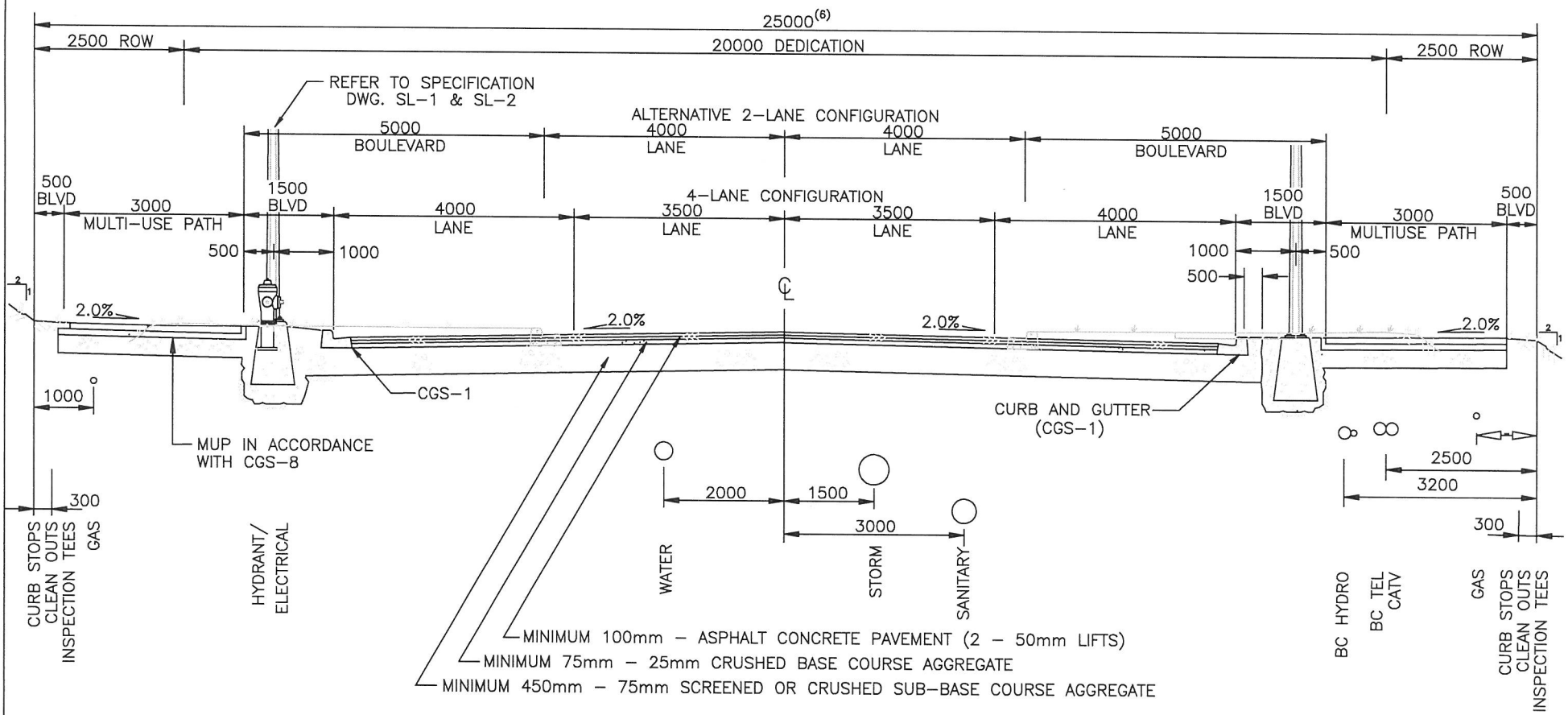
No.	REVISION	Date
A	SDSB 4293 – ISSUED FOR APPROVAL	06/12/23

APPROVED

PROFESSIONAL ENGINEER – PROVINCE OF BRITISH COLUMBIA – G. BAU BAIGES # 43133

20m R/W Urban Local Road Cross–Section

SPECIFICATION DRAWING No.: RD–02



NOTES:

1) All utility appurtenances to be set to designed boulevard grade.
2) Boulevards to be graded towards the Roadway (Maximum 5% and Minimum 2%)
3) All materials shall be supplied and placed in accordance with schedule B, Part 3.0 and Schedule D, Approved material list.
4) Grades in excess of 2H:1V shall be recommended by a geotechnical engineer and approved by the City Engineer.
5) Additional 3.5m x 3.5m ROW may be required for BC Hydro infrastucture.
6) Where 25.0m of dedication is not available, ROW shall be provided to supplement available dedication.

APPROVED

PROFESSIONAL ENGINEER – PROVINCE OF BRITISH COLUMBIA – G. BAU BAICES #43133

25M R/W URBAN ARTERIAL ROAD CROSS–SECTION

SPECIFICATION DRAWING No.: RD–04

CITY OF SALMONARM

No.	REVISION	Date
A	SDSB 4293 – ISSUED FOR APPROVAL	06/12/23