

Vehicles	Limited Access	Single Lane	Single Flow	Double Flow
Wheeled	At least 3.5 m	3.5 to 5.5 m	5.5 to 7.3 m	Over 7.3 m
Tracked and combination vehicles ¹	At least 4.0 m	4.0 to 6.0 m	6.0 to 8.0 m	Over 8 m

Table 1. Traffic-flow capacity based on route width following the Engineer Reconnaissance manual. The concentrate trucks are combination vehicles.

¹ Combination vehicles include multiple trailers and tractor trucks

Construction Stratification Type	from km	to km	Length km
I	5.14	6.2	1.06
II	7	8	1
?	13	13.76	0.76
?	23	23.7	0.7
III	25	26	1
IV	30	31	1
?	33.2	34.2	1
?	34.8	39	4.2
VI	44	45	1
VII	49	51.5	2.5
VIII	52	53	1
V	88	89	1
X	98.5	99.5	1
?	122.7	123.4	0.7
IX	147	149	2
		Total	19.92
		% of total length	10.83

Table 2. Construction stratification types allotted to various segments, including beginning and end km, and the respective lengths. Quotation marks (?) indicate missing data.

Table 510.B Min. SSD Low-volume Roads

Design Speed (km/h)	Minimum SSD (m)
30	30
40	45
50	65
60	85
70	110
80	140
90	170

Table 510.C SSD Corrections for Various Grades

Design Speed (km/h)	Decrease for Upgrade of:					Increase for Downgrade of:				
	3%	6%	9%	12%	14%	3%	6%	9%	12%	14%
	(m)					(m)				
30	0	0	0	0	0	0	0	5	5	5
40	0	0	5	5	5	0	5	5	10	10
50	5	5	10	10	10	0	5	10	15	20
60	5	5	10	10	*	5	10	15	25	*
70	5	10	15	15	*	5	10	20	35	*
80	10	15	20	*	*	10	15	30	*	*
90	10	20	25	*	*	10	20	40	*	*

(*) These grades are outside the range for LVR design (Refer to Table 350.A for maximum grades on LVRs.)

Vehicle weight	Speed	Slope vs. stopping distance (m) on dry hard surface		
		1.00%	5.00%	10.00%
100,000 lbs≈ 45 tonnes to 200,000 lbs≈ 91 tonnes	20Mph≈ 30km/h	130ft≈40m	170ft≈52m	220ft≈67m
	28Mph≈ 45km/h	220ft≈67m	260ft≈80m ₁	350ft≈107m ₁
	37Mph≈ 60km/h	310ft≈94m ₁	420ft≈128m ₁	n/a ₁

Table 3 US Information Circular 8758 vehicle weight vs. Speed and breaking distance on dry hard surface. **Note 1:** Since it is unrealistic to assume that brakes can remain applied without fade for excessive periods of time, heat build-up must be considered. Empirical test data from the British Columbia Department of Mines and Petroleum Resources. ('Dawson, V. E. Observations Concerning On Site Brake Testing of Large Mining Trucks. Pres. at Earthmoving Industry Conf., Central Illinois Sec., SAE, Warrendale, Pa. Apr. 15 16, 1975, 33 pp.) give some values. This organization conducted more than 1,000 haulage truck stopping distance tests at active mine sites in British Columbia. The variety of truck makes and models included in the testing program present a representative brake performance cross section for many vehicles. To preclude fade, a 200 foot (61m) braking distance should be considered the maximum allowable.

Slope degrees	Slope Characterization	Osha (indoor) ¹	YDS class for hiking/climbing (outdoor) ²
Less than 15 degrees ³	Fair	Limit of ramp for humans in dry, non slippery conditions	Class I
Between 15 and 25 degrees ⁴	Moderate	Lower end of stair use for humans in dry, non slippery conditions	Class 2
Over 25 degrees	Significant	Slope of stairs for humans in dry, non slippery conditions	Class 3

Table 4. various widely published and known ratings to characterize topographical slopes expressed in degrees and qualitatively (with an adjective).

1 https://www.ccohs.ca/oshanswers/safety_haz/stairs_fallprevention.html

2 https://en.wikipedia.org/wiki/Yosemite_Decimal_System

3 TransColorado_Gas_Pipeline_Transmission.pdf

4 <https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-guidelines/guidelines-part-26>: G26.16 Slope limitations - Safe work procedures

(b) a crawler tractor, feller buncher, excavator and other similar equipment must not be operated on a slope which exceeds 40% (22 degrees);

(c) any other forestry equipment specifically designed for use on a steep slope must not be operated on a slope which exceeds 50% (27 degrees). We will consider for our study a limit 25 degrees.

1 https://www.ccohs.ca/oshanswers/safety_haz/stairs_fallprevention.html

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Road and Environment features are:		Proposed Frequency		Do you agree with the tolerable number	For each box where you replied NO in the prior column	Your comments
ENVIRONMENTALLY SENSITIVE TARGETS ¹	DOMINANT CROSS SECTION/ TERRAIN (Downhill of road) SLOPE ²	CARGO ³ AND DIESEL FUEL COULD:	TOLERABLE NUMBER OF ACCIDENTS DURING SERVICE LIFE	Reply below YES or NO at each line	propose your values (one per line)	
NOT IN POTENTIAL REACH	Fair with fill less than 3m high	be easily contained and recovered Class 1	32			
	Moderate with fill less than 2m high	be contained and recovered with some effort Class 2	30			
	Significant even if fill height <1m	be contained and recovered with greater effort Class 3	28			
WITHN REACH Intersect environmentally sensitive target Or Containment and recovery require specific salvage equipment	Fair with fill less than 3m high	be contained and recovered Class 4	16			
	Moderate with fill less than 2m high	be contained and recovered in difficult conditions Class 5	9			
	Significant even if fill height <1m	be contained and recovered in very difficult conditions Class 6	5			
BRIDGE/WALL PRESENT						

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- 1 Environmentally sensitive targets can be water courses, water bodies, karst, habitats and others as defined by parks canada
 - 2 As specified in Table 4 from question 7 in this series of questions.
 - 3 Environmentally sensitive cargo as described in table 9-1 Material of environmental (EA1415-01_EA1415-01_Developer_s_Assessment_Report.PDF).

Road and Environment features are:		Comments	Proposed Frequency	Do you agree with the tolerable number	For each box where you replied NO in the prior column	Your comments
WITHIN IMMEDIATE REACH Intersect the environmentally sensitive target. Containment and recovery require specific salvage equipment	Low Bridge/culvert/wall (less than 2m from bottom)	be contained and recovered Class 7	2			
	Moderate high bridge/culvert/wall (2-3m from bottom)	be contained and recovered in difficult conditions Class 8	0.5			
	Higher bridge/culvert/wall (more than 3m from bottom)	be contained and recovered in very difficult conditions Class 9	0.1			

Table 5. List of accident scenarios and associated proposed frequencies (to be filled-in by Canzinc, expressed in non technical language to enhance comprehension) that could constitute a reasonable road accidents acceptability threshold for this road in Canzinc's view.