

CK-2370
CK-2370

KAREN 1.81km

2022 Inspection

CBR iPad Offline Ver 0.36



CBR Data

Latitude 49°27'42.19" Longitude -121°15'3.4"

Site Status Active

Insp. Status Inspect

Crossing Name Karen Creek

FSR # 8240 Branch # 1

Road Name KAREN

User km 1.81

Previous Load Rating (tonnes) 68

Structure Class Permanent Bridge

Portable N

Superstructure Steel I-beam

Deck Type Concrete Composite

Abutment Left Steel Pipe and Precast Pad

Abutment Right Steel Pipe and Precast Pad

Spans 1

Total Length (m) 21.6

Deck Width (m) 4.88

Updated Data

Latitude 49°27'42.08" Longitude -121°15'3.82"

HD Diff. (m) 9.2 Accuracy (m) 5

L75 or 68 tonnes

Inspection

Date of Inspection 2022-09-28 11:13:04 AM

Recommended Next Inspection 2023
Year

Inspector Name Tyson Miller

Inspection Company MoF

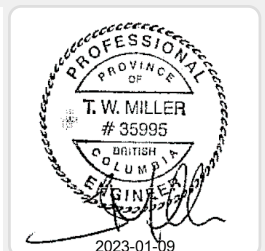
Inspector Comments

Timber deck appears to be floating on top of composite, installed as a wearing surface for construction equipment to cross

P.Eng Comments

Brush approaches. Tighten all guardrail hardware and install all 4 delineators. The current load rating of L75 or 68 tonnes to continue.

Restrictions to construction loads were sent via email to Trans Mountain Expansion Project personnel and are attached for reference. Those restrictions are expected to be followed.



PERMIT TO
PRACTICE: 1003022

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Approach

Alignment Fair

HC and VC both approaches

Bridge Ahead Signs
Missing ☒ 0 ☐ 1 ☐ 2

Brushing Required Y

Delineator Missing
Left ☐ 0 ☐ 1 ☒ 2

Delineator Missing
Right ☐ 0 ☐ 1 ☒ 2

Fender Condition Good

Concrete no post barriers

Posted Load Rating 68040

Road Surface Good

Abutment

Log/Timber Cribs

Tie Backs

Bin Wall

Pier

Concrete

Caps or Sills

Piles or Posts Good

Ballast Wall Good

Wing Wall

Bracing Good

Hardware

Fill Good

Riprap Good

Bearings Fair

Sediment collecting on bearings

Corrosion Protection Fair

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Deck

Running Surface Unrated Timber wear surface installed directly over top composite deck to allow construction equipment (ie. tracked equipment) to cross; therefore concrete deck surface not visible. No apparent damage noted from below.

Running Planks

Sub Deck

Ties

Nails

Deck to Girder Bolts

Concrete Deck Unrated Not visible from deck surface due to timbers on deck. Appears in good condition from below.

Grout Pockets Unrated Not visible from deck surface due to timbers on deck

Deck Joints Unrated Not visible from deck surface due to timbers on deck

Steel Deck Plate

Gravel Surface

Curb Rail/Blocks/Posts Good

Hand Rails/Walkouts

Hardware Fair A number of sideblock bolts visibly loose

Overall Deck Condition Fair

Gravel Depth (mm)

Pier Deck

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Steel/Concrete

Girders Good

Diaphragms Good 5 bolted bays

Bracing Good

Under Trussing

Hardware Good

Welded/grouted
shear connectors

Log

Log Curbs

Needle Beam

Needle Lashing/
Shimming

Needle Beam to Crib (m)

Needle Diameter (mm)

Stringer Number	Species	Peeled	Diameter (mm)	Rot Depth (mm)	Condition	Comment
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Hazards

Estimated Present Water Level Depth (m)	0.2	High Water	☐	Debris	☐
Estimated Present Water Level Width (m)	4.0	Aggradation	☐	Scour	☐
Estimated High Water Level Clearance	2.0	Ic	☐		

Comments

Repairs and Monitoring

Repair Item	Repair Description
1 Approach. Area/sight line brushing. m². Priority:Medium	Brush approaches
2 Structure. Delineator maintenance. . Priority:Medium	Add all 4 delineators
3 Structure. Curb Maintenance. # sites. Priority:Medium	Tighten all hardware

4

5

6

7

Item	Monitor Description	Frequency
1		
2		
3		



Approach from Right Bank when facing downstream



Deck



Subdeck appears to be 2"x10" dimension lumber



Upstream from Crossing



Downstream from Crossing



Approach from Left Bank when facing downstream



Right Bank Abutment when facing downstream



Superstructure



Loose rail hardware



Loose rail hardware



Loose rail hardware



Loose rail hardware



2022 Inspection

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CK-2370
CK-2370



Left Bank Abutment when facing downstream

From: [McTavish, Matthew](#)
To: [Miller, Tyson FOR:EX](#)
Cc: [Steinberg, Noah](#); [Jeff Irwin](#); [Hunter, James FOR:EX](#)
Subject: Re: Karen Creek
Date: December 7, 2022 3:20:54 PM
Attachments: [image001.png](#)
[Outlook-japwhz5q.png](#)

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Thanks for this Tyson. I have passed this over to the Construction team and will be having a meeting with them to discuss your comments and more importantly ongoing compliance as it relates to the Districts roads and associated infrastructure.

Matthew McTavish, E.P.

Manager, Forestry & Access (Contractor/Consultant)

Mobile: 604.323.4881 | Email: matthew_mctavish@transmountain.com



Trans Mountain Expansion Project

Toll Free: 1.866.514.6700 W: www.transmountain.com

From: Miller, Tyson FOR:EX <Tyson.Miller@gov.bc.ca>
Sent: Wednesday, December 7, 2022 11:50 AM
To: McTavish, Matthew <Matthew_McTavish@transmountain.com>
Cc: Steinberg, Noah <Noah_Steinberg@transmountain.com>; Jeff Irwin <jj.irwin@live.com>; Hunter, James FOR:EX <James.Hunter@gov.bc.ca>
Subject: RE: Karen Creek

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Hi Matt

Sorry for the delay in getting back to you. Regardless, I finally had a chance to review the attached memo with the district and have the following comments/restrictions to pass along.

First off, the Karen Creek road is a Forest Service Road (FSR) and the District Manager is the decision maker with regards to what restrictions that are allowed to be placed on it. As you're aware the 3 bridges in question are all designed to the L75 vehicle, and any equipment loads that equal or are less than what the L75 design vehicle produces are approved to cross. With regards to the memo that was submitted (attached); while the Ministry generally agree with the outcome of that analysis, we have serious reservations about allowing those limitations (10 km/hr, 100mm offset, balanced loads) if there is no way of proving you are meeting those requirements. For example, I was on site

several weeks ago and noted 30km/hr posted signs at all 3 bridge approaches and noted loaded rock trucks crossing the bridges that were beyond the 100mm offset limitation stated in the memo (although I did not catch the rock truck size that passed over the bridge I was inspecting). What is more concerning is that TMEP construction work has been ongoing for months, yet the analysis submitted was dated November 22, 2022.

In summary, the Ministry agrees with the outcomes of the submitted memo and will allow all “approved” equipment as listed in the memo (Tables 1, 2 and 3) over the bridges if TMEP:

1. Posts a stop sign and a 10km/hr speed limit sign at either approach of all 3 bridges and ensures these restrictions are being followed,
2. Places candle stick cones (or some other obstruction) down each side of the bridge ensuring a maximum 100mm offset from centerline of bridge, and ensures that these cones/obstructions remain in place and intact for the duration of use,
3. Ensures each load that crosses the bridges is balanced - 50/50,
4. All drivers are informed (documented) of the restrictions prior to crossing any of the 3 bridges

Alternatively, only equipment loads that are less than or equal to what the L75 design vehicle produces are allowed to cross the 3 bridges in question.

I will refer to your Road Use Permit (RUP) and Works Permit for any other obligations TMEP holds on this FSR. Also, the finalized bridge inspections are expected in the coming weeks and any maintenance items identified are a requirement of your RUP.

If you have any questions please let me know.

Tyson

From: McTavish, Matthew <Matthew_McTavish@transmountain.com>

Sent: November 23, 2022 10:32 AM

To: Miller, Tyson FOR:EX <Tyson.Miller@gov.bc.ca>

Cc: Steinberg, Noah <Noah_Steinberg@transmountain.com>; Fournier, Gino FOR:EX <Gino.Fournier@gov.bc.ca>; Jeff Irwin <jj.irwin@live.com>

Subject: Karen Creek

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Hi Tyson,

With respect to your request for engineer assessment on Karen Creek FSR bridges that TMEP is using, please find attached memorandum.

Let me know if you require anything further or have any questions.

Thanks,

Matthew McTavish, E.P.

Manager, Forestry & Access (Contractor/Consultant)

Mobile: 604.323.4881 | Email: matthew_mctavish@transmountain.com



Trans Mountain Expansion Project

Toll Free: 1.866.514.6700 W: www.transmountain.com

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DATE: November 22, 2022

TO: Mat Spendiff Kiewit Bonatii, TMEP Partnership

FROM: Francois Pepin, P.Eng. Peter Kiewit Sons ULC
Nick Moore, P.Eng. Peter Kiewit Sons ULC

SUBJECT: TMEP Spread 5B - Construction – Karen Creek Temp. Bridges Evaluation – R1

Spread 5B site team has requested Peter Kiewit Sons ULC. – Kiewit Infrastructure Engineers (KIE) review (3) bridges to be temporarily used for crossing construction equipment. The references and assumptions are as follows:

References:

1. British Columbia Commercial Transport Act Regulations 30/78, Sept 16, 2019
2. CSA S6-19 - Canadian Highway Bridge Design Code
3. Forest Service Bridge Design and Construction Manual.
4. "Load Limits for B.C. Forestry Bridges" by FPIInnovations and BC Ministry dated Nov.18, 2020
5. BC Ministry of Forests, Land, and Natural Resource Operations "Permanent Bridge Inspection Report" report ID CBR001A (3 documents for Structures CK-2368 (24.4m), CK-2370 (21.6m) and CK-2371 (18.3m))

Assumptions/Design Criteria:

1. The temporary bridges were adequately designed and fabricated for the L75 Design Truck specified in accordance with reference 5. It is further assumed; a 1.7 Live Load Factor and 1.25 Dynamic Factor were used in this design.
 - a. Minimum Design Truck L75:
 - i. GVW = 68,000 kg [150,000 lbs.],
 - ii. Max. Axle Load = 15,590 kg [34,370 lbs.]
 - iii. 60/40 Transverse Distribution of Axle Load
 - b. Bridge Lengths:
 - i. CK-2368 = 24.4m (80ft)
 - ii. CK-2370 = 21.6m (71ft)
 - iii. CK-2371 = 18.3m (60ft)
 - c. Bridge girder spacing = 3.6m (11.8ft)
2. Bridge Loading Summary (any other loading must be verified with KIE):
 - a. Equipment loading: See Table 1, Table 2 & Table 3.
 - b. Access mats (14ft x 8ft x 1ft) cover the entire existing bridges.
3. There is no structural damage or significant deterioration to the bridges in accordance with reference 5.
4. Fatigue is excluded from analysis as previous loading history cannot be verified. Bridges are assumed to be in good working condition with no-derating from prior use.
5. Environmental loads are considerably less compared to equipment weights.
6. All vehicles will travel down the centerline of the bridge **±100mm [4in]** to ensure no point loading of deck on the timber decked bridges.
7. All equipment will travel at speeds **less than 10km/h** except vehicles matching the L75 Design Truck, HS20-44 Loaded and CL625 Tandem Loaded designs may travel at speeds **less than 25km/h**.

November 22, 2022

SUBJECT: Karen Creek Temp. Bridges Evaluation

MEMORANDUM

Requirements/Findings:

1. Equipment approved and not approved for traveling across the bridges reviewed are as summarized in Table 1, Table 2 & Table 3.
2. Field team and contractor to verify all dimensions and site conditions prior to commencing work. Any error, omission or unusual condition are to be reported to the engineer immediately.
3. Periodical visual monitoring of the response of the bridge and its foundation should be undertaken for the duration of the operation by the field team.
4. A reduction in posted bridge rating of 68,000kg for the L75 design vehicle is not required for the installed access matting deck protection provided speed limits are in accordance with the design criteria above.
5. KIE structural team was on site November 17th 2022 and observed no notable damage to the superstructure of the three bridges.

Contact KIE if there are any questions.

FP/nm

November 22, 2022

SUBJECT: Karen Creek Temp. Bridges Evaluation

MEMORANDUM

EQUIPMENT	WEIGHT		TIRE / TRACK WIDTH (mm)	TRACK GAUGE (mm)	APPROVAL
	KG	LBS			
DOZERS					
CAT D9T	49,989	110,225	620	2250	APPROVED
CAT D8T	39,814	87,773	610	2083	APPROVED
CAT D6T	24,336	53,651	610	1880	APPROVED
JOHN DEERE 1050	43,591	96,100	610	2184	APPROVED
KOMATSU D155	40,506	89,300	610	2140	APPROVED
KOMATSU D65	24,460	53,934	560	1880	APPROVED
DRILLS					
ATLAS COPCO D7	14,198	31,300	305	2185	APPROVED
FLEXIROC T35	15,810	34,855	330	2125	APPROVED
COMACCHIO MC22	24,000	52,920	500	2000	APPROVED
RANGER DX800	15,600	34,398	500	1950	APPROVED
EXCAVATORS					
CAT349	47,719	105,200	900	2740	APPROVED
CAT336	37,150	81,900	850	2590	APPROVED
CAT335	36,300	80,042	600	2740	APPROVED
CAT330	30,900	68,125	600	2590	APPROVED
CAT325	28,800	63,493	600	2380	APPROVED
CAT324	29,479	64,990	600	2590	APPROVED
CAT308	9,483	20,906	450	1850	APPROVED
CAT305	5,423	11,958	400	1580	APPROVED
JD300G	31,339	69,223	700	2590	APPROVED
KOMATSU PC490	48,860	107,736	600	2890	APPROVED
KOMATSU PC360	36,850	81,254	600	2590	APPROVED
KOMATSU PC350	34,040	75,058	600	2590	APPROVED
VOLVO EC480EL	50,517	111,390	700	2740	APPROVED
VOLVO EC380EL	40,585	89,490	600	2390	APPROVED
VOLVO EC350EL	38,660	85,245	600	2590	APPROVED
JD670	69,900	154,130	900	3300	APPROVED
JD470	51,218	112,936	900	2890	APPROVED
JD350	36,734	80,998	800	2590	APPROVED
JD290	30,090	66,348	800	2590	APPROVED
GRADERS					
CAT 14 GRADER	24,375	53,738	435	2366	APPROVED
LOADERS					
CAT980 LOADED	54,351	119,821	762	2440	APPROVED
CAT966 LOADED	41,216	90,864	673	2230	APPROVED
CAT950 LOADED	33,133	73,044	644	2140	APPROVED
CAT930 LOADED	23,359	51,496	457	1960	APPROVED
CAT IT28 LOADED	20,810	45,878	587	1950	APPROVED
CAT IT38 LOADED	22,027	48,560	655	1950	APPROVED
PIPE LAYERS					
CAT 583 EMPTY	45,360	100,000	710	2337	APPROVED
CAT 583 LOADED	50,860	112,146	710	2337	NOT APPROVED
SP/CAT 594 EMPTY	55,102	121,500	800	2300	NOT APPROVED
SP/CAT 594 LOADED	60,602	133,628	800	2300	NOT APPROVED
CAT 572 EMPTY	31,845	70,218	660	2235	APPROVED
CAT 572 LOADED	37,345	82,346	660	2235	APPROVED
JD1050K - EMPTY	58,356	128,652	915	2642	NOT APPROVED
JD1050K - LOADED	63,856	140,802	915	2642	NOT APPROVED
TREX_EMPTY	67,750	149,363	1,010	2,820	NOT APPROVED
TREX_LOADED	N/A	N/A	1,010	2,820	NOT APPROVED
VOLVO_PL4608_EMPTY	57,931	127,738	750	2,902	NOT APPROVED
VOLVO_PL4608_LOADED	N/A	N/A	750	2,902	NOT APPROVED
TRUCKS					
HS20-44 LOADED	32,659	72,000	508	1830	APPROVED
CL625 TANDEM LOADED	63,732	140,529	600	1830	APPROVED
CAT745 LOADED	73,943	163,044	683	2687	APPROVED
CAT 745 w/ MAC9 TANK FULL	72,670	160,237	682	2688	APPROVED
CAT740 LOADED	72,600	160,055	743	2687	APPROVED
CAT 740 w/ MAC9 TANK FULL	73,713	162,537	743	2687	APPROVED
CAT730 LOADED	51,501	113,538	602	2275	APPROVED
KOMATSU HM400 LOADED	75,136	165,644	760	2690	APPROVED
KOMATSU HM300 LOADED	53,476	117,892	620	2280	APPROVED
CAT D250 LOADED	44,288	97,637	602	2218	APPROVED

Table 1: Allowable Equipment for 80ft Long, L75 Load Rated Bridge

Risk: Moderate

Permit to Practice, Peter Kiewit Sons ULC 1003169, EGBC

KIE Task #: 21-156-518.01.01

November 22, 2022

SUBJECT: Karen Creek Temp. Bridges Evaluation

MEMORANDUM

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CAT D250 LOADED	44,288	97,637	602	2218	APPROVED

Table 2: Allowable Equipment for 70ft Long, L75 Load Rated Bridge

Risk: Moderate

Permit to Practice, Peter Kiewit Sons ULC 1003169, EGBC

KIE Task #: 21-156-518.01.01

November 22, 2022

SUBJECT: Karen Creek Temp. Bridges Evaluation

MEMORANDUM

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CAT966 LOADED	41,216	90,864	673	2230	APPROVED
CAT950 LOADED	33,133	73,044	644	2140	APPROVED
CAT930 LOADED	23,359	51,496	457	1960	APPROVED
CAT IT28 LOADED	20,810	45,878	587	1950	APPROVED
CAT IT38 LOADED	22,027	48,560	655	1950	APPROVED
PIPE LAYERS					
CAT 583 EMPTY	45,360	100,000	710	2337	NOT APPROVED
CAT 583 LOADED	50,860	112,146	710	2337	NOT APPROVED
SPICAT 594 EMPTY	55,102	121,500	800	2300	NOT APPROVED
SPICAT 594 LOADED	60,602	133,628	800	2300	NOT APPROVED
CAT 572 EMPTY	31,845	70,218	660	2235	APPROVED
CAT 572 LOADED	37,345	82,346	660	2235	APPROVED
JD1050K - EMPTY	58,356	128,652	915	2642	NOT APPROVED
JD1050K - LOADED	63,856	140,802	915	2642	NOT APPROVED
TREX_EMPTY	67,750	149,363	1,010	2,820	NOT APPROVED
TREX_LOADED	N/A	N/A	1,010	2,820	NOT APPROVED
VOLVO_PL4608_EMPTY	57,931	127,738	750	2,902	NOT APPROVED
VOLVO_PL4608_LOADED	N/A	N/A	750	2,902	NOT APPROVED
TRUCKS					
HS20-44 LOADED	32,659	72,000	508	1830	APPROVED
CL625 TANDEM LOADED	63,732	140,529	600	1830	APPROVED
CAT745 LOADED	73,943	163,044	683	2687	NOT APPROVED
CAT 745 w/ MAC9 TANK FULL	72,670	160,237	682	2688	NOT APPROVED
CAT740 LOADED	72,600	160,055	743	2687	NOT APPROVED
CAT 740 w/ MAC9 TANK FULL	73,713	162,537	743	2687	NOT APPROVED
CAT730 LOADED	51,501	113,538	602	2275	APPROVED
KOMATSU HM400 LOADED	75,136	165,644	760	2690	NOT APPROVED
KOMATSU HM300 LOADED	53,476	117,892	620	2280	APPROVED
CAT D250 LOADED	44,288	97,637	602	2218	APPROVED

Table 3: Allowable Equipment for 60ft Long, L75 Load Rated Bridge

Risk: Moderate

Permit to Practice, Peter Kiewit Sons ULC 1003169, EGBC

KIE Task #: 21-156-518.01.01