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**To:** Schacher, Sarah E (DOT)  
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**Subject:** Mahn Choh Ore Truck Configuration  
**Date:** Friday, October 7, 2022 3:33:38 PM  
**Attachments:** 17AAC25.pdf  
 FHWA\_bridge\_formula.pdf  
 imaoe002.png

Hello Sarah,

We have examined most of the bridges on the proposed haul route for the Mahn Choh ore truck – see table below.

Bridge Number	Bridge Name	Inventory Rating Moment	Inventory Rating Shear	Operating Centered Rating Moment	Operating Centered Rating Shear	GVW limit for Inventory	Mahn Choh truck Equivalent Moment	Mahn Choh truck Equivalent Shear
506	Tok River	HS 43.9	HS 42.5	HS 97.0	HS 88.4	no post	HS 32.5	HS 20.2
507	Yerrick Creek	HS 35.4	HS 24.4	HS 72.6	HS 50.0	no post	HS 29.8	HS 27.4
508	Cathedral Rapids No 1	HS 32.2	HS 21.1	HS 70.3	HS 46.1	no post	HS 22.5	HS 23.3
510	Cathedral Rapids No 2	HS 32.2	HS 21.1	HS 70.3	HS 46.1	no post	HS 22.5	HS 23.2
511	Cathedral Rapids No 3	HS 32.2	HS 21.1	HS 70.3	HS 46.1	no post	HS 22.5	HS 23.2
509	Robertson River	HS 17.2	HS 38.2	HS 45.0	HS 106.7	TBD	HS 31.2	HS 28.9
513	Bear Creek	HS 32.2	HS 29.5	HS 74.1	HS 66.6	no post	HS 20.9	HS 18.5
514	Chief Creek	HS 33.0	HS 30.7	HS 80.3	HS 73.3	no post	HS 19.4	HS 19.0
515	Berry Creek	HS 41.0	HS 27.5	HS 85.6	HS 57.4	no post	HS 27.8	HS 26.4
516	Sears Creek	HS 34.8	HS 34.6	HS 88.5	HS 76.2	no post	HS 19.9	HS 16.1
517	Dry Creek	HS 15.7	HS 21.4	HS 46.5	HS 63.3	no post	HS 19.2	HS 18.1
518	Johnson River	HS 15.7	HS 31.2	HS 43.1	HS 85.4	69 Tons	HS 31.2	HS 28.9
519	Little Gerstle River	HS 38.5	HS 33.9	HS 90.1	HS 77.5	no post	HS 29.4	HS 28.2
520	Gerstle River - Truss	HS 22.7	HS 19.1	HS 98.5	HS 82.8	no post	HS 31.2	HS 28.9
520	Gerstle River - Floorbeam	HS 16.3	TBD	HS 115.7	TBD	no post	HS 19.2	HS 19.2
520	Gerstle River - Stringer	HS 21.7	HS 40.1	HS 59.9	HS 110.8	no post	HS 18.2	HS 15.8
521	Sawmill Creek	HS 38.0	HS 27.4	HS 89.8	HS 61.7	78 Tons	HS 34.8	HS 29.5
524	Tanana River Big Delta	HS 32.4	HS 63.2	HS 88.6	HS 164.9	no post	HS 20.6	HS 16.7
525	Shaw Creek	HS 31.5	HS 32.4	HS 72.0	HS 71.5	no post	HS 21.0	HS 16.6
526	Banner Creek	HS 33.9	HS 36.0	HS 99.3	HS 105.6	no post	HS 28.0	HS 28.0
527	Salcha River	HS 26.9	HS 26.1	HS 69.8	HS 67.8	TBD	HS 31.6	HS 32.5
528	Clear Creek	HS 31.2	HS 67.3	HS 84.9	HS 173.0	no post	HS 19.4	HS 19.0
529	Munson Slough	HS 28.6	HS 36.7	HS 82.7	HS 106.0	no post	HS 21.4	HS 22.4
530	Little Salcha River	HS 31.2	HS 67.3	HS 84.9	HS 173.0	no post	HS 19.4	HS 19.0
2133	Eielson Access Undercrossing	HS 43.7	HS 33.8	HS 93.1	HS 72.0	no post	HS 32.6	HS 23.3
531	Moose Creek East Bound (empty)	HS 31.1	HS 27.4	HS 81.9	HS 72.0	no post	HS 27.1	HS 24.6
1832	Moose Creek West Bound (full)	HS 31.1	HS 27.4	HS 81.9	HS 72.0	no post	HS 27.1	HS 27.6
2123	Moose Creek OH SB (empty)	HS 37.8	HS 36.0	HS 97.7	HS 88.8	no post	HS 25.4	HS 18.7
2124	Moose Creek OH NB (full)	HS 37.8	HS 36.0	HS 97.7	HS 88.8	no post	HS 25.4	HS 18.7
1364	Chena Flood Chanl - N.B. (full)	HS 22.5	HS 13.7	HS 52.4	HS 32.0	72 Tons	HS 22.9	HS 23.0
1866	Chena Flood Chanl - S.B. (empty)	HS 22.2	HS 13.5	HS 51.7	HS 31.4	71 Tons	HS 22.9	HS 23.0
2147	Dawson Road UC	HS 43.4	HS 40.7	HS 86.7	HS 81.6	no post	HS 34.0	HS 32.9
1767	Badger Loop Rd U.C.	HS 29.9	HS 19.7	HS 80.3	HS 53.1	78 Tons	HS 33.3	HS 33.1
1959	Badger Loop U.C.	HS 42.6	HS 48.6	HS 90.3	HS 96.6	no post	HS 31.6	HS 32.7
231	Chena River (Steese Hwy)	HS 24.0	HS 15.9	HS 52.6	HS 38.8	TBD	HS 26.5	HS 27.4
1342	Chena Hot Springs UC	HS 21.8	HS 15.6	HS 61.5	HS 44.1	68 Tons	HS 29.5	HS 29.0

We have a few "To Be Determined" bridges that will take additional time to evaluate that can be run, if requested, but as you can see, five bridges would require a reduction in the proposed haul truck weight to remain below the posting/inventory/legal limit.

#### BACKGROUND AND DISCUSSION

The "strength" of a bridge is calculated and reported in terms of the "inventory rating factor" and the "operating rating factor." The factors are the ratio of the bridge's "strength" to the live load that can cross the bridge under various conditions. The inventory rating is the live load that can cross the bridge as frequently as desired without the need for an overload permit (i.e., no traffic restrictions). An inventory rating factor of 1.0 implies that the bridge can safely accommodate legal highway loads. The operating rating is the heaviest load that the bridge can carry on an infrequent basis (i.e., overloads). Bridges that cannot accommodate legal highway loads must be load posted. A bridge's load posting is based upon the lowest inventory rating of the deck, girder, truss or other load-carrying component. An overload permit is required for any vehicle that exceeds (a) the legal highway truck weight or (2) the posted load weight for the bridge.

In general, the inventory rating factor of a bridge should be at least equivalent to HS20 (the legal highway load where rating factor = 1) for moment and shear. Based upon DOT policy, if the inventory rating factor is less than 0.75 then a load posting analysis is performed. The posting analysis examines "common Alaska trucks" crossing the bridge in an unrestricted manner (e.g., in multiple lanes of mixed highway traffic at full highway speed). If the posting vehicles do not require a reduction in legal weight, then no load posting sign is required. But if the posting vehicles exceed the bridge's inventory rating then a load posting sign is installed so that the posting vehicle does not exceed the bridge's "inventory strength." None of the bridges on the proposed haul route have load posting (restriction) signs.

There are algebraic formulas that can be used to evaluate a truck's axle weight and spacing to determine if it is a "legal load" – that is, if it is equivalent to HS20 or less. Most all states use the FHWA bridge formula as the basis for legal truck weights (see attached file). Alaska 17 AAC 25.013(a) defines legal highway loads in a