BSDMS Summary Report

4 Tazlina River at Richardson Hwy (S.R. 4) nr Glennallen,AK

Site Location:

Site ID: 4

Site Name: Tazlina River at Richardson Hwy (S.R. 4) nr Glennallen,AK

County: Town of Glennallen

Nearest City: Glennallen

State: AK

Latitude: 620000

Longitude: 1455000

USGS Station ID:

Route Number: 4

Route Class: State

Service Level: Mainline

Route Direction: NA

Highway Mile Point: 116.2

Stream Name: Tazlina River

River Mile:

Contact:
U.S. Geological Survey, Water Resources Division
218 E Street, Skyline Building
Anchorage, AK 99501

Publication:
U.S. Geological Survey
Water-Resources Investigations 32-75
Scour at Selected Bridge Sites in Alaska
By Vernon W. Norman
November 1975

Site Description:

This study site is located at bridge 573 at mile 116.2 on the Richardson Highway where it crosses the Tazlina River, 2 miles upstream from its confluence with the Copper River. It is 5 miles southeast of Glennallen.
The Tazlina River flows from a large glacier-fed lake about 26 miles west of the study site. The variations in discharge in the Tazlina River are subdued by the lake. Almost annually one of several glacier-dammed lakes above the lake breaks out to produce floodflows in the river. Post and Mayo discuss these lake breakouts in their report on glacier-dammed lakes. Stream-gaging records have been maintained at the bridge since 1951. Recorded annual peaks range from a low of 15,300 cfs in 1956 to a high of 60,700 cfs in 1962. The mean-annual and 50-year recurrence-interval floods are about 25,000 and 78,000 cfs respectively.
Brice (1971) suggests that the recent history of the Tazlina River has been one of slow degradation.
There is a large meander in the river about 4,000 ft upstream from the bridge, which may eventually be cut off by erosion.
Alternate bars composed largely of cobbles and gravel but containing occasional boulders are located in the study area. Heavy riprap protection is provided on both banks at the bridge opening and on the right bank for a distance of 200 ft upstream from the bridge.
The data included in this report were collected during a flood in Sept 1971 (Q = 39,700 cfs). Its recurrence interval is about 6 years.

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Elevation Reference

Datum: Gage

MSL (ft):

Description of Reference Elevation:

Stream Data

Drainage Area (sq mi):	2670	**Floodplain Width:**	Unknown
Slope in Vicinity(ft/ft):	0.0021	**Natural Levees:**	Unknown
Flow Impact:	Straight	**Apparent Incision:**	Unknown
Channel Evolution	Degradation	**Channel Boundary:**	Alluvial
Armoring:	High	**Banks Tree Cover:**	Medium
Debris Frequency:	Unknown	**Sinuosity:**	Sinuous
Debris Effect:	Unknown	**Braiding:**	Locally
Stream Size:	Medium	**Anabranching:**	Unknown
Flow Habit:	Perennial	**Bars:**	Irregular
Bed Material:	Cobbles	**Stream Width Variability:**	Unknown
Valley Setting:	Unknown		

Roughness Data

Manning's n Values

	Left Overbank	Channel	Right Overbank
High:			
Typical			
Low:			

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Bed Material

Measurement Number	Yr	Mo	Dy	Sampler	D95 (mm)	D84 (mm)	D50 (mm)	D16 (mm)	SP	Shape	Cohesion
1	1969	4	22	Zeiss	144	120	90	68	2.65		Unknown

Bed Material Comments

Measurement No: 1

Photographs of the exposed streambed material at cross section 1 on April 22, 1969 were analyzed by the Zeiss method. Photographs of some of the larger material near the right bank in cross section 1 showed large cobbles of 200 to 250 mm in diameter and a few boulders. Only the D90=130 and D50=90 were reported with the data. The D95, D84, and D16 were computed from the provided data. The D84 was interpolated from the D90 and D50 using a log-probability interpolation. Sigma was computed as D84/D50. D95 and D16 were computed from the equation D50 * Sigma^(standard normal deviate of 95 or 16).

Bridge Data

Structure No: 573

Length(ft): 400

Width(ft):

Number of Spans: 2

Vertical Configuration: Unknown

Low Chord Elev (ft):

Upper Chord Elev (ft):

Overtopping Elev (ft):

Skew (degrees): 0

Guide Banks: Unknown

Waterway Classification: Main

Year Built:

Avg Daily Traffic:

Plans on File: No

Parallel Bridges No

Upstream/Downstream: N/A

Continuous Abutment: No

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Distance Between Centerlines:

Distance Between Pier Faces:

Bridge Description:

The principal structure of this bridge consist of one 300-ft span and one 100-ft span, both supported by one large pointed-nose pier located in the right one third of the channel. The pier is founded on two concrete-filled sheet-piling caissons 15 ft in diameter whose centers are aligned with the flow.

Abutment Data

Left Station: 0

Right Station: 0

Left Skew (deg): 0

Right Skew (deg) 0

Left Abutment Length (ft):

Right Abutment Length (ft)

Left Abutment to Channel Bank (ft):

Right Abutment to Channel Bank (ft):

Left Abutment Protection:

Right Abutment Protection

Contracted Opening Type: Unknown

Embankment Skew (deg): 0

Embankment Slope (ft/ft):

Abutment Slope (ft/ft)

Wingwalls: No

Wingwall Angle (deg): 0

Pier Data

Pier ID	Bridge Station(ft)	Alignment	Highway Station	PierType	# Of Piles	Pile Spacing(ft)

1	328	0	0	Group	2

Pier ID	Pier Width(ft)	Pier Shape	Shape Factor	Length(ft)	Protection	Foundation
1	15	Round			None	Piles

Pier ID	Top Elevation(ft)	Bottom Elevation(ft)	Foot or Pile Cap Width(ft)	Cap Shape	Pile Tip Elevation(ft)
1				Round	

Pier Description

Pier ID 1

Although the site description of this pier (Norman 1975), indicates a pointed nose, the pier is founded on two concrete-filled sheet-piling caissons 15 ft in diameter whose centers are aligned with the flow. For hydraulic purposes, the pier is two round piles or caissons.

Pier Scour Data

Pier ID	Date	Time	USOrDS
1	9/2/71	0:00	Upstream
1	9/4/71	0:00	Upstream

Pier ID	Scour Depth	Accuracy (ft)	Side Slope (ft/ft)	TopWidth (ft)	Apprch Vel (ft/s)	Apprch Depth(ft)	Effective Pier Width	Skew to Flow(deg)
1	5	0.5			9.5	12	15	0
1	5.5	0.5			11.5	15	15	0

PierID	Sediment Transport	Bed Material	BedForm	Trough (ft)	Crest (ft)	Sigma	Debris Effects
1	Live-bed	Non-cohesive	Ripple			1.33	Insignificant
1	Live-bed	Non-cohesive	Ripple			1.33	Insignificant

PierID	D95 (mm)	D84 (mm)	D50 (mm)	D16 (mm)
1	144	120	90	68
1	144	120	90	68

Pier Scour Comments

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Pier ID 1 **Time:** 0:00 **US/DS:** Upstream

Scour was sampled using soundings from a sounding weight. Turbulence was severe during high water. Minimum bed elevation was near the nose of the pier. The nose wave this pier created at high flow sheds almost all of the debris that the current directed toward it.

Pier ID 1 **Time:** 0:00 **US/DS:** Upstream

Maximum observed scour occurred this date. Turbulence was severe during high water. Scour was measured using soundings from a sounding weight. The nose wave this pier created during high flow shed almost all of the debris that the current directed toward it. Minimum bed elevation was near nose of pier.

Abutment Scour

ContractionScour

Stage and Discharge Data

Peak Discharge					Flow		Peak Stage					Stage	Water	Return
year	mo	dy	hr	mi	(cfs)	Qacc	year	mo	dy	hr	mi	(ft)	Temp (C)	Period(yr)
1969	4	22		0	280	none	1969	4	22		0	7.8	1	
1971	9	4		0	39400	none	1971	9	4		0	20	8.5	6

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1971	9	2		0	25000	none	1971	9	2		0	18.4	8.5	6
1971	10	1		0	3530	none	1971	10	1		0	11.2	6	

Hydrograph

Hydrograph Number	Year	Month	Day	Hr	Min	Sec	Stage(ft)	Discharge (cfs)
1	1971	9	1	0	0	0	16.5	
1	1971	9	3	4	50	0	19.5	
1	1971	9	4	4	50	0	21	
1	1971	9	4	16	50	0	20	
1	1971	9	5	9	40	0	19	
1	1971	9	6	19	10	0	17.5	
1	1971	9	7	9	40	0	17.1	
1	1971	9	8	14	40	0	16.6	
2	1971	9	1	0	0	0		17000
2	1971	9	2	9	40	0		25000
2	1971	9	3	2	20	0		30000
2	1971	9	3	19	10	0		36000
2	1971	9	4	4	50	0		40000
2	1971	9	4	19	10	0		34000
2	1971	9	5	14	40	0		27000
2	1971	9	6	7	10	0		24000
2	1971	9	7	8	0	0		19000
2	1971	9	8	14	40	0		17000

Supporting Files