STATE OF VERMONT
AGENCY OF TRANSPORTATION

PRELIMINARY INFORMATION SHEET (BRIDGE)

Version 11.08.15

LRFD

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TRAFFIC DATA

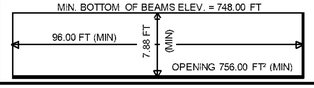
YEAR	ADT	DHV	% D	% T	ADTT
2013	4600	520	58	5.6	440
2033	5200	590	58	8.3	750

20 year ESAL for flexible pavement from 2013 to 2033 : 4401000

40 year ESAL for flexible pavement from 2013 to 2053 : 10806000

Design Speed : 40 mph

TEMPORARY BRIDGE PROFILE ALONG TEMP CL



FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: April 12, 2010

DRAINAGE AREA : 116.9 sq. mi.
CHARACTER OF TERRAIN : Hilly to mountainous, mostly forested with some open areas
STREAM CHARACTERISTICS : Sinuous to meandering, incised and stable
NATURE OF STREAMBED : Mostly cobbles with some gravel, sand and a few boulders

PEAK FLOW DATA

Q 2.33 =	2500 cfs	Q 50 =	6700 cfs
Q 10 =	4500 cfs	Q 100 =	7600 cfs
Q 25 =	5700 cfs	Q 500 =	9700 cfs

DATE OF FLOOD OF RECORD unknown
ESTIMATED DISCHARGE: unknown
WATER SURFACE ELEV.: unknown
NATURAL STREAM VELOCITY : @ Q50 = 8.0 fps
ICE CONDITIONS : Moderate to heavy
DEBRIS: Moderate
DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? Yes
IS ORDINARY RISE RAPID? Yes
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? No
IF YES, DESCRIBE:

WATERSHED STORAGE: <1%
HEADWATERS:
UNIFORM: X
IMMEDIATELY ABOVE SITE:

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: Three span steel beam bridge with concrete deck
YEAR BUILT: Built in 1929 and reconstructed in 1950
CLEAR SPAN(NORMAL TO STREAM): 17' + 54' + 17' = 88' total
VERTICAL CLEARANCE ABOVE STREAMBED: 11'
WATERWAY OF FULL OPENING: 810 sq. ft.
DISPOSITION OF STRUCTURE: Remove and replace
TYPE OF MATERIAL UNDER SUBSTRUCTURE: See boring logs

WATER SURFACE ELEVATIONS AT:

Q2.33 =	744.3'	VELOCITY =	7.3 fps
Q10 =	747.1'	"	8.6 fps
Q25 =	748.3'	"	9.9 fps
Q50 =	749.2'	"	10.8 fps
Q100 =	750.0'	"	11.9 fps

LONG TERM STREAMBED CHANGES: There is a 2' - 3' deep scour hole through the bridge area. No other changes were noted, and the streambed appears stable.

IS THE ROADWAY OVERTOPPED BELOW Q100: No
FREQUENCY: Above Q100
RELIEF ELEVATION: 752.0'
DISCHARGE OVER ROAD @Q100: None

UPSTREAM STRUCTURE

TOWN: St. Johnsbury — DISTANCE: 4600'
HIGHWAY # : Railway — STRUCTURE #:
CLEAR SPAN: No information available. — CLEAR HEIGHT:
YEAR BUILT: — FULL WATERWAY:
STRUCTURE TYPE:

DOWNSTREAM STRUCTURE

TOWN: St. Johnsbury — DISTANCE: 3400'
HIGHWAY # : U.S. Route 2 — STRUCTURE #: 107
CLEAR SPAN: 62' — CLEAR HEIGHT: 13'
YEAR BUILT: Built 1929 rehab. 1950 & 1978 — FULL WATERWAY: 870 sq. ft.
STRUCTURE TYPE: Single span steel beam bridge with concrete deck

LRFR LOAD RATING FACTORS

LOADING LEVELS	TRUCK						
	H-20	HL-93	3S2	6 AXLE	3A STR.	4A STR.	5A SEMI
TONNAGE	20	36	36	66	30	34.5	38
INVENTORY	2.20	1.40	2.23	1.38	2.18	1.93	1.97
POSTING							
OPERATING	2.85	1.81	2.89	1.79	2.83	2.51	2.55
COMMENTS:							

PILE DRIVING AND TESTING REQUIREMENTS

1. NOMINAL PILE DRIVING CAPACITY — Rndr: 486.00 KIP
2. PILE TEST RESISTANCE FACTOR — ϕ: 0.65
3. REQUIRED PILE PENETRATION BELOW ABUTMENT STEM — 35.00 FT
4. PERFORM ONE DYNAMIC PILE LOADING TEST FOR EACH ABUTMENT. PILES MUST BE DRIVEN TO THE REQUIRED DEPTH REGARDLESS IF THE REQUIRED DRIVING RESISTANCE HAS BEEN MET.

PROPOSED STRUCTURE

STRUCTURE TYPE: Single span steel plate girder bridge with concrete deck

CLEAR SPAN(NORMAL TO STREAM): 97.4' (99.0' along roadway)
VERTICAL CLEARANCE ABOVE STREAMBED: 11'
WATERWAY OF FULL OPENING: 898 sq. ft.

WATER SURFACE ELEVATIONS AT:

Q2.33 =	743.9'	VELOCITY=	6.0 fps
Q10 =	746.6'	"	6.8 fps
Q25 =	747.6'	"	7.8 fps
Q50 =	748.4'	"	8.6 fps
Q100 =	749.0'	"	9.4 fps

IS THE ROADWAY OVERTOPPED BELOW Q100: No
FREQUENCY: Above Q100
RELIEF ELEVATION: 752.0'
DISCHARGE OVER ROAD @Q100: None

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 750.5' upstream, 748.7' dnstream
VERTICAL CLEARANCE: @ Q50 = 2.1' upstream girder, 1.2' downstream girder

SCOUR: Contraction scour = 3' up to Q500.

REQUIRED CHANNEL PROTECTION: Stone Fill, Type III

PERMIT INFORMATION

AVERAGE DAILY FLOW:	240 cfs	
ORDINARY LOW WATER:	110 cfs	DEPTH OR ELEVATION:
ORDINARY HIGH WATER:	1075 cfs	Elevation 739'
		Elevation 742'

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE: Single span bridge
CLEAR SPAN (NORMAL TO STREAM): 96' minimum
VERTICAL CLEARANCE ABOVE STREAMBED: Elevation 748.0' minimum
WATERWAY AREA OF FULL OPENING: 756 sq. ft. minimum

ADDITIONAL INFORMATION

TRAFFIC MAINTENANCE NOTES

1. MAINTAIN TWO-WAY TRAFFIC ON A TEMPORARY BRIDGE.
2. TRAFFIC SIGNALS ARE NOT NECESSARY.
3. SIDEWALKS ARE NOT NECESSARY
4. THE APPROACHES FOR THE TEMPORARY BRIDGE SHALL BE PAVED.

DESIGN VALUES

1. DESIGN LIVE LOAD		HL-93
2. FUTURE PAVEMENT	d_p:	3.0 INCH
3. DESIGN SPAN	L:	101.00 FT
4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ:	---
5. PRESTRESSING STRAND	f_y:	---
6. PRESTRESSED CONCRETE STRENGTH	f'_c:	---
7. PRESTRESSED CONCRETE RELEASE STRENGTH	f'_{ci}:	---
8. CONCRETE, HIGH PERFORMANCE CLASS AA	f'_c:	---
9. CONCRETE, HIGH PERFORMANCE CLASS A	f'_c:	4.0 KSI
10. CONCRETE, HIGH PERFORMANCE CLASS B	f'_c:	3.5 KSI
11. CONCRETE, CLASS C	f'_c:	---
12. REINFORCING STEEL	f_y:	60 KSI
13. STRUCTURAL STEEL AASHTO M270	f_y:	50 KSI
14. SOIL UNIT WEIGHT	γ:	0.140 KCF
15. NOMINAL BEARING RESISTANCE OF SOIL	q_n:	---
16. SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	---
17. NOMINAL BEARING RESISTANCE OF ROCK	q_n:	---
18. ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	---
19. NOMINAL AXIAL PILE RESISTANCE	q_p:	486.0 KIPS
20. PILE YIELD STRENGTH ASTM A572	f_y:	50 KSI
21. PILE SIZE		HP 12X 84
22. EST. PILE LENGTHS (TWO SUBSTRUCTURES) (ABUTMENT 1 = 55 AND ABUTMENT 2 = 54) FT	L_p:	
23. PILE RESISTANCE FACTOR	ϕ:	0.65
24. LATERAL PILE DEFLECTION	Δ:	0.41 INCH
25. BASIC WIND SPEED	V_{3s}:	---
26. MINIMUM GROUND SNOW LOAD	p_g:	---
27. SEISMIC DATA PGA: ---	S_s:	---
	S_1:	---

PROJECT NAME: **ST. JOHNSBURY**
PROJECT NUMBER: **BRF 028-4(25)S**

FILE NAME: **s98b320pi.xls**
PROJECT LEADER: **C. CARLSON**
DESIGNED BY: **H. SALLS**
PRELIMINARY INFORMATION SHEET

PLOT DATE: 8/28/2012
DRAWN BY: **R. PELLETT**
CHECKED BY: **C. CARLSON**