STATE OF VERMONT
AGENCY OF TRANSPORTATION

PRELIMINARY INFORMATION SHEET (BRIDGE)

Version 09.02.01
LRFD Metric

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: February 2010

DRAINAGE AREA : 1262.8 sq. kilometers
CHARACTER OF TERRAIN : Moderate relief with wide floodplain, medium size
STREAM CHARACTERISTICS : Perennial and sinuous
NATURE OF STREAMBED : Gravel with sand and cobbles, some ledge outcrops

PEAK FLOW DATA

Q 2.33 =	312 cm/s	Q 50 =	630 cm/s
Q 10 =	425 cm/s	Q 100 =	743 cm/s
Q 25 =	524 cm/s	Q 500 =	1076 cm/s

DATE OF FLOOD OF RECORD : November 1927
ESTIMATED DISCHARGE: 1642 cm/s
WATER SURFACE ELEV.: 141.35 m - 141.50 m
NATURAL STREAM VELOCITY : @ Q50 = 2.5 m/s
ICE CONDITIONS : Moderate
DEBRIS: Moderate
DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? No
IS ORDINARY RISE RAPID? No
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: Steel Truss; Slab on girder approach
YEAR BUILT: 1931
CLEAR SPAN(NORMAL TO STREAM): 56 m
VERTICAL CLEARANCE ABOVE STREAMBED: 6.2 m +/- Avg. low beam = 140 m
WATERWAY OF FULL OPENING: 262 sq. m
DISPOSITION OF STRUCTURE: Remove and replace
TYPE OF MATERIAL UNDER SUBSTRUCTURE: See boring logs

WATER SURFACE ELEVATIONS AT:

Q2.33 =	138.03 m	VELOCITY =	2.40 m/s
Q10 =	138.47 m	"	3.02 m/s
Q25 =	138.91 m	"	3.41 m/s
Q50 =	139.35 m	"	3.80 m/s
Q100 =	139.80 m	"	4.19 m/s

LONG TERM STREAMBED CHANGES: Bank erosion just upstream of bridge.
Change in confluence with Brewster River.

IS THE ROADWAY OVERTOPPED BELOW Q100: Yes
FREQUENCY: Q50
RELIEF ELEVATION: 139.0 m
DISCHARGE OVER ROAD @Q100: 49 cm/s

UPSTREAM STRUCTURE

TOWN: Cambridge — DISTANCE: 1.610 km
HIGHWAY # : TH 23 — STRUCTURE #: 29
CLEAR SPAN: 43.0 m — CLEAR HEIGHT: 8.2 m
YEAR BUILT: 1887, reconstructed 2004 — FULL WATERWAY: 260 sq. m.
STRUCTURE TYPE: Covered Bridge

DOWNSTREAM STRUCTURE

TOWN: Cambridge — DISTANCE: 0.701 km
HIGHWAY # : VT 15 — STRUCTURE #: 21
CLEAR SPAN: 76.8 m — CLEAR HEIGHT: 6.71 m
YEAR BUILT: 1991 — FULL WATERWAY: 307 sq. m.
STRUCTURE TYPE: 3 span continuous girder

LRFR LOAD RATING FACTORS

LOADING LEVELS	TRUCK						
	M-18	HL-93	3S2	6 AXLE	3A STR.	4A STR.	5A SEMI
TONNAGE	18	33	33	60	27	31	34
INVENTORY	2.08	1.08					
POSTING							
OPERATING	2.69	1.40	2.21	1.73	2.29	2.15	2.08
COMMENTS:							

PROPOSED STRUCTURE

STRUCTURE TYPE: 3 span composite deck on continuous curved steel girders

CLEAR SPAN(NORMAL TO STREAM): 70.9 m
VERTICAL CLEARANCE ABOVE STREAMBED: 6.89 m
WATERWAY OF FULL OPENING: 370 sq. m

WATER SURFACE ELEVATIONS AT:

Q2.33 =	138.01 m	VELOCITY=	2.09 m/s
Q10 =	138.43 m	"	2.58m/s
Q25 =	138.86 m	"	2.83m/s
Q50 =	139.30 m	"	3.09 m/s
Q100 =	139.74 m	"	3.34 m/s

IS THE ROADWAY OVERTOPPED BELOW Q100: Yes
FREQUENCY: Q100
RELIEF ELEVATION: 139.27 m
DISCHARGE OVER ROAD @Q100: Minimal flow

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 141.3 m
VERTICAL CLEARANCE: @ Q50 = 2.0 m

SCOUR: At Q500, 0.5 m Contraction Scour; 6.0 m pier scour

REQUIRED CHANNEL PROTECTION: Stone fill type IV

PERMIT INFORMATION

		DEPTH OR ELEVATION:
AVERAGE DAILY FLOW:	28.5 cm/s	
ORDINARY LOW WATER:	12.2 cm/s	1.2 m
ORDINARY HIGH WATER:	134.0 cm/s	2.4 m

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE: 3 span Mabey bridge
CLEAR SPAN (NORMAL TO STREAM): 82 m
VERTICAL CLEARANCE ABOVE STREAMBED: 5.0 m
WATERWAY AREA OF FULL OPENING: 260 sq. m.

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. ABUTMENT BEARING TO BEARING LENGTH (THREE SPANS) (23.00 - 31.00 - 23.00) M	L:	77.00 M
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:	30.0 MPa
9. CONCRETE, HIGH PERFORMANCE CLASS A	f'_c:	30.0 MPa
10. CONCRETE, HIGH PERFORMANCE CLASS B	f'_c:	25.0 MPa
11. CONCRETE, CLASS C	f'_c:	20.0 MPa
12. REINFORCING STEEL	f_y:	420 MPa
13. STRUCTURAL STEEL AASHTO M270 (WEATHERING)	f_y:	345 MPa
14. SOIL UNIT WEIGHT	γ:	22 kN/m^3
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:	3.4 MPa
18. ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	0.45
19. NOMINAL AXIAL PILE RESISTANCE	q_p:	SEE NOTES
20. PILE YIELD STRENGTH ASTM A572	f_y:	345 MPa
21. PILE SIZE		HP 310X 125
22. EST. PILE LENGTH	L_p:	14 M
23. PILE RESISTANCE FACTOR	ϕ:	0.65
24. LATERAL PILE DEFLECTION	Δ:	22.00 mm
25. BASIC WIND SPEED	V_{3s}:	---
26. MINIMUM GROUND SNOW LOAD	P_g:	---
27. SEISMIC DATA PGA: ---	S_s:	---
	S_1:	---

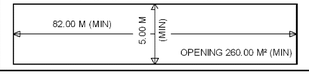
TRAFFIC DATA

SEE TITLE SHEET FOR TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT

20 year ESAL for flexible pavement from to :
40 year ESAL for flexible pavement from to :
Design Speed : km/hr

TEMPORARY BRIDGE PROFILE ALONG TEMP CL



PROJECT NAME: CAMBRIDGE
PROJECT NUMBER: BRF 027-1(4)

FILE NAME: s78f163bridgeexcelpi.dgn
PROJECT LEADER: EVANS-MONGEON
DESIGNED BY: T. FILLBACH
PRELIMINARY INFORMATION SHEET 1

PLOT DATE: 05-JUN-2012
DRAWN BY: R. PELLETT
CHECKED BY: T. FILLBACH
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