

PRELIMINARY INFORMATION SHEET



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FINAL HYDRAULIC REPORT

HYDROLOGIC DATA Date: April 2004

DRAINAGE AREA : 432 sq. km
 CHARACTER OF TERRAIN : Wide valley at site, with a hilly to mountainous watershed.
 STREAM CHARACTERISTICS : Incised, alluvial and sinuous channel with steep eroding banks.
 NATURE OF STREAMBED : Mostly sand and silt. See boring logs.

PEAK FLOW DATA

Q 2.33 = 95 cms	Q 50 = 327 cms
Q 10 = 200 cms	Q 100 = 385 cms
Q 25 = 269 cms	Q 500 = 573 cms

DATE OF FLOOD OF RECORD : November 1927
 ESTIMATED DISCHARGE : Unknown
 WATER SURFACE ELEV. : Approximately 207.0 m, per record plans.
 NATURAL STREAM VELOCITY : @ Q50 = 1.7 mps
 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? : Yes
 IF YES, DESCRIBE : Upstream ponds and reservoirs provide storage and reduce peak flood flows.

WATERSHED STORAGE : 3.0% HEADWATERS :
 UNIFORM : X
 IMMEDIATELY ABOVE SITE :

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE : 3 span concrete T-beam bridge
 YEAR BUILT : 1930
 CLEAR SPANNORMAL TO STREAM : 11.7 m + 16.2 m + 11.7 m = 39.6 m total
 VERTICAL CLEARANCE ABOVE STREAMBED : 8.0 m (209.4m - 199.4m)
 WATERWAY OF FULL OPENING : 205 sq. m
 DISPOSITION OF STRUCTURE : Remove and replace
 TYPE OF MATERIAL UNDER SUBSTRUCTURE : See boring logs.

WATER SURFACE ELEVATIONS AT:

Q2.33 = 202.4 m	VELOCITY = 2.9 mps
Q10 = 204.6 m	" 2.3 mps
Q25 = 205.1 m	" 2.6 mps
Q50 = 205.5 m	" 2.9 mps
Q100 = 205.9 m	" 3.1 mps

LONG TERM STREAMBED CHANGES : There is some scour through the bridge area and at the piers. Sheet piling has been placed around one pier due to scour problems.

IS THE ROADWAY OVERTOPPED BELOW Q100 : No
 FREQUENCY : Above Q100
 RELIEF ELEVATION : 207.8 m, on the easterly approach.
 DISCHARGE OVER ROAD @ Q100 : None

UPSTREAM STRUCTURE

TOWN : East Montpelier DISTANCE : 1.8 km
 HIGHWAY # : T.H. 30 STRUCTURE # : CB 22
 CLEAR SPAN : 17.7 m CLEAR HEIGHT : 4.4 m
 YEAR BUILT : 1951 FULL WATERWAY : 77 sq. m
 STRUCTURE TYPE : Single span covered bridge.

DOWNSTREAM STRUCTURE

TOWN : East Montpelier DISTANCE : 4.0 km
 HIGHWAY # : VT 14 STRUCTURE # : 68
 CLEAR SPAN : 36.3 m CLEAR HEIGHT : 6.0 m
 YEAR BUILT : 1936 FULL WATERWAY : 146 sq. m
 STRUCTURE TYPE : Two span steel beam bridge.

LOAD FACTOR - LOAD RATING (METRIC TONS)

LOADING LEVELS	TRUCK					
	M	MS	3S2	6 AXLE	3A. STR.	4A. STR. 6A. SEMI
INVENTORY						
POSTED						
OPERATING						

COMMENTS :

TRAFFIC DATA					
YEAR	ADT	DHV	% D	% T	ADTT
2005	8400	1000	60	4	480
2025	11100	1200	60	4	740

20 year ESAL for flexible pavement from 2005 to 2025 : 5,300,000
 40 year ESAL for flexible pavement from 2005 to 2045 : 13,889,000
 Design Speed : 80 km/h

PROPOSED STRUCTURE

STRUCTURE TYPE : Single span plate girder bridge.
 CLEAR SPANNORMAL TO STREAM : 35.0 m
 VERTICAL CLEARANCE ABOVE STREAMBED : 7.5 m (206.9 m - 199.4 m)
 WATERWAY OF FULL OPENING : 198 sq. m

WATER SURFACE ELEVATIONS AT:

Q2.33 = 202.2 m	VELOCITY = 2.3 mps
Q10 = 204.4 m	" 1.9 mps
Q25 = 204.9 m	" 2.2 mps
Q50 = 205.3 m	" 2.4 mps
Q100 = 205.7 m	" 2.7 mps

IS THE ROADWAY OVERTOPPED BELOW Q100 : No
 FREQUENCY : Above Q100
 RELIEF ELEVATION : 207.9 m, on the easterly approach.
 DISCHARGE OVER ROAD @ Q100 : None

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE : 206.9 m
 VERTICAL CLEARANCE : @ Q100 = 1.2 m

SCOUR : Calculated contraction scour depths are 0.5 m at Q100 and 1.0 m at Q500.
 Abutments will be founded on piles and protected with stone fill.
 REQUIRED CHANNEL PROTECTION : Stone Fill, Type IV

PERMIT INFORMATION

AVERAGE DAILY FLOW : 5 cms DEPTH OR ELEVATION :
 ORDINARY LOW WATER : 3 cms Elevation 200.8 m
 ORDINARY HIGH WATER : 40 cms Elevation 202.0 m

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE : Single span bridge, downstream of existing bridge.*
 CLEAR SPAN NORMAL TO STREAM : 34 m minimum**
 VERTICAL CLEARANCE ABOVE STREAMBED : Bottom of beam elev. 205.3m min.
 WATERWAY AREA OF FULL OPENING : 140 sq. m minimum

ADDITIONAL INFORMATION

*The temporary bridge should be designed to resist high water and ice forces.
 The superstructure should be anchored and vented.
 **The channel banks are steep and potentially unstable. The abutments should be far enough back from the banks to not cause a bank failure and to ensure the stability of the abutments.

DESIGN CRITERIA

1. DESIGN LIVE LOAD AASHTO : MS 22.5
2. DESIGN SPAN : 37.0m
3. ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL : N/A ON LEDGE : N/A
4. ALLOWABLE LOAD FOR PILING : 310x125 TYPE ESTIMATED LENGTH : 32-34m
5. STRUCTURAL STEEL : AASHTO M270/M270 GRADE : 345W
6. REINFORCING STEEL GRADE : 420
7. CONCRETE, HIGH PERFORMANCE CLASS A : fc : 30 Mpa
 CONCRETE, HIGH PERFORMANCE CLASS B : fc : 25 Mpa
8. DESIGN SOIL UNIT WEIGHT : 22.00 kN/m³
9. DESIGN LOAD FOR SPREAD FOOTINGS ON SOIL : _____

TRAFFIC MAINTENANCE

1. IS TRAFFIC TO BE MAINTAINED? : YES
- IF YES, ON EXISTING STRUCTURE? : NO
- OR ON TEMPORARY BRIDGE? : YES
- ONE OR TWO-WAY TRAVEL? : TWO
2. TRAFFIC CONTROL SIGNALS REQUIRED? : NO
3. ARE SIDEWALKS REQUIRED? : NO
- IF SO, ON WHAT SIDE? : N/A

PROJECT NAME : EAST MONTPELIER
 PROJECT NUMBER : BRF 028-3(36)SC

FILE NAME : /str508b254/sb254pl.xls PLOT DATE : 7/1/2004
 PROJECT MANAGER : C. KELLER DRAWN BY : J. GILMORE
 DESIGNED BY : T. SUMNER CHECKED BY : T. SUMNER
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