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LIST OF STANDARDS

B-5	06/01/94
B-71	07/08/05
D-6	06/01/94
D-8	01/03/00
D-16	06/01/94
D-33	03/12/07
E-100	01/02/04
E-101	05/30/03
E-102	06/30/03
E-102A	05/01/04
E-103	03/01/04
E-107	06/30/03
E-107A	06/08/09
E-108	06/08/09
E-110	08/08/95
E-121	08/08/95
E-138	05/30/03
E-142	09/20/95
E-151	05/01/04
E-153	05/01/04
E-163	05/20/99
G-1	01/03/00
G-1D	01/03/00
G-17A	09/27/02
G-17B	09/27/02
J-3	08/07/95

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: 2/2004

DRAINAGE AREA : 25.4 sq. km
 CHARACTER OF TERRAIN : Mixed open and forested areas with some wetlands
 STREAM CHARACTERISTIC S : Small, low relief, alluvial, meandering and equiwidth
 NATURE OF STREAMBED : Sand, gravel and cobble

PEAK FLOW DATA

Q 2.33 =	10.0 cms	Q 50 =	37.0 cms
Q 10 =	22.5 cms	Q 100 =	43.5 cms
Q 25 =	30.0 cms	Q 500 =	60.0 cms

DATE OF FLOOD OF RECORD : November 1927
 ESTIMATED DISCHARGE : unknown
 WATER SURFACE ELEV. : unknown
 NATURAL STREAM VELOCITY : @ Q50 = 3.2 mps
 ICE CONDITIONS : moderate
 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: 4% HEADWATERS: _____
 UNIFORM: X
 IMMEDIATELY ABOVE SITE: _____

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: Single span concrete slab bridge
 YEAR BUILT: 1924
 CLEAR SPAN(NORMAL TO STREAM): 5.2 m
 VERTICAL CLEARANCE ABOVE STREAMBED: 2.0 m
 WATERWAY OF FULL OPENING: 9.6 sq. m
 DISPOSITION OF STRUCTURE: Remove
 TYPE OF MATERIAL UNDER SUBSTRUCTURE: Refer to boring logs

WATER SURFACE ELEVATIONS AT:

Q2.33 =	205.7 m	VELOCITY=	1.8 mps
Q10 =	206.3 m	"	3.5 mps
Q25 =	207.4 m	"	3.9 mps
Q50 =	207.7 m	"	2.8 mps
Q100 =	207.8 m	"	2.4 mps

LONG TERM STREAMBED CHANGES: Bridge inspection files note some local scour along the existing abutments.

IS THE ROADWAY OVERTOPPED BELOW Q100: Yes
 FREQUENCY: Q35
 RELIEF ELEVATION: 207.5 m
 DISCHARGE OVER ROAD @Q100: 10.1 cms

UPSTREAM STRUCTURE

TOWN: East Montpelier DISTANCE: 0.85 km
 HIGHWAY #: TH-39 STRUCTURE #: 8
 CLEAR SPAN: 3.0 m CLEAR HEIGHT: 2.4 m
 YEAR BUILT: Unknown FULL WATERWAY: unknown
 STRUCTURE TYPE: Single span slab bridge

DOWNSTREAM STRUCTURE

TOWN: East Montpelier DISTANCE: 0.79 km
 HIGHWAY #: US 2 STRUCTURE #: 73
 CLEAR SPAN: 4.6 m CLEAR HEIGHT: 3.1 m
 YEAR BUILT: 1974 FULL WATERWAY: 11 sq. m
 STRUCTURE TYPE: Structural Plate Pipe Arch

PROPOSED STRUCTURE

STRUCTURE TYPE: Single span concrete slab bridge
 CLEAR SPAN(NORMAL TO STREAM): 8.46 m
 VERTICAL CLEARANCE ABOVE STREAMBED: 2.8 m
 WATERWAY OF FULL OPENING: 21.4 sq. m

WATER SURFACE ELEVATIONS AT:

Q2.33 =	205.6 m	VELOCITY=	1.3 mps
Q10 =	206.1 m	"	2.3 mps
Q25 =	206.4 m	"	3.0 mps
Q50 =	206.7 m	"	3.5 mps
Q100 =	206.9 m	"	3.7 mps

IS THE ROADWAY OVERTOPPED BELOW Q100: No
 FREQUENCY: Above Q100
 RELIEF ELEVATION: 207.9 m
 DISCHARGE OVER ROAD @Q100: None

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 207.1 m
 VERTICAL CLEARANCE: @ Q50 = 0.4 m

SCOUR: 1.0 m of contraction scour at Q500

REQUIRED CHANNEL PROTECTION: Type III stone fill

PERMIT INFORMATION

AVERAGE DAILY FLOW: 0.6 cms DEPTH OR ELEVATION:
 ORDINARY LOW WATER: 0.3 cms 0.1 m (204.4 m)
 ORDINARY HIGH WATER: 4.3 cms 0.5 m (204.8 m)

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE: Single span bridge
 CLEAR SPAN (NORMAL TO STREAM): 6.3 m
 VERTICAL CLEARANCE ABOVE STREAMBED: 2.0 m (206.3 m)
 WATERWAY AREA OF FULL OPENING: 10.9 sq. m minimum

ADDITIONAL INFORMATION

Note: Any new stone fill should not constrict the proposed waterway and should match upstream and downstream channel banks.

DESIGN CRITERIA

1. DESIGN LIVE LOAD AASHTO HL-93
2. DESIGN SPAN 9.5 m
3. ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL NA
ON LEDGE NA
4. ALLOWABLE LOAD FOR PILING SEE GENERAL NOTES
TYPE HP 310x79
ESTIMATED LENGTH VARIES
5. STRUCTURAL STEEL AASHTO M270MM270 GRADE NA
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 kN
9. DESIGN LOAD FOR SPREAD FOOTINGS ON SOIL N/A

TRAFFIC MAINTENANCE

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

LRFR - LOAD RATING FACTORS (TONS)						
LOADING LEVELS	TRUCK					
	HL-93	3S2	6 AXLE	3A. STR	4A. STR	5A. SEMI
INVENTORY	1.26					
OPERATING	1.63	3.05	1.54	2.18	1.94	2.88

TRAFFIC DATA					
YEAR	ADT	DHV	% D	% T	ADTT
2009	5700	640	74	8	550
2029	7300	820	74	12	1100

20 year ESAL for flexible pavement from 2009 to 2029 : 3,905,000
 40 year ESAL for flexible pavement from 2009 to 2049 : 9,800,000
 Design Speed : 80 km/h

PROJECT NAME: EAST MONTPELIER
 PROJECT NUMBER: STP 037-2(9)
 FILE NAME: 78f200\str\78f200pi.xls PLOT DATE: 7/22/2009
 PROJECT MANAGER: K. HIGGINS DRAWN BY: R. PELLETT
 DESIGNED BY: J. LACROIX CHECKED BY: J. LACROIX
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