STATE OF VERMONT
AGENCY OF TRANSPORTATION

PRELIMINARY INFORMATION SHEET

Metric

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LIST OF STANDARDS

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B-12M	1-03-00
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E-100A	1-02-04
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SB-R7-90M	7-10-97

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: 11/2/99

DRAINAGE AREA : 53.3 sq. km
CHARACTER OF TERRAIN : Mountainous
STREAM CHARACTERISTICS : Sinuous, Steep and Flashy
NATURE OF STREAMBED : Boulders to Cobbles

PEAK FLOW DATA

Q 2.33 =	50 cms	Q 50 =	95 cms
Q 10 =	65 cms	Q 100 =	130 cms
Q 25 =	80 cms	Q 500 =	220 cms

DATE OF FLOOD RECORD : Unknown
ESTIMATED DISCHARGE: Unknown
WATER SURFACE ELEV.: Unknown
NATURAL STREAM VELOCITY : @ Q25 = 3.5 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: N/A

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

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: Single Span, One Lane Steel Beam w/ Concrete Deck
YEAR BUILT: 1939
CLEAR SPAN(NORMAL TO STREAM): 23.5 m
VERTICAL CLEARANCE ABOVE STREAMBED: 2.9 m
WATERWAY OF FULL OPENING: 45 sq. m
DISPOSITION OF STRUCTURE: Remove
TYPE OF MATERIAL UNDER SUBSTRUCTURE: Unknown

WATER SURFACE ELEVATIONS AT:

Q2.33 =	283.3 m	VELOCITY =	3.1 mps
Q10 =	283.5 m	"	3.4 mps
Q25 =	283.7 m	"	3.5 mps
Q50 =	283.9 m	"	3.7 mps
Q100 =	284.3 m	"	4.0 mps

LONG TERM STREAMBED CHANGES: Unknown

IS THE ROADWAY OVERTOPPED BELOW Q100: No
FREQUENCY: Above Q100
RELIEF ELEVATION: 284.8 m
DISCHARGE OVER ROAD @Q100: None

UPSTREAM STRUCTURE

TOWN: Sunderland
HIGHWAY # : TH-3
CLEAR SPAN: 16.2 m
YEAR BUILT: Unknown - Reconstructed in 1984
STRUCTURE TYPE: Single Span, One Lane, Steel Beam w/ Timber Deck
DISTANCE: 5.6 km
STRUCTURE #: 16
CLEAR HEIGHT: 2.1 m
FULL WATERWAY: Unknown

DOWNSTREAM STRUCTURE

TOWN: Sunderland
HIGHWAY # : U.S. 7
CLEAR SPAN: 21.6 m
YEAR BUILT: 1982
STRUCTURE TYPE: Single Span, Steel Beam w/ Concrete Deck
DISTANCE: 0.6 km
STRUCTURE #: 22
CLEAR HEIGHT: 3 m
FULL WATERWAY: Unknown

LOAD FACTOR LOAD RATING (METRIC TONNES)

LOADING LEVELS (LOAD FACTOR)	TRUCK						
	M	MS	3S2	6 AXLE	3A. STR.	4A. STR.	5A. SEMI
INVENTORY A=2.17 B=1.00	41	46					
POSTED A=1.55 B=1.40	46	58	61		48	49	56
OPERATING A=1.30 B=1.67		52	69	83	54	55	

STRENGTH RF = $\frac{\phi R_N - 1.3 M_{DL}}{A \times M_{LL+I}}$ SERVICEABILITY RF = B $\frac{.95 F_y S_{LL+I} - M_{DL} \frac{S_{LL+I}}{S_{DL}} - M_{SDL} \frac{S_{LL+I}}{S_{SDL}}}{1.67 M_{LL+I}}$

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT
2017	940	130	55	2	2
2037	1200	170	55	2	2

20 year ESAL for flexible pavement from 2002 to 2022 : 120,000
40 year ESAL for flexible pavement from 2002 to 2042 : 362,000
Design Speed : 55 km/h

PROPOSED STRUCTURE

STRUCTURE TYPE: Single Span, Two Lane, Steel Beam w/ Concrete Deck

CLEAR SPAN(NORMAL TO STREAM): 24.0 m
VERTICAL CLEARANCE ABOVE STREAMBED: 2.9 m
WATERWAY OF FULL OPENING: 49 sq. m

WATER SURFACE ELEVATIONS AT:

Q2.33 =	283.3 m	VELOCITY=	3.1 mps
Q10 =	283.5 m	"	3.4 mps
Q25 =	283.7 m	"	3.5 mps
Q50 =	283.9 m	"	3.7 mps
Q100 =	284.2 m	"	3.8 mps

IS THE ROADWAY OVERTOPPED BELOW Q100: No
FREQUENCY: Above Q100
RELIEF ELEVATION: 284.4 m
DISCHARGE OVER ROAD @Q100: None

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 284.28 m
VERTICAL CLEARANCE: @ Q50 = 0.4 m

SCOUR: No contraction scour @ Q100 and 1 m of contraction scour @ Q500

REQUIRED CHANNEL PROTECTION: Stone Fill Type IV

PERMIT INFORMATION

		DEPTH OR ELEVATION:
AVERAGE DAILY FLOW:	1.2 cms	
ORDINARY LOW WATER:	0.6 cms	0.3 m
ORDINARY HIGH WATER:	20.7 cms	1.0 m

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE: N/R
CLEAR SPAN (NORMAL TO STREAM):
VERTICAL CLEARANCE ABOVE STREAMBED:
WATERWAY AREA OF FULL OPENING:

ADDITIONAL INFORMATION

DESIGN CRITERIA

1. DESIGN LIVE LOAD AASHTO MS 22.50
2. DESIGN SPAN 26.500m
3. ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL 240 kPa
   ON LEDGE N/A
4. ALLOWABLE LOAD FOR PILING N/A
   TYPE N/A
   ESTIMATED LENGTH N/A
5. STRUCTURAL STEEL AASHTO M270/M270M GRADE Grade 345W
6. REINFORCING STEEL GRADE 420
7. ALLOWABLE STRESS FOR CONCRETE
   HIGH PERFORMANCE CLASS A f'c: 30 Mpa
   HIGH PERFORMANCE CLASS B f'c: 25 Mpa
8. SOIL UNIT WEIGHT 22 KN/m³
9. DESIGN LOAD FOR SPREAD FOOTINGS ON SOIL 232 kPa

TRAFFIC MAINTENANCE

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

PROJECT NAME: SUNDERLAND
PROJECT NUMBER: BRF 0114(2)

FILE NAME: /TransFANS/93j009/sj009pi.xls
PROJECT MANAGER: R. R. WHITCOMB
DESIGNED BY: D. BONNEAU
PRELIMINARY INFORMATION SHEET

PLOT DATE: 11/16/2005
DRAWN BY: J. GILMORE
CHECKED BY: C. CARLSON
SHEET 2 OF 67