

# PRELIMINARY INFORMATION SHEET

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FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: Nov. 2006

DRAINAGE AREA : 15.4 sq. mi.  
 CHARACTER OF TERRAIN : Hilly to Mountainous  
 STREAM CHARACTERISTICS : Meandering, alluvial channel with some eroding stream banks.  
 NATURE OF STREAMBED : Silt, sand, gravel and cobbles

PEAK FLOW DATA

Q 2.33 =	1,000 cfs	Q 50 =	2,160 cfs
Q 10 =	1,500 cfs	Q 100 =	2,500 cfs
Q 25 =	1,850 cfs	Q 500 =	3,340 cfs

DATE OF FLOOD OF RECORD : Unknown  
 ESTIMATED DISCHARGE : Unknown  
 WATER SURFACE ELEV. : Unknown  
 NATURAL STREAM VELOCITY : @ Q50 = 2.8 fps  
 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 : <1% HEADWATERS :  
 UNIFORM : X  
 IMMEDIATELY ABOVE SITE :

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE : A concrete arch was damaged in a flood in 2004 and removed.  
 YEAR BUILT : Built in 1900. Widened in 1973.  
 CLEAR SPAN(NORMAL TO STREAM) : 35'  
 VERTICAL CLEARANCE ABOVE STREAMBED : 10'  
 WATERWAY OF FULL OPENING : 250 sq. ft.  
 DISPOSITION OF STRUCTURE : It has been removed.  
 TYPE OF MATERIAL UNDER SUBSTRUCTURE : See boring logs.

WATER SURFACE ELEVATIONS AT:

Q2.33 =	See note 1.	VELOCITY =	See note 1.
Q10 =	1015.7'	"	"
Q25 =	"	"	"
Q50 =	1017.6'	"	"
Q100 =	1018.5'	"	"

LONG TERM STREAMBED CHANGES : There is scour through the bridge area.  
 The stream is laterally unstable with areas of stream bank erosion.

IS THE ROADWAY OVERTOPPED BELOW Q100 : No  
 FREQUENCY : Above Q100  
 RELIEF ELEVATION : 1021.7'  
 DISCHARGE OVER ROAD @Q100 : None

UPSTREAM STRUCTURE

TOWN : N.A. - The stream divides DISTANCE :  
 HIGHWAY # : STRUCTURE # :  
 CLEAR SPAN : CLEAR HEIGHT :  
 YEAR BUILT : FULL WATERWAY :  
 STRUCTURE TYPE :

DOWNSTREAM STRUCTURE

TOWN : N.A. - Confluence with Connecticut River DISTANCE : 4,000'  
 HIGHWAY # : STRUCTURE # :  
 CLEAR SPAN : CLEAR HEIGHT :  
 YEAR BUILT : FULL WATERWAY :  
 STRUCTURE TYPE :

SERVICE II LOAD RATING

RATING FACTORS	LOAD FACTOR ANALYSIS					
	HL-93	3S2	6 AXLE	3 AXLE	4 AXLE	5 AXLE
INVENTORY	1.14	2.07	1.34	1.92	1.71	1.8
OPERATING	1.48	2.69	1.75	2.50	2.23	2.34

COMMENTS: LOAD RATED AS A BARE DECK.

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT
2005	610	220	51	6	40
2025	790	240	51	10	80

20 year ESAL for flexible pavement from 2005 to 2025 : 320,000  
 40 year ESAL for flexible pavement from 2005 to 2045 : 787,000  
 Design Speed : 50 mph

PROPOSED STRUCTURE

STRUCTURE TYPE : Single span steel beam bridge.  
 CLEAR SPAN(NORMAL TO STREAM) : 80'  
 VERTICAL CLEARANCE ABOVE STREAMBED : 11' maximum  
 WATERWAY OF FULL OPENING : 660 sq. ft.

WATER SURFACE ELEVATIONS AT:

Q2.33 =	1014.7'	VELOCITY =	2.7 fps
Q10 =	1015.5'	"	3.6 fps
Q25 =	1016.0'	"	4.0 fps
Q50 =	1016.5'	"	4.4 fps
Q100 =	1017.0'	"	4.7 fps

IS THE ROADWAY OVERTOPPED BELOW Q100 : No  
 FREQUENCY : Above Q100  
 RELIEF ELEVATION : 1022.8'  
 DISCHARGE OVER ROAD @Q100 : None

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE : 1018.3  
 VERTICAL CLEARANCE : @ Q100 1.3'

SCOUR : Estimate 4' of contraction scour up to Q500, based on the fact that the scour hole under the bridge has been at least 4' deeper than when the project was surveyed.  
 REQUIRED CHANNEL PROTECTION : Stone Fill, Type III

PERMIT INFORMATION

AVERAGE DAILY FLOW : 30 cfs DEPTH OR ELEVATION :  
 ORDINARY LOW WATER : 15 cfs Elevation 1011'  
 ORDINARY HIGH WATER : 150 cfs Elevation 1013'

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE : Temporary bridge already in use. It will be moved to a new alignment.  
 CLEAR SPAN (NORMAL TO STREAM) : 80'  
 VERTICAL CLEARANCE ABOVE STREAMBED : Minimum low beam elev. 1017.0'  
 WATERWAY AREA OF FULL OPENING : Approximately 500 sq. ft.

ADDITIONAL INFORMATION

Note 1 - There is not enough information available for the previous arch and pre-flood conditions to do an accurate hydraulic analysis of that structure. Information shown for the existing bridge is from records and the 1980 Flood Insurance Study. The new bridge has a larger span, so it will result in lower upstream water surface elevations and lower velocities than the previous arch.

DESIGN CRITERIA

- DESIGN LIVE LOAD AASHTO : HL-93
- DESIGN SPAN : 82 Feet centerline to centerline of bearing
- ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL : 2.5 ksf  
ON LEDGE : not applicable
- ALLOWABLE LOAD FOR PILING : not applicable  
TYPE :  
ESTIMATED LENGTH :
- STRUCTURAL STEEL AASHTO GRADE : 50 (painted)
- REINFORCING STEEL GRADE : 60
- SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE)  
CLASS A LOW CEMENT) f'c : 4000 psi  
CONCRETE CLASS B (HPC-B) f'c : 3500 psi
- SOIL UNIT WEIGHT : 140 pcf Dry Unit wt.
- DESIGN LOAD FOR SPREAD FOOTINGS ON SOIL : 2.5 ksf

TRAFFIC MAINTENANCE

- IS TRAFFIC TO BE MAINTAINED? : yes  
IF YES, ON EXISTING STRUCTURE? : not applicable  
OR ON TEMPORARY BRIDGE? : yes  
ONE OR TWO-WAY TRAVEL? : two-way
- TRAFFIC CONTROL SIGNALS REQUIRED? : no
- ARE SIDEWALKS REQUIRED? : no  
IF SO, ON WHAT SIDE? : not applicable

PROJECT NAME : CANAAN  
 PROJECT NUMBER : ER ST 0271(16)

FILE NAME : I04c098x04c098excel.xls PLOT DATE : 7/22/2008  
 PROJECT MANAGER : Evans-Mongeon DRAWN BY : L. DUQUETTE  
 DESIGNED BY : S. SCRIBNER CHECKED BY : S. SCRIBNER  
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