

LOAD FACTOR LOAD RATING (TONS)							
LOAD LEVELS (LOAD FACTOR)	TRUCK (TONS)						
	H	HS	3S2	6 AXLE	3A. STR.	4A. STR.	5A. SEMI
INVENTORY A1 = 1.3, A2 = 2.17	26	44					
POSTED A1 = 1.3, A2 = 1.55	37	62	71		58	59	55
OPERATING A1 = 1.3, A2 = 1.3		74	85	88	69	71	

RF = $\frac{C - A1 \cdot DL}{A2 \cdot (LL+1)}$ C = ϕM_n FLEXURE
C = ϕV_n SHEAR

WORKING STRESS LOAD RATING (TONS)							
STRESS LEVELS	TRUCK (TONS)						
	H	HS	3S2	6 AXLE	3A. STR.	4A. STR.	5A. SEMI
INVENTORY *	36	49					
POSTED **	37	51	61		42	47	55
OPERATING ***		54	63	74	48	50	

- * INVENTORY STRESSES
BOX BEAM TENSION
BOX BEAM COMPRESSION
OVERLAY COMPRESSION
- ** POSTED STRESSES
BOX BEAM TENSION
BOX BEAM COMPRESSION
OVERLAY COMPRESSION
- *** OPERATING STRESSES
BOX BEAM TENSION
BOX BEAM COMPRESSION
OVERLAY COMPRESSION

RATING NOTE:

- ALL VALUES REPRESENT MULTIPLE LANE LOADING.

**SEEDING FORMULA
URBAN AREAS**

% WT.	LBS./A.	NAME	PUR %	GERM %
42.5	34.0	CREeping RED FESCUE	98	85
10.0	8.0	PERENNIAL RYE GRASS	95	90
42.5	34.0	KENTUCKY BLUE GRASS	85	85
5.0	4.0	ANNUAL RYE GRASS	95	85
100.00	80.0			

GENERAL NOTES

SEED MIXTURE: SHALL NOT HAVE A WEED CONTENT EXCEEDING 0.40% BY WEIGHT AND SHALL BE FREE OF ALL NOXIOUS SEED.

SEED: TO BE APPLIED PER SEEDING FORMULAS OR AS DIRECTED BY THE ENGINEER.

FERTILIZER: FORMULA 10-20-10, TO BE USED WITH SEED, APPLIED AT THE RATE OF 500 LBS./ACRE. (HYDRO SEEDERS MAY USE 19-19-19 FORMULA).

AGRICULTURAL LIMESTONE: TO BE APPLIED AT THE RATE OF 2 TONS/ACRE, OR AS DIRECTED BY THE ENGINEER.

HAY MULCH: TO BE PLACED ON EARTH SLOPES AT THE RATE OF 2 TONS/ACRE, OR AS DIRECTED BY THE ENGINEER.

TOPSOIL: TO BE USED WITH SEED AS INDICATED ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.

SLOPE ROUND: ALL SLOPES TO BE ROUNDED IN ACCORDANCE WITH STANDARD SHEET B-5.

FINAL HYDRAULICS REPORT

HYDROLOGIC DATA

DRAINAGE AREA = 119.3 SQ MI
 CHARACTER OF TERRAIN: HILLY TO MOUNTAINOUS
 CHARACTER & TYPE OF STREAM: STRAIGHT WITH LARGE RADIUS BENDS, TRAPEZODIAL CHANNEL WITHOUT FLOODPLAIN
 NATURE OF STREAMBED: VERY COARSE GRAVEL WITH BOULDERS

Q2.33 = - Q50 = 17,645 CFS
 Q10 = 9615 CFS Q100 = 22,365 CFS
 Q25 = - Q500 = 36,595 CFS

DATE OF FLOOD OF RECORD: 1927
 WATER SURFACE ELEV.: UNKNOWN ESTIMATED DISCHARGE: UNKNOWN
 NATURAL STREAM VELOCITY @ 0 -
 ICE CONDITIONS: SEE NOTE 2 DEBRIS: SEE NOTE 2
 DOES THE STREAM REACH MAXIMUM HIGHWATER ELEVATION RAPIDLY? NO
 IS ORDINARY RISE RAPID? NO
 IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? NO
 IF YES, DESCRIBE.

WATERSHED STORAGE: HEADWATERS UNIFORM THROUGHOUT WATERSHED
 IMMEDIATELY ABOVE SITE

EXISTING STRUCTURE

STRUCTURE TYPE: 3 SPAN BEAM W/ CONCRETE DECK YEAR BUILT: 1938
 CLEAR SPAN (NORMAL TO STREAM): 179.3 FT REHAB: 1954
 VERTICAL CLEARANCE ABOVE STREAMBED: 24.2 FT
 WATERWAY OF FULL OPENING: 3523.0 SQ FT
 DISPOSITION OF STRUCTURE: SUPERSTRUCTURE REPLACEMENT

TYPE OF MATERIAL UNDER SUBSTRUCTURE: UNKNOWN (ABUT. 1, PIER 1, AND ABUT. 2 ON SPREAD FOOTING, PIER 2 ON PILES)

WATER SURFACE ELEV. @ Q2.33 = - VELOCITY = -
 Q10 = 689.0 " -
 Q25 = - " -
 Q50 = 693.9 " -
 Q100 = 695.9 " 8.8 fps

LONG TERM STREAM BED CHANGES: NEGLIGIBLE

IS THE ROADWAY OVERTOPPED BELOW THE Q100? NO FREQUENCY: -
 RELIEF ELEVATION: 704.2 DISCHARGE OVER ROAD @ Q100: -

UPSTREAM STRUCTURE: TOWN: WOODSTOCK DISTANCE: 1.1 mi
 HIGHWAY NO.: TH 50 STRUCTURE NO.: BR. NO. 30
 STRUCTURE TYPE: PINNED THROUGH TRUSS
 CLEAR SPAN: 177.0 ft CLEAR HEIGHT: 21.0 ft
 YEAR BUILT: 1900 FULL WATERWAY: UNKNOWN

DOWNSTREAM STRUCTURE: TOWN: WOODSTOCK DISTANCE: 0.3 mi
 HIGHWAY NO.: UNION STREET STRUCTURE NO.: BR. NO. 73
 STRUCTURE TYPE: TIMBER COVERED BRIDGE
 CLEAR SPAN: 181 ft CLEAR HEIGHT: 22.0 ft
 YEAR BUILT: 1968, 1974 FULL WATERWAY: UNKNOWN

DESIGN CRITERIA:

- DESIGN LIVE LOAD AASHTO HS 25
- DESIGN SPAN (56'-8 3/4") - (81'-6 1/4") - (56'-8 3/4")
- ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL - ON LEDGE - ESTIMATED LENGTH
- ALLOWABLE LOAD FOR PILING TYPE
- STRUCTURAL STEEL
- REINFORCING STEEL GRADE 60
- CONCRETE HIGH PERFORMANCE CLASS AA (MOD. - RAPID CURE) f'c 4000 psi
 HIGH PERFORMANCE CLASS A (MOD.) f'c 4000 psi
 HIGH PERFORMANCE CLASS B f'c 3500 psi
 HIGH PERFORMANCE CLASS B (MOD. - SCC) f'c 3500 psi

TRAFFIC MAINTENANCE:

- IS TRAFFIC TO BE MAINTAINED? NO IF YES, ON EXISTING STRUCTURE - OR ON TEMPORARY BRIDGE -
- TEMPORARY BRIDGE REQUIREMENTS: ONE OR TWO WAY N/A TRAFFIC CONTROL SIGNALS REQUIRED -
 MINIMUM CLEAR SPAN (NORMAL TO STREAM): - VERTICAL CLEARANCE ABOVE STREAMBED: -
 WATERWAY OF FULL OPENING: -
 ARE SIDEWALKS REQUIRED? - IF SO, ON WHAT SIDE? -
 STRUCTURE TYPE: -

TRAFFIC DATA (US 4)

2000 ADT = 14,200
 2000 DHV = 1,420
 2000 ADTT = 769
 2020 ADT = 19,810
 2020 DHV = 1,980
 2020 ADTT = 1,327

% D = 50
 % T = 5
 V = 25 MPH
 2000-2020 (20 YR.) ESAL'S 15,175,800

PROPOSED STRUCTURE

STRUCTURE TYPE: 3 SPAN CONCRETE BOX BEAM W/ CONCRETE OVERLAY

CLEAR SPAN (NORMAL TO STREAM): 179.3 FT
 VERTICAL CLEARANCE ABOVE STREAMBED: 24.2 FT
 WATERWAY OF FULL OPENING: 3523 SQ FT

WATER SURFACE ELEV. @ Q2.33 = - VELOCITY = -
 Q10 = 689.0 " -
 Q25 = - " -
 Q50 = 693.9 " -
 Q100 = 695.9 " 8.8 fps

IS THE ROADWAY OVERTOPPED BELOW THE Q100? NO FREQUENCY: -
 RELIEF ELEVATION: 704.3 DISCHARGE OVER ROAD @ Q100: -

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 700.4
 VERTICAL CLEARANCE @ Q100 4.5 FT

SCOUR: NOT CALCULATED, SUPERSTRUCTURE REPLACEMENT PROJECT
 REQUIRED CHANNEL PROTECTION: SEE NOTE 3

PERMIT INFORMATION

AVERAGE DAILY FLOW: 247.2 cfs
 ORDINARY LOW WATER: 105.9 cfs DEPTH: WS EL = 678.1
 ORDINARY HIGH WATER: 1942.3 cfs DEPTH: WS EL = 681.8

ADDITIONAL COMMENTS

- HYDROLOGIC DATA AND WATER SURFACE ELEVATIONS ARE BASED ON THE 2002 FEMA FLOOD INSURANCE STUDY. ADDITIONAL ANALYSES WERE NOT CONDUCTED AT THIS SITE.
- ALTHOUGH DEBRIS AND ICE FLOW ARE A CONCERN FOR OTHER BRIDGES OVER THE OTTAUQUECHEE RIVER, NEITHER IS TYPICALLY A PROBLEM AT THIS SITE.
- THE ONLY MODIFICATION TO THE CHANNEL IS THE CHINKING OF STONE FILL IN EXISTING VOIDS AT PIER NO. 2.

**STATE OF VERMONT
AGENCY OF TRANSPORTATION**

Town Of	WOODSTOCK	Bridge No.	50
Highway No.	U.S. ROUTE 4	Log Sta.	
		Surv. Sta.	
U.S. ROUTE 4 OVER OTTAUQUECHEE RIVER			
PRELIMINARY INFORMATION SHEET			
Designed By	K.G. KRETSCH	Drawn By	B.J. MASSE
Checked By	Date	Bridge Design Supervisor	
J.T. KLEIN	10/06	M.A. COLGAN	Date 10/06
PROJECT	WOODSTOCK	PROJECT NO.	BHF 020-2 (32)
I.G.C. Info.			
Bridge Sheet No.	ZJ028P1	Sheet	2 of 71

VHB Vanasse Hangen Brustlin, Inc.