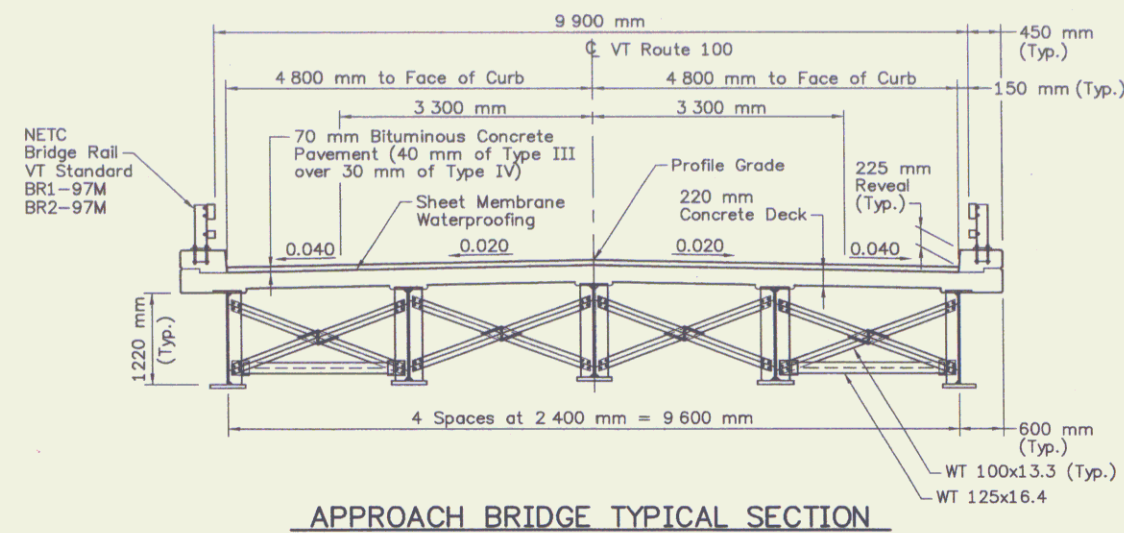
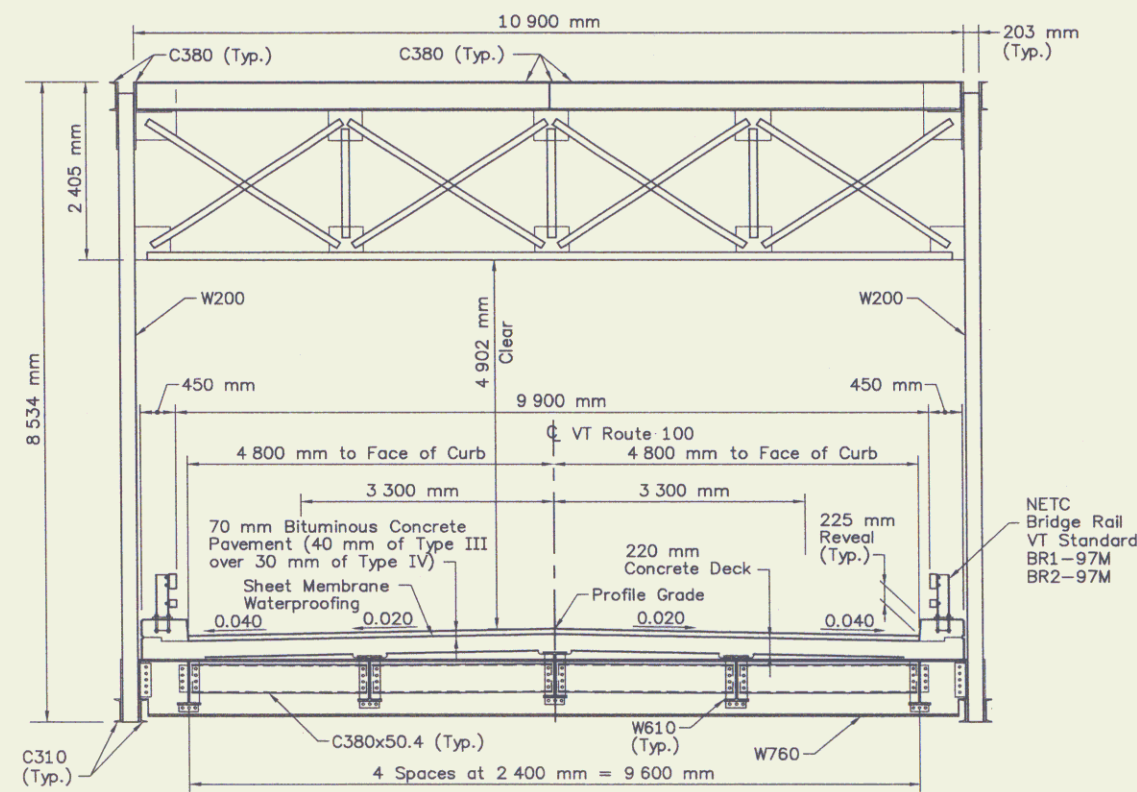


FINAL HYDRAULICS REPORT



APPROACH BRIDGE TYPICAL SECTION



TRUSS BRIDGE TYPICAL SECTION



HYDRAULIC DATA

- DRAINAGE AREA: 805.5 km²
- CHARACTER OF TERRAIN: MOUNTAINOUS
- CHARACTER AND TYPE OF STREAM: PERENNIAL CONTROLLED BY USACOE DAMS
- NATURE OF STREAMBED: DEEP, DENSE, SANDY GRAVEL COVERED BY BOULDER LAYER
- DATE OF FLOOD OF RECORD: UNCONTROLLED: NOV 1927; CONTROLLED: APR 1987
- WATER SURFACE ELEVATION: 169.0 (169.5) ESTIMATED DISCHARGE: 736 (170-238) m³/s
- NATURAL STREAM VELOCITY: $Q = 2.33 = 0.3 - 0.8$ m/s
- ICE CONDITIONS: MODERATE TO HEAVY DEBRIS LIGHT TO MODERATE
- DOES THE STREAM REACH MAX. HIGHWATER ELEVATION RAPIDLY? UNCONTROLLED: YES; CONTROLLED: NO
- TRIBUTARIES BELOW BALL MOUNTAIN RESERVOIR ARE FLASHY
- IS ORDINARY RISE RAPID? DAM OPERATIONS DAMPEN RISE
- IS STAGE AFFECTED BY UPSTREAM/DOWNSTREAM CONDITIONS? YES, USACOE DAMS
- IF STAGE DESCRIBE: UPSTREAM BALL MOUNTAIN DAM CONTROLS DISCHARGE, DOWNSTREAM TOWNSHEND DAM CAN CAUSE HIGH BACKWATER
- WATERSHED STORAGE: 62% HEADWATERS X UNIFORM THROUGHOUT WATERSHED

EXISTING STRUCTURE

- STRUCTURE TYPE: STEEL TRUSS W/STEEL GIRDER APPROACH SPANS YEAR BUILT: 1929
- CLEAR SPAN (NORMAL TO STREAM): 12 m - 49 m - 12 m
- VERTICAL CLEARANCE ABOVE STREAMBED: 5.5 m
- WATERWAY OF FULL OPENING: 351 m²
- DISPOSITION OF STRUCTURE: TO BE REMOVED
- TYPE OF MATERIAL UNDER SUBSTRUCTURE: SANDY GRAVEL
- WATER SURFACE ELEVATION* $Q = 2.33 = 167.04 (169.80)$ m VELOCITY = 1.14 (0.26) m/s
- LONG TERM STREAM BED CHANGES: NONE
- IS THE ROADWAY OVERTOPPED BELOW THE Q100? NO FREQUENCY: NA
- RELIEF ELEVATION: NA DISCHARGE OVER ROAD @Q100: NA
- UPSTREAM STRUCTURE: TOWN: JAMAICA DISTANCE: 2.17 km
- DOWNSTREAM STRUCTURE: TOWN: TOWNSHEND DISTANCE: 6.12 km

PROPOSED STRUCTURE

- STRUCTURE TYPE: STEEL TRUSS AND PLATE GIRDER WITH CENTER PIER
- CLEAR SPAN LENGTH(S) NORMAL TO STREAM: 48.8 m - 31.0 m
- VERTICAL CLEARANCE ABOVE STREAMBED: 6.4 m
- ARE PROVISIONS TO BE MADE FOR PUBLIC UTILITIES? NO
- WATERWAY AREA OF FULL OPENING (NORMAL TO STREAM): 406 m²
- WATER SURFACE ELEVATION* $Q = 2.33 = 167.04 (169.80)$ m VELOCITY = 1.14 (0.26) m/s
- IS THE ROADWAY OVERTOPPED BELOW THE Q100? NO FREQUENCY: NA
- RELIEF ELEVATION: NA DISCHARGE OVER ROAD @Q100: NA
- AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 170.60 m
- VERTICAL CLEARANCE @Q100: CONTROLLED = 0.8 m; UNCONTROLLED = 2.4 m
- SCOUR: GULLY CONTRACTION SCOUR = 0.9m, PIER SCOUR = 7.2m, ABUT. 1 = 4.3m, ABUT. 2 = 5.7m
- REQUIRED CHANNEL PROTECTION: STONE FILL, TYPE IV

PERMIT INFORMATION

- AVERAGE DAILY FLOW: 13.8 m³/s
 ORDINARY LOW WATER: 6.0 m³/s DEPTH: 0.6 m
 ORDINARY HIGH WATER: 40.7 m³/s DEPTH: 1.1 m

TRAFFIC DATA

- FUNCTIONAL CLASSIFICATION: MINOR ARTERIAL
- 1999 ADT = 1860
 2019 ADT = 2520
 1999 DHV = 260
 2019 DHV = 355
 D = 56%
 T = 8%
 V = 80 km/h
 1999-2019 18 KIP ESAL = 1 178 000
 1999-2039 18 KIP ESAL = 2 997 000

TEMPORARY BRIDGE REQUIREMENTS

- STRUCTURE TYPE: MULTI-SPAN BRIDGE
 - CLEAR SPAN LENGTH(S) NORMAL TO STREAM: 84 m TOTAL
 - VERTICAL CLEARANCE ABOVE STREAMBED: SEE NOTES BELOW
 - WATERWAY AREA OF FULL OPENING (NORMAL TO STREAM): 332 m² SEE NOTES BELOW
- NOTE: 1. LOW STEEL FOR TEMPORARY BRIDGE IS EL. 170.0 W/ NO FILL BELOW EL. 167.0
- TRAFFIC MAINTENANCE:
- IS TRAFFIC TO BE MAINTAINED? YES IF YES, ON EXISTING STRUCTURE OR ON TEMPORARY BRIDGE - X
 - TEMPORARY BRIDGE REQUIREMENTS: ONE OR TWO WAY ONE WAY
 - TRAFFIC CONTROL SIGNALS REQUIRED YES
 - ARE SIDEWALKS REQUIRED? NO IF SO, ON WHAT SIDE?
- STRUCTURE TYPE: BRIDGE



- NOTES:
- ALL HORIZONTAL REQUIREMENTS ARE PERPENDICULAR TO THE STREAM.
 - THE CONTRACTOR SHALL NOT CUT EXISTING STREAM BANKS TO PROVIDE MINIMUM OPENINGS.

DESIGN CRITERIA:

- DESIGN LIVE LOAD AASHTO: MS22.5
- DESIGN SPAN: TRUSS: 48.77 m APPROACH: 31.00 m
- ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL: ON LEDGE
- ALLOWABLE LOAD FOR PILING: TYPE ESTIMATED LENGTH
- ALLOWABLE STRESS FOR STRUCTURAL STEEL AASHTO M270M OR 345 PAINTED TENSION: 186 MPa
- ALLOWABLE STRESS FOR REINFORCING STEEL AASHTO M31M GRADE 420 TENSION: 165 MPa COMPRESSION: 138 MPa
- ALLOWABLE STRESS FOR CONCRETE CLASS A: $f_c = 30$ MPa $f_t = 10$ MPa
 CLASS B: $f_c = 25$ MPa $f_t = 10$ MPa
 SILICA FUME: $f_c = 35$ MPa $f_t = 15$ MPa

LOAD RATING (TONS)(LOAD FACTOR)

RATING LEVEL	TRUCK				
	H	HS	3S2	6 AXLE 3A STR	4A STR 5A SEM
INVENTORY					
POSTED					
OPERATING					

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of	JAMAICA	Bridge No.	80
Highway No.	VT. Route 100	Log Sta.	
		Surv. Sta.	
VT. Route 100 over the West River			

PRELIMINARY INFORMATION (1 of 2)

Designed By	L. M. MARTIN	Drawn By	G. F. BONIN
Checked By		Bridge Design Supervisor	
PROJECT	JAMAICA	PROJECT NO.	BRF 013-1(8)
I.G.C. Info.			



540 Commercial St.
 Manchester, NH 03101
 PH: (603) 668-8223
 FAX: (603) 668-8802