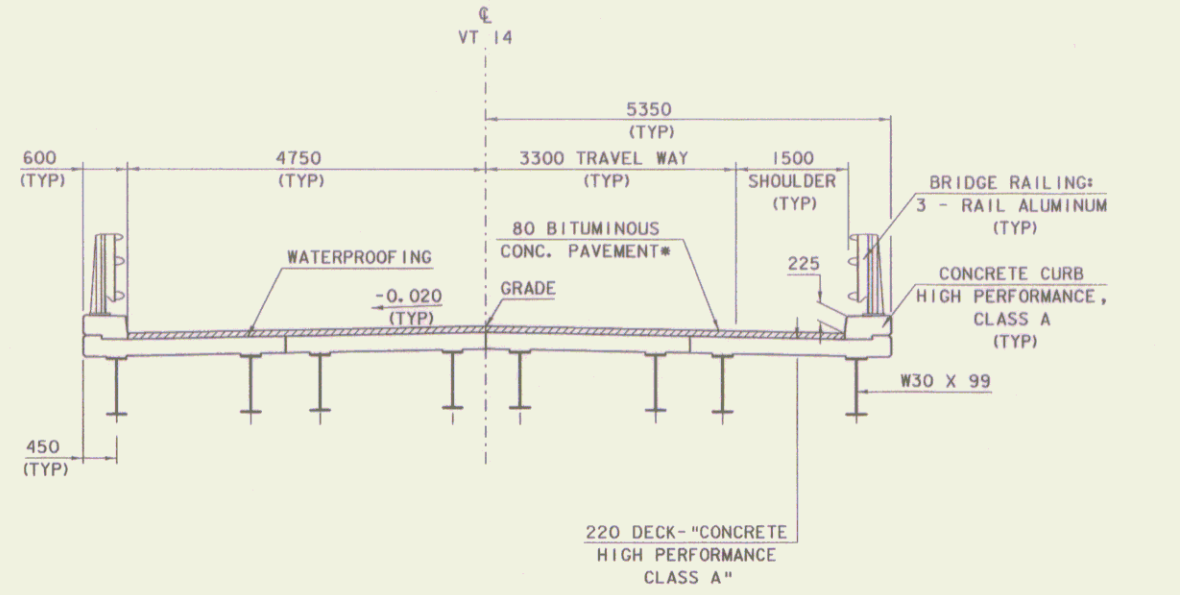
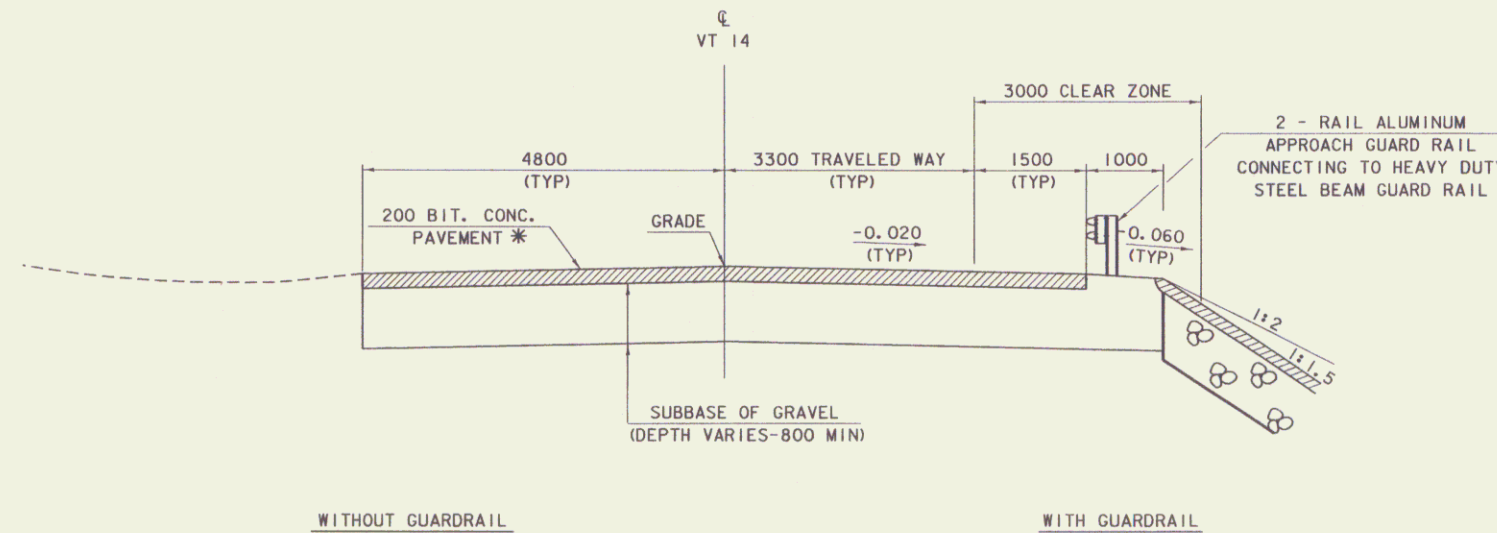
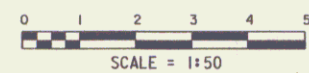


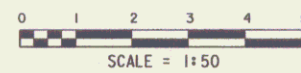
FINAL HYDRAULICS REPORT



TYPICAL BRIDGE SECTION (PRECAST)



TYPICAL ROADWAY SECTION



- 40 mm Type III or IV over 40 mm Type I or II over 60 mm Type I or II

MATERIAL ITEM	TOLERANCE
PAVEMENT	±5 mm TOTAL THICKNESS
BASE COURSE	±10 mm
SUBBASE	±30 mm
SAND BORROW	±30 mm
GRANULAR BORROW	±30 mm

•• See Special Provisions Section XX

HYDROLOGIC DATA

DRAINAGE AREA = 131.3 sq. km  
 CHARACTER OF TERRAIN: Rolling to mountainous  
 CHARACTER & TYPE OF STREAM: Perennial, straight at site but sinuous upstream and downstream. Not braided.  
 NATURE OF STREAMBED: Ledge  
 Q2.33 = 41 cms      Q50 = 133 cms  
 Q10 = 75 cms      Q100 = 160 cms  
 Q25 = 105 cms      Q500 = 270 cms  
 DATE OF FLOOD OF RECORD: November 1927  
 WATER SURFACE ELEV.: Unknown      ESTIMATED DISCHARGE: Unknown  
 NATURAL STREAM VELOCITY @ Q50 = 3.7 mps  
 ICE CONDITIONS: Slight      DEBRIS: Slight  
 DOES THE STREAM REACH MAXIMUM HIGHWATER ELEVATION RAPIDLY? No  
 IS ORDINARY RISE RAPID? No  
 IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? Yes  
 IF YES, DESCRIBE: There is a concrete dam under the upstream side of the bridge.  
 WATERSHED STORAGE: 3.72 HEADWATERS UNIFORM THROUGHOUT WATERSHED X IMMEDIATELY ABOVE SITE

EXISTING STRUCTURE

STRUCTURE TYPE: Single span steel beam bridge      YEAR BUILT: 1936  
 CLEAR SPAN (NORMAL TO STREAM): 17.1 m  
 VERTICAL CLEARANCE ABOVE STREAMBED: 3.1 m to top of dam  
 WATERWAY OF FULL OPENING: 56 sq. m  
 DISPOSITION OF STRUCTURE: Remove and replace  
 TYPE OF MATERIAL UNDER SUBSTRUCTURE: Ledge  
 WATER SURFACE ELEV. @ Q2.33 = 211.1      VELOCITY = 2.9 mps  
 Q10 = 211.7      "      3.5 mps  
 Q25 = 212.1      "      3.9 mps  
 Q50 = 212.5      "      4.2 mps  
 Q100 = 213.4      "      4.5 mps  
 LONG TERM STREAM BED CHANGES: None, due to ledge.  
 IS THE ROADWAY OVERTOPPED BELOW THE Q100? No      FREQUENCY: Above Q100  
 RELIEF ELEVATION: 213.5      DISCHARGE OVER ROAD @ Q100: None  
 UPSTREAM STRUCTURE: TOWN: East Montpelier      DISTANCE: 240 m  
 HIGHWAY NO.: VT 14      STRUCTURE NO.: 72  
 STRUCTURE TYPE: Single span steel beam bridge  
 CLEAR SPAN: 28.4 m      CLEAR HEIGHT: 5.0 m  
 YEAR BUILT: 1991      FULL WATERWAY: 87 sq. m  
 DOWNSTREAM STRUCTURE: TOWN: East Montpelier      DISTANCE: 2.4 km  
 HIGHWAY NO.: I.R. 31      STRUCTURE NO.: 21  
 STRUCTURE TYPE: Single span king truss bridge  
 CLEAR SPAN: 7.9 m      CLEAR HEIGHT: 4.0 m  
 YEAR BUILT: N.A.      FULL WATERWAY: 34 sq. m

PROPOSED STRUCTURE

STRUCTURE TYPE: Single span steel beam bridge  
 CLEAR SPAN (NORMAL TO STREAM): 18.2 m  
 VERTICAL CLEARANCE ABOVE STREAMBED: 2.9 m to top of dam  
 WATERWAY OF FULL OPENING: 58 sq. m  
 WATER SURFACE ELEV. @ Q2.33 = 211.0      VELOCITY = 2.8 mps  
 Q10 = 211.6      "      3.4 mps  
 Q25 = 212.0      "      3.8 mps  
 Q50 = 212.3      "      4.1 mps  
 Q100 = 212.7      "      4.4 mps  
 IS THE ROADWAY OVERTOPPED BELOW THE Q100? No      FREQUENCY: Above Q100  
 RELIEF ELEVATION: 213.6      DISCHARGE OVER ROAD @ Q100: None  
 AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 212.7  
 VERTICAL CLEARANCE @ Q50 = 0.4 m  
 SCOUR: None. Abutment footings will be poured on sound ledge.  
 REQUIRED CHANNEL PROTECTION: Stone Fills, Type IV

PERMIT INFORMATION

AVERAGE DAILY FLOW: 2.9 cms  
 ORDINARY LOW WATER: 1.3 cms      DEPTH: 0.3 m  
 ORDINARY HIGH WATER: 17.6 cms      DEPTH: 1.0 m

ADDITIONAL COMMENTS

DESIGN CRITERIA:

1. DESIGN LIVE LOAD AASHTO MS 22.5
2. DESIGN SPAN 19.600 m
3. ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL NA      ON LEDGE 480 kPa
4. ALLOWABLE LOAD FOR PILING NA      TYPE NA      ESTIMATED LENGTH NA
5. STRUCTURAL STEEL AASHTO GRADE M-270 GRADE 345W
6. REINFORCING STEEL GRADE 420
7. CONCRETE CLASS A/HPC  $f_c = 30$  MPa  
 CONCRETE CLASS B/HPC  $f_c = 25$  MPa  
 SILICA-FUME CONCRETE  $f_c = 35$  MPa

TRAFFIC MAINTENANCE:

1. IS TRAFFIC TO BE MAINTAINED? NO      IF YES, ON EXISTING STRUCTURE NO      OR ON TEMPORARY BRIDGE NO, ON A DETOUR
2. TEMPORARY BRIDGE REQUIREMENTS: ONE OR TWO WAY NA      TRAFFIC CONTROL SIGNALS REQUIRED NO  
 MINIMUM CLEAR SPAN (NORMAL TO STREAM): 17.0 m minimum      VERTICAL CLEARANCE ABOVE STREAMBED: minimum bottom of beam elev. 212.0  
 WATERWAY OF FULL OPENING: 40.0 sq. m minimum  
 ARE SIDEWALKS REQUIRED? NO      IF SO, ON WHAT SIDE? NA  
 STRUCTURE TYPE: Pedestrian Bridge

STATE OF VERMONT AGENCY OF TRANSPORTATION

Town Of E. MONTPELIER Bridge No. 71  
 Highway No. VT 14 Log Sta. 1+18,800  
 Surv. Sta. 1+18,800

PRELIMINARY INFORMATION  
 VT 14 OVER KINGSBURY BRANCH

Designed By K.M. HIGGINS Drawn By K.M. HIGGINS  
 Checked By Date Bridge Design Supervisor  
W.B. SYMONDS 3/98 C.P. WILLIAMS Date 3/98

PROJECT E. MONTPELIER PROJECT NO. BRF 037-218

I.G.C. Info. 88x054/structures/so054pl.dgn so054pl.1  
 Bridge Sheet No. ROW SHEET 2 OF 14

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT
2003	3960	545	68	5	220
2023	5290	705	68	4	260

18 kip ESAL for flexible pavement from 2003 to 2023: 2,656,000  
 18 kip ESAL for flexible pavement from 2003 to 2043: 6,356,000  
 Design speed: 60 kph