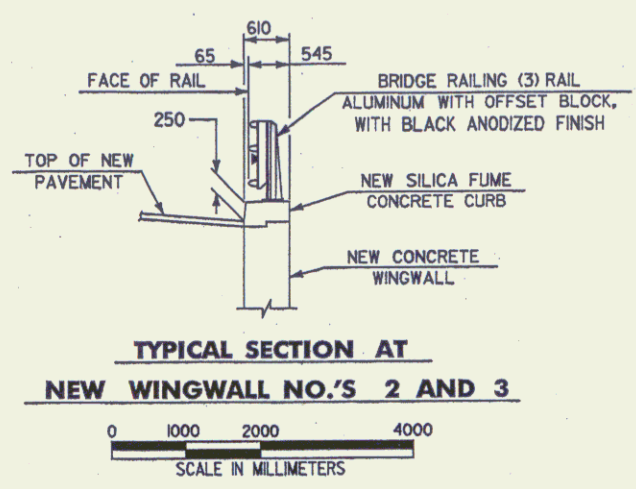
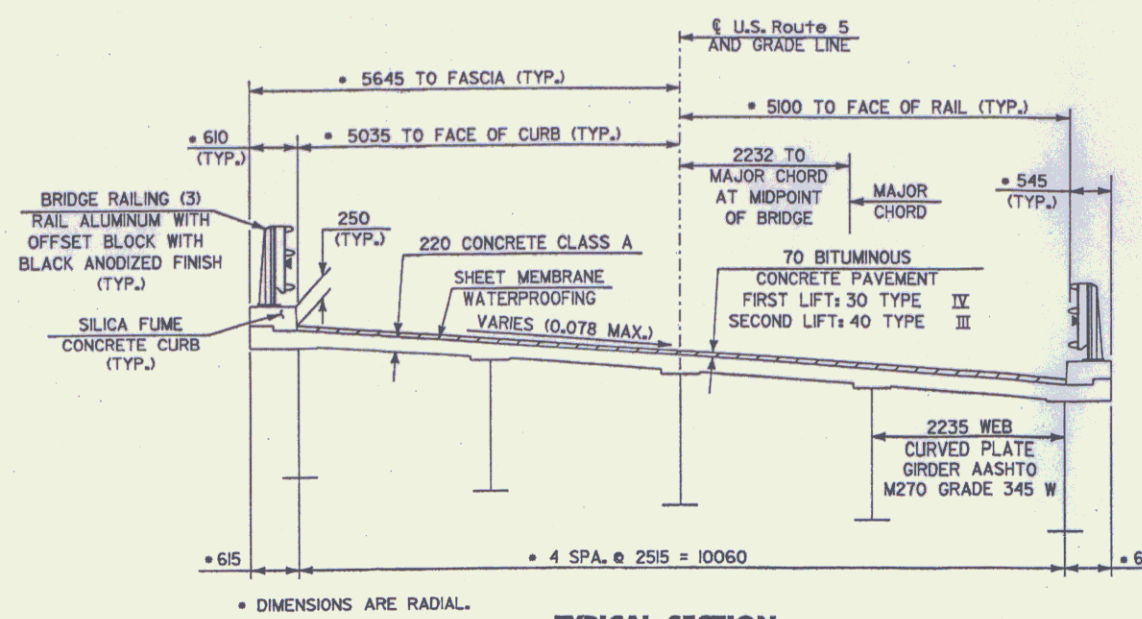


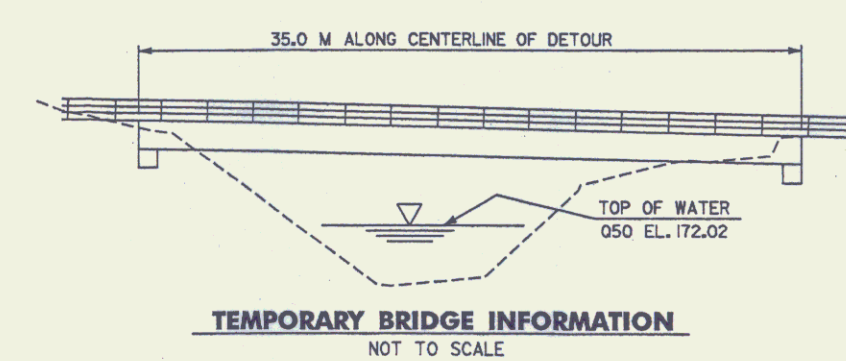
FINAL HYDRAULICS REPORT



TYPICAL SECTION  
SCALE IN MILLIMETERS

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- BR101 BRIDGE QUANTITY SHEET
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TEMPORARY BRIDGE INFORMATION  
NOT TO SCALE

HYDROLOGIC DATA

DRAINAGE AREA: 55.4 sq.km.  
 CHARACTER OF TERRAIN: HILLY  
 CHARACTER & TYPE OF STREAM: DEEP, GORGE-LIKE CHANNEL  
 NATURE OF STREAMBED: LEDGE  
 Q2.33= 24.5 cms      Q50= 95.8 cms  
 Q10= 53.8 cms      Q100= 117.8 cms  
 Q25= 73.1 cms      Q500= 184.3 cms  
 DATE OF FLOOD RECORD: NONE DOCUMENTED  
 WATER SURFACE ELEV. N/A      ESTIMATED DISCHARGE: N/A  
 NATURAL STREAM VELOCITY @ 0.25 = 7.5 mps  
 ICE CONDITIONS: MINOR      DEBRIS: MINOR  
 DOES THE STREAM REACH MAXIMUM HIGH WATER ELEVATION RAPIDLY? NO  
 IS ORDINARY RISE RAPID? NO  
 IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? YES  
 IF YES, DESCRIBE: BACK WATER PRODUCED BY A DAM IMPONDMENT 76.2 m DOWNSTREAM  
 WATERSHED STORAGE: HEADWATERS UNIFORM THROUGHOUT WATERSHED IMMEDIATELY ABOVE SITE.

EXISTING STRUCTURE

STRUCTURE TYPE: SINGLE SPAN STEEL GIRDER W/TWO CONCRETE SLABS, YEAR BUILT: 1926  
 CLEAR SPAN (NORMAL TO STREAM): 14.4 m  
 VERTICAL CLEARANCE ABOVE STREAMBED: 8.6 m  
 WATERWAY OF FULL OPENING: 80.3 SQUARE METERS  
 DISPOSITION OF STRUCTURE: REMOVE  
 TYPE OF MATERIAL UNDER SUBSTRUCTURE: LEDGE  
 WATER SURFACE ELEV. @ 02.33= 159.79 m VELOCITY= 3.10 mps  
 Q10= 170.49 m      3.67 mps  
 Q25= 170.84 m      4.28 mps  
 Q50= 171.22 m      4.52 mps  
 Q100= 171.55 m      4.78 mps  
 LONG TERM STREAM BED CHANGES: NONE NOTED

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

UPSTREAM STRUCTURE: TOWN: \_\_\_\_\_ DISTANCE: \_\_\_\_\_  
 HIGHWAY NO.: \_\_\_\_\_ STRUCTURE NO.: \_\_\_\_\_  
 STRUCTURE TYPE: \_\_\_\_\_  
 CLEAR SPAN: \_\_\_\_\_ CLEAR HEIGHT: \_\_\_\_\_  
 YEAR BUILT: \_\_\_\_\_ FULL WATERWAY: \_\_\_\_\_  
 DOWNSTREAM STRUCTURE: TOWN: \_\_\_\_\_ DISTANCE: \_\_\_\_\_  
 HIGHWAY NO.: \_\_\_\_\_ STRUCTURE NO.: \_\_\_\_\_  
 STRUCTURE TYPE: \_\_\_\_\_  
 CLEAR SPAN: \_\_\_\_\_ CLEAR HEIGHT: \_\_\_\_\_  
 YEAR BUILT: \_\_\_\_\_ FULL WATERWAY: \_\_\_\_\_

DESIGN CRITERIA:  
 1. DESIGN LIVE LOAD AASHTO MS 22.5  
 2. DESIGN SPAN 43.90 m  
 3. ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL N/A ON LEDGE 480 kpa  
 4. ALLOWABLE LOAD FOR PILING N/A TYPE N/A ESTIMATED LENGTH N/A  
 5. STRUCTURAL STEEL AASHTO GRADE M270 GRADE 345W TENSION 190 MPa  
 6. REINFORCING STEEL GRADE 420  
 7. CONCRETE CLASS A  $f_c = 30$  MPa  
 CONCRETE CLASS B  $f_c = 25$  MPa  
 SILICA-FUME CONCRETE  $f_c = 35$  MPa  
 \*WORKING STRESS METHOD IS USED TO DESIGN THE CURVED STEEL PLATE GIRDER. THE BRIDGE SHALL BE LOAD RATED USING THE LOAD FACTOR METHOD.  
 TRAFFIC MAINTENANCE:  
 1. IS TRAFFIC TO BE MAINTAINED? YES      IF YES, ON EXISTING STRUCTURE NO. \_\_\_\_\_ OR ON TEMPORARY BRIDGE YES  
 2. TEMPORARY BRIDGE REQUIREMENTS: ONE OR TWO WAY ONE      TRAFFIC CONTROL SIGNALS REQUIRED YES  
 MINIMUM CLEAR SPAN (NORMAL TO STREAM) 25 m      VERTICAL CLEARANCE ABOVE STREAMBED 5.85 m (TO CLEAR HISTORIC STONEWALL)  
 WATERWAY OF FULL OPENING 55.9 sq. m  
 ARE SIDEWALKS REQUIRED? NO      IF SO, ON WHAT SIDE? \_\_\_\_\_  
 STRUCTURE TYPE: \_\_\_\_\_

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT
2001	4600	630	55	2	30
2021	6100	800	55	2	320

LOAD RATING (TONS)

LOADING LEVELS (LOAD FACTOR)	TRUCK					
	M	MS	3S2	6 AXLE	3A. STR.	4A. STR.
INVENTORY A =						
POSTED A =						
OPERATING A =						

RF =  $\frac{M}{M_{LL+1}} = 1.3$   
 $A \times M_{LL+1}$

PROPOSED STRUCTURE

STRUCTURE TYPE: SIMPLE SPAN MULTI-STEEL CURVED GIRDER  
 CLEAR SPAN (NORMAL TO STREAM): 16.5 m  
 VERTICAL CLEARANCE ABOVE STREAMBED: 5.7 m  
 WATERWAY OF FULL OPENING: 84.2 SQUARE METERS  
 WATER SURFACE ELEV. @ 02.33= 159.79 m VELOCITY= 3.91 mps  
 Q10= 170.47 m      5.06 mps  
 Q25= 170.84 m      5.63 mps  
 Q50= 171.20 m      6.18 mps  
 Q100= 171.56 m      6.61 mps  
 IS THE ROADWAY OVERTOPPED BELOW THE Q100? NO      FREQUENCY: \_\_\_\_\_  
 RELIEF ELEVATION: \_\_\_\_\_ DISCHARGE OVER ROAD @ Q100: \_\_\_\_\_  
 MINIMUM LOW ELEVATION OF SUPERSTRUCTURE: 174.1 m  
 VERTICAL CLEARANCE @ Q100 = 2.44 m  
 SCOUR: 0.0 m  
 REQUIRED CHANNEL PROTECTION: NONE

PERMIT INFORMATION

AVERAGE DAILY FLOW: 1.2 cms  
 ORDINARY LOW WATER: 0.6 cms      DEPTH: 0.3 m  
 ORDINARY HIGH WATER: 14.2 cms      DEPTH: 0.9 m

ADDITIONAL COMMENTS

WATER ELEVATIONS INDICATED ARE AT THE APPROXIMATE LOCATION OF THE UPSTREAM FACE OF THE PROPOSED BRIDGE (SECT. 4.0)  
 VELOCITY HAS BEEN DETERMINED BY PERFORMING A NORMAL DEPTH CALCULATION THROUGH THE BRIDGE REACH UTILIZING THE REGULAR CHANNEL GEOMETRY AND ACTUAL CHANNEL SLOPE.



STATE OF VERMONT  
AGENCY OF TRANSPORTATION

Town Of: HARTLAND      Bridge No. 60  
 Highway No.: U.S. ROUTE 5      Log. Sta. \_\_\_\_\_  
 U.S. ROUTE 5 OVER LULLS BROOK  
**PRELIMINARY INFORMATION SHEET**  
 Designed By: S. BAKI 12/98      Drawn By: W. GAYNOR 12/98  
 Checked By: S. BAKI      Date: 12/98      Bridge Design Supervisor: J. MECZKOWSKI Date 12/98  
 PROJECT: HARTLAND      PROJECT NO.: BRS No. 0113(22)  
 L.G.C. Info: p:\users\j9145621\struct\zf204mpl.dgn  
 R.O.W. SHEET 5 OF 11 SHEETS