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	SB-R6-82M	7/10/1997
	SB-R7-90M	7/10/1997

## FINAL HYDRAULIC REPORT

**HYDROLOGIC DATA**

DRAINAGE AREA: 4.32 sq. km  
 CHARACTER OF TERRAIN: Mountainous  
 STREAM CHARACTERISTICS: Small, perennial but flashy  
 NATURE OF STREAMBED: Gravel, cobbles and boulders over sandy silt

PEAK FLOW DATA:  
 Q2.33 = 2.8 cms      Q50 = 11.3 cms  
 Q10 = 5.7 cms      Q100 = 14.2 cms  
 Q25 = 8.5 cms      Q500 = \_\_\_\_\_

DATE OF FLOOD RECORD: Unknown  
 ESTIMATED DISCHARGE: \_\_\_\_\_  
 WATER SURFACE ELEV.: \_\_\_\_\_  
 NATURAL STREAM VELOCITY: Q10 = 2.7 mps  
 ICE CONDITIONS: Minor  
 DEBRIS: \_\_\_\_\_  
 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: Minimal      HEADWATERS: \_\_\_\_\_  
 UNIFORM: \_\_\_\_\_  
 IMMEDIATELY ABOVE SITE: \_\_\_\_\_

**EXISTING STRUCTURE INFORMATION**

STRUCTURE TYPE: Rail steel and concrete deck on stone masonry walls  
 YEAR BUILT: 1930  
 CLEAR SPAN (NORMAL TO STREAM): 2.29 m +/-  
 VERTICAL CLEARANCE ABOVE STREAMBED: 2.29 m +/-  
 WATERWAY OF FULL OPENING: 5.20 sq. m +/-  
 DISPOSITION OF STRUCTURE: Remove  
 TYPE OF MATERIAL UNDER SUBSTRUCTURE: Sandy silt

WATER SURFACE ELEVATIONS AT:  
 Q2.33 = 0.61 m Depth      VELOCITY = \_\_\_\_\_  
 Q10 = \_\_\_\_\_      "      \_\_\_\_\_  
 Q25 = \_\_\_\_\_      "      \_\_\_\_\_  
 Q50 = 1.58 m Depth      "      \_\_\_\_\_  
 Q100 = \_\_\_\_\_      "      \_\_\_\_\_

LONG TERM STREAMBED CHANGES: \_\_\_\_\_

**PROPOSED STRUCTURE**

STRUCTURE TYPE: Precast concrete box, 3.050m x 2.450m gross rise  
 \*0.6m bed material

CLEAR SPAN (NORMAL TO STREAM): 3.05m, for 1.85 m net rise  
 VERTICAL CLEARANCE ABOVE STREAMBED: 1.85 m  
 WATERWAY OF FULL OPENING: 5.64 sq. m

WATER SURFACE ELEVATIONS AT:  
 Q2.33 = 178.1 m      VELOCITY: 2.1 mps  
 Q10 = 178.5 m      "      2.8 mps  
 Q25 = 178.9 m      "      3.3 mps  
 Q50 = 179.2 m      "      3.7 mps  
 Q100 = 179.5 m      "      4.0 mps

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

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: \_\_\_\_\_  
 VERTICAL CLEARANCE: @ Q50 = 0.8m in barrel (0.3m at inlet)

SCOUR: \_\_\_\_\_

REQUIRED CHANNEL PROTECTION: Stone Fill, Type III

**PERMIT INFORMATION**

AVERAGE DAILY FLOW: 0.1 cms      DEPTH OR ELEVATION: \_\_\_\_\_  
 ORDINARY LOW WATER: 0.06 cms      < 0.3 m  
 ORDINARY HIGH WATER: 1.2 cms      < 0.3m

**TEMPORARY BRIDGE REQUIREMENTS:**

STRUCTURE TYPE: \_\_\_\_\_  
 CLEAR SPAN (NORMAL TO STREAMBED): \_\_\_\_\_  
 VERTICAL CLEARANCE ABOVE STREAMBED: \_\_\_\_\_  
 WATERWAY AREA OF FULL OPENING: \_\_\_\_\_

**ADDITIONAL INFORMATION**

TAILWATER ELEVATION @ Q50 = 178.0  
 OUTLET VELOCITY @ Q50 = 3.7 mps  
 OUTLET VELOCITY @ Q100 = 4.0 mps

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

**UPSTREAM STRUCTURE**

TOWN: Pownal      DISTANCE: 245 m  
 HIGHWAY #: US 7      STRUCTURE #: 3A  
 CLEAR SPAN: 1.8 m      CLEAR HEIGHT: 1.8 m  
 YEAR BUILT: 1961      FULL WATERWAY: 2.6 sq. m  
 STRUCTURE TYPE: ACCGMP

**DOWNSTREAM STRUCTURE**

TOWN: Pownal      DISTANCE: 140 m  
 HIGHWAY #: T.H. 1      STRUCTURE #: 8  
 CLEAR SPAN: 3.0 m      CLEAR HEIGHT: 2.1 m  
 YEAR BUILT: 1993      FULL WATERWAY: 6.5 sq. m  
 STRUCTURE TYPE: Precast Concrete Box

**DESIGN CRITERIA**

- DESIGN LIVE LOAD AASHTO HL-93
- DESIGN SPAN 3050mm x 2450mm Precast Box
- ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL 210 kPa ON LEDGE
- ALLOWABLE LOAD FOR PILING TYPE \_\_\_\_\_ ESTIMATED LENGTH \_\_\_\_\_
- STRUCTURAL STEEL AASHTO M270MM270 GRADE 345W
- REINFORCING STEEL GRADE 420
- CONCRETE, HIGH PERFORMANCE CLASS A fc: 30 Mpa  
CONCRETE, HIGH PERFORMANCE CLASS B fc: 25 Mpa
- DESIGN SOIL UNIT WEIGHT 22.00 kN/m<sup>3</sup>
- DESIGN LOAD FOR SPREAD FOOTINGS ON SOIL \_\_\_\_\_

**TRAFFIC MAINTENANCE**

- IS TRAFFIC TO BE MAINTAINED? No, road closed to through traffic.  
 IF YES, ON EXISTING STRUCTURE? \_\_\_\_\_  
 OR ON TEMPORARY BRIDGE? \_\_\_\_\_  
 ONE OR TWO-WAY TRAVEL? \_\_\_\_\_
- TRAFFIC CONTROL SIGNALS REQUIRED? \_\_\_\_\_
- ARE SIDEWALKS REQUIRED? \_\_\_\_\_  
 IF SO, ON WHAT SIDE? \_\_\_\_\_

**LOAD FACTOR - LOAD RATING (METRIC TONS)**

LOADING LEVELS	TRUCK						
	M	MS	3S2	6 AXLE	3A STR.	4A STR.	5A SEMI
INVENTORY	X	X					
POSTED	X	X	X		X	X	X
OPERATING		X	X	X	X	X	

COMMENTS: \_\_\_\_\_

**TRAFFIC DATA**

YEAR	ADT	DHV	% D	% T	ADTT
1999	2680	375	53	7	215
2019	3640	505	53	6	255

20 year ESAL for flexible pavement from 1999 to 2019 : 2,817,000  
 40 year ESAL for flexible pavement from 1999 to 2039 : 7,068,000  
 Design Speed : 40 km/h

PROJECT NAME: POWNAL  
 PROJECT NUMBER: STP RS 0107(8)

FILE NAME: /84c028/str/s84c028pi.xls      PLOT DATE: 4/23/2007  
 PROJECT MANAGER: W. SYMONDS      DRAWN BY: K. RUTTER  
 DESIGNED BY: R. PELLETT      CHECKED BY: T. FILLBACH  
**PRELIMINARY INFORMATION SHEET**      SHEET 2 OF 65