

**FINAL HYDRAULIC REPORT**

**INDEX OF SHEETS**

1. TITLE SHEET
2. PRELIMINARY INFORMATION SHEET
3. TYPICAL SECTION SHEET
- 4-5. QUANTITY SHEETS
6. ROW DETAIL SHEET
7. ROW PLAN SHEET
8. TIE SHEET
9. PLAN SHEET
10. MAINLINE PROFILE
11. TRAFFIC CONTROL / CONSTRUCTION SIGNING SHEET
12. BORING LAYOUT SHEET
13. BORING LOG SHEET
14. PLAN AND ELEVATION
15. EROSION CONTROL NARRATIVE
16. EXISTING CONDITIONS SITE PLAN
17. EROSION & SEDIMENT CONTROL PLAN
18. FINAL CONDITIONS SITE PLAN
- 19A. EROSION CONTROL DETAILS
- 19B. EROSION CONTROL DETAILS - SILT FENCE
20. GENERAL NOTES
21. ACCESS RAMP DETAILS
22. DECK REINFORCING DETAILS
23. BOX BEAM DETAILS
24. CURB, RAIL AND CURTAIN WALL DETAILS
25. BEGIN AND END BRIDGE DETAILS
26. ABUTMENT #1 DETAILS
27. ABUTMENT #2 DETAILS
28. WINGWALL 3 & 4 DETAILS
29. ABUTMENT #1 AND #2 CORNER DETAILS
30. REINFORCING STEEL SCHEDULE
- 31-35. MAINLINE CROSS SECTIONS
- 36-38. CHANNEL SECTIONS

**HYDROLOGIC DATA**

Date: 5/6/99

DRAINAGE AREA: 265.5 sq. km  
 CHARACTER OF TERRAIN: Hilly to mountainous, with a narrow flood plain  
 STREAM CHARACTERISTICS: There is channel bend through the bridge section  
 NATURE OF STREAMBED: Sand, gravel, and cobbles

**PEAK FLOW DATA**

Q 2.33 = 93.4 cms                      Q 50 = 360 cms  
 Q 10 = 207 cms                        Q 100 = 445 cms  
 Q 25 = 300 cms                        Q 500 = 735 cms

DATE OF FLOOD RECORD: Unknown  
 ESTIMATED DISCHARGE: Unknown  
 WATER SURFACE ELEV.: Unknown  
 NATURAL STREAM VELOCITY: @ Q25 = 4.4 mps  
 ICE CONDITIONS: Moderate  
 DEBRIS: High  
 DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? No  
 IS ORDINARY RISE RAPID? No  
 IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? No  
 IF YES, DESCRIBE: N/A

WATERSHED STORAGE: 1%            HEADWATERS: \_\_\_\_\_  
 UNIFORM: \_\_\_\_\_ X  
 IMMEDIATELY ABOVE SITE: \_\_\_\_\_

**EXISTING STRUCTURE INFORMATION**

STRUCTURE TYPE: (Truss Bridge) Temp Mabey Bridge  
 YEAR BUILT: (1928)  
 CLEAR SPAN(NORMAL TO STREAM): 19 m  
 VERTICAL CLEARANCE ABOVE STREAMBED: 4.4 m  
 WATERWAY OF FULL OPENING: 66 sq. m  
 DISPOSITION OF STRUCTURE: Remove  
 TYPE OF MATERIAL UNDER SUBSTRUCTURE: Unknown

**WATER SURFACE ELEVATIONS AT:**

Q2.33 = 170.7 m                      VELOCITY = 2.3 mps  
 Q10 = 172.4 m                        "                      3.8 mps  
 Q25 = 172.5 m                        "                      4.4 mps  
 Q50 = 172.6 m                        "                      4.7 mps  
 Q100 = 172.8 m                        "                      5.1 mps

LONG TERM STREAMBED CHANGES: Abut.2 undermined full length due to channel migration

IS THE ROADWAY OVERTOPPED BELOW Q100: Yes  
 FREQUENCY: Less than Q10  
 RELIEF ELEVATION: 171.4 m  
 DISCHARGE OVER ROAD @Q100: 241 cms

**UPSTREAM STRUCTURE**

TOWN: Wallingford                      DISTANCE: +/- 300 m  
 HIGHWAY #: SNTH 140 (FAS 0138)                      STRUCTURE #: Bridge 54  
 CLEAR SPAN: 38.1 m                      CLEAR HEIGHT: 3.0 m (avg.)  
 YEAR BUILT: 1949                        FULL WATERWAY: Unknown  
 STRUCTURE TYPE: Single Span Thru Truss Steel

**DOWNSTREAM STRUCTURE**

TOWN: Wallingford                      DISTANCE: +/- 460 m  
 HIGHWAY #: TH-2                        STRUCTURE #: Bridge 59  
 CLEAR SPAN: 11.8 m (ea)                      CLEAR HEIGHT: 3.0 m (avg.)  
 YEAR BUILT: 1922                        FULL WATERWAY: Unknown  
 STRUCTURE TYPE: Two Span Concrete T-Beam

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

LOADING LEVELS (LOAD FACTOR)	TRUCK						
	M	MS	352	6 AXLE	3A. STR.	4A. STR.	5A. SEMI
INVENTORY A=2.1T	33	48					
POSTED A=1.55	36	50	65		48	48	58
OPERATING A=1.30		53	68	83	50	51	

STRENGTH RF =  $\frac{M_{M-1.3 M_{M-1.5 M_{M-1.5}}}{A \times M_{LL-1}}$

COMMENTS:

**TRAFFIC DATA**

YEAR	ADT	DHV	% D	% T	ADTT
1999	55	10	0	8	2
2019	75	15	0	10	15

20 year ESAL for flexible pavement from 1999 to 2019 : 58,000  
 40 year ESAL for flexible pavement from 1999 to 2039 : 150,000  
 Design Speed : 30 km/h

**PROPOSED STRUCTURE**

STRUCTURE TYPE: Precast concrete box beam bridge  
 CLEAR SPAN(NORMAL TO STREAM): 19.6 m  
 VERTICAL CLEARANCE ABOVE STREAMBED: 4.4 m  
 WATERWAY OF FULL OPENING: 67.4 sq.m

**WATER SURFACE ELEVATIONS AT:**

Q2.33 = 170.7 m                      VELOCITY = 2.3 mps  
 Q10 = 172.4 m                        "                      3.8 mps  
 Q25 = 172.6 m                        "                      4.4 mps  
 Q50 = 172.7 m                        "                      4.7 mps  
 Q100 = 172.8 m                        "                      5.1 mps

IS THE ROADWAY OVERTOPPED BELOW Q100: YES  
 FREQUENCY: Less than Q10  
 RELIEF ELEVATION: 171.4 m  
 DISCHARGE OVER ROAD @Q100: 238 cms

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 172.3 m  
 VERTICAL CLEARANCE: @ Q25 = -0.4 m

SCOUR: 0.3 m contraction scour at Q100, 0.9 m contraction scour at Q500

REQUIRED CHANNEL PROTECTION: Type IV Stone Fill

**PERMIT INFORMATION**

AVERAGE DAILY FLOW: 6.0 cms                      DEPTH OR ELEVATION:  
 ORDINARY LOW WATER: 2.7 cms                      168.5 m  
 ORDINARY HIGH WATER: 40.1 cms                      170.0 m

**TEMPORARY BRIDGE REQUIREMENTS**

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

**ADDITIONAL INFORMATION**

**DESIGN CRITERIA**

1. DESIGN LIVE LOAD AASHTO MS 22.5
2. DESIGN SPAN 21.5m
3. ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL 190 kPa  
ON LEDGE 480 kPa
4. ALLOWABLE LOAD FOR PILING N/A  
TYPE \_\_\_\_\_
5. ESTIMATED LENGTH N/A
5. STRUCTURAL STEEL AASHTO M270M/M270 GRADE N/A
6. REINFORCING STEEL GRADE 420
7. CONCRETE, HIGH PERFORMANCE CLASS AA fc: 30 Mpa  
CONCRETE, HIGH PERFORMANCE CLASS B fc: 25 Mpa
8. DESIGN SOIL UNIT WEIGHT 22.00 kN/m<sup>3</sup>
9. DESIGN LOAD FOR SPREAD FOOTINGS ON SOIL 176 kPa

**TRAFFIC MAINTENANCE**

1. IS TRAFFIC TO BE MAINTAINED? NO  
IF YES, ON EXISTING STRUCTURE?  
OR ON TEMPORARY BRIDGE?  
ONE OR TWO-WAY TRAVEL?
2. TRAFFIC CONTROL SIGNALS REQUIRED?
3. ARE SIDEWALKS REQUIRED? NO  
IF SO, ON WHAT SIDE?

**LIST OF STANDARDS**

E-100	CONSTRUCTION APPROACH SIGNS	1/2/2004
E-100A	SIDE ROAD CONSTRUCTION - APPROACH SIGNS	1/2/2004
E-101	CONSTRUCTION SIGN DETAILS	5/30/2003
E-102	CONSTRUCTION SIGN DETAILS	6/30/2003
E-102A	CONSTRUCTION SIGN DETAILS	6/13/1997
E-106	TRAFFIC CONTROL - MISCELLANEOUS DETAILS	3/1/2004
E-107	DELINEATION, BARRICADES AND DETOURS FOR U-TURNS ON DIVIDED HIGHWAY	6/30/2003
E-107A	BREAKAWAY BARRICADE DETAILS	8/8/1995
E-121	STANDARD SIGN PLACEMENT CONVENTIONAL ROAD	8/8/1995
G-1M	STEEL BEAM GUARDRAIL (50 MPH & OVER), HEAVY DUTY STEEL BEAM GUARDRAIL, TWISTED END TERMINAL, ANCHOR FOR STEEL BEAM RAIL	1/3/2000
G-1DM	STEEL BEAM GUARDRAIL (40 MPH & LESS), HEAVY DUTY STEEL BEAM GUARDRAIL, STEEL BEAM MEDIAN BARRIER, ANCHOR FOR STEEL BEAM RAIL	1/3/2000
SB-R6-82M	BRIDGE RAILING - HEAVY DUTY STEEL BEAM	7/10/1997

PROJECT NAME: WALLINGFORD

PROJECT NUMBER: BRO 1443(31)

FILE NAME: /TransFANS/04/084/sj084pi.xls

PLOT DATE: 8/23/2005

PROJECT MANAGER: R. WHITCOMB

DRAWN BY: J. GILMORE

DESIGNED BY: K. UPMAL

CHECKED BY: C. MEUNIER

PRELIMINARY INFORMATION SHEET

SHEET 2 OF 38