

LIST OF SHEETS

FINAL HYDRAULIC REPORT

1. TITLE SHEET
2. PRELIMINARY INFORMATION SHEET
3. TYPICAL SHEET
- 4-5. QUANTITY SHEETS
6. ITEM DETAIL SHEET
7. DRAINAGE DETAIL SHEET
8. EARTHWORKS SHEET
- 9-12. R.O.W. DETAIL SHEETS
13. TIE SHEET
- 14-16. LAYOUT SHEETS
- 17-19. PROFILE SHEETS
20. TEMPORARY DETOUR SHEET
21. BORING SHEET
22. BORING LOG SHEET
23. PLAN AND ELEVATION SHEET
- 24-26. EROSION CONTROL NOTES
- 27-31. EROSION CONTROL DETAILS
- 32-35. SOILS SHEETS
- 34-42. EROSION CONTROL SHEETS
43. PAVEMENT MARKINGS
44. GENERAL NOTES
45. BRIDGE TYPICALS & END DETAILS SHEET
46. DECK PLAN SHEET
47. GIRDER ELEVATION & FRAMING PLAN SHEET
48. CROSSFRAME DETAILS
49. MISCELLANEOUS DETAILS SHEET
50. BEARING DETAIL SHEET
51. APPROACH SLAB DETAILS
52. ABUTMENT NO. 1 PLAN AND ELEVATION SHEET
53. ABUTMENT NO. 2 PLAN AND ELEVATION SHEET
54. ABUTMENT NO. 1 AND ABUTMENT NO. 2 REINFORCING
55. WINGWALL NO. 1 AND NO. 2 DETAIL SHEET
56. WINGWALL NO. 3 AND NO. 4 DETAIL SHEET
- 57-58. EXPANSION JOINT DETAIL
59. HOPPER AND DOWNSPOUT DETAILS
- 60-61. BRIDGE RAILING DETAILS
62. REINFORCING STEEL SUMMARY SHEET
63. SUPERELEVATION & BANKING DIAGRAM SHEET
64. PIPE SECTION SHEETS
65. SKEWED SECTION SHEET
- 66-68. MAINLINE SECTION SHEETS
- 69-94. CHANNEL LINE SHEETS

LIST OF STANDARDS

A-76	STANDARD FOR DEVELOPMENT ROADS	3/3/2003
B-5M	SLOPE GRADING, EMBANKMENTS, MUCK	1/3/2000
B-71	RESIDENTIAL AND COMMERCIAL DRIVES	7/8/2005
C-1M	CURBS, BITUMINOUS CONCRETE SIDEWALKS GRANITE SLOPE EDGING, VERTICAL GRANITE CURB PRECAST REINFORCED CONCRETE CURB CAST IN PLACE CONCRETE CURB	1/3/2000
D-1M	BITUMINOUS CONCRETE CURB, TREATED TIMBER CURB PRECAST RCP DROP INLET	6/13/1997
D-2M	REINFORCED CONCRETE PIPE D.I. W/ CAST IRON GRATE REINFORCED CONCRETE PIPE D.I. W/ CONCRETE COVER	6/13/1997
D-3M	C.R.M. HEADWALLS, UNDERDRAIN	6/13/1997
D-6M	REINFORCED CONCRETE HEADWALL, UNDERDRAIN & CARRIER PIPE CONSTRUCTION DETAILS	6/13/1997
D-8M	TREATED GUTTERS	6/13/1997
D-8M	REINF. CONCRETE DROP INLET W/GRATE (DITCHES)	6/13/1997
D-8M	REINFORCED CONCRETE DROP INLET WITH PRECAST COVER & GRATE (BOTTOM SECTION) SEE SHEETS D-9,10,11 FOR TOP SECTION	1/3/2000
D-15M	PRECAST REINF. CONC. MANHOLE GRATES (BICYCLE S CAST IRON GRATE WITH FRAME, TYPE D CAST IRON GRATE WITH FRAME, TYPE E	6/13/1997
E-100	CONSTRUCTION APPROACH SIGNS	1/2/2004
E-100A	SIDE ROAD CONSTRUCTION APPROACH SIGNS	1/2/2004
E-102	CONSTRUCTION SIGN DETAILS	6/30/2003
E-102A	CONSTRUCTION SIGN DETAILS	5/1/2004
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
E-134	BRIDGE NUMBER PLAQUE	8/8/1995
E-180	FLANGED CHANNEL STEEL SIGN POST	5/20/1998
E-193	PAVEMENT MARKING DETAILS	8/10/1995
F-2M	CHAIN LINK FENCE (TYPE 1)	1/3/2000
G-1M	STEEL BEAM GUARDRAIL (50MPH & OVER) HEAVY DUTY STEEL BEAM GUARDRAIL TWISTED END TERMINAL	1/3/2000
G-1DM	STEEL BEAM GUARDRAIL (40MPH & LESS) HEAVY DUTY STEEL BEAM GUARDRAIL STEEL BEAM MEDIUM BARRIER ANCHOR FOR STEEL BEAM RAIL	1/3/2000

HYDROLOGIC DATA Date: 12/07/99

DRAINAGE AREA: 46.8 sq km
 CHARACTER OF TERRAIN: Mostly Mountainous and Forested
 STREAM CHARACTERISTICS: Perennial Stream
 NATURE OF STREAMBED: Gravel, Cobble and Boulder

PEAK FLOW DATA

Q 2.33 =	28.3 cms	Q 50 =	106.2 cms
Q 10 =	83.7 cms	Q 100 =	124.6 cms
Q 25 =	87.8 cms	Q 500 =	184.2 cms

DATE OF FLOOD RECORD: Unknown
 ESTIMATED DISCHARGE: N/A
 WATER SURFACE ELEV.: N/A
 NATURAL STREAM VELOCITY @ Q25 = 3.7 mps
 ICE CONDITIONS: Moderate
 DEBRIS: Moderate
 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: 1% HEADWATERS:
 UNIFORM: X
 IMMEDIATELY ABOVE SITE:

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: Single Span Bridge (Rolled Beam with Concrete Deck)
 YEAR BUILT: 1924
 CLEAR SPAN(NORMAL TO STREAM): 10.8 m
 VERTICAL CLEARANCE ABOVE STREAMBED: 4.3 m
 WATERWAY OF FULL OPENING: 41.8 sq m
 DISPOSITION OF STRUCTURE: Remove
 TYPE OF MATERIAL UNDER SUBSTRUCTURE: Unknown

WATER SURFACE ELEVATIONS AT:

Q2.33 =	298.1 m	VELOCITY =	2.9 mps
Q10 =	297.0 m	"	3.0 mps
Q25 =	297.5 m	"	4.3 mps
Q50 =	297.9 m	"	4.8 mps
Q100 =	298.3 m	"	4.9 mps

LONG TERM STREAMBED CHANGES: Some scour along northern abutment, due to poor channel alignment.

IS THE ROADWAY OVERTOPPED BELOW Q100: No
 FREQUENCY: Above Q100
 RELIEF ELEVATION: 298.6 m
 DISCHARGE OVER ROAD @Q100: None

UPSTREAM STRUCTURE

TOWN: Merdon DISTANCE: 0.8 km +
 HIGHWAY #: TH-13 STRUCTURE #: Bridge 25
 CLEAR SPAN: 8.1 m CLEAR HEIGHT: 3.1 m
 YEAR BUILT: Unknown FULL WATERWAY: Unknown
 STRUCTURE TYPE: Single Span Bridge

DOWNSTREAM STRUCTURE

TOWN: Rutland DISTANCE: 3.2 km +
 HIGHWAY #: TH-19 STRUCTURE #: Bridge 9
 CLEAR SPAN: 29.3 m CLEAR HEIGHT: 4.0 m
 YEAR BUILT: 1950 FULL WATERWAY: Unknown
 STRUCTURE TYPE: Single Span Bridge

LOAD FACTOR - LOAD RATING (METRIC TONS)

LOADING LEVELS	TRUCK						
	M	MS	3S2	6 AXLE	3A. STR.	4A. STR.	5A. SEMI
INVENTORY	30	45					
POSTED	42	64	74		61	62	68
OPERATING		76	89	99	73	74	

COMMENTS: SERVICEABILITY CONTROLS

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT
2001	2610	385	63	2	90
2021	3500	485	63	2	125

20 year ESAL for flexible pavement from 2001 to 2021 : 744,000
 40 year ESAL for flexible pavement from 2001 to 2041 : 1,702,000
 Design Speed : 60 km/h

PROPOSED STRUCTURE

STRUCTURE TYPE: Single Span Bridge

CLEAR SPAN(NORMAL TO STREAM): 20.8 m
 VERTICAL CLEARANCE ABOVE STREAMBED: 4.0 m
 WATERWAY OF FULL OPENING: 72.3 sq m 68.6

WATER SURFACE ELEVATIONS AT:

Q2.33 =	295.9 m	296	VELOCITY =	2.6 mps
Q10 =	296.5 m	"	"	3.3 mps 3.7
Q25 =	296.8 m	"	"	3.6 mps 4.0
Q50 =	297.0 m	"	"	3.7 mps 3.8
Q100 =	297.2 m	"	"	3.8 mps

IS THE ROADWAY OVERTOPPED BELOW Q100: No
 FREQUENCY: Over Q100
 RELIEF ELEVATION: 299.1 m
 DISCHARGE OVER ROAD @Q100: None

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 298.1 m
 VERTICAL CLEARANCE: @ Q100 = 0.9 m (vertical clearance @ northern end = 0.3 m)

SCOUR: Contraction Scour @ Q100 = 0.0 m @ Q500 = 0.3 m

REQUIRED CHANNEL PROTECTION: Type IV Stone Fill

PERMIT INFORMATION

AVERAGE DAILY FLOW: 1.0 cms DEPTH OR ELEVATION:
 ORDINARY LOW WATER: 0.5 cms 0.3 m
 ORDINARY HIGH WATER: 1.2 cms 0.6 m

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE: Single Span Bridge
 CLEAR SPAN (NORMAL TO STREAM): 19.0m (minimum)
 VERTICAL CLEARANCE ABOVE STREAMBED: Low Beam Elev. = 297.1 m (min.)
 WATERWAY AREA OF FULL OPENING: 17.0 sq m (minimum)

ADDITIONAL INFORMATION

* Temporary Bridge Low Beam elevation of 297.1 m is based on the temporary bridge being constructed 15 m downstream of the existing structure, and being removed before winter.

DESIGN CRITERIA

1. DESIGN LIVE LOAD AASHTO: MS 22.5
2. DESIGN SPAN: 33m CL BRG TO CL BRG
3. ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL: 380 Mpa
ON LEDGE: N/A
4. ALLOWABLE LOAD FOR PILING: N/A
TYPE: N/A
5. ESTIMATED LENGTH: N/A
6. STRUCTURAL STEEL AASHTO M270/MN270 GRADE: M270/MN270 GRADE 345W
7. REINFORCING STEEL GRADE: 420
8. CONCRETE, HIGH PERFORMANCE CLASS A fc: 30 Mpa
CONCRETE, HIGH PERFORMANCE CLASS B fc: 25 Mpa
9. DESIGN SOIL UNIT WEIGHT: 22.00 kN/m³
9. DESIGN LOAD FOR SPREAD FOOTINGS ON SOIL: 349 Mpa

TRAFFIC MAINTENANCE

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

PROJECT NAME: MENDON
 PROJECT NUMBER: BRO 1443(35)
 FILE NAME: /st/5/95j290/sj290pi.xls PLOT DATE: 11/28/2005
 PROJECT MANAGER: C. KELLER DRAWN BY: K. RUTTER
 DESIGNED BY: M. EVANS-MONGEON CHECKED BY: T. SUMNER
 PRELIMINARY INFORMATION SHEET SHEET 2 OF 94