

FINAL HYDRAULIC REPORT

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6-01-94	DRILLING AND BLASTING OF SOLID ROCK SUBGRADE
3-03-03	STANDARDS FOR TOWN & DEVELOPMENT ROADS
6-01-94	EMBANKMENT ON EARTH SLOPE, EMBANKMENT ON ROCK SLOPE, MUCK EXCAVATION, TYPICAL SLOPE ROUNDING
6-01-94	METHODS OF SLOPE STABILIZATION (USE OF UNDERDRAIN WITH SHATTERED ROCK SUBGRADE)
6-01-94	SIDE ROAD INTERSECTION SHOWING DEPRESSED RAMP
7-08-05	STANDARDS FOR RESIDENTIAL AND COMMERCIAL DRIVES
6-01-94	TREATED GUTTERS
8-13-07	CORRUGATED PIPE END SECTION, ARCH END SECTION, AND ELBOW, GRANULAR MATERIAL AT METAL CULVERT LOCATIONS
6-01-94	TYPICAL WATERFALL FOR CULVERTS
6-01-94	REINFORCED CONCRETE DROP INLET WITH GRATE FOR USE IN DITCHES
1-03-00	REINFORCED CONCRETE DROP INLET WITH PRECAST COVER, REINFORCED CONCRETE DROP INLET WITH GRATE
6-01-94	REINFORCED CONCRETE DROP INLET WITH VERTICAL CURB, REINFORCED CONCRETE DROP INLET THROAT ADAPTER
6-01-94	TOP FOR A DROP INLET WITH BITUMINOUS CONCRETE CURB, TOP FOR A DROP INLET WITH GRANITE SLOPE EDGING
6-01-94	STEEL GRATE, CAST IRON GRATE TYPE A, CAST IRON COVER
1-03-00	CONCRETE CATCH BASIN
6-01-94	PRECAST REINFORCED CONCRETE CATCH BASIN WITH CAST IRON GRATE, PRECAST REINFORCED CONCRETE MANHOLE WITH CAST IRON COVER, CAST IRON GRATE WITH FRAME, TYPE D
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1-03-00	STEEL BEAM GUARDRAIL APPROACH END TERMINAL
12-14-09	ANCHOR FOR STEEL BEAM GUARDRAIL
12-14-09	STEEL BEAM MEDIAN BARRIER
12-14-09	BRIDGE RAILING, GALVANIZED NETC 2 RAIL
12-14-09	GUARDRAIL APPROACH SECTION, GALVANIZED NETC 2 RAIL (NOT IN CONTRACT)

HYDROLOGIC DATA

Date: April 2009

DRAINAGE AREA : Approx. 620 km²

CHARACTER OF TERRAIN : Upstream=Narrow rock gorge/Downstream=wide flood plain

STREAM CHARACTERISTICS : Mountainous to Rolling

NATURE OF STREAMBED : Sandy/Gravel with grass covered, low shrub overbanks

PEAK FLOW DATA

Q 2.33 =	154 cms	Q 50 =	406 cms
Q 10 =	273 cms	Q 100 =	479 cms
Q 25 =	342 cms	Q 500 =	690 cms

DATE OF FLOOD OF RECORD : November, 1927

ESTIMATED DISCHARGE : Unknown

WATER SURFACE ELEV. : Unknown

NATURAL STREAM VELOCITY : Q100 = 1.3 mps

ICE CONDITIONS : Light

DEBRIS : Light

DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? No

IS ORDINARY RISE RAPID? No

IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? Yes

IF YES, DESCRIBE : Morrisville Dam approx. 0.48 km Upstream
Cadys Falls Dam approx. 2.01 km Downstream

WATERSHED STORAGE: < 2% HEADWATERS: UNIFORM: X

IMMEDIATELY ABOVE SITE: _____

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: No exist. structure at this location

YEAR BUILT: _____

CLEAR SPAN(NORMAL TO STREAM): _____

VERTICAL CLEARANCE ABOVE STREAMBED: _____

WATERWAY OF FULL OPENING: _____

DISPOSITION OF STRUCTURE: _____

TYPE OF MATERIAL UNDER SUBSTRUCTURE: _____

WATER SURFACE ELEVATIONS AT:

Q2.33 =	_____	VELOCITY =	_____
Q10 =	_____	"	_____
Q25 =	_____	"	_____
Q50 =	_____	"	_____
Q100 =	_____	"	_____

LONG TERM STREAMBED CHANGES: _____

IS THE ROADWAY OVERTOPPED BELOW Q100: _____

FREQUENCY: _____

RELIEF ELEVATION: _____

DISCHARGE OVER ROAD @Q100: _____

UPSTREAM STRUCTURE

TOWN: Morrisville DISTANCE: 376 m

HIGHWAY #: "B" Street STRUCTURE #: B53

CLEAR SPAN: 29.6 m CLEAR HEIGHT: 8.5 m

YEAR BUILT: 2006 FULL WATERWAY: 165.4 m²

STRUCTURE TYPE: Single Span Plate Girder

DOWNSTREAM STRUCTURE

TOWN: Morristown DISTANCE: 503 m

HIGHWAY #: TH3MHS STRUCTURE #: B9

CLEAR SPAN: 82.3 m CLEAR HEIGHT: 6.5 m

YEAR BUILT: 1981 FULL WATERWAY: 294 m²

STRUCTURE TYPE: Two Span Continuous Plate Girder

LOAD FACTOR LOAD RATING (METRIC TONS)

LOADING LEVELS	TRUCK						
	M	MS	3S2	6 AXLE	3A. STR.	4A. STR.	5A. SEMI
INVENTORY	26	48					
POSTED	37	68	117		106	107	117
OPERATING		81	139	166	127	127	

COMMENTS: Lane Load on Frame Leg Controls Design. Inventory (A=2.17) Posted (A=1.55) Operating (A=1.3)

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT
2014	9200	1000	58	9.1	930
2034	11300	1300	58	13.7	1700

20 year ESAL for flexible pavement from 2014 to 2034 : 6,668,000

40 year ESAL for flexible pavement from 2014 to 2054 : 16,136,000

Design Speed : 80 km/h

PROPOSED STRUCTURE

STRUCTURE TYPE: Continuous Steel Plate Girder Slant Legged Frame

CLEAR SPAN(NORMAL TO STREAM): 163.0 m

VERTICAL CLEARANCE ABOVE STREAMBED: 16.0 m @ center

WATERWAY OF FULL OPENING: 2149 m²

WATER SURFACE ELEVATIONS AT:

Q2.33 =	178.15 m	VELOCITY =	0.6 mps
Q10 =	178.40 m	"	1.0 mps
Q25 =	178.64 m	"	1.1 mps
Q50 =	178.96 m	"	1.2 mps
Q100 =	179.24 m	"	1.3 mps

IS THE ROADWAY OVERTOPPED BELOW Q100: No

FREQUENCY: _____

RELIEF ELEVATION: _____

DISCHARGE OVER ROAD @Q100: _____

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 192.0 m

VERTICAL CLEARANCE @ Q100: 12.9 m

SCOUR: to ledge at approx. 4.3 m

REQUIRED CHANNEL PROTECTION: Stone Fill Type II around slant leg foundations

PERMIT INFORMATION

AVERAGE DAILY FLOW: 15.0 cms DEPTH OR ELEVATION: _____

ORDINARY LOW WATER: 6.0 cms Elev. 175.9 m

ORDINARY HIGH WATER: 61.0 cms Elev. 177.1 m

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE: No temporary bridge required.

CLEAR SPAN(NORMAL TO STREAM): _____

VERTICAL CLEARANCE ABOVE STREAMBED: _____

WATERWAY AREA OF FULL OPENING: _____

ADDITIONAL INFORMATION

1. Peak discharges for 10 - year, 100 - year and 500 - year events were obtained from 1987 FIS and Cadys Falls Dam

DESIGN CRITERIA

- DESIGN LIVE LOAD AASHTO: MS 22.5
- DESIGN SPAN: 42,900 - 78,000 - 42,900 (meters)
- ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL: N/A
ON LEDGE: 950 kPa
- ULTIMATE PILE CAPACITY: 1400 kN
TYPE: HP 310x79
ESTIMATED LENGTH: Abut. No. 1 Avg. = 11M Abut. No. 2 Avg. = 12M
- STRUCTURAL STEEL AASHTO M270/M270 GRADE: 345W & HPS 485W
- REINFORCING STEEL GRADE: 420
- CONCRETE, HIGH PERFORMANCE CLASS A fc: 30 MPa
CONCRETE, HIGH PERFORMANCE CLASS B fc: 25 MPa
CONCRETE, CLASS C fc: 20 MPa
- DESIGN SOIL UNIT WEIGHT: 22 Kn/m³
- DESIGN LOAD FOR SPREAD FOOTINGS ON SOIL: _____

TRAFFIC MAINTENANCE

- IS TRAFFIC TO BE MAINTAINED? N/A
IF YES, ON EXISTING STRUCTURE? N/A
OR ON TEMPORARY BRIDGE? N/A
ONE OR TWO-WAY TRAVEL? N/A
- TRAFFIC CONTROL SIGNALS REQUIRED? N/A
- ARE SIDEWALKS REQUIRED? N/A
IF SO, ON WHAT SIDE? N/A

PROJECT NAME: **MORRISTOWN**

PROJECT NUMBER: **STP F 029-1(2)C/1**

FILE NAME: **z10b194api.xls** PLOT DATE: **1/8/2010**

PROJECT MANAGER: **DMB** DRAWN BY: **S. Merkwana**

DESIGNED BY: **D. Kull/B. Bennett** CHECKED BY: **R. Joy**

PRELIMINARY INFORMATION SHEET SHEET **2** OF **123**