

PRELIMINARY INFORMATION SHEET (CULVERT)

LRFD

INDEX OF SHEETS

PLAN SHEETS

SEE SHEET 2 FOR
INDEX OF SHEETS AND
LIST OF STANDARDS

STANDARDS LIST

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: Nov 2013

DRAINAGE AREA: 1.2 sq. mi.
CHARACTER OF TERRAIN: Mountainous, mostly forested, some development
STREAM CHARACTERISTICS: Sinuous and alluvial
NATURE OF STREAMBED: Boulders, cobbles and gravel

PEAK FLOW DATA

Q 2.33 = 90 cfs Q 50 = 370 cfs
Q 10 = 230 cfs Q 100 = 450 cfs
Q 25 = 300 cfs Q 500 = 630 cfs

DATE OF FLOOD OF RECORD: Unknown
ESTIMATED DISCHARGE: Unknown
WATER SURFACE ELEV.: Unknown
NATURAL STREAM VELOCITY: @ Q50 = 8.3 fps
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: Multiplate Pipe Arch
YEAR BUILT: 1957
CLEAR SPAN(NORMAL TO STREAM): 8'-2"
VERTICAL CLEARANCE ABOVE STREAMBED: 5'-9"
WATERWAY OF FULL OPENING: 38 sq. ft.
DISPOSITION OF STRUCTURE: Remove and replace
TYPE OF MATERIAL UNDER SUBSTRUCTURE: See borings

WATER SURFACE ELEVATIONS AT:

Q2.33 = 1087.0' VELOCITY = 5.4 fps
Q10 = 1089.7' " 9.9 fps
Q25 = 1090.8' " 11.1 fps
Q50 = 1092.0' " 11.9 fps
Q100 = 1092.2' " 12.1 fps

LONG TERM STREAMBED CHANGES: None noted

IS THE ROADWAY OVERTOPPED BELOW Q100: Yes
FREQUENCY: Below Q50
RELIEF ELEVATION: 1091.9' @ arch
DISCHARGE OVER ROAD @Q100: 90 cfs

UPSTREAM STRUCTURE

TOWN: Wardsboro DISTANCE: 1800'
HIGHWAY #: TH STRUCTURE #: _____
CLEAR SPAN: _____ CLEAR HEIGHT: _____
YEAR BUILT: _____ FULL WATERWAY: _____
STRUCTURE TYPE: _____

DOWNSTREAM STRUCTURE

TOWN: Wardsboro DISTANCE: 600'
HIGHWAY #: _____ STRUCTURE #: _____
CLEAR SPAN: _____ CLEAR HEIGHT: _____
YEAR BUILT: _____ FULL WATERWAY: _____
STRUCTURE TYPE: Confluence with Wardsboro Brook

LRFR LOAD RATING FACTORS

LOADING LEVELS	TRUCK						
	H-20	HL-93	3S2	6 AXLE	3A. STR.	4A. STR.	5A. SEMI
TONNAGE	20	36	36	66	30	34.5	38
INVENTORY							
POSTING							
OPERATING							
COMMENTS:	TABLE TO BE COMPLETED BY CONTRACTOR'S DESIGNER						

AS BUILT "REBAR" DETAIL		
LEVEL I	LEVEL II	LEVEL III
TYPE: _____	TYPE: _____	TYPE: _____
GRADE: _____	GRADE: _____	GRADE: _____

- CULVERT DESIGN CRITERIA**
- PROPOSED CULVERT IS A PRECAST CONCRETE STRUCTURE (14'-0" x 8'-0" x 52'-6" BOX)
 - CULVERT ENDS ARE SKEWED BY AN ANGLE OF 90°
 - CULVERT WILL BE SET AT A SLOPE OF 41.60 IN. ON 100 FT.
 - CULVERT WILL REQUIRE FISH PASSAGE ACCOMMODATIONS
 - CULVERT CONSTRUCTION WILL REQUIRE A TEMPORARY PIPE

PROPOSED STRUCTURE

STRUCTURE TYPE: Precast Concrete Box
CLEAR SPAN(NORMAL TO STREAM): 14'
VERTICAL CLEARANCE ABOVE STREAMBED: 6'
WATERWAY OF FULL OPENING: 84 sq. ft.

WATER SURFACE ELEVATIONS AT:

Q2.33 = 1086.2' VELOCITY= 7.5 fps
Q10 = 1087.6' " 10.7 fps
Q25 = 1088.1' " 11.7 fps
Q50 = 1088.7' " 12.5 fps
Q100 = 1089.3' " 13.4 fps

IS THE ROADWAY OVERTOPPED BELOW Q100: No
FREQUENCY: N/A
RELIEF ELEVATION: 1091.9' at box
DISCHARGE OVER ROAD @Q100: N/A

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 1090.7' at inlet
VERTICAL CLEARANCE: @ Q50 = 2.0'

SCOUR: Scour not calculated for a box

REQUIRED CHANNEL PROTECTION: Stone Fill, Type III

PERMIT INFORMATION

AVERAGE DAILY FLOW: 3 cfs DEPTH OR ELEVATION:
ORDINARY LOW WATER: 1 cfs < 0.5'
ORDINARY HIGH WATER: 40 cfs ~-1.0'

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE: None required
CLEAR SPAN (NORMAL TO STREAM): _____
VERTICAL CLEARANCE ABOVE STREAMBED: _____
WATERWAY AREA OF FULL OPENING: _____

ADDITIONAL INFORMATION

TRAFFIC MAINTENANCE NOTES

- MAINTAIN TRAFFIC ON AN OFF SITE DETOUR
- TRAFFIC SIGNALS ARE NOT NECESSARY
- SIDEWALKS ARE NOT NECESSARY

DESIGN VALUES

1. DESIGN LIVE LOAD	HL-93
2. FUTURE PAVEMENT	d _p : 3.0 INCH
3. CULVERT OPENING	D: 84.00 FT

4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ: ---
5. PRESTRESSING STRAND	f _y : ---
6. PRESTRESSED CONCRETE STRENGTH	f' _c : ---
7. PRESTRESSED CONCRETE RELEASE STRENGTH	f' _{cr} : ---
8. CONCRETE, HIGH PERFORMANCE CLASS AA	f' _c : ---
9. CONCRETE, HIGH PERFORMANCE CLASS A	f' _c : ---
10. CONCRETE, HIGH PERFORMANCE CLASS B	f' _c : ---
11. CONCRETE, CLASS C	f' _c : ---
12. REINFORCING STEEL	f _y : 60 KSI
13. STRUCTURAL STEEL AASHTO M270	f _y : ---
14. SOIL UNIT WEIGHT	γ: ---
15. NOMINAL BEARING RESISTANCE OF SOIL	q _n : ---
16. SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	φ: ---
17. NOMINAL BEARING RESISTANCE OF ROCK	q _n : ---
18. ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	φ: ---
19. NOMINAL AXIAL PILE RESISTANCE	q _p : ---
20. PILE YIELD STRENGTH ASTM A572	f _y : ---
21. PILE SIZE	---
22. EST. PILE LENGTH	L _p : ---
23. PILE RESISTANCE FACTOR	φ: ---
24. LATERAL PILE DEFLECTION	Δ: ---
25. BASIC WIND SPEED	V _{3s} : ---
26. MINIMUM GROUND SNOW LOAD	p _g : ---
27. SEISMIC DATA	PGA: --- S ₁ : ---

PROJECT NAME: WARDBORO

PROJECT NUMBER: BF 013-1(22)

FILE NAME: 13b074/s13b074excel.dgn PLOT DATE: 2/6/2014
PROJECT LEADER: K. HIGGINS DRAWN BY: J. SALVATORI
DESIGNED BY: J. SALVATORI CHECKED BY: G. LAROCHE
PRELIMINARY INFORMATION SHEET SHEET 425 OF 444

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT	20 year ESAL for flexible pavement from 2016 to 2036 : 898000	40 year ESAL for flexible pavement from 2016 to 2056 : 2056000
2016	1100	150	55	13.7	130		
2036	1200	170	55	20.4	210	Design Speed : 50 mph	