STATE OF VERMONT
AGENCY OF TRANSPORTATION

PRELIMINARY INFORMATION SHEET (CULVERT)

Version 12.01.01c

LRFD

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STANDARDS LIST

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: APRIL 2012

DRAINAGE AREA : 1.2 Sq. Miles
CHARACTER OF TERRAIN : Hilly - mostly forest
STREAM CHARACTERISTICS : Narrow and curving with small current
NATURE OF STREAMBED : Mostly gravel and cobbles

PEAK FLOW DATA

Q 2.33 =	70 cfs	Q 50 =	200 cfs
Q 10 =	140 cfs	Q 100 =	220 cfs
Q 25 =	170 cfs	Q 500 =	280 cfs

DATE OF FLOOD OF RECORD : NOV 1927 and Aug. 2011
ESTIMATED DISCHARGE: Unknown
WATER SURFACE ELEV.:
NATURAL STREAM VELOCITY : @ Q50 = Unknown
ICE CONDITIONS : Light
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: Three sided concrete frame 8 ft x 4 ft
YEAR BUILT: 1957 - Undermined Aug 2011
CLEAR SPAN(NORMAL TO STREAM): 8 Foot Diameter
VERTICAL CLEARANCE ABOVE STREAMBED: 4 feet
WATERWAY OF FULL OPENING: Approx. 32 Sq. Feet
DISPOSITION OF STRUCTURE: Removed be VTrans Fall 2011
TYPE OF MATERIAL UNDER SUBSTRUCTURE: Gravel and sand

WATER SURFACE ELEVATIONS AT:

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

LONG TERM STREAMBED CHANGES:

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

UPSTREAM STRUCTURE

TOWN: None
DISTANCE:
HIGHWAY # :
STRUCTURE #:
CLEAR SPAN:
CLEAR HEIGHT:
YEAR BUILT:
FULL WATERWAY:
STRUCTURE TYPE:

DOWNSTREAM STRUCTURE

TOWN: Beebe Pond
DISTANCE: 350 ft
HIGHWAY # :
STRUCTURE #:
CLEAR SPAN:
CLEAR HEIGHT:
YEAR BUILT:
FULL WATERWAY:
STRUCTURE TYPE:

FABRICATOR RESPONSIBLE FOR LOAD RATING

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" DETAILS

LEVEL I	LEVEL II	LEVEL III
TYPE:	TYPE:	TYPE:
GRADE:	GRADE:	GRADE:

CULVERT DESIGN CRITERIA

1. CULVERT WILL BE SET AT A SLOPE OF 0.006 FT/FT
2. CULVERT WILL NOT REQUIRE FISH PASSAGE ACCOMODATIONS
3. CULVERT CONSTRUCTION WILL NOT REQUIRE A TEMPORARY PIPE OR PUMPING

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT
2012	1500	190	50	6.4	100
2032	1800	210	50	6.4	120

20 year ESAL for flexible pavement from 2010 to 2030 :
40 year ESAL for flexible pavement from 2010 to 2050 :
Design Speed : 50 mph

VHB Vanasse Hangen Brustlin, Inc.

PROPOSED STRUCTURE

STRUCTURE TYPE: BOX CULVERT

CLEAR SPAN(NORMAL TO STREAM): 14 Feet
VERTICAL CLEARANCE ABOVE STREAMBED: 5 Feet
WATERWAY OF FULL OPENING: 70 Sq. Feet

WATER SURFACE ELEVATIONS AT:

Q2.33 =	624.7	VELOCITY=	3.1 FT/SEC
Q10 =	626.3	"	4.7 FT/SEC
Q25 =	628.8	"	5.3 FT/SEC
Q50 =	627.3	"	6.3 FT/SEC
Q100 =	627.6 Feet	"	6.9 FT/SEC

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

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 628.0
VERTICAL CLEARANCE: @ Q 50 = 0.7 FT @ Q 100 = 0.4 FT

SCOUR:

REQUIRED CHANNEL PROTECTION: Type II Stone Fill

PERMIT INFORMATION

		DEPTH OR ELEVATION:
AVERAGE DAILY FLOW:	3 CFS	
ORDINARY LOW WATER:	1 CFS	0.2 FEET
ORDINARY HIGH WATER:	70 CFS	2.0 FEET

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE: N/A - VT 30 to be closed
CLEAR SPAN (NORMAL TO STREAM):
VERTICAL CLEARANCE ABOVE STREAMBED:
WATERWAY AREA OF FULL OPENING:

ADDITIONAL INFORMATION

Existing two 48 in x 40 ft HDPE temporary pipes, installed in Fall of 2011 by VTrans are to be removed and retained by contractor.

TRAFFIC MAINTENANCE NOTES

1. MAINTAIN TRAFFIC ON AN OFF SITE DETOUR.
2. TRAFFIC SIGNALS ARE NOT NECESSARY.
3. SIDEWALKS ARE NOT NECESSARY

DESIGN VALUES

1. DESIGN LIVE LOAD		HL-93
2. FUTURE PAVEMENT	d_p:	3.0 INCH
3. CULVERT OPENING	D:	14 FT 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'_{ci}:	---
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:	0.130 KCF
15. NOMINAL BEARING RESISTANCE OF SOIL	q_n:	2.5 KSF
16. SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	1.00
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_s: ---
		S_1: ---

PROJECT NAME: **HUBBARDTON**
PROJECT NUMBER: **ER STP 0161(27)**

FILE NAME: z11c290pi.xls
PROJECT LEADER: M.A. COLGAN
DESIGNED BY: S.G. FARNSWORTH
PRELIMINARY INFORMATION SHEET

PLOT DATE: 7/16/2012
DRAWN BY: C.L. CILLEY
CHECKED BY: S.G. FARSWORTH
SHEET 42 OF 70

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