

PRELIMINARY INFORMATION SHEET (BRIDGE 27)

LRFD

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STANDARDS LIST

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: December 2010

DRAINAGE AREA : 70.1 sq. mi.
 CHARACTER OF TERRAIN : Mixture of woods and open fields
 STREAM CHARACTERISTICS : Meandering and incised
 NATURE OF STREAMBED : Silty sand

PEAK FLOW DATA

Q 2.33 = 3000 cfs Q 50 = 6400 cfs
 Q 10 = 4300 cfs Q 100 = 7600 cfs
 Q 25 = 5400 cfs Q 500 = 10,300 cfs

DATE OF FLOOD OF RECORD : unknown
 ESTIMATED DISCHARGE : unknown
 WATER SURFACE ELEV. : unknown
 NATURAL STREAM VELOCITY : @ Q50 = 5.2 fps
 ICE CONDITIONS : moderate
 DEBRIS : light to moderate
 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:

WATERSHED STORAGE : <1% HEADWATERS :
 UNIFORM : X
 IMMEDIATELY ABOVE SITE :

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE : 3-span concrete T-beam bridge
 YEAR BUILT : 1927
 CLEAR SPAN(NORMAL TO STREAM): 89'
 VERTICAL CLEARANCE ABOVE STREAMBED: 12.5'
 WATERWAY OF FULL OPENING: 755 sq. ft.
 DISPOSITION OF STRUCTURE: Remove and replace
 TYPE OF MATERIAL UNDER SUBSTRUCTURE: See borings

WATER SURFACE ELEVATIONS AT:

Q2.33 = 501.1' VELOCITY = 9.0 fps
 Q10 = 503.5' " 8.2 fps
 Q25 = 506.0' " 7.7 fps
 Q50 = 508.7' " 8.9 fps
 Q100 = 511.1' " 9.7 fps

LONG TERM STREAMBED CHANGES: None

IS THE ROADWAY OVERTOPPED BELOW Q100: Yes
 FREQUENCY: Below Q50
 RELIEF ELEVATION: 507.6'
 DISCHARGE OVER ROAD @Q100: 820 cfs

UPSTREAM STRUCTURE

TOWN: Royallton DISTANCE: 3100'
 HIGHWAY #: VT 14 STRUCTURE #: BR 28
 CLEAR SPAN: 100' CLEAR HEIGHT: 15'
 YEAR BUILT: 1925 FULL WATERWAY: 630 sq. ft.
 STRUCTURE TYPE: 3-span concrete T-beam

DOWNSTREAM STRUCTURE

TOWN: Royallton DISTANCE: 9230'
 HIGHWAY #: VT 107 STRUCTURE #: BR 21
 CLEAR SPAN: 148' CLEAR HEIGHT: 31'
 YEAR BUILT: 1937 FULL WATERWAY: 3300 sq. ft.
 STRUCTURE TYPE: 3-span rolled beam

LRFR LOAD RATING FACTORS

LOADING LEVELS	TRUCK						
	HL-93	HL-93	3S2	6 AXLE	3A STR	4A STR	5A SEMI
TONNAGE	20	36	36	66	30	34.5	38
INVENTORY	3.43	1.12					
POSTING							
OPERATING	4.44	1.45	2.94	1.77	3.04	2.69	
COMMENTS:							

AS BUILT "REBAR" DETAIL

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

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT	20 year ESAL for flexible pavement from 2003 to 2023 : 2667000
2003	1500	210	59	8	170	40 year ESAL for flexible pavement from 2003 to 2043 : 6477000
2023	2000	280	59	8	230	Design Speed : 50 mph

PILE DRIVING AND TESTING REQUIREMENTS

- NOMINAL PILE DRIVING CAPACITY P_{nd} : 612.0 KIP
- PILE TEST RESISTANCE FACTOR ϕ : 0.65
- MAXIMUM PILE TIP ELEVATION: 455 FT
- PERFORM ONE DYNAMIC LOAD TEST FOR EACH ABUTMENT.

PROPOSED STRUCTURE

STRUCTURE TYPE: Single span steel beam bridge

CLEAR SPAN(NORMAL TO STREAM): 107'
 VERTICAL CLEARANCE ABOVE STREAMBED: 16.8'
 WATERWAY OF FULL OPENING: 1280 sq. ft.

WATER SURFACE ELEVATIONS AT:

Q2.33 = 500.7' VELOCITY = 8.1 fps
 Q10 = 503.2' " 7.5 fps
 Q25 = 505.5' " 7.1 fps
 Q50 = 507.7' " 6.8 fps
 Q100 = 509.8' " 6.9 fps

IS THE ROADWAY OVERTOPPED BELOW Q100: No
 FREQUENCY: N/A
 RELIEF ELEVATION: 512.9'
 DISCHARGE OVER ROAD @Q100: None

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 509.3'
 VERTICAL CLEARANCE: @ Q50 = 1.2'

SCOUR: 1.0' @ Q100 and 2.0' @ Q500

REQUIRED CHANNEL PROTECTION: Stone Fill, Type III

PERMIT INFORMATION

AVERAGE DAILY FLOW: 145 cfs DEPTH OR ELEVATION:
 ORDINARY LOW WATER: 70 cfs 2.0'
 ORDINARY HIGH WATER: 1300 cfs 6.0'

TEMPORARY BRIDGE REQUIREMENTS

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

ADDITIONAL INFORMATION

NAVD 88 elevations

TRAFFIC MAINTENANCE NOTES

- MAINTAIN TWO-WAY TRAFFIC ON THE EXISTING STRUCTURE.
- TRAFFIC SIGNALS ARE NOT NECESSARY.
- SIDEWALKS ARE NOT NECESSARY

DESIGN VALUES

1. DESIGN LIVE LOAD	HL-93
2. FUTURE PAVEMENT	d_p : ---
3. DESIGN SPAN	L : 136.00 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	$f'c$: 4.0 KSI
10. CONCRETE, HIGH PERFORMANCE CLASS B	$f'c$: 3.5 KSI
11. CONCRETE, CLASS C	$f'c$: ---
12. REINFORCING STEEL	f_y : 60 KSI
13. STRUCTURAL STEEL AASHTO M270 (WEATHERING)	f_y : 50 KSI
14. SOIL UNIT WEIGHT	γ : 0.140 KCF
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 : 612.0 KIPS
20. PILE YIELD STRENGTH ASTM A572	f_y : 50 KSI
21. PILE SIZE	HP 12X 84
22. EST. PILE LENGTH	L_p : 58 FT
23. PILE RESISTANCE FACTOR	ϕ : 0.65
24. LATERAL PILE DEFLECTION	Δ : 0.52 INCH
25. BASIC WIND SPEED	V_{3s} : ---
26. MINIMUM GROUND SNOW LOAD	p_g : ---
27. SEISMIC DATA	PGA: --- S : --- S_f : ---

PROJECT NAME: ROYALTON

PROJECT NUMBER: BRS 0147(13)

FILE NAME: IBR 271s86e055pi_27.dgn PLOT DATE: 10/4/2013
 PROJECT LEADER: C. CARLSON DRAWN BY: D. PETERSON
 DESIGNED BY: D. PETERSON CHECKED BY: C. CARLSON
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