

PRELIMINARY INFORMATION SHEET (BRIDGE)

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STANDARDS LIST

B-12	SIDE ROAD INTERSECTION - DEPRESSED RAMP	6/1/1994
B-71	STANDARD FOR RESIDENTIAL AND COMMERCIAL DRIVES	7/8/2005
E-121	STANDARD SIGN PLACEMENT - CONVENTIONAL ROAD	8/8/1995
E-136B	STATE ROUTE MARKER SIGN DETAILS	8/8/1995
E-193	PAVEMENT MARKING DETAILS	8/18/1995
G-1	STEEL BEAM GUARDRAIL DETAILS (POST, DELINEATOR, TYPICALS)	2/10/2014
G-1D	STEEL BEAM GUARDRAIL DETAILS (END TERMINAL, ANCHOR, MEDIUM)	2/10/2014
S-360A	BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM	4/23/2012
S-360B	GUARDRAIL APPROACH SECTION, GALVANIZED 2 RAIL BOX BEAM	4/23/2012
S-363	THREE BEAM TO STANDARD STEEL BEAM TRANSITION SECTION	4/23/2012
T-1	TRAFFIC CONTROL GENERAL NOTES	8/6/2012
T-10	CONVENTIONAL ROADS CONSTRUCTION APPROACH SIGNING	8/6/2012
T-28	CONSTRUCTION SIGN DETAILS	8/6/2012
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T-35	CONSTRUCTION ZONE LONGITUDINAL DROP-OFFS	8/6/2012
T-42	BRIDGE NUMBER PLAQUE	4/9/2014
T-45	SQUARE TUBE SIGN POST AND ANCHOR	1/2/2013

STRUCTURES DETAIL SHEETS

SD-501.00	CONCRETE DETAILS AND NOTES	5/7/2010
SD-502.00	CONCRETE DETAILS AND NOTES	5/7/2010
SD-516.10	BRIDGE JOINT ASPHALTIC PLUG	5/7/2010

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: Oct. 2014
 DRAINAGE AREA: 10.7 sq. mi.
 CHARACTER OF TERRAIN: Hilly to mountainous, mostly forested with a few open areas
 STREAM CHARACTERISTICS: Mountainous in headwaters, to flatter and meandering at site
 NATURE OF STREAMBED: Gravel and sand

PEAK FLOW DATA

Q 2.33 =	530 cfs	Q 50 =	1800 cfs
Q 10 =	1100 cfs	Q 100 =	2100 cfs
Q 25 =	1450 cfs	Q 500 =	2950 cfs

DATE OF FLOOD OF RECORD: Unknown
 ESTIMATED DISCHARGE: Unknown
 WATER SURFACE ELEV.: Unknown
 NATURAL STREAM VELOCITY: @ Q50 = 6.6 fps (2.4 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? Yes
 IF YES, DESCRIBE: Hydraulics at the bridge may be controlled by backwater from the New Haven River, during high water events on that river.

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

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: Single span concrete slab bridge.
 YEAR BUILT: Built 1931, reconstructed in 1970
 CLEAR SPAN(NORMAL TO STREAM): 16'
 VERTICAL CLEARANCE ABOVE STREAMBED: 8'
 WATERWAY OF FULL OPENING: 120 sq. ft.
 DISPOSITION OF STRUCTURE: Remove and replace with a new bridge
 TYPE OF MATERIAL UNDER SUBSTRUCTURE: See boring information

WATER SURFACE ELEVATIONS AT:

Q2.33 =	326.5' (327.8)'	VELOCITY =	10.2 fps (5.8 fps)
Q10 =	329.5' (329.5)'	"	7.9 fps (5.8 fps)
Q25 =	329.7' (329.7)'	"	9.3 fps (6.4 fps)
Q50 =	329.8' (329.8)'	"	6.9 fps (6.9 fps)
Q100 =	330.0' (330.0)'	"	7.2 fps (6.6 fps)

LONG TERM STREAMBED CHANGES: The channel appears to have degraded or scoured over 5' since 1931. There is presently about 2' of local scour through the existing bridge.

IS THE ROADWAY OVERTOPPED BELOW Q100: Yes
 FREQUENCY: Below Q10
 RELIEF ELEVATION: 328.8' on the northern roadway approach
 DISCHARGE OVER ROAD @Q100: 1235 cfs (1305 cfs)

UPSTREAM STRUCTURE

TOWN: Bristol DISTANCE: 2400'
 HIGHWAY #: TH 27 STRUCTURE #: 20
 CLEAR SPAN: 43' CLEAR HEIGHT: 10'
 YEAR BUILT: Built in 1919, reconstructed in 2002 FULL WATERWAY:
 STRUCTURE TYPE: Single span steel beam bridge with wood deck

DOWNSTREAM STRUCTURE

TOWN: Bristol DISTANCE: 250'
 HIGHWAY #: STRUCTURE #:
 CLEAR SPAN: CLEAR HEIGHT:
 YEAR BUILT: FULL WATERWAY:
 STRUCTURE TYPE: Confluence with the New Haven River

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	1.93	1.05					
POSTING							
OPERATING	2.51	1.36	2.21	1.3	1.77	1.61	
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
2012	2600	290	53	8.9	270
2032	3000	340	53	12.9	460

20 year ESAL for flexible pavement from 2012 to 2032 : 1911000
 40 year ESAL for flexible pavement from 2012 to 2052 : 4465000
 Design Speed : 40 mph

PILE DRIVING AND TESTING REQUIREMENTS

- NOMINAL PILE DRIVING CAPACITY P_{max} : 255.00 KIP
- PILE TEST RESISTANCE FACTOR ϕ : 0.65
- MAXIMUM PILE TIP ELEVATION: 282.00 FT
- ONE DYNAMIC PILE LOADING TEST SHALL BE PERFORMED AT EACH ABUTMENT.

PROPOSED STRUCTURE

STRUCTURE TYPE: Single Span Pre-stressed Concrete Voids Slab Bridge
 CLEAR SPAN(NORMAL TO STREAM): 41'
 VERTICAL CLEARANCE ABOVE STREAMBED: 9'
 WATERWAY OF FULL OPENING: 280 sq. ft.

WATER SURFACE ELEVATIONS AT:

Q2.33 =	325.1' (327.4)'	VELOCITY =	5.7 fps (2.9 fps)
Q10 =	327.1' (328.2)'	"	8.6 fps (5.8 fps)
Q25 =	328.2' (328.7)'	"	10.7 fps (7.6 fps)
Q50 =	329.1' (329.2)'	"	12.0 fps (8.9 fps)
Q100 =	329.4' (329.6)'	"	12.3 fps (7.4 fps)

IS THE ROADWAY OVERTOPPED BELOW Q100: Yes
 FREQUENCY: Between Q25 and Q50
 RELIEF ELEVATION: 328.8' on the northern roadway approach
 DISCHARGE OVER ROAD @Q100: 250 cfs (450 cfs)

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 329.5'
 VERTICAL CLEARANCE: @Q50 = 0.4' (0.3')

SCOUR: Maximum contraction scour up to Q500 is 7.5' without New Haven River tailwater and 7.0' with concurrent New Haven River floods.
 REQUIRED CHANNEL PROTECTION: Stone Fill, Type III

PERMIT INFORMATION

AVERAGE DAILY FLOW: 20 cfs DEPTH OR ELEVATION:
 ORDINARY LOW WATER: 10 cfs Depth = 1.0'
 ORDINARY HIGH WATER: 230 cfs Depth = 3.5'

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

* Hydraulics at this site can be affected by high flows on the New Haven River, which is 250' downstream. Water surface elevations and velocities are reported without tailwater from that river first, followed by values based on concurrent flows on both rivers in parenthesis.

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. DESIGN SPAN	L: 48.00 FT
4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ : SEE SHT 6
5. PRESTRESSING STRAND (0.60 INCH DIAMETER - LOW RELAX)	f_y : 270 KSI
6. PRESTRESSED CONCRETE STRENGTH	f'_c : 7.5 KSI
7. PRESTRESSED CONCRETE RELEASE STRENGTH	f'_{ci} : 5.0 KSI
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	f_y : ---
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 : ---
20. PILE YIELD STRENGTH ASTM A572	f_y : 50 KSI
21. PILE SIZE	HP 12X 84
22. EST. PILE LENGTHS (TWO SUBSTRUCTURES) (ABUTMENT 1 = 50 AND ABUTMENT 2 = 70) FT	L p: ---
23. PILE RESISTANCE FACTOR	ϕ : 0.65
24. LATERAL PILE DEFLECTION	Δ : ---
25. BASIC WIND SPEED	V3s: 90 MPH
26. MINIMUM GROUND SNOW LOAD	p_g: 0.05 K/FT ²
27. SEISMIC DATA	PGA: --- S: --- S1: ---

PROJECT NAME: BRISTOL
 PROJECT NUMBER: BRF 021-1 (29)
 FILE NAME: s10b094pi.dgn PLOT DATE: 12/5/2014
 PROJECT LEADER: C. CARLSON DRAWN BY: G. ROY
 DESIGNED BY: M. EVANS-MONGEON CHECKED BY: EVANS-MONGEO
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