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STRUCTURAL DETAIL SHEETS

SD-501.00	CONCRETE DETAILS AND NOTES
SD-502.00	CONCRETE DETAILS AND NOTES
SD-516.10	BRIDGE JOINT, ASPHALTIC PLUG
SD-601.00	STRUCTURAL STEEL DETAILS AND NOTES
SD-602.00	STRUCTURAL STEEL PLATE GIRDER AND NOTES

STANDARDS LIST

A-78	SHARED USE PATH TYPICAL	03-31-2004
A-80	SHARED USE PATH / HIGHWAY INTERSECTION DETAILS	03-31-2004
C-3A	SIDEWALK RAMPS	03-10-2008
C-10	CURBING	02-11-2008
D-1	PRECAST REINFORCED CONCRETE DROP INLET DETAILS	06-01-1994
D-11	STEEL OR IRON GRATES & COVERS (TYPE A)	06-01-1994
D-15	PRECAST REINF CONC. MH-GRATES, CAST IRON GRATE WITH FRAME, TYPE D & E	06-01-1994
E-100	CONSTRUCTION APPROACH SIGNS	01-02-2004
E-102	CONSTRUCTION SIGN DETAILS	06-30-2003
E-102A	CONSTRUCTION SIGN DETAILS	05-01-2004
E-107	DELINEATION, BARRICADES AND DETOURS FOR CONSTRUCTION AREAS	06-30-2003
E-107A	BREAKAWAY BARRICADE DETAILS	06-08-2009
E-121	STANDARD SIGN PLACEMENT - CONVENTIONAL ROAD	08-08-1995
E-134	BRIDGE NUMBER PLAQUE	08-08-1995
E-164	SQUARE STEEL SIGN POST	06-08-2009
E-193	PAVEMENT MARKING DETAILS	08-18-1995
E-195	SHARED USE PATH PAVEMENT MARKINGS AND SIGN DETAILS	06-09-2008
F-2	CHAIN LINK FENCE, TYPE I DETAILS	06-01-1994
G-1	STEEL BEAM GUARDRAIL DETAILS (POST, DELINEATOR, TYPICALS)	01-03-2000
G-1D	STEEL BEAM GUARDRAIL DETAILS (END TERMINAL, ANCHOR, MEDIAN)	01-03-2000

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: vised October 2010

DRAINAGE AREA : 34.0 sq. mi.
 CHARACTER OF TERRAIN : Hilly to mountainous, mostly rural, mostly forested
 STREAM CHARACTERISTICS : Sinuous, incised, gorge at bridge site
 NATURE OF STREAMBED : Mixed upstream, ledge at bridge

PEAK FLOW DATA

Q 2.33 =	1600 cfs	Q 50 =	5950 cfs
Q 10 =	3325 cfs	Q 100 =	7225 cfs
Q 25 =	4750 cfs	Q 500 =	10,850 cfs

DATE OF FLOOD OF RECORD : 1927
 ESTIMATED DISCHARGE : unknown
 WATER SURFACE ELEV. : unknown
 NATURAL STREAM VELOCITY : @ Q25 = 25.2 fps
 ICE CONDITIONS : moderate
 DEBRIS : 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 : Single span steel beam bridge
 YEAR BUILT : 1949
 CLEAR SPAN(NORMAL TO STREAM): 89'
 VERTICAL CLEARANCE ABOVE STREAMBED: 36' +/-
 WATERWAY OF FULL OPENING: 1965 sq. ft.
 DISPOSITION OF STRUCTURE: Replace
 TYPE OF MATERIAL UNDER SUBSTRUCTURE: See borings

WATER SURFACE ELEVATIONS AT:

Q2.33 =	707.9'	VELOCITY =	21.2 fps
Q10 =	710.1'	"	24.1 fps
Q25 =	711.5'	"	25.8 fps
Q50 =	712.6'	"	26.8 fps
Q100 =	713.7'	"	27.7 fps

LONG TERM STREAMBED CHANGES: None noted

IS THE ROADWAY OVERTOPPED BELOW Q100: No
 FREQUENCY: N/A
 RELIEF ELEVATION: 732.8'
 DISCHARGE OVER ROAD @Q100: N/A

UPSTREAM STRUCTURE

TOWN: Barre Town DISTANCE: 2000'
 HIGHWAY #: VT 63 STRUCTURE #: BR 5
 CLEAR SPAN: 15' + 15' = 30' CLEAR HEIGHT: 12'
 YEAR BUILT: 1970 FULL WATERWAY: 360 sf
 STRUCTURE TYPE: Twin cell RC Box

DOWNSTREAM STRUCTURE

TOWN: Barre Town DISTANCE: 3200'
 HIGHWAY #: Parkside Terrace STRUCTURE #: BR 13
 CLEAR SPAN: 82' CLEAR HEIGHT: 26'
 YEAR BUILT: 1997 FULL WATERWAY: 1750 sf
 STRUCTURE TYPE: Welded plate girder

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	2.47	1.1					
POSTING							
OPERATING	3.2	1.42	2.11	1.46	2.2	2.11	2.15
COMMENTS:							

PILE DRIVING AND TESTING REQUIREMENTS

- NOMINAL PILE DRIVING CAPACITY P_{nd} : 627.00 KIP
- PILE TEST RESISTANCE FACTOR ϕ : 0.65
- MAXIMUM PILE TIP ELEVATION VARIES
- THREE DYNAMIC PILES TESTS REQUIRED

PROPOSED STRUCTURE

STRUCTURE TYPE: Single span curved steel girder
 CLEAR SPAN(NORMAL TO STREAM): 116'
 VERTICAL CLEARANCE ABOVE STREAMBED: 38'
 WATERWAY OF FULL OPENING: 2145 sq. ft.

WATER SURFACE ELEVATIONS AT:

Q2.33 =	#REF!	VELOCITY=	21.2 fps
Q10 =	#REF!	"	24.1 fps
Q25 =	#REF!	"	25.8 fps
Q50 =	#REF!	"	26.8 fps
Q100 =	#REF!	"	27.7 fps

IS THE ROADWAY OVERTOPPED BELOW Q100: No
 FREQUENCY: N/A
 RELIEF ELEVATION: 734.3'
 DISCHARGE OVER ROAD @Q100: N/A

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 732.3'
 VERTICAL CLEARANCE: @ Q25 = 20.8'

SCOUR: Abutments to be founded on ledge

REQUIRED CHANNEL PROTECTION: Stone Fill, Type II

PERMIT INFORMATION

AVERAGE DAILY FLOW: 70 cfs DEPTH OR ELEVATION:
 ORDINARY LOW WATER: 30 cfs 1.5'
 ORDINARY HIGH WATER: 700 cfs 4.0'

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. DESIGN SPAN	L: 120.00 FT
4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ : --- INCH
5. PRESTRESSING STRAND (0.60 INCH DIAMETER - LOW RELAX)	f_y : 270 KSI
6. PRESTRESSED CONCRETE STRENGTH	f'_c : 6.0 KSI
7. PRESTRESSED CONCRETE RELEASE STRENGTH	f'_{cr} : 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 : 3.0 KSI
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 : 22.2 KSF
18. ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ : 0.45
19. NOMINAL AXIAL PILE RESISTANCE	q_p : ---
20. PILE YIELD STRENGTH ASTM A572	f_y : 50 KSI
21. PILE SIZE	HP 14X117
22. EST. AVG. PILE LENGTH	L _p : 25 FT
23. PILE RESISTANCE FACTOR	ϕ : 0.65
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: BARRE TOWN
 PROJECT NUMBER: BRF 6100(7)

FILE NAME: s06j002pi.xls PLOT DATE: 9/19/2012
 PROJECT LEADER: J. LACROIX DRAWN BY: R. PELLET
 DESIGNED BY: T. FILLBACH CHECKED BY: T. FILLBACH
 PRELIMINARY INFORMATION SHEET 1 SHEET 2 OF 70

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT	20 year ESAL for flexible pavement from 2013 to 2033 : 594000
2013	3400	380	53	3	180	40 year ESAL for flexible pavement from 2013 to 2053 : 1323000
2033	4100	460	53	3.6	260	Design Speed : 25 mph