

PRELIMINARY INFORMATION SHEET (BRIDGE)

LRFD

INDEX OF SHEETS

FINAL HYDRAULIC REPORT

PLAN SHEETS

1	TITLE SHEET
2	PRELIMINARY INFORMATION (BRIDGE)
3	GENERAL NOTES
4 - 5	QUANTITY SHEETS
6	TYPICAL SECTIONS
7	TIE SHEET
8	LAYOUT SHEET
9	PROFILE SHEET
10	EPSC NARRATIVE
11	EPSC EXISTING CONDITIONS
12	BORING LAYOUT SHEET
13	BORING LOGS
14	PLAN AND ELEVATION
15	FRAMING PLAN
16 - 17	BOX BEAM DETAILS #1-#2
18	BEARING DETAILS
19	ABUTMENTS
20	RETAINING WALL
21	RAL LAYOUT SHEET
22	RAL DETAIL
23 - 25	MAINLINE SECTIONS
26	CHANNEL SECTIONS

STANDARDS LIST

E-100	CONSTRUCTION APPROACH SIGNS	2-Jan-04
E-100A	SIDE ROAD CONSTRUCTION - APPROACH SIGNS	2-Jan-04
E-101	CONSTRUCTION SIGN DETAILS	30-May-03
E-102	CONSTRUCTION SIGN DETAILS	30-Jun-03
E-102A	CONSTRUCTION SIGN DETAILS	1-May-04
E-106	TRAFFIC CONTROL- MISCELLANEOUS DETAILS	1-Mar-04
E-107	DELINEATION, BARRICADES AND DETOURS FOR CONSTRUCTION AREAS	30-Jun-03
E-107A	BREAKAWAY BARRICADE DETAILS	8-Jun-09
E-108	CONSTRUCTION ZONE LONGITUDINAL DROP OFFS	8-Jun-09
E-120	STANDARD SIGN PLACEMENT - EXPRESSWAY & FREEWAY	8-Aug-95
E-121	STANDARD SIGN PLACEMENT - CONVENTIONAL ROAD	8-Aug-95
E-138	MILE MARKER DETAILS - STATE & TOWN HIGHWAYS	30-May-03
E-150	WARNING SIGN DETAILS	1-May-04
E-151	WARNING SIGN DETAILS	1-May-04
E-160	FLANGED CHANNEL STEEL SIGN POST	20-May-99
E-161	W-SHAPED STEEL SIGN POST	18-Aug-95
E-162	TUBULAR ALUMINUM SIGN POST	20-May-99
E-163	TUBULAR STEEL SIGN POST	20-May-99
E-164	SQUARE STEEL SIGN POST	8-Jun-09
E-197	DELINEATOR PLACEMENT TYPICAL	1-Apr-05
E-198	DELINEATOR SAND MILE POSTS	1-Apr-05
E-199	DELINEATOR AND MILE POST MOUNTING ON BRIDGE RAIL	1-Apr-05
G-1	STEEL BEAM GUARDRAIL DETAILS (POST, DELINEATOR, TYPICALS)	3-Jan-00
G-1D	STEEL BEAM GUARDRAIL DETAILS (END TERMINAL, ANCHOR, MEDIAN)	3-Jan-00
SB-R6-82	BRIDGE RAILING - HEAVY DUTY STEEL BEAM	6-Jan-95

HYDROLOGIC DATA

Date: Sept 2009

DRAINAGE AREA : 18.8 sq. mi.
 CHARACTER OF TERRAIN : Rural, mixed forest and open, moderate to steep slopes
 STREAM CHARACTERISTICS : Incised, unstable stream banks
 NATURE OF STREAMBED : Sand, gravel and cobbles

PEAK FLOW DATA

Q 2.33 =	700 cfs	Q 50 =	2275 cfs
Q 10 =	1400 cfs	Q 100 =	2700 cfs
Q 25 =	1850 cfs	Q 500 =	3500 cfs

DATE OF FLOOD OF RECORD: November 1927
 ESTIMATED DISCHARGE: Unknown
 WATER SURFACE ELEV.: Unknown
 NATURAL STREAM VELOCITY: @ Q25 = 10.2 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: N/A

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

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: Temporary Mabey bridge
 YEAR BUILT: Original structure built in 1929
 CLEAR SPAN(NORMAL TO STREAM): 21'
 VERTICAL CLEARANCE ABOVE STREAMBED: ~11'
 WATERWAY OF FULL OPENING: 220 sq. ft.
 DISPOSITION OF STRUCTURE: Remove and replace superstructure
 TYPE OF MATERIAL UNDER SUBSTRUCTURE: See borings

WATER SURFACE ELEVATIONS AT:

Q2.33 =	697.8'	VELOCITY =	7.2 fps
Q10 =	700.5'	"	11.8 fps
Q25 =	701.7'	"	14.2 fps
Q50 =	702.3'	"	14.6 fps
Q100 =	703.7'	"	11.2 fps

LONG TERM STREAMBED CHANGES: Channel has moved laterally within floodplain over time.

IS THE ROADWAY OVERTOPPED BELOW Q100: Yes
 FREQUENCY: Q25
 RELIEF ELEVATION: 701.1'
 DISCHARGE OVER ROAD @Q100: 1290 cfs

UPSTREAM STRUCTURE

TOWN: Braintree DISTANCE: 5700'
 HIGHWAY #: VT 12 STRUCTURE #: BR 47
 CLEAR SPAN: 25' CLEAR HEIGHT: 11.5'
 YEAR BUILT: 1928, reconstructed in 1969 FULL WATERWAY:
 STRUCTURE TYPE: T beam bridge and multiplate arch

DOWNSTREAM STRUCTURE

TOWN: Randolph DISTANCE: 9500'
 HIGHWAY #: TH 42 STRUCTURE #: BR 37
 CLEAR SPAN: 37' CLEAR HEIGHT: 11'
 YEAR BUILT: 1985 FULL WATERWAY:
 STRUCTURE TYPE: Concrete Slab

LRFR LOAD RATING FACTORS

LOADING LEVELS	TRUCK						
	H-20	HL-93	3S2	6 AXLE	3A STR	4A STR	5A SEM
TONNAGE	20	36	36	66	30	34.5	38
INVENTORY	1.67	1.07					
POSTING							
OPERATING	2.17	1.38	1.83	1.10	1.54	1.38	1.53
COMMENTS:							

PILE DRIVING AND TESTING REQUIREMENTS
 1. NOMINAL PILE DRIVING CAPACITY: 465.00 KIP
 2. PILE TEST RESISTANCE FACTOR: 0.40
 3. MAXIMUM PILE TIP ELEVATION: SEE BORING LOGS
 4. 0

PROPOSED STRUCTURE

STRUCTURE TYPE: Single span
 CLEAR SPAN(NORMAL TO STREAM): 21'
 VERTICAL CLEARANCE ABOVE STREAMBED: ~12'
 WATERWAY OF FULL OPENING: 225 sq. ft.

WATER SURFACE ELEVATIONS AT:

Q2.33 =	697.8'	VELOCITY =	7.3 fps
Q10 =	700.5'	"	11.9 fps
Q25 =	701.7'	"	14.2 fps
Q50 =	702.3'	"	14.6 fps
Q100 =	703.7'	"	11.2 fps

IS THE ROADWAY OVERTOPPED BELOW Q100: Yes
 FREQUENCY: Q25
 RELIEF ELEVATION: 701.1'
 DISCHARGE OVER ROAD @Q100: 1290 cfs

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 702.7'
 VERTICAL CLEARANCE: @ Q25 = 1.0'

SCOUR: Contraction scour of 6.0' at Q25

REQUIRED CHANNEL PROTECTION: None required.

PERMIT INFORMATION

AVERAGE DAILY FLOW: 40 cfs DEPTH OR ELEVATION:
 ORDINARY LOW WATER: 20 cfs 0.5' *
 ORDINARY HIGH WATER: 300 cfs 2.5' *

TEMPORARY BRIDGE REQUIREMENTS

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

ADDITIONAL INFORMATION

Elevations based on NAVD88
 Existing abutments will be retained with the new bridge constructed over and behind them.
 * Water depths given are those where no scour holes occur in river.

DESIGN VALUES

1. DESIGN LIVE LOAD	HL-93
2. FUTURE PAVEMENT	d _p : 2.0 INCH
3. DESIGN SPAN	L: 67.00 FT
4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ: 1.56 INCH
5. PRESTRESSING STRAND (0.60 INCH DIAMETER - LOW RELAX)	f _y : 270 KSI
6. PRESTRESSED CONCRETE STRENGTH	f' _c : 7.0 KSI
7. PRESTRESSED CONCRETE RELEASE STRENGTH	f' _c : 5.5 KSI
8. CONCRETE, HIGH PERFORMANCE CLASS AA	f' _c : 4.0 KSI
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	f _y : ---
14. SOIL UNIT WEIGHT	γ: 0.140 KCF
15. NOMINAL BEARING RESISTANCE OF SOIL	q _n : 9.0 KSF
16. SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	φ: 0.45
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 : 465.0 KIPS
20. PILE YIELD STRENGTH ASTM A572	f _y : 50 KSI
21. PILE SIZE	HP 12X53
22. EST. PILE LENGTH	SEE BORING LOGS
23. PILE RESISTANCE FACTOR	φ: 0.40
24. LATERAL PILE DEFLECTION	Δ: 0.25 INCH
25. BASIC WIND SPEED	V _{3S} : ---
26. MINIMUM GROUND SNOW LOAD	p _g : ---
27. SEISMIC DATA	PGA: --- S _s : --- S _i : ---

PROJECT NAME: BRAINTREE
 PROJECT NUMBER: BRO 1444(36)

FILE NAME: s95j292pi.xls PLOT DATE: 12/29/2009
 PROJECT LEADER: K. HIGGINS DRAWN BY: R. PELLETT
 DESIGNED BY: T. FILLBACH CHECKED BY: T. FILLBACH
 PRELIMINARY INFORMATION (BRIDGE) SHEET 2 OF 26

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT	
2009	20	5	52	4	6	20 year ESAL for flexible pavement from 2009 to 2029 : < 50000
2029	30	5	52	4	6	40 year ESAL for flexible pavement from 2009 to 2049 : <50000
						Design Speed : 30 mph