

PRELIMINARY INFORMATION SHEET (CULVERT)

LRFD

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STANDARDS LIST

E-100	CONSTRUCTION APPROACH SIGNS	2-Jan-04
E-101	CONSTRUCTIONSIGN DETAILS	30-May-03
E-102	CONSTRUCTIONSIGN DETAILS	30-Jun-03
E-102A	CONSTRUCTION SIGN DETAILS	1-May-04
E-107	DELINEATION, BARRICADES AND DETOURS FOR CONSTRUCTION AF	30-Jun-03
E-107A	BREAKAWAY BARRICADE DETAILS	8-Jun-09
E-108	CONSTRUCTION ZONE LONGITUDINAL DROP OFFS	8-Dec-08
E-110	MAJOR MAINTENANCE OPERATION LANE CLOSURE	8-Aug-95
E-111	MINOR MAINTENANCE OPERATIONS	11-Mar-97
E-142	REGULATORY SIGN DETAILS	20-Sep-95

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: Dec. 2012

DRAINAGE AREA : 1.0 sq. mi.
 CHARACTER OF TERRAIN : Hilly to mountainous. Mostly forested with some open areas.
 STREAM CHARACTERISTICS : Small, perennial, sinuous, semi-alluvial
 NATURE OF STREAMBED : Sand, Gravel and boulders

PEAK FLOW DATA

Q 2.33 =	80 cfs	Q 50 =	280 cfs
Q 10 =	180 cfs	Q 100 =	330 cfs
Q 25 =	230 cfs	Q 500 =	460 cfs

DATE OF FLOOD OF RECORD : Unknown
 ESTIMATED DISCHARGE : Unknown
 WATER SURFACE ELEV. : Unknown
 NATURAL STREAM VELOCITY : @ Q50 = 8.2 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:

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

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: Reinforced concrete pipe
 YEAR BUILT: 1959
 CLEAR SPAN(NORMAL TO STREAM): 72"
 VERTICAL CLEARANCE ABOVE STREAMBED: 72"
 WATERWAY OF FULL OPENING: 28.3 sq. ft.
 DISPOSITION OF STRUCTURE: Retain and insert new CIPP liner in existing pipe.
 TYPE OF MATERIAL UNDER SUBSTRUCTURE: Unknown

WATER SURFACE ELEVATIONS AT:

Q2.33 =	768.5'	VELOCITY =	13.4 fps
Q10 =	770.5'	"	16.1 fps
Q25 =	771.4'	"	17.0 fps
Q50 =	772.4'	"	17.8 fps
Q100 =	773.5'	"	18.5 fps

LONG TERM STREAMBED CHANGES: None noted.

IS THE ROADWAY OVERTOPPED BELOW Q100: No
 FREQUENCY: Above Q100
 RELIEF ELEVATION: 794.8'
 DISCHARGE OVER ROAD @Q100: None

UPSTREAM STRUCTURE

TOWN: Weathersfield DISTANCE: 300'
 HIGHWAY #: TH 65 STRUCTURE #: CB 83
 CLEAR SPAN: about 47' CLEAR HEIGHT: about 4'
 YEAR BUILT: Built 1870 - reconstructed 1986 FULL WATERWAY:
 STRUCTURE TYPE: Covered bridge

DOWNSTREAM STRUCTURE

TOWN: Weathersfield DISTANCE: 6800'
 HIGHWAY #: TH 8 STRUCTURE #: N/A
 CLEAR SPAN: N/A CLEAR HEIGHT: N/A
 YEAR BUILT: N/A FULL WATERWAY: N/A
 STRUCTURE TYPE: N/A

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						

CULVERT DESIGN CRITERIA

- PROPOSED CULVERT IS A LINING.
- CULVERT ENDS ARE NOT SKEWED.
- CULVERT WILL BE SET AT A SLOPE OF 1.96 IN. ON 10 FT.
- CULVERT WILL NOT REQUIRE FISH PASSAGE ACCOMODATIONS.
- CULVERT CONSTRUCTION WILL REQUIRE TEMPORARY RELOCATION OF STREAM FLOW.

PROPOSED STRUCTURE

STRUCTURE TYPE: New CIPP Liner in existing pipe
 CLEAR SPAN(NORMAL TO STREAM): 68" Minimum
 VERTICAL CLEARANCE ABOVE STREAMBED: 68" Minimum
 WATERWAY OF FULL OPENING: 25.2 sq. ft.

WATER SURFACE ELEVATIONS AT:

Q2.33 =	768.9'	VELOCITY =	14.4 fps
Q10 =	771.2'	"	17.0 fps
Q25 =	772.5'	"	18.0 fps
Q50 =	774.0'	"	18.8 fps
Q100 =	775.9'	"	19.7 fps

IS THE ROADWAY OVERTOPPED BELOW Q100: No
 FREQUENCY: Above Q100
 RELIEF ELEVATION: 794.8'
 DISCHARGE OVER ROAD @Q100: None

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 771.1' - Top of liner at inlet
 VERTICAL CLEARANCE: @ Q50 = -2.9'; Water is above the top of pipe at Q10.

SCOUR: Not applicable for a pipe.

REQUIRED CHANNEL PROTECTION: Stone Fill, Type II at inlet

PERMIT INFORMATION

AVERAGE DAILY FLOW: 2 cfs DEPTH OR ELEVATION:
 ORDINARY LOW WATER: 1 cfs Depth = 0.5'
 ORDINARY HIGH WATER: 35 cfs Depth = 2.0'

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

TRAFFIC MAINTENANCE NOTES

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

DESIGN VALUES

1. DESIGN LIVE LOAD	HL-93
2. FUTURE PAVEMENT	d _p : 3.0 INCH
3. CULVERT OPENING	D: 5.67 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 : ---
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. BACKFILL UNIT WEIGHT	γ: ---
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 : ---
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: ---

PROJECT NAME: **WEATHERSFIELD**

PROJECT NUMBER: **STP 0146(11)**

FILE NAME: z00c268-pi.dgn PLOT DATE: 4/9/2013
 PROJECT LEADER: J.FITCH DRAWN BY: K.RUTTER
 DESIGNED BY: K.RUTTER CHECKED BY: C.GREGORY
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TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT	
2015	3200	370	57	7.4	320	20 year ESAL for flexible pavement from 2015 to 2035 : 2219000
2035	3400	400	57	9.5	440	40 year ESAL for flexible pavement from 2015 to 2055 : 4884000
						Design Speed : 50 mph