

PRELIMINARY INFORMATION SHEET (BRIDGE)

LRFD

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STANDARDS LIST

FINAL HYDRAULIC REPORT - BRIDGE NO. 5

HYDROLOGIC DATA

Date: 29 October 2013

DRAINAGE AREA : 0.76 sq. mi.
 CHARACTER OF TERRAIN : Lowland agricultural with some wooded areas
 STREAM CHARACTERISTICS : Perennial, flat, straight
 NATURE OF STREAMBED : Clay streambed

PEAK FLOW DATA

Q 2.33 = 30 cfs Q 50 = 150 cfs
 Q 10 = 90 cfs Q 100 = 180 cfs
 Q 25 = 125 cfs Q 500 = 250 cfs

DATE OF FLOOD OF RECORD : Unknown
 ESTIMATED DISCHARGE : Unknown
 WATER SURFACE ELEV. : Unknown
 NATURAL STREAM VELOCITY : @ Q50 = 2.6 fps
 ICE CONDITIONS : Light
 DEBRIS : Light
 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 : Downstream Payne Road crossing creates a backwater condition at the subject culvert, making the structure outlet controlled.

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

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE : 7'-0" corrugated metal pipe (CMP)
 YEAR BUILT : 1949
 CLEAR SPAN(NORMAL TO STREAM) : 7'-0"
 VERTICAL CLEARANCE ABOVE STREAMBED : 7'-0"
 WATERWAY OF FULL OPENING : 38.5 sq. ft.
 DISPOSITION OF STRUCTURE : Remove and replace
 TYPE OF MATERIAL UNDER SUBSTRUCTURE : See borings

WATER SURFACE ELEVATIONS AT:

Q2.33 = 238.8 ft VELOCITY = 1.5 fps
 Q10 = 240.5 ft " 3.0 fps
 Q25 = 241.5 ft " 3.6 fps
 Q50 = 242.2 ft " 3.9 fps
 Q100 = 242.7 ft " 2.6 fps

LONG TERM STREAMBED CHANGES : None noted

IS THE ROADWAY OVERTOPPED BELOW Q100: Yes
 FREQUENCY : Q50
 RELIEF ELEVATION : 242.0 ft
 DISCHARGE OVER ROAD @Q100 : 79.0 cfs

UPSTREAM STRUCTURE

TOWN : Bridport DISTANCE : 1,500'
 HIGHWAY # : TH 24 STRUCTURE # :
 CLEAR SPAN : 4'-0" CLEAR HEIGHT : 4'-0"
 YEAR BUILT : Unknown FULL WATERWAY : 12.6 sq. ft.
 STRUCTURE TYPE : 48" dia. corrugated metal pipe

DOWNSTREAM STRUCTURE

TOWN : Bridport DISTANCE : 950'
 HIGHWAY # : TH 32 STRUCTURE # : BR 28
 CLEAR SPAN : 5'-6" CLEAR HEIGHT : 5'-6"
 YEAR BUILT : Unknown FULL WATERWAY : 23.8 sq. ft.
 STRUCTURE TYPE : 66" dia. corrugated metal pipe

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							
POSTING							
OPERATING							
COMMENTS:							

AS BUILT "REBAR" DETAIL		
LEVEL I	LEVEL II	LEVEL III
TYPE:	TYPE:	TYPE:
GRADE:	GRADE:	GRADE:

PROPOSED STRUCTURE

STRUCTURE TYPE: Precast Concrete Box Culvert

CLEAR SPAN(NORMAL TO STREAM): 12'-0"
 VERTICAL CLEARANCE ABOVE STREAMBED: 7'-0" / 5'-0"
 WATERWAY OF FULL OPENING: 76.0 sq. ft.

WATER SURFACE ELEVATIONS AT:

Q2.33 = 238.7 ft VELOCITY= 0.9 fps
 Q10 = 240.3 ft " 1.7 fps
 Q25 = 241.2 ft " 2.0 fps
 Q50 = 241.9 ft " 2.2 fps
 Q100 = 242.6 ft " 1.8 fps

IS THE ROADWAY OVERTOPPED BELOW Q100: Yes
 FREQUENCY : N/A
 RELIEF ELEVATION : 242.0 ft
 DISCHARGE OVER ROAD @Q100 : 48.9 cfs

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE : 242.3 ft
 VERTICAL CLEARANCE : @ Q50 = 0.4'

SCOUR : Replacement structure is a box culvert so scour is not a concern.

REQUIRED CHANNEL PROTECTION : Stone Fill, Type II

PERMIT INFORMATION

AVERAGE DAILY FLOW : 1.5 cfs DEPTH OR ELEVATION:
 ORDINARY LOW WATER : 0.8 cfs Depth = 1.5'
 ORDINARY HIGH WATER : 8 cfs Depth = 2.0'

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE : Temporary Bridge not Required
 CLEAR SPAN (NORMAL TO STREAM) : N/A
 VERTICAL CLEARANCE ABOVE STREAMBED : N/A
 WATERWAY AREA OF FULL OPENING : N/A

ADDITIONAL INFORMATION

TRAFFIC MAINTENANCE NOTES

1. MAINTAIN TRAFFIC ON AN OFF SITE DETOUR.
2. TRAFFIC SIGNALS ARE NOT NECESSARY.
3. SIDEWALKS ARE NOT NECESSARY

DESIGN VALUES

1. DESIGN LIVE LOAD HL-93
2. FUTURE PAVEMENT d_p : 3.0 INCH
3. DESIGN SPAN L: 0.00 FT
4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS) Δ : ---
5. PRESTRESSING STRAND f_y : ---
6. PRESTRESSED CONCRETE STRENGTH f'_{ci} : ---
7. PRESTRESSED CONCRETE RELEASE STRENGTH f'_{ci} : ---
8. CONCRETE, HIGH PERFORMANCE CLASS AA f'_{ci} : ---
9. CONCRETE, HIGH PERFORMANCE CLASS A f'_{ci} : ---
10. CONCRETE, HIGH PERFORMANCE CLASS B f'_{ci} : 3.5 KSI
11. CONCRETE, CLASS C f'_{ci} : ---
12. REINFORCING STEEL f_y : 60 KSI
13. STRUCTURAL STEEL AASHTO M270 f_y : ---
14. NOMINAL BEARING RESISTANCE OF SOIL q_n : * 1.36 KSF
15. SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD) ϕ : * 0.45
16. NOMINAL BEARING RESISTANCE OF ROCK q_n : ---
17. ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD) ϕ : ---

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT	
2013	1900	210	66	7.5	150	10 year ESAL for flexible pavement from 2013 to 2023 : 385000
2023	2000	230	66	9	190	20 year ESAL for flexible pavement from 2013 to 2033 : 882000
						Design Speed : 50 mph

PROJECT NAME: **Bridport**
 PROJECT NUMBER: **STP CULV(29)**

FILE NAME: z11c264_BR5_PL.xls PLOT DATE: 3/18/2014
 PROJECT LEADER: M. CHENETTE DRAWN BY: L. BUXTON
 DESIGNED BY: A LACHANCE CHECKED BY: M. CHENETTE
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