

PRELIMINARY INFORMATION SHEET (CULVERT)

LRFD

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STANDARDS LIST

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: July 2015

DRAINAGE AREA : 1.2 sq. mi.
CHARACTER OF TERRAIN : Mostly open and rural
STREAM CHARACTERISTICS : Sinuous and alluvial
NATURE OF STREAMBED : Silt and small gravel

PEAK FLOW DATA

Q 2.33 = 70 cfs
Q 10 = 155 cfs
Q 25 = 195 cfs
Q 50 = 235 cfs
Q 100 = 270 cfs
Q 500 = 380 cfs

DATE OF FLOOD OF RECORD : Unknown
ESTIMATED DISCHARGE : Unknown
WATER SURFACE ELEV. : Unknown
NATURAL STREAM VELOCITY : @ Q50 = 9.1 fps
ICE CONDITIONS : Light
DEBRIS : Light
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 : Concrete Box
YEAR BUILT : 1929, Reconstructed in 1949
CLEAR SPAN(NORMAL TO STREAM) : 7'
VERTICAL CLEARANCE ABOVE STREAMBED : 6.5'
WATERWAY OF FULL OPENING : 45 sq. ft.
DISPOSITION OF STRUCTURE : Remove and replace
TYPE OF MATERIAL UNDER SUBSTRUCTURE : Unknown

WATER SURFACE ELEVATIONS AT:

Q2.33 = 228.8' VELOCITY = 11.5 fps
Q10 = 230.4' " 13.7 fps
Q25 = 231.0' " 14.4 fps
Q50 = 231.6' " 15.0 fps
Q100 = 232.1' " 15.5 fps

LONG TERM STREAMBED CHANGES : None noted

IS THE ROADWAY OVERTOPPED BELOW Q100: No
FREQUENCY: N/A
RELIEF ELEVATION: 232.2'
DISCHARGE OVER ROAD @Q100: N/A

UPSTREAM STRUCTURE

TOWN: Charlotte DISTANCE: 2240'
HIGHWAY #: TH 5 STRUCTURE #:
CLEAR SPAN: CLEAR HEIGHT:
YEAR BUILT: FULL WATERWAY:
STRUCTURE TYPE:

DOWNSTREAM STRUCTURE

TOWN: Charlotte DISTANCE: 680'
HIGHWAY #: Maple Knoll Road STRUCTURE #:
CLEAR SPAN: CLEAR HEIGHT:
YEAR BUILT: FULL WATERWAY:
STRUCTURE TYPE:

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 PRESTRESS CONCRETE STRUCTURE (10'-0" X 7'-0" X 60'-0" BOX).
- CULVERT ENDS ARE NOT SKEWED.
- CULVERT WILL BE SET AT A SLOPE OF 16.80 IN. ON 60 FT.
- CULVERT WILL REQUIRE FISH PASSAGE ACCOMODATIONS
- CULVERT CONSTRUCTION WILL REQUIRE A TEMPORARY PIPE

PROPOSED STRUCTURE

STRUCTURE TYPE: Precast Concrete Box Culvert
CLEAR SPAN(NORMAL TO STREAM): 10'
VERTICAL CLEARANCE ABOVE STREAMBED: 5'
WATERWAY OF FULL OPENING: 50 sq. ft.

WATER SURFACE ELEVATIONS AT:

Q2.33 = 226.3' VELOCITY= 7.0' fps
Q10 = 227.5' " 9.6 fps
Q25 = 228.0' " 10.5 fps
Q50 = 228.4' " 11.2 fps
Q100 = 228.8' " 12.0 fps

IS THE ROADWAY OVERTOPPED BELOW Q100: No
FREQUENCY: N/A
RELIEF ELEVATION: 231.8'
DISCHARGE OVER ROAD @Q100: N/A

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 228.7'
VERTICAL CLEARANCE: @ Q50 = 0.3'

SCOUR: Scour is not calculated for a box

REQUIRED CHANNEL PROTECTION: Stone Fill Type III

PERMIT INFORMATION

AVERAGE DAILY FLOW: DEPTH OR ELEVATION:
ORDINARY LOW WATER:
ORDINARY HIGH WATER:

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

DESIGN VALUES

1. DESIGN LIVE LOAD	HL-93
2. FUTURE PAVEMENT	d _p : 8.5 INCH
3. CULVERT OPENING	D: 50 SF
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. SOIL 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: --- S ₁ : ---

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT	
2016	11200	1200	56	4.9	900	20 year ESAL for flexible pavement from 2016 to 2036 : 10,716,000
2036	11500	1200	56	5.2	970	40 year ESAL for flexible pavement from 2016 to 2056 : 22,153,000 Design Speed : 50 mph

PROJECT NAME: CHARLOTTE
PROJECT NUMBER: F EGC 019-4(20)

FILE NAME: d78d062_frm.dgn PLOT DATE: 15-MAR-2016
PROJECT LEADER: K. UPMAL DRAWN BY: C. LEACH
DESIGNED BY: B. KIPP CHECKED BY: M. GAMELIN
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