

PRELIMINARY INFORMATION SHEET (CULVERT)

LRFD

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FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: July 2015

DRAINAGE AREA : 0.7 sq. mi.
 CHARACTER OF TERRAIN : Mostly open and rural
 STREAM CHARACTERISTICS : Sinuous and incised
 NATURE OF STREAMBED : Silt, small gravel

PEAK FLOW DATA

Q 2.33 = 45 cfs Q 50 = 160 cfs
 Q 10 = 105 cfs Q 100 = 190 cfs
 Q 25 = 135 cfs Q 500 = 260 cfs

DATE OF FLOOD OF RECORD : Unknown
 ESTIMATED DISCHARGE : Unknown
 WATER SURFACE ELEV. : Unknown
 NATURAL STREAM VELOCITY : @ Q50= 6.3 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 : 1949
 CLEAR SPAN(NORMAL TO STREAM): 5'
 WATERWAY OF FULL OPENING: 25 sq. ft.
 DISPOSITION OF STRUCTURE: Remove and replace
 TYPE OF MATERIAL UNDER SUBSTRUCTURE: Unknown

WATER SURFACE ELEVATIONS AT:

Q2.33 = 176.6' VELOCITY = 7.6 fps
 Q10 = 178.2' " 9.7 fps
 Q25 = 178.9' " 10.2 fps
 Q50 = 179.5' " 10.7 fps
 Q100 = 180.2' " 11.2 fps

LONG TERM STREAMBED CHANGES: None noted

IS THE ROADWAY OVERTOPPED BELOW Q100: No
 FREQUENCY: N/A
 RELIEF ELEVATION: 183.7'
 DISCHARGE OVER ROAD @Q100: N/A

UPSTREAM STRUCTURE

TOWN: Charlotte DISTANCE: 1520'
 HIGHWAY #: TH 49 STRUCTURE #:
 CLEAR SPAN: CLEAR HEIGHT:
 YEAR BUILT: FULL WATERWAY:
 STRUCTURE TYPE:

DOWNSTREAM STRUCTURE

TOWN: Charlotte DISTANCE: 5215'
 HIGHWAY #: STRUCTURE #:
 CLEAR SPAN: CLEAR HEIGHT:
 YEAR BUILT: FULL WATERWAY:
 STRUCTURE TYPE: Confluence with Thorp Brook

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: TABLE TO BE COMPLETED BY CONTRACTOR'S DESIGNER

CULVERT DESIGN CRITERIA

- PROPOSED CULVERT IS A PRESTRESS CONCRETE STRUCTURE (6'-0" X 6'-0" X 56'-0" BOX).
- CULVERT ENDS ARE NOT SKEWED.
- CULVERT WILL BE SET AT A SLOPE OF 3.96 IN. ON 56 FT.
- CULVERT WILL NOT REQUIRE FISH PASSAGE ACCOMODATIONS
- CULVERT CONSTRUCTION WILL REQUIRE A TEMPORARY PIPE

PROPOSED STRUCTURE

STRUCTURE TYPE: Precast Concrete Box Culvert
 CLEAR SPAN(NORMAL TO STREAM): 6'
 VERTICAL CLEARANCE ABOVE STREAMBED: 5'
 WATERWAY OF FULL OPENING: 30 sq. ft.

WATER SURFACE ELEVATIONS AT:

Q2.33 = 176.6' VELOCITY= 4.5 fps
 Q10 = 178.2' " 6.4 fps
 Q25 = 178.8' " 7.2 fps
 Q50 = 179.3' " 7.8 fps
 Q100 = 179.9' " 8.5 fps

IS THE ROADWAY OVERTOPPED BELOW Q100: No
 FREQUENCY: N/A
 RELIEF ELEVATION: 183.4'
 DISCHARGE OVER ROAD @Q100: N/A

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 179.5'
 VERTICAL CLEARANCE: @ Q50 = 0.2'

SCOUR: Scour is not calculated for a box

REQUIRED CHANNEL PROTECTION: Stone Fill Type II

PERMIT INFORMATION

AVERAGE DAILY FLOW: DEPTH OR ELEVATION:
 ORDINARY LOW WATER:
 ORDINARY HIGH 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: 30.00 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	L _p : ---
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 : --- S ₁ : ---

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT	20 year ESAL for flexible pavement from 2016 to 2036 : 10,716,000
2016	11,200	1,200	56	4.9	900	40 year ESAL for flexible pavement from 2036 to 2056 : 22,153,000
2036	11,500	1,200	56	5.2	970	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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