ASSESSING THE FLOOD REDUCTION BENEFITS OF ON-ROAD STRUCTURES

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On-road Structures

Flow →

PROPOSED PROFILE TO BE CONSTRUCTED AS PART OF FAYETTE COUNTY’S ROADWAY IMPROVEMENT PLANS

SLOPE

POMONA PIPE PRODUCTS
ROOF STEEL TRASH RACK
WITH ANTI-VORTEX PLATE
OR EQUIVALENT

EXISTING GROUND PROFILE

PROPOSED GROUND PROFILE

PROPOSED 6’ DIA. MH

12’’ ORIFICE

INV = 1157.00

PROPOSED 10’’ RCP FES
INV = 1151.00

PROPOSED 9’’ LF. OF
15’’ DIA. RCP STORM
SEWER @ 2.0%

INV = 1150.70

EXISTING 36”x36” BOX CULVERT

INV = 1148.14

INV = 1149.02

TOP ELEV = 1159.50
a. Statewide GIS-based Analyses

b. Hydrologic Modeling

c. Web Platform
Statewide GIS-based Analyses
Statewide GIS-based Analyses

ac-ft  count
Statewide GIS-based Analyses

Iowa DOT On-road structure project status 8/31/2022

Legend
HUC12 Outlines
HUC12 ORS Capacity Storage (ac-ft)

- 0
- 1 - 300
- 301 - 600
- 601 - 1,200
- 1,201 - 4,800
- 4,801 - 25,000

1284 HUC12s hydro-enforced
1283 HUC12s with ORS model run
Planning Designs

\[ Q_{HP} = C_d A_{D1} \sqrt{2 \ g \ H_1} \]

\[ Q_{Orf} = C_d A_{D2} \sqrt{2 \ g \ H_2} \]

\[ Q_{Shf} = C \ D_3 \ H^{3/2} \]
Original Design:
Horizontal pipe [in] = 15"
Orifice [in] = 12"
Riser Pipe [in] = 6'
T = 100 YR

Design Data
Return Period:
T No. 1 [Yr] = 1
T No. 2 [Yr] = 50
T No. 3 [Yr] = 200

Diameters:
Horizontal Pipe [in] = 18
Orifice [in] = 14
Riser Pipe [ft] = 4

Elevations:
Horif [m] = 1.97
Hact [m] = 2.81
Hmax [m] = 5.62
Design Criteria

1. Horizontal pipe D <= 8% Hmax
2. Orifice D <= 10% Hmax
3. Horif = 70%Hact
4. Max water surface elevation for design riser pipe = 55% Hmax
Willow Creek
Mill Creek

Graph showing outflow (cfs) with dates from 2019-03-09 to 2019-03-21.

- ORS_3000 ac-ft
- Baseline

Map of Mill Creek area with streams and grid.