

Date: 1/14/2013

**Memorandum to: Road Design Group Coordinator****Bridge Design Squad/Team Leader**

From: Hydraulic Design Squad/Engineer Mungo (by AECOM)

Subject: Hydrology Data for Bridge Over Fishing Creek

County: York Rd/Rte.: S-103 Const. Pin: 31919

Structure No.: 467010300100

Bridge Length: 400 ft. Bridge Roadway Width: 37 ft.

Beg. Station: 58+97 End Station: 62+97 Skew Angle: 0 °

Bridge Span Configuration: 4-100's

Bridge Span Type: Type IV prestressed

Min. F. G. Elev.: 545.83 ft. Min. Low Steel: 540.09 ft.

End Fill Slope: 2 Riprap Req'd: Yes ☒ To Elevation: 540.70 ft.  
No ☐

Comments: Normal Rip Rap

Historical Highwater Elev. = 536.0 Josh Coggins, Fire Station Employee

Maximum Backwater Elevation Upstream of the Bridge

25 Year H. W. Elev. = 538.7 including 0.68 ft. Backwater

100 Year H. W. Elev. = 540.19 including 0.85 ft. Backwater

## HYDROLOGY DATA:

D. A. = 45.85 sq. mi. = 29344 ac.

Q<sub>25</sub> = 6250 cfs

Vel. = 7.47 ft/sec

25 Year W.S. Elev = 537.86 ft.

Q<sub>100</sub> = 8690 cfsVel.<sub>100</sub> = 7.88 ft/sec

100 Year W.S. Elev = 539.38 ft.

2 Year W.S. Elev = 535.4 ft.

## OVERTOPPING FLOOD:

Q = N/A cfs

Probability = N/A

cc: Program Manager  
Environmental Engineer Still

## Mungo, Randall

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**From:** Fedak, Ryan <Ryan.Fedak@aecom.com>  
**Sent:** Tuesday, January 15, 2013 2:48 PM  
**To:** Mungo, Randall  
**Subject:** RE: York S-103 New Alignment Files

Randall,

At this crossing, Fishing Creek is a FEMA Zone AE. We sized the shorter bridge to ensure that there will not be an increase in the 100-yr flood elevation compared to the existing conditions model. At XS 61477 just upstream of the proposed bridge, there is a 0.09 ft decrease in the 100-yr flood elevation. At XS 61798 about 350 ft upstream of the proposed bridge, there is a 0.55 ft decrease in the 100-yr flood elevation.

Is this is information you are looking for?

Thanks,  
Ryan

**Ryan Fedak, PE**  
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**From:** Mungo, Randall [<mailto:MungoGR@dot.state.sc.us>]  
**Sent:** Tuesday, January 15, 2013 2:20 PM  
**To:** Fedak, Ryan  
**Subject:** RE: York S-103 New Alignment Files

Thanks Ryan. Can you tell me for option 2 what the difference in headwater is compared to the existing bridge. Isn't this one in a Zone A? I'm wondering if we meet the Zone A criteria for FEMA without doing a re-map.

**From:** Fedak, Ryan [<mailto:Ryan.Fedak@aecom.com>]  
**Sent:** Tuesday, January 15, 2013 2:12 PM  
**To:** Mungo, Randall  
**Cc:** Shealy, Joy S.  
**Subject:** RE: York S-103 New Alignment Files

Randall,

We have completed the hydraulic analyses for the two options you requested. Attached are pdfs of the Bridge Data Sheets. As you directed, we used a horizontal roadway profile equal to the roadway elevation at the bridge. Below are brief descriptions of the bridges that correspond to the two options:

- 1- Bridge that meets all the hydraulic design requirements – A 400 ft four-span bridge will create 0.85 ft of backwater compared to the natural conditions for the 100-year flood. There is 2.2 ft of freeboard for the 25 year storm. The Low Steel Elevation is 540.09.
- 2- A shorter bridge that will require a design exception for backwater but it will not allow overtopping. A 200 ft two-span bridge will create 2.40 ft of backwater compared to the natural conditions for the 100-year flood. There is 2.03 ft of freeboard for the 25 year storm. The Low Steel Elevation is 541.34.

Please let me know if you have any questions or comments.

Thanks,  
Ryan

**Ryan Fedak, PE**  
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**From:** Mungo, Randall [<mailto:MungoGR@dot.state.sc.us>]  
**Sent:** Tuesday, January 08, 2013 8:28 AM  
**To:** Fedak, Ryan  
**Subject:** RE: York S-103 New Alignment Files

Ryan,  
The road will be raised in order to prevent any overtopping. You can assume a straight line and we can provide the specifics once we receive the minimum finished grade and bridge end stations and we determine the road profile.

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**From:** Fedak, Ryan [<mailto:Ryan.Fedak@aecom.com>]  
**Sent:** Friday, January 04, 2013 4:08 PM  
**To:** Mungo, Randall  
**Subject:** RE: York S-103 New Alignment Files

Randall,

This email is a follow-up to our phone conversation earlier today. We have been updating our HEC-RAS model and a question has arisen about the proposed roadway profile.

In our previous HEC-RAS modeling, we used the existing roadway profile to determine roadway overtopping. There is a significant amount of roadway overtopping for the 100-year flood because the low point in the roadway is approximately 4 ft lower than the bridge. However, with a revised horizontal alignment, we are looking for some direction regarding what to use for the proposed road grade. Will the roadway profile be similar to the existing or will it be raised so that it is not overtopped during the 100-year storm (or some design storm)?

Thanks,  
Ryan

**Ryan Fedak, PE**  
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**From:** Mungo, Randall [<mailto:MungoGR@dot.state.sc.us>]

**Sent:** Friday, November 30, 2012 8:47 AM

**To:** Fedak, Ryan

**Cc:** Lacy, Christopher R.; Shealy, Joy S.

**Subject:** York S-103 New Alignment Files

Ryan,

I have uploaded the files that I think you will need for the revised alignment for this project. Please let me know if you need any additional files. We are looking for 2 options:

- 1- Bridge that meets all the hydraulic design requirements
- 2- A shorter bridge that will require a design exception for backwater but it will not allow overtopping.

Let me know if we need to discuss further.

Randall Mungo, P.E.

Midlands RPG 3

Hydraulic Team Leader

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