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| HDR One Co alt format | Memo |
| To:  | Tom Barnitz, ODOT D9 |
| From:  | Kathryn Gruver, P.E. | Project:  | SCI-823-6.81 |
| CC:  | Brad Hyre, P.E., HDR PM |  |
| Date:  | December 14, 2011 | Job No: HDR 45878 |

**RE: Pre/Post Culvert Flow Rate Analysis**

**SCI-823-6.81 (Phase 1)**

 **PID 19415**

As requested by ODOT, a pre/post flow rate analysis was conducted on SCI-823-6.81 mainline culvert crossings. Each culvert crossing was analyzed at the point where the culverted stream flow exits the ODOT L/A right of way. The SCS TR-55 method was used to compare pre and post construction flow rates. The flow rates below may differ from those used in the hydraulic design calculations for the culverts. The culverts are designed using hydrology obtained from the regression equation, which is not applicable in pre/post condition analysis. The regression equation does not take into consideration surface conditions.

The table below summarizes the existing and proposed conditions for each of the culverted streams. One culvert, at Sta 504+53, has a significant increase in flow rate due to its relatively small drainage area causing the new construction area to have a greater impact on the overall surface conditions. Improvements were made to the downstream property including a larger drive pipe and channel modification to accommodate the increased flow rate.

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| --- | --- | --- | --- | --- | --- |
| Station | CulvertSize | Existing Condition | Post Construction | Percent change |  |
|  |  | 50 yr | 100 yr | 50 yr | 100 yr |  |  |
| 353+88 | 54” | 62 | 68 | 64 | 71 | 4% |  |
| 364+36 | 54” | 87 | 96 | 86 | 94 | -2% |  |
| 375+08 | 78” | 286 | 313 | 291 | 318 | 2% |  |
| 403+76 | 72” | 120 | 136 | 122 | 138 | 1% |  |
| 412+26 | 48” | 41 | 47 | 40 | 45 | -4% |  |
| 465+00 | 72” | 195 | 218 | 200 | 223 | 2% |  |
| 473+00 | 54” | 103 | 113 | 104 | 115 | 2% |  |
| 504+53 | 54” | 47 | 54 | 60 | 75 | 21% | Oliver Road Property - Ditch and Drive pipe improvement |