July 30, 2025

Mr. Mark Biberdorf, Town Manager
Town of Fletcher
Post Office Box 369
Fletcher, North Carolina 28732

RE: Wilkie Way culvert recommendations

Dear Mr. Biberdorf,

As part of our technical engineering consulting contract, we have analyzed the existing 18" stormwater culvert that discharges onto 100 & 96 Wilkie Way, drains across 6 Wilkie Way, and ultimately into Higgins Branch.

The existing 18" CMP culvert described above was due for routine maintenance. Upon inspection of the pipe discharge, a makeshift stormwater pipe plug was discovered. The pipe plug was concrete, and a rectangular orifice was formed at the top of the plug, with approximate dimensions of 2" x 4". As part of the maintenance, the plug was removed.

Photo of storm pipe with plug



Photo of storm pipe with plug removed



Following the removal of the plug and the occurrence of multiple rainfall events, the property owner located at 96 Wilkie Way began experiencing flooding issues in his driveway and basement. After multiple conversations between the Town of Fletcher and the property owners of 96 & 6 Wilkie Way, McGill Associates was included to provide stormwater recommendations to the Town.

Modifications to existing ditch and storm pipe

McGill Associates and the Town of Fletcher met on-site to inspect the existing conditions of the downstream properties. The receiving ditch appears to have accumulation of sediment within the rip rap apron, and a 12" (approximate size) storm pipe in the northeastern corner of 6 Wilkie Way was found. It appears this pipe captures upstream stormwater runoff and discharges it to the upstream side of the southern driveway as sketched on the photo below.

Photo of receiving ditch



Approximate pipe location on 6 Wilkie Way



At the request of the Town, we analyzed what would be required on the downstream properties to efficiently convey the upstream stormwater runoff. We have determined the Rational Method is best suited for the conveyance sizing, and we recommend sizing the conveyance to pass a 25-year storm event. With these parameters, we have determined that a trapezoidal ditch (2' bottom, 3:1 side slopes, 1' deep) would have sufficient capacity to adequately convey the flow that is leaving the existing unobstructed culvert. Based on our inspection and our calculations, the existing ditch does not currently have adequate capacity, and this may be causing the flooding issue that 96 Wilkie Way is experiencing. We are also finding that the existing 12" storm pipe on 6 Wilkie Way is undersized and would require a 24" pipe to adequately convey the upstream stormwater runoff.

Installation of weir plate on existing culvert

We also analyzed welding a steel weir plate (with an orifice) to the downstream end of the existing culvert to mimic the stormwater runoff condition the concrete plug/orifice were creating. The estimated cost for installation of a weir plate is approximately $1500. The GIS topo indicates there is an impoundment area within the existing roadside ditch, upstream of the existing culvert that spans across 97 & 101 Wilkie Way. Once the impoundment area is full (1-year storm event), runoff appears to crest the high point and enter the roadside ditch to the south, running across 105, 109, & 115 Wilkie Way. Once the high point is crested, the conveyance measures to the south experience the following flowrates **in addition** to what they appear to be designed to handle:

10-year: 12.92 cfs
25-year: 18.05 cfs

We modeled the existing conveyance measures on 105, 109, & 115 Wilkie Way with the additional flowrates noted above and find that none of the downstream measures are adequately sized to handle them. What is likely happening is the driveway culverts are backing up stormwater runoff to the point that it flows over the existing driveways. Because of this, we cannot recommend installing any device that would impede the flows leaving the existing 18" culvert. We also compared this to a model of the culvert without obstruction, and it shows that the high point of the ditch is not crested until a 25-year storm, which is a standard storm event design for these measures in Western North Carolina.

In North Carolina, the issue of stormwater discharges onto downstream property is governed by the Reasonable Use Rule. The rule states that the downstream landowner must receive and pass the water from the higher estate(s). They cannot simply block the natural flow of water coming onto their property. North Carolina law also includes statutes that prohibit obstructing streams, drainage ways, and easements that carry water from higher elevations.

In summary, it is our professional opinion that the Town of Fletcher is not responsible for stormwater conveyance past the discharge point of the existing culvert and should leave the culvert to convey stormwater as the original intention appears to be. We do not recommend obstructing runoff from the existing culvert due to the upstream issues noted above. It is recommended that improvements to the downstream conveyance measures (also noted above) take place to mitigate the flooding issues that the downstream property owners are experiencing.

If you have any questions or require additional information, please feel free to give me a call (828) 252-0575 or email me.

Sincerely,
McGILL ASSOCIATES, P.A.

BEN CATHEY, PE
Practice Area Leader