

THE UNIVERSITY of TENNESSEE   
INSTITUTE *for* PUBLIC SERVICE

MUNICIPAL TECHNICAL ADVISORY SERVICE

May 12, 2011

Mr. Jack Black, Councilmember  
City of Norris  
20 Chestnut Drive  
Norris, TN 37828

Dear Mr. Black:

Recently I met with you and Thurman Spencer to review drainage structures in the city. Specifically, the city has several stone lined ditches along city streets, and for several reasons, some of the ditches are cause for concern. One of the areas of most concern that we reviewed was the ditches along Oak Road. The photos below were taken on April 28, 2011 at approximately 131 Oak Road.



Oak Road is a narrow street (less than 20') with no surface markings. The street has built-up asphalt overlays with a surface that appears in very good condition. Houses are closely spaced along this street and there are many driveways with culverts of various sizes and materials (corrugated metal, concrete, etc.). Also, a church and park are located on this street. Thus Oak Road is heavily traveled.

I understand that there are concerns about vehicles leaving the roadway and traveling into the ditch. As shown in the photos above, there is a deep drop-off in some areas. There is also concern

about the amount of time city crews must devote to weed control and maintenance of the stone lined ditches.

We also examined ditches in other areas. The photos below are examples of ditch conditions along Norris Road. While these ditches show the maintenance issues associated with weed control, the safety concern here is not as critical as it is on Oak Road.



The Federal Highway Administration (FHWA) provides information on its website at [www.fhwa.dot.gov](http://www.fhwa.dot.gov) on unsafe drainage features. FHWA encourages that drainage structures be designed to be crashworthy. Crashworthy in regard to a highway feature means that the highway appurtenance (such as a ditch) will not stop a vehicle abruptly, cause the driver to lose control or cause the vehicle to roll over. Ditches that are bumpy, too steep and/or too deep are of concern. You have already recognized this concern in that your priorities in correcting these problems are (1) safety, (2) maintenance costs and (3) aesthetics.

On the day of my visit, we briefly discussed possible remedies:

- Replacing rock lined ditches with drainage pipe.
- Leaving the rock lined ditches in place and filling over the rock lining with an engineered soil system.
- Placing a concrete liner over rock lined ditches in certain areas.

We also discussed sources of funding. There aren't grants available for ditch improvements. The city could use state-street aid monies or seek loans. Please see the MTAS publication "Finding Money" at [www.mtas.tennessee.edu](http://www.mtas.tennessee.edu)

MTAS recommends for the right side (traveling downhill) ditch on Oak Road, that the city pursue the option of leaving the rock lined ditch in place and filling over the rock lining with an engineered soil system and pavers. Below is an illustration on such a system using layers of soil, geotextile and pavers. More information is available at [www.grass-reinforcement.com](http://www.grass-reinforcement.com)



This system will:

1. not disturb existing rock lined ditches;
2. provide drainage;
3. allow for a smooth surface adjacent to and almost level with the roadway;
4. provide a support surface for any vehicles that may leave the roadway; and
5. provide for easy mowing maintenance for city crews.

There are various manufacturers of engineered soil infiltration systems and pavers. One such provider is Jen Hill Construction Materials in Knoxville, TN. They work with local governments. Here's the link: [www.jenhill.com](http://www.jenhill.com). MTAS has requested more specific information from Jen Hill for Norris' ditch issues. If we receive that information, I will forward it to you.

If you decide to schedule an appointment with Jen Hill, please give me a call as I would like to be present if possible. I hope this is helpful. Thank you for contacting MTAS about this project. Please let me know if I may be of further help.

Sincerely,

*Sharon Rollins*

Sharon Rollins, P.E.  
Public Works/Engineering Consultant