Red Rose 1: 2002 Page 1/2

Barree Twp, Huntingdon County

Fill and Drainage Completed: 2001
DSA Placed: 2002 (overlayed in 2017)

Project Overview:

Red Rose Road was an extensive road rehabilitation project that was completed in 2001, with Driving Surface Aggregate placed on the road in 2002. This demonstration project was completed in cooperation with the Huntingdon County Conservation District, the Penn State Experimental Forest, and Barree Township.

The Problem:

Red Rose Road was a severely "entrenched" roadway. The road elevation had been lowered over time by traffic, erosion, and maintenance activities. Over 1,200 feet of road was acting like a stream channel, collecting water from the surrounding land and funneling it to the small stream below. The long ditch drainage overwhelmed the small stream with excessive flows and sediment. The road also had a steep drop-off to the stream after the crossing, and was heavily shaded.

The Solution:

The best permanent solution for Red Rose Road was to restore a more natural drainage pattern by raising the road elevation. An on-site shale pit was used to raise over 1,000 linear feet of road 3 to 6 feet in elevation in compacted 8" lifts. (See photo sequence on reverse) Raising the road eliminated the downslope ditch, and provided necessary cover for crosspipes to be installed to drain the upslope ditch.

In addition to raising the road elevation, several other Environmentally Sensitive Maintenance Practices were implemented. Trees around the road were selectively thinned to reduce canopy cover without wholesale "daylighting" of the road. The section of road immediately after the crossing was shifted upslope approximately 50' to provide a stable buffer between the road and stream. Several gradebreaks were installed on the road to provide pipe cover and prevent drainage from flowing down the road. The shale pit was retired after the project. Rootwads, stumps, and logs were used to stabilize both the shale pit and downslope bank on the relocated road.

Project Facts

Project:	Red Rose Road
Project Owner:	Barree Township
Watershed:	Shavers Creek (HQ)
Project Length:	2,500 feet
Date Completed:	2001, DSA in 2002

Cost Summary (2001 costs):

Road Fill & Drainage: ~$35,000

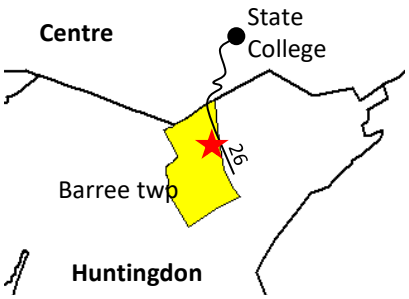
Included road filling (shale free on site), pipes, shale pit retirement, tree thinning, and bank stabilization.

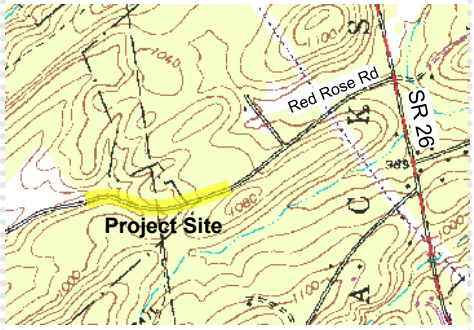
DSA: ~$10,000

6" compacted depth, paver placed, roller compacted

For More Information:

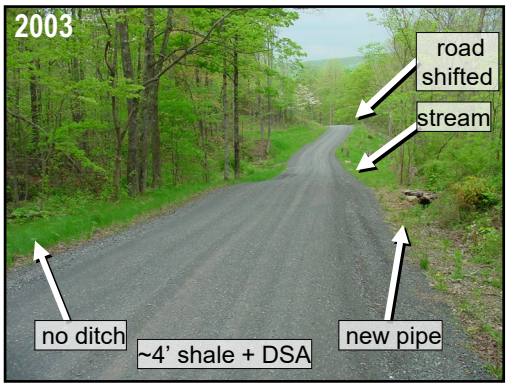
Center for Dirt and Gravel Road Studies
(814) 865-5355 www.dirtandgravelroads.org





Lat: 40° 40' 38" N Long: 77° 53' 25" W

BEFORE. Entrenched road traps runoff in ditch, transporting it to stream. Heavy canopy and insufficient cover to install crosspipes.



AFTER. Raised road eliminates left ditch, and provides cover for pipes to drain right ditch. Trees thinned and road shifted away from stream.

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Center for Dirt and Gravel Road Studies

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Barree Twp, Huntingdon County

Fill and Drainage Completed: 2001
DSA Placed: 2002 *(financial data not relevant 20 years later)*

Two Decades Later…

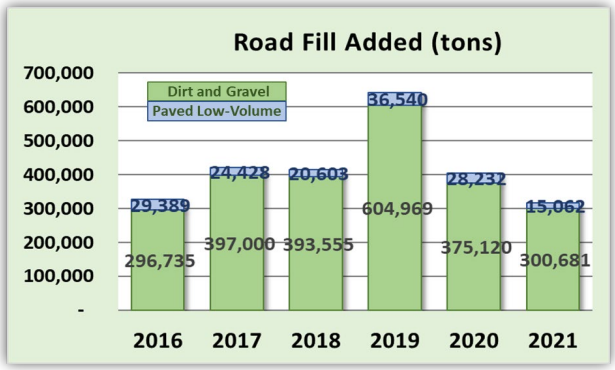
Filling the road and adding crosspipes are relatively permanent solutions. The drainage on Red Rose Road has withstood the test of time very well. The road still sheds water from its downslope side. Gradebreaks are still functioning to insure water does not flow down the road. The added crosspipes still function to separate uphill ditch flow into manageable volumes and outlet it away from the stream. The Driving Surface aggregate performed well for 15 years. An additional lift of DSA was placed on the road in 2017 as part of a larger project funded by other sources.

Road Fill

Many roads in Pennsylvania are entrenched or "sunken". This process happens slowly over time. A road that loses only one inch of surface a year due to traffic, erosion, and grading will be entrenched two feet in a matter of 25 years! It is often impossible to get drainage out of an entrenched road, so filling the road is the only solution to drainage issues.

Before (2001): Entrenched road with no drainage outlets.

Statewide, the DGLVR Program utilizes over 300,000 tons of road fill a year, as illustrated in the graph below



During (2001): Beginning to fill road with local shale.

During (2001): Final road base elevation achieved.

During (2002): Capping fill with DSA.

2022: Pipes and road fill still shed water.

Red Rose 2: 2020 and 2022

Jackson Twp, Huntingdon County

Drainage: 2020, $37K grant + $28K in-kind
DSA: 2022, $20K grant + $12K in-kind

Before (2020): Entrenched road traps water on surface.

During 1: Adding shale in 12" lifts then compacting

During 2: Compacted shale base ready for pipes and 2A.

During 3: Installing shallow pipe in new shale.

After (2020): Drainage complete, 2A surface.

2022: New pipe below driveway, DSA surface.

Notes:

- Road was entrenched with one crosspipe that was often bypassed or clogged
- Much of drainage was trapped on road and entered stream near route 26.
- An average of 18" of fill (12" shale capped with 6" of 2A) was utilized over the entire road to establish sheet flow and provide cover for installing shallow crosspipes.
- Seven new shallow crosspipes (and one replacement) were installed to disperse drainage. Care was taken to outlet pipes at ground level with minimal or no "outlet trenches". The landowner was very cooperative and care was taken not to put additional water on the driveway to the North about 2/3 the way up the hill.
- DSA was placed on the road in 2022, two years after drainage work was complete.

Camp Road: 2022

Jackson Twp, Huntingdon County

Installed in August 2022, contract not finalized yet.
Contracted for $88,000

Camp Road: The twin 24' pipes in this stream were significantly undersized. They caused gravel bars to form upstream which required constant maintenance from the township. The were also prone to plugging in this 100% forested watershed, causing the stream to overtop and wash out the road.

Before: Twin 24" pipes were severely undersized for this 7' channel causing a host of issues.

After: A 10' wide by 5' high plate arch is buried ~18"' deep into the stream channel.

Stream Crossing Replacements

Stream crossing replacements are eligible DGLVR projects, if they provide environmental improvements. This is tied to the Program's founding mission of reducing sedimentation to Pennsylvania's streams.

Undersized Stream Crossings

Many of Pennsylvania's stream culverts and bridges are significantly undersized for the streams they attempt to convey. This is due to several reasons, but mostly to save on initial structure costs. Crossing that are undersized can cause a host of problems including: gravel bar formation upstream (and constant need to cleanout), excessive erosion downstream (from pressurized flow), erosion to the road area, partial or complete barriers to the movement of fish and other aquatic organisms, and even catastrophic road washouts.

DGLVR Focus on Undersized Crossings

To be eligible for DGLVR funding, stream crossing must represent a significant "constriction" to the natural stream channel. Structures that constrict the stream to 75% or less of its natural channel width (called the bankfull width) are eligible for replacement since they are most likely to experience the problems listed above

Requirements for DGLVR Funded Stream Crossings:

The Program enacted new Policy and a new Standard in 2022 to guide stream crossing replacements. The goal of this effort is to provide **Stream Continuity** (see below) through the road. This requires the use of larger structures and often means that significant improvements must be made to stabilize a stream channel that has been impacted by decades of erosion from undersized structures. While the projects may cost more up-front, long-term savings in maintenance, erosion, and potential road washouts are realized over the 75-100 year lifespan expected from many of these structures.

Stream Continuity is the goal: As the name implies, the goal is to provide a stream that has continuity upstream, through, and downstream of the road crossing. **Continuity means that the steam has similar slopes, dimensions, and characteristics to the natural channel.** Continuity means that fish, aquatic organisms, sediment, and even debris such as floating trees, are able to move naturally through the system. Providing continuity also greatly increases flow capacity and reduces the potential for catastrophic road damage as storms get more intense in our changing climate.