

“THROUGH-THE-BANK” PIPE – A pipe placed in the down-slope road bank to carry ditch drainage through the bank and away from the road.

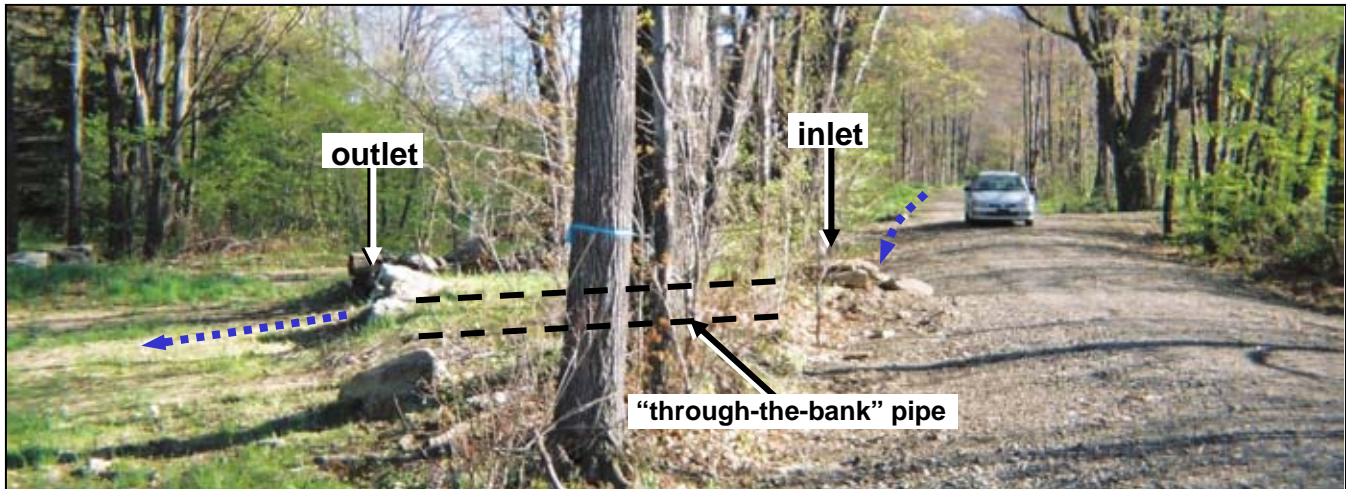


Photo 1. This “Through-the-Bank” pipe provides an outlet for road drainage that is trapped in the road corridor by road banks. The pipe inlet is located in the road ditch, and the outlet is at the natural ground elevation where the water can drain away from the road.

PURPOSE - “Through-the-bank” pipes provide additional outlets for ditch drainage that would otherwise be confined to the road corridor by the road bank on the downhill side of the road. On an entrenched road (a road that is sunken below the surrounding terrain), bank pipes can be used in conjunction with traditional culverts to provide additional outlets for road drainage. Through-the-bank pipes capture ditch flow and direct it away from the road to a point of lower elevation. The water is outletted at the natural ground elevation where it can flow away from the roadway. **(Fig B)**

BENEFITS

- Provides additional outlets for road drainage that would otherwise be trapped in the road corridor.
- Reduces length of flow of road drainage, which reduces the water velocity and erosion potential to the ditch, road bank, and road shoulder.
- Good alternative to “turnout trenches” that disturb the bank and require constant maintenance.

WHERE TO USE

- Any time a traditional “turn out” would disturb a large area of road bank.
- On entrenched roads (roads lower than the surrounding terrain) where drainage is funneled into the roadway without any opportunity for outlet.
- On entrenched roads where raising the road profile to a level above the surrounding roadbanks is impractical due to cost, absence of suitable fill material, or other limitations.
- On roads where water is trapped on the roadway because maintenance practices have created artificial roadside banks or berms that are difficult to remove on the down slope side of the road.
- Where an appropriate drainage area exists but is obscured by a down slope road bank.

IMPORTANT CONSIDERATIONS

EQUIPMENT

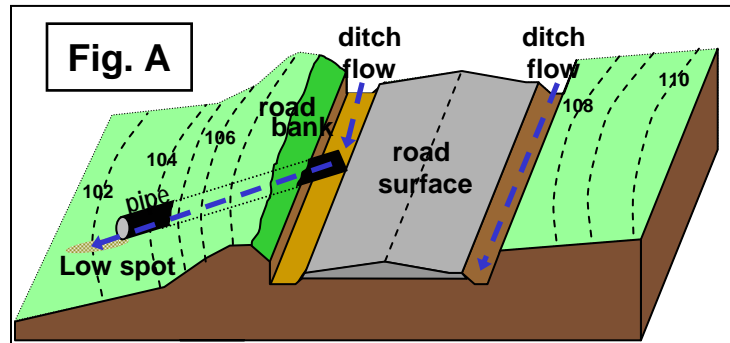
- A backhoe can typically be used to excavate the pipe trench from the roadway. Bank pipes can be installed with minimal off right-of-way impacts.

SITE SELECTION

- A leveling tool is recommended when locating and installing these pipes. Proper fall of the pipe into an appropriate drainage area is required for through-the-bank pipes to function correctly. Maintain at least a 1% fall in the pipe as with all crosspipes.
- Pipes should be outletted at the elevation of existing terrain to avoid the need for an outlet trench. Be sure that outlet water will flow away from the road!
- Vegetation may be affected by the excavation of the pipe trench. Look for areas to place the pipe trench that will minimize impacts on existing vegetation.

PIPE INSTALLATION

- Excavate pipe trench through the bank so that the inlet of the pipe lays on the bottom of the existing ditch. (**Photo 2**)
- “Through-the-Bank” pipes do not need the same amount of cover that cross pipes require since traffic is not crossing them. Excavated material from the pipe trench can be re-used as cover over the pipes. This will also help with vegetation re-establishment.
- Seeding and mulching of the disturbed soil is important. Native vegetation should be used whenever possible, as these plants are adapted to the site and will provide erosion protection. Non-native plants should be avoided.
- Outlet the bank pipe on the existing ground elevation to minimize disturbed area and to provide a stable outlet site. Native stone headwalls and endwalls are recommended to reduce erosion around the pipe.



Figures not drawn to scale.

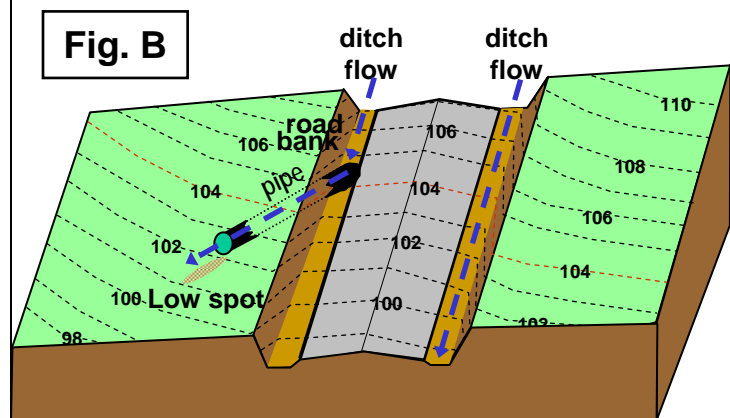


Figure A shows how a “through-the-bank” pipe can be used to “punch a hole” in an immovable bank or berm to get water off the road. Figure B shows a less obvious scenario where the “through-the-bank” is installed on an entrenched road. Using a level is important in these situations because the pipe may actually appear to run uphill with the naked eye, especially on steeper roads!



Photo 2. This is the inlet of the same “through-the-bank” pipe shown in Photo 1. The pipe has just been placed and is about to be covered.