

Technical Bulletin

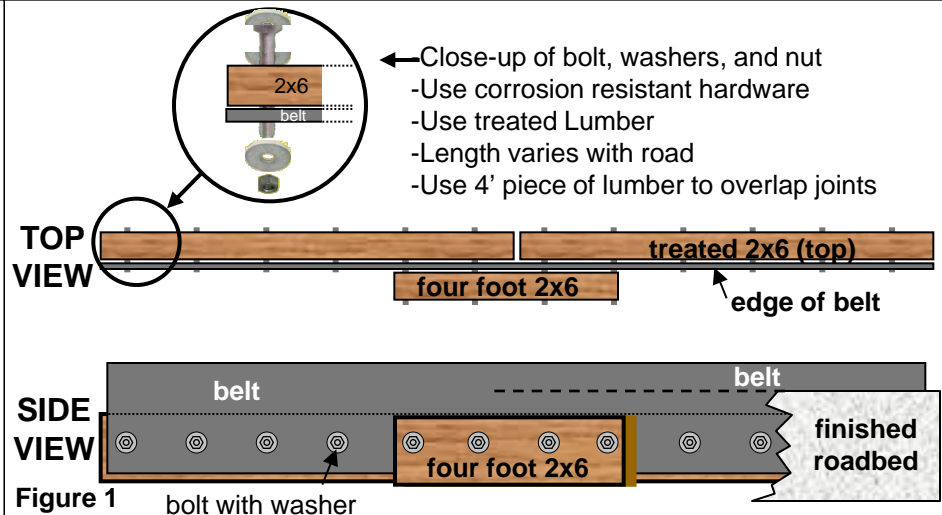
Conveyor Belt Diversion

CONVEYOR BELT DIVERSION – A structure used on low traffic roads to divert water off the road surface. It consists of a piece of used conveyor belt bolted to treated lumber and buried in the road.



Photo 1

Completed Conveyor Belt Diversion



PURPOSE

Conveyor Belt Diversions reduce erosion caused by flowing water that is trapped in wheel tracks and ruts by diverting concentrated drainage from the surface of the road while still allowing vehicles to pass. The belt diversion gives under tire pressure, then springs back to its original position (see step 5 on reverse).

BENEFITS OF A CONVEYOR BELT DIVERSION

- forces water off the road surface similar to waterbars or grade-breaks to reduce erosion on road surface
- functions when road crown is lost (provided belt diversions are properly spaced)
- will not deform or crush under heavy hauling as can be the case with earthen and aggregate structures
- has a long life expectancy and low maintenance

WHERE TO USE A CONVEYOR BELT DIVERSION

- Low volume (traffic) roads and access roads (consider for driveways, farm lanes, and camp lanes)
 - they are NOT suitable for roads that receive high traffic volume, fast traffic, frequent grading, or snow plowing
 - they work well for “off right of way” water issues
- on sloping sections of low traffic roads with evidence of water velocity damage to the surface
- on roads that do not receive sufficient surface maintenance to maintain proper crown or cross-slope

CONSIDERATIONS

- Large rocks should be placed at the end of the diversion to slow water and disperse flow.
- Multiple Conveyor Belt Diversions may be used to prevent the buildup of erosive volume and velocity. Spacing between the diversions is determined by the grade of the road, the stability of the surface material, available outlets, and the amount of water entering the road drainage system (including off right-of-way sources).



Photo 2

Low volume access lanes such as this are ideal candidates for diversions.

TYPICAL REQUIREMENTS:

MATERIALS (to build)

- (1) conveyor belt ½" x ~15" x necessary length
- treated 2"x6" lumber
 - length and number depends on road width—overlap joints with 4' length board (see diagram on front)
- (12) 3/8" diameter bolts and nuts (length varies with belt)
- (24) wide diameter washers
- tools: utility knife; drill; hammer; adjustable wrenches

EQUIPMENT (to install)

- backhoe, excavator, or trenching machine
- upright tamper (Jumping Jack)
- shovel and rake

CONSTRUCTION: Building diversion (see diagram on front)

Note: These instructions assume 20' length. Yours will vary.

1. Cut conveyor belt into ~15" x 20' piece.
2. Lay belt on two 2"x6"x10' boards laid end to end. Leave ~8" of belt above board (4" to be buried & 4" left above road).
3. Starting at one end, drill holes through belt and lumber (~2' spacing) and secure with bolts and washers. **(Step 1)**
4. On diversions longer than 16', a lumber joint is necessary. Longer bolts should be used to attach a 4' piece of lumber on the opposite side of the belt at the joint (visible in **Step 2**).

INSTALLATION (Installing diversion)

1. Excavate a trench diagonally across the road
 - a. Angle: Dig trench at min 30% angle to road **(Step 3)**.
 - b. Fall: Minimum of 1% of continuous fall toward the outlet.
 - c. Width: Wide enough trench to allow for compaction equipment beside the belt diversion (typically 15" – 18").
 - d. Depth: The trench should be deep enough to provide 3"-4" of cover over the top of the supporting 2" x 6" board.
2. Place the diversion against bottom edge of the trench, leaving ~4" of the belt exposed above the final road surface. **(Step 2)**
3. Backfill the trench and compact with a tamper. **(Step 3 & 4)**
4. Place large stones at the end of the diversion to control erosion.
5. Mark the ends of the Conveyor Belt Diversion with reflective posts to avoid damage during future maintenance.

ADDITIONAL NOTES

- Be sure diversion is long enough to a) be angled across roadway and b) insure that water does not flow back to the roadway around the end of the diversion.
- Used belts may be available at a local quarry or mine at low or even no cost. Belts typically come in 26"-30" widths. Unless they contain steel, most belts can be cut with a utility knife.
- Once the belt is cut in half lengthwise, it will begin to bow. You will need to adjust the belt as you secure it to the boards.
- For longer diversions. It may be easier to construct the belt, then remove the 4' joint board. The diversion can then be folded in half for transport and reassembled on site.

This document is based on a brochure produced by PA's Indiana County Conservation District.

