

# 2018 Cumberland County Field Day

## Beetem Hollow Road Cold Springs Road

1. **Beetem Hollow Road 4, Penn Township:** Contracted Project, LVR, \$135.5K + 66K In-kind

- Existing Structure: 6'10" x 4'10" squash metal pipe
- Bankfull Channel Width: 13'8"
- New Structure:
  - Size: 14 ft wide x 6 ft deep x 60 ft long
  - Type: Bottomless Box Culvert
  - Other Notes: extended inlet and outlet and stream restoration considerations



2. **Beetem Hollow 2, Penn Township:** Completed Project, LVR, \$ 138K Grant + \$43.5K In-kind

Part I: Box Culvert: \$69.5K Grant; 21.7K In-kind

- Existing Structure: 4ft round concrete pipe
- Bankfull Channel Width: 12 ft
- New Structure:
  - Size: 12 ft wide x 6 ft deep x 36 ft long
  - Type: Open Bottom Box Culvert
- Other notes: Box sits on precast footers buried by ~ 2 ft of material.



Part 2: Drainage: \$68.5K Grant, 21.8K In-kind

- Wet road base, spring seeps in both ditches
- 500 ft French Mattress
- 800 ft of Underdrain (400 ft on each side of road)
- Paved over French Mattress
- new cross pipe 35" x 24" metal

3. **Cold Springs Road, Dickinson Township:** On-going Project. So far: \$344K Grant + \$43K In-kind

- 2.4 Mile Project!
- 43 Shallow Cross Pipes with Turn outs
  - 23 cross pipes in 2016, 20 cross pipes in 2017
- 1,200 ft of underdrain
- 10,000 tons of shale to build base and crown
- 2,795 tons of DSA on top mile of road



**DICKINSON TOWNSHIP**  
MT HOLLY SPRINGS, PA



## Beetem Hollow 4 Penn Township

Status: Contract  
Length: 100 ft

Construction: Summer 2019  
Contract: \$135K

**Summary:** Existing structure is undersized and failing. Head wall and end wall are undermined and starting to fall in. There is a large scour hole at the outlet of the pipe and a large gravel bar deposited downstream of the scour hole. There are eroded banks at outlet pipe, which was patched with pavement to help hold the bank, but this is also being scoured from the back water. On the inlet side, the stream has created a braided channel at an angle. The culvert pipe is corroded and allows water to flow under the existing pipe.



**New structure** (60 ft long x 14 ft wide) Open-bottom concrete box culvert and will be extended upstream to help direct the flow of stream into the structure. The outlet side is also being extended for safety conditions of the road. Stream channel will have fill placed to help with reconstruct the channel width at the culvert to prevent backwater from circling. Scour hole will be restored to natural conditions.

### Considerations for stream crossings:

- Stream Crossing Policy-reference reach and channel width, structure size, impact structure has on stream, Gravel Bars and scour holes, bank Erosion, stream bed material, stream substrate material
- Permitting--Request for Proposal form—will help with scope of work for engineering costs and estimating construction costs
- New structure:
  - Type? Box Culvert, metal arch structure, squash pipe—no round pipes!
  - Alignment: does it need re-aligned? Can it be re-aligned?
  - Size—Road profile! Can the new pipe fit? At least 6" of stream material in bottom of pipe
  - Construction-equipment?, pumps?, overhead wires?
  - Stream Restoration: Bank stabilization/scour hole/channel width, permitting?  
Grade Control! Materials to construct grade control?



## Beetem Hollow 2 Penn Township

Status: Completed  
Length: 800 ft

Construction: Aug 2017  
Contract: \$138K

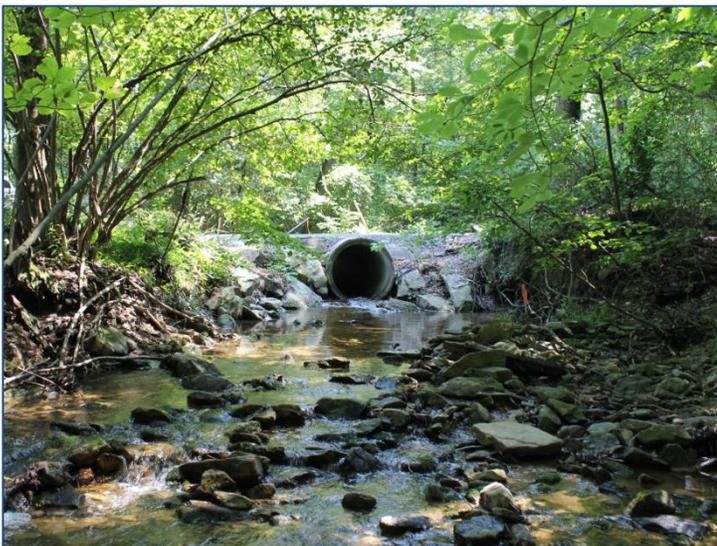
### Summary:

Under-sized culvert would overflow, which would cause the water to flow down the road and wash away the R-4 stones in the ditch. Spring seeps along both sides of the road and water in the base of the road caused the pavement in the center of the road to also fail. This road is a dead end road, which created a huge challenge for construction of this culvert. Penn Township, in partnership with Dickinson Township, Cooke Township, and South Newton Township constructed the box culvert in 3 days!



### Solutions:

- Stream Pipe: New 12 ft x 6 ft open-bottom concrete box culvert installed, with pre-cast footers and wing walls
- 800 ft of udrain to transfer spring seeps
- 500 ft French Mattress to dry out road base, connected to udrain and pavement over French Mattress
- New cross pipe for small feeder stream (35"x24")



# Cold Springs Road Dickinson Township

Status: In Progress  
Length: 12,600 ft

Construction: 2016-2019  
Contract: \$344K

## Summary:

This is a multi-phased, multiple year project that started in 2016. The entire project site is 2.4 miles long. Before work began on this project, the road was very rutted and almost impassable. Water would channelize in the wheel ruts and bypass the existing drainage pipes. The township added a lot of material before the first phase of the project started in summer 2016 with drainage work.

## Solution:

### **Phase 1, 2016:** 23 Shallow Cross Pipes

- Shallow cross pipes installed on a sharp angle to help direct the water into the pipe—cut the inlet of pipe
- Create a water break to keep the water from continuous flow down the road

### **Phase 2, 2017:** 20 Shallow Cross Pipes and 1200 feet of udrain

- Ground water table rose and we found lots of water!

### **Phase 3, 2018:** Additional underdrain (Township in-kind) and 2.4 miles of Shale (10,000 tons)

- Three separate areas had ground water pumping springs in the middle of the road!
- Added 10,000 tons of material to base and established 4-6% crown

### **Phase 4, 2018:** 2,795 tons Driving Surface Aggregate

- Paver placed on 5,875 ft of road, 6" loose material compacted to 4.5" with 5% crown

### **Phase 5, 2019:** DSA on rest of road?

