





Dealing with Road Drainage
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Obstructing Waterways
Discussion Topics


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Obstructing Waterways
Discussion Topics
1. Storm Water Runoff


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Obstructing Waterways

Discussion Topics

1. Storm Water Runoff
2. Ohio Drainage Law




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Obstructing Waterways

Discussion Topics

1. Storm Water Runoff
2. Ohio Drainage Law
3. OEPA Regulations




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Obstructing Waterways

Discussion Topics

1. Storm Water Runoff
2. Ohio Drainage Law
3. OEPA Regulations
4. Roadside Options




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Storm Water Runoff

Runoff concerns:

- Pesticides
- Herbicides
- Sediments
- Nutrients i.e. fertilizers
- Fodder/Trash/Debris
- Volume
- Flow Rate i.e. velocity




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Storm Water Runoff

Water runoff due to:


- Rain
- Melted snow
- Irrigation



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Storm Water Runoff


- Watersheds incorporate an entire area of land draining into a catch basin, ditch, stream or river.
- The intentions are to prevent localized flooding, however, when an obstruction is preventing excess storm water to flow through, the effects can be seen upstream.
- Ditch maintenance is critical in the efficiency of waterflow in rural areas as it is the primary mean of drainage.



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Storm Water Runoff


- Obstructed waterways can result in various unfortunate situations, including but not limited to
 - Flooding
 - Septic system failures
 - Delays in planting and harvesting
 - Soil compaction
 - Softening roadway subgrades
- Problem may originate a few miles away



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Ohio Drainage Law

- What happens when an obstruction is found?
- Ohio Laws and Rules; Code 5589.06 Obstructing ditch, drain, or watercourse – duty of superintendent.
 - Township Highway Superintendent
 - Townships Trustees
 - Written notice to person/firm/corporation/agent in charge of property.
 - Proceed to remove obstruction within 5 days
 - Should be done within reasonable time.



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Ohio Drainage Law

Ohio follows “Reasonable Use” legal doctrine

Applies to drainage and subsurface water disputes

Landowner may make reasonable use of their land

- Flow of waters can be altered
- Waters can cause harm
 - Not liable for harm unless harm is deemed unreasonable




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Ohio Drainage Law

“Reasonable” vs “Unreasonable”
Case by case basis

- Balance harm against need and usefulness
- Extent of harm caused
- Fairness of requiring the victim to endure harm
- Suitability and social value of drainage use and harmed property
- Practicality of avoiding harm




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Ohio Drainage Law

Unreasonable Surface Drainage Change

- ✓ Little social value
- ✓ Not suited to the area
- ✓ Causes extensive harm to a property use that is suitable to the area
- ✓ Easily remedied to avoid the harm

➔ Violation of Ohio’s Reasonable Use Law




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Ohio Drainage Law

Water Disputes

Solved by one of two methods

1. Cooperation
2. Civil Litigation
 - ❖ Judge decides harm
 - Reasonable
 - Unreasonable




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Ohio Drainage Law

2003: Drainage Mitigation Law

- ❖ Prevent drainage interferences caused by new development
- ❖ Avoid negative impacts on existing drainage
- ❖ Proactively prevents drainage conflicts between landowners

Ohio Revised Code Section 307.37



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Ohio Drainage Law

Group Drainage Projects

Landowner files a petition with either

1. Soil and Water Conservation Service
- OR -
2. County Commissioners

- ❖ County Commissioners can levy assessments whether filed with Soil and Water or Commissioners



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Ohio Drainage Law

Each County is directed to create a Ditch Maintenance Fund

Used exclusively for:

- Upkeep
- Repair
- Maintenance

Any drainage improvements constructed through either ditch petition process




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Ohio Drainage Law

Landowners can do drainage projects privately

Cooperation with affected neighbors

Written agreements for cost and upkeep of drainage infrastructure



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Ohio Drainage Law


- Petition filed to Board of county commissioners
- The Board may deem a ditch improvement as necessary when it appears to be the best course of action.
- Ditch improvements include relocate, reconstruct, straighten, deepen, widen, etc.



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Ohio Drainage Law

- The process of filing a petition
 - Ohio Revised Code 6131:
 - The petition is filed to the clerk of the Board of Commissioners.
 - The project is reviewed by the commissioners.
 - Hearing is held for the public input.
 - County Engineer ordered to prepare plans and schedules and report to the commissioners.
 - A final hearing must be conducted. Once held, bids can be received, and construction can take place
 - Project goes on maintenance



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Ohio Drainage Law

- Keep in mind the project objectives.
 - Provide a modern and feasible drainage outlet for residential drainage, as well as agricultural drainage.
 - Landscaping and tree locations relative to the improvement.
 - Known and anticipated future connection to the improvement.
 - When in areas of residential development, provide house drain connections and maintenance access.
 - A maintenance program will need to be generated to easily and efficiently maintain the improvement.




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Ditch No. 2134

Royalton Township Trustees
Ditch No. 2134: Branch 7d North Branch Bad Creek

- Single County Petition
- 150 Acres Drained
- 28 Parcels




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Ditch No. 2134

Past Projects in the Area

- 1902 Ditch Petition – Tile and open ditch
- 2005 Outlet Ditch Petitioned – Branch 7 NB
- 2012 SWCD Wetland Outlet



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Ditch No. 2134

Problems Observed



- Random blind house drain connections
- Trees and other landscaping close to drain
- Reports of ongoing drainage maintenance issues for the Township
- Recent ag drainage improvements that may not have an adequate outlet



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Ditch No. 2134

Fulton County GIS



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Ditch No. 2134

Project Objectives

- Provide a modern outlet for residential drainage
- Provide an adequate drainage outlet for agricultural drainage
- Establish a maintenance program




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Ditch No. 2134


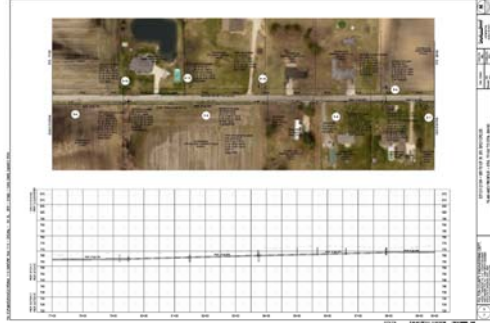
Work Proposed

- Checked the existing drainage outlet to determine the adequacy of the outlet
- Install new tile along the east side of Road 11-2
- Install catch basins and inline inlets for surface drainage, maintenance access, and to facilitate house drain connections
- Restore disturbed lawns, fields, and pavements



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Ditch No. 2134




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Ditch No. 2134

Project Costs = \$129,236.54

Project Assessments


- House Lots: \$2,100 - \$6,310 per Lot
- Tillable: \$500/acre
- Right-of-Way: \$600 - \$4,000/acre



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OEPA Regulations


- US EPA mandated storm water pollution control
- Delegated authority to oversee the program to the individual states – i.e. Ohio EPA for us
- Regulated through the National Pollutant Discharge Elimination System Permit (NPDES)



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OEPA Regulations


- Objectives of the NPDES Permit
 - Erosion and sediment controls
 - Controlled storm water volume and velocities
 - Controlled storm water discharges
 - Minimizing soil exposed during construction
 - Minimizing disturbance of steep slopes
 - Minimize sediment discharges from the site
 - Preserve natural buffer around surface waters
 - Minimize soil compaction
 - Soil stabilization



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OEPA Regulations


- Post Construction BMP's (Best Management Practices)
 - Wet extended detention basins
 - Constructed Extended Detention Wetland
 - Dry Extended Detention Basin
 - Permeable Pavement
 - Underground Storage
 - Sand and media filtration
 - Bioretention Cells
 - Infiltration Basin
 - Infiltration Trench



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OEPA Regulations

- Intercept pollutants and manage other environmental concerns via:
 - Riparian buffers
 - Filter strips
 - Grassed waterways
 - Shelterbelts
 - Windbreaks
 - Snow fence
 - Etc.




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OEPA Regulations

Water Quality Volume

- Drainage Area – Area to the BMP
- Impervious area within the Drainage area
- Precipitation – 0.90 in rainfall event

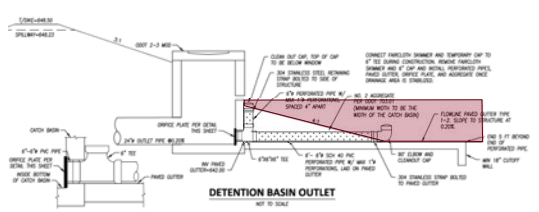
- $WQv = Rv * P * A/12$
- $Rv = 0.05 + 0.9i$




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OEPA Regulations

Example:



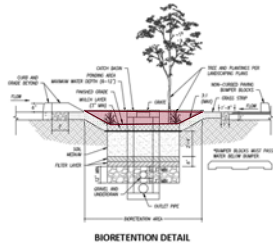
DETENTION BASIN OUTLET
NOT TO SCALE



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OEPA Regulations

Example:



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OEPA Regulations

- ODOT Locations and Design Manual II
 - Not even ODOT is exempt
- File NOI (Notice of Intent) for 1 or more acres of disturbance.
- Routine Maintenance
 - Abutment repairs, brush removal, ditch cleanout, etc....
- Erosion Control
- Post Construction BMP's



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Roadside Options


Urban Areas



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Roadside Options


Rural Areas



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Roadside Options

Rural Areas - Reality




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Roadside Options

Options

1. Acquire more Right-of-Way
2. Channel lining
 1. Rock
 2. Concrete
3. Storm Sewers
4. Retaining Walls




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Roadside Options

Options (Continued)

4. Retaining Walls
 1. Sheet Pile
 2. Soldier Pile and Lagging
 3. Geosynthetic Reinforcement
 4. Gabion Baskets
 5. Cast-in-Place Concrete
 6. Modular Block
 7. Mechanically Stabilized Earth




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Dealing with Road Drainage

Questions ???

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