

Lessons Learned Words Matter

or Stormwater vs. Drainage

Presented by:
Stephen G. Wright, PE
DeIDOT Stormwater Engineer

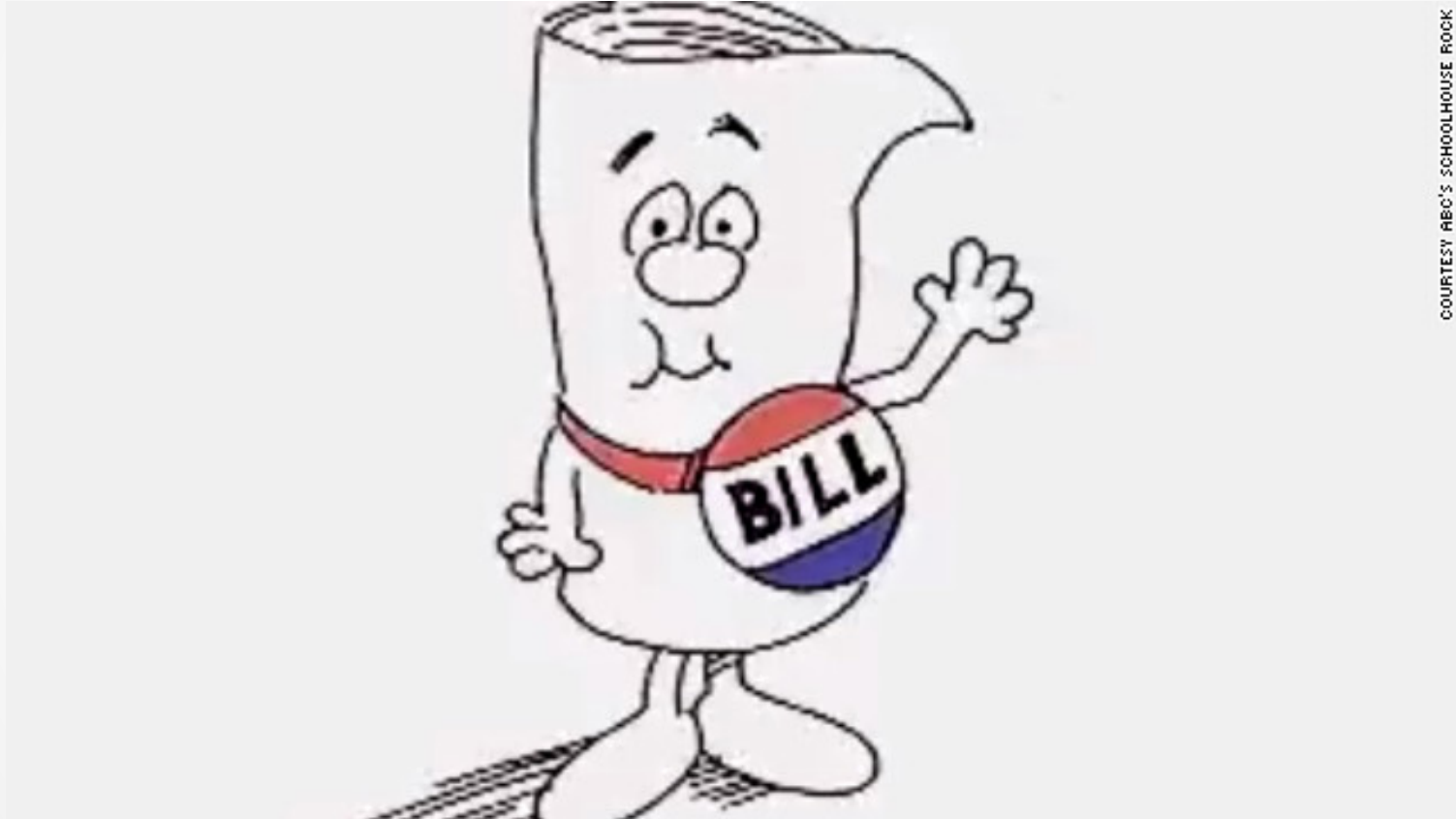
In the beginning, it rained...



...And as we know, that can
cause a mess...



...but even worse, it can
cause legislation!



Stormwater Law

- Water pollution is regulated by federal law via the Clean Water Act **33 U.S.C. §1251 et seq.** (1972) which requires the States to regulate surface water discharges.
- Stormwater is defined in the Clean Water Act as the runoff of water from the surface of the land resulting from any form of precipitation.
- The State of Delaware satisfies the regulation of this requirement via 7 Del. C. c. 40.

Drainage Law

- Drainage of Lands and Management of Waters; Tax Ditches is Title 7 Chapter 41 of Delaware Code.
- Drainage means water management, by drainage areas or watersheds, to safely remove or control both excess, surface flood waters and damaging, excess subsurface waters.
- “Maintenance,” as applied to constructed or reconstructed highways, is the upkeep and support thereof with true surfaces in a hard, smooth condition as when such highways were constructed or reconstructed and **with proper and adequate drainage systems**; ... and shall include the keeping of the right-of-way of all state highways clear of underbrush and debris which might interfere with the drainage or injure the foundation of such highway...

What is a road?



DeIDOT Legal Authority

- Title 17 – Highways, Chapter 1, Subchapter III, Section 131 – General Jurisdiction
- Title 17 – Highways, Chapter 1, Subchapter III, Section 141 – Regulation of Traffic
- Title 17 – Highways, Chapter 1, Subchapter III, Section 146 – Access to State-Maintained Highways
- Title 17 – Highways, Chapter 5, Section 508 – Dedication of New Roads for State Maintenance
- Title 21 – Motor Vehicles, Chapter 41 – Rules of the Road
- Title 9 – Counties

§ 146 Access to state-maintained highways

- The Department is authorized to adopt standards and regulations...to maintain highway right-of-way drainage, to regulate the drainage from property leading into or carried by the highway drainage system...
- No person, firm, corporation or the like shall construct, open, reconstruct, maintain, modify or use any crossing or entrance onto a state-maintained highway, street or road, including any drainage modifications leading into or carried by the highway drainage system, without first having complied with standards and regulations adopted by the Department and having obtained a permit issued by the Department.

Do words matter?

Standards or Regulations?!?

- DeIDOT's "Road Design Manual" is a Standard.
- "Delaware Manual on Uniform Traffic Control Devices (MUTCD)" is a Regulation.
- DeIDOT's "Development Coordination Manual" is a Regulation.
- "A Policy on Geometric Design of Highways and Streets" is a Standard.
- DeIDOT's "Standard Construction Details" are a Standard.

What do those words MEAN?!?

- Stormwater laws and our obligations at DeIDOT center around minimizing how much runoff (volume of water) is leaving our sites, and the requirements to make sure that the water that does runoff meets some level of cleanliness.
- Drainage laws and our obligations at DeIDOT center around helping water to leave our roads and the lands draining to our roads effectively without flooding the roads.
- Notice the problem?
- The issue is that drainage and stormwater laws are actively opposing each other. The Shangri-La of Stormwater management would have **no drainage**, because it means no possibility of erosion or sediment laden discharge downstream. The best possible drainage scenario would be to convey all rainfall off-site and downstream as fast as possible to the ocean with no “**best management practice**” impeding the flow.
- In order to serve the best interest of the public, design and construction practices must do both.

Stormwater vs Drainage: Design Requirements

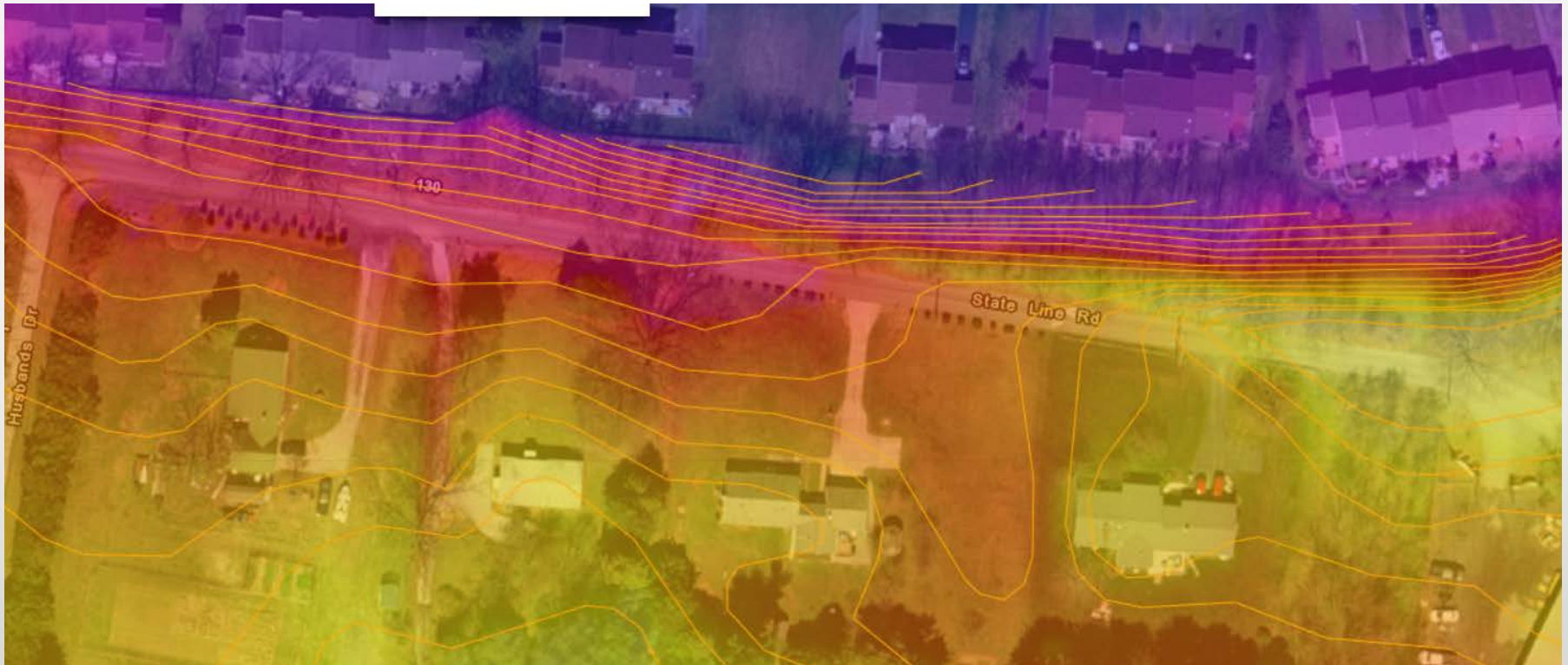
- Design Storm Requirement Differences:
 - Design storms for Stormwater Management are the RPv (1-year design storm), Cv (10-year design storm) and the Fv (100-year design storm).
 - Design Storms for DeIDOT Drainage requirements vary by Functional Classification of the roadway, whether the conveyance system is open or closed drainage, spread requirements, and even whether or not the drainage system is in a depressed area. See DeIDOT Road Design Manual Chapter 6 Drainage and Stormwater Management for more details.
- Conveyance must be proved via the Pipe Cover Angle Worksheet, Hydraulic Grade Line calculations, and ponding requirements.

Actual Lessons Learned!!!

- Please know your projects outlet. This is **NOT** easy, and it is **NOT** obvious.
- Especially in the lower two-thirds of the State this can be extremely challenging. Roman aqueducts (and it feels like most of Delaware) operated at a slope of 1:1,500 (**0.067%**). Water will flow when the drainage is flat, but it is driven by the surface elevation of the water and not the ditch bottom or invert in many cases.
- The outlet for any given project may not even been within the scope of the project. This is especially true in maintenance or reconstruction projects.

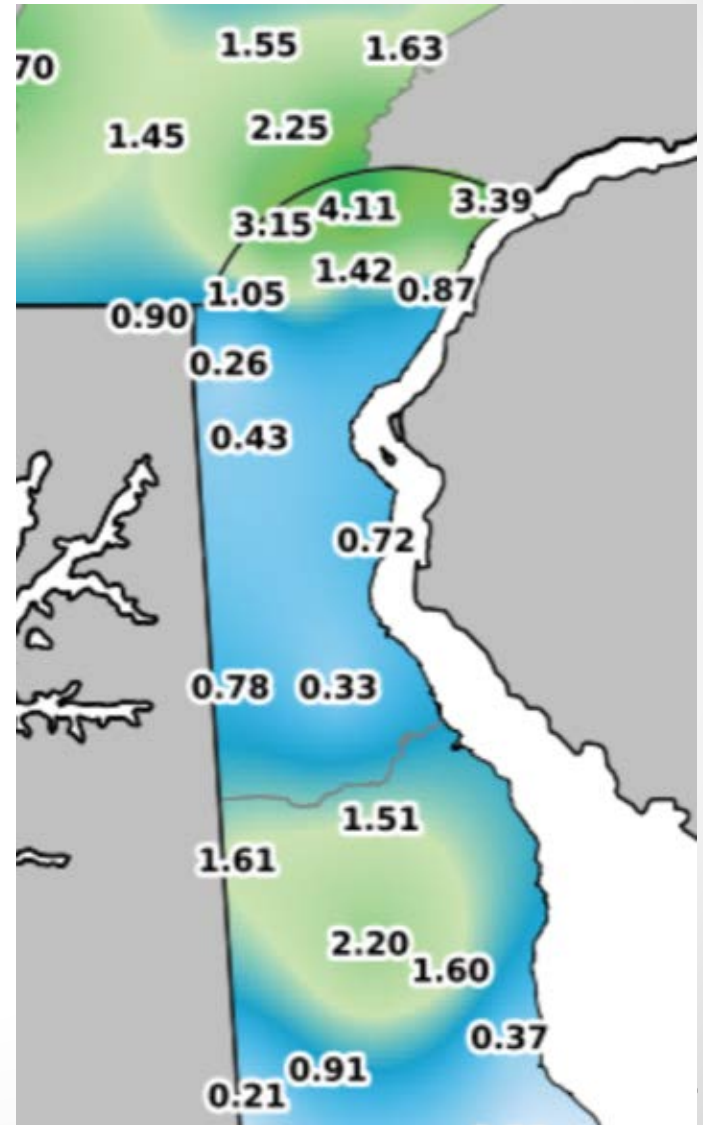
Actual Lessons Learned!!!

- Please use Gateway! Planning has graced us with a wonderful tool that provides a background level of knowledge that make our field investigations, surveys and engineering work much more efficient by letting us do desktop research that directs out efforts more effectively.



Actual Lessons Learned!!!

- Please share other tools that you find that make your job easier, with everyone else!
- This is an example of the Delaware Environmental Observing System which uses more than 50 connected mini-weather systems to keep real time data throughout the State. This can be invaluable in understanding issues that you see in the field.
- Deos.udel.edu



Lessons Learned

Soil Stockpile

- **Soil Stockpile.** A soil stockpile is defined as any location within the Limits of Construction in which the contractor temporarily stockpiles soil for a period of 14 calendar days or more as part of normal construction activities. Per DeDOT standard specifications, it is assumed that any soil removed from the Limit of Construction shall be stockpiled or spread in a permitted manner consistent with any environmental permits or approvals (coordination with the Environmental Stewardship section may be necessary). It is the contractor's responsibility to ensure these approvals are in place beforehand.



Lessons Learned

Soil Stockpile

- **When does a soil stockpile become an item to be reviewed by the Certified Construction Reviewer (CCR)?**

Soil stockpiled within the limit of construction for a period of 14 calendar days, must be located as shown on the plans and protected via perimeter controls in accordance with the Delaware Erosion & Sediment Control Handbook (E&S) and DelDOT's standard specifications. The CCR should identify a soil stockpile in their reports when first viewed on site, but the report should list the soil stockpile as Satisfactory if it is in the boundary identified on the plans regardless of perimeter controls or vegetative stabilization. If the soil stockpile remains on site after 14 calendar days the CCR should report is as either Satisfactory if it complies with the DSSR, or Unsatisfactory if the soil stockpile needs attention to bring it into compliance with the DSSR.

- **When does a soil stockpile require stabilization (i.e. seeded and mulched, or approved equal)?**

The stockpile should be stabilized per DelDOT Standard Specification 908 after 14 calendar days of inactivity. However, the CCR should not report the soil stockpile as an Unsatisfactory item until 14 calendar days have passed since the soil stockpile has been actively worked in accordance with the DSSR and E&S Handbook. Stockpile locations that are routinely removing/adding material do not require stabilization. The stockpile may exist for greater than 14 calendar days without stabilization if it has weekly material turnover.

- **“Hey, if it’s the Delaware Sediment & Erosion Control *Handbook*, I don’t actually have to do that...right?”**

The Delaware Sediment & Erosion Control Handbook is referenced in law by name (Title 7 § 4006) as well as in the Delaware Sediment and Stormwater Regulations (3.4.1.4). Violations of the E&S Handbook may result in fines and construction stoppage.

Lessons Learned

Soil Stockpile

- **“Calendar days”? You mean working days, right?**

No. Regardless of intent, once a stockpile has existed within the limit of construction for greater than 14 *calendar* days, the CCR should identify this as an Unsatisfactory item to be addressed by the contractor. In order to avoid an Unsatisfactory CCR report the contractor should understand the timeline of CCR reviews and ensure the soil stockpile comply before completing their work on the last working day prior to the 14th calendar day.

- **If I “re-disturb” the soil stockpile, does my time limit reset?**

Regarding the sediment control perimeter requirement of the E&S Handbook, re-disturbance does not qualify as a clock reset. Once the soil stockpile has existed within the limits of construction for 14 calendar days it must have a perimeter control in place.

Regarding the vegetative stabilization components of both DeIDOT standard specification 908 and DSSR, the portions of a soil stockpile that are being re-disturbed do not need to be vegetatively stabilized until 14 calendar days from the ceasing of ground disturbing activity of that portion.

- **Doesn’t the Federal Construction General Permit (CGP) tell me that the plans must show me “Locations where sediment, soil, or other construction activities will be stockpiled”?**

It does. The Limit of Construction line covers these items, a contractor must, per DeIDOT standard specifications, either contain all construction activities within the Limits of Construction or ensure all permits and environmental approvals are in place with all applicable agencies for all work outside the limits of construction. The DSSR is more restrictive than the CGP when it comes to the locating of soil stockpiles.

Lessons Learned

Sequence of Construction

- Changes to the Sequence of Construction effect many facets of a project and may require multiple signatures. The Erosion and Sediment Control Revision form looks like this;



Erosion and Sediment Control Revision Form

Contract Name: _____ Contract No.: _____

Date: _____ Revision No.: _____ Requested by: Department Contractor

Revised Plan Sheet Number(s): _____

Revision Category:		
<input type="checkbox"/> BMP/E&S Device Modification	<input type="checkbox"/> Sequencing/Phasing (Minor)	<input type="checkbox"/> LOC (Minor)
<input type="checkbox"/> Alternate BMP/E&S Device	<input type="checkbox"/> Sequencing/Phasing (Major)	<input type="checkbox"/> LOC (Major)
<input type="checkbox"/> Wetland/Environmental Impacts	<input type="checkbox"/> Permanent Modification	

Revision Reason And Description :

Review Comments/Conditions/Notes:

<input type="checkbox"/> Approved	<input type="checkbox"/> Revisions Required
<input type="checkbox"/> Approved with Conditions (see above)	<input type="checkbox"/> Rejected

Signatures Required*: (ESI/Department use only)

QUESTIONS?

LASAGNA

