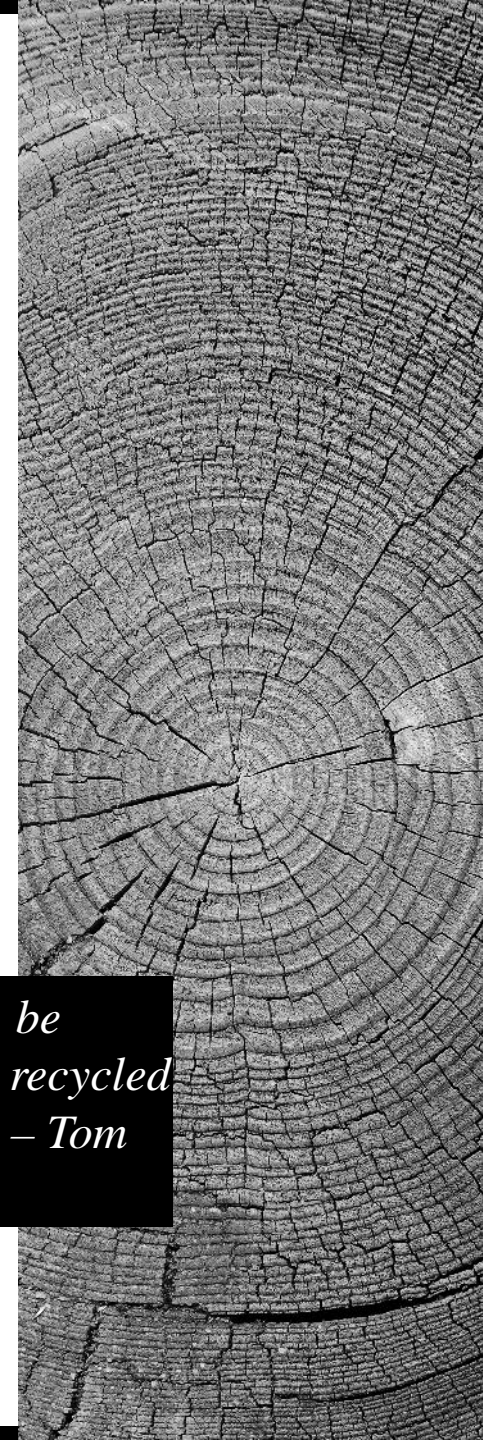


DENT CIVIL ENGINEERING
KENTUCKY STORMWATER ASSOCIATION
June 27, 2019

UNDERGROUND DETENTION 101

AN OVERVIEW OF UD WITH A PUBLIC
AND PRIVATE PERSPECTIVE

*“Water will, increasingly, be
detained, stored and then recycled
or infiltrated in gardens” – Tom
Turner*



UNDERGROUND DETENTION 101

OVERVIEW

I. What is Underground Detention (UD)

- i. Why use UD?
- ii. Different types of UD

II. Basic UD Design Considerations

- i. Designer
- ii. Regulator

III. Current UD Regulations

IV. UD Inspections

UNDERGROUND DETENTION 101

OVERVIEW



UNDERGROUND DETENTION 101

OVERVIEW





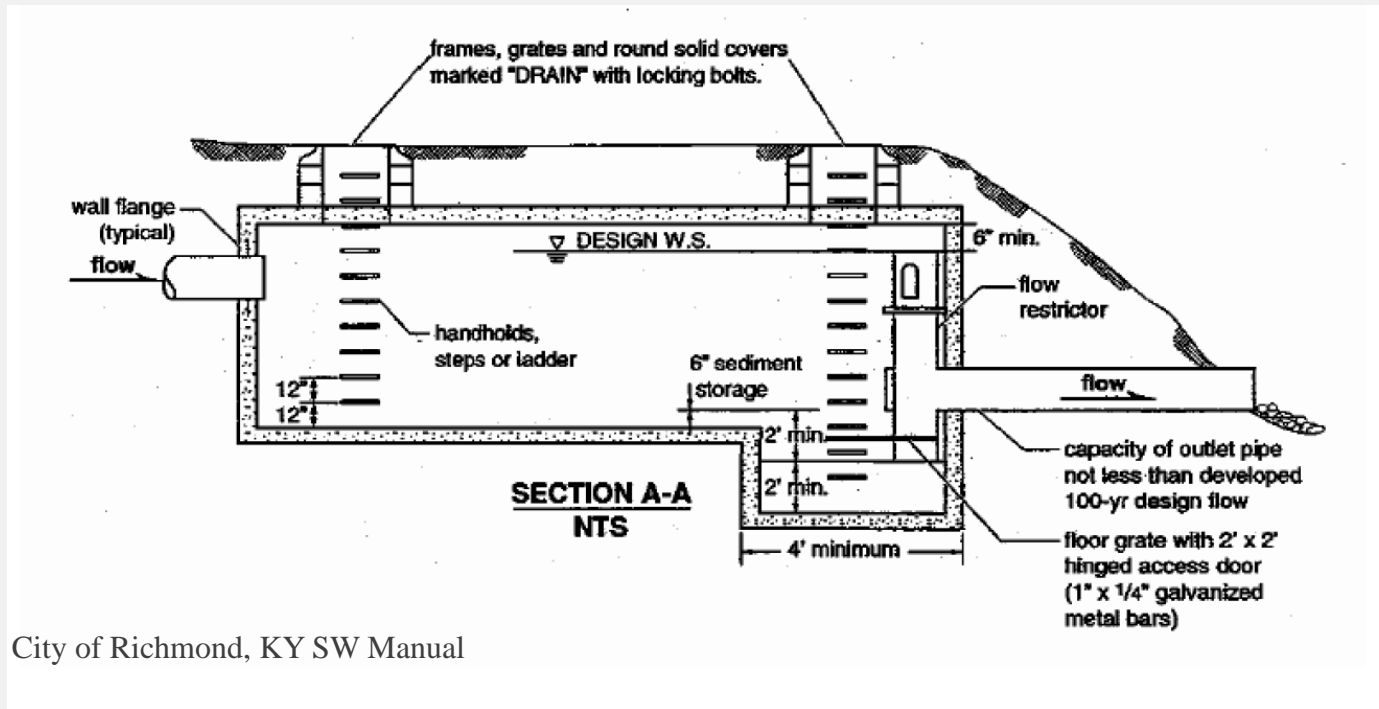
WHAT IS UNDERGROUND DETENTION



UNDERGROUND DETENTION 101

WHAT IS UNDERGROUND DETENTION (UD)

A structure used to manage stormwater quantity located underground. These are similar to above ground detention basins in they store stormwater runoff and release it at a controlled rate. Can be Precast or Cast-In-Place and be made of Concrete, Metal, Plastic, Fiberglass, Natural Materials, etc.



City of Richmond, KY SW Manual

UNDERGROUND DETENTION 101

WHAT IS UNDERGROUND DETENTION (UD)

WHY USE UD?

- Limited surface area on site.
- Land Value is greater than cost for UD.
- Surface storage is not appropriate for site (i.e. safety around children, safety in public places, airports, etc.)
- Help meet regulations for infiltration.
- Reuse.

UNDERGROUND DETENTION 101

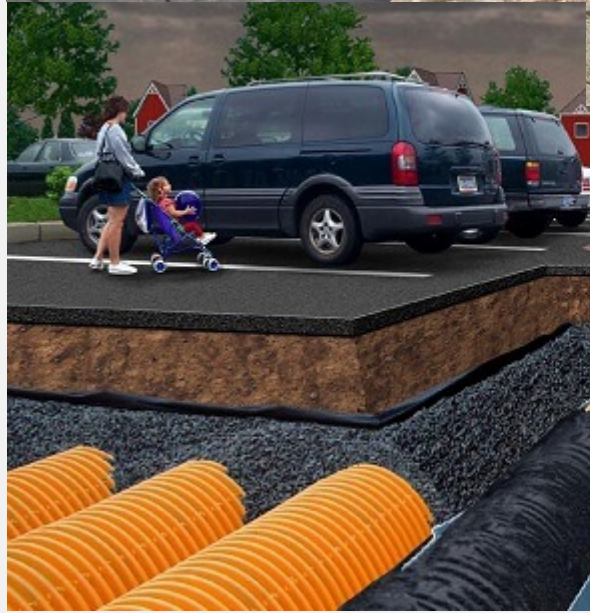
WHAT IS UNDERGROUND DETENTION (UD)

DIFFERENT TYPES OF UD

- Pipes
- Chambers
- Tanks
- Compartments
- Modular systems
- Vaults

UNDERGROUND DETENTION 101

WHAT IS UNDERGROUND DETENTION (UD)



UNDERGROUND DETENTION 101

WHAT IS UNDERGROUND DETENTION (UD)





BASIC UD DESIGN CONSIDERATIONS



UNDERGROUND DETENTION 101

BASIC UD DESIGN CONSIDERATIONS

DESIGNER

- Is it worth it for the Owner?
- Location. On the site. Proximity to other features.
- Is infiltration needed? Wanted?
- Overflow size and location.
- What is anticipated to be above the system? What could be above the system?
- Is there anything that could be done now to make future maintenance easier for the owner? I.E. Treatment train, observation/access locations, maintenance vehicles, etc.

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BASIC UD DESIGN CONSIDERATIONS

REGULATOR

- Who will be doing inspections? Maintenance?
- Overflow size and location.
- Where is UD allowable?
- Oversize for Sediment?
- Allowable materials or products?
- Maximum drainage area?
- Pretreatment, required or preferred?
- Who certifies construction and inspections?
- Plans, As-Builts, Reports requirements.



CURRENT UD REGULATIONS



UNDERGROUND DETENTION 101

CURRENT UD REGULATIONS

KENTUCKY

- Louisville
- Lexington
- SD1
- Others

UD INSPECTIONS

UNDERGROUND DETENTION 101

UD INSPECTIONS



UNDERGROUND DETENTION 101

UD INSPECTIONS

THINGS TO CONSIDER

- Where is it? Are there Plans?
- Can you get access? Confined Space Entry?
- What are the surface conditions?
- What are the downstream conditions?
- Are there any defects observed?
- Sediment/trash amounts and locations?
- When did it last rain?
- Is it holding water?
- Has anything changed from last inspection?

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UD INSPECTIONS

Where is the UD?

Surface condition?



UNDERGROUND DETENTION 101

UD INSPECTIONS

Where is the UD?

Surface condition?



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UD INSPECTIONS

Can you get access?



UNDERGROUND DETENTION 101

UD INSPECTIONS

Are any defects observed?

Sediment/trash?



UNDERGROUND DETENTION 101

UD INSPECTIONS

When did it last rain?

Is it holding water?

Sediment/trash?



UNDERGROUND DETENTION 101

QUESTIONS

“Do unto those downstream
as you would have those upstream
do unto you.”
– Wendall Berry

QUESTIONS?

THANK YOU

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