Premature Storm Drainage System Repairs and Replacement

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Date

Agenda

- Storm Water Infrastructure
- Identifying Problems (Before and After) Infrastructure is Installation
- Common Premature Problems and Failures
- What is Storm Water Doing on Our Projects?

Stormwater Infrastructure

- Stormwater infrastructure consists of pipe, inlets, junctions, creeks, and ditches
- Systems in public rights-of-way
- Systems on private property in public drainage easements
- Connected as a system
- Access and easements (private/public versus City)

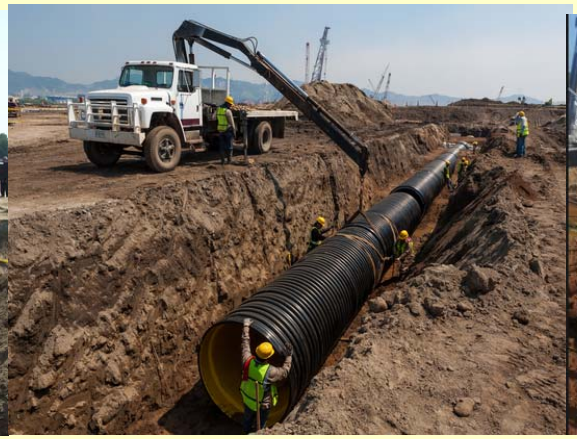
Steele Creek Landing Subdivision

Stormwater Infrastructure

Service Life Expectations (examples)

- Reinforced Concrete Pipe (RCP) – 100+ years
- High Density Polyethylene Pipe (HDPE) – 50 years + TBD
- Corrugated Metal Pipe (CMP-no longer allowed) – 25-30 years
- Aluminized (other new coatings) Corrugated Pipe – 75 years
  - Life Expectancy comes from different sources ACPA, FHWA, FLH, NASPD, local experience, etc. and *assumes appropriate installation. The actual life can be influenced by local conditions, environmental characteristics, installation, use, etc.*

RCP



HDPE

CMP

Identifying Problems During and After Infrastructure is Installed

- Construction inspection
- Testing (compaction and materials)
- Closed Circuit Television (CCTV - video) inspection
- Confined space entry (Manual Entry)

CCTV Drain Surveys

Identifying Problems During and After Infrastructure is Installed

Images from Astonboro Drive (Built 2002)

Identifying Problems During and After Infrastructure is Installed

- HDPE (plastic pipe egged shaped) loss of structural integrity

- Sanitary sewer punched through the storm drain

Images from Mallard Landing Road Built 2006

Identifying Problems During and After Infrastructure is Installed

- Reinforcing steel used to support frame and grate

- Slab cut to move inlet position

Images from Mallard Landing Road Built 2006

Common Premature Problems

- Premature failures impact public roads and private property
- Problems usually are not detected until several years have past.
- Streets settle
- Sinkholes form
- House foundations impacted
- Need structural shoring during repair construction.

Sahalee Lane

Common Premature Problems

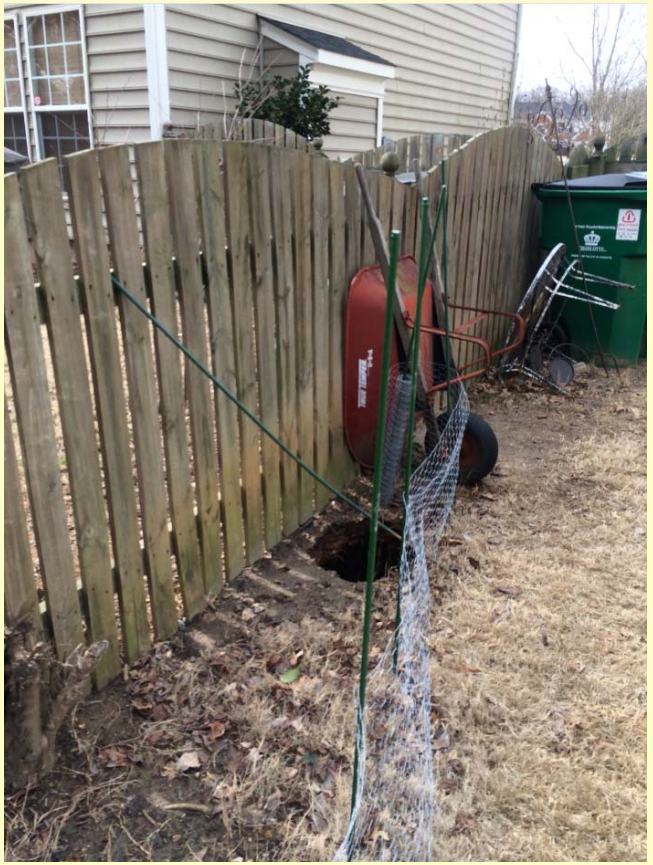
Haines Mill Road
The Villas at Laurel Valley
Built 2006

- Precast catch basin leaking around joints
- Sinkholes formed
- System is in backyards and access is limited
- Shoring will be needed to protect the foundations of nearby homes

Common Premature Problems

Provincetowne Drive
Reavencrest
Built 2001

- Separated pipe joints
- Sinkholes formed
- Shoring will be needed to protect the foundations of nearby homes



Common Premature Problems

Cozen Way
Drawley Farms
Built 2004

- Sinkholes formed
- Non-standard structures
- Poor pipe installation
- Public safety and liability concerns for the City

Common Premature Problems

Clementine Court
Providence Pointe
Built 2002

- Missing brick in catch basin
- Sinkholes formed
- Precast structures leaking
- Presents a public safety concern to the property owner
- Limited access to enter and repair system
- Shoring will be needed to protect the foundations of nearby homes

Common Premature Problems

Sahalee Lane

Claiborne Woods Subdivision

Built 2000

- Sinkhole formed due to pipe being damaged (egged shaped and joints failed) during installation
- Pipe damage allowed backfill material to migrate away and created a sinkhole
- Shoring will be needed to protect the foundations of nearby homes

Common Premature Problems

Astonboro Drive
Chastain Parc
Built 2002

- Broken and cracked pipe
- Road is settling and rutting
- Potential cavities under the road
- Estimated $100,000 repair

Common Premature Problems

Steele Creek Landing

Mallard Landing

Built 2006

- Broken pipes and separated joints
- Sinkholes formed
- Pipe holding water
- Estimated $500,000 repair

Note: Steele Creek Landing was presented to the City for a voluntary annexation consideration.

Common Premature Problems

Oasis Lane

Belmeade Green Subdivision

Built 2006

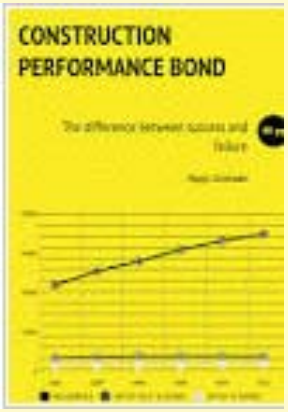
- Separated joints, broken pipe, poor compaction
- Sinkholes formed
- Shoring will be needed to protect the foundations of nearby homes
- Estimated $250,000 repair costs

Challenges (Correcting Problems on Existing Infrastructure)

- Inconveniencies to traffic and property owners
- Shoring houses, reconstruction of road infrastructure, restoring landscaping, additional costs
- Working around utility infrastructure (gas, communication, electric, poles, sewer, etc.)
- Estimated approximately $2M of the $10M annual Storm Water Budget is needed to repair premature failures
- Takes away from intent of program

Shoring is not installed during the development phase, but is required during repairs.

What is Storm Water Doing on Our Projects



- Increased level of inspection
- Increased training of inspection staff and contractors
- CCTV (pipe video) inspection after work is complete and at end of warranty period
- Longer warranty periods from contractor on questionable infrastructure

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The End

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