

City of Alexandria, Virginia

# Fort Ward Park

Fort Ward Park & Museum  
Advisory Group

T&ES Project Update

Wednesday, December 14, 2011

Rich Baier, Director, T&ES  
Brian Rahal, Civil Engineer III, T&ES

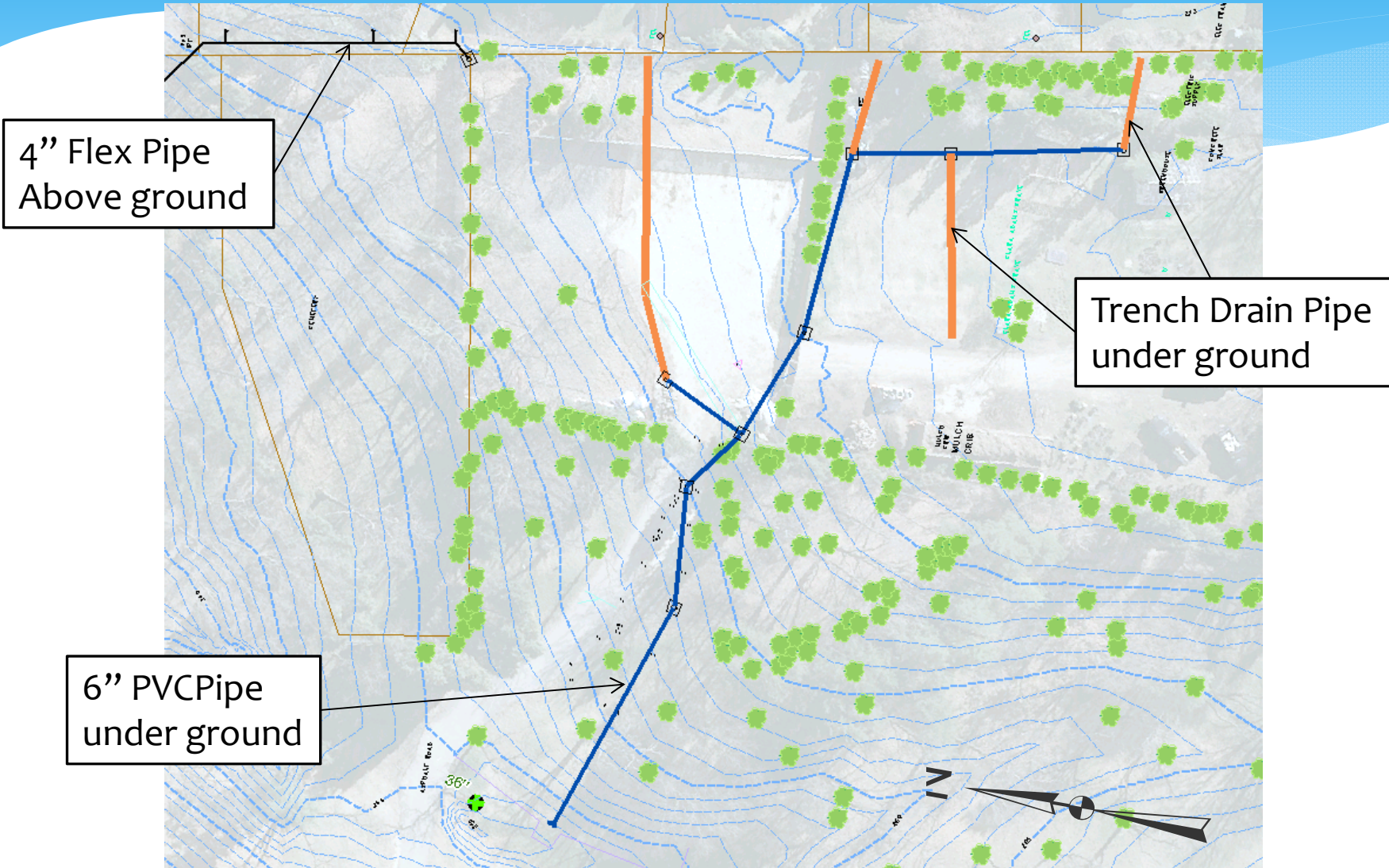


# Interim Drainage System

- \* Trench Drains Installed
  - Overall Goal: Capture & Divert overland flow around the Oakland Baptist Cemetery to the extent practical.
  - Direct expenses to date on the Interim System total less than \$35,000.

# Interim Drainage System

- \* Trench Drains Installed





# Interim Drainage System

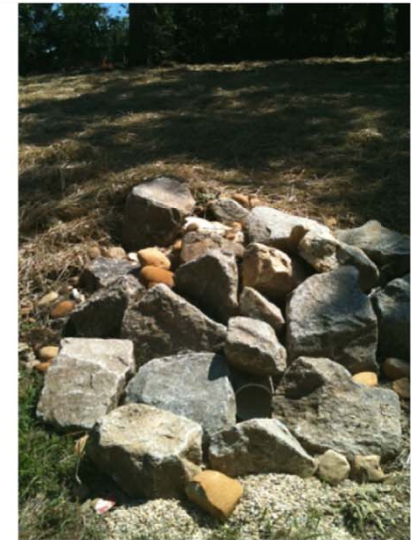
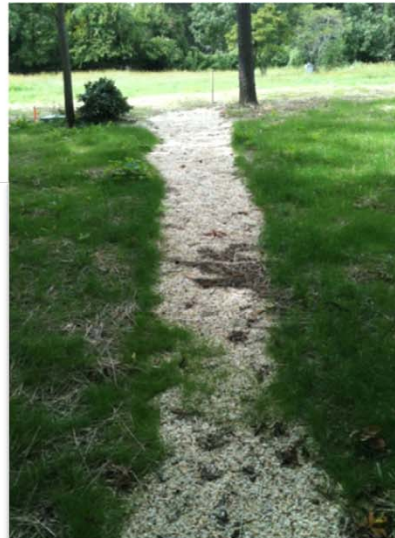
## \* Trench Drains During Construction





# Interim Drainage System

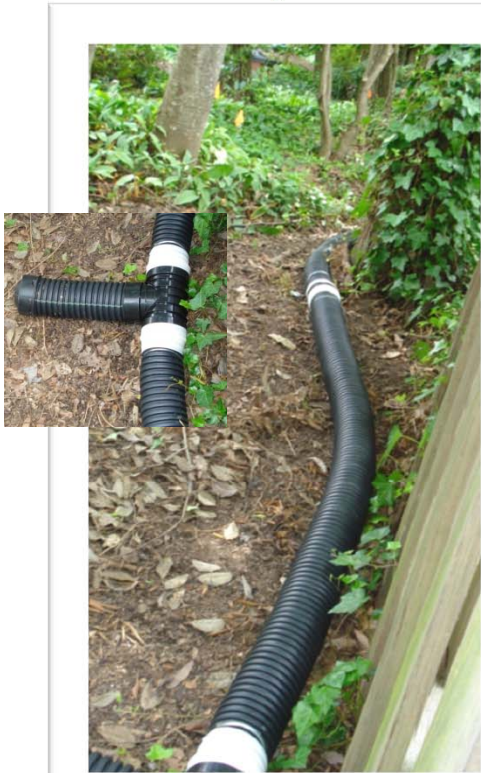
## \* Trench Drains Post Construction



Photos taken September 16, 2011

# Interim Drainage System

## \* Flex Pipe Post Construction





# September 8, 2011 Remnants of Tropical Storm Lee



National Weather Service Forecast Office

Baltimore/Washington



THE REMNANTS OF LEE BROUGHT TWO INTENSE BANDS OF RAINFALL TO THE REGION...ONE STRETCHING FROM CHARLES COUNTY NORTHWARD INTO BALTIMORE COUNTY...AND ANOTHER FROM KING GEORGE COUNTY NORTHWARD INTO MONTGOMERY COUNTY. THESE RAINBANDS LED TO RAINFALL THAT IS EXTREMELY UNUSUAL.

THE HEAVY RAINS ON THURSDAY...SEPTEMBER 8TH...WERE EVEN MORE RARE. THE KINGSTOWNE IFLOWS GAUGE NEAR FRANCONIA IN FAIRFAX COUNTY RECORDED 5.47 INCHES IN JUST THREE HOURS...WHICH HAS APPROXIMATELY A 0.2 PERCENT CHANCE OF OCCURRING IN ANY GIVEN YEAR /SOMETIMES CALLED A 500-YEAR RAINFALL/. THE SAME IS TRUE FOR RAINS IN RESTON...WHERE 6.57 INCHES WAS RECORDED IN SIX HOURS.

AT FORT BELVOIR...THE AUTOMATED WEATHER STATION THERE RECORDED AN INCREDIBLE 7.03 INCHES IN JUST THREE HOURS. THIS HAS LESS THAN A 0.1 PERCENT CHANCE OF OCCURRING IN ANY GIVEN YEAR /SOMETIMES CALLED A 1000-YEAR RAINFALL/.

# Interim Drainage System

- Post Tropical Storm Lee





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# Interim Drainage System

- ✦ Post Tropical Storm Lee





# Interim Drainage System

- Post Tropical Storm Lee





# Interim Drainage System

- \* Post Tropical Storm Lee Observations
  - Private Property runoff entering park.
  - Additional mitigation needed to capture Private Property runoff from extreme events, such as:
    - Additional Straw Bales

# Interim Drainage System

- \* Subsidence of Graves Observed in Oakland Baptist Cemetery



December 8, 2011



September 16, 2011





# Interim Drainage System

- \* Michigan Historic Cemetery



This degradation attributed to mowing methods used in the cemetery.

Source: Michigan Historic Cemetery Preservation Manual, Gregg King, et. al. 2004

# Interim Drainage System

- \* Next Steps:

- Engineer of Record (EOR) to be selected once new EOR contracts in place for Storm Water Management Master Plan Study.
- Spring 2012
- Implementation of Plan & Improvements FY2013
- Partnership opportunities for Maintenance & Stewardship within Oakland Baptist Cemetery?



**Questions?**