Fort Ward Park Master Drainage Plan

Prepared for the City of Alexandria

Presented by URS Corporation

August 14, 2013

Agenda

- Project Status
- Overview of Technical Analyses
- Next Steps

Project Status

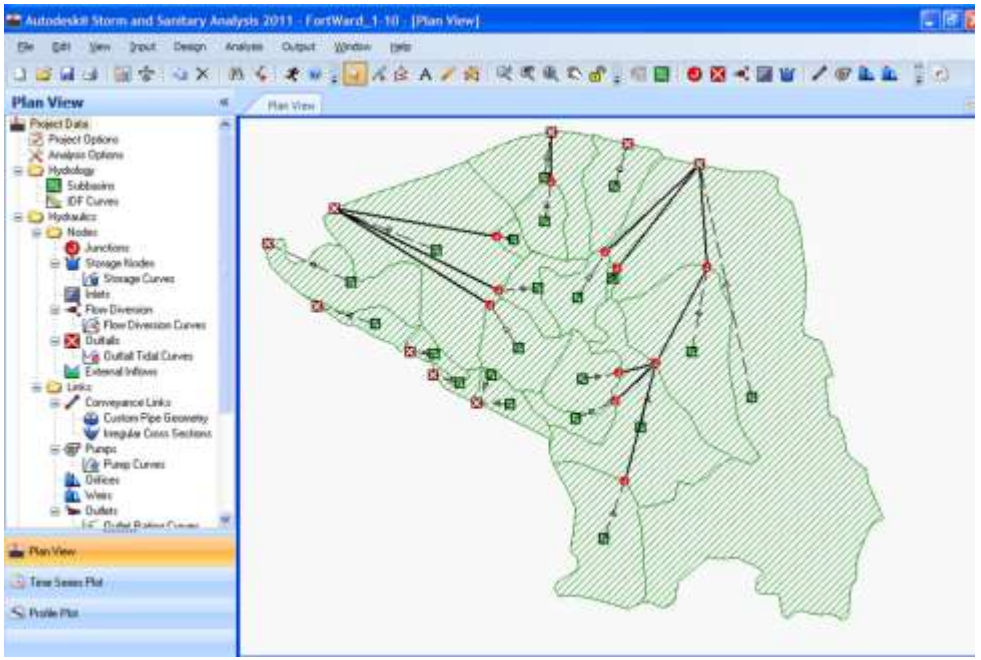
Project Status

- Since last public meeting on June 12, 2013
  - Field Reconnaissance: June 28, 2013
  - Hydrologic & Hydraulic Analysis:
    - Hydrologic Analyses: Completed
    - Hydraulic Capacity Analyses: Completed
    - Identification of drainage system deficiencies and proposed improvements: in progress
    - Report: in progress

Technical Analyses

Hydrologic and Hydraulic Analyses

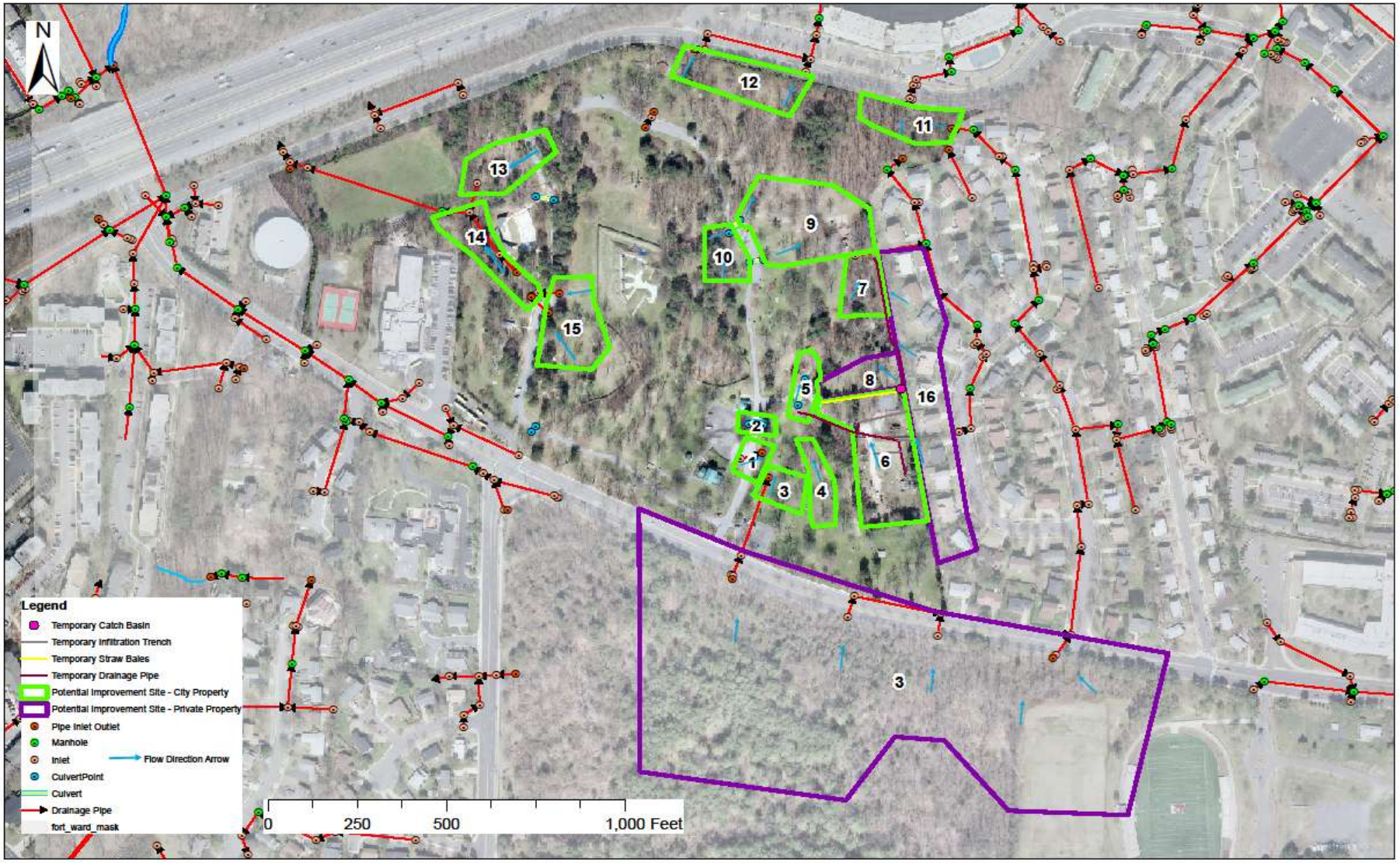
- Developed drainage area map with 21 subbasins
- Hydrologic analyses conducted utilizing available land use, soils information, and drainage areas
- Hydrologic Analyses conducted using Rational Method.
- Estimated capacity of existing culverts using HY-8



Analyses of Potential Drainage Issues

- Conducted field visit to assess drainage conditions
- Identified potential drainage improvements
- 16 sites were identified with existing drainage condition problems

Site Map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12
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10
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15
8
5
16
2
1
6
3
4
3
Legend
Temporary Catch Basin
Temporary Infiltration Trench
Temporary Straw Bales
Temporary Drainage Pipe
Potential Improvement Site - City Property
Potential Improvement Site - Private Property
Pipe Inlet Outlet
Manhole
Inlet
Flow Direction Arrow
CulvertPoint
Culvert
Drainage Pipe
fort_ward_mask
0
250
500
1,000 Feet

Site 1

- Shallow drop inlet near the museum and the parking lot. No major problems noted during the field trip.

Upstream Inlet

Downstream Outlet

Site 2

- 15" culvert crossing under the entrance road near bathrooms. A small ponding area was observed at the culvert inlet.

Upstream Inlet

Downstream Outlet

Site 3

- Outlet of 18" pipe that collects runoff from upstream forested area and Braddock Road. Sediment and debris deposition was noted at the outfall.

Downstream Outlet

Downstream of the Outlet

Site 4

- Swale in the natural area with "No Mowing" sign nearby. No major problems noted during the field trip.

Site 5

- The 36" culvert under the road that leads to the utility yard is partially blocked and vegetation was overgrown around the culvert. Observed sediment and debris build up at the 6” PVC underdrain pipe that located just upstream of the 36” culvert.

Downstream Outlet

Sedimentation on the Road

Site 6

- Old Utility Yard. Several infiltration trenches have been installed to prevent runoff from reaching the cemetery. A temporary catch basin collects runoff from the small trench along the fence line which divides the park property from the neighborhood. The runoff from the catch basin drains to an area uphill of the road over the 36” culvert and downhill of the cemetery. Temporary hay bales have been setup up to prevent runoff from entering the cemetery.

Infiltration Trenches

Catch Basin

Hay Barrel

Site 7

- Main stream channel that runs through the park is eroded and there is concrete debris in the channel. A swale has formed from backyard drainage conveyance from residential property. In addition, there is a clogged inlet at downstream end of the natural stream channel.

Stream Bed

Swale from the backyard

Site 8

- The base areas are exposed on several gravestones in the cemetery. Depressions have formed in front of several graves from ponding during rain events. There are several areas of exposed, bare ground in the cemetery. A channel is forming through the cemetery where runoff flows during rain

Exposed Gravestone

Exposed Bare Ground and Gravestone

Exposed Bare Ground

Site 9

- A channel has formed on the hill adjacent to the playground. There are two yard inlets that collect drainage from the hill before it gets to the playground. One of these inlets is completely covered by sediment and leaves. A channel has formed through the playground. There is a rock outfall and filter fabric at the outfall of the channel through the playground. There are areas of bare ground on the hill upstream of the playground.

Channel in the playground

Channel upstream of the playground

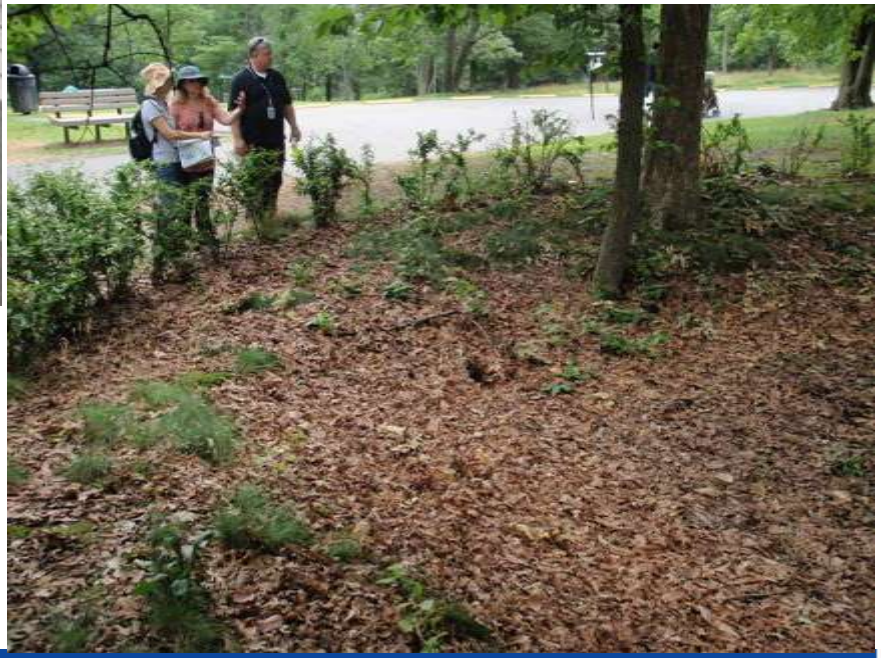
Exposed Bare Ground

Site 10

- There is a clogged yard inlet near the footbridge over the swale surrounding the Fort. The cross culvert inlet upstream from the rifle trench appeared to be clogged at the time of the field visit.

Clogged Inlet near Footbridge

Clogged Inlet



Site 11

- Pond at the NE corner of Park boundary. Potential water quality issues.

Inlet feeding into SWM pond from Marlboro Properties

SWM Riser

Site 12

- Park outfalls along Van Dorn Street. Inlets collecting drainage from parks are clogged with debris. Channels have formed downstream of cross culverts discharging runoff

Clogged Inlet Outfall at the Park Property Line

Upstream Channel of the Outfall

Site 13

- There are bare spots on hill near the soccer field. An inlet at the base of the hill is clogged and a channel has formed upstream of the inlet.

Bare Ground

Channel Upstream

Clogged Inlet

Site 14

- No problems were observed near the manhole and inlets near soccer field and amphitheater.

Upstream

Inlet next to Amphitheater

Site 15

- There are areas of exposed, bare ground in the open areas near the parking lot near amphitheater and adjacent open area. The inlet adjacent to the west side of the Fort is clogged. There is a depression at 15” inlet to the cross culvert under the parking lot. Sedimentation in the parking lot due to blockage from telephone poll being used as a landscape timber.

Bare Ground

Sedimentation at the parking lot

Depression at the inlet

Site 16

- Runoff from the properties in Marlboro Estates is draining onto Park property and contributing to drainage issues

Potential Solutions - General

- Encourage infiltration to reduce runoff (re-seeding, reduced mowing, soil amendments, etc.)
- Conveyance Improvements (e.g., clean-up and maintenance of the existing system, swales, closed systems, etc.)
- Redirect drainage away from erodable areas and sensitive resources (long-term solutions include: roof downspouts and sump pumps to storm drain system, etc.)

Next Steps

Next Steps

- Solicit ideas for potential solutions from work group
- Complete the H&H Report
- Select sites for concept design development
- Develop concept designs for selected improvements

Questions