March 22, 2018

Re: Stormwater Runoff Assessment for Lafayette Recreation Center

Rebecca Maydak, ANC Commissioner 3/4G-04 contacted DOEE for assistance in finding solutions to stormwater runoff issues at the Lafayette Recreation Center and to obtain a rough price estimate for those solutions.

On February 27, DOEE met with Commissioner Maydak, Patty Myler and Jeff Stoiber (stakeholders) to visit Takoma Recreation Center as an example of a solution applied to a site with similar conditions, and then to assess Lafayette Recreation Center.

This document outlines the existing conditions, challenges and proposed solutions to the stormwater runoff issues. Accompanying maps include notes identifying areas with specific challenges and areas of opportunities for stormwater management solutions.

Existing Conditions and Stormwater Issues:

Lafayette Recreation Center is a steeply sloped site that falls within the Municipal Separate Storm Sewer System (MS4) sewershed area of the District. The highest elevation on this site is at the playground and extending to some of the field adjacent to it. These steep slopes create conditions for stormwater to gather momentum as it makes its way downhill causing erosion, stripping the trees of protective soil at the roots, creating gulleys, eroding and compromising the asphalt walking paths, and depositing sediment and debris in drainage grates throughout the site.

The existence of multiple mature trees throughout the site and the heavy play use of the park make it difficult for grass to grow consistently. Additionally the neighborhood frequently uses the top field as an unofficial dog park and the stakeholders expressed the residents' desire for it to remain as such.

In the north-west corner of the site, this downhill rush of stormwater results in a concentrated flow at the stairs descending to the sidewalk on Quesada Street. The erosive forces of the flow result in sediment being deposited on the sidewalk adjacent to Broad Branch Road.

On the athletic field, drainage is poor and the field remains soaked well after a rain event.

Currently DGS is resurfacing the playground in response to requests to address accessibility issues. Work conducted on this playground will have a direct impact on future conditions downslope.

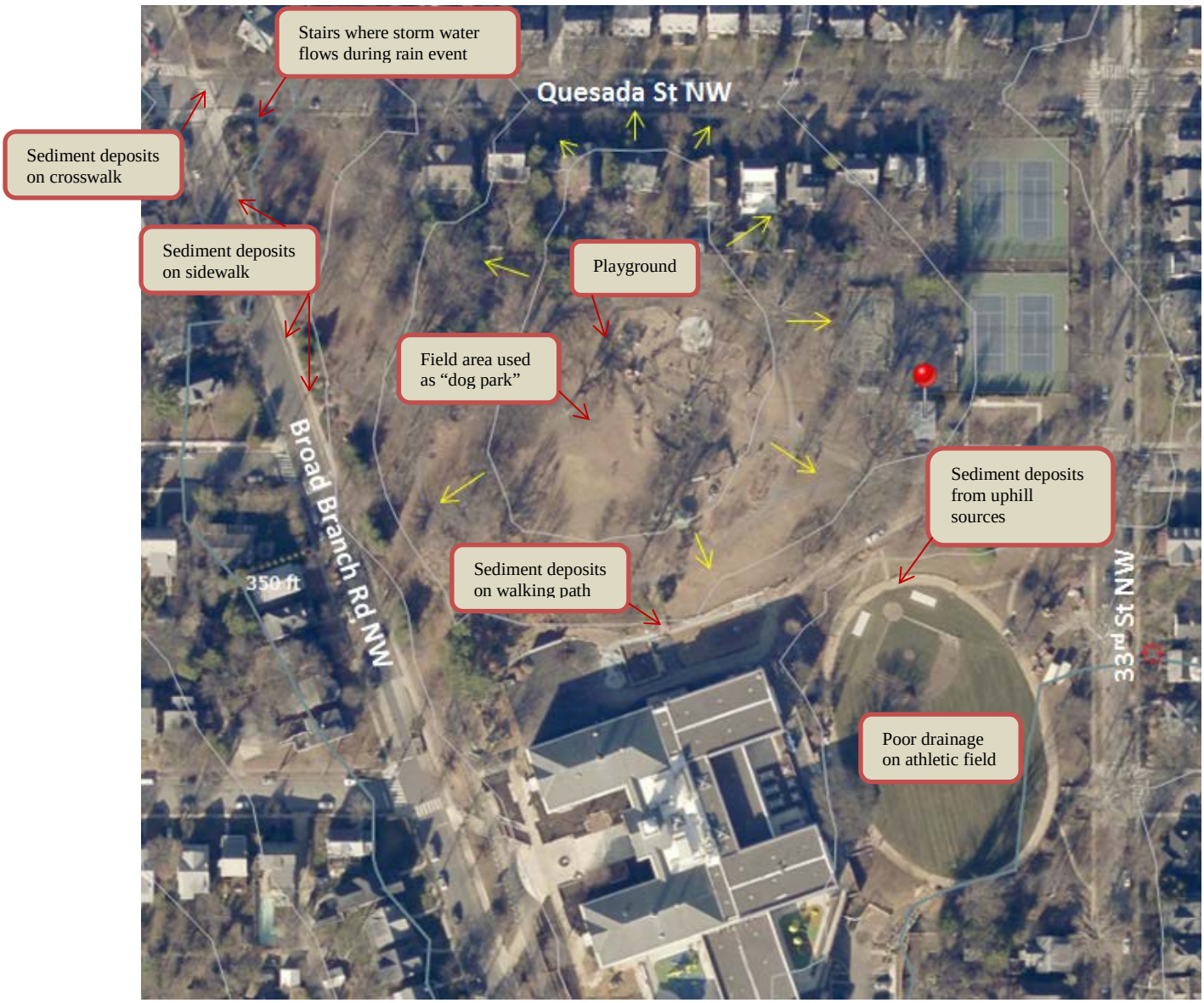


Figure 1. Existing Conditions at Lafayette Recreation Center

Figure 2. Pictures of erosion and bare ground on upper fields

Figure 3. Picture of a gulley south of the playground

Figure 4. Pictures of sediment deposit on Broad Branch Road

Figure 5. Pictures of destabilized walkways

Figure 6. Pictures of sediment and debris deposit at drainage grates

Figure 7. Pictures of sediment deposit on athletic track, the saturated athletic field and the driveway which stakeholders desire to be removed.

Proposed solutions:

DOEE offers the following solutions for the various areas on the site:

DPR Playground:

DOEE does not propose any solutions for this area as it is already being worked on. DGS is currently working on the playground to maintain it and to add ADA accessibility. Additionally, there is an existing bioretention cell adjacent to the playground that is not functioning properly. DGS is responsible for its maintenance and upkeep.

Lafayette Recreation Center

DOEE does not propose anything for this portion of the site. DGS is working on plans for the recreation center. This work will likely trigger stormwater regulations and therefore will necessarily be reviewed by DOEE.

Fields Uphill Adjacent to Playground, and downhill throughout the site

The existence of multiple mature trees on the site presents a challenge in finding solutions that would not damage the trees. Wide tree canopies and corresponding root systems exclude any stormwater practice that would require excavation. And although DOEE had mentioned subsoiling as a potential solution to the area used as a dog park, upon further consideration we no longer deem this to be a feasible solution. Since the stakeholders have indicated that this area will continue to be used as a dog park, any efforts to aerate the soil would quickly lose their effectiveness as the animal and human traffic would return the soil to compaction. Therefore, DOEE proposes the following:

- Stakeholders indicated that the uphill area adjacent to the playground is frequently used by residents as an informal dog park and would like it to remain as such. As such, DOEE recommends the use of mulch and other natural materials to create a series of low berms that would a) slow down the stormwater, and b) direct and contain it in areas for slow infiltration and irrigation for the surrounding trees. Strategically placed berms at this uphill location would help stabilize the hillsides and help prevent the extensive erosion. This system has been used at Takoma Recreation Center, a site that had similar conditions and challenges, at a relatively low cost. It is important to note that although up to date this solution at Takoma Recreation Center has been working well, DOEE's use of this technique is fairly new and therefore still in an experimental stage.

Lafayette Elementary School Athletic Field

The stakeholders have expressed that they would like to remove the portion of the road that begins at 33rd Street and curves around the athletic field leading to the school. Removal of this impervious cover and adding in its place stormwater practices such as

bioretention will help capture some of the stormwater that would have otherwise gone to the athletic field.

A review of the as-built plans for the athletic field renovation project has revealed the following:

Soil test results show an infiltration rate of .4"/hr. This means that stormwater should fully infiltrate within 40 hours after a significant rain event (1.2").

The athletic field was designed with 3 drainage areas:

- The northernmost tip of the athletic field abuts DPR property and receives significant runoff from the fields uphill. Because this is not DCPS property, regulation only required them to convey the uphill stormwater, not treat it. A trench drain was therefore implemented to capture the stormwater from uphill and convey it via a pipe to an inlet on the east of the field. However due to the conditions uphill, this stormwater carries with it a lot of sediment (see Fig. 7) which has clogged the trench drains and rendered them dysfunctional.

- South of this area, the plan calls for grading that conveys the stormwater from the southwestern section of the field towards the yard inlet east of the field and to the storm sewer system.

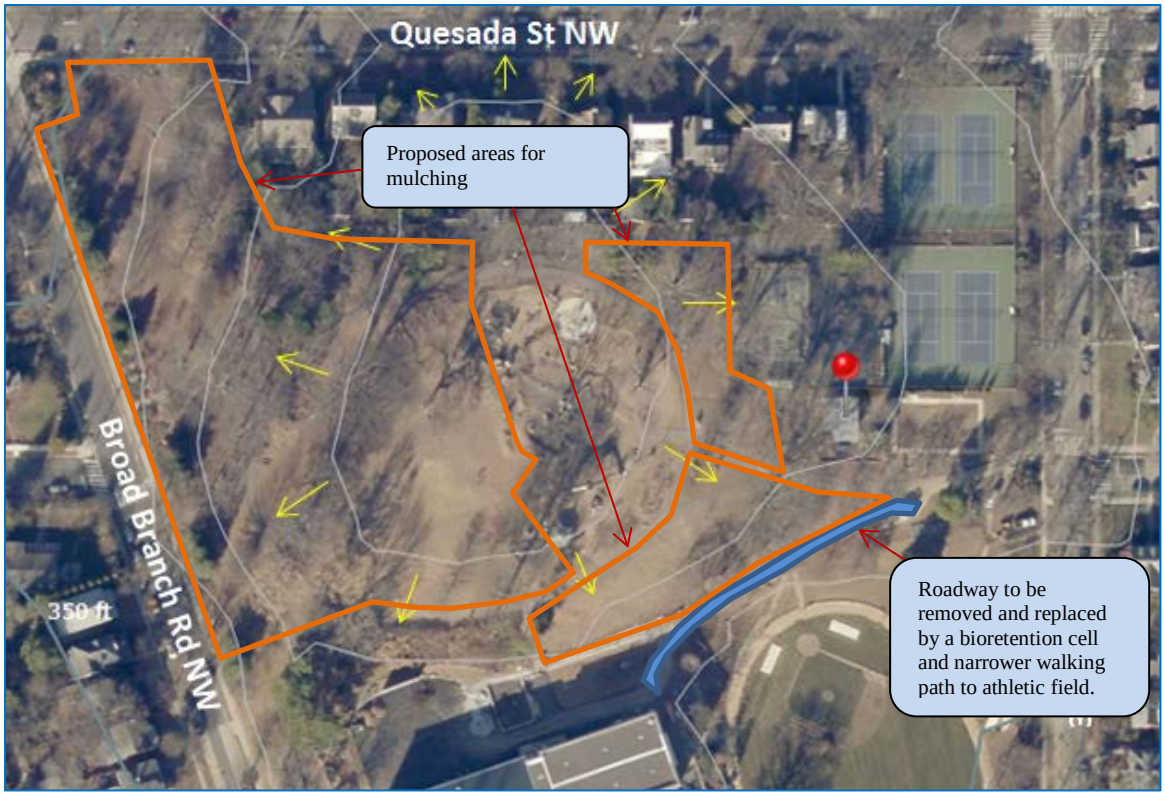
- There is an infiltration basin in the southern portion of the field that is designed to capture stormwater from the south/southwestern portion of the field.

However, as the site visit revealed, the northern half of the field remained saturated over 40 hours beyond a storm event, and again sediment had accumulated on the north track abutting DPR land. DOEE suggests that stakeholders have a conversation with DCPS to address these concerns. Possible areas for review may include verification of the grading on that drainage area to ensure that it was indeed sloped sufficiently enough to convey stormwater towards the disconnection per the design intention.

DOEE and stakeholders had not walked the entire field to assess the southern half of the field. If stakeholders believe that this area also has poor drainage, soil tests may have to be verified.

A cleaning of the trench drains should alleviate the problem of the uphill stormwater, but this would have to be done periodically.

Lastly, DOEE notes that based on our assessment above, at least some of the problem on the athletic field will persist unless the site uphill is stabilized. DOEE's suggestion of implementing a bioretention in the place of the driveway should aid towards this solution.



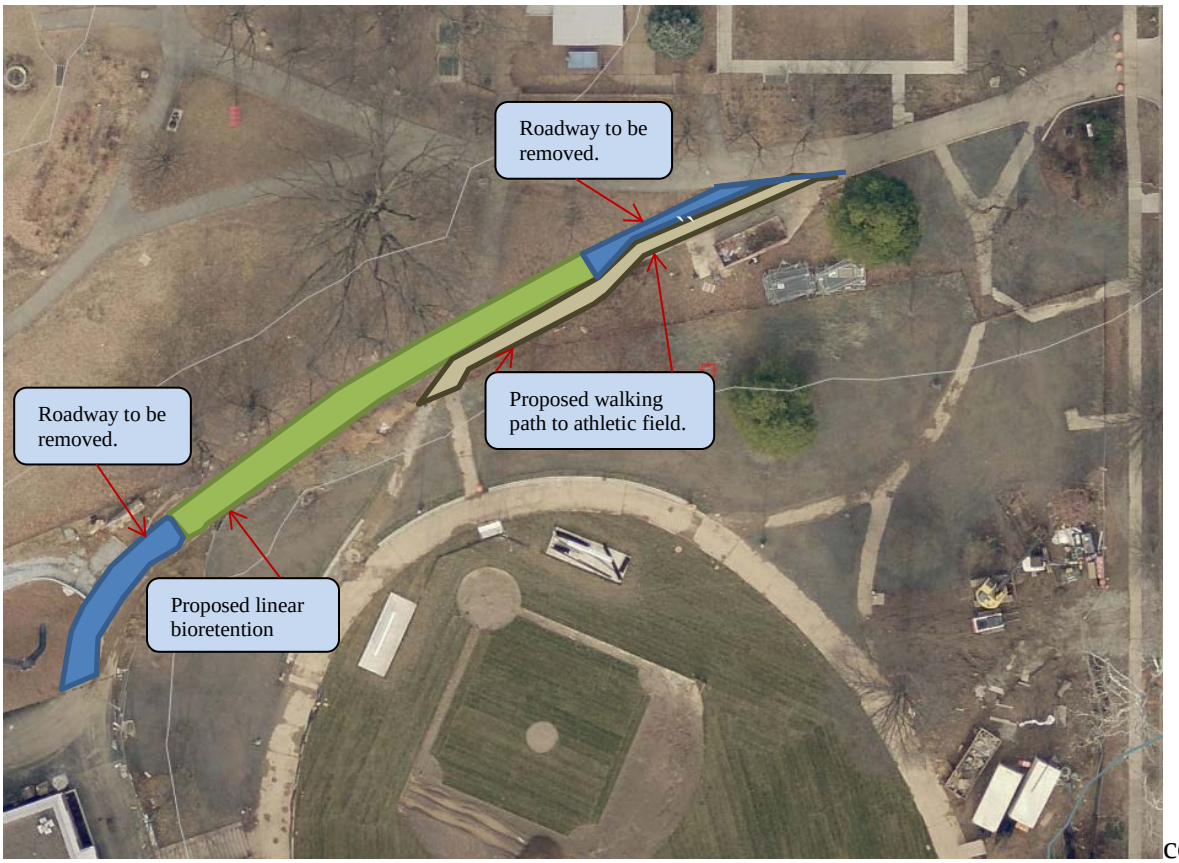


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Figure 8: Proposed solutions at Lafayette Recreation Center

Drainage grates

DOEE proposes that DGS clean out the drainage grates to get them back to functioning order in conjunction with uphill site stabilization to prevent further sediment clogging from occurring.

Resident Stormwater Proposal

Lastly, the stakeholders noted that a young resident has written a proposal for constructing a gravel filled swale along the walking path on the uphill field, furthest north that leads to the middle of Quesada street – as part of his Eagle Scout project. The resident has proposed to pay for and construct the project but stakeholders need to know how to legally proceed with the project. They are looking for guidance from DOEE.

DOEE believes that due to the large volume of stormwater that comes through this project's proposed work area, this end of pipe solution will not offset the damage to the asphalt walkways because the vast erosion uphill will quickly clog the proposed system. The solution of creating berms throughout the field, from uphill to down, will slow down the water that has been causing the destabilization of the walkways.

As an alternate project, the resident might work with the landscape designer to employ DOEE's proposed mulch and berm solution at a smaller scale. Mulching the area adjacent to the walking path and building low berms perpendicular to the flow path may help mitigate future damage to the walking path and offer protection and irrigation for the trees in the project area. Please note that this would only be a temporary solution since the practice would be demolished when a comprehensive solution to the area is being worked on.

Figure 9. Possible project alternative for Eagle Scout

Project Cost Estimate

Below is a rough estimate for the proposed stormwater solutions. Please note that the prices are based on the price of the project at Takoma Recreation Center as well as from previous work done by various vendors for DOEE. Actual prices may vary based on site variables, vendor used, etc.

Quantity	Description	Unit Cost	Cost
	Hillside stabilization with mulch/berm application[1]	$1.50/sq.ft.	$20,000.00
	Design/engineering for hillside stabilization[2]	$.48/sq.ft.	$20,000.00
	Impervious Removal[3]	$14/sq. ft.	$50,000.00
	Linear bioretention construction[4]	$25/sq.ft.	$75,000.00
	Bioretention design	--	$20,000.00
	Total Cost		$185,000.00

Notes:

1. Hillside stabilization cost includes demolition, erosion and sediment control, materials, stabilization with mulch/berm application) for 34,592 sq.ft. and rounded up.
2. Cost estimated for 34,592 sq.ft. and rounded up.
3. Removal of 3,274 sq.ft. of roadway from 33rd Street to Lafayette Elementary School.
4. Bioretention construction cost includes demolition, erosion and sediment control, materials and construction.