

March 9, 2017

Mr. Harry Martin  
3601 Idaho Ave., NW  
Washington, DC 20016

Re: Arboricultural review of DGS study for pool facility at Hearst Park

Dear Mr. Martin:

Thank you for the opportunity to offer the following observations and recommendations as they relate to the proposed Hearst Park & Pool Project. They are in response to the 'Hearst Park & Pool Project' document prepared by the Department of General Services (DGS), for a community meeting of February 15, 2017, and a response added by the Casey Trees organization on October 11, 2016.

The DGS study provides overwhelming evidence of equal support for both the pool, and the preservation of the large trees. The Casey Trees document supports protection of the large trees as a component of the city's goal to increase tree canopy coverage to 40% by 2032, and makes several appropriate protection suggestions. However, neither document provides a thorough examination of the potential for irreparable impacts to the trees on site.

A more robust study of the impacts to fourteen (14) large willow oaks within the park, and the other perimeter trees is necessary. Listed below are tree protection issues that must be addressed for each option in order to make a more informed decision about whether a pool, and associated features, can be installed without causing irreparable damage to the trees.

At a minimum, a tree preservation study should include:

- Accurate depictions of the critical root zones (CRZ) for each impacted tree.
- A study of utility installation alignments, and where trenching will be required.
- Identification of staging areas for materials, chemicals and excavated dirt.
- Ingress/egress routes for large machinery, and how tree trunks and roots are protected.
- The type of machinery required for this project.
- Extent of canopy pruning to provide clearance for machinery, cranes, etc.
- Root pruning limits.
- Tree protection fencing locations and type.
- Bio-swale locations and extent of grading.
- Alignment of drainage pipes from the bio-swales to storm water system.
- Possibility of chemical releases from the pool, or pool area that could leach into tree roots.
- Contractor experience with this type of tree protection job. A history of at least 5 similar projects should be a baseline.
- Pre- construction treatments for willow oaks.
- Post -construction treatments for willow oaks.
- Tree preservation oversight during construction.

This list is not exhaustive, but it provides insight into why this project is more than just the graphic outline of the pool, and pool house. The externalities of construction are many due to the legions of sub-contractors involved, and high level of activity that accompanies each. It only takes one mistake by one contractor to inflict irreparable damage.

#### Existing tree conditions:

The 14 willow oaks that surround the soccer field are all in the 45"-55" diameter range, which suggests that they were planted at the time of the park's creation in the 1930's. At an age of roughly 85 years, they are in a mature to over-mature stage of their life cycle. Their years of vigorous growth are likely behind them. As they slow physiologically, they will become increasingly prone to insect and disease infestations. Therefore, more detail must be paid to the full extent of the root loss, and canopy pruning that accompanies each option, and the attendant consequences.

To the south of the tennis courts is a forested buffer that is comprised primarily of white ash, and tulip poplar. The ash trees are in the first row of trees, which overhang the courts and provide shade. Unfortunately, ash trees in our area are under tremendous threat from an insect called the Emerald ash borer (EAB). The EAB is an Asian exotic introduction that arrived in Michigan in the 1990's, and has spread throughout the Mid-west and Mid-Atlantic. They are now overwhelming ash trees in the DC region, and killing them in great numbers. Therefore, unless chemical protection measures were put into place several years ago, these trees will likely succumb to this insect within the next few years.

Similarly, at the far end of the soccer field, there is a wooded stand dominated by white ash, tulip poplar and elm that provide a buffer to 37<sup>th</sup> Street. The fate of the ash trees here will likely be the same, which is a total loss within the next several years. Fortunately, the other tree types are not impacted by this insect and will survive the infestation. And, at the western end of the soccer field is a grouping of white oak. These are in good condition, and do not appear to be under any pressure from insects or disease.

My examination of the three options is based entirely on the potential to construct them without causing irreparable damage to the willow oaks, and surrounding trees. I draw on 28 years of experience with trees and construction sites to reach these conclusions.

#### Option 1:

This option is not tenable because of the close proximity of at least five large diameter willow oaks, and the high likelihood of irreparable damage being done to them. Although there are no quantitative standards for critical root zones (CRZ) in the arboricultural industry, the DC DDOT has promulgated guidelines that determine the CRZ to be 1' in radial distance for every 1" of trunk diameter. For example, tree #512 has a diameter of 52.5 inches, which equates to a CRZ of 52.5 feet in all directions. Therefore, the CRZ's of all five willow oaks are within the limits of this construction site. And, I question whether 1' of radial distance for each inch of trunk diameter is adequate for trees of this size and life stage. A CRZ of 1.5' for each inch of trunk diameter might be more appropriate, in which case tree #512 would have a CRZ of over 78' in all directions.

It is also important to consider how soil conditions influence root growth. I predict that the majority of absorbing roots would be found in the low lying areas along the soccer field where water collects, and that there is a lesser density on the steep adjacent to the tennis courts. Roots will have extended up this bank to some degree, but most are likely down in the lower lying areas. The depictions of the CRZ's for all options were not provided in the DGS report of February 15<sup>th</sup>. Mapping of these zones is needed to insure protection of all potentially impacted trees.

Another important root zone consideration is the extent of the large woody roots that emanate from the base of the willow oaks. This feature is termed the "root plate," and it provides the tree's structural support. There are no quantitative standards for determining the root plate dimension either, however a widely used guideline states that they can extend 6" of radial distance for each inch of trunk diameter. This means that these supporting roots could extend as much as 25', or more from tree #512. Therefore, any root damage must be outside of this zone in order to avoid compromising the tree's structural integrity, and an almost certain rapid decline in tree health.

Tree protection fencing would have to be installed on the steep dirt bank half way between the tennis courts and the near edge of the sidewalk. This would be the limit of disturbance (LOD) along this edge. The remainder of the work zone would be the wooded edges to the south, and east of the tennis courts and Idaho Avenue. All utilities, excavation and vehicles must be restricted to this very small building envelope.

A significant concern with this option is that the proposed pool house is almost certainly within the root plate dimensions of trees # 510 and 511. The proposed 60' long north wall would severely impact the root plates of both trees, which could lead to a diminishment of structural integrity, and a significant decline in their long-term health.

Overall, a great deal of construction is planned for this tight space including the renovation of two tennis courts, demolition of another, the installation of a pool and pool house, and possibly removing as much as 30' of old fill dirt. This would involve many trips by dump trucks, and it is hard to see how trucks could maneuver in such a small space. Access could be accomplished from Idaho Avenue, near the park entrance, and the truck route protected by rubber matting along its length. Access could also occur from an entrance near the corner of Idaho Avenue and Quebec Street, but it would involve a steep slope and the removal of several of the cherry trees at the top of the steep bank.

Material stockpiling would also be difficult. It would likely occur in the soccer field, which brings the trucks in close proximity to these same willow oaks, but on the opposite side. So, these trees could be damaged on two sides. It is certainly possible to move the staging area further out into the soccer field, but this is not likely to be the default preference of the construction company.

In conclusion, this option is severely limited by its small building envelope, and close proximity to at least five of the large willow oaks (#'s 510 to 514). A high level of construction activity within a small space would threaten all of these trees. Therefore, I do not see this location as tenable for both construction and tree preservation. There are simply too many things that could go wrong, and it is unlikely that the city would institute a post-construction maintenance program to insure that the willow oaks would receive after care in the event of extensive damage.

## Option 2:

As rendered by DGS, Option 2 endangers the wooded buffer along 37<sup>th</sup> Street, which is dominated by white ash and several American elms, including trees #550 and 554. The elms appear to be in good condition. However, if stressed by root loss from construction they will become targets for bark beetle infestations, and subsequent infection with Dutch elm disease (DED).

Also, I feel that the pool needs to move to the south, and further into the soccer field, to avoid damaging the stand of white oaks on the slope between the field and the Hearst School. These are trees #742-746. They are all in good condition, and should absolutely be protected. Additionally, the bio-swale at the eastern end of the pool is too close to the willow oaks (#501 to 504). It should be shifted to be closer to the pool itself, or shifted to the western property line behind the new soccer field. However, shifting it to the west may ultimately interfere with the newly aligned soccer field.

Access to this site for construction vehicles would impact trees #507 and 508. The route would have to be protected by fencing and root protection matting, until it is well beyond the driplines of these oaks.

Unresolved issues include utility alignments and how they would impact the CRZ's, and also the construction of a new soccer field and its impact on the willow oaks. Any new soccer field would represent a tree preservation challenge, because of the potential for root loss from new grading. I also noticed the sprinkler system, and sprinkler heads, on the existing soccer field and assume that these would be updated for any new field. This could lead to further root loss. Or, the city may opt for an artificial turf system, which would present its own challenges in terms of the impact to the trees. So, option #2 is not without serious design challenges.

My conclusion is that this option as rendered by DGS is likely to inflict damage to the willow oaks, as well as the American elms and white oaks as mentioned. The damage could be mitigated somewhat by shifting the entire pool feature closer to the middle of the existing soccer field, and further from all of the trees.

## Option 3:

This option is the least desirable. It would involve considerable construction impacts to all 14 willow oaks, and perimeter trees. I cannot envision a scenario where this option would avoid irreparable harm to all surrounding trees. Therefore, it is a nonstarter, and should not be considered.

In summary, all three options pose threats to the health and long-term viability of the willow oaks, and surrounding trees. Alternative proposals could have lesser impacts, however as proposed the impacts are considerable. They all represent significant challenges in terms of adequate tree preservation.

Thank you for the opportunity to present this analysis, and please let me know if you have any subsequent questions.

Sincerely,



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