Fort Ward Park and Museum Area Management Plan

SECTION I
SUMMARY REPORT

The City of Alexandria, Virginia

Adopted January 2015

The City of Alexandria affirms that significant parts of Fort Ward Park are hallowed ground. Fort Ward Park is home to significant historic and cultural resources, including sacred burial grounds of the families that lived there. The City of Alexandria recognizes that these sacred places and any other burial sites Identified in the future shall be protected from disturbance and treated with respect and dignity. The Fort Ward Park and Museum Area Management Plan provides a sensitive approach to acknowledging, protecting and interpreting the resources on this property, which is listed on the National Register of Historic Placest along with guidelines for managing the area's natural resources and compatible passive recreation uses.

Acknowledgements

City Council

William D. Euille, Mayor
Allison Silberberg, Vice Mayor
John T. Chapman
Timothy B. Lovain
Redella S. "Del" Pepper
Paul C. Smedberg
Justin Wilson

Ad Hoc Fort Ward Park and Museum Area Stakeholder Advisory Group

(FWAG or SAG) Roster as of 1/2014

Member	Group
Ripley Forbes	Park and Recreation Commission
Linda Ries (resigned 2014)	Park and Recreation Commission
Robert Moir	Park and Recreation Commission
Charles (Chuck) Ziegler	Historic Alexandria Resources Commission
Ellen Stanton	Historic Alexandria Resources Commission
Janice Magnuson	Historic Alexandria Resources Commission
Ryan Sloan (replaced by Susan Gitlin 2014)	Environmental Policy Commission
Adrienne Washington	Fort Ward/Seminary African American Descendants Society
Lena Rainey	Oakland Baptist Church
Frances Terrell	Seminary Civic Association
Sharon Annear	Seminary Hill Association, Inc.
James Walpole (resigned May 2014)	Citizen at Large
Richard Brune	Citizen at Large
Vacant	Citizen Living within One Mile Radius

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Office of Historic Alexandria
Transportation & Environmental Services

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Figure 1 - Entrance to Fort Ward Park from West Braddock Road

Introduction

Fort Ward Park Today

Fort Ward Park is an asset to the City of Alexandria and the region. Rich in historical and natural resources, it is fraying, heavily used and in need of a collective vision to move forward, steward its resources and expand its interpretive and passive recreation offerings in a responsible manner. It is time to explore additional sources of financial and volunteer support for the park. Issues that must be addressed in the development of the Fort Ward Park and Museum Area Management Plan include the stewardship of the park's rich collection of cultural[1] and natural resources, the park's importance as a recreational opportunity for the residents of Alexandria and the park's importance as open space for the west end.

Acquisition and Early Development of the Park

The first 35 acres of the 43.46 acre property were acquired in the 1950s to both preserve and reconstruct a portion of the fort for the upcoming Civil War Centennial and to establish a public park. In addition to the Civil War resources, the land possesses a century-long legacy of community life and heritage that preceded development of the park as a public amenity. Known to local families as "The Fort" community, physical evidence of its history includes archaeological sites, burial sites, plantings and road traces. Fort Ward Park's museum has an outstanding collection of Civil War artifacts, a research library and educational and interpretive programming. In recent years, the history and significance of the post-Civil War evolution of the Fort Ward site has been brought to light, focusing on the African American families that built homes and created a community in and around the Seminary. The park was placed on the National Register of Historic Places in 1982.

The Challenge

Every square foot of Fort Ward Park is used and in demand—for historic interpretation and preservation, for recreation and as native woodland and open space. Many issues must be answered to effectively address the needs of the park and museum. The lengthy list of issues generated through the planning process are clustered under the following five questions. Later in the Summary Report, the five goal statements directly respond to the issues raised under each question.

Figure 2 - Loop path users in Fort Ward Park

Who is in Charge?

The park is currently managed by four separate departments of the City. A formal Memorandum of Agreement (MOU), annually updated, establishes the roles for each entity and their operational responsibilities. Budget pressures within the City of Alexandria have adversely impacted the park, making it challenging to meet the needs for the

1 'Cultural resources' is a term commonly used in reference to archaeological and historical features

Figure 3 - Loop path near fort gate

FORT WARD PARK DEFINITION AND PURPOSE

Fort Ward Park is classified as a Destination/Historical Park by the City of Alexandria. It is similar in service area, use and size to the City's six other Citywide Parks[1]. Fort Ward Park's founding purpose was for use as a 35-acre historic park and Civil War museum with supporting recreational facilities, picnic areas and an amphitheater all enhanced by carefully located planting beds[2].

Later, additional acres (not subject to this Management Plan) were acquired and are used for active recreation and athletic fields. Today, in addition to its historic, interpretive and educational mission, the park serves the surrounding community's need for passive recreation consisting of less structured and less formal activities. Examples include: a playground, picnic areas, historic/cultural sites, an amphitheater and natural resource areas. The park is also significant locally as preserved open space for the City of Alexandria—associated with an adjoining complex of centrally located and largely wooded parcels of land owned by Episcopal High School and the Episcopal Theological Seminary.

1 Citywide Parks Improvement Plan 2014, City of Alexandria, Virginia Department of Recreation, Parks, and Cultural Activities, Park Planning, Design & Capital Development, Draft, January 16, 2014. Page 9

2 Application for listing on the National Register of Historic Places approved by the Executive Director, Virginia Historic Landmarks Commission, Commonwealth of Virginia, February 16, 1982

preservation of its nationally and regionally significant resources while at the same time meeting recreation needs.

A number of different volunteer groups support the park within very specific areas of focus, primarily related to its history. Currently, there is not a formal, single coalition of interest groups or an over-arching volunteer group independent of the City to take the lead in advocacy for the park and its many resources. The City Council-appointed advisory group—Ad Hoc Fort Ward Park and Museum Stakeholder Advisory Group (FWAG)—terminates in September 2014.

What Should the Park Become?

As archaeological investigations document more of the rich stories of the site while the demand for the park's role as open space increases, tensions between what the park has been and where it is headed are apparent in the ongoing transformation of the site. Best practices for management and maintenance activities address issues and site constraints facing the park.

How Should the Park be Maintained?

Maintenance practices have been deterred while investigations of potential archaeological elements were ongoing. Wisely, normal park maintenance ground disturbing activities such as tree planting, stump removal or ground aeration were prevented until further information was made available to ensure that cultural resources were not inadvertently damaged or destroyed. The challenge is to now restore appropriate landscape cultural (maintenance) practices to the site.

Which Stories Should be Told?

Multiple threads of interpretive stories should be tied together to share the stories of the site from the Civil War to Civil Rights eras. Much of the current interpretation and museum display is focused on stories related to the site's role during the Civil War. Recent installation of interpretive panels share the story of "The Fort" community that grew up in conjunction with the fort and remained until the creation of the park. Many additional stories remain and await interpretation.

Which Recreation Facilities Belong in the Park?

Fort Ward Park is one of Alexandria's citywide large parks. In addition to its rich cultural resources, the park also serves as open space for passive recreation in the west end of the city. As the population grows, additional demands for facilities supporting these activities will grow as well.

Figure 4 - Oakland Baptist Cemetery

The Management Plan

Why a Management Plan?

A management plan lays out a long-range plan that provides strategic guidance for decision-making on complex issues that have many variables and potential answers. Expanded from the concept of a master plan—a type of plan that prescribes improvements and their location within a set time period—a management plan is usually focused on historical and natural resources, educational opportunities and operational issues.

The Fort Ward Park and Museum Area Management Plan focuses on the protection and enhancement of the site's natural and historical resources, interpretation of those resources, pedestrian and vehicular circulation and recreation facilities. The plan recommends best practices and actions to better manage the park and synthesizes years of work—from early FWAG reports to the current planning team effort—to document the significance, threats and vulnerabilities to the resources at the park while recognizing the continuum of history within the region and parkland. These findings are incorporated in the management recommendations to address immediate and long-term needs of the park.

The plan seeks to integrate Fort Ward Park's historical significance and context with contemporary park operations and more recently updated archaeological information. The over-arching intent is that Fort Ward and its resources are sustained, maintained and interpreted. Management recommendations for resource protection, interpretation and enhancement synthesize and apply the best practices available to address the management issues and concerns identified through the planning process. Management recommendations support a broad array of users and uses; protect and maintain the park's nationally significant natural resources; serve to educate the park and museum visitors through innovative and engaging interpretation and programming; and continue to satisfy the growing needs for passive recreational enjoyment of a shady, natural oasis from an increasingly complex urban environment.

Separately, but equally important, is a series of maps that delineate management zones for park operations. One of the challenges that has long faced park managers is the potential that ground disturbing activities such as tree planting or stump removal might inadvertently damage undocumented cultural resources. All ground disturbing activities were halted in 2010 as archaeological investigations took place. Based on this report and the work leading to its compilation by the Office of Historic Alexandria (OHA) and the Recreation, Parks and Cultural Activities (RPCA), park operations were able to begin selected ground disturbing maintenance practices in designated areas of the park in the fall of 2013. Management zones are defined for park operations and serve as graphic definitions of areas of responsibilities and directed actions. Examples of zone maps include the location for maintenance responsibilities between OHA, RPCA, Transportation and Environmental Services (T&ES) and General Services (GS) and the identification of landcover types and maintenance boundaries for woodlands, turf and meadow land.

The MOU and the map designating levels of ground disturbance are the linchpin of this management plan. Developed by OHA (Plate 12 in Section II.8, with additional detail provided in Appendix II), it summarizes findings from archaeological investigations in the park. It delineates archaeological sites and ranks their vulnerability to

Figure 5 - Picnickers near meadow at park entry

ground disturbing activities. This work serves as the basis for all park operation management zone mapping, the proposed soft path alignment and recommendations for facility improvements and relocation. As additional site investigations take place, it is critical that all parties coordinate document updates.

As described in the City's Request for Proposal for the development of the management plan, the Fort Ward Park and Museum Area Management Plan addresses and incorporates the following elements.

- Serves as a guide and policy document for current and future park staff, other partnering agencies, elected officials and interested members of the public
- Identifies stakeholders affected by the park management plan and park use
- Balances the management of natural, cultural and recreational resources and defines needed actions to mitigate any adverse effects
- Identifies sustainable practice strategies that coordinate site use, site protection and changes at the site over time
- Provides a framework for monitoring, preserving, protecting and maintaining resources at the park, including the earthwork fort, archaeological resources, interments, natural features and landscape
- Identifies coordinated park enhancement opportunities, including possible upgrades related to historical education and interpretation; the recognition and demarcation of graves and cemeteries; park facilities, museum additions and improvements; recreation infrastructure; public accessibility and plantings.
- Provides estimates of probable costs for those actions ranked as being of the highest priority by members of FWAG
- Provides overall project priority for the actions included in the management plan
- Serves as a guide for future park budget allocations and annual funding requests

By integrating the historical context of the site and contemporary park operations, successful implementation of the management plan will sustain, maintain and interpret the park and its many resources.

The Management Planning Process

Prior to the planning team's involvement, the Alexandria City Council-appointed FWAG researched and developed a report for City Council that identified issues facing the park and proposed a number of recommendations to address them. Published over a two-year period in 2011 and 2012, the FWAG document includes chapters focused on history and culture; recreational use; environmental and natural resources; park operations; planning; development and promotion; Civil War resources; African American cemeteries and burial sites; African American structures and other resources; cultural resources related to the museum and its collections; and programs and management recommendations for the environmental resources at Fort Ward.

The planning team's work incorporates the issues facing the park and museum as identified by the FWAG. This work was supplemented with additional field work, mapping and research. Planning team members used their professional judgment to shape the framework for the Fort Ward Park and Museum Area Management Plan.

The plan has five structuring goals drawn from the grouping of challenges that face the park. It is organized in a framework structured by these goals to guide the management activities related to the park. Derived from discussions during the public engagement process, from the FWAG's work and additional research from the planning team, each goal focuses on a specific sector of issues and challenges facing the park. Each of the five

Figure 6 - Amphitheater in park (photo courtesy of Sharon Annear)

goals are further articulated with objectives, strategies and actions. To assist the reader in navigating the plan, the goals are consistently color-coded in Section I and Section II. This framework, in association with recommended best practices and actions, was presented to the FWAG and the general public. The five goals, shaped by issues and challenges as identified by FWAG and confirmed by the planning team and public review, are as follows.

- *Who is in Charge?*

Goal 1 **Management and Funding**

- *What Should the Park Become?*

Goal 2 **Park Character**

- *How Should the Park be Maintained?*

Goal 3 **Landscape Cultural Practices**

- *Which Stories Should be Told?*

Goal 4 **Educate and Engage Visitors**

- *Which Recreation Facilities Belong in the Park?*

Goal 5 **Enhance Park Facilities**

Public Engagement

In addition to the close interaction with the FWAG appointees, the planning process incorporated an active and broadly based engagement of the general public. Monthly FWAG meetings were open to the public, with a public comment period incorporated at each meeting.

Two park "listening sessions" were conducted at Fort Ward Park in early June 2013. Display tables were staffed by the planning team to elicit informal conversations with park visitors. A park survey was provided at the display table and to users throughout the park. The survey was also made available on the City's website. It included questions specific to Fort Ward Park and questions parallel to those asked during the Citywide Parks Improvement planning effort for the City's large parks.

The January 13, 2014 Fort Ward Park and Museum Area Management Plan was linked to the City's website. Following the draft publication, two public meetings were held to answer questions and to explain the plan contents. The first session, a formal presentation with questions and answers following, was held on the evening of February 24, 2014 at St. Stephen's and St. Agnes' Middle School gymnasium, next door to the park. The second

Figure 7 - Fort Ward gate and cannons

session, an open house, was held the following Saturday afternoon, March 8, 2014, at the same meeting site. Comments on the draft plan were also solicited on the City's website.

Associated Work Efforts

Drainage Report, URS 2014

The site and its issues are complex. A separate study on stormwater and drainage, *Fort Ward Park Drainage Master Plan,* was undertaken by URS under a separate contract simultaneous to the management planning effort. Coordination of the management plan and drainage report recommendations was key to both work products. A copy of the report is included in Appendix I of this plan.

Sixteen sites were examined through field reconnaissance to evaluate the existing conditions and to identify potential measures to improve the drainage and sedimentation. URS performed hydrologic and hydraulic analyses to verify the capacity of the existing stormwater system. Drainage recommendations include both structural and nonstructural measures.

Three recommended storm drainage system pilot project improvements were proposed.

- The first is the retrofitting of the existing stormwater system to reduce sedimentation and to improve the water quality of runoff through the installation of a filter system under the existing gravel parking area adjacent to West Braddock Road
- The second is the construction of a diversion berm (shaped landform) and installation of an underground drainage pipe to improve the sheet runoff and subsequent erosion that is impacting the Oakland Baptist Church Cemetery and adjacent Old Grave Yard
- The third is to stabilize the stream north of the cemetery

Archaeological Investigations

Three stages of archaeological work have been completed in the park—Stages 1, 2A and 2B. Stage 3 has been recommended by the Office of Historic Alexandria (OHA) staff but has not been funded during the past two City budget cycles. Other than the archaeological review associated with the current MOU agreement, the Save America's Treasures grant, or upcoming drainage improvements, no additional investigation has been conducted with the exception of week-long summer camp programs for middle and high school students. Archaeological investigation will continue at Fort Ward over a number of future years, as funding and opportunities present themselves. In the meantime, the existing MOU serves to protect archaeologically sensitive areas until further study can be undertaken.

History Report, Dr. Krystyn Moon 2014

Although not completed in time for incorporation within the recommendations of this report, Dr. Krystyn Moon produced an historical report on the parkland, *Finding the Fort: A History of an African American Neighborhood in Northern Virginia, 1860s-1960s,* that is referenced in this document's Appendix III.

Citywide Parks Improvement Plan 2014

Parallel to the development of the Fort Ward Park and Museum Area Management Plan, the City of Alexandria conducted a planning effort for Alexandria's parks that are over 15 acres, municipally owned and have multiple uses. Six parks were included: Ben Brenman and Armistead L. Boothe Parks, Chinquapin Park, Four Mile Run

Figure 8 - Archaeological findings from Fort Ward Park

Park, Joseph Hensley Park, Holmes Run Park System and Simpson Stadium Park. Although Fort Ward Park also meets the criteria for inclusion, the complexities facing park management and operations at Fort Ward led to a separate planning effort.

Although generated separately, the Citywide Parks Improvement Plan's four objectives and eight recommendations (sidebar) are equally applicable to Fort Ward. The plan's four objectives follow.

- *Increase accessibility to the City's large parks and their facilities*
- *Design public spaces that meet multiple community needs and balance passive and active uses*
- *Steward and cultivate the parks' many natural and cultural resource assets*
- *Strengthen the network of Citywide Parks and its role in connecting the community*

Each recommendation noted in the sidebar included an estimated cost for the six parks were the focus of the plan. Since Fort Ward was excluded from the citywide planning effort, costs to implement any of the eight common recommendations at Fort Ward Park must be generated separately.

Other City Plans and Documents

A number of other citywide plans that influence Fort Ward's operations and management, influencing and guiding policy decisions affecting implementation of the management plan's recommendations. These include the *Urban Forestry Master Plan*, the *Environmental Action Plan 2030, Alexandria Open Space Plan*, *Park and Open Space Facilities Prioritization Analysis* amongst others. A full list is included in the bibliography in Section II.10.

Plan Structure

Section I

Section I, the Summary Report, identifies the key recommendations and findings of the Fort Ward planning effort and directs the reader to a specific location for further information. It is a guide and policy document for use by

Recommendations for all Citywide Parks[1]

- ***Improve Wayfinding throughout the Park System***
  A similar concern was identified in the Fort Ward planning effort and is addressed under Goal 5, Strategy 5.2.3. Currently, there is no consistent graphic conformity for welcome, rules and regulation, and historical/educational signs.
- ***Provide Improved Trash Receptacle Locations and Recycling Program***
- ***Include Universal Accessibility in all Plans***
  The Fort Ward Management Plan addresses this issue under Goal 1 and Strategy 1.3.2—Enhance park's accessibility and meet ADA standards. In addition to meeting the 2010 standards, the Fort Ward plan recommends meeting the draft 2009 Outdoor Recreation Access Route standards for paths connecting park features.
- ***Locate Public Art in Collaboration with the Office of the Arts Public Master Plan***
  The management plan recognizes the interest in the incorporation of public art at Fort Ward Park under Goal 1, Strategy 1.3.1.
- ***Establish Parking Policy and Standards***
  This is focused on athletic facility parking, given the exclusion of the athletic fields from the Management Plan, it is not addressed in this document.
- ***Upgrade Utilities in the Parks to Support Park Uses, including Special Events***
  Opportunities to upgrade or expand the park's existing facilities—the amphitheater, restrooms, the museum, etc.—are directly affected by the park's infrastructure.
- ***Install Additional Bicycle Racks in the Parks***
  Recommendations specific to bike racks did not come up in discussions during the Fort Ward planning sessions, but the park is used by bicyclists and is featured as a stop on several bicycle trails.
- ***Complete a Documentary Study and Archaeological Evaluation and Incorporate Interpretive Elements***
  Of great relevance at Fort Ward, this is addressed under all goals, and in particular, interpretation is the focus of Goal 4.

1 Although Fort Ward is one of the City's large parks, it was not included in the Citywide Parks Improvement Plan because of the separate development of the management plan.

Figure 9 - Tree damage at Fort Ward Park

park staff, other partnering agencies, elected officials and interested members of the public. Recommendations are structured by the goals and subdivided into multiple actions. Given the large number of recommended actions, priorities were established and the Summary Report focuses on high priority actions.

Section II

This section provides supporting documentation to the Summary Report. Section II provides background material and discussion considered by FWAG in support of the key recommendations. The first five chapters reflect the January 13, 2014 draft document. Section II chapters are as follows.

- **Section II.1** - Summarizes the background, location and history of Fort Ward Park.
- **Section II.2** - Presents a snapshot of the site's present natural and cultural resources.
- **Section II.3 and II.4** - Outlines a framework for balancing the need to accommodate a wide range of users and bring awareness to the special significance of Fort Ward Park and the Museum.
- **Section II.5** - Presents the report's recommendations in greater detail than found in this Summary Report. Recommendations are focused around a framework of goals, objectives, strategies and actions. The framework recognizes that the management actions for Fort Ward Park must support a broad array of users and uses; must protect and maintain the park's nationally significant historic and cultural resources and locally significant natural resources; must strive to educate its visitors through innovative and engaging interpretation and programming; and must continue to satisfy the growing needs for passive recreational enjoyment of a shady, natural oasis from an increasing complex urban environment.
- **Section II.6 -** Contains the illustrated compilation of Best Practices as tied to each of the recommended actions under the five goals. Section II.6, in conjunction with Section II.7, contains the most critical background material related to the plan's implementation. Both chapters include a comprehensive listing and explanation of each action item. Only those actions ranked as high priority actions by the FWAG or the City are included in the presentation of actions in the Summary Report. Refer to Section II.5, II.6 and II.7 for a full list of actions.
- **Section II.7** - Incorporates an implementation table, with details related to management and monitoring for each action, priority ranking, probable cost (if applicable), responsible party and time frame for implementation. Each action's level of priority, drawn from both FWAG responses and the City, is noted with caveats. The most highly ranked actions by FWAG determined which actions would have probable costs developed. Not all actions identified as a priority by individual FWAG members had costs developed for them. Generally, actions that received support from four or more FWAG members were evaluated in more detail with probable statements of costs developed.
- **Section II.8 -** Plates - series of maps prepared for the planning effort.
- **Section II.9 -** Landscape Management of Earthworks and Other Civil War Resources.
- **Section II.10** - Bibliography.

Appendices

- **Appendix I -** *Fort Ward Park Drainage Master Plan*, prepared by URS, 2014.
- **Appendix II -** Text, Table and mapping summarizing the status of the archaeological research in the park as of April 2014. This information was used to generate Plate 22, Ground Disturbing Activities.
- **Appendix III** - *Finding the Fort: A History of an African American Neighborhood in Northern Virginia 1860s-1960s,* prepared by Krystyn Moon for OHA under a separate contract.
- **Appendix IV** - 2011 MOU, 2014 MOU DRAFT, Ground Disturbing Activities Notification Protocol

Figure 10 - Speed bump on paved loop path that does not meet current ADA standards

Recommendations

Goals, Objectives and Strategies

The five goals are summarized in this document on the following pages. Using the color coding that is consistent throughout the plan, each goal statement is supported by its objectives and strategies and accompanied by an illustration of a best practice employed to achieve the recommended goal. The highest priority actions related to each strategy follow this section.

Goal statement, consistently color coded throughout the document

Listing of the associated objectives and supporting strategies

Illustration of best practice example - in this case a revision of the boundaries for park maintenance

Goal 1—Management and Funding

The City of Alexandria will support a broad array of users and uses by collaboratively managing the park and equitably investing in the Fort Ward Park and Museum Area as compared with other regional city parks and facilities.

Goal 1 Objectives and Strategies

1.1 Continue the collaborative management process between City agencies as established in the Memorandum of Understanding (MOU)

The MOU between the Office of Historic Alexandria (OHA), Department of Recreation, Parks and Cultural Activities (RPCA), Department of Transportation and Environmental (T&ES) Services and Department of General Services (GS) spells out the operations and maintenance responsibilities for the Fort Ward Park and Museum Area. It is the primary tool for allocating resources and identifying needs in a manner consistent with the management plan.

- 1.1.1 Use the MOU process to assess and monitor progress and identify problems and solutions

1.2 Make Fort Ward Park a priority in the City of Alexandria funding

The annual update of the MOU and annual monitoring and progress reporting can be utilized to establish a defensible budget for management and maintenance practices as needed to preserve, protect, repair and maintain the nationally and regionally significant resources that are the responsibility of its owner, the City of Alexandria.

- 1.2.1 Plan for and communicate the needs and priorities for park management funding (operational and capital) as part of the City budget consistent with the responsible stewardship of a significant historic site and regional park serving the entire City and beyond

1.3 Support and finance enhancements to park facilities to meet the needs of the broadest array of park users and neighbors

Broadening the user base is a critical step in gaining the financial and management support for the responsible stewardship and necessary enhancements to Fort Ward Park.

- 1.3.1 Broaden the array of programming and public art in Fort Ward Park
- 1.3.2 Enhance park's accessibility and meet ADA standards

The level of funding and resources available to manage the park is a critical issue facing the park. Current funding levels do not meet all the needs for the preservation of its nationally and regionally significant resources while at the same time meeting recreational needs. There is a strong perception that the allocation of resources is unbalanced and Fort Ward Park is not receiving a fair share of resources when compared with other parks of its size and significance.

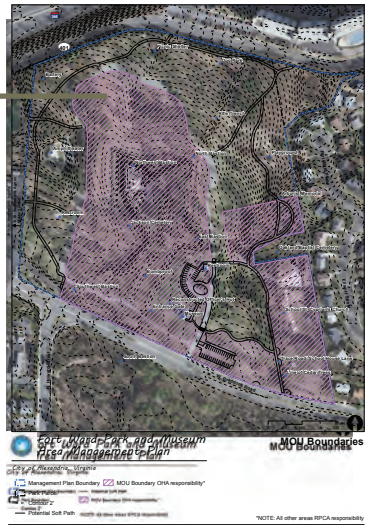

Figure 8 - MOU Boundary Zone Map, proposed adjustment to clarify park maintenance responsibilities for historic sites

Figure 11 - Diagram of goal sheets

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Who is in Charge?

The level of funding and resources available to manage the park is a critical issue facing the park. Current funding levels do not meet all the needs for the preservation of its nationally and regionally significant resources while at the same time meeting recreational needs. There is a strong perception that the allocation of resources is unbalanced and Fort Ward Park is not receiving a fair share of resources when compared with other parks of its size and significance.

Fort Ward Park and Museum Area Management Plan

City of Alexandria, Virginia

MOU Boundaries

Management Plan Boundary
MOU Boundary OHA responsibility*
Park Parcel
Contour 2'
Potential Soft Path

*NOTE: All other areas RPCA responsibility

Figure 12 - Goal 1 Example: MOU Boundary Zone Map, proposed adjustment to clarify park maintenance responsibilities for historic sites

Goal 2—Park Character: Preserve, Protect, Repair and Maintain Resources

The City of Alexandria, working with its boards and commissions, volunteers and park neighbors, will work to protect and maintain the nationally significant historic and cultural resources and locally significant natural resources found within Fort Ward Park.

Goal 2 Objectives and Strategies

2.1 Protect vulnerable park areas from adverse ground disturbing activities

At the most basic level, vulnerable park resources must be protected from ground disturbing activities; however this does not mean that nothing can be disturbed. Ground disturbance must be monitored by activity, depth and frequency. Mapping should reflect the most recent finding on site and included in the annual MOU review and update.

- 2.1.1 Determine level of permitted ground disturbance

2.2 Heal areas of erosion and compacted soils within the park

Erosion and compacted soils contribute to stormwater management problems and degrade the recreational experience in the park.

- 2.2.1 Stabilize surface areas
- 2.2.2 Improve compacted soils
- 2.2.3 Relocate or remove uses that conflict with resources

2.3 Enhance park's vegetative character and open space

The park's open grassy areas, its mature woods and rich ornamental plantings have all declined due to over use and a general lack of investment needed to keep up with the maintenance needs. Storm damaged vegetation has not been replaced due to concerns about adversely affecting archaeological resources. The once thriving azaleas and other plants are in decline. A map designated 'Management Zones for Landcover' has been prepared that crisply identifies turf area (irrigated and non), woodlands and meadows.

- 2.3.1 Maintain mix of open and wooded landscapes
- 2.3.2. Develop and adopt planting approach for Fort Ward's natural and cultural landscapes

What Should the Park Become?

The management plan recognizes the competing roles and demands on the park. What kind of place is the park? How do all the park's competing interests intersect into a coherent whole?

The plan identifies a range of maintenance and management practices that best address the issues and site constraints, presented in Sections II.6 and II.7. These "best practices" are generally applicable throughout the park, specific to natural resources or specific to the cultural resources—in particular the earthworks, "The Fort" community and burial and cemetery sites.

Fort Ward Park and Museum Area Management Plan

City of Alexandria, Virginia

Management Plan Boundary

Park Parcel

Potential Soft Path

Ground Disturbing Activities

*Minimal Ground Disturbing Activities source: Draft Summary - Archaeological Investigations Fort Ward Park spreadsheet, Fran Bromberg, Jan. 2013.

General Note: Areas denoted as "Minimal Ground Disturbing Activities" may contain impervious surfaces such as concrete or asphalt.

Minimal Ground Disturbing Activities (such as aeration, stump grinding, tree planting, and soft path construction)*

No Ground Disturbing Activities Allowed without further review by OHA

No Ground Disturbing Activities Allowed except for placement of formal interpretive elements with archaeological review and investigation by OHA

Figure 13 - Goal 2 Example: Level of ground disturbance allowed and associated landscape cultural practices; striped green pattern allows for greatest level of ground disturbance (tree planting for example with notification of OHA) and red indicates most restrictive area where ground disturbance is most limited

Goal 3—Landscape Cultural Practices

Adopt appropriate and coordinated landscape management practices.

Goal 3 Objectives and Strategies

3.1 Support ongoing landscape cultural practices

The City of Alexandria's RPCA currently has a monthly maintenance calendar and is moving towards adapting guidelines for the level of maintenance service (leaf removal frequency, mowing frequency, etc.) modeled on standards developed by the APPA as defined in *Operational Guidelines for Educational Facilities, Grounds*, second edition.

- 3.1.1 Coordinate Management Plan recommendations with RPCA operations

3.2 Contribute towards the City of Alexandria's Tree Canopy Goal of 40%

The City of Alexandria's Urban Forestry Master Plan identifies a goal of establishing a 40% tree canopy cover for the City as a whole and planting 400 new trees citywide per year to achieve that goal.

- 3.2.1 Restore and expand the existing woodlands
- 3.2.2 Assess tree cover and health
- 3.2.3 Perform tree maintenance

3.3 Restore shrub layer

The shrub layer is an important element of the desired park character as noted during the park listening sessions and in the Fort Ward Advisory Group report on the park's natural resources. Restoration of the shrub layer requires restorative pruning, soil amendments, top dressing and weeding to remove non-native invasive species.

- 3.3.1 Restore shrub layer in high visitor use areas and at woodland edges
- 3.3.2 Perform shrub maintenance

3.4 Remove inappropriate vegetative growth

Non-native invasive plant materials are problematic in the park. Vines smother trees, groundcovers potentially damage the earthworks and burial grounds. Identification of the extent of the problem, followed by a systemic eradication program is needed.

- 3.4.1 Remove non-native invasive groundcovers and undesired shrubs and saplings from earthworks and burial grounds
- 3.4.2 Minimize non-native invasive plants

3.5 Establish attractive and sturdy turf

Turf areas in the park serve as a back yard for many of the neighboring apartments, as well as for those wishing to picnic, relax or appreciate the park-like setting of Fort Ward Park. This appreciation has led to over use, soil compaction and lack of vigorous turf growth. Several areas of the park have been designated as "no mow" areas, where grasses are allowed to grow, enhancing infiltration and preventing foot traffic from fragile resources.

- 3.5.1 Actively manage turf
- 3.5.2 Actively manage meadow growth

3.6 Train maintenance personnel on appropriate practices for historic and archaeological sties and natural areas

Under the current MOU, OHA is responsible for maintenance around the Civil War fortification and museum. With extensive historic and archaeological resources throughout the park, training for maintenance personnel should be directed towards all those with maintenance responsibilities throughout the park.

- 3.6.1 Use the MOU park maintenance zone areas to identify level of training required for maintenance personnel

How Should the Park be Maintained?

This goal is focused on the more traditional park maintenance and operations needs. The City of Alexandria is moving towards adopting the APPA guidelines for grounds maintenance, where levels of service are defined as 1 through 5.

The existing woodlands at Fort Ward Park are in serious decline. Tree count is down by one-quarter or more, based on a survey of approximately 600 trees in the park. No new trees or shrubs have been planted since 2010 due to ground disturbance concerns related to unknown archaeological resources. Now that more information is known about the archaeological resources and a process has been established for ground disturbing activities as part of the management plan, new trees and shrubs need to be planted on an annual basis. Additional effort must be invested in maintaining the remaining trees, shrubs and turf.

Figure 14 - Goal 3 Example: Land over treatments: woodland, meadow, turf

Goal 4—Educate and Engage Visitors - Share the Stories of Fort Ward Park

Increase and broaden the audience in support of the park's preservation and enhancement by providing a high quality interpretive and educational experience.

Goal 4 Objectives and Strategies

4.1 Develop a detailed Interpretive Plan for Fort Ward Park that celebrates the park's multi-faceted history

The management plan lays out a broad interpretive framework regarding the time frame, geography, audiences and potential themes for park interpretation. A more detailed interpretive planning effort is needed to apply themes to sites, select appropriate stories related to each theme and site and to identify the appropriate interpretive tools that best tell the stories. The more detailed interpretive plan is necessary to define ways the landscape can be used as an interpretive tool while not overwhelming the park and its resources. The incorporation of the landscape will allow the Civil War-era interpretation to expand from the museum and "The Fort" community interpretation to be brought into the museum—presenting the site as one connected story from the Civil War to Civil Rights. OHA is to formally invite key stakeholders from the Fort Ward and Seminary African American Descendants Society, Civil War historians, naturalists, educators and community representatives to participate in a new advisory committee working on the development of an interpretive plan.

- 4.1.1 Expand or reform the Fort Ward History Work Group and Fort Ward Advisory Group to provide advice on the interpretive planning, design and implementation
- 4.1.2 Make use of landscape features to tell the stories

4.2 Increase awareness of the site's local, regional and national significance by linking to themes related to the Defenses of Washington with the establishment and building of an African American community

Recent archaeological work and historical research presents a tremendous opportunity to link the system of forts associated with the Defenses of Washington with the African American settlements that grew into communities in and around many of these forts. The story is not being told anywhere else—allowing Fort Ward to be identified as a significant place for the interpretation of African American heritage.

- 4.2.1 Greet and orient the visitor
- 4.2.2 Link interpretation at Fort Ward to broader citywide and region-wide themes
- 4.2.3 Strengthen regional linkages to interpretation at Fort Ward

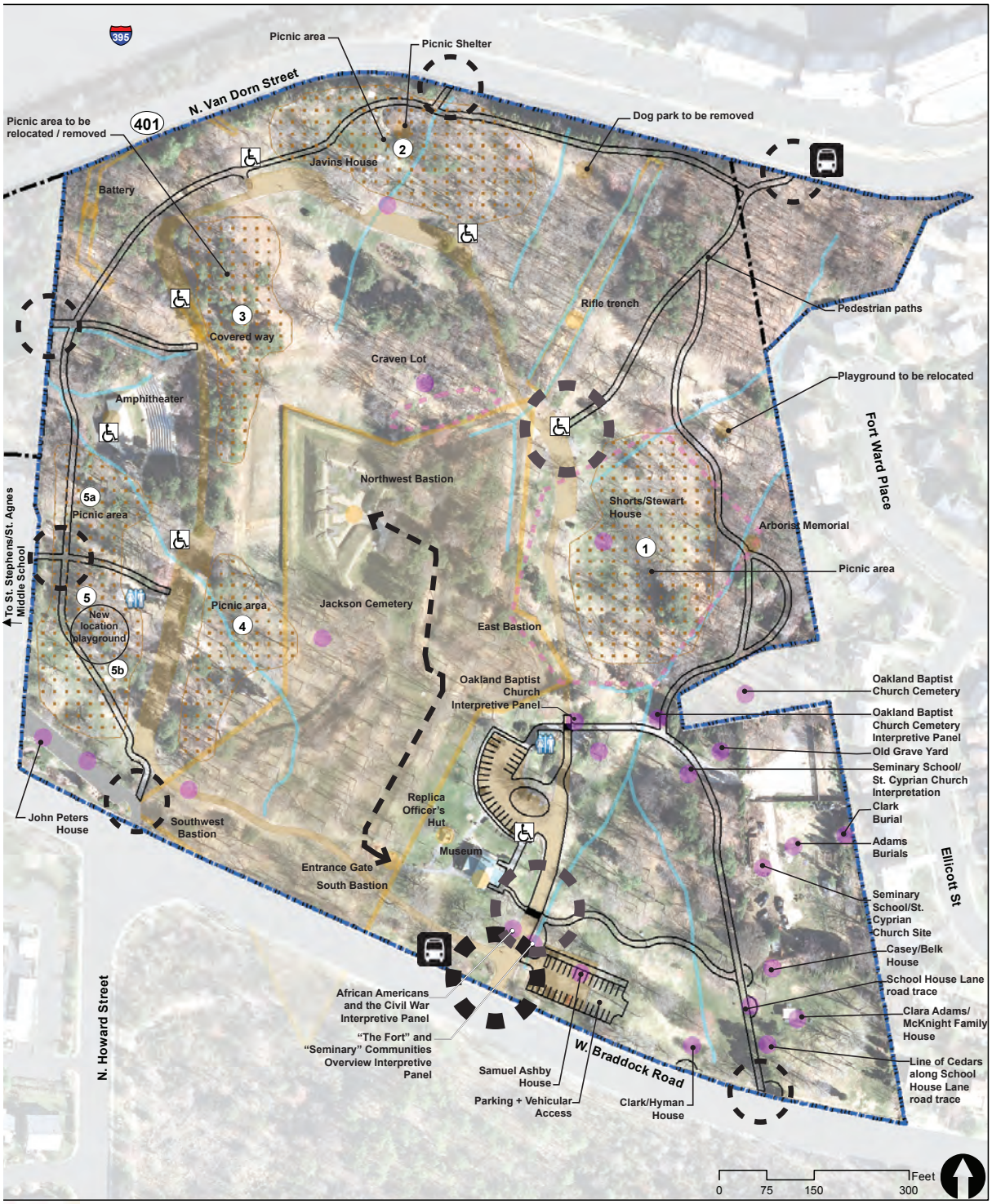
4.3 Reorganize and/or expand the museum to engage more visitors and broaden the stories told

The Fort Ward museum is a tremendous resource for telling the story of the Civil War fortifications, the Defenses of Washington and the African American communities that grew up around them after the war. But more than just the story, the museum has the potential to encourage visitors to establish connections with the people and places associated with the stories—involving moments of intellectual and emotional revelation, perception, insight or discovery. The museum and park can encourage these connections by developing more self-guided experiences where the visitor discovers the connection through a more interactive experience.

- 4.3.1 Develop the tools and resources needed to expand museum interpretive opportunities with self-guided experiences
- 4.3.2 Create a capital campaign to raise funds for a museum expansion
- 4.3.3 Use the existing museum building for new exhibits
- 4.3.4 Create as many opportunities for personal connections as possible and visitors will enjoy the experience and find relevancy
- 4.3.5 Reach people who do not normally go to museums by taking the museum to places where this audience normally goes

Which Stories Should be Told?

Currently there is both passive and active interpretation in the park. Many of the existing interpretive exhibits need to be refreshed, and recent findings from archaeological work and historical research for the fort need to be incorporated into new and updated interpretations focusing on the overall thematic time frame, from the Civil War to the Civil Rights-eras. A more detailed interpretive plan is needed to apply themes, topics and related stories to sites and places within the park.



Fort Ward Park and Museum Area Management Plan

City of Alexandria, Virginia

- Management Plan Boundary
- Park Parcel
- Park Road or Parking
- Drainage flowlines
- Native American Resource
- The Fort Community Features
- Civil War Features
- Fort earthworks and interior features
- Exterior Fort earthworks
- Recreational Feature
- Picnic Area
- Restroom

Potential Soft Path System and Enhancement Opportunities

- Potential Soft Path System
- Potential park access point
- Entrance / orientation
- Planned ADA path
- Potential ADA parking

Figure 15 - Goal 4 Example: Potential interpretive opportunities

Goal 5—Enhance Park Facilities

Satisfy the growing need for passive recreational enjoyment of a shady, natural oasis from an increasingly complex urban environment.

Goal 5 Objectives and Strategies

5.1 Clarify and enhance park circulation and parking

Park users and FWAG members identified a number of issues and problems that related to the park entrance, parking, vehicular and pedestrian use of park roadways, pedestrian circulation and the need for a secondary system of soft paths.

- 5.1.1 Improve pedestrian circulation and safety
- 5.1.2 Improve bus access and parking (tour and school groups)
- 5.1.3 Reconfigure existing parking

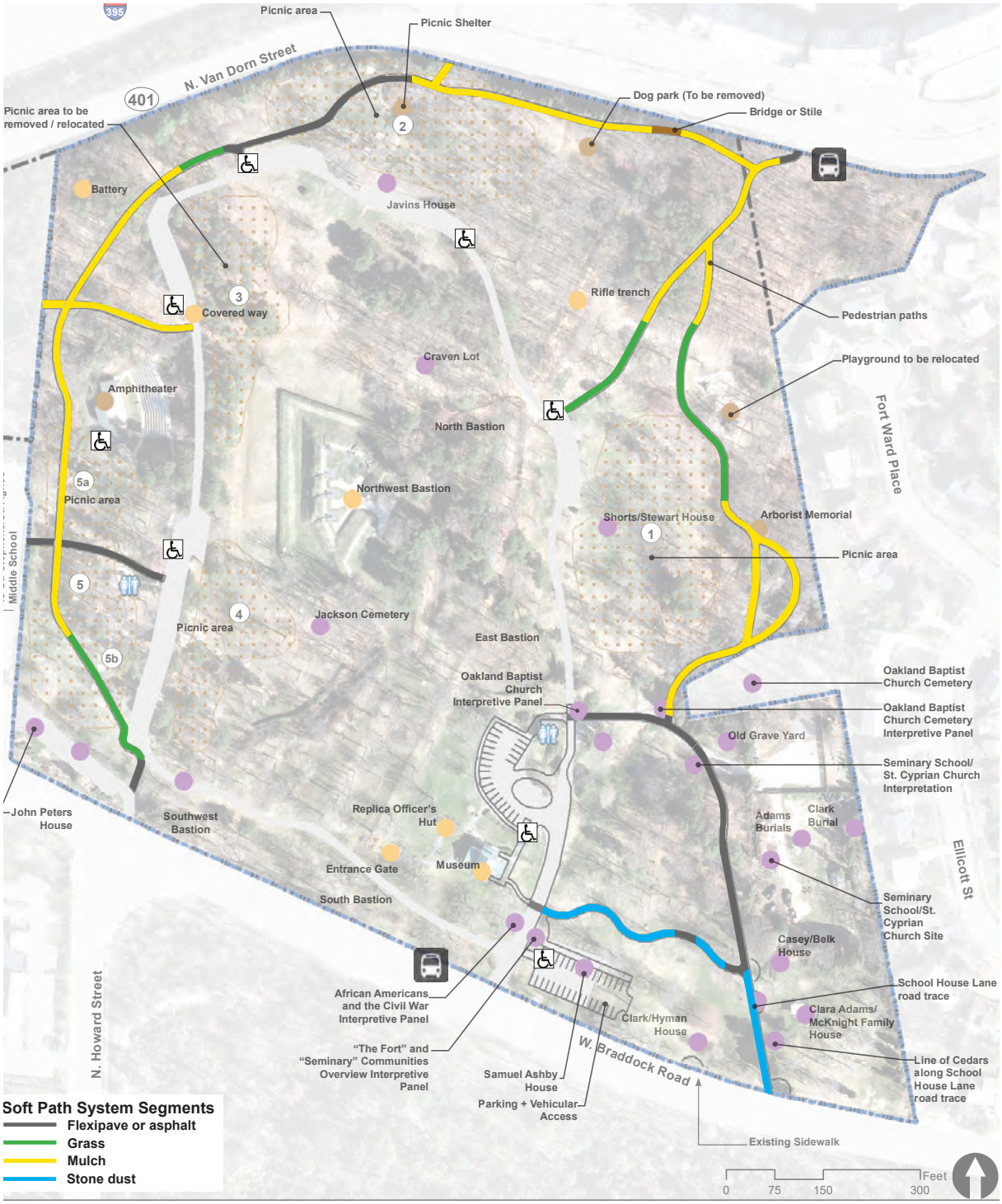
5.2 Minimize conflicts between adjacent uses both within and around the park

Park users and FWAG members identified a number of issues and problems that have led to conflicting experiences among users with different expectations during their visit to Fort Ward Park.

- 5.2.1 Communicate park regulations
- 5.2.2 Remove the off-leash dog exercise area location and facility
- 5.2.3 Relocate and enhance park facilities (long-term) to better serve the public and to protect the park's resources
- 5.2.4 Evaluate the effort required to upgrade and improve the amphitheater for more active use
- 5.2.5 Replace, upgrade or remove failing facilities

Which Recreation Facilities Belong in the Park?

As noted in Section II.3, Fort Ward Park is valued for its passive recreational uses, as well as for the events and gatherings associated with the historical aspects of the park.



Fort Ward Park and Museum Area Management Plan

City of Alexandria, Virginia

Soft Path System

Management Plan Boundary
Park Parcel
Park Road or Parking
The Fort Community Features
Civil War Features
Recreational Feature
Picnic Area
Restroom

Figure 16 - Goal 5 Example: Soft path alignment with four different surface treatments

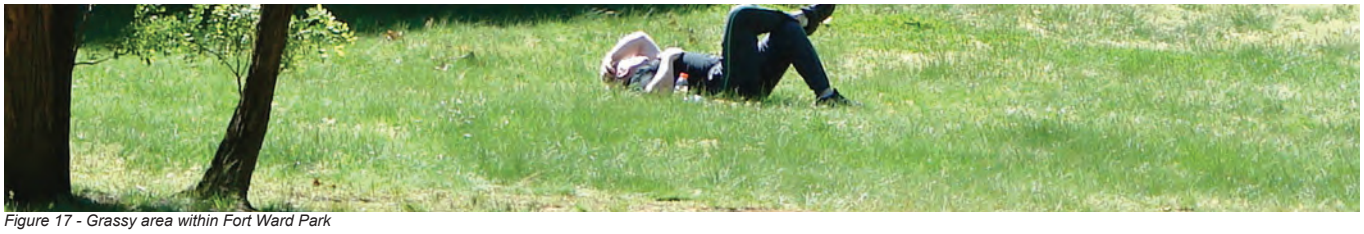


Figure 17 - Grassy area within Fort Ward Park

Management Actions

Key to the plan's implementation are its actions, identified and related to each goal and organized under separate strategies. Actions match the best maintenance and management practices with the issues and site constraints facing Fort Ward. All the recommended actions are listed in Section II.5 Recommendations, illustrated in maps and photographs in Section II.6 Best Practices and are outlined in tabular format in Section II.7 Implementation Table. The highest priority actions are discussed more fully in this Summary Report.

Action Ranking

Fort Ward has many needs, all of which cannot be addressed immediately or simultaneously due to funding, staffing and volunteer limitations. The Fort Ward Park and Museum Area Plan recognizes that the needs of the park must be addressed incrementally, over time as resources, staff and volunteer time become available. Action ranking takes into consideration priority of need and an understanding of what action needs to occur prior to another action taking place.

Ranking actions as medium or low priority does not mean that the lower ranked action is unimportant. Instead, ranking recognizes that phasing of the plan's recommendations is necessary. Funding is not available for all of the desired changes and improvements at this time. Funding requests must be placed in future City Capital Improvement Plans or gained from private fundraising and donations. Although some actions may be accomplished by volunteers, currently there is no structured volunteer organization, representative of the full spectrum of interests in the park, to oversee such activities.

High Priority Actions

The action priority ranking incorporates phasing needs, particularly in terms of what must take place prior to another action being implemented and what actions are most critical to address Fort Ward's many needs. Decisions were predicated on several factors. Did an action need to be accomplished before another action could be implemented? For example, the fencing around the maintenance yard must remain for security purposes until the archaeological investigation can take place there.

Decisions were also based on park operations and good landscape cultural practices. For example, how should park operations handle leaf litter, where should meadows be located, what are the boundaries for turf and woodlands, etc.? Presumably, a number of these operation related actions ranked highly by the planning team or City staff were not ranked highly by FWAG as they were already being implemented in the spring of 2014. Although a number of the highly ranked actions are underway, others fall in the timetable of 1-3 years, 3-5 years or 5-10+ years.

Ranking also took into consideration priorities noted by the FWAG. Members were asked to identify their top three priorities under each of the five goal statements. Individual priorities are noted in Section II.7

Estimated Cost

Probable estimate of costs were developed for the most highly ranked actions. Prices are in 2013 dollars, using unit costs developed for the Citywide Parks Improvement Plan unless noted. More detailed price information with line items is included in Section II.7. Year 1 is assumed to begin at Fiscal Year (FY) 2016. Current park operations

funding is complex. Funds for OHA managed contracts as defined in the MOU are currently transferred out of the RPCA operating budget. Any new or additional operating and maintenance activities will require an increase to the related operating budget. All funds noted in the following charts will require new or additional funding allocations.

To clarify the next steps priority actions are grouped by time frame and associated goals within three categories: Operations; Capital/CIP; and Partnerships.

Figure 18 - Action Priority Categories

The park is big and complex. Many actions were identified during the planning process. Highly ranked actions, to be undertaken in the near future, are listed in this Summary Report and are grouped by timing for implementation, categories and goal association. A much lengthier list of actions is included in Section II.6 Best Practices and Section II.7 Implementation, categorized by goal statement. The diagram below dissects the information presented for each highly ranked action in the Summary Report.

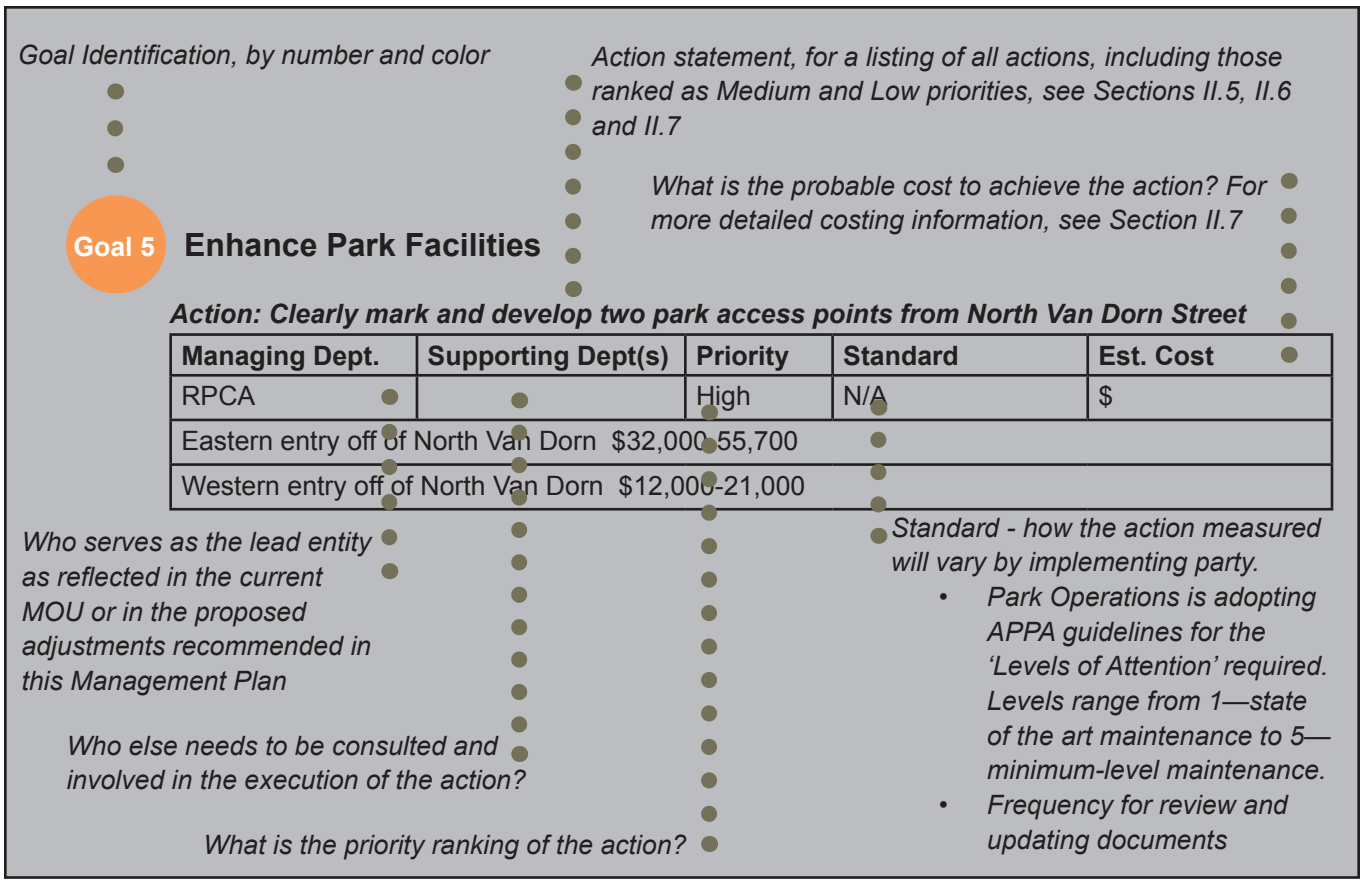


Figure 19 - Diagram of Action matrix

Action Priorities: Underway or Completed

A number of actions included in the management plan are being or have been successfully implemented prior to adoption of the management plan. Their successful incorporation into park operations demonstrates the planning effort's value in achieving consensus with FWAG's, City staff and the planning team. As best practices were identified and supported by the work group, the practices have been incorporated into the care of the park. Although some are complete, none have been eliminated from the plan's recommendations to ensure that the actions continue to be supported and updated as appropriate.

Operations

Goal 1 Management and Funding

Action: Review and update Memorandum of Understanding (MOU) annually

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
OHA	RPCA/T&ES/GS	High	Review quarterly	N/A
Managing Department may change in accordance with future changes to the MOU.				

Goal 2 Park Character

Action: Map areas in conjunction with RPCA to identify where ground disturbance may occur unsupervised; where ground disturbance may occur with supervision; and where ground disturbance is NOT allowed

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
OHA	RPCA	High	Update annually	N/A

Action: Address animal tunneling in earthworks

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
OHA		High	Annually	N/A

Action: Restore shovel pit testing sites to original grade

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
OHA	RPCA	High	W/contract	N/A

Action: Reinforce eroded edges of paved surfaces

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
T&ES	RPCA	High	Level 2	N/A
Continue to fill eroded edges with river rock as an interim solution to more permanently reinforcing the loop path's shoulders. Cost for reinforced shoulder in Section II.7 Implementation Table.				

Action: Repair surface erosion damage

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
RPCA	OHA	High	Level 3	N/A
Through standard maintenance practices during turf management, repair erosion damage with new topsoil to fill holes and to smooth out eroded areas, aerate and reseed, add compost and leaf litter as appropriate.				

Action: Establish boundaries for turf and meadow management

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
RPCA		High	Level 3 turf; Level 4 meadow	N/A

Action: Establish boundaries for areas managed as native woodlands

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
RPCA		High	Level 5	N/A

Goal 3 Landscape Cultural Practices

Action: Coordinate with City maintenance practices and City maintenance calendar

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
RPCA	OHA	High	Annually	N/A

Action: Identify appropriate treatment of leaf litter

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
RPCA	OHA	High	Level 3	N/A

Action: Core aerate soils to address compaction

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
RPCA	OHA	High	Level 1 for 2-3 years; then Level 3	N/A
Initial cycles required to address severity of soil compaction are as frequent as 4-6 times per year. As the soil is improved, likely after 3 years, frequency may be reduced to 2 times per year.				

Action: Overseed and top dress turf

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
RPCA	OHA	High	Level 3	N/A

Action: Define mowing height

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
RPCA		High	Level 3	N/A
The intent is to maintain turf at the same height within the OHA and RPCA areas of responsibility. However, there may be times and circumstances when this is not possible and mowing heights will differ.				

Action: Remove invasives and woody plant materials from meadows

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
RPCA		High	Level 4	N/A
Coordination is needed between private contractor under OHA supervision and park operations.				

Goal 5 Enhance Park Facilities

Action: Enforce existing park regulations

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
APD		High	Ongoing monitoring	N/A

Action Priorities: 1-3 Years

A number of actions, or an initial investment addressing each action, should be implemented within the next three years. Actions listed under the time frame of 1-3 years for implementation may require additional investments in later years. Where this is the case, a note is added to the action table.

Partnership/CIP

Goal 1 Management and Funding

Action: Link financial needs of the park to other City initiatives; broaden 'ask' for funding and support

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
OHA	RPCA	High	N/A	N/A

Goal 4 Educate and Engage Visitors

Action: OHA to formally invite key stakeholders from the Fort Ward and Seminary African American Descendants Society, Civil War historians, naturalists, educators and community representatives to participate in a new advisory committee working on the development of an interpretive plan

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
OHA	RPCA	High	N/A	$35,000-150,000 plan (scope dependent)
A discussion of models and potential structures for a broadly based "Friends of" Fort Ward group is found in Section II.5. One possibility is to "grow" a formal, 501c3 group from the newly formed advisory committee on interpretation, creating opportunities for fundraising and connections with similarly-focused groups in the metropolitan region.				
Fund interpretive plan and early action interpretive elements - $35,000-$150,000, scope dependent				

Goal 1 Management and Funding

Action: Make existing paved loop pedestrian path system accessible where possible and sign areas where not possible

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
T&ES	RPCA	High	Level 3	$7,100-8,600 for ADA compliant speed bumps/sign slopes exceeding ADA
5+ Years - Desire to repave path using 'pedestrian friendly' material; $50,000-228,000 (if current paving funding allocation is not adequate to complete in 1-3 Year time period)				
10+ Years - regrade portions of path that exceed 2010 ADA Standards or 2009 ORAR standards to meet ADA Standards for accessibility				

Action: Provide accessible park furniture

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
RPCA		High	N/A	$7,500/ Annual allocation

Action: Provide accessible parking and pathways for all park and museum features

Managing Dept.	Supporting Depts)	Priority	Standard	Est. Cost
RPCA	T&ES	High	N/A	$42,000-76,800
Cost may be less, dependent on grading and paving needs. 12 spaces required per Kimley -Horn study				

Goal 2 Park Character

Action: Mark and protect unrecognized Civil War archaeology

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
OHA	RPCA	High	N/A	$68,500-98,000
Time frame 1-7 Years: Ground survey earthworks and tie data to GIS database = $3,500-8,000; Perform metal detector site survey = $10,000-15,000; Perform Barracks archaeological investigation = $55,000-75,000				

Action: Mark and protect "The Fort" community and burial sites

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
OHA	RPCA	High	N/A	Maint Yard: $60,000-120,000; School House: $25,000-40,000
Time frame 1-3 Years: Perform archaeological investigation in former maintenance yard prior to removal of fencing and gate (***also noted under action related to 'Remove former maintenance yard'***)				
Time frame 1-7 Years: Perform archaeological investigation for School House/Church/Residence site				

Action: Redirect stormwater and sheet flow away from sensitive cultural and recreational resources through small berms, spreaders and other techniques

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
T&ES	OHA, RPCA	High	See Appendix I	N/A
Time frame 1-3 Years for two pilot projects: berm near cemetery, filter in parking lot				

Action: Remove former maintenance yard access drive, fencing and gate

Managing Dept.	Supporting Dept(s)	Priority	Level	Est. Cost
OHA- archaeological investigation prior to removal	RPCA - remove fence, gate and drive	High	N/A	$60,000 - 120,000 for archaeology investigation; $38,000-60,400 demolition - includes driveway demo, topsoil replacement, reseeding
Time frame 1-3 Years: Perform archaeological investigation in former maintenance yard prior to removal of fencing and gate (***also noted under action related to 'Mark and protect "The Fort" community and burial sites'***) Note on demolition - costs may be less dependent on amount of driveway removal undertaken; clarification still needed on status of potential easement and location of drive for Oakland Baptist Cemetery.				

Action: Reshape or remove fill at site of former maintenance yard

Managing Dept.	Supporting Dept(s)	Priority	Level	Est. Cost
T&ES	OHA, RPCA	High	N/A	N/A
Reshape area in conjunction with berm installation per *Fort Ward Park Drainage Master Plan* **and following** archaeological investigation.				

Goal 3 Landscape Cultural Practices

Action: Plant new trees

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
RPCA		High	Level 3	$10,350-13,250
Cost is for planting 24 nursery-sized trees; budget for new nursery-scaled tree planting every 10 years; seedling installation may be more frequent				
Initial tree planting to take place in areas shown on Plate 22 Ground Disturbing Activities within areas defined by green striping on map and in legend 'Minimal Ground Disturbing Activities'. Tree species selection to be drawn from the City of Alexandria's *Landscape Guidelines*, April 2007 and in consultation with the Natural Resources Division of RPCA.				

Action: Prune diseased and dead tree limbs

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
RPCA		High	Level 3 - turf and meadow areas, along paths; Level 5 - woodlands	$5,000-10,000

Action: Remove fallen and hazard trees

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
RPCA		High	Level 3 - turf and meadow areas, along paths; Level 5 - woodlands	$3,000-7,750, annual allocation

Action: Remove inappropriate vegetation from earthworks

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
OHA		High	Level 3	$2,500-7,500, annual allocation

Action: Remove inappropriate vegetation from burial grounds and cemeteries

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
OHA		High	Level 3	$2,500-7,500, annual allocation

Goal 5 Enhance Park Facilities

Action: Make pedestrian use the priority use for the paved loop path and mark mileage distances on or near pavement

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
RPCA	T&ES	High	N/A	$6,700-6,800
Change signs, add mileage markers				

Action: Develop a pedestrian network of soft paths

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
RPCA	OHA	High	N/A	N/A
Year 1-3 Develop ADA accessible path between parking and picnic shelter using flex pave or similar material (evaluate cost differential between access from western side of parking lot—longer length vs. impact on known archaeological resources at eastern end of parking lot)				$42,500-75,000
Ongoing, develop in increments the soft path as shown in Section II.8, Plate 24, using different surface materials as recommended in the diagram: grass, mulch, stonedust, FlexPave or asphalt				$441,000-641,000 (cost excludes separately priced path segments - see II.7)

Action: Redesign the existing parking area to better accommodate a bus drop-off

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
OHA	T&ES, RPCA	High	N/A	N/A
Year 1-3 Test concept with cones of reconfiguring gravel lot behind museum				

Action: Remove the off-leash dog exercise area from the park

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
RPCA		High	N/A	$3,125-6,325
Restore grounds, remove sign; Requires approval for revision to Dog Park Master Plan.				

Action: Repair and evaluate the upgrading of the existing restroom located on the western side of the park

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
RPCA		High	N/A	N/A
1 Year - Repair roof 3-5 Years - Evaluate feasibility for expansion in conjunction with evaluation of the amphitheater				

Operations

Goal 2 Park Character

Action: Protect earthworks from undesignated foot traffic

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
OHA		High	N/A	N/A
Add a barrier and explanatory sign at each end of the rifle trench to deter and prevent use of the berm top as a trail and access point into the park				

Action: Protect burial sites from unintentional recreational use

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
OHA		High	N/A	N/A
1-3 Years - Add signs to perimeter of burial sites indicating site and response requested				
5+ Years - install enclosure system				

Action: Renovate picnic areas by rotation or partial closure of group area

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
RPCA		High	Level 3	N/A
Time frame 1-7 Years				

Goal 3 Landscape Cultural Practices

Action: Train all personnel on the use of equipment to minimize damage to resources

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
OHA	RPCA	High	Annually	N/A

Action: Provide training and certification for maintenance personnel at the park

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
OHA	RPCA	High	Annually	N/A

Action Priorities: 3-7 Years

Partnership

Goal 4

Educate and Engage Visitors

Action: Work with partners to encourage the National Park Service to interpret and promote the circle forts to promote regional interpretation of the Defenses of Washington

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
OHA		High	N/A	N/A

Capital/CIP

Goal 2

Park Character

Action: Develop a planting strategy, with recommended plant list and planting zone

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
RPCA		High	N/A	N/A

Goal 4

Educate and Engage Visitors

Action: Design and install an interpretive trail as part of the overall trail network as a means of organizing the outdoor interpretive experience

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
OHA	RPCA, T&ES	High	N/A	N/A

Action: Install a small, 1-panel orientation kiosk at each minor entrance to the park

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
OHA		High	N/A	N/A

Action: Identify Fort Ward on region-wide maps, brochures, web-sites and other city publications as a place to explore Alexandria's history from the Civil War to the Civil Rights eras

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
OHA		High	N/A	N/A

Action: Update the historic information on the picnic area map to include areas associated with burial sites

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
OHA	RPCA	High	N/A	N/A

Goal 5 Enhance Park Facilities

Action: Clearly mark and develop two park access points from North Van Dorn Street

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
RPCA		High	N/A	see below
Eastern entry off of North Van Dorn $32,000-55,700				
Western entry off of North Van Dorn $12,000-21,000				

Action Priorities: 7+ Years

Capital/CIP

Goal 1 Management and Funding

Action: Relocate the current playground facility to the western side of the park, making access and equipment accessible

Managing Dept.	Supporting Dept(s)	Priority	Standard	Est. Cost
RPCA		High	N/A	see below
The cost to make the existing location meet ADA standards (parking, path, surface, equipment) $246,000-455,000; difference between two locations is path construction				
Relocate to western side of park to meet ADA standards (parking, path, surface, equipment) $116,000-190,000				

Fort Ward Park and Museum Area Management Plan

SECTION II

The City of Alexandria, Virginia

October 2014

FINAL DRAFT

Acknowledgements

City Council

William D. Euille, Mayor
Allison Silberberg, Vice Mayor
John T. Chapman
Timothy B. Lovain
Redella S. "Del" Pepper
Paul C. Smedberg
Justin Wilson

Ad Hoc Fort Ward Park and Museum Area Stakeholder Advisory Group

(FWAG or SAG) Roster as of 1/2014

Member	Group
Ripley Forbes	Park and Recreation Commission
Linda Ries (resigned 2014)	Park and Recreation Commission
Robert Moir	Park and Recreation Commission
Charles (Chuck) Ziegler	Historic Alexandria Resources Commission
Ellen Stanton	Historic Alexandria Resources Commission
Janice Magnuson	Historic Alexandria Resources Commission
Ryan Sloan (replaced by Susan Gitlin 2014)	Environmental Policy Commission
Adrienne Washington	Fort Ward/Seminary African American Descendants Society
Lena Rainey	Oakland Baptist Church
Frances Terrell	Seminary Civic Association
Sharon Annear	Seminary Hill Association, Inc.
James Walpole (resigned May 2014)	Citizen at Large
Richard Brune	Citizen at Large
Vacant	Citizen Living within One Mile Radius

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Park Planning, Design and Capital Development Staff

In coordination with:

Office of Historic Alexandria
Transportation & Environmental Services

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Section II

1. Background

A. Purpose of the Plan

The Fort Ward Park and Museum Area Management Plan[1] synthesizes work to document the significance, threats and vulnerabilities to the resources at the park, recognizing the continuum of history within the region and parkland. The findings drawn from this document, in conjunction with other specific areas of focus, are incorporated in the management recommendations that address long-term resource management and interpretation.

Figure 1 - Parcel map and park boundary

The management plan that follows seeks to integrate Fort Ward Park's historical significance and context with contemporary park operations and more recently updated archaeological information. The over-arching intent is that Fort Ward and its resources may be sustained, maintained and interpreted. The management recommendations for resource protection, interpretation and enhancement synthesize and apply the best practices available to address the management issues and concerns identified through the planning process.

B. Site Description

Fort Ward Park is located in the Seminary Hills area, adjacent to Shirley Highway/Interstate 395, between North Van Dorn Street to the north and West Braddock Road to the south. In aggregate, it covers 43.46 acres.[2] The 36.52-acre core property that surrounds the earthworks dating from the Civil War and the smaller 1.94-acre parcel adjacent to Van Dorn is the focus of the management plan. For purposes of this planning effort, these two parcels will be treated as a single entity. A separate, third parcel, 5 acres in size, is also a part of Fort Ward Park, but is not included in the management plan due to its existing development with synthetic turf athletic fields and tennis courts. The third parcel was not part of the original acquisition of the Civil War fort.

Fort Ward Park has a rolling topography and is heavily wooded with meadows (recently grown via 'no mow' practices) and traditional grass turf interspersed throughout. In addition

1 As defined by the City of Alexandria Department of Recreation, Parks, and Cultural Activities. (Spengler, Jim. Fort Ward Advisory Group [FWAG] Minutes. 2/15/12. 'a Management Plan is a document of policies and provides guidance to park management'.)

2 Simmons, R.H. *Remnant Natural Areas in Parks, Waterways, and Undeveloped Sites in the City of Alexandria, Virginia: Seminary Hill Area*. City of Alexandria Department of Recreation, Parks, and Cultural Activities. Alexandria, VA. 2013.

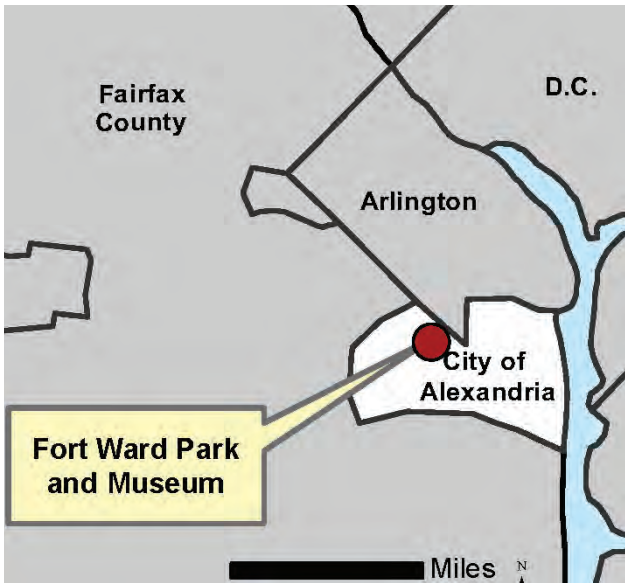


Figure 2 - Fort Ward Park location within the metropolitan region

to its significant Civil War and post Civil War African American cultural resources, the park contains important habitat and provides a 'green lung'[3] for the surrounding suburban and urban area. Site features enhance groundwater infiltration and recharge. However, some features and practices such as heavy use, poor soils, grade manipulation, changing rainfall patterns and the recent hold on ground-disturbing maintenance practices to protect cultural resources have contributed to problems with excessive stormwater runoff and erosion.

The park, along with Episcopal High School and the Virginia Theological Seminary, sits on the highest of a series of ancient river terraces that step down from the park to Old Town Alexandria, along with Episcopal High School and the Virginia Theological Seminary. Seminary Terrace's height was strategically key terrain, and a fortification at this location had commanding views of the western approaches to the City of Alexandria.

The three main land uses with tangible evidence found on the site are the Civil War fort, the African American community— "The Fort" community—and the current use as a recreational site, Fort Ward Park. Each has made changes to the physical fabric of the landscape to fit its needs. Parts of the evidence of previous uses were erased by the succeeding use. Archaeological investigations have helped and will continue to help to clarify what was done to the landscape and to document the lives of the occupants. The cultural resources associated with "The Fort" community provide a tangible link between the present and a past that has significance for the local community and descendent groups.

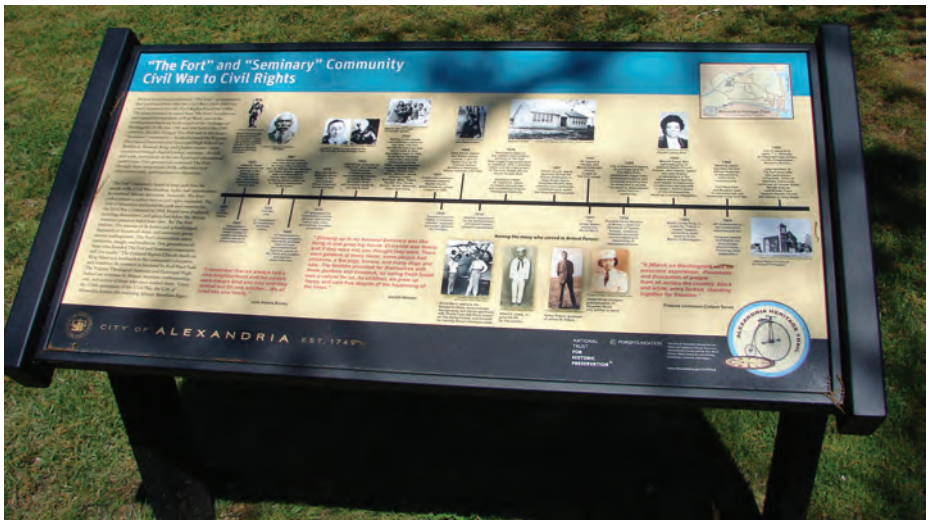


Figure 3 - "The Fort" community interpretive wayside sign located at Fort Ward Park

Fort Ward was a Civil War-era military stronghold established as part of the Defenses of Washington that ringed the Union capital of Washington, D.C. It is the fifth largest of the 164 earthen fortifications that comprised the system, including 68 enclosed forts and 93 fortified field artillery positions. Today it is one of the best preserved. The area remained rural into the 1950s. Acquisition of the site began in the 1950s as the construction of Interstate 395/Shirley Highway began making this land valuable for future development. The park was created to both preserve and reconstruct a portion of the fort for the upcoming Civil War Centennial, and also to establish a public park and open space in the West End of the City of Alexandria.

3 A term to describe parkland within an urban area, in the context of the health benefits it provides through green space, vegetation and recreation.

The parklands also possess a century-long legacy of community life and heritage that preceded development of the park as a public amenity. "The Fort" community, which grew up around the earthen fortification, was composed primarily of African American families that settled here to work at local institutions such as the nearby Virginia Theological Seminary and Episcopal High School. Like many rural communities, "The Fort" community was self-sustaining, sharing produce from gardens and farms.[4] Descendents of these families were present when the park was conceived and the land acquired—some properties through the use of eminent domain. Residents who were able were relocated into the larger "The Seminary" community. Physical evidence of the former community includes archaeological sites, burial sites, plantings and road traces.

Figure 4 - Fort Ward Park shown within its surrounding land use pattern

Surrounded by residential neighborhoods (Marlboro Estates immediately to the east) and institutional uses (Episcopal High School, St. Stephen's and St. Agnes Middle School and the Virginia Theological Seminary) the park is accessed from West Braddock Road. An informal pedestrian trail links the park to North Van Dorn Street on the park's northern edge. Interstate 395/Shirley Highway is northwest of the park. A commercial area at the intersection of Braddock Road, King Street and Quaker Lane is located east of the residential neighborhood, separated from the park by Minnie Howard School and a single family residential neighborhood. Soccer fields and tennis courts lie to the west of the park's core and northwest of the St. Stephen's and St. Agnes Middle School property.

Fort Ward Park's landscape has been managed or manipulated by humans for many years. Flakes of milky quartz found on the site indicate an early presence of Native Americans, although the evidence was too limited to date the finds.[5] According to historic reports, the land was farmed prior to the Civil War. During construction of the Civil War fort, trees were removed for wood products and to provide for open views from the fort. After the war, people settled on the surrounding land, built homes

Figure 5 - Azalea shrub bed at Fort Ward Park

4 Washington, Adrienne, Frances Terrell and Jim Walpole. Chapter 4. *African American Structures and Other Resources: Consideration of historical resources including location of roads and paths, African American structures, schools, landscaping, and artifacts* (with the exception of graves and burial sites). May 2013.

5 Ziegler, Charles and Frances Terrell. Chapter 2. *History and Culture: Issues and Recommendations, Recommendations for the Management of Fort Ward Historical Park*. January 2011.

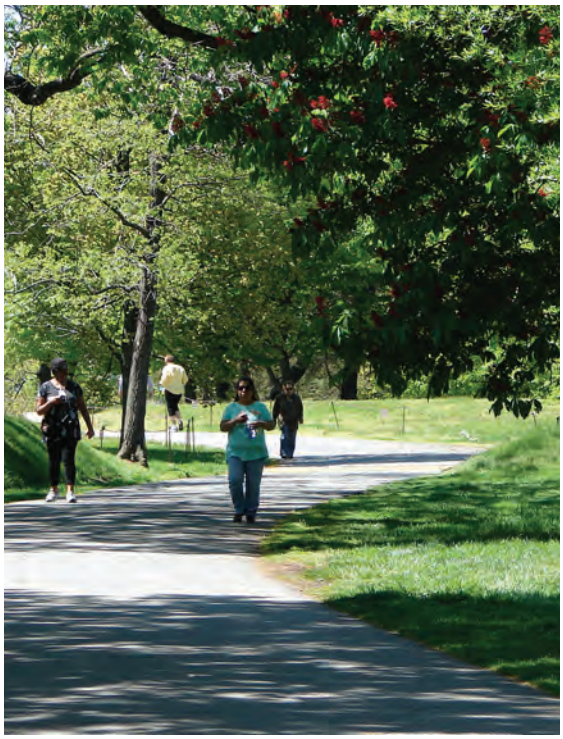


Figure 6 - Walkers at Fort Ward

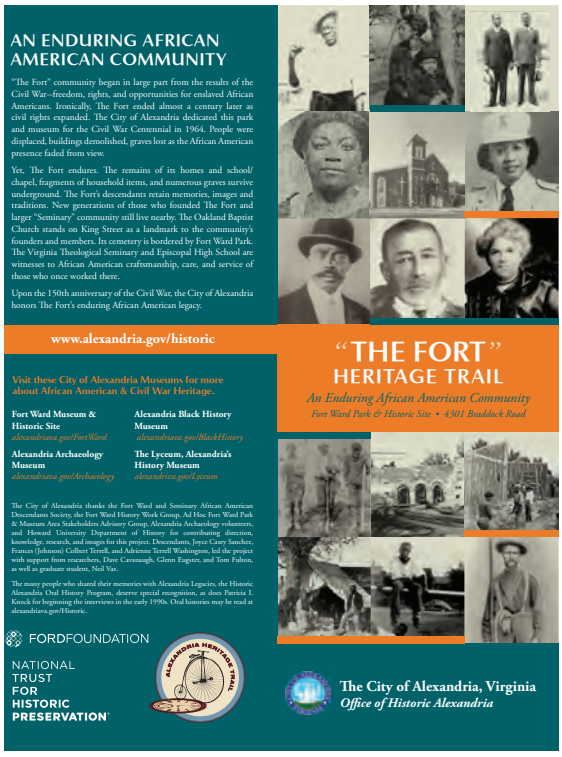


Figure 7 - Brochure and flyer for the trail within Fort Ward Park, linking to the Alexandria Heritage Trail

and planted gardens and other vegetation. Following the creation of the park in the 1960s, additional trees were planted and others seeded themselves. Remnants of the former community's gardens and plantings remained, as did some more natural patterns of vegetated succession.[6] The park was designated as the City's Arboretum in the mid-1980s. A brochure featured lists of species and identified their locations and the locations of eighteen shrub beds. Over 60 varieties of azaleas and camellias were planted in these beds found throughout the park.[7] Many of the azaleas were Glenn Dale hybrids, drawn from the test gardens of the U.S. Arboretum in the 1960s. Today, the park includes wooded areas with scattered groves and champion trees, ornamental plantings, lawn areas managed as meadow or 'no mow' areas, plantings or turf and two intermittent streams.

Park features include late 19th century and early 20th century African American historical sites, approximately 90-95% of the earthworks remains of the Civil War fort and associated features like the outlying battery and rifle trench, a Civil War museum, an amphitheater, picnic areas, a playground, a dog exercise area, and a 0.6 mile marked walking loop.

C. Adjacent Land Use and Planning Context

Related Resources outside of Current Park Boundaries

Fort Ward Park is included in the Alexandria Heritage Trail, a 23-mile marked urban route that explores Alexandria's archaeology and history. Wayside signs, brochures and mobile 'apps' help to convey information about heritage sites located along the trail. A Civil War Alexandria iPhone 'app' provides mobile information about Civil War sites within the region. The City also administers an African American Historic Sites self-guided tour with a brochure that includes Fort Ward. The Alexandria Civil War Defenses of Washington Bike Trail is identified on maps and brochures available around the city and online. Fort Ward is marked as one of the stops on the Virginia Civil War Trails system. Fort Ward Park is included as a part of the Potomac Heritage National Scenic Trail, administered by the National Park Service.

Other surviving forts, and the portion of the south bastion of Fort Ward that extends across West Braddock Road also relate to the park and its resources. The residential neighborhood to the east, and the seminary and schools across the street are also tied to Fort Ward Park in their relationship to the former "The Fort" community.

6 Ries, Linda and Richard Brune. Chapter 4. *Environment and Natural Resources: Issues and Recommendations*.

7 National Register Nomination Form. March 30, 1981.

2. Existing Conditions

The Existing Conditions report describes the natural and built environment of Fort Ward Park. It serves as the base, or starting point, for recommendations and best management practices that address the challenges and issues related to the park's physical resources in the Fort Ward Park and Museum Area Management Plan. Recreation resources and facilities are addressed in a separate chapter.

A. Natural Landscape

Fort Ward Park is primarily characterized by turf lawn punctuated by individual shade and evergreen trees and shrub borders, many ornamental in character. Woodlands are found primarily along the park margins so there is a great deal of species richness within the park. For many years, Fort Ward was managed as an arboretum. Once heavily planted with azaleas and camellias, azalea festivals were held beginning in the 1970s. Time has taken its toll on the park. Due to natural aging and storms, many trees and shrub bed plantings have disappeared or continue to decline. New trees and shrubs have not been planted since 2010, due to restrictions on ground disturbing maintenance to protect the park's cultural resources.

Figure 8 - Tree shaded walkway

Fort Ward Park's natural resources provide multiple benefits.[1] These include:

- Forested buffer for adjacent neighborhoods
- Habitat for birds, squirrels, bats other wildlife and insects
- Chesapeake Bay watershed protection
- Pleasing landscape and refuge from urban life
- Shade for park users
- Noise reduction from I-395 and local road traffic
- Protection of historic artifacts with vegetative ground cover
- Opportunities for public education on horticulture using the landscape of Fort Ward Park (care of plants, including trees) and dendrology (trees species id and study)
- Opportunities to interpret Civil War and the African American history using the landscape as indicators of past history (cedar lane)

Geology

Fort Ward Park sits on one of the highest in a series of river terraces—Seminary Terrace—with an average elevation between 265 and 280 feet that step down across the city to the

1 Chapter 7: *Environmental Resources of Fort Ward: Issues, Assessment and Recommendations for Management.* May 2013

lowest terrace, the Old Town Terrace. The park has been subdivided into five geologic map units depicting the principal type of rocks and/or sediment based on current geologic surface conditions.[2] The core of the park, the site within the walking loop and the area of fort construction and reconstruction, is described as being artificial fill or disturbed ground. A second unit, the Seminary Terrace unit, a broad upland plain centered on the Episcopal Seminary, wraps the disturbed area. As the summit of the Alexandria highlands, the upland plain is composed chiefly of medium-coarse gravel in strong orange-brown heavy loam, with the highest portion capped with heavy, sandy silt that locally exceeds 10 feet in thickness and is poorly drained. The Seminary terrace units are in the Tertiary–Early Pleistocene Upland Terraces time frame.

The two intermittent stream valleys are located within other geologic units. The western stream valley lies on a map unit made up of chiefly massive lacustrine clay, forming steep bluffs and hillsides with many prehistoric and modern landslide scars. Arell clay's (in the Potomac Formation–Early Cretaceous) permeability is exceedingly low, yielding sparse amounts of ground-water discharge that result in ravines that are typically dry for much of the year. The eastern stream valley falls within the Fort Ward escarpment unit (Tertiary period), dating from the same period as the Seminary terrace units, and is a clay overlaid with a few inches to a few feet of gravelly and cobbly colluvium. Steeper slopes in this unit may be subject to slope failures.

Soils

Three soil types or complexes are identified in the National Resources Conservation Service's soil map for the portion of Fort Ward Park included within the Fort Ward Park Management Plan.[3] The soil survey and rankings support site observations regarding challenges in obtaining good turf growth. Soils have been compacted over time through construction activities, recreational use and vehicle traffic, exacerbating already challenging conditions. In addition to the compacted soils, the parklands have extensive stormwater run-off that intensifies the erosion problem, damaging tree roots and diminishing the vigor of all plants. Excessive sheet erosion as well as evidence of gully erosion is visible in the drainage areas with topsoil being lost throughout much of the park.

Figure 9 - Compacted soil on rifle trench

Hydrology

A separate stormwater and drainage evaluation of the park was completed by URS Corporation in 2014.[4] A copy of the report is included as an Appendix of the Management Plan.

The study evaluated sixteen sites within the park, assessing existing conditions and identifying potential measures to improve drainage and sedimentation. The capacity of the existing stormwater system was also verified.

2 Fleming, Tony. *Geologic Atlas of the City of Alexandria, Virginia and Vicinity*. March 2008.

3 Web Soil Survey http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. Soil map prepared by Natural Resources Conservation Service, Version 5, December 14, 2009.

4 Fort Ward Park Drainage Master Plan, URS Corporation, February 2014

Report recommendations include both structural and nonstructural measures. Three of the improvements are defined in more detail as initial, pilot projects for the park. These include retrofitting the existing stormwater system to reduce sedimentation and to improve the water quality of the runoff; construction of two diversion berms and an underground pipe to improve nuisance flooding and erosion at the Oakland Baptist Cemetery and Old Grave Yard sites; and stream stabilization to reduce erosion and improve the overall health of the stream.

Figure 10 - Line of cedars along School House Lane

Vegetation

Surveys and Snapshots for Tree Cover

Individual trees such as state and city champion trees have been identified and some historic or memorial trees have been noted; however, no comprehensive, current database exists of tree plantings, champion trees on site or historic/witness trees. There is no master plan for planting in the park, nor has the arboretum label applied in the 1980s borne any additional investment or caretaking. The arboretum subject is touched upon in Appendix F of the *The City of Alexandria's Urban Forestry Master Plan, 2009*. One of the plan's pilot projects is the 'Rededication of the City of Alexandria Arboretum at Fort Ward Park.' According to the Master Plan, "This rededication should include a careful study and development of a plan that will integrate and celebrate the park's historic past as well as its future and importance as one of the city's premiere recreational sites. It should also include the reestablishment of the park's once enviable collections of azaleas and camellias and the thoughtful development of plant collections that will demonstrate a variety of plants that can be incorporated into local landscapes."[5]

Comparing the most recent tree survey's data completed in 2002, to the tree inventory species list contained in the brochure developed in the 1980s and earlier aerial photographs is informative. The 1927 and 1937 aerial photographs (southern portion of the park only) display similar features—clusters of wooded areas immediately adjacent and south of the Oakland Baptist Cemetery, with more woodlands along the stream valley to the north. The majority of the site is covered with open fields. The lands surrounding the park are undeveloped and appear to be farmed or pasture lands. By 1927, West Braddock Road was aligned to cut through the southern leg of the fort structure. The remains on the south side of the road can still be seen on the 1927 image. Scattered throughout the site, but concentrated on the eastern side, are individual buildings, primarily connected to West Braddock Road. Further tree growth is shown in the 1949 aerial photograph, although a hedgerow seen in the 1937 photo has disappeared (see Section II.8, Plates 6 and 7 for copies of the 1937 and 1949 aerial photographs).

Recent observations indicate that the variety of tree species within the park reinforce the continuation of the diversity of species noted in earlier inventories, if not in the quantities from the past. However, many of the trees lost in recent storms have not been replaced—22 large trees failed in 2010 storms and other trees are stressed or dying. When some of these damaged or destroyed trees were recently removed, their lower trunks (2–3 feet high) and roots were left in place. More recently, some of those stumps have been

5 Alexandria Urban Forestry Master Plan, page 84

Figure 11 - Broken branch on fort wall, Summer 2013

flush cut to the ground level, but again no ground disturbing activities were undertaken to avoid inadvertent damage to archaeological features. Trees along the fence line of the cemetery have been removed as well.

Today, many trees in the park show signs of extensive decay, broken branches, disease and insect damage and are leaning.[6] Sampling of approximately 600 of the trees in the park indicated that 100-200 of those are weakened and will potentially fail within the next five years. Healthy trees face future risks. The large Green Ash grove found in the southeastern corner of the park is vulnerable to the Emerald Ash Borer. Many experts predict the area will suffer a total loss of ash trees in the near future; however, many distinguished trees continue to thrive in the park. Several of the twenty Memorial Trees noted in the 1980s brochure remain standing. The recently published Natural Resources Technical Report 13-1[7] describes the City co-champion Blackjack Oak (*Quercus marilandica*), which is located at the north edge of the parking area near the state co-champion Blackjack Oak, which is located above an open grassy swale east of the museum parking lot. Nearby is the state champion Black Haw (*Viburnum prunifolium*). The City champion Downy Serviceberry (*Amelanchier arborea*), once one of two co-champions on site, grows near the Northwest Bastion. The City co-champion Pignut, a hickory, (*Carya glabra*) is located nearby. A Virginia Pine (*Pinus virginiana*) City Champion is growing on the slope below the Northeast Bastion. Another City co-champion, a Black Gum (*Nyssa sylvatica*), is growing on the east of the rifle trench, near the playground. The Rudkin Oak (*Quercus x rudkinii*), a natural hybrid between Blackjack Oak and Willow Oak (*Quercus phellos*), is found at Fort Ward Park on the eastern flank of the Rifle Trench, one of only two locations where the tree is found in the city.

Due to the recent archaeological discoveries and prior to completion of an archaeological survey of the park, restrictions were placed on ground disturbing activities. No new tree planting has occurred since 2010. This lack of planting is conspicuous as the park has been subject to several damaging storms—an ice storm in 2010, the June 29, 2012 derecho windstorm, and again in 2013.

Figure 12 - Grassland meadow at Fort Ward Park

Shrubs and Grasslands

Ten of the eighteen shrub beds shown in the arboretum brochure from the 1980s remain, some in different configurations and all in different stages of growth. Many are still planted primarily with azaleas. One shrub bed is filled with pyracantha and is overgrown with vines. Some of these vines are non-native invasive species such as Oriental porcelainberry and Japanese honeysuckle. In addition, poison ivy has grown in areas of high use, such as picnic areas and along trails, and should be removed from those areas. A cedar hedge wraps an area in the southeastern corner of the park.

6 Ries, Linda. FWAG

7 Simmons, Rod. *Remnant Natural Areas in Parks, Waterways, and Undeveloped Sites in the City of Alexandria, Virginia: Seminary Hill Area*. Natural Resources Technical Report 13-1, June 2013, page 9.

As displayed in the historic aerial photographs, much of the parkland is still covered in grass, whether mowed as turf or designated to revert to meadow. The condition of the grassy areas vary widely throughout the park; areas within the loop road are under the control of the Office of Historic Alexandria (OHA), while the areas generally outside the loop road are maintained by the Department of Recreation, Parks, and Cultural Activities (RPCA). Management of the turf affects tree health as well as soil erosion. Much of the park areas outside the loop road continue to be under stress. It is difficult to get turf reestablished when soils are highly compacted and subject to erosion. The City has begun to address these issues, with OHA and RCPA identifying areas of the park that can be aerated without damaging cultural resources and repairing surface areas. Initial aeration of those areas took place over the fall of 2013, with up to four cycles proposed for the 2014 season.

The City's *Natural Resource Technical Report* states "Dry, gravelly, open areas throughout the park provide unique habitat for crustose lichens and a variety of native, warm-season grasses, such as varieties of Rosette Grass (*Dichanthelium acuminatum*), Poverty Oatgrass (*Danthonia spicata*), Poverty Grass (*Sporobolus vaginiflorus*) and others." Perhaps the common names indicate soil conditions best—impoverished. Wildflowers are also found on site, including Pinweed (*Lechea spp.*) and St. Andrew's Cross (*Hypericum hypericoides*). Additional uncommon to rare species identified in the recent Technical Report include Hairy Thoroughwort (*Eupatorium pubescens*), Pineweed (*Hypericum gentianoides*), Hairy Bushclover (*Lespedeza hirt var. hirta*) and Frosted Hawthorne (*Crataegus pruinosa*).[8]

Recently, in an attempt to better manage stormwater and site conditions, areas within the park were designated as 'no mow' or natural areas to alleviate some erosion problems, better protect historic sites and to save money on turf management. Initially, three areas were designated as 'meadow' and three areas were designated as 'woodland glade.'[9] Both categories are mowed only once, annually in the fall. These six areas were reduced to two meadows, both located on the eastern side of the park. The attempt to generate woodland glades did not take off. A similar but slightly different proposal in included in this management plan in the continuing attempt to reduce costs and better manage stormwater on the site. The third meadow, located between the fort and West Braddock Road was eliminated and that area is managed as turf grass.

The turf area within the park is managed by two separate entities—one portion by the park's maintenance operation and the other by a private contractor under the supervision of the Office of Historic Alexandria. Beginning in 2013, the area outside of the fort area (maintained by City crews) is mowed on a two-week rotation due to recent budget shortfalls. The turf within the fort area, independently contracted, is managed

Tree Inventories and Surveys

A tree identification map and key were printed in the mid-1980s in a brochure that references the Arbor Day, 1983 establishment of the Arboretum in Fort Ward Park. A separate survey was undertaken in 2002. The earlier arboretum survey did not include a tree count so quantity cannot be compared, but species survival can be deduced. As could be expected, ornamental species declined, as they are often short-lived and less likely than natives to easily acclimate to site conditions. Some change could also be attributed to the authors of each survey identifying a different variety for the same plant material.

Missing species from the 2002 list, but included in the earlier version are Hop Hornbeam (*Ostrya virginiana*), Sassafras (*Sassafras albidum*) Groenveldt Elm (*Ulmus 'Groenveldt'*), River Birch (*Betula nigra*), European Mountain Ash (*Sorbus aucuparia*), Chinese Elm (*Ulmus parvifolia*), Cedar of Lebanon (*Cedrus libani*), European Larch (*Larix decidua*), Lacebark Pine (*Pinus bungeana*), Carolina Silverbell (*Halesia carolina*), Star Magnolia (*Magnolia stellata*), Hedge Maple (*Acer campestre*), Paperbark Maple (*Acer griseum*), White Redbud (*Cercis canadensis 'Alba'*) and Stewartia (*Stewartia pseudocamellia*).

Plants listed in 2002 that were not indicated on the brochure (this does not necessarily mean that the plant was not there at that time) include Red Sunset Maple (*Acer rubrum 'Sunset'*), Grey Birch (*Betula populifolia*), Green Ash (*Fraxinus pennslyvanica*), Paulownia (*Paulownia tomentosum*), Black Maple (*Acer nigrum*), Chamaecyparis (*Chamaecyparis sp.*), Washington Hawthorne (*Crataegus phaenopyrum*), Camellia (*Camellia sp.*), Amorpha (*Amorhpa fruticosa*), Pennsylvania Cherry (*Prunus pensylvanica*), Sweet Cherry (*Prunus avium*), Burford Holly (*Ilex cornuta*), Colorado Blue Spruce (*Picea pungens*) and Eastern White Cedar (*Thuja occidentalis*).

8 Simmons, Rod. page 10.

9 City of Alexandria Memorandum of Understanding on Maintenance Practices for Fort Ward Park.

Figure 13 - English ivy, as a groundcover in this picture, is considered to be an non-native invasive plant species

differently. Implemented in 2005, management of certain areas within the fort is subject to an annual cyclical turf maintenance treatment involving seeding, fertilizing, liming, aerating and weed control by landscape specialists in the fall and spring.[10]

The 'no mow' practice appears to have been beneficial in some areas, slowing the flow of stormwater and saving mowing costs; however, park users have expressed concerns regarding the perceived increase in ticks, the establishment of non-native invasive species and limitations on walking access. The intentional act to not mow is not clear to park users, with limited or no signage. Further confusing the user, in June 2013 a picnic table was located within the long grass near the parking lot.

Non-native Invasive Plant Species

As with any urban landscape in Northern Virginia, non-native invasive plant species are found within in the park. Some like English Ivy (*Hedera helix*) were intentionally planted before there was concern as to the aggressive growth habits of a particular species. Others have been brought to the park by birds and animals. No comprehensive inventory or specific plan for eradication of non-native invasive species has been developed for the park.

There is one sign in the northwest section of the park indicating a native plants and wildlife habitat area. The City of Alexandria has published a document, *Invasive Exotic Plants That Threaten Parks and Natural Areas in Alexandria*, that lists exotic (non-native) plants that are especially invasive, damaging and persistent. Plants found in the park that are on the list include English Ivy (*Hedera hibernica*)[11], Flowering Crabapple (*Malus spp.*) and Callery or Bradford Pear (*Pyrus calleryana*). Other non-native invasives found in the park include Waxleaf Privet (*Ligustrum sinensis*), Japanese Honeysuckle (*Lonicera japonica*), Multiflora Rose (*Rosa multiflora*), Barberry (*Berberis thunbergii*) Oriental porceleinberry (*Ampelopsis brevipedunculata*), Japanese knotweed (*Fallopia japonica*) and wisteria (*Wisteria*).

Riparian Areas

Fort Ward Park has two intermittent streams, one draining to the park's northeastern corner and one to the park's west. The drainageway alignments can be discerned from the topographic maps, soil maps and field observation. There is no mapping available of the riparian area.

Wildlife

A review using the interactive website for the US Fish and Wildlife Services Ipac program does not identify any listed threatened or endangered species within Fort Ward Park. There is no record of any wildlife counts or studies being performed on site in the park, although

10 Ziegler, Charles. Chapter 1. Civil War Resources – Fort Ward Park. May 2013.

11 Genus and species name per *Invasive Exotic Plants That Threaten Parks and Natural Areas in Alexandria*

from the plant materials found within the park, it can be surmised that the park presents a rich habitat for squirrels, birds and various butterflies and insect species.[12]

Fort Ward Park is not identified as a Northern Virginia Bird Survey site according to a representative of the Northern Virginia Audubon Society[13], nor is anyone in the birding community aware of counts being performed in the park. Birders are seen in the park as informal observers. A Cooper's Hawk has been sighted. The park has a richness in bird species in part because of the mix of pines and hardwoods, as well as a variety of sunny and shaded areas. A separate search through the bald eagle web site indicated that there are no known nest sites in or near the park.[14]

"On forested hills surrounding the nation's capital are the remnants of a complex system of Civil War fortifications. Built by Union forces, these strategic earthwork forts transformed the young capital into one of the world's most fortified cities. Today, the remaining circle of forts and parkland are part of the local legacy of park planning. The Civil War Defenses of Washington hiking and biking trails are a wonderful way to explore D.C.'s Civil war history. Whether traveling by foot or by bicycle, visitors can experience many of the historic fort sites along with some of the District's neighborhoods, popular green spaces, and tremendous views of the city."

National Park Service brochure, "Civil War Defenses of Washington."

B. Built Landscape

Archaeological Studies and Investigations

Several archaeological studies have been undertaken in the park. More work is needed. Some efforts will be funded through the stormwater and drainage work. Other needed investigations have not been funded by the City in recent budget years. The City of Alexandria conducted archaeological investigations to support the reconstruction of the Northwest Bastion. The reconstructed parapet is located above the original. In 1991, Alexandria Archaeology discovered post holes and a brick platform, probably a base for a stove from one of the barracks situated near the present-day Officer's Hut during the Civil War. More recently, recognition of the African American community has occurred, with a recent study of the site completed in 2010-2011 and another in 2013. More archaeology work will done in conjunction with stormwater and drainage work.

The land use history of a particular place, especially in high population areas, is likely to be complex, as it is at Fort Ward Park. The use of residential lots and Civil War barracks areas followed different rules of behavior and therefore their archaeological signatures will reflect these differences. The archaeological evidence of these behaviors is likely to be spread over the landscape in different places and in different densities. Recognition of these differences will be required when addressing management strategies and techniques; for example, how much sensitivity is required for ground disturbing activities? Parameters are established for each of the identified archaeological resources and may be reviewed in the table in Appendix II.

The archaeological remains tell us much about the unrecorded day-to-day behavior of the people who used the site in the past. The documentary evidence and historical information gathered by descendents of the African American residents

Figure 14 - Fort Ward gate

12 Ries, Linda. FWAG

13 Williams, Carolyn. Email correspondence. July 10. 2013.

14 Eagle Nest Locator - The Center for Conservation Biology, July 7, 2013.

and the archaeological evidence provide tangible connections between the past and the present within the changing land use of this property. Some of this information has greater importance to some groups than to others, including different groups within Alexandria and beyond. But in sum, this integrated understanding strengthens our knowledge of the history and the changing land use of this property.

1960s Restoration

Before restoring the Northwest bastion, the City of Alexandria sponsored an archaeological investigation on that portion of the fort. The investigation focused on the parapet/ditch/glacis profile, gun embrasures, ammunition filling room, and powder magazine. Field methods consisted of excavating three trenches (Larrabee 1961: 80). The 1961 work investigated fort features to be modified or destroyed by restoring the Northwest bastion. Excavations found few artifacts (Larrabee 1961:47). The profiles from the investigation provide invaluable documentation on how the fort was constructed and document post-War salvage.

1991 Alexandria Archaeology

In the summer of 1991, Alexandria Archaeology conducted their archaeological field school at Fort Ward (Bromberg 1991). The focus of the investigations was the former ancillary buildings housing and supporting the troops garrisoned at the fort. These buildings were located east of the fort's main gate. About one foot below the modern ground surface, the field school found artifacts associated with the military occupation as well as postholes and a possible brick stove platform associated with one of the barracks buildings.

The excavations also identified evidence for post-War African American homes, including artifacts and landscaping. Portions of the fort's ditch were filled by these occupants to create more usable yard space.

The Ottery Group 2010-2011

Between the fall of 2010 and continuing into the summer of 2011, the Ottery Group conducted investigations at Fort Ward. The fieldwork was undertaken in two distinct periods that were labeled by Alexandria Archaeology for their scheduling and funding purposes as Stage 1 and Stage 2B. (Stage 2A was undertaken as a separate effort by Alexandria Archaeology) Stage 1 focused on finding unmarked graves, testing the efficacy of ground penetrating radar to find graves at Fort Ward, and finding other potentially significant resources at selected areas within the park.

Stage 2B fieldwork, also by the Ottery group, was completed during the summer of 2011; it involved archaeological investigation and monitoring, primarily to ensure that installation of a temporary drainage system in the southeastern section of the park did not have an impact on any graves, but also to look for other resources that were present in areas to be disturbed by the drainage project.

Alexandria Archaeology

The City's archaeology office, Alexandria Archaeology conducted the Stage 2A investigation to find additional grave locations and other potentially significant resources throughout the section of the park tested by the Ottery Group during the Stage 1 investigation. The City has prepared a series of overlays showing the archaeology and areas where nothing was found; archaeology separated into type—Prehistoric, Civil War, "The Fort" community and significant and non-significant archaeological sites.

Archaeological Resources - Known and Predicted

Locally significant archaeological resources (architectural remains, activity areas, features and artifacts) and graves associated with "The Fort" community were found in archaeological investigations and are noted in this section. Specific methods and results are found in the archaeological reports posted online. The archaeologists targeted locations within yards for investigation lots where oral history and documentary research indicated that graves could be present. The methods used are standard archaeological procedures for testing graves. These methods were successful and their findings accurate when the archaeologists stripped and examined the ground surface. In yard areas that were not investigated and in areas where historical research and oral traditions hold that there are internments, but graves were not found, the possibility does exist that there are burials present in these locations.

"Through sheer strength of will, determination, fortitude, guts and against all odds, our ancestors fashioned a life here at Fort Ward, an abandoned Union fort. Then, out of necessity, they developed an entire viable, self-sustaining community that is still very much in existence today. It's undergone many changes, but we're still here.

In the 1950s and 1960s, the City moved the residents out of Fort Ward to establish the Park and Museum, which disrupted their tranquility. In 1962, the City displaced our community once again to build T.C. Williams High School. But we're still here."

Frances (Johnson) Colbert Terrell, great-great-grandaughter of Seminary community founders, Wallace and Virginia Roy Wanzer

Prehistoric

Located on an upland terrace near the headwaters of an unnamed stream, Native American groups would have included this general area in their food gathering territory as a non-intensive and short-term use. Expectations for prehistoric archaeological resources are for small low-density sites and isolated finds reflecting short-term use of the area. (see Plate 8, Section II.8)

Civil War

Archaeological resources associated with the Civil War are varied and include earthworks, features associated with former building locations, and artifact scatters. The main earthworks that make up Fort Ward are protected and are located within the park access loop road. The fort's earthworks and interior retain archaeological integrity and have the potential to add significant information to our knowledge of the Civil War occupation of the park. However, the 1960s reconstruction of the Northwest Bastion disturbed and destroyed deposits associated with the construction and use of the fort at this location. Because the main portions of the earthworks are protected, there are no plans for expanded use. Issues that will affect the archaeological resources in this area involve long-term landscape maintenance.

Alexandria Archaeology has conducted subsurface testing and a metal detector survey along the proposed right-of-way of a planned ADA walkway that will lead from the fort's gate to the restored bastion. The investigations have shown that evidence of Civil War and a post-Civil War domestic occupation are present.

There are three earthworks on the exterior of the main fortification: outer battery, covered way and rifle trench. Recreational use of the park has resulted in these features deteriorating because they lack the ground cover vegetation that covers the fort. The outer battery and covered way are in active picnic areas; meanwhile, the rifle trench is actively used as a walkway. As a result, at many locations the ground surface is exposed and active erosion is destroying the Civil War features.

Three barracks, stables, a mess hall and a privy were located north of the fort road. This location currently contains the park's museum buildings and a parking lot. These archaeological resources have the potential for providing significant information on the soldiers who occupied the fort and can be used to address research questions about military housing, adherence to regulations, material culture, and supplying fortifications

"In planning future use of the Park, it is necessary to identify the significant prior activities and uses, such as dwellings, schools, churches, barns, public roads or streets, privies and wells, landscaping, etc. Over the past 20 years, a substantial amount of information has been developed from public records such as wills, tax records, property records, City directories, and census records. Also, US geological survey maps and aerial photos as early as 1927 have provided helpful data. Archaeologists have uncovered a wealth of information about the community, and substantially more archaeological work is ongoing. For over 20 years oral histories of some of the former residents and their relatives have been obtained, as well as photographs and entries in family Bibles. Taken together this information helps provide an understanding of the lives of the families who occupied the Fort possibly as enslaved people, contraband, members of the US Colored Troops, and as free people (some of the first African Americans to vote) during the Reconstruction period, and for the next 100 years."

Washington, Adrienne and Frances Terrell and Jim Walpole. Chapter 4. African American Structures and Other Resources: Consideration of historical resources including location of roads and paths, African American structures, schools, landscaping, and artifacts (with the exception of graves and burial sites). January 2013.

within the Defenses of Washington. Civil War artifact scatters were identified outside the earthworks on the east side of the fortifications. It is unlikely that Civil War resources would be present west of the fort in the field-of-fire.

Roadways

Historical maps and aerial photographs have indicated the presence of old roads, some of which are still visible in the park landscape.

School House Lane, the late nineteenth- through early twentieth-century road that ran from Braddock Road to the school house, has survived. This landscape feature is readily observable and a portion of it is lined with cedar trees.

Another neighborhood road is visible as a dip in the landscape between the School House Lane and the current paved loop road.

Eagle Crest development included two roads. The two perpendicular roadbeds are visible on the west and north sides of the glacis of the fort. They were constructed as infrastructure for a community that was platted in 1938 but never developed.

Maps show a Civil War road east of the fort. Portions of this road may be under the current east loop road. It is not visible today.

Another community road, predating the Eagle Crest roads, was present along the west side of the fort. The current park paved loop path is situated in this location and there is no evidence of this earlier roadbed.

Known Cemeteries

Oakland Baptist Cemetery - This private cemetery is found within the park. The known interments are within a fenced area.

Old Grave Yard - The Old Grave Yard is next to the Oakland Baptist Cemetery. It predates the Oakland Baptist Cemetery and the orientation of the graves differs from that of the other cemeteries. There are five existing gravestones. Only two of these stones are in situ. The disposition of the stones not marking graves, one of which is broken, needs to be determined. Conservation needs should be addressed. Investigations resulted in identifying 17 grave locations and defined the boundaries. The cemetery is not fenced and it is located on a side slope that is actively eroding. Like all locations within the park, there is a threat of damage due to soil erosion if a long-term landscape maintenance plan is not implemented.

Adams Burial Area - One monument is present at this location, marking the grave of Clara W. Adams. Investigations confirmed the grave location of Ms. Adams and found three more grave shafts. Originally, it was thought that Clara's husband, Robert, was buried in the adjacent grave to the north, but a more recent discovery of a grave to the south makes this uncertain. The identities of the two individuals buried in the other two graves are not known. The archaeological investigations did not establish boundaries for this burial plot. Added investigations extending in all directions from the graves are needed to discover

boundaries. Like all locations within the park, there is a threat of damage due to soil erosion if a long-term landscape maintenance plan is not implemented.

Clark Burial Area - Amanda Clark requested that on her death she be buried on her property in a little grove near what is referred to in the historic documentation as the Clara Adams "line." Investigations identified two adjacent unmarked grave shafts at the location Ms. Clark had asked to be buried. It is believed that one of the graves could be Amanda's. It is unknown which grave is hers and who is buried in the other. The archaeological investigations did not establish boundaries for this burial plot. Added investigations extending in all directions from the graves are needed to discover boundaries. Like all locations within the park, there is a threat of damage due to soil erosion if a long-term landscape maintenance plan is not implemented.

Jackson Cemetery - There are no surface indications for graves and no markers at the Jackson cemetery. Investigations resulted in the identification of at least 20 grave locations and defined the boundaries on all but one side. The east side has not been formally identified but should be near the fort's earthworks. Because this early twentieth-century cemetery was established on the fort's glacis, it is in an area that is protected from most park development. The cemetery is not marked. Like all locations within the park, there is a threat of damage due to soil erosion if a long-term landscape maintenance plan is not implemented.

Figure 15 - View of cemetery on park's eastern edge

Possible Cemeteries and Sites

Craven Lot - James Walter Craven bought Lot 16 in 1921. There is weak documentary evidence for burials on this lot; it is likely the document mentioning a cemetery is referring to the Jackson Cemetery. There is also anecdotal evidence that states that Cravens said that burials occurred on their property. Although there are slight indications for cemeteries on this property, due diligence is required if any ground disturbance occurs on this lot. Like all locations within the park, there is a threat of damage due to soil erosion if a long-term landscape maintenance plan is not implemented.

North of Oakland Baptist Cemetery - Oral histories suggest the area north of Oakland Baptist Cemetery (Research Lots 5 and 6) may contain undocumented graves. Field investigations will need to occur in this location before any ground disturbance.

West of Oakland Baptist Cemetery - Lot 9a was owned by the Oakland Baptist Church prior to 1969 and is directly west of the existing boundary of the Oakland Baptist Cemetery (Lot 9b). When the City of Alexandria acquired the property, it was stated there were no burials on this portion of Lot 9. This location crosses a drainage ravine and up to 8 feet of fill covers the original ground surface. Because undocumented burials may be associated with the Oakland Baptist Church and because many graves within the park are unmarked, the City cannot assume there are no undocumented graves in Lot 9b. Added investigation specifically designed to find undocumented graves is warranted before any other ground disturbance activity occurs in this area.

Clark Lot - Historic research and oral histories suggest the entire Amanda Clark property (Lot 11) may contain undocumented graves. Field investigations will need to occur in this location before any ground disturbance.

School/Church/Residence Lot - In 1898, Clara Adams sold a ¼ acre plot to the Falls Church District of Fairfax County for use as an African American School. Later this plot was bought by Diocesan Missionary Society of Virginia. The oral history of former resident of this property, Sargent Young, recounts how there were three gravestones in the front yard of his house. However, additional research and field investigations are needed to corroborate Mr. Young's information. Before any ground disturbance in this area occurs, added investigations are needed.

Adams/Ruffner Lot - The proximity of this property to the Clark burial ground is the only indicator that the northern half of the Adams/Ruffner Lot has the potential for containing undocumented burials. Added investigations are needed in this area before any ground disturbance.

Good Samaritan Lot - The Good Samaritan Lot is a small parcel of land fronting on Braddock Road. No one understands why, in 1887, the landowners (Miller) sold a small portion of their lot to the St. Mathews Lodge No. 220, Independent Order of Good Samaritans and Daughters of Samaria. This organization was an African American beneficial and temperance organization. Since the Good Samaritans are known for their care and maintenance of cemeteries, there is a possibility the plot was a cemetery. Added investigations are needed in this area before any ground disturbance.

African American Household Sites - Archaeologists have delineated the loci of 29 areas associated with "The Fort" community. These include scatters of artifacts, foundation footings and piers, wells and a privy. Historical research has led to the association of many of these significant areas with the families who lived at "The Fort" community.

Synthesis of Existing Conditions

The park's landscape is composed of the site's natural features as modified by periods of development both in the landscape—rows of trees such as the line of cedars along School House Lane—and built conditions—the fort, "The Fort" community and the more recent recreation features. This section synthesizes the continuum of history within the region and the parkland. These findings will contribute to and inform the recommendations for long-term management and interpretation of the natural and built landscape at Fort Ward Park. The section summarizes the character and composition of Fort Ward Park, while assessing the origin and importance of its features to historical significance, environmental quality and visitors.

Feature descriptions are organized into a series of landscape characteristics—patterns of spatial organization; land uses; natural features and systems; responses to natural resources; circulation; vegetation; buildings and structures; views and viewsheds; small-scale features; and archaeological resources. These characteristics, in combination with condition issues and concerns observed, will contribute to the structure of the Management Plan and its recommendations.

The museum and several additional educational, recreational and cultural programs were created at Fort Ward in the 1960s as part of park development by the City of Alexandria. Today, the park is a popular draw for local residents as well as tourists. Park visitors enjoy the park for its history, outdoor recreational opportunities such as walking, picnicking and family gatherings, cultural events and performances, children's playground facilities and a dedicated space for dogs.

The popularity of the park, however, has led to some concerns about resource protection and repair. Today, the mix of uses, heavy visitation, and maturing infrastructure contribute to the deteriorating condition of park resources and concerns regarding ongoing appropriateness of programming. Families with ties to the historic "The Fort" community have worked with the City to integrate and honor the legacy of their forebearers, suggesting that any proposed changes to park operations be considered within a larger framework than has been the case in the past.

Figure 16 - Park user, near fort plantings

Significance as a Historic Landscape

Fort Ward—both the Civil War fortification and "The Fort" community—is considered an historic landscape recognized for its patterns of spatial organization, its relationships between the built and natural landscape as a fortification in the defense of Washington and its cultural, social and political ramifications as a settlement for African Americans who located near the fort (as well as other parts of the fort system).

The original 35 acre park is listed on the National Register of Historic Places.

Figure 17 - Fort earthworks with barberry hedge and wooden steps

Patterns of Spatial Organization

A critical element in defining appropriate treatment and management recommendations for historic landscapes such as at Fort Ward Park is to document the spatial organization and patterns that establish the structure of the landscape. In the case of Fort Ward, the spatial organization has three identifiable layers that form overlapping patterns: the Civil War fortification; "The Fort" community that grew up around the fortification after the war; and the commemorative period resulting in the establishment of Fort Ward Park including its recreational uses. The significance of an historic landscape often lies in the relationships among elements (for example the

Inventory of Patterns of Spatial Organization

- *Civil War earthen fort (enclosed structure with several bastions) forming the core of the park, with extensions to the northwest, north central, and southwest*
- *Cluster of exhibit period buildings designed to reflect Civil War era fort support buildings*
- *Evidence of "The Fort" community road networks*
- *Evidence of "The Fort" community associated tree plantings*
- *Woodland areas associated with "The Fort" community*
- *Grave sites and cemeteries associated with "The Fort" community that ring the remnant Civil War fortification*
- *Park loop road that encircles the earthworks and forms a spine for recreational park activities (hub and spoke configuration)*
- *Pods of activity centers clustered along the road margins – picnic areas, amphitheater, dog park, playground*
- *Fencing along the perimeter to define the park margin*
- *Mixed plantings with views into the park from West Braddock Road*
- *Sections of densely screened edges along the park boundaries*

Inventory of Land Uses and Activities

- *Museum/interpretive/educational*
- *Recreational (passive)*
- *Maintenance*
- *Utility*
- *Natural areas—woodlands and meadows*
- *"The Fort" community burial sites, building sites and plantings*
- *Adjacent private cemetery*

Inventory of Built Landscape Responses to Natural Landscape

- *Siting of Fort Ward atop a high point, with bastion extensions pointing toward primary road corridors of the mid nineteenth century*
- *Stair and bridge structures providing access to the fort interior*
- *Well sites associated with the Civil War fort and "The Fort" community*
- *Amanda Clark burial site in wooded grove*
- *Historic use of the gentle terrain surrounding the fortification for farming and gardens and for road development*
- *Drop inlets, catchment structures and culverts used to channel and convey storm water beneath roads and trails*
- *Storm water management responses (riprap, silt fencing, straw bales, meadow establishment)*

fortification was built to take advantage of the landform position in the defense of Washington).

Earthworks

The large earthworks that comprise the fort are composed of a continuous outer wall and protected interior space designed to accommodate artillery, soldiers, arms storage and shelter. From the reconstructed Northwest Bastion, views are afforded from the artillery emplacements into the landscape. These views extend to the vegetation that edges the park boundary. They historically extended across a broad expanse of open terrain that had been cleared to support artillery fire toward potential avenues of approach such as the Leesburg and Alexandria Turnpike. The park's main building, the Fort Ward Museum, faces West Braddock Road as an inviting gesture to visitors.

"The Fort" Community

"The Fort" community is less visible, with recent investigations confirming locations of burial sites and several of the buildings, schools, churches and road systems. The Oakland Baptist Cemetery, a private cemetery, extends into the park and provides visible confirmation of the community. Recent interpretive panels produced by the Fort Ward and Seminary African American Descendents Society have been installed in the park, telling the story of "The Fort" community—'We're Still Here.'

Recreational Use

The park's use today as a recreational site for Alexandria residents is visible in the spatial organization of today's park.

Land Uses

There are several land uses and activities associated with Fort Ward Park that address visitor interests as well as park administration and operations. These include museum/interpretive/educational, recreational, maintenance, utility and conservation uses. There are several marked and numerous unmarked graves located within the park. Wayside exhibits are placed in the landscape to support self-guided tours and to tell some of the park's history.

Built Landscapes Responses to Natural Landscapes

Several features located within the park reflect cultural responses to natural features. The most dominant example is the siting and military design of the Fort Ward

earthworks conducted during the 1860s. Sited atop a ridge and high ground that afforded an expansive prospect of the surrounding terrain, both due to agricultural activities and to clearing by Union soldiers, the fortification allowed for a clear field of fire and protection of potential avenues of approach into the city. The high earthen walls of the parapet, and deep frontal ditch, coupled with the naturally descending terrain to the north and west enhanced the commanding position of the earthworks.

Figure 18 - View of the fort's interior, within the context of the location's sight lines

Other aspects of the fort that reflected cultural responses to natural resources included the establishment of a brick-lined well within the protected central portion of the fort to create a defensible water source for those stationed in the earthworks and the drainage system that conveyed stormwater from the center to the ditch and elsewhere beyond the perimeter walls. Today, the site of the Civil War-era well is not currently known, but the feature is interpreted within the fort.

"The Fort" community is known to have conveyed associations with the natural landscape that are in evidence today. The land surrounding the fortification was used for farming and gardens. Wells were used to supply fresh water to many of the dwellings, and roads were developed on the gentle terrain around the perimeter of the Civil War fortifications. Oral history accounts indicate that there was also a spring on the east tributary.

Views

Views associated with Fort Ward Park are generally inwardly focused. There are few opportunities to view the landscape beyond park boundaries due to the extent of dense vegetation along the margins. In most cases, the vegetation helps to screen views of contemporary development, consequently maintaining the distinctive character of the park.

Travelers along West Braddock Road have the best views of the park. The break in the fencing and the plantings at the entrance allow for views of the Fort Ward Museum and verdant green space within. Along the road corridor, additional views are afforded where there are breaks in the plantings; these views are enhanced during the winter when the deciduous species lose their leaves.

Within the park, views are afforded across the meadow and other areas maintained in mown grass. The picnic areas, amphitheater, playground, and picnic pavilion are all generally visible from the loop road. It is also possible to view the Oakland Baptist Cemetery from the loop road. Views toward the former maintenance area are limited by screen fencing.

Inventory of Views

- *View from restored bastion*
- *View directed through the reconstructed Fort Ward gate*
- *View to Oakland Baptist Church Cemetery from the loop road*
- *View into the amphitheater from road, walks and seating*
- *Glimpses into the park along Braddock Road through tree plantings and at entrance*
- *Views across open meadows and lawn*
- *View through the center of the redoubt*
- *Views blocked at park boundaries by dense vegetation*
- *Directed views from wayside exhibits associated with "The Fort" community*

Figure 19 - Entrance to Fort Ward Park

Other views of interest include the fort exterior from several locations that help to convey a sense of the size and scale of the structure, the fort interior from the reconstructed gate and the break in the parapet associated with the loop road, and the top of the earthen structure from the bridge structures that lead in and out of the fort. Views associated with the reconstructed Northwest Bastion are dramatic. Interpretive waysides are oriented to provide a connection between the information conveyed and a view toward a particular historic resource.

Buildings and Structures

There are several buildings and structures located within Fort Ward Park. Three of the buildings are clustered to the east of the fort. These are reproductions of Defenses of Washington military buildings constructed in the 1960s to support park development. They include a headquarters building, used as a museum, an officer's hut, used for exhibit purposes, and a replica of the headquarters of a hospital near Alexandria that serves as a restroom. In addition to the fort itself, there is a reconstructed ceremonial gate located along the fort perimeter and park-related features that include a second restroom building, a picnic pavilion, an amphitheater, maintenance operations buildings, fencing and gates, walls, bridges, culverts and utility boxes.

Inventory of Buildings and Structures

- *Fort Ward Museum (Civil War-era exhibit or period building)*
- *Fort Ward Ceremonial Gate (reconstruction)*
- *Replica Officer's Hut (Civil War-era exhibit or period building)*
- *Archaeological evidence of "The Fort" community dwellings, outbuildings and institutional structures such as the school house*
- *Restroom building (Civil War-era exhibit or period building)*
- *Restroom near amphitheater and picnic area*
- *Amphitheater*
- *Maintenance facilities*
- *Fort Ward (composed of remains of original perimeter parapet wall and ditch system—southwest bastion, east bastion, north bastion, south bastion, bombproofs and reconstructed Northwest Bastion)*
- *Rifle trench*
- *Outer battery*
- *Covered way*
- *Utility cabinets near park entrance*
- *Bridges*
- *Culverts*
- *Fencing (post and rail, chain link, stockade fencing behind museum and restroom building, around dumpster, edging amphitheater)*
- *Gates (wooden post and arm at entrance)*
- *Picnic pavilion*
- *Wood retaining wall around picnic pavilion*

The Civil War fort was designed to occupy high ground, which afforded military advantages such as the ability to command long views of potential avenues of approach by enemy forces. Specifically, the fort was designed to defend the Leesburg and Alexandria Turnpike (Route 7) and Bailey's and Balls Cross Roads. It was part of a continuous line of earthen walls or parapets, punctuated at key locations such as road corridors by more elaborate structures that housed artillery batteries such as Fort Ward. The line of parapets, and the fortifications placed on high points and other key terrain features, ringed the perimeter of the city.

The importance of the Fort Ward fortification was recognized by the City of Alexandria during the 1950s, when plans were prepared to establish a park in time to mark the 100th anniversary of the Civil War. Between the late 1950s and 1964, the City slowly acquired land for the proposed park, in some cases through condemnation and eminent domain from less than willing sellers. The City engaged archeologists to investigate the Northwest Bastion before it was reconstructed. To complete the interpretation of the

military landscape, the City also reconstructed a ceremonial entrance gate illustrated in period documents and built three replica military support structures. These buildings formed the core of the park near the southeastern edge of the fortification, on or near the actual site of barracks and a mess hall during the Civil War for which no documentation of style of construction had been found. These facilities house a museum, an officer's hut exhibit, and restrooms.

Fort Ward is marked by tall earthen walls, exterior ditches and sculpted landform referred to as the glacis, and a central open space marked by two dismantled bombproofs and a replica well cover. Paths, stairs, and bridges provide access to the central open space.

Circulation

The park is served by a one-way loop road, open for vehicular traffic during specific hours. The loop road is used by pedestrians throughout the day, with and without vehicular traffic. Much of the loop road alignment was developed from roads that served "The Fort" community at the time the park was developed, although the segment that leads west from the entrance was built specifically for park use. The park's loop road circumnavigates the perimeter of Fort Ward.

A trace road, or physical evidence of a former road, of School House Lane is present between the Oakland Baptist Church Cemetery and West Braddock Road. It is edged by a row of eastern red cedar trees. Residences and a schoolhouse, elements within "The Fort" community, were associated with the road.

Paved asphalt and concrete paths connect the park's entrance road, museum, reconstructed gate, officer's hut and paved parking area. The asphalt path is six feet wide and universally accessible. Concrete walks connect the amphitheater and adjacent restroom. Short segments of exposed aggregate concrete walks are found in the interior of the parapet. Other walks within the interior of the fort complex are formed of loose pea gravel and turf. The City currently plans to install an accessible path within the fort interior, made of recycled tire material - Flexi-Pave. The installation requires 4-6 inches of soil to be removed. Archaeological testing was conducted, and the site was shovel tested and metal detected in preliminary archaeological work.

Small-scale Features

There are many small-scaled features that contribute to the character and composition of the park. They relate to site furnishings such as benches (two styles) and trash receptacles (one style), grills and picnic tables. Several formal picnic areas have been removed from the park, but the pads remain.

Signs relating to interpretive stories, rules and information are present throughout the park. There is also a small garden with a stone marker and bronze plaque that honors a former City arborist. The marker is set within the center of a circular walk of cobbles, edged by plantings and asphalt paths located between the Oakland Baptist Church Cemetery and the playground in the eastern half of the park. The site is currently overgrown.

Inventory of Circulation

- *Entrance at Braddock Road*
- *Parking near entrance*
- *Parking behind museum*
- *Loop road, partially follows "The Fort" community road system (with speed bumps)*
- *Traces of "The Fort" community road network, including School House Lane, portions of the loop road alignment*
- *Parking pods along circular drive*
- *Amphitheater parking*
- *Former maintenance access and parking*
- *Walk to and through Fort Ward Gate*
- *Paths and trails (from parking area to museum entrances, to restored officer's hut)*
- *Amphitheater walks with handrails*
- *Social trails*
- *Boy Scout constructed steps from North Van Dorn Street*
- *Pea gravel staging area inside restored Northwest Bastion*

Inventory of Small-scale Features

- *Park identity sign*
- *Oakland Baptist Church Cemetery headstones*
- *Five gravestones associated with the Old Grave Yard adjacent to the Oakland Baptist Church Cemetery*
- *Clara Adams gravestone*
- *Museum identity sign*
- *Kiosk near museum*
- *Picnic area information kiosks*
- *Playground equipment*
- *Virginia Civil War Trails sign*
- *Wayfinding signs (Oakland Baptist Church Cemetery, amphitheater)*
- *Traffic signs (along roadway and at exit and entrance)*
- *Wayside exhibits (two styles)*
- *Informational signs (park hours and rules at entrance)*
- *Regulatory signs for park users*
- *Benches*
- *Picnic tables*
- *Grills*
- *Trash receptacles*
- *Flagpole*
- *Bike racks*
- *Interpreted well site within Fort Ward*
- *Replica cannon*
- *Posts to demarcate dog park*
- *Dog park signage*
- *Dog waste bag dispenser*
- *Dumpster*
- *Wood posts marking the locations of speed bumps*
- *Lighting at amphitheater*
- *Light platforms at amphitheater*
- *Post and rope edging*
- *Civil War Roundtable historical marker along Braddock Road*
- *Beatley Tree marker*
- *Arborist marker*

Inventory of Vegetation

- *Ornamental tree and shrub plantings (legacy of Arboretum plantings)*
- *Rows of eastern red cedar trees that line the former School House Lane*
- *Woodland areas*
- *Lawn*
- *Meadow*
- *Barberry hedges on earthworks*
- *Mixed vegetation on earthworks*

C. Existing Conditions Management Issues

Fort Ward Park's significant cultural and natural resources have been adversely affected by ad-hoc internal decision making, lack of coordination between entities, overuse and a shortage of funds. The park's rich collection of cultural and natural resources, its importance as a recreational resource for the residents of Alexandria and its importance as a green lung for the west end present issues that must be addressed in the development of the Fort Ward Park and Museum Area Management Plan.

All areas within Fort Ward Park are not equally sensitive or fragile or in need of protection. The mapping developed as part of the planning effort outlines areas for park managers and planners to logically and defensibly identify and prioritize the site's cultural resources and the appropriate level, if any, of development and site disturbing activities that may take place within those priority areas.

An outline of issues facing the park related to park operations, management and funding and natural and cultural resources is listed below. Some potential ways to address these issues are included in the discussion. Issues related to recreation uses are included in Section II.3 and Interpretation in Section II.4. Each are addressed separately from Existing Conditions.

Issues from all the chapters are organized into a management framework that brings together all of the previously isolated discussions into a comprehensive and collaborative approach for preserving, enhancing and managing the park over time.

Operations, Management and Funding Issues

Fort Ward Park is maintained by several different entities. Building maintenance is performed by the City's General Services. Landscape management and day-to-day building maintenance responsibilities are shared by a private contractor and the City, per the current Memorandum of Understanding (MOU).

Currently, ground level maintenance such as turf management, leaf removal and pruning is performed by a private contractor under the direction of OHA and by the City's park operations. Both are fully funded by the City of Alexandria. The MOU establishes the geographic areas of responsibility and identifies tasks to be performed.

The City of Alexandria is moving towards benchmarking park maintenance practices using a national metric, measuring 1 (highest cost and level of maintenance) and 5 (lowest cost - example would be natural woodlands). Given the restrictions on

budgets, significant changes in the current maintenance practices will require additional support from City funds or from private funds and volunteers.

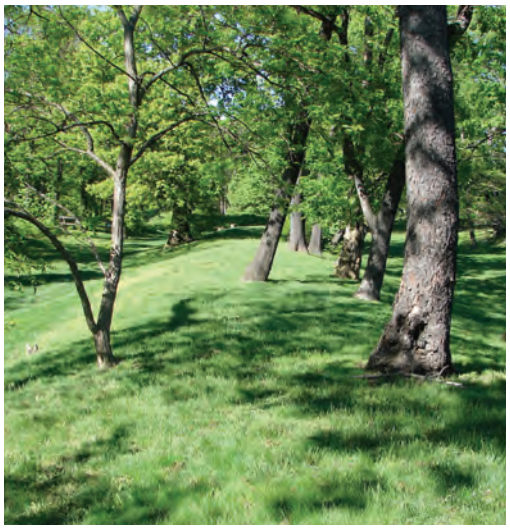


Figure 20 - Mixed vegetation on the earthworks

Issue: Park Management and Funding Considerations

- Who funds? (Parks vs. OHA oversight).
- Four City departments share responsibility for the care of the park (T&ES - stormwater; GS - buildings; Parks - grounds; OHA - programming)
- OHA oversees preservation/programming in the park
- MOU delineates a two-zone system with different entities performing landscape maintenance tasks in each zone - updates to the MOU in 2014 have expanded geographic areas for OHA oversight to include most if not all of the identified cultural resource sites
- Need to demarcate sacred areas that have been established - how could site be marked at ground level vs. vertically?
- Lack of funding - budget constraints with the City - members of FWAG believe that funding activities in the park is not a City priority

Natural Resources

Issue: Preserve and Enhance the Park's Natural Character

- Retention of shaded, smooth walking surfaces
- Preservation of quiet character of the fort area
- Determination of park's role within City's overall arboretum (not singular, but opportunity for a featured piece of the arboretum)
- Maintenance of the urban oasis for people and wildlife (e.g. owl and black squirrel)
- Enhancement of the park's appearance: park is worn, maintenance practices and investment have not been on par with Waterfront and other Old Town parks (park maintenance since 2010 has been impacted by archaeological research and concern that resources not be inadvertently disturbed during maintenance activities)
- Retention of the wooded area between dog exercise area and playground

Features Adjacent to Fort Ward

- *Portion of the original Fort Ward located across Braddock Road from the park*
- *Roads serving as potential avenues of approach guarded by Fort Ward*
- *Other forts associated with Defenses of Washington*
- *Fort neighborhood dwellings*
- *Oakland Baptist Church Cemetery*
- *10 acres of the park that includes an athletic field, parking area, and tennis courts*
- *Alexandria Heritage Trail*
- *Civil War Trails*

Issue: Define Landscape Maintenance/Cultural Practices

- Clearly define turf practices for: aeration, fertilization, over-seeding and mowing height
- Clearly define standards for stump removal - when stumps can be ground or must be flush-cut; eliminate tree cutting with two foot stump remaining
- Determine need and frequency to top dress turf and shrub beds
- Clearly define standards for debris removal (downed limbs, leaves, etc.) and debris retention (leaf litter used as mulch) and for tree removal (remove at a minimum flush to ground)
- Restrict equipment in specific areas: weed whacker (tree trunk damage), mower, 'heavy' equipment

Issue: Declining Trees

- Establish cycle for tree pruning (many trees have considerable dieback of limbs; cherries near amphitheater need pruning)
- Restart tree planting (20-30 trees lost per year with no new trees planted since 2010; Need to identify places where trees should be planted; consider reusing locations of trees that were removed over the years and identify priorities for future planting)
- Evaluate the current mix of tree species found at Fort Ward—many short-lived species (black cherry, black locust); Many trees planted as part of Arboretum effort unsuited to site characteristics and have difficulty in thriving
- Absence of master plan for new tree planting and documentation for existing memorial and historic trees
- Canopy cover goal is 40% for city as a whole—what is park's role in achieving?
- Tree inventory is over 10 years old; value is on tracking/update to determine tree failure/patterns/trends/change

Issue: Declining or Absent Shrub Plantings

- Establish cycle for shrub pruning/thinning
- Diminishment of shrub plantings (When featured in a brochure as the City Arboretum in the 1980s, the park contained massive quantities of azaleas and camellias. Many of these have died or been poorly maintained over the years.)
- When new plantings installed, ensure they receive water, etc.
- Site location - (high terrace) is exposed to cold winter winds, may be inhospitable to camellia plantings according to City staff member Rod Simmons

Issue: Declining Turf and Misunderstood Meadows

- Better incorporate 'No mow' areas into park's overall aesthetic; evaluate for stormwater management effectiveness, habitat and cost savings; make clear intentional 'no mow' areas by maintaining edges in different way - use path system to separate turf grass mowed areas and annually mowed areas and to better define boundaries (confusion with picnic table located in no mow area)
- Non-native invasive plant and weed growth in no mow areas; management practices need to address pest management or fire hazard
- Frequent (non-meadow) mowed areas are maintained by two entities that have varying levels of maintenance presenting an appearance of poor and uneven turf maintenance

Issue: Non-native Invasive Species

- Concern with non-native invasive species in existing shrub beds and no mow areas: vine growth on trees

Issue: Soil Erosion

- Vehicular traffic (mowing, trash removal, park monitoring) compacts soil
- Heavy recreation use in picnic and playground areas exacerbates loss of topsoil, soil erosion and compaction
- Parking is occurring in picnic areas and other sites off of the pavement, killing what little vegetation is in these areas,compacting soils and damaging tree roots

Issue: Stormwater

- Excessive surface water runoff - particularly on the eastern side of the park

- Stormwater sheet runoff over graves
- Area surrounding stormwater pond in northeastern corner of park requires maintenance without incurring further erosion and site damage
- Need to define what mean by 'cleaning' - tree removal, surface plant removal, etc.
- Address the lack of pervious surfaces under picnic tables, walkways, etc.
- Address the lack of maintenance for stormwater facilities; make better use of bio infiltration systems

Figure 21 - Loop road path with speed bump and eroded edge

Built Resources

Issue: Exposure or Potential Exposure of Archaeological Resources: Ground Disturbance/Depth to Resource/Soil Erosion

The bullet list below provides a sampling of resources found at Fort Ward Park and the issues related to their care, the level of protection required for the archaeological resource and treatment recommendations. A full inventory, with the level of protection required and recommended treatments, is contained in a series of Fort Ward Cultural Resources maps and an associated table prepared by OHA. They are compiled in a series of maps that are summarized in Plate 12 in Section II.8. The full table is found in Appendix II.

- Need to stabilize (noninvasive vegetation) earthworks walls of main fortification (outer battery, covered way and rifle trench) due to erosion and exposed ground surface; lack ground cover
- Need to better manage access to earthworks outside of main fortification from casual recreation use/pathways; outer battery and covered way are located in active picnic areas and rifle trench used as a walkway
- Continual sinking of past shovel pits and other archaeological units
- Determine depth to resource (example of ADA installation of walkway - no disturbance greater than 3"); will not impact significant archaeological resources within the fort
- Lack of protection or enclosure of Old Grave Yard - located on a side slope that is actively eroding
- Jackson Cemetery - lack of protection or enclosure; ivy and non-native invasive vegetation is encroaching on the stairway leading into the fort near the cemetery
- Clark Burial Area - lack of protection or enclosure; threat of damage due to soil erosion
- Clark Lot - possible cemetery area - if minimal ground disturbance is necessary, coordinate with City archaeologists to determine preservation measures
- Craven Lot - if minimal ground disturbance is necessary, coordinate with City archaeologists to determine preservation measures to ensure protection of burials
- Adams/Ruffner Lot - possible cemetery area - if minimal ground disturbance is necessary, coordinate with City archaeologists to determine

Figure 22 - Interpretive sign

Figure 23 - View toward the Fort Ward Museum

preservation measures, excavations will be conducted as needed, and changes to plans will be instituted if graves are threatened

- School/Church/Residence Lot - possible cemetery area - conduct archaeological investigation prior to construction of interpretive elements
- Monitoring of the bastion wall for slippage (earlier cause was due to insufficient integration of the two soil systems when the original earthworks served as the base for the reconstructed upper wall in the early 1960s not because of the irrigation system -irrigation system is important for retention of groundcovers on the earthworks)
- Monitoring of the bastion wall drainage system, replaced in 2003 as part of the effort to correct the fissure and re-direct water away from the walls
- Monitoring of the Northwest bastion wall to ensure no further slumping occurs (Earlier slump repaired in 2007 to correct a slope slump that occurred due to an unusually high volume of rainfall in the spring/early summer of 2006, which over-saturated that section of the earthworks).
- Invasive animal tunneling in fort walls
- Clarity of the amount of fill found in the former maintenance yard and adjacent stream bed is needed and how best to address findings

Issue: Data Still to be Determined

- Boundary determination for Adams Burial Ground, Clark Burial Ground

Issue: Vegetation/Damage to Historic Resources

- Need to establish non-invasive ground cover on earthworks, mixed success with using groundcover (vinca) to control erosion on outer wall
- Review adherence to NPS preservation standards for care of historic earthworks sites
- Mature trees, saplings and non-native invasive vegetative growth on earthworks walls may come down in storms and pull up historic soil, etc.
- Profusion of mature trees, saplings and non-native invasive plant growth on bastion walls: front wall of fort leading to southwest bastion
- Mature trees growing out of wall on rear wall between East and North bastions
- Improper mowing has adversely impacted rear wall between fort's gate and East bastion
- Conflict with tree growth and vegetation in trench
- Poor turf growth on earthworks
- Deterioration of the wooden revetment structures in the staging area at the center of the bastion

Issue: Lack of Recognition for "The Fort" Community and Burial Sites

- Need for protection and recognition of grave sites
- Identification of School House Lane/other walking paths or road traces (potential to link together to create 'We're Still Here Trail' with interpretive signs, recognition of

former site features, etc.)

Figure 24 - Shaded loop road approaching picnic area #2 and picnic shelter in background

Issue: Other Considerations

- Stormwater not retained in park for irrigation
- Use of park by birds and wildlife not documented - no survey exists
- No organized community service group or volunteers to assist with park maintenance - cleaning flower beds, planting trees, light pruning by arborists or trained Tree Stewards, litter pick up, assistance with interpretive and educational materials, update of 2002 tree inventory, etc.
- Unused/unclear role for Alexandria/Arlington Tree Stewards
- Lack of decision as to priority - spend money on another park inventory of vegetation or on planting new shrubs and trees
- Lack of established ratio for tree replacement (such as plant 3 replacement trees to every 1 lost; knowing some trees won't make it)
- Recognize that it is less expensive to care for existing trees than to remove trees and replace them with new ones
- Consider tracking vegetative patterns and the identification of vegetative communities in park
- Evaluate the opportunity to recycle wood from cut trees to portable sawmills
- Many of the site furnishings are worn, consideration should be given to durable options for signs, park tables and benches
- Make better use of printed, online and cellphone interpretation tools for education - schools, youth groups
- Evaluate need and costs to conduct annual tree risk exam for trees adjacent to picnic areas, roads and locations where people gather
- Need to identify areas with the greatest need for tree canopy increase
- Need to clarify maintenance and operations responsibilities and priorities in zone format
- There is no formal plant list for acceptable plant material selection for the park - consider identifying plants that are durable, long-lived and need minimal care with a scheduled maintenance checklist for watering, mulching and pruning; include plants attractive to native birds and wildlife
- There is no on-going program of preventative tree pruning and maintenance
- Tree and branch fall remain on the ground for long periods of time, need more prompt response to remove fallen trees and limbs
- Lack of clarity for vehicle parking areas,including how best to accommodate bus traffic and drop-offs

Figure 25 - Recreational users on the loop road

3. Recreation Resources

Fort Ward Park, in addition to its historic and cultural significance, is valued for its passive recreational uses—walking, jogging, using the playground, dog exercising, picnicking, family gathering, relaxing, sunbathing, birding, observing wildlife and learning about history and nature. The events and gatherings associated with the historical aspects of the park—the Civil War fortification and "The Fort" community—are also highly valued and are considered as part of the "recreational" experience of the park. Recreational users of the park are sometimes unaware of its historic and cultural significance.

The City of Alexandria's Department of Recreation, Parks, and Cultural Activities staff have identified and documented some of the issues and conditions of facilities within the park.[1] Separately, an assessment of six City parks for their compliance with the Americans with Disabilities Act was prepared in 2012. Entitled "*Park & Open Space Facilities Prioritization Analysis",* it was prepared by Kimley Horn and Associates. The Fort Ward Park and Museum Area Management Plan builds upon these assessments and work prepared by the Fort Ward Advisory Group (FWAG), particularly in their chapter on *Recreational Use; Issues and Recommendations*.[2]

The FWAG draft chapter on recreational use[3] recognizes the inherent challenge in successfully balancing the cultural and natural needs of the park for educational and recreational activities. An excerpt from the chapter states that "*the growing appreciation for the historic and cultural nature of this Park needs to be reflected in how Park resources and Park administration support the needs of citizens who value the Park as a site for passive recreation, relaxation and unstructured physical activity. Historic, cultural and recreational activities can mutually co-exist but reforms may be needed."*[4]

A concept diagram of existing recreational resources has been prepared and is included on the following page. Recreation areas are referenced on the map by the letters noted below. Park features included in this discussion are:

A. Amphitheater and Adjacent Restrooms
B. Dog Exercise Area
C. Picnic Shelter
D. Picnic Areas
E. Playground
F. Pedestrian Paths
G. Parking and Vehicular Access
H. Park Character and Landscape Design

1 RPCA conducted a number of informal studies of park facilities prior to the formation of the Fort Ward Advisory Group.

2 Forbes, Ripley and Robert Moir, Chapter 3, Recreational Use; Issues and Recommendations, Fort Ward Advisory Group, 2011 and 2012

3 The FWAG Chapter, updated in 2012-2013, is relatively unchanged from the original developed in 2011.

4 ibid.

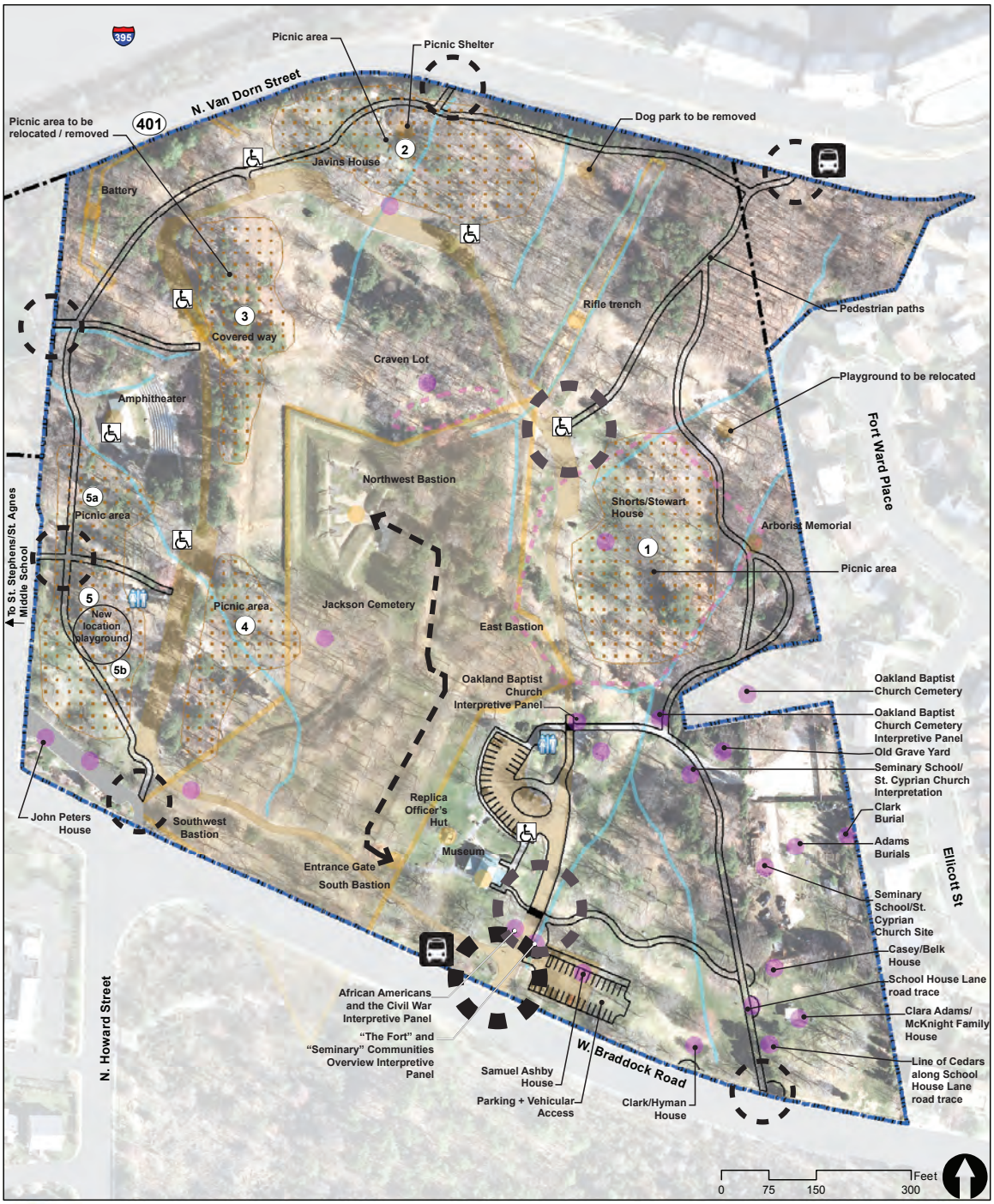


Figure 26 - Recreation Resource Map DRAFT

The adjoining and fenced-off portion of the park to the west and behind the St. Stephens and St. Agnes School includes a multi-purpose rectangular playing field and tennis courts. These active recreational uses are not included in the Fort Ward Park and Museum Area Management Plan as these uses and their management are already agreed upon and fixed.

A number of initiatives to better manage recreational use in relationship to the preservation needs of the park's resources and its neighbors have been put into effect over the past four years. These include:[5]

- Decreasing the number of reserved picnic areas
- Limiting the size and length of picnics
- Limiting the number of vehicles on the roadway during peak pedestrian use
- Relocating the City maintenance facility outside of the park
- Prohibiting amplified music other than Special Events
- Eliminating inflatable recreational attractions
- Limiting alcohol use
- Increasing informational signage (parking, avoiding sensitive areas, establishing no mow areas)

Park Regulations

The following uses are prohibited or controlled in the park as noted on the City of Alexandria web site and as posted on kiosks within the park:

- *"Camping - No person shall set up tents, shacks, trailers or any other temporary shelter for the purpose of overnight camping. Exceptions: Overnight camping may be allowed for large groups under certain conditions."*
- *"Alcohol Beverage Policy: Fort Ward is specified and designed as a park where the use of alcoholic beverages by a group of 50 or more, based within the City of Alexandria, is permitted under strict regulation and control. Only draft beer and wine will be permitted in the park areas 2,3, and 4. Beer must be in a keg and served in paper cups." [Additional permitting requirements follow, but are not included, see City web site for more information]*
- *"Dogs: Unleashing dogs or allowing dogs to urinate or defecate in the park (except in the dog exercise area near the front gate is prohibited. Dog owners are required to clean up)." [This information is now out of date, the current location of the dog exercise area is in northern portion of park.]*
- *"Fires and Grills: Fires are permitted in park grills or personal grills only. Barbecue pits for cooking on the ground are prohibited. Propane gas grills are prohibited. All fires must be extinguished and ashes placed in designated containers or left in the park grill before the area is vacated."*

A. Amphitheater and Adjacent Restrooms

Programming for the amphitheater has been reduced significantly in the past decade. Occasional concerts with historical themes comprise the current schedule. Park users, responding to the 'Listening Session' outreach effort held in the park in June, 2013, suggested that the amphitheater be more actively programmed for community events. Anecdotally, community members have stated that they miss the extensive programming that used to occur in the amphitheater. Other community members suggested that larger events unrelated to historic significance of the park were inappropriate. No one has suggested removing the amphitheater. One park user suggested that community arts organizations be encouraged to perform on site as a "thank you" to Alexandria when receiving City money and support. Another park user suggested hosting "Movie Nights" at the amphitheater. Many respondents mentioned positive memories of concerts and events they attended in years past.

Of concern is whether the amphitheater facility meets the Americans with Disabilities Act (ADA) standards for accessible design. The facility

Figure 27 - Amphitheater

5 The actions noted were updated from the 2011 FWAG Chapter based upon information provided by RPCA staff.

was included in the 2012 ADA citywide assessment. At that time, the amphitheater met guidelines with the exception that the site does not have appropriate accessible parking spaces. Contrary to many who voiced concern that the facility itself was inadequate, the study states that the facility has the required number of accessible viewing areas and that there is appropriate access to restrooms, a drinking fountain and the stage itself.

If the amphitheater is to remain in the park and if the City is to continue to invest in it, more frequent programming should result. Previous City staff assessments have recommended tying the enhancement of the amphitheater facility with an upgrade and enhancement to the adjacent year-round restrooms. Expanding the restrooms capacity and making them accessible is desirable. Immediate repairs to the existing restrooms should be made to keep them usable until alternative approaches to upgrading and expanding the restrooms can be studied in conjunction with a feasibility study of the amphitheater upgrade. In addition to topics related to restrooms, other potential topics to address include:

- Evaluation of options to improve the adjacent restrooms:
  - Adaptive re-use of existing facility
  - Demolition and reconstruction of new permanent facility
- Evaluation of the physical condition and life cycle maintenance costs for the current 360-seat amphitheater, including confirming that the amphitheater is fully compliant with the Americans with Disability Act (to confirm the citywide concept level study performed by Kimley Horn in 2012)
- Evaluation of the costs and benefits of current and potential uses and programs including but not limited to:
  - Historical interpretation including living history and performing arts
  - Performances by City of Alexandria performing arts groups and schools
  - Summer movie night series
  - Restoration of the summer concert series
- Ongoing use of the amphitheater is encouraged; following receipt of the results from the feasibility study, updated standards and operating conditions should be established.

Figure 28 - Fort Ward Park - dog watering

B. Dog Exercise Area

While there are no national standards for dog parks or dog exercise areas[6], there are many examples of such facilities in the City of Alexandria and greater Washington, D.C. metro area. Originally, the Fort Ward dog exercise area was located off of West Braddock Road. It is now located adjacent to North Van Dorn Street, a four-lane roadway not separated from the park by fencing. The current site is between a high family use area (Group Picnic Area #2 and picnic shelter) and a fragile cultural resource (rifle trench).

The existing off-leash dog exercise area appears to be little used.[7] Many dogs are walked in the park on-leash, but in visits to the park, no dogs have been observed running loose in the designated exercise area. Anecdotal reports from a walker with a dog on leash said that the current exercise area is unfenced and too close to a busy road—North Van Dorn Street. Another dog owner said that the park is one of the few places

6 Email and telephone correspondence with Bill Becker, Senior Research Manager, NRPA and Randy Burkhardt, NRPA member, March 2014

7 Based on observation and interviews with park users, June 1 and June 5, 2013

where dogs can legally run off-leash, within the designated area. There are reports that dogs are off-leash in areas outside of the designated area.

Relocating the dog exercise area to another area within the park would be very difficult. At one time, the exercise area was located to the east of the entry drive off of West Braddock Road. Having been moved once already, other alternative, suitable locations within the park do not exist that will not infringe upon historically significant areas, adjacent uses or have the same exposure to traffic. Consideration was given to modifying the existing location by adding better signage and adjusting the footprint of the exercise area away from the rifle trench. After discussion with FWAG members, the impact of the off-leash exercise area on existing cultural resources; its proximity to a four-lane and no opportunity to add fencing made keeping an off-leash dog exercise area in the park infeasible. Removal will likely require a public hearing and an assessment of the locations of nearby dog exercise areas.

C. Picnic Shelter

At one time the park had multiple picnic shelters. Today, following removal of a second shelter several years ago, there is one large shelter available for rent near the dog exercise area and adjacent to the North Van Dorn Street edge of the park. The shelter structure was assessed in 2008 and was noted to be in relatively good shape at that time.

Figure 29 - Family baby shower at the Fort Ward Park picnic shelter

Regular inspections of the shelter should continue. Modifications and improvements should include:

- Accessible parking spaces and an accessible route to the shelter from the parking space, as noted in the 2012 Accessibility Study. The accessible route should be incorporated into the proposed soft path trail network.
- The ground surface immediately adjacent to the shelter needs to be maintained so that roof runoff and compaction associated with normal use of the shelter do not create walking and trip hazards. A surface using the Flexi-pave or a well-graded stone dust material (with subgrade improvements) could be used to address accessibility and soil compaction issues around the perimeter of the shelter.

Figure 30 - Picnic table in park

D. Picnic Areas

One enthusiastic respondent to the June 2013 'Listening Session' was a park user in search of a grill. He had been to many City parks before finding Fort Ward and its numerous grills. In addition to the availability of the grills, their location near vehicle parking areas is an attractant. Other sites within the city that provide grills for public use require a long walk while toting picnic supplies and grilling gear.

The picnic areas at Fort Ward Park are also valued for their shade and for their ability to accommodate groups through the use of a reservation system. At one time, the park had 11 picnic areas, two with shelters. The park was oversubscribed, particularly on weekends and with large events. More recently, the number of designated picnic areas has been reduced to five, one with a shelter. Limitations and prohibitions on amplified music have reduced the noise volume and parking demand and bus use has diminished. However, the more intense focus and use of the five remaining sites presents challenges related to soil compaction and erosion, damage to tree roots and tree health, and the difficulty in establishing a vegetative cover. Many of the existing picnic tables are placed on individual concrete pads, minimizing issues related to soil compaction at the table; however, significant compaction is occurring between pads.

In order to achieve turf management goals outlined in the resource management section, the following should be considered:

- One additional picnic area could be created from a large existing picnic area (most likely splitting Group 5 Area into two areas) to provide an opportunity to have five fully operational group picnic areas and a sixth rotational site serving as a substitute for one of the five as they are each rested and rehabilitated. A new, sixth, area is not being added for ongoing use. Where possible, the rotational site will not be used and the portions of an existing group area will be closed for rehabilitation as needed —closing one area for a growing season or sufficient enough time to reestablish the turf.
- Shade is one of the most important assets of the picnic areas. The natural resources and best practices sections of the management plan address this issue as well as the issue of best tree planting practices within archaeological resource areas. Maintenance of the tree canopy in and around the picnic shelters should be a high priority for both the safety and comfort of park users.
- Updating the picnic area map—the historic areas marked on the picnic area map need to be updated to include the areas associated with the burial sites. This will help to increase awareness of African American heritage as well as the Civil War fortification. In addition, the picnic area map could be used to provide interpretive information about the significance of the historic areas.

E. Playground

The existing playground is used by nearby residents, families that visit the park specifically for the playground and families that are picnicking in the park. The playground is located on the eastern side of the park, adjacent to the Marlboro Estates neighborhood. It is approximately 250 feet from the asphalt loop road and parking area, down a steep slope that falls about 35 feet from the parking site. Subject to erosion and stormwater runoff

across the hillside, the drainage piping installed at the site of the playground is undersized.[8]

The equipment itself is relatively new. Although subject to weekly safety inspections by City staff, there is no recent ADA-accessibility evaluation on the equipment or playground surfacing. No accessible path connects the playground to the rest of the park features. According to the 2012 ADA Accessibility Study, there are not accessible parking spaces or a route between the parking area and the equipment that meets current ADA accessibility criteria.

Figure 31 - Shaded playground and benches in current location

8 URS Draft Presentation on Stormwater to FWAG , August 2013

Playground Site Comparison

Criteria	Existing Site	South of Dog Exercise Area	South of Amphitheater
Potential Impact to Archaeological Resources	Accessible route and expansion of ADA accessible parking space will require excavation into the subsoil	Construction of footings (below frost line) and play surface (12-24 inches) will require excavation and replacement with suitable materials; Accessible route and expansion of ADA accessible parking space will require excavation into the subsoil (but for a shorter distance than the existing site)	Construction of footings (below frost line) and play surface (12-24 inches) will require excavation and replacement with suitable materials; Accessible route and expansion of ADA accessible parking space will require excavation into the subsoil (but for a shorter distance than the existing site)
Proximity to Neighbors	Close to path that links from North Van Dorn Street and proximate to adjoining houses on east side	Close to path that links from North Van Dorn Street and proximate to adjoining houses on east side	Farther distance from adjoining residential areas
Proximity to Parking	Longer accessible route (approximately 175-200 feet)	Shorter accessible route (Approximately 100-125 feet depending upon location chosen)	Shorter accessible route (Approximately 100-125 feet depending upon location chosen)
Relationship to other users (both positive and negative)	Adjacent to existing picnic area	Adjacent to picnic area and dog park (dog park would need to be relocated); This site may also raise concerns about being too close to the Civil War fortifications	Adjacent to amphitheater, public restrooms and picnic area
Cost of Required Physical Improvements	ADA parking space (850), ADA accessible path to play ground (6000) Premium cost for equipment related to stormwater management (cost unknown)	ADA parking space (850), ADA accessible path to play ground (3000) Premium cost related to making adjustments to dog exercise area (or removing)	ADA parking space (850), ADA accessible path to play ground (3000)

No mention was made in the FWAG report regarding removal of the playground equipment from the park. FWAG members recommended that if a new site is selected to serve as the playground area, equipment should be installed prior to the removal of the current equipment.

Three options exist for the play area:

- Retain the equipment in its current location and upgrade, if needed, to meet the most current ADA accessibility standards. This site requires the addition of an ADA compliant parking space and accessible route. This option would also require installation of new stormwater runoff management practices to address the flow of surface water through and around the playground.
- Relocate or replace the playground to the site south of the existing Dog Exercise Area, just north of the loop road. This site requires the addition of an ADA compliant parking space and accessible route (although the structure could be placed closer to the parking area thereby shortening the route) between the parking area and equipment. This is near the single picnic shelter in the park.
- Relocate or replace the playground to the area south of amphitheater. This site requires the addition of an ADA compliant parking space and accessible route (although the structure could be placed closer to the parking area and thereby shortening the route) between the parking area and the equipment. This locates the equipment near an existing restroom.

Criteria for determining the most suitable location for the playground include:

- Quality of recreational experience (shady areas, grassy areas nearby, level and well drained surface).
- Potential impact to archaeological resources associated with the installation of footings to support the play structure, installation of a sub-base below the surface of the playground to support the playground surface, and modifications to the soil surface and subsurface to create an accessible route and parking space for the playground.
- Proximity to adjoining neighborhoods and future uses.
- Proximity to existing parking and length of ADA accessible route that would have to be constructed.
- Relationship to other uses—nearby picnic areas and restrooms are beneficial, but the dog park is not, unless it is removed from the park or the area.
- Avoid potential intensification of uses in only one or two area of the park.
- Avoid unintentional segregation of the east and west ends of the park when locating park activities.

F. Pedestrian Path Network

The loop road that circumnavigates the primary portion of Fort Ward partially follows a portion of a Fort community road system that pre-dates the park. As noted, it is accessed from the entrance road to the south of the museum. The loop road passes through Fort Ward as a one-way, narrow, asphalt-paved corridor, later widening as it encircles the fort to the west, north, and east, returning to the primary parking area, and later the park entrance. The road is used by both cars and pedestrians, and offers access to all of the park's recreational and historical features and activity areas. Since the road is popular for recreational walking, the park closes the road to vehicles at certain times of the day. Activity areas available to visitors include several picnic areas, a restroom facility, the amphitheater, a picnic pavilion, dog park and children's playground. A series of small parking areas or

pods edge the loop road to allow visitors to conveniently access the activity areas. Most of these park-related features were established during the initial development phase in the 1960s.

Loop Road Management and Enhancement

One of the primary ways that park visitors experience the park is traveling along the six-tenths of a mile loop road on foot or by vehicle. The loop road circles the Civil War fortification and connects many of the park's features. Always open during park hours for use as a walking path, it is closed to vehicular traffic early in the morning. The road opens later in the day for one-way vehicular access and provides access to park features and parking areas.

Figure 32 - Loop road

A sign is located at the entry where the width narrows to one-lane and priority is given to vehicles over pedestrians. Over 400 walkers were counted on a weekend day in early September 2010 walking the route[9]. The walk is valued for its shade and generally smooth walking surface, and is heavily used as a measured loop for exercisers.

Most of the road width varies from 12 to 14 feet, slightly wider than a normal traffic lane. This segment is not wide enough to provide separate lanes for vehicles and pedestrians. The entrance to the park is wider, accommodating two-way traffic. Between the park's entrance on West Braddock Road and the museum parking lot, the road width is approximately 22-24 feet. Shared use between pedestrians of all shapes, abilities and ages, and motor vehicles using the park road is an ongoing challenge. Speed humps have been installed along the loop road, but while these slow the speed of vehicles, they do not meet current standards for accessible routes and are challenging to navigate for some users.

Sharing the pavement between pedestrians and vehicles and limiting the number of cars that can enter the park at any one time (based upon parking availability) continues to be the best way to manage the shared use. However, changing the sign to encourage vehicles to look out for pedestrians rather than the current version that encourage pedestrians to look out for vehicles would help to clarify that the pedestrian use is the primary use of the loop road, and that vehicular use is secondary. Vehicles will still be permitted on the loop road during appropriate hours. Vehicular access is useful for group gatherings at the picnic areas for and improved accessibility of the park and its resources. Parking near the picnic

9 FWAG, 2011, Chapter 3

areas and amphitheater on the loop road will remain, but needs to be improved to increase its adherence with accessibility standards.

The following enhancements to the shared loop road are recommended:
In the short term, consideration should be given to convert the speed humps to "speed cushions" providing the minimum gap width to meet accessibility guidelines.

- Introducing a sharp curve right at the point where the park road changes from two-way to one way would also keep drivers from accelerating along that stretch of roadway (see Plate 25, Section II.8).
- At the time of resurfacing the park road, consider modifications to the shoulder using a reinforced turf shoulder (subsoil being composed of 50% topsoil and 50% gravel mix) that will also support greater pedestrian use along the edge of the road and the occasional vehicle that runs off the road.
- Roadside drainage should be addressed by improving the infiltration rates of areas that receive roadside runoff. In addition, where runoff rates exceed the soil moisture holding capacity of a turf area, runoff should be directed to specially designed infiltration areas. As this requires trenching and replacement of soil, it can only be done in areas that have been surveyed for archaeological potential and where such potential has been ruled out.

Pedestrian Paths - Soft Path Trail Network

An additional soft path trail network was proposed by the Fort Ward Ad Hoc Committee report.[10] The soft path would serve to supplement the paved loop road by formalizing and linking existing informal trail segments together with new segments, developed with interpretive sites in mind.

The proposed pedestrian path "soft path trail network" needs to support multiple functions including historical interpretation, natural resource interpretation, exercise, connectivity and safety. The trail network, as proposed, would circulate around the perimeter of the park with connection points to major destination and orientation points. Formalizing a park entrance,

10 Forbes, Ripley and Robert Moir. Recreational Use; Issues and Recommendations, page 3. Received May 2013.

Trail Surfacing Types Comparisons

Trail Type	Surface Type	Cleared Width	Cleared Height	Tread Width
Wooded Section	Natural soil, leaf mold or wood chips from park maintenance	10'	8'	6'
Open Grass or Meadow	Mowed turf	10'	NA	NA
Interpretive Trail Portions	Well-graded surface of stone dust or permeable pavement material such as flexi-pave	12'	8'	8-10'

or entrances, from North Van Dorn Street, the linkage will benefit the preservation of the rifle trench by providing an alternate entry route other than the top of the parapet. The surface of the trail will vary depending upon location: a natural soil or mulch surface in the less traveled portions of the wooded areas; mowed grass for connecting trail routes where interpretation is desirable or where cut through traffic is likely; stone dust as the primary surface material and flexi-pave or other similar permeable paving solution in the most heavily trafficked areas and associated with interpretive installations.

The table 'Trail Surfacing Types Comparison' chart summarizes the design criteria that should be utilized for building the trail network over time.

The Universal Trail Assessment Process (UTAP) is a system for train management. It is a recommended process to encourage more comprehensive monitoring of trail conditions. The UTAP is used by many federal agencies to monitor and prioritize maintenance activities and report on conditions of the trails for park users. While typically applied to larger areas, the UTAP process can be adapted to an urban park and conducted by volunteers.

The UTAP process records the accessibility data for the trail including:

- Trail length
- Maximum and average cross slopes
- Maximum and average running slopes
- Surface type and firmness
- Minimum clear width
- Average tread width

The primary maintenance information recorded about a trail includes:

- Tread condition
- Obstacle locations and magnitude
- Vegetation within the trail corridor
- Condition of drainage structures
- Presence of downed trees
- Washed out sections of the trail
- Condition of signage and related trail amenities

By recording conditions on a regular maintenance and operations cycle within the City of Alexandria's park maintenance staff, a prioritized list of maintenance needs can be established and monitored on a seasonal basis.

G. Parking and Vehicular Access

A total of 152 on-site parking spaces are provided at the park. There are two gravel surfaced parking lots near the entrance to the park, and a series of asphalt paved, angled pull-off parking areas along the loop road. For the most part, these spaces are adequate

Figure 33 - Parking area near park entrance

for the current and anticipated use in the park. The main lot, approximately 24 spaces,[11] adjacent to Braddock Road requires that visitors cross the park entrance road to visit the museum and fort or restrooms. The current configuration of the split rail fencing around the lot pushes the pedestrian to cross close to West Braddock Road, where vehicle driver distraction is most likely. The lot to the north of the museum accommodates approximately 33 parking spaces. Additional parking is available outside of school hours at the St. Stephen's and St. Agnes Middle School campus next door and the parking lot adjacent to the athletic fields in the lower section of the park.

Programming has an effect on parking. The City employs several different strategies to address the parking demand associated with large events—closure of one travel lane on West Braddock Road to be used for parking or a shuttle that connects off-site parking with the park. Such parking arrangements are typically associated with event programming tied to the fort or museum. Recreational use can also increase the demand for parking. The amphitheater, for example has 360 seats. To meet on-site parking demand for an amphitheater production, all parking spaces in the park could be consumed by amphitheater attendees. Similarly, on summer weekends when all picnic areas are in use, pressure is placed on the on-site parking. Fortunately, many of the everyday users of the park walk to the site and do not need parking to make use of the park and its resources.

Group events and access present another challenge. The current configuration for school and tour bus drop-off and parking is awkward. Museum staff have raised concerns and requested that alternatives be examined. Buses currently drop off riders behind the museum in the gravel lot. The lot is served by a single access point, so the bus must turn around within the lot or block the access to the lot while loading and unloading.

11 Kimley-Horn and Associates, Inc. *Park & Open Space Facilities Prioritization Analysis*, April 2012.

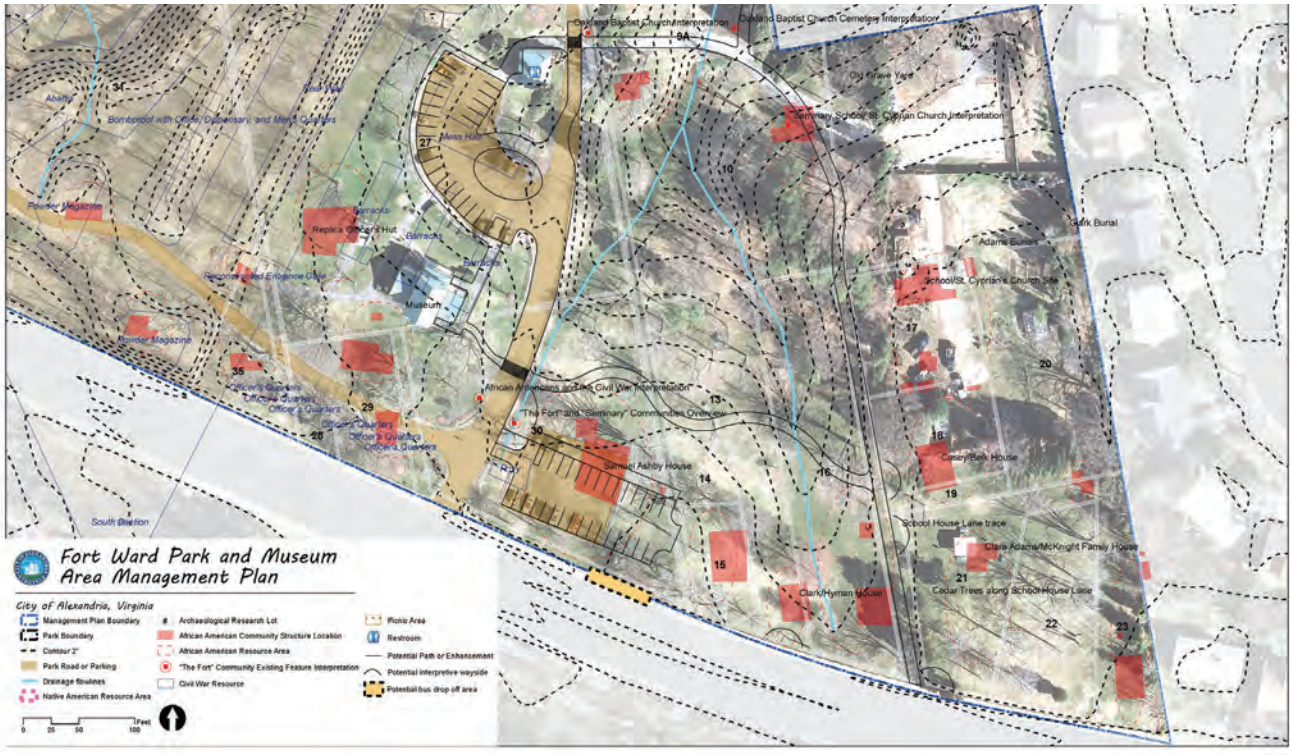


Figure 34 - Concept Diagram Enlargement

The Concept Diagram Enlargement, Figure 36, illustrates one approach that would create a loop drive so that buses (WB-40 type) can circulate through the lot, drop off passengers and return to West Braddock Road.
There are a number of issues that have been identified that need to be addressed in both the short-term and the long-term related to parking and access.

Potential ways to address these issues include:

- Narrow the main parking lot, as it is over 70' wide. The lot could be narrowed to 62' wide, with the addition of a central island or reduced in overall width. The area removed from the current parking configuration could be transformed into an accessible walkway route on the northern edge of the lot, connecting to an orientation area (as recommended in the interpretive discussion in Section II.4). An ADA accessible parking space should be located in this lot as recommended in the Kimley-Horn report. Contrary to the report's recommendation, consideration should be given to locating it on the northwest side of the lot, close to the proposed orientation area.
- Designate and mark a crosswalk on the northern side of the parking area, relocating the existing access road crossing further from the park entrance off of West Braddock Road. This would give greater pedestrian visibility to oncoming drivers and provide the driver more time to react and slow down.
- Accommodate school group/bus and other large vehicle access and parking by re-configuring the gravel parking lot behind the museum as a "U" shaped lot, allowing enough room for school busses (WB-40) and other large vehicles to turn within the lot. Approximately eight to ten spaces would be affected by the new school bus configuration. The spaces could relocated to the main parking area as shown in Figure 34, or marked off during anticipated school bus site visits.
- An alternative to the U-shaped configuration would be to construct a bus pullout on Braddock Road as shown in Figure 34. Space is available for one bus. The City's Department of Transportation and Environmental Services briefly evaluated the feasibility of this option, estimating that cost for curb and gutter and pavement alone would be approximately $25,000. Estimated costs for stormwater treatment, relocation of the sidewalk and other soft costs were not generated. It is unclear if the park's status as a National Register site would affect this option. Under this scenario, buses would have to find an alternative parking location once passengers have been dropped off.
- Replace Loop Road speed humps and change the existing sign to give the right-of-way to pedestrians rather than vehicles.

Figure 35 - Before sketch of potential modifications to the parking area behind the museum to better accommodate school buses

Figure 36 - After sketch of potential modifications

Figure 37 - Sketch illustrating potential marking and interpretation of Ashby House and new orientation area as a part of the re-configured West Braddock Road parking area

- Develop a pedestrian path trail network.
- Provide better access between the athletic fields and the park by installing another opening in the fence as shown on the path network diagram. Currently the only connection is located in the school parking lot, further to the south. Having a second opening in the field side would enhance personal safety by removing a potential "trap" in the northeast corner of the fenced field and provide access to the restrooms on the south side of the amphitheater.
- Provide for additional parking. The current parking configuration is suitable for events in the amphitheater. Any additional parking should be developed either as a drivable grass surface (such as turf block, or similar), or as permeable pavers. The parking area can be narrowed to recapture space on the north side of the lot used for a walkway and interpretation of the Ashby House as part of the overall orientation area for the park.
- Shared parking in nearby lots may also be considered for events. The adjacent middle school spaces are already being shared with the use of the adjacent athletic fields and during other events. Other potential lots, such as at Minnie Howard School, are approximately a 1/2 mile away. Sites greater than 1/2 mile away may require a shuttle system.
- There is no formal bicycle parking area or structures provided in the park, although the park is used by cyclists and is located on city and regional bike trails.

H. Park Character and Landscape Design

There are several landscape architectural design strategies that should be implemented to reinforce the desired enhancements to park facilities. Several of these strategies involve protection of the Civil War fortification, and these are discussed in the resource management section (protection of the rifle trench, for example). Others address utilizing landscape elements associated with "The Fort" community to help set the context for interpreting the lives of the families that lived there or to help mark the burial sites nearby; these are discussed in the interpretive section.

- **Main entrance** - establish an identifiable landscape character (use shade trees and hedges or hedgerows to define circulation).
- **West Braddock Road** - bring the park and its interpretation out to West Braddock Road and make West Braddock Road "part of the park" by establishing a double row of street trees at the edge of the park to create an opening and orientation point for visitors at the historical location of School House Lane.
- **Secondary entrances** - create a welcoming appearance and improve safety at the North Van Dorn entrances.
- **Parking areas** - consider reshaping both primary parking lots to achieve more efficient use of gravel surfaces. For the long term, consider an alternative type of permeable paving system.
- **Loop road** - maintain a shaded route for recreational use by planting new shade trees on both sides of the road. Vary the landscape design and species selection to reflect the adjoining uses—more formal in the entrance areas, at orientation points where trails intersect with the loop road and grassy open areas, and more informal in the existing wooded areas.
- **Renovating Special Areas** - consider restoring the legacy of the azalea gardens and the City Arborist's Memorial. Renovation of the azalea beds will require careful management to gradually reshape the azaleas, coupled with the use of various soil amendments and mulches to achieve the proper pH and soil drainage to achieve optimal growth. Similarly, the Arborist's Memorial will require special attention and an inventory of the condition of the original landscape design. Work can begin by pruning out and removing dead materials, amending the soil to achieve proper pH and drainage, and weeding and mulching the beds on a regular basis to revitalize the desired and original plants. In both cases, where trees from the original planting have died, they should be replaced in kind, or with an appropriate substitute if the plant is either no longer available, susceptible to disease or considered to be non-native invasive.
- **Landscape** - use predominately native plant materials to enhance the park and for screening structures such as transformers or parking areas.

4. Interpretive Framework

Fort Ward Park is a complex site with many layers of history–each with their own set of known facts and their own set of meanings to a wide and diverse audience. The role of interpretation is to help the diverse audience to better appreciate and experience the meanings that can be derived from information and facts. Through storytelling, interpretation at Fort Ward Park can embrace the site's rich and layered history in a way that touches audiences and connects to the broader themes and stories of the city and region.

The purpose of this portion of the report is to compile the background information that provides the context for developing interpretive goals and an interpretive framework for telling the multi-layered stories of Fort Ward Park and its environs. Four fundamental questions set the stage for the development of an interpretive framework for the park:

- Geography: To what extent is interpretation limited to within boundaries of the park itself? The archaeological studies focus on what evidence can be found and pieced together by examining the site. For the museum, the setting of Fort Ward within the larger city and regional context is critical to telling the many-layered stories. To the descendants group, the geography is viewed in terms of community and family relationships as well as land ownership.

- Timeframe: When does story to be told at Fort Ward story begin and end? The museum focuses upon the Civil War period, 1860-1870. The descendent group focuses primarily upon the establishment of "The Fort" community to the present. Is it important to place the Fort Ward story in a broader context of both time and place?

- Themes: What subjects can and should be covered in interpretation? Defenses of Washington? Alexandria's Civil War history? Building African American community after the Civil War? Urban renewal and suburbanization? Centennial? Segregation and desegregation? Slavery to freedom?

- Implementation: Who will tell these stories? How does one coordinate storytelling so the presentation is seamless? Which of the stories should be told at Fort Ward Park and which should be told elsewhere? If told elsewhere, how does the interpretation tie in to the other places to make sure the stories are complete and whole?

A. Existing Interpretation

The discussion of existing conditions within the interpretive component of the Fort Ward Park and Museum Area Management Plan provides general background information to set the context for discussion of interpretation at the site. It briefly outlines the regional

context, reviews existing interpretive programming at the site, and highlights issues and opportunities that have been identified through discussions with stakeholders.

Fort Ward Park was established by the City of Alexandria in the early 1960s at the time of the Civil War Centennial to preserve the remaining Civil War earthworks existing there and to interpret the fort. The park's early establishment featured reconstruction of Fort Ward's historic gate, restoration of the fort's Northwest Bastion and construction of period appropriate buildings to serve as a visitor center and visitor facilities.

Soon after the park's establishment, the role of the visitor center transformed into that of a museum, which became known as the Fort Ward Museum and Historic Site in 1982. Over the years, the museum has developed into a unique, high quality facility with an outstanding collection of Civil War artifacts, a research library and educational and interpretive programming. Fort Ward Museum has become a model small museum and it is the regional leader in interpretation of the Civil War Defenses of Washington.

In recent years, the history and significance of the post-Civil War evolution of the Fort Ward site has been brought to light, focusing upon the African American families that built homes and created a community there. Largely through the leadership of descendents of these families, the stories of the community, known as "The Fort," are being explored and beginning to be told in the context of Alexandria's overall history. Remaining historic features related to the community including grave sites have been identified and are being archaeologically investigated, researched and preserved.

Figure 38 - Brick pier from Shorts House. Photo courtesy of Office of Historic Alexandria.

Today through the work of many stakeholders, those interested in the complete history of the Fort Ward site are discussing how best to preserve and commemorate remaining resources and tell the layered stories associated with the site in a way that engages the public and presents a full picture of the site's significance. A recent study of Fort Ward Park by a Stakeholders Advisory Group provided background and developed recommendations for the future management of the park, including interpretation (Ad Hoc Stakeholders Advisory Group 2012).

The purpose of the interpretive component of the Fort Ward Park and Museum Management Plan is to further that discussion in consultation with stakeholders by outlining a comprehensive interpretive strategy for the site for the guidance of future initiatives.

Regional Context for Interpretation

Three regional topics set the context for interpretation of history at Fort Ward Park, the overall story of the Defenses of Washington which includes the construction of the fort; the experience of African Americans in Alexandria which is exemplified by the community at "The Fort," and the historical development of the City of Alexandria with which the fort is directly associated.

The establishment and evolution of Fort Ward Park within the City of Alexandria is also part of the potential context for interpretation.

The Defenses of Washington

At the beginning of the Civil War, the national capital of Washington was largely unprotected and extremely vulnerable to attack by hostile forces. Located at the southern edge of what remained of the Union, Washington was surrounded by rival forces, the Confederate state of Virginia to the west and the neutral but slave-owning state of Maryland on the north, east and south. Over the course of the war, an extensive network of defensive works was constructed to defend and protect the city making Washington the most heavily fortified city in the nation (National Park Service 2010; Cooling and Owen 2010: xi).

Figure 39 - View from Stout's Farm, Virginia, Showing "The Seminary," Fort Ward, etc. Oct. 1861. (from Volume 1, 1861 April 12–1862 May 5 Figure 40A Guide to the Robert Knox Sneden Diary Volume 1, 1861 April 12–1862 May 5. Collection Number Mss5:1 Sn237:1 v. 1)

Washington's defensive works were continually developed and improved over the course of the war, advancing the science and construction of earthworks fortifications in response to the threat from ever improving and destructive armaments. By the war's end, the defensive works included 68 forts, 20 miles of rifle pits, 32 miles of military roads, and 93 detached batteries (National Park Service 2010).

After the war, most of the fortifications were dismantled and abandoned. Some properties reverted to former owners and were sold, modified, re-graded, and used for other purposes. Washington and its suburbs expanded, and once isolated fortification sites were overwhelmed by twentieth century urban and suburban development. Nonetheless, a fair number of remnants of the defensive works remain, and some have been preserved as public open space.

Today, Washington's Civil War story and the story of the Defenses of Washington in particular are an unfulfilled opportunity. The limited number of earthworks remnants throughout the region, in general, are highly compromised in terms of historical integrity, condition, and ability to tell their Civil War story.

North of and along the Potomac River, the National Park Service is steward to the largest number of remaining earthworks, including 22 historic fort sites. Originally acquired as part of a 1902 initiative to create a greenbelt and Circle Forts Drive, these sites are distributed between three separate park management units (Rock Creek Park, National Capital Parks – East, and George Washington Memorial Parkway) with many competing needs and interests and little capability to coordinate a coherent presentation.

While the significance of the Civil War sites is well recognized, and an organizational concept has been defined under a 2004 Circle Forts Parks Management Plan, meaningful interpretation has only been implemented at a few locations and the concept of a coordinated circle forts interpretive presentation remains unfulfilled. A 2010 Civil War Defenses of Washington Hiking and Biking Trail brochure is the most recent contribution in presenting the circle forts to the broader public.

South of the Potomac River, most of the remaining earthworks associated with the Defenses of Washington are in the custody of local governments or are privately owned.

The City of Alexandria, Arlington County, and Fairfax County each own and manage significant historic fort sites, but with the exception of Fort Ward, little interpretation has been undertaken and in some cases, sites have been compromised or left unacknowledged. Interpretive wayside exhibits have been recently installed at Fort Ethan Allen in Arlington with the assistance of Fort Ward Museum staff and could provide a model for exterior exhibits at Fort Ward.

Regardless of the site, the extensive change to the landscape throughout the region since the Civil War through urban and suburban growth, strikingly conveyed by period photographs, makes the Defenses of Washington story hard to visualize and present. Nonetheless, the opportunity to convey this story remains if the defensive remnants can be preserved and an organizational capacity can be developed with the creativity and resources to implement the vision. A small private organization, the Alliance for the Civil War Defenses of Washington, was formed a few years ago and potentially could serve as the genesis for a new regional preservation and interpretive initiative.

The African American Experience

Over the past fifty years, since the public prominence of the Civil Rights Movement, the African American experience in this country has received increased study and interest. Through three centuries of slavery and another century of repression under Jim Crow, African American individuals and families have persevered in forging their identity, shaping their communities, and simply surviving. Today that struggle is beginning to be recognized as an achievement of immense proportions and a new dimension of the American story and spirit that we share.

Figure 41 - City of Alexandria staff installed the six interpretive panels now part of the Alexandria Heritage Trail. Photo courtesy of Office of Historic Alexandria

Within a larger national context, the story of Alexandria's African American community is a current focus of examination, discussion, and emerging recognition. Inequities related to that story are not old and are directly related to the establishment of Fort Ward Park, the T.C. Williams High School, and other events of the recent past and present.

The City of Alexandria's interpretive program, implemented primarily through the Office of Historic Alexandria, is committed to expression of cultural diversity. The African American story is being researched and told. City initiatives include:

- The Alexandria Black History Museum, a facility of the Office of Historic Alexandria, was originally a segregated library constructed in 1940 for African Americans and is devoted to stimulating appreciation of the diversity of the African American experience. Its permanent exhibit focuses upon the local African American community and documents how area African Americans survived slavery and helped shape today's city. The museum features the first Alexandria African American history book, *African Americans in Alexandria, Virginia: Beacons of Light in the Twentieth Century*.
- The African American Heritage Park is a 7.6-acre green space that includes a one-acre, 19th century African American cemetery. The park offers a place for celebration, commemoration and quiet reflection.
- As a result of mitigation measures associated with construction of the Woodrow Wilson bridge, the City of Alexandria is constructing the Contrabands and Freedman Cemetery Memorial on the site of the historic Alexandria Freedmen's Cemetery. Between 1864 and 1869, the cemetery served as the burial place

for approximately 1,800 African Americans who fled to Alexandria to escape from bondage during the Civil War. The cemetery had been desecrated through construction of a gas station and office building in the mid-20th century. Memory of the site faded until 1987 when historians rediscovered documents indicating its location and listing names of the individuals buried there. Since then, the site has been the subject of historical and archaeological investigation. More than 600 burial locations have been identified. The dedication ceremony for the Contrabands and Freedmen Cemetery is scheduled for September 2014.

- The Alexandria Heritage Trail and Alexandria Civil War Defenses of Washington Bike Trail link African American historic sites within the overall context of the city's history. The City also administers an African American Historic Sites self-guided tour with a brochure that includes Fort Ward.
- The success of the Fort Ward History Work Group, archaeological investigations, installation of wayside exhibits at Fort Ward Park, and continuing research into "The Fort" community is an ongoing progress in the understanding and appreciation of the African American community at Fort Ward and the overall African American experience within Alexandria (Ad Hoc Stakeholders Advisory Group 2011:12-18).

B. Existing On-site Interpretive Programming

The Fort Ward Museum and Historic Site has developed a reputation as a focused, high quality small museum telling the stories of Fort Ward, the Defenses of Washington and Alexandria during the Civil War. The museum's highly developed programming, including exhibits, tours, living history, educational outreach to schools, publications, events, lectures and research, is a model for a small community museum with limited staff and resources. Recently, the Fort Ward Park's programming has been enhanced through the installation of wayside exhibits related to "The Fort" community.

Figure 42 - Civil War Days at Fort Ward Park, June 2013

Fort Ward Museum and Historic Site

Located within Fort Ward Park, the Fort Ward Museum and Historic Site is a City of Alexandria agency, one of seven small museums operated under the City's Office of Historic Alexandria. The museum has been accredited by the American Alliance of Museums since 1987.

The Fort Ward Museum and Historic Site's mission is to provide visitors with a meaningful educational experience related to the American Civil War within the time frame of 1860 to 1870 by interpreting

- Fort Ward as a military site
- The Civil War Defenses of Washington
- Wartime Alexandria
- Experiences of Alexandrians during the Union occupation of the city (Fort Ward Museum and Historic Site 2008: 2)

Museum Facilities

The Fort Ward Museum was opened in 1964 and is housed in a period reconstruction of the headquarters building at Fort Sumner, which was located north of the Potomac River in suburban Maryland. Originally intended as the park's visitor center, the building has

now served as a museum for almost fifty years. It is open to the public Tuesday through Saturday, 10 AM to 5 PM and on Sundays noon to 5 PM.

The museum building features exhibit space, museum shop, rest rooms and support space on the first floor; the Dorothy C.S. Starr Research Library on the second floor; and collections, office space, kitchen, and mechanical rooms in the basement. The building is older and often unmonitored in the evenings and on holidays.

A unique structure, the existing building is not adequate for its purpose, and the museum has outgrown the available space. The entrance to the museum is not inviting; it is difficult to know if the building is even open. The museum's first floor has limited floor space for exhibits and is not capable of flexible arrangements. The research library on the second floor is not accessible by elevator and cannot be easily used for public lectures and meetings. The basement, which houses the museum's valuable collections as well as office space, is not suitable for those purposes.

Figure 43 - Officers at headquarters. U.S. National Archives' Local Identifier: 111-B-247; From: Series: Mathew Brady Photographs of Civil War-Era Personalities and Scenes, (Record Group 111) Officers identified from group photo in front of quarters at Fort Ward 1863. Unidentified black adolescent sitting on steps by the men - Harwood, Hemingway, Rockwood, Gillette. Samuel Proal Hatfield Civil War Photograph Album, Special Collections & Archives, Wesleyan University, Middletown, CT, USA.

Adjacent to the museum building are two other period reconstructions that were designed from Civil War photographs of buildings that existed as part of the Defenses of Washington. None of the museum's three reconstructed buildings replicate structures that actually existed at Fort Ward, though historic photographs of the fort show buildings of similar character and location.

The replica Officer's Hut located adjacent to the museum is used for interpretation and living history presentations. The rest room structure located across the parking lot from the museum is a reconstruction of the headquarters building of the second Camp Convalescent in Arlington (Cooling and Owen 2010: 40).

Historic Site

The historic features that the museum interprets include the extensive remnant earthworks of Fort Ward; the rifle trench extending through the park northward from the fort; the remains of the outlying gun battery and its associated features located northwest of the fort; and the overall location and topography of the site.

The restoration/reconstruction of the Northwest Bastion of the fort is a powerful feature of the site's interpretation and has five replica artillery pieces. In the original 1960s reconstruction, the artillery pieces had woven gabions around them as well.

The reconstructed Ceremonial Entrance Gate is an iconic feature by which Fort Ward is known and promoted and serves as the entrance to the fort's self-guided walking tour. A replica well structure is interpreted within the fort, though its precise historic location is not known.

The grounds of the historic fort have not changed substantially since the museum's opening in 1964. Existing waysides that are part of the self-guided walking tour inside the fort were introduced in the 1980s, though some of the currently existing waysides are replacements.

Wooden walkways provide access over the ramparts of the fort at several locations. A new ADA compliant walkway is being constructed from the gate to and within the Northwest

Bastion. The walkway will have a rubberized surface with a texture chosen to resemble the compacted gravel that appears in historic photographs of some Washington era forts, replacing the loose pea gravel currently in the Bastion.

Collections

Among the Fort Ward Museum's most significant holdings is its extensive collection of Civil War artifacts that provide the core of many of its exhibits. The museum has a collection of over 4,000 objects related to the Civil War that is housed in state-of-the-art climate controlled storage cabinets located in its basement. The museum selectively acquires historic artifacts of the 1860-1870 period related to the history of the American Civil War, the Defenses of Washington and Fort Ward, and the City of Alexandria. Emphasis is placed on objects of Union provenance to better interpret the historic site.

The scope of the collection ranges from objects of general Civil War historical value that are used to interpret army life in the Defenses of Washington, to objects of local significance. Major categories of the permanent collection include arms and equipment related to the artillery, infantry, cavalry and navy; uniforms and clothing accessories; artwork, rare documents and photographs; medical instruments; mess equipment; and musical instruments (Fort Ward Museum and Historic Site 2008: 3).

Figure 44 - Fort Ward Museum exhibit portraying the Defenses of Washington

Staffing

The Fort Ward Museum and Historic Site has two full time staff members, a Director and an Assistant Director/Curator. A half-time Museum Technician provides valuable assistance, and a goal of the museum, reflected in the Office of Historic Alexandria's Five Year Plan, is to make the Museum Technician a full time position. A handful of part-time staff assist in managing the museum when it is open, especially on weekends.

The Friends of Fort Ward provides important support for the museum including consultation, advocacy, volunteers and funding for small projects. The Friends sponsor popular bus tours to other Civil War sites in the Mid-Atlantic region for members and the general public.

Programming

Over its fifty-year life, the Fort Ward Museum has developed a wide range of educational and interpretive programming. Key audiences include specialized history and military organizations. In recent years, as available staff and funding resources have diminished, the museum has increasingly had to focus upon its core set of programming initiatives. In fulfilling its mission to the public, the Fort Ward Museum

- Preserves and interprets the historic fort through informative signs, brochures, maps, and tours
- Collects, preserves, and interprets historic artifacts relating to the Defenses of Washington and the Civil War in general
- Distributes an interactive classroom learning kit which complies with the Virginia Department of Education's Standards of Learning and presents other programs that address all age levels
- Mounts exhibitions, presents lectures and tours, and offers living history programs for the general public and specialized audiences

- Maintains the Dorothy C.S. Starr Research Library as a center for the study of the American Civil War with emphasis on the Defenses of Washington
- Offers a web site with in-depth educational information about Fort Ward to the Internet community
- Makes available site brochures printed in French, German and Spanish
- Complies with the ADA, providing brochures printed in Braille and large print formats, as well as a closed caption video (Fort Ward Museum and Historic Site 2008: 2)

The museum's interior exhibits are a core element of its presentation. Its exhibits include an introduction to the regional story of the Defenses of Washington as well as an orientation exhibit of Fort Ward's history and restoration with a model of the fort. A 12-minute video entitled *Fort Ward and the Defenses of Washington: Silent Guardians of the Capital City* may be viewed on the main exhibit floor.

Long-term exhibits support local Civil War themes such as army life in the Defenses of Washington and Alexandria as a major hospital center for the Union army. Permanent exhibits include *The Common Soldier,* displaying objects illustrating the daily life of the common soldier; *The Art of the Artilleryman*, showing the tools and techniques used by artillery in the fort; and *Medical Care for the Civil War Soldier w*ith a broad selection of medical tools, equipment and images illustrating treatment practices of the time. Brochures support the exhibits' presentations (Fort Ward Museum and Historic Site 2013).

A printed walking tour, the historic earthworks, wayside exhibits, and the reconstructed Northwest Bastion provide a self-guided presentation of the site. Exterior interpretive content is, however, limited. Guided tours are offered by arrangement and during special events.

The museum conducts at least five major events each year with living history demonstrations providing a close look at the daily life of a Civil War soldier. Events include Recruiting Day in February, Civil War Fort Day in June, the week-long Civil War Kids Camp in June, Civil War Artillery Day in October and Christmas in Camp in December. Additional special events feature guided tours, talks, musical programs, and smaller interpretive programs to fill out the calendar.

The Fort Ward Museum's educational programming features award winning educational kits called *Life During the Civil War* that may be borrowed by teachers for use in class. Designed for elementary through high school grades, the kits address Virginia's Standards of Learning and contain a selection of materials and objects to be explored by students in visual, tactile and audio form.

A Teacher's Guide Notebook contains lessons and exercises to be selected by the teacher for use in the classroom on themes such as the common soldier; photography during the Civil War; civilian response to military occupation; music during the war; and the role of women and African American soldiers. The different sections of the program feature exercises, games, suggested reading lists and follow-up activities (Fort Ward Museum and Historic Site 2013).

"The Fort" – The African American Community at Fort Ward

The African American history of Fort Ward site has recently been the subject of considerable discussion and investigation due largely to the efforts of the non-profit Fort

Ward and Seminary African American Descendents Society, which has been active in promoting recognition of the significance of the site. Their efforts and those of the Office of Historic Alexandria-sponsored Fort Ward History Work Group have led to important research findings on the history of the African American community that lived at "The Fort" until creation of Fort Ward Park in the early 1960s (Ad Hoc Stakeholders Advisory Group 2011: 13-14).

Archaeological investigations have been undertaken to identify the locations of historic features such as building foundations related to the community. The archaeological investigations have identified the locations of multiple graves that were known to be present. Additional grave sites may exist and additional investigations are required.

Remaining topographic and vegetative resources within Fort Ward Park associated with the physical layout of the community have been identified and are being preserved. Alexandria Archaeology initiated an oral history program in collaboration with the descendents that has recorded the stories of individuals and families. An archival history of the site has been prepared by Krystyn R. Moon, Ph.D. for the Office of Historic Alexandria and is currently under review.

Through a series of generous grants a series of six interpretive waysides have been installed at locations throughout Fort Ward Park interpreting "The Fort" and its residents. A companion brochure includes a trail map of the waysides, provides context, and builds upon the interpretive content presented on site. Living history interpreters of the African American stories are involved in Fort Ward Museum events, and the museum is exploring ways in which exhibits on "The Fort" and Alexandria's African American Civil War experience may be incorporated into its interior and exterior presentations. Fort Ward's African American stories are connected to other African American sites in Alexandria through the Alexandria Heritage Trail and its guidebook and brochures.

C. The City of Alexandria's Interpretive Resources

The City of Alexandria is a national model as a community that has had the foresight and ability to create a history and museum system staffed with archeologists, researchers, curators, educators and archivists. Alexandria's identity is grounded in its historic character, and the city's residents and government have invested in historic resources in a meaningful way.

Office of Historic Alexandria

The Office of Historic Alexandria (OHA) is the comprehensive public history agency for the City of Alexandria and manages the City's museum system. Established in 1982, its administrative office is located in the historic Lloyd House in downtown Alexandria. In addition to its administrative group, the agency is comprised of eight management units, including Alexandria Archaeology, Archives and Records Management, and seven small museums

- Alexandria Archaeology Museum (part of Alexandria Archaeology)
- Alexandria Black History Museum
- Fort Ward Museum and Historic Site
- Friendship Firehouse
- Gadsby's Tavern Museum
- The Lyceum
- Stabler-Leadbeater Apothecary Museum

The Office of Historic Alexandria was accredited as a museum system in 2012 by the American Alliance of Museums, the highest national recognition achievable by an American museum. It is only one of eight municipal organizations across the country accredited for their museum systems (Office of Historic Alexandria 2013). Its museums operate independently and provide educational and interpretive programming based upon the themes to which they relate through exhibits, school programming, public programming, and special events.

In addition to its public history programming, the Office of Historic Alexandria develops and promotes heritage tourism initiatives, assists other City departments with inter-departmental planning and review, and provides staff support to public commissions and advisory groups including the Alexandria Archaeological Commission, Alexandria Historical Restoration and Preservation Commission, Historic Alexandria Resources Commission, Public Records Advisory Commission and Fort Ward Ad Hoc Park and Museum Area Stakeholder Advisory Group.

The Office of Historic Alexandria's mission, vision and educational philosophy state

- ***OHA Departmental Mission Statement*** *- The Office of Historic Alexandria (OHA) enhances the quality of life for city residents and visitors by preserving and interpreting Alexandria's historic properties, archaeological sites, cultural resources, artifact collections, objects, archives, records, and personal stories, and by encouraging audiences to appreciate Alexandria's diverse historic heritage and its place within the broader context of American history.*
- ***OHA Departmental Vision Statement*** *- to be the leader in authentic, engaging, and imaginative history learning experiences for all who live in or visit the City of Alexandria, Virginia.*
- ***OHA Education Philosophy Statement -*** *OHA's departments of education work to integrate research, discovery, public outreach, and educational opportunities. Education and outreach include hands-on experience, tours, role playing, and school programs, using specific and appropriate primary resources. The intent is to engage citizens, students, and visitors of all ages in the adventure that is American history* (Office of Historic Alexandria 2012: 10).

OHA is facing the challenge of reduced budgets that impact its citywide operations as well as individual museums. Budget reductions are expected to continue in future years given limited revenues and competing City priorities. The agency is exploring pursuit of private funding sources as an alternative but has limited staff capability for the scope of development activities that are necessary.

Nonetheless, Historic Alexandria's Five Year Strategic Plan outlines goals and objectives that include maintaining the high quality of interpretive programming and service to the community. The plan cites objectives related to celebrating diversity, expanding partnerships, marketing, use of new technologies, research, and maintaining a high-quality professional staff.

With respect to research, the plan highlights the success of the Fort Ward History Work Group as a creative approach to research of the African American community that occupied the Fort Ward site while also engaging a broader community discussion.

With respect to interpretation, the plan notes a special focus on the American Civil War for its sesquicentennial, recognizing that the war poses issues that may be controversial and

uncomfortable from the different perspectives of residents and visitors and that need to be addressed carefully so that all viewpoints are represented. The plan states that the City's interpretation will highlight the social significance of the Civil War, rather than focusing on military heroes and strategy, to help promote a greater understanding of the causes, impacts, and ultimate resolution of the conflict (Office of Historic Alexandria 2012: 25).

The Strategic Plan also commits to

- Identifying exhibit and event objectives at each museum site so that an engaging and active public program can be achieved
- Developing programs geared to particular audiences and the needs of residents and visitors to Alexandria
- Maintaining its role in interpretive signage and other public amenities associated with history, that are erected throughout the city
- Continuing to maintain its ongoing commitment to interpretive activities at the Fort Ward site, "The Fort," associated with the African American settlement that developed in the post-Civil War period

Alexandria Heritage Trail

The City of Alexandria has created a 23-mile Alexandria Heritage Trail through which residents and visitors can explore the city and learn about its history and historic sites. The trail is a portion of the larger Potomac Heritage National Scenic Trail. The Heritage Trail is divided into thirteen segments of individual trails and off-trail detours, each exploring a specific area of the city and the resources associated with it.

The Alexandria Heritage Trail is described in an 80 page illustrated guidebook written by Pamela Cressey, the former City Archaeologist. While the book is out of print, plans call for putting it on the web. The guidebook describes 110 historic sites along the trail and wayside signs, brochures and mobile 'apps' help to convey supporting interpretation of many of the sites. The installation of additional wayside exhibits at sites is an ongoing City initiative.

Fort Ward Park is identified as a location along the segment called the Preservation Trail, which follows Braddock Road. The park presentation features the historic fort and wayside exhibits associated with the African American community that lived there.

Alexandria Civil War Defenses of Washington Bike Trail

Associated with the Alexandria Heritage Trail and the regional Civil War Defenses of Washington Trail, the Alexandria Civil War Defenses of Washington Bike Trail identifies a biking route linking Alexandria's primary Civil War interpretive sites. Opened in 2011, the trail stops include

- Fort Ward
- Fort Worth
- Fort Ellsworth
- Alexandria National Cemetery
- Alexandria Contrabands and Freedmen's Cemetery
- Battery Rogers

Figure 45 - Bicyclist stops at Fort Ward to look at Alexandria Heritage Trail interpretive panel as part of a ride along the Civil War Defenses of Washington Bike Trail

A Civil War Alexandria iPhone 'app' provides mobile information about Civil War sites within the region.

D. Strengths, Weaknesses, Threats and Opportunities

Strengths related to interpretation at Fort Ward Park include

- Fort Ward has an impressive layered history with interesting stories related to Alexandria and the region
- The City has made a significant investment over many years in the preservation, research, and interpretation of local history and historic sites
- The City has developed a structured interpretive framework through which to tell its citywide stories and to link site interpretation citywide
- A series of significant interpretive programs and vehicles (such as the museum system, Alexandria Heritage Trail, etc.) are in place to build upon
- Fort Ward Park has high visitation with the opportunity to reach out to new and expanded public audiences
- The historic fort is an important historic resource and offers an impressive physical interpretive presence
- Fort Ward Museum maintains a high quality of programming and professional standards
- Remaining physical and archaeological resources can be used to tell the story of "The Fort" community
- There is considerable interest in telling stories reflecting the theme "We're Still Here", as part of the African American history of the Fort Ward Park and nearby Seminary community areas
- Stakeholders have demonstrated commitment to the site and its stories

Weaknesses related to interpretation at Fort Ward Park include

- Limited financial resources from the City and other sources
- Lack of a coordinated regional initiative in presenting the Civil War Defenses of Washington
- The Fort Ward Museum staff and volunteers are working at or beyond capacity in maintaining the current level of programming
- Limited tangible and visible resources remain from the African American community era, making it a challenge to interpret
- Difficulty of representing and coordinating multiple stories physically and thematically within a limited physical area
- Segmented audiences–park users do not often interact with historic interpretation

Threats related to interpretation at Fort Ward Park include

- Preservation of gravesites
- Divergent visions, perspectives, and processes of stakeholders at the site and citywide
- Reduction in funding for Fort Ward
- Loss or deterioration of historic resources
- Lack of appreciation among the general public

Opportunities related to interpretation at Fort Ward Park include

- Outdoor interpretation has not been fully developed at the park beyond traditional interpretive panels; it could be greatly enhanced
- The landscape of Fort Ward Park, including the remnants of "The Fort" community, has the potential to engage current users in creative ways
- Linking natural and historic interpretation
- Expanding audiences

- Continuing to be a leader in museum interpretation
- Programs aimed at next generation users

E. Interpretive Concept for Fort Ward Park

The rich and layered history of Fort Ward Park provides the opportunity to touch audiences through storytelling and interpretation. The interpretive concept for the park outlined below builds upon the recommendations of the Fort Ward Advisory Group (FWAG) draft chapters–each of which identify preservation, interpretation and education as important parts of their recommendations.

As noted in the FWAG chapter report on "African American Structures and Other Resources", a substantial amount of information has been developed over the last 20 years that, as a whole, helps to provide an understanding of the lives of the families who occupied the fort. Much of this new information, as it is further examined, can be the basis for telling the complete story from the defenses of Washington through reconstruction to the Jim Crow era and beyond.

Similarly, the importance of the ongoing efforts to preserve the Civil War fortification, as described in the FWAG chapter report on Civil War Resources, can be further amplified and emphasized by linking that piece of the story to the broader story of its aftermath. Extending the interpretation of Fort Ward beyond the museum walls–for example introducing the story of the Defense of Washington outdoors–helps to introduce the complete story to the widest range of audiences that are using the park for both recreational and educational purposes.

With the limitations of space and staffing identified in the FWAG Draft Chapter on "Cultural Resources–The Museum, its Collections and Programs"–the idea of extending the interpretation outdoors and using the park's historic landscapes and remaining historic features to help tell the complete story must be a critical component of any future interpretive and educational efforts.

Figure 46 - Fort Ward Museum director Susan Cumbey working with student historians. Photo courtesy of Office of Historic Alexandria

The idea of an interpreted trail–a soft path that loops around the park–is a common recommendation that is found in several of the FWAG chapters and discussed at many of the FWAG meetings. The interpreted trail can be a primary tool for achieving the interpretive goals for the park. It can provide an orientation and introduction, providing context for its establishment in the defense of Washington and its role in the establishment of an African American community that mirrors such community building elsewhere in the region and the country.

Goals for Interpretation

Primary goals for the interpretative presentation at Fort Ward Park include:

- Interpretive Goal 1: Increase and broaden the audience in support of the park's preservation and enhancement by providing a high quality interpretive and educational experience.
- Interpretive Goal 2: Strengthen community identity by using the stories at Fort Ward to stimulate community conversation, dialogue, and understanding.

- Interpretive Goal 3: Increase awareness of the site's national and regional significance by linking themes related to the Defense of Washington with the establishment and building of an African American community.

Interpretive Concept

Interpretation at Fort Ward Park uses the specific historic landscape and stories associated with the site and its remaining historic features to engage audiences in broader themes associated with the American experience. The park situates its unique stories within a national and regional context and links to Alexandria's citywide interpretive structure both physically and thematically.

Within the context of the Office of Historic Alexandria's interpretive structure, theme topics most appropriate for presentation at Fort Ward Park include the following.

Primary Theme

- Civil War to Civil Rights – A Century of Change at Fort Ward

Secondary Themes

- Fort Ward and the American Civil War 1860-1870
  - The Civil War Defenses of Washington
  - Wartime Alexandria
  - Fort Ward as a Military Site
  - The Experiences of Alexandrians during Union Occupation
- "The Fort"–The African American Experience, Reconstruction through Civil Rights
  - Triumph over Adversity
  - Strength in Community
  - Strength in Family
  - We're Still Here

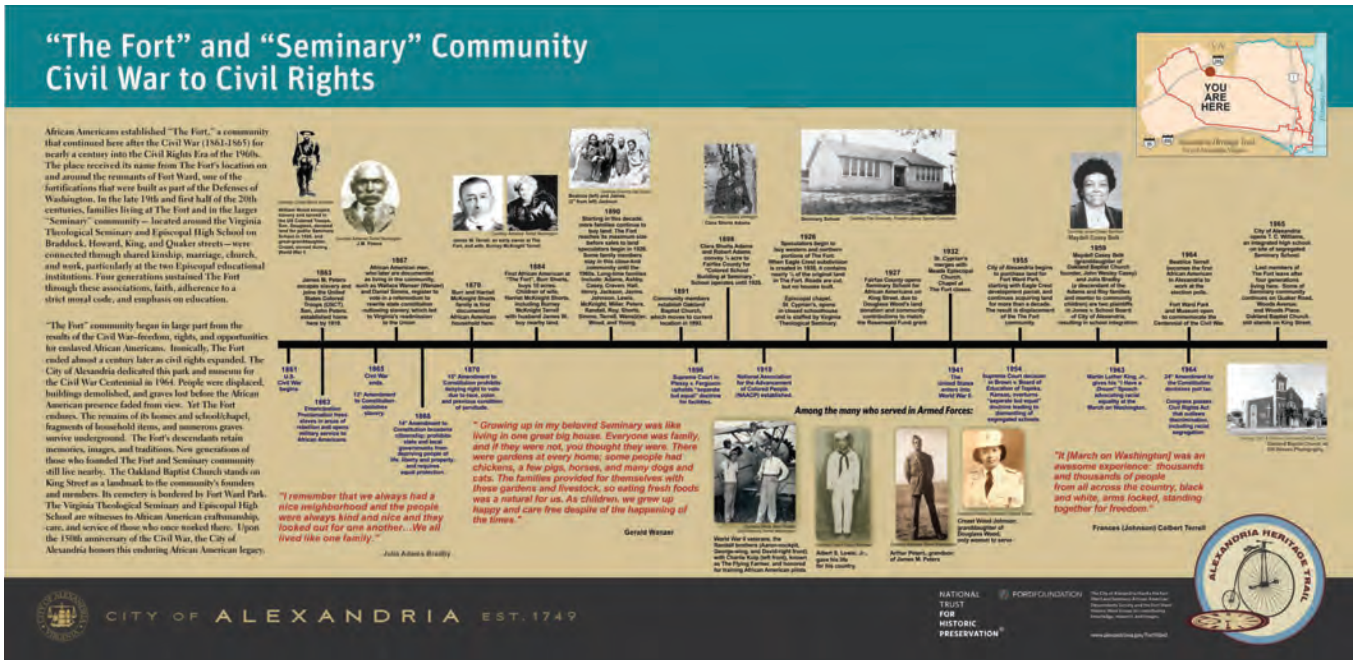


Figure 47 - "Civil War to Civil Rights" timeline interpreted as part of the Alexandria Heritage Trail at Fort Ward Park

Supporting Context

- Before the fort (geology, natural history, landscape history)
- Fort Ward Park Today (social history, nearby nature, refuge)

Interpretive Elements

The interpretive presentation will be organized using existing park resources supported by additional enhancements and landscape management protocols and techniques. The presentation will feature a coordinated indoor and outdoor experience with the following components.

- Provide a single central location for outdoor orientation to inform visitors about the layout and scope of the presentation, opportunities to explore, interpretive context, and to introduce interpretive themes and storylines.
- Small, one-panel, orientation exhibits should also be installed at secondary entrances along North Van Dorn Street, and at the southwest corner of the site.
- Create a self-guided outdoor interpretive experience that encourages exploration, can be entered at any point, and can be experienced in any order.
- Use historic landscape features and carefully designed landscape enhancements to tell selected stories that illustrate desired themes. Any new landscape enhancements should be appropriate to the character of the historic site and consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties.
- Link interpretive locations using existing and new walking trails that provide connections and options for exploring the park and its resources. Use interpretive locations to engage recreational visitors using the walking trails.
- With respect to interpretation of Fort Ward and the American Civil War 1860-1870, the remnant earthworks of Fort Ward and the overall topography of the site are the principal landscape features to be used in storytelling. Manage the features and surrounding landscape to support storytelling and suggest historic conditions. The restored northwest bastion, reconstructed entrance gate and reconstructed officers' quarters are landscape enhancements that evoke the character of the site and help tell the story.
  - On the interior of the Fort Ward earthworks, feature interpretation associated with Fort Ward as a Military Site.
  - On the exterior of the Fort Ward earthworks, including the vicinity of the battery, covered way, and rifle trench, feature interpretation connecting the military site to the larger landscape, geography and Civil War Defenses of Washington.
- With respect to interpretation of "The Fort"–The African American Experience, Reconstruction through Civil Rights, use remnant landscape features, the locations of archaeological features and appropriate new landscape enhancements to evoke conditions and convey themes through stories associated with the site.
  - Focus interpretation primarily upon the School House Lane corridor from Braddock Road to the Oakland Baptist Cemetery.
  - Use former home locations to interpret appropriate themes through stories associated with the families of those homes.
  - Use the School House site and the Clara Adams gravesite as the principal destination and interpretive focus.
  - Use the cemetery and graveyards as special places for appropriate recognition, commemoration, and contemplation.
  - Feature locations beyond the School House Lane corridor to include 'The Fort' community story throughout the park.

- Mark the foundation of the Ashby House in the parking area adjacent to West Braddock Road.

- Use the Fort Ward Museum to provide detailed, in-depth interpretation and programming of the larger themes related to the Defenses of Washington, Wartime Alexandria, and 'The Fort' community using the museum's collections.
  - Expand the museum to provide a place for interior visitor orientation and information, space for educational programming, accessibility, additional visitor services, and upgraded collection facilities.
  - Continue to offer events and public programming in support of the site's themes and storylines.
- Tie interpretation to other related sites within Alexandria and the region. Work on the Civil War and African American tours of Alexandria by enhancing interpretation at other sites featured on the tours and connecting the interpretation at all sites to citywide interpretive themes and storylines.
  - Celebrate the 150th anniversary of "The Fort" community.

Theme Statements

Fort Ward Park was founded to preserve, rebuild and interpret the earthworks and their role in the Defenses of Washington during the Civil War. The current museum exhibits are heavily focused on the Civil War. The themes presented in this document are intended to extend the rich story already preserved and interpreted at Fort Ward Park and Museum, not to diminish it. They, of course, can be modified and improved during the development of the actual interpretive plan.

Figure 48 - Archaeological work in Fort Ward Park has uncovered Civil War era artifacts such as this belt buckle (top) and more recent artifacts from the Ashby House (bottom). Photos courtesy of Office of Historic Alexandria

The following theme statements should provide guidance to interpretive installations to be implemented at Fort Ward Park. Stories to be told and interpretive content to be prepared should be related to and illustrative of the themes outlined below and to additional subthemes to be developed regarding them.

Primary Theme

Civil War to Civil Rights – A Century of Change at Fort Ward

Fort Ward is a unique site where compelling stories of the American experience may be told. The primary theme incorporates the larger stories that are directly related to slavery, the struggle for freedom and the contributions of former slaves as soldiers during the Civil War. The primary theme incorporates the stories of the refugees that settled at Fort Ward after the war who were part of a vanguard of first generation blacks in the United States to live freely; experience the right to own property; provide education for their children; work; enjoy the fruits of ones labor; form fraternal organizations; pursue their religious faith and vote. The primary theme incorporates the ability to reach out to other similar communities—as this story is not unique to the Oakland/Seminary community—to compare and contrast similar stories that occurred in other black communities immediately after the Civil War.[1]

1 Adapted from Dave Cavenaugh, personal correspondence to Glenn Eugster, November 24, 2014, Fort Ward Observer web site

Secondary Theme 1

Fort Ward And the American Civil War 1860-1870

Fort Ward is a physical manifestation of the nation's extraordinary effort to keep the nation united and expand the freedom of its people.

1A. The Civil War Defenses of Washington

Fort Ward was a key strategic link in a chain of fortifications for defense of the nation's capital. Today, it is the best preserved of the 'circle forts' and is uniquely positioned to tell the story of Washington's defense.

1B. Wartime Alexandria

As an occupied city, Alexandria experienced extreme social and economic disruption during the Civil War. The city's port served as a logistical center for Union forces. Contributing to the upheaval, large numbers of 'contraband'–former slaves–arrived seeking protection.

1C. Fort Ward as a Military Site

Fort Ward was positioned on a hilltop to defend the strategic Leesburg and Alexandria Turnpike, a primary route into the city. Adapted to the terrain, the fort was part of an interconnected system for the defense of Alexandria and the nation's capital. Its original construction and later adaptation demonstrated advances in military planning and technology.

1D. The Experiences of Alexandrians during Union Occupation

Overwhelmed by the influx of strangers, Alexandrians responded differently to occupation according to their situation–resistance, resolution, adaptation, acceptance–and some with realization of their new-found freedom. All faced struggle, uncertainty and change.

Secondary Theme 2

"The Fort" - The African American Experience, Reconstruction through Civil Rights

In Fort Ward's post Civil War era, continuing struggles to realize the fruits of freedom are evident through the stories of community, family, faith and personal endeavor.

2A. Triumph over Adversity

Over generations, residents of "The Fort" established themselves as a productive and loving community in the face of great difficulties. Despite hardship, they are representative of the nation's transition from slavery to productive residents starting from scratch and building a new reality out of available opportunities over time.

2B. Strength in Community

Residents of "The Fort" worked together to realize and strengthen the best aspects of community for their own betterment–education, faith, economic opportunity and mutual support–characteristic of American life.

2C. Strength in Family

Family was the most important ingredient in the evolution and stability of "The Fort" community. Through successive generations, mothers and fathers, brothers and sisters, aunts and uncles lived together, shared experiences and supported each other.

2D. "We're Still Here"

Today, "The Fort" community survives and is a strong, vital presence within the city. Stories of "The Fort" inform and inspire those who hear them. Descendants of "The Fort" are active participants in community life.

F. Design of Interpretative Installations

Guidelines and recommendations for design of the outdoor interpretive exhibits and landscape enhancements to be installed at various locations within Fort Ward Park are presented below. In addition, specific topics are suggested for each installation that should be addressed in conveying the site's interpretive themes. Interpretation of the site should convey the sense that this is one story with one primary over-arching theme, *Civil War to Civil Rights*. Secondary themes and subthemes should be consistent and follow a general set of proposed guiding principles that follow this section with respect to authenticity, accuracy, quality, context and other attributes.

Most of the proposed outdoor interpretive locations at Fort Ward Park are sites where historic features remain and use those historic features for interpretation. With respect to the historic earthworks, the features are for the most part visible and can be appreciated by visitors without additional landscape enhancement. Non-extant features such as former buildings, construction details, and vistas can be conveyed through graphics and other means.

With respect to "The Fort" community, most of the remaining historic features are below-ground archaeological features such as former home sites and unmarked graves. These sites require landscape enhancements to visually convey their presence. The interpretive design process, therefore, involves not only interpretive exhibits but landscape design elements that can be evocative and creative in nature. Public art may also be used. Suggestions for each site are provided below, but the design process should be used

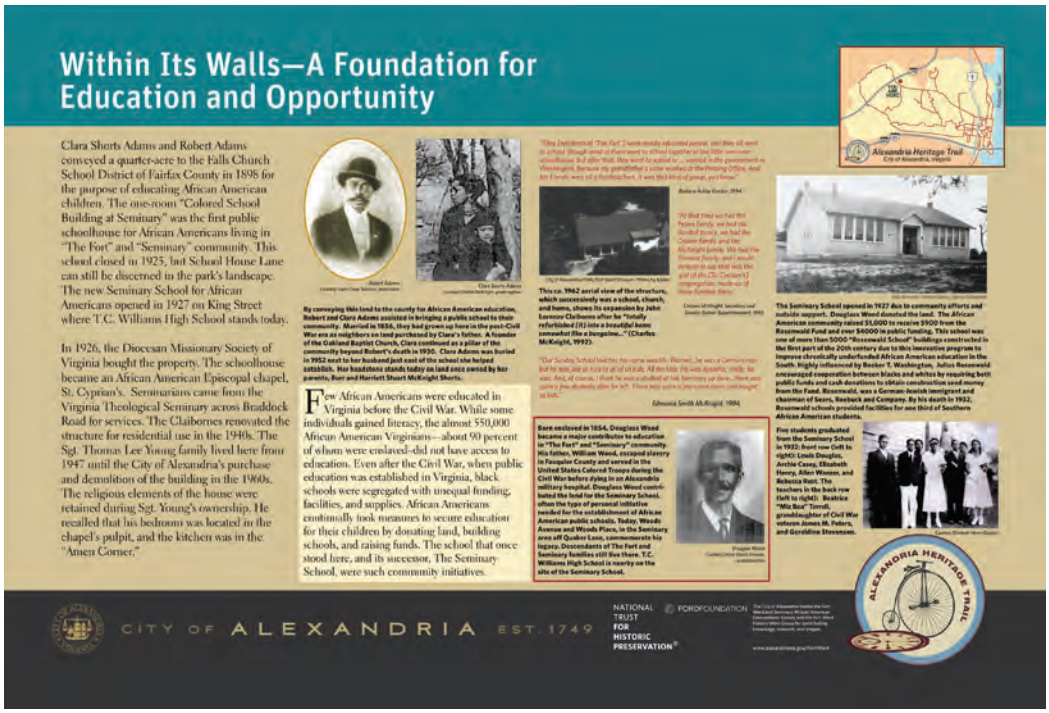


Figure 49 - Graphic style and layout of recently installed interpretive panels

to explore ideas for creative and appropriate solutions. Landscape installations used for interpretation should be consistent with these recommendations.

The interpretive design process should be led by Office of Historic Alexandria (OHA) staff, including the staff of the Fort Ward Museum, in close collaboration with the Fort Ward Advisory Group and stakeholders. The Fort Ward and Seminary African American Descendants Society and specific families should be intimately involved in the interpretation of "The Fort" community. The Oakland Baptist Church should be involved in interpretation of the Oakland Baptist Church Cemetery. The Department of Recreation, Parks, and Cultural Activities should manage the design and installation of landscape enhancements in association with OHA and stakeholders. The services of professional consultants should be used for coordinated design of interpretive landscape enhancements.

Exhibit carriers, formats, graphics, printed materials and electronic formats should be consistent with citywide standards used for interpretation by OHA in order to strengthen connections between Fort Ward Park and other city interpretive sites. This should not, however, limit consideration of creative new ideas that might be appropriate for Fort Ward or for adaptation of OHA standards.

The following guidelines and recommendations are suggested for locations within Fort Ward Park. They should be further developed and enriched during the design process and may be modified and revised as appropriate as work proceeds and additional ideas are considered.

Figure 50 - Example of highly interactive "on-the-ground" exhibit on the Mississippi River in Memphis illustrates a technique that could be used to interpret the Defenses of Washington

Orientation Exhibit

The orientation exhibit for the outdoor interpretive presentation should be sited at a central location visible from the primary entrance drive to the park and safely accessible from the primary parking areas. It should be sited in such a way as to be the first place that visitors would see as they enter the primary entrance to the park.

The orientation exhibit will include a plan of the park showing the locations of trails and interpretive sites and presenting how the park may be explored by visitors. Interpretively, the orientation exhibit should provide an overview and context for the park's themes and stories as well as conveying the significance of the site's resources. The exhibit should feature the primary theme, *Civil War to Civil Rights,* and relate how secondary themes are derived from it. The small orientation exhibits installed at secondary entrances to the site should briefly summarize the content of the main exhibit.

It is recommended that the orientation exhibit feature a series of three long, low exhibit carriers similar to OHA standard carriers but longer horizontally–six to seven feet each–to provide a substantial area for exhibit content and illustrations. The carriers could be curved. It is suggested that two artist renderings be used to illustrate birds-eye views of (1) Fort Ward during the Civil War and (2) "The Fort" community during the early twentieth century. The color renderings should be detailed, high quality, and as accurate as possible and should convey the character of the landscape during these two periods. Details of the illustrations may be used for interpretive exhibits elsewhere within the park as well as in supporting interpretive materials.

Figure 51 - The School House site and current interpretive panel "Within These Walls"

The exhibit carriers should be positioned along the perimeter of a paved area where visitors can gather. People viewing the Fort Ward exhibit should face west toward the earthworks. People viewing the "The Fort" community exhibit should face east toward School House Lane. The third exhibit with the park plan and supporting context should face north into the park.

Landscape enhancements should be provided in the paved area, including benches and waste receptacle, and appropriate canopy trees and ground level vegetation should be planted to provide spatial context. The self-guided interpretive trail, discussed below and in other portions of this report, should pass through the paved area and provide access to other interpretive locations.

The orientation exhibit should address the following topics:

Fort Ward During the American Civil War 1860-1870

- Overview of the Civil War Defenses of Washington
- Overview of the Defenses of Alexandria
  - Economic and strategic significance of Alexandria
  - Geography of Alexandria – topography, roads, locations selected for defense
  - The interconnected nature of the various defensive works
  - The military role of Fort Ward
- Introduction to Fort Ward
  - The original fort and its reconstruction
  - Exterior support structures and logistics
  - Personal stories of those who served
  - Abandonment and auction at the War's end

"The Fort" community The African American Experience in America, Reconstruction through Civil Rights

- Introduction to the Civil War experience of African Americans in Alexandria (adaptation of the existing wayside exhibit African Americans and the Civil War – Fleeing, Fighting, and Working for Freedom may be used here.)
  - National context in the struggle to gain social, economic, and political freedom
  - The Civil War experience of African Americans in Alexandria
  - "The Fort" community as representative of African American communities established following the war
  - Relate to other African American communities within the city
- The role of the Virginia Theological Seminary with respect to "The Fort" community
  - Depict the physical proximity of the Seminary to Fort Ward
  - Economic, social, and religious interdependence over generations

- Introduction to "The Fort" community cultural landscape
  - Organization and layout of the landscape
  - Family domains over time
- Introduction to the themes Strength of Community and Strength of Family
  - Institutions created to support the community
  - Family relationships over generations

Interpretive Trail Network

A self-guided interpretive trail network is proposed as the primary means through which the site will be explored and interpretive exhibits offered. The trail will connect the African American heritage sites associated with "The Fort" community with the Fort Ward earthworks and landscape, providing an enjoyable, shaded walking experience on a relatively soft path (e.g. mowed grass, wood chips, stone dust, etc.).

The trail is organized as a loop around the perimeter of the park. Along the trail are side paths connecting to interpreted resources and elements associated with the themes and subthemes noted above. The primary interpretive elements of the trail, described as you enter the park in a counter clockwise direction, include the following.

"We're Still Here" Trail

A portion of the trail network on the eastern side of the park in the vicinity of the highest concentration of remaining historic features associated with "The Fort" community is designated as the "We're Still Here" Trail. The Fort Ward and Seminary African American Descendants Society and specific families should be intimately involved in the interpretation of "The Fort" community. The trail has three primary sections.

"The Fort" community – School House Lane

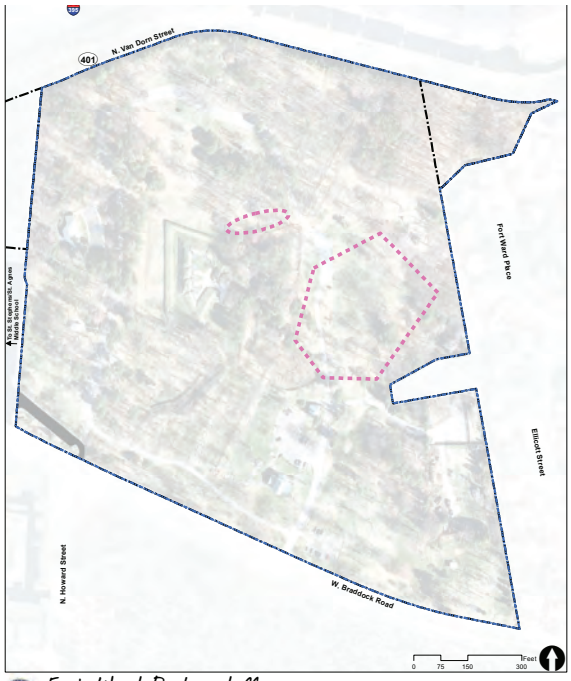
Interpretation along the School House Lane road trace should focus upon the themes *Strength of Community* and *Strength of Family*. The existing wayside exhibit *"The Fort" and "Seminary" Community – From Civil War to Civil Rights* may be featured in association with School House Lane.

Landscape enhancements at the location of each home site of the families living on the lane should delineate the outline of the home; provide photographs of the home, yard and residents (if available); and use the personal stories of the families and family members to illustrate topics associated with the themes. School House Lane, property lines, and other cultural features identifiable through historic photographs and research should be delineated in the landscape.

Figure 52 - Marking foundations at ground level

Historical research related to "The Fort" community is being completed and interpretation should be developed at each home site along with the oral histories and additional information provided by former residents and family members. The families associated with each home site should be engaged in the interpretive design process.

Through discussion, key points related to interpretation of the themes of *Strength of Community and Strength of Family* should be identified. Stories associated with the families and home sites that could be used to present those key points should then be identified.

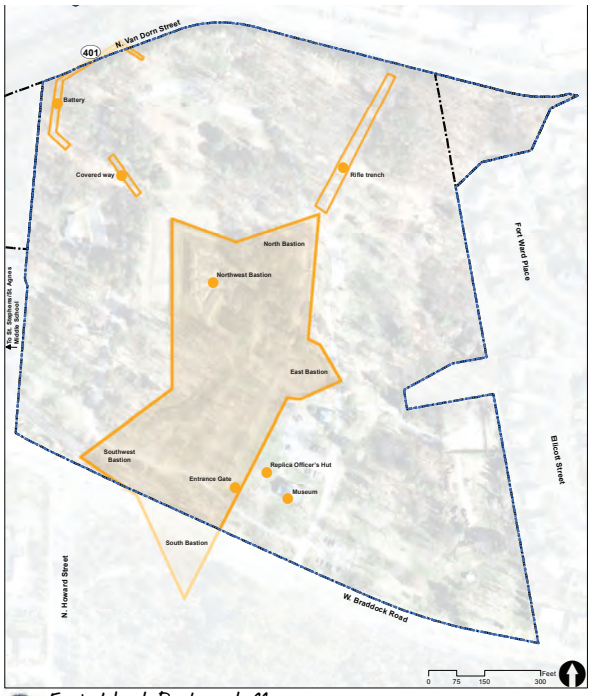


Fort Ward Park and Museum Area Management Plan

City of Alexandria, Virginia

Management Plan Boundary
Park Parcel
Native American Resource Area

Native American Resource Areas

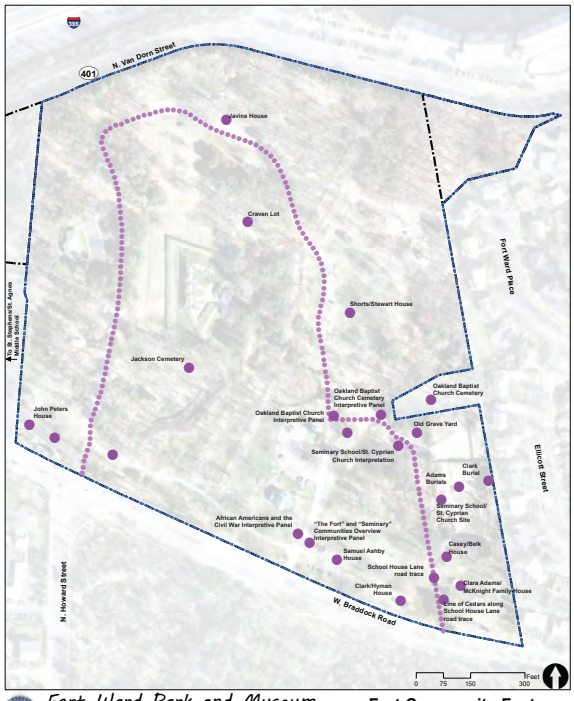


Fort Ward Park and Museum Area Management Plan

City of Alexandria, Virginia

Management Plan Boundary
Park Parcel
Civil WarFeatures
Fort earthworks and interior features
Exterior Fort earthworks

Civil War Features

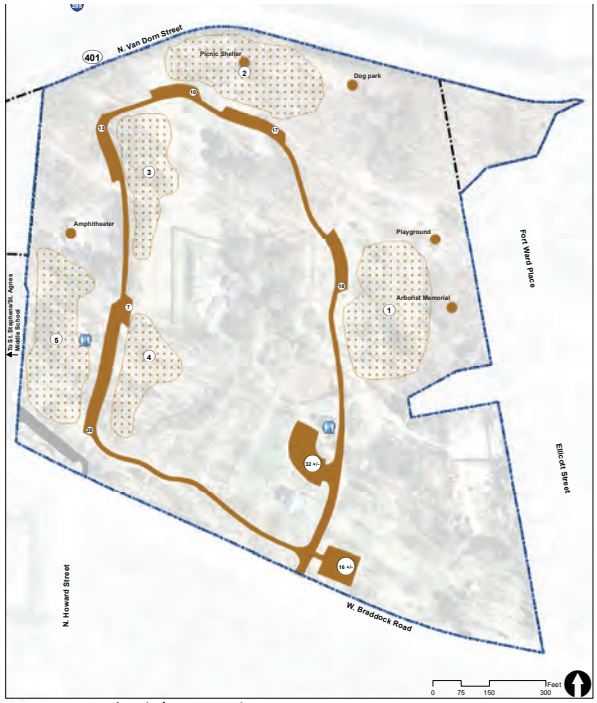


Fort Ward Park and Museum Area Management Plan

City of Alexandria, Virginia

Management Plan Boundary
Park Parcel
The Fort Community Features
"The Fort" Heritage Trail

Fort Community Features



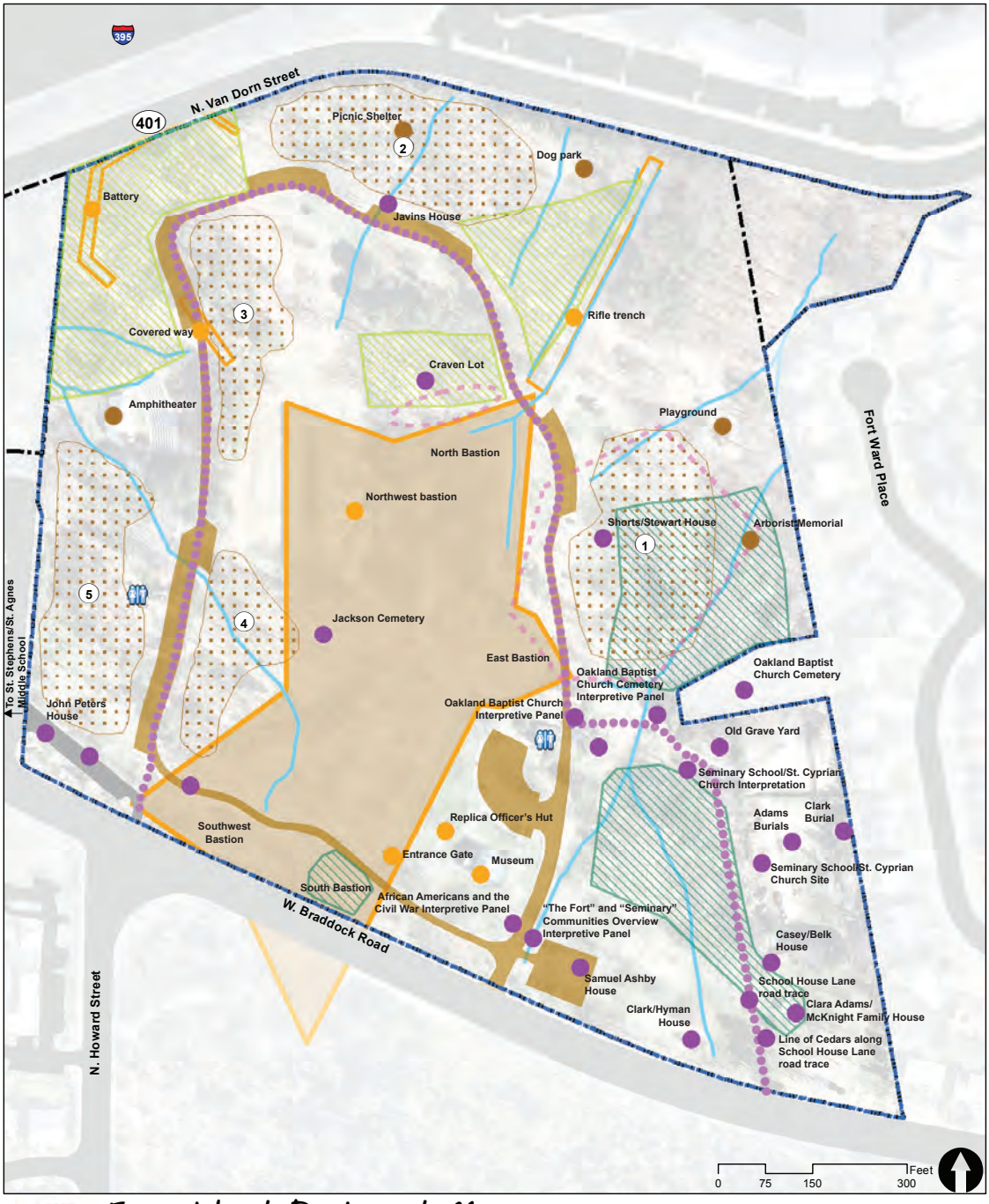
Fort Ward Park and Museum Area Management Plan

City of Alexandria, Virginia

Management Plan Boundary
Park Parcel
Park Road or Parking
Number of parking spaces
Recreational Feature
Picnic Area
Restroom

Recreational Features

Figure 53 - Resource Compilations



Fort Ward Park and Museum Area Management Plan

Composite of Features

City of Alexandria, Virginia

- Management Plan Boundary
- Park Parcel
- Park Road or Parking
- Drainage flowlines

Tree Inventory

- Tree or Azalea bed (LKLA inventory 6/2013)*
- Tree (Archeology-City of Alexandria)
- Woodland Glade (mowed annually in fall)**
- Meadows (mowed annually in fall)**

- The Fort Community Features
- "The Fort" Heritage Trail
- Civil War Features
- Fort earthworks and interior features
- Exterior Fort earthworks

- Native American Resource
- Recreational Feature
- Picnic Area
- Restroom

Figure 54 - Composite Diagram

One or two stories should be selected and presented at each home site. The number of stories told at each home site should be limited in order to provide a strong, clear message so as not to overwhelm visitors.

Moving from home site to home site, visitors will have the opportunity to reflect upon and connect the stories. Together, the stories should provide a complete presentation of the key points associated with the two themes.

The purpose of the presentation is not to fully relate the history of each family (which is done in the more extensive research document and can be made available to visitors) but to convey the key points associated with the themes. The guiding principles outlined later in this Section should be used to formulate the storytelling. Through the personal stories of the families of "The Fort" community, larger themes of regional and national significance will be richly and memorably conveyed.

Home sites that may be interpreted include the following

- Clara Adams/McKnight Family Home Site
- Clark/Hyman Family Home Site
- Casey/ Belk Family Home Site
- Amanda Clark Family Home Site
- Shorts/Stewart Family Home Site
- Families along Braddock Road - Millers, Ashbys, Robert McNight

"The Fort" community - The School House and Clara Adams Gravesite

The sites of the School House and the Clara Adams grave, close to each other at the north end of the School House Lane road trace, should be the primary destination along the interpretive trail where interpretation of "The Fort" community if offered. One potential interpretive opportunity is to mark the footprint of the school house by an outline of pavers or plant materials or by paving it in its entirety. The site could serve as an outdoor courtyard where gatherings can be held, self-guided interpretation provided and guided interpretation offered during events. The existing interpretive wayside *Within its Walls – A Foundation for Education and Opportunity* may be used here.

Figure 55 - Jackson Cemetery

All of "The Fort" community themes should be interpreted at this site using stories from the community's history presented in their national context. Themes include *Triumph over Adversity, Strength in Community, Strength in Family,* and "*We're Still Here."*

The site should be enhanced with landscaping, public art and visitor facilities such as benches. Contemplation of the grave sites should be encouraged; a commemorative garden could be created at this location.

"The Fort" community - Oakland Baptist Church Cemetery and Old Grave Yard

Interpretation related to the Oakland Baptist Church Cemetery and adjacent Old Grave Yard should recognize and commemorate those buried there and provide an opportunity for quiet and respectful contemplation. Interpretation and related enhancements should be undertaken in collaboration with the Oakland Baptist Church, Descendents Society and families.

The existing wayside exhibit *The Oakland Baptist Church* may be used here. Additional interpretation and enhancements should relate to the themes *Strength of Community* and *We're Still Here*. Landscaping, artwork, paved areas, and benches should be considered as part of potential enhancements.

Figure 56 - Earthworks at Northwest Bastion

Exterior of Fort Ward

Interpretation outside of the earthworks should be located along the trail network near the entrance gate and on the north and west sections of the perimeter trail. Interpretation should continue relating the theme *Fort Ward as a Military Site* but may also address topics associated with the themes *The Civil War Defenses of Washington* and *Wartime Alexandria*. Among others, it may address the following topics. Exhibits may be developed by Fort Ward Museum staff in collaboration with other OHA staff.

- The surrounding landscape – farms, land use, residents before the war and during the war
- Braddock Road and the Leesburg and Alexandria Turnpike in wartime Alexandria
- Exterior support buildings military roads, and logistics
- The Rifle Trench–role, geography, and connections to other fortifications defending Alexandria
- The Battery and Covered Way–role, geography, field of fire, and connections to other fortifications defending Alexandria
- Personal stories of those who served

"The Fort" community - Jackson Cemetery and Javins and Craven Lots

Sites located beyond the vicinity of "*The We're Still Here Trail*" are significant to the "The Fort" story and have the potential to convey interpretation associated with *The African American Experience* and related themes. Interpretive exhibits and enhancements may be implemented at these sites but need to be designed in a manner that does not compromise historic features and viewsheds associated with Fort Ward and its Civil War landscape.

The existing interpretive wayside Jackson Cemetery is installed on the glacis of Fort Ward at the site of the cemetery. Additional enhancement of the ground plane of the site, such as the marking of identified graves, could be considered. Similar exhibits and enhancement could be considered for the Javins and Craven Lots on the north side of the fort in the vicinity of the paved road and near the Ashby, Miller and McKnight properties. Thematic relationships and storylines may be determined based upon research, oral histories, and other information.

Interior of Fort Ward

Interpretation within the Fort Ward earthworks should focus upon the theme *Fort Ward as a Military Site*. The introduction of a limited number of self-guided wayside exhibits in OHA format similar to those recently prepared for Fort Ethan Allen by Fort Ward staff are envisioned. Exhibits may be developed by Fort Ward Museum staff in collaboration with other OHA staff. The exhibits might address the following topics.

- Layout of the fort–how it is shaped for defense of the surrounding geography
- Fields of Fire – the role of various artillery positions within the fort showing the purpose, range, and coverage of the artillery pieces they were designed to accommodate
- Parts of the fort–role, function, construction
- Firing an Artillery Piece–men, positions, roles, activities
- Personal stories of those who served

Fort Ward Museum

Over the longer term, funding should be sought for the expansion of the Fort Ward Museum to address deficiencies in the ability of the museum facility to support its mission. Planning for the museum expansion should be undertaken to provide materials to support a fund-raising initiative. Conceptual design drawings, renderings, a description, and cost estimate should be prepared. A capital campaign should be professionally planned to prepare for fundraising.

It is recommended that the future expansion be accomplished through construction of a new addition to the existing building on the north, parking lot side of the building. The addition should become the new entrance to the museum from the parking lot, which should be reconfigured. It should relate to the park's trail network and outdoor living history areas near the fort. Alternatively, discussion and plans in the past have focused on evaluating the reconstruction of the Civil War Barracks buildings as a possible museum expansion and interpretation in the same area. Any form of museum expansion in this area will require relocation and reconfiguration of the existing parking area.

The current museum's location is highly likely to contain significant archaeological features and deposits associated with the fort's outbuildings and should be addressed. An expansion of the museum would require extensive archaeological investigations.

In general, the existing replica museum building should remain with its current exterior appearance on the east, west and south elevations. On the north, the new two story addition should be compatible with, but should not replicate, the character of the existing building. The design of the museum would be subject to Board of Architectural Review and would need to consider its potential impact on the setting of Fort Ward Park as an historic site and landscape. To the extent practical, the new addition should incorporate a significant amount of glass to enable views of the fort and the landscape from within the building, especially public spaces.

The first floor of the addition should provide an entrance and visitor reception area where visitors and small groups can gather. A visitor reception desk, museum store, seating and information kiosks should be provided. ADA compliant rest rooms and an education/ meeting room (if there is enough space) should be available on the first floor. An elevator should provide access to the basement and second floor. A fire stair should serve the basement and second floor as well.

The expanded second floor should proved space for offices and meeting space. The expanded basement should be dedicated to the museum's collection and work space. The first floor of the existing building should be devoted entirely to exhibits, and the second floor should continue to serve as a library and research space.

Site orientation should be provided primarily at the outdoor orientation exhibit, discussed above, rather than within the building. Interior exhibits should continue to focus upon supporting themes related to Fort Ward's Civil War history as they do now, featuring the museum's extensive collection. Interpretation of African American themes should focus upon the Civil War experience of African Americans in Alexandria and national themes of race prior to, during, and following the war, relating to and setting a context for interpretation of "The Fort" community at sites along the interpretive trail network.

Citywide and Regional Linkages

The Office of Historic Alexandria should work to strengthen citywide and regional linkages between Civil War sites and African American interpretive sites. The existing City interpretive presentation, developed over decades, is unique and the historical research that has been undertaken in Alexandria is extraordinary. Yet interpretation at many of the sites identified in the existing Civil War and African American self-guided trails in Alexandria is not well developed and not well connected. Some identified sites have no self-guided interpretation at all. The following steps are recommended to enrich the two trails networks and make the experience fulfilling. Strengthened citywide interpretation will help promote Fort Ward and link it to other interpretive sites within the city and the region.

- Work with partners and legislators to strongly encourage the National Park Service to interpret and promote the circle forts. Identify an achievable 'next step' for regional interpretation and work toward its funding and implementation.
- Create a relationship with the developing National Museum of African American History and Culture of the Smithsonian Institute on the Mall. Support its development and connect to its educational programming. Identify ways in which Alexandria's African American interpretive presentation of authentic sites can link to and illustrate themes and storylines being used by the museum.
- Continue to provide leadership to Civil War Defense of Washington sites south and west of the Potomac River. Support a working group that meets regularly to coordinate activities and promotion. Identify and undertake joint projects. Advocate for preservation and interpretation of remaining sites.
- Clarify themes and storylines associated with Alexandria's Civil War and African American history and interpretation. Develop an overarching set of themes and storylines for each topic into which each interpretive site within the city can fit. Identify how each individual site and its stories relate to the citywide themes.
- Using the citywide themes and storylines, create interpretive linkages between sites featured along Alexandria's Civil War and African American trails. Refresh the trail presentation by enhancing self-guided interpretation at each identified trail site, making connections clear, and enriching web-based interpretive content to create an outstanding self-guided trail experience.

Figure 57 - Excerpt from Military Map of NE Virginia Showing Forts and Roads, Engineer Bureau, War Dept. 1863

Programs and Supporting Materials

Fort Ward Museum currently offers a variety of high quality interpretive programs and events that are well attended and promote the park. These programs should continue to be supported. It is not anticipated that additional programs can be offered without additional staff, volunteer, and funding resources.

It suggested that a new fold-out map of Fort Ward Park be designed and produced integrating interpretation of the themes discussed above. The map should illustrate both the Civil War and early twentieth century "The Fort" community landscapes and provide interpretive content that builds upon and deepens the self-guided exhibits provided along the interpretive trail network and within the earthworks.

The City website should continue to be used as a primary vehicle for historical information and interpretive content. A comprehensive approach should be taken to the design of the Fort Ward section of the website to clearly present the history and significance of Fort Ward Park, present each of the park's interpretive themes, illustrate the themes with stories derived from the site, provide access to historical documents and research, and relate the park to citywide interpretive themes and stories.

Figure 58 - Example of public art incorporated into an interpretive presentation at Steigerwald Lake Wildlife Trail, Clark County, WA

G. Guiding Principles

As interpretive projects and programs are implemented over time, the following guidelines for interpretation should inform decision-making in creating a successful interpretive presentation within the park.

- **Authenticity:** Wherever possible, tell each story where it happened in a tangible, real place. Use authentic physical features–earthworks, home sites, graves, landscape, and other resources–to tell stories.

- **Accuracy:** Stories should be well-researched and accurate, and interpretation should convey authentic experiences. Information and perspectives may well be at variance with contemporary sensibilities, but should be presented accurately nonetheless. Honest, complicated, and sometimes unpleasant stories are a time-tested way to touch audiences deeply and affect people's lives. Sources for stories based upon legend, lore, or oral tradition, should be identified.

- **Quality:** Each interpretive installation and enhancement should provide a high quality visitor experience in terms of location, design, orientation to resource, storytelling, physical installation, accessibility, and educational impact.

- **Context:** Present stories in ways that make them immediate and understandable and that connect them to larger themes and historical context. Present stories from multiple perspectives and points of view in their thematic and historical context to help audiences appreciate how different people from diverse groups and political persuasions see things differently. Audiences should be able to draw their own conclusions from each story presented.

- **Significance and Meaning:** Interpretation goes beyond conveying a story's facts–drawing connections, significance, and meaning to audiences. In developing interpretive content, examine each story for its significance–for a key message to be conveyed by the story or exhibit. Communicate this significance or message to audiences in ways that connect to their life experiences. Provide interpretation in ways that help audiences relate it to experiences in their own lives. Use authentic stories of real people in their words in the actual places where events occurred wherever possible. Use expression of universal concepts such as love, loss, uncertainty, and success to which everyone can relate in their lives to help forge personal connections to a story.

- **Experiential Learning:** People learn and remember things better when they are engaged physically and intellectually. Emphasize communication that is visual and

tied to real things and authentic places and features, not just reading waysides and text. Present themes and stories in ways that encourage audiences to explore other sites within the city and region by drawing interpretive connections, inserting tempting leads, and providing the information and tools needed to spark and follow through on interests. Encourage audiences to explore the landscape physically by inviting them to move around from place to place.

- **Variety of Experiences:** Provide a variety of interpretive approaches to satisfy the interests and capabilities of different age groups, temperaments, and orientations. Options should offer varying levels of activity, timeframes and levels of required concentration. Provide alternative ways to experience interpretation for individuals with physical limitations or disabilities.

- **Depth of Information:** Primary interpretive content should be succinct and well written, emphasizing key messages, context, and connections. Provide information and guidance for exploring subjects in greater detail through a layered approach or using alternative communication methods to encourage those who are interested in learning more or digging deeper.

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5. Recommendations

A. Purpose and Significance of the Park

The management framework recognizes that the management actions for Fort Ward Park must support a broad array of users and uses; must protect and maintain the park's nationally significant historic and cultural resources and locally significant natural resources; must serve to educate its visitors through innovative and engaging interpretation and programming; and must continue to satisfy the growing needs for passive recreational enjoyment of a shady, natural oasis from an increasingly complex urban environment.

B. Process

Recommendations in this document are the result of a sequence of Fort Ward Advisory Group (FWAG) meetings focused on each of the major topics that are covered as part of this management plan: preservation and management of natural, historic and archaeological resources; the interpretation of those resources; recreational opportunities; and the facilities that are needed to support the use and operation of the park.

The recommendations are also based on an active public engagement process. Two park "listening sessions" were conducted at Fort Ward Park in early June 2013 with a follow up online survey to gather additional public input. Following publication of the January 13, 2014 FWAG draft document, it was placed online at the City's website. A public meeting was held on February 24, 2014 and an open house was held on March 8, 2014. Comments were solicited through all public outreach efforts and an online comment option.

Three stages of archaeological work have been completed in the park - Stages 1, 2A and 2B. Stage 3 has been recommended by OHA staff but has not been funded in the past two City budget cycles. Other than the archaeological review associated with the current MOU agreement, Save America's Treasures grant, or upcoming drainage improvements to be implemented once a permanent drainage plan has been selected, no additional investigation has been pursued. Archaeological investigation will continue at Fort Ward over a number of future years, as funding and opportunities present themselves. In the meantime, the existing MOU serves to protect archaeologically sensitive areas until further study can be undertaken. (from OHA memo and email dated 3/21/14)

FORT WARD PARK DEFINITION AND PURPOSE

Fort Ward Park is classified as a Destination/Historical Park by the City of Alexandria. It is similar in service area, use and size to the City's six other Citywide Parks[1]. Fort Ward Park's founding purpose was for use as a 35-acre historic park and Civil War museum with supporting recreational facilities, picnic areas and an amphitheater all enhanced by carefully located planting beds[2].

Later, additional acres (not subject to this Management Plan) were acquired and are used for active recreation and athletic fields. Today, in addition to its historic, interpretive and educational mission, the park serves the surrounding community's need for passive recreation consisting of less structured and less formal activities. Examples include: a playground, picnic areas, historic/ cultural sites, an amphitheater and natural resource areas. The park is also significant locally as preserved open space for the City of Alexandria—associated with an adjoining complex of centrally located and largely wooded parcels of land owned by Episcopal High School and the Episcopal Theological Seminary.

1 Citywide Parks Improvement Plan 2014, City of Alexandria, Virginia Recreation, Parks, and Cultural Activities, Park Planning, Design & Capital Development, Draft, January 16, 2014. Page 9

2 Application for listing on the National Register of Historic Places approved by the Executive Director, Virginia Historic Landmarks Commission, Commonwealth of Virginia, February 16, 1982

Secretary of the Interior's Standards for the Treatment of Historic Properties.

For Fort Ward, the overarching treatment approach for the site is rehabilitation. The Standards for Rehabilitation are:

- *A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.*
- *The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.*
- *Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.*
- *Changes to a property that have acquired historic significance in their own right will be retained and preserved.*
- *Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.*
- *Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.*
- *Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.*
- *Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.*
- *New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.*
- *New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.* [1]

1 http://www.nps.gov/hps/tps/standguide/rehab/rehab_standards.htm

C. Management Goals

The management actions are organized along five specific goals that were derived from discussions at the meetings, the FWAG's work and additional research from the planning team.

Goal 1: Management and Funding
Goal 2: Park Character - Preserve, Protect, Repair and Maintain Resources
Goal 3: Landscape Cultural Practices
Goal 4: Educate and Engage Visitors - Share the Stories of Fort Ward Park
Goal 5: Enhance Park Facilities

Each goal includes a set of related objectives, strategies and actions. The recommendations tie together all of the previously identified actions and ideas into a single set of proposed management actions.

Fort Ward Park is filled with historic resources and is rich in natural resources. Every square foot of the park is used, for historic interpretation, for recreation and as native woodland. Management practices must recognize that the interrelated nature of the park's resources are key to the park's future and its good management. Section II.2 of the Fort Ward Park and Museum Area Management Plan documents the known state of the site's existing conditions and resources. Section II.3 and .4 outline a recreational and interpretive framework for balancing the need to accommodate a wide range of users and increase awareness of the special significance of Fort Ward Park. This section of the recommendations is focused on identifying the best maintenance and management practices that address the issues and site constraints found within the park. These practices are presented as related to 'general recommendations,' applicable throughout the park; specific to natural resources; and specific to the cultural resources—in particular the earthworks, "The Fort" community, and the burial and cemetery sites.

The Secretary of the Interior's Standards for the Treatment of Historic Properties is one of the best practices that applies to the entire park and its listing on the National Register of Historic Places. When unsure if a site practice is appropriate or not, refer to the guidance offered by the standards and the caveat of "Do no harm."

In addition, the City of Alexandria applies a number of best practices with regard to "sustainability" policies associated with its efforts and those practices should also apply to all aspects of the park's management. The Environmental

Action Plan 2030 (EAP 2030) was adopted by City Council in June 2009 and follows the guiding principles outlined in Alexandria's "Eco-City Charter."

Best practices consistent with the charter include minimizing energy expenditure; limiting the need for irrigation to extreme drought and plant establishment and reducing the need for fertilizers, or other soil amendments, and water by selecting plant materials that are native and naturally adapted to existing site conditions; limiting herbicide and pesticide use as much as possible and taking advantage of natural ecological processes to manage resources efficiently.

Figure 59 - Cedar trees along School House Lane

D. Summary of Goals, Objectives, Strategies and Actions

A short overview of the full list of recommendations is incorporated here. More detailed information related to why such a recommendation is made and how it might be applied is included in the chart in Section II.7, tied to specific actions.

Goal 1 - Management and Funding

The City of Alexandria will support a broad array of users and uses by collaboratively managing the park and equitably investing in the Fort Ward Park and Museum Area as compared with other regional city parks and facilities.

Throughout the planning process, Fort Ward Advisory Group (FWAG) members have expressed concerns that:

- Fort Ward Park is not receiving resources adequate to address its role as a regionally and nationally significant historic and cultural resource
- Fort Ward Park is not receiving a proportional share of funding when compared to the other major parks in the City (there are six other 'large' parks); in particular, there is a sensitivity among FWAG members to the balance of investment between the waterfront parks and Fort Ward Park
- Fort Ward Park is in need of "deep" maintenance; landscape cultural practices were suspended and impacted by the reasonable hold on maintenance activities while the archaeology efforts were underway

There are a number of activities that could be implemented to bring the necessary attention and funding to Fort Ward Park:

- Communicate the significance of Fort Ward Park to the broader audiences: city leaders, business leaders, preservation and conservation organizations, community groups and other civic organizations
- Sponsor educational and research symposia on the significant and unique Civil War and African American heritage found at Fort Ward Park and the region
- Link the financial needs of Fort Ward Park with those of other City parks and open space in support of alternative public park financing such as a bond issue, real estate transfer tax, or public/private partnerships, donations and endowments
- Link the preservation, enhancement and management of Fort Ward Park to broader regional and national audiences associated with the circle forts and

the Defenses of Washington and seek broader recognition and funding for preservation, interpretation and enhancements as a system of forts (the Circle Fort Trail), with an emphasis on the role of the African American communities often associated with them

- Link the preservation, enhancement and management of Fort Ward Park to broader regional and national audiences associated with African American heritage, including the pending opening of the National Museum of African American History and Culture (NMAAHC)

City staff can accomplish some of the needed activities. However the City's Department of Recreation, Parks, and Cultural Activities and its Office of Historic Alexandria do not have a staff position dedicated to pursuing public/private partnerships, donations or endowments. Establishing a professional development position is critical to the maintenance, management and expansion of the City's museums and its park properties.

Figure 60 - Leaf litter in native woodlands at Fort Ward Park

The level of funding and resources available to manage the park is a critical issue facing the park. Current levels do not meet all the needs for the preservation of its nationally and regionally significant resources while at the same time meeting recreational needs. There is a strong perception that the allocation of resources is unbalanced and Fort Ward Park is not receiving a fair share of resources when compared with other parks of its size and significance. The following objectives strategies and actions are recommended to address this critical issue.

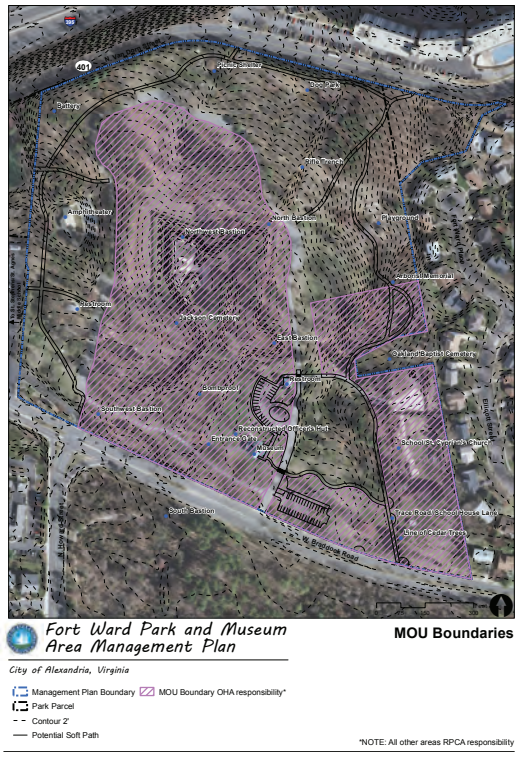


Figure 61 - Purple areas under OHA oversight (MOU)

Objective 1.1

Continue the collaborative management process between City agencies as established in the Memorandum of Understanding (MOU)

The MOU between the Office of Historic Alexandria (OHA), Department of Recreation, Parks and Cultural Activities (RPCA), Department of Transportation and Environmental (T&ES) Services and Department of General Services (GS) spells out the operations and maintenance responsibilities for the Fort Ward Park and Museum Area. The interdepartmental MOU should be seen as the primary tool for allocating resources and identifying needs in a manner that is consistent with the approved management plan.

Administration of the MOU will benefit from quarterly meetings with appropriate staff in attendance from RPCA, OHA, T&ES and GS to coordinate and resolve park issues, including an assessment of seasonal staffing needs in terms of daily security and operations. The MOU will annually identify the specific individuals who will participate in the quarterly meetings.

The diagram in Plate 19 and in the Best Practice section related to the MOU recommends adding several portions of the park to the area managed and maintained through OHA's oversight: the

area with Old Grave Yard (shown in blue on Plate 12: Cultural Resource Level) and the areas in the southeastern corner of the park. Responsibilities (and funding) should cover all maintenance activities—OHA tackling tree care, turf management, leaf raking, etc. within its area and RPCA tackling all within its area. This aggregation of landscape maintenance activities should help to clarify the responsible party. The diagram should be updated annually in conjunction with the updating of the ground disturbance diagram. Whether the Old Grave Yard is incorporated into the Oakland Baptist Church Cemetery physically or not, at a minimum it should be incorporated visually and managed as a single entity.

Strategy 1.1.1 Use the MOU process to assess and monitor progress and identify problems and solutions

Action: Review and update MOU annually

Objective 1.2

Make Fort Ward Park a priority in the City of Alexandria funding

The annual update of the MOU and annual monitoring and progress reporting can be utilized to establish a defensible budget for management and maintenance practices as needed to preserve, protect, repair and maintain the nationally and regionally significant resources that are the responsibility of its owner, the City of Alexandria. Beyond the budgeting annual review and budgeting process, park managers and supporters should communicate progress and activities to the broader audience of stakeholders with an interest in the preservation and enhancement of Fort Ward Park.

Figure 62 - Worn trails on earthworks

Strategy 1.2.1 Plan for and communicate the needs and priorities for park management funding (operational and capital) as part of the City budget consistent with the responsible stewardship of a significant historic site and regional park serving the entire City and beyond

Action: Communicate significance and importance of Fort Ward Park to a wider audience

Action: Link financial needs of the park to other City Initiatives; broaden 'ask' for funding and support

Objective 1.3

Support and finance enhancements to park facilities to meet the needs of the broadest array of park users and neighbors

Broadening the user base is a critical step in gaining the financial and management support for the responsible stewardship and necessary enhancements to Fort Ward Park. Broadening the user base should include programming for education, interpretation, performing arts, public art and upgrading the accessibility of the park to all users of all ages and abilities.

Strategy 1.3.1 Broaden the array of programming and public art in Fort Ward Park

Action: Sponsor educational and research panels and symposia

Action: *Expand community-oriented offerings at the amphitheater*
Action: *Locate public art in collaboration with the Office of the Arts' Public Art Master Plan*

Strategy 1.3.2 Enhance park's accessibility and meet ADA standards
Action: *Relocate the current playground facility to the western side of the park, making access and equipment accessible*
Action: *Provide accessible park furniture*
Action: *Make the existing paved loop pedestrian path system accessible where possible and sign areas where not possible*
Action: *Provide accessible parking and pathways for all park and museum features*

Goal 2 - Park Character: Preserve, Protect, Repair and Maintain Resources

The City of Alexandria, working with its boards and commissions, volunteers and park neighbors, will work to protect and maintain the nationally significant historic and cultural resources and locally significant natural resources found within Fort Ward Park.

The management plan identifies a range of maintenance and management practices that comprehensively address the issues and site constraints found within the park and then identifies specific practices related to each action. Comprehensive "best practices" are presented in Section II.5 and are generally applicable throughout the park; specific to natural resources; or specific to the cultural resources—in particular the earthworks, "The Fort" community and the burial and cemetery sites. Best practices for each of the recommended actions (where applicable) are listed in a detailed management practices matrix found in Section II.6 and Section II.7.

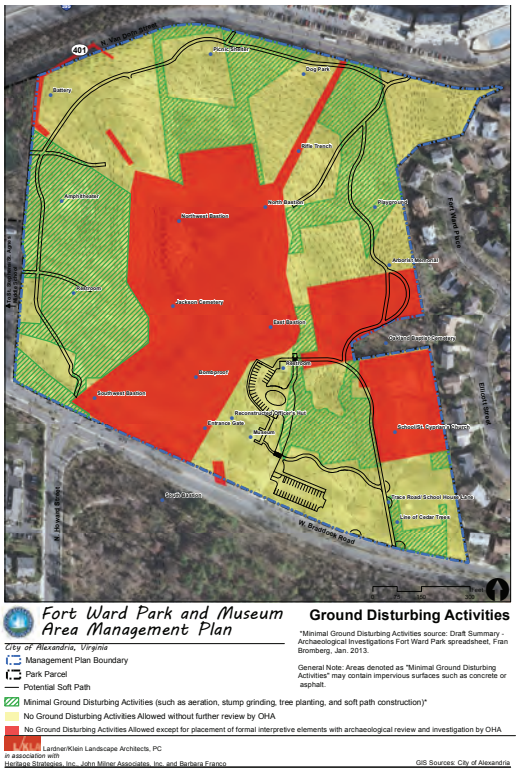


Figure 63 - Level of permitted ground disturbance for tree planting, stump grinding, etc.; Areas are shown without removing nonplantable areas such as the amphitheater, parking lots and roads

Objective 2.1

Protect vulnerable park areas from adverse ground disturbing activities

At the most basic level, vulnerable park resources must be protected from ground disturbing resources; however, this does not mean that nothing can be disturbed. Ground disturbance must be monitored by activity, depth and frequency. Adopting the following strategies and actions will result in a clear process for maintaining and enhancing the park and allowing such activities as aeration, stormwater management, tree planting, pathway construction, facility construction and other activities that are needed to accommodate increasing numbers of park users.

Strategy 2.1.1 Determine level of permitted ground disturbance
Action: Mark and protect unrecognized Civil War archaeology
Action: Mark and protect "The Fort" community and burial sites
Action: Map areas in conjunction with OHA and RPCA to identify where ground disturbance may occur unsupervised; where ground

disturbance may occur with supervision; and where ground disturbance is NOT allowed

Figure 65 - Tree maintenance

Objective 2.2

Heal areas of erosion and compacted soils within the park

Erosion and compacted soils contribute to stormwater management problems and degrade the recreational experience in the park.

Strategy 2.2.1 Stabilize surface areas

Action: *Address animal tunneling in earthworks*
Action: *Restore shovel pit testing sites to original grade*
Action: *Redirect stormwater and sheet flow away from sensitive cultural and recreational resources through small berms, spreaders and other techniques*
Action: *Reinforce eroded edges of paved surfaces*
Action: *Repair surface erosion damage*
Action: *Protect earthworks from undesignated foot traffic*
Action *Protect burial sites from unintentional recreational use*

Strategy 2.2.2 Improve compacted soils

Action: *Renovate picnic areas by rotation or partial closure of group area*

Strategy 2.2.3 Relocate or remove uses that conflict with resources

Action: *Remove former maintenance yard access drive, fencing and gate*
Action: *Remove former maintenance structures from eastern edge of park*
Action: *Reshape or remove fill at site of former maintenance yard*

Objective 2.3

Enhance park's vegetative character and open space

The park's open grassy areas, its mature woods and rich ornamental plantings have all declined due to over use and a general lack of investment needed to keep up with the maintenance needs. Storm damaged vegetation has not been replaced due to concerns about adversely affecting archaeological resources. The once thriving azaleas and other plants are in decline. A map designated 'Management Zones for Landcover' has been prepared that crisply identifies turf area (irrigated and non), woodlands and meadows. The following strategies and actions are recommended to restore Fort Ward Park's distinctive landscape character.

Figure 64 - Management Zones for landcover

Strategy 2.3.1 Maintain mix of open and wooded landscapes

Action: Establish boundaries for turf and meadow management
Action: Establish boundaries for areas managed as native woodlands
Action: Develop a data set on wildlife (birds, animals, etc.)

Strategy 2.3.2 Develop and adopt planting approach for Fort Ward Park's natural and cultural landscapes

Action: Determine role to play in 'City Arboretum' proposal
Action: Develop and update data set on vegetative resources
Action: Develop a planting strategy, recommended plant list and planting zones

Goal 3 - Landscape Cultural Practices

Adopt appropriate and coordinated landscape management practices.

The existing woodlands at Fort Ward Park are in serious decline. Tree count is down by one-quarter or more, based on a survey of approximately 600 trees in the park. No new trees or shrubs have been planted since 2010 due to ground disturbance concerns related to unknown archaeological resources. Now that more information is known about the archaeological resources and a process has been established for ground disturbing activities as part of the management plan, new trees and shrubs need to be planted on an annual basis at greater than replacement levels. Additional effort must be invested in maintaining the remaining trees and shrubs, especially along the wooded pathways that will frame part of the soft path trail network proposed for the park.

Objective 3.1

Tie ongoing City of Alexandria maintenance practices with those specific to the park

The City of Alexandria's park operations has a monthly task calendar and is moving the department's maintenance practices to align with the APPA Operational Guidelines for Educational Facilities, Grounds, second edition. These guidelines identify five levels of staffing with related practices for grounds maintenance.

3.1.1 Coordinate Management Plan recommendations with other City of Alexandria park maintenance efforts

Action: Reference the City's working list and supplement with Landscape Cultural Practices for Fort Ward Park
Action: Coordinate efforts and appearance between private contractor operations (OHA) and RPCA staff area of responsibilities

Objective 3.2

Contribute towards the City of Alexandria's Tree Canopy Goal of 40%

The City of Alexandria's Urban Forestry Plan identifies a goal of establishing a 40% tree canopy cover for the city as a whole and planting citywide 400 new trees per year to achieve that goal. Achieving this goal is highly dependent upon maintaining existing cover, especially in public parks where the opportunity exists to exceed the target canopy coverage of 40%. Many urban sites are unlikely to achieve a canopy coverage of 5% due to parking lots, road ways, dense urban development.

Strategy 3.2.1 Restore and expand the existing woodlands
Action: Plant new trees
Strategy 3.2.2 Assess tree cover and health
Action: Prune diseased and dead tree limbs
Action: Remove fallen and hazard trees

Strategy 3.2.3 Perform tree maintenance
Action: Assess tree growth on earthworks
Action: Identify appropriate treatment of leaf litter
Action: Remove standing stumps in the park

Objective 3.3

Restore shrub layer

The shrub layer is an important element of the desired park character as noted during the park listening sessions and in the FWAG report on natural resources. Restoration of the shrub layer requires restorative pruning, soil amendments, top dressing, and weeding to remove non-native invasive species.

Figure 67 - Signage on earthworks

Strategy 3.3.1 Restore shrub layer in high visitor use areas and at woodland edges
Action: Plant new shrubs

Strategy 3.3.2 Perform shrub maintenance
Action: Maintain existing shrubs
Action: Maintain shrub beds

Objective 3.4

Remove inappropriate vegetative growth

Strategy 3.4.1 Remove non-native invasive groundcovers and undesired shrubs and saplings from earthworks and burial grounds
Action: Remove inappropriate vegetation from earthworks
Action: Remove inappropriate vegetation from burial grounds and cemeteries

Strategy 3.4.2 Minimize non-native invasive plants
Action: Remove non-native invasive plants

Figure 66 - Trees on the earthworks

Objective 3.5

Establish attractive and sturdy turf

Turf areas in the park serve as a back yard for many of the neighboring apartments, as well as those wishing to picnic, relax or appreciate the park-like setting of Fort Ward Park. This appreciation has led to over use, soil compaction and lack of vigorous turf growth. Specific areas within the park have been designated as 'no mow' areas, where limited mowing to manage non-native invasives and weed infestations encourages native grasses and wildflowers to flourish.

Strategy 3.5.1 Actively manage turf growth

Action: Core aerate soils to address compaction
Action: Overseed and top dress turf
Action: Define mowing height

Strategy 3.5.2 Actively manage meadow growth

Action: Remove invasives and woody plant materials from meadows

Objective 3.6

Train maintenance personnel on appropriate practices for historic and archaeological sites and natural areas

Under the current MOU, OHA is responsible for maintenance around the Civil War fortification and museum. With extensive historic and archaeological resources throughout the park, training for maintenance personnel should be directed towards all those with maintenance responsibilities throughout the park.

Strategy 3.6.1 Use the MOU park maintenance zone areas to identify level of training required for maintenance personnel

Action: Train all personnel on use of equipment to minimize damage to resources
Action: Provide training and certification for maintenance personnel at the park

Goal 4 - Educate and Engage Visitors: Share the Stories of Fort Ward Park

Increase and broaden the audience in support of the park's preservation and enhancement by providing a high quality interpretive and educational experience.

Currently there is both passive and active interpretation in the park. Many of the existing interpretive exhibits need to be refreshed, and recent findings from archaeological work and historical research for the fort need to be incorporated into new and updated interpretations focusing on the overall thematic time frame, from the Civil War to the Civil Rights-eras.

A more detailed interpretive plan is needed to apply themes, topics and related stories to sites and places within the park. The themes and stories can be linked to the broader relationships associated with the circle forts and the Defenses of Washington. Fort Ward Park represents a tremendous opportunity to link the themes related to Defenses of Washington with the post Civil War settlement of African American communities after the

forts were abandoned, and to better tell the stories as to how these settlements evolved into unique and established communities.

Objective 4.1

Develop a detailed Interpretive Plan for Fort Ward Park that celebrates the park's multi-faceted history

The management plan lays out a broad interpretive framework regarding the time frame, geography, audiences and potential themes for park interpretation. A more detailed interpretive planning effort is needed to apply themes to sites, select appropriate stories related to each theme and site and to identify the appropriate interpretive tools that best tell the stories. The more detailed interpretive plan is necessary to define ways the landscape can be used as an interpretive tool while not overwhelming the park and its resources. The incorporation of the landscape will allow the Civil War-era interpretation to expand from the museum and "The Fort" community interpretation to be brought into the museum—presenting the site as one connected story from the Civil War to Civil Rights.

The intent is to integrate the overall interpretive story and museum offerings to include displays and interpretation for the period from the Civil War to the Civil Rights eras both within the museum and in the park's landscape. Elements reflecting the African American experience, such as the USCT mannequin, may be appropriate displays within the museum, as determined by the more detailed interpretive planning effort to come. Similarly, elements presented in the museum today may be more fully interpreted within the larger park, removed from the museum itself, creating room within the museum for exhibits related to the African American experience during this time period.

Strategy 4.1.1 Expand or reform the Fort Ward History Work Group and Fort Ward Advisory Group to provide advice on the interpretive planning, design and implementation

Action: *OHA to formally invite key stakeholders from the Fort Ward and Seminary African American Descendants Society, Civil War historians, naturalists, educators and community representatives to participate in a new advisory committee working on the development of an interpretive plan*

Action: *Working with the advisory committee on interpretation, select topics, stories, text, and images that best represent the recommended themes for Fort Ward Park (including both citywide or regionwide themes and site specific themes)*

Action: *Match the recommended stories, sites and places with the best communication and educational practices including a range of web-based and mobile technology, as well as exhibit design*

Action: *Where historical imagery is not available, utilize drawings and illustrations to evoke the imagery sought to capture the meaning of the interpretation*

Strategy 4.1.2 Make use of landscape features to tell the stories

Action: *Match the recommended stories with the sites and places where the stories are best told; develop conceptual site plans for any related physical improvements needed to help tell the stories*

Action: *Design and install an interpretive trail as part of the overall trail network as a means of organizing the outdoor interpretive experience*

Action: *Use the 'We're Still Here" theme as part of the trail system as a means of organizing the stories associated with the "The Fort" community, and link those stories to the larger citywide themes associated with African American heritage*

Action: *Connect and reorganize the pathways through the fort so they become part of the trail network as a means of interpreting the fort's unique earthworks and to encourage movement through and around the earthworks in a careful and respectful manner*

Action: *Install outdoor exhibits and enhance historic landscapes (use vegetation to de-mark old road alignments, gardens, house sites, etc.) to interpret "The Fort" community*

Action: *Design and install landscape elements and a Memorial Stone that allow for the cemeteries and grave sites to be experienced as places of contemplation*

Action: *Design and install interpretive exhibits or landscape elements that help to tell stories of family and community, and connect to broader themes of race and the struggle for social, economic and political survival*

Objective 4.2

Increase awareness of the site's local, regional and national significance by linking to themes related to the Defenses of Washington with the establishment and building of an African American community

Recent archaeological work and historical research presents a tremendous opportunity to link the system of forts associated with the defenses of Washington with the African American settlements that grew into communities in and around many of these forts. The story is not being told anywhere else—allowing Fort Ward to be identified as a significant place for the interpretation of African American heritage. The stories of the families, their schools, churches and community life can be associated with broader themes of US Colored Troops involved in the Civil War, the role of the Seminary, the Jim Crow-era and the Civil Rights-era that followed.

Strategy 4.2.1 Greet and orient the visitor

Action: *Install a comprehensive exterior orientation exhibit at the primary entrance to introduce themes and stories, provide context and orient visitors to the park*

Action: *Install a small, 1-panel orientation kiosk at each minor entrance to the park*

Action: *Provide web-based and mobile technology applications and content to allow visitors to dig deeper and broader into the themes introduced at Fort Ward Park; use social media (Facebook, Twitter, Instagram and Tumblr) to celebrate all aspects of the park—see National Archives and Library of Congress for examples*

Strategy 4.2.2 Link interpretation at Fort Ward to broader citywide and regionwide themes

Action: *Identify Fort Ward on region-wide maps, brochures, websites, and other city publications as a place to explore Alexandria's history from the Civil War to the Civil Rights eras*

Action: *Feature Fort Ward Park in enhanced citywide Civil War and African American interpretive trails*

Action: *Develop interpretive and educational resources that help visitors compare and contrast "The Fort" community with other African*

American communities in Alexandria and beyond; clarify themes and storylines and identify how each individual site and its stories relate to the citywide themes

Action: Promote and encourage visitors to come to Fort Ward Park to better understand how "The Fort" community is representative of African American communities of freedmen established in the wake of the Civil War and their experiences

Strategy 4.2.3 Strengthen regional linkages to interpretation at Fort Ward

Action: Work with partners to encourage the National Park Service to interpret and promote the circle forts to promote regional interpretation of the Defenses of Washington

Action: Continue to provide leadership to Civil War Defenses of Washington sites south and west of the Potomac

Action: Forge a relationship with the National Museum of African American History and Culture and the African American Civil War Museum

Action: Coordinate with NMAAHC themes and storylines to use Alexandria and Fort Ward Park as authentic locations illustrating the themes and storylines

Objective 4.3

Reorganize and/or expand the museum to engage more visitors and broaden the stories told

The Fort Ward Museum is a tremendous resource for telling the story of the Civil War fortifications, the defenses of Washington and the African American communities that grew up around them after the war. But more than just the story, the museum has the potential to encourage visitors to establish connections with the people and places associated with the stories—involving moments of intellectual and emotional revelation, perception, insight or discovery. The museum and the park can encourage these connections by developing more self-guided experiences where the visitor discovers the connection through a more interactive experience. An expanded museum experience extending from indoors to outdoors would help to introduce visitors to that process of discovery and connect their lives to the lives of people in the past.

From a practical standpoint, extending interpretation outside provides a mechanism to tell the whole story—from Civil War to Civil Rights—and to connect the stories with broader themes in the city and region beyond. Over the long-term, the museum may need to expand to make better use of the exhibit space; provide more space for orientation and educational programs; make the museum more accessible; and freshen the museum to attract new and younger audiences.

Strategy 4.3.1: Develop the tools and resources needed to expand museum interpretive opportunities with self-guided experiences

Action: Update the museum's strategic plan to reflect the goals, objectives, strategies and actions of the Fort Ward Park and Museum Area Management Plan—resulting in an updated program of uses for the museum

Action: Develop a feasibility study and a new museum master plan (and design of an addition, if feasible) that leads to a more visitor friendly museum; provides views of the park landscape; incorporates both indoor and outdoor exhibits that are secure and properly monitored; incorporates space for the management and storage

Figure 68 - Diagram of features, potential 'soft path' and off-site connections

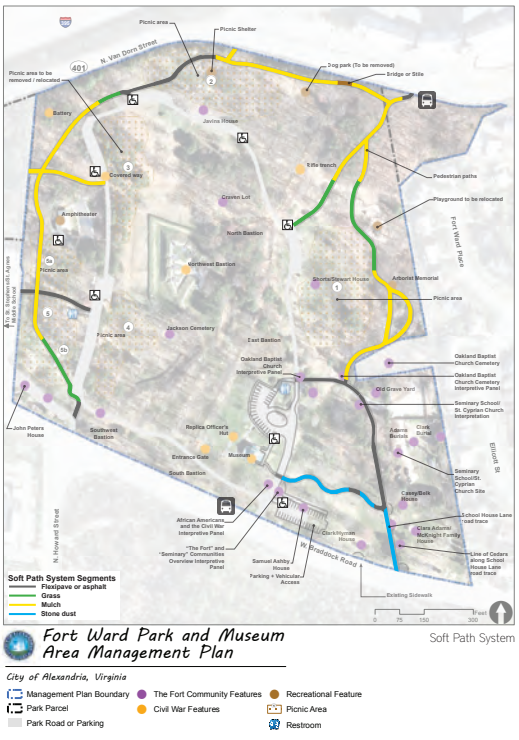


Figure 69 - Diagram of potential parking changes, bus-loop and gateways

of collections; and makes the museum and its educational facilities accessible to individuals with disabilities

Action: Undertake preliminary design of the expanded museum and prepare illustrative materials and cost estimates

Strategy 4.3.2 Create a capital campaign to raise funds for a museum expansion

Action: Using the results of the feasibility study and master plan, develop a fundraising program to implement the master plan (as part of the overall citywide system of museums)

Action: Retain a professional development specialist to guide the capital campaign (as part of the overall citywide system of museums)

Strategy 4.3.3 Use the existing museum building for new exhibits

Action: Continue to feature exhibits on topics that support interpretation of Fort Ward using the museum's extensive collection

Action: Introduce exhibits on the African American experience before, during and after the Civil War to provide context for outdoor exhibits of "The Fort" community

Strategy 4.3.4 Create as many opportunities for personal connections as possible and visitors will enjoy the experience and find relevancy

Action: Make use of talk back boards, interactives (leave something behind, problem solve, active learning)

Action: Use stories of the families that are associated with Fort Ward and "The Fort" community to connect people with their past through personal connections

Strategy 4.3.5 Reach people who do not normally go to museums by taking the museum to places where this audience normally goes

Action: Include interpretive information in picnic area map and signboards

Action: Update the historic information on the picnic area map to include areas associated with burial sites

Action: Look at New Media grants from NEH

Goal 5 - Enhance Park Facilities

Satisfy the growing need for passive recreational enjoyment of a shady, natural oasis from an increasingly complex urban environment.

As noted in Section II.3, Fort Ward Park is valued for its passive recreational uses, as well as for the events and gatherings associated with the historical aspects of the park. Based upon the 2012 and 2013 draft of the recommendations of the Fort Ward Advisory Group and the follow up meetings and discussions with users of the park, the following objectives, strategies and actions are recommended to address the growing recreational needs in a manner that is sensitive to the historic and cultural significance of Fort Ward Park.

Objective 5.1

Clarify and enhance park circulation and parking

Park users and FWAG members identified a number of issues and problems that related to the park entrance, parking, vehicular and pedestrian use of park roadways, pedestrian circulation and the need for a secondary system of soft paths.

Strategy 5.1.1 Improve pedestrian circulation and safety

Action: *Make pedestrian use the priority use for the paved loop path and mark mileage distances on or near pavement*
Action: *Introduce a sharp curve at the junction of the paved loop path*
Action: *Develop a pedestrian network of soft paths*
Action: *Connect the existing park path to the West Braddock Road sidewalk*
Action: *Clearly mark and develop two park access points from North Van Dorn Street*
Action: *Re-connect athletic fields with rest of the park*

Strategy 5.1.2 Improve bus access and parking (tour and school groups)

Action: *Redesign the existing parking area to better accommodate a bus drop-off*

Strategy 5.1.3 Reconfigure existing parking

Action: *Expand the length and reduce the width of the gravel parking lot*

Objective 5.2

Minimize conflicts between adjacent uses both within and around the park

Park users and FWAG members identified a number of issues and problems that have led to conflicting experiences among users with different expectations during their visit to Fort Ward Park. Issues and problems have mostly revolved around visitor information and orientation; accessibility; conflicts between uses and historic preservation goals; and the deteriorating condition of certain facilities and infrastructure.

Strategy 5.2.1 Communicate park regulations

Action: *Continue to monitor and to limit noise from park activities*
Action: *Better communicate park regulations*
Action: *Enforce existing park regulations*

Strategy 5.2.2 Remove the off-leash dog exercise area location and facility

Action: *Remove the off-leash dog exercise area from the park*

Strategy 5.2.3 Relocate and enhance park facilities (long-term) to better serve the public and to protect the park's resources

Action: Relocate group picnic area #3, avoiding any culturally sensitive sites or resources

Action: Adopt design standards for all park furnishings and signs

Strategy 5.2.4 Evaluate the effort required to upgrade and improve the amphitheater for more active use

Action: Evaluate upgrade or removal of the existing amphitheater

Strategy 5.2.5 Replace, upgrade or remove failing facilities

Action: Repair and evaluate the upgrading of the existing restroom located on the western side of the park

E. Best Management Practices

Successfully achieving the recommendations requires implementation of the actions in a manner that benefits the park. Best Management Practices describe the maintenance, operation or management approaches matched to a specific challenge facing the park. There are many versions to choose from. This discussion is broadly presented here, in Section II.5 and includes park-wide recommendations that articulate an approach and philosophy to park management. Following this discussion, each individual action is addressed with specificity and recommendations in Section II.6.

Best Management Practices for Park Stewardship

Two successful partnership organizations that have been in operation for two or three decades are the Prospect Park Alliance (Brooklyn, New York) and Friends of Patterson Park (City of Baltimore, Maryland).

Prospect Park Model

Prospect Park's group was established in the 1980s. The 526-acre park is the heart of Brooklyn and is used by 1.7 million people every year. The park, designed by Frederick Law Olmsted and Calvert Vaux, was rapidly deteriorating from over use and under funding. The City of New York used Community Development Block Grant funds to create a Park Administrator's office solely for Prospect Park.

Following the infusion of public funds, Prospect Park Alliance was formed in 1987. It became clear that private funds were needed to supplement public funding and to successfully implement the plans for the park's restoration and enhancement. The Alliance raised private funds and oversaw the volunteer program. The director of the City's Prospect Park administrator's office also served as the president of the board of the Alliance. The dual role allowed for close coordination and collaboration.

Friends of Patterson Park Model

Friends of Patterson Park is another successful non-profit membership organization that was formed in 1998. Its purpose is "to promote, protect and advocate for our treasured common ground so that it can be enjoyed for generations to come." Patterson Park is a major city park located in an inner Baltimore neighborhood. Baltimore's waterfront is well known, gets a great deal of attention and receives significant resources from city and business leaders. Patterson Park has historic significance as the oldest park in Baltimore,

nationally significant due to its ties with the War of 1812 and Civil War history, and provides an important urban oasis and recreation site for Baltimoreans.

The Friends group considers these primary activities as part of their mission

- Advocating for and educating people about the importance of preserving this historic, urban green space
- Maintaining and promoting a positive park image
- Providing a forum for and ensuring community input into the process for change in the park
- Acting as a liaison between the community and the Baltimore City Department of Recreation & Parks
- Increasing fiscal and human (volunteer and staff) resources available for park projects and programs
- Fostering park stewardship in the community and building the skills of the community to care for the park
- Developing events and programs that bring the community into the park to learn, recreate, and make friends

Park Stewardship Options

The Friends of Fort Ward, the Descendents Society, or a newly formed group should be encouraged to more aggressively pursue the level of funding that is needed to responsibly steward and interpret these nationally significant resources. This effort, conducted as a partnership with the City, can positively influence a citywide effort to bring external funding to its museums, parks and open space. There is no current regionally based organization for a group from Fort Ward Park to partner that is dedicated to the preservation and interpretation of the Defenses of Washington or the African American communities that were established and grew around the circle forts.

Figure 70 - Rifle trench parapet

There are three distinct expansion options worth exploring to achieve more recognition, awareness and funding of Fort Ward Park and Museum.

- **Expand the mission, role and reach of the existing 'Friends of Fort Ward' Group**

  The current group is a membership organization that seeks donations to fund publications, guided tours, special programs and projects, and professional conservation and storage of the museum's collection, among other elements.

  Advantage

  The existing Friends of Fort Ward group is an established non-profit organization. The group has a relationship with OHA and the Museum operations and programming. Should the group have the desire and capacity to grow and expand their mission to encompass the entire park, the existing Friends group could play a more significant role in the management plan's implementation. This may be an opportunity for the group to broaden its membership and bring in a new generation of supporters.

Disadvantage

The Friends of Fort Ward has a very defined mission and a dedicated group of supporters that may or may not be interested or have the volunteer capacity to expand their reach without watering down what they are already doing well.

- **Form a New Regional Partnership**

  Fort Ward is one of the best preserved and interpreted examples of the circle forts that formed the Defenses of Washington and the communities that grew up around them. The recent partnership efforts by the The Fort Ward and Seminary African American Descendants Society, the City of Alexandria's Department of Recreation, Parks, and Cultural Activities and its archaeologists has resulted in wealth of new knowledge about "The Fort" community that can be interpreted to reach broader audiences. The focus of a new organization should be more regional in scope, with a key mission being the preservation and enhancement of the circle forts and their associated African American communities.

  Advantage

  The National Park Service has a 'Fort Circle Trail' established (designated as a "National Recreation Trail" by the US Department of Interior) and permanent, part-time staff assigned to that trail. A strong case for funding is through the expansion of the story to one that is more regional in scope and encompasses a unique piece of African American heritage that just is not being told anywhere else. Tying that history to the preservation, enhancement and interpretation of the circle fort system would be critical to increase the leverage for outside funding. Such a regional group, associated with the Fort Circle Trail, may be better able to access resources of the foundations that support the National Park Service sites. The National Park Foundation and its African American Experience Fund, (AAEF) is the only national fundraising organization of the congressionally chartered, National Park Foundation that supports and preserves African American history found in national parks (see http://aaexperience.org/about-aaef).

  Disadvantage

  A regional partnership would be a significant challenge to start and initiate. The potential exists that the more day-to-day needs for Fort Ward Park may get lost among the competing interests of the multiple jurisdictions that would form the partnership. While more leverage could be obtained for future funding, the larger pool of potential funding would have to be shared more broadly.

  Successful organizations that operate to conserve and enhance parks are typically very well endowed at their start, focus directly on the primary park in the community (such as Prospect Park in Brooklyn or Patterson Park in Baltimore), have a large number of users from which they can draw their support and have a highly deteriorated park as the focus of their attention.

  Could either model work for a 47-acre park on the west end of a city that in 2010 had a population of less than 150,000? It would be a significant challenge—one that would require all of the groups with an interest in the future of Fort Ward: whether it is the African American heritage; the Civil War

heritage; recreation or urban nature that are valued—to work together with common purpose and resolve.

Moreover, it may be difficult, in these days of such a highly competitive funding environment, to achieve the necessary momentum to make such an organization work for the benefit of Fort Ward Park alone.

- **Phased Approach**
  A third way, then, might be to consider both moderate expansion of the Friends of Fort Ward for the near term to work on gaining support for the needed expansion of the museum to bring African American heritage into the museum and move Civil War heritage outside into the landscape of the park. The longer-term focus would be to initiate the partnership efforts needed to create a Fort Circle Trail regional support group of which Fort Ward Park would be a critical player. This may necessitate the reforming of the existing friends group and a rewriting of the mission and goals, while expanding the board of directors to reflect the broadened vision.

Park-wide Best Management Practices for Physical Changes

Woodland Management

- Prioritize tree removals by first identifying those trees that pose the greatest threat of windthrow or loss during a storm.
- Remove the trees identified as posing the highest risk, along with non-native invasive species, short-lived old-field invader species, species with shallow root systems, and all debris, brush, and other material not considered healthy vegetation from the earthworks.
- Assess the resulting light levels and leaf litter coverage.
- Over time all trees, including saplings, should be removed from the earthen parapet and ditch. Healthy, existing, longer-lived hardwood saplings that do not possess shallow root systems should be removed last once the desired forest management conditions are met.
- Healthy, longer-lived hardwood trees located around the earthworks should be retained and maintained, and augmented with new plantings, to provide leaf litter to protect the soil of the earthworks from erosion. In areas where trees have been removed, allow saplings of the longer-lived hardwoods to become established around the earthworks, but continue to remove trees from the earthworks themselves.

Ground Disturbance

- Avoid disturbing the soil during tree removal activities. Special care must therefore be taken in the removal process so as to not cause erosion. Trees should be sectioned and the cut sections lowered to the ground, taking care not to disturb existing soil and grades. Remove non-native invasive plants such as tree-of-heaven and Japanese honeysuckle identified during monitoring programs by cutting stems flush with the ground and applying a systemic herbicide. Avoid hand-pulling or other techniques that may cause soil disturbance.

Landscape Cultural Practices

- Cut stumps flush with the surrounding grades and apply a systemic herbicide to the cut end of deciduous hardwoods to discourage resprouting. Stump grinding of trees removed from the earthworks is not recommended due to the disturbance this would cause to potential archaeological resources and the stability of the earthen structures. Stump grinding may take place in portions of the park where ground disturbance is allowed, or with supervision from OHA.
- Monitor earthworks to ensure that landcover of leaf litter or grass entirely covers the earthworks as an erosion control measure.

Ground Surface Manipulation

- Retain and maintain existing grades, except where drainage or soil erosion problems have been identified. In particular, avoid modifying existing topography that may reflect evidence of military activities. Also avoid removing soil in the environs of the earthworks. If soil is added in the vicinity of the earthworks to improve drainage, a sand tracer could be used to identify the repair for future archaeological investigations.

Best Management Practices for Earthworks

Although individual approaches to earthworks management vary depending on site-specific conditions and management capabilities, there are four fundamental components of any earthworks management program:

- Understanding historic landscape conditions through research, documentation, and archaeological investigation;
- Understanding contemporary landscape conditions through inventory, mapping, documentation, and assessment;
- Establishing a management strategy that sets forth goals, issues, concerns, and a desired outcome, as well as a prioritized process for achieving the vision; and
- Evaluating the success of the process through review and monitoring, and revising the management plan as needed based on the evaluation.

Although many of these efforts have already been addressed to some degree (for example, documentation of the historic origin, location, and use of the earthworks has already been completed) park mapping and documentation will need to be updated as elements of the management plan are implemented, such as where new trails are added or erosion is repaired, and to record monitoring information.

Best Management Practices for Landcover Establishment

- Establish criteria for the desired character and composition of new landcover. For example, for landcover on the earthworks, consider the following:
  - Species must be able to be maintained at a height of between three and fifteen feet above the ground.
  - Species must be suited to local soil types, the planting zone, and rainfall conditions (soil testing should precede species selection).
  - Species should be drought tolerant.
  - Species must provide above ground cover and/or a root system that protects against soil erosion characteristics particular to the local soil.
  - If the species provides long-term soil erosion protection but no short-term protection, there must be a viable annual or interim landcover option for the establishment period.

  - The long-term cover species must be perennial or self-perpetuating, although temporary cover species may be annual.
  - Preference will be given to a species that is relatively easy to establish.
  - Preference will be given to species with greater benefits to wildlife.
  - Preference will be given to a species that has less onerous maintenance requirements than fescue, specifically as regards mowing frequency.
  - Preference will be given to native species over non-native species.
  - Non-native invasive species will not be used.
- Re-vegetate all disturbed soil in a manner that optimizes plant establishment for that specific site, unless ongoing disturbance at the site will prevent establishment of non-native invasive species.
- Use local seeding guidelines and appropriate mixes, but realize that many species previously recommended for this purpose are now presenting non-native invasive problems. Use native material where appropriate and available. Re-vegetation may include plug planting, seeding or hydroseeding, fertilization, and mulching.
- Monitor and evaluate the success of revegetation in relation to the project plan.
- When re-vegetating areas that were previously dominated by non-native invasive plants, try to achieve at least 90 percent control of the non-native invasive before attempting restoration.

Best Management Practices for Non-native Invasive Species Control

- Before starting any ground-disturbing activities, inventory non-native invasive plant infestations both on site and in the adjacent area.
- Begin activities in uninfested areas before operating in infested areas.
- Use uninfested areas for staging, parking, and cleaning equipment. Avoid or minimize all types of travel through infested areas, or restrict to those periods when spread of seed or propagules are least likely.
- When possible, to suppress growth of non-native invasive plants and prevent their establishment, retain relatively closed canopies.
- Minimize soil disturbance and retain desirable vegetation in and around the area to the maximum extent possible.
- Monitor infested areas for at least three growing seasons following completion of activities. Provide for follow-up treatments based on inspection results.
- When it is necessary to conduct soil work in infested roadsides and ditches, schedule the activity when seeds and propagules are least likely to be viable and to be spread.
- Quarantine soil from infested areas to prevent off-site spread.
- Non-native invasive plants can be introduced and spread by moving infested equipment, sand, gravel, borrow, fill, and other off-site material. Inspect material sources at site of origin to ensure that they are free of non-native invasive plant material before use and transport.

Best Management Practices for Woodlands

- Plan felling and extraction to minimize adverse effects on standing trees, ground cover, soil, and sensitive environmental features.
- Select silvicultural techniques according to slope, erosion-hazard rating, and/or risk of landslides in order to minimize soil disturbance and erosion, and disturbance of watercourse.
- Do not allow surface water runoff from any type of soil disturbance to run directly into a watercourse.

- Maintain the integrity of all streambeds and banks. When it is necessary to alter a stream's course for any reason, return the streambed and banks, as near as possible, to their original condition.
- Do not leave construction debris of any type in streambeds.
- Do not spray chemicals directly into water or allow chemicals, herbicides, fertilizers, or petroleum products to degrade surface or groundwater.
- Leave streamside management zones along watercourses both to filter sediment from overland flow and to maintain the inherent, normal temperature of water in all streams and other bodies of water.
- Provide for rapid revegetation of all denuded areas through natural processes supplemented by artificial revegetation where necessary.

Best Management Practices for Adapting Historic Road Traces as Trails

- Use only low-tire-pressure vehicles when working along historic road traces.
- Design new trails that follow or traverse historic road traces in such a way as to avoid cutting into the ground in order to preserve archaeological resources. Utilize fill sections rather than cutting into the existing grade wherever possible to achieve positive drainage and address drainage and erosion control needs.
- Incorporate local materials, such as stone and wood, into trail-related structures including water bars, stepping stones, signage, fences, steps, treads, stream crossings, stone boxes or treadways crossing marshy areas, retaining walls, trail markers, and shelters. Design these features to be clearly a product of their own time.

FINAL DRAFT

Fort Ward Park and Museum Area Management Plan

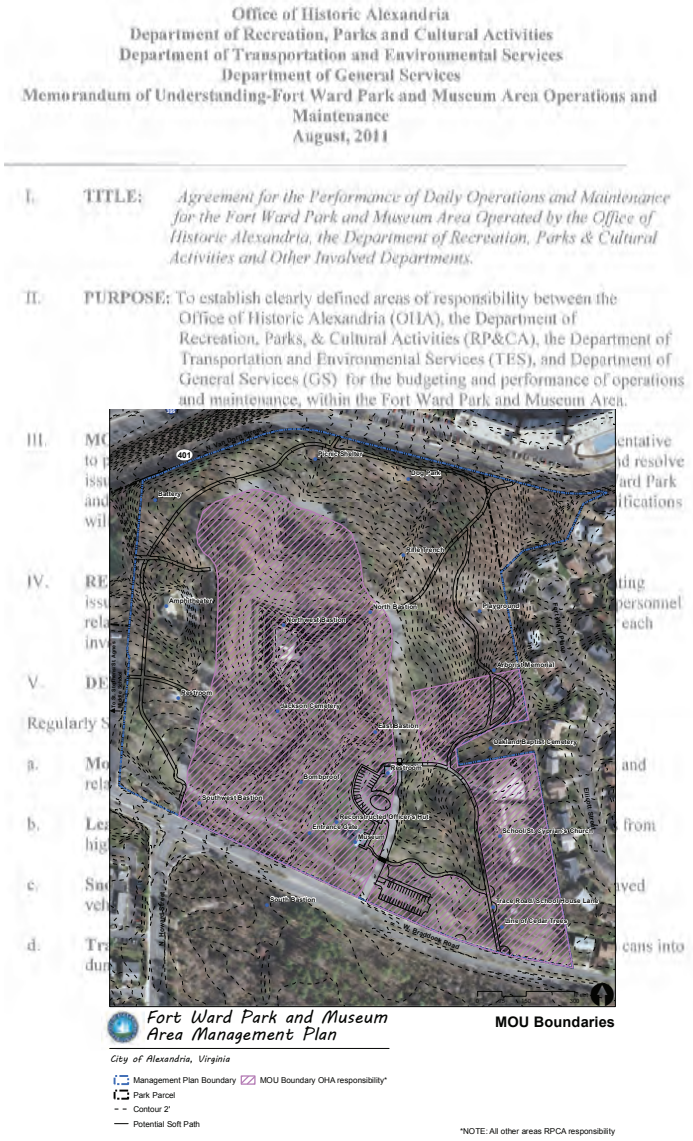
The City of Alexandria, Virginia
October 2014

SECTION II

6. BEST PRACTICES

Table of Contents

Best Practices: Park Management



Office of Historic Alexandria
Department of Recreation, Parks and Cultural Activities
Department of Transportation and Environmental Services
Department of General Services
Memorandum of Understanding-Fort Ward Park and Museum Area Operations and Maintenance
August, 2011

I. TITLE: *Agreement for the Performance of Daily Operations and Maintenance for the Fort Ward Park and Museum Area Operated by the Office of Historic Alexandria, the Department of Recreation, Parks & Cultural Activities and Other Involved Departments.*

II. PURPOSE: To establish clearly defined areas of responsibility between the Office of Historic Alexandria (OHA), the Department of Recreation, Parks, & Cultural Activities (RP&CA), the Department of Transportation and Environmental Services (TES), and Department of General Services (GS) for the budgeting and performance of operations and maintenance, within the Fort Ward Park and Museum Area.

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Action: Review and update the MOU annually

Benefits

- Establish clear lines of responsibility between entities responsible for care of the park; updated annually

Application

- Keep MOU current and responsive to park needs

Methods

- Annually review physical boundaries and task lists for each party; determine which entity is responsible for each activity (T&ES-Stormwater; GS-Buildings; OHA-cultural resource grounds; RPCA-park grounds; OHA and RPCA park programming)
- Annually update park management protocols for turf and meadow management; planting, maintenance and removal; pedestrian paths; installation/location of interpretive exhibits; modifications to vehicular circulation/parking; ground disturbance such as footers for playground equipment, fort structures
- Annually address landscape, trash, snow, site monitoring issues and responsibilities
- *2014 adjustments to the MOU document - expansion of OHA jurisdiction, incorporation of ALL landscape maintenance practices within each geographic area; modification to address rifle trench, adjustment of 'no mow' and leaf placement areas; incorporation of findings from stormwater runoff management study and responsibilities of T&ES*

Monitoring

- Quarterly - Review MOU to review effectiveness in addressing existing and new issues
- Annually - Review effectiveness of the division of responsibilities between OHA Contractor and Parks Operation staff; adjust responsibilities as appropriate; update associated mapping and distribute to all effected parties
- Host annual public meeting to provide an update on the park status and MOU
- Provide an annual Report to Council

Reference to Management Plan

Objective 1.1: Continue the collaborative management process between City agencies as established in the Memorandum of Understanding (MOU)

Strategy 1.1.1: Use the MOU process to assess and monitor progress and identify problems and solutions

Best Practices: Park Recognition

Example:
Annual reports of Central Park Conservancy
http://www.centralparknyc.org/assets/pdfs/annual-reports/AnnualReport_2013.pdf

Action: Communicate significance and importance of Fort Ward Park to a wider audience

Benefits

- Support of the park and museum is commensurate with the value of the resource to the City and to the region; it is clear that Fort Ward Park is recognized as a citywide and regionally important resource

Application

- Expand advocacy and support for Fort Ward Park and Museum

Methods

- Communicate the significance and condition of the park to City leaders, business leaders, preservation and conservation organizations and other civic groups
- Review examples of 'Friends' or other support groups to advocate and to raise supplemental funds
- Reconstitute and expand 'Friends' group with broad base of supporters and members
- Broaden advocacy during the City budget process for the park (tourism development, environmental value, cultural history, recreation site)
- Produce Annual Report on the state of the park—initial 'Annual Report' preparation by City staff, with intent to turn over preparation effort to 'Friends' group within three years

Monitoring

- Annually review effectiveness of Friends Group, measure activities accomplished; funding achieved; volunteer hours logged; challenges remaining

Reference to Management Plan

Objective 1.2: Make Fort Ward Park a priority in the City of Alexandria funding
Strategy 1.2.1: Plan for and communicate the needs and priorities for park management funding (operational and capital) as part of the City budget consistent with the responsible stewardship of a significant historic site and regional park serving the entire city and beyond

Best Practices: Park Funding

Indianapolis Parks Foundation
http://indyparksfoundation.org/site/what_we_do/faq

Action: Link financial needs of park to other City initiatives; broaden 'ask' for funding and support

Benefits

- Identification of common funding needs (operational and capital) among City parks, museums and historic sites; opportunity to leverage at a citywide scale

Application

- Tie park improvements to meeting citywide needs such as trail development, recreation accessibility improvement, tree canopy goals, etc. for funding purposes

Methods

- Tie park improvements to meeting citywide needs such as trail development, recreation accessibility, tree canopy goals, etc.
- Evaluate existing operational and capital funding and identify new sources of funding: bond issues; public/private partnerships; donations; and endowments
- Link preservation of Civil War and African American heritage to citywide preservation goals and objectives, NEH Museum Assessment Program, federal health and wellness goals, etc.

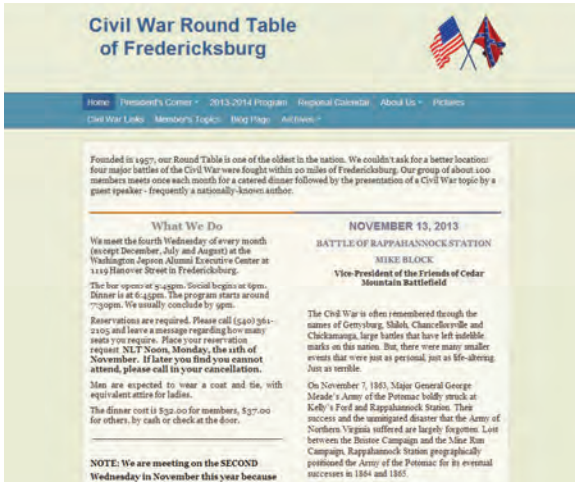
Monitoring

- Annually - Review funding achievements; measure increase of park funding through public and private efforts for maintenance operations and programming

Reference to Management Plan

Objective 1.2: Make Fort Ward Park a priority in the City of Alexandria funding
Strategy 1.2.1: Plan for and communicate the needs and priorities for park management funding (operational and capital) as part of the City budget consistent with the responsible stewardship of a significant historic site and regional park serving the entire city and beyond

Best Practices: Resource Education Enhancements



Fredericksburg Civil War Roundtable:
http://civilwarroundtablefredericksburg.com

Timucuan Science and History Symposium
(NPS park symposia and roundtable)
http://www.nps.gov/timu/naturescience/symposium.htm

Action: Sponsor educational and research panels and symposia

Benefits

- Expand recognition of the significance of the Civil War and African American heritage found at Fort Ward Park and region

Application

- Hold annual symposia on Fort Ward Park and its ties to the region, with more frequent, informal, year-round panel discussions to make significance of resources more visible to academic and museum professionals, as well as to the general public

Methods

- Develop a list of panel and symposia topics and research agenda
- Host informal panel discussions
- Host symposia annually or every two years addressing cultural complexities found at Fort Ward and the region

Monitoring

- Assess interest via attendance, attendees and topics and evaluate if outreach is succeeding

Reference to Management Plan

Objective 1.3: Support and finance enhancements to park facilities to meet the needs of the broadest array of park users and neighbors

Strategy 1.3.1: Broaden the array of programming and public art in Fort Ward Park

Best Practices: Resource Education Enhancements

Example:
The Friends of Mason District Park 'Spotlight by Starlight' (small scale funding by program and membership)
http://www.fairfaxcounty.gov/parks/performances/spotlight-by-starlight.htm

Action: Expand community-oriented offerings at the amphitheater

Benefits

- Expanded community-oriented programming of the existing amphitheater facility

Application

- Tie scale of event to capacity of park; focus on local community-scaled events

Methods

- Program the amphitheater in conjunction with local community groups as sponsors and performers (movie night, City grant recipient performances, etc.)
- Address the parking demand for events or activities by forming shared use agreements with adjacent schools (public and private)
- Address inadequacy of the existing restroom facilities by provision of temporary, accessible structures while existing facilities are made accessible and upgraded
- Evaluate if corporate or nonprofit underwriting is available

Monitoring

- Assess attendance, survey attendees for interest and programming ideas
- Annually re-evaluate operational costs to RPCA— due to additional staff hours required for operation and clean up

Reference to Management Plan

Objective 1.3: Support and finance enhancements to park facilities to meet the needs of the broadest array of park users and neighbors

Strategy 1.3.1: Broaden the array of programming and public art in Fort Ward Park

Best Practices: Resource Education Enhancements

Steigerwald Lake Wildlife Trail, Washougal, WA
http://columbiariverimages.com/Regions/Places/gibbons_creek_wildlife_art_trail.html

Action: Locate public art in collaboration with the City's Office of Arts' Public Art Master Plan

Benefits

- Opportunity to enhance the park and engage park visitors

Application

- Identify specific projects where public art should be considered as part of design or interpretive program

Methods

- Tie recommendations to those incorporated in the Public Arts Master Plan and the City's Office of the Arts
- Recognize that maintenance requirements for public art installations may differ from standard parks maintenance practices

Monitoring

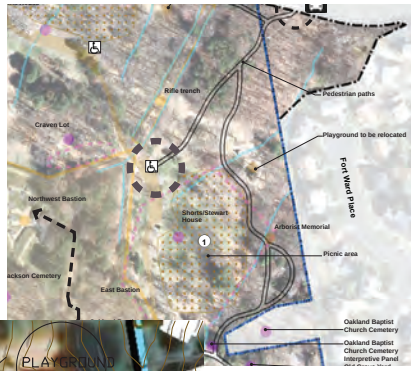
- Annually evaluate maintenance needs

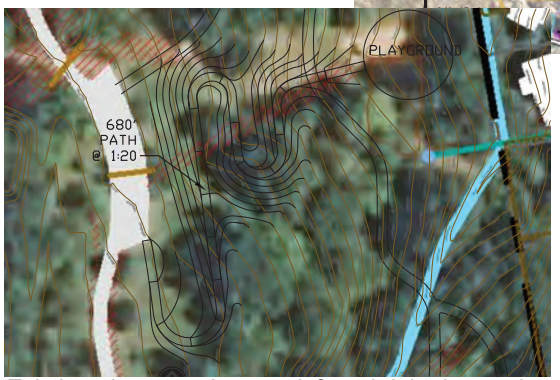
Reference to Management Plan

Objective 1.3: Support and finance enhancements to park facilities to meet the needs of the broadest array of park users and neighbors

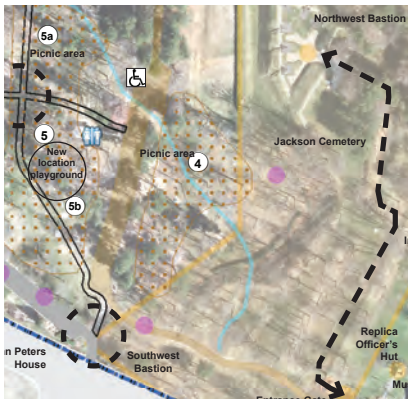
Strategy 1.3.1: Broaden the array of programming and public art in Fort Ward Park

Best Practices: Enhance Park's Accessibility





Existing playground, upper left and right; lower sketch showing extent of grading required to meet ADA standards for path connecting playground and parking adjacent to loop path



Potential playground location on western side of park

Action: Relocate the current playground facility to the western side of the park, making access and equipment accessible

Benefits

- Accessible playground and access
- If moved to western side of park, enhance accessibility to playground and proximity to other supportive services - picnic area, restrooms, amphitheater

Application

- Extent of grading required to provide path that meets ADA Standards between existing playground equipment and parking area is cost-prohibitive
- Relocate playground to western side of park and provide access that meets ADA Standards

Methods

- Sketch to left demonstrates extent of grading required to provide access that meets 2010 ADA or 2009 ORAR standards is costly, relocating facility on more level site within the park will be less costly
- Identify alternative location for the playground near amphitheater and restrooms
- Ensure alternate site has adequate shade
- Ensure playground surfacing, equipment, access and parking meet ADA standards

Monitoring

- Annual replenishment and check of playground surface and access; weekly check on playground equipment
- Annual assessment of compliance with ADA standards

Reference to Management Plan

Objective 1.3: Support and finance enhancements to park facilities to meet the needs of the broadest array of park users and neighbors

Strategy 1.3.2: Enhance park's accessibility and meet ADA standards

Best Practices: Enhance Park's Accessibility

Courtesy of R.J. Thomas Mfg. Co. of Cherokee, Iowa

Excerpt from Standards

1011.2.1 Clear Ground Space:
36 inches (915 mm) on all usable sides of the table measured from the back edge of the benches

1011.4.2 Wheelchair Space. Picnic tables shall provide at least one wheelchair space for each 24 linear feet (7320 mm) of usable table surface perimeter. Wheelchair spaces shall be 30 inches (760 mm) minimum by 48 inches (1220 mm) minimum. Wheelchair spaces shall be positioned for a forward approach to the table and provide knee and toe clearance complying with 306 under the table

For recently published guidelines see: http://www.access-board.gov/guidelines-and-standards/recreation-facilities/outdoor-developed-areas/final-guidelines-for-outdoor-developed-areas/text-of-the-guidelines

Action: Provide accessible park furniture

Benefits

- Access to park facilities for all members of the community

Application

- As site furniture is replaced, ensure that fully accessible equipment is incorporated in replacement

Methods

- Identify features and equipment that must be upgraded to ensure accessibility—drinking fountains, interpretive and orientation features, picnic tables, grills, benches etc.
- Replace aging equipment with accessible equipment

Monitoring

- Annual inspection of park furnishings, documenting compliance with current ADA standards

Reference to Management Plan

Objective 1.3: Support and finance enhancements to park facilities to meet the needs of the broadest array of park users and neighbors

Strategy 1.3.2: Enhance park's accessibility and meet ADA Standards

Best Practices: Enhance Park's Accessibility

Action: Make existing paved loop pedestrian path system accessible where possible and sign areas where not possible

Benefits

- More accessible park pedestrian path system

Application

- Provide continuous accessible pedestrian path where physically and financially feasible; sign areas slope (cross slope and running slope based on terrain exceptions clause - see Table 2 in Executive Summary of final rule) prevent path from meeting standards

Methods

- Repave pedestrian walking loop with ADA compliant materials
- Replace existing speed bumps with traffic calming technique (speed cushions with 36" between cushions) that is ADA compliant
- Complete installation of ADA alternatives or replacements to existing stairs and bridges in the park
- Provide signs for areas that are not accessible indicating steep slope

Monitoring

- Annually inspect facilities for compliance with current ADA standards and regulations

Reference to Management Plan

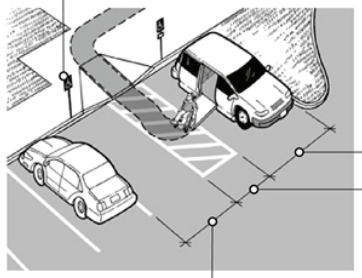
Objective 1.3: Support and finance enhancements to park facilities to meet the needs of the broadest array of park users and neighbors

Strategy 1.3.2: Enhance park's accessibility and meet ADA Standards

http://www.ada.gov/regs2010/2010ADAStandards/Guidance2010ADAstandards.htm

http://www.access-board.gov/guidelines-and-standards/recreation-facilities/outdoor-developed-areas/final-guidelines-for-outdoor-developed-areas/single-file-version-of-rule#text

Best Practices: Enhance Park's Accessibility



http://www.ada.gov/regs2010/smallbusiness/smallbusprimer2010.htm

Diagram showing 12 spaces required to meet ADA standards, locations shown in red; prepared by Kimley-Horn 2012

Action: Provide accessible parking and pathways for all park and museum features

Benefits

- Provision of accessible parking for park visitors

Application

- Develop accessible parking spaces in areas needed as indicated in Kimley-Horn 2012 reports; 12 spaces shown in diagram on left with additional spaces shown in gravel lot adjacent to athletic fields

Methods

- Provide accessible parking spaces in the park by reconfiguring pavement grade, paving, striping, and location
- Existing gravel lots require surface for ADA parking spaces that meets ADA standards
- Upgrade or provide alternative access paths to site features, where possible incorporate proposed 'soft path' alignment

Monitoring

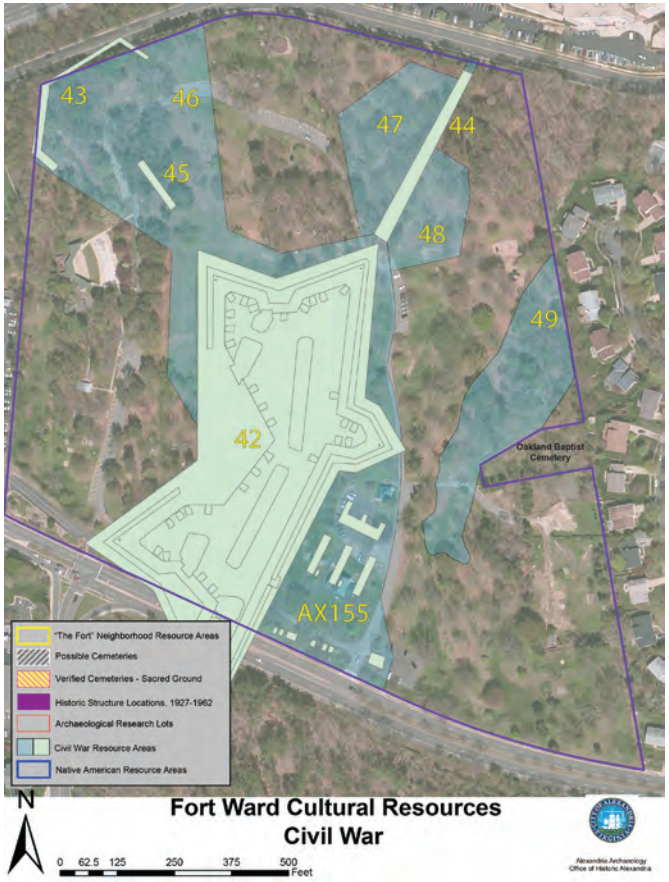
- Annually inspect facilities for compliance with ADA standards and regulations

Reference to Management Plan

Objective 1.3: Support and finance enhancements to park facilities to meet the needs of the broadest array of park users and neighbors

Strategy 1.3.2: Enhance park's accessibility and meet ADA Standards

Best Practices: Ground Disturbance



Action: Mark and protect unrecognized Civil War archaeology

Benefits

- Additional knowledge and understanding of Fort Ward; Civil War Garrison area (barracks), ancillary fort buildings, outer works, covered way, rifle trench, artifact scatters

Application

- Continue to add to the existing site inventory of historic resource investigation

Methods

- Investigate the Civil War Garrison (barracks) area in anticipation of potential parking lot reconfiguration and museum expansion using a site metal detector survey as first step
- Investigate outer works, covered way, rifle trench and artifact scatters using a site metal detector survey as a first step
- Perform a laser survey of the extant earthworks to accurately record the current level of preservation and use this data for a baseline in future monitoring and assessment

Monitoring

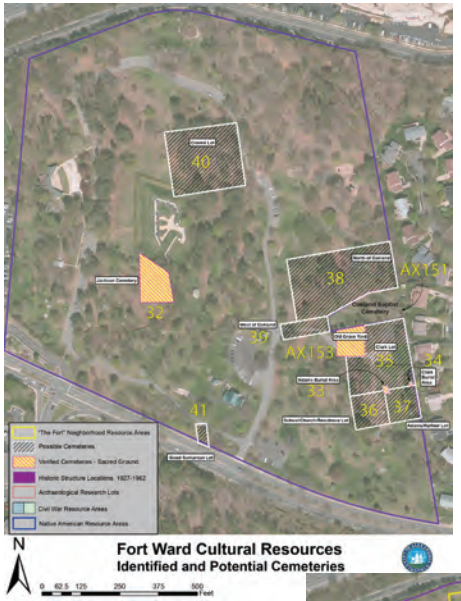
- Annually update mapping and documentation on park resources; aggregating work completed through the year in one accessible document

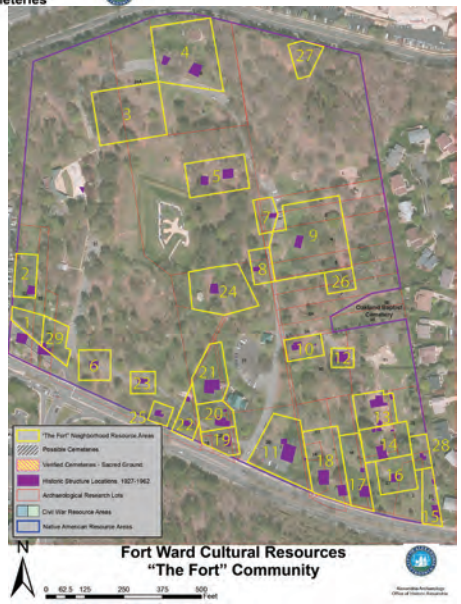
Reference to Management Plan

Objective 2.1: Protect vulnerable park areas from adverse ground disturbing activities

Strategy 2.1.1: Determine level of permitted ground disturbance

Best Practices: Ground Disturbance





Action: Mark and protect "The Fort" community and burial sites

Benefits

- Recognition of "The Fort" community for a larger audience; acknowledgement that the site has been home to different users over time, with varying stories to tell and resources to protect

Application

- Continue to add to the existing site inventory of historic resource investigation; make protection and interpretation of "The Fort" community resources a park priority
- Incorporate the larger story of place within specific periods of history and use the patterns of site buildings and landscape features to assist in storytelling

Methods

- Place appropriately designed enclosure around the perimeter of the Old Grave Yard and Jackson Cemetery; mark graves at the Clark Burial Grounds
- Use proper methods for archaeological investigation of the School House/Church/ Residence site
- Continue to identify the locations of "The Fort" community and establish protection strategies for maintaining above-and below-ground evidence of "The Fort" community

Monitoring

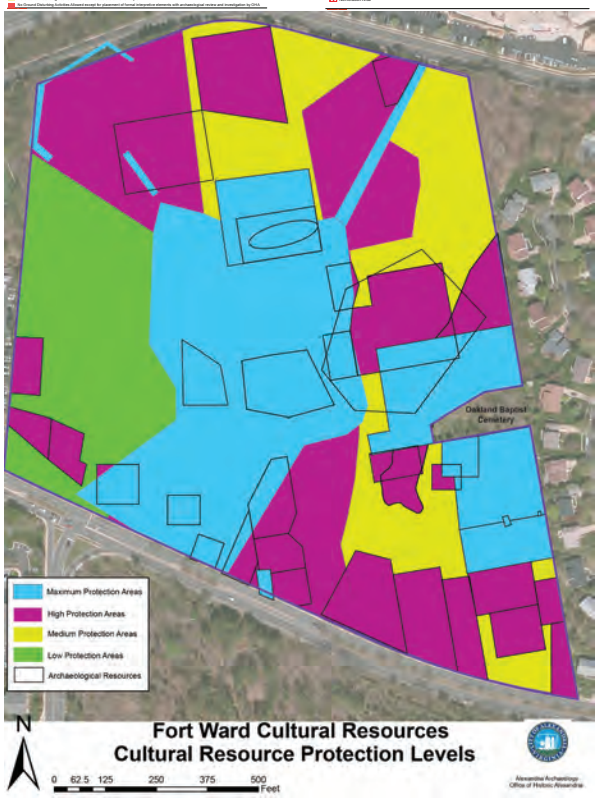
- Annually update mapping and documentation on park resources; aggregating work completed through the year in one accessible document

Reference to Management Plan

Objective 2.1: Protect vulnerable park areas from adverse ground disturbing activities

Strategy 2.1.1: Determine level of permitted ground disturbance

Best Practices: Ground Disturbance



Action: Map areas in conjunction with OHA to identify where ground disturbance may occur unsupervised; where ground disturbance may occur with supervision; and where ground disturbance is NOT allowed

Benefits

- Clear and updated documentation of level of ground disturbance permitted, and under what observance protocol with OHA oversight

Application

- Identify level of cultural resource sensitivity to ground disturbance (initial mapping completed Winter 2014)

Methods

- Keep GIS database current with additional investigation results and updates
- Establish and renew protocols with OHA and RCPA related to notification procedures prior to activity; level of monitoring required, if any; and restoration required to minimize or eliminate erosion potential
- Include protocols in the MOU

Monitoring

- Annually update map indicating level of sensitivity to ground disturbance based on OHA soil profile research and other ongoing park investigations
- Annually update protocols in MOU related to notification and ground disturbing activities
- Annually, in conjunction with MOU renewal, ensure that RPCA Operations receives updated ground disturbance mapping to update resource management related zones: aeration, tree planting, stump grinding, etc.

Reference to Management Plan

Objective 2.1: Protect vulnerable park areas from adverse ground disturbing activities

Strategy 2.1.1: Determine level of permitted ground disturbance

Best Practices: Heal Erosion

Action: Address animal tunneling in earthworks

Benefits

- Reduction or elimination of animal tunnels that threaten the integrity of the earthworks

Application

- Remove tunneling animal and repair damage to earthworks

Methods

- Identify animal and means to address removal or control
- Remove tunneling animal from area
- Repair tunneling damage by filling tunnels with archaeologically sterile soil to avoid compromising the information potential of the earthworks
- Cover tunnel entrance with a degradable erosion control fabric and seed or cover with leaf litter or mulch

Monitoring

- Annually inspect, and if needed remove animal and repair tunneling damage to earthworks

Reference to Management Plan

Objective 2.2: Heal areas of erosion and compacted soils within the park

Strategy 2.2.1: Stabilize surface areas

Best Practices: Heal Erosion

Action: Restore shovel pit testing sites to original grade

Benefits

- Shovel holes stabilized and no longer contributing to park erosion or creating a trip hazard

Application

- Fill and stabilize with planting to match surrounding land cover

Methods

- Monitor shovel pits to repair sinking
- Identify holes to be filled
- Require OHA and contractor to carefully remove land cover prior to shovel test
- When testing is complete, backfill and tamp pit and replace land cover cap

Monitoring

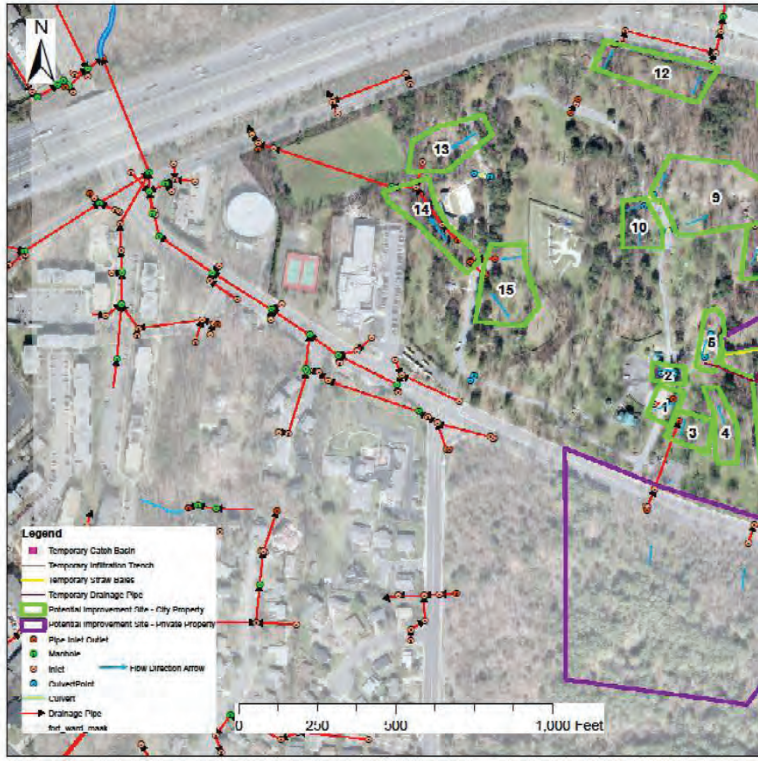
- Repair shovel pits upon completion of testing, use backfill, tamp and replace cover cap for full landscape restoration
- Annually inspect and repair shovel pits until clear that pit has stabilized (5 year period)

Reference to Management Plan

Objective 2.2: Heal areas of erosion and compacted soils within the park

Strategy 2.2.1: Stabilize surface areas

Best Practices: Prevent Stormwater Runoff Erosion



Action: Redirect stormwater and sheet flow away from sensitive cultural and recreational resources through small berms, spreaders and other techniques

Benefits

- Reduction and elimination of stormwater runoff erosion damage to park resources

Application

- Implement Stormwater Management Plan that promotes landform based solutions, avoids cutting in areas of sensitive archaeological resources and promotes groundwater infiltration (see URS Study 2014, Appendix I, for specific recommendations)

Methods

- Where erosion is present, subtly shape landform to redirect sheet flow away from sensitive cultural resources such as burial grounds and cemeteries and recreation resources
- Add protective land cover such as turf or leaf litter
- Use infiltration methods to capture sheet flow that are integrated with park design and character instead of closed systems with piping
- Clean storm drains after leaf fall in autumn and in late spring to remove winter debris

Monitoring

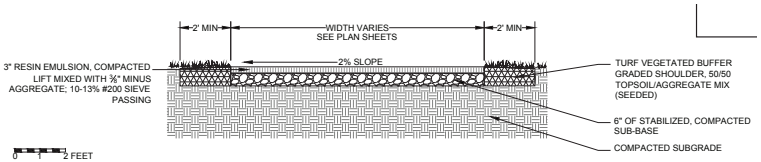
- Annually inspect outfalls (RPCA) and conduits (T&ES) to ensure clear
- Annually inspect park for signs of increasing erosion - if found, add to database and address

Reference to Management Plan

Objective 2.2: Heal areas of erosion and compacted soils within the park

Strategy 2.2.1: Stabilize surface areas

Best Practices: Prevent Stormwater Runoff Erosion



Action: Reinforce eroded edges of paved surfaces

Benefits

- Reduction and elimination of stormwater runoff erosion damage to park resources

Application

- Implement Stormwater Management Plan that promotes landform based solutions, avoids cutting in areas of sensitive archaeological resources and promotes groundwater infiltration (see URS Study 2014, Appendix X, for further guidance)

Methods

- Short-term: Add river cobble stone to temporarily fill eroded areas immediately adjacent to pavement
- Long-term: Redirect storm water away from pavement edge and install reinforced shoulders (50% aggregate/50% soil mix)
- Clean storm drains after leaf fall in autumn and in late spring to remove winter debris

Monitoring

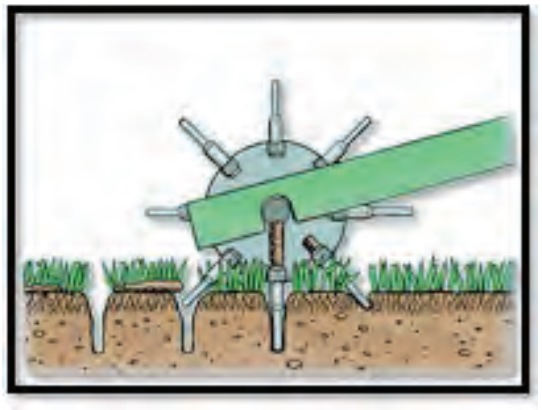
- Annually inspect outfalls (RPCA) and conduits (T&ES) to ensure clear
- Annually inspect path and road edge for signs of erosion

Reference to Management Plan

Objective 2.2: Heal areas of erosion and compacted soils within the park

Strategy 2.2.1: Stabilize surface areas

Best Practices: Heal Stormwater Runoff Erosion



Action: Repair surface erosion damage

Benefits

- Reduction and elimination of stormwater runoff erosion damage to park resources

Application

- Implement Stormwater Management Plan that promotes landform based solutions, avoids cutting in areas of sensitive archaeological resources and promotes groundwater infiltration (see URS Study 2014, Appendix X, for further guidance)

Methods

- Add soil to fill holes, smooth out eroded areas and to reshape ground plan to redirect surface flow from becoming channelized and causing erosion (playground, earthworks, burial sites)
- Aerate, top dress and reseed turf cover where allowed per OHA ground disturbance mapping

Monitoring

- Annually inspect park for signs of erosion

Reference to Management Plan

Objective 2.2: Heal areas of erosion and compacted soils within the park

Strategy 2.2.1: Stabilize surface areas

Best Practices: Heal Erosion Damage from Foot Traffic

Action: Protect earthworks from undesignated foot traffic

Benefits

- Preservation of earthworks

Application

- Block points of informal, undesignated foot access to earthworks, including informal park access along rifle trench

Methods

- Remove informal trail from rifle trench parapet by blocking access
- Identify alternative access point(s) to park from North Van Dorn Street
- Deter visitors from walking on earthworks with sign indicating that rifle trench area is under restoration and is not a foot path; if not effective use visually unobtrusive barrier system
- Cover rifle trench with leaf litter

Monitoring

- Annually monitor earthworks for erosion damage and soil compaction of trench embankment

Reference to Management Plan

Objective 2.2: Heal areas of erosion and compacted soils within the park

Strategy 2.2.1: Stabilize surface areas

Best Practices: Heal Erosion Damage from Foot Traffic

President Andrew Jackson's Family Cemetary

Taken at The Hermitage, home of President Andrew Jackson. Nashville, Tennessee.

http://www.flickr.com/photos/rbglasson/3452567306/

Alexandria National Cemetery fence style adapted from historic style (left) and grave demarcation (right)

Action: Protect burial sites from unintentional recreational use

Benefits

- Respect and preservation of burial sites

Application

- Public notice that cemeteries and burial sites are not active recreation areas

Methods

- Install signs indicating that the immediate site is a burial site or cemetery
- If necessary, install enclosure system using plant materials or fencing that is sympathetic to its historic surroundings at the perimeter of the Old Grave Yard, Clark Burial Grounds and Jackson Cemetery

Monitoring

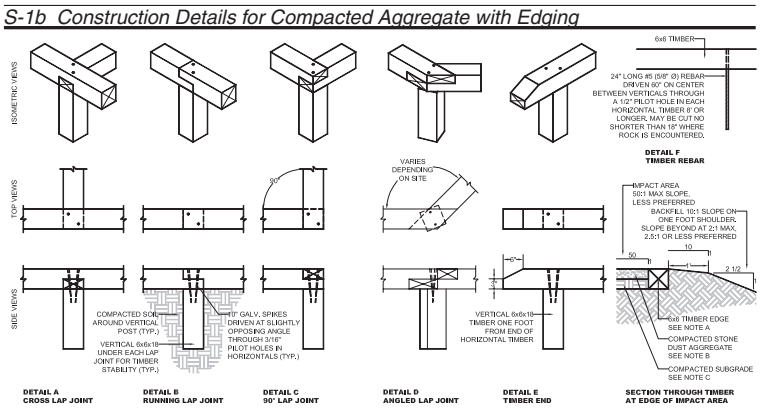
- Monitor site for erosion damage and inappropriate use

Reference to Management Plan

Objective 2.2: Heal areas of erosion and compacted soils within the park

Strategy 2.2.1: Stabilize surface areas

Best Practices: Improve Compacted Soil



Alternative surfacing for picnic grounds surface areas with details for installation

Action: Renovate picnic areas by rotation or partial closure of group area

Benefits

- Renovation and stabilization of heavily used resource—picnic areas have exposed tree roots, no or minimal turf growth and compacted soils from heavy use and drainage runoff

Application

- Remove all or a portion of a group picnic area from use during the growing season for renovation of ground surface

Methods

- Inventory and rank the five existing group picnic areas in terms of damage and need for renovation
- Refer to City of Alexandria Recreation, Parks and Cultural Activities 2013 Picnic Season Summary for utilization of specific picnic areas within Fort Ward Park—in 2013 Area # 3 had the lowest reservation count of the group areas within the park and Area #5 received the third largest number of reservations of the five sites
- Identify a sixth site (potentially split Picnic Area 5 into two separate picnic areas for purposes of rotation due to its large geographic size and number of reservations in 2013 falling in the mid-range for group areas within the park) to serve as a rotation site should an area be so damaged that it must be fully removed from a growing season's use
- Annually remove a portion of a group picnic area from use for renovation during a growing season (or an entire picnic group area if necessary)
- Combine picnic table pads into singular, soft surface in heavily used areas

Monitoring

- Annually monitor group picnic areas for erosion damage and compacted soils

Reference to Management Plan

Objective 2.2: Heal areas of erosion and compacted soils within the park

Strategy 2.2.2: Improve compacted soils

Best Practices: Restore Site of Former Maintenance Yard

Action: Remove former maintenance yard access drive, fencing and gate

Benefits

- Restoration of eastern parkland to park landscape that is a contemplative setting for "The Fort" community burial sites

Application

- Complete archaeological investigations of area within fence prior to removal of fencing and access drive (secure investigation site)
- Remove fencing, gate and access drive to former maintenance yard

Methods

- Coordinate with OHA prior to removal - complete archaeological investigations to ensure appropriate direction is given for ground disturbing activities
- Remove gravel paving from former access road and top dress and reseed if ground disturbance is acceptable to OHA
- If ground disturbance is not acceptable, reshape landscape in area of road to direct storm water away from cemetery and to provide enough soil surface on top of former access drive to support turf growth
- Remove perimeter fencing and gate from former maintenance yard

Monitoring

- Removal of fence and gate following completion of archaeology investigations within fenced area

Reference to Management Plan

Objective 2.2: Heal areas of erosion and compacted soils within the park

Strategy 2.2.3: Relocate or remove uses that conflict with resources

Best Practices: Restore Site of Former Maintenance Yard

Action: Remove former maintenance structures from eastern edge of park

Benefits

- Restoration of eastern parkland to park landscape that is a contemplative setting for "The Fort" community burial sites

Application

- Remove two structures located in the former maintenance yard and relocate, if practical, in a less sensitive area of park (adjacent to athletic fields, for example)

Methods

- Coordinate with OHA prior to removal - ground disturbing activities
- Remove two park structures from current location on eastern edge of park
- Relocate elsewhere in park if possible
- If relocation is not possible, adhere to 'Environmental Action 2030' goals for reducing, reusing and recycling solid waste when considering relocation costs and benefits of the two structures
- Repair site with sterile soil (in archaeological terms), add topsoil, smooth and seed with turf

Monitoring

- Remove structures from site

Reference to Management Plan

Objective 2.2: Heal areas of erosion and compacted soils within the park

Strategy 2.2.3: Relocate or remove uses that conflict with resources

Best Practices: Restore Site of Former Maintenance Yard

Action: Reshape or remove fill at site of former maintenance yard

Benefits

- Restoration of eastern parkland to park landscape that is a contemplative setting for "The Fort" community burial sites

Application

- Reshape or remove some or all of the fill (gravel, mulch, dirt)
- Integrate with storm drainage proposals for protective berms for the Old Grave Yard and Oakland Baptist Cemetery

Methods

- Work with OHA to determine degree of ground disturbance allowed following archaeological investigation of site
- Restore the site to its historic grade by removal of fill—if restoration is not feasible, shape land to reflect general landform and character of surrounding historic landscape
- Repair site with sterile soil (in archaeological terms), add topsoil, smooth and seed with turf

Monitoring

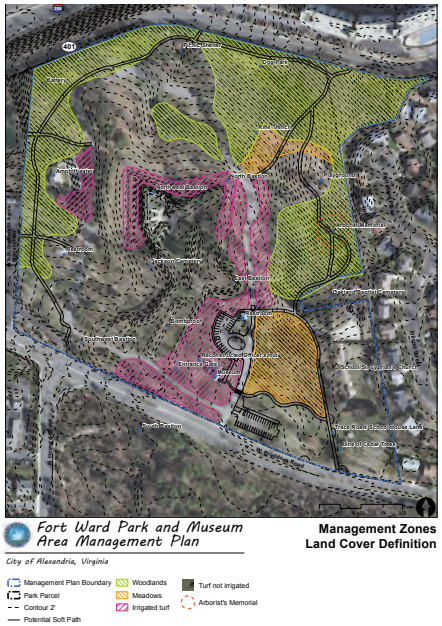
- Restoration of landform

Reference to Management Plan

Objective 2.2: Heal areas of erosion and compacted soils within the park

Strategy 2.2.3: Relocate or remove uses that conflict with resources

Best Practices: Enhance Park's Natural Character



Action: Establish boundaries for turf and meadow management

Benefits

- Turf and meadows that fit within the overall character of the park's landscape

Application

- Establish turf and meadow areas that reflect topography, historic resources and recreational needs

Methods

- Define Management Zones for turf - irrigated, non-irrigated and meadow
- Identify turf areas to serve as flexible recreation areas that are accessible from the pedestrian system and parking areas and do not conflict with cultural resource preservation or interpretive activities
- Identify turf areas to form a protective land cover on historic resources (not active recreation site)
- Identify meadow areas and align them with the shape of the land and its drainage patterns; incorporate "no mow" areas into the overall park aesthetic
- Clearly identify meadow plantings as intentional and productive for wildlife (butterflies, birds, voles, insects)
- Locate wide mowed paths within meadows for walkers and visitor education

Monitoring

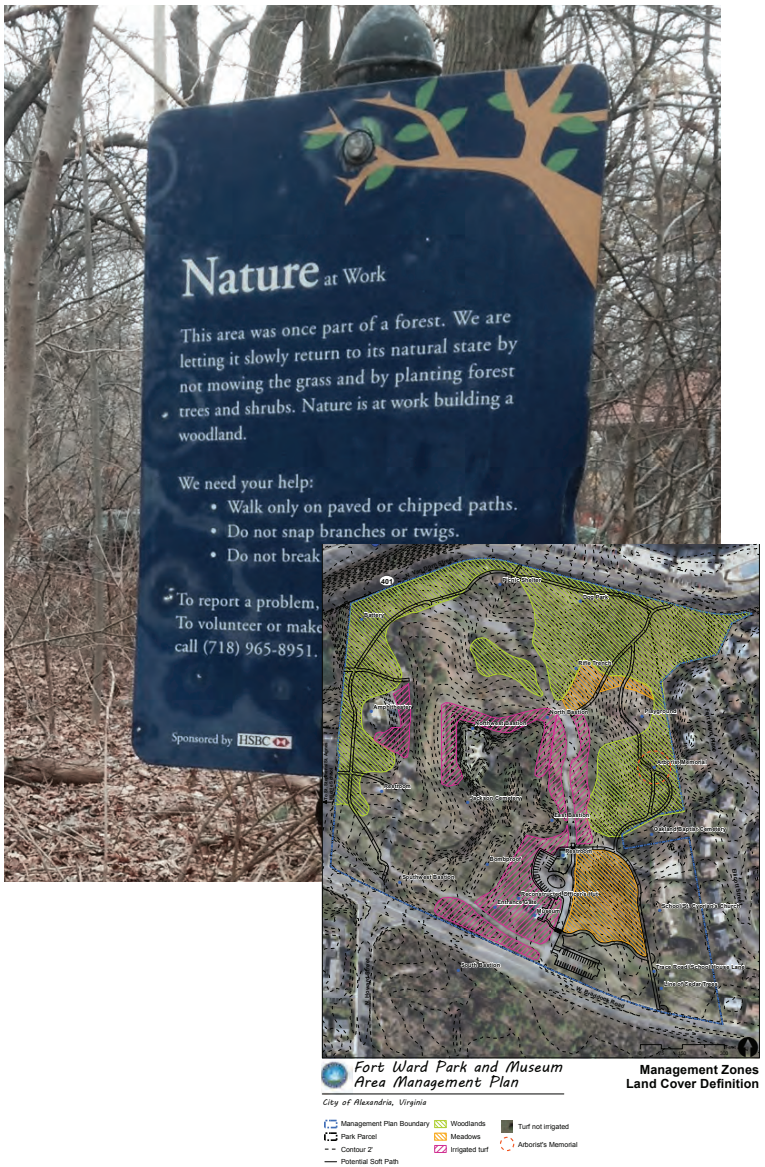
- Monitor turf and meadow growth (see Landscape Cultural Practices for more information)
- Annually evaluate and update map to reflect current conditions

Reference to Management Plan

Objective 2.3: Enhance park's vegetative character and open space

Strategy 2.3.1: Maintain mix of open and wooded landscapes

Best Practices: Enhance Park's Natural Character



Fort Ward Park and Museum Area Management Plan
City of Alexandria, Virginia

Management Zones Land Cover Definition

Management Plan Boundary
Park Parcel
Contour 2'
Potential Soft Path
Woodlands
Meadows
Irrigated turf
Turf not irrigated
Arborist's Memorial

Action: Establish boundaries for areas managed for native woodlands

Benefits

- Reduce amount of grass to be mowed and mowing time
- Reduce competition for plant roots, resulting in healthier trees

Application

- Establish woodland areas

Methods

- Identify the Management Zone landcover type for woodlands
- Inventory the existing composition of designated woodland areas; manage for desired vegetation community and species to be removed (non-native invasive species for example)
- Shape woodland areas irregularly to better fit with natural site conditions; create woodland edges without corners or tight turns to ease mowing
- Sign woodlands to indicate intentional management as woodlands
- Identify and remove remnants from former recreation uses (picnic table slabs, waste can anchors, etc.)

Monitoring

- Monitor woodlands (see Landscape Cultural Practices for more information)
- Annually evaluate and update the map to reflect current conditions

Reference to Management Plan

Objective 2.3: Enhance park's vegetative character and open space

Strategy 2.3.1: Maintain mix of open and wooded landscapes

Best Practices: Enhance Park's Natural Character

Action: Determine role to play in 'City Arboretum' proposal

Benefits

- Clarification of the status of an arboretum - Fort Ward focused, or citywide concept
- If arboretum concept is expanded citywide, opportunities specific to Fort Ward's cultural and natural resources and history interpretation are expanded, allowing the park to better integrate its historic and cultural role and lessening the requirement to provide a full citywide arboretum within the boundaries of Fort Ward Park

Application

- If the park is no longer to serve as the singular arboretum for the city, the park's focus can be placed on ornamental plantings, native woodlands, meadows and historically appropriate plantings in support of the sites and time periods being interpreted within the park

Methods

- Use past plant surveys (mid 1980s and 2001) as a basis for determining what had previously been planted in the park
- Determine the role of Fort Ward Park within proposed the citywide arboretum
- Establish a vision for future vegetation composition in the park (consider native species, historic species - Civil War fort, "The Fort" community, Glenn Dale azalea plantings, etc.)
- Be aware of and consider maintenance requirements for plant materials - fertilizer, irrigation, etc.
- Don't plant any species that are considered to be non-native invasives in Virginia

Monitoring

- Update tree planting species list every five years in coordination with City Arborist

Reference to Management Plan

Objective 2.3: Enhance park's vegetative character and open space

Strategy 2.3.2: Develop and adopt planting approach for Fort Ward Park's natural and cultural landscapes

Best Practices: Enhance Park's Natural Character

Action: Develop and update data set on vegetative resources

Benefits

- Establishment of a baseline of vegetative cover, trends and patterns in the park

Application

- Develop an updated data set documenting park vegetation installed and removed, trends overall and status of key plantings such as Champion or Memorial species

Methods

- Correlate past plant surveys (mid 1980s and 2001) and make digitally accessible for future updates
- Determine existing tree canopy coverage in the park, and the City's goal for Fort Ward Park
- As a baseline, determine the current amount of shade coverage found on the walking paths, playground and picnic areas
- Assess the pattern of tree loss and decline
- Establish target goals (for example, amount of shade cover for picnic areas) based on current status
- Work with Northern Virginia Conservation Trust to develop baseline for vegetation

Operations and Maintenance Requirements

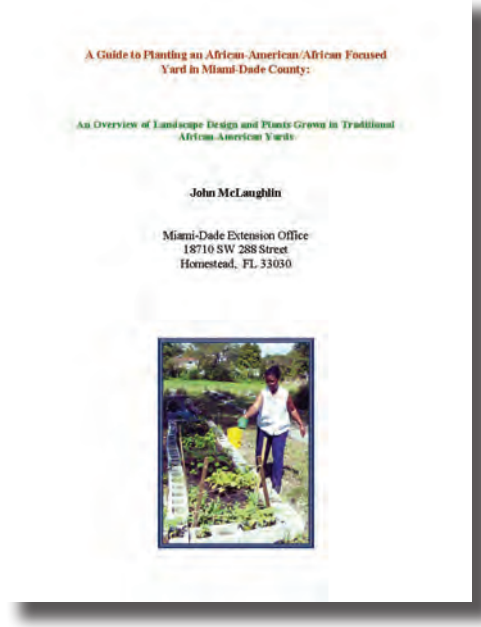
- Update data every five years

Reference to Management Plan

Objective 2.3: Enhance park's vegetative character and open space

Strategy 2.3.2: Develop and adopt planting approach for Fort Ward Park's natural and cultural landscapes

Best Practices: Enhance Park's Natural Character


A Guide to Planting an African-American/African Focused Yard in Miami-Dade County:

An Overview of Landscape Design and Plants Grown in Traditional African-American Yards

John McLaughlin

Miami-Dade Extension Office
18710 SW 288 Street
Homestead, FL 33030

Action: Develop a planting strategy, recommended plant list and planting zones

Benefits

- Clear direction for vegetation management

Application

- Identification of planting character and plant materials to be added to the park

Methods

- Draw on data collection to determine a master planting list for the park and develop a plant list by area, type, etc.
- Use historic aerial photography and oral histories to determine historic planting patterns, identify which to restore or interpret
- Ensure new plantings emphasize positive views and screen others (for example: new tree placement may better explain fort's fire-of-fire; screen utility boxes)
- Incorporate volunteers in plantings (Tree Stewards, Scouts, Garden Club, etc.) and organize a community service group or volunteers to assist with park maintenance - maintaining beds, planting trees, light pruning, etc.
- Follow guidance in City of Alexandria's Landscape Guidelines, April 2007 which lists preferred tree species and undesired non-native invasive plant species

Monitoring

- Revisit the planting strategy every five years

Reference to Management Plan

Objective 2.3: Enhance park's vegetative character and open space

Strategy 2.3.2: Develop and adopt planting approach for Fort Ward Park's natural and cultural landscapes

School House Lane at Fort Ward Park, upper left

An example of research needed at Fort Ward Park, lower right: A Guide to Planting an African American/African Focused Yard

Goal 2 - Park Character: Preserve, Protect, Repair and Maintain Resources ***The City of Alexandria, working with its boards and commissions, volunteers and park neighbors, will work to protect and maintain the nationally significant historic and cultural resources and locally significant natural resources found within Fort Ward Park.***

Best Practices: Research Opportunities

Action: Develop a data set on wildlife (birds, animals, etc.)

Benefits

- Information on park resources

Application

- Develop a data bank of park wildlife

Methods

- Survey and document use of the park by birds and wildlife
- Inventory and assess habitat types; link to potential wildlife populations
- Establish annual bird and wildlife surveys
- Work with Bio-Blitz approach
- Invite Northern Virginia Audubon Society to use the park as a counting location
- Identify desirable habitat enhancements to promote wildlife diversity
- Work with local universities—GMU, UMW, NOVA, etc. to develop data set on wildlife

Monitoring

- Annually monitor wildlife in the park

Reference to Management Plan

Objective 2.3: Enhance park's vegetative character and open space

Strategy 2.3.1: Maintain mix of open and wooded landscapes

Best Practices: City of Alexandria Monthly Maintenance Calendar

March
• Upon break in weather, spring cleaning begins
○ Weed all landscape beds by hand
○ Cultivate planting beds
○ Clean catch basins, and other drainage facilities within in the landscaped area
○ Removing all leaves, sticks and debris from the landscape
• Apply supplemental irrigation to trees and turf as necessary (specifically at Freedman's Cemetery)
• Replenish and grade stone dust on walking paths (material Supplied by the City) maintenance?
• Continue removing litter and debris from the entire landscape area weekly
• Initiate the irrigation system by the 3rd/4th week of March. Start-up includes retrieving the backflow device from Park Operations and installing in the park, blowing off the system, adjusting heads, cleaning filters, nozzles, valve boxes as necessary, programming the irrigation run times, replacing the backup batteries and submitting a formal written report to the City indicating system status and additional repairs if necessary. Additional irrigation service includes weekly scouting from March 15th through November 30th to ensure proper operation of the system. In the event that suspected leaks, breaks or other system abnormalities are observed, the City is to be notified immediately upon discovery.
• Initiate drinking fountains
• Obtain soil samples
• Begin mowing operation based on site conditions. Initial cut, should reduce turf height to 2.75". Follow-up cuts shall be at a height of 3" with a rotary style finishing mower that is equipped with a mulch kit. Mulched clipping may be returned to the turf, but no visible piles or trails of clippings may be left. When excessive clippings are present; Contractor is responsible for their removal and disposal.
• Dethatch and verti-cut lawns when dry
• Apply lime to the turf areas if determined by the soil tests
• Graffiti removal as needed
• Empty litter and recycling receptacles weekly

Action: Reference the City's working list and supplement with Landscape Cultural Practices for Fort Ward Park

Benefits

- Coordination with City maintenance practices

Application

- Park Cultural Practices

Methods

- The City Park Operations monthly task calendar is a starting point for landscape and park maintenance activities
- Supplement with Best Practices in the management plan

Monitoring

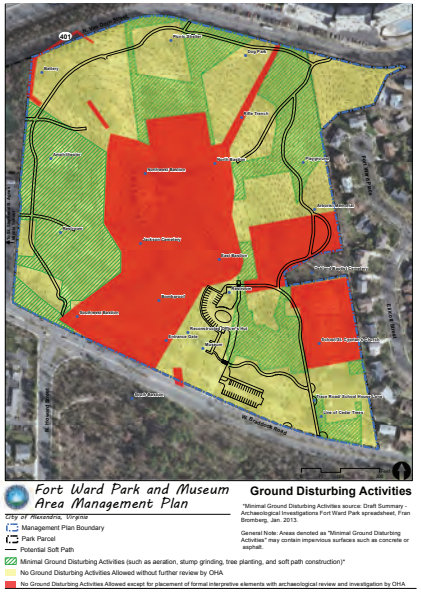
- Coordination between all parties, private contractors and City staff

Reference to Management Plan

Objective 3.1: Tie ongoing City of Alexandria maintenance practices with those specific to the park

Strategy 3.1.1: Coordinate Management Plan recommendations with other City of Alexandria park maintenance efforts

Best Practices: Tree Planting



Action: Plant new trees

Benefits

- Replace trees lost to storm damage and disease (200-300 trees lost in recent years)
- Increase city's canopy coverage

Application

- Trees are being planted in the park

Methods

- Divide the park into planting zones; taking into consideration the level of ground disturbance allowed
- Identify priority zone(s) for plantings (see map above and Plate 22)
- Select tree species from the park planting list (to be developed)
- Plant a minimum of 24 nursery-sized trees annually per the City's standards on an annual basis; select species from list specific to Fort Ward Park
- Plant native seedlings in tubes (volunteer opportunity, locally and regionally) in established woodlands

Monitoring

- Water and care for tree planting through a three year establishment period
- After five years, revisit and update the annual tree planting goal based upon storm replacement needs and overall tree canopy coverage

Reference to Management Plan

Objective 3.2: Contribute towards the City of Alexandria's Tree Canopy Goal of 40%

Strategy 3.2.1: Restore and expand the existing woodlands

Best Practices: Tree Health

Tree Stewards
ARLINGTON · ALEXANDRIA

Action: Prune diseased and dead tree limbs

Benefits

- Tree health improved through judicious pruning

Application

- Prune and remove diseased and dead limbs as required

Methods

- Annually walk park and conduct a tree assessment and tree risk exam
- Assess needs for limb pruning and hazards, paying particular attention to high activity areas such as picnic grounds, paths and playground
- Consider training Tree Stewards to inventory tree maintenance requirements and to develop a prioritized list of maintenance needs

Monitoring

- The City Arborist or designee shall annually walk the park and perform a tree assessment and tree risk exam to assess needs for limb pruning, hazards and paying particular attention to high activity areas such as picnic grounds, paths and the playground

Reference to Management Plan

Objective 3.2: Contribute towards the City of Alexandria's Tree Canopy Goal of 40%

Strategy 3.2.2: Assess tree cover and health

Best Practices: Tree Health

Action: Remove fallen and hazard trees

Benefits

- Removal of dead and 'hazard' trees

Application

- Prune and care for trees within the park appropriately

Methods

- Standardize assessment (biannual) of pruning and tree removal needs—the City Arborist or designee shall annually walk park and perform a tree assessment and tree risk exam; assessing needs for limb pruning, hazards, paying particular attention to high activity areas such as picnic grounds, paths and playgrounds
- Immediately close the area until the hazard tree and its debris are completely removed from the area when located in an actively used area (trails, interpretive areas, picnic grounds, playground)
- Seasonally remove dead trees when located away from use areas; mulch the crown and leave mid- to small-sized branches in place; lay the trunk on the ground and leave it in place on the ground; leave the trunk to a height of 10' -12' as a "snag" for wildlife use, if stable
- Determine if the tree is located in an area acceptable for ground disturbance before grinding the stump; flush cut the stump if disturbance is not allowed (see ground disturbance map or consult OHA)

Monitoring

- The City Arborist or designee shall annually walk the park and conduct a tree assessment and tree risk exam; assess needs for limb pruning, hazards and tree removal, paying particular attention to high activity areas such as adjacent to picnic areas, paths and playground

Reference to Management Plan

Objective 3.2: Contribute towards the City of Alexandria's Tree Canopy Goal of 40%

Strategy 3.2.2: Assess tree cover and health

Best Practices: Tree Maintenance

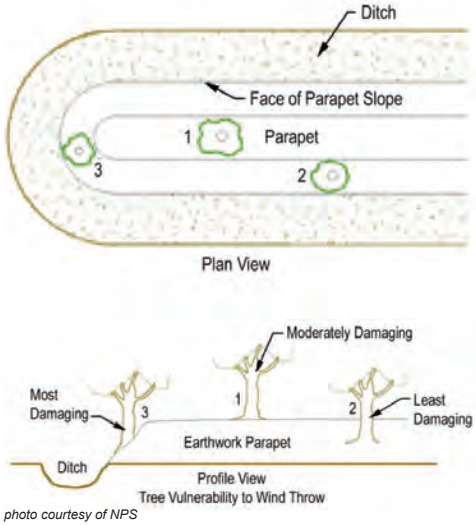


photo courtesy of NPS

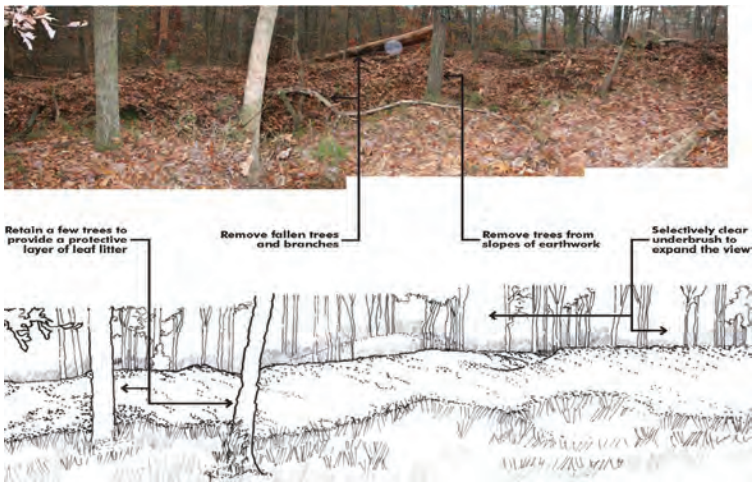


photo courtesy of JMA

Action: Assess tree growth on earthworks

Benefits

- Reduce damage to earthworks by limb drop or tree throw; encourage selective woodland coverage of earthworks, as a layer of leaf litter provides the best protective land cover

Application

- Assess tree growth and identify trees to be removed due to potential windthrow or damage to earthworks

Methods

- Inventory and record species, height, diameter at breast height, root system type—shallow rooted, tap root, etc.—as may effect windthrow potential, age, structural integrity and specific location of trees growing on or adjacent to the earthworks
- Identify and map areas where sapling and tree growth is acceptable to remain (except hazardous trees) on earthworks and where trees should be removed

Monitoring

- Every three years update inventory annually and evaluate/monitor trees growing on earthworks for windthrow potential, structural integrity and hazard tree

Reference to Management Plan

Objective 3.2: Contribute towards the City of Alexandria's Tree Canopy Goal of 40%

Strategy 3.2.3: Perform tree maintenance

Best Practices: Tree Maintenance

Action: Remove standing stumps in the park

Benefits

- Remove unsightly and tripping hazard tree stumps in the park

Application

- Remove by flush cutting trees in areas where ground disturbance is not allowed; grind the stump if the tree is located where ground disturbance is acceptable to OHA (may require OHA on-site supervision)

Methods

- Ensure that no stumps are left standing in the park, unless specifically identified as such for wildlife habitat and located in a designated woodland area
- Flush cut stumps where the ground is not to be disturbed
- Prior to grinding a stump, contact OHA to determine if on-site supervision is required or if it is located in area designated by OHA as acceptable for ground disturbance
- Match equipment to constraints on access

Monitoring

- Annually update the map with “no ground disturbance” areas noted

Reference to Management Plan

Objective 3.2: Contribute towards the City of Alexandria’s Tree Canopy Goal of 40%

Strategy 3.2.3: Perform tree maintenance

Best Practices: Mulch Leaf Litter On-site

Fort Ward Park and Museum Area Management Plan

City of Alexandria, Virginia

Leaf Litter Disposal Managment Areas

- Management Plan Boundary
- Park Parcel
- Contour 2'
- Potential Soft Path
- Area 1 - Leaf litter to remain in place
- Area 2 - Leaf litter to be vacuumed except for final fall and then mulch mowed
- Area 3 - Leaf litter to be mowed, mulched and left in place

Action: Identify appropriate treatment of leaf litter

Benefits

- Reduce maintenance needs and naturally replenish nutrients

Application

- Map indicates areas where leaves and minor tree debris are to remain in place; where leaves are to be removed until final clearance when they are to be mulch-mowed; and areas where tree cover is light enough that leaves may be mulch-mowed and left in place throughout the leaf removal season

Methods

- Mulch-mow in place leaves in areas as shown; remove leaves early in season in grassed areas with heavy tree cover

Monitoring

- Annually update the map

Reference to Management Plan

Objective 3.2: Contribute towards the City of Alexandria's Tree Canopy Goal of 40%

Strategy 3.2.3: Perform tree maintenance

Best Practices: Shrub Planting

Action: Plant new shrubs

Benefits

- Restoration and enhancement of the park's history as a showplace and healthy natural habitat

Application

- Replace and replenish shrubs in existing irrigated shrub beds and add shrub plantings throughout park

Methods

- Identify areas that need additional shrub plantings; limit new plantings that require irrigation to areas that are currently irrigated
- Plant native shrubs as understory in woodland areas (non irrigated areas)
- Expand and replenish existing shrub beds in existing irrigated areas
- Add shrubs to the earthworks area to redirect foot traffic and to protect earthworks from trampling
- Add shrub plantings to interpretive areas
- Supplemental watering may be required to establish plantings; seasonal weeding of shrub beds; mulch beds as needed (annually) to maintain a 2"-3" cover

Monitoring

- Survey shrub growth every three years to identify needs for additional planting

Reference to Management Plan

Objective 3.3: Restore shrub layer

Strategy 3.3.1: Restore shrub layer in high visitor use areas and at woodland edges

Best Practices: Shrub Maintenance

Action: Maintain existing shrubs

Benefits

- Enhance health and attractiveness of existing plantings

Application

- Prune as needed; remove shrubs under direction of OHA unless in areas cleared for ground disturbance by OHA

Methods

- Annually prune shrubs during the appropriate season (i.e. azaleas to be pruned in late spring after flowering but before buds set for the following year's bloom)
- Do not shear shrubs, with the exception of hedges associated specifically with the earthworks
- Involve Alexandria/Arlington Tree Stewards as volunteers
- Remove shrubs under guidance from OHA and ground disturbance mapping

Monitoring

- Annually assess pruning needs

Reference to Management Plan

Objective 3.3: Restore shrub layer

Strategy 3.3.2: Perform shrub maintenance

Best Practices: Shrub Maintenance

Action: Maintain shrub beds

Benefits

- Enhance health and attractiveness of existing plantings by removing weeds, vines and overgrowth from existing shrub beds

Application

- Top dress and clean existing shrub beds seasonally (spring, summer, fall)
- Clean existing shrub beds seasonally (spring, summer, fall)

Methods

- Annually refresh or replace mulch (leaf litter or shredded hardwood) to 2” -3” deep in formal shrub beds
- Re-establish existing irrigated shrub bed edges
- Top dress and clean shrub beds seasonally of weeds and debris 3 times per year (spring, summer, fall)
- Cultivate and add compost in the spring to established shrub beds
- Remove non-native invasive plant materials, vines and weeds
- Test soil annually; apply fertilizer as determined by soil testing
- Work with community service group or volunteers (trained by RCPA staff) to maintain beds

Monitoring

- Review existing shrub bed health and location every three years

Reference to Management Plan

Objective 3.3: Restore shrub layer

Strategy 3.3.2: Perform shrub maintenance

Best Practices: Removal of Undesired Vegetation

photo courtesy of Oculus

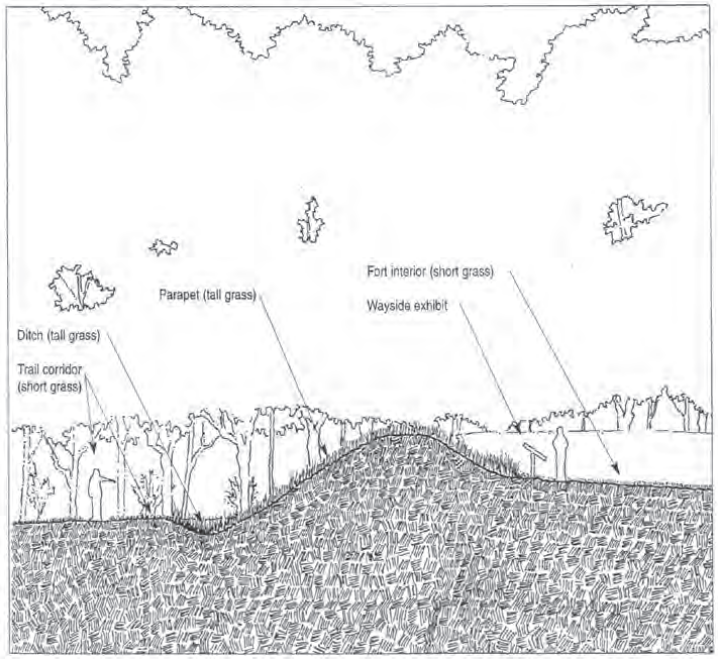


photo courtesy of WMDC

Action: Remove inappropriate vegetation from earthworks

Benefits

- Protect earthworks from damage by erosion, trampling, tree windthrow and unwanted plant materials; consider using taller, native warm-season grass for the fort parapet to reduce mowing and to discourage visitors from climbing on earthworks
- Ensure visibility of earthworks through use appropriate groundcovers - scrubby growth limits the visual accessibility and reduces interpretive value; frame views for interpretation

Application

- Replace inappropriate land cover with native grasses or leaf litter to ensure complete coverage

Methods

- Inventory and map earthworks to show soil type and conditions; light levels; current groundcover
- Use techniques to remove undesirable growth that do not damage the earthworks
- Determine and map most appropriate coverage types: turf, meadow, non-native invasive groundcover or leaf litter
- Replace undesired vegetation with Virginia Wild Rye or native warm season grasses or turf
- Adhere to NPS preservation standards for care of historic earthworks
- Ensure that earthworks are covered with turf or tree and leaf litter as mulch; transform one wing/bastion annually and then monitor to retain desired coverage

Monitoring

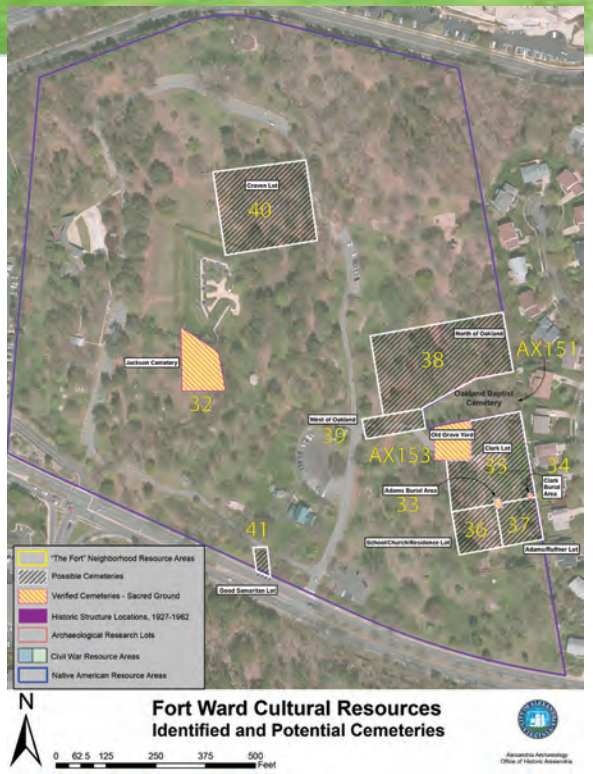
- Assess sites annually for undesired growth

Reference to Management Plan

Objective 3.4: Remove inappropriate vegetative growth

Strategy 3.4.1: Remove non-native invasive groundcovers and undesired shrubs and saplings from earthworks and burial grounds

Best Practices: Removal of Undesired Vegetation



Action: Remove inappropriate vegetation from burial grounds and cemeteries

Benefits

- Respectful treatment of burial grounds and cemeteries

Application

- Appropriate land cover for burial grounds and cemeteries - respectful and potential barrier to trespassing and play activities

Methods

- Remove non-native invasive plant materials such as English ivy from Jackson Cemetery and nearby earthworks
- Given the depth of the burials, there is no possibility of disturbance to burials by aeration at the Jackson Cemetery
- Replant with turf or meadow grasses as a sustainable land cover (consider use of meadow as a perimeter marking to dissuade park visitors from using a cemetery as a play area)
- Mow the meadow perimeter annually; mow turf as necessary; aerate annually to encourage healthy turf growth

Monitoring

- Assess sites annually for undesired growth

Reference to Management Plan

Objective 3.4: Remove inappropriate vegetative growth

Strategy 3.4.1: Remove non-native invasive groundcovers and undesired shrubs and saplings from earthworks and burial grounds

Best Practices: Non-native Invasive Plant Growth Removal

Action: Remove non-native invasive plants

Benefits

- Maintain park's natural ecosystem to support and benefit wildlife, insects and plants

Application

- Remove a targeted amount of non-native invasive plants annually

Methods

- Conduct an initial park survey and update every three years to identify existing non-native invasive species and the extent of the problem
- Establish priorities for removal
- Avoid removal where ground disturbance is prohibited; remove under oversight of OHA in other areas
- Use hand removal and environmentally-sensitive, appropriately applied herbicides; dispose of debris properly
- Employ preventive measures to reduce introduction of new non-native invasive species - monitor areas subject to ground disturbance (seed bank), inspect new plants prior to installation, clean maintenance equipment prior to use in the park

Monitoring

- Assess non-native invasive species growth every three years

Reference to Management Plan

Objective 3.4: Remove inappropriate vegetative growth

Strategy 3.4.2: Minimize non-native invasive growth

Best Practices: Healthy Turf Growth

Action: Core aerate soils to address compaction

Benefits

- Healthy soils contribute to healthy turf; healthy turf reduces erosion and resource damage; improves water infiltration

Application

- Core aerate all turf areas within park where appropriate to renovate heavily compacted soils
- Aerate, add organic matter to reseed turf areas if area receives adequate sunlight
- Cover with leaf litter as a mulch layer if turf growth is unlikely due to heavy shade cover

Methods

- Refer to map for areas where aeration may occur without OHA direct supervision; where OHA must be on site to supervise aeration; and where aeration may not occur under any scenario
- Aerate turf two times per year (spring and fall) as regular maintenance; where soils are particularly compacted, aerate four times a year for the first three years

Monitoring

- Update aeration mapping (initial map - 2014) annually based on OHA investigations and ground disturbance mapping
- Annually assess turf for improvement in surface water infiltration and turf health

Reference to Management Plan

Objective 3.5: Establish attractive and sturdy turf

Strategy 3.5.1: Actively manage turf growth

Best Practices: Healthy Turf Growth

Action: Overseed and top dress turf

Benefits

- Healthy turf reduces erosion and resource damage

Application

- Overseed and top dress existing turf areas

Methods

- Apply pre-emergent herbicide, followed by overseeding and top dressing with compost
- Identify areas where overseeding is appropriate and no additional preparation work is required (humus or other organic matter, new topsoil, etc.)
- Identify areas where rehabilitation is needed - humus, organic matter, topsoil
- De-thatch annually
- Supplement with fertilizer in fall if the need is demonstrated by soil tests
- Overseed and top dress annually (if needed) following aeration if over 40% of existing turf is sparse
- Test soil annually in five areas of the park: near West Braddock Road; near the amphitheater; near the picnic shelter; near the playground and in the fort area

Monitoring

- Test soil annually in five areas of the park: near West Braddock Road; near the amphitheater; near the picnic shelter; near the playground and in the fort area

Reference to Management Plan

Objective 3.5: Establish attractive and sturdy turf

Strategy 3.5.1: Actively manage turf growth

Best Practices: Healthy Turf Growth

Action: Define mowing height

Benefits

- Park looks 'whole' with consistent mowing height for all turf areas

Application

- Common turf cultural practices to be adhered to by all entities caring for turf within the park

Methods

- Establish a consistent mow cycle and mowing height
- Modify mowing practices to ensure that no damage is made to earthworks (inadvertent gauging and soil compaction)
- Use a rotary style finishing mower equipped with a mulch kit
- Initial spring mow to 2.75" turf height
- Mow turf to maintain 3" height during summer season
- Adjust turf height to 2.5" in height in fall

Monitoring

- Assess height seasonally

Reference to Management Plan

Objective 3.5: Establish attractive and sturdy turf

Strategy 3.5.1: Actively manage turf growth

Best Practices: Healthy Meadow Growth

Action: Remove invasives and woody plant materials from meadows

Benefits

- Meadows add aesthetic, ecological and environmental value to the park landscape

Application

- Meadows mowed or bush-hogged to remove invasive and woody species
- Avoid bush-hogging during nesting season

Methods

- Mow meadow once a year between December and March to avoid the nesting period and to remove standing material; encourage seed germination and encourage vigorous plant growth; set the mower deck as low to the ground as possible without gouging the soil surface, removing everything with the mow
- Alternatively, bush hog the meadow every three to five years to remove woody growth between April and July; apply more frequently if woody growth is heavy

Monitoring

- Assess woody and invasive species growth annually

Reference to Management Plan

Objective 3.5: Establish attractive and sturdy turf
Strategy 3.5.2: Actively manage meadow growth

Best Practices: Equipment Operation and Use

Action: Train all personnel on the use of equipment to minimize damage to resources

Benefits

- Minimize damage to the park from equipment operation

Application

- Train employees in proper equipment operation to avoid weed whacker and potential damage to tree trunks; heavy vehicular equipment (ranger carts, trash vehicles) can compact soil and damage earthworks and other cultural resources; erosion occurs where equipment runs off a path edge

Methods

- Identify equipment prone to causing soil compaction or tree damage
- Identify areas that vehicular traffic should not enter
- Identify travel corridors if access is needed off of paved surfaces
- Train operators annually on equipment 'safe' routes and use

Monitoring

- Assess damage caused by equipment operation annually

Reference to Management Plan

Objective 3.6: Train maintenance personnel on appropriate practices for historic and archaeological sites and natural areas

Strategy 3.6.1: Use the MOU park maintenance zone areas to identify level of training required for maintenance personnel

Best Practices: Certifications

Action: Provide training and certification for maintenance personnel at the park

Benefits

- Educate operators on the importance and fragility of cultural resources found in the park

Application

- Train employees on identification of Fort Ward Park's historic and archaeological resources, tree and shrub care, turf management, proper pruning techniques and non-native invasive species removal techniques

Methods

- Train key personnel at the park for special duties unique to Fort Ward and its stewardship of cultural resources
- Train key personnel at the park on landscape cultural practices as they relate to a historically rich and resource-fragile park, where ground disturbing activities are of great concern
- Train employees on identification of Fort Ward Park's historic and archaeological resources; tree and shrub care, turf management, proper pruning techniques and non-native invasive species removal techniques

Monitoring

- Assess effectiveness of operator training annually

Reference to Management Plan

Objective 3.6: Train maintenance personnel on appropriate practices for historic and archaeological sites and natural areas

Strategy 3.6.1: Use the MOU park maintenance zone areas to identify level of training required for maintenance personnel

- INTERPRETIVE RECOMMENDATIONS AND BEST PRACTICES ARE INCLUDED IN Section II.4
- ADDITIONAL WORK MUST BE DONE TO DEVELOP THE FRAMEWORK, WHICH IS A PORTION OF THIS MANAGEMENT PLAN, INTO AN ACTUAL INTERPRETATION PLAN
- THE INTERPRETATION PLAN, PRIORITIES AND PROBABLE ESTIMATE OF COST IS NOT A PART OF THIS MANAGEMENT PLAN'S WORK PRODUCT
- BEST PRACTICES WILL BE GENERATED TO REFLECT GOAL 4 UNDER A SEPARATE WORK PRODUCT

Best Practices: Circulation

Surfacing options:
Context Sensitive Roadway Surfacing Selection Guide Publication No. FHWA-CFL/TD-05-004 and Roadway Surfacing Options Photo Album Publication No. FHWA-CFL/TD-05-004a August 2005

Action: Make pedestrian use the priority use for paved loop path and mark mileage distances on or near pavement

Benefits

- A safe environment for park users

Application

- Repair the surface of the shared pedestrian/vehicle loop drive with materials that are pedestrian friendly in color and texture; consider the use of permeable material and avoid the use of asphalt to reduce its appearance as 'road'

Methods

- Make pedestrian circulation the priority on the internal park paved loop path; use a surface treatment alternative to the current vehicular pavement styled asphalt material
- Change the sign to give pedestrian use priority over vehicular use (the current sign tells pedestrians to yield to vehicular traffic)
- Mark distances for pedestrian walks

Monitoring

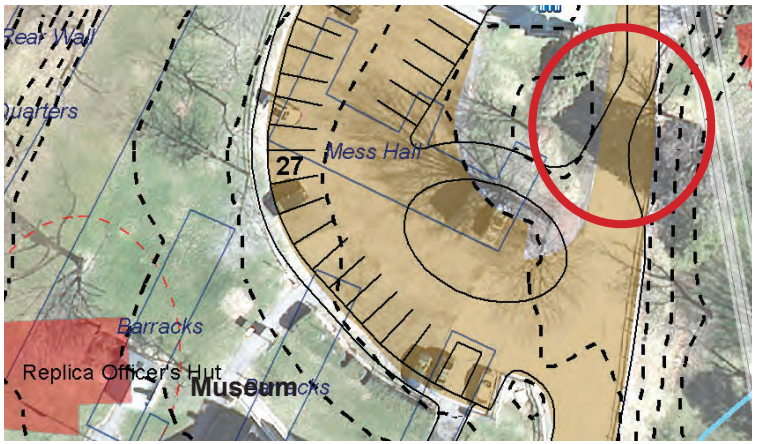
- Inspect pavement annually and identify areas to be repaired or replaced

Reference to Management Plan

Objective 5.1: Clarify and enhance park circulation and parking
Strategy 5.1.1: Improve pedestrian circulation and safety

Best Practices: Circulation

Introduction of sharp curve at loop path with alternate paving material: existing - upper photo; curve and alternative pavement- lower photo; location indicated by red circle below



Action: Introduce a sharp curve at the junction of the paved loop path

Benefits

- A safe environment for park users

Application

- Realign a section of pavement where the paved loop path changes from one-way to two-way at the time of the next repaving project (2015)

Methods

- Adjust the pavement alignment to clearly indicate that the priority is for pedestrian use; vehicular access is only as route to recreation facilities and should be more 'driveway-like' in appearance
- Realign pavement at next repaving

Monitoring

- Assess effectiveness of reconfiguration

Reference to Management Plan

Objective 5.1: Clarify and enhance park circulation and parking

Strategy 5.1.1: Improve pedestrian circulation and safety

Best Practices: Circulation

Action: Develop a pedestrian network of soft paths

Benefits

- A safe environment for park users

Application

- Develop overtime a system of 'soft' walking paths throughout the park, linking interpretive opportunities and providing pedestrian only walking trails

Methods

- Identify a secondary pedestrian path alignment along the park's perimeter
- Connect a 'soft path' to park entrances and features
- Ensure that path meets ADA standards, when possible

Monitoring

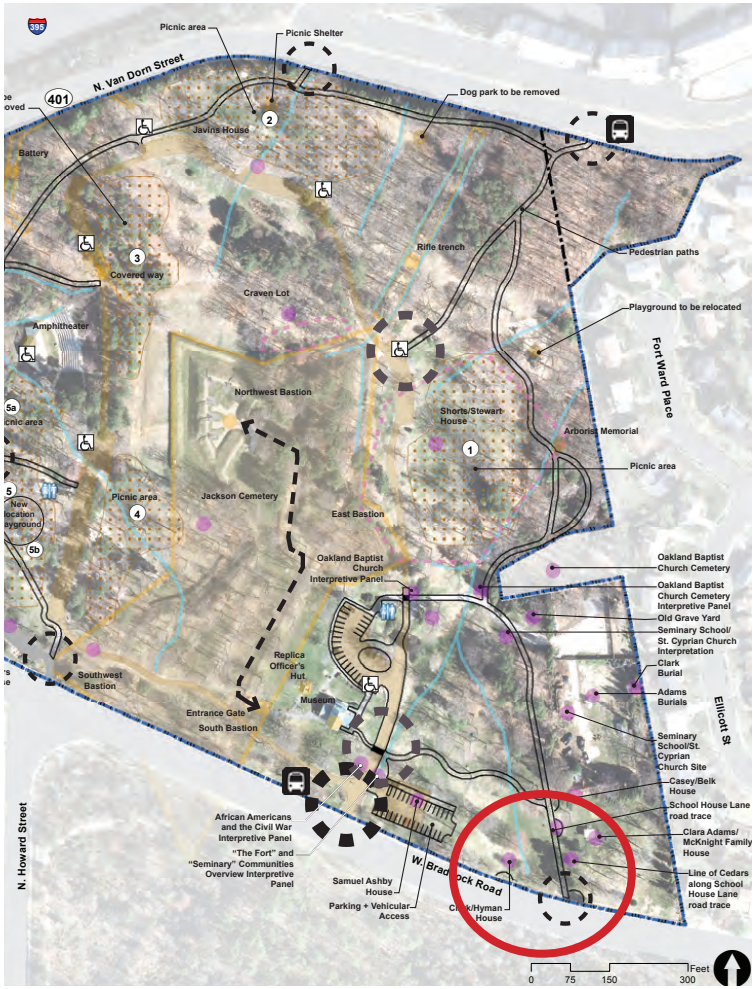
- Assess integrity of path surfacing and path edges for safety concerns every six months

Reference to Management Plan

Objective 5.1: Clarify and enhance park circulation and parking

Strategy 5.1.1: Improve pedestrian circulation and safety

Best Practices: Circulation



Location indicated by red circle

Action: Connect the existing park path to the West Braddock Road sidewalk

Benefits

- A safe environment for park access and park users

Application

- Increase connectivity in the pedestrian system by connecting the street sidewalk to the internal park path system

Methods

- Install a sidewalk segment to connect the park with West Braddock Road - public sidewalks along the park's perimeter do not connect with the internal park pedestrian system

Monitoring

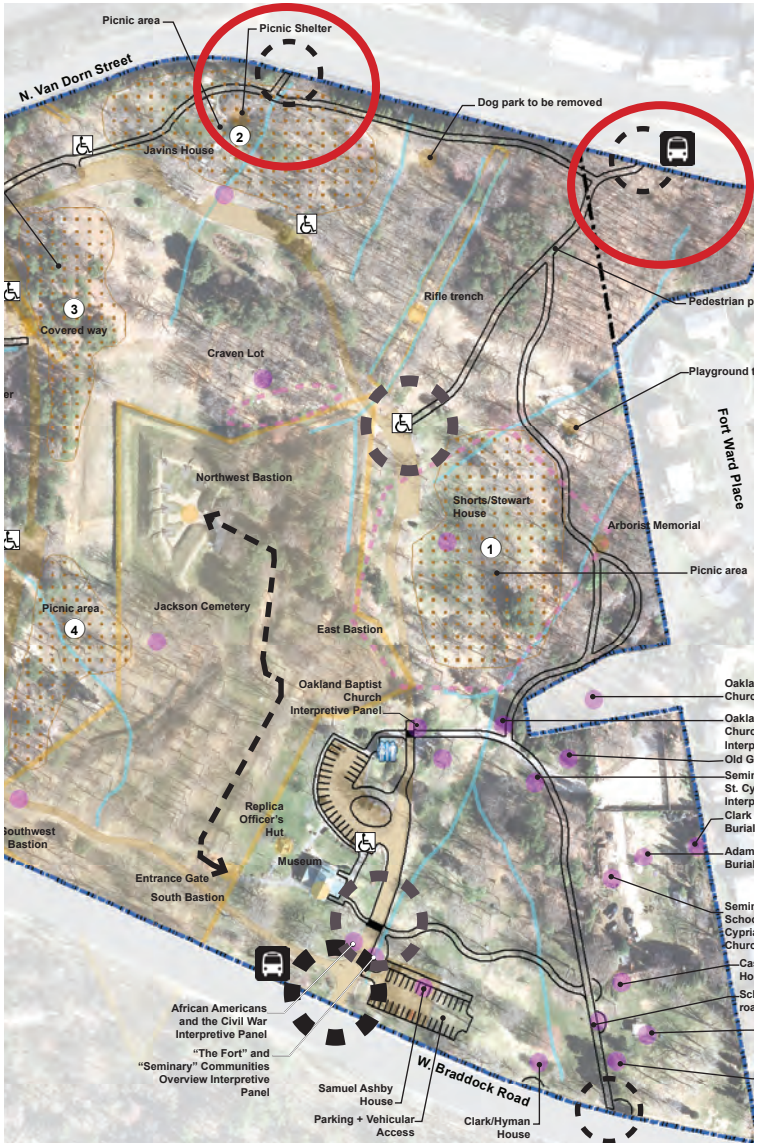
- Annually survey sidewalk surface and condition

Reference to Management Plan

Objective 5.1: Clarify and enhance park circulation and parking

Strategy 5.1.1: Improve pedestrian circulation and safety

Best Practices: Circulation



Locations indicated by red circles

Action: Clearly mark and develop two park access points from North Van Dorn Street

Benefits

- A safe environment for park access and park users
- Protection of cultural and natural resources from inadvertent damage by park users

Application

- Increase connectivity in the pedestrian system by connecting the street sidewalk to the internal park path system

Methods

- Install two entry points to connect the park with North Van Dorn Street—public sidewalks along the park's perimeter do not connect with the internal park pedestrian system
- Develop two formal access points to the park from North Van Dorn Street; one near the bus stop east of the rifle trench and the second near the picnic shelter
- Close 'goat herd' paths
- Block access to the rifle trench by installing a 'stile'/stair over it at the North Van Dorn Street side of the park

Monitoring

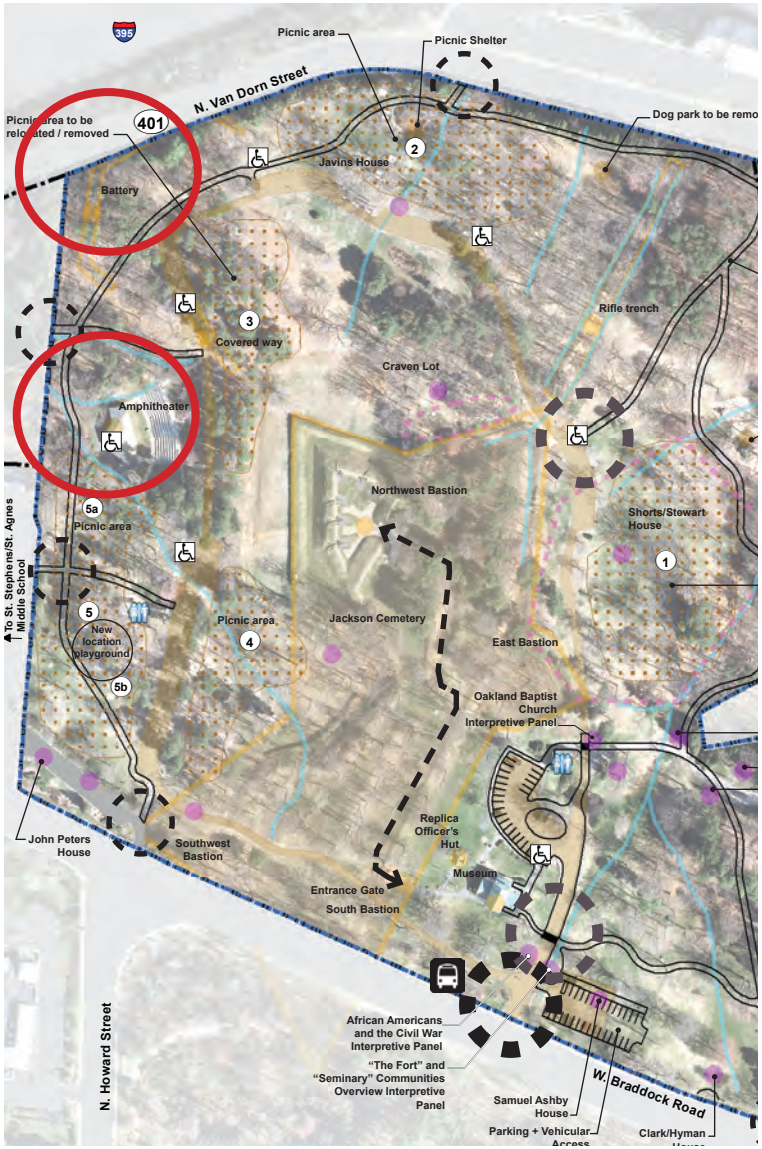
- Monitor the area monthly for tree fall, trail blockage, informal paths on earthworks or other cultural resources
- Monitor and remove poison ivy within 10' of each side of the path

Reference to Management Plan

Objective 5.1: Clarify and enhance park circulation and parking

Strategy 5.1.1: Improve pedestrian circulation and safety

Best Practices: Circulation



Locations indicated by red circles

Action: Re-connect athletic fields with the rest of the park

Benefits

- A safe environment for park access and park users

Application

- Increase connectivity in the pedestrian system by connecting all portions of the park

Methods

- Provide a gate between athletic fields and the northwestern portion of the park
- Develop protocols to address access/gate closure when athletic fields remain open later than the rest of the park (fields are lighted and open until 10 PM; the rest of the park closes at dusk)

Monitoring

- Monitor operational issues with different hours

Reference to Management Plan

Objective 5.1: Clarify and enhance park circulation and parking

Strategy 5.1.1: Improve pedestrian circulation and safety

Best Practices: Circulation

Sketch of potential reconfiguration of parking area to better accommodate bus circulation behind the Museum, restrooms on right side of image

Action: Redesign the existing parking area to better accommodate a bus drop-off

Benefits

- A safe environment for park access and park users

Application

- Provide bus drop-offs and turnarounds that do not conflict with parking and pedestrian use of the park

Methods

- Temporarily 'test' concept with barrels and cones to mark circulation patterns
- Evaluate the potential to redesign the gravel parking area behind the museum to better accommodate drop-offs and turnarounds
- Mark the foundation or former location of the barracks with surface materials as part of the new layout design for the parking lot and bus turnaround (similar to that proposed for the Ashby House in front parking lot)
- Consider using permeable materials for paving (existing gravel is heavily compacted) and ADA access

Monitoring

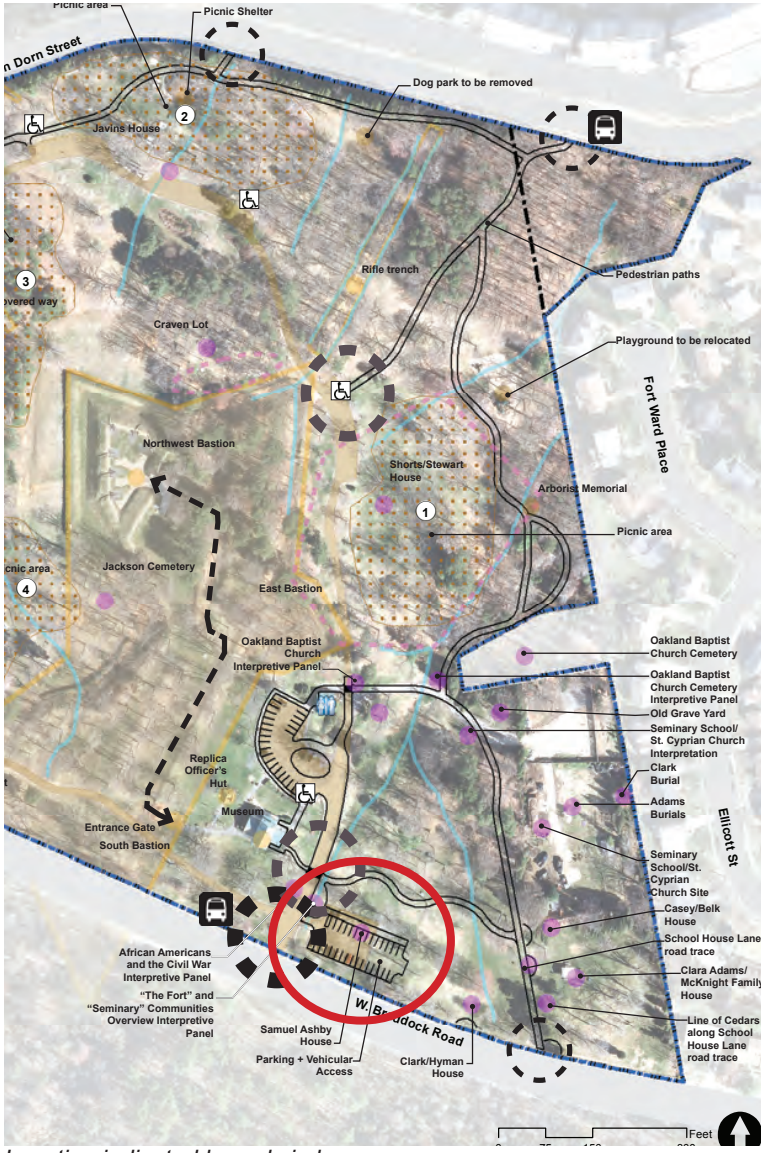
- Monitor 'test' to see if conflicts between users are reduced

Reference to Management Plan

Objective 5.1: Clarify and enhance park circulation and parking

Strategy 5.1.2: Improve bus access and parking (tour and school groups)

Best Practices: Circulation



Location indicated by red circle

Action: Expand the length and reduce width of the gravel parking lot

Benefits

- A safe environment for park access and park users

Application

- Reduce the footprint of the existing parking lot adjacent to West Braddock Road while increasing its capacity and making it ADA accessible and more suited for infiltration

Methods

- Evaluate the possibility to relocate parking spaces removed in the redesign of the museum lot (8-10 spaces to be removed in reconfiguration to accommodate bus turn-around)
- Include interpretation of the Ashby House as part of the parking lot redesign; potentially mark the Ashby House as part of the new layout and surfacing materials of the parking area (similar to the barracks interpretation at the museum parking area)
- Consider using permeable materials for paving (existing gravel is heavily compacted) and ADA access

Monitoring

- Monitor for pavement issues (potholes or loose pavers, depending on the material)

Reference to Management Plan

Objective 5.1: Clarify and enhance park circulation and parking

Strategy 5.1.3: Reconfigure existing parking

Best Practices: Protect Park's 'Soundscape'

Action: Continue to monitor and to limit noise from park activities

Benefits

- An urban oasis, a respite from artificial noise and activity

Application

- Limit artificial (human derived - amplifiers, speakers, radios, etc.) noise within the park

Methods

- Continue to enforce noise restrictions such as the prohibition of amplified noise without a permit (noise had been a major park issue and source of neighbor complaints in the past)
- Identify areas where noisy activities associated with reenactments, gatherings, etc. are inappropriate and where noise-making activities are appropriate such as associated with fort programming
- Map areas where noise should be kept to a minimum (areas for quiet contemplation or for wildlife) use signs, interpretive materials and plants to educate visitors
- Recognize that some sanctioned activities in the park will be loud

Operations and Maintenance Requirements

- Monitor noise limits in the park

Reference to Management Plan

Objective 5.2: Minimize conflicts between adjacent uses both within and around the park

Strategy 5.2.1: Communicate park regulations

Best Practices: Communicate Park Regulations

Action: Better communicate park regulations

Benefits

- A positive and clear message, conveyed creatively, sets a good tone for the park

Application

- Phrase regulations in positive manner; explain why regulations are in place

Methods

- Inventory the location and content of existing regulatory signs within the park
- Coordinate visitor information, orientation and interpretive messages to minimize visual clutter and confusion
- Reinforce resource protection importance through interpretive programming and exhibits
- Use web-and mobile-based 'What is Here' technologies to communicate information regarding resource sensitivity, significance and location
- Enhance sign visibility

Monitoring

- Monitor number and size of signs in the park every three years

Reference to Management Plan

Objective 5.2: Minimize conflicts between adjacent uses both within and around the park

Strategy 5.2.1: Communicate park regulations

Best Practices: Enforcement of Park Regulations

photo courtesy of Sharon Annear

Action: Enforce existing park regulations

Benefits

- Well managed and safe place to be educated and to recreate

Application

- Enforce existing regulations

Methods

- Consistent and proactive enforcement of regulations
- Consider reinstating a ranger staffing on high-use days or time periods

Operations and Maintenance Requirements

- Monitor the effectiveness of regulation enforcement

Monitoring

Objective 5.2: Minimize conflicts between adjacent uses both within and around the park

Strategy 5.2.1: Communicate park regulations

Best Practices: Dog Exercise Area

Action: Remove the off-leash dog exercise area from the park

Benefits

- Remove conflicts between dogs running free and unclear boundaries of the off-leash dog exercise area; clarify rules for dogs in the park—on leash at all times

Application

- Remove the existing off-leash dog exercise area in the park; do not relocate it within the park

Methods

- Hold Public Hearing and advertise intent to close dog exercise area at park
- Remove sign indicating off-leash dog exercise area in park
- Place signs welcoming leashed dogs to park

Monitoring

- Monitor dog use of the park

Reference to Management Plan

Objective 5.2: Minimize conflicts between adjacent uses both within and around the park

Strategy 5.2.2: Remove the off-leash dog exercise area location and facility

Best Practices: Long-term Facility Relocation

Location indicated by red circle

Action: Relocate Group Picnic Area # 3, avoiding any culturally sensitive sites or resources

Benefits

- Opportunity to preserve and interpret Civil War resources: the 'Outer Battery' and the 'Covered Way'

Application

- Removal of recreation use from culturally significant site

Methods

- Identify an alternative location for the group picnic area where cultural resources will not be adversely affected
- Relocate the existing group picnic area (may be a temporary relocation - need for more permanent relocation is dependent upon archaeological research results and if picnic area and interpretation of potential findings can be successfully combined)
- If long-term, find an alternative site within park for permanent relocation that does not intrude on other culturally sensitive sites (for example the Shorts property)
- Refer to City of Alexandria Recreation, Parks and Cultural Activities 2013 Picnic Season Summary for utilization of specific picnic areas within Fort Ward Park—in 2013 Area # 3 had the lowest reservation count of the group areas within the park and Area #5 received the third largest number of reservations of the five sites

Monitoring

- Monitor impact on cultural resources

Reference to Management Plan

Objective 5.2: Minimize conflicts between adjacent uses both within and around the park

Strategy 5.2.3: Relocate and enhance park facilities (long-term) to better serve the public and to protect the park's resources

Best Practices: Long-term Facility Upgrades

Action: Adopt design standards for all park furnishings and signs

Benefits

- Accessible facility for park visitors
- Park identity enhanced through common vocabulary of site furnishings

Application

- When replacing site furnishings, ensure that replacement fixtures are accessible and meet ADA standards

Methods

- Develop strategy for site furnishings replacement, extend and compliment current City replacement policy—grills, picnic tables, benches, signs, etc.
- Cycle furnishing upgrades
- Adopt standards for site furnishings and signs for future installation (quality, style, ADA compliant, etc.)

Monitoring

- Assess site furnishings every five years

Reference to Management Plan

Objective 5.2: Minimize conflicts between adjacent uses both within and around the park

Strategy 5.2.3: Relocate and enhance park facilities (long-term) to better serve the public and to protect the park's resources

Best Practices: Long-term Facility Upgrades

Action: Evaluate upgrade or removal of the existing amphitheater

Benefits

- Accessible facility for park visitors or removal of the amphitheater with space dedicated to an alternative use

Application

- Feasibility study to upgrade the existing amphitheater; ensure that the renovated amphitheater is fully accessible

Methods

- Develop a cost-benefit analysis of improving amphitheater to meet ADA standards, performance standards, electrical needs and furnishings upgrade
- Develop and execute a feasibility study
- Evaluate additional supporting infrastructure needs should the amphitheater be upgraded (parking, loading, restrooms, etc.)
- Evaluate the impact on the site if the study concludes that the amphitheater should be removed
- Evaluate the impact on the performing arts spaces in city, etc. if amphitheater is changed or removed

Monitoring

- Monitor compliance with current ADA standards (current evaluation states all but parking is compliant)

Reference to Management Plan

Objective 5.2: Minimize conflicts between adjacent uses both within and around the park

Strategy 5.2.4: Evaluate the effort required to upgrade and improve the amphitheater for more active use

Best Practices: Long-term Facility Upgrades

Action: Repair and evaluate the upgrading of the existing restroom located on the western side of the park

Benefits

- Accessible and upgraded restrooms

Application

- Feasibility study to upgrade restrooms

Methods

- Repair roof regardless of future of restroom facility
- Develop and execute a feasibility study on restroom improvement
- Develop a cost-benefit analysis of improving or replacing restrooms to meet ADA standards, performance standards, electrical needs and furnishings upgrade
- Evaluate additional supporting infrastructure needs should restrooms be upgraded (water, sewer, electrical capacity, etc.)

Monitoring

- Annually assess condition of facility

Reference to Management Plan

Objective 5.2: Minimize conflicts between adjacent uses both within and around the park

Strategy 5.2.5: Replace, upgrade or remove failing facilities

Fort Ward Park and Museum Area Management Plan

SECTION II

7. IMPLEMENATION

The City of Alexandria, Virginia

October 2014

FINAL DRAFT

Table of Contents

7. Implementation

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Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Goal 1 - Management and Funding ***The City of Alexandria will support a broad array of users and uses by collaboratively managing the park and equitably investing in the Fort Ward Park and Museum Area as compared with other regional city parks and facilities.***											
Objective 1.1: Continue the collaborative management process between City agencies as established in the Memorandum of Understanding (MOU)								**Priority**	**Probable Cost**	**Timeframe**	**Responsible Party**
Strategy 1.1.1: Use the MOU process to assess and monitor progress and identify problems and solutions											
Action: Review and update MOU annually	• Current MOU delineates two-zone system with different entities performing daily operations and maintenance tasks in each zone • Improvement of overall park appearance; less visible visual division between areas maintained by OHA contractor and by Park's Operations staff • Maintain and adhere to clear protocols for addressing cultural and natural resource conflicts	• Review physical boundaries and task lists for each party and determine which entity is responsible for each activity (T&SE-Stormwater; GS-Buildings; OHA-cultural resource grounds; RPCA-park grounds; OHA and RPCA-park programming) • Establish park management protocols for turf and meadow management; tree and shrub planting, maintenance and removal; pedestrian path repair and development; installation and location of interpretive exhibits; additions and modifications to vehicular circulation and parking areas; hardscape construction that involves ground disturbance such as footers for playground equipment, fort structures • Address landscape, trash, snow, site monitoring issues and responsibilities	• Update MOU annually and establish clear lines of responsibility between entities responsible for care of the park	• Continue current agreement • Modify agreement to include rifle trenches within OHA and adjust "no-mow" areas • Modify agreement to incorporate findings of stormwater runoff management study and responsibilities of T&ES • Modify agreement to account for the role of the support group	**Park Management** 2014 MOU: • Modify MOU to address rifle trench, adjust "no mow" and leaf placement areas • Incorporate findings of stormwater runoff management study and oversight by OHA • Expand OHA jurisdiction • Incorporate all landscape maintenance practices within each geographic area	• Quarterly - Review MOU to review effectiveness in addressing existing and new issues • Annually - Review effectiveness of the division of responsibilities between OHA Contractor and Park's Operation staff • Host an annual public meeting to provide an update on the park status and MOU • Provide an annual Report to Council		**PRIORITY: High** • FWAG Members: *Brune; Forbes; Moir - a; Annear - a; Ziegler - a* **PRIORITY: HIGH** • City	Staff time from four departments; meeting quarterly and revisiting MOU annually	Every year, ongoing	City Staff: RPCA, OHA, T&ES, DGS Staff Time - Updated MOU
Objective 1.2: Make Fort Ward Park a priority in the City of Alexandria funding								**Priority**	**Probable Cost**	**Timeframe**	**Responsible Party**
Strategy 1.2.1: Plan for and communicate the needs and priorities for park management funding (operational and capital) as part of the City budget consistent with the responsible stewardship of a significant historic site and regional park serving the entire city and beyond											
Action: Communicate significance and importance of Fort Ward Park to a wider audience	• Support of the park and museum is commensurate with value of resource to city and to region; not clear that Fort Ward Park is recognized as a citywide and regionally important resource	• Communicate significance and condition of park to city leaders, business leaders, preservation and conservation organizations and other civic groups • Review examples of 'Friends' or other support groups to advocate and to raise supplemental funds • Broaden advocacy during City budget process for park (tourism development, environmental value, cultural history, recreation site)	• Prepare annual report on the "state of the park" at Fort Ward Park reflecting the monitoring practices recommended as part of this management plan - listing accomplishments, continuing threats and vulnerabilities, recommended proactive approaches to addressing vulnerabilities	• City staff to prepare report using matrix as basis for updating park priorities and management tasks • Support group to gradually take on responsibilities for annual reports within three years *Example:* Annual reports of Central Park Conservancy (http://www.centralparknyc.org/assets/pdfs/annual-reports/AnnualReport_2013.pdf)	**Park Recognition:** • Reconstitute and expand 'Friends' group with broad base of supporters and members • Produce Annual Report - initial effort, City staff produce 'State of the Park' Annual Report (in conjunction with reconstituted 'Friends Group'); within three years turn over responsibility to Friends Group'	Annually - Review effectiveness of Friends Group - measure activities accomplished; funding achieved; volunteer hours logged; challenges remaining		**PRIORITY: Low** • FWAG Members: *Stanton; Magnuson* **PRIORITY: Med** • City		3-7 Years	Support Organization or FWAG and RPCA Report to be based upon adopted inventory and standards using this matrix
Action: Link financial needs of the park to other City initiatives; broaden 'ask' for funding and support	• Need to identify common funding needs (operational and capital) among city parks, museums and historic sites; opportunity to leverage at a citywide scale	• Evaluate existing operational and capital funding and identify new sources of funding: bond issues, public private partnerships, donations and endowments • Link preservation of Civil War and African American heritage to citywide preservation goals and objectives; NEH Museum Assessment Program, federal health and wellness goals, etc. • Tie funding of loop road improvements, development of trail network, improvements to park connections (North Van Dorn Street), amphitheater renovation and programming, incorporation of public art into interpretive projects and tree planting and woodland management to citywide needs	• Tie park improvements to meeting citywide needs such as trail development, recreation accessibility improvement, tree canopy goals, etc. • City Recreation Needs Assessment (85% need walking trails near home) • Fort Ward Park role in 'City as an Arboretum' and City's tree cover goal of 40% • Citywide sustainability goals (park maintenance and operations) • NEH Museum Assessment Program (system of city museums/historic sites) • Federal health and wellness goals (funding for proposed trail system)	• Link preservation of Civil War and African American heritage to citywide preservation goals and objectives • Tie funding of loop road improvements, development of trail network, improvements to connections to park (North Van Dorn St.); programming and improvement of amphitheater, incorporation of public art into interpretive projects, and tree planting and woodland management to citywide needs *Example*: Indianapolis Parks Foundation http://indyparksfoundation.org/site/what_we_do/faq	**Park Funding:** • Tie park improvements to meeting citywide needs such as trail development, recreation accessibility, tree canopy goals, etc. • Evaluate existing operational and capital funding and identify new sources of funding: bond issues; public/private partnerships; donations; and endowments • Link preservation of Civil War and African American heritage to citywide preservation goals and objectives	• Annually - Review funding achievements; measure increase of park funding through public and private efforts for maintenance operations and programming		**PRIORITY: High** • FWAG Members: *Forbes; Washington; Terrell; Stanton; Magnuson; Ziegler* **PRIORITY: High** • City		1-3 Years	Parks and Recreation Commission, various Friends Groups, support organizations and FWAG members, RPCA, OHA

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Objective 1.3: Support and finance enhancements to park facilities to meet the needs of the broadest array of park users and neighbors								**Priority**	**Probable Cost**	**Timeframe**	**Responsible Party**
Strategy 1.3.1: Broaden the array of programming and public art in Fort Ward Park											
Action: Sponsor educational and research panels and symposia	• Expand recognition of the significance of the Civil War and African American heritage found at Fort Ward and region	• Develop list of panel and symposia topics and research agenda • Host informal panel discussions • Host annual or every two year symposia on cultural complexities found at Fort Ward and region	• Hold annual symposia on Fort Ward Park and its ties to the region, with more frequent informal year-round panel discussions to make significance of resources more visible to academic and museum professionals as well as the general public	• Start with smaller symposia and panel discussions with local historians and experts • Build on first symposia to expand range of speakers and audiences *Examples:* Fredericksburg Civil War Roundtable: http://civilwarroundtablefredericksburg.com Timucuan Science and History Symposium (NPS park symposia and roundtable) http://www.nps.gov/timu/naturescience/symposium.htm	**Resource Education Enhancements:** • Host panel discussions and annual symposia	• Assess interest via attendance, attendees and topics and evaluate if outreach is succeeding		**PRIORITY: Low** FWAG Members: *Washington - a; Terrell - a* **PRIORITY: Low** • City		5+ Years	OHA; Friends Group; FWAG members
Action: Expand community-oriented offerings at the amphitheater	• Strong interest expressed at planning sessions in the park for movie nights, performances by community performing arts groups and expanded community-oriented programming	• Address parking demand for events or activities by forming shared use agreements with adjacent schools (public and private) • FWAG members did not support the use of temporary restroom facilities to support activities at the amphitheater • Tie scale of event to capacity of park; focus on local community-scaled event	• Limit event size by parking capacity and condition of adjacent restrooms • Scale events to be consistent with adjoining land uses (residential neighborhood and institutional uses)	• Program the amphitheater in conjunction with local community groups as sponsors and performers; create a 'movie night' in the park; community performances by groups receiving arts grants from the city • Update or establish MOU for shared parking arrangements with adjacent elementary school and Minnie Howard *Examples:* The Friends of Mason District Park "Spotlight by Starlight" (small scale program funding by program and membership) http://www.fairfaxcounty.gov/parks/performances/spotlight-by-starlight.htm • Comcast/City of Alexandria outdoor movie nights (Alexandria at foot of Prince Street)	**Resource Education Enhancements:** • Program the amphitheater in conjunction with local community groups as sponsors and performers (movie night, City grant recipient performances, etc.) • Address the parking demand for events or activities by forming shared use agreements with adjacent schools (public and private) • Evaluate if corporate or nonprofit underwriting is available	• Assess attendance, survey attendees for interest and programming ideas • Annually re-evaluate operational costs to RPCA		**PRIORITY: Low** FWAG Members: *Washington - a; Terrell - a* **PRIORITY: Low** • City		5+ Years	Friends Group; RPCA Operations for operation and clean up
Action: Locate public art in collaboration with the City's Office of Arts' Public Art Master Plan	• Strong interest expressed for incorporating public art into Fort Ward Park including interpretation • Opportunity to enhance park and engage park visitors	• Tie recommendations to those incorporated in the Public Arts Master Plan and the City's Office of the Arts; *In 2012, the Alexandria City Council adopted a policy to grow the city's public art into an inspired and engaging program that reflects the city's unique history, people, cultural identity, and future aspirations. To support this growth, the City has commissioned the development of a Public Art Master Plan. The Public Art Master Plan, currently underway, will set priorities for the location and funding of projects which may include the citywide park sites.*	• Identify specific projects where public art should be considered as part of design and/or interpretative program	• Incorporate public art in new capital and interpretive projects *Examples:* Steigerwald Lake Wildlife Trail, Washougal, WA http://columbiariverimages.com/Regions/Places/gibbons_creek_wildlife_art_trail.html	**Resource Education Enhancements:** • Incorporate public art in park improvements per Public Art Master Plan recommendations	• Annually evaluate art maintenance needs		**PRIORITY: Med** FWAG Members: *Washington - a; Terrell - a; Annear* **PRIORITY: Med** • City		5+ Years	RPCA Operations - maintenance of public art may differ from standard parks maintenance
Strategy 1.3.2: Enhance park's accessibility and meet ADA standards											
Action: Relocate the current playground facility to the western side of the park, making access and equipment accessible	• Improved parking, access to playground and surface material are needed to meet 2010 accessibility standards • See Park & Open Space Facilities Prioritization Analysis • Current site of playground is subject to erosion, stormwater run-off and is not easily access from parking and path network	• Identify alternative location for the playground near amphitheater and restrooms	• Accessible playground facility and access	• Long-term relocation of playground to western side of park	**Enhance Park's Accessibility:** • Relocate playground to western side of park due to cost of providing ADA compliant access at current site • Identify alternative location for the playground near amphitheater and restrooms • Ensure site has adequate shade • Ensure playground surfacing, equipment, access, and parking meet ADA standards	• Annually assess compliance with ADA standards		**PRIORITY: High to renovate existing site** • FWAG Members: *Brune; Washington; Terrell; Moir; Annear* **PRIORITY: Low to relocate site** FWAG *Members: Moir* **PRIORITY: High** • City	*All new and accessible: access path, equipment, surfacing, equipment, parking* **Existing site:** $246,000-455,000 **New site, western portion of park:** • $116,000-190,000	10+ Years for new facility	RPCA, OHA

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Action: Provide accessible park furniture	• Current picnic tables and picnic shelter are not accessible • Provide access to park facilities for all members of the community	• Ensure that each of the group picnic area have accessible picnic tables • Identify picnic area(s) that must be upgraded to be made accessible; what would be involved to make the existing picnic shelter accessible • Identify features and equipment that must be upgraded to ensure accessibility (drinking fountains, interpretive and orientation signs, etc.)	• As equipment is replaced, ensure that fully accessible equipment is available at every type of park experience and incorporate accessible site furniture, grills etc.	• Incorporate renovation into picnic area rotation • As new equipment is added to existing picnic areas and the park, ensure that a proportion of the equipment is accessible and that an accessible route from the parking area or pedestrian system is provided for access to accessible equipment	**Enhance Park's Accessibility:** • Identify features and equipment that must be upgraded to ensure accessibility—drinking fountains, interpretive and orientation features, picnic tables, grills, benches etc. • Replace aging equipment with accessible equipment	• Annually inspect park furnishings for compliance with current ADA standards and regulations		**PRIORITY: Low** • FWAG Members: **PRIORITY: High** • City	Annual allowance of $7,500	1-5 Years	RPCA
Action: Make existing paved loop pedestrian path system accessible where possible and sign areas where not possible	• See Park & Open Space Facilities Prioritization Analysis • Path system not fully accessible • Stairs and bridges in park are not ADA accessible; some exhibit problems with warping, or require other repairs to properly meet the surrounding grade and diminish the potential for trip hazards	• Identify elements that must be renovated to meet ADA standards • Identify speed bumps that need reconfiguration • Identify areas where cross slope or running slope exceeds ADA ORAR standards; where pavement surface is cracked or in disrepair and does not meet ADA standards for surfacing; where impediments such as speed bumps do not meet ADA standards • Pea gravel being replaced with Flex Pave within Northwest Bastion; inventory and identify remaining non-ADA accessible pathways in fort area • Inventory and identify components that need replacement or upgrade to meet ADA standards	• Repave pedestrian walking loop with ADA compliant materials • Replace existing speed bumps with traffic calming technique (speed cushions with 36" between cushions) that is ADA compliant • Complete installation of ADA alternatives or replacements to existing stairs and bridges in the park • Sign areas that are not accessible	• Provide continuous accessible walking path that provides access to the bulk of the park • Sign areas that exceed ADA standards for slope (cross slope and other) - based upon terrain exceptions clause (See Table 2 in Executive Summary of final rule) • Repave surface with ADA compliant and pedestrian attractive materials • Replace existing speed bumps with traffic calming technique that is ADA compliant *Standards:* http://www.ada.gov/regs2010/2010ADAStandards/Guidance2010ADAstandards.htm http://www.access-board.gov/guidelines-and-standards/recreation-facilities/outdoor-developed-areas/final-guidelines-for-outdoor-developed-areas/single-file-version-of-rule#text	**Enhance Park's Accessibility:** • Repave pedestrian walking loop with ADA compliant materials • Replace existing speed bumps with traffic calming technique (speed cushions with 36" between cushions) that is ADA compliant • Complete installation of ADA alternatives or replacements to existing stairs and bridges in the park • Provide signs for areas that are not accessible indicating steep slope	• Annually inspect facilities for compliance with current ADA standards and regulations		**PRIORITY: High** • FWAG Members: *Brune; Forbes; Moir; Stanton; Magnuson; Ziegler* **PRIORITY: High** • City	*Speed bumps, repaving, slope assessment for future work, accessible parking along loop path* **Speed bumps:** $7,100 - 8,600 **Repaving with new materials:** $50,000- 228,000 **4 reconfigured existing parking spaces along loop path:** $14,000 - 25,600	1-3 Years (speed bumps, pavement surface in conjunction with repaving) 1-3 Years - signage for steep slopes 10 Years + Regrade portions of path for compliance	RPCA, T&ES
Action: Provide accessible parking and pathways for all park and museum features	• Shortage of accessible parking for park visitors near specific activity areas • Ensure access path to park features meet ADA standards (2010 or 2009 Outdoor Recreation Access Route (ORAR) standards	• Refer to Kimley Horn report 2012 for identification of areas requiring improvements to parking for ADA accessibility • Evaluate existing access paths to park features for ADA compliance • Reconfigure adjacent parking to make parking spaces accessible for amphitheater use per report findings prepared for the City of Alexandria in 2012 by Kimley Horn that states that the 'amphitheater meets the guidelines with the exception of the accessible parking spaces'	• Develop accessible parking spaces for each picnic area, playground, amphitheater and other park features • Ensure each park feature has ADA compliant access	• Upgrade parking to make appropriate spaces (per report) accessible by reconfiguring pavement grade, striping and location • Upgrade existing access paths where physically and financially feasible; provide alternative experiences where not • Provide appropriate surface for ADA parking located within gravel parking lots	**Enhance Park's Accessibility:** • Provide accessible parking spaces by reconfiguring pavement grade, striping and location • Upgrade or provide alternative access paths to site features, where possible incorporate proposed 'soft path' alignment	• Annually inspect facilities for compliance with ADA standards and regulations		**PRIORITY: Low** • FWAG Members: **PRIORITY: High** • City	$42,000-76,800 for 12 spaces per K-H 2012 study	1-3 Years Make existing parking spaces per Kimley Horn report recommendations accessible in conjunction with repaving (KH report states need for 10, diagram shows 12) 3 -7 Years Upgrade connector paths	RPCA and T&ES
Action: Make interim improvements to amphitheater to improve accessibility	• Kimley-Horn report evaluated the amphitheater area for compliance with the 2010 Standards for Accessible Design and" believes that the amphitheater meets the guidelines with the exception of the accessible parking spaces"	• Reconfigure adjacent parking to make parking spaces accessible for amphitheater use per report findings prepared for the City of Alexandria in 2012 by Kimley Horn that states that the 'amphitheater meets the guidelines with the exception of the accessible parking spaces'	• Ensure accessible parking is available at the amphitheater *(Section 35.151(g)(1) ensures that there is greater dispersion of wheelchair spaces and companion seats throughout stadiums, arenas, and grandstands than would otherwise be required by sections 221 and 802 of the 2004 ADAAG.)*	• Provide accessible parking for amphitheater	**Enhance Park's Accessibility:** • Provide accessible parking	• Annually inspect facilities for compliance with ADA standards and regulations		**PRIORITY: Low** • FWAG Members: **PRIORITY: High** • City		1-3 Years Make existing parking spaces per Kimley Horn report recommendations accessible in conjunction with repaving 3 -7 Years Upgrade connector paths	RPCA and T&ES

Notes on FWAG Priorities Submissions:

***Walpole** - priorities differ from those listed*

1. Management and Funding—the former is dependent on the later. Thus—Funding must be obtained to maintain status quo (which is not sufficient) or increase it to make improvements. See #4 below. Fundamental City financial requirements (police, fire, roads, judicial system, etc.) will, by their nature, likely reduce funding in the future for all parks, including Ft. Ward.

Funding for Management of Ft Ward should not depend only on City funding. There should be outside organizations formed or contacted to raise necessary funds to manage the Park PROPERLY, not minimally . Soliciting support from a local or national celebrity (artist, or someone like Jim Moran, Frank Wolfe,etc) to publicize the need for major funding for the Park. Many nationally known artists and others are from the Alexandria and efforts can be made to elicit their support. Large corporations and foundations should also be contacted. How about new or existing hotels –restaurants (whose guests would enjoy the park)?

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
	An experienced fundraiser—volunteer, there must be plenty in Alexandria—would be needed, and arrangements for the City to accept donated funds. The Friends of Ft Ward or a fundraiser could work actively with DOI American Battlefield Protection Plan which has a grant and partnering outreach section (202-619-7474),; VA Department of Historic Restoration, etc. City staff has been quite successful in identifying and obtaining grant funds, so they can provide suggestions. The community members should use contacts and efforts, and not put the burden on City staff (which has many other properties to attend to.) Possibly Oakland Baptist Church has ideas, or Descendants Society have contacts at or knowledge of other African American foundations or donors.										

Washington - a: *comment priority incorporates all three actions under strategy*

Terrell - a; *comment priority incorporates all three actions under strategy*

Moir - a; *add comment 'and ensure that quarterly meetings **at the working level** are held on a regular basis'*

Annear - a; *'ensure that quarterly meetings **at the working leve**l are held on a regular basis. Updated MOU accompanied by a status report and minutes of the quarterly meetings to be sent forward to the City Council each November. Receipt of same to be docketed item which is set for public hearing by the Council.'*

*Ziegler - a; 'ensure that quarterly meetings **at the working level** are held on a regular basis'*

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Goal 2 - Park Character: Preserve, Protect, Repair and Maintain Resources ***The City of Alexandria, working with its boards and commissions, volunteers and park neighbors, will work to protect and maintain the nationally significant historic and cultural resources and locally significant natural resources found within Fort Ward Park.***											
Objective 2.1: Protect vulnerable park areas from adverse ground disturbing activities								**Priority**	**Probable Cost**	**Timeframe**	**Responsible Party**
Strategy 2.1.1: Determine level of permitted ground disturbance											
Action: Mark and protect unrecognized Civil War archaeology	• Produce additional knowledge and understanding of Fort Ward; Civil War Garrison area (barracks), ancillary fort buildings, outer works, covered way, rifle trench, artifact scatters	• Perform site metal detector survey in conjunction with a ground-based laser survey of the extant earthworks • Accurately record the current level of preservation and use this data for future monitoring and assessment • Continue to add to existing site inventory of historic resource investigation	• Use appropriate methods when conducting ground disturbing activities around the museum, parking areas and restrooms • The potential exists for significant buried archaeological resources associated with the Civil War Garrison	• Consider the potential for significant buried archaeological resources associated with the Civil War Garrison when conducting any ground disturbing activities around the museum, parking areas and restrooms • The park, east of the fort, has not been surveyed using field methods that would identify Civil War resources. Develop a long-term testing strategy that incorporates a metal detector survey • Consider a ground based laser survey of the extant earthworks. This survey would result in accurate recordation of the current level of preservation and can be used in the future to monitor and assess the preservation of these features.	**Ground Disturbance:** • Investigate the Civil War Garrison (barracks) area in anticipation of potential parking lot reconfiguration and museum expansion using a site metal detector survey as first step • Investigate outer works, covered way, rifle trench and artifact scatters using a site metal detector survey as a first step • Perform a laser survey of the extant earthworks to use as baseline in future evaluations	• Annually update mapping and documentation on park resources; aggregating work completed through the year in one accessible document		**PRIORITY: High** • FWAG Members: *Forbes; Washington - a; Terrell - a; Ziegler - a* **PRIORITY: High** • City	$68,500-98,000 for ground survey of earthworks and to tie data to GIS database; metal detector site survey; barracks archaeological investigation	1-5 Years - laser survey of earthworks - tie into GIS database 1-5 Years - metal detector survey of potential resources 3-7 Years - Civil War Garrison area (barracks)	OHA, RPCA
Action: Mark and protect "The Fort" community and burial sites	• Recognition of "The Fort" community for a larger audience; acknowledgement that the site has been home to different users over time, with varying stories to tell and resources to protect	• Identify appropriately designed enclosure to put around perimeter of Old Grave Yard and the Jackson Cemetery; mark graves at the Clark Burial Grounds • Incorporate larger story of place within specific periods of history and use patterns of site buildings and landscape features to assist in storytelling • Identify the locations of "The Fort" community and establish protection strategies for maintaining above and below-ground evidence of "The Fort" community	• Continue to add to existing site inventory of historic resource investigation; make protection and interpretation of "The Fort" community resources a park priority	• Identify resource protection and interpretation of "The Fort" community as a priority of park management • Incorporate larger story of place within specific periods of history and use patterns of site buildings and landscape features to assist in storytelling • Identify the locations of "The Fort" community and establish protection strategies for maintaining above- and below-ground evidence of "The Fort" community • Place appropriately designed enclosure around the perimeter of Old Grave Yard and the Jackson Cemetery; mark the graves at the Clark Burial Grounds	**Ground Disturbances** • Identify and design appropriate enclosure for cemeteries and burial grounds • Archaeological investigation of School House/Church/Residence site	• Annually update mapping and documentation on park resources; aggregating work completed through the year in one accessible document		**PRIORITY: High** • FWAG Members: *Forbes; Washington - a; Terrell - a; Moir; Annear; Ziegler - a* **PRIORITY: High** • City	$25,000-40,000 for School House archeological investigations	1-3 Years - Design and place appropriate enclosure at Jackson Cemetery and Old Grave Yard, mark graves at the Clark Burial Grounds 1-3 Years - School House/Church/ Residence archaeological investigation 5 Years + - Larger interpretive story development	OHA for archaeological investigation RPCA and T&ES for enclosure design (do in conjunction with stormwater improvements) OHA for larger interpretive story as part of Interpretive Plan development

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Action: Map areas in conjunction with OHA to identify where ground disturbance may occur unsupervised; where ground disturbance may occur with supervision; and where ground disturbance is NOT allowed	• Need to have a clear understanding by all parties as to areas that may be more actively managed by RPCA Operations and OHA Contractor for aeration activities, tree and shrub planting, stump removal, invasive plant removal, etc. Cultural resources throughout the park are found at varying levels of ground surface/subsurface, unrelated to resource type or time period. • Maintenance work, tree planting, stormwater management, etc. within the park since 2009 has been limited due to archeological sensitivity	• Expand aeration mapping for additional ground (deeper) ground disturbing activities • Establish protocols with OHA and RCPA related to notification procedures prior to activity; monitoring required; repair of work to minimize or eliminate erosion potential and include protocols in the MOU • Once initial cultural practices have been implemented (such as aeration) with high levels of oversight by OHA and RCPA successfully, supervision may be lessened on update if agreed to by all parties • Identify depth to resources/required cover or level of disturbance for cultural resources within the park • Assess and evaluate after OHA completes report of their investigations in this area. Use the soil profile information from OHA to develop a long range plan, where appropriate, remove fill down to buried historic landscapes.	• Map park indicating level of sensitivity to ground disturbance (initial mapping completed Winter 2014) for aeration activities - 4" max disturbance by depth and area • Protocols needed for turf and meadow management, shrub bed renovation, tree planting, stump removal, trail construction, installation of interpretive exhibits, additions, modifications to parking areas, new hardscape construction with footings (play equipment, benches, picnic tables, etc.)	• Develop a plan: know where to dig; note areas where ground disturbance will not impact archaeological resources; where OHA must be on site when ground disturbance activities occur; and where no ground disturbance is allowed • Update map annually in conjunction with MOU renewal and ensure distribution to OHA and RPCA staff and operations • Notify Office of Historic Alexandria (OHA) prior to any ground disturbing activities taking place	**Ground Disturbance:** • Keep GIS database current with discoveries of resources requiring protection from ground disturbing activities • Establish and renew protocols with OHA and RPCA related to notification procedures prior to activity; level of monitoring required, if any; and restoration required to minimize or eliminate erosion potential • Include protocols in MOU	• Annually update map indicating level of sensitivity to ground disturbance based on OHA soil profile research and other ongoing park investigations • Annually update protocols in MOU • Annually, in conjunction with MOU renewal, ensure that RPCA Operations receives updated ground disturbance mapping to update resource management related zones: aeration, tree planting, stump grinding, etc.		**PRIORITY: High** • FWAG Members: *Brune; Washington - a; Terrell - a; Moir; Stanton; Magnuson; Ziegler - a* **PRIORITY: High** • City		Ongoing	OHA and RPCA
Objective 2.2: Heal areas of erosion and compacted soils within the park								**Priority**	**Probable Cost**	**Timeframe**	**Responsible Party**
Strategy 2.2.1: Stabilize surface areas											
Action: Address animal tunneling in earthworks	• Animal tunnels observed in earthworks	• Identify animal and means to address removal or control	• Annually survey the earthworks for signs of animal tunneling and address any evidence of new tunneling	• Identify animal and means to address removal or control • Repair the damage caused by tunneling by filling the tunnels to the extent possible with an archaeologically sterile soil to avoid compromising the information potential of the earthwork • Cover tunnel entrance with a degradable erosion control fabric and seed or cover with leaf litter and/or mulch • Remove tunneling animal from the area	**Heal Erosion:** • Remove the tunneling animal and repair the damage	• Annually survey the earthworks for signs of animal tunneling and address any evidence of new tunneling		**PRIORITY: Low** • FWAG Members: *Washington - c; Terrell - c* **PRIORITY: Med** • City		Ongoing	OHA
Action: Restore shovel pit testing sites to original grade	• Continual sinking of past shovel pits - need to fill and monitor	• Identify holes to be filled	• All shovel pit holes filled and stabilized, survey annually	• Monitor shovel pits to repair sinking • Identify holes to fill • Require OHA and contractor to carefully remove land cover prior to shovel test • When testing complete, backfill and tamp pit and replace land cover cap	**Heal Erosion:** • Repair shovel pits upon completion of testing, use backfill, tamp and replace cover cap for full landscape restoration	• Annually inspect and repair shovel pits until clear that pit has stabilized (5 year period)		**PRIORITY: Low** • FWAG Members: *Washington - c; Terrell - c* **PRIORITY: High** • City		Ongoing	OHA

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Action: Redirect stormwater and sheet flow away from sensitive cultural and recreational resources through small berms, spreaders and other techniques	• Large areas of turf are eroded with cobble rock exposed • Erosion appears along the edges of paths (caused by heavy use/width and/or stormwater runoff) • Sheet runoff has eroded mulch at playground and surface areas at group picnic areas, burial sites and cemeteries	• Identify areas adversely affected by stormwater (see URS Drainage Master Plan, Appendix I) • Identify the underlying causes of stormwater runoff - low spots, lack of berms or other protective measures to redirect water sheet flow, clogged drains, etc.	• Land shaped to subtly redirect sheet flow away from sensitive cultural resources such as burial grounds and cemeteries and recreation resources • Infiltration methods capture sheet flow and are integrated with park design and character instead of closed systems with piping • Soil and land cover added to eroded areas after stormwater is redirected away from resource • Stormdrains cleaned after leaf fall in autumn and in late spring to remove winter debris	• Develop a stormwater management plan that promotes landform based solutions, avoids cutting in areas of sensitive archeological resources, and promotes groundwater infiltration • (Coordinate with Drainage Master Plan, URS 2014)	**Prevent Stormwater Runoff Erosion:** • Implement Stormwater Management Plan that promotes landform based solutions, avoids cutting in areas of sensitive archaeological resources and promotes groundwater infiltration (URS Drainage Master Plan, 2014) • Clean out drains • Where erosion is present, reshape landforms and add soil and land cover such as turf or leaf litter	• Annually inspect outfalls (RPCA) and conduits (T&ES) to ensure clear • Annually inspect park for signs of increasing erosion - if found, add to database and address		**PRIORITY: High** • FWAG Members: *Brune; Washington - c; Terrell - c; Moir; Annear; Stanton; Magnuson; Ziegler* **PRIORITY: High** • City	Costs by T&ES	1-3 Years - Pilot projects 1 and 2: Reshape landform with berm to redirect sheet flow away from Old Grave Yard and Oakland Baptist Cemetery and add filtration box to existing storm line under gravel parking lot near West Braddock Road 3-5 Years - Pilot project 3 - reform stream valley 5 Years + - remaining 13 recommendations in URS study	T&ES, OHA, RPCA
Action: Reinforce eroded edges of paved surfaces	• Significant pavement edge erosion trip hazard and damage to resources	• Identify areas of paved path system where slope and siting lead to edge damage and erosion	• Stabilize pavement edge	• Short-term: Add river cobble stone to temporarily fill eroded areas immediately adjacent to pavement • Long-term: redirect storm water away from pavement edge and install reinforced shoulders (50% aggregate/ 50% soil mix) • Clean storm drains after leaf fall in autumn and in late spring to remove winter debris	**Prevent Stormwater Runoff Erosion** • Temporarily 'fill' eroded edges of pavement with river cobble stones; long-term install reinforced shoulders • Implement Stormwater Management Plan that promotes landform based solutions, avoids cutting in areas of sensitive archaeological resources and promotes groundwater infiltration (URS Study 2014)	• Annually inspect outfalls (RPCA) and conduits (T&ES) to ensure clear • Annually inspect path and road edge for signs of increasing erosion - if found, temporarily place river cobbles		**PRIORITY: Low** • FWAG Members: *Washington - c; Terrell - c* **PRIORITY: High** • City	$38,500-40,500 entire length of path, both sides (likely reinforcement not needed in entirety)	1-10 Years - temporarily reinforce shoulder with application of river cobble Year 10+ - replace shoulder with reinforced shoulder material	T&ES, RPCA
Action: Repair surface erosion damage	• Burial sites and cemetery areas are adversely affected by stormwater runoff • Grave and burial sites are eroding from the overland flow of concentrated stormwater drainage • Old Grave Yard is located on actively eroding side slope, uneven ground • Adams Burial site - threat of damage due to soil erosion, uneven ground • Jackson Cemetery - eroded topsoil • Clark Burial - threat of damage due to soil erosion • Outer battery and covered way • Drainage system near playground	• Identify areas in park that are subject to surface erosion (draw from URS study 2014)	• Stabilize surface and fill holes	• Prevent further erosion by maintaining comprehensive coverage of either turf or leaf litter/mulch over all site areas • Require OHA and contractors to backfill and repair locations of excavations at end of fieldwork, protect these areas from erosion until vegetation is established • Implement Stormwater Management Plan that promotes landform based solutions, avoids cutting in areas of sensitive archaeological resources and promotes groundwater infiltration (URS study 2014)	**Heal Stormwater Runoff Erosion:** • Add soil to fill holes, smooth out eroded areas and to reshape ground plane to redirect surface flow from becoming channelized and causing erosion (playground, earthworks, burial sites) • Aerate and reseed turf cover per OHA ground disturbance mapping • Treat per recommendations in Appendix I	• Annually inspect park for signs of erosion		**PRIORITY: Low** • FWAG Members: *Washington - c; Terrell - c* **PRIORITY: High** • City		1-3 Years	RPCA, OHA
Action: Protect earthworks from undesignated foot traffic	• Top surface of rifle trench is highly compacted from over use as access path into park • Fort earthworks used as pathways	• Identify alternative access route to enter from north side of the park as replacement informal access path on rifle trench parapet	• Preserve earthworks	• Remove informal trail from rifle trench parapet and block informal access points to earthworks • Identify alternative access point to park from North Van Dorn Street; integrate with other planned trail improvements (i.e. soft trail) • Deter visitors from walking on earthworks with signs; if not effective use visually unobtrusive barrier system • Place sign indicating that rifle trench area is under restoration and is not a foot path • Cover rifle trench with leaf litter	**Heal Erosion Damage From Foot Traffic:** • Remove informal trail from rifle trench parapet by blocking access • Identify alternative access point(s) to park from North Van Dorn Street • Deter visitors from walking on earthworks with sign indicating that rifle trench area is under restoration and is not a foot path; if not effective use visually unobtrusive barrier system • Cover rifle trench with leaf litter	• Annually monitor earthworks for erosion damage and soil compaction of trench embankment		**PRIORITY: Med** • FWAG Members: *Washington - c; Terrell - c; Annear* **PRIORITY: High** • City		3-5 Years	OHA

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Action: Protect burial sites from unintentional recreational use	• Burial sites and cemeteries are being used for recreational activities (intentionally or not)	• Identify sites to be protected and public notice posted or enclosures erected	• Install signs indicating that the immediate site is a burial site or cemetery • If necessary, install an enclosure system using plant materials or fencing that is sympathetic to its historic surroundings at the perimeter of the Old Grave Yard, Clark Burial Grounds and two graves near former maintenance yard	• Signs and enclosures	**Heal Erosion Damage from Foot Traffic:** • Install signs indicating that the immediate site is a burial site or cemetery • If necessary, install enclosure system using plant materials or fencing that is sympathetic to its historic surroundings at the perimeter of the Old Grave Yard, Clark Burial Grounds and Jackson Cemetery	• Monitor site for erosion damage and inappropriate use		**PRIORITY: Med** • FWAG Members: *Washington - b; Washington - c; Terrell - b; Terrell - c* **PRIORITY: High** • City		1-3 Years install signs 5+ Years - install enclosure system	OHA
Strategy 2.2.2: Improve compacted soils											
Action: Renovate picnic areas by rotation or partial closure of group area	• Group picnic areas have exposed roots, no or poor turf growth, compacted soils from heavy use and drainage runoff	• Inventory and rank the five existing group picnic areas in terms of damage and need for renovation • Identify a sixth site to serve as a rotation site should an area be so damaged that it must be fully removed from a growing season's use • At no time, no more than five active group picnic sites will be in use	• Ensure that picnic areas have healthy turf or leaf litter on ground plane; if unable to achieve either coverage consider use of an artificial or shredded mulch surfacing material	• Annually remove all or a portion of a group picnic area from use for renovation during a growing season • Combine picnic table pads into singular, soft surface in heavily used areas • Rotate picnic sites for ground restoration; identify sixth site to serve as alternate so there are five fully functional sites at all times (potentially split Picnic Area 5 into two distinct areas)	**Improve Compacted Soils:** • Inventory and rank the five existing group picnic areas in terms of damage and need for renovation • Identify a sixth site (potentially split Picnic Area 5 into two separate picnic areas for purposes of rotation) to serve as a rotation site should an area be so damaged that it must be fully removed from a growing season's use • Annually remove a portion of or entire group picnic area from use for renovation during a growing season • Combine picnic table pads into singular, soft surface in heavily used areas	• Annually monitor group picnic areas for erosion damage and compacted soils		**PRIORITY: Low** • FWAG Members: **PRIORITY: High** • City		1-7 Years	RPCA
Strategy 2.2.3: Relocate or remove uses that conflict with resources											
Action: Remove former maintenance yard access drive, fencing and gate	• Road access to former maintenance yard crosses over two known graves (one a dog's grave); marked in field with river cobble • Work with OHA when removing gravel	• Identify any ground disturbing concerns with OHA prior to remove • Complete OHA archaeological investigations prior to removing fence, gate and access drive	• Restoration of landform and historic character of site	• Remove fencing, gate and access drive to former maintenance yard in coordination with OHA, following archaeological investigations • Remove gravel paving from former access road and top dress and reseed if ground disturbance is acceptable to OHA • If ground disturbance is not acceptable, reshape landscape in area of road to direct storm water away from cemetery and to provide enough soil surface on top of former access drive to support turf growth • Remove perimeter fencing and gate from former maintenance yard	**Restore site of Former Maintenance Yard** • Coordinate with OHA prior to removal - complete archaeological investigations to ensure appropriate direction is given for ground disturbing activities • Remove gravel paving from former access road and top dress and reseed if ground disturbance is acceptable to OHA • If ground disturbance is not acceptable, reshape landscape in area of road to direct storm water away from cemetery and to provide enough soil surface on top of former access drive to support turf growth • Remove perimeter fencing and gate from former maintenance yard	• Removal of fence and gate following completion of archaeology investigations within fenced area		**PRIORITY: High** • FWAG Members: *Brune; Forbes - a; Stanton; Magnuson; Ziegler* **PRIORITY: High** • City	$38,500 - 60,400 for physical elements demolition and removal; PRIOR to removal archaeological investigation required - $60,000-120,000 within fenced area	1-3 Years	OHA, RPCA

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Action: Remove former maintenance structures from eastern edge of park	• Sheds and fences are incompatible with the objective of creating a contemplative setting for the fort burial sites	• Identify relocation options for sheds	• Restoration of landform and historic character of site	• Remove two structures located in former maintenance yard and relocate, if practical, in a less sensitive area of park (adjacent to athletic fields for example)	**Restore site of Former Maintenance Yard** • Coordinate with OHA prior to removal - ground disturbing activities • Remove two park structures from current location on eastern edge of park • Relocated elsewhere in park if possible • If relocation is not possible, adhere to 'Environmental Action 2030' goals for reducing, reusing and recycling solid waste when considering relocation costs and benefits of the two structures • Repair site with sterile soil (in archaeological terms), add topsoil, smooth and seed with turf	• Remove structures from site		**PRIORITY: Low** • FWAG Members: *Forbes - a* **PRIORITY: Low** • City		5-10+ Years	OHA
Action: Reshape or remove fill at site of former maintenance yard	• Maintenance yard may have 'fill' or gravel layered overtime for vehicle support, debris from material storage such as mulch, etc. (unknown depth - likely gravel, mulch, topsoil piles within fill coverage)	• Identify quantity of fill to be removed if site returned to original grade • Identify concerns related to ground disturbance (OHA)	• Restoration of landform and historic character of site	• Remove of some or all of the unknown amount of fill (gravel, mulch, topsoil) and reshape landscape in coordination with OHA • Work with OHA to determine degree of ground disturbance allowed; potential identification of additional burials, features and deposits associated with "The Fort" community • Identify quantity of fill to be removed if site is to be returned to its original grade • If restoration is not feasible, shape land to reflect general form and character of surrounding historic landscape • Repair site with sterile soil (in archaeological terms), add topsoil, smooth and seed with turf	**Restore site of Former Maintenance Yard:** • Work with OHA to determine degree of ground disturbance allowed following archaeological investigation of site • Restore the site to its historic grade by removal of fill—if restoration is not feasible, shape land to reflect general landform and character of surrounding historic landscape • Repair site with sterile soil (in archaeological terms), add topsoil, smooth and seed with turf	• Restoration of landform		**PRIORITY: Low** • FWAG Members: *Forbes - a* **PRIORITY: High** • City	Wrap costs into drainage work and berm construction to reshape landform following archaeology investigations	5-10+ Years (unless tied to T&ES work on stormwater)	OHA, RPCA, T&ES
Objective 2.3: Enhance park's vegetative character and open space								**Priority**	**Probable Cost**	**Timeframe**	**Responsible Party**
Strategy 2.3.1: Maintain mix of open and wooded landscapes											
Action: Establish boundaries for turf and meadow management	• Confusion as to role of meadows in parkland • Areas are currently being mowed for turf with poor potential for turf growth	• Identify turf areas that can serve as flexible recreation areas; are accessible from the pedestrian system and parking areas; and do not conflict with cultural resource preservation or interpretive activities • Identify areas of turf currently irrigated (see Plate 20) • Identify separately, turf areas that are not intended for recreation use but form a protective land cover on historic resources • Identify meadow areas and align with the shape of the land and its drainage patterns; incorporate 'no mow' areas into overall park aesthetic • Evaluate turf and meadow areas for stormwater management effectiveness, habitat and cost savings (turf transfer to meadow cover - less frequent mowing; turf return to woodlands - no mowing) • Refer to site's Drainage Master Plan (URS)	• Reduced amount of turf area to be mowed • Reduced competition from turf grasses for healthy tree and shrub growth in wooded areas	• Establish turf and meadow areas that reflect topography, historic resources and recreational needs	**Enhance Park's Natural Character:** • Define Management Zones for turf - irrigated, non-irrigated and meadow • Identify turf areas to serve as flexible recreation areas that are accessible from the pedestrian system and parking areas and do not conflict with cultural resource preservation or interpretive activities • Identify turf areas to form a protective land cover on historic resources (not active recreation site) • Identify meadow areas and align them with the shape of the land and its drainage patterns; incorporate "no mow" areas into the overall park aesthetic • Clearly identify meadow plantings as intentional and productive for wildlife (butterflies, birds, voles, insects) • Locate wide mowed paths within meadows for walkers and visitor education	• Annually evaluate park vegetation by comparing Plate 20 to current conditions		**PRIORITY: Low** • FWAG Members: *Washington - c; Terrell - c* **PRIORITY: High** • City	Operational	1-3 Years	RPCA

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Action: Establish boundaries for areas managed as native woodlands	• Woodland areas are degraded by physical remnants of prior uses such as picnic table concrete pads that remain following removal of the picnic area designation; footers and anchors remain in place from prior use for trash receptacle • Wooded landscapes buffer adjacent neighborhoods to the north and east of the park, stretches of the buffer are infested with vines • Woodlands near storm pond have significant damage - broken limbs, downed trees and separate lawn areas within the park	• Inventory and map physical remnants to be removed from wooded areas • Inventory existing composition of designated woodlands and identify species to be removed (invasive, etc.) • Identify woodland areas to retain and enhance - buffer areas • Identify disturbed areas to be restored to woodlands and identify appropriate land cover • Identify desired future condition of woodlands (25-year timeframe) - perform gap analysis between inventory and desired future condition	• Healthy, well defined woodlands with remnant debris from former park site furnishings removed	• Manage natural areas (woodlands, buffer areas along perimeter and between uses) for vegetation compositions suited to local soils, solar orientation and moisture conditions; plant desirable species and either allow to undergo secondary succession, or manage at a particular seral stage, such as meadows mown to limit woody growth • Remove concrete pads and anchors from former trash cans no longer in use • Manage woodlands for desired vegetation community (ID) possibly tied to wildlife habitat *Examples:* City of Portland Natural Areas Restoration Plan http://www.portlandoregon.gov/parks/article/323540	**Enhance Park's Natural Character:** • Identify the Management Zone landcover type for woodlands (Plate 20) • Inventory the existing composition of designated woodland areas; manage for desired vegetation community and species to be removed (invasive species for example) • Shape woodland areas irregularly to better fit with natural site conditions; create woodland edges without corners or tight turns to ease mowing • Sign woodlands to indicate intentional management as woodlands • Identify and remove remnants from former recreation uses (picnic table slabs, waste can anchors, etc.)	• Annually evaluate and update Plate 20 to reflect current conditions		**PRIORITY: Low** • FWAG Members: *Washington -c; Terrell - c* **PRIORITY: High** • City	Operational	1-3 Years	RPCA
Action: Develop a data set on wildlife (birds, animals, etc.)	• Although park used informally for wildlife observation, no survey data exists, and the value of habitats available to wildlife is not currently known.	• Survey and document use of park by birds and wildlife • Inventory and assess habitat types; link to potential wildlife populations	• Establish annual bird and wildlife surveys	• Work with a Bio-Blitz approach • Invite Northern Virginia Audubon Society to use park as counting location • Survey wildlife resources (birds, animals, etc.) • Identify desirable habitat enhancement actions to promote wildlife diversity • Identify groups and organizations that may want to support implementation of the plan	**Research Opportunities:** • Survey and document use of the park by birds and wildlife Inventory and assess habitat types; link to potential wildlife populations • Establish annual bird and wildlife surveys • Work with Bio-Blitz approach • Invite Northern Virginia Audubon Society to use the park as a counting location • Identify desirable habitat enhancements to promote wildlife diversity • Work with local universities—GMU, UMW, NOVA, etc. to develop data set on wildlife	• Annually monitor wildlife in park		**PRIORITY: Low** • FWAG Members: **PRIORITY: Low** • City		10+ Years	Volunteers
Strategy 2.3.2: Develop and adopt planting approach for Fort Ward Park's natural and cultural landscapes											
Action: Determine role to play in 'City Arboretum' proposal	• Fort Ward Park served as designated City Arboretum and Nursery, the current and past plant palette reflects such history • City of Alexandria is considering expanding concept of Arboretum to entire city or re-establishing the Arboretum at Fort Ward Park (City Urban Forestry Master Plan reference)	• Garner information from past plant surveys (mid-1980s and 2001) • Determine role to play within City's Arboretum approach - retain role as singular site for arboretum or as a featured piece of a citywide arboretum • Establish vision for future vegetation composition in park (recommended species; historic species - Civil War fort, "The Fort" community, Glenn Dale azalea plantings, etc.)	• Clear understanding of role within Arboretum concept	• Feature historically appropriate plantings - "The Fort" community, Civil War era, azalea showcase - Glenn Dale sprouts from the Bowie Research Garden • Feature native vegetation • Manage as interpretive and educational resource	**Enhance Park's Natural Character:** • Use past plant surveys (mid 1980s and 2001) as a basis for determining what had previously been planted in the park • Determine the role of Fort Ward Park within proposed the citywide arboretum • Establish a vision for future vegetation composition in the park (consider native species, historic species - Civil War fort, "The Fort" community, Glenn Dale azalea plantings, etc.) • Be aware of and consider maintenance requirements for plant materials - fertilizer, irrigation, etc. • Don't plant any species that are considered to be non-native invasives in Virginia	• Update species list every five years		**PRIORITY: Low** • FWAG Members: *Washington - c; Terrell - c* **PRIORITY: Med** • City		3-5 Years	RPCA

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Action: Develop and update data set on vegetative resources	• Tree loss throughout the park is threatening the shaded character of the park • Vegetation surveys completed in mid 1980s and 2001 have not been updated or made digitally accessible • Tree inventory is over 10 years old; value is on tracking/update to determine tree failure/patterns/ trends/change • Many of the trees in the park are short-lived (black cherry, black locust)	• Determine existing tree canopy cover percentage (City goal of 40% citywide) and City goal for park itself (assume it may be higher than 40%) • Assess pattern of tree loss and decline - draw from Arboretum inventory in the mid-80s and the 2002 inventory • Determine percent of existing shade coverage of walking surface, playground, picnic facilities (shade is highly desired and appreciated asset at park) to establish a target, or goal to continue to meet or exceed • Identify areas in need of shade at picnic areas and recreation facilities such as the playground	• Policy regarding canopy coverage requirements in the park	• Track vegetative patterns of change, vegetative communities overtime and species mix and survival • Survey vegetative resources (shade retention and enhancement) • Develop goals for natural area vegetation compositions within the park • Develop an updated data set documenting park vegetation installed, removed, trends overall and status of key plantings such as Champion or Memorial species	**Enhance Park's Natural Character** • Correlate past plant surveys (mid 1980s and 2001) and make digitally accessible for future updates • Determine existing tree canopy coverage in the park, and the City's goal for Fort Ward Park • As a baseline, determine the current amount of shade coverage found on the walking paths, playground and picnic areas • Assess the pattern of tree loss and decline • Establish target goals (for example, amount of shade cover for picnic areas) based on current status • Work with Northern Virginia Conservation Trust to develop baseline for vegetation	• Update species list every five years		**PRIORITY: Low** • FWAG Members: *Washington - c; Terrell - c* **PRIORITY: Low** • City		5-7 Years	RPCA
Action: Develop a planting strategy, recommended plant list and planting zones	• There is no master planting plan or plant list of planting strategy for the park	• Build on vegetative data collected and updated • Identify volunteer groups interested/willing to plant • Develop study with OHA using historic aerial photography and oral histories to see regular planting pattern in "The Fort" community; incorporate in replanting • Conduct study with Alexandria and Fort Ward Museum staff to locate planting on the landscape so appropriate views are emphasized and/or certain things hidden from view. For example: new tree placement may better explain fort's fire-of-fire • Inventory Arborist's Memorial; find original plans - determine if restoration to original is possible • Follow guidance in City of Alexandria's Landscape Guidelines, April 2007 which lists preferred tree species and undesired non-native invasive plant species	• Develop goals and plant lists for natural area vegetation compositions with clear direction for planting character and plant materials (species list by area, size, etc.) for each park area • Develop plant list for park: by park area; type; size; etc. • Determine canopy goal for park itself (if City is 40%, park should be 65%?) • Determine if any, all or some of the azalea beds (Glenn Dale experimental plantings) should be restored • Extend tree planting to West Braddock Road, incorporating historic planting patterns from "The Fort" community • Enhance and expand shade plantings along heavily used recreation areas - target 65% of paved walking surfaces?; 50% at picnic areas? (from shelter or tree canopy?) • Reinvigorate native woodland plantings	• Consider featuring historically appropriate plantings, such as those from "The Fort" community, from the Civil War era and the azalea plantings from the Bowie research gardens • Implement a plant survey on a five-year or similar cycle to track vegetative patterns and identify vegetative communities in the park • Develop list of acceptable plant materials for park installation; durable, long-lived and needing minimal care with scheduled maintenance checklist for watering, mulching and pruning; include plants attractive to native birds and wildlife; determine size at planting and watering needs Example: A Guide to Planting an African American/African Focused Yard http://miami-dad.ifas.ufl.edu/old/programs/urbanhort/publications/PDF/Historical%20Background.PDF	**Enhance Park's Natural Character** • Draw on data collection to determine a master planting list for the park and develop a plant list by area, type, etc. (refer to City of Alexandria's Landscape Guidelines, April 2007) • Use historic aerial photography and oral histories to determine historic planting patterns, identify which to restore or interpret • Ensure new plantings emphasize positive views and screen others (for example: new tree placement may better explain fort's fire-of-fire; screen utility boxes) • Incorporate volunteers in plantings (Tree Stewards, Scouts, Garden Club, etc.) and organize a community service group or volunteers to assist with park maintenance - maintaining beds, planting trees, light pruning, etc.	• Revisit the planting strategy every five years		**PRIORITY: Low** • FWAG Members: *Washington - c; Terrell - c* **PRIORITY: High** • City		3-5 Years	RPCA/Volunteers

Notes on FWAG Priorities Submissions:

Forbes *- a: All of Strategy 2.2.3's actions as one of three action priorities*

Washington *- a: All of Strategy 2.1.1 actions as one of three action priorities*

Washington *- b: specifically: 'Identify appropriately designed fence to put around perimeter of Old Grave Yard; to mark graves at Clark Burial Grounds; and to mark two graves near former maintenance yard entrance'*

Washington *- c: Priority incorporates entire Objective: 'Heal areas of erosion throughout the park, stormwater system, and enhance vegetative character and open space*

Walpole *- differ from actions: 3 priorit As primarily a CIVIL WAR historic landmark, the original characteristics are of paramount importance. Money raised to improve the Park should focus initially on the Military use aspect.*
The fact that the park has many other significant and important uses should be recognized
The maintenance actions in the Park are details that can be worked out by those knowledgeable and experienced in such matters. Water run-off, location of maintenance area, fencing, etc. can be worked out through routine discussions. Nothing drastic is immediately at stake so long as grave sites are protected.

Terrell *- a; All of Strategy 2.1.1 actions as one of three action priorities*

Terrell *- b; specifically: 'Identify appropriately designed fence to put around perimeter of Old Grave Yard; to mark graves at Clark Burial Grounds; and to mark two graves near former maintenance yard entrance'*

Terrell *- c: Priority incorporates entire Objective: 'Heal areas of erosion throughout the park, stormwater system, and enhance vegetative character and open space*

Ziegler *- a; All three actions under Strategy 2.1.1 with additional action 'Request funding from the City Council for the third stage of archaeological research for Fort Ward Park'*

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Goal 3 - Landscape Cultural Practices *Adopt appropriate and coordinated landscape management practices.*											
Objective 3.1: Tie ongoing City of Alexandria maintenance practices with those specific to the park											
Strategy 3.1.1: Coordinate Management Plan recommendations with other City of Alexandria park maintenance efforts											
Action: Coordinate with City maintenance practices and City maintenance calendar	• City of Alexandria has monthly maintenance tasks identified - list to serve as starting point for all activities at Fort Ward and for coordination on OHA and RCPA activities • City of Alexandria is adopting its park maintenance operations to be consistent with Levels of Service as described in APPA Operational Guidelines for Educational Facilities, Grounds, second edition	• Identify additional tasks to be performed at Fort Ward	• Integration of City RPCA Operations Calendar for Maintenance Practices with activities specific to Fort Ward Park Cultural Practices	• Coordination between entities	**Coordinate with City Calendar for Maintenance Practices:** • The City's Park Operations' monthly task calendar and APPA levels of Service is a starting point for landscape and park maintenance activities • Supplement with Best Practices described in the Fort Ward Management Plan	• Annually coordinate between all parties, private contractors and City staff		**PRIORITY: Low** • FWAG Members: **PRIORITY: High** • City	Operational	annually	RPCA, OHA
Objective 3.2: Contribute towards the City of Alexandria's Tree Canopy Goal of 40%											
Strategy 3.2.1: Restore and expand existing woodlands											
Action: Plant new trees	• Tree count is down by one-quarter (of approx. 600 trees surveyed in park at one point,100-200 have been lost recently) due to natural aging and several severe storms • No new trees have planted since 2010 due to ground disturbance concerns • Many trees that were planted as part of past City Arboretum efforts are unsuited to site characteristics and have difficulty in thriving	• Identify areas where tree planting can occur without supervision from OHA; where planting can occur with simultaneous supervision from OHA and where no planting can take place due to ground disturbance of cultural resources and burial sites • Identify target goal for canopy coverage and/or tree count for park • Identify priority zones(s) for plantings	• Trees are being planted in the park	• Divide park into planting areas and within those areas identify zones as priority areas for tree planting (take into consideration level of ground disturbance allowed, etc.) • Plant minimum of 24 trees annually • Divide park into planting zones; taking into consideration level of ground disturbance allowed • Select tree species from park planting list (to be developed)	**Tree Planting:** • Divide the park into planting zones; taking into consideration the level of ground disturbance allowed • Identify priority zone(s) for plantings (see Plate 22) • Select tree species from the park planting list (to be developed) • Plant a minimum of 24 nursery-sized trees annually per the City's standards on an annual basis; select species from list specific to Fort Ward Park • Plant native seedlings in tubes (volunteer opportunity, locally and regionally) in established woodlands	• Water and care for tree planting through a three year establishment period • After five years, revisit and update annual tree planting goal based upon storm replacement and overall tree canopy coverage		**PRIORITY: High** • FWAG Members: *Forbes; Washington - a; Terrell - a; Annear a; Ziegler* **PRIORITY: Medium** • City	$10,350-13,250	1-3 Years, ongoing	RPCA
Strategy 3.2.2: Assess tree cover and health											
Action : Prune diseased and dead tree limbs	• Considerable dieback of tree limbs in park • Cherry trees near amphitheater need pruning	* Coordinate inventory with City Arborist for periodic assessments for pruning and tree removal needs and scheduling for such activities	• Tree health improved through judicious pruning	• Walk the park to determine pruning and removal needs • Remove wood that is not to remain (woodlands) can be recycled through use of portable sawmill or chipped for use as mulch on shrub beds • Use community service group or volunteers to assist with light pruning (arborist service work day or trained Alexandria/Arlington Tree Stewards)	**Tree Health:** • Annually walk park and conduct a tree assessment and tree risk exam • Assess needs for limb pruning and hazards, paying particular attention to high activity areas such as picnic grounds, paths and playground • Consider training Tree Stewards to inventory tree maintenance requirements and to develop a prioritized list of maintenance needs	• Annually walk the park and conduct a tree assessment and tree risk exam; assess needs for limb pruning, hazards and tree removal, paying particular attention to high activity areas such as adjacent to picnic areas, paths and playground		**PRIORITY: High** • FWAG Members: *Brune; Washington - a; Terrell - a; Annear a* **PRIORITY: High** • City	Assume budgeting for specific number of trees. $5,000-10,000	1-3 Years, ongoing	RPCA

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Action: Remove fallen and hazard trees	• Tree fall is evident within park use areas	• Set priorities for identified hazard trees around high activity areas • Walk park and conduct a tree assessment and tree risk exam: identify trees to be removed, paying particular attention to high activity areas such as picnic grounds, paths and playground • Determine if tree is located in area acceptable for ground disturbance before grinding stump; flush cut stump if disturbance not allowed (see ground disturbance map and consult with OHA)	• Hazard trees are addressed immediately and appropriately	• Remove hazard and fallen trees • In designated woodland areas mulch crowns and use mulch on pathways within wooded areas; leave snags for wildlife; lay trunk on ground • In turf and meadow areas, mulch tree crowns and stockpile for future application; remove larger branches and trunks • Seasonally remove dead trees when located away from use areas	**Tree Health:** • Standardize assessment (biannual) of pruning and tree removal needs • Immediately close the area until the hazard tree and its debris are completely removed from the area when located in an actively used area (trails, interpretive areas, picnic grounds, playground) • Seasonally remove dead trees when located away from use areas; mulch the crown and leave mid- to small-sized branches in place; lay the trunk on the ground and leave it in place on the ground; leave the trunk to a height of 10' -12' as a "snag" for wildlife use, if stable • Determine if the tree is located in an area acceptable for ground disturbance before grinding the stump; flush cut the stump if disturbance is not allowed (see ground disturbance map or consult OHA)	• Annually walk the park and conduct a tree assessment and tree risk exam; assess needs for limb pruning, hazards and tree removal, paying particular attention to high activity areas such as adjacent to picnic areas, paths and playground		**PRIORITY: High** • FWAG Members: *Forbes; Washington - a; Terrell - a; Annear a; Stanton; Magnuson; Ziegler* **PRIORITY: High** • City	Assume budgeting for specific number of trees. $3,000-7,750	1-3 Years, ongoing	RPCA
Strategy 3.2.3: Perform tree maintenance											
Action: Assess tree growth on earthworks	• Woody species are currently growing in the parapet and ditch - the most sensitive areas of the earthworks; on the front wall leading to the southwest bastion, on the rear wall between the east and north bastions • Trees and large shrubs have the potential to damage the earthworks if they drop branches or are blown over	• Inventory trees growing on the earthworks; record their species, height and diameter at breast height, as well as their position on the earthworks • Identify, if any, areas on the earthworks where sapling and tree growth is acceptable and areas where all woody growth is to be removed • Assess the windthrow potential of each tree by recording its root system type (shallow rooted, tap root) and increased chance of windthrow due to position on the earthwork, age, and structural integrity.	• Reducing damage to earthworks from windfall and tree throw	• Identify and map areas where sapling and tree growth is acceptable to remain (except hazardous trees) on earthworks and where trees should be removed • Adhere to NPS preservation standards for care of historic earthwork sites • Establish an annual evaluation by a certified arborist to determine any hazardous potential of all trees growing on or within falling distance of the earthworks	**Tree Maintenance** • Inventory and record species, height, diameter at breast height, root system type (shallow rooted, tap root, etc. as may effect windthrow potential), age, structural integrity and specific location of trees growing on or adjacent to the earthworks • Identify and map areas where sapling and tree growth is acceptable to remain (except hazardous trees) on earthworks and where trees should be removed	• Every three years update inventory annually and evaluate/monitor trees growing on earthworks for windthrow potential, structural integrity and hazard tree		**PRIORITY: Low** • FWAG Members: **PRIORITY: Low** • City		5 + Years, ongoing	OHA, RPCA

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Action: Identify appropriate treatment of leaf litter	• Downed limbs and trees are found throughout park, on lawn areas and in woodlands • Leaf litter has been collected in much of the park, and has accumulated in some areas too deeply to easily decompose • Leaf litter provides good nutrients to soil	• Identify areas where leaves and minor tree debris are to remain in place; where leaves are to be removed until final clearance when they are to be mulch-mowed; and areas where tree cover is light that leaves may be mulch-mowed and left in place throughout leaf removal season	• Dispose of leaves on site for use as organic fertilizer and soil enhancer	• Consider methods for using leaf litter to protect the Fort Ward parapet and ditch system. May require chipping and wetting to establish a mat that will adhere to the sloped landforms. • Mulch-mow in place leaves in areas as shown; remove leaves early in season in grassed areas with heavy tree cover • Lawn areas with heavy tree cover - remove bulk of leaf fall with blower; final removal use mulching mower and leave on site • Lawn areas with light tree cover - use mulching mower and leave on site • Earthworks and fort area - remove bulk of leaf fall with blower; final removal use mulching mower and leave on site; trenches clean out bulk of leaf fall, leaf no more than 2" deep of loosely packed leaves at season end • Woodlands - leave leaves in place unless in earthworks trench or where total depth will exceed 6" of loosely packed leaves at season end	**Mulch Leaf Litter On-Site:** • Mulch-mow in place leaves in areas as shown on map; remove leaves early in season in grassed areas with heavy tree cover	• Annually update the leaf litter treatment shown on Plate 23		**PRIORITY: Low** • FWAG Members: **PRIORITY: HIGH** • CIty	Operational	1-3 Years, ongoing	RPCA, OHA
Action: Remove standing stumps in the park	• Many trees that were removed in the recent past were not cut to the ground (stumps extend several feet above grade) and did not have their stumps ground due to concerns regarding ground disturbance • Stump removal may disturb cultural resources - assess and evaluate after OHA completes report of 2012 investigations	• Identify areas where: stumps may be ground with oversight by OHA; where stumps may be ground without oversight by OHA (no significant archaeological deposits identified/expected); where stumps must be flush cut (and possibly treated to prevent resprouting); and where the ground must be left undisturbed.	• Stumps removed from turf areas	• Grind stump under supervision of OHA if required • Flush cut stump if located in area of no ground disturbance	**Tree Maintenance:** • Ensure that no stumps are left standing in the park, unless specifically identified as such for wildlife habitat and located in a designated woodland area • Flush cut stumps where the ground is not to be disturbed • Prior to grinding a stump, contact OHA to determine if on-site supervision is required or if it is located in area designated by OHA as acceptable for ground disturbance • Match equipment to constraints on access	• Annually update Plate 22 Ground Disturbing Activities		**PRIORITY: Med** • FWAG Members: *Washington - a; Terrell - a; Annear a* **PRIORITY: Med** • City		3-5 Years	RPCA

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Objective 3.3: Restore shrub layer											
Strategy 3.3.1: Restore shrub layer in high visitor use areas and at woodland edges											
Action: Plant new shrubs	• Park is beloved for its historic azalea and camellia shrub plantings which have declined over the years, in quantity and number of beds • Determine what plants have thrived in park to date; is plant decline due to lack of cultural care such as high need for fertilizer, irrigation, etc. or for natural reasons such as age, storm damage • Deer browse likely adversely impacting understory	• Identify areas that need additional shrub plantings	• Enhanced understory/shrub layer of plant materials throughout park	• Replace and replenish shrub plantings throughout the park • Organize a community service group or volunteers to assist with park maintenance - cleaning flower beds, planting trees, light pruning by arborists or trained Alexandria/Arlington Tree Stewards, litter pick up, assistance with interpretive and educational materials, update of 2002 tree inventory, etc.	**Shrub Planting:** • Identify areas that need additional shrub plantings; limit new plantings that require irrigation to areas that are currently irrigated • Plant native shrubs as understory in woodland areas (non irrigated areas) • Expand and replenish existing shrub beds in existing irrigated areas • Add shrubs to the earthworks area to redirect foot traffic and to protect earthworks from trampling • Add shrub plantings to interpretive areas • Supplemental watering may be required to establish plantings; seasonal weeding of shrub beds; mulch beds as needed (annually) to maintain a 2"-3" cover	• Survey shrub growth every three years to identify needs for additional planting		**PRIORITY: Low** • FWAG Members: **PRIORITY: Low** • City		10 + Years	RPCA
Strategy 3.3.2: Perform shrub maintenance											
Action: Maintain existing shrubs	• Existing shrubs need to be pruned and thinned • Pruning needs to be done at proper time of year and in accordance with desired form - loose and open for most shrubs in the park; trimmed as hedges for shrubs near the museum and within the earthworks and fort area	• Inventory shrubs and identify plants that should be pruned or removed	• Maintain healthy shrub population in park	• Prune shrubs (no shearing except for hedges near the museum and within the earthworks and fort area) annually to keep them vital and healthy • Remove dead shrubs twice a year	**Shrub Maintenance** • Annually prune shrubs during the appropriate season (i.e. azaleas to be pruned in late spring after flowering but before buds set for the following year's bloom) • Do not shear shrubs, with the exception of hedges associated specifically with the earthworks • Involve Alexandria/Arlington Tree Stewards as volunteers • Remove shrubs under guidance from OHA and ground disturbance mapping	• Annually assess pruning needs		**PRIORITY: Low** • FWAG Members: **PRIORITY: Low** • City		10 + Years	RPCA
Action: Maintain shrub beds	• Shrub beds are weed infested • Shrub beds are being overgrown by woody growth, vines and ground level weeds	• Identify shrub beds to be retained and enhanced • Assess current mulch status and level of weed infestation	• Maintenance of attractive and healthy shrub beds	• Top dress and mulch shrub beds • Organize a community service group or volunteers to assist with cleaning flower beds and mulching	**Shrub Maintenance** • Annually refresh or replace mulch (leaf litter or shredded hardwood) to 2" -3" deep in formal shrub beds • Re-establish existing irrigated shrub bed edges • Top dress and clean shrub beds seasonally of weeds and debris 3 times per year (spring, summer, fall) • Cultivate and add compost in the spring to established shrub beds • Remove invasive plant materials, vines and weeds • Test soil annually; apply fertilizer as determined by soil testing • Work with community service group or volunteers (trained by RCPA staff) to maintain beds	• Review bed health and location every three years		**PRIORITY: Low** • FWAG Members: **PRIORITY: Med** • City		10 + Years	RPCA

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Objective 3.4: Remove inappropriate vegetative growth											
Strategy 3.4.1: Remove invasive groundcovers and undesired shrubs and saplings from earthworks and burial grounds											
Action: Remove inappropriate vegetation from earthworks	• The earthworks are protected by a mixture of land cover types, including turf, trees and leaf litter, vines and scrubby growth. The mixed groundcover vegetation offers a range of protection against erosion; some species are not well suited to soil stabilization due to a lack of a fibrous root system. • Scrubby growth limits the visual accessibility of the earthworks, reducing their interpretive value. •There has been mixed success with using vines like vinca to control erosion of the earthen walls	• Inventory and map earthworks to show soil type and conditions, light levels, current groundcover and ground that may be disturbed without OHA oversight, areas that may be disturbed with on-site supervision by OHA and areas that cannot be disturbed • Identify techniques to remove undesirable groundcover without disturbing the soil of the earthwork	• Earthworks are free of inappropriate vegetation	• Establish a sustainable land cover to protect against erosion (leaf litter or turf) • Use a taller, native warm-season grass for the fort parapet to reduce mowing and to discourage visitors from climbing on the earthwork; at Jackson Cemetery/earthwork site create a band of grass on perimeter of cemetery with mown turf within • Remove all non-native invasive plant species from the earthworks	**Removal of Undesired Vegetation** • Inventory and map earthworks to show soil type and conditions; light levels; current groundcover • Use techniques to remove undesirable growth that do not damage the earthworks • Determine and map most appropriate coverage types: turf, meadow, noninvasive groundcover or leaf litter • Replace undesired vegetation with Virginia Wild Rye or native warm season grasses or turf • Adhere to NPS preservation standards for care of historic earthworks • Ensure that earthworks are covered with turf or tree and leaf litter as mulch; transform one wing/bastion annually and then monitor to retain desired coverage	• Assess sites annually for undesired growth		**PRIORITY: High** • FWAG Members: *Washington - c; Terrell - c; Moir; Annear - c* **PRIORITY: Med** • City	Annually allocate for portion of site: $2,500 - 7,500	Ongoing	OHA
Action: Remove inappropriate vegetation from burial grounds and cemeteries	• Jackson Cemetery - English ivy and other non-native invasive species encroaching on the stairway leading into the fort near the cemetery	• Identify areas in the Jackson Cemetery to remove groundcover and invasive vegetation (given depth of burials, no possibility of disturbance to burials by aeration)	• Burial grounds and cemeteries are free of inappropriate vegetation	• Establish a sustainable land cover to protect against erosion - turf or meadow (if meadow, consider using it as a perimeter marker to dissuade park visitors from using the area as play space and mow internal space) or leaf litter	**Removal of Undesired Vegetation** • Remove invasive plant materials such as English ivy from Jackson Cemetery and nearby earthworks • Given the depth of the burials, there is no possibility of disturbance to burials by aeration at the Jackson Cemetery • Replant with turf or meadow grasses as a sustainable land cover (consider use of meadow as a perimeter marking to dissuade park visitors from using a cemetery as a play area) • Mow the meadow perimeter annually; mow turf as necessary; aerate annually to encourage healthy turf growth	• Assess sites annually for undesired growth		**PRIORITY: High** • FWAG Members: *Brune; Washington - c; Terrell - c; Moir; Annear - c* **PRIORITY: Med** • City	Annually allocate for portion of site: $2,500 - 7,500	Ongoing	OHA

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Strategy 3.4.2: Minimize non-native invasive plants											
Action: Remove non-native invasive plants	• Invasive plant species are in existing shrub beds and no mow areas: vine growth on trees; coverage on cultural resources such as earthworks • Invasive non-natives in woodlands and in particular along buffer planting on North Van Dorn Street	• Conduct a survey of the park to identify existing non-native invasive species present; extent of the problem; and establish priorities for removal	• Reduction in non-native invasive plants in park	• Return park's natural ecosystem (wildlife, insects, etc. beneficiaries) and plantings to good health • Conduct initial park survey and update every three years to identify existing non-native invasive species present, the extent of the problem, and to establish priorities for removal	**Invasive Plant Growth Removal** • Conduct an initial park survey and update every three years to identify existing non-native invasive species and the extent of the problem • Establish priorities for removal • Avoid removal where ground disturbance is prohibited; remove under oversight of OHA in other areas • Use hand removal and environmentally-sensitive, appropriately applied herbicides; dispose of debris properly • Employ preventive measures to reduce introduction of new non-native invasive species - monitor areas subject to ground disturbance (seed bank), inspect new plants prior to installation, clean maintenance equipment prior to use in the park	• Assess non-native invasive species growth every three years		**PRIORITY: Low** • FWAG Members: *Moir* **PRIORITY: Low** • City		5+ Years	RPCA, OHA
Objective 3.5: Establish attractive and sturdy turf											
Strategy 3.5.1: Actively manage turf growth											
Action: Core aerate soils to address compaction	• Compacted soil results in poor turf growth • Erosion and cobble wash within turf areas; where ground too compacted for thick turf cover • Areas of poor turf growth on earthworks - problems can be attributed to compaction from visitor access, maintenance practices (for example rear wall where mowing has caused damage), animal burrowing, damage from fallen trees or branches, lack of moisture, soil fertility, or low pH	• Identify areas where 4" aeration can occur and where no aeration can occur • Identify areas where the turf requires repair or attention, for example on the rear wall of earthworks where mowing has caused damage • Inventory highly compacted areas (picnic areas - turf)	• Healthy turf growth and good infiltration of surface water	• Aerate turf • Redirect visitors from walking and climbing on the earthworks	**Healthy Turf Growth:** • Refer to Plate 21 for areas where aeration may occur without OHA direct supervision; where OHA must be on site to supervise aeration; and where aeration may not occur under any scenario • Aerate turf two times per year (spring and fall) as regular maintenance; where soils are particularly compacted, aerate four times a year for the first three years	• Update aeration Plate 23 (initial map - 2014) annually based on OHA investigations and ground disturbance mapping • Assess turf for improvement in surface water infiltration and turf health annually		**PRIORITY: Low** • FWAG Members: *Stanton; Magnuson* **PRIORITY: High** • City	Operational	1-3 Years and ongoing	RPCA, OHA
Action: Overseed and top dress turf	• Turf is sparse in areas and washed away by erosion and soil compaction in others	• Identify areas where overseeding is appropriate and no additional preparation work is required (humus or other organic matter, new topsoil, aeration, etc.) • Identify areas where rehabilitation is required - new topsoil, organic material and reseeding	• Healthy turf growth and good infiltration of surface water	• Overseeding • Address cultural requirement needs such as soil tilth using mulch, aeration, and watering	**Healthy Turf Growth** • Apply pre-emergent herbicide, followed by overseeding and top dressing with compost • Identify areas where overseeding is appropriate and no additional preparation work is required (humus or other organic matter, new topsoil, etc.) • Identify areas where rehabilitation is needed - humus, organic matter, topsoil • De-thatch annually • Supplement with fertilizer in fall if the need is demonstrated by soil tests • Overseed and top dressing annually (if needed) following aeration if over 40% of existing turf is sparse • Test soil annually in five areas of the park: near West Braddock Road; near the amphitheater; near the picnic shelter; near the playground and in the fort area	• Assess turf for improvement in surface water infiltration and turf health annually		**PRIORITY: Low** • FWAG Members: **PRIORITY: High** • City	Operational	1-3 Years and ongoing	RPCA, OHA

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Action: Define mowing height	• Mowing height and mowing frequency varies between two zones (OHA and RCPA supervision)	• Establish turf cultural practices that are adhered to by all entities caring for turf within the park	• Healthy turf with no discernable difference between RCPA maintained area and private contractor maintained area	• Establish consistent mow cycle and mowing height in conjunction with two entities • Modify mowing practices on rear wall between fort's gate and East Bastion to avoid damaging wall	**Healthy Turf Growth:** • Establish a consistent mow cycle and mowing height • Modify mowing practices to ensure that no damage is made to earthworks (inadvertent gauging and soil compaction) • Use a rotary style finishing mower equipped with a mulch kit • Initial spring mow to 2.75" turf height • Mow turf to maintain 3" height during summer season • Mow turf in late summer to 3"-4" • Adjust turf height to 2.5" in height in fall	• Assess height seasonally		**PRIORITY: Low** • FWAG Members: **PRIORITY: High** • City	Operational	1-3 Years and ongoing	RPCA, OHA
Strategy 3.5.2: Actively manage meadow growth											
Action: Remove invasives and woody plant materials from meadows	• Unmowed meadows have significant invasive plant species and woody plant growth in designated meadows (prior to mow in fall 2013)	• Update meadow locations (five meadows initially identified by City, updated 2013)	• Attractive and healthy meadow established	• Determine mow schedule that maintains a grass and forb community of native species and prevents colonization by woody material, but also avoids disturbing nesting habitat for wildlife	**Healthy Meadow Growth:** • Mow meadow once a year between December and March to avoid the nesting period and to remove standing material; encourage seed germination and encourage vigorous plant growth; set the mower deck as low to the ground as possible without gouging the soil surface, removing everything with the mow • Alternatively, bush hog the meadow every three to five years to remove woody growth between April and July; apply more frequently if woody growth is heavy	• Assess woody and non-native invasive species growth annually		**PRIORITY: Low** • FWAG Members: **PRIORITY: High** • City		1-3 Years and ongoing	RPCA
Objective 3.6: Train maintenance personnel on appropriate practices for historic and archeological sites and natural areas											
Strategy 3.6.1: Use the MOU park maintenance zone areas to identify levels of training required for maintenance personnel											
Action: Train all personnel on the use of equipment to minimize damage to resources	• Weed whacker (tree trunk damage) • Heavy vehicular equipment traffic (mowing, trash removal, park monitoring) compacts soil • Soil erosion is occurring on path edges from equipment and drainage	• Identify equipment prone to causing soil compaction or tree damage • Identify areas that vehicular traffic should not enter • Identify travel corridors if access is needed off paved surfaces	• Damage to park from equipment is nonexistent	• Place leaf or mulch beds at base of trees to avoid turf immediately adjacent to tree trunk (damage from weed whacker) • Diagram 'safe' routes for equipment travel and storage within park and limit equipment to those locations only (update and adjust routes as needed) • Train employees in proper equipment operation: weed whacker and potential damage to tree trunks; heavy vehicular equipment (ranger carts, trash vehicles) • Train operators annually (ensure seasonal employees receive training) on equipment operation to avoid further soil compaction, earthwork damage or tree damage • Ensure that heavy equipment is never used in association with the Fort Ward earthworks	**Equipment Operation and Use** • Identify equipment prone to causing soil compaction or tree damage • Identify areas that vehicular traffic should not enter • Identify travel corridors if access is needed off of paved surfaces • Train operators annually on equipment 'safe' routes and use	• Assess damage caused by equipment operation annually		**PRIORITY: High** • FWAG Members: *Forbes; Washington - b; Terrell - b; Annear b; Stanton; Magnuson; Ziegler* **PRIORITY: High** • City		1-3 Years and ongoing	OHA, RPCA

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Action: Provide training and certification for maintenance personnel at park	• Operators need to be made aware of importance and fragility of cultural resources found in park (particularly seasonal workers)	• Identify equipment issues (weed whacker, vehicle routes, damage to earthworks)	• Equipment operators at Fort Ward Park are educated as to the fragility of the park's cultural and natural resources	• Develop training programs to make park personnel familiar with significance and fragility of resources at park	**Certifications:** • Train key personnel at the park for special duties unique to Fort Ward and its stewardship of cultural resources • Train key personnel at the park on landscape cultural practices as they relate to a historically rich and resource-fragile park, where ground disturbing activities are of great concern • Train employees on identification of Fort Ward Park's historic and archaeological resources; tree and shrub care, turf management, proper pruning techniques and invasive species removal techniques	• Assess effectiveness of operator training annually		**PRIORITY: Med** • FWAG Members: *Brune; Washington - b; Terrell - b; Annear b* **PRIORITY: Low** • City		1-3 Years and ongoing	OHA, RPCA

Notes on FWAG Priorities Submissions:

Washington *- a; Multiple actions identified*

Washington *- b; Reference two actions under Strategy 3.5.1*

Washington *- c; Reference two actions under Strategy 3.3.1.*

Walpole*: 'These involve routine tasks for any Park and can be determined by those doing the work. If fallen trees should be removed, let the tree people decide. While I see no need to plant new trees, I leave that in the hands of arborists.'*

Terrell *- a; Multiple actions identified*

Terrell *- b; Reference two actions under Strategy 3.5.1*

Terrell *- c; Reference two actions under Strategy 3.3.1.*

Annear *- a; Multiple actions identified*

Annear *- b; Reference two actions under Strategy 3.5.1*

Annear *-c; Reference two actions under Strategy 3.3.1*

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Goal 4 - Educate and Engage Visitors - Share the Stories of Fort Ward Park ***Increase and broaden the audience in support of the park's preservation and enhancement by providing a high quality interpretive and educational experience.***											
Objective 4.1: Develop a detailed interpretive plan for Fort Ward Park that celebrates the park's multi-faceted history											
Strategy 4.1.1: Expand or reform the Fort Ward History Work Group and Fort Ward Advisory Group to provide advice on the interpretive planning, design and implementation											
Action: OHA to formally invite key stakeholders from the Fort Ward and Seminary African American Descendants Society, Civil War historians, naturalists, educators, and community representatives to participate in a new advisory committee working on the development of an interpretive plan	• Stakeholder groups have expressed strong interest in the telling of the stories (both facts and meanings), and educating visitors about the national and regional significance of Fort Ward Park			Invitation to be member of new group to be offered by OHA staff	• Create a newly formed (derivative of existing group and Friends Group) advisory committee			**PRIORITY: High** • FWAG Members: *Forbes; Annear; Stanton; Magnuson; Ziegler* **PRIORITY: High** • City	$35,000-150,000, scope dependent	1-3 Years	OHA
Action: Working with the advisory committee on interpretation, select topics, stories, text, and images that best represent the recommended themes for Fort Ward Park (including both citywide or region wide themes and site specific themes)	• There are extensive resources available that have to be reviewed and narrowed down to those that best tell the desired stories							**PRIORITY - Low** • FWAG Members:		TBD during Interpretive Planning Process	OHA
Action: Match the recommended stories, sites and places with the best communication and educational practices including a range of web-based and mobile technology, as well as exhibit design	• There are a range of new technologies that can help the story							**PRIORITY - Low** • FWAG Members:		TBD during Interpretive Planning Process	OHA
Action: Where historical imagery is not available, utilize drawings and illustrations to evoke the imagery sought to capture the meaning of the interpretation	• Extensive photographic records exists, but may not cover all the facts and meanings							**PRIORITY - Low** • FWAG Members:		TBD during Interpretive Planning Process	OHA
Strategy 4.1.2: Make use of landscape features to tell the stories											
Action: Match the recommended stories with the sites and places where the stories are best told and develop conceptual site plans for any related physical improvements needed to help tell the stories	• While placement of existing interpretive panels are appropriate, the story can be expanded by paying attention to the setting and view from the panel as well as visitor comfort; adjust existing location of panel if need to better tell the story							**PRIORITY - Low** • FWAG Members: *Washington - c; Terrell - c*		TBD during Interpretive Planning Process	OHA
Action: Design and install an interpretive trail as part of the overall trail network as a means of organizing the outdoor interpretive experience	• All of the FWAG reports indicated the need for a trail - recreational, nature-based interpretation, historical and cultural interpretation							**PRIORITY - High** • FWAG Members: *Washington - c; Terrell - c; Moir; Annear - a*		3-5 Years	OHA
Action: Use the 'We're Still Here" theme as part of the trail system as a means of organizing the stories associated with the "The Fort" community and linking those stories to the larger citywide themes associated with African American Heritage	• The theme evolved from the FWAG chapters on African American Heritage							**PRIORITY - Med** • FWAG Members: *Washington -c; Terrell -c; Moir*		TBD during Interpretive Planning Process	OHA
Action: Connect and reorganize the pathways through the fort so they become part of the trail network as a means of interpreting the fort's unique earthworks and to encourage movement through and around the earthworks in a careful and respectful manner	• Pathways are needed to direct visitors away from sensitive resources							**PRIORITY - Med** • FWAG Members: *Washington - c; Terrell - c; Moir*		TBD during Interpretive Planning Process	OHA

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Action: Install outdoor exhibits and enhance historic landscapes (use vegetation to demark old road alignments, gardens, house sites, etc.) to interpret "The Fort" community	• There are few visible remnants of "The Fort" community; some landscape elements can be restored or rehabilitated using historic photographs and oral histories							**PRIORITY - Low** • FWAG Members: *Washington - c; Terrell - c*		TBD during Interpretive Planning Process	OHA
Action: Design and install landscape elements and a Memorial Stone that allow for the cemeteries and grave site to be experienced as places of contemplation	• Benches, shade, and simple markings are preferred based upon input from FWAG							**PRIORITY - Med** • FWAG Members: *Washington - c; Terrell - c; Annear a*		TBD during Interpretive Planning Process	OHA
Action: Design and install interpretive exhibits or landscape elements that help to tell stories of family and community and connect to broader themes of race and the struggle for social, economic and political survival	• The idea of connecting stories to broader themes was discussed at FWAG meeting on interpretation							**PRIORITY - Low** • FWAG Members: *Washington -c; Terrell - c*		TBD during Interpretive Planning Process	OHA
Objective 4.2: Increase awareness of the site's local, regional and national significance by linking to themes related to the Defenses of Washington with the establishment and building of an African American community											
Strategy 4.2.1: Greet and orient the visitor											
Action: Install a comprehensive exterior orientation exhibit at the primary entrance to introduce themes and stories, provide context and orient visitors to the park	• The need for an outdoor orientation area was identified at the listening sessions in the park							**PRIORITY - Low** • FWAG Members: *Washington - a; Terrell - a;*		TBD during Interpretive Planning Process	OHA
Action: Install a small, 1-panel orientation kiosk at each minor entrance to the park	• This is an opportunity to provide information to visitors and neighbors that are primarily coming for recreation							**PRIORITY - High** • FWAG Members: *Forbes; Washington - a; Terrell - a; Stanton; Magnuson*		3-5 Years	OHA
Action: Provide web-based and mobile technology applications and content to allow visitors to dig deeper and broader into the themes introduced at Fort Ward Park; use social media (Facebook, Twitter, Instagram and Tumbler) to celebrate all aspects of the park—see National Archives and Library of Congress for examples	• Use of QR codes allow mobile phone users to easily connect to web sites							**PRIORITY - Low** • FWAG Members: *Washington - a; Terrell - a*		TBD during Interpretive Planning Process	OHA
Strategy 4.2.2: Link interpretation at Fort Ward to broader citywide and regionwide theme											
Action: Identify Fort Ward on region-wide maps, brochures, web-sites and other city publications as a place to explore Alexandria's history from the Civil War to the Civil Rights eras	• Little information is currently available on the historical significance and interpretation of Fort Ward							**PRIORITY - High** • FWAG Members: *Brune; Washington - a; Terrell - a; Ziegler*		3-5 Years	OHA
Action: Feature Fort Ward Park in enhanced citywide Civil War and African American interpretive trails	• Fort Ward is identified as a stop on existing trail guides, but more interpretive information could be provided within the guides							**PRIORITY - Low** • FWAG Members: *Washington - a; Terrell - a*		TBD during Interpretive Planning Process	OHA
Action: Develop interpretive and educational resources that help visitors compare and contrast "The Fort" community with other African-American communities in Alexandria and beyond; clarify themes and storylines and identify how each individual site and its stories relate to the citywide themes	• The idea of connecting stories to broader themes was discussed at FWAG meeting on interpretation							**PRIORITY - Low** • FWAG Members: *Washington - a; Terrell - a*		TBD during Interpretive Planning Process	OHA

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Action: Promote and encourage visitors to come to Fort Ward Park to better understand how "The Fort" community is representative of African American communities of freedmen established in the wake of the Civil War and their experiences	• While there is extensive information available interpreting the Civil War fort, there is much less available explaining the significance of "The Fort" community							**PRIORITY - Low** • FWAG Members: *Washington - a; Terrell - a*		TBD during Interpretive Planning Process	OHA
Strategy 4.2.3: Strengthen regional linkages to interpretation at Fort Ward											
Action: Work with partners to encourage the National Park Service to interpret and promote the circle forts to promote regional interpretation of the Defenses of Washington	• Fort Ward is one of the best sites available to interpret the Defenses of Washington.							**PRIORITY - High** • FWAG Members: *Washington - a; Terrell - a; Annear; Stanton; Magnuson*		3-5 Years	OHA
Action: Continue to provide leadership to Civil War Defenses of Washington sites south and west of the Potomac	• Fort Ward is one of the best sites available to interpret the Defenses of Washington							**PRIORITY - Low** • FWAG Members: *Washington - a; Terrell - a*		TBD during Interpretive Planning Process	OHA
Action: Forge a relationship with the National Museum of African American History and Culture and the African American Civil War Museum	• Similarly, "The Fort" community story is one that has broader national implications and, when interpretation is implemented, this could become a national resource for interpreting African American Heritage							**PRIORITY - Low** • FWAG Members: *Washington - a; Terrell - a*		TBD during Interpretive Planning Process	OHA
Action: Coordinate with NMAAHC themes and storylines to use Alexandria and Fort Ward Park as authentic locations illustrating the themes and storylines	• Linking themes to broader national themes will help reinforce the story to visitors as they go to other places							**PRIORITY - Low** • FWAG Members: *Washington - a; Terrell - a*		TBD during Interpretive Planning Process	OHA
Objective 4.3: Reorganize and/or expand the museum to engage more visitors and broaden the stories told											
Strategy 4.3.1: Develop the tools and resources needed to expand museum interpretive opportunities with self-guided experiences											
Action: Update the museum's strategic plan to reflect the goals, objectives, strategies and actions of the Fort Ward Park and Museum Area Management Plan - resulting in an updated program of uses for the museum	• Needs identified include addressing: visitor experience and orientation; bringing Civil War themes outside and "The Fort" community themes inside; stewardship of collections; an assessment of the feasibility of expanding the Fort Ward Museum; ADA accessibility; educational facilities							**PRIORITY - Low** • FWAG Members: *Washington - b; Terrell - b*		TBD during Interpretive Planning Process	OHA
Action: Develop a feasibility study and a new museum master plan (and design of an addition, if feasible) that leads to a more visitor friendly museum; provides views of the park landscape; incorporates both indoor and outdoor exhibits that are secure and properly monitored; incorporates space for the management and storage of collections; and makes the museum and its educational facilities accessible to individuals with disabilities	• Feasibility issues include impact on adjacent archaeological resources, parking, space requirements to accommodate desired program and the costs and benefits of the museum expansion related to other citywide goals for the system of museums							**PRIORITY - Low** • FWAG Members: *Washington - b; Terrell - b*		TBD during Interpretive Planning Process	OHA
Action: Undertake preliminary design of the expanded museum and prepare illustrative materials and cost estimates	• If feasible, illustrations and budgets will be needed to raise funds							**PRIORITY - Low** • FWAG Members: *Washington - b; Terrell - b*		TBD during Interpretive Planning Process	OHA

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Strategy 4.3.2: Create a capital campaign to raise funds for a museum expansion											
Action: Using the results of the feasibility study and master plan, develop a fundraising program to implement the master plan (as part of the overall citywide system of museums)	• Outside funds will likely be needed							**PRIORITY - Low** • FWAG Members: *Washington - b; Terrell - b*		TBD during Interpretive Planning Process	OHA
Action: Retain a professional consultant to guide the development of a capital campaign (as part of the overall citywide system of museums)	• Capital campaigns require skills that existing staff, whose primary mission is focused on the day to day operations of the museum, are unlikely to have							**PRIORITY - Low** • FWAG Members: *Washington - b; Terrell - b*		TBD during Interpretive Planning Process	OHA
Strategy 4.3.3: Use the existing museum building for new exhibits											
Action: Continue to feature exhibits on topics that support interpretation of Fort Ward using the museum's extensive collection	• Changing and refreshing exhibits is needed to broaden audiences							**PRIORITY - Med** • FWAG Members: *Washington - b; Terrell - b; Ziegler*		TBD during Interpretive Planning Process	OHA
Action: Introduce exhibits on the African American experience before, during and after the Civil War to provide context for outdoor exhibits of "The Fort" community	• The audience coming to the museum is different than those coming to the park and including "The Fort" community exhibits in the museum will link them directly to the Civil War fort and beyond							**PRIORITY - Med** • FWAG Members: *Brune; Washington - b; Terrell - b*		TBD during Interpretive Planning Process	OHA
Strategy 4.3.4: Create as many opportunities for personal connections as possible and visitors will enjoy the experience and find relevancy											
Action: Make use of talk back boards, interactives (leave something behind, problem solve, active learning)	• Younger audiences respond better and retain more through interactive learning							**PRIORITY - Low** • FWAG Members: *Washington - b; Terrell - b*		TBD during Interpretive Planning Process	OHA
Action: Use stories of the families that are associated with Fort Ward and "The Fort" community to connect people with their past through personal connections	• Genealogy and stories of families/descendants provide a way to make those connections			• Opportunity for schools to use park as an opportunity to link students with heritage				**PRIORITY - Low** • FWAG Members: *Washington - b; Terrell - b*		TBD during Interpretive Planning Process	OHA
Strategy 4.3.5: Reach people who do not normally go to museums by taking the museum to places where this audience normally goes											
Action: Include interpretive information in picnic area map and signboards	• Park users are a primary and captive audience							**PRIORITY - Low** • FWAG Members: *Washington - b; Terrell - b*		TBD during Interpretive Planning Process	OHA
Action: Update the historic information on the picnic area map to include areas associated with burial sites	• Park users may not be aware of the significance of nearby resources to picnic areas							**PRIORITY - High** • FWAG Members: *Brune; Forbes; Washington - b; Terrell - b*		3-5 Years	OHA
Action: Look at New Media grants from NEH										TBD during Interpretive Planning Process	OHA

Notes on FWAG Priorities Submissions:

Washington *- a; Identified all of Objective 4.2 as a single priority*

Washington *- b; identified all of Objective 4.3 as a single priority*

Washington *- c; identified all of Strategy 4.1.2 as a single priority*

Walpole *- comments independent of action list*

The central focus of Ft. Ward (as in most historic Parks) is a quality MUSEUM AND VISITORS CENTER. The existing "museum" is managed by extremely knowledgeable, capable and dedicated staff.

BUT THERE IS NO VISITORS CENTER and MUSEUM. There is a tiny little building with space only for the most cursory displays of artifacts, and a crowded counter with a few items for sale.

The MOST FUNDAMENTAL need of FT Ward renovations and management is building a new Visitor Center and Museum.

Like every other historical park, it will provide a meaningful concept of the story of Ft Ward—the Military aspects, the African American initial inhabitants, the Community that developed, the locations of buildings, houses, schools, roads, graves, playgrounds, picnic area, etc.

Without a REAL Visitor Center, Ft Ward will be encountered by visitors on a piecemeal basis, with some trails , areas to run, and a few signs. This is a shame since this Park has so much to tell and to educate visitors.

The Military aspects and the African American experiences can be shown on a 10-15 minute video in a small theatre area—just like in other Visitor Centers. Hundreds of artifacts in storage could be displayed., as well as artifacts from the African American Community. The huge library (now housed in an inaccessible room upstairs) can be brought forth and used by visitors, researchers, and scholars. Many of the volumes are fairly rare.

This essential aspect of Ft Ward will be expensive (?? $500K; $$2M…??)and not likely able to be funded by the City. But without this, the Park will limp along as it has done. Thus, as noted above, outside funding is necessary.

However, with such a Visitor Center, word of mouth and advertising will get around and tourists will make Alexandria their destination—certainly including the tremendous number of Civil War enthusiasts throughout the country. The City should be most proud of this wonderful resource, and cooperate with ideas of fundraising efforts that may be productive.

Terrell *- a; Identified all of Objective 4.2 as a single priority*

Terrell *- b; identified all of Objective 4.3 as a single priority*

Terrell *- c; identified all of Strategy 4.1.2 as a single priority*

Annear *- a: identified two actions as single priority*

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Goal 5 - Enhance Park Facilities ***Satisfy the growing need for passive recreational enjoyment of a shady, natural oasis from an increasingly complex urban environment.***											
Objective 5.1: Clarify and enhance park circulation and parking											
Strategy 5.1: Improve pedestrian circulation and safety											
Action: Make pedestrian use the priority use for paved loop path and mark mileage distances on or near pavement	• Existing circular asphalt loop path is a shared between vehicular and pedestrian users; the path is heavily used by walkers; some surface area is in poor condition; and edges are heavily eroded • Loop path provides no interpretation of the park's natural and little for cultural resources in the park • Signs at entry to loop path indicate that pedestrian user is to yield to vehicular user • Pedestrian use of existing loop trail is heavy, particularly at certain times of the day	• Identify sections of the loop path that need to be repaired or replaced, edges that need to be treated for erosion damage	• Enhanced pedestrian experience	• Repair surface of the shared pedestrian/vehicle loop drive with materials that are pedestrian friendly in color and texture; consider the use of permeable material and avoid the use of asphalt to reduce the its appearance as 'road' *Sources:* For surfacing options see: Context Sensitive Roadway Surfacing Selection Guide Publication No. FHWA-CFL/TD-05-004 and Roadway Surfacing Options Photo Album Publication No. FHWA-CFL/TD-05-004aAugust 2005	**Circulation:** • Make pedestrian circulation the priority on the internal park paved loop path; use a surface treatment alternative to the current vehicular pavement styled asphalt material • Change the sign to give pedestrian use priority over vehicular use (the current sign tells pedestrians to yield to vehicular traffic) • Mark distances for pedestrian walks	• Inspect pavement annually and identify areas to be repaired or replaced		**PRIORITY: High** • FWAG Members: *Brune; Forbes; Washington; Walpole - b; Terrell; Annear; Stanton; Magnuson; Ziegler* **PRIORITY: High** • City	Signs, including mile markers: $6700-6,860	1-3 Years	RPCA, T&ES
Action: Introduce a sharp curve at the junction of the paved loop path	• Paved path should only be used by vehicles for access to picnic areas and be designed to look more like a driveway/pedestrian path than a road	• Measure speed and volume of current traffic and update annually	• Enhanced safety for pedestrian use and clarity for vehicular operator	• Realign as part of next repaving project (2015)	**Circulation:** • Adjust the pavement alignment to clearly indicate that the priority is for pedestrian use; vehicular access is only as route to recreation facilities and should be more 'driveway-like' in appearance • Realign pavement at next repaving (2015)	• Assess effectiveness of reconfiguration		**PRIORITY: Low** FWAG Members: **PRIORITY: Med** • City		7+ Years	RPCA
Action: Develop a pedestrian network of soft paths	• 'Goat paths' wind through the perimeter of the park • No formal path(s) to recreation features (playground, picnic facilities and shelter) • Perimeter route already used informally by walkers in park	• Identify potential route and connections to formalize perimeter path • Identify areas where trails are not suitable due to slope, soil, or the presence of significant resources	• Formalized secondary path network connecting park features at the perimeter of the park to the paved loop trail	• Identify secondary pedestrian path to provide alternative to heavily used loop path • Identify natural and cultural resources ripe for interpretation and storytelling that could be linked by a secondary pedestrian path, perhaps making use of natural path surface (Identification of School House Road/other walking paths or road traces provides a potential to link together to create 'We're Still Here Trail' with interpretive signs, recognition of former site features, etc.)	**Circulation:** • Identify a secondary pedestrian path alignment along the park's perimeter • Connect a 'soft path' to park entrances and features • Ensure that path meets ADA standards, when possible	• Assess integrity of path surfacing and path edges for safety concerns every six months		**PRIORITY: Med** • FWAG Members: *Washington; Terrell; Moir* **PRIORITY: High** • City	**Entire course** (different surfaces): $471,400- 695,000; Segments can be installed incrementally over time **Picnic shelter to parking** with flex pave @8' wide: $42,500 - 75,000	1-3 Years: paved segment from paved loop to picnic shelter; grass path; mulch path in woodlands. 3-5 Years: paved segment to relocated playground 5+ Years: remaining paved segments	RPCA, OHA
Action: Connect existing park path to the West Braddock Road sidewalk	• Public sidewalks along perimeter roads do not connect with internal park pedestrian system	• Determine amount of missing sidewalk	• Pedestrian connectivity between sidewalk on West Braddock Road and the park's internal pedestrian network	• Connect street sidewalk to internal park path system	**Circulation** • Install a sidewalk segment to connect the park with West Braddock Road - public sidewalks along the park's perimeter do not connect with the internal park pedestrian system	• Annually survey sidewalk surface and condition		**PRIORITY: Low** • FWAG Members: **PRIORITY: Low** • City		7+ Years	RPCA

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Action: Clearly mark and develop two park access points from North Van Dorn Street	• Many foot paths enter the park along the North Van Dorn frontage, leading to erosion, vegetation trampling and soil compaction • Some foot paths connecting park to North Van Dorn Street blocked due to tree fall and poison ivy; leads to new 'goat paths' being created to circumvent obstacle • Parapet of rifle trench being used as alternative trail access from North Van Dorn Street - wide, flat, no poison ivy - connects to the sidewalk via a concrete drainage structure on the hillside between the woods and the sidewalk on N. Van Dorn	• Identify access points and connecting paths from North Van Dorn to park to improve and formalize • Identify 'goat paths' to close; existing access points to close; paths to block (access on parapet above rifle trench)	• Establish and maintain two formal entrances to the park on its North Van Dorn border, protecting cultural and natural resources from further inadvertent damage by park users	• Identify two park entry points from North Van Dorn Street and redirect informal trail access to those points • Organize volunteer trail crew for monitoring, maintenance, and trail construction	**Circulation** • Install two entry points to connect the park with North Van Dorn Street - public sidewalks along the park's perimeter do not connect with the internal park pedestrian system • Develop two formal access points to the park from North Van Dorn Street; one near the bus stop east of the rifle trench and the second near the picnic shelter • Close 'goat herd' paths • Block access to the rifle trench by installing a 'stile'/stair over it at the North Van Dorn Street side of the park	• Monitor the area monthly for tree fall, trail blockage, informal paths on earthworks or other cultural resources • Monitor and remove poison ivy within 10' of each side of the path		**PRIORITY: Med** • FWAG Members: *Forbes; Washington; Terrell* **PRIORITY: High** • City	**North Van Dorn: eastern entry:** $32,000 - 55,750 **Northern Van Dorn: western entry:** $12,000 - 21,000	3-5 Years	RPCA
Action: Re-connect athletic fields with the rest of the park	• New fencing blocks former gate connection between athletic fields and large portion of the park	• Evaluate former gate location and identify potential other connections between athletic fields and larger park • Conflict between park closing at dusk and lighted fields open until 10pm	• Create pedestrian connectivity between two sections of the park	• Provide gate between athletic fields and northwestern portion of the park	**Circulation** • Provide a gate between athletic fields and the northwestern portion of the park • Develop protocols to address access/gate closure when athletic fields remain open later than the rest of the park (fields are lighted and open until 10 PM; the rest of the park closes at dusk)	• Monitor operational issues with different hours		**PRIORITY: Low** • FWAG Members: **PRIORITY: Low** • City		5+ Years	RPCA
Strategy 5.1.2: Improve bus access and parking (tour and school groups)											
Action: Redesign the existing parking area to better accommodate a bus drop-off	• Existing large expanse of gravel lot is inefficient • Lot could be better used for multiple purposes (accessible parking spaces, bus drop off, parking and future interpretation of the barracks) • Gravel surfacing does not provide good infiltration or ADA access	• Inventory parking lot size and identify needed turning radius for bus use	• Provision of bus drop-offs and turnarounds that don't conflict with parking and pedestrian use of park	• Reconfigure parking lot behind museum • Relocate bus drop off to pull-out lane if barracks reconstruction comes to fruition • Barracks foundation can be marked as part of the parking lot layout • Alternatively, evaluate the potential of developing a dedicated bus drop-off lane along West Braddock Road (will require coordination with TE&S)	**Circulation** • Evaluate the potential to redesign the gravel parking area behind the museum to better accommodate drop-offs and turnarounds and temporarily 'test' parking concept behind museum with barrels and cones to mark circulation patterns • Mark the foundation or former location of the barracks with surface materials as part of the new layout design for the parking lot and bus turnaround (similar to that proposed for the Ashby House in front parking lot) • Consider using permeable materials for paving (existing gravel is heavily compacted) and ADA access	• Monitor 'test' to see if conflicts between users are reduced		**PRIORITY: Low** • FWAG Members: **PRIORITY: High** • City - for 'test' scenario with construction priority dependent upon outcome of 'test'		1-3 Years for 'test' scenario	RPCA, OHA, T&ES

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Strategy 5.1.3: Reconfigure existing parking											
Action: Expand the length and reduce the width of gravel parking lot	• Existing gravel lot off Braddock Road is wider than needed • Space available on parking lot's eastern end to extend to relocate 8-10 spaces from museum lot	• Inventory parking lot size and identify program needed/number of spaces required	• Reduction of parking lot footprint with increased parking capacity	• Include interpretation of Ashby House as part of parking lot redesign • Reduce footprint of existing parking lot adjacent to West Braddock Road while increasing its capacity	**Circulation** • Evaluate the possibility to relocate parking spaces removed in the redesign of the museum lot (8-10 spaces to be removed in reconfiguration to accommodate bus turn-around) • Include interpretation of the Ashby House as part of the parking lot redesign; potentially mark the Ashby House as part of the new layout and surfacing materials of the parking area (similar to the barracks interpretation at the museum parking area) • Consider using permeable materials for paving (existing gravel is heavily compacted) and ADA access	• Monitor for pavement issues (potholes or loose pavers, depending on the material)		**PRIORITY: Low** • FWAG Members: *Stanton, Magnuson* **PRIORITY: Med** • City		1-3 Years if done in conjunction with stormwater filter installation under parking lot	RPCA, OHA, T&ES
Objective 5.2 Minimize conflicts between adjacent uses both within and around the park											
Strategy 5.2.1: Communicate park regulations											
Action: Continue to monitor and to limit noise from park activities	• Large areas of the park are undeveloped and quiet given their location in an urban area • Park visitors value their ability to hear birds and other wildlife within the park • Some sanctioned activities programs at the park will be loud - noise levels at historic and combative (for example, fort reenactment exercises) sites • Amplified noise is no longer allowed without a Special Permit issued by the City of Alexandria	• Identify areas where noise activities are inappropriate and where noise activities are likely to occur (for example, those connected with the fort programming)	• Artificial amplification of noise within the park is not allowed without a permit	• Separate active recreation areas from areas suited to quiet contemplation or wildlife observation • Signal quiet areas in park with signs, interpretive materials, park orientation signs, use plant materials to reinforce • Limit amplified noise to permit only use	**Protect Park's Soundscape:** • Continue to enforce noise restrictions such as the prohibition of amplified noise without a permit • Identify areas where noisy activities associated with reenactments, gatherings, etc. are inappropriate and where noise-making activities are appropriate such as associated with fort programming • Map areas where noise should be kept to a minimum (areas for quiet contemplation or for wildlife) use signs, interpretive materials and plants to educate visitors • Recognize that some sanctioned activities in the park will be loud	• Monitor noise limits in the park		**PRIORITY: Med** • FWAG Members: *Brune; Walpole - a; Ziegler* **PRIORITY: Med** • City		Ongoing	RPCA
Action: Better communicate park regulations	• Regulatory signs are not integrated with interpretation or resource protection goals • Message not reaching audiences due to negative tone	• Identify locations and messages of all existing regulatory signs • Inventory existing signs - their content and location	• Park signs are clean with a positive and clear message, conveyed creatively and accessibly	• Display positive messaging and park rules. • Phrase regulations in positive manner; explain why regulation in place	**Communicate Park's Regulations** • Inventory existing regulatory signs - their content and location—in park • Coordinate visitor information, orientation and interpretive messages to minimize visual clutter and confusion • Reinforce resource protection importance through interpretive programming and exhibits • Use web-and mobile-based 'What is Here' technologies to communicate information regarding resource sensitivity, significance and location • Enhance sign visibility	• Monitor number and size of signs in the park every three years		**PRIORITY: Low** • FWAG Members: **PRIORITY: Med** • City		5-7 Years	RPCA, OHA
Action: Enforce existing park regulations	• Recent enforcement of regulations has improved park operations	• Identify and educate park personnel and park users on regulations	• Maintain safe and secure environment	• Enforce existing regulations	**Enforcement of Park Regulations:** • Consistent and proactive enforcement of regulations • Consider reinstating ranger staffing on high-use days or time periods	• Monitor the effectiveness of regulation enforcement		**PRIORITY: Low** • FWAG Members: *Stanton, Magnuson* **PRIORITY: High** • City		Ongoing	Alexandria Police Department (APD)

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Strategy 5.2.2: Remove the off-leash dog exercise area location and facility											
Action: Remove the off-leash dog exercise area from the park	• Off-leash dog exercise area's (unfenced) proximity to formal picnic area and rifle trench conflicts with adjacent park uses and its proximity to busy four-lane road (North Van Dorn Street) dampens use of facility by dog owners • Off-leash dog use of park has extended across loop road to area adjacent to earthworks surrounding fort	• Identify current usage (number of uses/pattern of use) of and concerns with existing dog exercise area • Inventory park to identify potential alternative location • Evaluate local context - what is the distance to other dog exercise areas in the city • Review and modify CIty of Alexandria Dog Park Master Plan to remove facility from Fort Ward Park	Consistency with Citywide Plan for Dog Parks and Dog Exercise Areas	• Eliminate off leash area • Place signs welcoming dogs on-leash to park	**Dog Exercise Area:** • Hold Public Hearing and advertise intent to close dog exercise area at park • Remove sign indicating off-leash dog exercise area in park • Place signs welcoming leashed dogs to park	• Monitor off-leash dog use of the park		**PRIORITY: High** • FWAG Members: *Forbes; Walpole; Moir; Annear; Ziegler* **PRIORITY: High** • City	$3,125 - 6,325	1-3 Years	RPCA
Strategy 5.2.3: Relocate and enhance park facilities (long-term) to better serve the public and to protect the park's resources											
Action: Relocate group picnic area #3, avoiding any culturally sensitive sites or resources	• A picnic area is located over top of the faint remains of the fort's outer battery and covered way	• Identify alternative location for the picnic area currently located on outer battery and covered way	• Protection and stabilization of cultural resources	• Relocated picnic area (temporarily or long-term)	**Long-term Facility Relocation** • Identify an alternative location for the group picnic area where cultural resources will not be adversely affected • Relocate the existing group picnic area (may be a temporary relocation - need for more permanent relocation is dependent upon archaeological research results and if picnic area and interpretation of potential findings can be successfully combined) • If long-term, find an alternative site within park for permanent relocation that does not intrude on other culturally sensitive sites (for example the Shorts property)	• Monitor impact on cultural resources		**PRIORITY: Low** • FWAG Members: **PRIORITY: Low** • City		10+ Years	RPCA, OHA
Action: Adopt design standards for all park furnishings and signs	• Variety of site furnishings and signs - in style and condition	• Inventory condition and style of existing site furnishings • Inventory signs, messages and styles	• Accessible facility for park visitors • Park identity enhanced through common vocabulary of site furnishings	• Adopt standard furnishing standards • Adopt sign standards - message, style, type-style, etc.	**Long-term Facility Enhancements:** • Develop strategy for site furnishings replacement, extend and compliment current City replacement policy—grills, picnic tables, benches, signs, etc. • Cycle furnishing upgrades • Adopt standards for site furnishings and signs for future installation (quality, style, ADA compliant, etc.)	• Assess site furnishings every five years		**PRIORITY: Low** • FWAG Members: **PRIORITY: Med** • City		5-7 Years	RPCA
Strategy 5.2.4: Evaluate the effort required to upgrade and improve the amphitheater for more active use											
Action: Evaluate upgrade or removal of the existing amphitheater	• Amphitheater is usable, but will need investment to address ADA issues (parking) and to remain viable and functional in years to come	• Inventory and evaluate physical condition and life-cycle operations cost of operating the facility; addressing electrical needs, access issues, condition of materials - seats, lighting, sound system, etc.	• Feasibility study to upgrade existing amphitheater; ensure renovated amphitheater is fully accessible	• Assess feasibility of improving and upgrading amphitheater and its supportive infrastructure: parking, restrooms, access, facilities, etc.	**Long-term Facility Relocation:** • Develop a cost-benefit analysis of improving amphitheater to meet ADA standards, performance standards, electrical needs and furnishings upgrade • Develop and execute a feasibility study • Evaluate additional supporting infrastructure needs should the amphitheater be upgraded (parking, loading, restrooms, etc.) • Evaluate the impact on the site if the study concludes that the amphitheater should be removed • Evaluate the impact on the performing arts spaces in city, etc. if amphitheater is changed or removed	• Monitor compliance with current ADA standards (current evaluation states all but parking is compliant)		**PRIORITY: Low** • FWAG Members: **PRIORITY: Low** • City		10+ Years	RPCA, OHA, T&ES, GS

Action	Indicators (1) *(Reason)*	Inventory (2)	Standards (3)	Management Options (4)	Best Practices Options (5)	Monitoring of Indicator (6)	Evaluation of Actions (7)	Priority	Probable Cost	Proposed Timeframe	Responsible Party
Strategy 5.2.5: Replace, upgrade or remove failing facilities											
Action: Repair and evaluate the upgrading of the existing restroom located on the western side of the park	• Current restrooms in need of upgrade, roof is in need of repair • Need to determine long-term needs for restroom facilities to sere activities on western side of park	• Assess what needed to upgrade restrooms to ensure ADA standards are met and restroom size matches needs in western area of the park • Kimley-Horn 2012 report states that restroom meets ADA standards, that the access path needs to have the curb stop removed and the parking space upgraded to meet ADA standards	• Functional and accessible restrooms on western side of park	• Feasibility study to upgrade restrooms	**Long-term Facility Upgrades:** • Repair roof regardless of future of restroom facility • Develop and execute a feasibility study on restroom improvement • Develop a cost-benefit analysis of improving or replacing restrooms to meet ADA standards, performance standards, electrical needs and furnishings upgrade • Evaluate additional supporting infrastructure needs should restrooms be upgraded (water, sewer, electrical capacity, etc.)	• Annually assess condition of facility		**PRIORITY: Med** • FWAG Members: *Brune; Walpole - c; Annear - a* **PRIORITY: High** • City		1-3 Years for immediate roof repairs 1-3 Years remove curb stop blocking access on path 5+ Years for facility upgrade	RPCA

Notes on FWAG Priorities Submissions:

Walpole - a: 'Have Police come down quickly and directly where there is excessive noise at events'

Walpole: b: 'Keep cars out of pedestrian walking-running areas.'

Walpole c: 'Install a unisex – handicapped restroom near arena and promote more activities. If a Corporation or private organization wants to use this as a venue for company awards, speeches, classes etc., consider charging for its use.'

Annear - a: 'Repair roof and other minor problems of current restrooms at west side of park..'

This table identifies the rationale, inventory needs, applicable standards, management options and applicable best practices for implementing each of the recommended actions in the management plan. Definitions apply to each of the columns (italicized text indicates how the model with its natural resource orientation was adapted for cultural and recreational resources). *[Adapted from Limits of Acceptable Change (LAC) Model, U.S. Forest Service in 1985 (Stankey, Cole, Lucas, Petersen, Frissel: The Limits of Acceptable Change (LAC) System for Wilderness Planning. General Technical Report INT-176, January 1985. Adapted for use by Rasar State Park Management Plan, Washington State Parks - July 12, 1997)].*

(1) quantifiable, recorded event or physical property used to gauge a resources condition (*or indicating the rationale for the proposed action*)
(2) description of how an indicator will be inventoried and how numeric measurements will be made (*or how objective measurements of performance will be made*)
(3) numeric objective or objectives for each indicator *(or measurable objective)*
(4) broad set of management approaches that may be applied to a resource in order to achieve or maintain standards
(5) selected Management Options
(6) schedule of when and how often indicators will be inventoried and measured
(7) overall evaluation of the effectiveness of applied management actions in achieving standards and/or the appropriateness of chosen standards

Final Draft 7/21/14		THIS IS A VERY CONCEPTUAL COST ESTIMATE AND SHOULD BE REVISED AS SOON AS PLANS BECOME AVAILABLE.	
Goal 1 Priorities			
Operation Costing	Staff Hours - Low	Staff Hours - High	Task/Notes
Review and update MOU annually			
Review quarterly/Update annually			
RPCA			Time to coordinate data received from OHA; update mapping for operations in advance of annual renewal: aeration, leaf litter, mowing, MOU boundaries, tree planting
Alexandria Archaeology			Annual hourly estimate for OHA map work; GIS updates; field compilation
GS			
T&ES			
Link financial needs of park to other City initiatives - broaden ask			
Operational/Staff Hours	Hours - Low	Hours - High	Task/Notes
RPCA - Identify potential funding pockets			

Construction Costing	**TAKEOFF QUANTITY**	**TAKEOFF UNIT**	**LOW RANGE UNIT PRICE***	**LOW RANGE EXTENSION PRICE**	**HIGH RANGE UNIT PRICE***	**HIGH RANGE EXTENSION PRICE**
Make current playground facility accessible - Subtotal:				**$246,317.28**		**$454,605.15**
New accessible path between parking and equipment				***$ 160,710.59***		***$ 319,109.59***
Clearing and Grubbing						
Remove vegetation	0	AC	$ 30,000.00	$ -	$ 30,000.00	$ -
Earthwork and Grading/Shape grade to redirect drainage away from playground, similar to cemetery						
Fill required	3,025	CY	$ 20.00	**$ 60,500.00**	$ 35.00	**$ 105,875.00**
Rough grading	1	LS	$ 10,000.00	**$ 10,000.00**	$ 15,000.00	**$ 15,000.00**
Erosion Controls						
Super silt fence	960	LF	$ 7.88	**$ 7,564.80**	$ 8.00	**$ 7,680.00**
Tree protection	781	LF	$ 3.38	**$ 2,639.78**	$ 4.00	**$ 3,124.00**
Temporary seed and mulch	4,678	SY	$ 0.33	**$ 1,543.74**	$ 0.50	**$ 2,339.00**
Trail						
8' Flexi-pave Trail	604	SY	$ 108.00	**$ 65,232.00**	$ 225.00	**$ 135,900.00**
8' Asphalt Trail (ALTERNATE TO FLEXI PAVE)	*604*	*SY*	*$ 34.05*	***$ 20,566.20***	*$ 42.56*	***$ 25,706.24***
Detectable warning strip at parking lot edge	16	SF	$ 15.00	**$ 240.00**	$ 20.00	**$ 320.00**
Landscaping						
Respread topsoil	519	CY	$ 5.03	**$ 2,610.57**	$ 7.65	**$ 3,970.35**
Fine grade/seed/mulch/fertilize	4,678	SY	$ 1.15	**$ 5,379.70**	$ 2.50	**$ 11,695.00**
Drainage						
Culvert under trail	1	LS	$ 5,000.00	**$ 5,000.00**	$ 7,500.00	**$ 7,500.00**
ACCESSIBLE PLAYGROUND PARKING: Provide accessible parking spaces adjacent to new playground access path to existing playground (work within existing paved area)				***$ 2,333.22***		***$ 2,785.56***
Clearing and Demolition						
Demo Ex Asphalt	28	SY	$ 7.24	**$ 202.72**	$ 9.00	**$ 252.00**
Saw cut existing asphalt	33	LF	$ 5.99	**$ 197.67**	$ 7.48	**$ 246.84**
Earthwork and Clearing						
Rough grade repavement area	28	SY	$ 0.70	**$ 19.60**	$ 0.70	**$ 19.60**
Cut to fill	3	CY	$ 3.00	**$ 9.00**	$ 5.00	**$ 15.00**
Import to fill	3	CY	$ 20.00	**$ 60.00**	$ 35.00	**$ 105.00**
Erosion Controls						
Super silt fence	33	LF	$ 7.88	**$ 260.04**	$ 8.00	**$ 264.00**
Temp. seed and mulch	55	SY	$ 0.33	**$ 18.15**	$ 0.50	**$ 27.50**
Pavement						
Fine grade	28	SY	$ 0.75	**$ 21.00**	$ 1.00	**$ 28.00**
8" 21-A base	28	SY	$ 13.34	**$ 373.52**	$ 16.10	**$ 450.80**
3" asphalt base (115#)	28	SY	$ 14.66	**$ 410.48**	$ 16.39	**$ 458.92**
1.5" final asphalt paving	28	SY	$ 8.19	**$ 229.32**	$ 9.49	**$ 265.72**
Striping, Signage and Lighting						
Parking stall paint	1	EA	$ 30.00	**$ 30.00**	$ 40.00	**$ 40.00**
Handicap space paint	1	EA	$ 226.60	**$ 226.60**	$ 271.93	**$ 271.93**
Handicap sign	1	EA	$ 275.12	**$ 275.12**	$ 340.25	**$ 340.25**
ACCESSIBLE PLAYGROUND SURFACING: Upgrade playground surfacing for accessibility				***$ 22,313.97***		***$ 33,881.30***
Earthwork and Grading						
Strip mulch to haul off-site	42	CY	$ 20.00	**$ 840.00**	$ 35.00	**$ 1,470.00**
Rough grade playground	504	SY	$ 0.70	**$ 352.80**	$ 0.70	**$ 352.80**
Erosion Controls						
Super silt fence	166	LF	$ 7.88	**$ 1,308.08**	$ 8.00	**$ 1,328.00**
Tree protection	164	LF	$ 3.38	**$ 554.32**	$ 4.00	**$ 656.00**
Structure protection	1	LS	$ 1,500.00	**$ 1,500.00**	$ 5,000.00	**$ 5,000.00**
Temp. Seed & Mulch	253	SY	$ 0.33	**$ 83.49**	$ 0.50	**$ 126.50**
Replace playground surface						
Fine grade	504	SY	$ 0.75	**$ 378.00**	$ 1.00	**$ 504.00**
10" 21-A Base	504	SY	$ 16.68	**$ 8,406.72**	$ 20.13	**$ 10,145.52**
2" Asphalt paving	504	SY	$ 10.93	**$ 5,508.72**	$ 18.98	**$ 9,565.92**
Rubberized surface	504	SY	$ 6.71	**$ 3,381.84**	$ 9.39	**$ 4,732.56**
accessibility				***$ 60,959.50***		***$ 98,828.70***
Demolition existing equipment						
Remove existing playground equipment	1	LS	$ 4,500.00	**$ 4,500.00**	$ 6,500.00	**$ 6,500.00**
Replacement playground equipment and fencing						
4" Chainlink fence	280	LF	$ 15.43	**$ 4,320.40**	$ 19.28	**$ 5,398.40**
4" Chainlink gate	1	EA	$ 350.00	**$ 350.00**	$ 750.00	**$ 750.00**
Bench	2	EA	$ 1,000.00	**$ 2,000.00**	$ 1,500.00	**$ 3,000.00**
Trash can	1	EA	$ 500.00	**$ 500.00**	$ 750.00	**$ 750.00**
Playground equipment allowance - ages 3-6	1	LS	$ 15,000.00	**$ 15,000.00**	$ 25,000.00	**$ 25,000.00**
Playground equipment allowance - ages 6-9	1	LS	$ 15,000.00	**$ 15,000.00**	$ 25,000.00	**$ 25,000.00**
Playground equipment allowance - ages 9-12	1	LS	$ 15,000.00	**$ 15,000.00**	$ 25,000.00	**$ 25,000.00**
Landscaping						
Fine grade/seed/mulch/fertilize	253	SY	$ 1.15	**$ 290.95**	$ 2.50	**$ 632.50**
Deciduous trees	5	EA	$ 299.63	**$ 1,498.15**	$ 359.56	**$ 1,797.80**
Miscellaneous						
Pedestrian traffic control	1	LS	$ 2,500.00	**$ 2,500.00**	$ 5,000.00	**$ 5,000.00**

Relocate Playground to western side of park				**$ 115,918.28**			**$189,587.56**
ACCESSIBLE PATH: Develop accessible paved path between parking lot (accessible parking space) and western playground site				***$ 34,732.28***			***$ 62,760.80***
Clearing and Grubbing							
Remove vegetation	0	AC	$ 30,000.00	**$ -**	$ 30,000.00		**$ -**
Earthwork and Grading							
Rough grade	1,554	SY	$ 0.70	**$ 1,087.80**	$ 0.70		**$ 1,087.80**
Cut and fill	1	LS	$ 5,000.00	**$ 5,000.00**	$ 7,500.00		**$ 7,500.00**
Erosion Controls							
Super silt fence	200	LF	$ 7.88	**$ 1,576.00**	$ 8.00		**$ 1,600.00**
Tree protection	200	LF	$ 3.38	**$ 676.00**	$ 4.00		**$ 800.00**
Temporary seed and mulch	1,376	SY	$ 0.33	**$ 454.08**	$ 0.50		**$ 688.00**
Trail							
8' Flexi-pave Trail	177	SY	$ 108.00	**$ 19,116.00**	$ 225.00		**$ 39,825.00**
8' Asphalt Trail (ALTERNATE TO FLEXI PAVE)	*177*	*SY*	*$ 34.05*	***$ 6,026.85***	*$ 42.56*		***$ 7,533.12***
Detectable warning strip at parking lot edge	16	SF	$ 15.00	**$ 240.00**	$ 20.00		**$ 320.00**
Landscaping							
Fine grade/seed/mulch/fertilize	1,376	SY	$ 1.15	**$ 1,582.40**	$ 2.50		**$ 3,440.00**
Drainage							
Culvert under trail	1		$ 5,000.00	**$ 5,000.00**	$ 7,500.00		**$ 7,500.00**
NEW ACCESSIBLE PLAYGROUND: Construct new playground on western side of park				***$ 78,852.78***			***$ 124,041.20***
Clearing and Grubbing							
Remove vegetation	0	AC	$ 30,000.00	**$ -**	$ 30,000.00		**$ -**
Earthwork and Grading							
Cut to export	127	CY	$ 20.00	**$ 2,540.00**	$ 35.00		**$ 4,445.00**
Rough grade playground	500	SY	$ 0.70	**$ 350.00**	$ 0.70		**$ 350.00**
Erosion Controls							
Super silt fence	150	LF	$ 7.88	**$ 1,182.00**	$ 8.00		**$ 1,200.00**
Tree protection	150	LF	$ 3.38	**$ 507.00**	$ 4.00		**$ 600.00**
Structure protection	1	EA	$ 200.23	**$ 200.23**	$ 250.00		**$ 250.00**
Temp. Seed & Mulch	250	SY	$ 0.33	**$ 82.50**	$ 0.50		**$ 125.00**
Playground surface							
Fine grade	500	SY	$ 0.75	**$ 375.00**	$ 1.00		**$ 500.00**
10" 21-A Base	500	SY	$ 16.68	**$ 8,340.00**	$ 20.13		**$ 10,065.00**
2" Asphalt paving	500	SY	$ 10.93	**$ 5,465.00**	$ 18.98		**$ 9,490.00**
Rubberized surface	500	SY	$ 6.71	**$ 3,355.00**	$ 9.39		**$ 4,695.00**
Playground equipment and fencing							
4" Chainlink fence	280	LF	$ 15.43	**$ 4,320.40**	$ 19.28		**$ 5,398.40**
4" Chainlink gate	1	EA	$ 350.00	**$ 350.00**	$ 750.00		**$ 750.00**
Bench	2	EA	$ 1,000.00	**$ 2,000.00**	$ 1,500.00		**$ 3,000.00**
Trash can	1	EA	$ 500.00	**$ 500.00**	$ 750.00		**$ 750.00**
Playground equipment allowance - ages 3-6	1	LS	$ 15,000.00	**$ 15,000.00**	$ 25,000.00		**$ 25,000.00**
Playground equipment allowance - ages 6-9	1	LS	$ 15,000.00	**$ 15,000.00**	$ 25,000.00		**$ 25,000.00**
Playground equipment allowance - ages 9-12	1	LS	$ 15,000.00	**$ 15,000.00**	$ 25,000.00		**$ 25,000.00**
Landscaping							
Fine grade/seed/mulch/fertilize	250	SY	$ 1.15	**$ 287.50**	$ 2.50		**$ 625.00**
Deciduous trees	5	EA	$ 299.63	**$ 1,498.15**	$ 359.56		**$ 1,797.80**
Miscellaneous							
Pedestrian traffic control	1	LS	$ 2,500.00	**$ 2,500.00**	$ 5,000.00		**$ 5,000.00**
ACCESSIBLE PARKING: Provide accessible parking spaces adjacent to western playground site				***$ 2,333.22***			***$ 2,785.56***
Clearing and Demolition							
Demo Ex Asphalt	28	SY	$ 7.24	**$ 202.72**	$ 9.00		**$ 252.00**
Saw cut existing asphalt	33	LF	$ 5.99	**$ 197.67**	$ 7.48		**$ 246.84**
Earthwork and Clearing							
Rough grade repavement area	28	SY	$ 0.70	**$ 19.60**	$ 0.70		**$ 19.60**
Cut to fill	3	CY	$ 3.00	**$ 9.00**	$ 5.00		**$ 15.00**
Import to fill	3	CY	$ 20.00	**$ 60.00**	$ 35.00		**$ 105.00**
Erosion Controls							
Super silt fence	33	LF	$ 7.88	**$ 260.04**	$ 8.00		**$ 264.00**
Temp. seed and mulch	55	SY	$ 0.33	**$ 18.15**	$ 0.50		**$ 27.50**
Pavement							
Fine grade	28	SY	$ 0.75	**$ 21.00**	$ 1.00		**$ 28.00**
8" 21-A base	28	SY	$ 13.34	**$ 373.52**	$ 16.10		**$ 450.80**
3" asphalt base (115#)	28	SY	$ 14.66	**$ 410.48**	$ 16.39		**$ 458.92**
1.5" final asphalt paving	28	SY	$ 8.19	**$ 229.32**	$ 9.49		**$ 265.72**
Striping, Signage and Lighting							
Parking stall paint	1	EA	$ 30.00	**$ 30.00**	$ 40.00		**$ 40.00**
Handicap space paint	1	EA	$ 226.60	**$ 226.60**	$ 271.93		**$ 271.93**
Handicap sign	1	EA	$ 275.12	**$ 275.12**	$ 340.25		**$ 340.25**
Make existing paved loop pedestrian path system accessible where possible and sign areas where not possible, repave, reinforce shoulders and provide accessible parking				**$ 71,501.19**			**$ 262,394.61**
Replacement of 'speed bumps'				***$ 7,172.21***			***$ 8,605.27***
Clearing and Demolition							
Demo Ex Asphalt	54	SY	$ 7.24	**$ 390.96**	$ 9.00		**$ 486.00**
Saw Cut Ex Asphalt	266	LF	$ 5.99	**$ 1,593.34**	$ 7.48		**$ 1,989.68**
Demo Ex Speed Bumps	490	SF	$ 0.80	**$ 392.00**	$ 1.00		**$ 490.00**
Earthwork and Grading							
Rough grade pavement	54	SY	$ 0.70	**$ 37.80**	$ 0.70		**$ 37.80**
Erosion Controls							
Super silt fence	100	LF	$ 7.88	**$ 788.00**	$ 8.00		**$ 800.00**
Temp. seed and mulch	31	SY	$ 0.33	**$ 10.23**	$ 0.50		**$ 15.50**
Pavement							
Fine grade	54	SY	$ 0.75	**$ 40.50**	$ 1.00		**$ 54.00**
8" 21-A base	54	SY	$ 13.34	**$ 720.36**	$ 16.10		**$ 869.40**
3" asphalt base (115#)	54	SY	$ 14.66	**$ 791.64**	$ 16.39		**$ 885.06**
1.5" asphalt paving - speed table	42	SY	$ 8.19	**$ 343.98**	$ 9.49		**$ 398.58**
Signage							
Steep slope notification - large sign	3	EA	$ 412.68	**$ 1,238.04**	$ 515.85		**$ 1,547.55**
Steep slope notification - small sign	3	EA	$ 275.12	**$ 825.36**	$ 343.90		**$ 1,031.70**
Resurface pedestrian path				***$ 50,350.50***			***$ 228,205.50***
Demolition							
Mill existing pavement	5010	SY	$ 0.55	**$ 2,755.50**	$ 0.55		**$ 2,755.50**
Pavement							

Resurface with 1.5" asphalt lift	*5010*	*SY*	*$ 8.19*	***$ 41,031.90***	*$ 9.49*	***$ 47,544.90***
Resurface with 1.5" integral color or alt paving lift Alternative pedestrian attractive pavement treatment (paint/color) resin pave	5010	SY	$ 9.50	**$ 47,595.00**	$ 45.00	**$ 225,450.00**
Provide accessible parking spaces along pedestrian loop path				***$ 13,978.48***		***$ 25,583.84***
Clearing and Demolition						
Demo Ex Asphalt	112	SY	$ 7.24	**$ 810.88**	$ 9.00	**$ 1,008.00**
Saw cut existing asphalt	132	LF	$ 5.99	**$ 790.68**	$ 7.48	**$ 987.36**
Earthwork and Clearing						
Rough grading estimate (no data available to estimate)	1	LS	$ 5,000.00	**$ 5,000.00**	$ 15,000.00	**$ 15,000.00**
Erosion Controls						
Super silt fence	132	LF	$ 7.88	**$ 1,040.16**	$ 8.00	**$ 1,056.00**
Temp. seed and mulch	220	SY	$ 0.33	**$ 72.60**	$ 0.50	**$ 110.00**
Pavement						
Fine grade	112	SY	$ 0.75	**$ 84.00**	$ 1.00	**$ 112.00**
8" 21-A base	112	SY	$ 13.34	**$ 1,494.08**	$ 16.10	**$ 1,803.20**
3" asphalt base (115#)	112	SY	$ 14.66	**$ 1,641.92**	$ 16.39	**$ 1,835.68**
1.5" final asphalt paving	112	SY	$ 8.19	**$ 917.28**	$ 9.49	**$ 1,062.88**
Striping, Signage and Lighting						
Parking stall paint	4	EA	$ 30.00	**$ 120.00**	$ 40.00	**$ 160.00**
Handicap space paint	4	EA	$ 226.60	**$ 906.40**	$ 271.93	**$ 1,087.72**
Handicap sign	4	EA	$ 275.12	**$ 1,100.48**	$ 340.25	**$ 1,361.00**
END OF ESTIMATE						

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Priority Identification:

• See Table: five+ stating action as priority

FORT WARD PARK AND MUSEUM AREA MANAGEMENT PLAN
ESTIMATE OF COSTING, Prepared July 2014

Final Draft 7/21/14 THIS IS A VERY CONCEPTUAL COST ESTIMATE AND SHOULD BE REVISED AS SOON AS PLANS BECOME AVAILABLE

Goal 2 Priorities

Operation Costing	TAKEOFF QUANTITY	TAKEOFF UNIT	LOW RANGE UNIT PRICE	LOW RANGE EXTENSION PRICE	HIGH RANGE UNIT PRICE	HIGH RANGE EXTENSION PRICE
Mark and protect unrecognized Civil War archaeology				**$ 68,500.00**		**$ 98,000.00**
Survey earthworks and tie data into GIS database	1	LS	$ 3,500.00	**$ 3,500.00**	$ 8,000.00	**$ 8,000.00**
Perform metal detector survey	1	LS	$ 10,000.00	**$ 10,000.00**	$ 15,000.00	**$ 15,000.00**
Archaeological investigation of barracks area behind Museum	1	LS	$ 55,000.00	**$ 55,000.00**	$ 75,000.00	**$ 75,000.00**
Mark and protect "The Fort" community and burial sites				**$ 25,000.00**		**$ 40,000.00**
Archaeological investigation of 'School house' site (schoolhouse/church/ residence)	1	LS	$ 25,000.00	**$ 25,000.00**	$ 40,000.00	**$ 40,000.00**
Map areas in conjunction with OHA where ground disturbance may occur unsupervised; where ground disturbance may occur with supervision; and where no ground disturbance is allowed						
Initial mapping complete in draft 01.13.14; Review and Update annually if not more frequently when new data is available	***See GOAL 1: Review and update MOU annually for costs***					
Archaeological Investigation of maintenance yard				**$ 60,000.00**		**$120,000.00**
Maintenance Yard Archaeological Investigation	1	LS	$ 60,000.00	**$ 60,000.00**	$ 120,000.00	**$ 120,000.00**
Commemorative/Contemplative Monument				**funding by others**		**funding by others**
Commemorative Marker						

Construction Costing	TAKEOFF QUANTITY	TAKEOFF UNIT	LOW RANGE UNIT PRICE	LOW RANGE EXTENSION PRICE	HIGH RANGE UNIT PRICE	HIGH RANGE EXTENSION PRICE
Redirect stormwater and sheet flow away from sensitive cultural and recreation resources through small berms, spreaders and other techniques						
See T&ES estimates in URS 2014 Drainage Master Plan						
Trail Edge Reinforcement				**$ 38,523.16**		**$ 40,423.55**
Shoulder Treatment						
River rock - 18" wide (assume needed on half length)	3221	LF	$ 2.96	**$ 9,534.16**	$ 3.55	**$ 11,434.55**
Gravel reinforced shoulder (use on half of length, where no river rock used)	3221	LF	$ 9.00	**$ 28,989.00**	$ 9.00	**$ 28,989.00**
Remove former maintenance yard access drive, fencing and gate				**$ 38,552.98**		**$ 60,384.90**
Clean up of maintenance yard access						
Clearing and Demolition						
Demo fence and gates	1084	LF	$ 2.50	**$ 2,710.00**	$ 3.75	**$ 4,065.00**
Demo surface of driveway within fence	1118	SY	$ 7.24	**$ 8,094.32**	$ 9.00	**$ 10,062.00**
Demo surface of driveway outside of fence	474	SY	$ 7.24	**$ 3,431.76**	$ 9.00	**$ 4,266.00**
Earthwork and Grading						
Rough grade former driveway surface	1667	SY	$ 0.70	**$ 1,166.90**	$ 0.70	**$ 1,166.90**
Add topsoil in former driveway area	845	CY	$ 20.00	**$ 16,900.00**	$ 35.00	**$ 29,575.00**
Fine grade	2500	SY	$ 0.75	**$ 1,875.00**	$ 1.00	**$ 2,500.00**
Fill holes from fence and gate removal	1	LS	$ 1,500.00	**$ 1,500.00**	$ 2,500.00	**$ 2,500.00**
Landscaping						
Fine grade/seed/mulch/fertilize	2500	SY	$ 1.15	**$ 2,875.00**	$ 2.50	**$ 6,250.00**
END OF ESTIMATE						

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Goal 3 Priorities

Operation Costing	Staff Hours - Low	Staff Hours - High	Task/Notes
Prune diseased and dead tree limbs			
RPCA			
Train all personnel on use of equipment to minimize damage to resources			
RPCA			
Provide training and certification for maintenance personnel at park			
RPCA			

Construction Costing	TAKEOFF QUANTITY	TAKEOFF UNIT	LOW RANGE UNIT PRICE	LOW RANGE EXTENSION PRICE	HIGH RANGE UNIT PRICE	HIGH RANGE EXTENSION PRICE
Plant new trees annually				**$ 10,365.32**		**$ 13,188.46**
Woodland Plantings						
Seedlings/Reforestation	0.25	AC	$ 10,000.00	**$ 2,500.00**	$ 15,000.00	**$ 3,750.00**
Lawn Plantings						
Deciduous trees - nursery scaled	12	EA	$ 299.63	**$ 3,595.56**	$ 359.56	**$ 4,314.72**
Flowering trees - nursery scaled	10	EA	$ 374.54	**$ 3,745.40**	$ 449.45	**$ 4,494.50**
Evergreen trees - nursery sca	2	EA	$ 262.18	**$ 524.36**	$ 314.62	**$ 629.24**
Remove fallen and hazard trees				**$ 3,000.00**		**$ 7,750.00**
Remove Trees	Assumptions/year					
Standing tree	2	EA	$ 350.00	**$ 700.00**	$ 1,500.00	**$ 3,000.00**
Fallen tree (where leaving tree debris is not viable)	5	EA	$ 250.00	**$ 1,250.00**	$ 500.00	**$ 2,500.00**
Saw into 8' lengths and leave on ground in place; remove brush debris	3	EA	$ 350.00	**$ 1,050.00**	$ 750.00	**$ 2,250.00**
Remove inappropriate vegetation from earthworks - prorated rate for annual dollar amount				**$ 2,500.00**		**$ 7,500.00**
Clearing and Demolition						
Clearing	*1.84*	*AC*	*$ 30,000.00*	***$ 55,200.00***	*$ 30,000.00*	***$ 55,200.00***
Phase per year allocation	1	LS	$ 2,500.00	**$ 2,500.00**	$ 7,500.00	**$ 7,500.00**
Remove inappropriate vegetation from burial grounds and cemeteries - annual expenditure prorated				**$ 2,500.00**		**$ 7,500.00**
Clearing and Demolition						
Clearing	*0.37*	*AC*	*$ 30,000.00*	***$ 11,100.00***	*$ 30,000.00*	***$ 11,100.00***
Phase per year allocation	1	LS	$ 2,500.00	**$ 2,500.00**	$ 7,500.00	**$ 7,500.00**
END OF ESTIMATE						

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Priority Identification:
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FORT WARD PARK AND MUSEUM AREA MANAGEMENT PLAN
ESTIMATE OF COSTING, prepared July 2014

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Goal 4 Priorities

Operation Costing	TAKEOFF QUANTITY	TAKEOFF UNIT	LOW RANGE UNIT PRICE	LOW RANGE EXTENSION PRICE	HIGH RANGE UNIT PRICE	HIGH RANGE EXTENSION PRICE
Identify Fort Ward on region-wide maps, brochures, web-sites, and other city publications as a place to experience Alexandria's history from the Civil War to the Civil Rights eras				**$ 5,000.00**		**$ 50,000.00**
	1	LS	$ 5,000.00	**$ 5,000.00**	$ 50,000.00	**$ 50,000.00**
Work with partners to encourage the National Park Service to interpret and promote the Circle Forts to promote regional interpretation of the Defenses of Washington						
	1	**LS**				
Update the historic information on the picnic area map to include areas associated with burial sites				**$ 1,000.00**		**$ 5,000.00**
	1	LS	$ 1,000.00	**$ 1,000.00**	$ 5,000.00	**$ 5,000.00**
Develop Interpretive Plan/Identify and invite key stakeholders from the Descendants Group, Civil War historians, naturalists, educators and community representatives to participate in a new advisory committee on interpretation				**$ 35,000.00**		**$150,000.00**
	1	LS	$ 35,000.00	**$ 35,000.00**	$ 150,000.00	**$ 150,000.00**

Construction Costing	TAKEOFF QUANTITY	TAKEOFF UNIT	LOW RANGE UNIT PRICE	LOW RANGE EXTENSION PRICE	HIGH RANGE UNIT PRICE	HIGH RANGE EXTENSION PRICE
Design and install an interpretive trail as a part of the overall trail network as a means of organizing the outdoor interpretive experience				**$ 3,750.00**		**$ 5,000.00**
Interpretive Signs for interpretive trail	5	EA	$ 750.00	**$ 3,750.00**	$ 1,000.00	**$ 5,000.00**
Install a small, 1 panel orientation kiosk at each minor entrance to the park				**$ 3,838.52**		**$ 4,923.15**
Signage						
Destination Identification - entry	1	EA	$ 550.24	**$ 550.24**	$ 687.80	**$ 687.80**
Large sign (three primary entrances	3	EA	$ 412.68	**$ 1,238.04**	$ 515.85	**$ 1,547.55**
Small sign (St. Stephen's side)	2	EA	$ 275.12	**$ 550.24**	$ 343.90	**$ 687.80**
Information Kiosk	1	EA	$ 1,500.00	**$ 1,500.00**	$ 2,000.00	**$ 2,000.00**
END OF ESTIMATE						

* Unit pricing for Construction Costing, unless noted, drawn from work prepared by PENNONI Associates, Inc. /SDS, INC for the City of Alexandria's *Citywide Parks Improvement Plan 2014* DRAFT, Conceptual Cost Estimate December 26, 2013 to be consistent with unit costing between documents. Operation Costing derived from other sources.

Priority Identification:

• See Table: four + stating action as priority

FORT WARD PARK AND MUSEUM AREA MANAGEMENT PLAN
ESTIMATE OF COSTING, prepared July 2014

Final Draft 7/21/14 THIS IS A VERY CONCEPTUAL COST ESTIMATE AND SHOULD BE REVISED AS SOON AS PLANS BECOME AVAILABLE

Goal 5 Priorities

Operation Costing	Staff Hours - Low	Staff Hours - High	Task/Notes
Continue to monitor and to limit noise from park activities			
RPCA staff time/operations	104	208	Annually - 2 - 4 hrs/wk; likely not needed from Nov through March

Feasibility Study Costing	TAKEOFF QUANTITY	TAKEOFF UNIT	UNIT PRICE	EXTENSION PRICE	UNIT PRICE	EXTENSION PRICE
Evaluate upgrade of existing restrooms near amphitheater						
Immediate stabilization						
Reroof existing structure	1	LS		$ -		$ -
Feasibility Study for replacement and/or ADA accessibility adaption						
Engineering study	1	LS		$ -		$ -

Construction Costing	TAKEOFF QUANTITY	TAKEOFF UNIT	LOW RANGE UNIT PRICE	LOW RANGE EXTENSION PRICE	HIGH RANGE UNIT PRICE	HIGH RANGE EXTENSION PRICE
Make pedestrian use the priority use for paved loop road				**$ 6,687.80**		**$ 6,859.75**
Identify pedestrian as priority user with signs				**$ 6,687.80**		**$ 6,859.75**
Signage for paved loop path						
Large sign	1	EA	$ 412.68	**$ 412.68**	$ 515.85	**$ 515.85**
Small sign	1	EA	$ 275.12	**$ 275.12**	$ 343.90	**$ 343.90**
Mile Markers	1	LS	$ 6,000.00	**$ 6,000.00**	$ 6,000.00	**$ 6,000.00**
Soft Path network; all widths 8': can be done in segments, figure is for total length				**$ 441,088.25**		**$ 640,838.24**
Mulch Surface (based on unit compilation below)	**2555**	LF	$ 82.28	**$ 210,228.98**	$ 100.07	**$ 255,676.93**
Asphalt Surface (based on unit compilation below)	***1160***	*LF*	*$ 132.15*	***$ 153,288.90***	*$ 174.45*	***$ 202,362.29***
Turf/Mown Grass Surface	**932**	LF	$ 8.07	**$ 7,521.24**	$ 21.20	**$ 19,758.40**
FlexiPave or Permeable Pavement (based on unit compilation below)	**1160**	LF	$ 134.95	**$ 156,536.90**	$ 236.79	**$ 274,676.69**
Stonedust Surface (based on unit compilation below)	**501**	LF	$ 133.34	**$ 66,801.14**	$ 181.09	**$ 90,726.22**
Discrete, High Priority Segments for Soft Trail connections				**$ 42,509.25**		**$ 74,588.85**
ADA access to playground - see Goal 1 for figures						
ADA access to picnic shelter (flex pave 8 feet wide)	315	LF	$ 134.95	**$ 42,509.25**	$ 236.79	**$ 74,588.85**
Signage for soft path network				**$ 6,687.80**		**$ 6,859.75**
Large sign	1	EA	$ 412.68	**$ 412.68**	$ 515.85	**$ 515.85**
Small sign	1	EA	$ 275.12	**$ 275.12**	$ 343.90	**$ 343.90**
Trail markers (particularly necessary for grass and mulch segments	1	LS	$ 6,000.00	**$ 6,000.00**	$ 6,000.00	**$ 6,000.00**
Path Connectors to North Van Dorn Street				**$ 31,705.97**		**$ 55,640.92**
Eastern Entry off N. Van Dorn				***$ 19,700.23***		***$ 34,672.61***
ADA access to park (flex pave 8 feet wide)	120	LF	$ 134.95	**$ 16,194.00**	$ 236.79	**$ 28,414.80**
Miscellaneous						
Pedestrian traffic control	1	LS	$ 2,500.00	**$ 2,500.00**	$ 5,000.00	**$ 5,000.00**
Standard bollards	3	EA	$ 335.41	**$ 1,006.23**	$ 419.27	**$ 1,257.81**
Western Entry off N. Van Dorn				***$ 12,005.74***		***$ 20,968.31***
ADA access to park (flex pave 8 feet wide)	60	LF	$ 134.95	**$ 8,097.00**	$ 236.79	**$ 14,207.40**
Miscellaneous						
Pedestrian traffic control	1	LS	$ 2,500.00	**$ 2,500.00**	$ 5,000.00	**$ 5,000.00**
Removable bollards	3	EA	$ 469.58	**$ 1,408.74**	$ 586.97	**$ 1,760.91**
Remove off-leash dog exercise area from park				**$ 3,123.64**		**$ 6,324.20**
Signage						
Remove signs at exercise are	1	LS	$ 100.00	**$ 100.00**	$ 500.00	**$ 500.00**
Landscaping						
Spread topsoil and compost	228	CY	$ 5.03	**$ 1,146.84**	$ 7.65	**$ 1,744.20**
Fine grade/seed/mulch/fertiliz	1632	SY	$ 1.15	**$ 1,876.80**	$ 2.50	**$ 4,080.00**

CALCULATIONS to determine lf (at 8') cost for four trail surfaces						
Mulch Surface Unit Module - 1 LF at 8 feet wide = 8 SF				**$ 82.28**		**$ 100.07**
Clearing and Demolition						
Clearing	0.005	AC	$ 7,350.28	**$ 36.75**	$ 9,187.85	**$ 45.94**
Earthork and Grading						
Cut to export	0.14	CY	$ 20.00	**$ 2.80**	$ 35.00	**$ 4.90**
Rough grading soft trail surfa	1	SY	$ 0.50	**$ 0.50**	$ 0.50	**$ 0.50**

Erosion Controls						
Super silt fence	2	LF	$ 7.88	**$ 15.76**	$ 8.00	**$ 16.00**
Tree protection	2	LF	$ 3.38	**$ 6.76**	$ 4.00	**$ 8.00**
Temp. seed and mulch	1	SY	$ 0.33	**$ 0.33**	$ 0.50	**$ 0.50**
Trails						
8' mulch trail	1	SY	$ 19.38	**$ 19.38**	$ 24.23	**$ 24.23**
Asphalt Surface Unit Module - 1 LF at 8 feet wide = 8 sf (use 1 sy as comp to 8 sf)				**$ 132.15**		**$ 174.45**
Clearing and Demolition						
Clearing	0.005	AC	$ 7,350.28	**$ 36.75**	$ 9,187.85	**$ 45.94**
Earthork and Grading						
Strip topsoil to stock for resp	0.14	CY	$ 3.00	**$ 0.42**	$ 5.00	**$ 0.70**
Cut to export	0.14	CY	$ 20.00	**$ 2.80**	$ 35.00	**$ 4.90**
Remove individual trees	0.05	EA	$ 350.00	**$ 17.50**	$ 650.00	**$ 32.50**
Rough grading soft trail surfa	1	SY	$ 0.50	**$ 0.50**	$ 0.50	**$ 0.50**
Erosion Controls						
Super silt fence	2	LF	$ 7.88	**$ 15.76**	$ 8.00	**$ 16.00**
Tree protection	2	LF	$ 3.38	**$ 6.76**	$ 4.00	**$ 8.00**
Temp. seed and mulch	1	SY	$ 0.33	**$ 0.33**	$ 0.50	**$ 0.50**
Stormwater						
Ditch - seeded	2	LF	$ 7.71	**$ 15.42**	$ 9.64	**$ 19.28**
Trails						
8' asphalt trail	1	SY	$ 34.05	**$ 34.05**	$ 42.56	**$ 42.56**
Landscaping						
Respread topsoil	0.14	CY	$ 5.03	**$ 0.70**	$ 7.65	**$ 1.07**
Fine grade/seed/mulch/fertiliz	1	SY	$ 1.15	**$ 1.15**	$ 2.50	**$ 2.50**
Turf Surface Unit Module - 1 LF at 8 feet wide = 8 sf (use 1 sy as comp to 8 sf)				**$ 8.07**		**$ 21.20**
Earthork and Grading						
Rough grading soft trail surfa	1	SY	$ 1.50	**$ 1.50**	$ 3.00	**$ 3.00**
Trails						
8' turf/mown grass trail	1	SY	$ 5.00	**$ 5.00**	$ 15.00	**$ 15.00**
Landscaping						
Respread topsoil	0.14	CY	$ 3.00	**$ 0.42**	$ 5.00	**$ 0.70**
Fine grade/seed/mulch/fertiliz	1	SY	$ 1.15	**$ 1.15**	$ 2.50	**$ 2.50**
FlexiPave/Permeable Surface Unit Module - 1 LF at 8 feet wide = 8sf (use 1 sy as comp to 8 sf)				**$ 134.95**		**$ 236.79**
Clearing and Demolition						
Clearing	0.005	AC	$ 7,350.28	**$ 36.75**	$ 9,187.85	**$ 45.94**
Earthork and Grading						
Strip topsoil to stock for resp	0.14	CY	$ 3.00	**$ 0.42**	$ 5.00	**$ 0.70**
Strip topsoil to haul off	0.14	CY	$ 20.00	**$ 2.80**	$ 35.00	**$ 4.90**
Cut to export	0.14	CY	$ 20.00	**$ 2.80**	$ 35.00	**$ 4.90**
Remove individual trees	0.05	EA	$ 350.00	**$ 17.50**	$ 650.00	**$ 32.50**
Rough grading soft trail surfa	1	SY	$ 0.50	**$ 0.50**	$ 0.50	**$ 0.50**
Erosion Controls						
Super silt fence	2	LF	$ 7.88	**$ 15.76**	$ 8.00	**$ 16.00**
Tree protection	2	LF	$ 3.38	**$ 6.76**	$ 4.00	**$ 8.00**
Temp. seed and mulch	1	SY	$ 0.33	**$ 0.33**	$ 0.50	**$ 0.50**
Stormwater						
Ditch - seeded	2	LF	$ 7.71	**$ 15.42**	$ 9.64	**$ 19.28**
Trails						
8' FlexiPave/Permeable surface trail	1	SY	$ 34.05	**$ 34.05**	$ 100.00	**$ 100.00**
Landscaping						
Respread topsoil	0.14	CY	$ 5.03	**$ 0.70**	$ 7.65	**$ 1.07**
Fine grade/seed/mulch/fertiliz	1	SY	$ 1.15	**$ 1.15**	$ 2.50	**$ 2.50**
Stonedust Surface Unit Module - 1 LF at 8 feet wide = 8 sf (use 1 sy as comp to 8 sf)				**$ 133.34**		**$ 181.09**
Clearing and Demolition						
Clearing	0.005	AC	$ 7,350.28	**$ 36.75**	$ 9,187.85	**$ 45.94**
Earthork and Grading						
Strip topsoil to stock for resp	0.14	CY	$ 3.00	**$ 0.42**	$ 5.00	**$ 0.70**
Strip topsoil to haul off	0.14	CY	$ 20.00	**$ 2.80**	$ 35.00	**$ 4.90**
Cut to export	0.14	CY	$ 20.00	**$ 2.80**	$ 35.00	**$ 4.90**
Remove individual trees	0.05	EA	$ 350.00	**$ 17.50**	$ 650.00	**$ 32.50**
Rough grading soft trail surfa	1	SY	$ 0.50	**$ 0.50**	$ 0.50	**$ 0.50**
Erosion Controls						
Super silt fence	2	LF	$ 7.88	**$ 15.76**	$ 8.00	**$ 16.00**
Tree protection	2	LF	$ 3.38	**$ 6.76**	$ 4.00	**$ 8.00**
Temp. seed and mulch	1	SY	$ 0.33	**$ 0.33**	$ 0.50	**$ 0.50**
Stormwater						
Ditch - seeded	2	LF	$ 7.71	**$ 15.42**	$ 9.64	**$ 19.28**

Trails						
8' Stonedust	1	SY	$ 23.44	**$ 23.44**	$ 29.30	**$ 29.30**
Filter fabric	1	SY	$ 3.00	**$ 3.00**	$ 5.00	**$ 5.00**
Steel Edging	2	LF	$ 3.00	**$ 6.00**	$ 5.00	**$ 10.00**
Landscaping						
Respread topsoil	0.14	CY	$ 5.03	**$ 0.70**	$ 7.65	**$ 1.07**
Fine grade/seed/mulch/fertiliz	1	SY	$ 1.15	**$ 1.15**	$ 2.50	**$ 2.50**
END OF ESTIMATE						

* Unit pricing for Construction Costing, unless noted, drawn from work prepared by PENNONI Associates, Inc. /SDS, INC for the City of Alexandria's Citywide Parks Improvement Plan 2014 DRAFT, Conceptual Cost Estimate December 26, 2013 to be consistent with unit costing between documents. Operation Costing derived from other sources.

Priority Identification:

• See Table: three + stating action as priority

Fort Ward Park and Museum Area Management Plan

SECTION II
8. PLATES

The City of Alexandria, Virginia

October 2014

FINAL DRAFT

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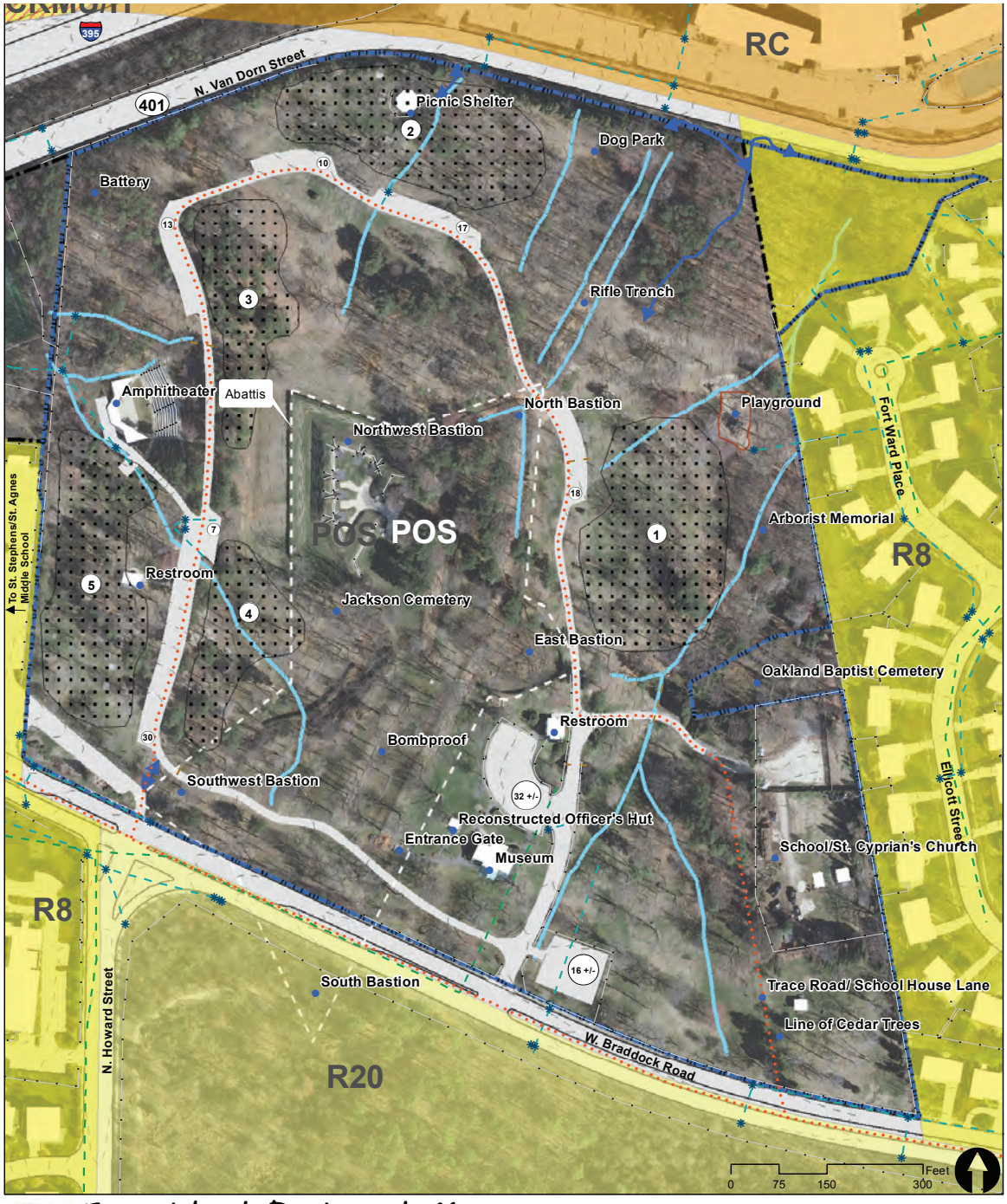


Fort Ward Park and Museum Area Management Plan

City of Alexandria, Virginia

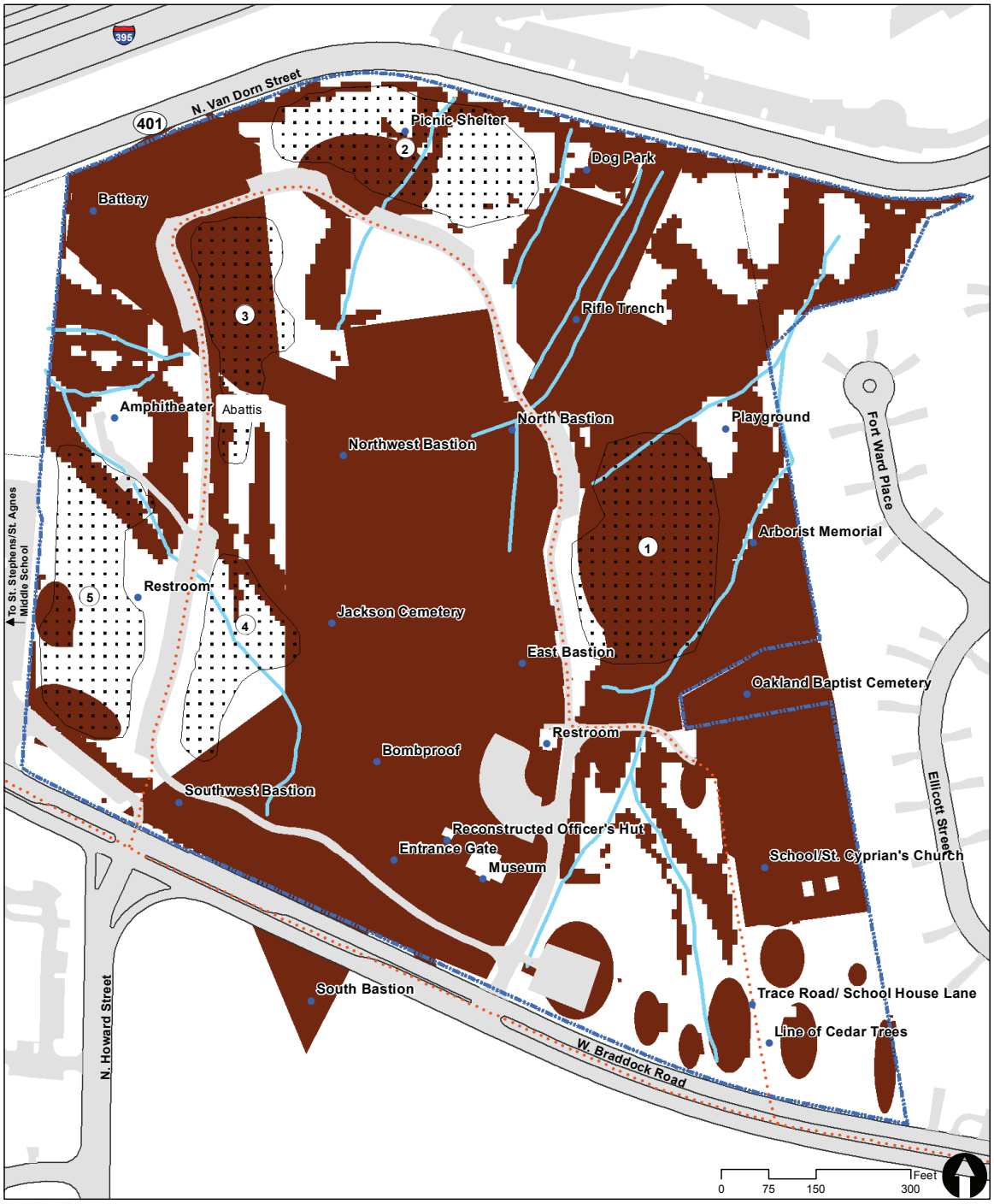
Existing Conditions/ Adjacent Land Use

Management Plan Boundary
Park Parcel
Road or pavement
Number of parking spaces
Parcel
Contour 2'
Park Feature
Picnic Area
Alexandria Heritage Trail
Pedestrian access &/or social trail
Play ground
Fence, Wall, Retaining Wall
Drainage lines
Culvert
Traditional Pipe
Drainage inlet
Sanitary lines
Collector
Interceptor
Drainage flowlines
Zoning
CRMU/H
R20
R8
RC

Lardner/Klein Landscape Architects, PC
in association with
Heritage Strategies, Inc., John Milner Associates, Inc. and Barbara Franco

GIS Sources: City of Alexandria

Plate 1. Existing Conditions/Adjacent Land Use



Fort Ward Park and Museum Area Management Plan

City of Alexandria, Virginia

Synthesis of Archaeological Resources + ORAR* Slope Intervals

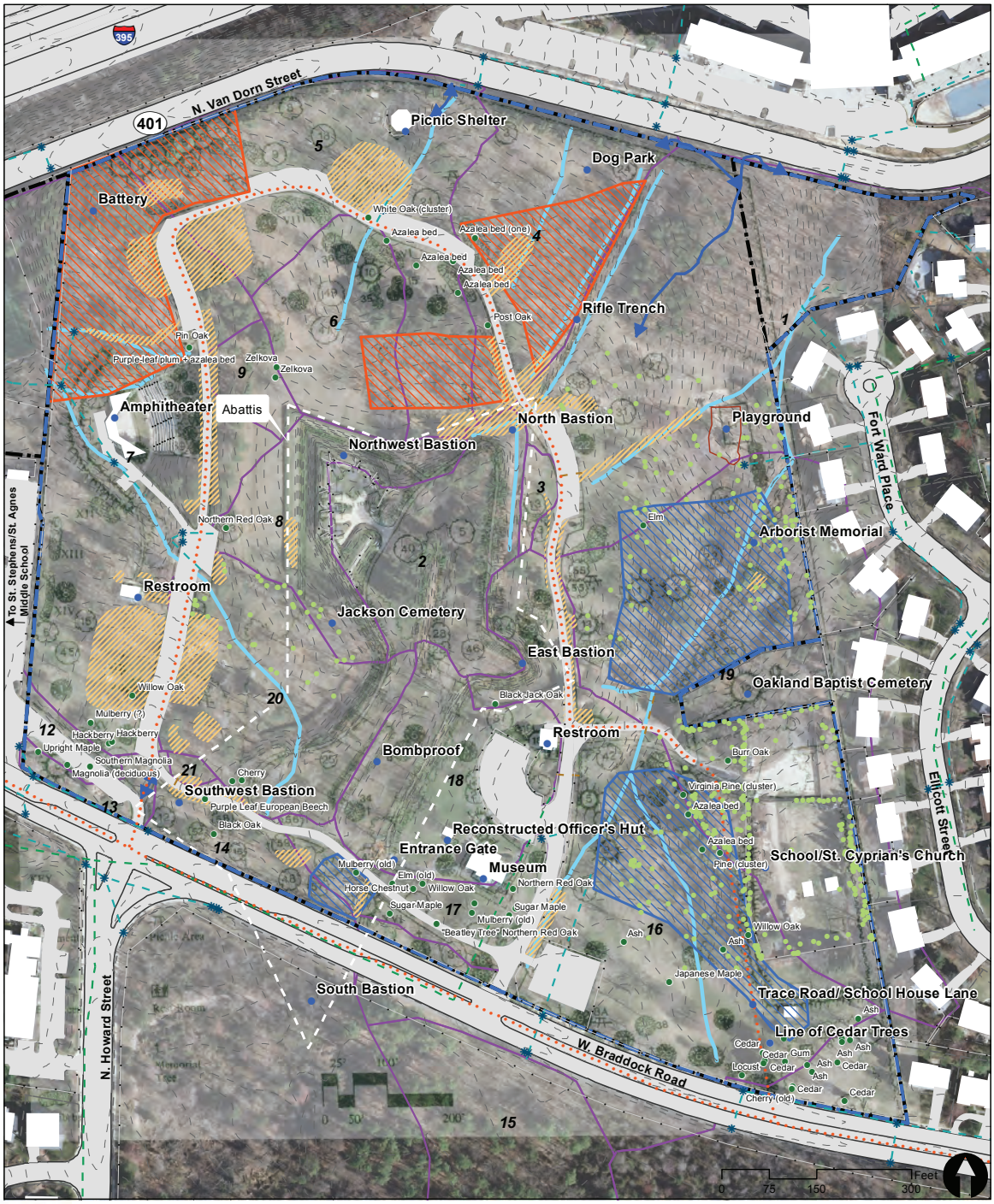
- Management Plan Boundary
- Park Parcel
- Road or pavement
- Drainage flowlines
- Park Feature
- Picnic Area
- Alexandria Heritage Trail
- Archaeological Resources + Slopes over 10%*

*Slopes greater than 1:10 (10%) are too steep for outdoor recreation access routes.

L/KLA Lardner/Klein Landscape Architects, PC
in association with
Heritage Strategies, Inc., John Milner Associates, Inc. and Barbara Franco

GIS Sources: City of Alexandria

Plate 2. Synthesis of Archaeological Resources + ORAR Slope Intervals



Fort Ward Park and Museum Area Management Plan

City of Alexandria, Virginia

Summary of Existing Natural Resource Conditions

- Management Plan Boundary
- Park Parcel
- Road or pavement
- Parcel
- Contour 2'
- Park Feature
- Alexandria Heritage Trail
- Pedestrian access &/or social trail
- Play ground
- Fence, Wall, Retaining Wall
- Drainage flowlines
- Drainage area
- **Sanitary lines**
- Collector
- Interceptor
- **Drainage lines**
- Culvert
- Traditional Pipe
- Drainage inlet
- Erosion and/or compacted soil**
- Woodland Glade (mowed annually in fall)*
- Meadows (mowed annually in fall)*
- **Tree Inventory**
- Tree or Azalea bed (LKLA inventory 6/2013)***
- Tree (Archeology-City of Alexandria)

NOTE: City of Alexandria Arboretum Map Brochure is overlaid on aerial photo for reference.

*Woodland glade, meadows, and management source: X
**Erosion and/or compacted soil layer was generated from a field inventory by L/KLA in June of 2013. Only those areas visible from the loop road were recorded in these data.
***Points indicate the general locations (hand-held GPS) of trees and azalea beds.

GIS Sources: City of Alexandria

L/KLA Lardner/Klein Landscape Architects, PC
in association with
Heritage Strategies, Inc., John Milner Associates, Inc. and Barbara Franco

Plate 3. Summary of Existing Natural Resource Conditions

Fort Ward Park and Museum Area Management Plan

City of Alexandria, Virginia

Existing Drainage Patterns + Watersheds

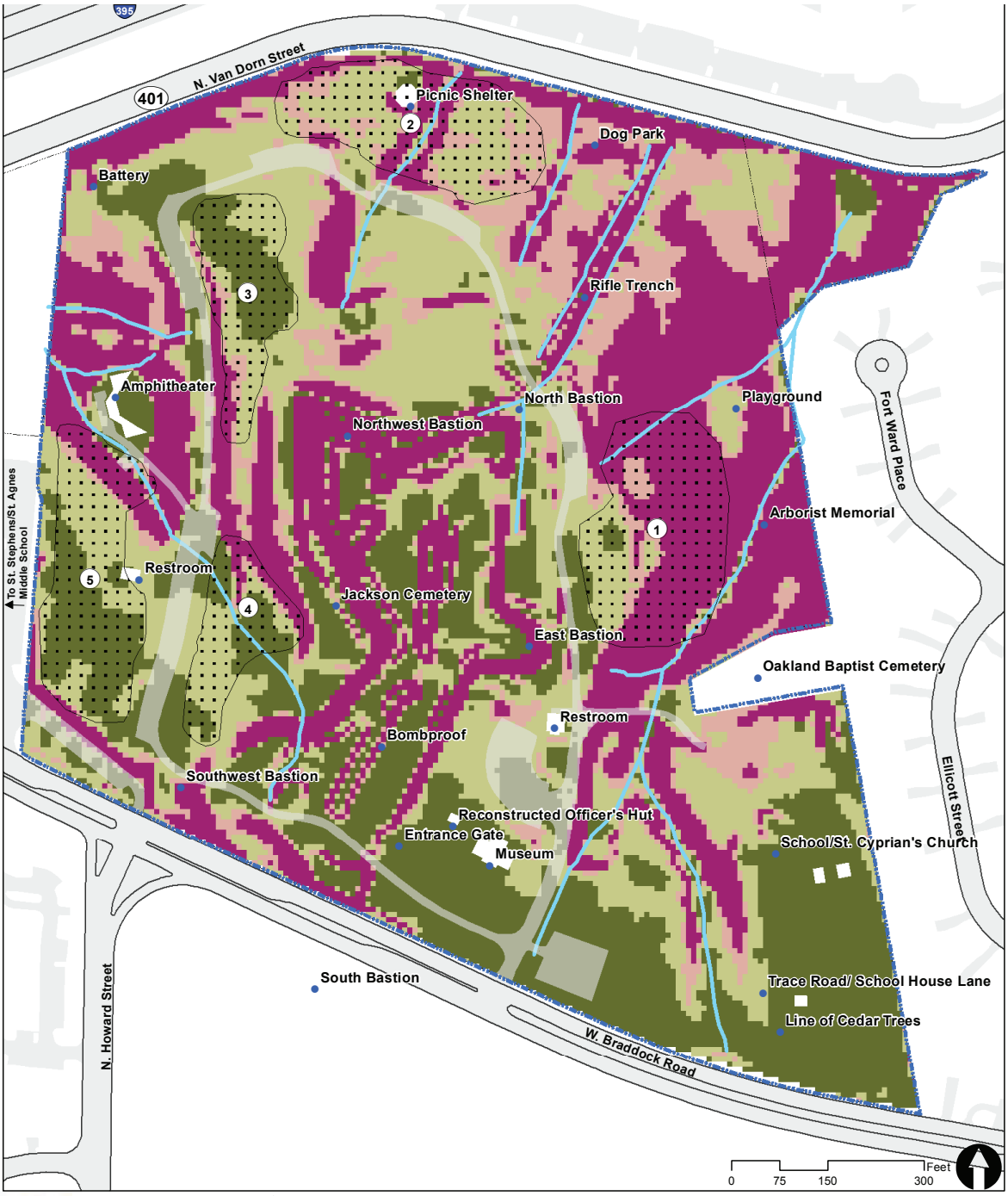
Management Plan Boundary
Park Parcel
Road or pavement
Contour 2'
Play ground
Fence, Wall, Retaining Wall
Stream centerline (approximate)*
Sanitary lines
Collector
Interceptor
Drainage lines
Culvert
Traditional Pipe
Drainage inlet
Erosion and/or compacted soil**
Management Plan Boundary

NOTES:
*Stream centerline layer was traced from the map, "Fort Ward Park - Native American Cultural Resources" from the Inventory of Historical Resources - Fort Ward Park WORKING DRAFT - 9/10/09.
**Erosion and/or compacted soil layer was generated from a field inventory by L/KLA in June of 2013.

GIS Sources: City of Alexandria, USDA

L/KLA Lardner/Klein Landscape Architects, PC
in association with
Heritage Strategies, Inc., John Milner Associates, Inc. and Barbara Franco

Plate 4. Existing Drainage Patterns + Watersheds



Fort Ward Park and Museum Area Management Plan

City of Alexandria, Virginia

Management Plan Boundary
Road or pavement
Drainage flowlines
Park Feature
Picnic Area
Contour 2'

Percent Slope (per ORAR guidelines)
0% - 5%
5.000000001% - 8.3%
8.300000001% - 10%
10.00000001% - 80%

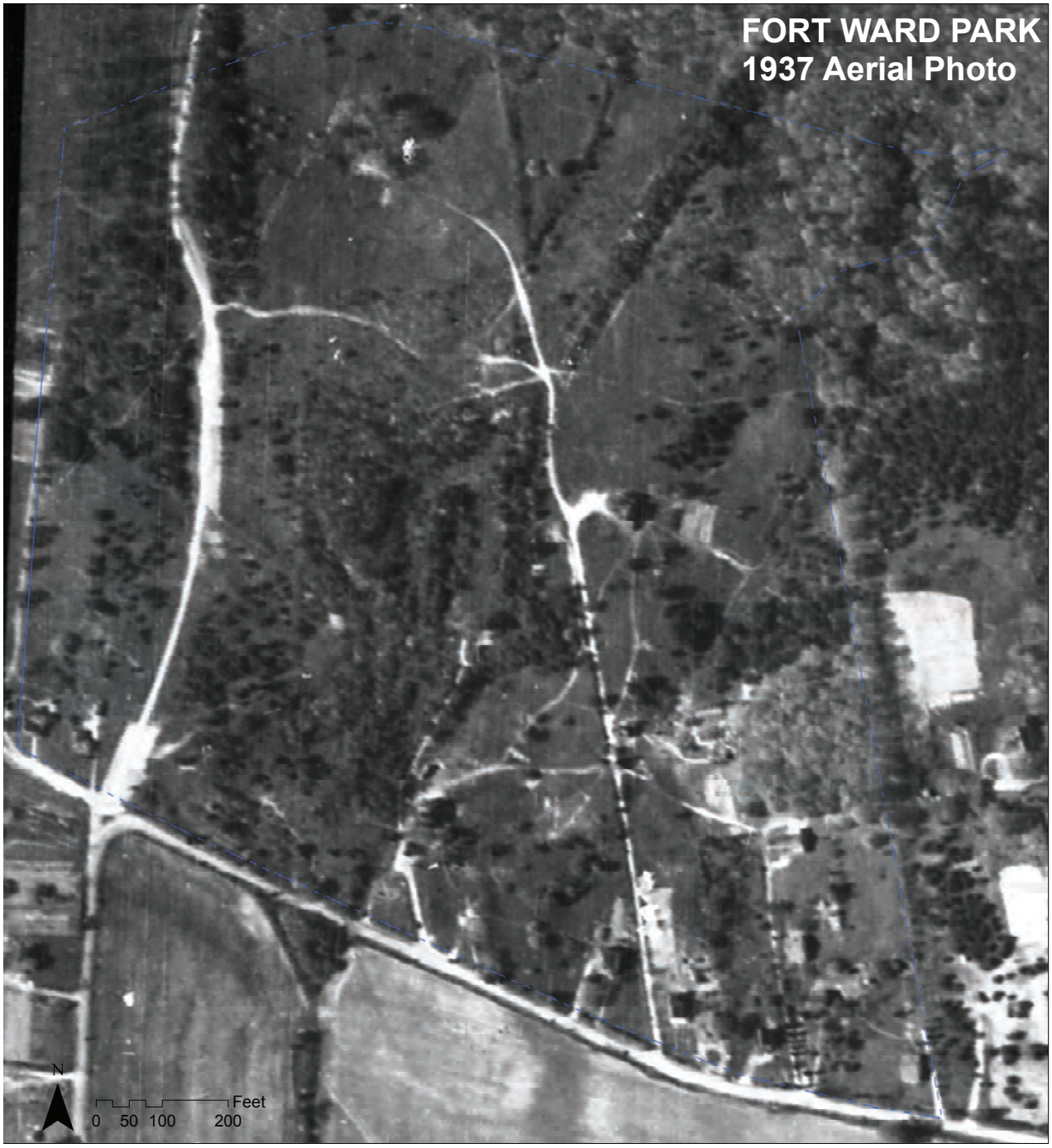
ORAR* Slope Intervals

* According to the Access Board Outdoor Recreation Access Route (ORAR) Guidelines for Outdoor Developed Areas (Oct. 19, 2009): "1016.7.1 Running Slope. The running slope of any segment of an outdoor recreation access route shall not be steeper than 1:10. Where the running slope of a segment of an outdoor recreation access route is steeper than 1:20, the maximum length of the segment shall be in accordance with Table 1016.7.1, and a resting interval complying with 1016.8 shall be provided at each end of the segment."
Slope intervals shown on this map correspond with the slope guidelines for Outdoor Recreation Access Routes indicated above. Slopes steeper than 1:20 (5%) but not steeper than 1:12 (8.3%) can have a maximum segment length of 50 feet. Slopes steeper than 1:12 (8.3%) but not steeper than 1:10 (10%) can have a maximum segment length of 30 feet. Slopes greater than 1:10 (10%) are too steep for outdoor recreation access routes.

L/KLA Lardner/Klein Landscape Architects, PC
in association with
Heritage Strategies, Inc., John Milner Associates, Inc. and Barbara Franco

GIS Sources: City of Alexandria

Plate 5. ORAR Slope Intervals



Aerial Photo of Fort Ward Park 1937

Plate 6. Aerial Photograph 1937

Aerial Photo of Fort Ward Park 1949

Plate 7. Aerial Photograph 1949

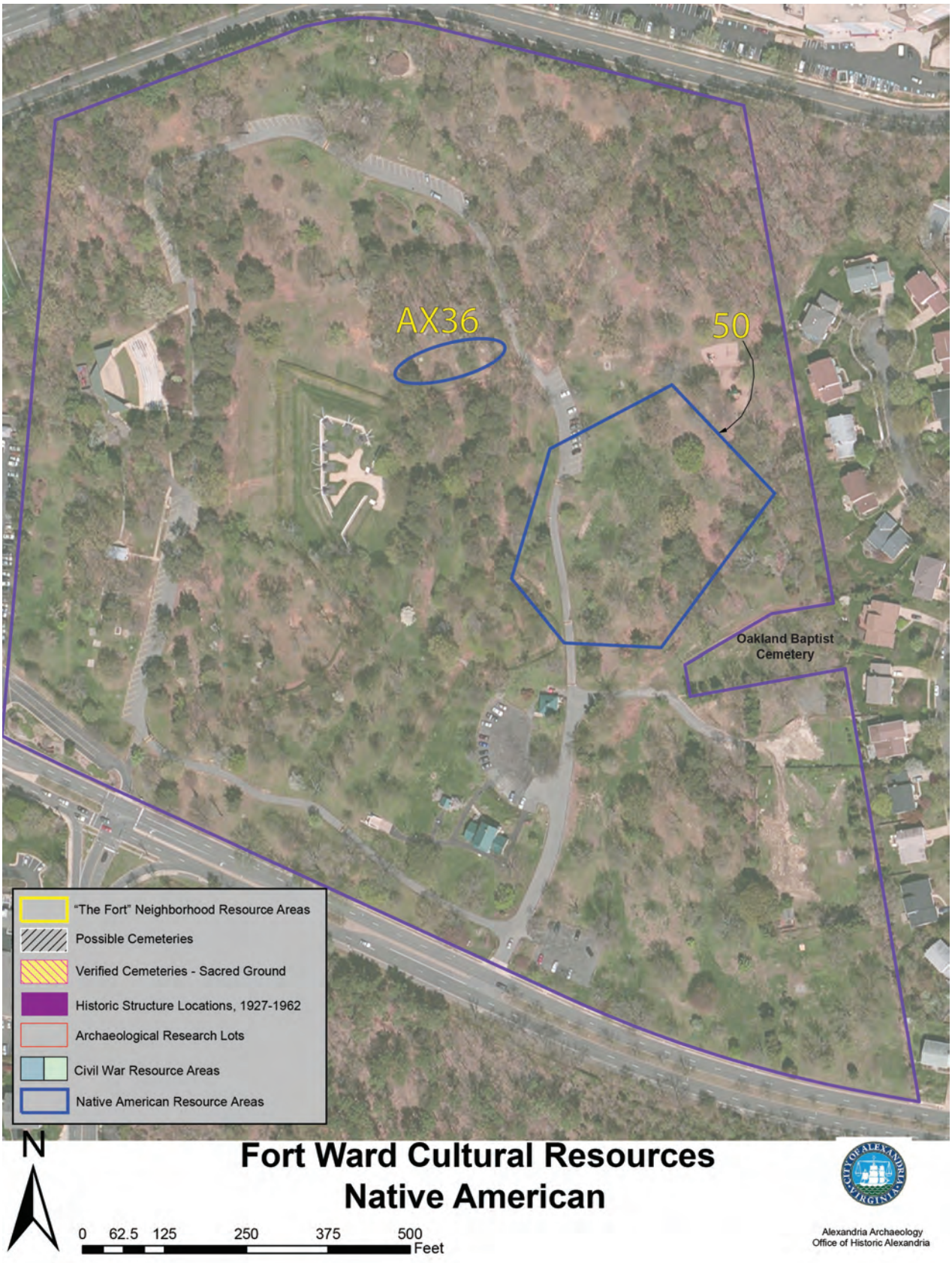


Plate 8. OHA Mapping - Fort Ward Cultural Resources - Native American

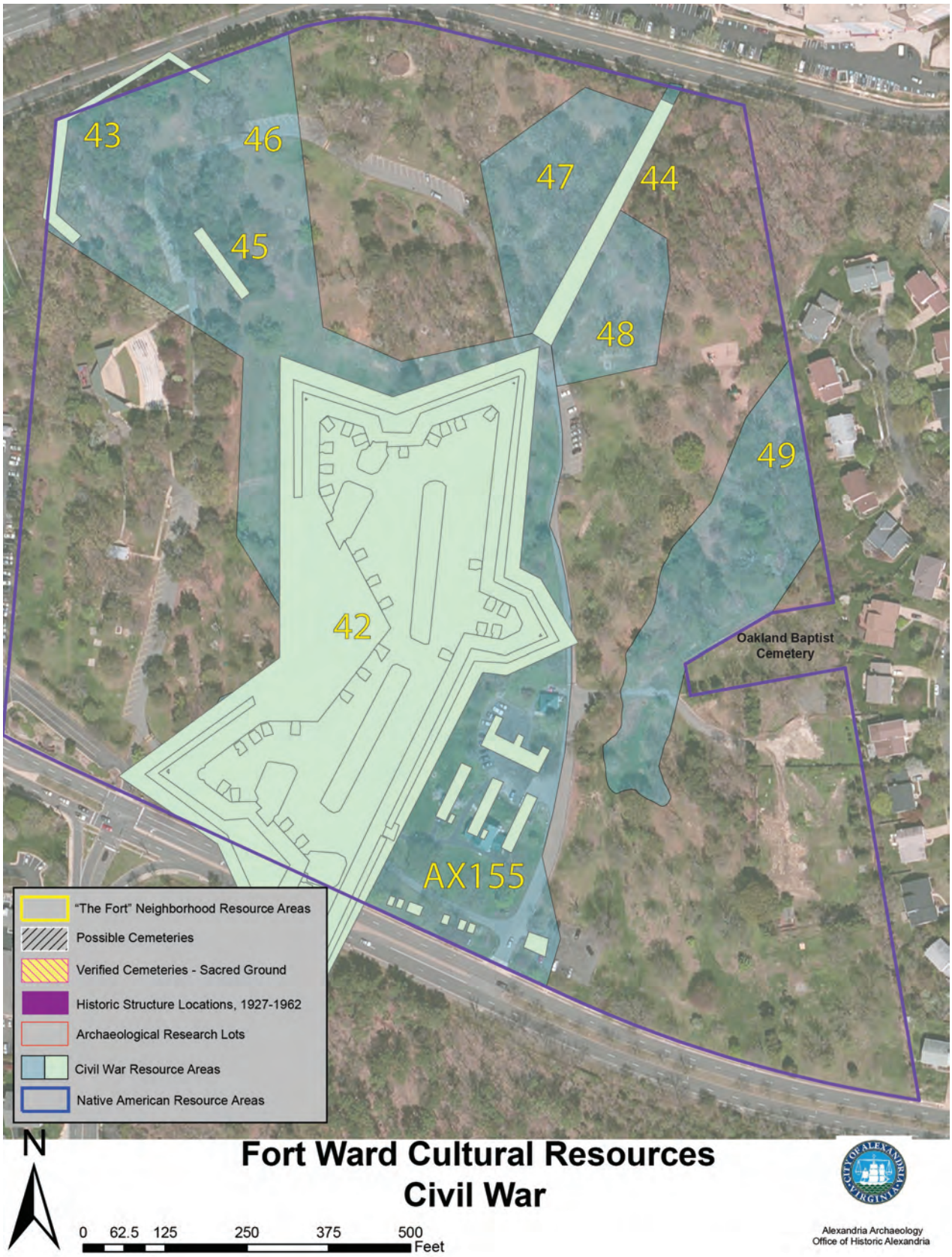


Plate 9. OHA Mapping - Fort Ward Cultural Resources - Civil War

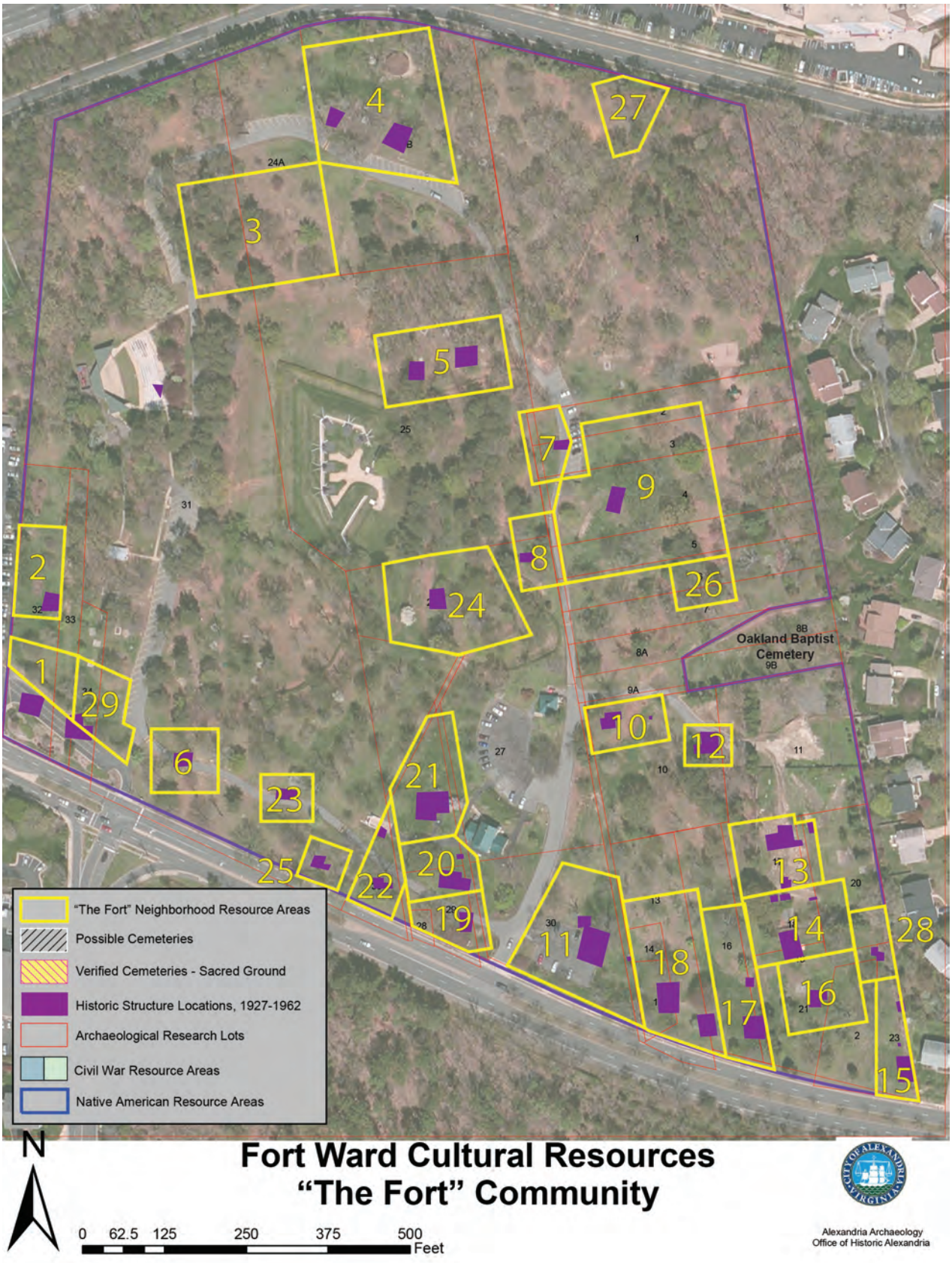


Plate 10. OHA Mapping - Fort Ward Cultural Resources - "The Fort Community"

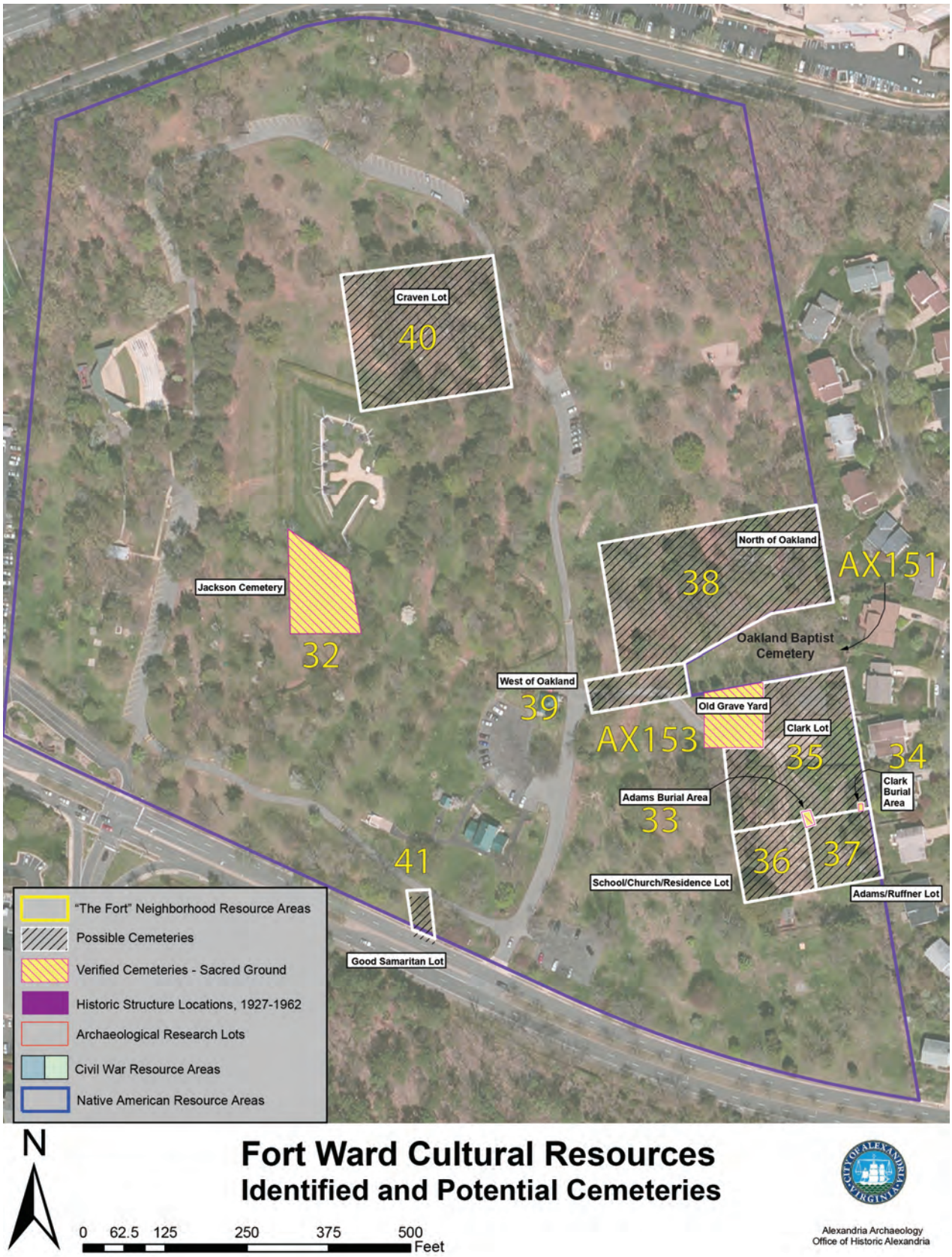


Plate 11. OHA Mapping - Fort Ward Cultural Resources - Identified and Potential Cemeteries

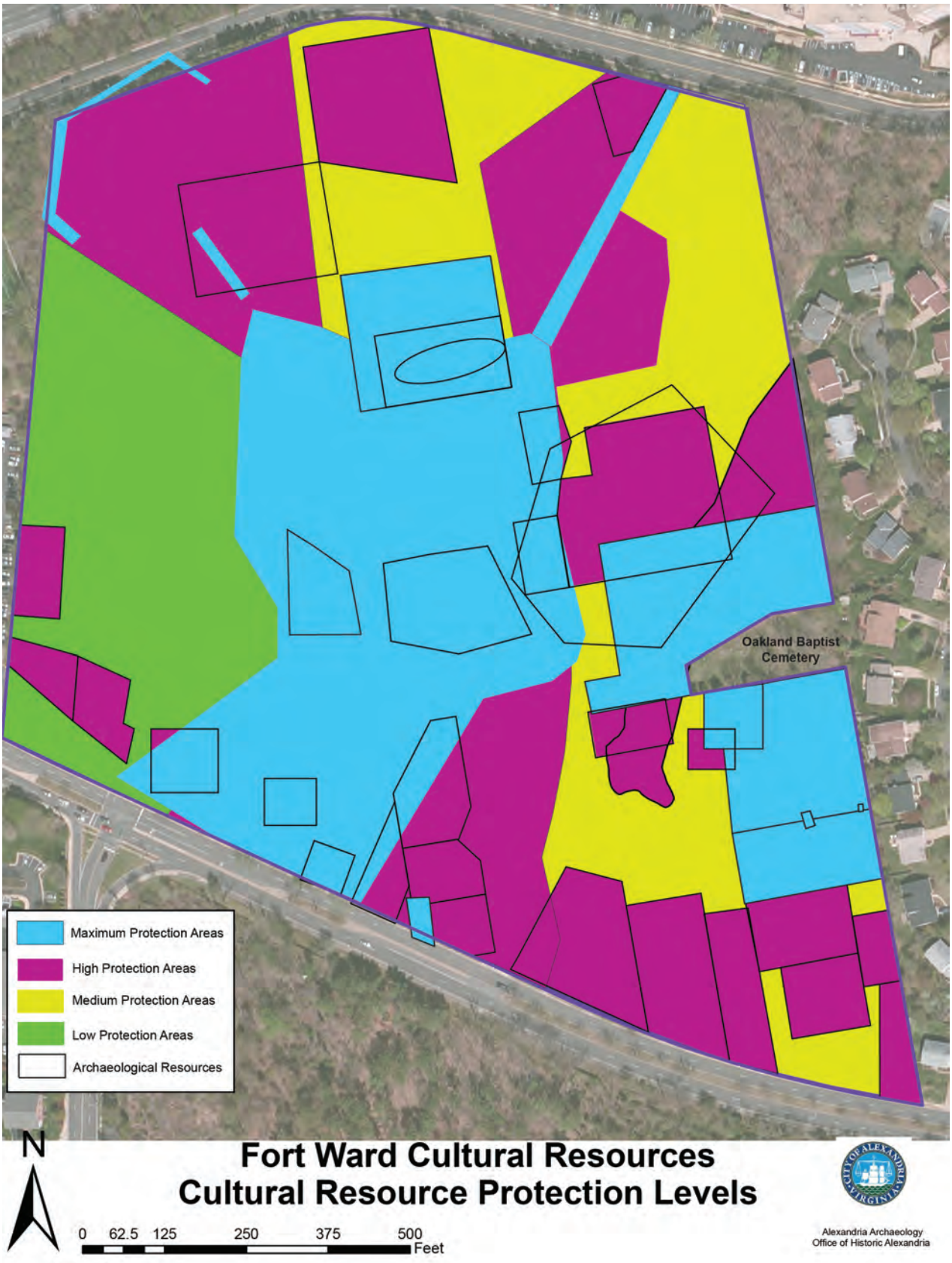
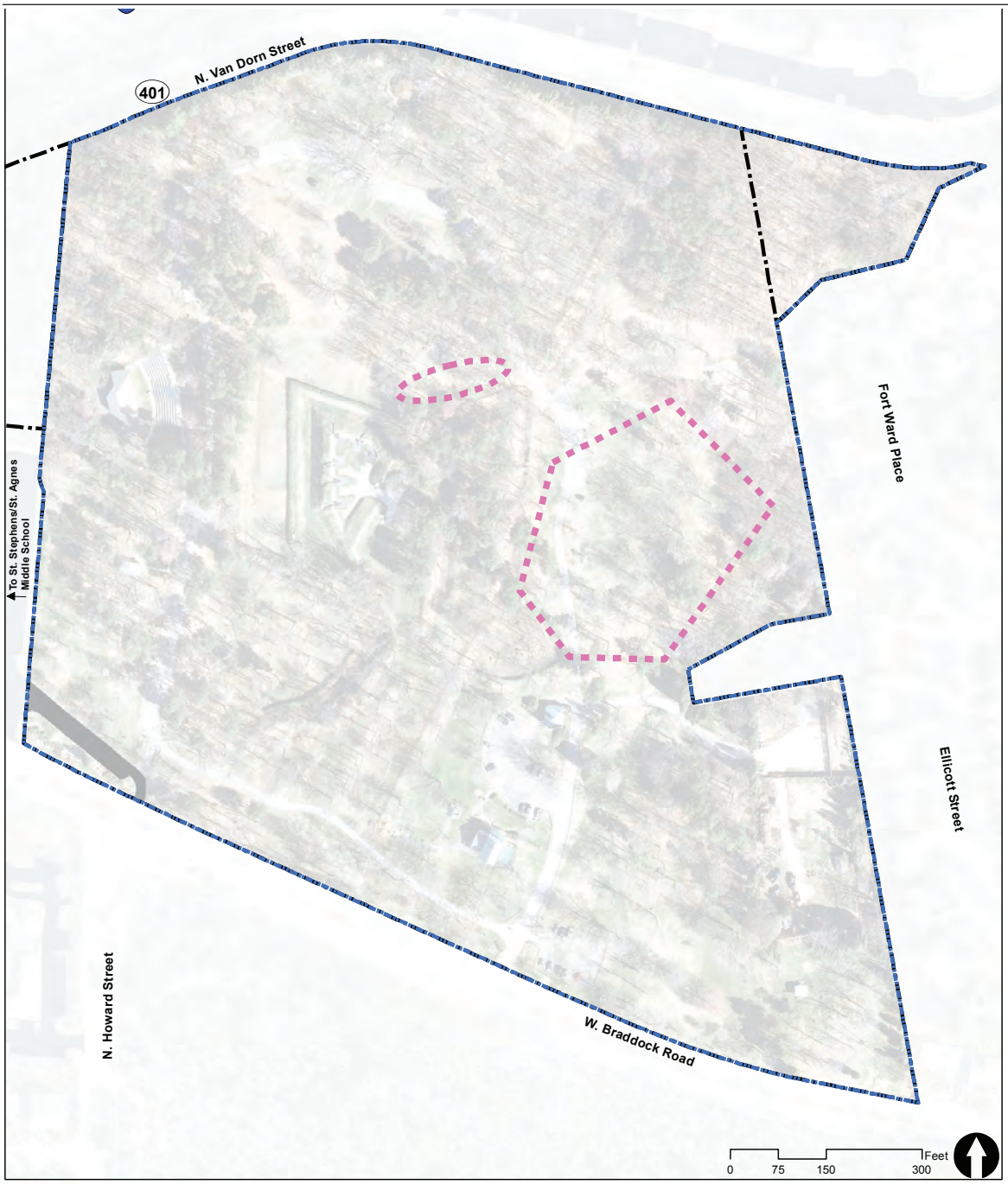


Plate 12. OHA Mapping - Fort Ward Cultural Resources - Cultural Resource Protection Levels



Fort Ward Park and Museum Area Management Plan

City of Alexandria, Virginia

Native American Resource Areas

Management Plan Boundary

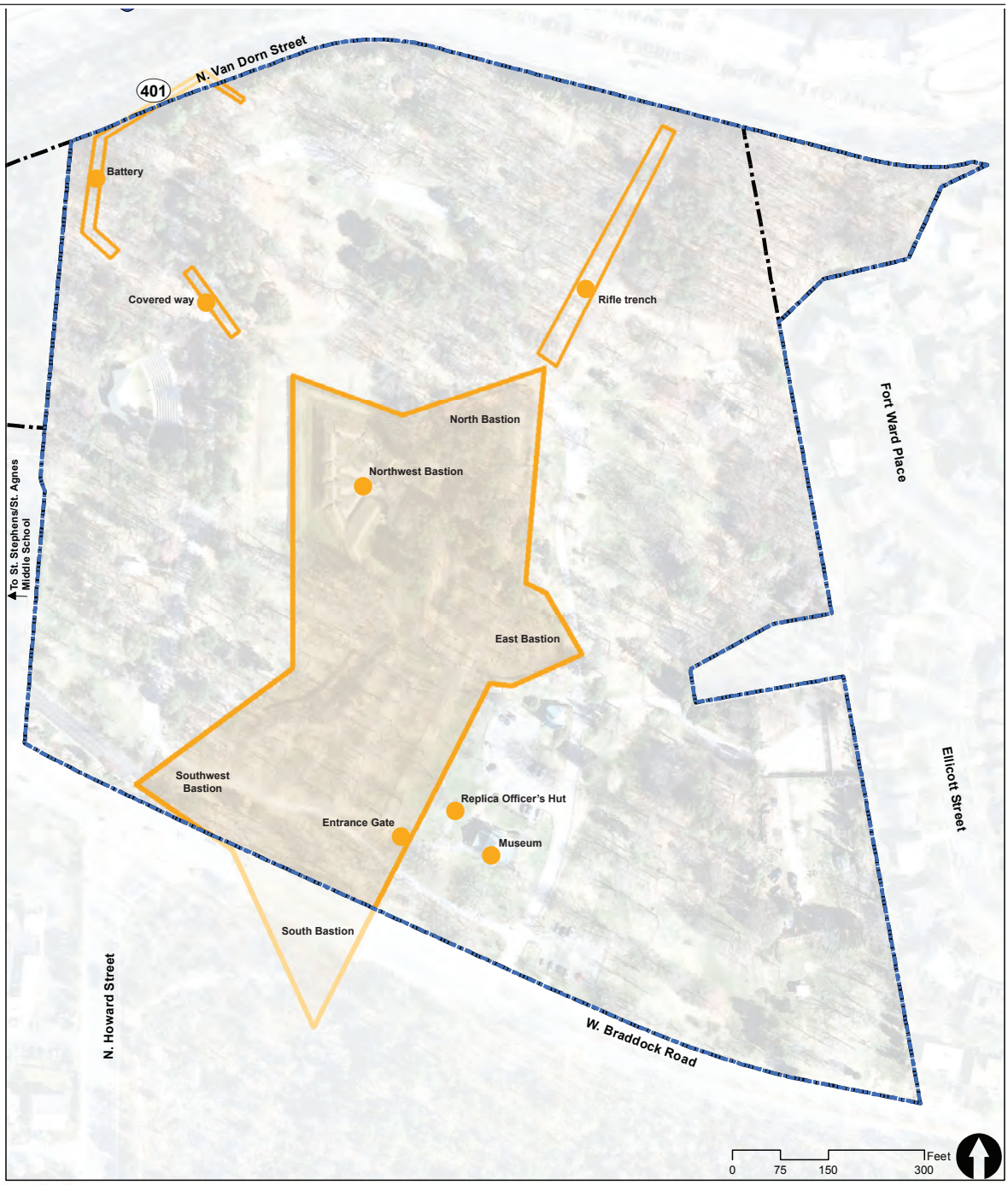
Park Parcel

Native American Resource Area

Lardner/Klein Landscape Architects, PC
in association with
Heritage Strategies, Inc., John Milner Associates, Inc. and Barbara Franco

GIS Sources: City of Alexandria

Plate 13. Native American Resource Areas (drawn from OHA data)



Fort Ward Park and Museum Area Management Plan

City of Alexandria, Virginia

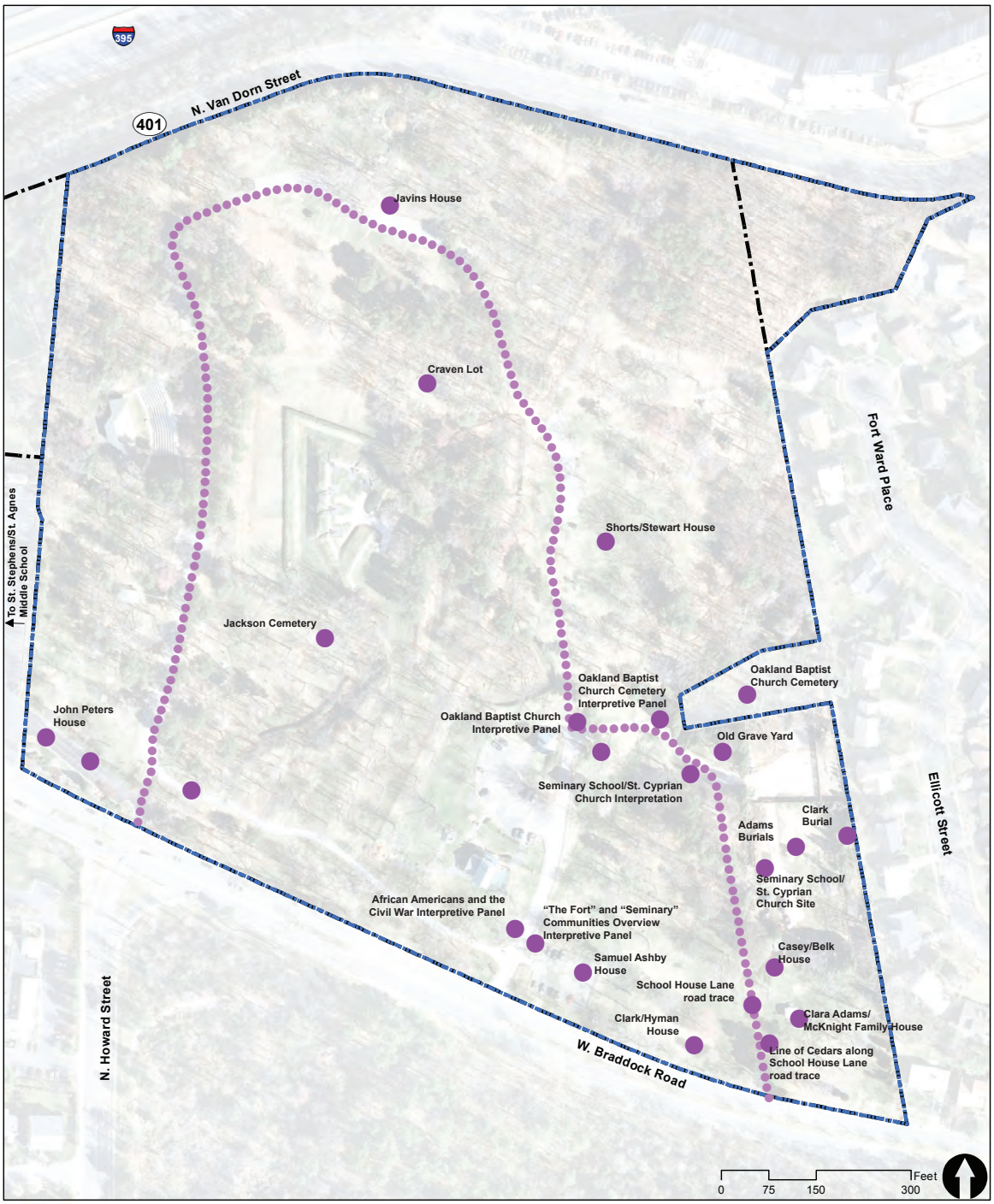
Civil War Features

- Management Plan Boundary
- Park Parcel
- Civil WarFeatures
- Fort earthworks and interior features
- Exterior Fort earthworks

LKLA Lardner/Klein Landscape Architects, PC
in association with
Heritage Strategies, Inc., John Milner Associates, Inc. and Barbara Franco

GIS Sources: City of Alexandria

Plate 14. Civil War Features (drawn from OHA data)



Fort Ward Park and Museum Area Management Plan

City of Alexandria, Virginia

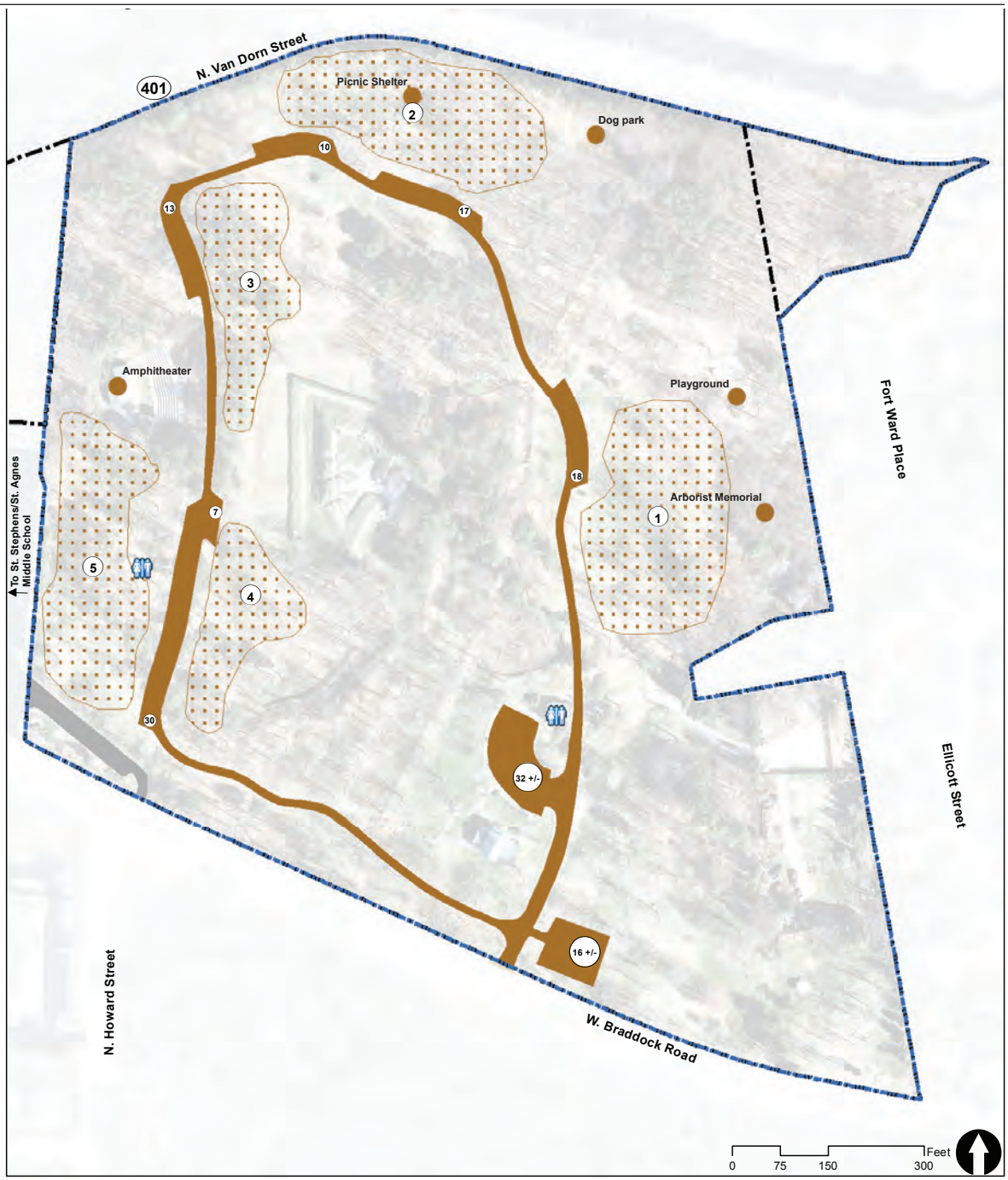
Fort Community Features

- Management Plan Boundary
- Park Parcel
- The Fort Community Features
- "The Fort" Heritage Trail

Lardner/Klein Landscape Architects, PC
in association with
Heritage Strategies, Inc., John Milner Associates, Inc. and Barbara Franco

GIS Sources: City of Alexandria

Plate 15. "The Fort" Community Features (drawn from OHA data)



Fort Ward Park and Museum Area Management Plan

Recreational Features

City of Alexandria, Virginia

- Management Plan Boundary
- Park Parcel
- Park Road or Parking
- Number of parking spaces
- Recreational Feature
- Picnic Area
- Restroom

L/KLA Lardner/Klein Landscape Architects, PC
in association with
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GIS Sources: City of Alexandria

Plate 16. Recreational Features

Fort Ward Park and Museum Area Management Plan

Natural Features

City of Alexandria, Virginia

- Management Plan Boundary
- Park Parcel
- Drainage flowlines
- Contour 2'

Tree Inventory

- Tree or Azalea bed (LKLA inventory 6/2013)*
- Tree (Archeology-City of Alexandria)

- Woodland Glade (mowed annually in fall)**
- Meadows (mowed annually in fall)**

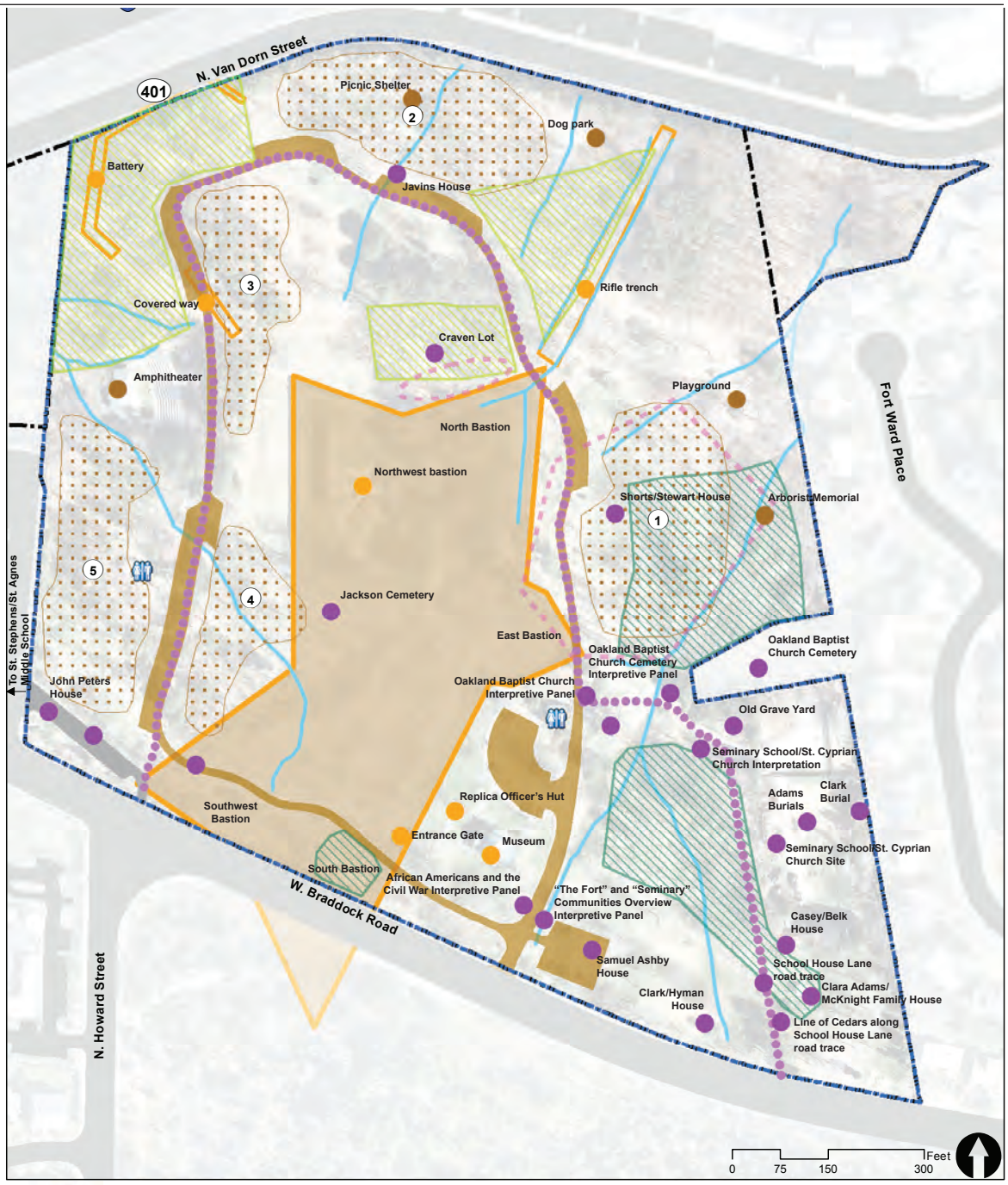
*Points indicate the general locations (hand-held GPS) of trees and azalea beds.
**Woodland glade and meadows polygons are in draft form--an update is forthcoming. Only one meadow remains as of 2013.

LKLA Lardner/Klein Landscape Architects, PC
in association with
Heritage Strategies, Inc., John Milner Associates, Inc. and Barbara Franco

NOTE: City of Alexandria Arboretum Map Brochure is overlaid on aerial photo for reference.

GIS Sources: City of Alexandria

Plate 17. Natural Features



Fort Ward Park and Museum Area Management Plan

Composite of Features

City of Alexandria, Virginia

- Management Plan Boundary
- Park Parcel
- Park Road or Parking
- Drainage flowlines

Tree Inventory

- Tree or Azalea bed (LKLA inventory 6/2013)*
- Tree (Archeology-City of Alexandria)
- Woodland Glade (mowed annually in fall)**
- Meadows (mowed annually in fall)**

- The Fort Community Features
- "The Fort" Heritage Trail
- Civil War Features
- Fort earthworks and interior features
- Exterior Fort earthworks
- Native American Resource
- Recreational Feature
- Picnic Area
- Restroom

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*Points indicate the general locations (hand-held GPS) of trees and azalea beds.

**Woodland glade and meadows polygons are in draft form--an update is forthcoming.

GIS Sources: City of Alexandria

Plate 18. Composite of Features

Fort Ward Park and Museum Area Management Plan

City of Alexandria, Virginia

MOU Boundaries

Management Plan Boundary
MOU Boundary OHA responsibility*
Park Parcel
Contour 2'
Potential Soft Path

*NOTE: All other areas RPCA responsibility

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in association with
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GIS Sources: City of Alexandria

Plate 19. MOU Boundaries - Proposed for 2015

Fort Ward Park and Museum Area Management Plan

City of Alexandria, Virginia

Management Zones Land Cover Definition

- Management Plan Boundary
- Park Parcel
- Contour 2'
- Potential Soft Path
- Woodlands
- Meadows
- Irrigated turf
- Turf not irrigated
- Arborist's Memorial

LKLA Lardner/Klein Landscape Architects, PC
in association with
Heritage Strategies, Inc., John Milner Associates, Inc. and Barbara Franco

GIS Sources: City of Alexandria

Plate 20. Management Zones Land Cover Definition

Fort Ward Park and Museum Area Management Plan

Aeration

City of Alexandria, Virginia

- Management Plan Boundary
- Park Parcel
- Contour 2'
- No Aeration Area*

*NOTE: "No Aeration Areas" were identified in a sketch by Fran Bromberg 01/10/14 via email. No Aeration Areas at the battery would have to be surveyed for a more accurate location. Aeration is not allowed on the elevated areas of the fort, rifle trench, battery, nor the old grave yard, Adams burial area or Clark burial area.

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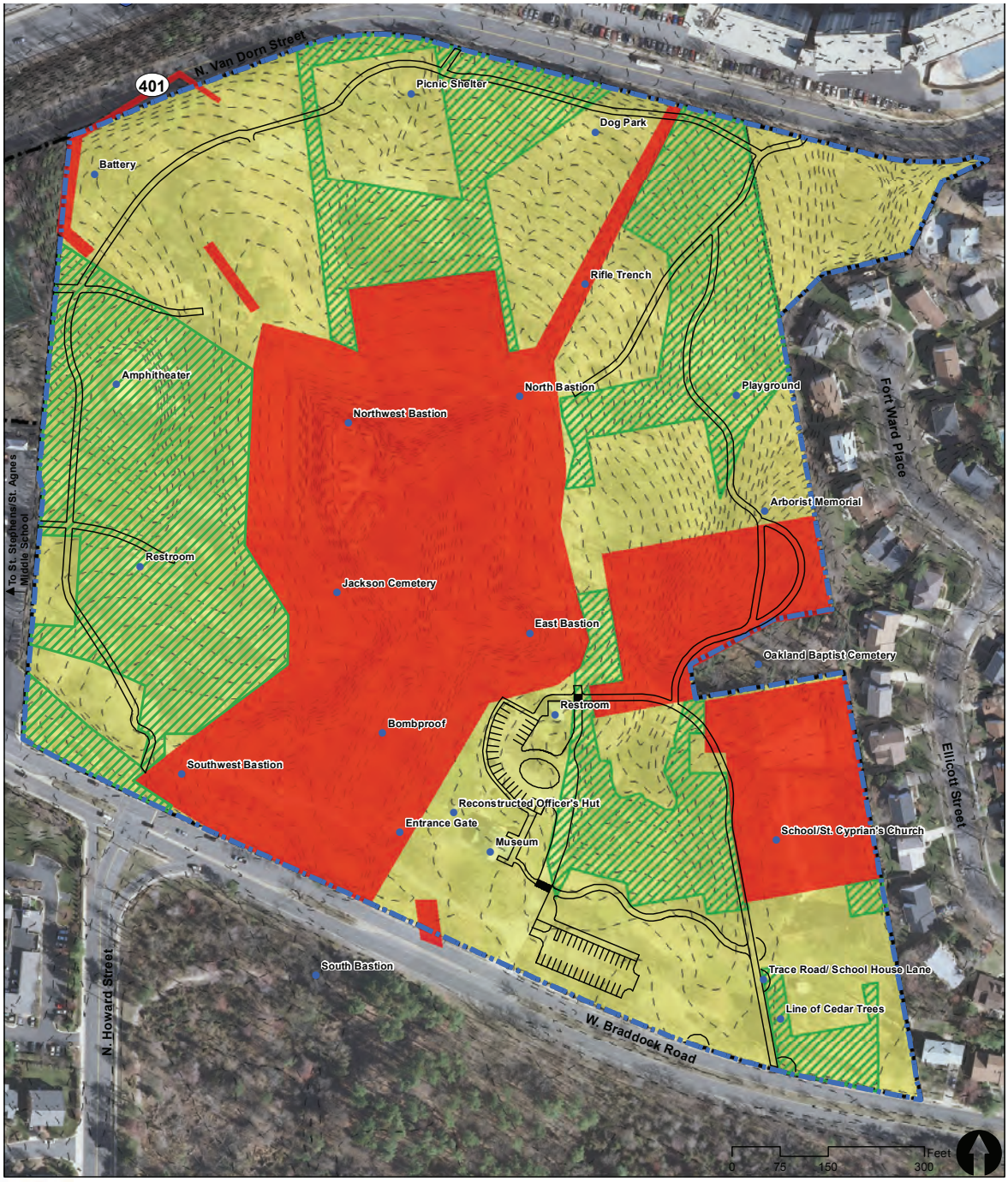
GIS Sources: City of Alexandria

Plate 21. Aeration



Fort Ward Park and Museum Area Management Plan

City of Alexandria, Virginia

Ground Disturbing Activities

*Minimal Ground Disturbing Activities source: Draft Summary - Archaeological Investigations Fort Ward Park spreadsheet, Fran Bromberg, Jan. 2013.

General Note: Areas denoted as "Minimal Ground Disturbing Activities" may contain impervious surfaces such as concrete or asphalt.

- Management Plan Boundary
- Park Parcel
- Potential Soft Path
- Minimal Ground Disturbing Activities (such as aeration, stump grinding, tree planting, and soft path construction)*
- No Ground Disturbing Activities Allowed without further review by OHA
- No Ground Disturbing Activities Allowed except for placement of formal interpretive elements with archaeological review and investigation by OHA

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GIS Sources: City of Alexandria

Plate 22. Ground Disturbing Activities

Fort Ward Park and Museum Area Management Plan

City of Alexandria, Virginia

Leaf Litter Disposal Managment Areas

- Management Plan Boundary
- Park Parcel
- Contour 2'
- Potential Soft Path
- Area 1 - Leaf litter to remain in place
- Area 2 - Leaf litter to be vacuumed except for final fall and then mulch mowed
- Area 3 - Leaf litter to be mowed, mulched and left in place

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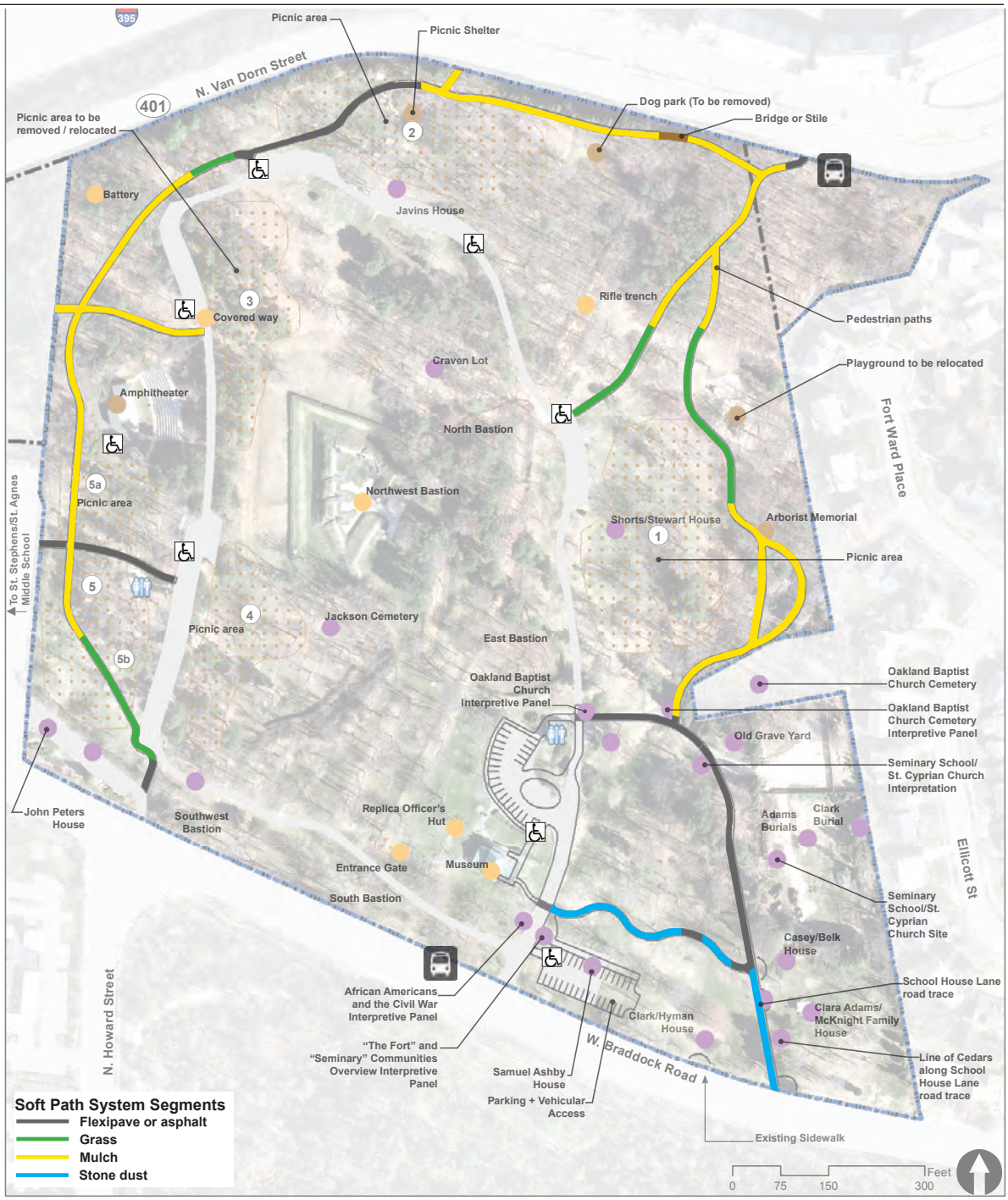
GIS Sources: City of Alexandria

Plate 23. Leaf Litter Disposal Management Areas



Fort Ward Park and Museum Area Management Plan

Soft Path System

City of Alexandria, Virginia

- Management Plan Boundary
- Park Parcel
- Park Road or Parking
- The Fort Community Features
- Civil War Features
- Recreational Feature
- Picnic Area
- Restroom

Lardner/Klein Landscape Architects, PC
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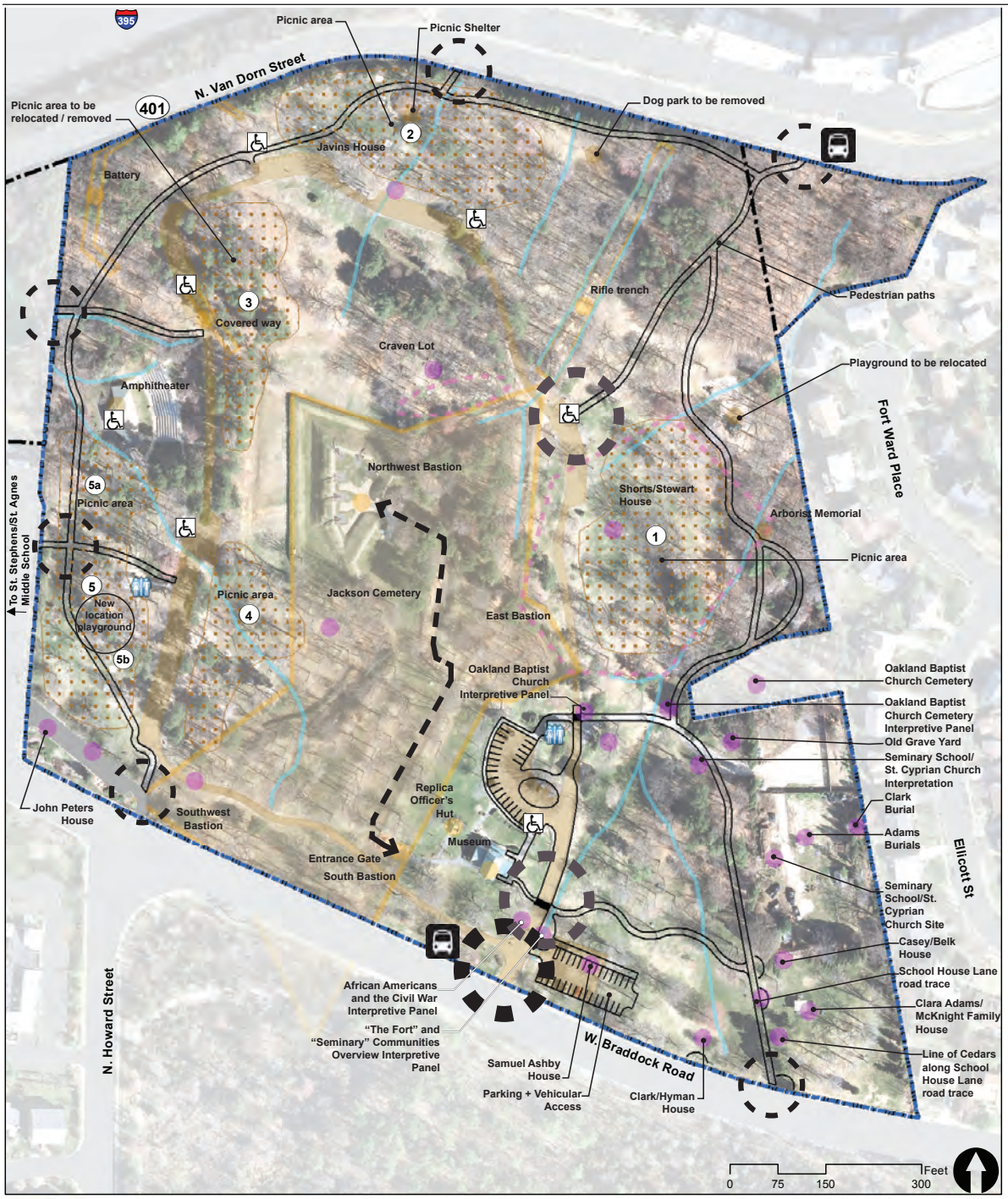
GIS Sources: City of Alexandria

Plate 24. Soft Path System



Fort Ward Park and Museum Area Management Plan

City of Alexandria, Virginia

Potential Soft Path System and Enhancement Opportunities

- Management Plan Boundary
- Park Parcel
- Park Road or Parking
- Drainage flowlines
- Native American Resource
- The Fort Community Features
- Civil War Features
- Fort earthworks and interior features
- Exterior Fort earthworks
- Recreational Feature
- Picnic Area
- Restroom
- Potential Soft Path System
- Potential park access point
- Entrance / orientation
- Planned ADA path
- Potential ADA parking

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GIS Sources: City of Alexandria

Plate 25. Potential Soft Path System and Enhancement Opportunities

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Fort Ward Park and Museum Area Management Plan

SECTION II

9. LANDSCAPE MANAGEMENT OF EARTHWORKS AND OTHER CIVIL WAR RESOURCES

The City of Alexandria, Virginia

October 2014

FINAL DRAFT

Table of Contents

Landscape Management of Earthworks and Other Civil War Resources

Introduction


Model of Fort Ward located in the museum

Fort Ward Museum & Historic Site offers visitors a unique opportunity to experience the best preserved example of the Union fort and battery system built to protect Washington, D.C., during the American Civil War (1861-1865). Fort Ward Park features **Fort Ward Museum**, a carefully assembled collection of historic maps, photographs, and artifacts that explain the military importance of the fort, and other aspects of the site's history, as well as **authentic military fortifications—**physical, tangible evidence of the Civil War that has survived for more than 150 years. A portion of the historic fortifications—the **Northwest Bastion**—has been faithfully reconstructed by the city of Alexandria to exhibit several ephemeral features—headlog revetments, artillery emplacements, powder magazines, and bombproofs—that have not survived elsewhere. The fort itself affords a unique opportunity for visitors to understand Civil War-era military engineering, particularly as part of a larger system encircling the Union capital.

While the fort is accessible to visitors whenever the park is open to engage in self-guided tours, park staff also regularly arrange for educational and interpretive programs, tours, lecture and video series, bus tours, and living history activities that include visits to the fort. Through these programs, visitors experience first-hand the everyday life of Civil War soldiers and Alexandria citizens, the city's role as a vital Union Army crossroads, life within the defenses of Washington, and the strategic importance of the fort.


View of the interior of Fort Ward and the reconstructed gate

The various features that comprise Fort Ward and are the focus of resource management and

interpretation include the original surviving elements of Fort Ward, the reconstructed Northwest Bastion, a rifle trench, covered way, and forward battery. Irreplaceable resources with a direct connection to America's Civil War, the original fort features are composed of fragile mounds of soil called parapets and excavated troughs referred to as ditches. Civil War earthen fortifications are extremely fragile due to their susceptibility to erosion. To protect against the erosion, which can be caused by a number of factors such as rain, wind, and animal burrowing, earthworks must be carefully and comprehensively protected under a land cover material, such as grass, mulch, or leaf litter. Protection against erosion is also an important consideration for archeological resources and artifacts associated with the earthworks.

Interior of Fort Ward and the bombproof

The Fort Ward Park Resource Management Plan addresses the protection of a wide range of resource types within the park, including earthworks. This appendix provides additional detailed information relating to earthworks management. This information is based on specific objectives, including 1) their preservation, and 2) protection against damage and erosion, 3) the sustainable management of the land cover designed to protect the soil from erosion, 4) interpretation that conveys the need for stewardship, and 5) the establishment of a program of regular evaluation and monitoring that can be used to make adaptive management decisions.

Ultimately, the resource management strategies implemented for the Fort Ward earthworks should address:

- aboveground and belowground evidence of Civil War activities, taking into consideration resource protection, best management and maintenance practices, control of visitor access, and interpretation;
- the relationship between the earthworks and the Fort community, and related issues of resource management and interpretation;
- the provision of an engaging and informative visitor experience that also instills a sense of stewardship for the resources;

- the relationship between the earthworks and the park's natural resources, and maintenance and management approaches that respect this relationship;
- management and maintenance within the context of overall park operations;
- current and potential future partnerships and linkages with related sites.

Earthworks management strategies should also meet the vision, goals, and objectives for earthworks and Civil War resources at Fort Ward as discussed below.

Management Vision

The vision of the Park in managing earthworks and Civil War resources is as follows:

- Fort Ward Park will continue to protect and preserve, for the edification and enjoyment of future generations, the original, authentic Civil War earthworks, as well as the reconstructed Northwest Bastion;
- Park and city personnel will strive to establish and implement maintenance and management protocols for earthworks protection and preservation that are consistent with federal historic preservation standards and an ethic of stewardship, while also taking into consideration both financial and environmental sustainability;
- Visitors will be afforded a rich and engaging interpretive program that enhances appreciation for and understanding of the earthworks and their role in the military events of the Civil War and the protection of Washington, D.C. from Confederate attack between 1861 and 1865, without contributing to resource deterioration.

Management Goals

The goals of the Park in managing earthworks and Civil War resources include:

- Appropriate maintenance and repair of the impacts of visitation and natural degradation on the historic earthworks resources;
- Enhancement of the visitor experience by increasing the interpretive opportunities associated with the earthworks;
- A clear distinction made between the original and reconstructed earthworks for visitors; and

- Establishment of management and maintenance protocols that support environmental and financial sustainability.

Two of these goals suggest an inherent conflict that requires special consideration. These include the goals of making the earthworks more understandable to the public, while protecting the resources from the visitor. At Fort Ward, the Resource Management Plan affords guidance in how to strike a balance between resource protection and enhancing the visitor experience. For the plan to succeed, it will be important for the park to restrict visitor access to the most fragile portions of the resources, while also minimizing all other access, including that related to maintenance and repair. To compensate for a lack of access, the Park should provide enhanced interpretive opportunities and address the natural inclination for visitors to climb atop the parapet to achieve the view by offering alternative view options. Specialized maintenance practices are recommended to limit Park personnel access to the earthworks.

Management Objectives

The Park has already identified several management objectives for addressing protection of the Civil War earthen fortifications as outlined below. These are consistent with the approach recommended as part of this study:

- Ensuring that strategies are consistent with the guidance afforded in the Secretary of the Interior's Standards for the Treatment of Historic Properties;
- Balancing the management of natural, cultural, and recreational resources, and defining the actions required to mitigate any adverse effects;
- Identifying best management and sustainable practice strategies that will coordinate site use, site protection, and changes at the site over time;
- Providing a framework for monitoring, preserving, protecting, and maintaining resources at the Park, including earthworks, archeological resources, interments, natural features, and the landscape as a whole;
- Identifying coordinated park enhancement opportunities, including possible upgrades related to historical education and interpretation, the recognition and demarcation of graves/cemeteries, Park facilities, museum additions and improvements, recreation infrastructure, public accessibility, and plantings;
- Identifying what areas are important to preserve, maintain, and enhance;

- Establishing park management activities that avoid impacts to known and unknown resources;
- Establishing park management policies in relation to:
    - tree and shrub planting
    - construction or reconstruction of pathways and trails, and bridges
    - stormwater management
    - meadow management
    - picnic area pads or modified surfaces to accommodate group activities
    - installation of elements with posts and footings such as signs and kiosks
- Enhancing recognition of the park and its importance;
- Enhancing maintenance to improve the appearance of the park;
- Considering re-establishing an arboretum approach to vegetation management, replacing missing specimens, and taking better care of those that survive;
- Establishing Fort Ward as the primary location for telling the broader story of the Circle Fort system;
- Continuing to offer living history programs.

Management Process

Although individual approaches to earthworks management vary depending on site-specific conditions and management capabilities, there are four fundamental components of any earthworks management program:

1. Understanding historic landscape conditions through research, documentation, and archeological investigation;

2. Understanding contemporary landscape conditions through inventory, mapping, documentation, and assessment;

3. Establishing a management strategy that sets forth goals, issues, concerns, and a desired outcome, as well as a prioritized process for achieving the vision; and

4. Evaluating the success of the resource management process implemented through review, monitoring, and revision as needed based on the evaluation.[1]

Although many of these efforts have already been addressed to some degree, for example, documentation of the historic origin, location, and use of the earthworks has already been completed, park mapping and documentation will need to be updated as elements of the Resource Management Plan are implemented, such as when new trails are added or erosion is repaired, and to record monitoring information.

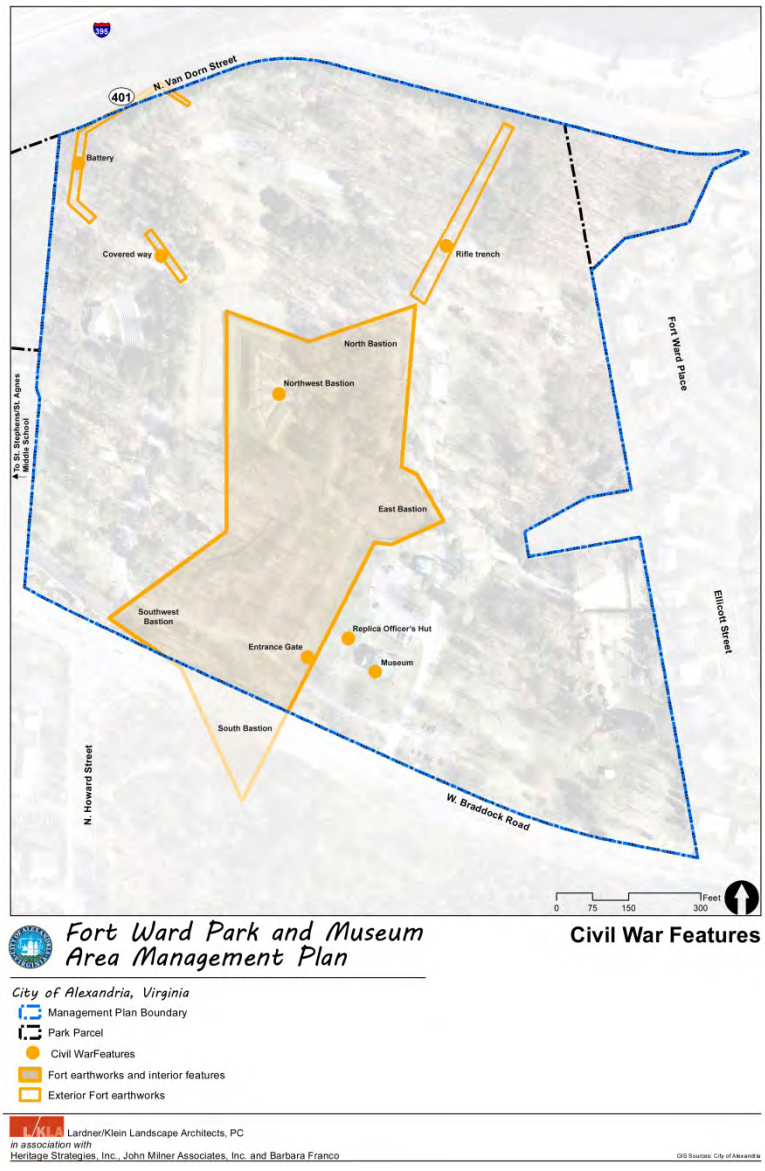


Diagram of Civil War earthworks and resources at Fort Ward Park.

[1] National Park Service, "Implementation + Management; Techniques for Sustainable Earthworks Management" in *05 Currents; Sustainable Earthworks Management,* online at http://www.nps.gov/hps/hli/currents/earthworks/imp_manage.htm (accessed February 1, 2010).

Fort Ward Resource Management Plan

The Earthworks Management Plan is comprised of four parts. The first outlines protocols for earthworks management and integrally-related issues involving visitor access and interpretation. The second discusses several considerations associated with managing earthworks: erosion control and vegetation management and maintenance. The third part is comprised of specific recommendations for action to be conducted by the park, while keeping the protocols and considerations in mind. The fourth and final part features best practices to be used when implementing the recommendations.

Earthworks Management. Protocols for earthworks management include:

- First and foremost, do no harm. Minimize any action that results in the exposure of the earthwork soil to erosion. Plan to minimize or mitigate any impacts of proposed change, and be prepared to address unintended results.
- Implement proposed changes on a trial basis, and monitor the results before undertaking a new strategy over a large area.
- Avoid making substantive changes or instituting new management programs that cannot be completed or are not sustainable in the long term.
- Ensure that a comprehensive grass, grass and forb, or leaf litter exists over the entirety of the earthworks to protect against erosion. The cover type may vary over the extent of the earthworks depending on several factors, such as existing vegetation, and maintenance capabilities.
- Identify the desirable cover type for each area of the earthworks on a map.
- Establish or maintain healthy grass stands in the environs of earthworks to be managed under herbaceous cover. Consider replacing non-native species with native species over time.
- Remove invasive plants and hazard trees, and woody growth from the earthworks within areas managed under grass cover.
- Establish or maintain healthy native woodland cover around the earthworks managed under trees, and use the allow leaf litter produced to protect the earthworks from erosion.
- Immediately repair eroded areas.

- Protect the resources from the destructive actions of animals.
- Address any drainage problems associated with the ditch system of the earthworks, such as ponding water that might result in the decline of the grass cover.
- Limit human access to the earthen parapet and ditch by park visitors as well as maintenance personnel.
- Relocate or consider carefully the design of any trail sections that cross the earthwork parapet or ditch systems to limit potential damage to the earthen resource.
- Relocate signs and structures to support visitor access and interpretation that have been set into the parapet or ditch. These structures can cause damage to the earthworks.
- Establish a monitoring program for the earthworks that will facilitate the identification of problems requiring immediate attention on the park of the park to correct, such as evidence of dead or dying vegetation, animal burrowing, visitor access, unwanted woody or invasive plant growth, and fallen trees.

Visitor Access. Protocols for visitor access associated with the earthworks trails are to:

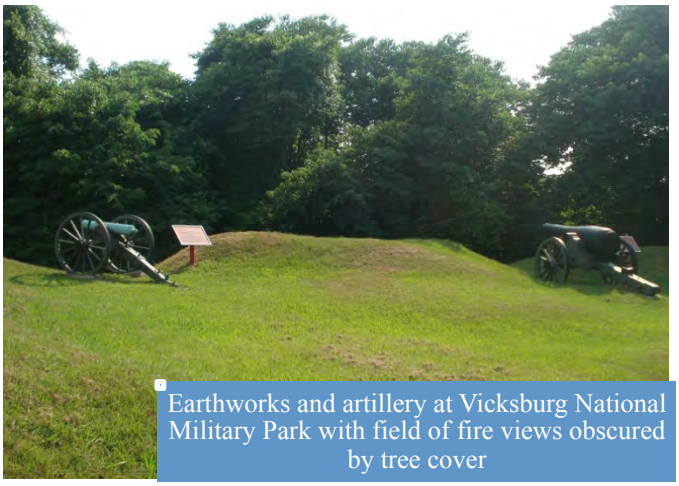
- Provide a designated pedestrian path system that allows visitors to experience and understand the earthworks without damaging the resources.
- Limit human access to the earthen parapet and ditch, including visitors as well as park maintenance personnel.
- Post signs along trails that come into close contact with the earthworks urging visitors to be good stewards of the fragile resources and refrain from climbing or walking on them.
- Establish physical barriers at the margins of parapet and ditch features where visitors are found to be walking and climbing on the earthworks.
- Remove potentially hazardous trees that could potentially injure visitors.

Interpretation. Protocols for interpretation associated with the earthworks trails are to:

- Provide a rich and engaging interpretive experience that explains the role of the earthworks in the events of the Civil War as part of the system known as the Defenses of Washington, D.C., the

military engineering and design principles associated with the earthworks, and their history as an occupied fortification, and partial reconstruction and incorporation into a park by the city of Alexandria.

- Connect visitors with the site and engage their sense of stewardship of the earthworks. Link the design of the system to the terrain and features of the landscape. Interpret the interconnectedness between the site's historical and natural resources, their geographic and historic context, the role of historic preservation in protecting the earthworks from loss, the role of archeology in understanding the site's history, including development of the Fort community.
- Apply a uniform approach to interpretation throughout the park that establishes a recognizable brand or identity for the site. Consider using a range of interpretive media, including exhibits, waysides, directed viewsheds, and technologically-creative programming.



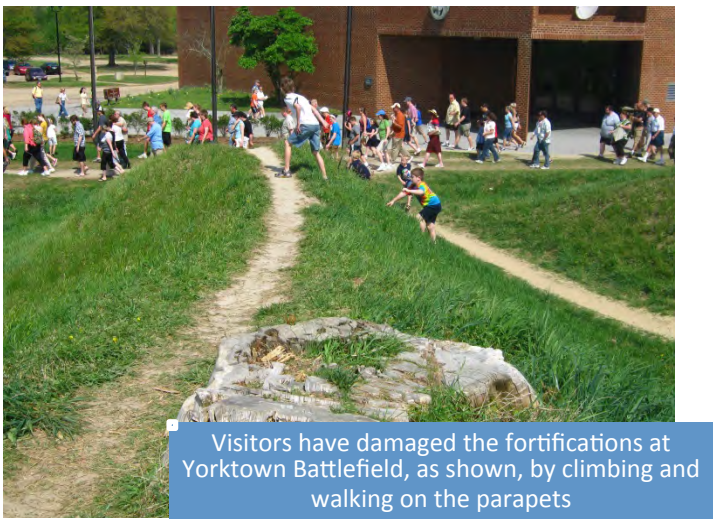
Earthworks and artillery at Vicksburg National Military Park with field of fire views obscured by tree cover

- Remove specific stands of woody vegetation that limit viewsheds that are important to interpreting key relationships in the landscape, such as the intended field of fire for fort artillery.

Resource Management Considerations

Erosion Control

Protecting the earthworks from erosion while interpreting them for visitors requires a delicate balance between affording visual access and restricting physical access. Earthworks are highly susceptible to erosion unless carefully protected against stormwater, visitor access, the installation of signs and structures, and damage by tree fall and animal burrowing. Erosion occurs when



Visitors have damaged the fortifications at Yorktown Battlefield, as shown, by climbing and walking on the parapets

the soil that comprises the parapet structure is exposed to wind, precipitation, and the overland flow of stormwater. Any current evidence of erosion needs to be quickly corrected, and associated causes mitigated to limit future erosion using a combination of monitoring and rapid response. Visitor access to the fragile earthworks leads decline of turf grass and the potential for erosion. Evidence of visitor access must be addressed through the use of inc*r*eased signage, additional barriers, or personal advisement and policing of the earthworks by park personnel and volunteers.

Vegetation Management and Maintenance

The Fort Ward earthworks are protected by combinations of **woodland** and **grass** cover, and plantings of thorny **barberry hedges**. Each of these conditions requires its own maintenance and management strategy to ensure protection of the earthworks.

Woodland trees generally offer the best protection of earthworks from erosion by dropping a layer of leaf litter or duff that creates a barrier to erosive activity. Grass is also a successful barrier, but requires regular mowing and other periodic maintenance. Soil erodes more quickly under grass cover than it does under forest cover. Maintenance of grass through mowing also has the potential to damage the earthworks. Methods of mowing that protect the earthworks from damage should be identified and used regularly by well-trained personnel.

Earthworks at Kennesaw Mountain National Battlefield Park protected under woodland duff

Woodlands, however, also require maintenance in the form of monitoring, removal of dead limbs and trunks, hazards, and likely hazards. On an individual basis, the trees that compose a woodland and provide leaf litter that can protect the earthworks from the destructive power of stormwater are also living entities that will eventually succumb to age, disease, or insect infestation, and their demise has the potential to damage the earthen structures by falling on or across them, or by dislodging historic fabric through root upheaval. Falling trees also present a danger to the visitor and to interpretative features and site amenities. Managing the woodland in the vicinity of the earthworks thus involves protection of historic resources and minimization of risks to the visitor.

Taking an ecological approach to vegetation management, with earthworks preservation as the goal, will afford the highest degree of protection with the smallest input of financial and personnel resources.

Vegetation management strategies must also take aesthetics into consideration. Vegetation has the potential to enhance or detract from interpretation, and to affect the visitor's impression of the park. The maintenance and management of vegetation has the potential to enhance or block views, and to elicit a sense of mystery, surprise, awe, and beauty. These qualities may be encouraged through simple maintenance practices such as the removal of downed dead trees visible near the trail, selective limbing up of trees for directed views, and thinning of shrubs. While it may be desirable to remove vegetation in specific locations where interpretation is a focus, the park should avoid establishing an overly manicured or controlled appearance, which may send the wrong message to visitors about the accessibility of the earthworks.

Hazard Trees

The large deciduous trees that are growing on and around the earthworks pose a threat of windthrow, branch drop, and other structural failure that can cause damage to the earthworks. Regardless of their condition, all trees have the potential to fail as a result of the many unpredictable variables such as weather, climate, and pests. Unsafe, hazardous, and other undesirable trees need to be carefully removed from the site without causing harm to the earthworks.

Careful tree maintenance directed by an arborist is an important part of managing earthworks under woodland cover

Hazard trees pose a risk of damage to historic resources and other park property and injury to visitors through the potential for all or portions of a tree to fall or fail. Although any tree or portion of a tree may present some degree of risk or hazard to people or property at any time, hazard trees are those that are determined to possess a significant flaw or structural defect that greatly increases the potential for failure.[2] Conditions that contribute to a hazard tree designation include decay, cavities, dead limbs or overhangs, splits and shakes, weak crotches, heavy horizontal limbs, basal or crown rot, root decay, termite and carpenter ant infestations, wind and vehicle damage, construction damage, leaning or heaving trees, soil slippage areas, tree declines due to insect or disease, and decline due to soil compaction, root damage, or filling.[3] Of particular concern are those trees that are located within falling distance of visitor use areas or historic resources. These trees require regular inspection by qualified professionals. It is possible for a

[2] National Park Service, *NPS-77: Natural Resource Management Guideline* (Washington, D.C.: U.S. Department of the Interior, 1991), 349.
[3] Ibid., 356.

certified arborist to quantify and rate hazard potential, and prescribe and prioritize mitigation techniques and procedures. The form and frequency of inspection should be determined as part of the monitoring plan recommended herein.

Assessment of the windthrow hazard of individual trees relates to the inherent root structure of the species in combination with the soil conditions where they are growing. Larger roots contribute to tree stability. Trees subject to windthrow are those with shallow roots in rocky or wet soils, leaning trees, or trees in areas of grade change that lead to poor drainage. The position of a tree on the earthwork itself will affect the windthrow potential due to the ability of the roots to grow in various directions and anchor the tree. Seventy-five percent of tree failures are root related. Poor soil growing conditions inhibit root growth. Older trees are more susceptible to windthrow because of their height to crown relationship. Trees most likely to be susceptible to windthrow or become hazards are trees growing on the edge of the woods that are exposed to wind and storms, lone trees that are subject to lightning strikes, and trees located in high traffic areas that may suffer from the effects of soil compaction and wounding that leads to decay. Dead limbs, branch structure, an unbalanced crown, co-dominant leaders, and trunk wounds and cracks can all lead to a higher percentage of failure of part(s) of the tree, or its susceptibility to windthrow.

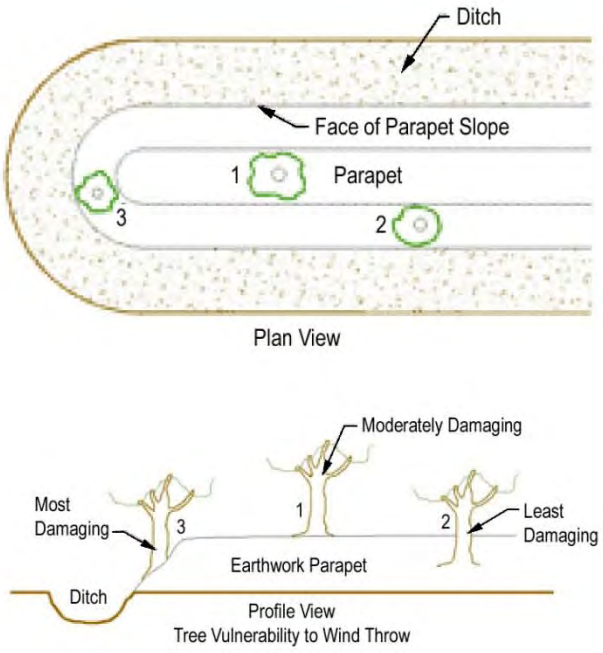


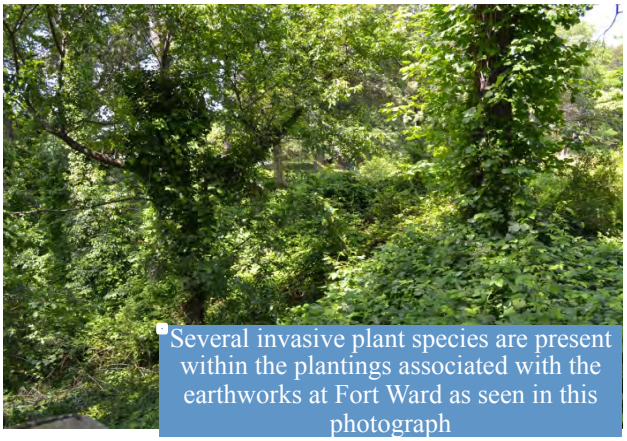
Diagram indicating the potential for trees growing on earthworks to become windthrow hazards. (Prepared by the National Park Service)

The removal of hazard trees to protect the earthworks and visitors must be carefully mitigated to avoid unanticipated consequences. Ecologists have determined that woodlands have two distinct zones—the forest interior and the forest edge—and that each supports a different association of plant species. The forest interior is denser and allows less light to reach the forest floor. Typically, the understory layer includes saplings of the overstory tree species. The understory is relatively sparse, allowing for views through the trees. These saplings act as replacement reserves that will perpetuate the forest when the current overstory trees die. Along the forest edge, and in gaps in the forest where higher light levels

penetrate to the forest floor, a completely different composition of plant species will arise. The character of this vegetation is typically shrubby, dense, and leafy. This type of growth obscures views, and will limit or interfere with the visual accessibility of earthworks. Thus, planned tree removal must be carefully considered to anticipate the resulting dense growth of shrubs and vegetation that will follow. If properly anticipated, important views of earthworks can be maintained.

Invasive Plants

Invasive plants have the potential to impact native vegetation communities. The health of the native woodland and grass cover that offer protection against erosion could potentially be threatened by invasive plant species.



Several invasive plant species are present within the plantings associated with the earthworks at Fort Ward as seen in this photograph

Invasive plants are an issue of special concern to the earthworks management because of their potential to threaten native vegetation and a healthy balanced ecosystem. Non-native or exotic vegetation falls into one of two categories: innocuous or disruptive. Innocuous species are those that do not invade native ecosystems without human-caused disturbance, whose populations tend not to expand, or which generally do not displace native species to any significant extent.[4] Maintenance and management activities should not be focused on innocuous species, but rather concentrate on the disruptive species that have the potential to significantly alter natural processes. The effects of disruptive species, which are herein referred to as invasive plants, include alteration of successional patterns, reduction of native species populations, hybridization with native species, and deterioration of historic resources through rampant growth.

The primary control mechanism for invasive species is to prevent their establishment. Invasive plant species are generally easier to eradicate when they first appear. Monitoring programs can be used to foster early detection and removal of invasive species. It should be noted, however, that one of the primary vehicles for invasive plant establishment is site disturbance through construction or grading, or the alteration of natural vegetation patterns such as woodland clearing. Because these activities may occur through necessary activities such as hazard tree removal, regular monitoring of sites undergoing disturbance to identify the presence of disruptive species is highly recommended.

[4] Ibid., 288.

Prior to any site disturbance, a list of predicted invader species should also be developed so that personnel involved in monitoring can be on the lookout for these species and implement measures to prevent their invasion. Each predicted species may require a unique monitoring and control strategy. Long-term or even permanent management commitments and consistent follow-up are essential to successful invasive plant control programs. The persistent seed banks and long-lived seeds of invasive plants often require control efforts over many years to eradicate. Initial control of invasive species, particularly woody species, may accelerate recruitment of the seed bank or additional growth. Thus missed treatment cycles can actually result in population levels greater than pre-control levels.

Herbicides are frequently included in invasive plant control programs because of the ineffectiveness or unavailability of biological control agents and the inapplicability of mechanical and cultural control methods in natural systems. Biological control agents such as beneficial insects are available for only a few invasive plant species, and the research required to locate and test potential biological control agents is beyond the individual capabilities of many parks. However, research of available literature is invaluable in developing control methods and strategies, including cultural, mechanical, biological, and pesticide control methods. Without the application of herbicides, most woody invasive plant species can re-sprout from the cut stump, root crown, or roots when cut or disturbed. As natural weedy invaders, invasive plant species will usually re-colonize sites where undesirable plants have been removed. Native plants may need to be planted or encouraged to flourish in areas where invasive species have been removed.[5]

Park maintenance personnel will also need to be familiar with the types of plant pathogens and insects likely to adversely affect the existing desirable vegetation and with mechanisms for their control and/or eradication. In addition, park personnel should be mindful of the fact that plant pathogens and insect infestations can be transmitted to local native plant populations through the introduction of new plantings. Prior to bringing them into the park, all plants intended to be planted on site need to be inspected for diseases, pests, and parasites.

Resource Management Recommendations

General Recommendations

- Update the park's National Register documentation to consider the significance of the park and reconstructed Northwest Bastion, as well as other historical associations, such as the Fort community.

[5] Ibid., 297–298.

- Complete an administrative history of Fort Ward Park.
- Identify a responsible party to oversee management, maintenance, and monitoring of the earthworks that report to museum personnel.
- Enhance interpretation of the military engineering and earthworks construction process, the relationship between military terrain and the overall design of the defense system at the fort, and the physical relationship between the earthworks and the Fort community. Integrate interpretation of all aboveground evidence of fort features within the park into a designated walking tour that is outlined at an orientation station located near the museum.
- Consider opportunities to expand interpretation to a broader audience, such as incorporating earthworks references in the design of the playground.
- Acquire an easement for the portion of the earthwork that lies south of West Braddock Road.
- Develop an overarching plan for future archeological investigations that prioritizes proposed actions, supports a broad knowledge and documentation base, and establishes the key research questions to be addressed.
- Ensure that all management procedures are conducted in conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. For Fort Ward, the overarching treatment approach for the site is **rehabilitation**. The Standards for Rehabilitation are:

    1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.
    2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.
    3. Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.
    4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.

5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.

7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.

10. New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.[6]

Earthworks Management Recommendations

- Assess the existing land cover associated with the fort, rifle trench, covered way, and forward battery for its ability to protect the earthworks from erosion. Identify any areas that are not currently protected by either grass cover or leaf litter derived from woodland cover. Determine an appropriate plan of action for immediately addressing exposed areas (see also below).

- At **Fort Ward**, the land cover includes areas maintained under grass cover as well as areas maintained under woodland cover. In both cases, the park should manage for a healthy plant community composition that is free of invasive species. For grass cover, consider replacing non-native species with natives that might include Virginia wild rye or native warm-season grasses. Native warm-season grasses offer the advantage of requiring less frequent mowing. Taller grasses

[6] http://www.nps.gov/hps/tps/standguide/rehab/rehab_standards.htm

will help deter visitors from climbing on the resource. Consider carefully the placement of paths to avoid damaging the earthwork. Encourage visitor stewardship of the earthworks through a park-wide culture of protection that includes posting signs in key locations, including the orientation station, noting the fragility of the resource and requiring that visitors refrain from leaving designated trails.

The placement of signs, such as the one shown at Kennesaw Mountain National Battlefield Park, to guide visitors away from the earthworks is recommended

- At the **covered way and outer battery**, consider establishing a short spur trail that is part of a comprehensive interpreted self-guided tour of the park's earthworks. Consider options for enhancing grass cover where light levels are sufficient; otherwise ensure a comprehensive protective layer of leaf litter or mulch atop the earthworks structures. Consider native species for the grass cover that might include Virginia wild rye or native warm-season grasses. This approach is consistent with the park's native meadow program.

- At the **rifle trench**, relocate visitor access routes away from the top of the earthen structure to a new designated trail that is part of a comprehensive interpreted self-guided tour of the park's earthworks. Apply a comprehensive layer of matted leaf litter and/or mulch to the rifle trench structure.


The rifle trench at Fort Ward. This original Civil War feature is being negatively affected by people walking over its surface.

- Engage a forester or certified arborist to regularly inspect and evaluate existing vegetation for its potential to damage Civil War era-resources, particularly trees growing on the parapet and ditch that constitute hazards. Identify and prioritize necessary hazardous and large tree and limb removals. Determine a phased removal strategy based on the inspection and evaluation. Flag trees to be removed.

- Retain and maintain existing native tree cover around the **earthworks**, with the exception of hazard trees. Retain and maintain healthy longer-lived hardwood saplings in the earthworks environs as future replacements for current woodland species. In areas where trees have been removed, retain longer-lived hardwood saplings, and remove short-lived volunteer species and species with shallow root systems that may constitute future hazard trees. Consider planting saplings of locally native canopy tree species suited to the soil and moisture conditions of the site around the margins of the earthworks to perpetuate woodland conditions. Always remove invasive species.

- Remove hazard trees and likely windthrow hazards that have the potential to damage the earthworks, recognizing that special techniques must be employed in the removal of vegetation in this area to avoid threats to the resource. Avoid disturbing the soil in the environs of the earthworks. While conducting necessary removals, retain healthy trees that are less likely to be windthrown in order to maintain light levels and duff production. Over time, consider removing all of the trees growing directly on the parapet and in the ditch, but only after a stand of healthy trees exists along the perimeter of the earthworks capable of providing the necessary sheltering qualities and leaf litter.

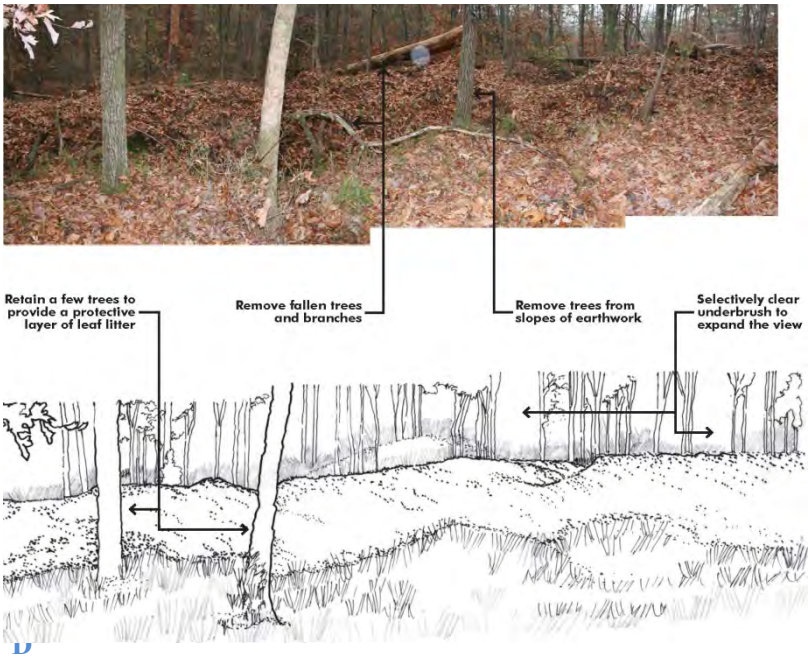
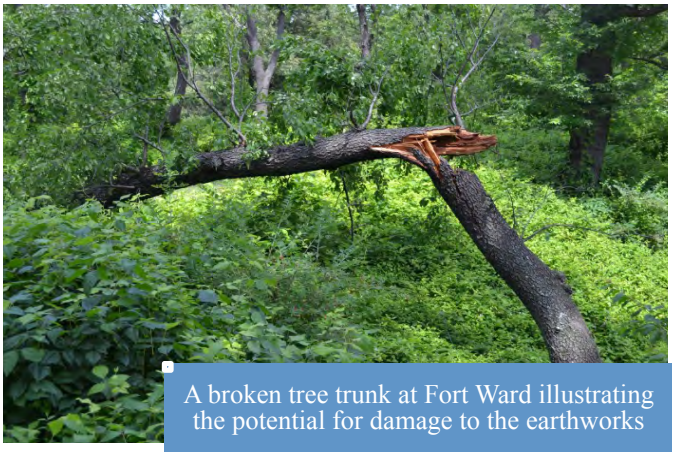


Diagram indicating the approach to woodland management recommended for the earthworks. Shown is Kennesaw Mountain National Battlefield Park.

- Clear all debris, brush, fallen trees and branches, and other plant materials not considered healthy vegetation from the earthworks without causing additional damage. Undertake vegetation removal and erosion mitigation using specialized techniques that avoid damage to the earthen resources (see also below).

- Chip or remove cleared vegetation to an approved landfill or appropriate location within the park for decomposition. Consider using chipped material derived from healthy native trees and shrubs as a mulch to protect areas of earthworks not adequately covered by leaf litter.



A broken tree trunk at Fort Ward illustrating the potential for damage to the earthworks

- Control and eradicate invasive plants from the parapet and ditch system of the earthworks that have the potential to diminish the health of the woodland or grass cover that protects the earthworks, and use invasive species control programs as an opportunity to educate the general public about the harm that invasive species cause, and the importance of preventing their introduction. Ensure that all plant material relating to invasive species is removed from the site.

- Institute a cyclical monitoring program—annually at a minimum—that includes regular inspection of the earthworks for erosion, the presence of invasive plant species, tree falls requiring removal, maintain vertical clear zones, identify evidence of visitors leaving trail corridors, animal burrows, and comprehensive leaf litter cover in areas under woodland cover. The annual inspection of trees by a certified arborist should be considered part of the monitoring program. During inspection, and subsequent monitoring activities, document instances of these problems requiring repair, including their locations on a map. Identify areas requiring rehabilitation, and replacement or establishment of grass cover or leaf litter. Evaluate and monitor the health of the woodland with the intention of planting saplings if the community is found not to be regenerating itself. Record all procedures and techniques conducted as part of the monitoring and management program on forms created for this purpose.

- Repair immediately upon its discovery erosion and structural damage to the earthworks. Establish vegetative or leaf litter cover in all areas currently undergoing soil erosion and that may erode in the future.

- Protect the resources from the destructive actions of animals. Determine the type of animal engaged in creating burrows, and identify the best method of control, considering humane methods such as relocation. Repair burrow sites, and document the repair.

- Locate signage carefully to avoid inviting visitors to access the earthworks. Signage should never be installed by digging a footer within the structure of the parapet or ditch.

Visitor Access

- Prevent visitor access to the earthen parapet and ditch, and limit access by park maintenance personnel. Establish a designated path to be followed by visitors. Use signage and stewardship information placed in key locations around the park to indicate rules and regulations that restrict access to the earthworks. Continue to use signage to direct visitors from walking on the earthworks. Install fencing or bollard and chain barriers along trails if it is determined that visitors are disregarding the signage.

- Relocate any trails, benches, and signage that are founded within the parapet or ditch system of the earthworks.

- Consider the establishment of native warm-season grasses that can be mown less frequently as a deterrent to visitor access to the earthworks.

Interpretation

- Remove and thin shrubs and understory vegetation where visual accessibility is desirable to support interpretation.

- Consider using the barberry hedges as an interpretive aid for recalling ephemeral features of the fortification system, namely the abattis that served as an outer obstacle to approaching Fort Ward.

- Consider replacing the existing barberry hedges, which are tall and narrow, with a lower, wider planting that will allow for views from the Northwest Bastion that better approximate the field of fire of the fortification during the Civil War. Interpret the firing distance of the artillery emplaced in the bastion, and consider options for expressing that distance on the ground, potentially by clearing a view corridor.

Example of a cleared viewshed to indicate an important historic military relationship. Shown is Fort Mill Ridge

- Prune and thin shrubs growing on the earthworks where visual accessibility is deemed desirable. Maintain a vertical clear zone between the interpretive trail and the earthworks to enhance visual accessibility in specific locations where it is intended to support interpretive objectives such as at waysides. The vertical clear zone should be established through removal of dead and dying vegetation, removal of fallen limbs and branches, and thinning and pruning shrubs taller than 2 feet, and removing the lower branches of the trees below 16 feet measured from the ground plane to open specific, desirable views to the earthworks from the trail.

Best Practices Relating to the Recommendations

Best practices involving establishing and maintaining grass cover, woodland management issues including tree removal, invasive plant control, and sustainability are addressed below.

Best Practices for Woodland Management and Tree Removal

- Prioritize tree removals by first identifying those trees that pose the greatest threat of windthrow or loss during a storm. Remove the trees identified as posing the highest risk, along with invasive plants, short-lived old-field invader species, species with shallow root systems, and all debris, brush, and other material not considered healthy vegetation, from the earthworks. Assess the resulting light levels and leaf litter coverage. Over time all trees, including saplings, should be removed from the earthen parapet and ditch. Healthy, existing, longer-lived hardwood saplings that do not possess shallow root systems should be removed last once the desired forest management conditions for areas providing leaf litter are met. Healthy longer-lived hardwood trees located around the earthworks should be retained and maintained, and augmented with new plantings, to protect the soil of the earthworks from erosion. In areas where trees have been

removed, allow saplings of the longer-lived hardwoods to become established around the earthworks, but continue to remove trees from the earthworks themselves.

- Avoid disturbing the soil during tree removal activities. Special care must therefore be taken in the removal process not to cause erosion. Trees should be sectioned and the cut sections lowered to the ground, taking care not to disturb existing soil and grades.

- Cut stumps flush with the surrounding grades and apply a systemic herbicide to the cut end of deciduous hardwoods to discourage resprouting. Stump grinding of trees removed from the earthworks is not recommended due to the disturbance this would cause to potential archeological resources and the stability of the earthen structures.

- Remove invasive plants such as tree-of-heaven and Japanese honeysuckle identified during monitoring programs by cutting stems flush with the ground and applying a systemic herbicide. Avoid hand-pulling or other techniques that may cause soil disturbance.

- Monitor earthworks to ensure that the earthworks remain entirely covered with leaf litter as an erosion control measure.

Best Management Practices for New Grass Cover Establishment

- Retain and maintain existing grades, except where drainage or soil erosion problems have been identified. In particular, avoid modifying existing topography that may reflect evidence of military activities. Also avoid removing soil in the environs of the earthworks.

- Establish criteria for the desired character and composition of new grass cover. Consider the following:

    - Species must be able to be maintained at a height of between three and fifteen feet above the ground.

    - Species must be suited to local soil types, the planting zone, and rainfall conditions (soil testing should precede species selection).

    - Species should be drought tolerant.

  - Species must provide above ground cover and/or a root system that protects against soil erosion characteristics particular to the local soil.
  - If the species provides long-term soil erosion protection but no short-term protection, there must be a viable annual or interim landcover option for the establishment period.
  - The long-term cover species must be perennial or self-perpetuating, although temporary cover species may be annual.
  - Preference will be given to a species that is relatively easy to establish.
  - Preference will be given to species that promote diversity and offer benefits to wildlife.
  - Preference will be given to a species that has less onerous maintenance requirements than fescue, specifically as regards mowing frequency.
  - Preference will be given to native species over non-native species.
  - Invasive species will not be used.

- Re-vegetate all disturbed soil in a manner that optimizes plant establishment for that specific site, unless ongoing disturbance at the site will prevent establishment of invasive species. Re-vegetation may include plug planting, seeding or hydroseeding, fertilization, and mulching.
- Monitor and evaluate the success of revegetation.
- When re-vegetating areas that were previously dominated by invasive plants, try to achieve at least 90 percent control of the invasive before attempting restoration.
- Monitor earthworks to ensure that grass entirely covers the earthworks as an erosion control measure.

Best Practices for Invasive Plant Species Control

- Before starting any ground-disturbing activities, inventory invasive plant infestations both on-site and in the adjacent area.
- Begin activities in uninfested areas before operating in infested areas.

- Use uninfested areas for staging, parking, and cleaning equipment. Avoid or minimize all types of travel through infested areas, or restrict to those periods when spread of seed or propagules are least likely.

- When possible, to suppress growth of invasive plants and prevent their establishment, retain relatively closed canopies.

- Minimize soil disturbance and retain desirable vegetation in and around the area to the maximum extent possible.

- Schedule disturbance activity when seeds and propagules are least likely to be viable and to be spread.

- Monitor infested areas for at least three growing seasons following completion of activities. Provide for follow-up treatments based on inspection results.

- Quarantine soil from infested areas to prevent off-site spread.

- Invasive plants can be introduced and spread by moving infested equipment and material. Inspect material sources at site of origin to ensure that they are free of invasive plant material before use and transport.

Best Practices for Sustainability

- Consider sustainability practices in all aspects of earthworks management, limiting the need for irrigation to periods of extreme drought and during plant establishment, and reducing the need for fertilizers, other soil amendments, and water by selecting plant species that are native and naturally adapted to existing site conditions.

- Limit herbicide and pesticide use as much as possible.

- Take advantage of natural ecological processes to manage resources efficiently.

Fort Ward Park and Museum Area Management Plan

SECTION II

10. BIBLIOGRAPHY

The City of Alexandria, Virginia

October 2014

FINAL DRAFT

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Fort Ward Park and Museum Area Management Plan

Appendix I
FORT WARD PARK DRAINAGE MASTER PLAN

URS Corporation, 2014

The City of Alexandria, Virginia

October 2014

FINAL DRAFT

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FORT WARD PARK
DRAINAGE MASTER PLAN

Prepared for

City of Alexandria, Virginia
301 King Street, Suite 3200
Alexandria, VA 22314

June, 2014

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Figures

Tables

Appendices

ADA	Americans with Disabilities Act
BMP	Best Management Practice
C	Rational Method Runoff Coefficient
cfs	cubic feet per second
City	City of Alexandria
CWA	Clean Water Act
DEQ	Virginia Department of Environmental Quality
EMO	Environmental Management Ordinance
ESC	Erosion and Sediment Control
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
IDF	Intensity-Duration-Frequency
in	inch
min	minute
MOT	Maintenance of Traffic
MS4	Small Municipal Separate Storm Sewer System
N/A	Not Applicable
NAVD	North American Vertical Datum
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWP	Nationwide Permit
Park	Fort Ward Park
PVC	polyvinyl chloride
SSA	Storm and Sanitary Analysis
SWM	Stormwater Management
SWPPP	Stormwater Pollution Prevention Plan
T_c	time of concentration
T_t	calculated travel time
TMDL	Total Maximum Daily Load
URS	URS Corporation

USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
VDHR	Virginia Department of Historic Resources
VPDES	Virginia Pollutant Discharge Elimination System
VSMP	Virginia Stormwater Management Program
WQS	Water Quality Standards

EXECUTIVE SUMMARY

This report summarizes URS Corporation's (URS') analyses of the potential opportunities to address the drainage and erosion issues in Fort Ward Park (Park) in the City of Alexandria (City), Virginia.

Fort Ward Park covers 43.46 acres of land on the west end of Old Town Alexandria, large areas of which are forested or grassy and have limited constructed stormwater systems and few existing stormwater controls. The Park is susceptible to nuisance flooding and erosion due to overland flow concentration and flooding on properties near the southeastern boundary of the Park.

URS conducted a field reconnaissance and examined 16 sites at the Park to evaluate the existing conditions and to identify potential measures to improve the drainage and sedimentation. In addition, URS performed hydrologic and hydraulic analyses to verify the capacity of the existing stormwater system (Sections Three and Four).

URS attended two public meetings held by the Ad Hoc Fort Ward Park and Museum Area Stakeholder Advisory Group. During the meetings, URS presented the engineering findings of this study and addressed stakeholders' comments.

Section Five of the report summarizes the drainage improvement recommendations based on the field observations, engineering calculations, and community input. The recommendations include both structural and nonstructural measures. Further analyses are performed and described in Section Six for three recommended storm drainage system improvements to address drainage issues on targeted sites. The recommendations include retrofitting the existing stormwater system to reduce sedimentation and to improve the water quality of runoff; constructing two diversion berms and an underground drainage pipe to improve the nuisance flooding and erosion at the Oakland Baptist Cemetery; and stream stabilization to reduce erosion and improve the overall health of the stream. Section Six includes preliminary description of the recommended improvements, design consideration, feasibility, and cost estimates on planning level.

Section Seven summarizes the regulatory and permitting considerations applicable to the recommended drainage improvements.

This report compliments the Fort Ward Park and Museum Area Management Plan and can be used as supporting documentation for future drainage improvements. The recommendations in the report are consistent with the recommended best practices in the Fort Ward Park and Museum Area Management Plan.

SECTION ONE: INTRODUCTION

1.1 AUTHORIZATION

The City of Alexandria (City) signed a contract with URS Corporation (URS) on April 30, 2013 to develop a *Storm Drainage Master Plan* for Fort Ward Park. The project was funded by the City.

1.2 BACKGROUND AND PURPOSE

Fort Ward Park (Park) is a historic park located in the City of Alexandria (City), Virginia. It is regarded as the best preserved fort and battery built to protect Washington, DC during the American Civil War (1861−1865). The Park is the home of the Fort Ward Museum, which features Civil War exhibits, interpretive programs, tours, lectures, and living history activities.

The Park covers 43.46 acres of land on the west end of Old Town Alexandria. Much of the Fort has been preserved or restored. An archaeological investigation conducted in 2011 identified and documented 22 previously unmarked grave sites.

The Park is susceptible to drainage problems including erosion due to overland flow concentration and flooding, especially on properties near the southeastern boundary of the Park. The challenge is to manage the stormwater runoff and to minimize flooding and erosion while preserving the historic and archaeological resources of the Park.

The City's goals are to determine methods to improve the stormwater conveyance and minimize erosion while preserving the recreational, historic, and archaeological functions of the Park. The purpose of this study is to evaluate existing storm drainage problems and provide recommendations to the City for future storm drainage improvements in the Park while meeting the goals and expectations of the City.

URS performed the following tasks:

- Identification of Drainage Problems: This task involves a desktop analysis using GIS, as well as field reconnaissance at the Park.
- Hydrologic and Hydraulic Analysis: This task involves the hydraulic and hydrologic analyses within the Park drainage area.
- General Recommendations: This task involves general recommendations for each of the drainage problems at the Park based on field investigation and hydrologic and hydraulic analysis.
- Project Presentations to Stakeholders and the City: This task includes communicating and coordinating with the City and the stakeholder on project findings and recommendations.
- Concept Design Plans: This task involves developing schematic concept plans for three recommended improvements.
- Estimated Cost of Construction: This task involves developing preliminary cost estimates for construction of the recommended capital improvements.

1.3 STAKEHOLDER MEETINGS

URS attended three public meetings with the Ad Hoc Fort Ward Park and Museum Area Stakeholder Advisory Group. The intent of these meetings was to provide the stakeholders with information about the City's goals and the methods used in the course of this study. Stakeholders were also given an opportunity to express their thoughts and comments on existing drainage issues.

A number of public concerns were identified during these meetings, including the restoration effort necessary to correct the drainage and erosion issues in the cemetery and Marlboro Estate neighborhood.

The dates of the stakeholder meetings are presented in Table 1. The presentations for each stakeholder meeting can be found in Appendix A.

Table 1: Stakeholder Meetings

Meeting Date	Location	Attendees
June 12, 2013	Minnie Howard School	Representatives from the Advisory Group, the City, and URS
August 14, 2013	Minnie Howard School	Representatives from the Advisory Group, the City, URS, and Ladner/Klein Landscape Architects, PC
May 7, 2014	Minnie Howard School	Representatives from the Advisory Group, the City, URS, and Ladner/Klein Landscape Architects, PC

1.4 FORT WARD PARK AND MUSEUM AREA MANAGEMENT PLAN

The City has launched a long-term effort to develop the Fort Ward Park and Museum Area by documenting the historical, cultural, and recreational significance of the Park as well as risks and vulnerabilities. The ongoing effort was initiated in April 2012 by the City's Park and Recreation Commission. The Fort Ward Park and Museum Area Management Plan Management Plan synthesizes these efforts into a cohesive document that offers management recommendations to protect and enhance Park resources and benefit the public.

The Final Draft Fort Ward Park and Museum Area Management Plan (January 2014) outlines potential and anticipated improvements to the Park. These improvements include a series of Best Management Practices for the following topics:

- Park Stewardship
- Physical Changes
- Earthworks
- Landcover Establishment
- Plant Species Control

- Woodland Clearing
- Adapting Historic Road Traces as Trails.

Some of the Best Management Practices include specific recommendations relating to drainage issues on the site with respect to reducing erosion and improving stormwater conveyance such as: aerating soil and reseeding turf; redirecting stormwater away from sensitive areas; and maintaining clogged storm drain systems. The recommendations related to drainage systems contained in the Fort Ward Park and Museum Area Management Plan are consistent with and complement the information presented in this Drainage Master Plan.

1.5 HOW THIS PLAN SHOULD BE USED

This Drainage Master Plan should be used in the following manner:

- This plan complements and echoes the objectives/recommendations in the Fort Ward Park and Museum Area Management Plan and should be used as a supporting document for future storm drainage improvements.
- The plan should be reviewed annually for the purpose of prioritizing and budgeting for the needed improvements.
- Specific capital improvement recommendations set forth in this plan should be considered as conceptual only. Additional details and potential alternatives should be investigated and analyzed in the engineering phase of the final project designs.
- Archeological investigation is required for any land disturbing activities in the Park.
- Cost estimates should be considered as planning level only, and do not include the cost for archeological investigations required for any land disturbing activities. Cost estimate should be updated and funding sources should be identified with the preliminary engineering and final project designs.

SECTION TWO: STUDY AREA CHARACTERISTICS

2.1 STUDY AREA LOCATION

Fort Ward Park is at the west end of Old Town Alexandria and consists of 43.5 acres. The Park is bounded by Braddock Road to the south, Van Dorn Street to the north, and a residential community to the east. Figure 1 shows an aerial view of the Park and the existing condition on the site.

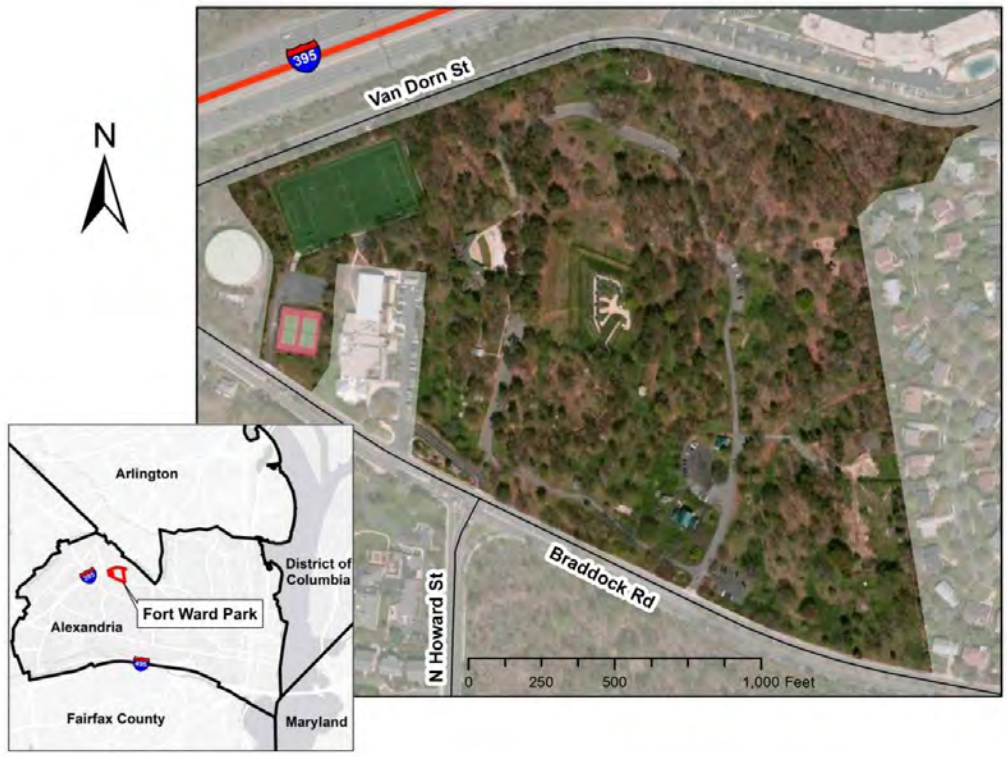

Figure 1: Fort Ward Park Vicinity Map

2.2 LAND USE

The Park land use is primarily public open space incorporating woodlands, meadows, the fort, and the cemetery. Approximately 3.5 acres of the site is developed and paved with impervious surface. The surrounding land use is made up of single-family residential zones, townhouse residential zones, and high-density apartment zones. The City of Alexandria provided 2009 zoning data that showed the current zoning of the Park is "Public Open Space."

2.3 TOPOGRAPHY

The site has a rolling topography with moderate slopes. Topographic data were provided by the City and the vertical datum for the data is the North American Vertical Datum 1988 (NAVD 88).

The highest point is located near the center of the park and has an elevation of 290 feet. The lowest point is at the northeast corner of the Park with an elevation of 212 feet.

2.4 SOILS

Most of the Park consists of the Kingstowne-Sassafras-Neabsco complex, which has poorly drained soils with low infiltration rates and high clay content. Soils have also been compacted due to recreational use, vehicle traffic, and construction activities, further reducing infiltration capacity. Less than 10 percent of the Park is made up of moderately well drained loamy soils (Sassafras-Neabsco complex) with moderate infiltration capacity. Soil data were obtained from the 2009 Soil Survey Geographic database of the Natural Resources Conservation Service (NRCS).

2.5 CHALLENGES

2.5.1 Environmental Challenges

Drainage problems in the Park include erosion due to overland flow concentration and flooding on the cemetery and properties near the southeastern boundary of the Park.

In 2012, the City implemented interim drainage improvements on the east side of the Park to divert runoff from Oakland Baptist Church Cemetery and neighboring Marlboro Estates subdivision. The measures included installation of small catch basins, drainage pipes, and infiltration trench drains (Figure 2). The improvements provide a temporary solution to prevent runoff from flowing into the cemetery.

A recent report by the Ad Hoc Fort Ward Park and Museum Area Stakeholder Advisory Group (2013) explains that erosion remains the critical threat to the stability and preservation of the Fort and the integrity of the bastions. Erosion is caused by natural effects of weather; poor soil quality; lack of sunlight in some areas, which prevents the growth of healthy ground cover; uprooted trees, which disturb earthen remains; and foot traffic on the wall surfaces.

2.5.2 Archaeological Activities

Contemporary interest in the historical significance of Fort Ward Park as a whole and its African-American history, as well as a desire to preserve its cultural resources, led to an archaeological investigation starting in 2009. The City carried out a ground-penetrating radar survey to identify unmarked graves and then completed fieldwork in January 2011. The survey results confirmed the presence of many burial sites. Additional research and family accounts chronicled how the Fort neighborhood was lost in the process of the City's efforts to purchase the land and create the historical park. The archaeological study documented 22 graves, 19 of which were unmarked, in the Jackson Cemetery on the west side of the Fort, the old graveyard adjoining the Oakland Baptist Cemetery, and in the eastern portion of the Park (Adams' graves). Also discovered were foundations and artifacts associated with one of the earliest households at the Fort and an African-American school. It is believed that the Park harbors many more unmarked burial sites.

The ongoing archaeological investigation expands to suspected burial areas and home sites. A shovel test survey of the entire park will be performed at 30-foot intervals to identify sensitive resource areas. This will result in an updated cultural resource inventory in preparation for planning activities for the Park.

According to a memo by Office of the City Manager (2013), the archaeological investigation has identified 43 gravesites, including 3 burials marked by a gravestone and 40 unmarked burials.

2.5.3 Recreational Significance

The Park serves as a significant recreational resource to residents and visitors. A 2013 survey conducted by the Ad Hoc Fort Ward Park and Museum Area Stakeholder Advisory Group suggested the Park has more than 100 visitors on average per day. Park visitors enjoy outdoor recreational opportunities such as walking, jogging, picnicking, gatherings, and cultural events, and benefit from the playground facilities and the dog park.

SECTION THREE: EXISTING STORM DRAINAGE CONDITION

The evaluation of the Fort Ward Park includes an analysis of existing land use, pervious and impervious areas, soils, development, and archaeological and natural resources of the site. Geographic Information System (GIS) data available from the City in 2012 were used to characterize the existing conditions. Field assessments were conducted to evaluate the ground condition, on-site stormwater collection system, and interim drainage solutions.

3.1 DATA REVIEW AND COLLECTION

The City of Alexandria provided URS with GIS data that included:

- 2-foot contours
- Aerial photographs
- City boundary
- City parcels
- Roads
- Zoning
- Building footprints
- Storm drain networks and nodes
- Streams
- 100-year floodplain boundary
- Parks
- Impervious coverage

URS conducted an extensive review of local development plans, archaeological investigations, and Park management plans to better understand the baseline conditions and the future vision for the Park. Additionally, potential restoration opportunities were evaluated based on the benefit they would provide to the City and the Advisory Group. The City provided information to URS as AutoCAD drawings, site plans, and reports. A summary of the data reviewed is provided in Table 2.

Table 2: Data Received from the City of Alexandria

Name	Author	Format
U.S. Geological Survey (USGS) quadrangle map, Alexandria (1945)	USGS	Quadrangle map in JPG format
Marlboro Estates Site Plan (1976)	City of Alexandria	Site Plan in PDF format
Fort Ward Archaeological Investigations (2010–2012)	City of Alexandria	GIS data
Survey files for Fort Ward archaeology investigations (2010–2012)	City of Alexandria	AutoCAD files
Fort Ward Park Interim Drainage Design Solution (2011)	City of Alexandria	PowerPoint Presentation in PDF format
Fort Ward Park Temporary Drainage Improvement (2011)	City of Alexandria	Site Plan in PDF format
Recommendations for the Management of Fort Ward Historical Park (2011)	Ad Hoc Fort Ward Park and Museum Area Stakeholder Advisory Group	Report in PDF format
Fort Ward Park/Bastion Walkway Project (2013)	City of Alexandria	Site Plans in PDF format

Name	Author	Format
City's Responses to Fort Ward Issues (2013)	City of Alexandria	Letter to Oakland Baptist Church and The Fort Ward and Seminary African-American Descendants Society in PDF format, dated May 6, 2013
2012–2013 Advisory Group Draft Recommendations	The Ad Hoc Fort Ward Park and Museum Area Stakeholder Advisory Group	Report in PDF format
Fort Ward Park and Museum Area Management Plan: Existing Conditions (Final Draft) (January 2014)	Fort Ward Advisory Group, City of Alexandria	Final Draft report in PDF format

3.2 FIELD RECONNAISSANCE

URS performed field reconnaissance to review the existing conditions of the Park. The purpose of the field assessment was to obtain information required to conduct hydrologic and hydraulic analyses, to observe the existing ground condition, to assess existing drainage issues, and to assess the possibility of drainage improvements. Factors that affect the potential for drainage improvements include site constraints, access issues, and utility conflicts.

During the field reconnaissance trip, URS staff conducted a detailed on-site investigation, and identified existing drainage problems. Field data collected at each location included:

- Location
- Observed problems at the site
- Sketch of site
- Sketch of identified potential improvement measures

Photographs were taken as part of the field reconnaissance to record the existing condition at each site.

The detailed field reconnaissance report is included in Appendix B.

3.3 EXISTING DRAINAGE PATTERN AND CONVEYANCE SYSTEM OVERVIEW

Figure 2 shows the general drainage patterns in the Park. There are three major outfalls in the Park. Approximately 35 percent of the site drains west to the storm drainage system underneath the football field to Outfall A.

Approximately 50 percent of the Park drains northeast to the Stormwater Management (SWM) Pond before entering the City's storm drainage system at Outfall C. The SWM Pond also captures the off-site runoff from the area west of Braddock Road and the Marlboro Estate subdivision.

The rest of the Park drains north via swales before entering the storm drainage system near Van Dorn Street at Outfall B.

Approximately 3.5 acres of the Park is developed with impervious surface (e.g., buildings, parking lots, and roads), with the remaining undeveloped land consisting of open field and grassy areas.

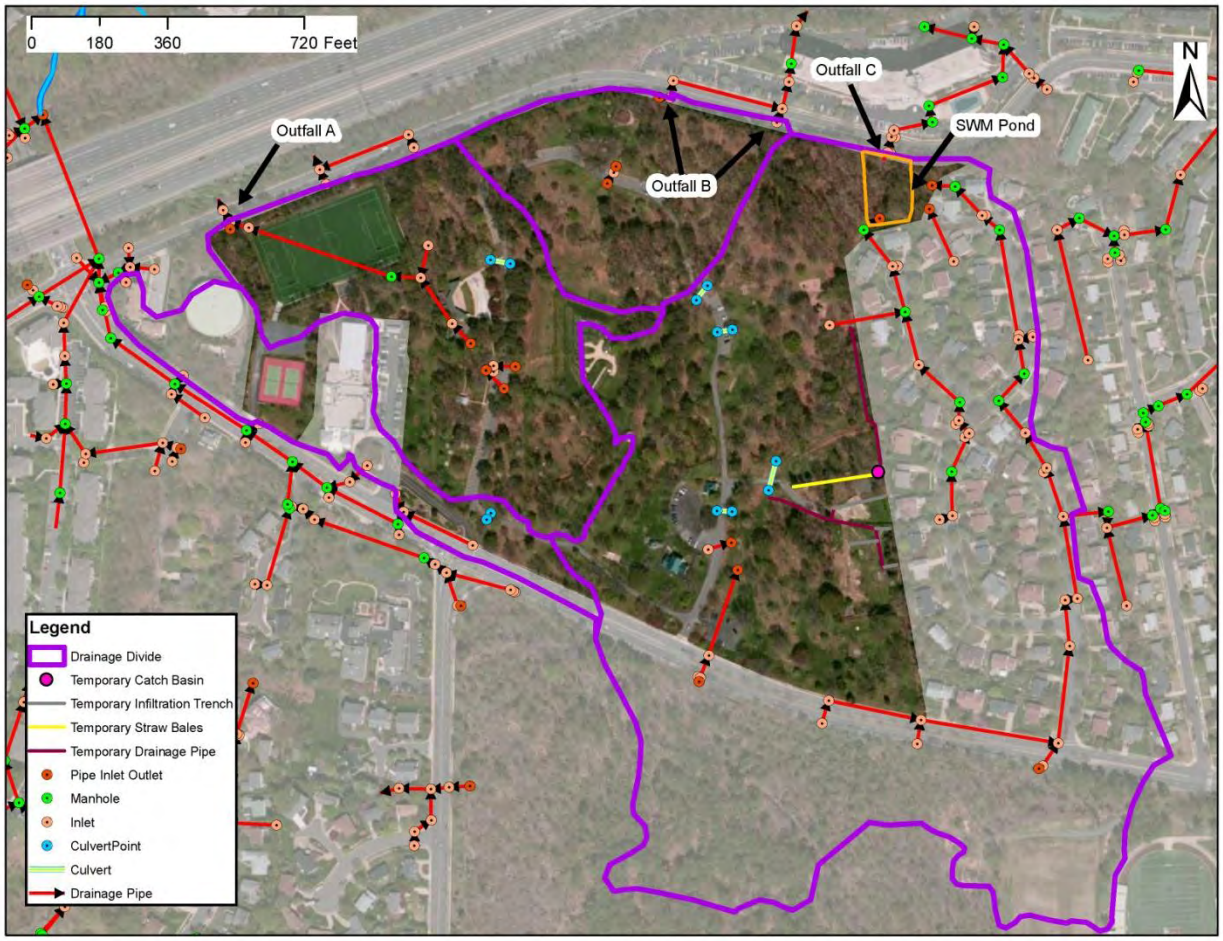

Figure 2: Drainage Patterns in Fort Ward Park

3.4 WATERSHED AND DRAINAGE BASINS

Fort Ward Park is part of the Four Mile Run watershed, which is approximately 20 square miles in area covering the Cities of Alexandria and Falls Church and portions of Arlington and Fairfax Counties. The Four Mile Run watershed is highly urbanized and approximately 85 percent of the watershed is considered to be a developed area. Fort Ward Park drains into the lower portion of the Four Mile Run through the storm sewer system via the various outfalls (shown in Figure 2).

3.5 EXISTING STORMWATER DEFICIENCIES

Combining the observations from the field reconnaissance and the results of hydrologic and hydraulic analysis, URS identified 16 sites that have or could develop drainage deficiencies.

Deficiencies include nuisance flooding, sedimentation and erosion, flooding during more extreme events, or a combination. Figure 3 shows the locations of the 16 sites.

The following information is provided for each site:

- Ownership: the party responsible for the site improvement.
- Existing conditions: a summary of existing site conditions, including the drainage capacity of swales and culverts if applicable.

Site Number	Ownership	Existing Conditions
1	City	Shallow drop inlet near the museum and the parking lot. No major problems noted during the field reconnaissance.
2	City	15-inch culvert crossing under the entrance road near bathrooms. A small ponding area was observed at the culvert inlet.
3	City/Private	Outlet of 18-inch pipe that collects runoff from upstream forested area and Braddock Road. Sediment and debris deposition was noted at the outfall.
4	City	Swale in the natural area with "No Mowing" sign nearby. No major problems noted during the field reconnaissance.
5	City	The 36-inch culvert under the road that leads to the utility yard appeared to be partially blocked; in addition, vegetation was overgrown around the culvert. Observed sediment and debris buildup at the 6-inch PVC underdrain pipe located just upstream of the 36-inch culvert.
6	City	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 toward the 36-inch culvert and downhill of the cemetery. Temporary hay bales have been set up to prevent runoff from entering the cemetery.
7	City	The 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 the downstream end of the natural stream channel.
8	Private	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 events.
9	City	A channel has formed on the hill adjacent to the playground. Two yard inlets collect drainage from the hill before it gets to the playground. One of them 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.
10	City	A clogged yard inlet was noted 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.
11	City/Private	There appear to be water quality issues in the Pond at the northeast corner of the Park boundary. The water is cloudy from sediment and appears discolored.
12	City	Park outfalls along Van Dorn Street. Inlets collecting drainage from the Park are clogged with debris. Channels have formed downstream of cross culverts discharging runoff.

Site Number	Ownership	Existing Conditions
13	City	Bare spots were noted on the hill near the soccer field. An inlet at the base of the hill is clogged and a channel has formed upstream of the inlet.
14	City	No problems were observed near the manhole and inlets near the soccer field and amphitheater.
15	City	Areas of exposed, bare ground were seen in the open areas near the parking lot, near the amphitheater and adjacent open area. The inlet adjacent to the west side of the Fort is clogged. There is a depression at the 15-inch culvert inlet under the parking lot. Sedimentation was seen in the parking lot due to blockage from a telephone pole being used as a landscape timber.
16	Private	Runoff from the properties in Marlboro Estates is draining onto Park property and contributing to drainage issues.

PVC = polyvinyl chloride

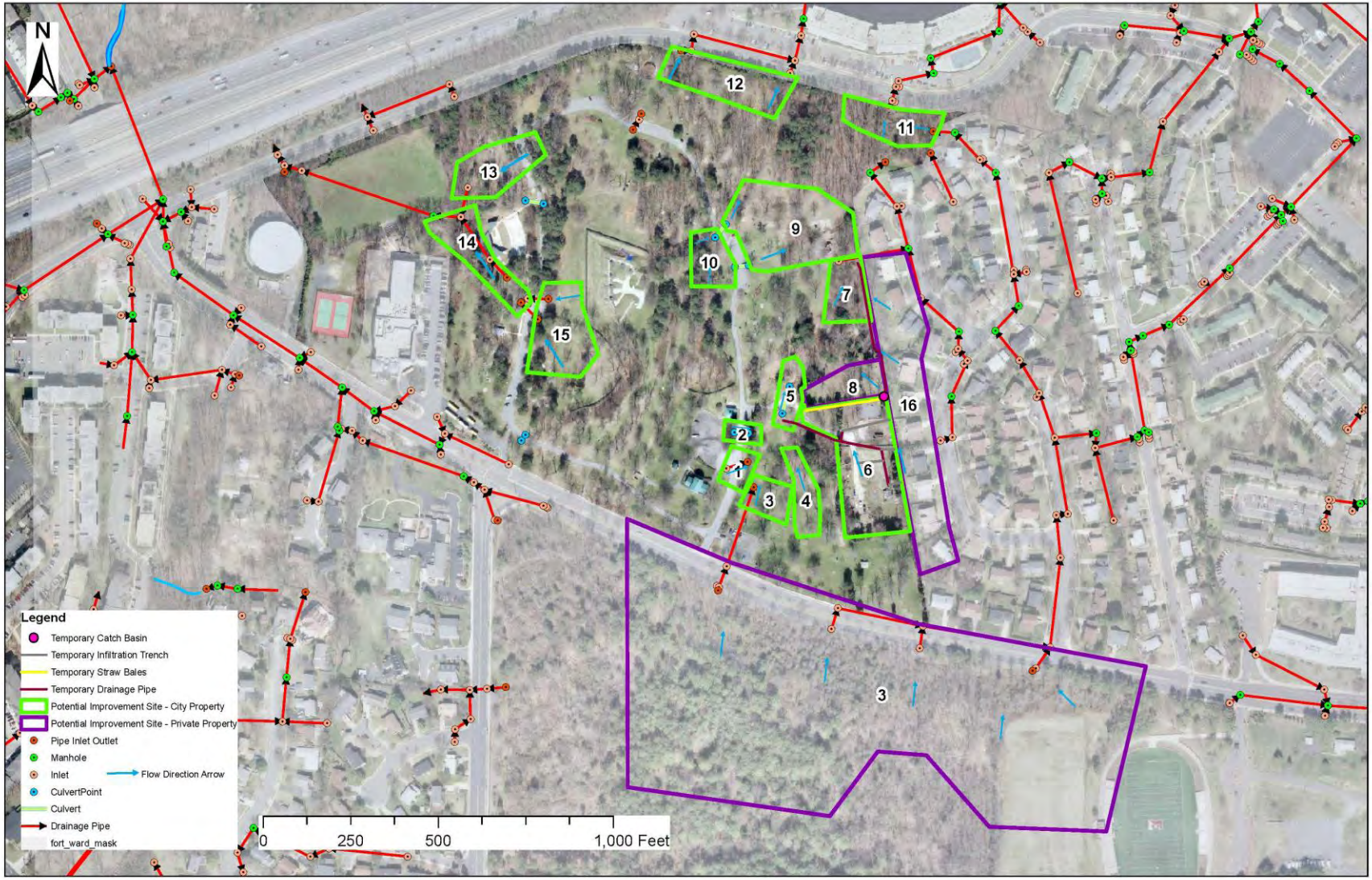

Figure 3: Fort Ward Park Sites for Potential Improvement

SECTION FOUR: ANALYSIS METHODOLOGY

4.1 HYDROLOGIC ANALYSIS

4.1.1 Modeling Development

URS performed a hydrologic analysis of the Park to develop a baseline model for the City. Results of the analysis shows the volume of water flowing through each location and can be used by the City for future Stormwater Management projects.

URS developed the hydrologic model using GIS mapping and Autodesk Storm and Sanitary Analysis (SSA) 2011 version 5.0 as requested by the City. The 2012 Zoning GIS data provided by the City were used along with data from the field reconnaissance in hydrologic modeling and calculations. URS developed the watershed delineation and attribute management using Esri ArcGIS 10. After conversations with the City on the preferred analytical method, the Rational Method was used to perform the hydrologic analysis for the Park. SSA was used to develop flows for the 1-, 2-, 10-, 25-, and 100-year storm events.

4.1.2 Modeling Input Parameters

After reviewing project specifications and recommendations, and understanding the project's objectives, specific data needs were defined and collected. The data sets used in the hydrologic modeling are described below.

The City provided 2-foot topographic data. The vertical datum used for this project is the North American Vertical Datum 1988 (NAVD 88), dated October 2012. The data were provided in a GIS shapefile format. The topographic data were used to delineate subwatersheds within the Park. The City also provided GIS zoning data. The 2009 City of Alexandria zoning data were used to represent existing land use. The GIS soil data coverage used for modeling the Park was obtained from the Soil Survey Geographic database (NRCS, 2009), which can be accessed at http://SoilDataMart.nrcs.usda.gov/.

Rainfall infiltration losses were estimated using the Rational Method Runoff Coefficient (C). The 2009 Alexandria zoning data contain five different land use types in the drainage area surrounding Fort Ward Park (Table 3). These zones were reclassified into four hydrologic soil groups based on their similarity in hydrologic responses. Each of these categories has a different C value depending on the hydrologic soil group classification of the land use. Due to the relative steepness of slopes within the park, C values were chosen based on 6 percent or greater land slope. Table 3 summarizes C values for the different zoning categories and four hydrologic soil groups. The rainfall intensity estimates were obtained from the rainfall Intensity-Duration-Frequency (IDF) curves for the City of Alexandria dated from 1941–1969.

Table 3: Land Use and C Values from Autodesk Storm and Sanitary Analysis 2011

No.	2009 Alexandria Zoning Categories	Equivalent C Category	C Value by Soil Type			
			A	B	C	D
1	Public Open Space	Open Space, less than 25 years	0.14	0.19	0.24	0.28
2	Public Open Space	Open Space, 25 years or greater	0.2	0.26	0.32	0.39
3	Residential Single Family Zone, 20,000 square-foot lot	Residential Lot Size 1/2 Acre, less than 25 years	0.24	0.28	0.32	0.37
4	Residential Single Family Zone, 20,000 square-foot lot	Residential Lot Size 1/2 Acre, 25 years or greater	0.32	0.36	0.42	0.48
5	Residential Single Family Zone, 8,000 square-foot lot	Residential Lot Size 1/4 Acre, less than 25 years	0.29	0.33	0.36	0.4
6	Residential Single Family Zone, 8,000 square-foot lot	Residential Lot Size 1/4 Acre, 25 years or greater	0.37	0.42	0.47	0.52
7	Residential Townhouse Zone	Residential Lot Size 1/8 Acre, less than 25 years	0.31	0.35	0.38	0.42
8	Residential Townhouse Zone	Residential Lot Size 1/8 Acre, 25 years or greater	0.4	0.44	0.49	0.54
9	Residential High Density Apartment Zone	Residential Lot Size 1/8 Acre, less than 25 years	0.31	0.35	0.38	0.42
10	Residential High Density Apartment	Residential Lot Size 1/8 Acre, 25 years or greater	0.4	0.44	0.49	0.54

4.1.3 Modeling Approach

URS developed the hydrologic model using Autodesk SSA 2011 (Autodesk, 2011) as requested by the City. Autodesk SSA can be used to model drainage systems using GIS shapefiles and user inputs. URS developed the terrain preprocessing, watershed delineation, and attribute management using ArcGIS 10 (Esri, 2010). The drainage map is shown in Figure 4.

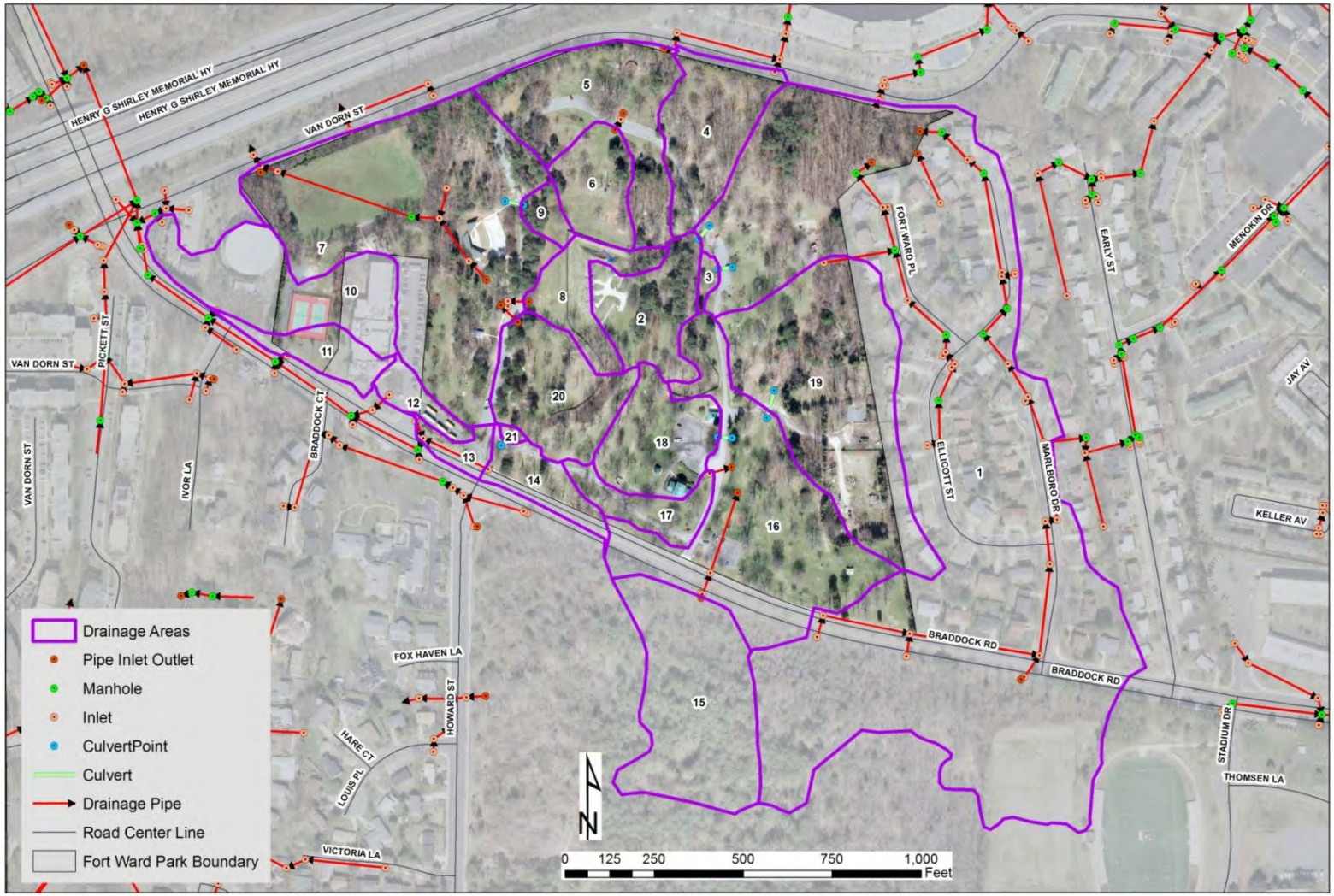

Figure 4: Fort Ward Park Drainage Divide Map

Key hydrologic parameters that are required for the SSA rainfall-runoff model include watershed-related parameters and precipitation data associated with design storms. Watershed-related input parameters needed for the SSA model include rainfall infiltration losses, drainage area, and time of concentration.

Rainfall infiltration losses were estimated using the Rational Method Runoff Coefficient, C, wherein C is the parameter used to represent drainage area properties including soil type, land use, and average slope. Composite runoff coefficients were calculated in the Subbasins tool in SSA. Table 4 shows the C values calculated for each sub-area.

Table 4: Hydrologic Parameters for Subbasins

Basin	Area (ac)	Runoff Coefficient (less than 25 years)	Runoff Coefficient (greater than 25 years)	Time of Concentration (min)
1	29.50	0.34	0.45	20.47
2	1.91	0.28	0.39	13.14
3	0.15	0.28	0.39	7.71
4	2.39	0.28	0.39	11.41
5	3.61	0.28	0.39	13.41
6	1.40	0.28	0.39	7.12
7	9.82	0.27	0.37	5.00
8	1.40	0.28	0.39	13.72
9	0.37	0.28	0.39	6.76
10	3.24	0.35	0.46	12.57
11	0.91	0.34	0.45	14.57
12	0.56	0.35	0.46	5.00
13	0.44	0.28	0.39	5.00
14	0.99	0.28	0.39	7.41
15	4.45	0.28	0.36	35.79
16	6.53	0.28	0.39	16.13
17	0.98	0.28	0.39	12.13
18	2.03	0.28	0.39	10.58
19	6.44	0.30	0.41	23.35
20	2.44	0.28	0.39	8.82
21	0.06	0.28	0.39	5.00

ac = acre
min = minute

The watershed subbasins shown in Figure 4 were delineated and the enclosed areas were calculated using 2-foot topography in ArcGIS 10. The subbasin sizes summarized in Table 4 were used as an input for the SSA model for the hydrologic simulation.

Time of concentration (T_c) is defined as the time it takes for stormwater runoff to travel from the most hydraulically distant point of the watershed to a point of interest within the watershed. T_c values for each subbasin were determined using the T_c estimation method described in NRCS TR55 (1986). Runoff from each sub-area was divided into a sheet flow segment (non-concentrated runoff from the most distant point), shallow concentrated flow segment, and channel flow and storm drain flow.

T_c values for sheet and shallow concentrated flows were estimated using generalized curves that relate surface and channel conditions, slope, and flow velocity. A maximum sheet flow segment length of 100 feet was used in accordance with NRCS recommendations. Shallow concentrated flow lengths were assumed to extend from the end of the sheet flow portion of runoff to the origin of a well-defined channel segment.

The velocities for channel flows were calculated using Manning's equation assuming the bankfull discharges. Hydraulic roughness characteristics were based on aerial imagery and field reconnaissance.

The calculated travel time (T_t) values for sheet flow, shallow concentrated flow, and channel flow were summed to give the total T_c value for each sub-area. The estimated T_c values for the sub-areas are summarized in Table 4.

Rainfall intensities for the City of Alexandria were input to the SSA model. The rainfall intensities for the 1-, 2-, 10-, 25-, and 100-year rainfall events were used to calculate the discharges at the 100-, 50-, 10-, 4-, and 1-percent-annual-chance events, respectively.

4.1.4 Summary of Results

Results of the hydrologic simulations are summarized in Table 5. Results of the SSA model are reported by subbasin name. The locations of the junctions and outfalls are shown in Figure 5.

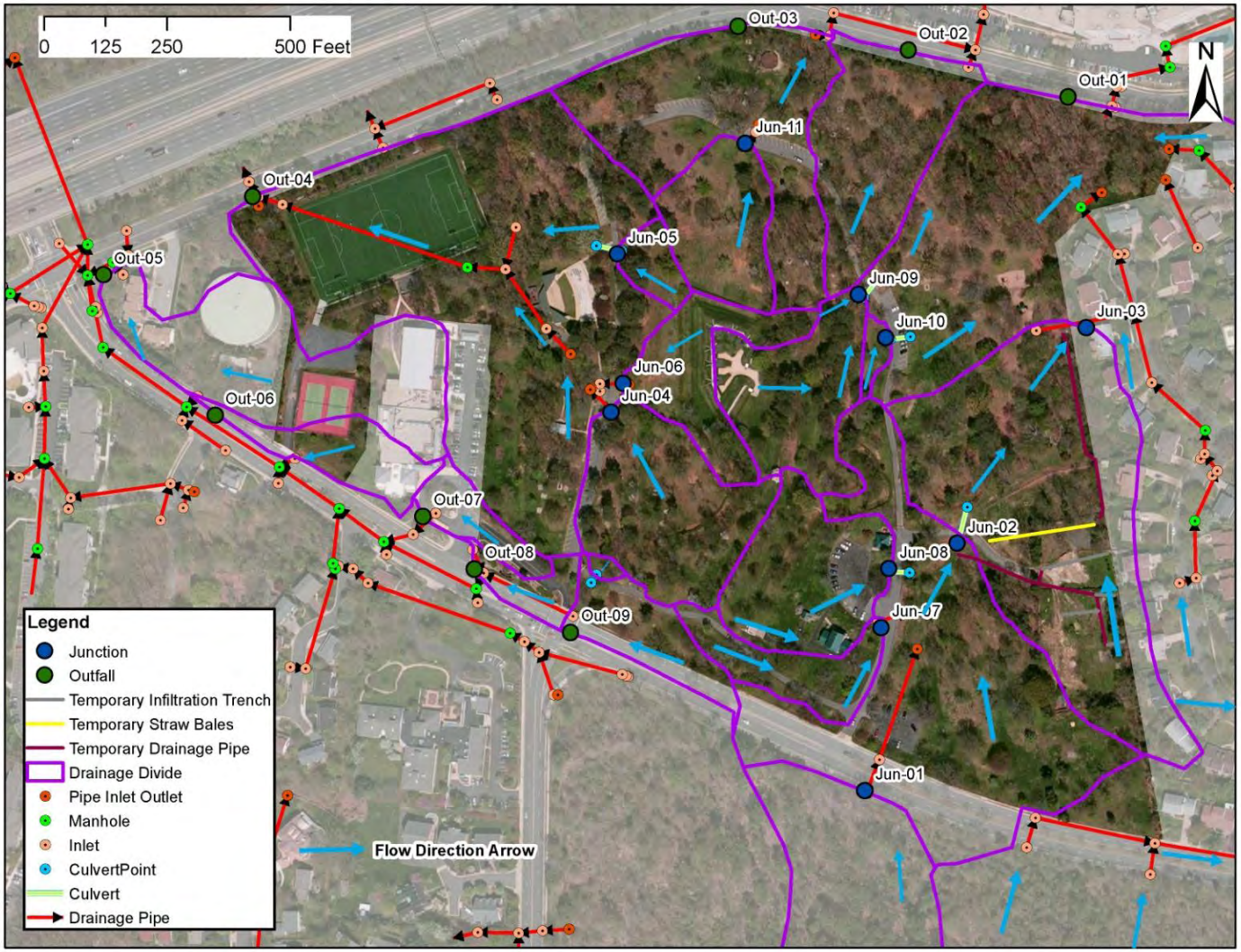

Figure 5: Fort Ward Park Drainage Divide Map with Junctions and Outfalls

Table 5: Summary of Hydrologic Analysis

Name	Drainage Area (ac)	Drainage Area within Park Limits (%)	Storm Event Flows (cfs)				
			1-yr	2-yr	10-yr	25-yr	100-yr
Subbasin 1	29.5	18.8	26.34	34.15	49.71	78.46	98.69
Subbasin 2	1.91	100	1.77	2.29	3.34	5.55	7.04
Subbasin 3	0.15	100	0.17	0.22	0.32	0.54	0.70
Subbasin 4	2.39	93.4	2.33	3.04	4.43	7.41	9.44
Subbasin 5	3.61	98	3.32	4.29	6.25	10.38	13.17
Subbasin 6	1.4	100	1.60	2.13	3.10	5.22	6.67
Subbasin 7	9.82	92.6	12.20	16.31	23.86	39.42	50.50
Subbasin 8	1.4	100	1.28	1.65	2.40	3.98	5.05
Subbasin 9	0.37	100	0.43	0.57	0.84	1.40	1.80
Subbasin 10	3.24	20.2	3.81	4.95	7.21	11.33	14.39
Subbasin 11	0.91	39.7	0.98	1.26	1.84	2.90	3.66
Subbasin 12	0.56	42.6	0.90	1.21	1.76	2.80	3.58
Subbasin 13	0.44	63	0.57	0.76	1.11	1.86	2.39
Subbasin 14	0.99	68.4	1.12	1.48	2.16	3.62	4.64
Subbasin 15	4.45	0	2.34	3.08	4.47	6.85	8.59
Subbasin 16	6.53	77.7	5.52	7.11	10.36	17.14	21.64
Subbasin 17	0.98	100	0.93	1.22	1.77	2.95	3.75
Subbasin 18	2.03	100	2.03	2.67	3.89	6.52	8.32
Subbasin 19	6.44	77.5	4.70	6.11	8.89	14.53	18.23
Subbasin 20	2.44	100	2.60	3.43	5.01	8.41	10.76
Subbasin 21	0.06	100	0.08	0.11	0.16	0.27	0.35
Junction 1	4.45	0	2.34	3.08	4.47	6.85	8.59
Junction 2	13.98	69.4	8.14	10.54	15.35	25.21	31.86
Junction 3	20.42	71	11.39	14.77	21.51	35.27	44.49
Junction 4	2.44	100	2.60	3.43	5.01	8.41	10.76
Junction 5	2.39	100	0.43	0.57	0.84	1.40	1.80
Junction 6	1.4	100	1.28	1.65	2.40	3.98	5.05
Junction 7	0.98	100	0.93	1.21	1.77	2.95	3.75
Junction 8	2.03	100	2.03	2.66	3.89	6.52	8.32
Junction 9	1.91	100	1.77	2.29	3.34	5.54	7.04
Junction 10	0.15	100	0.17	0.22	0.32	0.54	0.69
Junction 11	1.4	100	1.60	2.12	3.10	5.22	6.67
Outfall 1	65.97	71.7	37.02	48.00	69.88	111.38	140.15

Name	Drainage Area (ac)	Drainage Area within Park Limits (%)	Storm Event Flows (cfs)				
			1-yr	2-yr	10-yr	25-yr	100-yr
Outfall 2	2.39	93.4	2.33	3.04	4.43	7.41	9.44
Outfall 3	5.01	99	3.54	4.59	6.69	11.11	14.10
Outfall 4	14.02	98.2	14.45	19.27	28.19	46.67	59.76
Outfall 5	3.24	20.2	3.81	4.95	7.21	11.33	14.39
Outfall 6	0.91	39.7	0.98	1.26	1.84	2.90	3.66
Outfall 7	0.56	42.6	0.90	1.21	1.76	2.79	3.58
Outfall 8	0.99	63	0.57	0.76	1.11	1.86	2.39
Outfall 9	1.05	84.2	1.16	1.54	2.24	3.77	4.82

ac = acre
cfs = cubic feet per second
yr = year

Results from the SSA model are consistent with what was expected from field studies, which showed locations of eroded streams and the need for storm drain improvements. The results of this study can be used by the City for future stormwater management improvements or stream restoration projects. Additionally, the results of the hydrology are used to perform the hydraulic capacity analysis.

4.2 HYDRAULIC CAPACITY ANALYSIS

4.2.1 Modeling Development

URS performed a hydraulic capacity analysis for the cross culverts. The results of the hydraulic modeling will aid in future park improvement assessments and the City of Alexandria's management strategies for the park.

The hydraulic model for the Fort Ward Park Master Drainage Plan was developed using current Geographic Information System (GIS) datasets from the City and peak discharges calculated during the hydrologic analysis.

A culvert analysis program, HY-8, was used to analyze the performance of the culverts. There are 11 existing cross culverts in the Park and all of them were investigated for the conveyance capacity.

4.2.2 Modeling Input Parameters

Key parameters that are required for HY-8 include discharge data, culvert data, tailwater data, and roadway data. The discharges for the 2-year, 10-year, 25-year, and 100-year storm events were obtained from the hydrologic analysis. The culvert data required by HY-8 include:

- Culvert shape
- Material (to define Manning's n values)
- Size
- Inlet type, edge condition, and depression
- Invert data
- Embankment data

The above culvert data were obtained from the GIS data provided by the City, the field reconnaissance, aerial images, and topographic information.

The downstream tailwater channel shape and condition were defined using topographic data provided by the City and the field reconnaissance observations. The following parameters are required when defining the roadway data for the culvert:

- Roadway profile
- Roadway station
- Crest length
- Crest elevation
- Roadway surface
- Top width

The above road data were obtained from the GIS data provided by the City, the field reconnaissance, aerial images, and topographic information. The roadway surface conditions were confirmed during the field reconnaissance trip. The values entered for the crest length and top width of the roadway have no effect on the hydraulic computations unless overtopping occurs.

4.2.3 Modeling Approach

URS determined the conveyance capacity of the existing drainage systems and for the limited existing cross culverts on the site. Defined conveyance systems are not prevalent on the site, and there are no closed drainage systems other than cross culverts. The flow capacities for the existing cross culverts were determined using the discharges from the hydrologic analysis.

Culvert capacities and associated velocities were computed using the Federal Highway Administration's HY-8. HY-8 was developed by Federal Highway Administration in the 1980s

and has been continuously maintained and updated since. URS used the latest version, Version 7.2, to examine the hydraulic capacity of the cross culverts in the Fort Ward Park.

4.2.4 Summary of Results

The summary of the hydraulic capacity analysis (Table 6) shows that all the culverts, except Culverts 2, 18, and 20, are designed to convey 25-year storm events, provided routine maintenance is performed. For example, sedimentation in the culvert under West Braddock Road (Culvert 15) will cause the water to overtop the crossing road during the 25-year storm event. However, the conveyance can be restored by cleanup and routine maintenance. The detailed model output for each culvert is available in Appendix C.

Table 6: Summary of Culvert Capacity Analysis

Culvert ID	Subbasin ID	Site ID	Storm Event Flows (cfs)			Flows that would cause overtopping (cfs)	Will it be overtopped during a 25-year storm event?	Will it be overtopped during a 100-year storm event?
			10-yr	25-yr	100-yr			
Culvert 15	Subbasin 15	Site 3	4.47	6.85	8.59	8.25	No	Yes
Culvert 15*	Subbasin 15	Site 3	4.47	6.85	8.59	6.04	Yes	Yes
Culvert 17	Subbasin 17	Site 1	1.77	2.95	3.75	5.30	No	No
Culvert 18	Subbasin 18	Site 2	3.89	6.52	8.32	5.17	Yes	Yes
Culvert 16	Junction 2	Site 5	15.35	25.21	31.86	40.27	No	No
Culvert 3	Subbasin 3	Site 10	0.32	0.54	0.70	4.0	No	No
Culvert 2	Subbasin 2	Site 10	3.34	5.55	7.04	5.06	Yes	Yes
Culvert 6	Subbasin 6	N/A	3.10	5.22	6.67	7.55	No	No
Culvert 9	Subbasin 9	N/A	0.84	1.40	1.80	4.05	No	No
Culvert 8	Subbasin 8	Site 15	2.40	3.98	5.05	4.04	No	Yes
Culvert 20	Subbasin 20	Site 15	5.01	8.41	10.76	7.35	Yes	Yes
Culvert 21	Subbasin 21	Site 21	0.16	0.27	0.35	2.6	No	No

*with 1/3 of the culvert blocked by sedimentation

SECTION FIVE: RECOMMENDATIONS

5.1 GENERAL RECOMMENDATIONS

Over the course of the study, URS identified potential improvements to address nuisance flooding and erosion issues at the Park. These improvements are based on field observations, engineering analysis, and community input. The improvements include both structural and nonstructural measures. Nonstructural measures are defined as not requiring design and generally involving lower-cost activities that can be integrated into the maintenance already occurring at the Park. Structural measures, also referred to as capital projects, typically require additional analyses such as design development, geotechnical analysis, field surveying, archaeological investigation, and permitting. These measures typically involve greater effort and higher costs.

Nonstructural improvement options recommended for general implementation at the Park are listed below:

- Aeration and Turf Seeding: This alternative consists of aerating the soil to increase infiltration capacity and seeding turf. Aerated soil has a higher infiltration capacity (decreasing runoff) and is also more suitable for plant growth. Healthy turf reduces erosion while greatly improving park aesthetics. The Fort Ward Park and Museum Area Management Plan provides additional information on aeration of soils at the park
- Conveyance Improvements: This alternative includes cleanup and maintenance of the existing system, swales, closed systems, etc. This includes removing sediment and debris that decrease flow in existing conveyance systems, or avoiding cutting grass in infiltration trenches. These practices increase flow conveyance and decrease flooding frequency.
- Redirect Drainage from Homes: This alternative requires redirecting residential drainage away from erodible areas and sensitive resources by redirecting roof downspouts or sump pumps to storm drain systems. This option decreases runoff on to the Park by redirecting residential runoff.
- Mowing Maintenance Plan: This alternative requires a maintenance plan to clearly identify areas to be mowed and areas to avoid mowing. “No Mow” areas should also be established for drainage practices that use plant growth for retention, and where undesired pedestrian traffic is causing erosion.

General structural improvement options considered are as follows:

- Increase Culvert Capacity: This alternative involves increasing the size of culverts to accommodate the 25-year storm. This will lead to culverts surcharging less frequently, potentially avoiding nuisance flooding.
- Redirect Surface Flow: This alternative requires creating or upgrading an existing conveyance system. This can include swales, berms, culverts, etc. depending on the site requirements. Directly altering surface flow should be used where sheet flow is eroding sensitive areas.

- Level Spreader: This alternative involves implementation of gravel or riprap downstream of a culvert outlet to reduce erosion. Level spreaders reduce energy, converting high-velocity flow into sheet flow.
- Stream Restoration/Stabilization: This alternative consists of modifying an existing stream so it is more stable under existing and future flow conditions. This can decrease stream erosion, improve stream aesthetics, and decrease sediment loading downstream.
- Install Underground Best Management Practices (BMPs): This alternative involves adding water quality BMPs to an existing or proposed culvert. The BMPs are designed to trap sediment, debris, and other contaminants to improve water quality downstream.

5.2 GENERAL MAINTENANCE BEST PRACTICES FOR CEMETERY AREAS

The following summarizes best practices for grounds and headstone maintenance at cemeteries, but is focused on the Oakland Baptist Church Cemetery (Site 8), although the cemetery is not under City jurisdiction. The parties responsible for maintenance of the cemetery should view this document as general guidance and refer specifically to the Additional References and Resources at the end of this document to help determine the most appropriate methods and means of implementation.

5.2.1 Virginia Cemetery Regulations

The State of Virginia has a number of laws and regulations related to marked and unmarked cemeteries including ones that address impacts to graves and access to gravesites, among others (see Code of Virginia Titles 18 and 57). Questions regarding cemetery regulations in Virginia can be directed to the Virginia Department of Historic Resources (VDHR) at 804-367-2323 / http://www.dhr.virginia.gov/.

5.2.2 Maintenance Recommendations

Maintenance issues at cemeteries typically revolve around two often interconnected themes: vegetation and drainage. Vegetative issues include poor turf quality resulting from soil compaction and excessive shade and trees growing in and around graves, displacing headstones. Drainage issues at cemeteries are often related to sheet flow of water due to impervious surfaces upslope from the cemetery, compaction of soil around and within the cemetery proper, and poor soil drainage characteristics, such as impermeable clay layers; a high, or perched, water table can be another contributing factor. There are a number of mitigation measures that can be implemented by parties responsible for cemetery maintenance to address vegetative and drainage issues both outside a cemetery and within the boundary of a cemetery.

Turf Maintenance: Within the boundaries of a cemetery, poor drainage and erosion is most commonly related to soil compaction, which prevents water from infiltrating into the ground and instead contributing to surficial erosion or subsidence of head stones or pooling in depressions. Soil compaction issues can be addressed through a turf maintenance program, whereby the soil is aerated and appropriate grassy vegetation is planted as an erosion prevention technique. Such an

activity may involve the removal or pruning of trees that are contributing to excessive shade or could be diverting water flow, but care must be taken to ensure that the trees removed do not contribute to the character and feeling of the cemetery and do not cause additional damage during the removal process. Mowing, edging, and related turf maintenance activities are major contributors to headstone damage. Any turf management program must include damage prevention measures.

Water Diversion: There are three main methods that can be used around a cemetery to redirect water flowing from upslope sources: berms (see Section 6.2 for example), ditches, and subsurface installations such as French drains or drainage tiles. Construction of any of these features can have adverse impacts to a cemetery due to either compaction of burials (e.g., berms) or physical disturbance of a burial (e.g., ditches and French drains). As such, it is important that an accurate map of the limits of burials, marked and unmarked, within the cemetery be prepared to ensure that such features will not be constructed through any burials.

Grave Depressions: While water can pool in grave depressions caused by casket and soil subsidence, it is recommended that these not be filled unless they pose a safety hazard, especially if an accurate map of the cemetery and all marked and unmarked burials has not been developed (Chicora Foundation, Inc. (CFI) N.D.a). Grave depressions are an important indicator of unmarked graves and filling of the depression can remove any sign of a burial if it is not properly mapped and/or marked. Issues with grave depressions collecting water can be mitigated by instituting a turf management program.

Conservation and Repair of Damaged Headstones: Trees and tree roots as well as drainage issues can cause subsidence of and damage to headstones. If resetting of headstones is feasible, care should be taken when identifying which headstones should be reset and the manner in which the resetting is undertaken. It is recommended that only headstones with a severe amount of tilting be reset. Headstones can contain internal cracking that is not visible to the naked eye and the process of resetting can result in failure of the stone, thus causing a more severe impact to the headstone and more costly repair. There are numerous methods for repairing cracked or broken headstones, but improper repair techniques can cause additional damage or minimally result in disfigurement. Additionally, it should be noted that mowing and other turf maintenance can be the most damaging activities to headstones, and proper guidance is critical to preventing damage from these activities.

5.2.3 Potential Funding Sources

A number of different options may exist for procuring funding to support cemetery maintenance activities. Within the City of Alexandria, it is recommended that the Alexandria Archaeology Museum be contacted at 703-746-4399 / http://alexandriava.gov/Archaeology. The VDHR is a resource that can be used to identify potential state and federal funding sources, and can be contacted at 804-367-2323 / http://www.dhr.virginia.gov/. The State, Tribal, and Local Plans & Grants Division of the National Park Service (http://www.nps.gov/history/hpg/) often works with State Historic Preservation Offices such as the VDHR. While cemeteries are not typically

considered eligible for listing in the National Register of Historic Places (NRHP), there are a number of "Criteria Considerations" under which a cemetery may be considered eligible. VDHR may be able to provide guidance on the NRHP nomination process and possible funding sources.

A list of organizations that would provide additional funding sources is included in Additional References and Resources at the end of this document.

5.3 DESIGN STANDARDS FOR PROPOSED IMPROVEMENTS

Several design standards were used when considering proposed improvements to Fort Ward Park, including the following:

- The Four Mile Run Design Guidelines (2009)
- The Amendments to City of Alexandria Article XIII Environmental Management Ordinance (2006)
- The Virginia Stream Restoration & Stabilization Best Management Practices Guide (2004) – used when considering stream restoration improvements
- The Virginia Department of Transportation Drainage Manual (2002)
- The Virginia Erosion and Sediment Control Handbook (1992)

5.4 SITE-SPECIFIC RECOMMENDATIONS

Specific recommendations are summarized below for each of the sites shown in Figure 3. Section Six includes additional information for the recommended capital projects that were analyzed in detail.

5.4.1 Site 1

Two nonstructural measures are recommended for Site 1:

- Aeration and turf seeding
- Conveyance improvements: periodic removal of sediment and debris from culverts is recommended.

5.4.2 Site 2

Two nonstructural measures and one structural measure are recommended for Site 2:

- Increase culvert capacity: Increase the capacity of the 15-inch culvert under the entrance road near the bathrooms
- Aeration and turf seeding
- Conveyance improvements: periodic removal of sediment and debris from culverts is recommended. Re-grading to avoid ponding is also recommended.

5.4.3 Site 3

Two nonstructural measures and one structural measure are recommended for Site 3:

- BMP implementation: this alternative requires the installation of a BMP at the site or upstream of the outfall to remove sediment, trash, and debris. (See Section Six for concept design.)
- Level spreader: this alternative requires the implementation of a level spreader at the culvert outlet.
- Conveyance improvements: periodic removal of sediment and debris from culverts is recommended.

5.4.4 Site 4

One nonstructural measure is recommended for Site 4:

- Aeration and turf seeding

5.4.5 Site 5

Two nonstructural measures are recommended for Site 5:

- Aeration and turf seeding: seeding is recommended at the sloped area upstream of the 36-inch culvert.
- Conveyance improvements: periodic removal of sediment and debris from the 36-inch culvert and the 6-inch PVC pipes is recommended.

5.4.6 Site 6

One nonstructural measure and one structural measure are recommended for Site 6 (Old Utility Yard).

- Redirect surface flow: this alternative requires the construction of berms to direct runoff and to replace temporary hay bales. (See Section Six for concept design.)
- Mowing maintenance plan: reduce mowing due to the existing infiltration basins and graves.

5.4.7 Site 7

Two nonstructural measures and two structural measures are recommended for Site 7:

- Stream restoration/stabilization: this alternative involves implementing stream restoration measures for eroded stream banks. (See Section Six for concept design.)
- Redirect surface flow: this alternative requires developing a solution to effectively handle concentrated flow from the nearby residential property.
- Aeration and turf seeding

- Conveyance improvements: periodic removal of debris from the stream and yard inlets is recommended.

5.4.8 Site 8

Recommendations for the Oakland Baptist Cemetery property are discussed in Section 5.3.

5.4.9 Site 9

Two nonstructural measures and two structural measures are recommended for Site 9:

- Level spreader: this alternative requires the implementation of a level spreader at the culvert outlet to prevent concentrated flow.
- Redirect surface flow: this alternative requires the construction of a berm to direct runoff around playground area before the playground is relocated to a different location.
- Aeration and turf seeding
- Conveyance improvements: periodic removal of sediment and debris at yard inlets is recommended.

5.4.10 Site 10

One nonstructural measure and one structural measure are recommended for Site 10:

- Increase culvert capacity: Increase the capacity of the 15 inch culvert.
- Aeration and turf seeding

5.4.11 Site 11

One nonstructural measure is recommended for Site 11:

- Community outreach: Conduct outreach activities with residents to prevent pollutants from entering the storm drain system.

5.4.12 Site 12

One nonstructural measure and two structural measures are recommended for Site 12:

- Level spreader: this alternative requires the implementation of a level spreader at the culvert outlet to prevent concentrated flow.
- Aeration and turf seeding
- Conveyance improvements: periodic removal of sediment and debris from inlets is recommended.

5.4.13 Site 13

Two nonstructural measures and one structural measure are recommended for Site 13:

- Level spreader: this alternative requires the implementation of a level spreader at the culvert outlet to prevent concentrated flow.
- Aeration and turf seeding
- Conveyance improvements: periodic removal of sediment and debris from inlets is recommended.

5.4.14 Site 14

Two nonstructural measures are recommended for Site 14:

- Aeration and turf seeding
- Conveyance improvements: periodic removal of sediment and debris from inlets is recommended.

5.4.15 Site 15

Two nonstructural measures and one structural measure are recommended for Site 15:

- Increase culvert capacity: Increase the capacity of the 15 inch culvert.
- Aeration and turf seeding
- Conveyance improvements: periodic removal of sediment and debris from inlets is recommended. A slight re-grading and the removal of the telephone pole at the upstream culvert are also recommended.

5.4.16 Site 16

One nonstructural measure is recommended for Site 16:

- Redirect surface flow: this alternative requires developing a solution to effectively handle concentrated flow from the nearby residential property.

SECTION SIX: RECOMMENDED CAPITAL IMPROVEMENT PROJECTS AND COST ESTIMATES

This section provides the concept design for the recommended capital improvement projects to address the flooding and erosion issues and improve the drainage on selected sites. The specific recommendations set forth in this section should be considered as conceptual only. Additional details and potential alternatives should be investigated and analyzed in the preliminary engineering phase of final project designs.

6.1 STORMWATER FILTER (SITE 3)

6.1.1 Existing Site Description

Sedimentation is occurring at the outfall 150 feet east of the Fort Ward Park Museum (Site 3). The flow at the outfall is made up of runoff from the 5-acre forested area south of Braddock Road and approximately 1 acre of Braddock Road. An 18-inch reinforced concrete pipe conveys water from Braddock Road to the outfall. The pipe was found to be adequate to convey the 25-year flood event as long as the pipe was not blocked by sediment. This site is the only area in the Park where offsite runoff enters and flows through the Park. The outfall is close to two parking lots and the museum, so it is considered a medium- to high-visibility area. The soils from the pipe inlet to the outfall are composed of hydrologic soil group D soils, which are poorly drained with low infiltration rates and high clay content.

6.1.2 Proposed Design

The primary goal for the proposed design is to improve the water quality of runoff at the Park. The secondary goal is to provide a solution that the community will accept while not detracting from the aesthetics of the Park. It is recommended that the existing sediment and debris within the outfall be removed prior to the implementation of any structural improvements at this location.

Existing Site 3 Outfall

The proposed retrofit to the Site 3 outfall is to install an underground stormwater filter beneath the parking lot southeast of the museum (Figure 6). Excavation of a portion of the parking lot is necessary and excess soil needs to be hauled offsite. The existing 18-inch reinforced concrete pipe would be cut in place and reconfigured and connected to the underground stormwater filter unit.

A filter such as the Contech StormFilter is recommended for adequate removal of sediment and other stormwater pollutants (including Phosphorous). Figure 7 shows a standard detail of this model. Within the StormFilter unit there is a bypass structure for overflow, pre-treatment to capture sediment, and filters to treat stormwater. Following installation, the excavated area of the

parking lot would need to be resurfaced and regraded. More detailed calculations are needed for final design. Preliminary calculations used for conceptual design are provided in Appendix D.

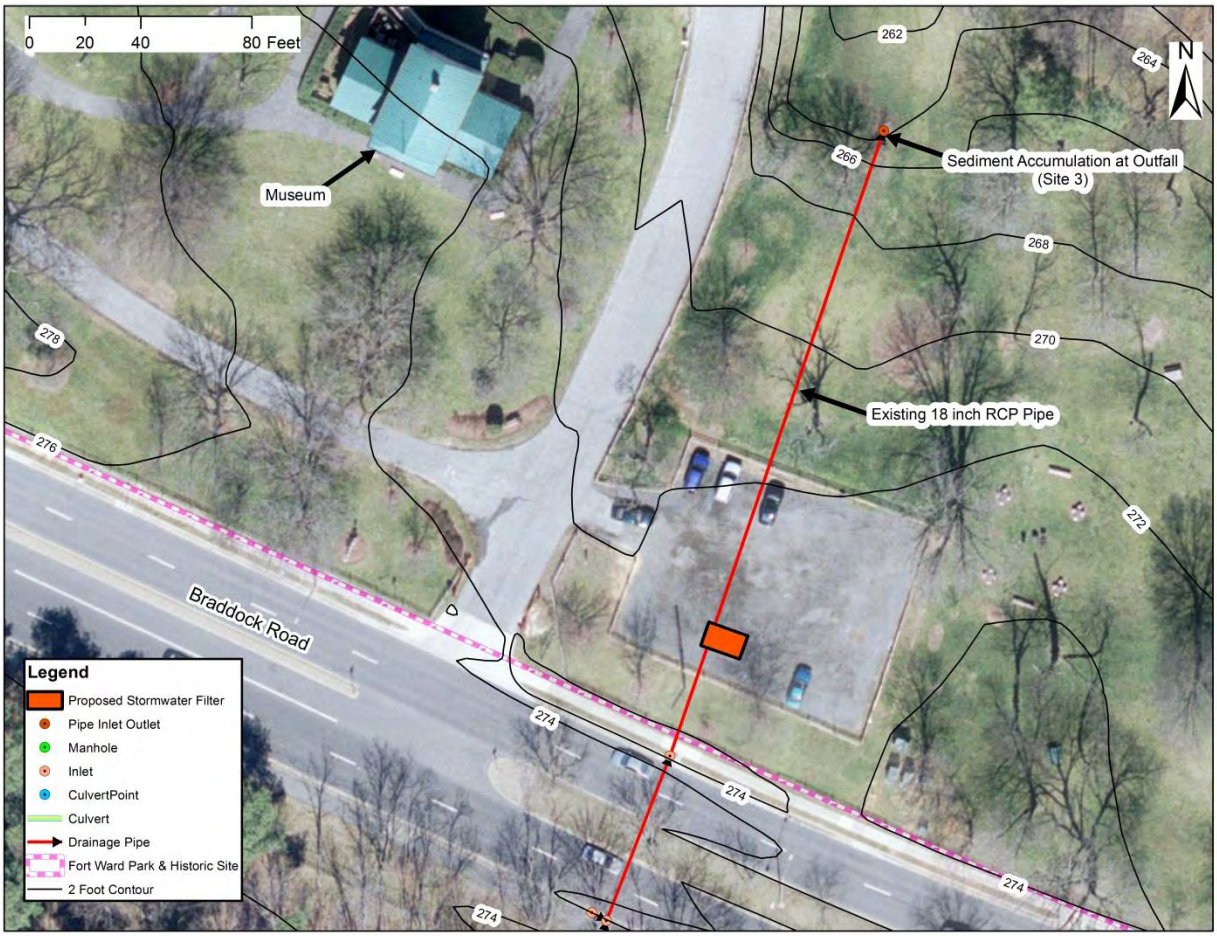

Figure 6: Proposed Stormwater Filter Concept Design

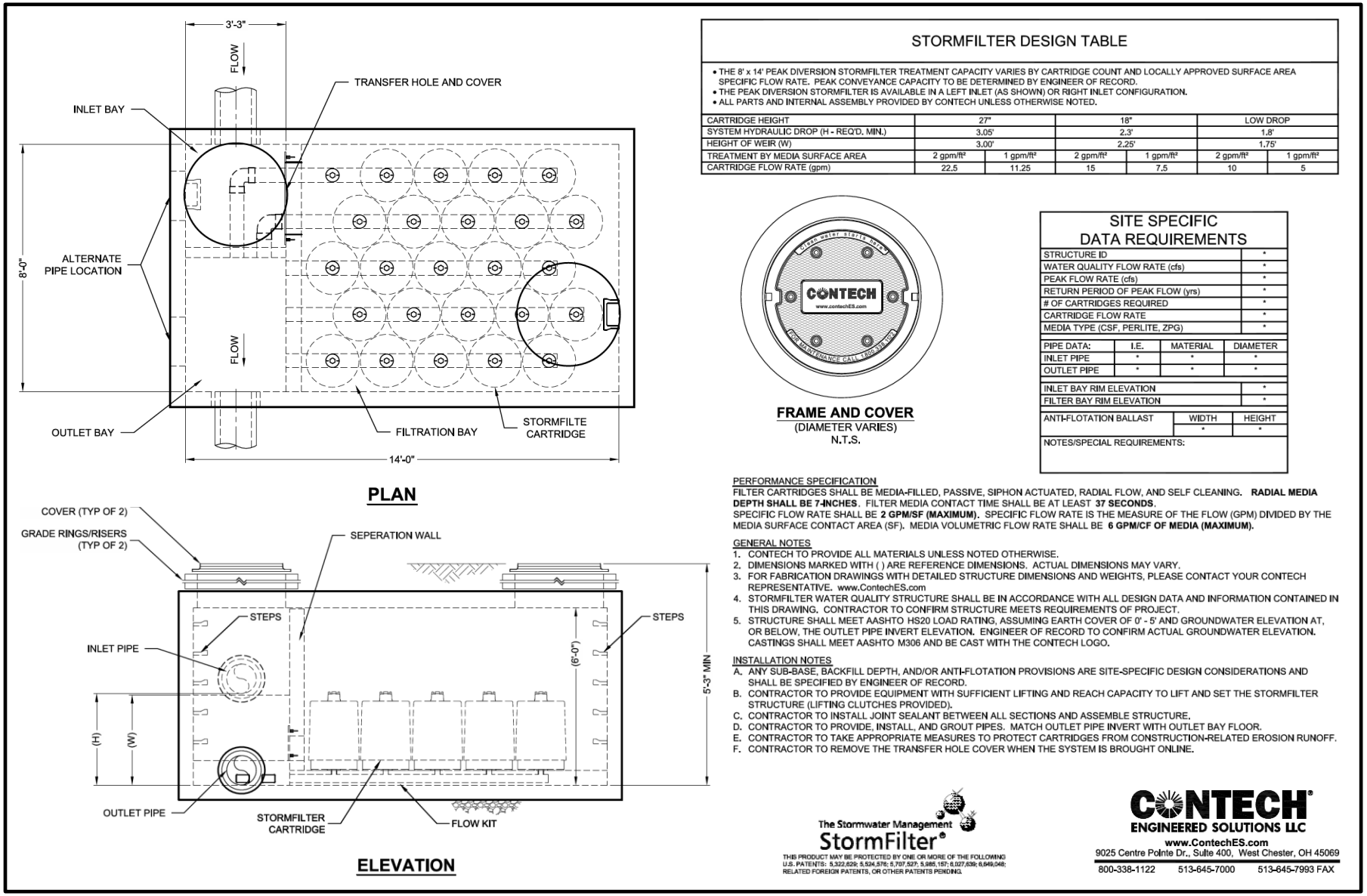

Figure 7: Stormwater Filter Example Standard Detail: Peak Diversion StormFilter

6.1.3 Improvements and Benefits

The current drainage system is adequate for water conveyance, but not water quality. A stormwater filter would intercept fine sediment, oil, floating debris, sinking debris, and nutrients. A StormFilter with twenty filter cartridges is rated to treat up to 1 cfs, which is sufficient to meet Virginia requirements for stormwater filters. Stormwater filters have emergency spillways allowing safe conveyance of up to the 100-year storm, although excess water would not be treated. The proposed retrofit would improve aesthetics by reducing sediment, debris, and pollutant loading into the Park.

6.1.4 Project Design Considerations

The proposed design is consistent with the Four Mile Watershed design guidelines, as well as the Amendment to the City of Alexandria Article XIII Environmental Management Ordinance. The design would involve the installation of a stormwater filter. In order for maintenance access the stormwater filter needs to be installed in or adjacent to the parking lot. Several trees would have to be removed if the filter were installed to the north or south of the parking lot. Construction in the proposed location would require excavation within the existing parking lot and would not impact existing trees. The amount of parking at the Park would be temporarily impacted during construction.

The proposed stormwater filter would detract from the Park aesthetically during construction, but would neither be visible nor take up valuable park space following completion. This is one of the benefits compared to a retention pond or bio-swale, for which more space would be needed.

6.1.5 Feasibility

Construction access to the parking lot will be available through the main entrance on Braddock Road. The parking lot is located near the entrance, so the Park Loop Road would not be impacted. No utilities are expected to be impacted, although further coordination with the City will be needed during detailed design for confirmation.

The environmental impacts of the proposed design would not be substantial as long as construction occurred in the parking lot. The trees on either side of the parking lot would be impacted if the stormwater filter were installed in the grass areas north or south of the proposed location. There would be a temporary loss of public parking during construction at the proposed location. Temporary fences and barriers would be required for safety.

The site is located within a High Cultural Resource Protection area as specified by the Alexandria Archeology Office of Historic Alexandria. Therefore, an archeological investigation at the site is required prior to or in conjunction with construction. The proposed concept design could occur concurrently or prior to installation of pervious pavement for the parking lot if desired by the City.

Routine inspection and maintenance would be required for the proposed stormwater filter. Cleaning would be required during dry periods to remove the sediment and debris that were retained. To clean the cartridges workers must enter the vault and remove cartridges for cleaning above ground. A

maintenance plan is recommended to ensure that the unit would continue to function as it was designed. Permitting and regulations are discussed in Section Seven.

6.2 DIVERSION BERM AROUND CEMETERY (SITE 6)

6.2.1 Existing Site Description

Runoff from the utility yard (Site 6) to the Oakland Baptist Cemetery (Site 8) is eroding the cemetery site. Temporary practices including hay bales, trenches, culverts, and a catch basin are in place to control runoff (Figure 3). The drainage area includes 0.2 acre of developed area (driveways and buildings) and 1.5 acres of grass or bare earth. The utility yard and the cemetery are composed of hydrologic soil group D soils, which are poorly drained with low infiltration rates and high clay content.

Existing Site 6 Hay Bales

6.2.2 Proposed Design

The primary goal for the proposed design is to limit erosion and nuisance flooding at the Oakland Baptist Cemetery. The secondary goal is to provide a permanent solution that will have community acceptance and look more aesthetically appealing than the current hay bale practice.

The proposed site improvements are two permanent earthen diversion berms to direct runoff from the utility yard to a catch basin. Figure 8 displays the proposed location of the two diversion berms. The northern berm keeps runoff from entering the cemetery while the southern berm keeps runoff from the road off the site and provides additional protection on the grave sites outside of and south of the cemetery from upstream runoff. The berm would follow the natural slope (4 percent) south of the Oakland Baptist Cemetery. The proposed berm would be approximately 1.5 feet tall, with a minimum 2:1 side slopes (depending on obstructions), and would be 1 foot wide at the top (Figure 9). Erosion protection matting would extend from the base of the berm to the existing grade, and the upstream face would be protected using erosion protection matting or other erosion prevention measures (see Figure 9). The remainder of the berm would be made up of fill. The entire berm can be seeded with grass unless an impervious material is required to protect the berm slope instead of erosion protection matting. There are several potential options for the protected slope including erosion control matting, porous pavers, or riprap.

For the proposed design both diversion berms lead to a catch basin (yard inlet) that is connected to a 12-inch reinforced concrete pipe (Figure 8). The pipe would extend from the catch basin to the stream with outlet protection to reduce flow velocity. Outlet protection options include stone (e.g., riprap), a level spreader, and a concrete structure. Preliminary calculations are available in Appendix D.

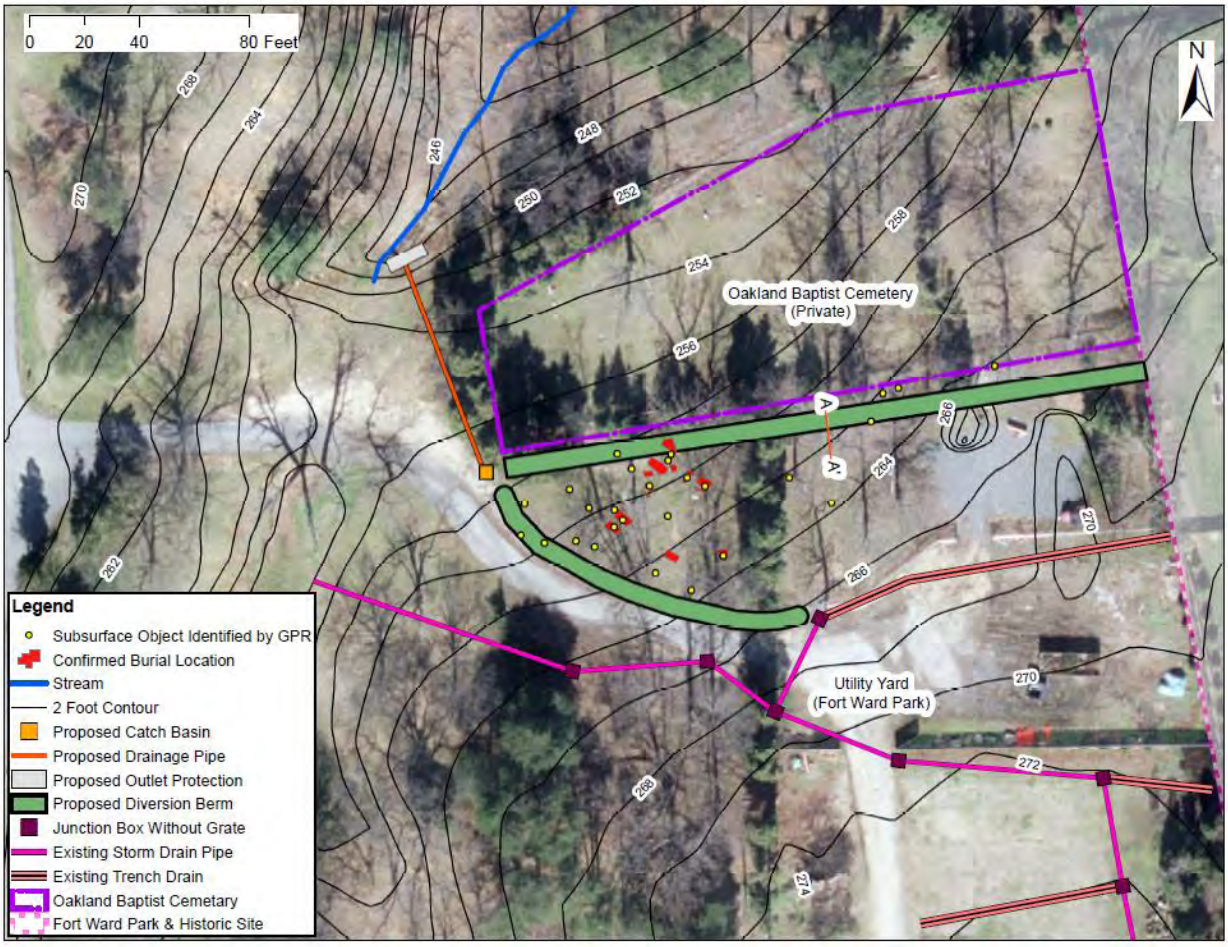

Figure 8: Proposed Diversion Berm Concept Design

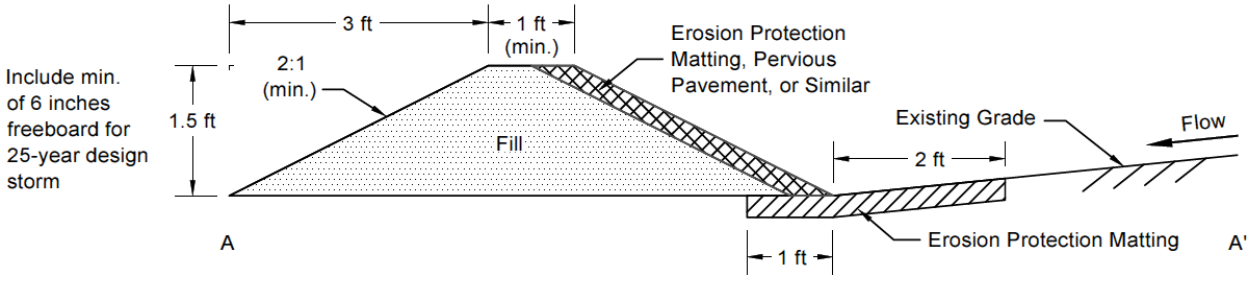

Figure 9: Proposed Diversion Berm Concept Design Cross-Section A – A'

6.2.3 Improvements and Benefits

The temporary drainage solutions at the utility yard require a more permanent upgrade to direct runoff away from sensitive areas. The berms would direct sheet flow into concentrated flow with erosion preventative measures (e.g., the erosion protection matting). Runoff from the Park would no longer have access to Oakland Baptist Cemetery. The catch basin and drainage pipe would direct

runoff from the site directly into the stream, alleviating some of the sedimentation concerns at the road (Site 5).

6.2.4 Project Design Consideration

The proposed design involves bringing fill and erosion protection matting onsite and creating two diversion berm segments. The proposed design also requires the installation of a catch basin, drainage pipe, and outlet protection. The site would need to be cleared of debris and some vegetation would need to be trimmed or removed. The design is flexible so most trees should be avoidable, although it is possible that some trees may need to be removed and replaced. Construction of the berm would require compaction, as well as seeding with grass or other vegetation. Installation of the underground drainage solution would require excavation, placement of the drainage structures, backfill, and seeding grass. Construction of the proposed concept design would affect the public when construction was occurring near the unpaved road, and when trucks were hauling soil into the area.

The site is located within a Maximum Cultural Resource Protection area as specified by the Alexandria Archeology Office of Historic Alexandria. There are several confirmed burial sites and potential burial sites that have been identified in the area surrounding the proposed berms (Figure 8). Due to the confirmed and potential burial sites, digging south of Oakland Baptist Cemetery is not considered to be an option. Due to this constraint, below-ground techniques that otherwise may have been suitable for the site (e.g., wet swales, infiltration trenches, and stormwater pipes) were not considered to replace the hay bales. These below-ground techniques also would have been complicated by the large numbers of trees in the area. There are no confirmed burial sites west of the Oakland Baptist Cemetery where the drainage pipe has been proposed. Careful archeological study will need to occur prior to construction to verify that no historical artifacts or burials would be impacted by the design. Above ground techniques were not suitable for this area because they would interfere with public access to the Oakland Baptist Cemetery.

6.2.5 Feasibility

Construction access to the proposed site will be available through Fort Ward Park Loop Road via Braddock Road. The proposed construction site would be located near the southeastern Fort Ward Park entrance so the Park Loop Road would not be significantly impacted by construction traffic. No utilities are expected to be impacted, although further coordination with the City would be needed during detailed design for confirmation.

The environmental impacts of the proposed design primarily involve potential impacts to trees north of the berm. These impacts will need to be considered during final design, and most of the trees should be avoidable. The public would temporarily lose access to a small portion of the Park, and temporary fences or barriers could be necessary to keep the public out of construction areas. An archeological investigation will be required prior to or in conjunction with construction.

Routine maintenance would be required for the proposed berms. This maintenance would include seeding grass, clearing of debris, and occasional visual inspections. The catch basin would also need to be cleaned periodically. Permitting and regulations are discussed in Section Seven.

6.3 STREAM STABILIZATION (SITE 7)

6.3.1 Existing Site Description

Bank erosion is occurring along the intermittent stream (Site 7) northeast of the Oakland Baptist Cemetery. The banks are incised, and a significant amount of sediment is accumulating at the northern segment of the stream prior to entering the closed storm drain system. The drainage area consists of 2 acres of developed area (roads and buildings) and 18 acres of undeveloped area (grass and brush). The area surrounding the stream is composed of hydrologic soil group D soils, which are poorly drained with low infiltration rates and high clay content, as noted previously. The material within the stream is coarser, but the grain size distribution has not been determined. The existing stream slope is approximately 6 percent on average and is greater than 7 percent at some locations.

6.3.2 Proposed Design

The primary goal for the proposed design is to limit erosion and sedimentation along the intermittent stream northeast of Oakland Baptist Cemetery. The secondary goal is to provide a solution that will have community acceptance and look more aesthetically appealing than the current incised channel.

The proposed site improvement is a stream stabilization, including the replacement of the two yard inlets at the downstream boundary of the stream reach. The proposed stream stabilization strategy is to connect the channel to its floodplain and add a step-pool configuration for improved channel stability and function. The Virginia Stream Restoration & Stabilization Best Management Practices Guide (2004) was used to estimate the geometry and spacing of the step-pool configuration. Based on the estimated channel conditions (without survey), seven steps are expected at approximately 50-foot intervals. The steps would have heights varying from 0.5 to 1.5 feet and would be preceded by pools that are approximately 10 feet long. The proposed stream slope would be approximately 4 percent as a result of the elevation drops from step-pool geometry. The step-pools would require Class II rip-rap or equivalent, and fill would be required for most of the stabilization reach. For this application, it is recommended that more aesthetic rocks, such as river rocks, be utilized. Figure 10 show the layout of the improvements and Figure 11 shows a conceptual cross-section of the nonstructural locations for the concept design. Figure 12 shows a conceptual cross-section for the steps and pools for the concept design. The final stabilization design is not expected to be trapezoidal; however, it was assumed for concept-level design purposes. The two damaged yard inlets north of the restoration reach will be replaced with standard yard inlets.

Both stream restoration and stream stabilization are complex because of the dynamic nature of streams. Detailed survey and analysis will be necessary prior to detailed design. Preliminary calculations that were used to estimate the appropriate stabilization design are available in Appendix D.

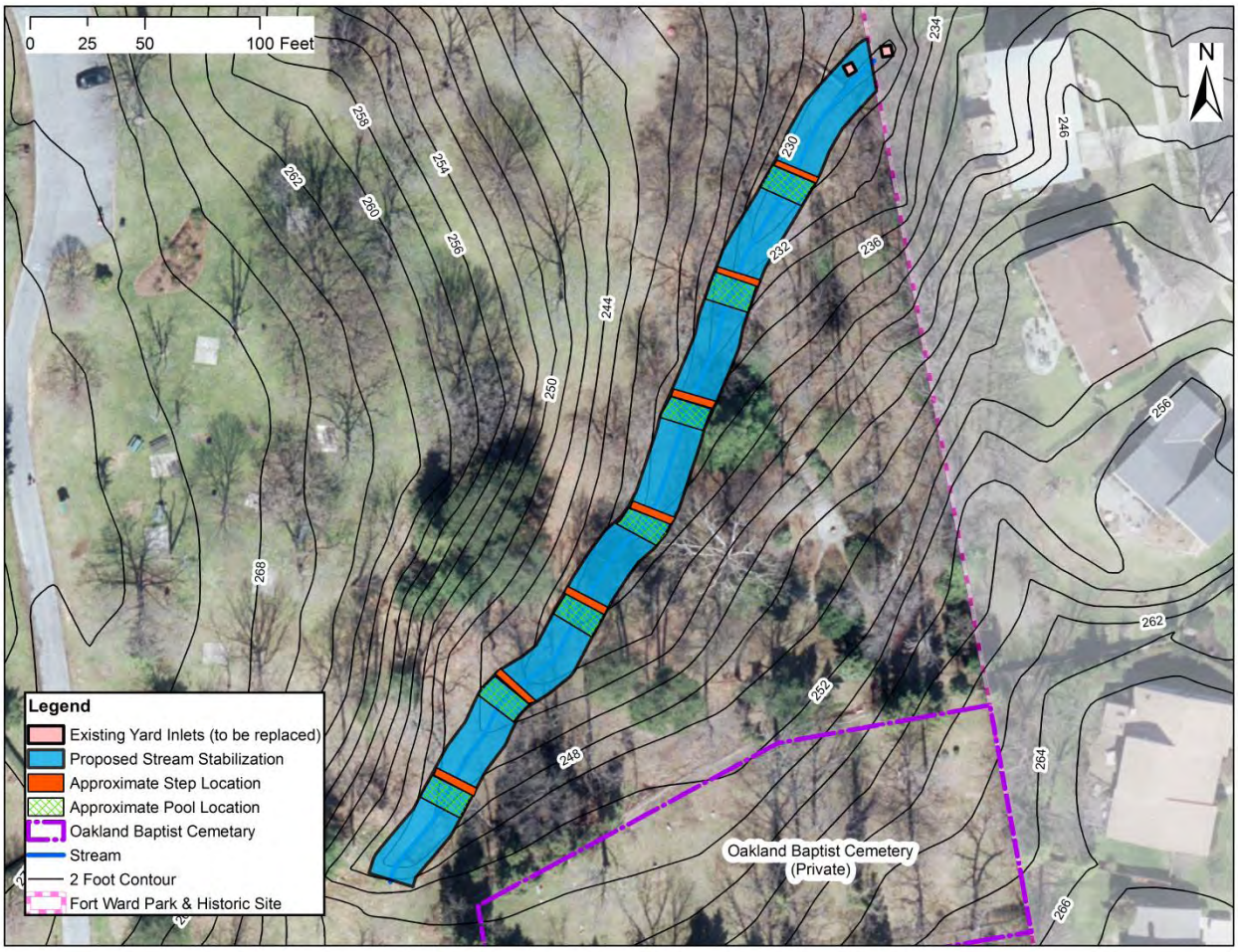

Figure 10: Proposed Stream Stabilization Concept Design

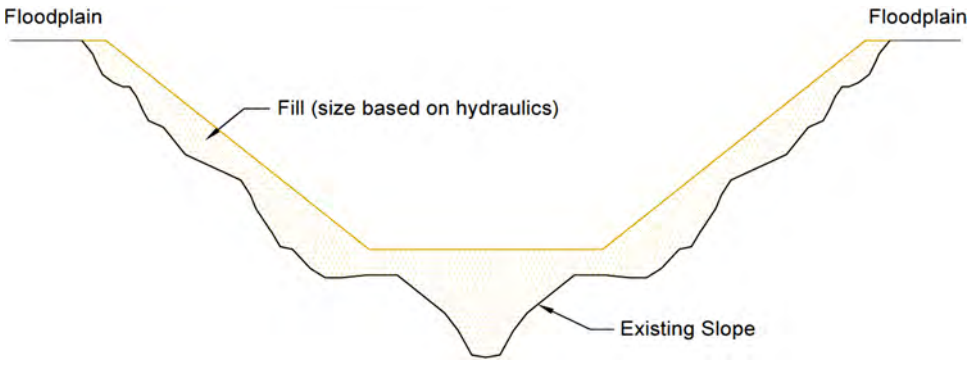

Figure 11: Typical Cross-Section Concept Design (Not to Scale)

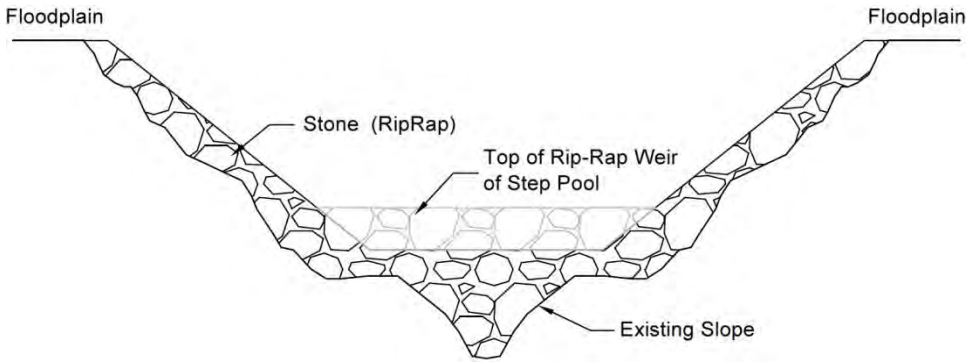

Figure 12: Step-Pool Cross-Section Concept Design (Not to Scale)

6.3.3 Improvements and Benefits

Incised stream banks indicate that a stream is not in a stable state. Without intervention, the stream condition is expected to continue to degrade with time. If the proposed stream stabilization occurs, the banks would be stabilized due to the addition of stone structures, lower channel slope, and an increase in channel roughness (due to the steps and pools). Pools would also allow for settling of fine particles, as well as providing potential habitat. Replacing the yard inlets would improve conveyance from the stream to the existing stormwater network.

Stream stabilization substantially improves the aesthetics of urban streams, and is often well received by the public. An educational sign is recommended to explain why stabilization occurred, as well as the benefits to a healthy stream.

6.3.4 Project Design Considerations

The proposed stream stabilization requires stone and sediment to be brought onsite. The installation of the elevated step-pool configuration would occur in the stream followed by the addition of fill to connect the channel to its floodplain. Pump-around diversion will be required to temporarily pump base flow around segments of the stream channel that are under construction.

Several other options were considered for stabilization design. These include connecting the bank to the channel by creating inset floodplains (cutting into the bank instead of raising the channel). The site is located within a Maximum Cultural Resource Protection area as specified by the Alexandria Archeology Office of Historic Alexandria due to potential burial sites in the area. Because of its location in the Maximum Cultural Resource Protection area, stream or bank excavation is not an option. Other stream structures including cross-vanes and log drops were also considered, but they generally require more excavation than step-pools.

Replacing the existing yard inlets would require excavation of the current inlets and hauling of the excess material offsite. The new yard inlets would also need to be installed and connected to the existing stormwater network.

6.3.5 Feasibility

Construction access to the proposed stream stabilization site would be available through Fort Ward Park Loop Road via Braddock Road. It will be necessary to drive on grass from the Park Loop Road. No utilities are expected to be impacted, although further coordination with the City would be needed during detailed design for confirmation.

The site is located within a Maximum Cultural Resource Protection area as specified by the Alexandria Archeology Office of Historic Alexandria due to potential burial sites in the area. Therefore, an archeological investigation at the site is required prior to or in conjunction with construction. Ideally, no trees would be removed during the stabilization process, but it is possible that some may need to be removed or relocated. It is also possible that trees could be damaged as a result of equipment. Trees may be planted following the stream restoration to help meet the City of Alexandria's Urban Forestry Plan goal of 40 percent tree cover over the City. Sediment control practices will have to be implemented during construction to avoid negatively impacting downstream waters.

The area surrounding the stream stabilization site will need to be temporarily closed off to the public. Fencing and signs may be necessary to keep park visitors from accessing the construction areas. Once the stabilization is complete, periodic inspection would be required to verify that there was not substantial movement of channel aggregate. In the two years following stream stabilization, some steps and pools typically require slight adjustments to function efficiently in the long term. Permitting and regulations are discussed in Section Seven.

6.4 COST ESTIMATE

Costs have been estimated for each of the proposed improvements described in sections 6.1-6.3.

The cost estimate described below should be considered as planning level only, and should be updated and refined with preliminary engineering and final project design.

The estimated costs for the proposed stormwater filter are shown in Table 7. The unit cost for the stormwater filter unit and installation was based on correspondence with Contech for the StormFilter. The remaining unit costs are from the Fairfax County Land Development Services 2013 Comprehensive Unit Price document as requested by the City of Alexandria.

Table 7: Stormwater Filter Concept Design Estimated Costs (Site 3)

Item	Quantity	Units	Unit Cost	Total
Excavation	70	CY	$23.36	$1,635.20
StormFilter Filtration System	1	EA	$60,000.00	$60,000.00
StormFilter Installation	1	EA	$15,000.00	$15,000.00
Restore Parking Area	30	SY	$35.04	$1,051.20
Mobilization	1	EA	$10,000.00	$10,000.00
CY = Cubic Yard		Initial Project Costs		$87,686.40
EA = Each		Maintenance	25%	$21,921.60
SY = Square Yard		Erosion and Sediment Control	20%	$17,537.28
		Subtotal 1		$127,145.28
		Contingency	25%	$31,786.32
		Subtotal 2		$158,931.60
		Engineering		$40,000.00
		Total		**$198,931.60**

The estimated costs for the proposed diversion berm concept design are shown in Table 8. The unit costs are from the Fairfax County Land Development Services 2013 Comprehensive Unit Price document as requested by the City of Alexandria.

Table 8: Diversion Berm Concept Design Estimated Project Costs (Site 6)

Item	Quantity	Units	Unit Cost	Total
Fill	100	CY	$23.36	$2,336.00
Excavation	30	CY	$29.20	$876.00
Erosion Control Matting	400	SY	$1.87	$748.00
Grading	700	SY	$0.90	$630.00
Clearing / Grubbing	1	AC	$7,006.50	$7,006.50
Tree Planting	5	EA	$525.49	$2,627.45
Catch Basin (Yard Inlet)	1	EA	$5,464.37	$5,464.37
12" Reinforced Concrete Pipe	80	LF	$47.88	$3,830.40
Outlet Protection (RipRap)	5	SY	$56.05	$280.25
Grass Seeding and Fertilizer	1000	SY	$2.34	$2,340.00
Mobilization	1	EA	$10,000.00	$10,000.00
AC = Acres		Initial Project Costs		$36,138.97
CY = Cubic Yard		Berm Maintenance	25%	$9,034.74
EA = Each		Erosion and Sediment Control	20%	$7,227.79
LF = Linear Feet		Subtotal 1		$52,401.51
SY = Square Yard		Contingency	25%	$13,100.38
		Subtotal 2		$65,501.88
		Engineering		$50,000.00
		Total		**$115,501.88**

The estimated costs for the proposed stream stabilization are shown in Table 9. The unit cost for step-pools is from the Virginia Stream Restoration & Stabilization Best Management Practices Guide (2004). The remaining unit costs are from the Fairfax County Land Development Services 2013 Comprehensive Unit Price document as requested by the City of Alexandria.

Table 9: Stream Stabilization Concept Design Estimated Project Costs (Site 7)

Item	Quantity	Units	Unit Cost	Total
Step Pools (Stone and Labor)	410	Ton	$50.00	$20,500.00
Fill	350	CY	$23.36	$8,176.00
Grading	1000	SY	$0.90	$900.00
Clearing / Grubbing	1	AC	$7,006.50	$7,006.50
Tree Planting	5	EA	$525.49	$2,627.45
Yard Inlet	2	EA	$5,736.69	$11,473.38
Dispose of Existing Yard Inlet	10	CY	$40.88	$408.80
Temporary Pump Around	2	Month	$11,677.00	$23,354.00
Mobilization	1	EA	$10,000	$10,000.00
		Initial Project Costs		$84,446.13
		Step-Pool Maintenance	25%	$21,111.53
		Erosion and Sediment Control	20%	$16,889.23
		Subtotal 1		$122,446.89
		Contingency	25%	$30,611.72
		Subtotal 2		$153,058.61
		Engineering		$50,000.00
		Total		**$203,058.61**

AC = Acres
CY = Cubic Yard
EA = Each
SY = Square Yard

SECTION SEVEN: PERMITTING REQUIREMENTS AND FUTURE REGULATIONS

7.1 FEDERAL REGULATIONS

7.1.1 General

The Clean Water Act (CWA) of 1972 and its amendments are the primary federal law that protects "navigable waters" of the U.S. from water pollution. Titles III and IV of CWA discuss EPA's Water Quality Standards (WQS) program and the National Pollutant Discharge Elimination System (NPDES) program.

CWA gives individual states the authority to implement CWA on all lands including federal property. In Virginia, the Virginia Department of Environmental Quality (DEQ) is responsible for issuing NPDES construction activity permits and NPDES Small Municipal Separate Storm Sewer System (MS4) permits. The terminology in Virginia is slightly different: the NPDES program is called the Virginia Pollutant Discharge Elimination System (VPDES) program and the NPDES permits are called Virginia Stormwater Management Program (VSMP) permits.

When activities require discharge of dredged or fill material into Waters of the U.S., a permit authorized by the U.S. Army Corps of Engineers (USACE) pursuant to section 404 of the Clean Water Act (CWA) (33 U.S.C. 1344) and a Virginia Water Protection permit Section 401 Certification must be obtained prior to conducting work.

7.1.2 Total Maximum Daily Loads (TMDLs) and Waste Load Allocations

Title III of the CWA discusses the federal WQS program. States are responsible for setting WQS by designating uses for each water body (e.g., drinking water use, primary contact/swimming use, fishing use, shell-fishing use, and aquatic life use) and applying water quality criteria to protect the designated uses.

TMDLs, which are the maximum amounts of pollutants that a water body can receive and still meet WQS, are developed for impaired waters listed in the 2012 Virginia 305(b)/303(d) Waster Quality Assessment Integrated Report. The TMDL applicable to Fort Ward Park is shown in Table 10.

Table 10: Impairments of Nearby Waterbodies from the 2012 Virginia 305(b)/303(d) List

Associated Waterbody	Pollution Status	Cause for Impairment	Source
Four Mile Run	Impaired	E. Coli	Illicit connections/hook-ups to storm sewers Wastes from pets Waterfowl

Source: Virginia Environmental GIS dataset "2012 Draft Water Quality Assessment GIS Applications" available at: http://www.deq.virginia.gov/ConnectWithDEQ/VEGIS/2012DraftWQMAssessmentGISApplications.aspx

A bacteria TMDL for the Four Mile Run watershed was completed and approved in 2002.

The TMDL implementation plan was approved in 2004, which called for "proper pet waste disposal." The Park is in compliance with the implementation plan since it has a pet waste station at the dog exercise area. This is the only dog exercise area within the non-tidal Four Mile Run watershed.

7.1.3 Approvals for Bank Stabilization Projects

USACE issued Nationwide Permit 13 (NWP 13) for bank stabilization projects on February 21 2012. NWP (13) authorizes bank stabilization up to 500 feet in length and up to 1 cubic yard of material per running foot placed along the bank below the plane of the ordinary high water mark. The recommended bank stabilization project in Section Six is less than 500 feet long. Therefore, no additional permitting is required from USACE.

A Virginia Water Protection Permit is required for bank stabilization projects, and the City needs to submit the Virginia Joint Permit Application to the Virginia Marine Resources Commission, which serves as the clearinghouse for Federal and State wetland and waterway permits.

7.2 STATE REGULATIONS

Legislation passed by the 2012 General Assembly integrated and consolidated components of the Erosion and Sediment Control (ESC) Act, the Stormwater Management Act, and the Chesapeake Bay Preservation Act so that these regulatory programs could be implemented in a consolidated and more consistent and efficient manner. The new regulations were approved by the Board of Conservation and Recreation on September 28, 2012, and became effective on November 21, 2012.

During construction, a land disturbance permit may be required for ESC. These permits are issued by localities as part of their ESC program. A stormwater permit may be required to discharge stormwater from a construction activity. Such a permit may also be required to discharge stormwater through a stormwater conveyance system owned or operated by a government entity. DEQ administers these stormwater permits under the VSMP Permit Regulations, authorized by the Virginia Stormwater Management Act. As mandated by CWA and the Code of Federal Regulations, federal permitting requirements have been incorporated into the VSMP permit regulations.

7.2.1 General Permit for Discharge of Stormwater from Small Municipal Separate Storm Sewer System (MS4)

Under the VSMP permit regulations, the City is required to control stormwater pollution to the maximum extent practicable and to develop a pollution prevention plan – known as a Municipal Separate Storm Sewer System (MS4) Program Plan. The current MS4 permit for the City is valid from July 1, 2013 to June 30 2017.

7.2.2 General Permit for Discharge of Stormwater from Construction Activities (VAR10)

The Virginia DEQ administers VSMP's General Permit for Discharges of Stormwater from Construction Activities. The General VSMP Permit authorizes stormwater discharges from the following types of land-disturbing activities at Fort Ward Park:

- Operators of construction activities resulting in land disturbance equal to or greater than one acre;
- Construction activities with land disturbance less than one acre that are part of a larger common plan of development or sale that disturb one or more acres. A larger common plan of development or sale is a contiguous area where separate and distinct construction may be taking place at different times on different schedules.

To be in compliance with the general permit, it is necessary to follow the steps listed below. In most cases, construction projects at the Park will be contracted out; however, the City of Alexandria is ultimately responsible for ensuring that a Stormwater Pollution Prevention Plan (SWPPP) is written and implemented for all regulated construction activities, and that construction activities are properly registered.

- Prepare a Registration Statement
- Prepare a site-specific SWPPP
- Apply for permit coverage
- Conduct construction in accordance with the permit and SWPPP
- Submit a notice of termination after construction is complete

A registration statement (Form DEQ199-146) and fee form (DEQ199-213) must be completed and submitted to the State along with the appropriate fee payment.

The SWPPP must be prepared prior to submitting a registration statement for permit coverage. The SWPPP is to be retained at the construction site along with a copy of the permit and permit coverage letter.

7.3 CITY OF ALEXANDRIA PERMIT REQUIREMENTS

Currently, the City plans to amend the Environmental Management Ordinance (EMO) and the Erosion and Sediment Control Ordinance to comply with several new regulatory requirements. The proposed EMO is available on the City website (http://www.alexandriava.gov/tes/oeq/info/default.aspx?id=3844) and the first hearing is scheduled for March 11, 2014.

No land-disturbing activities may commence until the final site plan is approved by the City and a state construction general permit has been issued.

7.3.1 Floodplain

The Park does not have lands designated as Federal Emergency Management Agency (FEMA) floodplains.

7.3.2 Chesapeake Bay Preservation

The Park does not have lands designated as a Chesapeake Bay Preservation Area.

7.3.3 Maintenance of Traffic (MOT) Permit

The City requires a permit on any work in the public right-of-way (street, grass strip [area between the sidewalk and the street], sidewalk, public alleys). Types of work that require a permit includes: placing a ladder and/or scaffolding on the sidewalk; closing the sidewalk; crossing the curb, gutter, and sidewalk with heavy equipment, a dumpster, or a crane; lane closure; stockpiling materials in the public right-of-way; trailer in the public right-of-way; temporary fence in the public right-of-way; hauling construction debris, materials, or equipment; excavation in the public right-of-way; and special events such as a block party, foot race/walk-a-thon, or parade/procession.

City code definition of "street" [see code section 1-1-5(13)] - The word "street" shall include avenues, boulevards, highways, roads, alleys, lanes, viaducts, bridges and the approaches thereto and all other public thoroughfares in the city and shall mean the entire width thereof between abutting property lines; it shall be construed to include a sidewalk or footpath, unless the contrary is expressed or unless such construction would be inconsistent with the manifest intent of the council.

A permit for work in/use of the public right-of-way should be applied for 5 business days prior to the start of the work. A drawing will be required showing the location of the work/use and equipment, together with a maintenance of traffic plan.

SECTION EIGHT: CONCLUSIONS

Fort Ward Park is susceptible to nuisance flooding and erosion due to overland flow and flooding. URS conducted a field reconnaissance and examined 16 sites at the Park to evaluate the existing conditions and identify potential measures to improve drainage and reduce sedimentation. URS also performed hydrologic and hydraulic analyses to verify the capacity of the existing stormwater systems. Most culverts are designed to convey 25-year storm events, provided routine maintenance is performed.

This report summarizes the drainage improvement recommendations based on the field observations, engineering calculations, and community input. The most frequent recommendations for the 16 sites evaluated by URS were for nonstructural improvements. These include turf seeding, soil aeration, and routine maintenance. Structural improvements were also recommended at some of the sites, including at the locations of the three proposed concept designs. The concept designs include a stormwater filter, stream stabilization, and a diversion berm.

SECTION NINE: REFERENCES

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National Trust for Historic Preservation
http://www.preservationnation.org/resources/find-funding/

Research Grant Guides
www.researchgrant.com

Preservation Virginia
http://preservationvirginia.org/

Saving Graves
http://www.savinggraves.net/

Appendix A
Public Meeting Presentations

Fort Ward Park Master Drainage Plan

Prepared for City of Alexandria

Presented by URS Corporation

June 12, 2013

Introductions – URS

Zhongyan Xu, PhD, PE

Project Manager

Mary Roman, PE

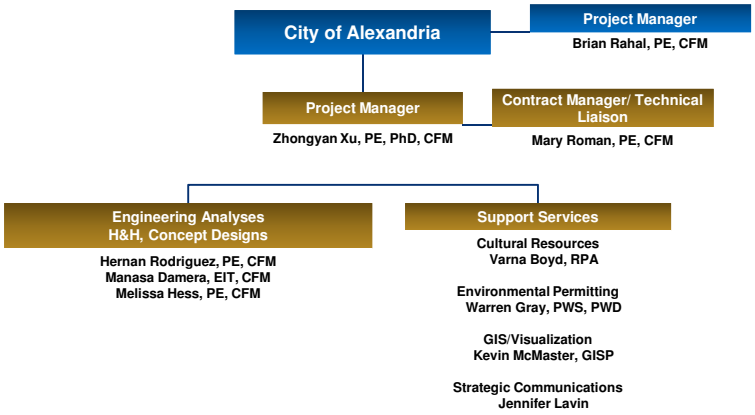
Contract Manager/Technical Liaison

Agenda

- Team Organization
- Project Goals and Objectives
- Project Work Plan
- Project Schedule

URS | Team Organization

Project Organization



URS Approach

- National leader in water resources with local expertise
- Dedicated project team members with required planning, regulatory, and engineering expertise
- Results oriented approach:
  - Objective prioritization of problems and solutions
  - Effective assessment of drainage issues
  - Experience with a wide range of cost effective drainage solutions
  - Efficient concept development and feasibility evaluation

URS | Project Goals and Objectives

Issue: Flooding and Erosion

- Nuisance flooding and erosion in the park and at adjacent properties

Pictures obtained from ttps://www.facebook.com/pages/The-Ft-Ward-and-Seminary-African-American-Descendants-Society/

Project Goals and Objectives

- Identify potential drainage improvements
- Develop effective solutions
- Minimize impacts to the historic nature of the park
- Minimize impacts to adjacent properties

Work with Local Government and Citizens to Create Viable Solutions

- Focus on approaches that balance the historical, natural and recreational significance of the park
- Address important municipal issues:
  - Flooding
  - Sewer system function
  - Erosion
- Coordinate with on-going projects
  - Fort Ward Park and Museum Management Plan
  - Park Walkway Project
  - Interim Drainage Solutions
  - Archaeological Investigation

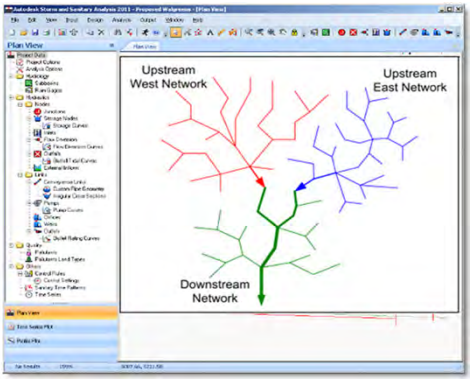
Community Outreach

- Provide Information
- Solicit support
- Address needs
- Obtain consensus

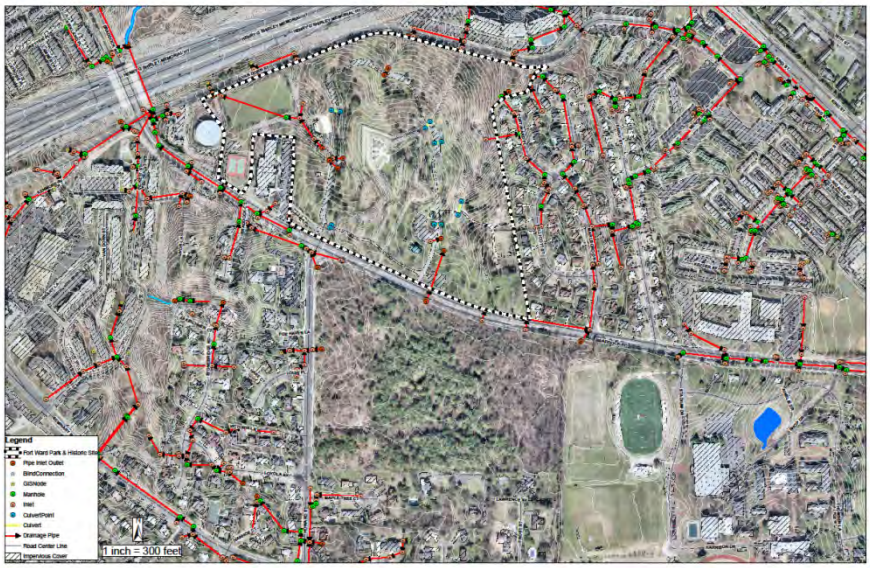
URS | Project Work Plan

Project Work Plan

- Hydrologic/Hydraulic Analyses
  - Hydrologic Modeling
  - Hydraulic Capacity Analyses
  - Identify drainage system deficiencies and proposed improvements



Overall Drainage Patterns

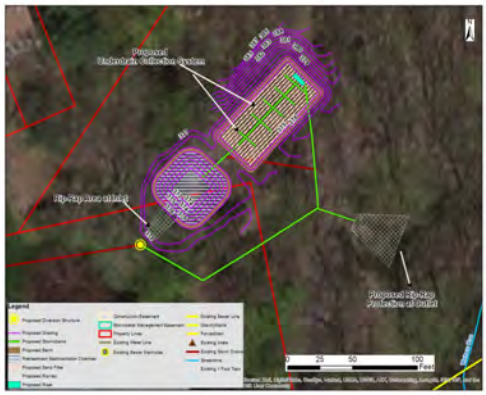


Project Work Plan

- Identify Potential Solutions
  - Conveyance Improvements (e.g., swales, closed systems, other)
  - Redirect drainage away from erodable areas and sensitive resources
  - Encourage infiltration to reduce runoff
- Conduct Feasibility Assessment
  - Technical
  - Permitting
  - Cultural Resources Impacts

Project Work Plan

- Concept Plans and Computations
  - A 10% concept plan with site grading
  - Planning level capacity analysis
- Cost Estimate Development
  - Cost estimate including design, permitting and construction



Graphics obtained from Hyde Park Dry Pond Project and Maryland Storm Water Manual

URS | Project Schedule

Project Schedule

- Draft H&H Report: Late Summer 2013
- Concept Improvement Plans: Fall 2013
- Public Meeting: Winter 2013
- Final Report Submission: Winter 2013

Questions

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

URS | Project Status

Project Schedule

- Field Reconnaissance: Complete July 2013
- Draft Hydrologic/Hydraulic Analyses Report: Late Summer 2013

  On Schedule
- Concept Improvement Plans: Fall 2013
- Public Meeting: Winter 2013
- Final Report Submission: Winter 2013

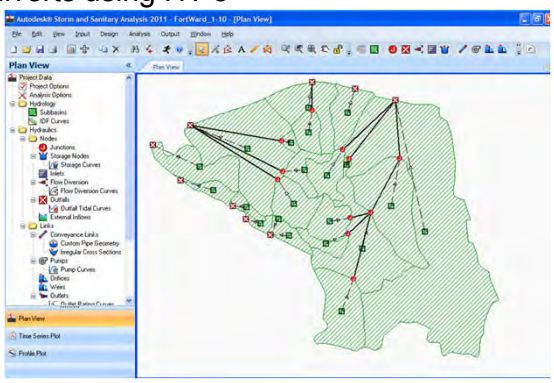
Project Status

- 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

URS | **Technical Analyses**

Hydrologic and Hydraulic Analyses

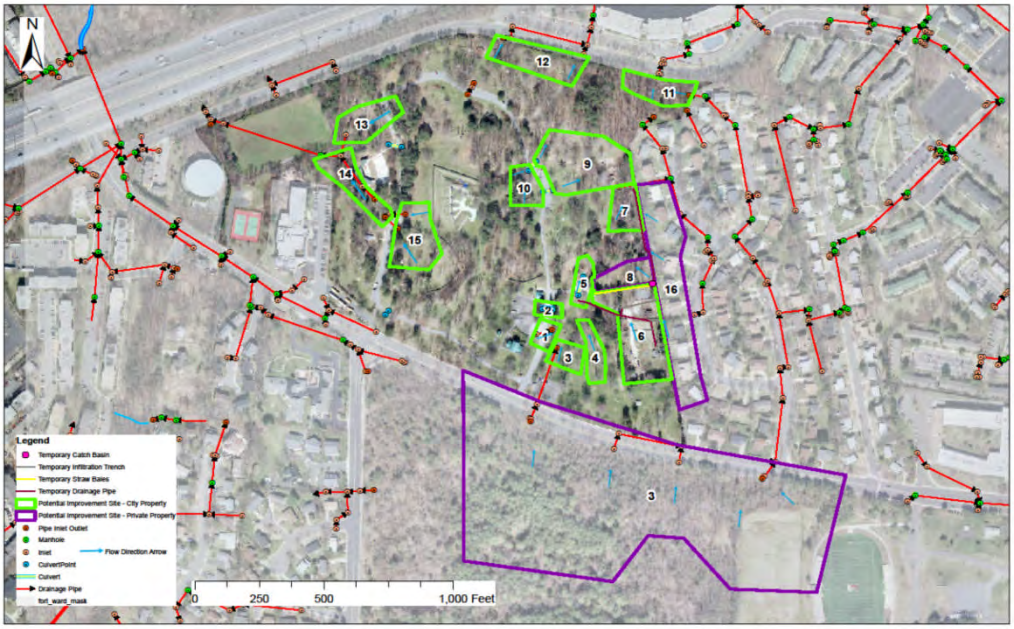
- Developed drainage area map with 21 subbasins
- Hydrologic analyses conducted utilizing available land use, soils information, and drainage areas
- Hydrologic Analyses conducted using Rational Method.
- Estimated capacity of existing culverts using HY-8



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



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.

Upstream Face of the Culvert

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

Hay Barrel

Catch Basin

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

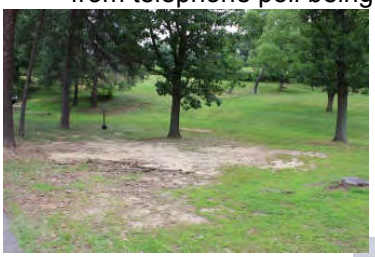
- No problems were observed near the manhole and inlets near soccer field and amphitheater.

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.)

URS | 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

Fort Ward Park Drainage Master Plan

Prepared for the City of Alexandria

Presented by URS Corporation

May 7, 2014

Agenda

- Project Overview and Status
- Recommendations for Drainage Improvements
  - General (non-structural)
  - High Priority Structural Projects
  - Cemetery Area – Drainage Best Practices

2

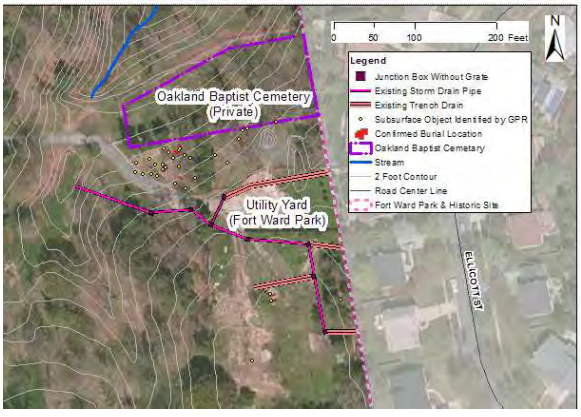
Project Overview

- Concerns
  - Stormwater runoff
  - Erosion
  - Storm sewer system function

3

Project Overview

- Existing Measures (Interim Project)
  - Storm Drain Pipes
  - Infiltration Trenches
  - Perimeter Straw Wattles
  - Catch Basin



Project Overview

- Existing Measures (Interim Project)

5

Project Overview

- Project Goals and Objectives
  - Identify potential drainage improvements
  - Develop effective solutions
  - Minimize impacts to the historic nature of the Park
  - Minimize runoff impacts from adjacent properties

6

Project Status

- Since August 2013:
  - Completed Hydrologic & Hydraulic Analysis and Report
  - Completed Draft Drainage Master Plan and Submitted to City
    - Recommended solutions for identified drainage deficiencies
    - Developed concept designs
      - Stormwater Filter (Site 3)
      - Diversion Berm around Cemetery (Site 6)
      - Stream Stabilization (Site 7)
    - Cemetery Areas Best Practices

7

Recommendations

- The recommendations are based on
  - Field observations
  - Engineering analysis
  - Advisory Group input
- The recommendations are consistent with the best practices presented in the Fort Ward Park and Museum Area Management Plan

8

Recommendations

- Nonstructural Improvements
  - No design required
  - Lower cost
  - Can be integrated into existing Park Maintenance activities
- Structural Improvements
  - Design development
  - Higher cost
  - Archaeological investigation prior to any earthwork
  - May require permitting

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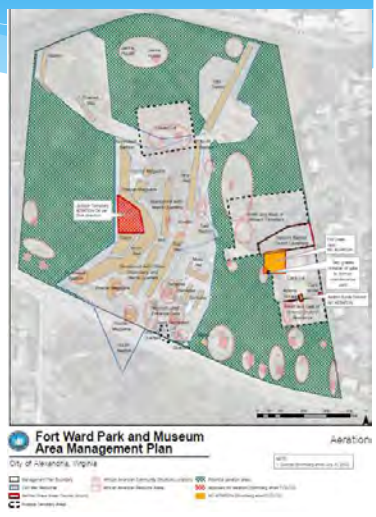
Recommended Nonstructural Improvements

- Aeration and Turf Seeding
  - Increase infiltration capacity
  - Reduce erosion
  - Improve aesthetics

Note: Aeration and Turf Seeding began last Fall by RPCA in partnership with Office of Historic Alexandria. More is planned for this Spring



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Recommended Nonstructural Improvements

- Conveyance Improvements
  - Remove sediment and debris
  - Increase flow conveyance
  - Improve inlet and outlet areas

Site 9: Near the playground

Site 3: Near the Park entrance

Recommended Nonstructural Improvements

- Mowing Maintenance Plan
  - Identify areas to be mowed and areas to avoid mowing

Site 4: Open Space

Recommended Nonstructural Improvements

- Storm drain outlet enhancements to diffuse flow
  - Convert high-velocity concentrated flow into sheet flow
  - Reduce erosion
- For Homeowners and Park Neighbors
  - Redirect drainage away from homes
    - Redirecting roof downspouts
    - Sump pumps away from the Park

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Recommended Structural Improvements

- Increase Culvert Maintenance Activities
  - Increase the size of culverts to accommodate for up to the 25-year storm
  - Reduce runoff inundation
    - Site 2: Near the Entrance
    - Site 3: Near the Visitor Parking
    - Site 10: Near the Rifle Trench
    - Site 15: Near the Amphitheater

Site 2 Near the entrance

Site 10 Near Rifle Trench

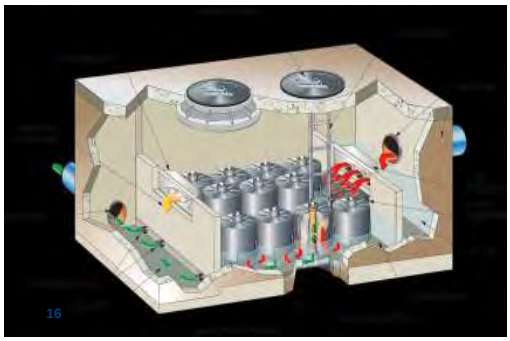
Recommended High Priority Structural Improvements

- Install Underground Stormwater Filter in the visitor parking lot (Site 3)
- Redirect Surface Flow near Oakland Baptist Cemetery (Site 6)
- Stream Restoration/Stabilization on the intermittent stream northeast of the Oakland Baptist Cemetery (Site 7)

15

Recommended Structural Improvements

- Install Underground Stormwater Filter (Site 3)
  - Trap sediment, debris, and pollutants in a filter system
  - Improve the water quality



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Site 3: Stormwater Filter

- Existing Conditions: Sediment and debris deposition was noted at the outlet of 18" pipe that collects runoff from Braddock Road. Engineering analysis shows that the pipe capacity is impaired by the sedimentation.

Downstream Outlet

17

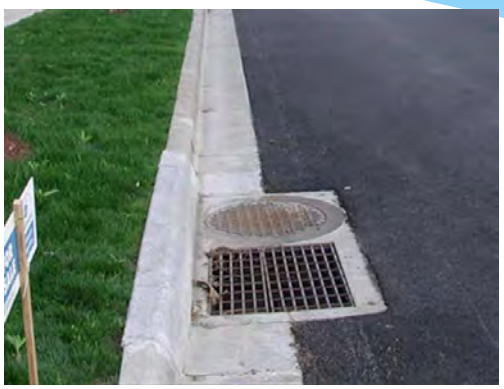
Downstream of the Outlet

Site 3: Stormwater Filter

Site 3: Stormwater Filter

Pictures from http://www.conteches.com/

Site 3: Stormwater Filter



Pictures from http://www.conteches.com/

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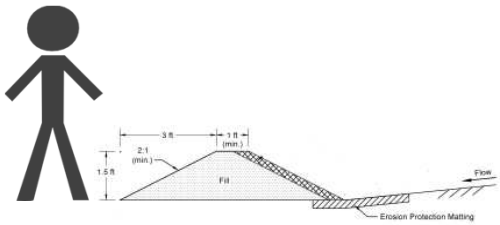
Recommended Structural Improvements

- Redirect Surface Flow around Oakland Baptist Cemetery (Site 6)
  - Diversion berm to redirect flow to avoid sensitive areas
  - Reduce inundation and erosion on the sensitive areas
  - Berm design avoids need for excavation adjacent to cemetery area
  - Protect cultural resources



Site 6: Diversion Berms

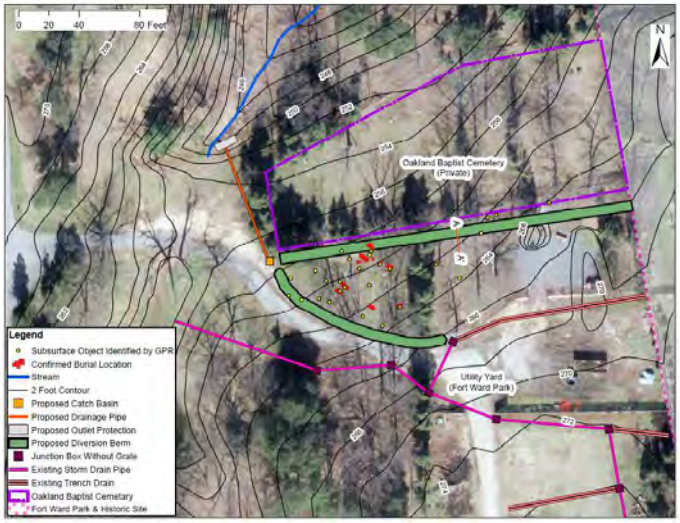
- Existing Conditions: Temporary solutions to address existing drainage issues in the area: infiltration trenches, a temporary catch basin, and temporary straw wattles. A permanent solution is needed.


Infiltration Trenches


Straw Wattles


Catch Basin

Site 6: Diversion Berms



Site 6: Diversion Berms

Recommended Structural Improvements

- Stream Restoration/Stabilization on intermittent stream northeast of the Oakland Baptist Cemetery (Site 7)
  - Stabilize stream channel and banks
  - Reduce erosion and sedimentation along the stream
  - Improve potential habitat

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Site 7: Step Pools

- Existing Conditions: Main stream channel that runs through the park is eroded and there is concrete debris in the channel. In addition, there is a clogged inlet at the end of the natural stream channel.

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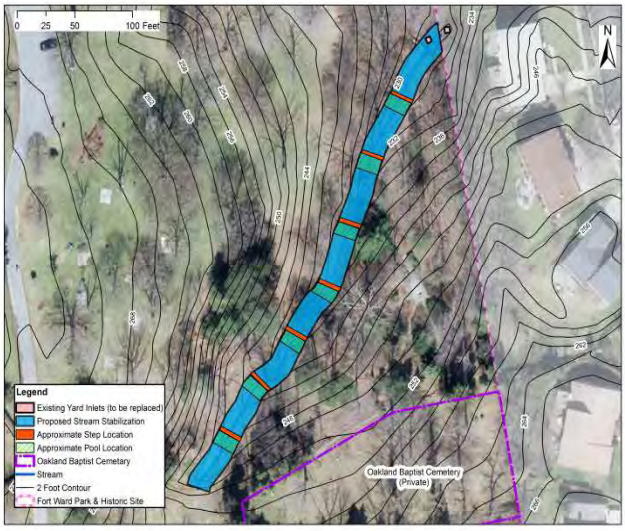
Site 7: Step Pools



Site 7: Step Pools

28

Site 7: Step Pools

29

Site 8: Cemetery Area

- Existing Conditions: 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 and channel is forming through the area.

Exposed Gravestone

Exposed Bare Ground

Exposed Bare Ground and Gravestone

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Recommended Best Practices for Cemetery Area

- Turf Maintenance
- Water Diversion
- Conservation of Grave Depressions
- Conservation and Repair of Damaged Headstones

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Summary of Project Purpose/Goals

- Identify opportunities to improve drainage conditions in the Fort Ward Park using a holistic approach
  - Conduct hydrologic analyses
  - Address drainage issues for
    - Park area
    - Cemetery
    - Offisite contributions
  - Development and prioritization of a wide range of solutions
    - Structural
    - Non structural

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Comments from the Public

- Best Practices for Cemetery Areas
- Runoff from the Park and Marlboro Estates into the Cemetery
- Increased runoff from compacted dumped gravel and fill in the maintenance yard
- Graves in the maintenance yard

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Next Steps

- Coordination with OHA & Management Plan
- Standard Operating Procedures (SOPs) for Park Personnel
  - Practices and procedures

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Next Steps

- Funding
  - Total funding = **$585,000** (Already approved funding)
  - Drainage Master Plan spent $80,000
  - Remaining Funding **$505,000** for 100% Design & Construction

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Next Steps

- Cost Estimates for Recommended Improvements (Includes Engineering Design)
  - Diversion Berms at Site 6 = **$116,000**
  - Stormwater Filter at Site 3 = **$199,000**
  - Stream Stabilization at Site 7 = **$203,000**
  - Total Estimated Costs for all three:
    - **$518,000**

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Next Steps

- Schedule
  - **FY2014** (Ends June 30, 2014)
    - Wrap up Final Drainage Master Plan
    - Deliver project list to DPI
  - **FY2015** (Starts July 1, 2014)
    - Design services for 100% design & construction drawings – 12mo
    - Perform Archaeology at designated site(s)
    - Advertise Construction for Fall/Winter 2015

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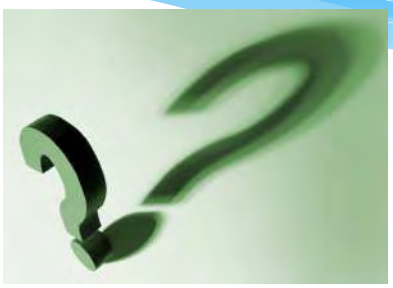
Questions



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Appendix B
Field Reconnaissance Report

URS Corporation (URS) performed a detailed field reconnaissance with Brian Rahal, PE, the City Engineer, on June 28, 2013, to inspect the condition of the on-site stormwater collection system and interim drainage solutions. Ground condition was also inspected for signs of erosion and sedimentation. Photographs were taken as part of the field reconnaissance to record the existing condition.

To prepare the field reconnaissance trip, URS obtained and reviewed the 2-foot contour interval topographic information in the digital format provided by City of Alexandria (City). In addition, URS examined the drainage network showing the locations and orientation of pipe systems at the Fort Ward Park (Park), provided by the City. During the field reconnaissance trip, URS conducted a throughout on-site investigation on the existing drainage system and verified the onsite and offsite drainage area boundaries.

The results of the field reconnaissance confirmed that the most on-site drainage systems that collect and divert runoff from off-paved areas are functional. However, erosion and sedimentation were observed at various locations. Engineering calculations were performed to verify the capacity of the cross culverts and drainage systems (summarized in Appendix B).

URS inspected the surrounding areas of the Park, including a number of outfall points along Van Dorn Street. The field reconnaissance showed outfall pipes with built-up debris, which are typical for locations that lack regular maintenance and inspection.

URS also inspected the stormwater management pond near the Marlboro Subdivision. Due to limited access in wooded areas, only representative locations were inspected. The results showed unstable areas immediately above the riser and the degradation of the channels in the wooded areas.

Figure B-1 identifies the locations of all photographs. Figure B- 2 to Figure B- 106 shows the existing conditions.

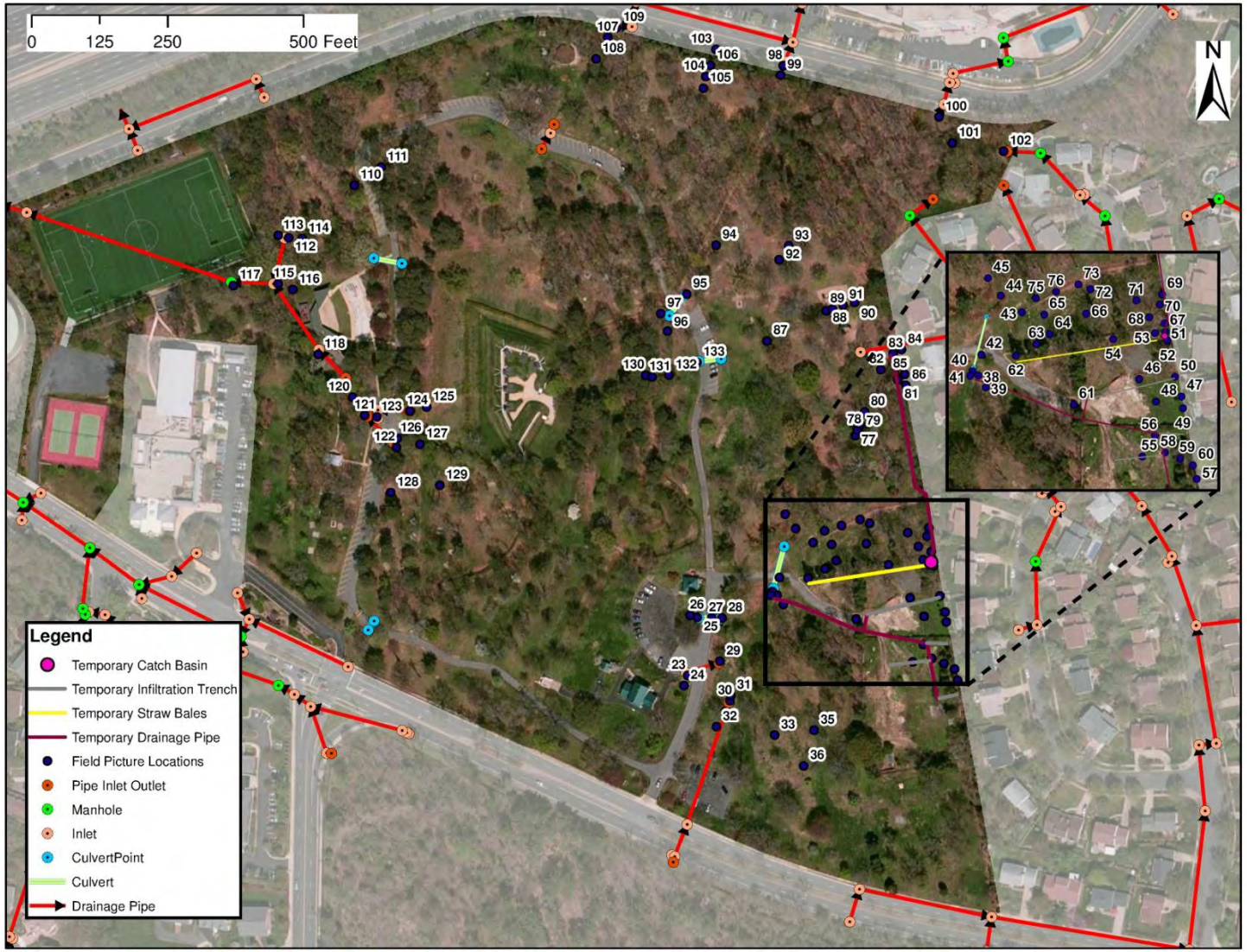


Figure B-1: Fort Ward Park Field Reconnaissance Location Map

Figure B-2: Shallow drop inlet next to the parking lot (Location ID #23)

Figure B-3: Upstream of the shallow drop inlet (Location ID #24)

Figure B-4: Outlet of the 15-inch concrete pipe. No erosion was observed(Location ID #29)

Figure B- 5: Inlet of the 15-inch concrete pipe next to the parking lot (Location ID #25). Observed a small ponding area at the inlet

Figure B- 6: Upstream of the 15-inch concrete pipe (Location ID #26)

Figure B- 7: Downstream of the 15-inch concrete pipe (Location ID #27)

Figure B- 8: Outlet of the 15-inch concrete pipe (Location ID #28)

Figure B- 9: Outlet of 18-inch concrete pipe. Observed built-up debris and sedimentation, which may come from roadway (Location ID #30)

Figure B- 10: Downstream of the 18-inch concrete pipe. Observed built-up debris (Location ID #31)

Figure B- 11: Open space upstream between the parking lot and the swale (Location ID #32)

Figure B- 12: Open space upstream between the parking lot and the swale (Location ID #33)

Figure B- 13: The swale. No erosion observed (Location ID #35)

Figure B- 14: The sign at the swale (Location ID #36)

Figure B- 15: Blocked Outlet for 6-inch PVC underdrain pipe. Observed built-up debris and tree branches (Location ID #38)

Figure B- 16: Upstream of the 6-inch PVC underdrain pipe (Location ID #39)

Figure B- 17: Inlet of the 36-inch culvert. Observed built-up tree branches at the inlet (Location ID #40)

Figure B- 18: Inlet of the 36-invch culvert. Observed built-up tree branches at the inlet (Location ID #41)

Figure B- 19: Road Crossing of the 36-inch culvert. Observed sedimentation at the road (Location ID #42)

Figure B- 20: Silt fence downstream of the culvert (Location ID #43)

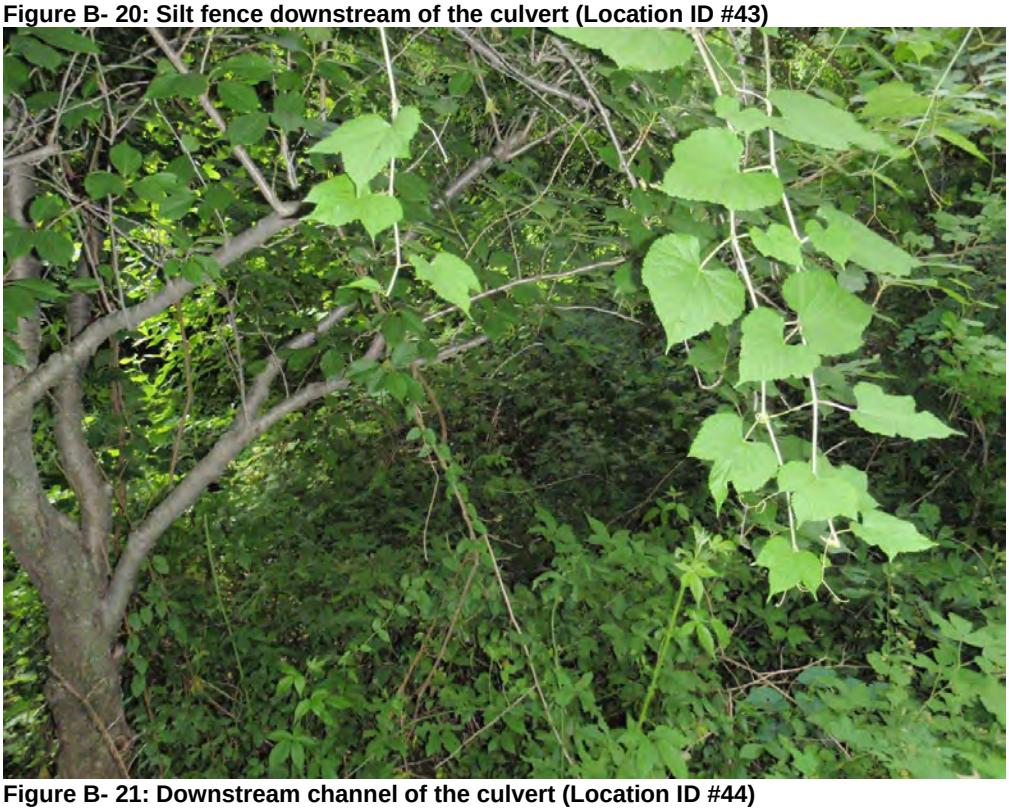


Figure B- 21: Downstream channel of the culvert (Location ID #44)

Figure B- 22: Downstream overbanks of the culvert (Location ID #45)

Figure B- 23: Trench drain along the chain-linked fence on the City property (Location ID #46)

Figure B- 24: Area adjacent to the backyard of a private property. The area was seeded to improve drainage and prevent erosion. No erosion was observed (Location ID #47)

Figure B- 25: Open space (Location ID #48)

Figure B- 26: Swale by the chain-linked fence along the property boundary (Location ID #49)

Figure B- 27: Swale at the chain-linked fence (Location ID #50)

Figure B- 28: Catch basin as interim drainage solution (Location ID #51)

Figure B- 29: Upstream of the catch basin (Location ID #52)

Figure B- 30: Hay barrel along the fence to the outfall pipe (Location ID #53)

Figure B- 31: Hay barrel along the fence to the outfall pipe (Location ID #54)

Figure B- 32: Open space (Location ID #55)

Figure B- 33: Trench drain along the fence (Location ID #56)

Figure B- 34: Area near a private property upstream of the trench drain. Observed dryness after the storm (Location ID #57)

Figure B- 35: Covered catch basin/trench drain (Location ID #58)

Figure B- 36: Trench drain. Homeowners covered the bare soil with mulch which helped to improve the drainage. Observed dry ground after the storm (Location ID #59)

Figure B- 37: Fence along the private properties. Observed dry ground after the storm (Location ID #60)

Figure B- 38: Gate at the City property (Location ID #61)

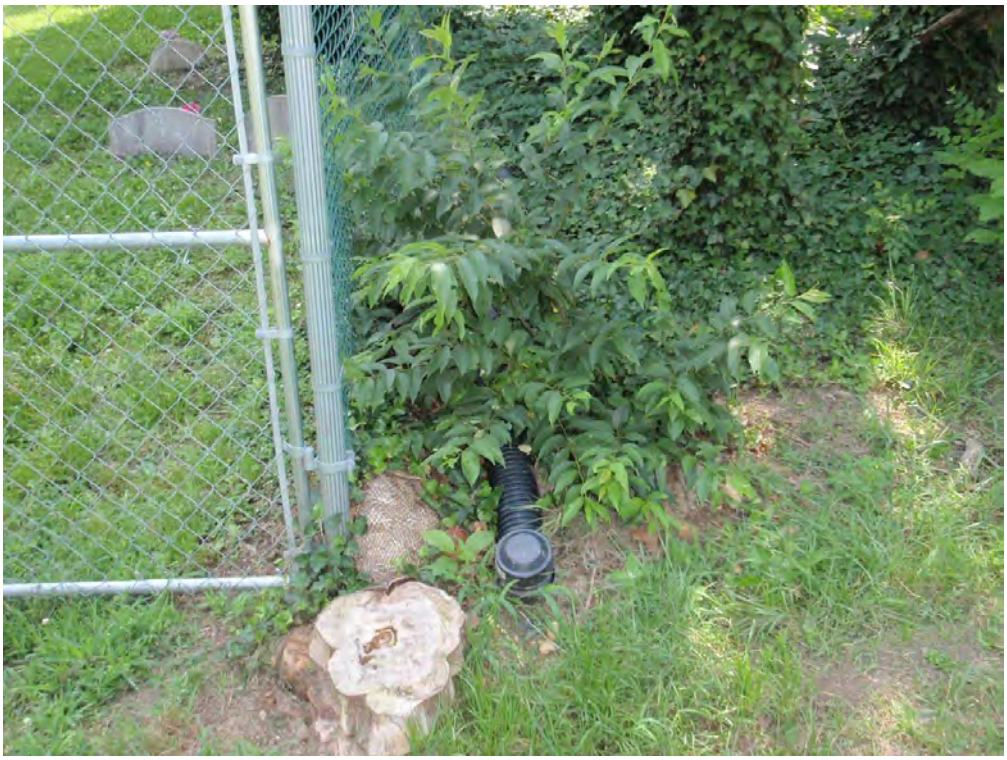


Figure B- 39: End of the hay barrel along the cemetery fence. (Location ID #62)

Figure B- 40: Exposed head stone in the cemetery (Location ID #63)

Figure B- 41: Exposed head stone in the cemetery (Location ID #64)

Figure B- 42: Depression in front of the grave (Location ID #65)

Figure B- 43: Exposed bare ground in the cemetery (Location ID #66)

Figure B- 44: Exposed bare ground at southeast corner of the cemetery (Location ID #67)

Figure B- 45: Exposed bare ground at southeast corner facing west (Location ID #68)

Figure B- 46: Exposed bare ground along the property fence (Location ID #69)

Figure B- 47: Three grave stones (at the southeast corner) (Location ID #70). Used to be ponded after storms. Observed dry ground after the storm due to the interim drainage solution

Figure B- 48: Exposed bare ground at southeast corner facing northwest (Location ID #71)

Figure B- 49: Upstream of the swale outfall in the cemetery (Location ID #72)

Figure B- 50: Downstream of the swale outfall in the cemetery (Location ID #73)

Figure B- 51: Outfall outside the cemetery (Location ID #75)

Figure B- 52: Outfall from the cemetery (Location ID #76)

Figure B- 53: Stream. Observed debris in the channel. (Location ID #77)

Figure B- 54: Streambed and overbanks (Location ID #78)

Figure B- 55: Upstream of the foot bridge (Location ID #79)

Figure B- 56: Downstream of the foot bridge (Location ID #80)

Figure B- 57: Swale from the properties (Location ID 81)

Figure B- 58: Streambed (Location ID 82). Observed channel erosion

Figure B- 59: Inlet next to the stream (Location ID #83)

Figure B- 60: Inlet next to the property (Location ID #84)

Figure B- 61: Rock channel in the Property upstream of the swale (Location ID #86)

Figure B- 62: Channel upstream of the playground (Location ID #87). Observed erosion

Figure B- 63: Inlet at the playground (Location ID #88)

Figure B- 64: Blocked Inlet at the playground (Location ID #89)

Figure B- 65: Downstream of the playground (Location ID #64)

Figure B- 66: Swale in the playground (Location ID #91)

Figure B- 67: Bare ground next to the playground (Location ID #92)

Figure B- 68: Bare ground next to the playground (Location ID #92)

Figure B- 69: Upstream of the drainage inlet (Location ID #96). The inlet appeared to be clogged

Figure B- 70: Upstream of the Drainage Inlet (Location ID #97)

Figure B- 71: Inlet next to the street (Location ID #98)

Figure B- 72: Upstream of the inlet (Location ID #99)

Figure B- 73: Stormwater management (SWM) pond riser (Location ID #100)

Figure B- 74: Upstream of the SWM facility (Location ID # 101)

Figure B- 75: Inlet feeding into the SWM pond from the Marlboro properties (Location ID #102)

Figure B- 76: Outfall from the Park along N. Van Dorn Street (Location ID #103). Observed outlet clogged by debris

Figure B- 77: Upstream channel of the outfall (Location ID 104)

Figure B- 78: Upstream area of the outfall from the Park (Location ID #105)

Figure B- 79: Concrete channel in the Park (Location ID #106)

Figure B- 80: Upstream area of the outfall (Location ID #107)

Figure B- 81: Upstream area of the outfall (Location ID #108)

Figure B- 82: Inlet outfall at the Park property line (Location ID #109). Observed clogged inlet

Figure B- 83: Open space (Location ID #110). Observed bare ground

Figure B- 84: Open space (Location ID #111). Observed bare ground

Figure B- 85: Inlet (Location ID #112). Observed built-up debris clogging the inlet

Figure B- 86: Downstream area of the manhole (Location ID #113)

Figure B- 87: Upstream area of the inlet (Location ID #114). Observed debris and sedimentation

Figure B- 88: Inlet (Location ID #115). Observed vegetation clogging the inlet

Figure B- 89: Upstream Area of the Inlet (Location ID #116)

Figure B- 90: Manhole near the soccer field (Location ID #117)

Figure B- 91: Inlet next to amphitheatre (Location ID #118)

Figure B- 92: Inlet culvert next to amphitheatre (Location ID #119)

Figure B- 93: Upstream of the inlet (Location ID #120)

Figure B- 94: Outlet of the 15-inch culvert crossing (Location ID #121).

Figure B- 95: Inlet of the 15-inch culvert crossing (Location ID #122). Observed depression at the inlet

Figure B- 96: Parking lot next to the Inlet (Location ID #126). Observed sedimentation at the parking lot

Figure B- 97: Inlets at the parking lot near the amphitheater (Location ID #123)

Figure B- 98: Inlet adjacent to the west Side of the fort (Location ID #124). Observed debris at the inlet

Figure B- 99: Upstream area of the inlet (Location ID #125)

Figure B- 100: Open space (Location ID #127). Observed bare ground

Figure B- 101: Open space (Location ID #128). Observed bare ground

Figure B- 102: Open space (Location ID #129). Observed bare ground near the silt fence

Figure B- 103: Inlet near the footbridge (Location ID #130)

Figure B- 104: Clogged inlet near the footbridge (Location ID #131)

Figure B- 105: PVC Outlet by the footbridge. Observed clogging during previous storm events (Location ID #132)

Figure B- 106: Inlet of the culvert to the Playground (Location ID #133)

Appendix C
Detailed Hydraulic Results

INTRODUCTION

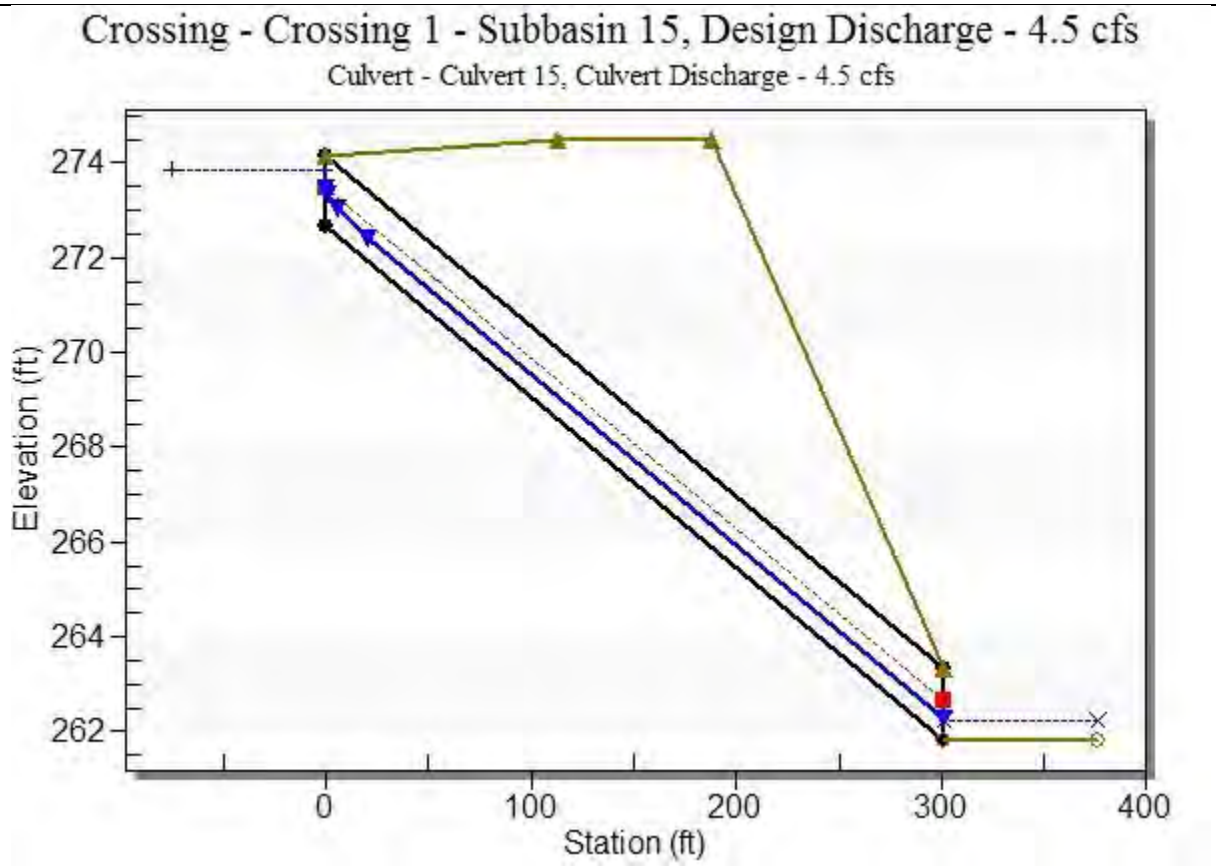
URS Corporation (URS) performed a hydraulic capacity analysis for the crossing culverts as part of the Fort Ward Park (Park) Master Drainage Plan. The results of the hydraulic modeling will aid in future park improvement assessments and the City of Alexandria's (City's) management strategies for the park.

The hydraulic model for the Fort Ward Park Master Drainage Plan was developed using current Geographic Information System (GIS) datasets from the City and peak discharges calculated during the hydrologic analysis.

An automatic culvert analysis program, HY-8, was used to analyze the performance of the culverts. The methodology and results of this analysis are discussed in Section 4 of the Fort Ward Park Drainage Master Plan.

MODEL RESULTS

The HY-8 model output is shown below for each of the culverts studied. The culvert geometry, performance curves, and a table summarizing the culvert flows are shown. Results for crossing 1 (Subbasin 15) are given assuming the culvert is clean (page C-3), and also assuming the culvert is 1/3 blocked by sediment (page C-25).



Site Data - Culvert 15

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 feet (ft)

Inlet Elevation: 272.65 ft

Outlet Station: 301.20 ft

Outlet Elevation: 261.83 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 15

Barrel Shape: Circular

Barrel Diameter: 1.50 ft

Barrel Material: Concrete

Embedment: 0.00 inches (in)

Barrel Manning's n: 0.0110

Inlet Type: Conventional

Inlet Edge Condition: Square Edge with Headwall

Inlet Depression: None

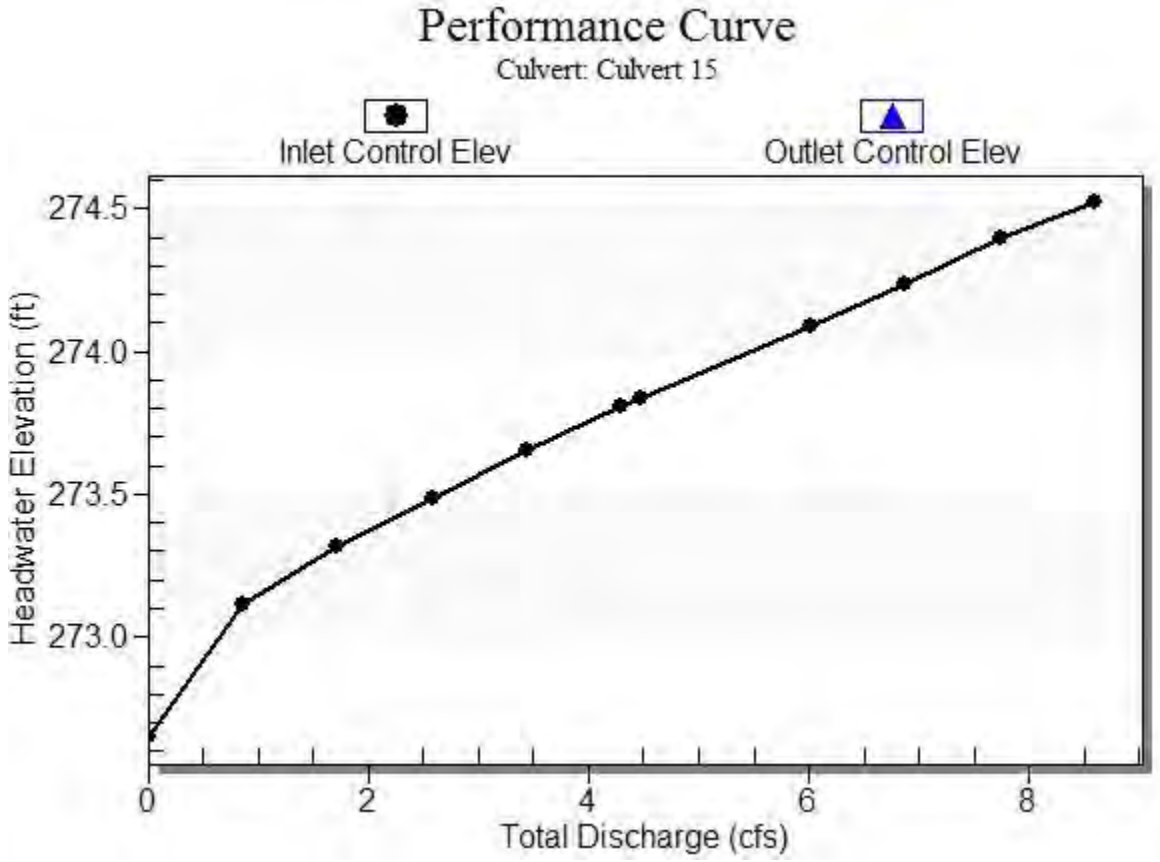
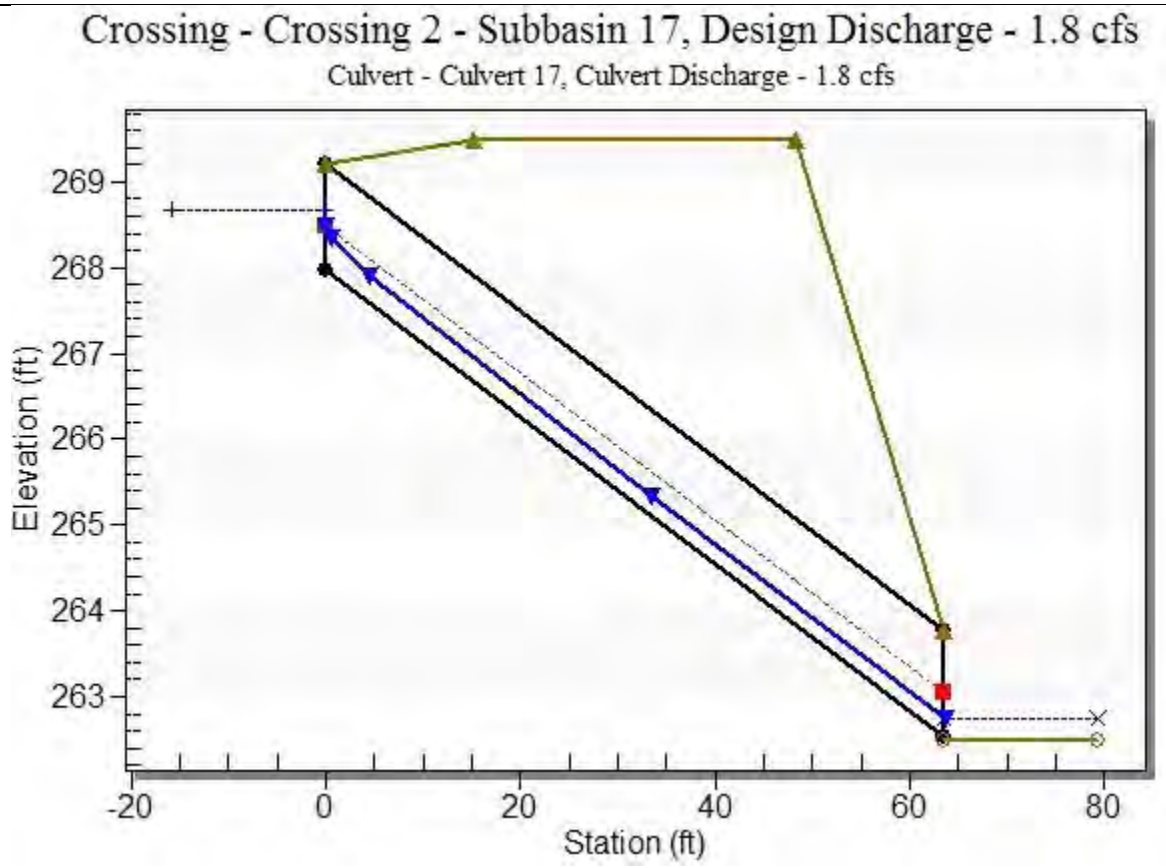


Table 1 - Summary of Culvert Flows at Crossing: Crossing 1 - Subbasin 15

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 15 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
272.65	0.00	0.00	0.00	1
273.11	0.86	0.86	0.00	1
273.31	1.72	1.72	0.00	1
273.49	2.58	2.58	0.00	1
273.66	3.44	3.44	0.00	1
273.81	4.29	4.29	0.00	1
273.84	4.47	4.47	0.00	1
274.09	6.01	6.01	0.00	1
274.24	6.87	6.87	0.00	1
274.40	7.73	7.73	0.00	1
274.53	8.59	8.37	0.18	10
274.50	8.25	8.25	0.00	Overtopping

cfs = cubic feet per second
ft = feet



Site Data - Culvert 17

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 267.97 ft

Outlet Station: 63.53 ft

Outlet Elevation: 262.53 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 17

Barrel Shape: Circular

Barrel Diameter: 1.25 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0110

Inlet Type: Conventional

Inlet Edge Condition: Square Edge with Headwall

Inlet Depression: None

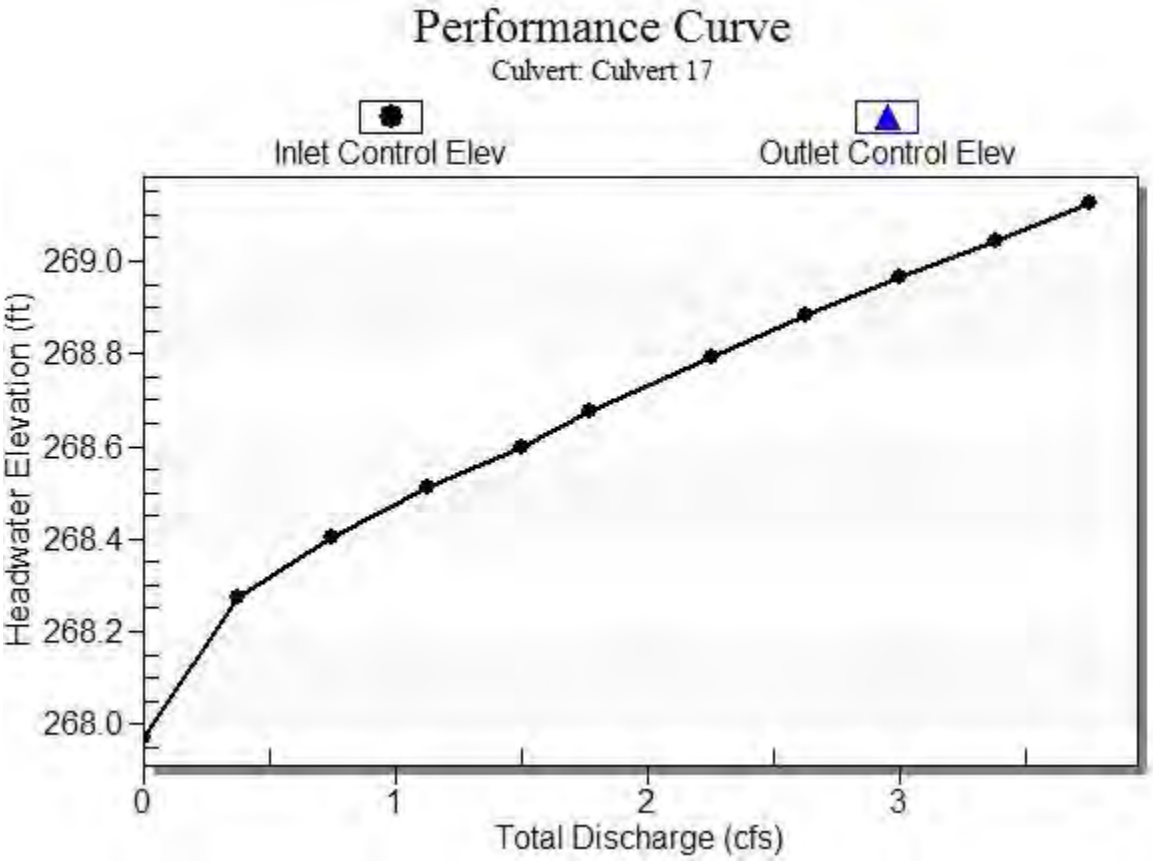
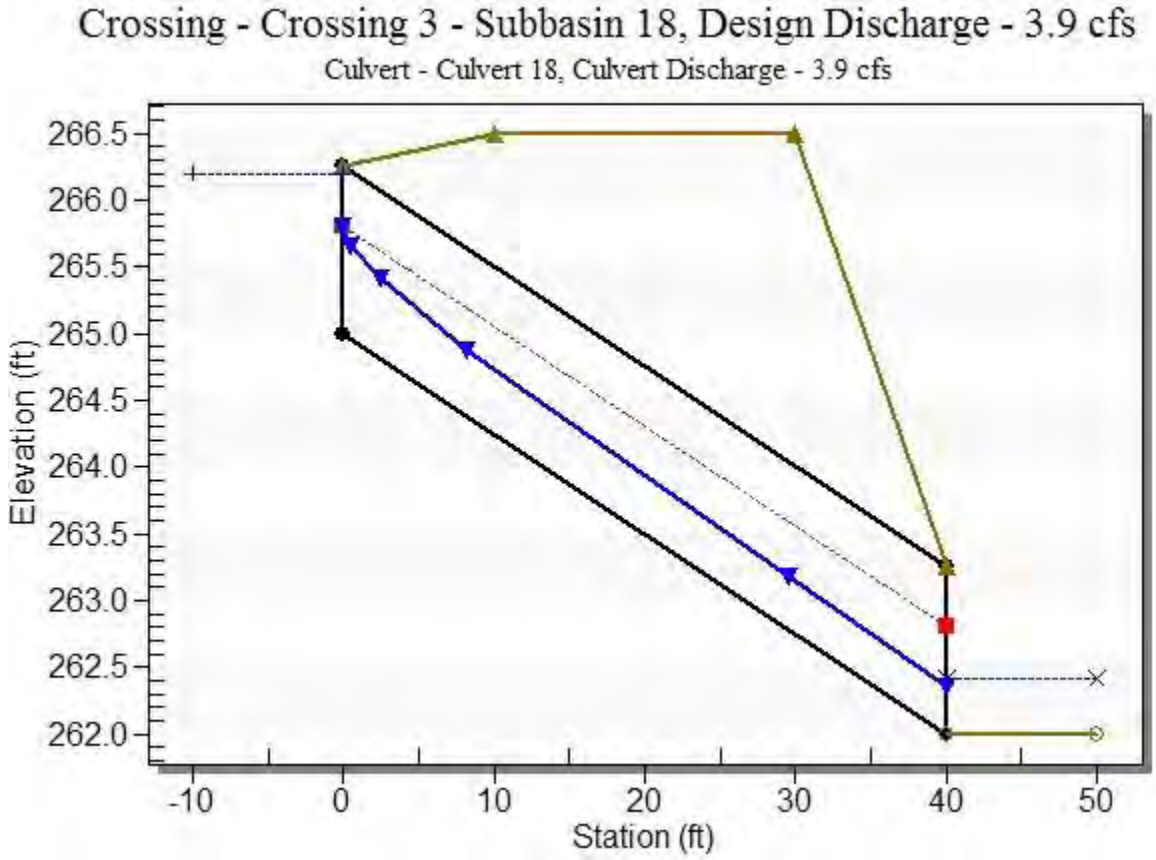


Table 2 - Summary of Culvert Flows at Crossing: Crossing 2 - Subbasin 17

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 17 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
267.97	0.00	0.00	0.00	1
268.27	0.38	0.38	0.00	1
268.40	0.75	0.75	0.00	1
268.51	1.13	1.13	0.00	1
268.60	1.50	1.50	0.00	1
268.67	1.77	1.77	0.00	1
268.79	2.25	2.25	0.00	1
268.88	2.63	2.63	0.00	1
268.96	3.00	3.00	0.00	1
269.04	3.38	3.38	0.00	1
269.13	3.75	3.75	0.00	1
269.50	5.30	5.30	0.00	Overtopping

cfs = cubic feet per second
ft = feet



Site Data - Culvert 18

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 265.00 ft

Outlet Station: 40.00 ft

Outlet Elevation: 262.00 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 18

Barrel Shape: Circular

Barrel Diameter: 1.25 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0110

Inlet Type: Conventional

Inlet Edge Condition: Square Edge with Headwall

Inlet Depression: None

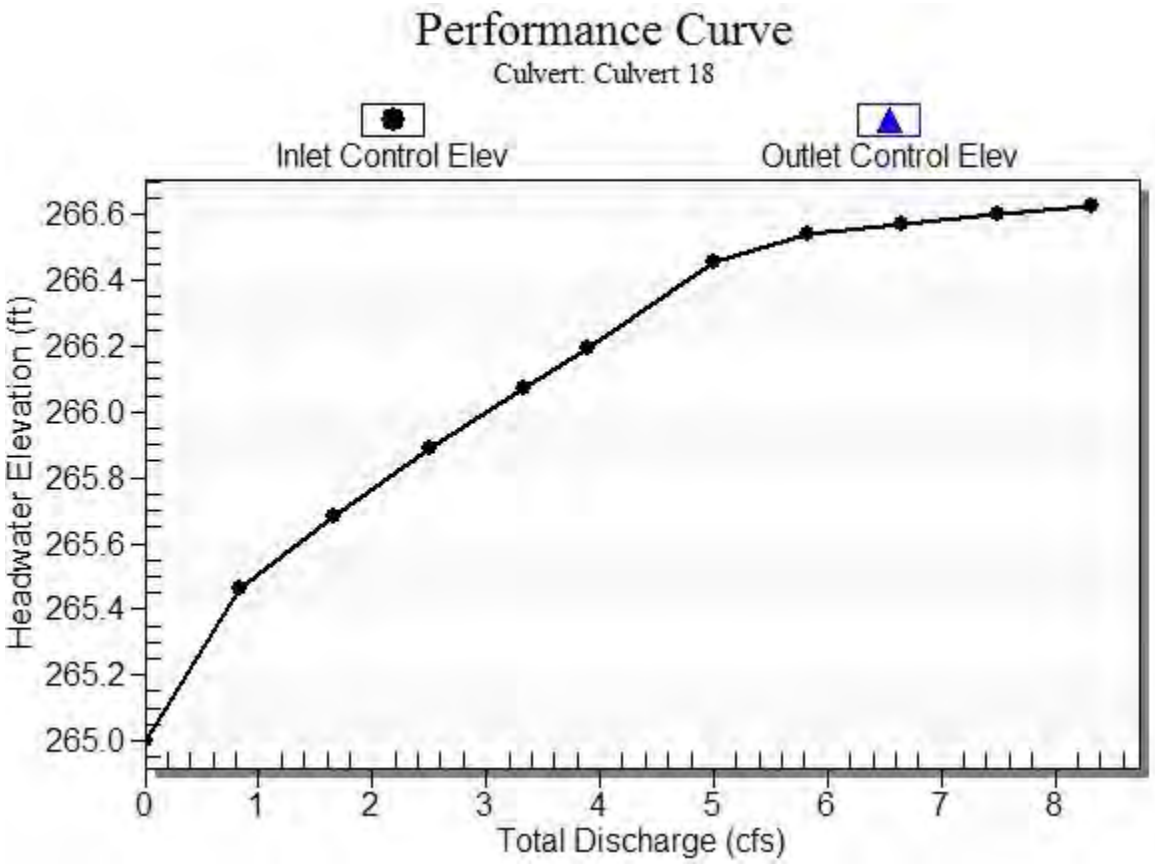
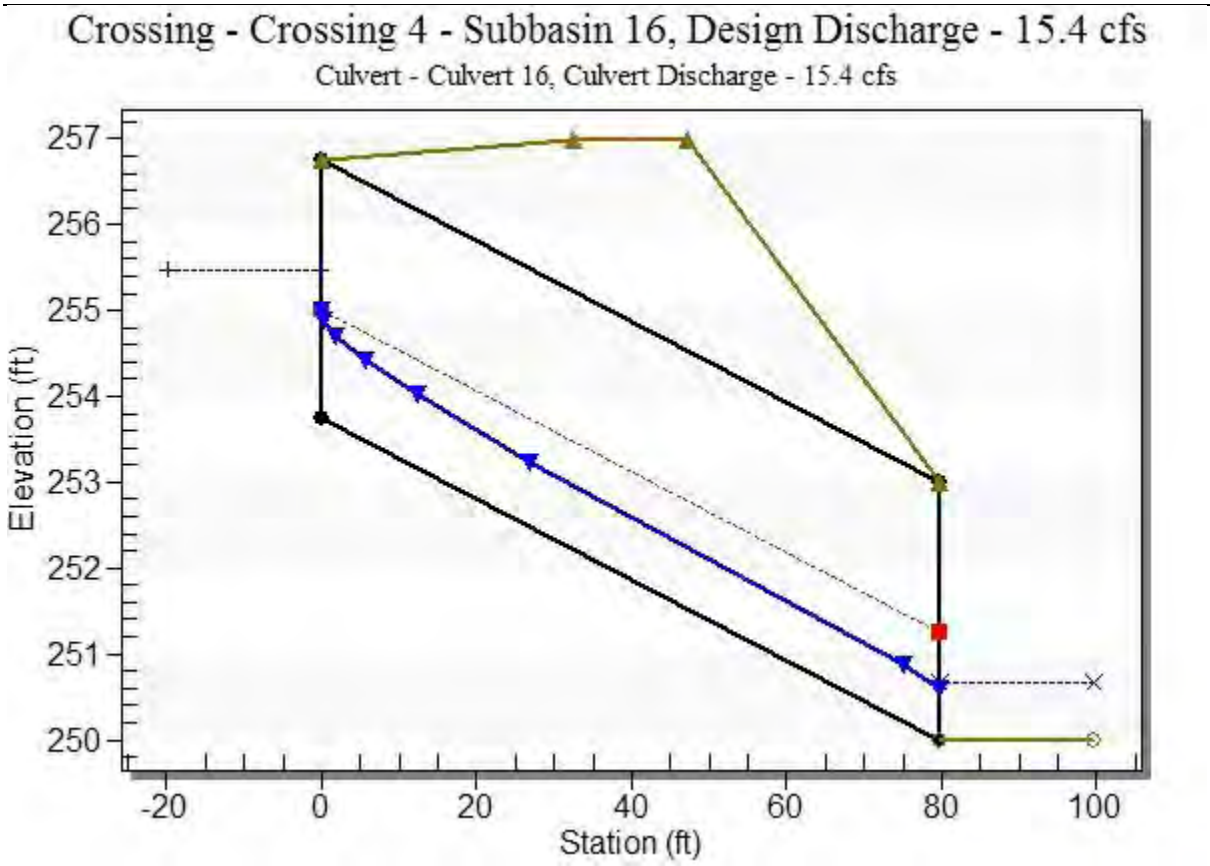


Table 3 - Summary of Culvert Flows at Crossing: Crossing 3 - Subbasin 18

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 18 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
265.00	0.00	0.00	0.00	1
265.46	0.83	0.83	0.00	1
265.68	1.66	1.66	0.00	1
265.89	2.50	2.50	0.00	1
266.07	3.33	3.33	0.00	1
266.19	3.89	3.89	0.00	1
266.45	4.99	4.99	0.00	1
266.54	5.82	5.32	0.49	8
266.57	6.66	5.44	1.18	4
266.60	7.49	5.54	1.93	4
266.63	8.32	5.63	2.66	3
266.50	5.17	5.17	0.00	Overtopping

cfs = cubic feet per second
ft = feet



Site Data - Culvert 16

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 253.75 ft

Outlet Station: 79.76 ft

Outlet Elevation: 250.00 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 16

Barrel Shape: Circular

Barrel Diameter: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0110

Inlet Type: Conventional

Inlet Edge Condition: Square Edge with Headwall

Inlet Depression: None

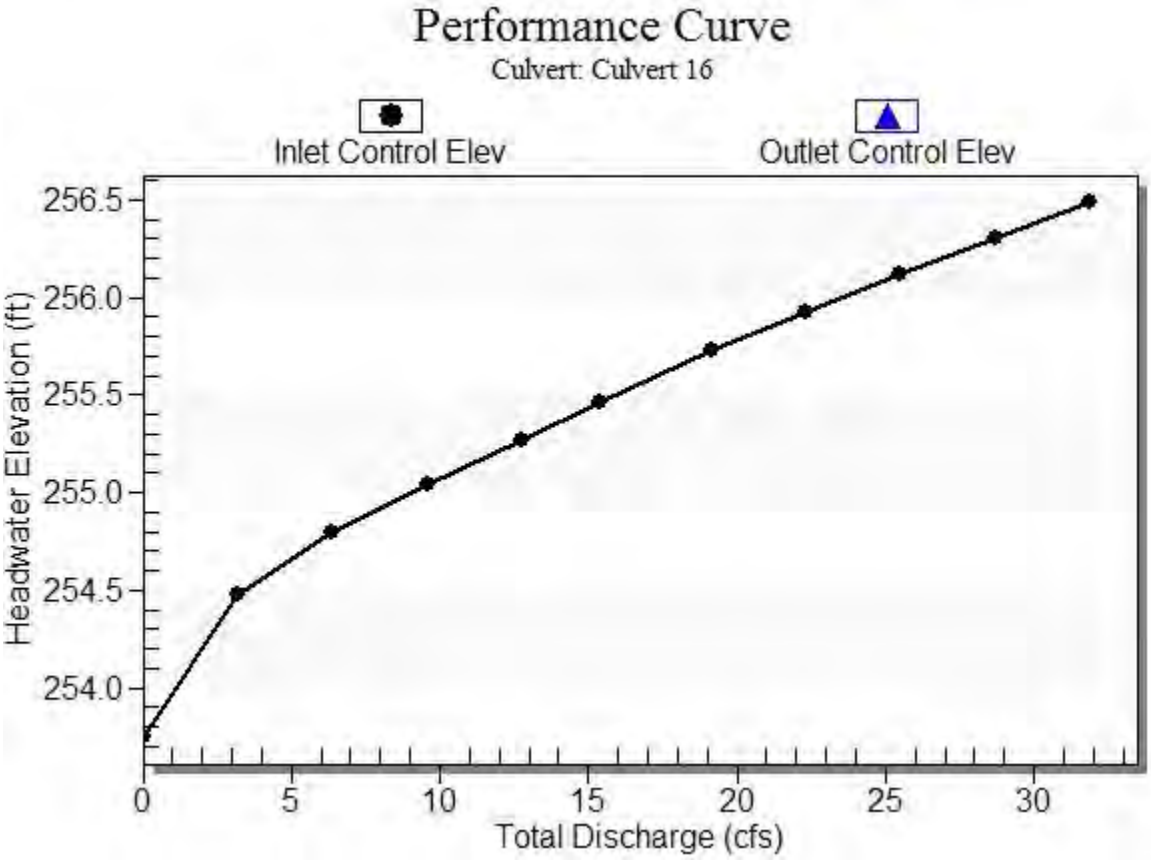
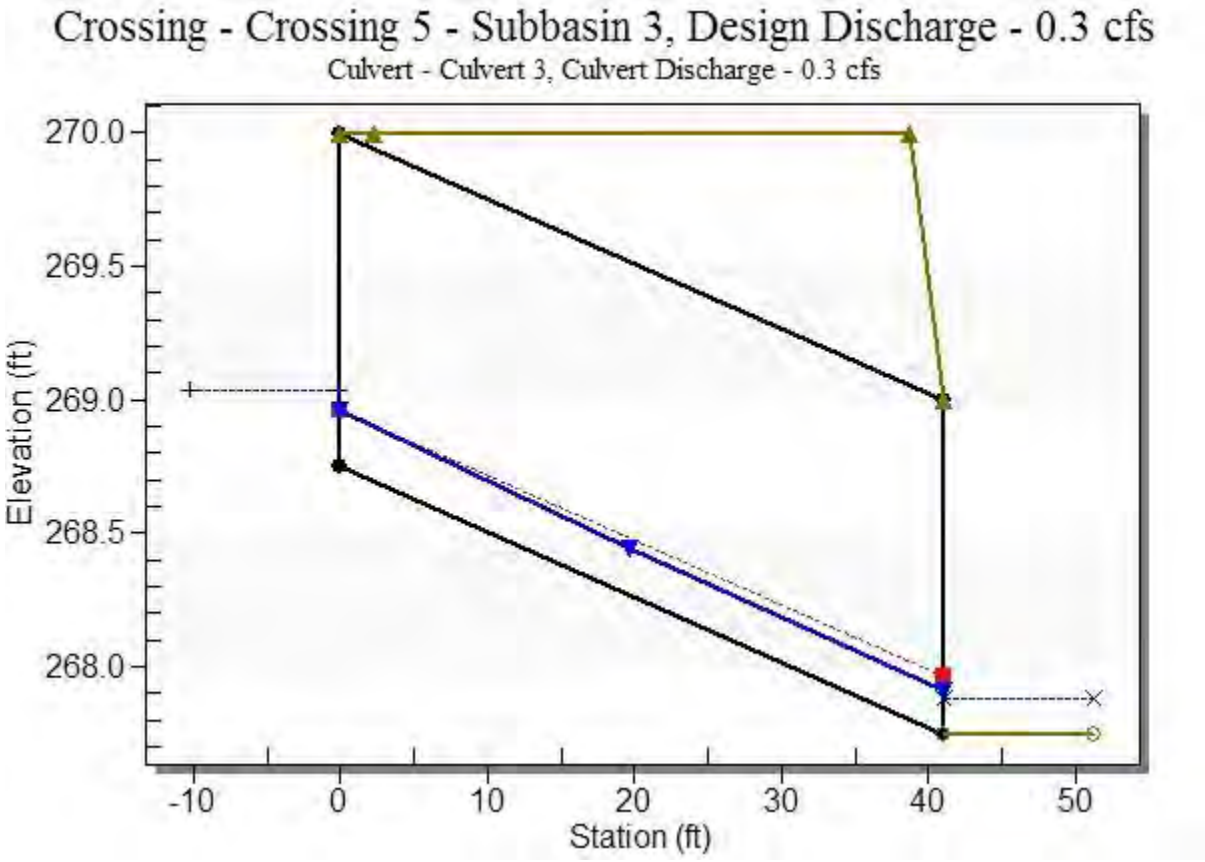


Table 4 - Summary of Culvert Flows at Crossing: Crossing 4 - Subbasin 16

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 16 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
253.75	0.00	0.00	0.00	1
254.48	3.19	3.19	0.00	1
254.79	6.37	6.37	0.00	1
255.05	9.56	9.56	0.00	1
255.27	12.74	12.74	0.00	1
255.47	15.35	15.35	0.00	1
255.72	19.12	19.12	0.00	1
255.93	22.30	22.30	0.00	1
256.12	25.49	25.49	0.00	1
256.30	28.67	28.67	0.00	1
256.49	31.86	31.86	0.00	1
257.00	40.27	40.27	0.00	Overtopping

cfs = cubic feet per second
ft = feet



Site Data - Culvert 3

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 268.75 ft

Outlet Station: 41.00 ft

Outlet Elevation: 267.75 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 3

Barrel Shape: Circular

Barrel Diameter: 1.25 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0110

Inlet Type: Conventional

Inlet Edge Condition: Square Edge with Headwall

Inlet Depression: None

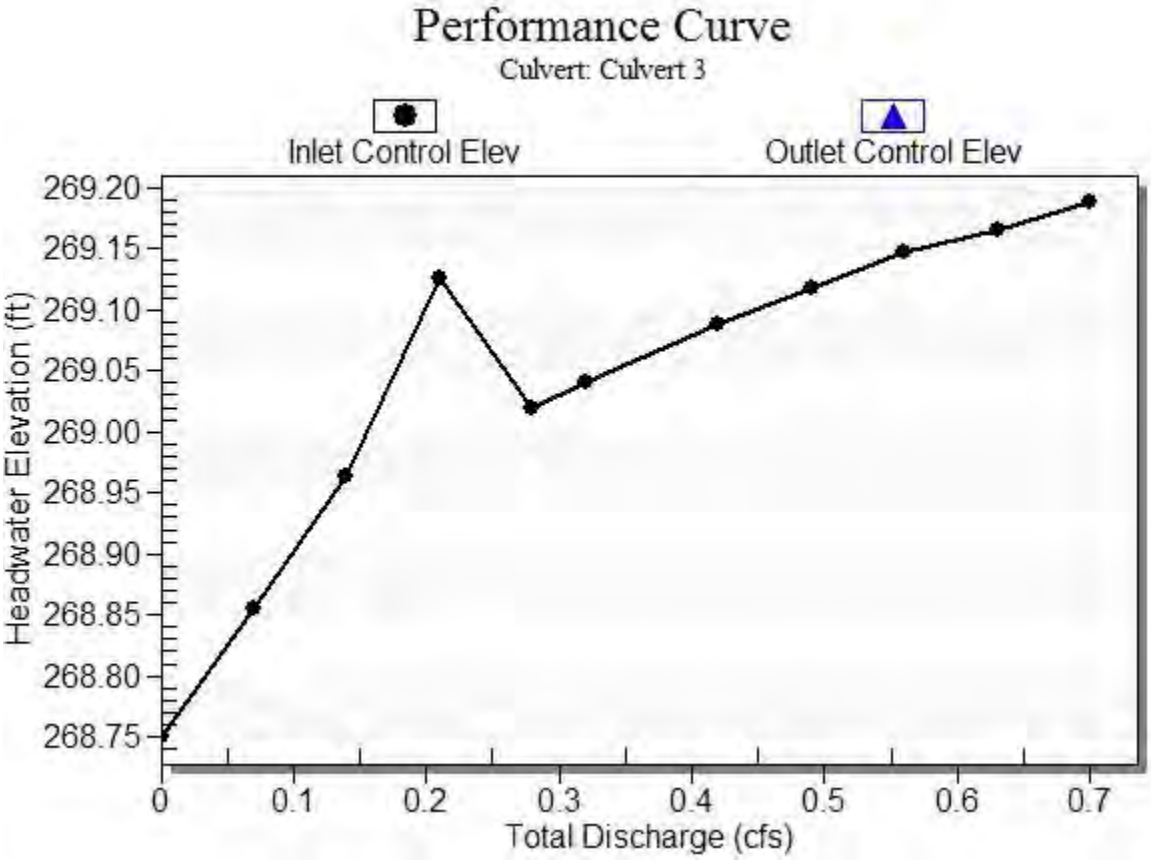
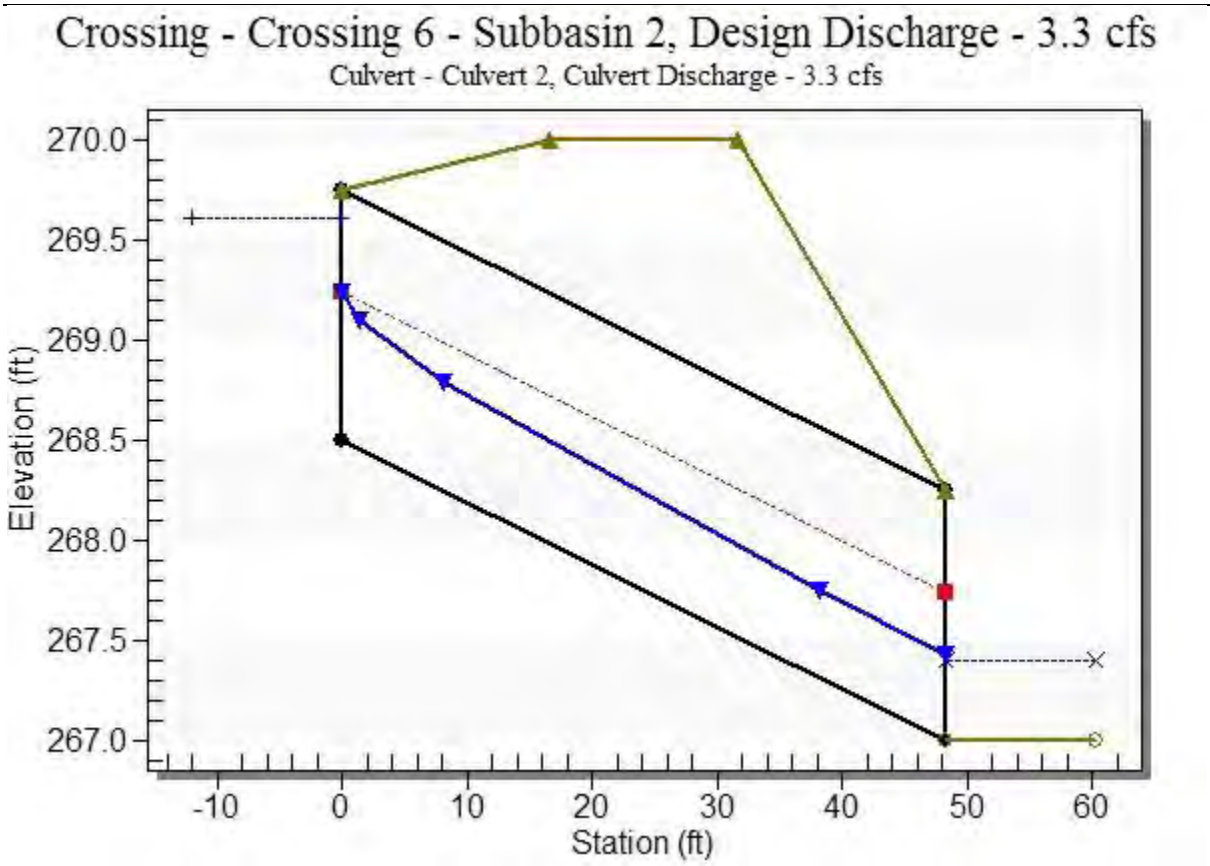


Table 5 - Summary of Culvert Flows at Crossing: Crossing 5 - Subbasin 3

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 3 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
268.75	0.00	0.00	0.00	1
268.86	0.07	0.07	0.00	1
268.96	0.14	0.14	0.00	1
269.13	0.21	0.21	0.00	1
269.02	0.28	0.28	0.00	1
269.04	0.32	0.32	0.00	1
269.09	0.42	0.42	0.00	1
269.12	0.49	0.49	0.00	1
269.15	0.56	0.56	0.00	1
269.16	0.63	0.63	0.00	1
269.19	0.70	0.70	0.00	1
270.00	4.00	4.00	0.00	Overtopping

cfs = cubic feet per second
ft = feet



Site Data - Culvert 2

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 268.50 ft

Outlet Station: 48.20 ft

Outlet Elevation: 267.00 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 2

Barrel Shape: Circular

Barrel Diameter: 1.25 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0110

Inlet Type: Conventional

Inlet Edge Condition: Square Edge with Headwall

Inlet Depression: None

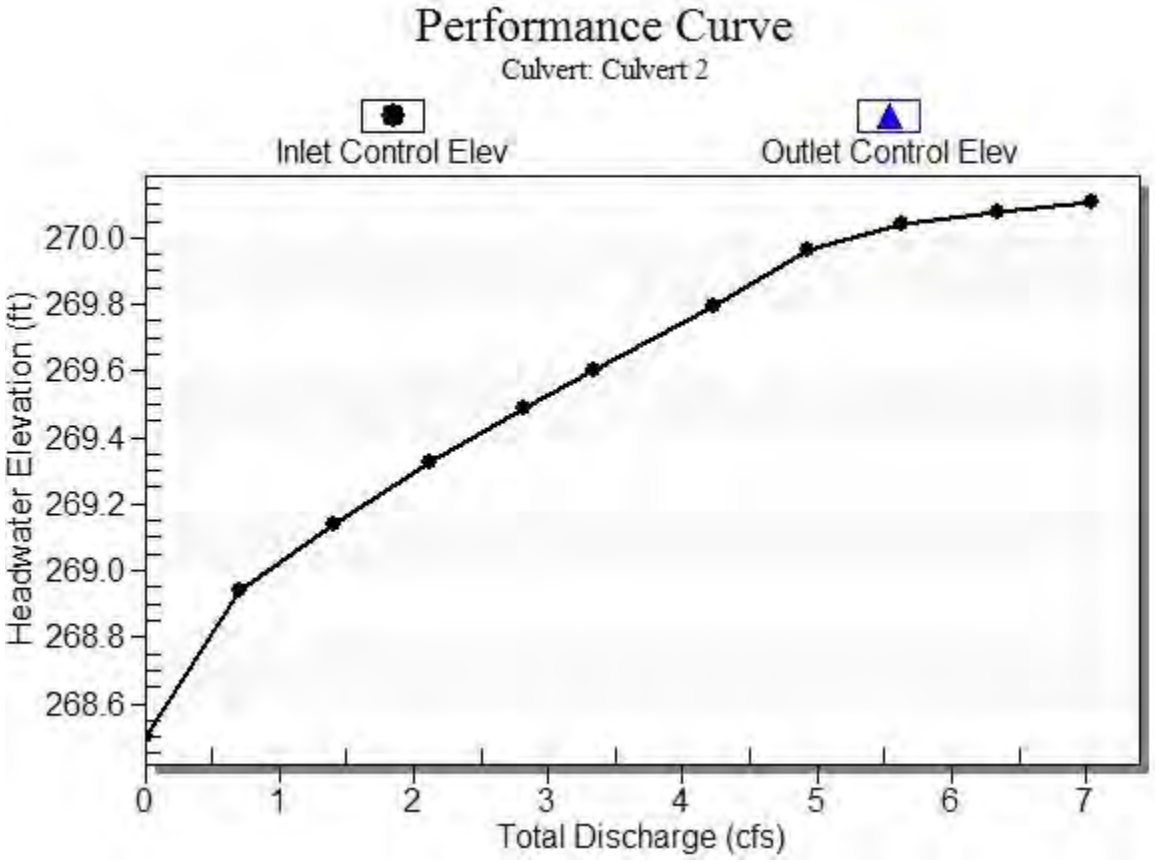
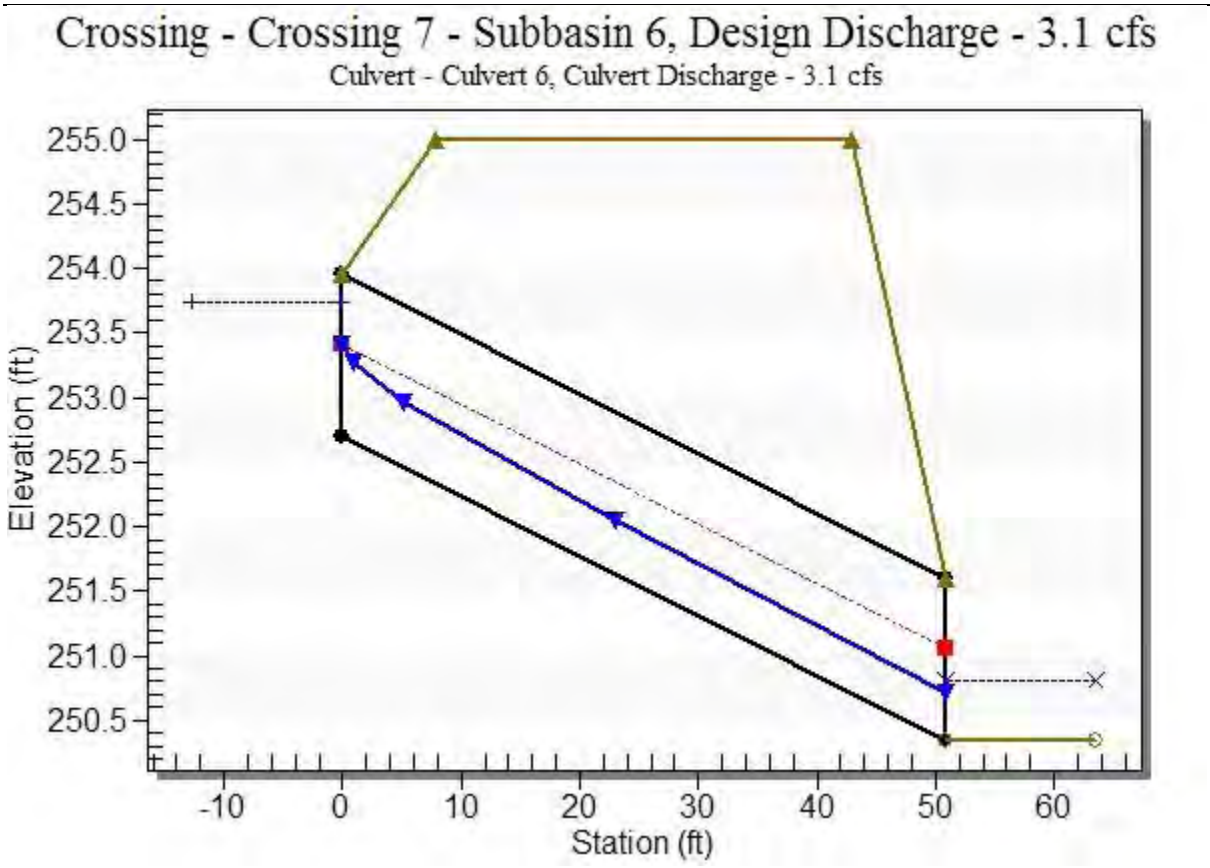


Table 6 - Summary of Culvert Flows at Crossing: Crossing 6 - Subbasin 2

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 2 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
268.50	0.00	0.00	0.00	1
268.94	0.70	0.70	0.00	1
269.14	1.41	1.41	0.00	1
269.33	2.11	2.11	0.00	1
269.49	2.82	2.82	0.00	1
269.60	3.34	3.34	0.00	1
269.80	4.22	4.22	0.00	1
269.97	4.93	4.93	0.00	1
270.04	5.63	5.22	0.39	7
270.08	6.34	5.35	0.95	4
270.11	7.04	5.46	1.56	4
270.00	5.06	5.06	0.00	Overtopping

cfs = cubic feet per second
ft = feet



Site Data - Culvert 6

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 252.70 ft

Outlet Station: 50.81 ft

Outlet Elevation: 250.35 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 6

Barrel Shape: Circular

Barrel Diameter: 1.25 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0110

Inlet Type: Conventional

Inlet Edge Condition: Square Edge with Headwall

Inlet Depression: None

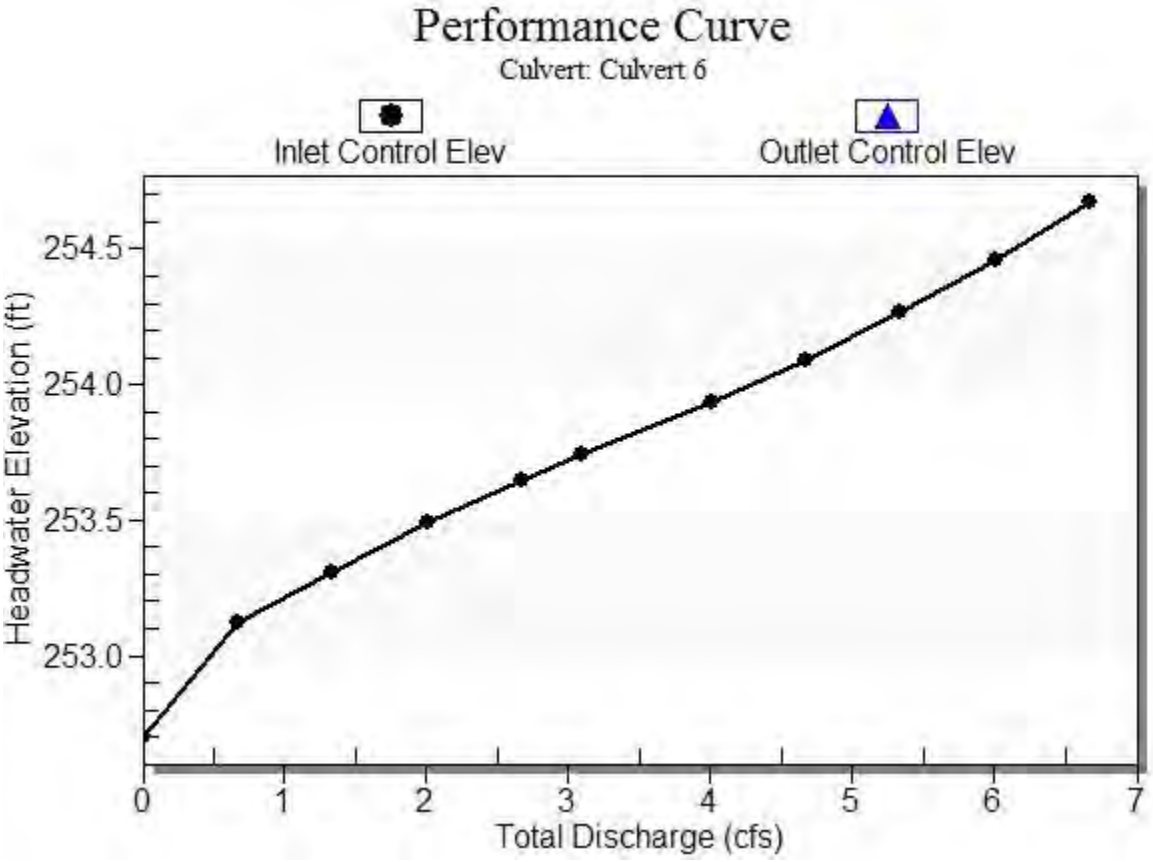
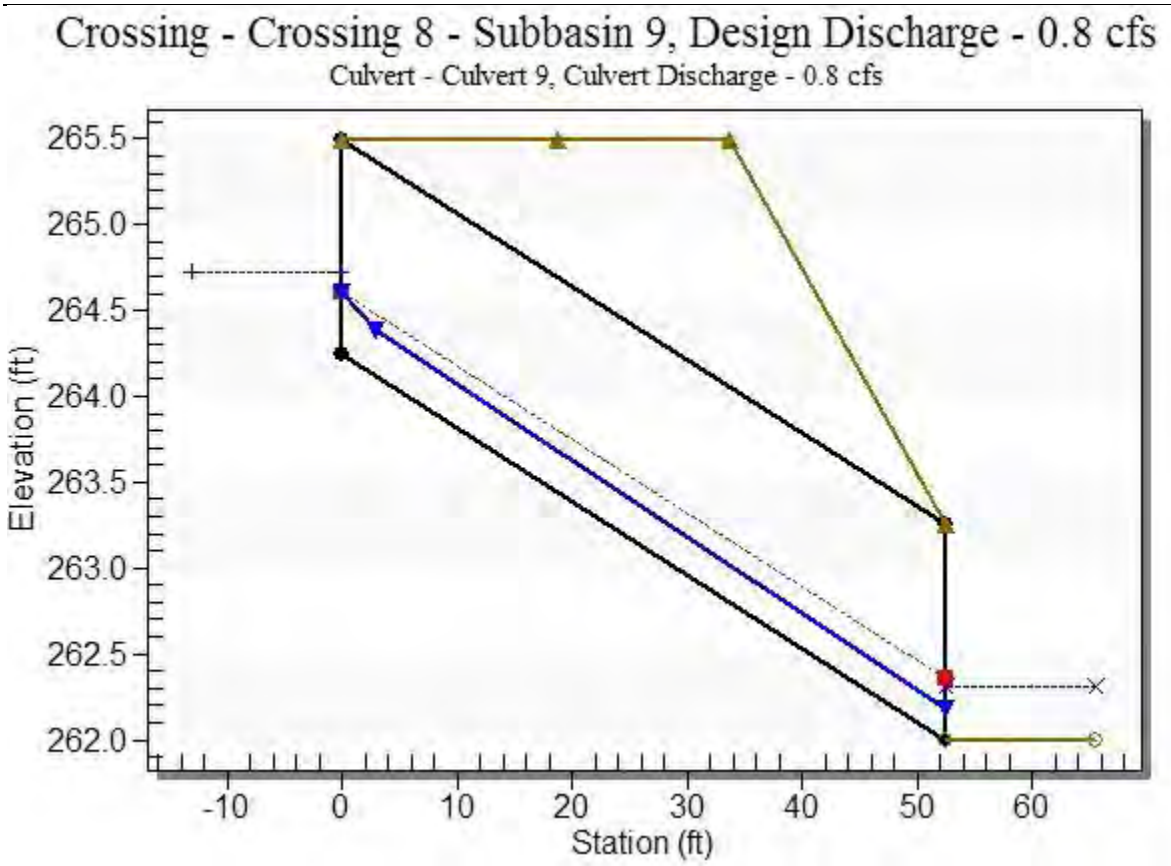


Table 7 - Summary of Culvert Flows at Crossing: Crossing 7 - Subbasin 6

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 6 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
252.70	0.00	0.00	0.00	1
253.12	0.67	0.67	0.00	1
253.31	1.33	1.33	0.00	1
253.49	2.00	2.00	0.00	1
253.65	2.67	2.67	0.00	1
253.74	3.10	3.10	0.00	1
253.94	4.00	4.00	0.00	1
254.09	4.67	4.67	0.00	1
254.26	5.34	5.34	0.00	1
254.46	6.00	6.00	0.00	1
254.67	6.67	6.67	0.00	1
255.00	7.55	7.55	0.00	Overtopping

cfs = cubic feet per second
ft = feet



Site Data - Culvert 9

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 264.25 ft

Outlet Station: 52.40 ft

Outlet Elevation: 262.00 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 9

Barrel Shape: Circular

Barrel Diameter: 1.25 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0110

Inlet Type: Conventional

Inlet Edge Condition: Square Edge with Headwall

Inlet Depression: None

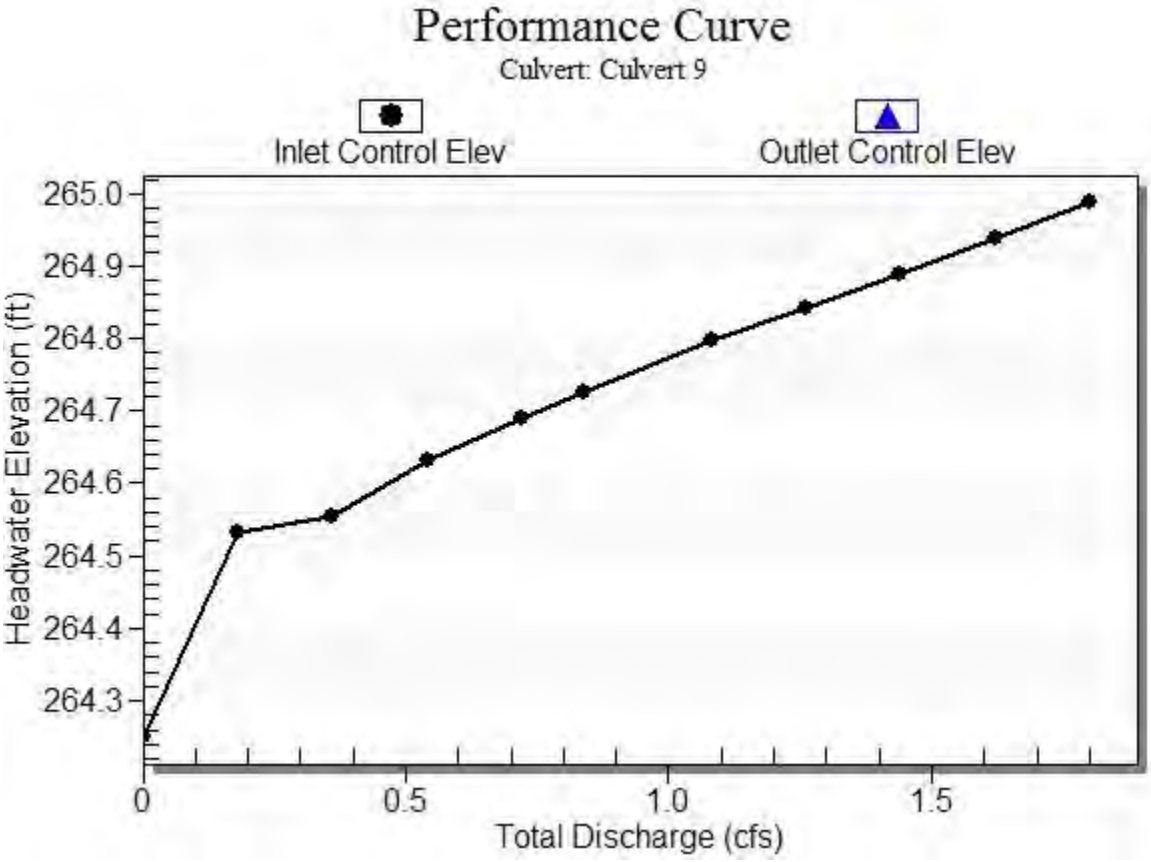
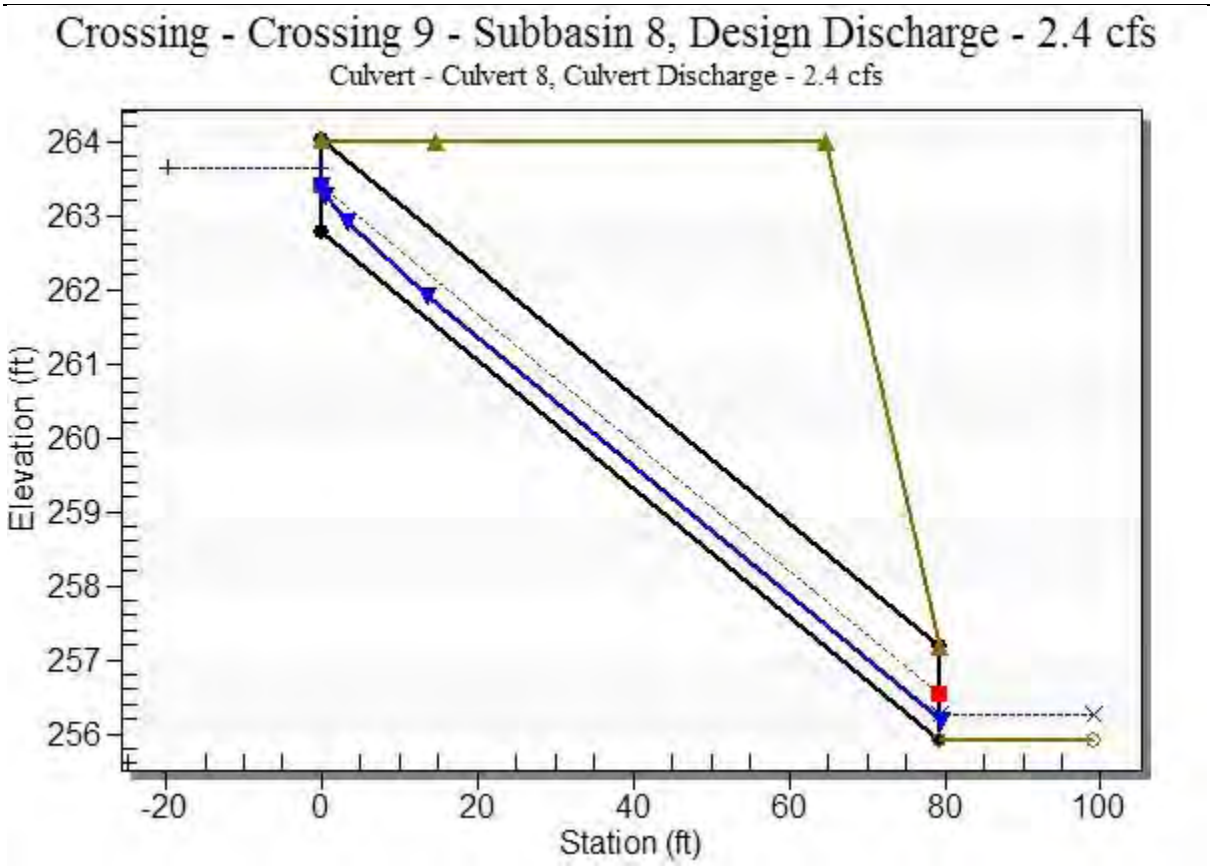


Table 8 - Summary of Culvert Flows at Crossing: Crossing 8 - Subbasin 9

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 9 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
264.25	0.00	0.00	0.00	1
264.53	0.18	0.18	0.00	1
264.55	0.36	0.36	0.00	1
264.63	0.54	0.54	0.00	1
264.69	0.72	0.72	0.00	1
264.73	0.84	0.84	0.00	1
264.80	1.08	1.08	0.00	1
264.84	1.26	1.26	0.00	1
264.89	1.44	1.44	0.00	1
264.94	1.62	1.62	0.00	1
264.99	1.80	1.80	0.00	1
265.50	4.05	4.05	0.00	Overtopping

cfs = cubic feet per second
ft = feet



Site Data - Culvert 8

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 262.78 ft

Outlet Station: 79.35 ft

Outlet Elevation: 255.92 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 8

Barrel Shape: Circular

Barrel Diameter: 1.25 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0110

Inlet Type: Conventional

Inlet Edge Condition: Square Edge with Headwall

Inlet Depression: None

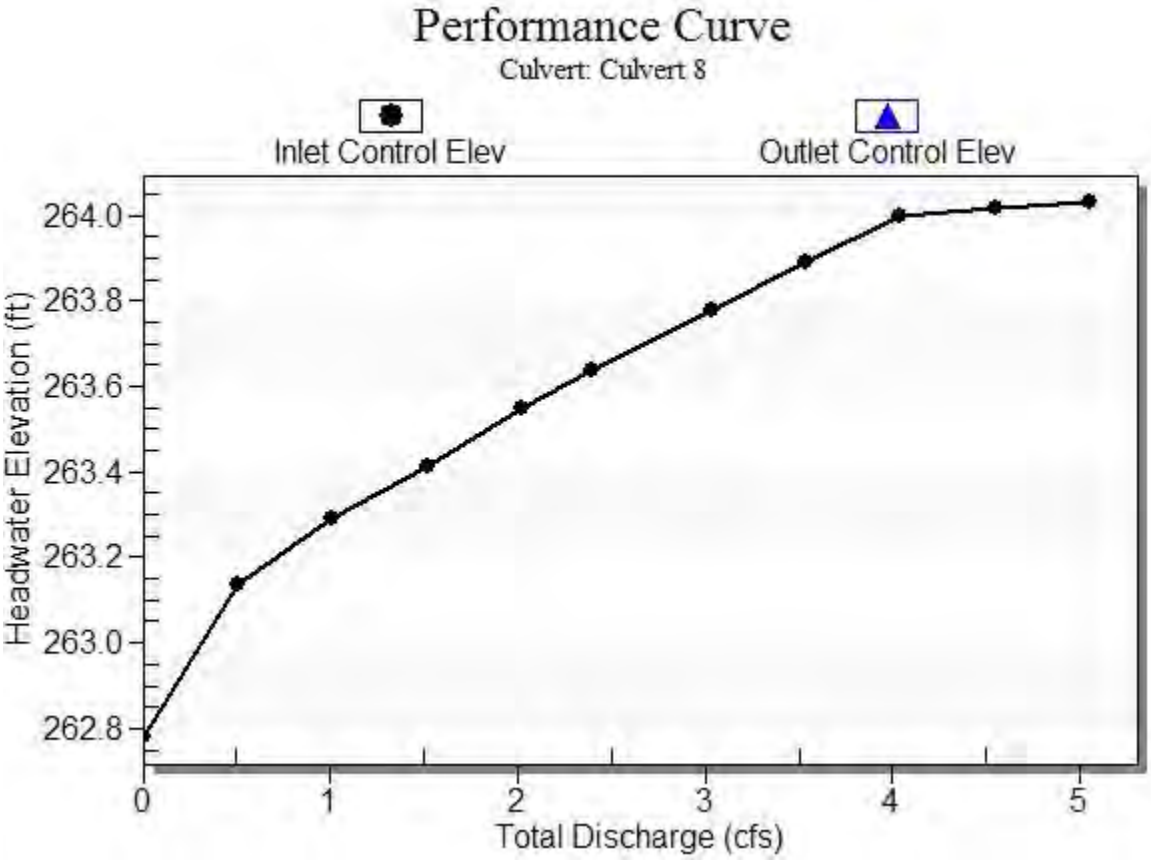
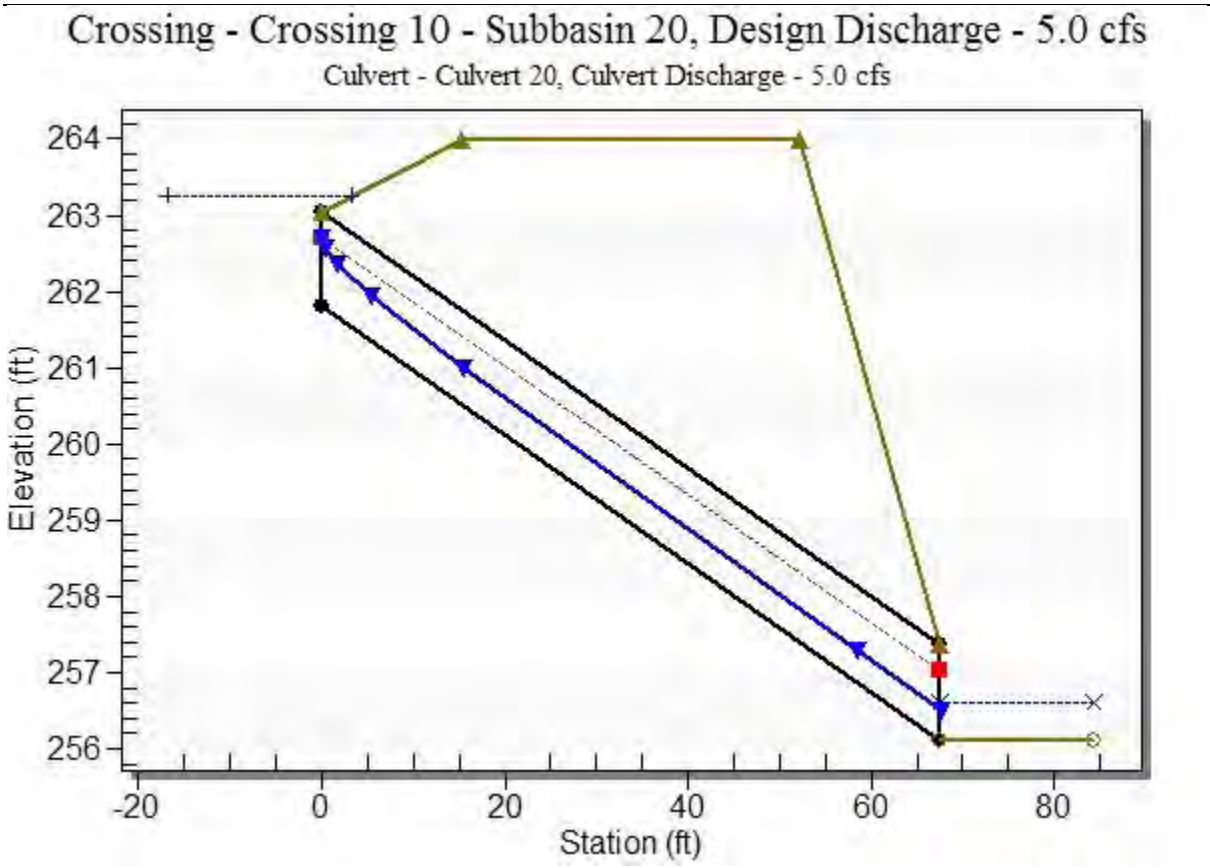


Table 9 - Summary of Culvert Flows at Crossing: Crossing 9 - Subbasin 8

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 8 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
262.78	0.00	0.00	0.00	1
263.14	0.51	0.51	0.00	1
263.29	1.01	1.01	0.00	1
263.41	1.52	1.52	0.00	1
263.55	2.02	2.02	0.00	1
263.64	2.40	2.40	0.00	1
263.78	3.03	3.03	0.00	1
263.89	3.54	3.54	0.00	1
264.00	4.04	4.04	0.00	1
264.02	4.54	4.12	0.39	5
264.03	5.05	4.18	0.85	4
264.00	4.04	4.04	0.00	Overtopping

cfs = cubic feet per second
ft = feet



Site Data - Culvert 20

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 261.80 ft

Outlet Station: 67.50 ft

Outlet Elevation: 256.12 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 20

Barrel Shape: Circular

Barrel Diameter: 1.25 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0110

Inlet Type: Conventional

Inlet Edge Condition: Square Edge with Headwall

Inlet Depression: None

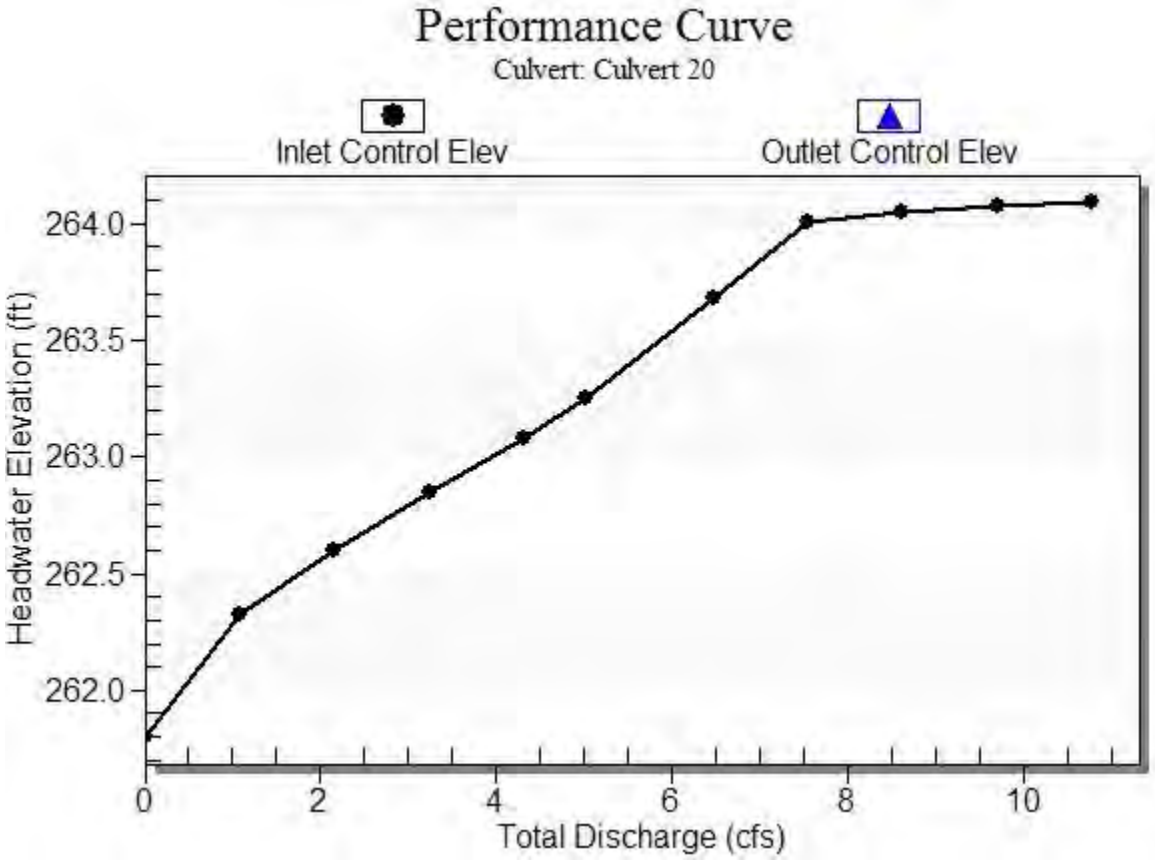
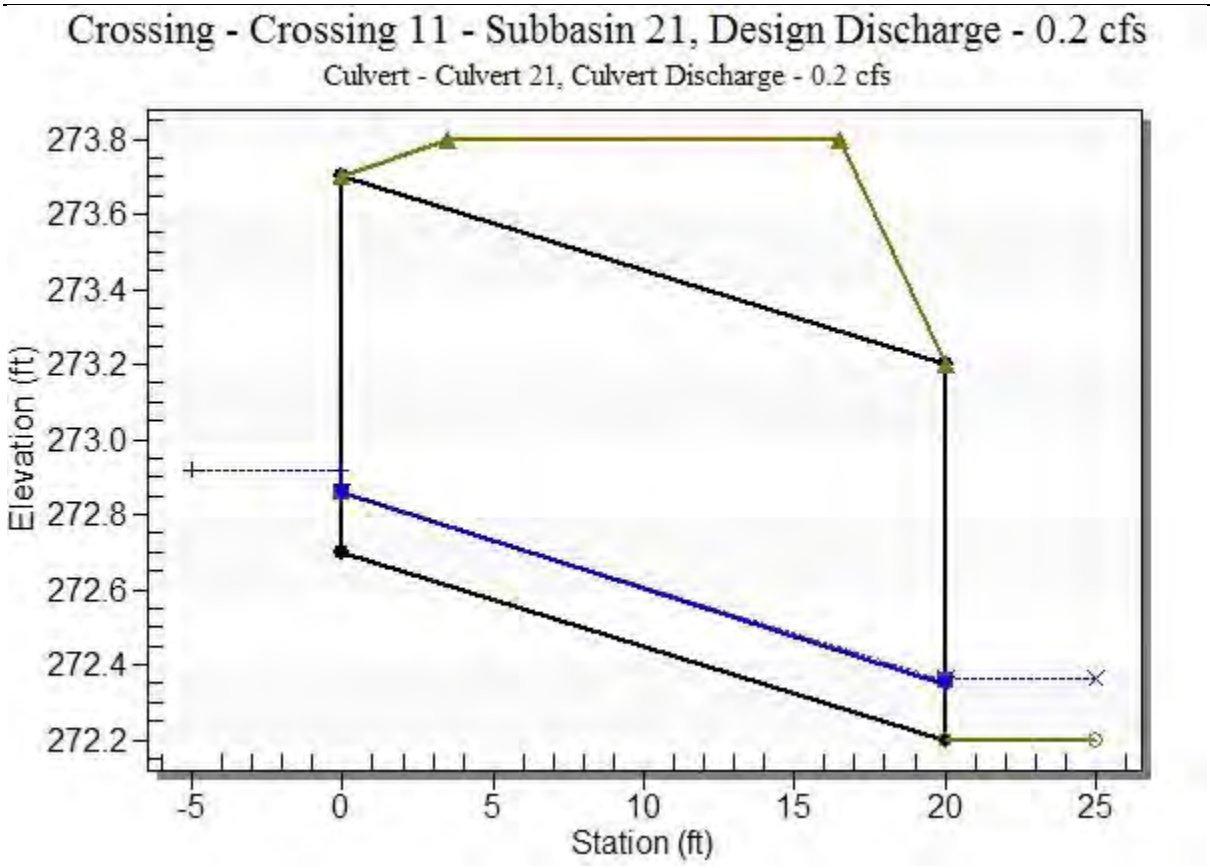


Table 10 - Summary of Culvert Flows at Crossing: Crossing 10 - Subbasin 20

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 20 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
261.80	0.00	0.00	0.00	1
262.33	1.08	1.08	0.00	1
262.60	2.15	2.15	0.00	1
262.84	3.23	3.23	0.00	1
263.08	4.30	4.30	0.00	1
263.25	5.01	5.01	0.00	1
263.68	6.46	6.46	0.00	1
264.01	7.53	7.38	0.11	29
264.05	8.61	7.47	1.09	5
264.07	9.68	7.54	2.11	4
264.09	10.76	7.59	3.11	3
264.00	7.35	7.35	0.00	Overtopping

cfs = cubic feet per second
ft = feet



Site Data - Culvert 21

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 272.70 ft

Outlet Station: 20.00 ft

Outlet Elevation: 272.20 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 21

Barrel Shape: Circular

Barrel Diameter: 1.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0110

Inlet Type: Conventional

Inlet Edge Condition: Square Edge with Headwall

Inlet Depression: None

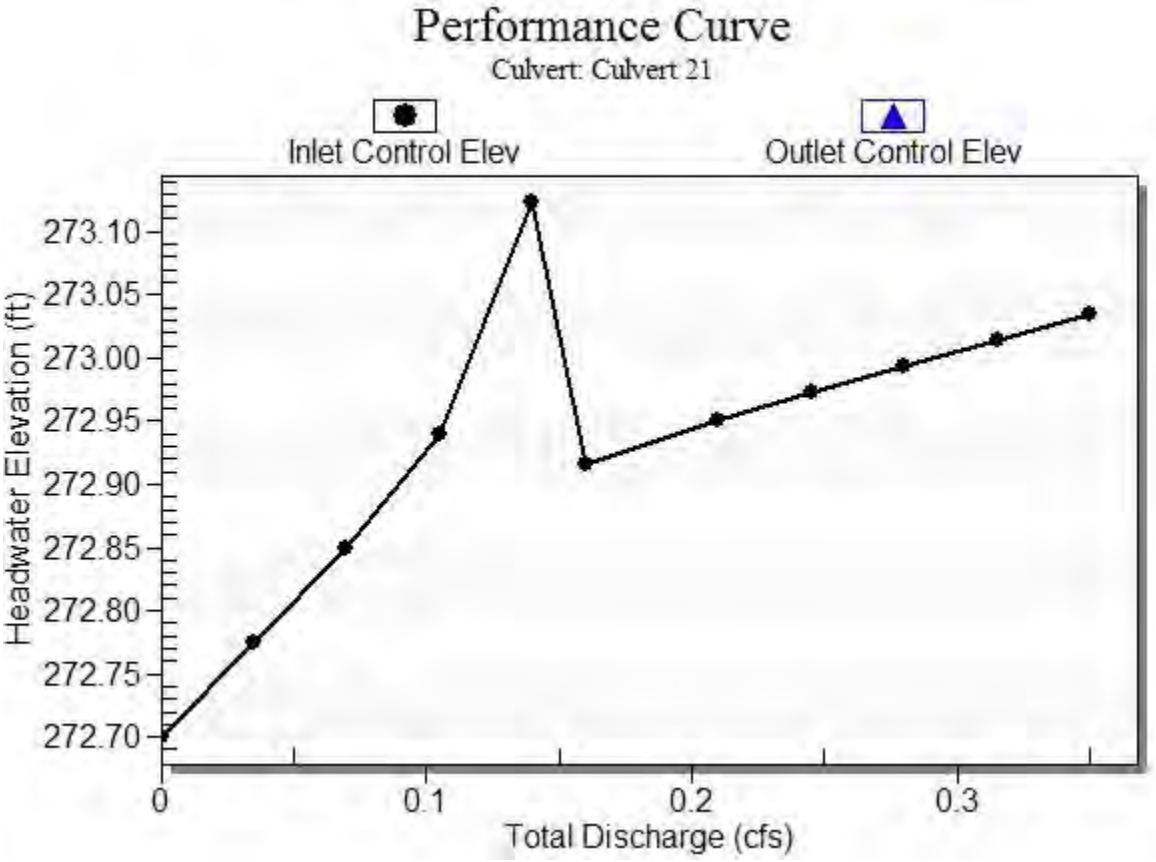
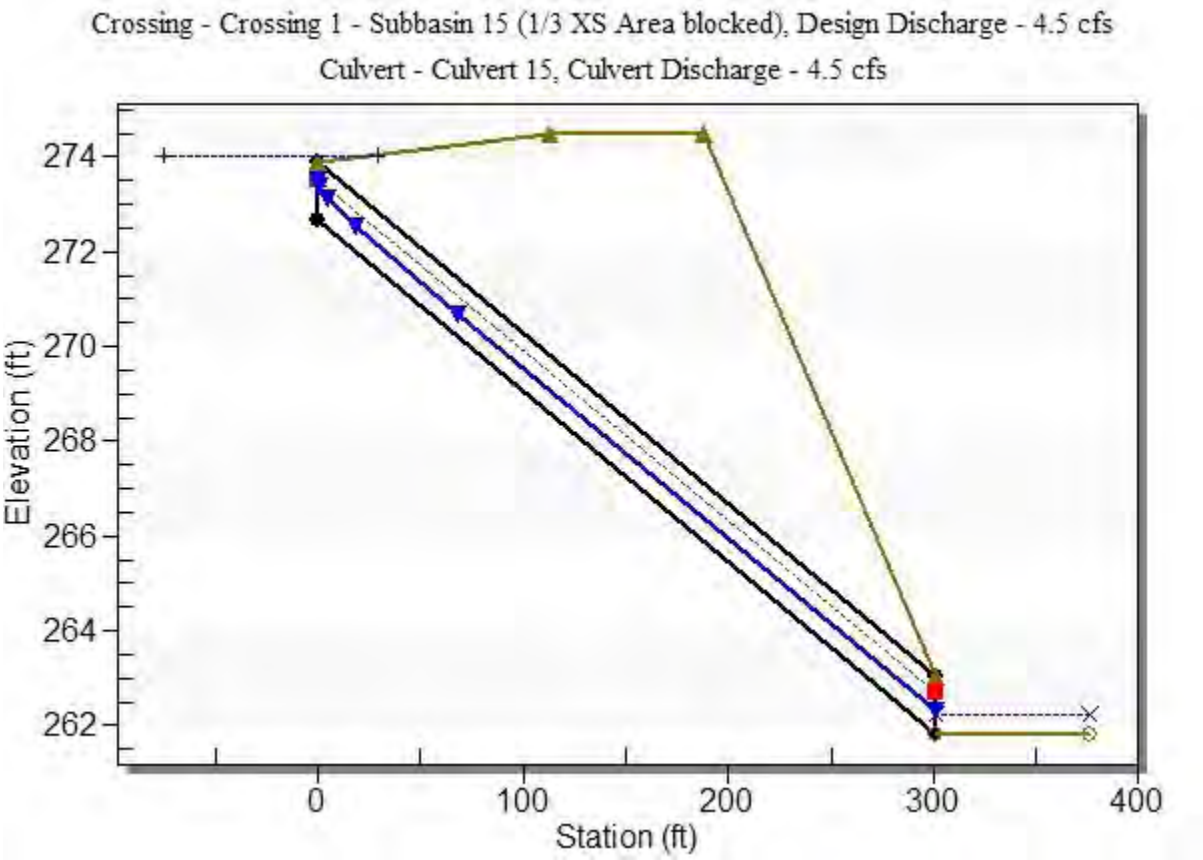


Table 11 - Summary of Culvert Flows at Crossing: Crossing 11 - Subbasin 21

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 21 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
272.70	0.00	0.00	0.00	1
272.77	0.03	0.03	0.00	1
272.85	0.07	0.07	0.00	1
272.94	0.10	0.10	0.00	1
273.12	0.14	0.14	0.00	1
272.92	0.16	0.16	0.00	1
272.95	0.21	0.21	0.00	1
272.97	0.24	0.24	0.00	1
272.99	0.28	0.28	0.00	1
273.01	0.31	0.31	0.00	1
273.03	0.35	0.35	0.00	1
273.80	2.60	2.60	0.00	Overtopping

cfs = cubic feet per second
ft = feet



Site Data - Culvert 15

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 272.65 ft

Outlet Station: 301.20 ft

Outlet Elevation: 261.83 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 15

Barrel Shape: Circular

Barrel Diameter: 1.22 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0110

Inlet Type: Conventional

Inlet Edge Condition: Square Edge with Headwall

Inlet Depression: None

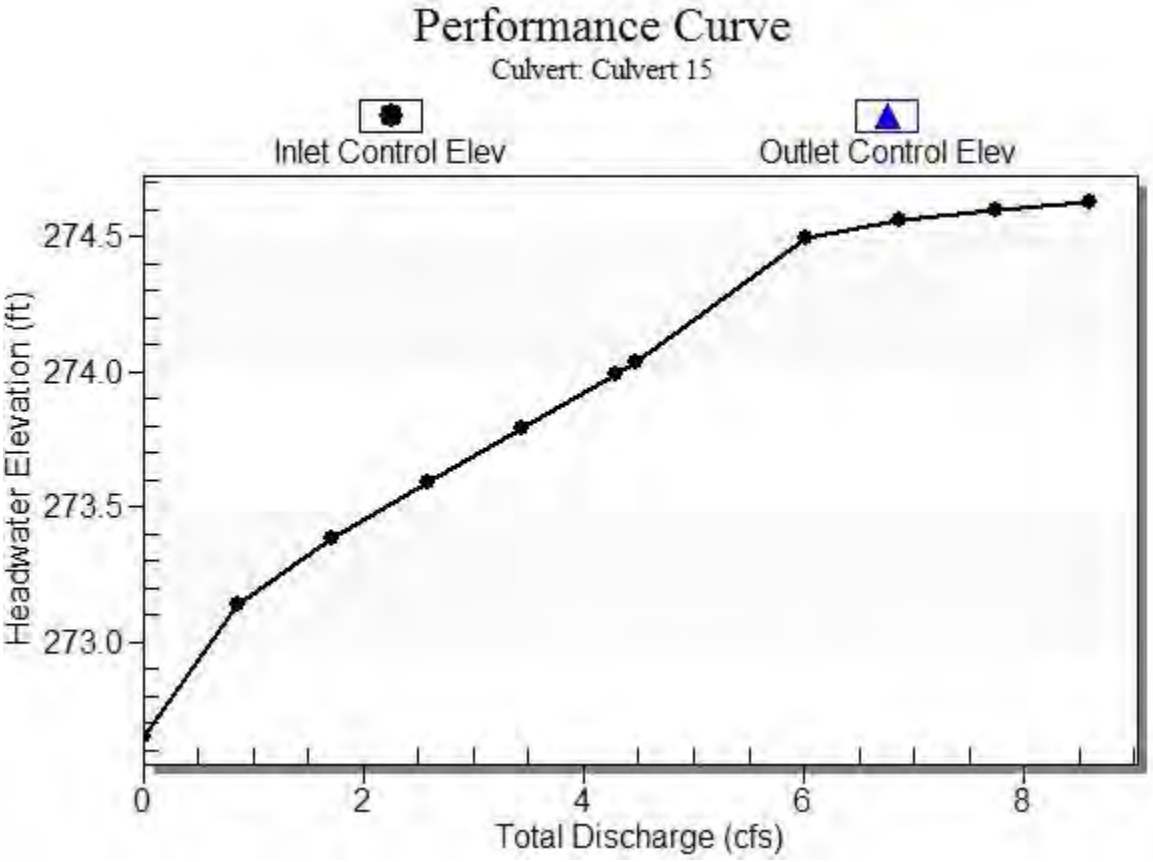


Table 12 - Summary of Culvert Flows at Crossing: Crossing 1 - Subbasin 15 (1/3 XS Area blocked)

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 15 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
272.65	0.00	0.00	0.00	1
273.14	0.86	0.86	0.00	1
273.38	1.72	1.72	0.00	1
273.59	2.58	2.58	0.00	1
273.79	3.44	3.44	0.00	1
273.99	4.29	4.29	0.00	1
274.03	4.47	4.47	0.00	1
274.49	6.01	6.01	0.00	1
274.56	6.87	6.20	0.64	6
274.60	7.73	6.31	1.39	4
274.63	8.59	6.40	2.18	4
274.50	6.04	6.04	0.00	Overtopping

cfs = cubic feet per second
ft = feet

CONCLUSION

The results show that all the culverts, except Culvert 2, 18 and 20, are well designed and have the capacity to convey 25-year storm events, provided routine check and maintenance are performed. However, if the culverts are not well maintained and are partially blocked due to erosion and sedimentation, it would reduce the actual conveyance capacity of the culverts and cause the flow backups at the entrance or overflow at the crossing, such as Culvert 15. During the field reconnaissance trip, it was noticed that almost 1/3 of the culvert was blocked by the sedimentation at the downstream end. The results from HY-8 suggest that the sedimentation at the Culvert 15 will cause the water to overtop the crossing road during the 25-year storm events. However, the conveyance of the Culvert 15 can be restored to 25-year storm events by clean-up and routine maintenance.

REFERENCES

ESRI, 2010. ArcGIS Version 10.0. www.esri.com/.

Federal Lands Highway Division Engineers, HY-8 Version 7.2., https://www.fhwa.dot.gov/engineering/hydraulics/software/hy8/

Appendix D
Concept Design Calculations

INTRODUCTION

URS Corporation (URS) created three concept designs as part of the Fort Ward Park (Park) Drainage Master Plan. These designs are described in Section Six of the report. The calculations used to estimate the geometry and hydraulics for the concept designs are provided in this Appendix. All calculations are rough estimates considered sufficient for a 10 percent design. Additional effort will be required for final design.

Concept designs have been created for sites 3, 6, and 7 (Figure D-1). Proposed modifications to the utility yard (Site 6) reduce flow from the Park into the Oakland Baptist Cemetery (Site 8). Hydrologic modeling data for these sites is also summarized in this appendix.

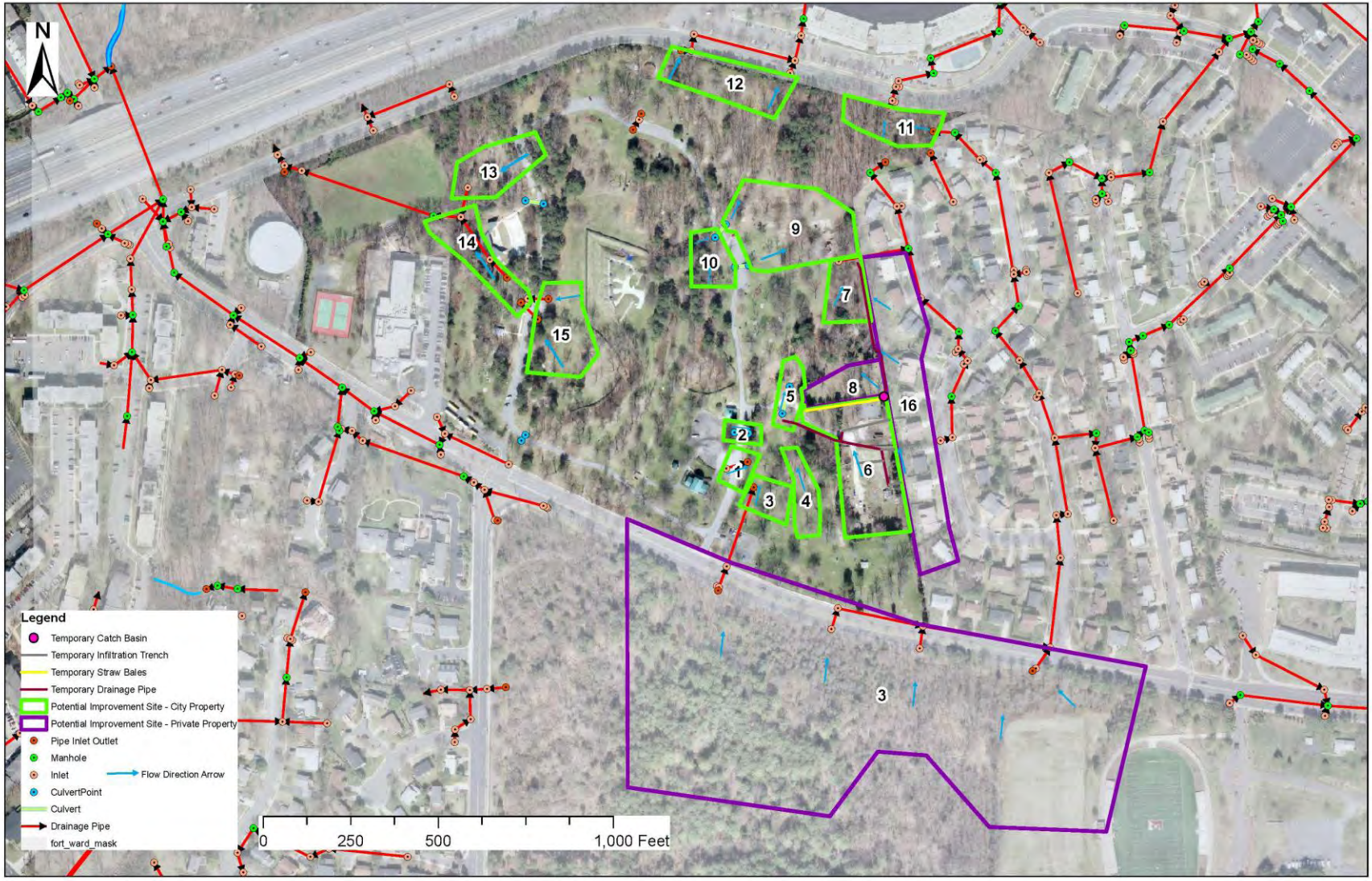


Figure D-1: Fort Ward Park Sites for Potential Improvements

FLOW CALCULATIONS

The hydrologic analysis of Fort Ward Park developed flows for the 1-, 2-, 10-, 25-, and 100-year storm events. These flows were calculated for the drainage areas shown in Figure D-2. The drainage area for the proposed stream stabilization concept design at Site 7 was identical to the outfall of drainage area 19. These flows did not have to be recalculated for the concept design. The drainage areas for the proposed concept designs at Site 3 and Site 6 varied from those originally calculated for this study. The drainage areas for the two proposed concept designs are shown in Figure D-3.

The C value was estimated for each of the two drainage areas following the methodology outlined in Section 4.1 of the Master Plan. The times of concentration for the drainage areas were also calculated following the methodology outlined in Section 4.1 of the Master Plan. The calculated C value and times of concentration are shown in Table D-1. The flows calculated for each site are shown in Table D-2.

Table D-1: Hydrologic Parameters for Concept Design Drainage Areas

Concept Site ID	Area (Acres)	Runoff Coefficient (less than 25 years)	Runoff Coefficient (more than 25 years)	Time of Concentration (min)
Site 3	5.9	0.3	0.4	36
Site 6	1.7	0.3	0.4	20

Table D-2: Summary of Hydrologic Analysis for Concept Design

Concept Site ID	Storm Event Flows (cfs)				
	1-yr	2-yr	10-yr	25-yr	100-yr
Site 3	3.4	3.9	6.1	9.2	11.4
Site 6	1.3	1.6	2.4	3.9	4.9
Site 7*	11.4	14.8	21.5	35.3	44.5

cfs = cubic feet per second

*Flow estimate from Junction 3 of Master Plan Hydrologic Analysis

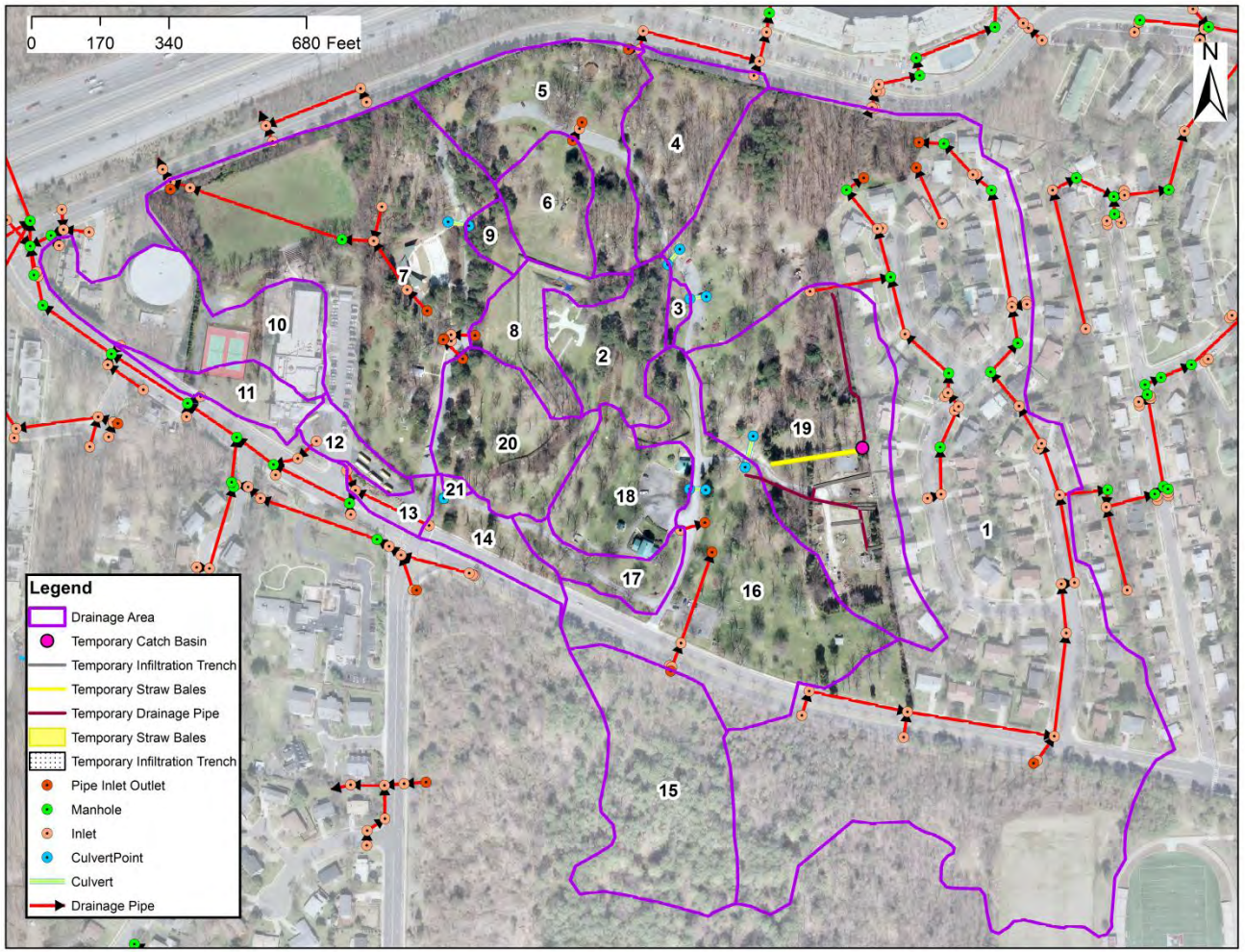


Figure D-2: Fort Ward Drainage Areas from Hydrologic Analysis

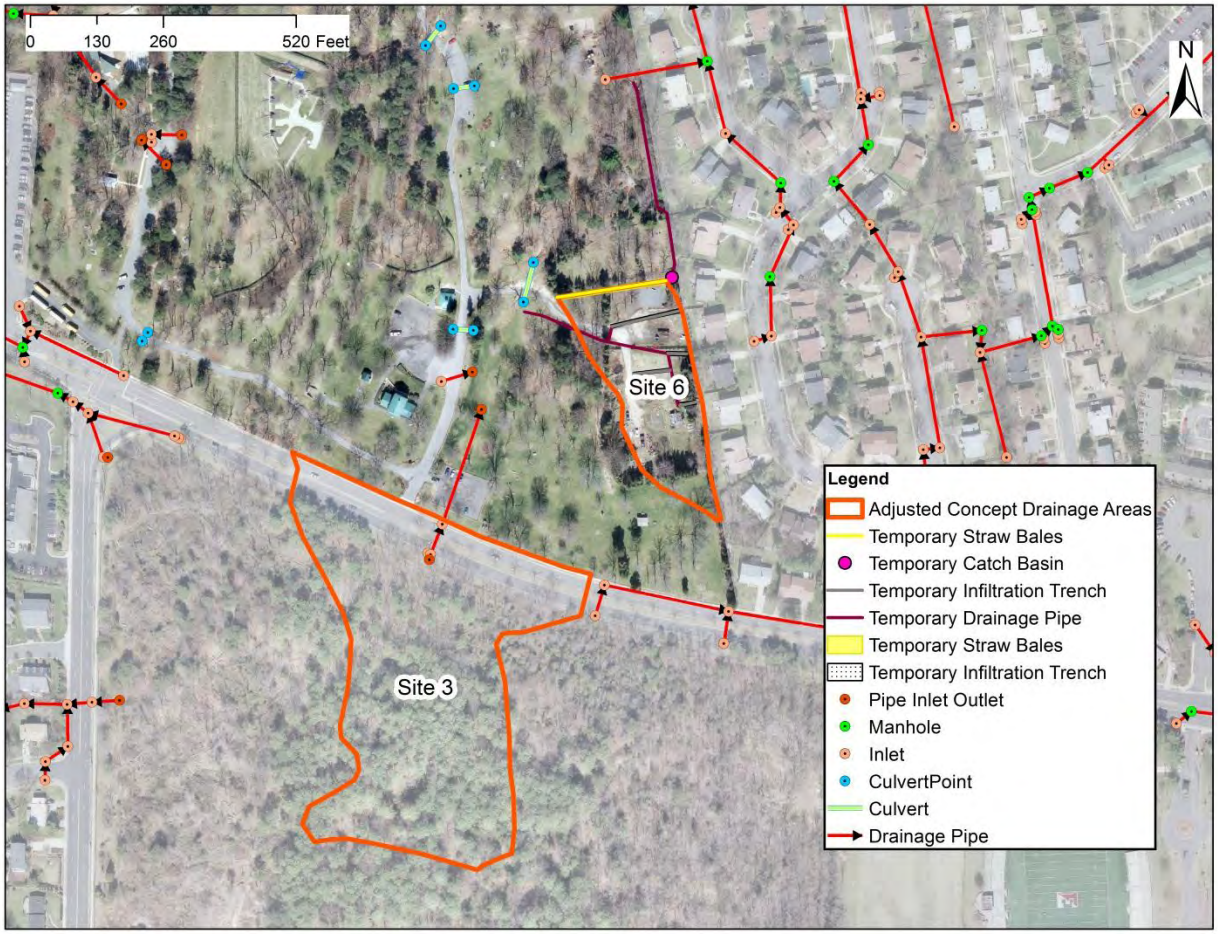


Figure D-3: Fort Ward Concept Design Drainage Area

SITE-SPECIFIC CONCEPT DESIGN CALCULATIONS

Stormwater Filter (Site 3)

The City of Alexandria requested a stormwater filter for concept design at Site 3 (Figure D-4). The Contech StormFilter was chosen as an example of a stormwater filter. As specified in Amendments to the City of Alexandria Article XIII Environmental Management Ordinance (2006), the proposed system can be designed to meet the 10-year storm event. The StormFilter is an approved Best Management Practice (BMP) in the Commonwealth of Virginia. Guidance for StormFilter design from Stormwater Management Inc. (2004) requires design using a rainfall intensity of 0.35 inches/hour. Using modified rational method with the parameters from Table D-2 the design flow is 1 cubic foot per second (cfs). This requires approximately twenty 27-inch filter cartridges in a concrete casing. The external dimensions for this casing are 15 feet long, 9 feet wide, and 6 feet deep. This unit is not necessarily recommended for final design, but is used to give a concept-level estimate of geometry and costs.

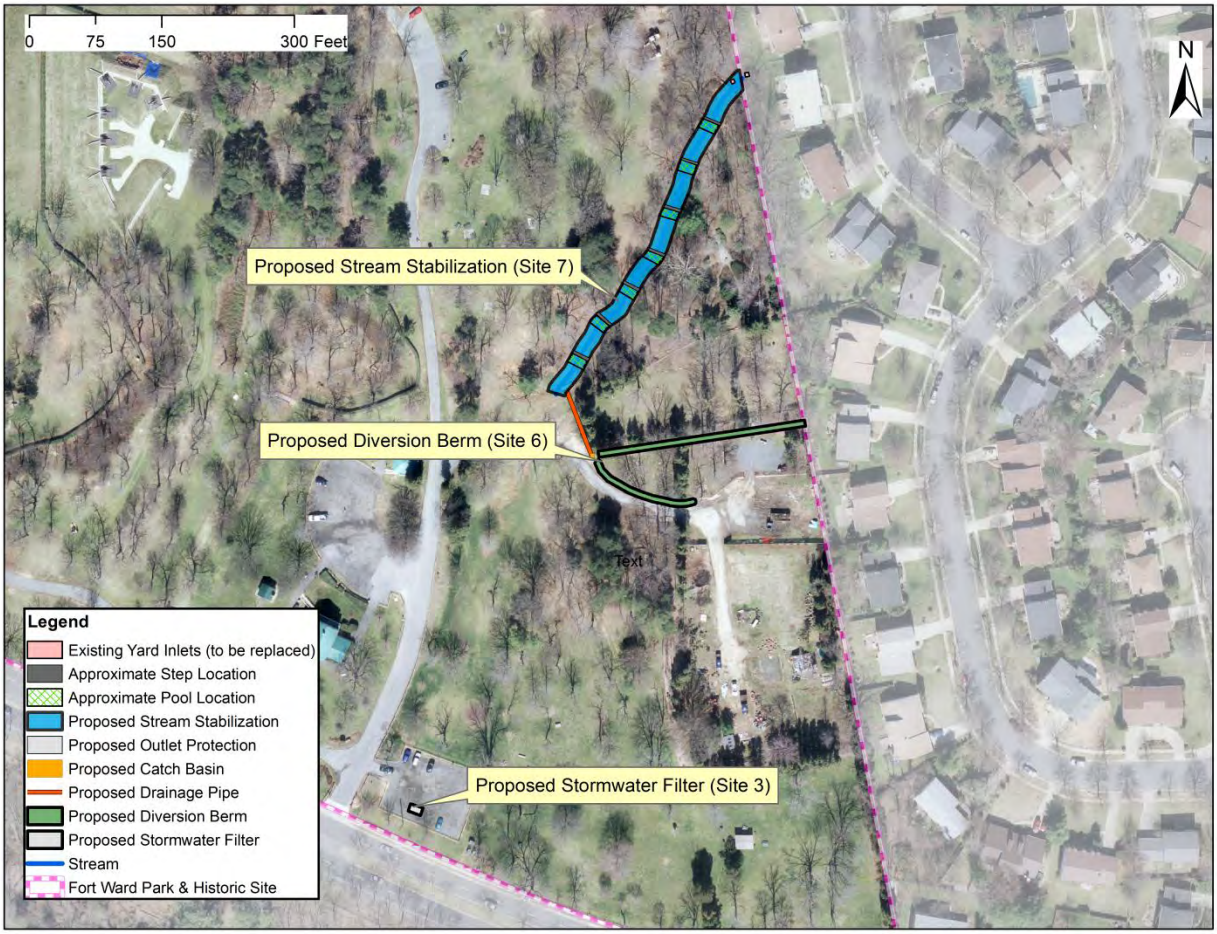


Figure D-4: Proposed Concept Design Location

Diversion Berm (Site 6)

The proposed concept design for Site 6 is a permanent earth berm to replace the existing hay bales located between Site 6 and Site 7 (Figure D-1, Figure D-4), another diversion berm to keep runoff from the road out of the utility yard, and an underground drainage pipe to direct runoff to the stream. A proposed concept cross section is shown in Figure D-5. The height of the proposed berm was estimated using Manning's equation. The channel is "V" shaped (see Figure D-5) with the existing grade slope of 10:1 (H:V) on one side, and the berm slope of 2:1 (H:V) on the other side. The berm side slope was estimated as a minimum of 2:1 (H:V) as a compromise between stability and obstruction constraints. Most of the wetted perimeter lies on the existing grade, so a roughness coefficient for short grass of 0.15 is assumed (Virginia Department of Transportation Drainage Manual). The existing slope in the direction of flow was 4 percent as determined by GIS topography. The flow from Table D-2 was used to estimate the depth associated with the 10-year flow (0.7 feet) and 25-year flow (0.8 feet). Due to uncertainty about the topography, a minimum 6-inch freeboard is recommended, resulting in a berm height of approximately 1.5 feet.

The berm geometry is calculated based on the peak flow considering the entire site 6 drainage area (Figure D-3). This is reasonable for the berm closest to the cemetery but may be overdesigned for the berm east of the entrance road. This level of calculation is considered sufficient for 10% design but the geometry of the two berms will need to be computed separately for final design.

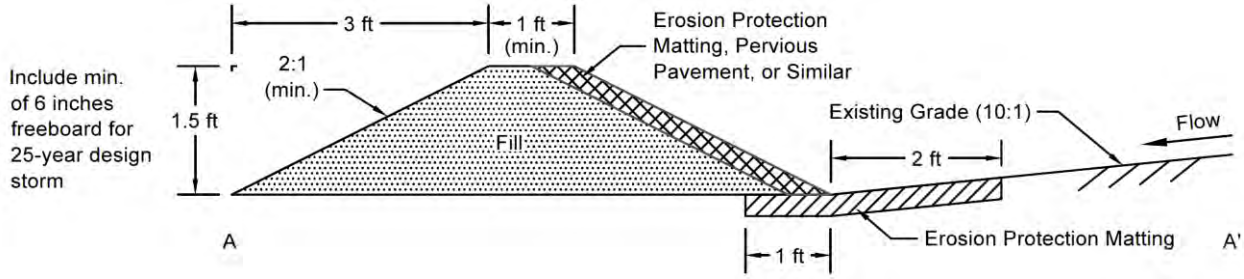


Figure D-5: Proposed Diversion Berm Concept Design Cross Section

The design meets the permissible velocity for grass-lined channel guidelines in Table 5-14 of the Virginia Sediment and Control Handbook (1992). The handbook indicates a permissible velocity range of 2.5 to 6 feet per second (ft/sec) for slopes less than 5 percent. The permissible velocity varies depending on the grass type, but the estimated velocity for the proposed concept design of 1 ft/s would meet this requirement regardless of the grass type.

The proposed design also involves a catch basin and drainage pipe to convey water from the berm to the stream. A 12-inch reinforced concrete drainage pipe is the minimum size that is recommended for catch basin. A 12-inch pipe is sufficient to convey the 10- and 25- year storm events. Excavation will be required during construction. The proposed design recommends outlet protection to avoid erosion at the stream. Potential outlet protection measures include stone (e.g., riprap), a level spreader, or a concrete slab. For cost estimates the outlet protection is assumed to be riprap.

Stream Stabilization (Site 7)

The proposed concept design for Site 7 is a step-pool stream stabilization with fill in the stream reach between steps and pools to connect the channel to its floodplain (Figure D-4). The two existing yard inlets at the downstream boundary of the stream would also be replaced as part of the proposed design. The Virginia Stream Restoration & Stabilization Best Management Practices Guide was used to estimate the geometry of the proposed stream stabilization concept design. Stream stabilization is complex due to the dynamic nature of streams. Detailed survey and analysis will be necessary prior to the final design. The calculations described in this section are based on limited data, and should be used for 10 percent concept design only.

The bankfull flow is the flow where the water level in a channel reaches its floodplain. This flow generally corresponds with the 1- and 2-year rainfall event. The bankfull width of the stream was estimated to be approximately 20 feet based on field investigation. According to the Virginia

Stream Restoration & Stabilization Best Management Practices Guide, step spacing should be 1 to 4 bankfull widths for channel slopes between 3 and 6.5 percent. Using a spacing of 2.5 bankfull widths, the step spacing was estimated to be 50 feet. For a stream reach of approximately 420 feet, this would correspond with 7 steps. (The stabilization should neither start nor end with a step.)

According to the Virginia Stream Restoration & Stabilization Best Management Practices Guide, natural steps generally fall between 1 and 2 feet above pool elevation. An average height of 1.5 feet was assumed for the proposed concept design. It was also assumed that each pool was approximately 10 feet long and was constructed upstream of the steps. With 10-foot-long pools preceding each 1.5-foot-tall step drop, the slope for the remainder of the channel was calculated to be approximately 0.035 ft/ft. With this slope, the ratio of the mean steepness (step height divided by the distance between steps) to the mean channel slope is 1.7. This falls within the 1 to 2 range recommended in the Virginia Stream Restoration & Stabilization Best Management Practices Guide for channel stability.

The channel will need to be constructed with stone around steps and pools and fill for the remainder of the channel. Excavation is not advised at the stabilization location due to the potential for historic burial sites. The proposed concept design therefore uses fill without any excavation. The average depth of fill over the reach invert would be approximately 1.5 feet. According to the Virginia Stream Restoration & Stabilization Best Management Practices Guide, the stones used for steps and pools should be approximately 1.5 feet long, requiring Class II riprap or similar. The median length for Class II riprap is 1.6 feet according to the Virginia Erosion and Sediment Control Handbook.

Manning's equation was used to estimate the velocity if the proposed stream stabilization was performed. The roughness coefficient was calculated using the Virginia Erosion and Sediment Control Handbook. An earth channel with minor irregularities and appreciable obstructions is expected to have a roughness coefficient of 0.05. Assuming a trapezoidal channel with a width of 3 feet, side slopes with 3:1 slope, and a bankfull flow of 14.8 cfs (Table D-2), the depth of flow is approximately 0.8 feet with a velocity of 3.6 feet. This height should correspond with the channel bank, but survey and detailed design would be needed to verify this. The computed velocity meets the Virginia Erosion and Sediment Control Handbook permissible velocity for unlined earth channels with fine gravel or a mixture of cobbles and fine sediments. The detailed channel design would be somewhat irregular, so lower velocities would be expected.

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Stormwater Management Inc., 2004 "Information regarding modification of design storm method for Stormwater Management, Inc. stormwater treatment systems in the Commonwealth of Virginia"

City of Alexandria, 2006 "Amendments to the City of Alexandria Article XIII Environmental Management Ordinance" http://www.alexandriava.gov/uploadedFiles/tes/info/Article_XIII_2006.pdf, accessed February 3, 2014.

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Fort Ward Park and Museum Area Management Plan

Appendix II ARCHAEOLOGICAL INVESTIGATIONS

The City of Alexandria, Virginia

October 2014

FINAL DRAFT

OFFICE OF HISTORIC ALEXANDRIA

2014

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Status of Fort Ward Archaeology, March 2014

Prepared for the Fort Ward Advisory Group
by Alexandria Archaeology, Office of Historic Alexandria

Fort Ward Park consists of 42.75 acres located at 4301 Braddock Road. Owned by the City of Alexandria, the park is managed by the Department of Recreation, Parks, and Cultural Activities. The central 36.5-acre parcel represents the historical section of the park (Figure 2). It contains a Civil War-era fortification and the Fort Ward Museum, which are administered by the Office of Historic Alexandria.

Fort Ward was recognized as a significant historical site with placement of the historical parcel on the National Register of Historic Places in 1982. The nomination for National Register designation highlights the role that Fort Ward played in the Civil War, when it formed one of the strongest links in a chain of 164 forts and batteries protecting Washington, D.C., from the Confederate Army. The northwest bastion of the fort was reconstructed in the 1960s when the City acquired the property to create the park. The historical section of the park is also registered as an archaeological site, 44AX90, with the Virginia Department of Historic Resources.

In October 2009, Alexandria City Council allocated funds to begin an archaeological investigation in the historical section of the park to provide information for park planning and management by locating and identifying the full range of cultural resources on the property, not just those related to the Civil War. The City's archaeological and historical work, which is ongoing, includes a focus on the study and interpretation of an African American community that developed on the property after the Civil War and continued as a neighborhood until the creation of the park in the 1960s. Known as "The Fort", the community included many families' homes, a school house that later became a chapel and then a residence, and several burial grounds. To ensure preservation of burials, locating and identifying the African American cemeteries and individual graves on the property has been a critical part of the City-funded initiative.

Fieldwork for three distinct excavation projects has been completed to date. For scheduling and funding purposes, the projects have been identified as Stage 1, Stage 2A and a first phase of Stage 2B. The Stage 1 excavation, conducted by the Ottery Group, Inc. from fall 2010 into January 2011, focused on identifying unmarked grave locations, testing the efficacy of using ground penetrating radar as a tool to locate graves, and locating other potentially significant resources in limited areas of the Fort Ward property. Stage 2B fieldwork, also by the Ottery Group, was completed during summer 2011; it involved archaeological investigation and monitoring, primarily to ensure that installation of a temporary drainage system in the southeastern section of the park did not have an impact on any graves, but also to look for other resources that were present in areas to be disturbed by the drainage project. Additional funds remain in the Stage 2B budget to allow for archaeological investigation prior to a more permanent solution to drainage issues within the park. The Stage 2A work, conducted in 2012 with a field crew of temporary city employees working under the supervision of Alexandria Archaeology staff, concentrated on identifying unmarked graves and other potentially significant resources in the sections of the park that were not investigated as part of the Stage 1 project. In addition, with funding from a Save America's Treasures grant from the National Park Service,

the 2012 work included testing to ensure that a proposed ADA walkway would not disturb any significant archaeological resources and to attempt to determine boundaries of both the Jackson Cemetery and Old Grave Yard so that these sacred areas of the Fort Ward property could be fenced or delineated without disturbing burials. In addition to the fieldwork, a draft of a history report on the Fort community has been prepared by consultant Dr. Krystyn Moon.

This report presents a brief summary of the work conducted to date to date for each stage and each project. The preliminary results of this work have been presented at various meetings of the Fort Ward Advisory Group and have been shared with Lardner-Klein, the consultants preparing a management plan for Fort Ward for the City of Alexandria. This report brings these results together to clarify the implications for planning and management.

Investigations Conducted To Date

Stage 1-October 2010 – January 2011,
Ground Penetrating Radar, Sara Lowry;
Excavation, Ottery Group, Inc.--Shorts Lot, Schoolhouse/Church lot, Old Grave Yard, Jackson Cemetery, former maintenance yard

Investigation

- A ground penetrating radar survey (GPR) was conducted by Sara Lowry to locate anomalies that could represent burials in known and possible cemetery areas on the grounds of Fort Ward.
- Ottery Group, Inc. conducted field excavations to field check the anomalies discovered and test the efficacy of using ground penetrating radar (GPR). They also conducted excavations to test for the presence of other cultural resources on the lot that contained the home of Harriett and Burr Shorts, one of the earliest African American families to live in The Fort Community, and within the former maintenance yard, including the school/church location.
- Metal detection was conducted to attempt to identify significant areas of Civil War activity outside of the fortification.

Results:

- Locations of 23 graves were identified, 4 in the Jackson Cemetery, 16 in the Old Grave Yard (Note: Two of these grave locations represent the head and the foot of a single burial.), and 2 in the Clara Adams burial area.
- GPR produced false positives and false negatives with regard to its ability to identify locations of graves.
- Buried resources on the Shorts house lot, the schoolhouse/church/residence property, and the Casey/Belk lot were discovered.

Stage 2B Excavation, Summer 2011, Ottery Group
Interim Drainage Project

Investigation

- Archaeologists conducted excavations along the lines of all interim drainage trenches to ensure that no burials would be disturbed as a result of placement of the interim drainage system and to look for evidence of other cultural features.
- Metal detection was conducted to attempt to identify significant areas of Civil War activity outside of the fortification.

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Results:

- Evidence of one possible human grave that had been graded away was discovered in an area just south of the entry road.
- A pet burial was discovered to the southwest of the Old Grave Yard.
- Two post holes were discovered and excavated in the former maintenance yard.

Stage 2A-Excavation, Spring and Summer 2012, Alexandria Archaeology
Investigation of full acreage of park outside of the fortification

Investigation

- City archaeologists dug trenches and hand-excavated units to look for evidences of graves on the Fort Ward property in 11 areas identified as having potential for burials to be present: Old Grave Yard, Jackson Cemetery, Adams Burial Area, Clark Burial Area, Clark Lot, School/Church and Ruffner Lots, North of Oakland Area, West of Oakland Area, Craven Lot, and Good Samaritan Lot.
- City archaeologists conducted a shovel test survey on all sections of the property (primarily outside of the fortifications) to identify locations of buried cultural resources in order to provide information about of the African American community and use during other historical periods for planning and interpretive purposes. Approximately 1400 shovel test pits were excavated.
- Hand-excavated units were placed in areas where significant numbers of artifacts related to the African American community were discovered and in areas where there was historical evidence from maps and photographs for structures to be present.
- Several hand-excavated units were placed inside the fortification to explore areas that could have contained significant Civil War features, such as a well and a base for the Fort Ward flagpole.
- A combination of more than 100 hand-excavated units and backhoe trenches were dug during Stage 2A archaeology.
- Metal detection was conducted in selected locations to attempt to discover significant areas of Civil War activity outside of the fortification.

Results

- Additional grave locations were discovered in four areas, bringing the total number of burials to 43: 20 in the Jackson Cemetery, 17 in the Old Grave Yard, 4 associated with the Adams Burial Area, and 2 in the Clark Burial Area (Figure 1).

- Twenty areas were identified with concentrations of artifacts or evidence of structures or other features relating to the African American community (Figure 2).
- Three scatters of Civil War materials were discovered outside of the fortification, but no evidence of the well or flagpole locations was found (Figure 3).
- A scatter of Native American artifacts was found north of the Oakland Baptist Church Cemetery (Figure 4).

Save America's Treasures Grant Excavations, Summer 2012, Alexandria Archaeology
Excavations for ADA walkway and possible cemetery demarcations

Investigation

- Archaeologists dug shovel tests and did metal detection inside the fortification to determine the effect of construction of a proposed walkway that would comply with the requirements of the AmericansWith Disabilities Act.
- Trenches were excavated around the identified graves in the Old Grave Yard and Jackson Cemetery areas in an attempt to locate areas where these cemeteries could be demarcated without causing disturbance to burials.

Results

- Archaeologists found that significant cultural levels would not be disturbed by construction of the walkway, which is extremely shallow.
- Perimeters containing no evidence of burials were identified that enclose much of the Old Grave Yard and Jackson Cemetery areas. More work is needed in these areas.

Summer Camp, Summer 2012 and 2013, Alexandria Archaeology

Investigation

- In 2012 and 2013, City archaeologists held a summer camp at Fort Ward. Campers excavated in the household areas of the Ashbys and the Javins, two of the earliest families of the African American community on the property.

Results

- Numerous artifacts from these two households have been discovered and will be analyzed. The foundations of the Ashby house were also found and mapped.

Fort Ward History Report

- Dr. Krystyn Moon has completed a draft report, *Finding the Fort: A History of an African American Neighborhood in Northern Virginia, 1860s – 1960s*
- Dr. Moon and City staff met with the descendants of Fort Ward and Seminary. They suggested revisions to the report, and she is currently working to address their comments and corrections.

Archaeological Work Funded for FY2014-2015

Funding for archaeological work associated with the implementation of the more permanent drainage project near Oakland Baptist Cemetery is available. Plans call for testing south of the Oakland Cemetery boundary in the summer and fall of this year.

Conclusions and Recommendations

The attached chart and maps provide the locations of significant archaeological resources identified on Fort Ward as a result of the archaeological investigations conducted to date (Table 1, Figures 1-4). The chart lists 53 areas that contain buried evidence of past activities on the property. In addition to the Civil War fortifications and barracks, these include 4 verified cemetery areas, 7 possible cemetery areas, 20 areas with the potential to provide insight into life of African Americans at The Fort, 3 scatters of other Civil War materials outside of the fortification, and a scatter of materials related to Native American use of the property. The locations of resources relating to these different periods are shown on Figures 1 through 3. Options and recommendations for additional archaeological work in each of these areas are indicated on the chart along with recommendations and implications for planning and management purposes. It should be noted that additional archaeological work is recommended in some of the verified and possible cemetery areas as well as in areas where ground disturbance associated with interpretation or other changes is proposed in the Lardner/Klein management plan.

The archaeological investigations have identified protection areas at Fort Ward that provide guidance for planning and management within the park. As shown on Figure 5 (the map that was included in the Lardner/Klein draft management plan), four levels of resource protection have been proposed:

Levels of Resource Protection

- Maximum Protection Areas—verified grave areas, possible cemeteries, and Civil War earthworks. No development should be planned. No ground disturbance without archaeological review and excavation and/or monitoring. Excavation should occur in all verified or possible cemetery areas prior to any ground disturbance; if evidence of graves is discovered, plans shall be changed to ensure protection of the burials *in situ*.

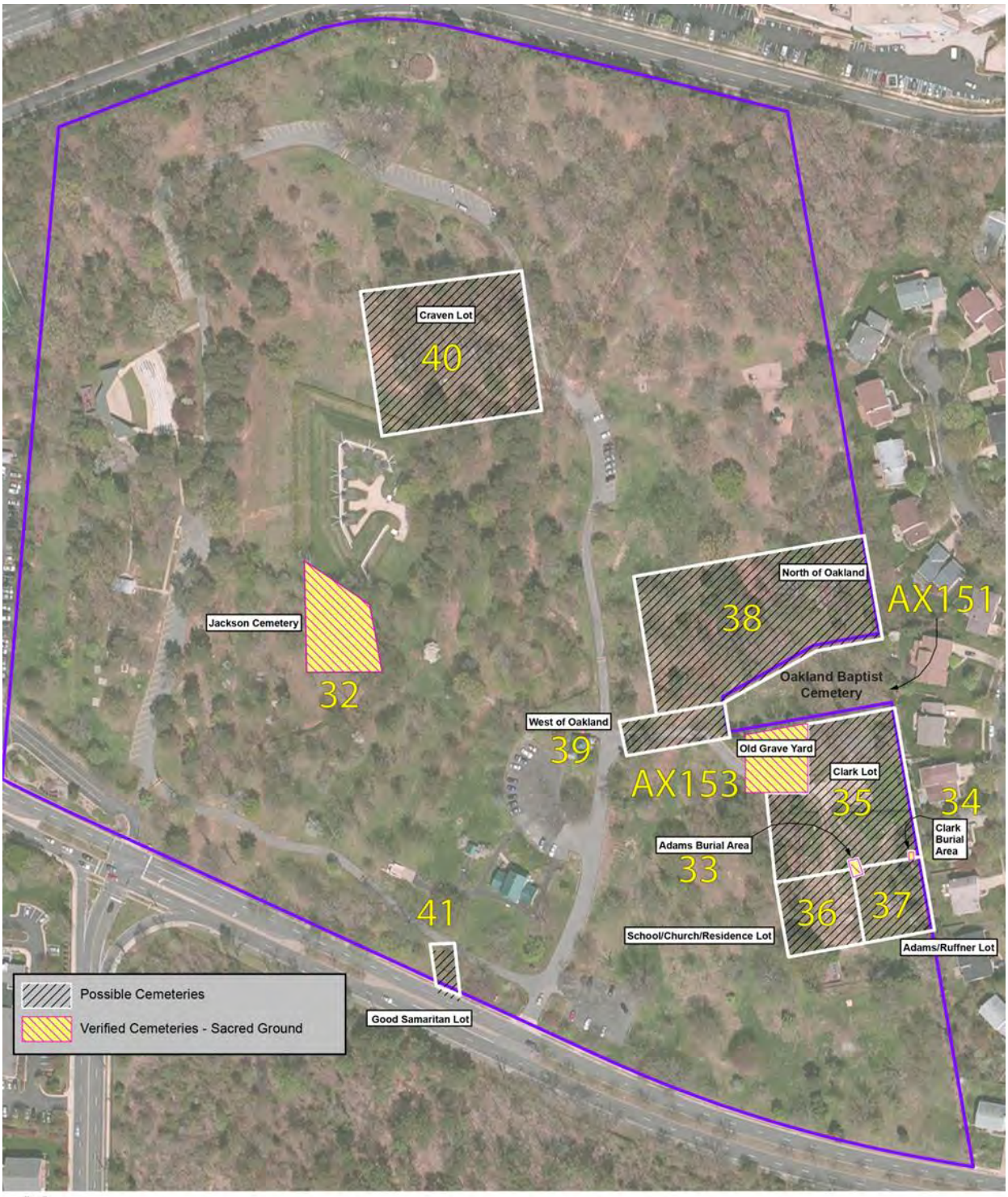
- High Protection Areas--areas where foundations, other features, and artifact scatters relating to the African American community, life of Civil War soldiers, and evidence of Native American use have been discovered. No development should be planned. No ground disturbance (other than aeration) shall proceed without archaeological review. If deemed necessary, archaeological excavation and/or monitoring will be conducted.

- Medium Protection Areas--areas where archaeological testing did not indicate the presence of significant archaeological resources. Minimal ground disturbing activities (such as, stump grinding, tree planting, etc.) may occur in these areas without archaeological excavation or monitoring. If development or major changes are proposed (such as, grading, construction of an interpretive or picnic area, etc.), archaeological

review is required. If deemed necessary, archaeological excavation and/or monitoring will be conducted.

- Low Protection Areas--areas with previous disturbances where archaeological testing did not indicate the presence of significant archaeological resources. Ground disturbing activities may occur in these areas without archaeological review.

In addition, in all protection areas, the following condition shall apply when an archaeologist is not on site: Call Alexandria Archaeology (703-746-4399) if structural remains (eg. foundations, wells, privies, etc.) or concentrations of artifacts are discovered during ground disturbing activities. Work must stop in the area of the discovery until a City archaeologist comes to the site to evaluate the resource and determine appropriate preservation measures.



Fort Ward Cultural Resources
Identified and Potential Cemeteries

Alexandria Archaeology
Office of Historic Alexandria

Figure 1

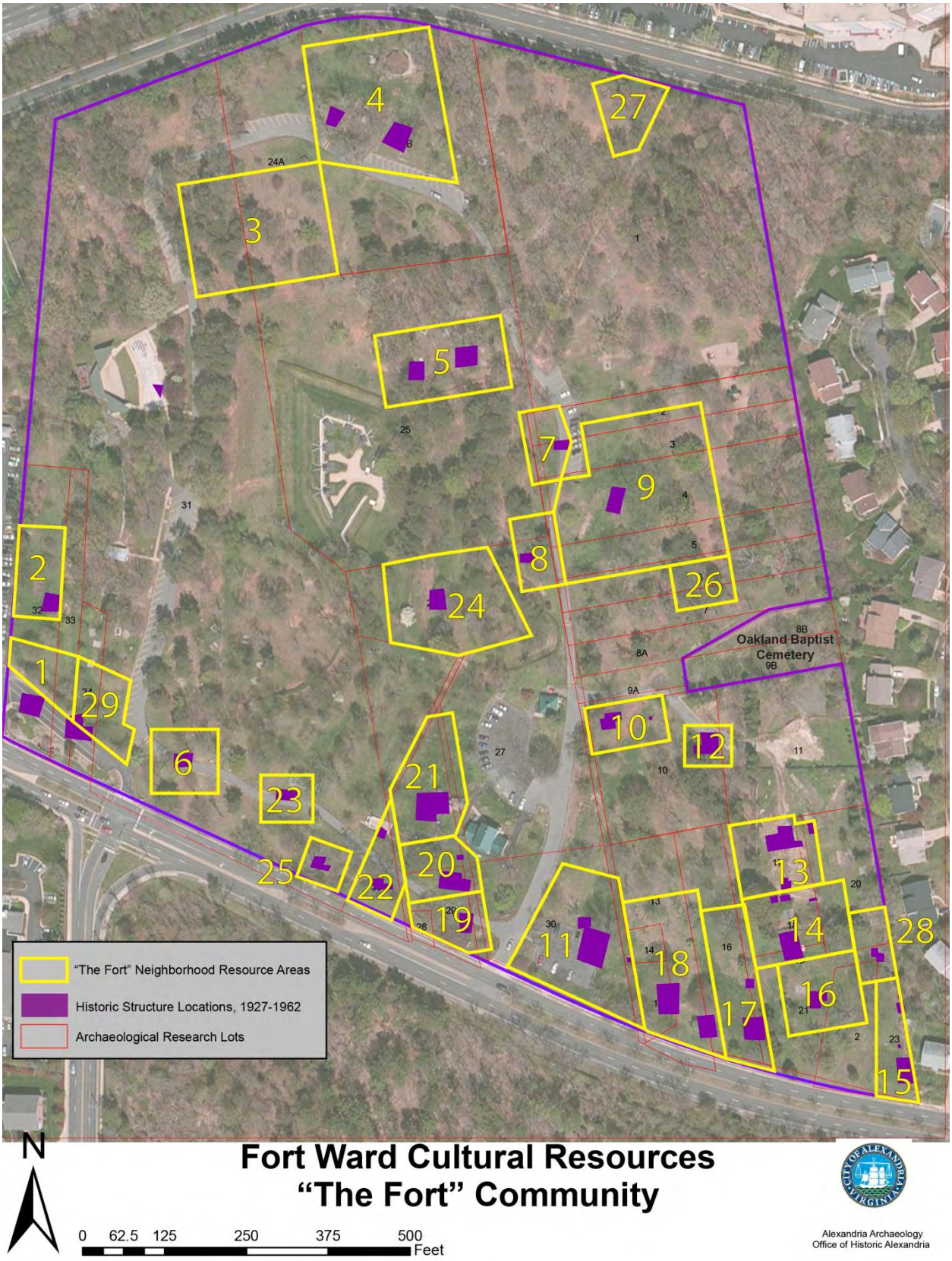
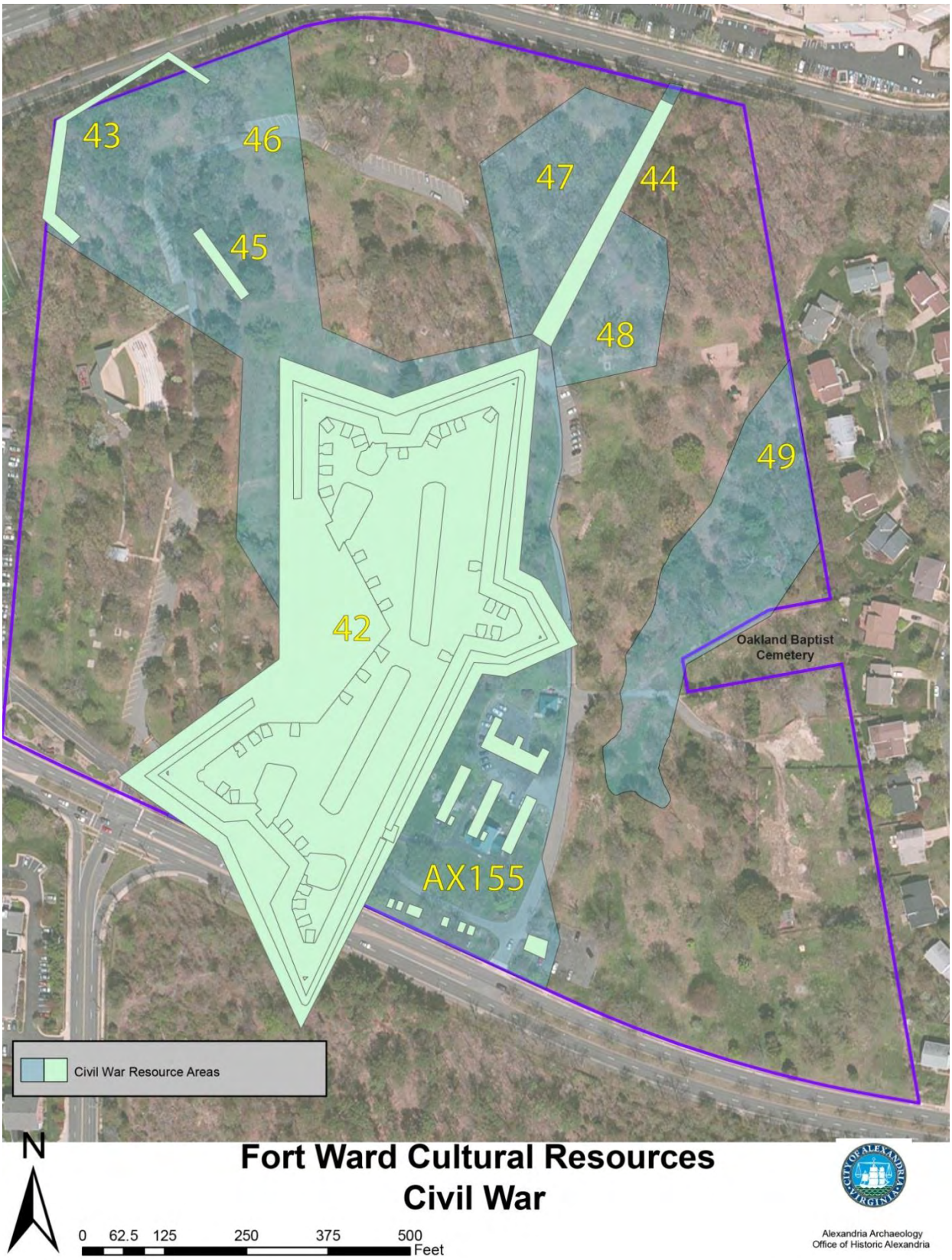

"The Fort" Neighborhood Resource Areas
Historic Structure Locations, 1927-1962
Archaeological Research Lots
Oakland Baptist Cemetery
N
0 62.5 125 250 375 500
Feet
Fort Ward Cultural Resources
"The Fort" Community
Alexandria Archaeology
Office of Historic Alexandria

Figure 2


43
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44
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49
42
AX155
Oakland Baptist Cemetery
Civil War Resource Areas
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0 62.5 125 250 375 500
Feet
Fort Ward Cultural Resources
Civil War
Alexandria Archaeology
Office of Historic Alexandria

Figure 3


AX36
50
Oakland Baptist Cemetery
Native American Resource Areas
N
0 62.5 125 250 375 500
Feet
Fort Ward Cultural Resources
Native American
Alexandria Archaeology
Office of Historic Alexandria

Figure 4

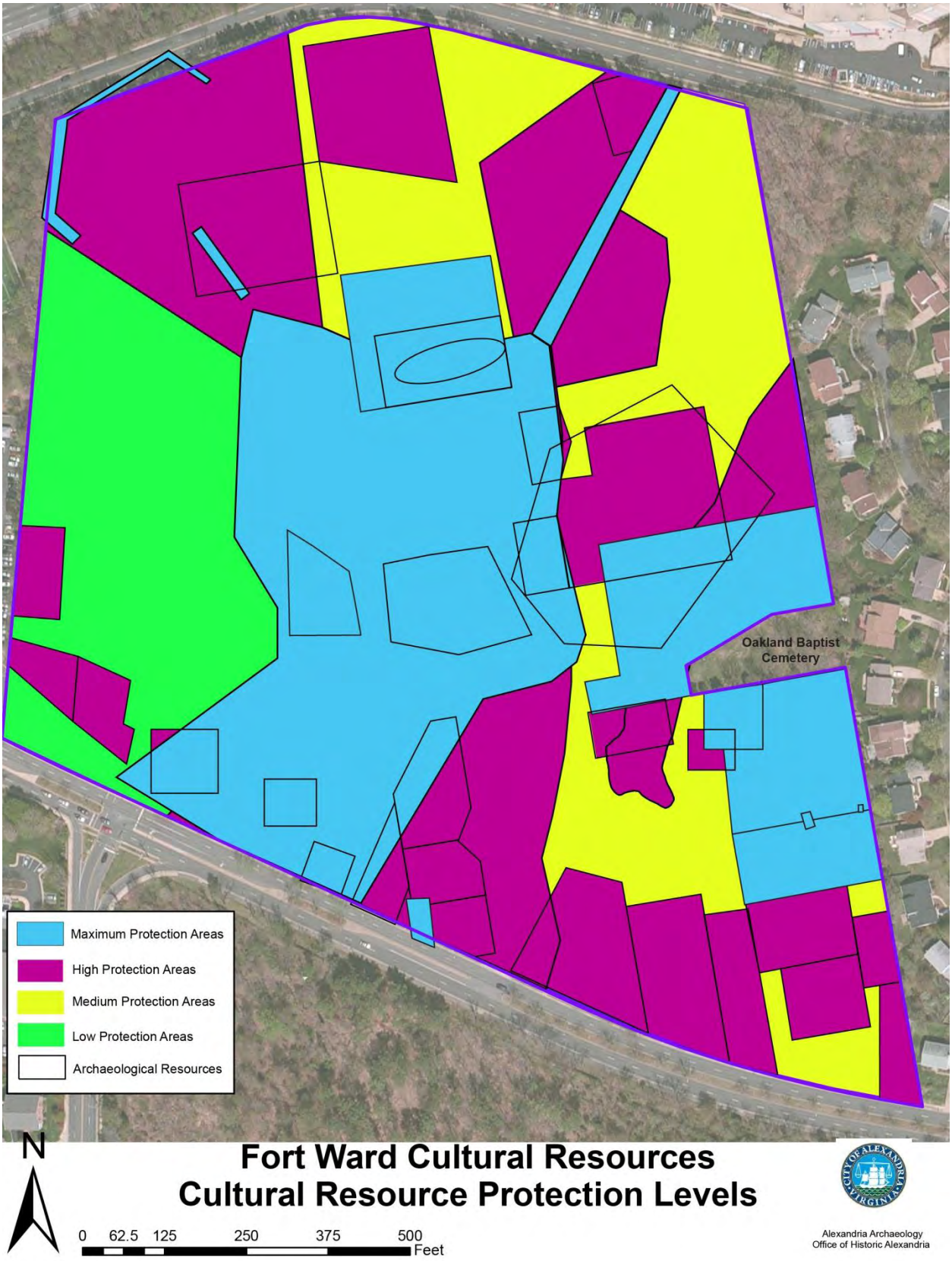

Figure 5—See report text for description of levels of protection.

DRAFT SUMMARY--ARCHAEOLOGICAL INVESTIGATIONS FORT WARD PARK, APRIL 2014

Archaeological Resources Number (ARN)	Name	Documented Time Period(s)	Documented Date Range	Resource Type	Re-search Lot	Components	Artifact Collec-tion	Archaeo-logical Features	Integrity	NRHP Significance	Archaeological Recommendations	Resource Protection Level[1]	Planning and Management Strategies
"THE FORT"-COMMUNITY RESOURCES													
44AX90- #1	Peters Lot-South	Reconstruction and Growth (1866-1916); World War I to World War II (1917-1945); The New Dominion (1946 to the present)	1913-1960	African American residence	32,33	artifact scatter	Yes	No	Yes (Note: foundation of house probably graded away-just south of resource area)	Recommend updating form--contributing to NRHP	No additional archaeological work recommended--unless needed for planning or maintenance purposes	High	No development should be planned for this area. Avoid ground disturbance to protect resource. If ground disturbance is necessary for planning or maintenance, coordinate with City archaeologists to determine preservation measures . Archaeological excavation and/or monitoring may be required.
44AX90- #2	Peters Lot-North	Reconstruction and Growth (1866-1916); World War I to World War II (1917-1945); The New Dominion (1946 to the present)	1913-1960, structure present 1940s-1960	African American residence or outbuilding	32	artifact scatter	Yes	No	Yes	Recommend updating form--contributing to NRHP	Option for additional archaeological excavations to aid in possible interpretation and to better understand time period of occupation; excavation as needed for planning or maintenance purposes	High	No development, other than interpretation, should be planned for this area. Avoid ground disturbance to protect resource. If ground disturbance is necessary for planning or maintenance, coordinate with City archaeologists to determine preservation measures . Archaeological excavation and/or monitoring may be required.
44AX90- #3	Jackson-Craven Lots, Refuse Deposit	Reconstruction and Growth (1866-1916); World War I to World War II (1917-1945); The New Dominion (1946 to the present)	c. 1900-1950s (dated from artifact assemblage)	Trash disposal area	31	dense artifact scatter- refuse (burnt)	Yes	No	Yes	Local significance	No additional archaeological work recommended--unless needed for planning or maintenance purposes	Medium, but within High Protection Area (Civil War Artifact Scatter 1)	See Civil War Resources--Civil War Artifact Scatter 1 for planning and management in this area.
44AX90- #4	Javins Lot	Reconstruction and Growth (1866-1916); World War I to World War II (1917-1945); The New Dominion (1946 to the present)	1894-1934	African American residence	24b	artifact scatter, possible well	Yes	Yes	Yes	Recommend updating form--contributing to NRHP	Option for additional archaeological excavations for interpretive purposes; as needed for planning or maintenance purposes	High	No development, other than interpretation, should be planned for this area. Avoid ground disturbance. If ground disturbance is necessary for planning or maintenance, coordinate with City archaeologists to determine preservation measures . Archaeological excavation and/or monitoring may be required.

Archaeological Resources Number (ARN)	Name	Documented Time Period(s)	Documented Date Range	Resource Type	Re-search Lot	Components	Artifact Collec-tion	Archaeo-logical Features	Integrity	NRHP Significance	Archaeological Recommendations	Resource Protection Level[1]	Planning and Management Strategies
44AX90- #5	J. Walter Craven Lot	World War I to World War II (1917-1945)	Craven ownership--1922-1926, rental property into 1930s	African American residence and possible outbuilding	25	light artifact scatter, foundation pier	Yes	Yes	Yes	Recommend updating form--contributing to NRHP	No additional archaeological work recommended--unless needed for planning or maintenance purposes	High, but within Maximum Protection Area (Fort Ward)	See Civil War Resources--Fort Ward for planning and management in this area.
44AX90- #6	Jackson Lot-West	World War I to World War II (1917-1945)	c. 1930s	Structure, probable African American residence	31	artifact scatter	Yes	No	Unevaluated - structure location probably disturbed by previous road construction	Recommend updating form--contributing to NRHP	No additional archaeological work recommended--unless needed for planning or maintenance purposes	within Maximum Protection Area (Fort Ward)	See Civil War Resources--Fort Ward for planning and management in this area.
44AX90- #7	Original Shorts Lot-Northwest	World War I to World War II (1917-1945)	c. 1920-1937	Structure	2, 3	unevaluated	No	No	Unevaluated	unevaluated	No additional archaeological work recommended--unless needed for planning or maintenance purposes	within Maximum Protection Area (Fort Ward)	See Civil War Resources--Fort Ward for planning and management in this area.
44AX90- #8	Miller Lot-North	World War I to World War II (1917-1945)	c. 1930s	Structure-	27	unevaluated	No	No	Unevaluated	unevaluated	No additional archaeological work recommended--unless needed for planning or maintenance purposes	within Maximum Protection Area (Fort Ward)	See Civil War Resources--Fort Ward for planning and management in this area.
44AX90- #9	Original Shorts Lot	Reconstruction and Growth (1866-1916); World War I to World War II (1917-1945); The New Dominion (1946 to the present)	c. 1884-1950	African American residence	2,3,4,5,6	foundations--house and chimney, artifact scatter	Yes	Yes	Yes	Recommend updating form--contributing to NRHP	Option for additional archaeological excavations for interpretive purposes; excavation as needed for other planning or maintenance purposes	High	No development, other than interpretation, should be planned for this area. Avoid ground disturbance to protect resource. If ground disturbance is necessary for planning or maintenance, coordinate with City archaeologists to determine preservation measures . Archaeological excavation and/or monitoring may be required.
44AX90- #10	Smith/Collins Lot-West	World War I to World War II (1917-1945); The New Dominion (1946 to the present	c. 1930-1950s	African American residence	10	artifact scatter	Yes	No	Yes	Recommend updating form--contributing to NRHP	No additional archaeological work recommended--unless needed for planning or maintenance purposes	High	No development should be planned for this area. Avoid ground disturbance to protect resource. If ground disturbance is necessary for planning or maintenance, coordinate with City archaeologists to determine preservation measures . Archaeological excavation and/or monitoring may be required.

Archaeological Resources Number (ARN)	Name	Documented Time Period(s)	Documented Date Range	Resource Type	Re-search Lot	Components	Artifact Collec-tion	Archaeo-logical Features	Integrity	NRHP Significance	Archaeological Recommendations	Resource Protection Level[1]	Planning and Management Strategies
44AX90- #11	Ashby Lot	Reconstruction and Growth (1866-1916); World War I to World War II (1917-1945); The New Dominion (1946 to the present)	c. 1898-1961	African American residence	30	artifact scatter, house foundations	Yes	Yes	Yes	Recommend updating form--contributing to NRHP	Development of possible interpretive elements planned for this area. Archaeological excavations may be needed for development of interpretive elements. Additional archaeological investigations--as needed for other planning or maintenance purposes.	High	Interpretive development possible in this area. Conduct archaeological investigation for interpretive purposes. Avoid other ground disturbance. If other ground disturbance is necessary for planning or maintenance, coordinate with City archaeologists to determine preservation measures . Additional archaeological excavation and/or monitoring may be required.
44AX90- #12	Smith/Collins Lot-East	World War I to World War II (1917-1945); The New Dominion (1946 to the present	c. 1930-1950s	structure, possible outbuilding or African American residence	10	artifact scatter, pet burial	Yes	Yes	Yes	Recommend updating form--contributing to NRHP	No additional archaeological work recommended--unless needed for planning or maintenance purposes	High	No development should be planned for this area. Avoid ground disturbance. If ground disturbance is necessary for planning or maintenance, coordinate with City archaeologists to determine preservation measures . Archaeological excavation and/or monitoring may be required.
44AX90- #13 See 44AX90-#36	Fairfax County--Falls Church District School/St. Cyprians Episcopal Church/Young Lot	Reconstruction and Growth (1866-1916); World War I to World War II (1917-1945); The New Dominion (1946 to the present)	c. 1898-1960	African American school, church, residence	12,17	artifact scatter, foundations	Yes	Yes	Yes	Recommend updating form--contributing to NRHP	Interpretive development possibly planned for this area. Archaeological excavation recommended prior to any development for interpretive purposes and to ensure that there is no impact on possible graves (Resource No.36). Additional archaeological excavation and/or monitoring as needed for planning and management purposes.	Maximum	Interpretive development possibly planned for this area. Conduct archaeological investigation prior to construction of proposed interpretive elements. If graves are discovered in locations where disturbance is proposed, development plans shall be changed to insure protection of burials in place. If other ground disturbance is necessary for other planning and management purposes, coordinate with City archaeologists to determine preservation measures. Additional archaeological excavation and/or monitoring may be required.

Archaeological Resources Number (ARN)	Name	Documented Time Period(s)	Documented Date Range	Resource Type	Re-search Lot	Components	Artifact Collec-tion	Archaeo-logical Features	Integrity	NRHP Significance	Archaeological Recommendations	Resource Protection Level[1]	Planning and Management Strategies
44AX90- #14	Casey/Belk Lot	World War I to World War II (1917-1945); The New Dominion (1946 to the present	c. 1931-1965	African American residence	18, 19	artifact scatter, privy	Yes	Yes	Yes	Recommend updating form--contributing to NRHP	Interpretive development possibly planned for this area. Archaeological excavation recommended prior to any development for interpretive purposes and to ensure that there is no impact on possible graves. Additional archaeological excavation and/or monitoring as needed for planning and management purposes.	High	Interpretive development possibly planned for this area. Conduct archaeological investigation prior to construction of proposed interpretive elements. If other ground disturbance is necessary for other planning and management purposes, coordinate with City archaeologists to determine preservation measures. Additional archaeological excavation and/or monitoring may be required.
44AX90- #15	Hogan Lot-South	World War I to World War II (1917-1945); The New Dominion (1946 to the present	c. 1931-1962	African American residence	23	artifact scatter, founations	Yes	Yes	Yes	Recommend updating form--contributing to NRHP	No additional archaeological work recommended--unless needed for planning or maintenance purposes	High	No development should be planned for this area. Avoid ground disturbance. If ground disturbance is necessary for planning or maintenance, coordinate with City archaeologists to determine preservation measures . Archaeological excavation and/or monitoring may be required.
44AX90- #16	Adams/Willis McKnight Lot	Reconstruction and Growth (1866-1916); World War I to World War II (1917-1945); The New Dominion (1946 to the present)	c. 1890-1964	African American residence	21	artifact scatter,	Yes	No	Yes	Recommend updating form--contributing to NRHP	Interpretive development possibly planned for this area. Archaeological excavation recommended prior to any development for interpretive purposes. Additional archaeological excavation and/or monitoring as needed for planning and management purposes.	High	Interpretive development possibly planned for this area. Conduct archaeological investigation prior to construction of proposed interpretive elements. If other ground disturbance is necessary for other planning and management purposes, coordinate with City archaeologists to determine preservation measures. Additional archaeological excavation and/or monitoring may be required.

Archaeological Resources Number (ARN)	Name	Documented Time Period(s)	Documented Date Range	Resource Type	Re-search Lot	Components	Artifact Collec-tion	Archaeo-logical Features	Integrity	NRHP Significance	Archaeological Recommendations	Resource Protection Level[1]	Planning and Management Strategies
44AX90- #17	Ball Lot	Reconstruction and Growth (1866-1916); World War I to World War II (1917-1945); The New Dominion (1946 to the present)	c. 1912-1962	African American residence	16	artifact scatter, possible structure foundation	Yes	Possibly	Yes	Recommend updating form--contributing to NRHP	Interpretive development possibly planned for this area. Archaeological excavation recommended prior to any development for interpretive purposes. Additional archaeological excavation and/or monitoring as needed for planning and management purposes.	High	Interpretive development possibly planned for this area. Conduct archaeological investigation prior to construction of proposed interpretive elements. If other ground disturbance is necessary for other planning and management purposes, coordinate with City archaeologists to determine preservation measures. Additional archaeological excavation and/or monitoring may be required.
44AX90- #18	Clark/Hyman Lot	World War I to World War II (1917-1945); The New Dominion (1946 to the present	c. 1920s-1962	African American residences	13, 14, 15	artifact scatter, foundations	Yes	Yes	Yes	Recommend updating form--contributing to NRHP	No additional archaeological work recommended--unless needed for planning or maintenance purposes	High	No development should be planned for this area. Avoid ground disturbance. If ground disturbance is necessary for planning or maintenance, coordinate with City archaeologists to determine preservation measures . Archaeological excavation and/or monitoring may be required.
44AX90- #19 & #20	Robert McKnight Lot	Reconstruction and Growth (1866-1916); World War I to World War II (1917-1945); The New Dominion (1946 to the present)		African American residences/ possible outbuilding	29	artifact scatter, well	Yes	Yes	Yes	Recommend updating form--contributing to NRHP	Option for additional archaeological excavations for interpretive purposes; as needed for other planning or maintenance purposes	High	No development, other than interpretation, should be planned for this area. Avoid ground disturbance. If ground disturbance is necessary for planning or maintenance, coordinate with City archaeologists to determine preservation measures . Archaeological excavation and/or monitoring may be required.
44AX90- #21	Miller Lot	Reconstruction and Growth (1866-1916); World War I to World War II (1917-1945); The New Dominion (1946 to the present)	c. 1886-1969	African American residence	27	artifact scatter	Yes	No	Yes	Recommend updating form--contributing to NRHP	Option for additional archaeological excavationsfor interpretive purposes; as needed for other planning or maintenance purposes	High	No development, other than interpretation, should be planned for this area. Avoid ground disturbance. If ground disturbance is necessary for planning or maintenance, coordinate with City archaeologists to determine preservation measures . Archaeological excavation and/or monitoring may be required.

Archaeological Resources Number (ARN)	Name	Documented Time Period(s)	Documented Date Range	Resource Type	Re-search Lot	Components	Artifact Collec-tion	Archaeo-logical Features	Integrity	NRHP Significance	Archaeological Recommendations	Resource Protection Level[1]	Planning and Management Strategies
44AX90- #22	Robert Jackson Lot	Reconstruction and Growth (1866-1916); World War I to World War II (1917-1945); The New Dominion (1946 to the present)	c. 1894-1969	African American residence	35	artifact scatter	Yes	No	Yes	Recommend updating form--contributing to NRHP	Option for additional archaeological excavationsfor interpretive purposes; as needed for other planning or maintenance purposes	High	No development, other than interpretation, should be planned for this area. Avoid ground disturbance. If ground disturbance is necessary for planning or maintenance, coordinate with City archaeologists to determine preservation measures . Archaeological excavation and/or monitoring may be required.
44AX90- #23	Jackson Lot-Center	Reconstruction and Growth (1866-1916); World War I to World War II (1917-1945); The New Dominion (1946 to the present)	c. 1920s-1950	structure, probable African American residence	31	artifact scatter	Yes	No	Yes	Recommend updating form--contributing to NRHP	No additional archaeological work recommended--unless needed for planning or maintenance purposes	High, but within Maximum Protection Area (Fort Ward)	No development should be planned for this area. Avoid ground disturbance. If ground disturbance is necessary for planning or maintenance, coordinate with City archaeologists to determine preservation measures . Archaeological excavation and/or monitoring may be required.
44AX90- #24	Cassius McKnight lot	Reconstruction and Growth (1866-1916); World War I to World War II (1917-1945); The New Dominion (1946 to the present)	c. 1890-1963	African American residence	26	artifact scatter, privy	Yes	No	Yes	Recommend updating form--contributing to NRHP	No additional archaeological work recommended--unless needed for planning or maintenance purposes	High, but within Maximum Protection Area (Fort Ward)	No development should be planned for this area. Avoid ground disturbance. If ground disturbance is necessary for planning or maintenance, coordinate with City archaeologists to determine preservation measures . Archaeological excavation and/or monitoring may be required.
44AX90- #25	Jackson Lot-East	Reconstruction and Growth (1866-1916); World War I to World War II (1917-1945); The New Dominion (1946 to the present)	c. 1920s-1950s	African American residence	31	artifact scatter	Yes	No	Yes	Recommend updating form--contributing to NRHP	No additional archaeological work recommended--unless needed for planning or maintenance purposes	High, but within Maximum Protection Area (Fort Ward)	No development should be planned for this area. Avoid ground disturbance. If ground disturbance is necessary for planning or maintenance, coordinate with City archaeologists to determine preservation measures . Archaeological excavation and/or monitoring may be required.

Archaeological Resources Number (ARN)	Name	Documented Time Period(s)	Documented Date Range	Resource Type	Re-search Lot	Components	Artifact Collec-tion	Archaeo-logical Features	Integrity	NRHP Significance	Archaeological Recommendations	Resource Protection Level[1]	Planning and Management Strategies
44AX90- #26	Original Shorts Lot-South	Reconstruction and Growth (1866-1916); World War I to World War II (1917-1945); The New Dominion (1946 to the present)	20th c.	Midden?	7, 8a	artifact scatter	Yes	No	Yes	Recommend updating form--contributing to NRHP	Option for additional archaeological excavations to better understand time period and nature of occupation; as needed for planning or maintenance purposes	High, but within Maximum Protection Area (North of Oakland)	No development should be planned for this area. Avoid ground disturbance. If ground disturbance is necessary for planning or maintenance, coordinate with City archaeologists to determine preservation measures . Archaeological excavation and/or monitoring may be required.
44AX90- #27	Trash Deposit	World War I to World War II (1917-1945); The New Dominion (1946 to the present	20th c.	Trash pit	1	trash disposal area/dump	Yes	Yes	Yes	Local significance	No additional archaeological work recommended--unless needed for planning or maintenance purposes	Medium, but within High Protection Area (Civil War Artifact Scatter 2)	No development should be planned for this area. Avoid ground disturbance. If ground disturbance is necessary for planning or maintenance, coordinate with City archaeologists to determine preservation measures . Archaeological excavation and/or monitoring may be required.
44AX90- #28	Hogan Lot North	World War I to World War II (1917-1945); The New Dominion (1946 to the present	1931-1962	possible outbuilding or African American residence	20, 21	unknown	No	No	Unevaluated	unevaluated	No additional archaeological work recommended--unless needed for planning or maintenance purposes	High	No development should be planned for this area. Avoid ground disturbance. If ground disturbance is necessary for planning or maintenance, coordinate with City archaeologists to determine preservation measures . Archaeological excavation and/or monitoring may be required.
44AX90- #29	Lewis-Peters Lot	World War I to World War II (1917-1945); The New Dominion (1946 to the present	1922-1960	African American residence		artifact scatter	Yes	No	Yes (Note: however, foundation of house graded away-just south of resource area)	Recommend updating form--contributing to NRHP	No additional archaeological work recommended--unless needed for planning or maintenance purposes	High	No development should be planned for this area. Avoid ground disturbance. If ground disturbance is necessary for planning or maintenance, coordinate with City archaeologists to determine preservation measures . Archaeological excavation and/or monitoring may be required.

Archaeological Resources Number (ARN)	Name	Documented Time Period(s)	Documented Date Range	Resource Type	Re-search Lot	Components	Artifact Collec-tion	Archaeo-logical Features	Integrity	NRHP Significance	Archaeological Recommendations	Resource Protection Level[1]	Planning and Management Strategies
44AX90- #30	Schoolhouse Road	Reconstruction and Growth (1866-1916); World War I to World War II (1917-1945); The New Dominion (1946 to the present)	1898-present	road bed		possible brick edge (but may be structure in Ball lot), line of cedar trees	Yes	possible	Yes	Recommend updating form--contributing to NRHP	Limited additional excavation to determine if brick edge is associated with road or structure. Other investigations as needed for planning and maintenance purposes.	High	No development should be planned for this area. Avoid ground disturbance. If ground disturbance is necessary for planning or maintenance, coordinate with City archaeologists to determine preservation measures . Archaeological excavation and/or monitoring may be required.
44AX90- #31	"The Fort" neighborhood road	Reconstruction and Growth (1866-1916); World War I to World War II (1917-1945); The New Dominion (1946 to the present)	19th century-present	road bed		road bed in landscape	No	landscape feature	Yes	Recommend updating form--contributing to NRHP	No additional archaeological work recommended--unless needed for planning or maintenance purposes	High	No development should be planned for this area. Avoid ground disturbance. If ground disturbance is necessary for planning, development or maintenance, coordinate with City archaeologists to determine preservation measures . Archaeological excavation and/or monitoring may be required.

Archaeological Resources Number (ARN)	Name	Documented Time Period(s)	Documented Date Range	Resource Type	Re-search Lot	Components	Artifact Collec-tion	Archaeo-logical Features	Integrity	NRHP Significance	Archaeological Recommendations	Resource Protection Level[1]	Planning and Management Strategies
Verified Grave Areas													
44AAX90- #32	Jackson Cemetery	Reconstruction and Growth (1866-1916); World War I to World War II (1917-1945); The New Dominion (1946 to the present)	Ca 1894 - Ca. 1924	African American cemetery	31	20 burials	No	Yes	Yes	Recommend updating form--contributing to NRHP	Additional archaeological investigations on perimeter to allow for demarcation of cemetery without disturbance to graves. Additional excavations to identify locations of more graves also possible..	Maximum	No development should be planned for this area. Protect all graves. Maintain as cemetery-sacred area with grass and trees. Delineate limits of burials. Mark graves. Avoid ground disturbance; if minimal disturbance is needed for future grave protection and interpretation (i.e. to mark graves) or maintenance (i.e. to deal with tree fall), coordinate with City archaeologists to determine preservation measures to ensure protection of burials. Excavations will be conducted as needed, and changes to plans will be instituted if graves are threatened. Establish permanent placement for interpretive marker.

Archaeological Resources Number (ARN)	Name	Documented Time Period(s)	Documented Date Range	Resource Type	Re-search Lot	Components	Artifact Collec-tion	Archaeo-logical Features	Integrity	NRHP Significance	Archaeological Recommendations	Resource Protection Level[1]	Planning and Management Strategies
44AX153	Old Grave Yard	Reconstruction and Growth (1866-1916); World War I to World War II (1917-1945); The New Dominion (1946 to the present)	Ca. 1897 -Ca. -1918	African American cemetery	11	17 burials	No	Yes	Yes	Recommend updating form--contributing to NRHP	Additional archaeological investigations on perimeter to allow for demarcation of cemetery without disturbance to graves. .	Maximum	No development should be planned for this area. Protect all graves. Maintain as cemetery-sacred area with grass and trees. Delineate limits of burials. Mark graves. Conserve extant gravestones. Avoid ground disturbance; if minimal disturbance is needed for future grave protection and interpretation (i.e. to mark graves) or maintenance (i.e. to deal with tree fall), coordinate with City archaeologists to determine preservation measures to ensure protection of burials. Excavations will be conducted as needed, and changes to plans will be instituted if graves are threatened. Consider placement of interpretive and/or commemorative marker.
44AX90-#33	Adams Burial Area	The New Dominion (1946 to the present)	1930-1952	African American cemetery	11, 20	4 burials	No	Yes	Yes	Recommend updating form--contributing to NRHP	Additional archeological investigations to determine if other burials are present and to discover the limits of the cluster of graves.	Maximum	No development should be planned for this area. Protect all graves. Maintain as cemetery-sacred area with grass and trees. Delineate limits of burials. Mark graves. Avoid ground disturbance; if disturbance is needed for future grave protection and interpretation (i.e. to mark graves) or maintenance (i.e. to deal with tree fall), coordinate with City archaeologists to determine preservation measures to ensure protection of burials. Excavations will be conducted as needed, and changes to plans will be instituted if graves are threatened.

Archaeological Resources Number (ARN)	Name	Documented Time Period(s)	Documented Date Range	Resource Type	Re-search Lot	Components	Artifact Collec-tion	Archaeo-logical Features	Integrity	NRHP Significance	Archaeological Recommendations	Resource Protection Level[1]	Planning and Management Strategies
44AX90-#34	Clark Burial Area	War I to World War II (1917-1945); The New Dominion (1946 to the present)	1933	African American cemetery	11	2 burials	No	Yes	Yes	Locally significant	Additional archeological investigations to determine if other burials are present and to discover the limits of the cluster of graves.	Maximum	No development should be planned for this area. Protect all graves. Maintain as cemetery-sacred area with grass and trees. Delineate limits of burials. Mark graves. Avoid ground disturbance; if minimal disturbance is needed for future grave protection and interpretation (i.e. to mark graves) or maintenance (i.e. to deal with tree fall), coordinate with City archaeologists to determine preservation measures to ensure protection of burials. Excavations will be conducted as needed, and changes to plans will be instituted if graves are threatened.
44AX151	Oakland Baptist Church Cemetery	Reconstruction and Growth (1866-1916); World War I to World War II (1917-1945); The New Dominion (1946 to the present)	c. 1925-1990s	African American cemetery	8b, 9b		No	Yes	Yes	Locally significant	N/A	Maximum	NA
POSSIBLE CEMETERIES													
44AX90- #35	Clark Lot-possible cemetery area	unknown	unknown	possible cemetery	11	unknown	NA	No graves identified	unknown	not determined	Given oral history accounts, this possible cemetery area has highest probability for discovery of additional grave locations. Additional archaeological work recommended.	Maximum	No development should be planned for this area. Avoid ground disturbance. If minimal ground disturbance is necessary, coordinate with City archaeologists to determine preservation measures Excavations will be conducted as needed, and changes to plans will be instituted if graves are threatened.

Archaeological Resources Number (ARN)	Name	Documented Time Period(s)	Documented Date Range	Resource Type	Re-search Lot	Components	Artifact Collec-tion	Archaeo-logical Features	Integrity	NRHP Significance	Archaeological Recommendations	Resource Protection Level[1]	Planning and Management Strategies
44AX90- #36 See 44AX- #13	School/Church Lot-possible cemetery area	unknown	unknown	possible cemetery	17	unknown	NA	No graves identified	unknown	not determined	Interpretive development associated with the school/church/residence possibly planned for this area. Archaeological excavation recommended prior to any development to ensure that there is no impact on possible graves.	Maximum	Conduct archaeological investigation prior to construction of interpretive elements. If graves are discovered in locations where disturbance is proposed, development plans shall be changed to insure protection of burials in place. If other ground disturbance is necessary for planning and management purposes, coordinate with City archaeologists to determine preservation measures. Excavations will be conducted as needed, and changes to plans will be instituted if graves are threatened.
44AX90- #37	Adams Ruffner Lot-possible cemetery area	unknown	unknown	possible cemetery	20	unknown	NA	No graves identified	unknown	not determined	No additional archaeological work recommended--unless needed for planning or maintenance purposes	Maximum	No development should be planned for this area. Avoid ground disturbance/ If minimal ground disturbance is necessary, coordinate with City archaeologists to determine preservation measures. Excavations will be conducted as needed, and changes to plans will be instituted if graves are threatened.
44AX90- #38	North of Oakland-possible cemetery area	unknown	unknown	possible cemetery	5,6,7,8a	unknown	NA	No graves identified	unknown	not determined	No additional archaeological work recommended--unless needed for planning or maintenance purposes	Maximum	No development should be planned for this area. Avoid ground disturbance. If minimal ground disturbance is necessary, coordinate with City archaeologists to determine preservation measures to ensure protection of burials. Excavations will be conducted as needed, and changes to plans will be instituted if graves are threatened.

Archaeological Resources Number (ARN)	Name	Documented Time Period(s)	Documented Date Range	Resource Type	Re-search Lot	Components	Artifact Collec-tion	Archaeo-logical Features	Integrity	NRHP Significance	Archaeological Recommendations	Resource Protection Level[1]	Planning and Management Strategies
44AX90- #39	West of Oakland-possible cemetery area	unknown	unknown	possible cemetery	9a	unknown	NA	No graves identified	unknown	not determined	No additional archaeological work recommended--unless needed for planning or maintenance purposes	Maximum	No development should be planned for this area. Avoid ground disturbance. If minimal ground disturbance is necessary, coordinate with City archaeologists to determine preservation measures to ensure protection of burials. Excavations will be conducted as needed, and changes to plans will be instituted if graves are threatened. .
44AX90- #40	Craven Lot	unknown	unknown	possible cemetery	25	unknown	NA	No graves identified	unknown	not determined	No additional archaeological work recommended--unless needed for planning or maintenance purposes	Maximum	No development should be planned for this area. Avoid ground disturbance. If minimal ground disturbance is necessary, coordinate with City archaeologists to determine preservation measures to ensure protection of burials . Excavations will be conducted as needed, and changes to plans will be instituted if graves are threatened.
44AX90- #41	Good Samaritan Lot	unknown	unknown	possible cemetery	28	unknown	NA	No graves identified	unknown	not determined	No additional archaeological work recommended--unless needed for planning or maintenance purposes	Maximum	No development should be planned for this area. Avoid ground disturbance. If minimal ground disturbance is necessary, coordinate with City archaeologists to determine preservation measures to ensure protection of burials. Excavations will be conducted as needed, and changes to plans will be instituted if graves are threatened.

Archaeological Resources Number (ARN)	Name	Documented Time Period(s)	Documented Date Range	Resource Type	Re-search Lot	Components	Artifact Collec-tion	Archaeo-logical Features	Integrity	NRHP Significance	Archaeological Recommendations	Resource Protection Level[1]	Planning and Management Strategies
CIVIL WAR RESOURCES													
44AX90- #42	Fort Ward	Civil War (1861-1865)	1861-1865	Civil War earthwork	NA	fortification-earthworks: bastions, dry moat, glacis, powder magazines bombproofs, gun emplacements, parade ground	Yes	Yes	Yes	Listed to NRHP	No additional archaeological work recommended--unless needed for planning or maintenance purposes	Maximum	Protect earthworks. No development should be planned for this area. Avoid ground disturbance. If minimal ground disturbance is necessary for planning or maintenance, coordinate with City archaeologists and Fort Ward Museum staff to determine preservation measures. Archaeological excavation and/or monitoring may be required.
44AX90- #43	Outer Battery	Civil War (1861-1865)	1861-1865	Civil War earthwork	NA	earthwork	No	Yes	Yes	Listed to NRHP	No archaeological work recommended--unless needed for planning or maintenance purposes	Maximum	Protect earthworks. No development should be planned for this area. Avoid ground disturbance. If minimal ground disturbance is necessary for planning or maintenance, coordinate with City archaeologists and Fort Ward Museum staff to determine preservation measures. Archaeological excavation and/or monitoring may be required.
44AX90- #44	Rifle Trench	Civil War (1861-1865)	1861-1865	Civil War earthwork	NA	earthwork	No	Yes	Yes	Listed to NRHP	No archaeological work recommended--unless needed for planning or maintenance purposes	Maximum	Protect earthworks. No development should be planned for this area. Avoid ground disturbance. If minimal ground disturbance is necessary for planning or maintenance, coordinate with City archaeologists and Fort Ward Museum staff to determine preservation measures. Archaeological excavation and/or monitoring may be required.

Archaeological Resources Number (ARN)	Name	Documented Time Period(s)	Documented Date Range	Resource Type	Re-search Lot	Components	Artifact Collec-tion	Archaeo-logical Features	Integrity	NRHP Significance	Archaeological Recommendations	Resource Protection Level[1]	Planning and Management Strategies
44AX90- #45	Covered way	Civil War (1861-1865)	1861-1865	Civil War earthwork	NA	earthwork	No	Yes	Yes	Listed to NRHP	No additional archaeological work recommended--unless needed for planning or maintenance purposes	Maximum	Protect earthworks. No development should be planned for this area. Avoid ground disturbance. If minimal ground disturbance is necessary for planning or maintenance, coordinate with City archaeologists and Fort Ward Museum staff to determine preservation measures. Archaeological excavation and/or monitoring may be required.
44AX90- #46	Civil War Artifact Scatter 1	Civil War (1861-1865)	1861-1865	Civil War artifact scatter	NA	artifact scatter-metal detection	Yes	No	Unknown	Contributing resource to NRHP	No additional archaeological work recommended--unless needed for planning or maintenance purposes	High	No development should be planned for this area. Avoid ground disturbance. If minimal ground disturbance is necessary, coordinate with City archaeologists to determine preservation measures Archaeological excavation and/or monitoring may be required.
44AX90- #47	Civil War Artifact Scatter 2	Civil War (1861-1865)	1861-1865	Civil War artifact scatter	NA	artifact scatter-metal detection	Yes	No	Unknown	Contributing resource to NRHP	No additional archaeological work recommended--unless needed for planning or maintenance purposes	High	No development should be planned for this area. Avoid ground disturbance. If minimal ground disturbance is necessary, coordinate with City archaeologists to determine preservation measures Archaeological excavation and/or monitoring may be required.
44AX90- #48	Civil War Artifact Scatter 3	Civil War (1861-1865)	1861-1865	Civil War artifact scatter	NA	artifact scatter-metal detection	Yes	No	Unknown	Contributing resource to NRHP	Option for additional archaeological work to investigate possibility of temporary encampment.	High	No development should be planned for this area. Avoid ground disturbance. If minimal ground disturbance is necessary, coordinate with City archaeologists to determine preservation measures Archaeological excavation and/or monitoring may be required.

Archaeological Resources Number (ARN)	Name	Documented Time Period(s)	Documented Date Range	Resource Type	Re-search Lot	Components	Artifact Collec-tion	Archaeo-logical Features	Integrity	NRHP Significance	Archaeological Recommendations	Resource Protection Level[1]	Planning and Management Strategies
44AX90- #49	Drainage-Possible Refuse Area	Civil War (1861-1865)	1861-1960	possible Civil War refuse area	NA	unknown	Yes	unknown	unknown	unknown	Plans call for ground disturbance associated with drainage improvements in this area. Additional archaeological work recommended prior to any other development actions	High	Conduct archaeological excavations and/or monitoring prior to and in concunction with construction of drainage improvements.. If graves are discovered in locations where disturbance is proposed, development plans shall be changed to insure protection of burials in place. If other ground disturbance is necessary for planning and management purposes, coordinate with City archaeologists to determine preservation measures. Excavations will be conducted as needed, and changes to plans will be instituted if graves are threatened.
44AX00155	Civil War Barracks, Mess Hall and Officer's Quarters	Civil War (1861-1865)	1861-1865	Civil War structures	NA	artifacts, post holes of barracks, possible brick support for heating barracks, dry moat	Yes	Yes	Yes	Contributing resource to NRHP	Plans call for ground disturbance associated with parking and roadway changes and possibly future museum expansion. Conduct archaeological excavations and/or monitoring prior to and in concunction with these developments. This work may also provide new interpretive opportunities. Additional archaeological work recommended prior to any other development actions	High	Conduct archaeological excavations and/or monitoring prior to and in concunction with parking/roadway and future museum construction or other devvelopment actions.. If other ground disturbance is necessary for planning and management purposes, coordinate with City archaeologists to determine preservation measures. Additional archaeological excavation and/or monitoring may be required.

Archaeological Resources Number (ARN)	Name	Documented Time Period(s)	Documented Date Range	Resource Type	Re-search Lot	Components	Artifact Collec-tion	Archaeo-logical Features	Integrity	NRHP Significance	Archaeological Recommendations	Resource Protection Level[1]	Planning and Management Strategies
NATIVE AMERICAN RESOURCES													
44AX90- #50	Native American	Native American	pre-1600	Prehistoric artifact scatter	NA	Lithic scatter	Yes	No	not fully evaluated	Undetermined	Possibly--limited additional excavation to more fully understand nature of site for interpretive purposes. This is within the possible cemetery area north of Oakland, and would also provide an opportunity to look for additional grave locations.	High, but within a Maximum Protection Area (North of Oakland--possible cemetery)	See Possible Cemeteries--North of Oakland for planning and management in this area.
44AX0036	44AX0036	Native American	pre-1600	Prehistoric artifact scatter	NA	Lithic scatter	Yes	No	No	Not significant	No additional excavation recommended--low integrity.	Low, but within a Maximum Protection Area (Fort Ward)	See Civil War--Fort Ward for planning and management in this area.

Archaeological Resources Number (ARN)	Name	Documented Time Period(s)	Documented Date Range	Resource Type	Re-search Lot	Components	Artifact Collec-tion	Archaeo-logical Features	Integrity	NRHP Significance	Archaeological Recommendations	Resource Protection Level[1]	Planning and Management Strategies

[1]Resource Protection Levels:

Maximum Protection Areas--verified grave areas, possible cemeteries, and Civil War earthworks. No development should be planned. No ground disturbance without archaeological review and excavation and/or monitoring. No stump grinding in these areas.

High Protection Areas--areas where foundations, other features, and artifact scatters relating to the African American community and life of Civil War soldiers have been discovered. No development should be planned. No ground disturbance (other than aeration) without archaeological review. Excavation and/or monitoring may be required.

Medium Protection Areas--areas where archaeological testing did not indicate the presence of significant archaeological resources. Minimal ground disturbing activities (such as, stump grinding, tree planting, etc.) may occur in these areas without archaeological excavation or monitoring. If major changes are proposed (such as, grading, construction of an interpretive or picnic area, etc.), then additional archaeological testing may be required.

Low Protection Areas--areas with previous disturbances where archaeological testing did not indicate the presence of significant archaeological resources. Ground disturbing activities may occur in these areas without archaeological review.

In all Protection Areas, the following condition applies: Call Alexandria Archaeology (703-746-4399) if structural remains (eg. Foundations, wells, privies, etc.) or concdentrations of artifacts are discovered during ground disturbing activities. Work must stop in the area of the discovery until a City archaeologist comes to the site to evaluate the resource and determine appropriate preservation measures.

Fort Ward Park and Museum Area Management Plan

Appendix III

FINDING THE FORT: A HISTORY OF AN AFRICAN AMERICAN NEIGHBORHOOD IN NORTHERN VIRGINIA, 1860s-1960s

DR. KRYSTYN MOON, 2014

The City of Alexandria, Virginia

October 2014

FINAL DRAFT

A copy of Dr. Moon's report (*Finding The Fort: A History of an African American Neighborhood in Northern Virginia, 1860s-1960s By Krystyn R. Moon. Amended draft report, June 2014*) may be found on the Alexandria Archaeology Museum's web page using this link:

http://alexandriava.gov/historic/archaeology/default.aspx?id=54262

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Fort Ward Park and Museum Area Management Plan

Appendix IV

2011 MOU

GROUND DISTURBING ACTIVITIES

NOTIFICATION PROTOCOLS

The City of Alexandria, Virginia

October 2014

FINAL DRAFT

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Office of Historic Alexandria
Department of Recreation, Parks and Cultural Activities
Department of Transportation and Environmental Services
Department of General Services
Memorandum of Understanding-Fort Ward Park and Museum Area Operations and Maintenance
August, 2011

I. **TITLE:** *Agreement for the Performance of Daily Operations and Maintenance for the Fort Ward Park and Museum Area Operated by the Office of Historic Alexandria, the Department of Recreation, Parks & Cultural Activities and Other Involved Departments.*

II. **PURPOSE:** To establish clearly defined areas of responsibility between the Office of Historic Alexandria (OHA), the Department of Recreation, Parks, & Cultural Activities (RP&CA), the Department of Transportation and Environmental Services (TES), and Department of General Services (GS) for the budgeting and performance of operations and maintenance, within the Fort Ward Park and Museum Area.

III. **MOU COORDINATION GROUP:** Each department will appoint a representative to participate in quarterly coordination meetings that will serve to address and resolve issues related to the management, maintenance and operations of the Fort Ward Park and Museum Area. Issues of interpretation of the MOU or changes and modifications will be placed on a quarterly meeting agenda of the coordination group.

IV. **RESOLUTION OF MOU AND NON-MOU RELATED ISSUES:** Operating issues not covered in the MOU, including special requests/work orders and personnel related matters, should be handled via the established chain of command for each involved department.

V. **DEFINITIONS OF SERVICES:**

Regularly Scheduled Maintenance Operations

a. **Mowing:** Responsibility for scheduled mowing, trimming and weed control and related contract management based on designated sensitive historical areas.

b. **Leaf Collection**: Seasonal responsibility to collect and remove fallen leaves from high traffic and/or areas not heavily wooded.

c. **Snow Removal:** Seasonal responsibility to remove snow and ice from all paved vehicular and pedestrian thoroughfares.

d. **Trash Pick-up**: Daily responsibility for litter control, emptying of site trash cans into dumpster, and dumpster pick-up.

e. **Housekeeping**: Custodial services to include general cleaning, vacuuming, dusting, trash pickup and removal, and replacement of operating supplies (toilet paper, paper towels, hand soap, trashcan liners).

As Needed Maintenance Operations

a. **Landscaping and Invasive Management**: Responsibility for management of site landscaping, including planting and maintaining landscape beds and control/removal of invasive species.

b. **Tree Maintenance and Planting**: Responsibility for identification of locations and planting of new, tree limbing, pruning and dead fall removal as needed.

c. **Site Amenities**: Responsibility for identification of locations for any new site amenities (including furnishings) and maintenance of existing amenities.

d. **Roadway and Parking Lot Maintenance**: Responsibility to maintain all paved areas throughout the park, including any repairs and repaving required.

e. **Stormwater Maintenance**: Responsibility to initiate necessary study, intervention and management of streams and stormwater run-off and related impacts on the site and adjacent properties.

f. **New Buildings or Renovations:** Responsibility to determine locations, design, obtain permits, and manage construction of any new or renovated buildings.

g. **Park Reservations:** Responsibility to manage the rental of picnic sites and amphitheater, including receiving and processing deposits and payments, informing renters of all rules and regulations, and alerting park management staff of all rentals.

h. **Special Events:** Responsibility to coordinate and schedule any special events held at the park, including ensuring all required permits are acquired.

VI. RESPONSIBILITIES:

The Department of Recreation, Parks and Cultural Activities, the Office of Historic Alexandria, the Department of Transportation and Environmental Services, and the Department of General Services agree to the areas of operations and maintenance service in accordance with the following:

	RPCA	OHA	TES	GS	Volunteer
Digging/ground disturbance	X	72 hour advance notice	X	X	
Archaeology work	Two weeks advance notice	X	Two weeks advance notice	Two weeks advance notice	
Support for History projects/events (special requests)	Two weeks advance notice	X			
Mowing and hedge trimming within historically sensitive areas as designated on Map A		X			
Mowing of park lawn areas not designated as historically sensitive on Map A	X				
Irrigation Management	X	X			
Tree maintenance	X				X
Determining location of new trees	X	X			
Landscaping and flower beds (planting and maintenance)	X				X
Trash pick-up Monday – Friday	X		X		
Trash pick-up Weekends	X		X		
Custodial and stocking for park restrooms/facilities M,W,TH,SA,SU mornings/afternoons as designated on Map C	X				

	RPCA	OHA	TES	GS	Volunteer
Custodial and stocking for park restrooms/facilities TU,FR mornings as designated on Map C		X			
Design of park signage	X	X			
Maintenance of park and regulatory signage			X		
Design and maintenance of historical/interpretive signage		X			
Design and determining location of site amenities (grills, park furniture, pavilions, playground, etc.)	X	X			
Maintenance of site amenities (grills, park furniture, pavilions, playground, etc.)	X	Two weeks advance notice			
Maintenance of roads, paved areas and walkways (no ground disturbance)	Two weeks advance notice	Two weeks advance notice	X		
Maintenance of stream/stormwater			X		
Cultural Resource Inventory (ongoing)		X			
Interpretation of Cultural and Historic Resources		X			
Interpretation of Natural Resources	X				
Park Reservations and Special Event Management	X	X			
Enforcement and Monitoring of park reservations	X	X			

	RPCA	OHA	TES	GS	Volunteer
Management of onsite reservations	X				
Maintenance of museum building, Officer's Hut, and Fort Gate as designated on Map C		X		X	
Museum building, Officer's Hut, Fort Gate CIP projects as designated on Map C		X		X	
Maintenance of grave/burial sites as designated on Map A		X			
Maintenance of restroom and storage facilities as designated on Map C	X	X		X	
Maintenance of two sheds in Adams memorial/grave area as designated on Map C		X			
Maintenance of amphitheater/storage area as designated on Map C	X				
Park buildings CIP projects as designated on Map C	X	X		X	
Design and determining location of new park or museum/fort buildings and structures	X	X		X	
Tree litter and leaf pick-up/removal	X				
Snow removal as indicated on Map B	X				
Bags of ice melt dropped at museum if necessary	X				
Coordination/ Meeting schedule	X	X	X	X	

Allocation and use of the park and museum structures is as shown on Map C.

We, the undersigned, agree to the items as outlined and defined in this memorandum of understanding:

James Spengler
Director of Recreation, Parks & Cultural Activities

Date: 9/12/2011

Lance Mallamo
Director of the Office of Historic Alexandria

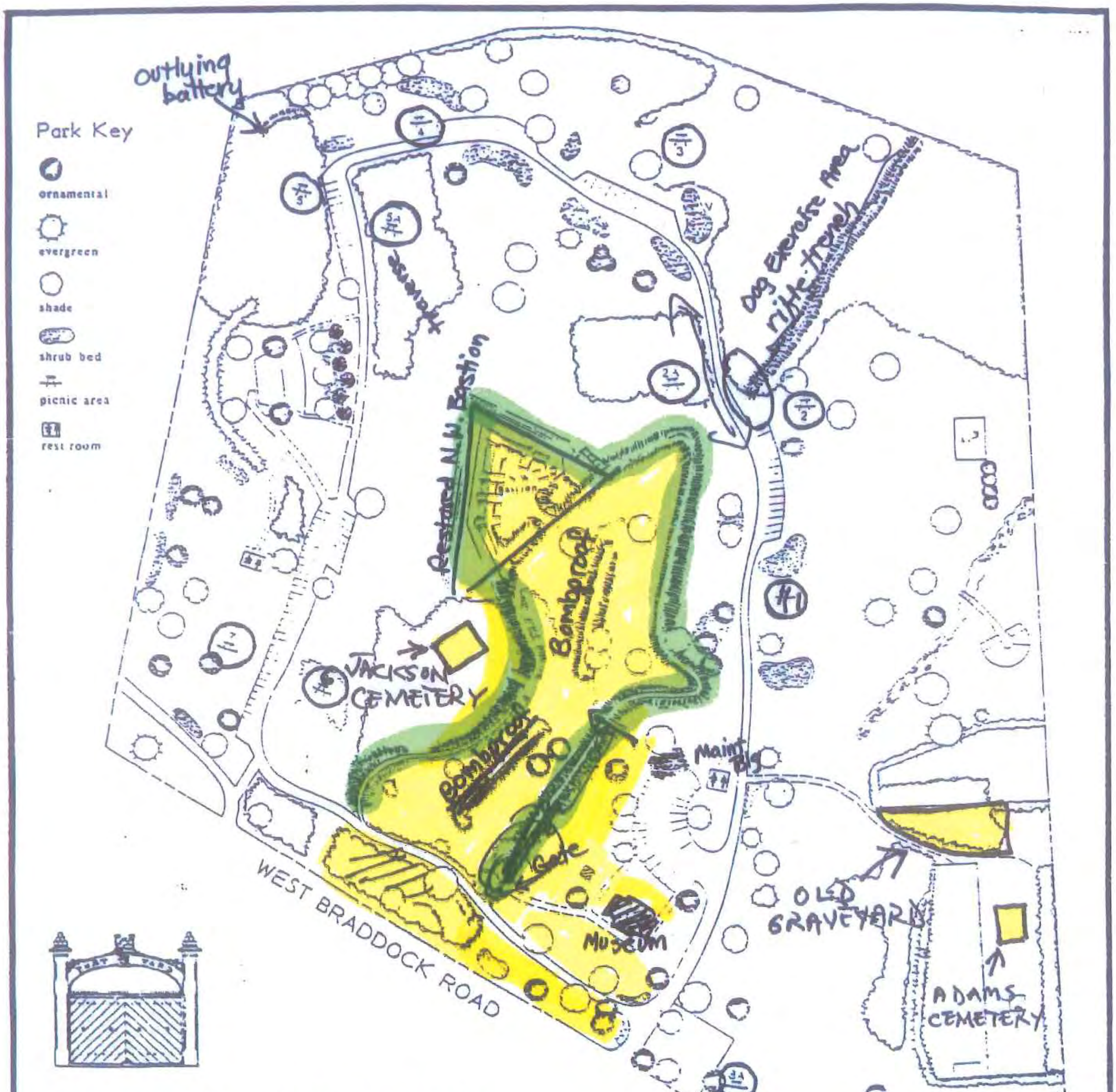
Date: 9/08/2011

Rich Baier
Director of Transportation and Environmental Services

Date: 11

Jeremy McPike
Director of General Services

Date: 9-9-11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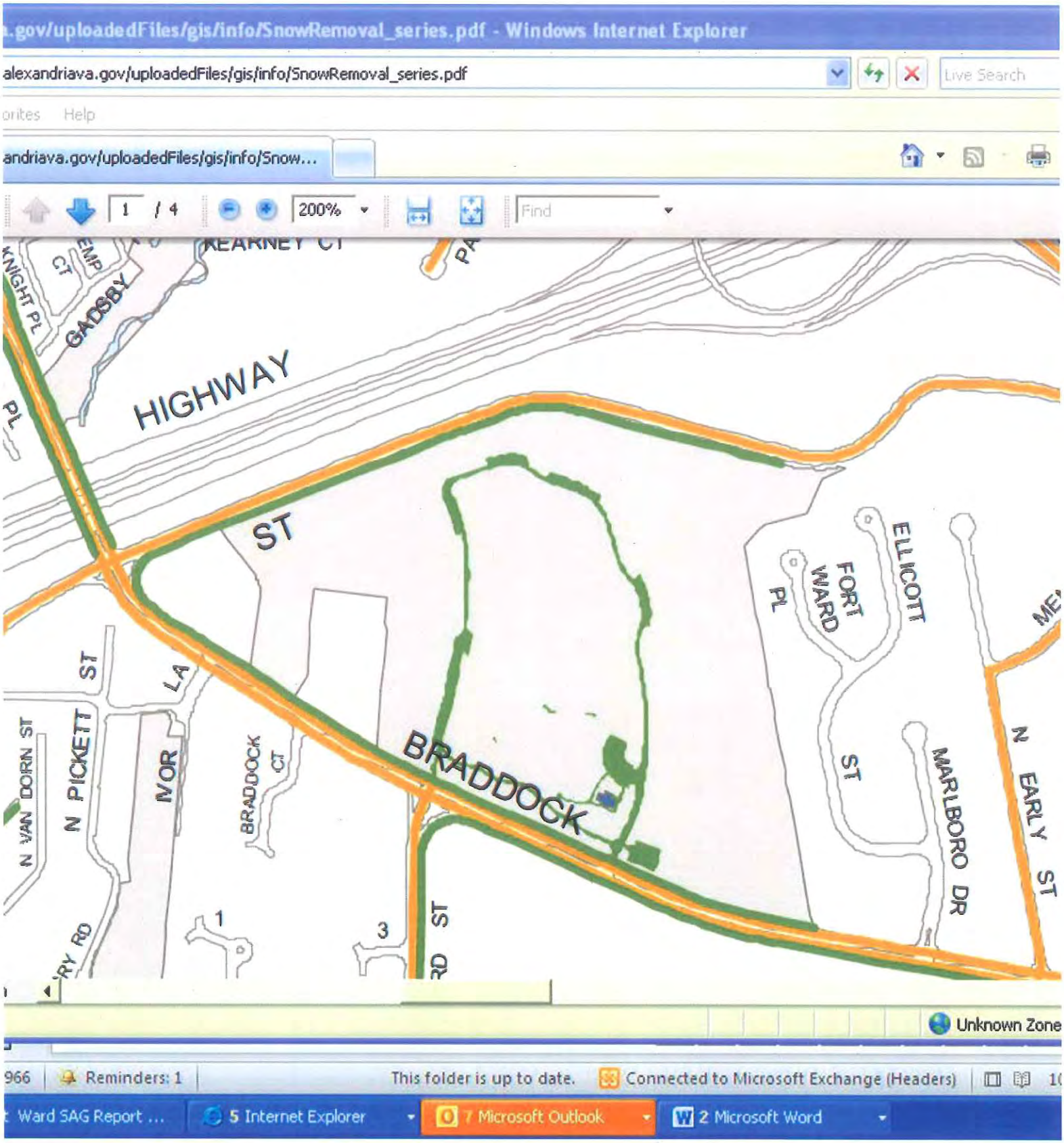
Park Key
ornamental
evergreen
shade
shrub bed
picnic area
rest room
Restored NW Bastion
Dog Exercise Area
rifle trench
Bombproof
Bombproof
Bombproof
JACKSON CEMETERY
Maint Blg
Gate
Museum
OLD GRAVEYARD
ADAMS CEMETERY
WEST BRADDOCK ROAD
FORT WARD MUSEUM & PARK
ALEXANDRIA, VIRGINIA

Map A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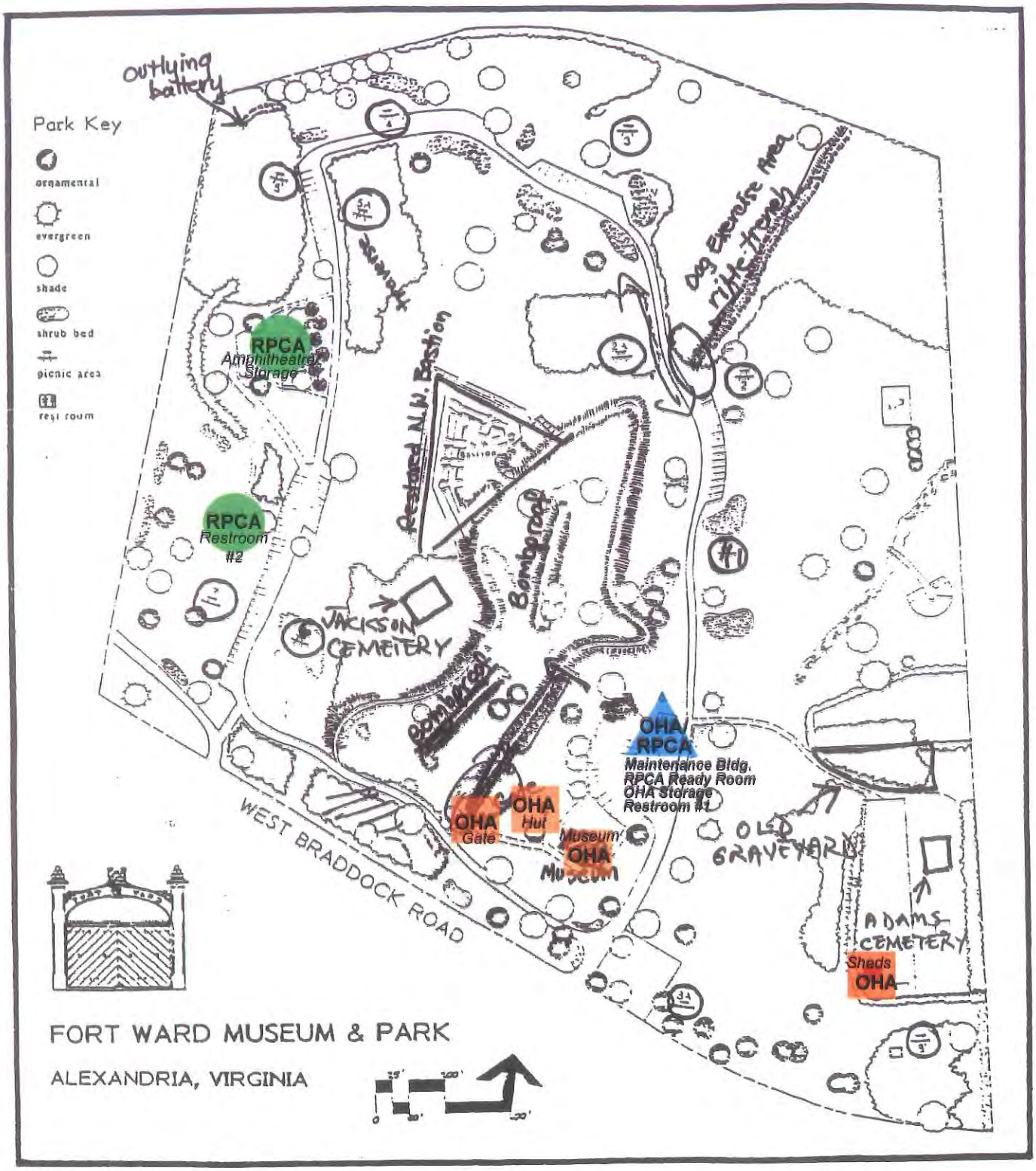
Find
KEARNEY CT
KNIGHT PL
GADSBY
HIGHWAY
ST
BRADDOCK
N PICKETT ST
N VAN DORN ST
MOR LA
BRADDOCK CT
ELLICOTT
FORT WARD PL
MARLBORO DR
N EARLY ST
Unknown Zone
966
Reminders: 1
This folder is up to date.
Connected to Microsoft Exchange (Headers)
Ward SAG Report ...
5 Internet Explorer
7 Microsoft Outlook
2 Microsoft Word

Map B



KEY

RPCA

OHA — Building Maintenance in conjunction with General Services

OHA/ RPCA

Map C

Fort Ward Park and Museum Area Interdepartmental Memorandum of Understanding Guidelines for Ground Disturbance, including Process and Procedures to Protect Cultural Resources

DRAFT Addendum to Annual M.O.U. (August, 2014)

The following definitions, process and procedures relate to any ground disturbing activities at Fort Ward Park. They apply to City employees, City contractors, and any volunteers.

I. Notification

Notify the Office of Historic Alexandria (OHA) 7 days in advance of the commencement of any ground disturbing activities to take place in areas on the map shaded Yellow or Red (attached). Notice of ground disturbing activities must also be posted within the park and at the Fort Ward Museum 7 days in advance of such work.

II. Definitions - Levels of Ground Disturbance

The Management Plan documents and maps the levels of ground disturbance permitted in all areas of the park based on archaeological findings and potential (See attached map).

Green Shading: Minimal Ground Disturbing Activities (aeration, stump grinding, tree planting and soft path construction) allowed. Ground disturbance is acceptable.

Green shading delineates areas where archaeological excavations have indicated that there is previous disturbance and/or low potential for significant archaeological resources to be present.

Yellow Shading: No Ground Disturbing Activities without review by the Office of Historic Alexandria (OHA). Ground disturbance shall be minimized. All proposed ground disturbing activities are to be reviewed by OHA prior to start of work. OHA will assess the impact of the proposed ground disturbance on potential archaeological resources based on the location and scope of the project and determine what is required to preserve cultural resources. OHA will require and implement preservation actions, if needed.

Yellow shading delineates areas where concentrations of artifacts (relating to Native American, Civil War and African American periods of use and occupation) were discovered and where African American structures and households were present.

Red Shading: No Ground Disturbing Activities allowed without archaeological review and investigation by OHA. Ground disturbance shall be avoided, if possible. All proposed ground disturbing activities are to be reviewed by OHA prior to start of work. Acceptable types of ground-disturbing activities in red shaded areas include interpretive

elements (signs, etc.) and those necessary for protection of environmental or cultural resources, including stormwater management. OHA will assess the impact of the proposed ground disturbance on potential archaeological resources based on the location and scope of the project and determine what is required to preserve cultural resources. OHA will implement preservation actions, if needed. For any ground disturbance greater than six inches (6”), implementation of preservation measures will be required. For ground disturbance less than six inches (6”), OHA must be on site prior to the commencement of activity to conduct a preliminary assessment of any potential impact to resources and to determine if preservation measures need to be implemented.

Red shading delineates areas where cemeteries or graves of the African American community are present or possibly present, and where earthworks relating to the Civil War fortifications exist.

III. Processes and Procedures for the Protection of Cultural Resources - Levels of Ground Disturbance

- Notify OHA a minimum of seven (7) days before work is to begin in Yellow Shaded and Red Shaded areas.
- Courtesy notification preferred for work to take place in Green Shaded areas.
- OHA will review the proposed work site and, when necessary, clearly work with RPCA and T&ES to mark off areas where ground disturbance may occur in accordance with the Management Plan.
- All capital projects (i.e., planned site improvements) shall include funding and related resources for archaeology in the project timeline and budget. Regardless of location, all ground disturbers must be made aware of the **Call If Finds** requirement in Section IV—Responsibilities of Ground Disturbers, no matter how small the ground-disturbing activity.
- There will be no disturbance to identified burial locations; all burials will be protected in place. If evidence of burials is discovered during any ground disturbing activities, OHA will immediately update the map showing levels of ground disturbance to ensure that the area of the burials is shaded red. The newly discovered burials will also be protected in place.

IV Responsibilities for Ground Disturbers

- If an archaeologist is not present, call Alexandria Archaeology immediately (703-746-4399) if any buried structural remains (wall foundations, wells, privies, cisterns, etc.), bones, or concentrations of artifacts (including wood framents) are discovered during ground disturbing activities. Work must cease in the area of the discovery until a City archaeologist comes to the site and determines the appropriate preservation action.

- For any emergency situation requiring immediate attention to ensure the safety of park visitors and staff, OHA must be contacted and alerted to the situation and necessary response.

V. **Responsibilities for OHA**

- Upon notification, review ground-disturbing activities to determine the need for preservation actions and the type of action that is required.
- Implement the required preservation action, which may include:
  - Monitoring ground-disturbing activities.
  - Conducting an archaeological excavation in concert with the ground disturbance.
  - Conducting an archaeological excavation prior to the ground-disturbing activities.