QUIET WATERS RETREAT
MASTER PLAN

PROJECT NO.:A720053400, CONTRACT NO. :P584607

DRAFT

Anne Arundel
RECREATION AND PARKS
ENJOY • EXPLORE • RESTORE

TRANSYSTEMS

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The Quiet Waters Retreat Master Plan transforms a sensitive 19-acre waterfront site into a sanctuary for nature, recreation, and reflection. Located at the southern edge of Quiet Waters Park, the property features forested slopes, Loden Pond's headwaters, and sweeping South River views. Originally considered for office development, public concern over environmental impacts led to a reimagining focused on preservation and public access.

Guided by a Stakeholder Advisory Group that included residents, environmental advocates, and park users, the County developed a new plan centered on restoration, habitat protection, and community-driven design. The plan reflects a shared vision: restoring ecosystems, supporting quiet enjoyment, and ensuring long-term stewardship.

The Master Plan protects ecological value by preserving forests, stabilizing slopes, and restoring native meadows. Instead of major infrastructure, it defines a low-impact framework of accessible trails, gathering areas, and interpretive features that invite visitors to experience the landscape with minimal disturbance.

Key elements include:

- Habitat Preservation: Protects steep slopes, specimen trees, and shoreline habitats
- Accessible Trails: Builds ADA-compliant stone dust and natural surface paths along natural contours to limit grading.
- Scenic Overlooks: Creates gathering spots like the Council Ring and Boathouse Platform framing South River and Loden Pond views.
- Environmental Restoration: Revives meadows with native plants, controls invasives, and improves stormwater with naturalized systems.
- Interpretive Education: Adds signage with Friends of Quiet Waters Park, focused on slope stability and habitat conservation.
- Minimal Infrastructure: Introduces limited service upgrades while preserving the site's rustic character and low-impact design.

The plan prioritizes universal access, allowing visitors of all ages and abilities to explore trails, overlooks, and gathering spaces. ADA-compliant routes are woven into the site's natural contours, minimizing disturbance while maximizing accessibility. Educational features along trails and gathering points foster environmental understanding, offering insight into native habitats, slope stabilization, and forest restoration. These elements invite both observation and active stewardship.

Implementation will occur in phases, starting with habitat restoration, trail construction, interpretive signage installation, and meadow reestablishment. Early work focuses on restoring ecological health and establishing core circulation. Later phases, as funding allows, may add outdoor classrooms, minor overlook enhancements, and expanded educational areas. Each step preserves the site's low-impact character and supports compliance with Chesapeake Bay Critical Area regulations, forest conservation standards, and broader County environmental goals.

The Quiet Waters Retreat Master Plan directly supports County and State initiatives, including Plan2040, the 2022 Land Preservation, Parks, and Recreation Plan (LPPRP), and the Anne Arundel Green Infrastructure Plan. It also leverages conservation funding through Program Open Space, turning public investment into lasting ecological and recreational benefits.

Through collaboration, ecological sensitivity, and long-term stewardship, Quiet Waters Retreat is reimagined as a resilient model of passive park design. A landscape where nature is protected, visitors are inspired, and future generations can experience Maryland's natural beauty. The plan is grounded in compliance with REPI partnership objectives, limits on impervious surfaces, and applicable local, state, and federal environmental standards, reinforcing its role as a demonstration of conservation-oriented development.

INTRODUCTION

The Quiet Waters Retreat Master Plan offers Anne Arundel County a rare opportunity to expand Quiet Waters Park while protecting a 19-acre waterfront gem. Located at the park's southern edge, this ecologically rich site that features forested slopes, the headwaters of Loden Pond, and sweeping South River views. The site was acquired in 2019 through $6 million in public funds and a $2 million donation from the Earl family, secured with the assistance of the Chesapeake Conservancy. Originally envisioned for passive park use and an environmental education center, the site later became associated with a proposed conservation office, which sparked public concern over potential environmental impacts. In response, the County paused development and launched a community-driven planning process.

This reimagined plan creates a restorative landscape that blends passive recreation with habitat preservation. Guided by the County's vision to provide a site that is (1) Accessible, (2) Passive Recreational in Use, and (3) Natural, the Retreat emphasizes restoration, quiet enjoyment, and minimal infrastructure, offering a tranquil experience rooted in ecological stewardship. It responds to growing demand for nature-based experiences while advancing County goals under Plan2040, the Land Preservation, Parks, and Recreation Plan, and the Green Infrastructure Plan. Aligned with state and federal conservation programs, including Program Open Space and the U.S. Navy's Readiness and Environmental Protection Integration (REPI) Program, the Retreat promotes equitable access to a sanctuary where visitors can meaningfully connect with the land.

Planning Goals

The master plan is guided by these priorities:

- Restore ecosystems through forest protection, meadow planting, and invasive species removal
- Expand access with inclusive, accessible trails
- Preserve views and water quality by minimizing development and restoring native plants
- Foster wellness through quiet, contemplative outdoor spaces
- Celebrate the site's natural beauty with low-impact features
- Inspire stewardship with interpretive signage and local partnerships

Key Stakeholders

The plan reflects diverse voices, including:

- Anne Arundel County Department of Recreation and Parks: Leads project management and implementation
- Stakeholder Advisory Group: Helps shape the vision with community and environmental insight
- Friends of Quiet Waters Park: Partners in environmental education and site stewardship
- Public Participants: Input from community meetings and a forthcoming public comment period will help shape future phases
- Environmental Consultants and Landscape Architects: Ensure technical quality and ecological sensitivity
- Program Open Space: Provides funding support and long-term conservation oversight
- U.S. Navy's Readiness and Environmental Protection Integration (REPI) Program: Protects military training readiness by conserving critical landscapes and limiting incompatible development in key buffer areas like Quiet Water
- The Chesapeake Conservancy: Provided critical support, including securing grant funding and advancing long-term conservation partnerships

Together, these goals and partnerships form the foundation of a master plan that reflects both ecological responsibility and public intent. The Quiet Waters Retreat is not a new park, but a deepening of what Quiet Waters Park already offers—spaces for restoration, reflection, and stewardship. Through careful design, broad collaboration, and phased implementation, the plan transforms a once-private parcel into a model for low-impact public land use. What follows is a roadmap for realizing that vision.

MASTER PLAN PROCESS

The Quiet Waters Retreat Master Plan emerged through a collaborative, community-guided process that balanced ecological priorities with public input. Launched in 2024 by Anne Arundel County's Department of Recreation and Parks, with support from TranSystems and a Stakeholder Advisory Group, the effort transformed a once-contested site into a shared vision for a wildlife sanctuary. This section outlines how diverse voices and technical rigor shaped a plan that honors the land and its users.

Site Investigation and Analysis

The planning team began by studying the site's natural features, using maps, field visits, and regulatory data. They analyzed slopes, forest cover, drainage patterns, and Chesapeake Bay Critical Area rules to identify opportunities and limits. This groundwork ensured trails, overlooks, and restoration areas would protect sensitive habitats like Loden Pond and the South River shoreline.

Stakeholder Engagement

From July 2024 to March 2025, four workshops brought together residents, park users, and environmental advocates. These sessions built consensus around a low-impact design:

- Workshop 1 (July 2024): Introduced the site and set shared goals for preservation and access.
- Workshop 2 (October 2024): Explored site constraints and brainstormed features like trails and meadows.
- Workshop 3 (December 2024): Reviewed three concepts, favoring a habitat-focused approach.
- Workshop 4 (March 2025): Refined the final plan, adding details like the Council Ring and boathouse deck.

Conceptual Design

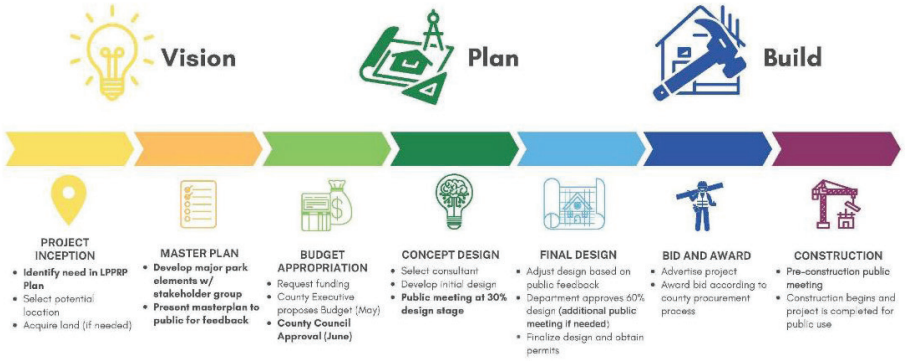
Using community feedback and site data, the team crafted three concepts; Wellness, Art and Culture, and Habitat Restoration. Public support rallied behind Habitat Restoration, which became the foundation for a plan blending native meadows, scenic overlooks, and quiet trails. Refinements ensured features fit the site's slopes and forests, preserving 70% tree cover.

Technical Coordination

County staff from Recreation and Parks, Public Works, and Planning and Zoning reviewed drafts to confirm feasibility. They assessed trail routes, stormwater solutions, and compliance with Critical Area limits. A preliminary cost estimate guided phasing, prioritizing trails and restoration to align with budgets and grants.

Public Review

In Summer 2025, the draft plan will be shared at a public meeting, followed by a 30-day comment period. This transparent approach ensures the final plan reflects the community's vision for a restorative retreat that welcomes all.



SITE INVESTIGATION & ANALYSIS

The 19.4-acre expansion area at Quiet Waters Park presents a rare opportunity to connect visitors with a diverse and sensitive ecological landscape. The property's natural resources, topography, and regulatory context informed every aspect of the design process, from trail alignment to stormwater management and habitat restoration. A thorough understanding of the site's physical, environmental, and visual characteristics allowed the design team to identify areas appropriate for low-impact improvements while protecting critical environmental assets.

LOCATION

The Quiet Waters Retreat property is located in Anne Arundel County, within the southern boundaries of Annapolis, Maryland. The site lies adjacent to the South River, with Loden Pond to the west, Quiet Waters Park to the north, and a residential neighborhood along Forest Hill Drive to the east. A mulch path currently connects the retreat area to Quiet Waters Park near the dog park, making the parcel a natural extension of the park system.

The topography of the site consists of upland terraces with steep slopes, especially along the western and southern edges of the property, where the terrain drops toward Loden Pond and the South River. Elevation across the site ranges from approximately 40 feet above sea level at its highest point down to 24 feet above sea level at the southwest shoreline.

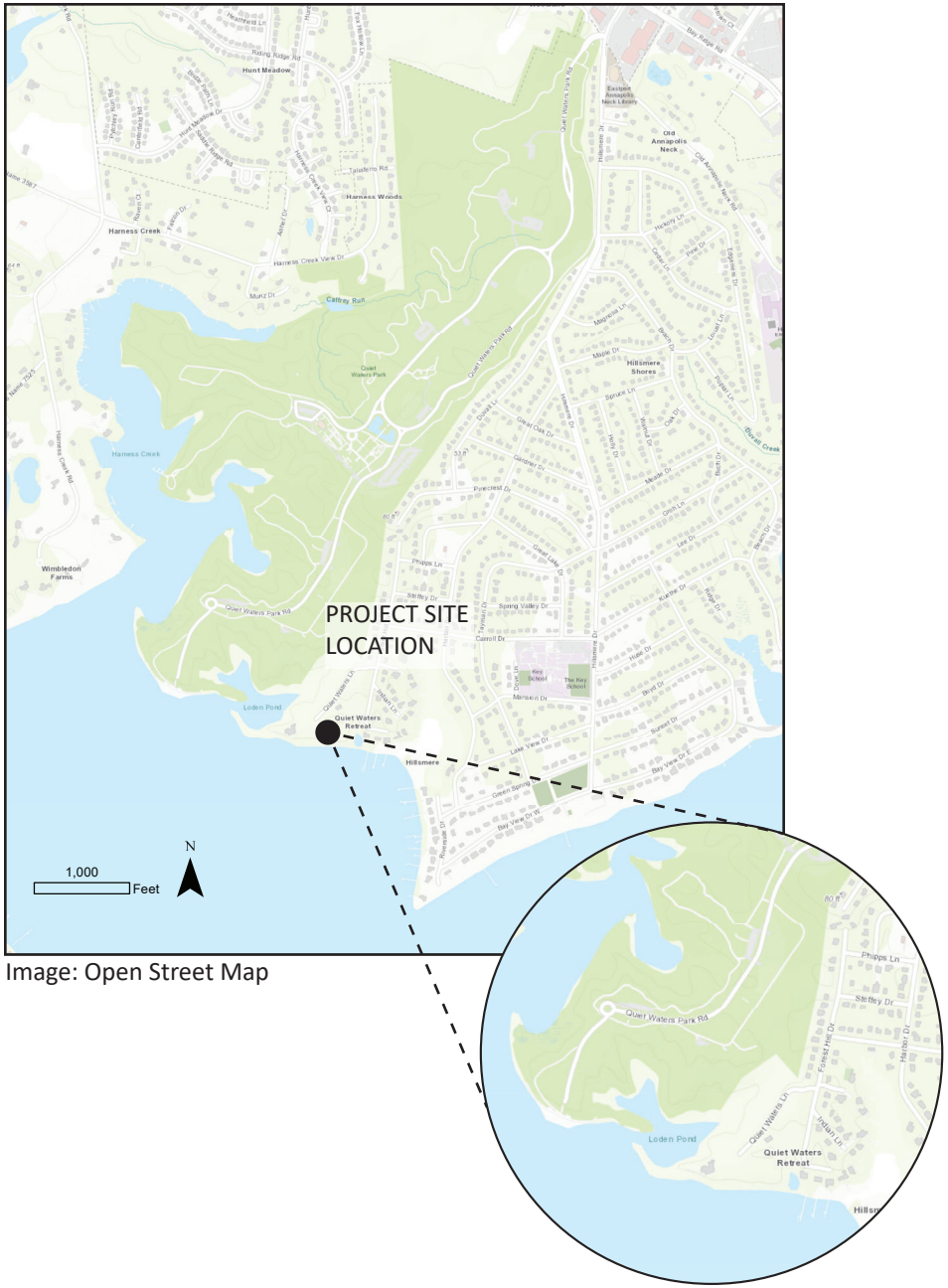


Image: Open Street Map

SITE INVESTIGATION & ANALYSIS

ARCHAEOLOGY

A Phase I archaeological investigation was conducted on a 5.82-acre section of the Retreat site. The survey determined that the property had seen intermittent seasonal use through the 20th century, with no significant cultural features or prehistoric artifacts discovered. No intact structural foundations were found beyond those associated with the known residential buildings. The site poses no known archaeological constraints for passive recreational development.

HISTORY

The property was first developed in the 1940s by the Bishop family as a seasonal retreat. Three residential structures were located along the bluff overlooking Loden Pond, including a brick house and a detached garage complex one with three bays and another with five located on the eastern portion of the property.

The Parker family acquired the property in 1976 and maintained it until 2018. In its later years, the site experienced reduced use and suffered storm damage. The largest house on the property became uninhabitable after a fire in 2019. By that time, Anne Arundel County had already acquired the parcel, in 2018, and the remaining structures except the remnants of the boathouse and wellhouse were removed due to safety concerns.

Since acquisition, the County has preserved the site for future park use and integrated it into the broader Quiet Waters Park system under REPI conservation restrictions and critical area development limitations.

Former Residence Prior to Demolition: Aerial view of the abandoned house overlooking Loden Pond and the South River, later removed to restore the site's natural landscape and integrate it into Quiet Waters Park.

Existing Boathouse Platform: The deteriorated boathouse structure will be stabilized and repurposed as an elevated scenic overlook, providing passive educational opportunities and expansive views of Loden Pond and the South River.

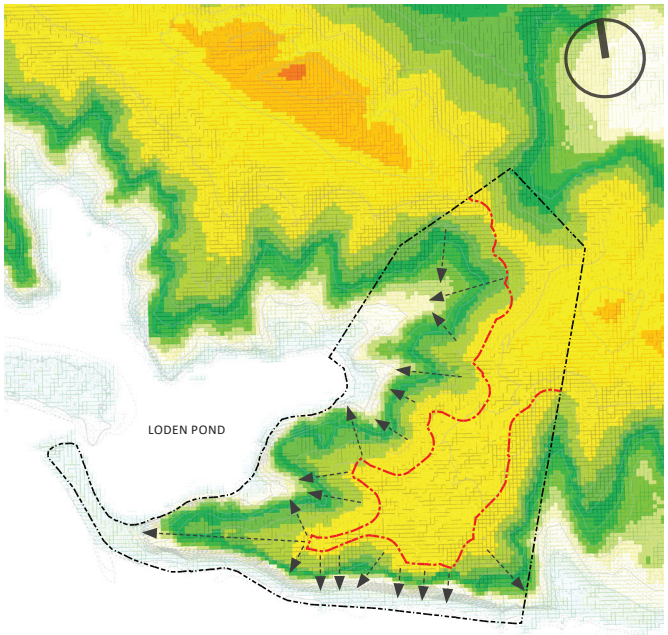
Existing Electrical Panel Near Boathouse: Abandoned electrical infrastructure associated with the former boathouse, slated for removal as part of shoreline restoration and safety improvements.

The Well House: planned to be removed, likely in the first construction phase, to restore meadow and improve the trailhead experience at Forest Hill Drive.

TOPOGRAPHY AND SLOPES

The site features a distinct ridgeline running north–south, sloping dramatically to the east and west toward Loden Pond and the South River, respectively. Many areas along the site perimeter exceed 15% slope, particularly near the water's edge. These slope conditions are protected under County and Critical Area regulations and trigger an expanded Critical Area Buffer, in some locations extending up to 200 feet inland from the shoreline.

These steep slopes shape the site's visual and ecological character, offering elevated river views while limiting grading and development potential. The master plan responds to this condition by preserving the slope face, avoiding new impervious surfaces in high-slope zones, and routing trails along the topographic contours of the upper ridge.



Topographic Conditions at Quiet Waters Retreat: Elevation and slope analysis highlighting steep areas along the shoreline and Loden Pond.

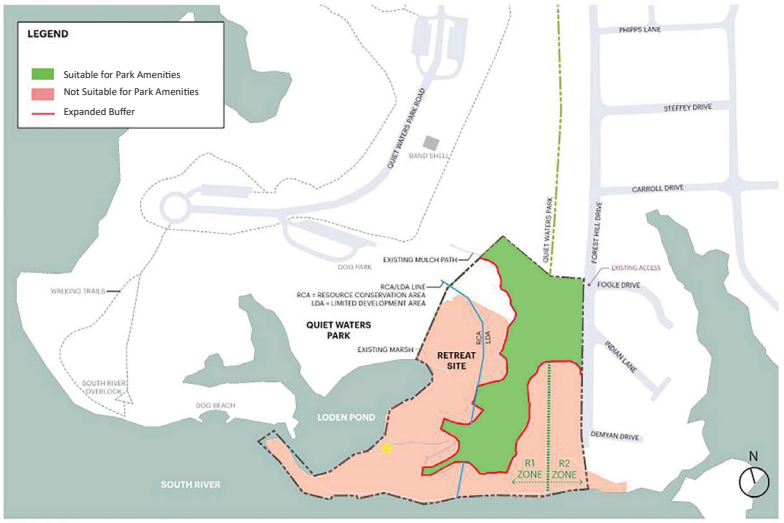
The master plan preserves the site's ridgeline and protects steep slopes through careful trail routing and minimal grading.

CRITICAL AREA AND REGULATORY CONTEXT

The entire site lies within the 1,000-foot Chesapeake Bay Critical Area, a designation intended to protect shoreline resources, water quality, and habitat. It is split between two zoning types:

- Limited Development Area (LDA) – Generally associated with transitional or low-impact development
- Resource Conservation Area (RCA) – The most protective designation, intended for lands critical to maintaining the health of the Bay

Due to steep slopes and proximity to tidal waters, the typical 100-foot buffer from the mean high-water line is expanded across much of the site. The master plan respects these boundaries by locating improvements outside the expanded buffer wherever feasible, and mitigating any minor disturbance through native planting, reforestation, and buffer enhancement.



SOILS & DRAINAGE

The Quiet Waters Retreat site consists of a range of mapped soil types, primarily including Collington fine sandy loam, Annapolis fine sandy loam, and Keyport silt loam, with limited areas of Downer and Sunnyside soils. These soils directly influence site drainage, erosion potential, and the feasibility of stormwater management strategies. Soil characteristics were assessed through NRCS data, hydrologic soil group mapping, and field observations during the planning phase.

Drainage Class - Most of the site features moderately well-drained to somewhat poorly drained soils, with areas near Loden Pond and steep slopes showing evidence of seasonal saturation or perched water. Annapolis and Collington soils generally perform well for infiltration-based practices in flatter areas, while Keyport soils are more compacted and may present challenges for infiltration-based stormwater management.

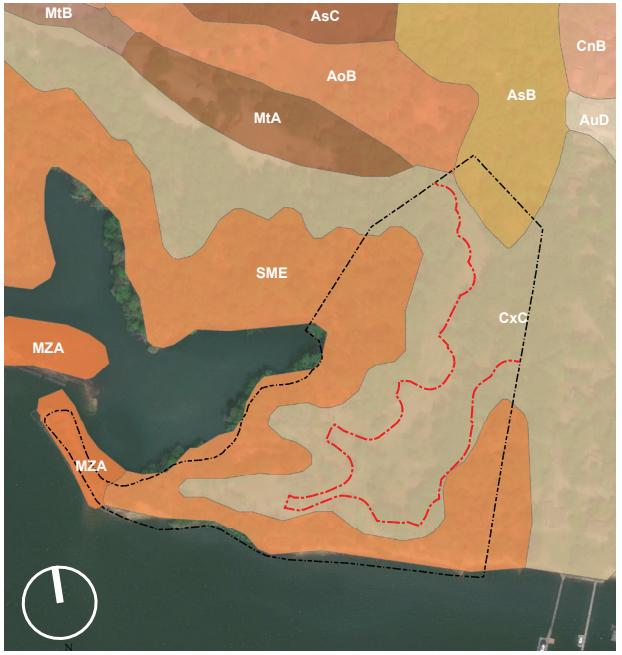
Hydrologic Soil Group - The Quiet Waters Retreat site consists of a range of mapped soil types, primarily including Collington fine sandy loam, Annapolis fine sandy loam, and Keyport silt loam, with limited areas of Downer and Sunnyside soils. These soils directly influence site drainage, erosion potential, and the feasibility of stormwater management strategies. Soil characteristics were assessed through NRCS data, hydrologic soil group mapping, and field observations during the planning phase.

Hydric Rating - While there are no mapped wetlands or hydric soils under the National Wetlands Inventory, local soil data indicates the presence of seasonally saturated or perched conditions in several pockets of Keyport and Annapolis series soils, which have partial hydric characteristics. These areas are flagged for additional field review during detailed design phases and are treated conservatively in the current plan, avoiding grading or infrastructure in those zones.

K Factor (Erodibility) - Based on USDA soil data and applicable County guidelines, the primary soils within the project area exhibit moderate to high erodibility:

- **CxC** - (Collington fine sandy loam, 5–10% slopes) have a K factor of 0.32 (Moderate), assigned a score of 5.
- **SME** - (Shrewsbury fine sandy loam, frequently flooded) have a K factor of 0.24 (Moderate to Low), assigned a score of 5.
- **MZA** - (Mixed alluvial land) are variable but typically classified as moderate erodibility, with an assumed K factor of 0.30 and a score of 5 for planning purposes.

Areas where moderate slopes and erodible soils coincide, particularly near ridgelines, pond edges, and drainage pathways, are prioritized for forest preservation, slope stabilization, and minimal disturbance in the site plan to reduce erosion risks and protect adjacent critical area buffers.

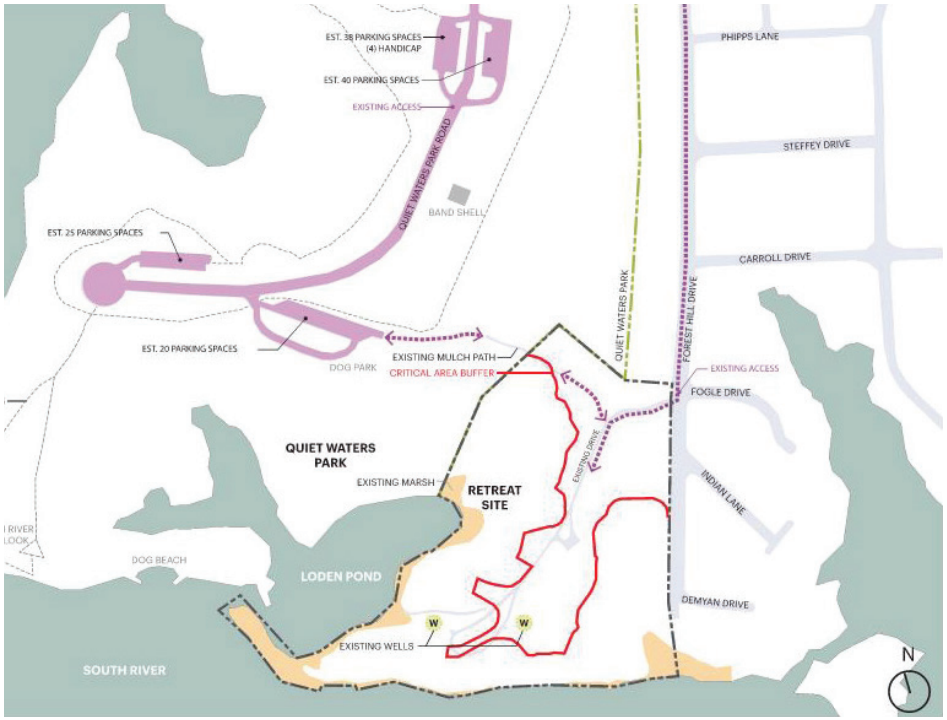


CxC – Collington fine sandy loam, 5 to 10 percent slopes
SME – Shrewsbury fine sandy loam, 0 to 2 percent slopes
AsB – Annapolis fine sandy loam, 2 to 5 percent slopes
AoB – Adelphia-Urban land complex, 0 to 5 percent slopes
MtA – Mattapex silt loam, 0 to 2 percent slopes
AsC – Annapolis fine sandy loam, 5 to 10 percent slopes
CnB – Collington-Urban land complex, 0 to 5 percent slopes
MZA – Mixed alluvial land
MtB – Mattapex silt loam, 2 to 5 percent slopes
AuD – Annapolis fine sandy loam, 10 to 15 percent slopes

EXISTING CIRCULATION AND ACCESS

Currently, the only vehicular access to the Quiet Waters Retreat site is indirect and limited. Visitors enter Quiet Waters Park through its main entrance on Hillsmere Drive, proceed south on Quiet Waters Park Road, and park at the gravel lot adjacent to the dog park. From there, pedestrian access to the retreat site begins.

A paved asphalt park trail leads southeast from the parking area and connects to a crushed stone trail, which exits the formal trail system and becomes a worn dirt path. This informal trail passes through a chain-link gate and connects with the former residential driveway, which is now a gravel access route leading into the retreat site. The old driveway, though still visible, is deteriorated and largely unmaintained.



A secondary access route exists at the former residential entrance along Forest Hill Drive, across from Indian Lane. This gated entrance, once intended for vehicles, is now limited to pedestrian access only. Residents from the adjacent neighborhood use this as an informal walking path to access Quiet Waters Park. From the gate, a mulch trail leads toward the dog park and park trail system.

The former driveway system includes a main gravel path that leads toward the bluff where the historic house once stood, and a second gravel spur that descends toward the former boathouse location near Loden Pond. These gravel paths, though still physically present, are in poor condition and not formally maintained for public use.

Overall, the existing access network is a patchwork of informal trails, degraded gravel driveways, and non-ADA-compliant footpaths. Infrastructure such as wooden steps and trail edges are worn or deteriorated. These conditions reinforce the need for formalized, accessible, and clearly defined circulation improvements in future park development.

FOREST COVER & VEGETATION

Roughly 70% of the site is forested, dominated by mature deciduous canopy including oak, hickory, tulip poplar, beech, and holly. A tree survey identified 51 specimen trees throughout the site, which helped inform trail routing and overlook placement to minimize impact. Invasive species such as English ivy, wisteria, Japanese honeysuckle, bamboo, and wineberry are present in disturbed edges and former cleared areas. The master plan incorporates a phased invasive species removal program and proposes native meadow conversion and understory restoration in priority zones.

STORMWATER MANAGEMENT

The park property and immediate surrounding area does not contain a public underground storm drainage collection system. The requirements for water quality and quantity will be in accordance with the regulations defined in the 2000 Maryland Stormwater Design Manual, Volume I and II prepared by the Maryland Department of the Environment Water Management Administration and subsequent Chapter 5 revisions as well the Anne Arundel County Stormwater Management Practice and Procedures Manual. Since the project site is located within the Chesapeake Bay Critical Area RCA and LDA lot coverage is limited to 15%. To meet the coverage limits, the proposed hard surfaces will utilize permeable paving where feasible.

Stormwater management requirements are recommended to be met using a combination of Environmental Site Design (ESD) techniques of non-structural practices and micro-scale practices. Linear paths and walks may be treated using non-rooftop disconnection credit where feasible. Park road ways are anticipated to be open sections using grass swales for both conveyance and ESD treatment.

WELLS

Public water service is not available at the project site. Several legacy wells are present and should be properly abandoned in accordance with COMAR regulations. At this time, no new well or on-site sewer system is proposed. The master plan emphasizes a light infrastructure footprint consistent with the Retreat's passive use and ecological sensitivity. If minimal water service is required in future phases or for limited maintenance or stewardship functions. It should be provided using low-impact solutions and housed within existing or minimally altered structures. Any future utility decisions will be evaluated based on their necessity, environmental impact, and consistency with the site's conservation goals.

SANITARY SEWER

Access to County public sewer system is available to the east of the property area along Forest Hill Drive. An existing 8-inch gravity sewer runs north-south in Forest Hill Drive. Any future utility decisions, including sewer service, would be based on the needs and scale of proposed improvements and will be designed to minimize disturbance. No new on-site sewer is currently anticipated.

SANITARY SEWER

ZONING AND PROPERTY RESTRICTIONS

The Quiet Waters Retreat property is located within Anne Arundel County and is subject to the County's zoning regulations under Article 18 of the County Code. Although the site is now owned and managed by the County as parkland, the underlying R1 and R2 Residential Districts and Chesapeake Bay Critical Area overlays remain relevant for determining allowable uses, development limitations, and conservation obligations.

Base Zoning Districts

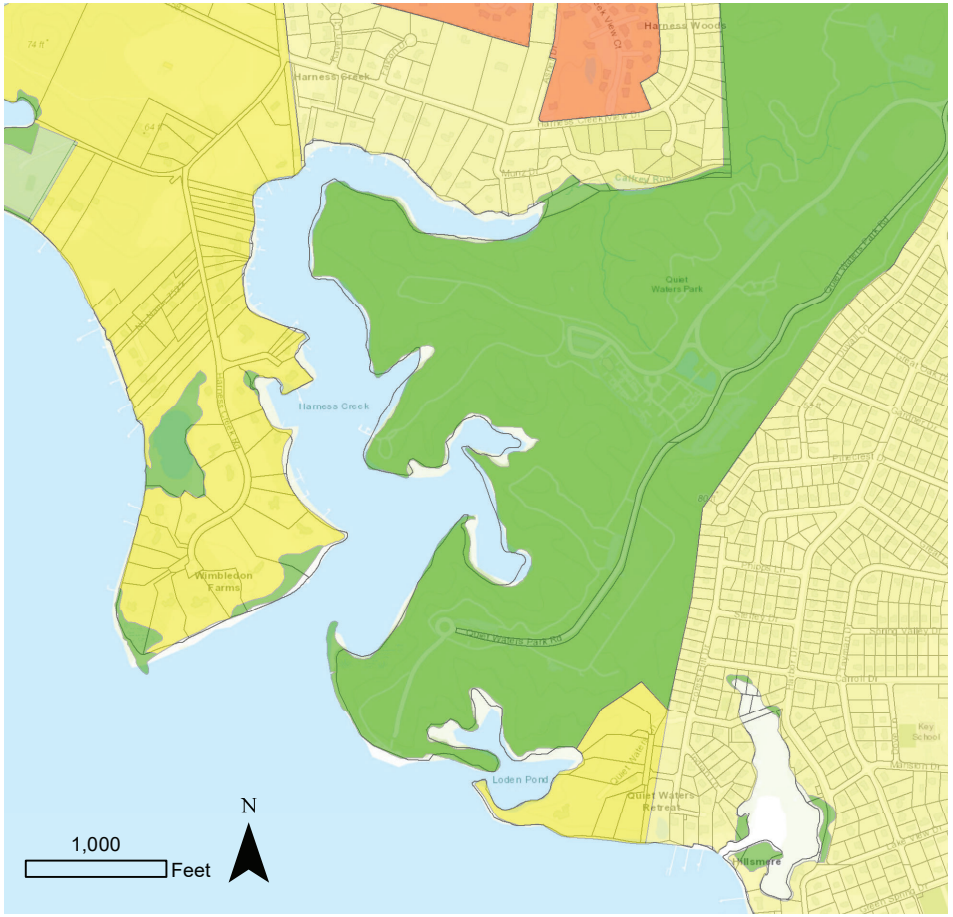
The parcel includes areas designated as R1 and R2 Residential Districts, which set baseline standards for bulk regulations and lot sizes.

R1 Residential District (Section 18-4-501)

- Front setback: 40 feet
- Rear setback: 35 feet
- Side setback: 15 feet
- Corner side lot line: 40 feet
- Arterial setback: 50 feet
- Max structure coverage: 25% of gross lot area
- Minimum lot size: 40,000 square feet
- Max height: 45 feet

R2 Residential District (Section 18-4-601)

- Front setback: 30 feet
- Rear setback: 25 feet
- Side setback: 7 feet
- Corner side lot line: 20 feet
- Arterial setback: 40 feet
- Max height: 35 feet
- Min lot size (no sewer): 20,000 sq ft
- Min lot size (with sewer): 15,000 sq ft



OS Open Space
C1 Commercial - Local
R1 Residential
R2 Residential

While these base zoning regulations are important for understanding development potential, they are now superseded by public ownership, environmental overlays, and deed restrictions that limit uses to passive park functions and conservation activities.

CONSERVATION EASEMENTS

The US Navy has a REPI (Readiness and Environmental Protection Integration) conservation easement on the 19.43-acre retreat parcel recorded in 2020. REPI is a program through the Department of Defense to mitigate development encroachments near installations and ranges that help sustain critical, military capabilities. The REPI easement restricts use and development of the property with certain conservation attributes. The total amount of impervious surfaces on the property shall never exceed two percent (2%). The total footprint of any structures, excluding pavilions or picnic shelters, shall never exceed 15,414 square feet. The final master plan proposes improvements that will be less than the prescribed maximum thresholds. A copy of the REPI easement is included in the Appendix.

PROGRAM OPEN SPACE

The Quiet Waters Retreat is supported in part through Maryland's Program Open Space (POS), a state initiative that funds the acquisition and development of parkland to serve present and future generations.

The Retreat's emphasis on passive recreation, ecological preservation, and low-impact access aligns directly with POS priorities. Rather than constructing new buildings or infrastructure-intensive amenities, the master plan proposes nature-based experiences—accessible trails, habitat restoration, and interpretive elements—designed to protect the site's critical area, forest cover, and water resources. Program Open Space support ensures that public investment is directed toward long-term stewardship, equitable access, and the enhancement of Maryland's natural heritage.

PERMITTING &TECHNICAL CONSIDERATIONS

The Quiet Waters Retreat Master Plan meets strict state and county standards to protect its natural beauty while enabling low-impact features like trails and overlooks. This section outlines the permits and studies ensuring the site's ecological health and public access. From forest preservation to minimal traffic impact, these steps align the plan with conservation goals and community needs.

Stormwater Management
Preliminary stormwater management areas are strategically located throughout the site and will be refined during the design development phase. These micro-bioretention areas and vegetated swales will manage runoff, support pollinator habitat, and use native species to attract beneficial wildlife such as bees, butterflies, and birds.

In accordance with the REPI conservation easement, the project strictly limits new impervious surface coverage. The current master plan proposes approximately 0.62 acres of new impervious area, primarily from accessible trail segments and limited gathering features. Stormwater strategies are designed to comply with these restrictions while supporting Chesapeake Bay Critical Area goals for infiltration, habitat enhancement, and long-term site resilience.

Utilities
Utility infrastructure will be limited but sufficient to support basic park functions. This includes electrical connections for lighting and any interpretive features. All infrastructure will be sited to minimize forest disturbance and preserve the park's natural character.

Connectivity and Accessibility
The Quiet Waters Retreat trail network ensures seamless access for users of all ages and abilities. ADA-compliant paths link major destinations like the Forest Hill entrance, Loden Pond Overlook Platform, and Council Ring. A mix of paved and mulch trails preserves natural conditions and protects steep slopes, reflecting stakeholder input focused on inclusivity and nature-first design.

Forest Preservation
A 2022 forest stand delineation mapped the site's woodlands, vital to wildlife and the plan's vision:

- Upland Area (8 acres): Gentle slopes with tulip poplar, white oak, and dense cover.
- Shoreline Area (6 acres): Steeper slopes with chestnut oak and bird habitats.
- Key Trees: 37 large oaks and poplars, mostly healthy, guide trail placement.

The plan qualifies for simple forest rules, minimizing tree removal, avoiding steep slopes, and adding meadows to enrich habitat, protecting birds and natural balance.

Traffic Assessment
A 2024 study estimated visitor trips using standard guidelines, finding low impact due to the site's focus on quiet recreation. Daily trips fall well below the county's 250-trip limit, needing no major traffic study. Current access via Quiet Waters Park's dog park lot works for expected use, with final checks planned during design.

Required Permits
The park's development requires the following regulatory approvals:

- *Notice of Intent for coverage under the state's General Permit for Stormwater Associated with Construction Activity*
- *Permit Agency Review submission through Land Use Navigator*
- *Grading Permit*
- *Building Permit for each structure*
- *Soil Conservation District approval*

These steps ensure the plan meets ecological and public access goals, while preserving the site's sensitive landscapes from Loden Pond to the South River.

CONCEPTUAL DESIGN PROCESS

The Quiet Waters Retreat Master Plan was developed through a multiphase, community-informed process led by Anne Arundel County Department of Recreation and Parks (DRP), supported by design and environmental consultants, and shaped in close coordination with the Stakeholder Advisory Group (SAG). This group included local residents, members of the Friends of Quiet Waters Park, environmental leaders, park users, County staff, representatives from the U.S. Navy REPI Program, and The Chesapeake Conservancy.

Rather than beginning with a fixed program, the process focused first on listening—gathering public priorities, observing site conditions, and shaping design strategies in response to both. Each phase of the project helped refine the plan into one that reflects both community values and environmental sensitivity.

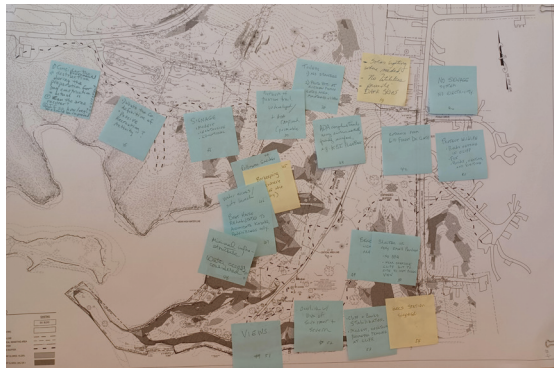
At the outset, DRP shared a clear vision: to create a nature-based public space rooted in preservation, passive recreation, and environmental education—one that provides meaningful access while keeping the landscape natural and undeveloped. This vision helped guide early conversations and set a tone of ecological responsibility and light-touch design.

KEY MILESTONES

- **Kickoff Meeting**
  An internal meeting established project goals, reviewed constraints (steep slopes, specimen trees, invasive species), and confirmed data needs for environmental analysis.

FROM BOARDS TO BLUEPRINT

Visual planning tools played a key role in distilling stakeholder feedback into design strategy. Participants used sticky notes on large-format maps to highlight meaningful locations and record specific recommendations. These boards captured the community's voice at a hyperlocal level—translating site familiarity and lived experience into actionable priorities. These recurring ideas were not only collected but synthesized into a focused design framework, ensuring the final master plan directly reflects stakeholder values, environmental conditions, and Quiet Waters Park's broader mission.



Stakeholder feedback gathered during early planning workshops, where participants identified site priorities, opportunities, and concerns directly on a base map of the Quiet Waters Retreat property.

- **Stakeholder Meetings #1–4**
  Over a series of workshops, the SAG reviewed early concepts and shared feedback on site history, user needs, and design values. Early sessions featured large-scale site maps and visioning boards where participants placed sticky notes highlighting specific priorities, concerns, and opportunities. This interactive feedback shaped successive design iterations and revealed a clear consensus: protect views, limit impervious surfaces, emphasize native landscapes, and foster a restorative, low-impact park character.

STAKEHOLDER-DRIVEN PRIORITIES

Throughout the process, recurring themes emerged and directly informed the final plan layout and features:

- Prioritize passive recreation over structured program elements
- Avoid new buildings or formal event venues
- Use natural materials and permeable surfaces where possible
- Maintain and frame views to the South River and Loden Pond
- Limit clearing and preserve large trees and forest structure
- Create an accessible trail network that blends into the landscape
- Rehabilitate the boathouse site as a scenic overlook and educational node
- Incorporate interpretive signage developed in partnership with the Friends of Quiet Waters Park
- Support pollinator habitat and existing bee boxes
- Address invasive species, soil erosion, and slope stabilization needs
- Provide opportunities for outdoor education and informal gathering (e.g., Council Ring)

View of South River from Quiet Waters Retreat

Existing Trail to Quiet Waters Retreat

Existing Medow Trail

View of Loden Pond from Quiet Waters Retreat

- **Concept Development**
  Following the survey and early workshops, the design team translated community feedback into three distinct concepts. Themes like habitat restoration, accessible trails, scenic overlooks, and natural materials guided the approach.

  Each concept reflected a unique theme while addressing site constraints and public priorities. Presented in Stakeholder Meetings #2 and #3, the designs sparked dialogue around layout, features, and materials, helping shape a final, blended plan.

  1. *Wellness and Mindfulness* – Featuring the Serenity Line, Hammock Grove, and contemplative spaces.

  2. *Art and Culture in Nature* – Introducing creative trails, learning installations, and a flexible event space.

  3. *Wildlife Habitat and Restoration* – Focusing on native meadow restoration, forest connectivity, and pollinator support.

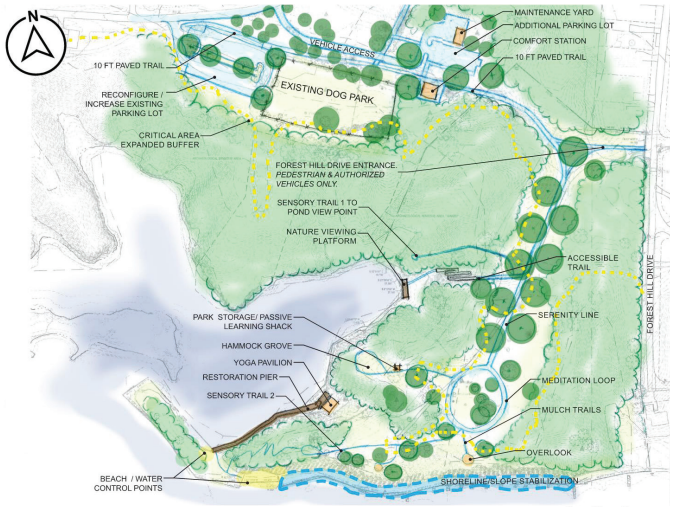
  Stakeholders selected a blended version based on Option C, which served as the foundation for the final plan.

- **Final Stakeholder Review -** Final refinements included adjusted overlook siting, pollinator placement, comfort station location, boardwalk coordination with future shoreline restoration, and confirmation of materials and signage strategy.

- **Public Draft Review** - The draft master plan will be presented for public feedback prior to County approval, with potential adjustments based on community input and budget review.

CONCEPT ALTERNATIVES OVERVIEW

To explore how the Quiet Waters Retreat could best support County goals and community values, three conceptual design alternatives were developed. Each concept reflected a distinct theme, ranging from wellness and creativity to ecological restoration, while addressing site constraints such as steep slopes, specimen trees, and habitat sensitivity. These concepts were presented to the Stakeholder Advisory Group to generate feedback and guide the refinement of a final, blended plan that balances public access with ecological stewardship.



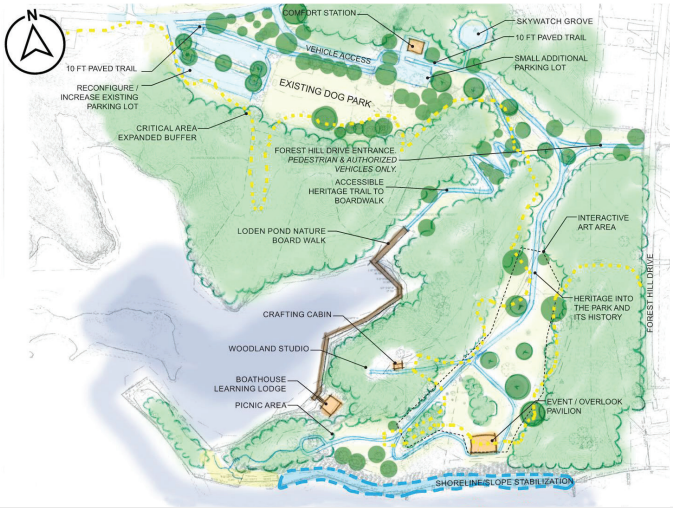
CONCEPT A: WELLNESS AND MINDFULNESS

This concept reimagines Quiet Waters Retreat as a peaceful refuge for wellness, reflection, and personal retreat. The design prioritizes quiet movement, sensory experience, and restorative spaces with minimal built infrastructure.

A central Serenity Line, a straight, tree-lined path, guides visitors through the landscape with moments of pause at hammock groves, meditation clearings, and shade shelters. A Sensory Trail invites interaction with nature through sound, texture, and light.

At the water's edge, a viewing platform offers a contemplative destination with South River views. Naturalistic materials and restored woodland trails support walking, yoga, and informal group activity while minimizing ecological impact.

This approach offers a quiet, immersive way to reflect and reconnect with nature.



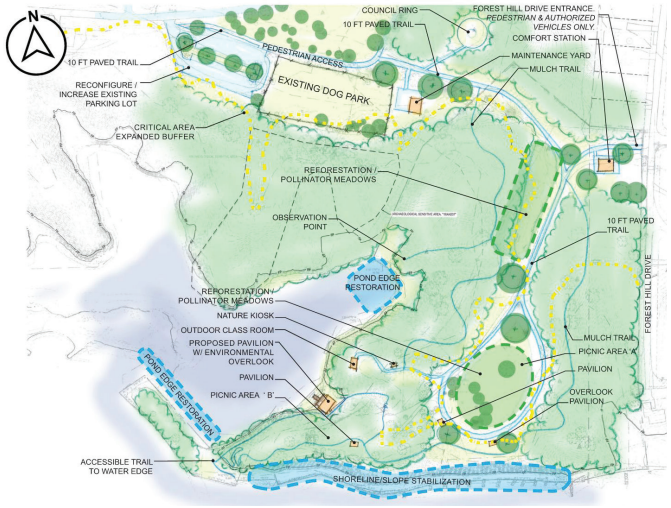
CONCEPT B: ART AND CULTURE IN THE PARK

This concept presents the Retreat as a space for creative expression and cultural engagement, blending art, education, and nature into a cohesive visitor experience.

A flexible Art @ the Park Pavilion anchors the concept, hosting exhibits, community events, and seasonal workshops. Surrounding it, a Sculpture Trail and interpretive pathways allow visitors to engage with art nestled in the landscape.

Reused site structures like the Crafting Cabin and Boathouse Learning Lodge support art programs and small group activities. The Woodland Studio and Skywatch Grove offer quiet spaces for sketching, writing, or stargazing.

With subtle infrastructure and a strong educational focus, this concept invites visitors to explore nature through the lens of creativity, culture, and shared expression.



CONCEPT C: WILDLIFE SANCTUARY AND HABITAT RESTORATION

This concept centers on habitat conservation, ecological restoration, and passive environmental learning. It protects the site's natural assets while allowing for low-impact public access and interpretation.

An accessible trail loop ties together key features: pollinator meadows, habitat zones, overlooks, and educational nodes. Natural mulch trails branch from this core, guiding users into forested areas and down toward the water.

The design includes a Council Ring, Outdoor Classroom, and Nature Kiosk to support learning and stewardship. A stabilized boathouse platform offers water views and interpretation, with future shoreline improvements noted.

Emphasizing reforestation, stormwater management, and biodiversity support, this concept balances quiet recreation with a commitment to long-term ecological health and environmental education.

OUTCOME

The final Quiet Waters Retreat Master Plan reflects the culmination of a thoughtful, community-driven design process. At the final stakeholder workshop in March 2025, the group reviewed a refined concept that blended key elements from the three original design options, prioritizing low-impact trails, ecological restoration, interpretive experiences, and small-scale gathering features.

The plan avoids programmed development in favor of trail-based discovery, habitat restoration, and naturalistic amenities. Features such as scenic overlooks, a rehabilitated boathouse platform, and informal spaces like the Council Ring were carefully sited to preserve specimen trees, protect sensitive slopes, and enhance views of the South River and Loden Pond.

The result is a nature, first park experience, a quiet extension of Quiet Waters Park that invites reflection, supports passive recreation, and fosters long-term environmental stewardship. The design maintains the site's natural character while offering inclusive access and meaningful opportunities to engage with the landscape.

MASTER PLAN - FINAL VISION

The Quiet Waters Retreat Master Plan envisions a public landscape shaped by restoration, reflection, and access to nature. Building on values identified through community input and guided by the site's natural conditions, the plan defines a low-impact framework for public use that enhances ecological function while offering opportunities for quiet recreation and environmental learning.

Set within forested slopes above Loden Pond and the South River, the site expands Quiet Waters Park while protecting sensitive shoreline and habitat. Rather than focus on programmed development, the plan centers on three core experiences: discovery through movement, gathering in nature, and learning through restoration.

CIRCULATION AND ACCESS

The trail system anchors the site's design, balancing recreational access with environmental protection. A primary loop, built with permeable and paved segments for ADA compliance that connects the Forest Hill Drive entrance to the existing Quiet Waters trail near the dog park, offering an accessible, naturalistic route.

Secondary mulch trails extend from this loop to forest clearings, overlooks, and wetlands. While not fully ADA-compliant, these trails are generally accessible to many users. Expanding ADA access to all overlooks would require grading and surfacing that would harm steep slopes and sensitive habitat.

The former driveway, now a stabilized trail, serves as a central spine linking destinations like the ADA-compliant Council Ring and Loden Pond Platform. Two additional pond overlooks are accessible by mulch trail but not fully ADA-compliant.

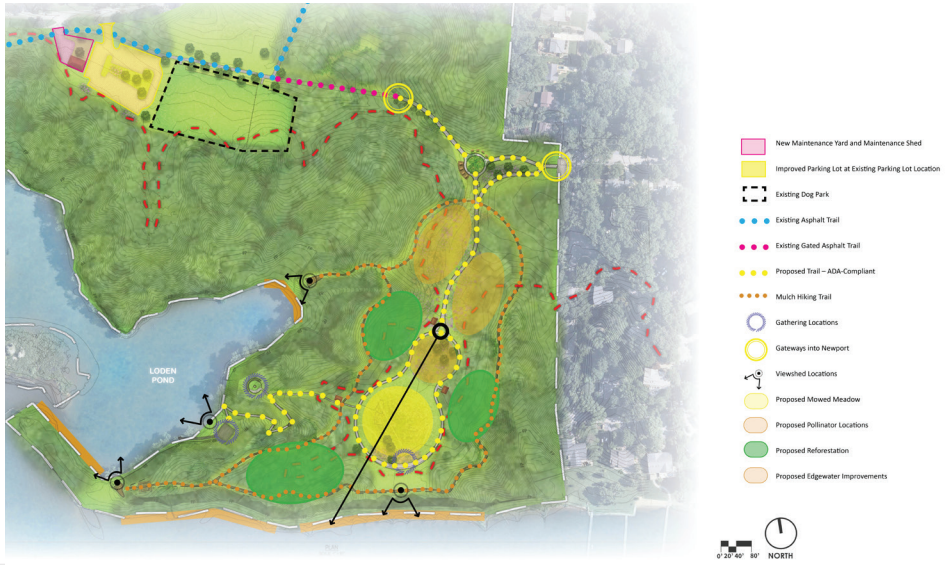
All circulation routes are carefully aligned to avoid disturbance to critical root zones, steep grades, and environmentally sensitive areas, ensuring long-term sustainability of both the trail system and the landscape.

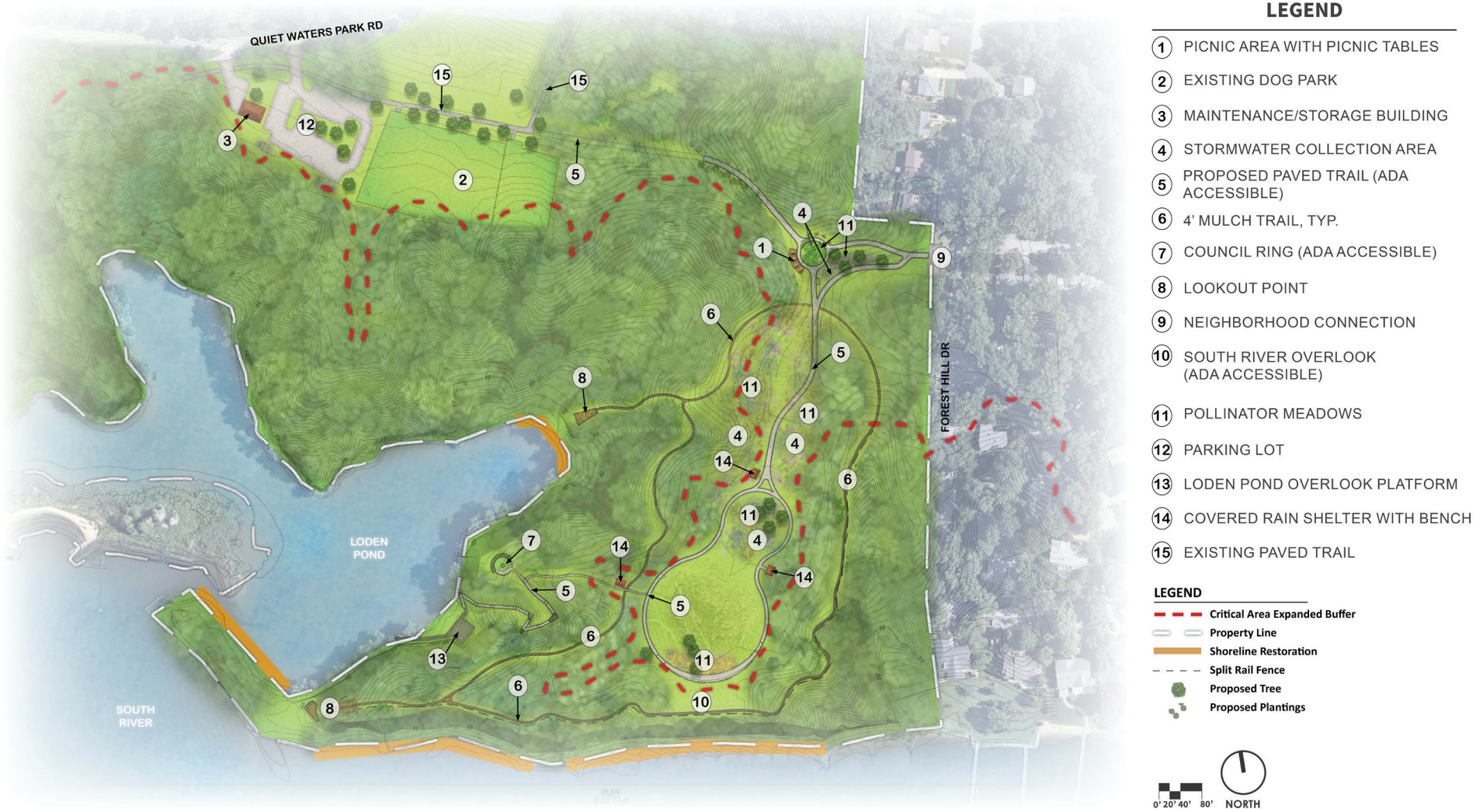
GATHERING AND RESTORATIVE FEATURES

The master plan introduces small-scale structures and features designed to encourage reflection and passive gathering. These include:

- A Council Ring nestled within a natural tree clearing
- A shade structure or pavilion adjacent to the main overlook
- The Serenity Line, a linear tree-lined path intended as a visual and experiential anchor
- Informal seating areas placed at key viewpoints overlooking the water

These elements are modest in scale, blending into the landscape and requiring minimal grading or disturbance. They serve not as destinations but as places to pause and observe.





The Quiet Waters Retreat Master Plan offers a resilient and community-rooted vision for a passive park landscape one where people can move slowly, engage deeply with nature, and contribute to the long-term care of a site already rich in beauty and ecological value. Shaped by public voices and grounded in ecological restoration, the plan extends the legacy of Quiet Waters Park with humility, purpose, and a lasting commitment to stewardship.

ENVIRONMENTAL EDUCATION AND RESTORATION

A defining goal of the plan is to use the landscape as a living classroom. The site offers multiple zones for passive environmental learning, including:

- A pollinator meadow near the entry, carefully sited to preserve views and minimize intrusion into the central experience zone
- Interpretive signage, developed in collaboration with the Friends of Quiet Waters Park, focusing on slope stability, invasive species, and native reforestation
- A repurposed boathouse platform, stabilized to allow safe water viewing and small-scale educational programming
- A potential future water-level overlook, to be explored through a separate shoreline restoration plan

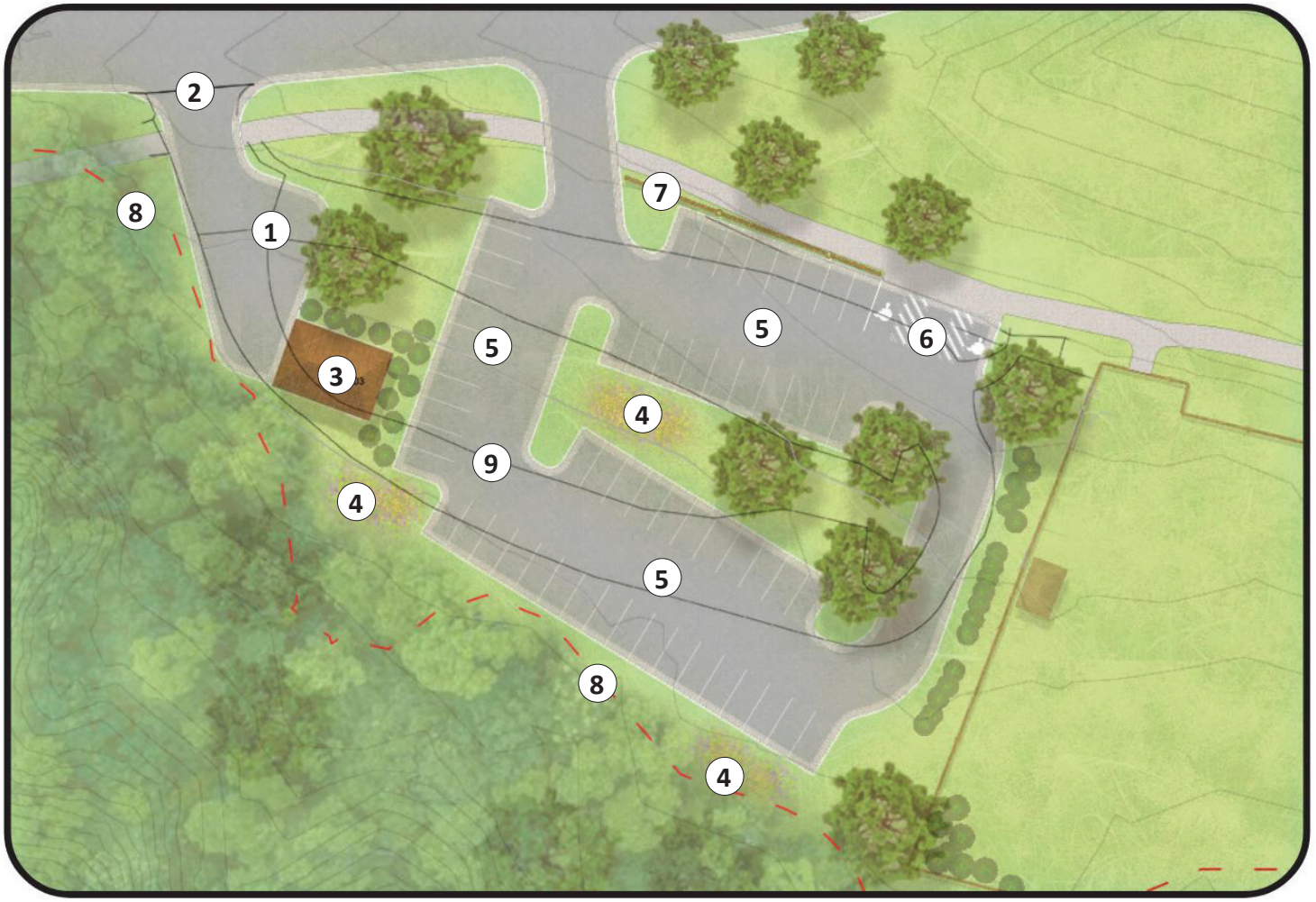
Restoration strategies include invasive species removal, native tree planting, and reestablishment of forest understory. Grading is minimized throughout the site, and stormwater is managed through micro-bioretention areas, vegetated swales, and natural infiltration.

SITE INFRASTRUCTURE AND PHASING

The plan maintains a light footprint by limiting infrastructure to essential needs. A portable toilet shelter is sited near the park's main entry for convenience, serving visitors without encouraging vehicular traffic deeper into the site.

A maintenance and storage building supports long-term park operations and is accessed via the existing service path. Interior fencing will be removed to allow for free movement, while the Forest Hill Drive gate and perimeter fencing will remain or be replaced to prevent unauthorized vehicle access and frame the retreat's eastern edge with a softer, naturalized appearance.

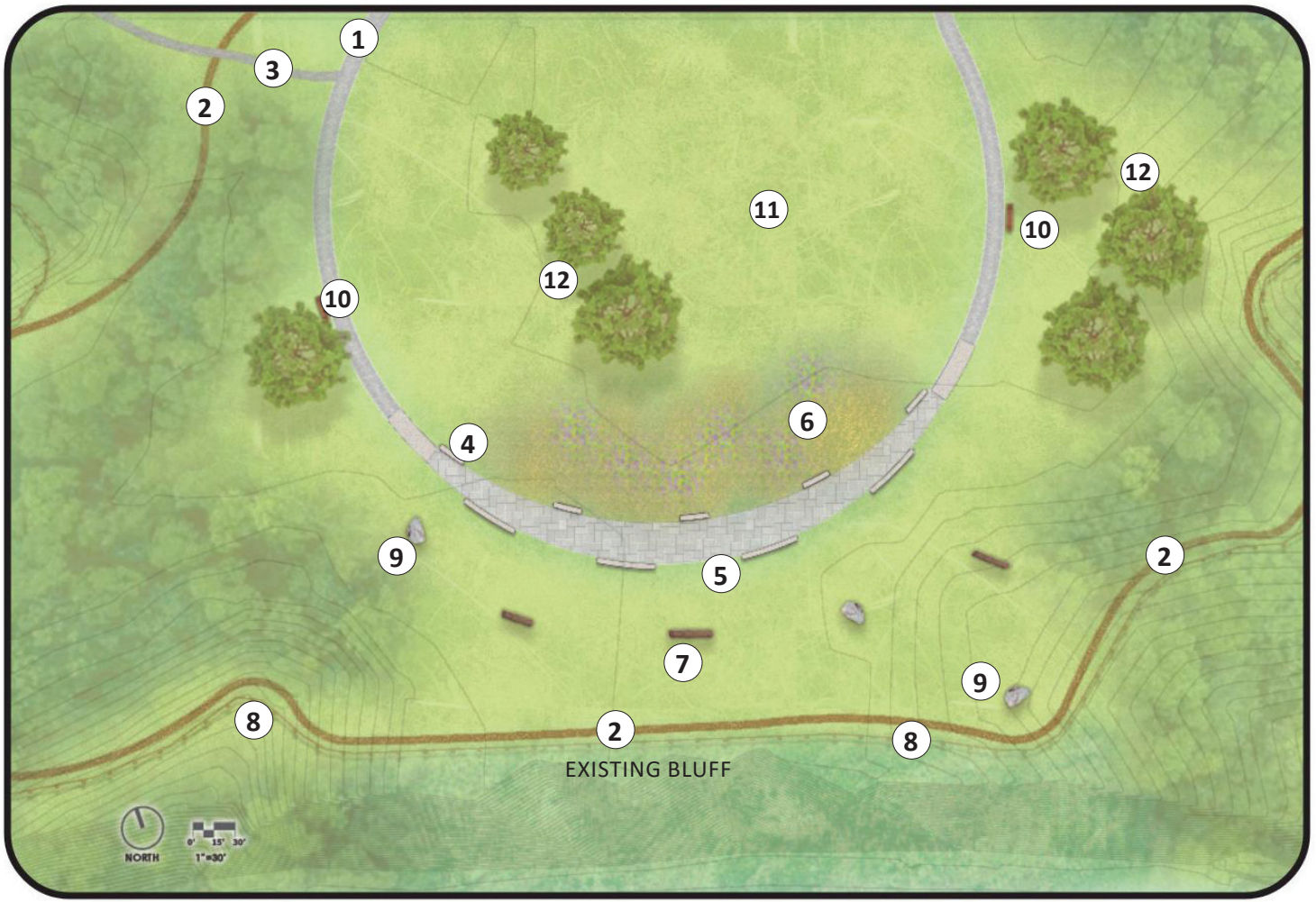
Implementation is envisioned in phased components, beginning with trail construction, meadow restoration, signage installation, and invasive species management. Future phases may include overlook enhancements and additional site furnishings as funding allows.



1. NEW ENTRANCE FOR PARKING LOT
2. EXISTING ENTRANCE (CONVERTED TO MAINTENANCE USE ONLY)
3. PROPOSED MAINTENANCE/STORAGE BUILDING
4. ESD SWM FACILITY
5. RECONFIGURED AND PAVED PARKING LOT (58 REGULAR SPACES)
6. ADDITIONAL ACCESSIBLE SPACES (3)
7. EXISTING POST/RAIL FENCE
8. CRITICAL AREA
9. EXISTING PARKING LOT

PARKING LOT AND MAINTENANCE BUILDING

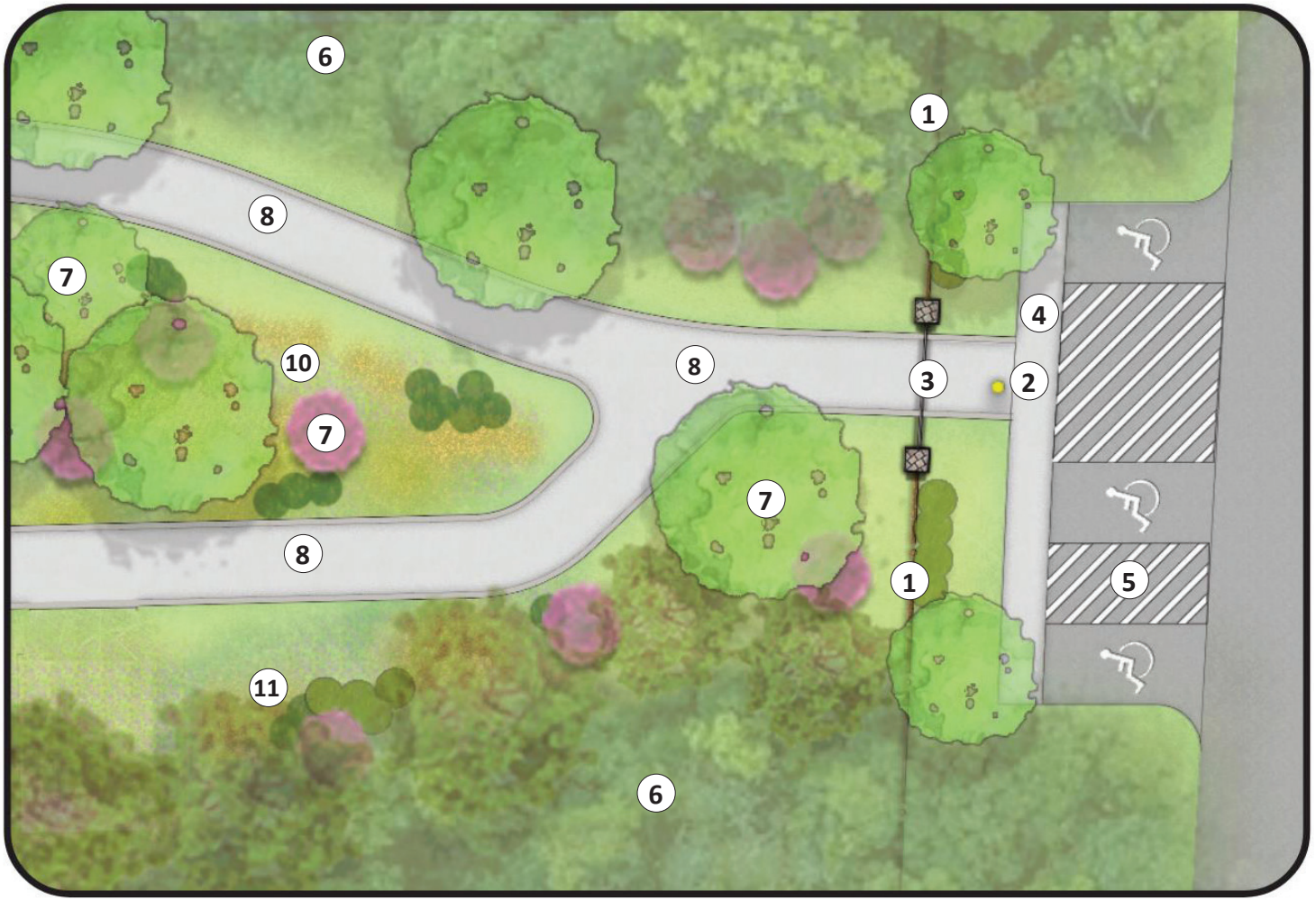
This area provides essential access and support infrastructure while maintaining a discreet footprint. The reconfigured parking lot offers ADA spaces and standard parking for visitors near the dog park entrance. A proposed maintenance building is positioned for efficiency and screened by vegetation. Stormwater is managed through bioretention areas that meet ESD (Environmental Site Design) requirements. This zone marks the primary arrival for most users, blending functionality with careful integration into the wooded landscape.



1. 6’ ADA PAVED TRAIL
2. 4’ MULCH TRAIL
3. 4’ ADA PAVED TRAIL
4. 10’ SEATWALL
5. 20’ SEATWALL
6. RAIN GARDEN
7. LOG SEATING
8. SPLIT RAIL FENCE (±145 LF)
9. LANDSCAPE BOULDER
10. BENCH
11. LAWN (UNPROGRAMMED PLAY)
12. EXISTING TREE (TYP)

RETREAT ACCESSIBLE OVERLOOK

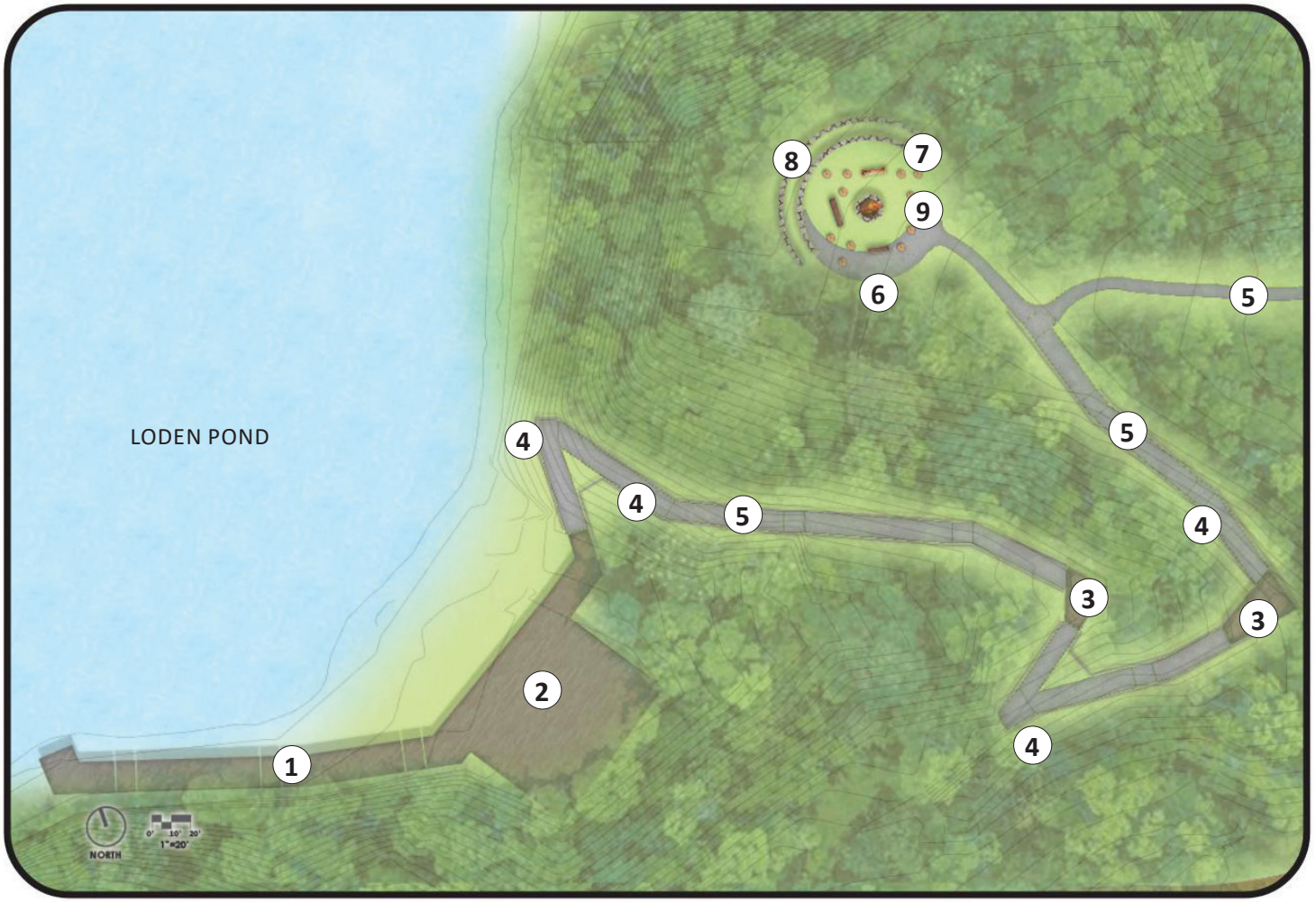
The overlook zone offers universal access to nature-based recreation and scenic views. An accessible paved loop encircles a flexible lawn and seating area for unprogrammed passive use. Mulch trails branch off toward bluff-edge overlooks and restored forest edges. Large boulders, low walls, and natural seating reinforce the site’s rustic character while encouraging informal gathering and pause points. This zone functions as a tranquil destination within the broader trail network.



1. PROPOSED FENCE
2. REMOVABLE BOLLARD
3. PROPOSED GATE / PIER
4. PEDESTRIAN & AUTHORIZED VEHICLES ONLY PARK ENTRANCE
5. ACCESSIBLE PARKING
6. EXISTING TREES
7. PROPOSED TREES
8. 10’ ACCESSIBLE TRAIL
9. PAVED TRAIL
10. ESD SWM FACILITY

FOREST HILLS ENTRANCE

At the Forest Hill Drive entrance, accessible parking creates a secondary park gateway. This entrance is designed for pedestrians, service, and emergency access only, with minimal visual impact. The trail connection is framed by existing trees and proposed plantings, setting the tone for a quiet, natural experience. Fencing and removable bollards provide access control while preserving the open feel. This space balances neighborhood access, operational needs, visitor comfort, and environmental sensitivity.



1. ACCESSIBLE RAMP / RAILING ON PIERS
2. LODEN POND OVERLOOK PLATFORM
3. DRAINAGE CROSSING (FOOTBRIDGE)
4. RETAINING WALL
5. ACCESSIBLE PATH
6. COUNCIL RING
7. 1.5’ SEAT WALL
8. 3’ RETAINING WALL
9. STUMP SEATS / LOGS

BOATHOUSE DECK AND RAMP TO DOCK

Located along the Loden Pond shoreline, the rehabilitated boathouse platform and new ramp provide inclusive water-edge access. Retaining walls and natural seating elements shape a council ring for reflection or outdoor learning. Drainage crossings and footbridges ensure trail continuity across low-lying areas. Though the structure is non-operational, the stabilized platform becomes a scenic overlook and educational node, tying the site’s historic character to its new environmental mission.

COST ESTIMATION

The development of Quiet Waters Retreat represents a strategic public investment in passive park infrastructure and ecological restoration. The preliminary cost estimate for implementation totals $4,952,008, reflecting current industry-standard unit costs and the scope of proposed improvements. These include accessible trails, native plantings, stormwater facilities, interpretive signage, and modest site structures.

The estimate also accounts for architecture and engineering design fees, as well as a design and construction contingency. Costs related to permitting and future inflation have not been included.

Item No.	Description	Cost
1	General Requirements	$ 274,508
2	Surface Preparation & Earthwork	$ 125,000
3	Earthwork	$ 400,500
4	Erosion Controls	$ 225,000
5	Drainage Facilities	$ 670,300
6	Paving & Site Improvements	$ 910,390
7	Landscaping	$ 426,425
8	Park Specialties	$ 1,094,550
	Subtotal	**$ 4,126,673**
	Design & Construction Contingency (20%)	$ 825,335
	Total Estimated Costs	**$ 4,952,008**

APPENDIX

1. Forest Stand Delineation (FSD)

2. DNR RTE Letter

3. Soil Information

4. REPI Easement

FOREST STAND DELINEATION (FSD)

FOREST STAND DELINEATION REPORT

QUIET WATERS PARK / RETREAT
1706 QUIET WATES LANE
ANNAPOLIS MD 21403

PREPARED FOR:

BY: WBCM
Whitney Bailey Cox & Magnani LLC
300 East Joppa Road Suite 200
Baltimore MD 21286
July 2022

FOREST STAND DELINEATION REPORT
QUIET WATERS RETREAT @ QUIET WATERS PARK
1706 QUIET WATERS QUIET WATERS LANE
ANNAPOILIS MD 21403

INTRODUCTION

This report provides a description of streams, wetlands and forest identified by WBCM at 1706 Quiet Waters Lane. Being the subject property identified in Anne Arundel County tax records as parcel account numbers 90058831, 900598889-90059891,90083702-90083706, Map:56, Grid:12 &18 Parcel 87. This property is bounded in the North and West by the existing Anne Arundel County owned Quiet Waters Park. To the South by the South River and to the East by Hillsmere Estates, an existing residential neighborhood on ¼ acre lots.

There were no regulated wetlands or water resources found to be present on the subject property. The entire site drains into the South River watershed. Additionally, there are no know rare, threatened, or endangered species and no known cultural or historical artifacts on the property as per Maryland department of Natural Resources Merlin and the Maryland Historical Trusts Cultural Resources Information Systems (MEDUSA). DNR does however state that remote analysis suggests that the forested area on this property contains Forest Interior Dwelling Bird habitat. Populations of many bird species which depend on this type of forested habitat are declining in Maryland and throughout the eastern United States. The conservation of this habitat is mandated within the Chesapeake Bay Critical Area and must be addressed by the project plan.

SITE PHYSIOGRAHPY

Information pertaining to the geology of the site was obtained from the Maryland Geological Survey's Geologic Map of Maryland. The property is located on the Atlantic Coastal Plain physiographic Province.
It is underlain by a wedge of unconsolidated sediments including gravel, sand silt and clay which overlaps the rocks of the eastern Piedmont along the Fall Line Zone. Mineral resources of the Coastal Plain are chiefly sand and gravel and used in the construction industry.
The property is located approximately 48 feet above the mean sea level, with elevations ranging from sea level at the southern end of the property to 48 feet above sea level at the north-western corner of the site. This waterfront property sits directly on the South River with a 30-40 food cliff facing due south. The entire site falls within the South River watershed. Inspection of the Federal Emergency Management Agency's (FEMA) Flood insurance Rate Map for this location (Map Panel No. ?????????????) determined there are no mapped FEMA 100-year floodplain areas on this property.

FOREST STAND DELINEATION

METHODOLOGY

This Forest Stand Delineation was performed with the criteria and guidelines outlined in the State Forest Conservation Manual. All field work was performed by a qualified professional with WBCM of Baltimore MD 21286. A random sampling method was employed on this 19-acre site with two major forest stands.

A fixed radius plot was employed for all stands and a ten-factor prism was used to determine basal areas. Four 1/20-acre sample plot locations were chosen, and data recorded in the attached Point Sampling Data Sheets.

RECORDED SOILS

According to the USDA Web Soil Survey (2014), four soil series fall within the Quiet Waters study area. The soil series table below gives a description of each soil unit present within the study area. The accompanying Critical Area Buffer Plan and Forest Stand Delineation Plan depicts the location of the soil units mapped at the site. Soils present on the site are mapped as (AsB) Annapolis Fine Sandy Loam 2-5% slopes, (CxC) Cumberstone-Mattapex complex 5-10% slopes, (MZA) Mispillion Transquaking soils 0-1% slopes and (SME) Sassafras and Croom Soils 15-25% slopes.

Quiet Waters Park, Soils Series		
Soil Series Map Unit- Anne Arundel County Maryland		
Map Unit Symbol	**Map Unit Name**	**Rating**
AsB	Annapolis Fine Sandy Loam, 2-5% slopes	Well Drained, HSG:C, K=.24
CxC	Cumberstone- Mattapex complex, 5-10% slopes	Somewhat poorly drained, HSG: D, K=.37
MZA	Mispillion and Transquaking Soils, 0-1% slopes, Tidal Flooding	Very poorly drained, HSG:A/D
SME	Sassafras & Croom Soils, 15-20% slopes	Well Drained, HSG:C, K=.15

Quiet Waters Park Specimen Trees

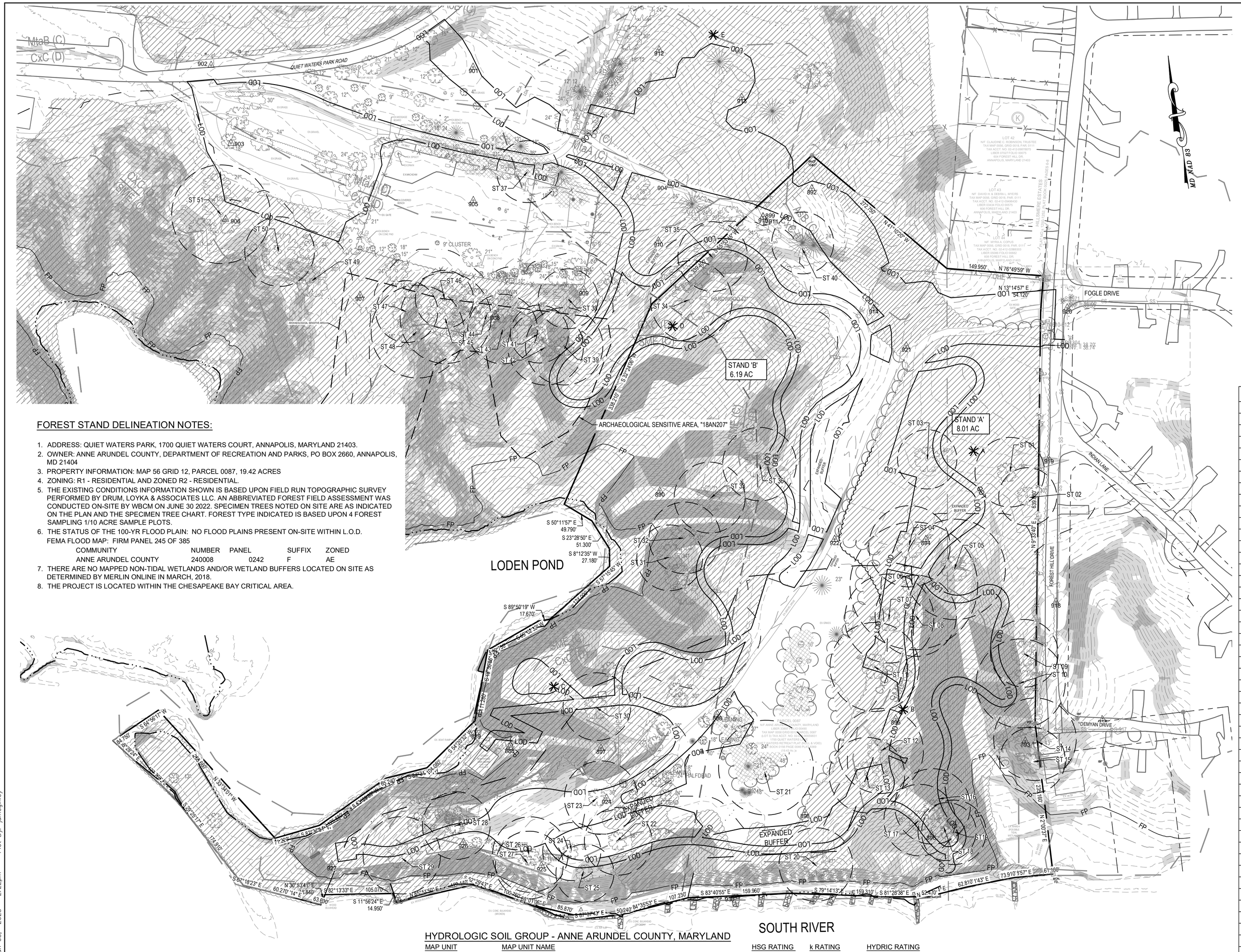
FOREST STAND A: East Side
North Atlantic Coastal Plain Mixed Oak Hardwood Forest

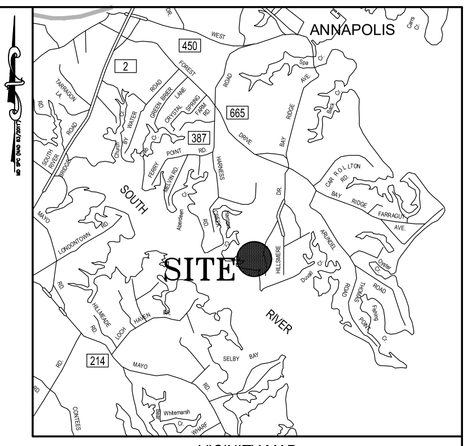
Priority 1 ranking
This Stand being approximately 8.0 Acres and is located in the eastern most portion of the site along the existing Forest Hill Drive. This mid successional mature mixed oak forest has a basal area of 85 sq. ft./acre and a dominant class size of 30" diameter at breast height (DBH). The dominant canopy species is Tulip Poplar (Liriodendron tulipifera) with two co-dominant species being Red Oak (Quercus falcata) and Chestnut Oak (Quercus montana) present in this stand with approximately 85 trees per acre. The average canopy cover is 80-90 percent. The understory canopy is dominated with a mix of PawPaw (Asimina triloba), American Holly (Ilex Opaca), Flowering Dogwood (Cornus florida) and Eastern Redbud (Cercis canadensis). The average understory coverage is 25 percent. The Herbaceous layer is dominated by Barberry (Berberis spp), Mountain Laurel (Kalmia spp), Snakeroot (Cimicifuga americana), Wisteria (Wisteria spp). There are many significant trees present in this stand, many over 50" DBH. The overall health of this stand is very good. Just to the north of the sample plot at the northern property line exists a stand of invasive bamboo approximately .35 Acres (Phylloostachys) which is spreading west into the forest and open spaces. There is a significant amount of steep slopes (25 percent or more) in the center of this stand which fall to sea level elevations. The southern-most portion of the stand faces the South River and is at the top of a 30'-40' cliff with significant erosion issues.

FOREST STAND B: West Side
North Atlantic Coastal Plain Mixed Oak Hardwood Forest

Priority 1 ranking
This stand is comprised of approximately 6.2 acres of mid successional, mature mixed hardwood, located along the western portion of the study site west of the existing driveway entrance and east of the shoreline at Loden Pond. This stands dominate canopy species is Chestnut Oak (Quercus Montana) and Tulip Poplar (Liriodendron tulipifera) with approximately 90 trees per acre. Other commonly occurring woody species include Sweetgum (liquidambar styraciflua), Red Maple (Acer rubra), American Holly (Ilex opaca) and Flowering Dogwood (Cornus florida). Stand B is characterized by sample plots C, D & E on the FSD plan. Stand B has a basal area of 90. The Dominant size class of this stand is greater than 30" diameter at breast height (DBH). The average canopy closure is 85 percent. The understory canopy is dominated by Pawpaw (Asimina triloba), Dogwood (Cornus florida) and American Holly (Ilex opaca). The average understory cover is 50 percent. The Herbaceous layer is dominated by Barberry (Berberis spp), Wineberry (Rubus phenicolasius) with a cover of 35 percent. Invasive species in this stand include Wisteria (Wisteria floribunda), Barberry (Berberis thunbergia), Wineberry (Rubus phoenicolasius), and English Ivy (Hedra helix).

Overall, Forest Stands A & B are assigned a priority 1 ranking. They both have good overall forest structure, contain several Specimen Trees and sensitive steep slopes.





VICINITY MAP
SCALE: 1" = 8,333'

LEGEND

- BITUMINOUS PAVEMENT
- CONCRETE PAVEMENT
- ELEVATION CONTOUR
- CHAIN LINK FENCE
- PROPERTY LINE
- INDIVIDUAL TREES (NON-SPECIMEN)
- SPECIMEN TREE CRITICAL ROOT ZONE
- SPECIMEN TREE WITH CRITICAL ROOT ZONE, >30" DBH
- FOREST
- PROPOSED LIMIT OF DISTURBANCE / NET TRACT AREA
- FOREST FIELD SURVEY LIMITS
- MAPPED SOIL UNIT / HYDROLOGIC SOIL GROUP RATING
- STEEP SLOPES (15% TO 25%)
- STEEP SLOPES (25% OR GREATER)
- EXISTING FOREST ON PROPERTY / NET TRACT AREA
- EXISTING TREE GROUPING (NO FOREST)
- FOREST STAND DELINEATION PLOT LOCATION

FOREST STAND DELINEATION NOTES:

1. ADDRESS: QUIET WATERS PARK, 1700 QUIET WATERS COURT, ANNAPOLIS, MARYLAND 21403.
2. OWNER: ANNE ARUNDEL COUNTY, DEPARTMENT OF RECREATION AND PARKS, PO BOX 2660, ANNAPOLIS, MD 21404
3. PROPERTY INFORMATION: MAP 56 GRID 12, PARCEL 0087, 19.42 ACRES
4. ZONING: R1 - RESIDENTIAL AND ZONED R2 - RESIDENTIAL.
5. THE EXISTING CONDITIONS INFORMATION SHOWN IS BASED UPON FIELD RUN TOPOGRAPHIC SURVEY PERFORMED BY DRUM, LOYKA & ASSOCIATES LLC. AN ABBREVIATED FOREST FIELD ASSESSMENT WAS CONDUCTED ON-SITE BY WBCM ON JUNE 30 2022. SPECIMEN TREES NOTED ON SITE ARE AS INDICATED ON THE PLAN AND THE SPECIMEN TREE CHART. FOREST TYPE INDICATED IS BASED UPON 4 FOREST SAMPLING 1/10 ACRE SAMPLE PLOTS.
6. THE STATUS OF THE 100-YR FLOOD PLAIN: NO FLOOD PLAINS PRESENT ON-SITE WITHIN L.O.D.
   FEMA FLOOD MAP: FIRM PANEL 245 OF 385

COMMUNITY	NUMBER	PANEL	SUFFIX	ZONED
ANNE ARUNDEL COUNTY	240008	0242	F	AE

7. THERE ARE NO MAPPED NON-TIDAL WETLANDS AND/OR WETLAND BUFFERS LOCATED ON SITE AS DETERMINED BY MERLIN ONLINE IN MARCH, 2018.
8. THE PROJECT IS LOCATED WITHIN THE CHESAPEAKE BAY CRITICAL AREA.

SPECIMAN TREE CHART

TREE NO.	SPECIES	DBH (in.)	CONDITION
ST #1	Quercus prinus / Chestnut Oak	36	Good
ST #2	Quercus prinus / Chestnut Oak	30	Good
ST #3	Quercus falcata / Southern Red Oak	46	Good
ST #4	Quercus prinus / Chestnut Oak	42	Good
ST #5	Liriodendron tulipifera / Tulip Poplar	52	Good
ST #6	Liriodendron tulipifera / Tulip Poplar	66	Good
ST #7	Liriodendron tulipifera / Tulip Poplar	46	Good
ST #8	Liriodendron tulipifera / Tulip Poplar	42	Good
ST #9	Quercus alba / White Oak	35	Good
ST #10	Quercus alba / White Oak	42	Good
ST #11	Liriodendron tulipifera / Tulip Poplar	46	Good
ST #12	Liriodendron tulipifera / Tulip Poplar	44	Fair
ST #13	Liriodendron tulipifera / Tulip Poplar	39	Good
ST #14	Liriodendron tulipifera / Tulip Poplar	43	Good
ST #15	Quercus alba / White Oak	34	Good
ST #16	Quercus prinus / Chestnut Oak	39	Good
ST #17	Quercus prinus / Chestnut Oak	37	Good
ST #18	Quercus prinus / Chestnut Oak	30	Good
ST #19	Quercus alba / White Oak	33	Good
ST #20	Quercus prinus / Chestnut Oak	38	Good
ST #21	Acer pensylvanicum / Striped Maple	49"	Good
ST #22	Quercus alba / White Oak	35	Good
ST #23	Quercus alba / White Oak	38	Good
ST #24	Quercus prinus / Chestnut Oak	30	Poor
ST #25	Quercus falcata / Southern Red Oak	35	Good
ST #26	Quercus prinus / Chestnut Oak	37	Poor
ST #27	Quercus prinus / Chestnut Oak	36	Poor
ST #28	Quercus prinus / Chestnut Oak	31	Good
ST #29	Quercus prinus / Chestnut Oak	40	Fair
ST #30	Quercus alba / White Oak	35	Good
ST #31	Liriodendron tulipifera / Tulip Poplar	34	Good
ST #32	Liriodendron tulipifera / Tulip Poplar	37	Good
ST #33	Liriodendron tulipifera / Tulip Poplar	37	Good
ST #34	Liriodendron tulipifera / Tulip Poplar	42	Poor
ST #35	Liriodendron tulipifera / Tulip Poplar	36	Good
ST #36	Liriodendron tulipifera / Tulip Poplar	38	Good
ST #37	Acer rubrum / Red Maple	32	Good
ST #38	Liriodendron tulipifera / Tulip Poplar	31	Fair, Scar
ST #39	Liriodendron tulipifera / Tulip Poplar	40	Poor, damage
ST #40	Acer saccharum / Sugar Maple	32	Fair, stressed
ST #41	Liriodendron tulipifera / Tulip Poplar	30	Fair
ST #42	Liriodendron tulipifera / Tulip Poplar	39	Fair
ST #43	Liriodendron tulipifera / Tulip Poplar	36	Good
ST #44	Liriodendron tulipifera / Tulip Poplar	32	Good
ST #45	Liriodendron tulipifera / Tulip Poplar	47	Fair, damage
ST #46	Liriodendron tulipifera / Tulip Poplar	30	Good
ST #47	Liriodendron tulipifera / Tulip Poplar	32	Good
ST #48	Quercus alba / White Oak	36	Good
ST #49	Quercus alba / White Oak	35	Dead
ST #50	Quercus alba / White Oak	36	Good
ST #51	Liriodendron tulipifera / Tulip Poplar	51	Poor, Hollow base

HYDROLOGIC SOIL GROUP - ANNE ARUNDEL COUNTY, MARYLAND

MAP UNIT SYMBOL	MAP UNIT NAME	HSG RATING	k RATING	HYDRIC RATING
AsB	ANNAPOLIS FINE SANDY LOAM, 2 TO 5 PERCENT SLOPES	C	.24	WELL DRAINED
CxC	CUMBERSTONE-MATTAPEX COMPLEX, 5 TO 10 PERCENT SLOPES	D	.37	SOMEWHAT POORLY DRAINED
MZA	MISPILLION AND TRANSQUAKING SOILS, 0 TO 1 PERCENT SLOPES, TIDAL FLOODING	A/D	-	VERY POORLY DRAINED
SME	SASSAFRAS AND CROOM SOILS, 15 TO 25 PERCENT SLOPES	C	.15	WELL DRAINED

GEOLOGY: LOWLAND DEPOSITS

GRAVEL, SAND, SILT, AND CLAY. MEDIUM-TO COARSE-GRAINED SAND AND GRAVEL; COBBLES AND BOULDERS NEAR BASE; COMMONLY CONTAINS REWORKED EOCENE GLAUCONITE; VARICOLORED SILTS AND CLAYS; BROWN TO DARK GRAY LIGNITIC SILTY CLAY; CONTAINS ESTUARINE TO MARINE FAUNA IN SOME AREAS (INCLUDES IN PART PAMLICO, TALBOT, WICOMICO AND SUNDERLAND FORMATIONS) THICKNESS 0-150 FEET.

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A QUALIFIED PROFESSIONAL UNDER THE LAWS OF THE STATE OF MARYLAND.

SIGNATURE: _____

DATE: _____

CAUTION:
IF THIS DRAWING IS A REDUCTION, USE THE GRAPHIC SCALES.

80 0 40 80 160
1"=80'-0"

WHITNEY BAILEY COX & MAGNANI, LLC
300 East Joppa Road Suite 200
Baltimore, MD 21286
410.512.4500 www.wbcm.com

WBCM
Designing Infrastructure for Tomorrow ®

ARCHITECT
Ziger Snead Architects
1006 Morton Road
Baltimore, MD 21201
410.576.9131

STRUCTURAL ENGINEER
1200 AE
210 North Lee Street
Suite 210
Alexandria, VA 22314
703.350.4151

LANDSCAPE ARCHITECT
Campion Hruby Landscape Architects
111 Cathedral Street
Suite 100
Annapolis, MD 21401
410.280.8850

MECHANICAL ENGINEER
James Posey Associates
11155 Red Run Boulevard
Suite 310
Baltimore, MD 21117
410.265.6100

I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License # 34682 Expiration Date: 07/08/23

REVISIONS			
NO.	DESCRIPTION	BY	DATE

ANNE ARUNDEL COUNTY
DEPARTMENT OF PUBLIC WORKS

APPROVED DATE — CHIEF ENGINEER	APPROVED DATE — PROJECT MANAGER	SCALE:	QUIET WATERS RETREAT
		DRAWN BY: M.L.H.	
		CHECKED BY: R.W.H.	FOREST STAND DELINEATION
APPROVED DATE — ASSISTANT CHIEF ENGINEER	APPROVED DATE — CHIEF, RIGHT-OF-WAY	SHEET NO. - OF -	C701
		PROJECT NO.: P584600	
		CONTRACT NO.: P584607	

P:\2022\22053400\Drawings\07-Site\22053400-C701-FSD Plan.dwg Jun 03, 2025 - 2:22pm Plot By: jdmcginley

DNR RTE LETTER

June 6, 2022

«AddressBlock»

RE: Environmental Review for Quiet Waters Park Earl Conservation Center, WBCM Project No.: 210783.00, Anne Arundel County, Maryland.

Dear Mr. Hughes:

The Wildlife and Heritage Service has determined that there are no official State or Federal records for listed plant or animal species within the delineated area shown on the map provided. We would like to point out, however, that our remote analysis suggests that the forested area on this property contains Forest Interior Dwelling Bird habitat. Populations of many bird species which depend on this type of forested habitat are declining in Maryland and throughout the eastern United States. The conservation of this habitat is mandated within the Chesapeake Bay Critical Area and must be addressed by the project plan. Specifically, if FIDS habitat is present, the following guidelines should be incorporated into the project plan (as applicable):

1. Restrict development to nonforested areas.
2. If forest loss or disturbance is unavoidable, concentrate or restrict development to the following areas:
   a. the perimeter of the forest (i.e., within 300 feet of existing forest edge)
   b. thin strips of upland forest less than 300 feet wide
   c. small, isolated forests less than 50 acres in size
   d. portions of the forest with low quality FIDS habitat, (i.e., areas that are already heavily fragmented, relatively young, exhibit low structural diversity, etc.)
3. Maximize the amount if forest "interior" (forest area >300 feet from the forest edge) within each forest tract (i.e., minimize the forest edge:area ratio). Circular forest tracts are ideal and square tracts are better than rectangular or long, linear forests.
4. Minimize forest isolation. Generally, forests that are adjacent, close to, or connected to other forests provide higher quality FIDS habitat than more isolated forests.
5. Limit forest removal to the "footprint" of houses and to that which is necessary for the placement of roads and driveways.
6. Minimize the number and length of driveways and roads.
7. Roads and driveways should be as narrow and as short as possible; preferably less than 25 and 15 feet, respectively
8. Maintain forest canopy closure over roads and driveways.
9. Maintain forest habitat up to the edges of roads and driveways; do not create or maintain mowed grassy berms.

10. Maintain or create wildlife corridors.

11. Do not remove or disturb forest habitat during April-August, the breeding season for most FIDS. This seasonal restriction may be expanded to February-August if certain early nesting FIDS (e.g., Barred Owl) are present.
12. Landscape homes with native trees, shrubs and other plants and/or encourage homeowners to do so.
13. Encourage homeowners to keep pet cats indoors or, if taken outside, kept on a leash or inside a fenced area.
14. In forested areas reserved from development, promote the development of a diverse forest understory by removing livestock from forested areas and controlling white-tailed deer populations. Do not mow the forest understory or remove woody debris and snags.
15. Afforestation efforts should target a) riparian or streamside areas that lack woody vegetative buffers, b) forested riparian areas less than 300 feet wide, and c) gaps or peninsulas of nonforested habitat within or adjacent to existing FIDS habitat.

The Critical Area Commission's document "A Guide to the Conservation of Forest Interior Dwelling Birds in the Chesapeake Bay Critical Area" provides details on development standards and information about mitigation for projects where impacts to FIDS habitat cannot be totally avoided. Mitigation plantings for impacts to FIDS habitat may be required under the local government's Critical Area Program. The amount of mitigation required is generally based in whether the guidelines listed above are followed.

Also, we would like to point out that the open waters that are adjacent to or part of the site are known historic waterfowl concentration areas. If there is to be any construction of water-dependent facilities please contact Josh Homyack of the Wildlife and Heritage Service at (410) 827-8612 x100 or josh.homyack@maryland.gov for further technical assistance regarding waterfowl.

Please be sure to let us know if the limits of proposed disturbance or overall site boundaries change and we will provide you with an updated evaluation. Thank you for allowing us the opportunity to review this project. If you should have any further questions regarding this information, please contact me at lori.byrne@maryland.gov or at (410) 260-8573.

Sincerely,

Lori A. Byrne

Lori A. Byrne,
Environmental Review Coordinator
Wildlife and Heritage Service
MD Dept. of Natural Resources

ER# 2022.0647.aa
Cc: J. Homyack, DNR
C. Jones, CAC

SOIL INFORMATION

GEOTECHNICAL ENGINEERING REPORT

QUIET WATERS RETREAT
ANNAPOLIS, MARYLAND

Schnabel Reference 22140028.000
December 21, 2022

Schnabel ENGINEERING
T 410.944.6170
300 Red Brook Blvd., Suite 109 / Owings Mills, MD 21117
schnabel-eng.com

December 21, 2022

Mr. Randall Hughes, PLA, AICP, PMP, LEED AP
Whitney, Bailey, Cox, Magnani, LLC
300 E. Joppa Rd., Suite 200
Baltimore, MD 21286

Subject: **Geotechnical Engineering Report, Quiet Waters Retreat, Annapolis, Maryland**
Schnabel Reference 22140028.000

Dear Mr. Hughes:

SCHNABEL ENGINEERING, LLC (Schnabel) is pleased to submit our geotechnical engineering report for this project. This study was performed in accordance with our proposal dated April 8, 2022, as authorized by WBCM on July 28, 2022.

We appreciate the opportunity to be of service for this project. Please call us if you have any questions regarding this report.

Sincerely,

SCHNABEL ENGINEERING, LLC

Sung Ryoo, PhD
Staff Engineer

Steve W. Fung, PE
Sr. Vice President

SWF:jdb

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 028855, Expiration Date: 06/27/2024

GEOTECHNICAL ENGINEERING REPORT
QUIET WATERS RETREAT
ANNAPOLIS, MARYLAND

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

1.0 SCOPE OF SERVICES

Our proposal dated April 8, 2022 defines the scope of services for this project. The objective of this study is to evaluate the subsurface conditions at the site and provide geotechnical engineering recommendations for the proposed construction regarding the design of shallow building foundations, a site retaining wall, a pedestrian bridge, pavements, site grading and stormwater management structures for the proposed site development. This study was conducted under the supervision of a Professional Engineer registered in the State of Maryland.

2.0 DESCRIPTION OF SITE AND PROPOSED CONSTRUCTION

The project site is approximately 26 acres and is located in a grassed and forested trail area, inside Quiet Waters Park in Annapolis, Maryland. The project site is bounded by the existing road of Forest Hill Drive to the east, Quiet Waters Park Rd and forested area on the north, a forested area as well as Loden Pond to the west, and the South River to the south. A dog park with a parking lot is located at the northern portion of the site. Several abandoned cabin and shed like structures and a site retaining wall is located at the southern portion of the site besides Loden Pond and the South River. A trail traverses through the site.

The site generally slopes from a high point of about EL 53 ft at the north end of the site, down to the west and south water's edge of the pond and river at about EL 0 ft. There is a steep slope (buff) at the water's edge. Figure 1 contains the site vicinity map of the project site.

Based on the Master Plan provided to us, the proposed facility will consist of a maintenance shed, a park restroom, an education pavilion, a boat house, retaining walls, a pedestrian bridge, an access road, and two parking lots. An existing parking lot will be updated to provide more parking spaces. New stormwater management structures are planned among the site to provide additional treatment volume for the proposed facilities. The proposed facilities are connected through the proposed Conservancy Drive roadway and trails. Two new parking lots are proposed with a total of 56 spaces and four handicap spaces. The existing parking lot next to Quiet Waters Dog Park is updated with a total of 64 parking spaces and two handicap spaces. The proposed structures are scattered throughout the north and south portion of the project site. The maintenance shed will a footprint of about 30 ft by 40 ft, the park restroom a 20 ft by 55 ft footprint, the boat house a 28 ft by 40 ft footprint, and the education pavilion a 20 ft by 40 ft footprint. We understand that all the structures will be one story high and assumed that they are lightly loaded, with maximum column loads of 20 kips and maximum wall loads of 3 kip/ft. We understand that the site retaining wall along the path will have a wall height of up to 5 ft.

Based on the Project Grading Plan dated September 2022, minor cuts are planned with the deepest cut of about 6-ft planned at the intersection between Quiet Waters Park Rd and the proposed Conservancy. Minor fills of less than 3-ft are planned.

Site and project information was obtained from the project plans provided by WBCM.

3.0 SUBSURFACE EXPLORATION PROGRAM

We performed a subsurface exploration and field testing program to identify the subsurface stratigraphy underlying the site and to evaluate the geotechnical properties of the materials encountered. This program included test borings. Exploration methods used are discussed below. The appendices to this report contain the results of our exploration.

3.1 Subsurface Exploration and Field Testing

3.1.1 Test Borings

Our subcontractor, Connelly and Associates, drilled 18 test borings under our observation on December 1 and December 2, 2022. The Standard Penetration Test (SPT) was performed at selected depths in the BP (five), BS (five), and RW (two) borings and Continuous SPT was performed in the SWM (six) borings. Appendix A includes specific observations, remarks, and logs for the borings; classification criteria; drilling methods; and sampling protocols. Figure 2, included at the end of this report, indicates the approximate test boring locations. We will retain soil samples up to 45 days beyond the issuance of this report, unless you request other disposition.

The SPT samples were obtained using a hydraulically driven automatic trip hammer (ATH). Most correlations with SPT data are based on N-values collected with a safety hammer. The energy applied to the split-spoon sampler using the ATH is about 33 percent greater than that applied using the safety hammer, resulting in lower N-values. The hammer blows shown on the boring logs are uncorrected for the higher energy. However, we correct SPT N-values for the higher energy when using N-values in our analyses.

4.0 LABORATORY TESTING

Selected tests were performed by our subcontractor, Jay Kay Testing, Inc. The testing aided in the classification of materials encountered in the subsurface exploration and provided data for use in the development of recommendations for design of foundations, earthwork, retaining walls, and pavements. Moisture contents and index test results are shown on the boring logs in Appendix A. The remainder of the test results is included in Appendix B.

4.1 Soils Testing

4.1.1 Index Testing

A series of index testing was performed on samples collected as part of the exploration to provide soil classifications and to provide parameters for use with published correlations with soil properties. Index testing included performing natural moisture content, Atterberg Limit, and gradation tests on two bulk samples, and 18 split spoon samples of soil representing Strata A, C and D.

4.1.2 Infiltration Testing

In addition to the SPTs performed in the test borings, we performed six infiltration tests adjacent to test borings SWM-1, SWM-2, SWM-3, SWM-4, SWM-5, and SWM-6 on December 6, 2022, to further establish the hydraulic properties of the materials encountered at the site. Infiltration tests were performed in general accordance with the guidelines contained in the 2000 MDE Maryland Stormwater Design Manual Appendix D.1 (revised 2009). The test results are included in Appendix C and are summarized in *Section 5.4 – Stormwater Management Structures* of this report.

4.1.3 Compaction and CBR Testing

Modified Proctor compaction and CBR testing was performed on a soil sample representing Stratum D to evaluate compaction characteristics and to provide soil parameters for pavement design. The test results are included in Appendix B.

4.1.4 Corrosivity Testing

We performed tests for pH, sulfides, redox potential, and resistivity testing on BS-3 samples of S-1 and S-2 representing Stratum D. The test results are presented in Appendix C and are summarized in Section 6.0.

5.0 SITE GEOLOGY AND SUBSURFACE CONDITIONS

5.1 Site Geology

During our exploration, we encountered the following stratigraphy: Fill, Alluvium, Talbot Formation, and Aquia Formation. Based on the geologic map titled "Geologic Map of Anne Arundel County" by John D. Glaser (1976), the site is located in the Atlantic Coastal Plain Physiographic Province of Maryland. The Atlantic Coastal Plain deposits in this area consists of Tertiary-age Aquia Formation, Quaternary-age Talbot Formation closer to the river and pond, and recent Alluvium deposits from South River. The geologic map describes Aquia Formation as "*Glauconitic sand, clean to moderately clayey, and calcareous sandstone Well-sorted, medium-grained sand dominant but fine or coarse-grained in places*". The geologic map describes Talbot Formation as "*Interbedded sand, silt, and clay; lower portion contains pebbly sand or gravel in places. Sand in the Talbot Formation is generally clayey or silty, poorly-sorted, and commonly contains glauconite in areas south of the Severn River*." Some of the above stratum has been removed during previous site development and replaced with fill, or fills were placed in low lying areas for site grading. A capture of the section of the map showing the project site is presented in Figure 3. Figure 3 also contains descriptions of the geologic formations at the approximate site location.

5.2 Generalized Subsurface Stratigraphy

We characterized the following generalized subsurface stratigraphy based on the exploration and laboratory test data included in the appendices.

- Ground Cover
- Stratum A: Existing Fill
- Stratum B: Alluvium (not encountered, but expected at the South river shoreline)
- Stratum C: Talbot Formation
- Stratum D: Aquia Formation

5.2.1 Ground Cover

The borings were drilled in grass areas encountered about 2 to 7 inches of topsoil. The topsoil depths were estimated at the boring locations based on visual identification procedures and may vary at other locations.

5.2.2 Stratum A: Existing Fill

Existing fill soils were encountered in all the test borings below the ground cover in four test borings to depths of 0.5 to 2 feet below the ground surface. The existing fill soils were visually classified as poorly graded sand with various amounts of sand, gravel and asphalt. The fill soils had loose compactness with an average standard penetration test (N) value of 7 blows per foot (bpf).

A soil sample tested within this stratum had the following properties:

- Moisture Content = 22.1%

5.2.3 Stratum B: Alluvium

Alluvial soils (designated Stratum B) was not encountered at the test boring locations, but is expected to be encountered near the shoreline of the site.

5.2.4 Stratum C: Talbot Formation

Talbot Formation (designated Stratum C) was encountered in test boring BS-5, at the lower grades of the site to a depth of 8 ft below the ground surface. The Talbot Formation deposit consisted of Silty Sand (SM). The N-values for the formation soils ranged from 5 to 11 bpf, indicating loose to medium dense compactness.

A soil sample tested within this stratum had the following property:

- Moisture Content = 15.4%

5.2.5 Stratum D: Aquia Formation

Aquia Formation (designated Stratum D) were encountered in 15 borings, to depths of 10 to 30 ft below the ground surface. The Aquia Formation deposits consisted of Clayey Sand (SC), Sandy Lean Clay (CL), Lean Clay with Sand (CL), Poorly Graded Sand (SP), Poorly Graded Sand with Clay (SP-SC), Silty Sand (SM), and Sandy Silt (ML). The N-values for the fine-grained sample ranged from 3 to 19 bpf, indicating soft to very stiff consistencies. The coarse-grained samples ranged from 3 to 55 bpf, indicating very loose to dense compactness.

The soil samples tested within this stratum have the following properties:

- Liquid Limit = 32 to 49
- Plasticity Index = 12 to 29
- Moisture Content = 13.5 to 26.7%
- Percent passing #200 sieve = 32.7 to 69.2%
- Maximum Dry Density = 123.3 to 125.3 pcf
- Optimum Moisture Content = 10.8 to 11.0%
- California Bearing Ratio = 4 to 13.8%
- Swell Potential = 2.65 to 4.61%

Tests were performed on one sample representing Stratum D soils to evaluate corrosivity. Table 1 presents the summary of the test results.

Table 1: Stratum B Corrosion Potential Series Test Results

Boring ID	Sample Depth (ft)	pH	Oxidation Reduction Potential (mV)	Resistivity (ohm-cm)	Sulfides (presence)	Sulfate (ppm)	Chloride (ppm)
BS-3	0 - 4	4.18	395	1,220	Negative	0.0005	13

The results of the corrosion series testing were used to evaluate the corrosion potential of soils at the site for metallic pipes per the American Water Works Association (AWWA) Specification C105 and the Federal Highway Administration (FHWA) GEC 012 Standards. Based on these test results, the soils of Stratum D are considered to be Potentially Corrosive to metallic structures in accordance with AWWA standards and Aggressive in accordance with FHWA standards.

We evaluated the soil potential of sulfate attack on concrete using the American Concrete Institute (ACI) Standards. Based on the laboratory test results, the soils at the site have low degree of corrosivity for sulfate attack on concrete. The results of the corrosion series testing are included in Appendix B.

5.3 Groundwater

The groundwater levels on the logs indicate our estimate of the hydrostatic water table at the time of our subsurface exploration. The final design should anticipate the fluctuation of the hydrostatic water table depending on variations in precipitation, surface runoff, pumping, evaporation, leaking utilities, and similar factors. Groundwater was encountered in two borings: BS-4 and BS-5. We recorded groundwater at BS-4 at a depth of 28.8 ft below the existing ground surface (about EL -3.0 ft), and BS-5 at a depth of 5 ft below the existing ground surface (about EL 3.0 ft). These borings were closest to Loden Pond, where the proposed boat house will be constructed.

5.4 Seismic Site Classification

We evaluated the Seismic Site Class and Seismic Site Coefficients in accordance with IBC 2018 for use in building design based on an extrapolation of data collected in the subsurface exploration. Our analysis indicates Site Class D for this location. This Site Class was evaluated based on corrected SPT values and extrapolated to a depth of 100 ft in accordance with site classification definitions of ASCE 7-16. The seismic design parameters that are calculated based on the recommended site class and project location are summarized in Table 2.

Table 2: Seismic Design Parameters

Period	Mapped Acceleration Parameters	Site Coefficient	Adjusted Maximum Spectral Response Acceleration Parameters	Design Spectral Response Acceleration Parameters	Seismic Design Category	
					Risk Categories I to III	Risk Category IV
Short	S_s = 0.126 g	F_a = 1.6 g	S_{ms} = 0.202 g	S_{ds} = 0.135 g	A	A
1 Second	S_1 = 0.042 g	F_v = 2.4 g	S_{m1} = 0.1 g	S_{d1} = 0.067 g		

We assume that the risk category for the structures to be I to III, corresponding to Seismic Design Category A. Thus, the potential for soil liquefaction to occur during a seismic event has not been evaluated in accordance with ASCE 7-16.

6.0 SITE GRADING AND EARTHWORK

The site work will require cuts of up to about 6-ft and fills of up to about 3-ft. The greatest amount of cut is planned in the north side of the site, along the peak of the hill adjacent to the intersection between Quiet Waters Park Rd and Conservancy Drive. The paved path leading to the maintenance shed will have fills of up to 3 ft. Recommendations for compacted fill subgrade preparation, fill soil requirements, placement and compaction criteria, are presented in subsequent sections.

6.1 Compacted Fill Subgrades

Subgrades to receive compacted structural fill should be stripped of vegetation, topsoil, and organic matter. Schnabel's subsurface exploration indicated topsoil to depths of up to about 7 inches below the ground surface. However, stripping of wooded or previously cultivated sites typically results in some disturbance and contamination of near-surface soils, particularly during periods of wet weather. An average topsoil stripping depth of 5 inches be considered for the site during the project planning.

The Geotechnical Engineer should evaluate the suitability of the subgrades. The stripped subgrades should be proofrolled with a loaded dump truck to evaluate the subgrade suitability for support of the fill, pads, or gravel roadway prior to any undercutting or initiation of fill, pad, or aggregate placement. Very loose to loose, and soft to medium stiff soils were encountered at shallow depths beneath the topsoil in about 80-percent of the test boring locations. These soils may exhibit excessive pumping, weaving and rutting under the proof-roll test. Areas that exhibit excessive pumping, weaving, or rutting should be scarified, dried and recompacted, or undercut and replaced with compacted structural fill as recommended by the Geotechnical Engineer. Subgrade evaluation techniques complementary to proofrolling could include a combination of probing with a penetrometer, drilling hand augers, or observing test pits.

When removal of unsuitable materials is required, the excavation should be performed in a manner to limit disturbance of the underlying suitable material. To evaluate required excavation depths, the excavation should be performed under the observation of the Geotechnical Engineer.

If stripping and earthwork operations are performed during an extended period of warm, dry weather, the non-organic portions of the materials excavated for site grading or shallow foundations may be reused as compacted structural fill. The use of these materials as compacted structural fill will depend on the soil moisture content, and the Contractor's ability during stripping and undercutting to limit contamination of these materials with organic matter.

Compacted structural fill subgrades should be kept free of ponded water. If water is present at the compacted structural fill subgrade level, the Contractor should direct water to discharge beyond the fill limits. Compacted structural fill subgrades should be free of snow, ice, and frozen soils. If snow, ice, or frozen soils are present at subgrade levels, these materials should be removed as recommended by the Geotechnical Engineer.

Compacted structural fill subgrades should not be steeper than about 4H:1V. If steeper slopes are present, subgrades should be benched to permit placement of horizontal lifts of fill.

6.2 Compacted Fill

Compacted structural fill and backfill should consist of low plasticity and non-organic on-site soils. The majority of the onsite soils are expected to meet this criteria. If off-site borrow materials are needed, these soils should classify as SC, SM, SP, SW, GC, GM, GP, or GW according to ASTM D2487. Fill materials should not contain particles larger than 3 inches. In addition, off-site borrow fill materials should exhibit Liquid Limit and Plasticity Index values of less than 40 and 15, respectively.

Compacted structural fill should be placed in maximum 8-inch thick horizontal, loose lifts. Fills placed in the pavement areas should be compacted to at least 95 percent of the maximum dry density per AASHTO T 180 (Modified Proctor). Fills placed in non-roadway areas should be compacted to at least 90 percent of the maximum dry density per AASHTO T 180 (Modified Proctor). Soil moisture contents at the time of compaction should be within ±3 percent of the soil's optimum moisture content. Backfill in excavations, trenches, and other areas that large compaction equipment cannot access should be placed in maximum 6-inch thick lifts. Backfill should meet the material, placement, and compaction requirements outlined above.

Successful re-use of the excavated, on-site soils as compacted structural fill will depend on their natural moisture contents during excavation. Laboratory test results indicate that much of the on-site soils are wet of the optimum moisture content. Scarifying and drying of these soils must be anticipated to achieve the recommended compaction. Drying of these soils will likely result in some delays, and may not be possible during cooler, wetter weather. We recommend that the earthwork be performed during the warmer, drier times of the year.

6.3 Slopes

Based on the site grading plan, minor cut slopes of less than 6-ft and fill slopes of less than 3-ft are planned and no heavy structures are planned at the top of the slopes. The planned cut and fill slopes may be constructed at 2H:1V or flatter.

7.0 FOUNDATION RECOMMENDATIONS

We based our geotechnical engineering analysis on the information developed from our subsurface exploration and soil laboratory testing, along with the project development plans, site plans, and structural loading furnished to our office. We recommend shallow spread footings for support of the proposed lightly loaded structures based on our analysis. The following sections of the report provide our detailed recommendations.

7.1 Spread Footings

We consider shallow foundations suitable for the support of the proposed maintenance shed, park restroom, education pavilion, boat house, retaining walls, pedestrian bridge structures. Suitable natural soils or compacted structural fill are generally considered suitable for support of the shallow foundations. Suitable natural soils are generally expected below the surface topsoil. We recommend footings supported on these materials be designed for a net allowable soil bearing pressure of 2,500 psf. This bearing pressure provides a factor of safety against general bearing capacity failure of at least 3.0. The above allowable soil bearing pressure may be increased by 33 percent for wind and seismic loads when used in conjunction with load combinations defined in IBC Section 1605.3.2, Alternative Basic Load Combinations for use with allowable stress design. This increase is not applicable for other allowable stress load combinations, strength design, or load and resistance factor design.

Considering a maximum foundation column load of 20 kips and maximum wall load of 3 kips/ft, settlements of shallow foundations supported on suitable natural soils and on properly placed compacted structural fill are not expected to exceed about one inch. Differential settlements between similarly loaded footings are not expected to exceed about half this value.

Spread column footings should be at least 24 inches wide, and wall footings at least 14-inches wide for shear considerations. Exterior footings should be founded at least 3 ft below final exterior grades for frost protection and to reduce the risk of excessive foundation settlement. Interior footings should also be founded at least 3 ft below slab grades to reduce the risk of excessive settlement. Where bearing grades between adjacent footings vary, the slope between the bottom edges of adjacent footings should not be steeper than 45 degrees (1H:1V).

If unsuitable soils are encountered at the design bearing grade, these soils should be removed and replaced as recommended by the Geotechnical Engineer. Unsuitable soils should be replaced with compacted fill as described in *Section 6.2. – Compacted Fill*, crushed stone such as MDOT Graded Aggregate Base (GAB), flowable fill, or concrete.

8.0 FLOOR SLAB RECOMMENDATIONS

We assume that the lowest floor grades are planned within 3 ft of existing grades. The test borings drilled near the proposed building structures encountered shallow fill soils of Stratum A and natural soils of Stratum C or D below the fills. These undisturbed and firm on-site soils are considered suitable for floor support. The suitability of the on-site soils for floor slab support should be evaluated by performing a proof-roll test. Areas that fail the proof-roll test should be undercut and replaced with new compacted fills are described in Section 6.0. Additionally, floors may be founded on compacted structural fill. A modulus of subgrade reaction, k, of 75 pci may be used in the design of floor slabs when supported on firm natural soils, firm existing fills, or suitably placed new compacted fill.

The Geotechnical Engineer should observe the floor slab subgrade soils during construction to evaluate the suitability of these soils. If unsuitable soils are encountered at the design slab bearing grade, these soils should be removed and replaced as recommended by the Geotechnical Engineer.

A 6-inch crushed stone or washed gravel capillary moisture barrier should underlie floor slabs on grade. Moisture barrier material should consist of AASHTO No. 57 crushed stone. The Contractor should compact the stone in place with at least two passes of suitable vibratory compaction equipment. The Contractor should compact floor slab subgrades to repair any disturbance that may occur due to construction operations before placing capillary moisture barrier materials.

9.0 RETAINING STRUCTURE RECOMMENDATIONS

Cantilevered site retaining walls should be designed considering equivalent fluid pressures as shown in Table 3 for the respective backfill conditions.

The shape of equivalent fluid pressure is triangular. Where applicable, the design should consider surcharge loads using a rectangular earth pressure distribution. The surcharge pressure ordinate should be obtained by multiplying the surface surcharge pressure, q, by the factor in Table 3 for the respective backfill condition. Horizontal forces on the wall should be resisted by friction acting on the base of the wall. Passive resistance should not be considered in the top 2-ft below the ground surface and for basement walls. Passive earth pressure acting on the front of the wall foundation may be used to resist horizontal forces on site retaining walls. Friction and passive earth pressure factors are also presented in Table 3. A factor of safety of 1.5 should be used when evaluating for sliding resistance, and a factor of safety of 2.0 for overturning resistance.

Table 3: Recommended Design Parameters for Walls

Wall Type	Backfill Materials	Active Equivalent Fluid Pressure Factor (psf)	Surcharge Pressure Factor	Friction Factor	Passive Equivalent Fluid Pressure Factor (psf)
Site Retaining Walls	Structural Fill	44 H	0.37	0.34	325 h
Note: H and h are the heights in ft of the retained soil.					

The above parameters consider a horizontal ground surface behind and in front of the walls. We should be contacted to provide alternative parameters if sloping ground surface conditions are anticipated. Some lateral movements of the walls should be expected.

Earth pressure recommendations provided do not include hydrostatic pressure because subdrainage will be provided behind the site retaining walls. Site wall subdrainage may be provided using weepholes when free-draining backfill is used. Weepholes should be four inches in diameter and installed on 8-ft centers. A filter plug consisting of at least one cubic foot of drainage filter material wrapped in drainage geotextile should be placed at the back of each weephole.

Drainage filter material should consist of AASHTO No. 78 aggregate. Drainage geotextile should consist of a non-woven geotextile such as Mirafi 140N (Geotex 401) or equivalent.

10.0 STORMWATER MANAGEMENT STRUCTURES

Construction of new stormwater structures are planned to provide treatment volume for the proposed facility. The Maryland Department of the Environment (MDE) has set particular standards and specifications for the design and construction of stormwater management devices with infiltration. These regulations include parameters on soil textures, depth of limiting zones, topographic conditions, and other considerations.

10.1 Depth to Limiting Zones

The 2000 MDE Maryland Stormwater Design Manual (revised 2009) recommends that a 2 to 4 ft distance be provided between the bottom of the infiltration system and any limiting zone. Limiting zones are defined as a seasonably high-water table, existing fill soils, or bedrock; limiting zones were not encountered at the test boring locations.

10.2 Infiltration Rates

The 2000 MDE Maryland Stormwater Design Manual requires United States Department of Agriculture (USDA) Soil Textural Classifications for each type of soil at the infiltration device. These classifications are used to correlate the material with typical minimum infiltration rates. Soil samples from all SWM test borings collected at or below the infiltration test depth, was classified based on soil laboratory testing in accordance with the USDA Soil Textural Classification System. The 2000 MDE Maryland Stormwater Design Manual recommends the minimum infiltration rates be assigned to the tested soils as shown in Table 4.

In order to evaluate the infiltration rates from the soil textural classifications, in-situ infiltration tests are required by MDE. Infiltration tests were performed at approximately 5 ft offset borings near test boring locations SWM-1 through SWM-6 at a depth of 6 ft below the ground surface. Infiltration test was conducted in general accordance with the 2000 MDE Stormwater Design Manual guideline. The infiltration test procedures and the test results are included in Appendix C. The summary of the infiltration test results and the 2000 MDE Maryland Stormwater Design Manual recommended minimum infiltration rates are presented in Table 4.

Table 4: Summary of Infiltration Rates

Boring ID	Test Depth / Elevation (ft)	USDA Textural Classification	Field Infiltration Rate (in/hr)	USDA Recommended Infiltration Rate (in/hr)
SWM-1	6 / 35.0	Sandy Clay Loam	0.0	0.17
SWM-2	6 / 41.0	Sandy Clay Loam	0.0	0.17
SWM-3	6 / 31.0	Sandy Clay Loam	1.0	0.17
SWM-4	6 / 23.0	Sandy Clay Loam	1.5	0.17
SWM-5	6 / 33.5	Sandy Clay Loam	0.0	0.17

Boring ID	Test Depth / Elevation (ft)	USDA Textural Classification	Field Infiltration Rate (in/hr)	USDA Recommended Infiltration Rate (in/hr)
SWM-6	6 / 34.0	Sandy Clay Loam	0.0	0.17

It should be noted that the recorded infiltration rate from the field infiltration testing is only an approximation of the in-situ soil permeability at the locations tested, and variations of the actual permeability at the facilities should be expected.

There is a possibility that the soils at the planned SWM facility subgrades may differ from what was encountered in our borings. We recommend that the SWM facility subgrade be observed by a Schnabel Engineering representative during construction to visually confirm its suitability for infiltration. Where the infiltration device bottom/basin is raised or lowered, the subgrade soils should be visually evaluated for suitability for infiltration by a Schnabel representative.

11.0 PAVEMENT RECOMMENDATIONS

We understand that the new parking areas and roads are planned for the site. The Anne Arundel County Design Manual (TOC-III-23) states that a CBR value of 5 is the minimum for the existing subgrade when using the County standards. Our laboratory testing, based on the samples taken near the surface soil within the pavement areas (BP-3 and BP-5), recorded CBR values of 4 and 13.8 with swell indices of 4.6 and 2.7 respectively. Thus, we expect that some of the onsite soils will not be suitable for support of the County standard pavement sections. Subgrade soils with CBR of less than 5 should be scarified and compacted or removed to a minimum depth of 1-ft and replaced with new compacted fills.

We believe that the suitability of the subgrade soils for pavement support may be evaluated by performing a proof-roll test with a loaded dump truck. Final pavement subgrades should be proofrolled under the observation of the Geotechnical Engineer immediately prior to placing subbase or base coarse aggregate to evaluate their suitability to support the pavement. Soft or rutting areas should be stabilized with new compacted fills as described in *Section 6.0. – Site Grading and Earthwork.*

Design traffic loading was not provided to us. To develop our pavement recommendations, we assumed 100 vehicles per day with 1 percent truck traffic in our analysis of the access road. Schnabel should be provided the opportunity to revise these recommendations once the design traffic loading is known.

We assumed a 25-year design life, a reliability of 80 percent, initial and terminal serviceability's of 4.2 and 2.6, respectively, and a standard deviation of 0.49 for the pavement design. The design input values were selected based on the Maryland State Highway Administration (MDOT SHA) Pavement Design Guide (2022) and the AASHTO Guide for Design of Pavement Structures (1993).

Based on our analysis and our observations, we recommend the following pavement sections for the light duty access road pavements:

Table 5: Recommended Pavement Section for Access Road: Light-Duty

Light Duty Pavement Section	Layer Thickness (inch)
HMA Superpave 9.5mm for Surface – PG64-22, Level 2	2
HMA Superpave 19.0mm for Base – PG64-22, Level 2	3
Graded Aggregate Base	6

The asphalt and aggregate materials should conform to Maryland State Highway Administration (MDSHA) Standards.

Adequate control of surface drainage will be a very important consideration for the overall performance of this pavement design. The area surrounding pavements should be graded to direct surface water away from paved areas. Utility excavations within pavement areas should be backfilled with compacted structural fill. Pavement drainage should be provided. The drainage layer (GAB layer) should be day-lighted into a drainage ditch. If the drainage layer (GAB layer) cannot be day-lighted, then a longitudinal underdrain should be provided.

12.0 CONSTRUCTION CONSIDERATIONS

12.1 Site Grading and Earthwork

The test boring data indicate the approximate depth of topsoil based on our visual identification procedures. The depth of stripping needed to provide a suitable base for placement and compaction of earthwork or for pavement subgrade preparation may include topsoil and other softer surficial layers, with or without organic matter. Stripping depths in wooded or previously cultivated areas will be greater, particularly during periods of wet weather. The depth of required stripping should be determined by the excavation Contractor prior to construction using test pits, probes, or other means that the Contractor wishes to employ, and this determination should be the excavation Contractor's responsibility.

Some of the onsite soils are susceptible to moisture changes, will be easily disturbed, and will be difficult to compact under wet weather conditions. Drying and reworking of the soils are likely to be difficult during periods of wet months. We recommend that the earthwork phases of this project be performed during the warmer, drier times of the year to limit the potential for disturbance of on-site soils.

Traffic on stripped or undercut subgrades should be limited to reduce disturbance of underlying soils. Also, using lightweight, track-mounted dozer equipment for stripping will limit the disturbance of underlying soils, and may reduce the undercut volume needed. The Contractor should provide site drainage to maintain subgrades free of water and to avoid saturation and disturbance of the subgrade soils before placing compacted structural fill, pavement base course, or moisture barrier material. This will be important during all phases of the construction work. The Contractor should be responsible for reworking of subgrades and compacted structural fill that were initially considered suitable but were later disturbed by equipment and/or weather.

12.2 Spread Footings

The Contractor must exercise care during excavation for spread footings so that as little disturbance as possible occurs at the foundation level. The Contractor should carefully clean loose or soft soils from the bottom of the excavation before placing compacted fill or concrete. A Geotechnical Engineer must observe footing subgrades prior to concrete placement to evaluate whether subgrade soils are as anticipated in this report.

Footing subgrades needing undercut should be backfilled to the original design subgrade elevation as described in *Section 6.0. – Site Grading and Earthwork*. We do not recommend open-graded crushed stone backfill since this material provides a path for moisture to reach subgrade soils, resulting in an increased potential for softening from water. The Contractor should place footing concrete immediately after excavation of the footing and approval by the Geotechnical Engineer to prevent accumulation of water in the excavation or drying of foundation soils.

The potential for variation of moisture content in foundation soils is probably greatest during construction. If the moisture content of foundation soils increases or decreases during construction, a moisture-related change in volume will likely occur as these soils return to their natural moisture content. Therefore, prompt placement of concrete, backfilling, and grading are very important for proper foundation performance.

12.3 Subdrainage

The Contractor should exercise care when placing and backfilling subdrainage pipe to avoid damage to the subdrainage system during installation.

12.4 Construction Dewatering

Groundwater was encountered at as close as 5-ft below the ground surface in borings BS-5, which was located near the bank of the pond during our geotechnical investigations. Groundwater was not encountered at the other test boring locations to the depth investigated and at the time of our investigations. Based on the groundwater observations in the borings, the need for dewatering of excavations is not anticipated. However, excavations performed close to the river and pond may encounter ground water and perched water may be encountered in excavations at other locations around the site. A system localized sumping and pumping may be effective for temporary groundwater control during construction. Ineffective groundwater control will result in softening of foundation and slab subgrades and the need to remove softened and otherwise unsuitable subgrade materials.

The Contractor should be prepared to address fluctuations and localized increases in groundwater flow. The localized increase in groundwater may result in over excavation of subgrades if not properly handled during construction.

12.5 Engineering Services During Construction

The engineering recommendations provided in this report are based on the information obtained from the subsurface exploration and laboratory testing. However, conditions on the site may vary between the discrete locations observed at the time of our subsurface exploration. The nature and extent of variations between borings may not become evident until during construction.

To account for this variability, we should provide professional observation and testing of subsurface conditions revealed during construction as an extension of our engineering services. These services will also help in evaluating the Contractor's conformance with the plans and specifications. Because of our unique position to understand the intent of the geotechnical engineering recommendations, retaining Schnabel for these services will allow us to provide consistent service throughout the project construction.

13.0 GENERAL SPECIFICATION RECOMMENDATIONS

An allowance should be established to account for possible additional costs that may be required to construct earthwork and foundations as recommended in this report. Additional costs may be incurred for a variety of reasons including variation of soil between borings, greater than anticipated unsuitable soils, need for borrow fill material, wet on-site soils, obstructions, and temporary dewatering.

The project specifications should indicate the Contractor's responsibility for providing adequate site drainage during construction. Inadequate drainage will most likely lead to disturbance of soils by construction traffic and increased volume of undercut.

This report may be made available to prospective bidders for informational purposes. We recommend that the project specifications contain the following statement:

> *Schnabel Engineering, LLC has prepared this geotechnical engineering report for this project. This report is for informational purposes only and is not part of the contract documents. The opinions expressed represent the Geotechnical Engineer's interpretation of the subsurface conditions, tests, and the results of analyses performed. Should the data contained in this report not be adequate for the Contractor's purposes, the Contractor may make, before bidding, independent exploration, tests, and analyses. This report may be examined by bidders at the office of the Owner, or copies may be obtained from the Owner at nominal charge.*

Additional data and reports prepared by others that could have an impact upon the Contractor's bid should also be made available to prospective bidders for informational purposes.

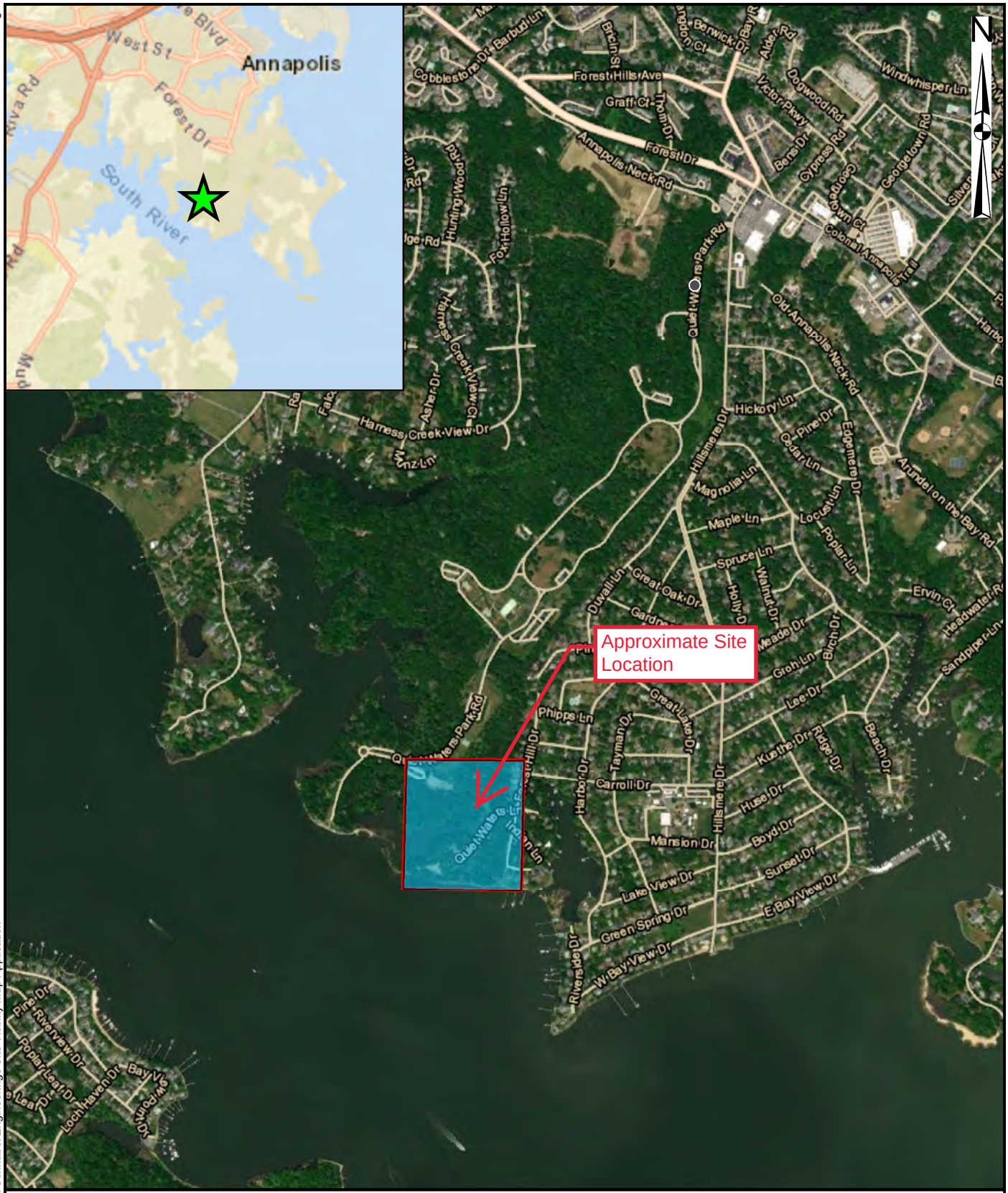
14.0 LIMITATIONS

We based the analyses and recommendations submitted in this report on the information revealed by our exploration. We attempted to provide for normal contingencies, but the possibility remains that unexpected conditions may be encountered during construction.

This report has been prepared to aid in the evaluation of this site and to assist in the design of the project. It is intended for use concerning this specific project. We based our recommendations on information on the site and proposed construction as described in this report. Substantial changes in loads, locations, or grades should be brought to our attention so we can modify our recommendations as needed. We would appreciate an opportunity to review the plans and specifications as they pertain to the recommendations contained in this report, and to submit our comments to you based on this review.

We have endeavored to complete the services identified herein in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality and under similar conditions as this project. No other representation, express or implied, is included or intended, and no warranty or guarantee is included or intended in this report or other instrument of service.

FIGURES



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
Esri, HERE, Garmin, (c) OpenStreetMap contributors
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
Projection: WGS 1984 Web Mercator Auxiliary Sphere

NOT TO SCALE

Schnabel ENGINEERING

QUIET WATERS RETREAT

PROJECT NO.22140028.000

SITE VICINITY MAP

FIGURE 1

200 0 200 400 ft

N

BP-1
BP-2
BS-1
BP-3
SWM-1
SWM-2
SWM-3
SWM-4
BP-4
SWM-5
BP-5
BS-2
SWM-6
BS-4
BS-5
BS-3
RW-1
RW-2

Quiet Waters Park Rd
Quiet Waters Dog Park
Quiet Waters Dog Beach
Quiet Waters Retreat
LODEN POND
Loden Pond
Forest Dr
Carroll Dr
Fogle Dr
Forest Hill Dr
Indian Ln
Demyan Dr

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the rest of the GIS User Community

Legend
- SWM Location
- Boring Location

Schnabel ENGINEERING

Quiet Waters Park

Annapolis, Maryland

Figure Name: Boring Location Plan	Done: S. Ryoo	Figure Number: 2	
Project Number: 22140028.000	Reviewed: S. Fung	Date: DEC 2022	

Ta

Aquia Formation

Glauconitic sand, clean to moderately clayey, and calcareous sandstone. Well-sorted, medium-grained sand dominant but fine or coarse-grained in places. Color dark gray-green or olive-green where unweathered, "salt and pepper" sand where moderately weathered, and rusty brown with abundant limonite crusts and pods where deeply weathered. Bedding massive or thick-bedded with abundant burrow mottling. Highly fossiliferous in places with large oysters and Turritella *dominant. Glauconite proportions variable, rarely exceeding 50% of the sediment.*

The Aquia is at the surface over a considerable portion of the mid-County including most of Broad and South Necks. Outcrops are numerous and spectacular in bluffs facing the lower Severn and South Rivers where as much as 80 ft. of Aquia is exposed in continuous section. Much of the Aquia, particularly in the northeastern part of the outcrop belt, is deeply weathered (to depths as great as 70 ft.) to a limonitic rusty sand in which considerable glauconite has been oxidized and shells leached. Boulders and blocks of reddish-brown sandstone are abundant in the soil zone and litter the surface in spots. Below the South River, beds or pods of shelly calcareous sandstone up to 5 ft. thick are common. The Aquia sands accumulated in very shallow marine waters on the inner shelf and record a regressive cycle. K-Ar dates obtained from Aquia glauconite samples in nearby Prince Georges County indicate ages of 56.7 + 2.2 m.y. for the basal sands and 51.9 + 2.0 m.y. for the top of the unit; thus deposition straddled the Paleocene-Eocene boundary.

Thickness 3-180 feet.

Brightseat Formation

Sand, variably clayey, predominantly fine-grained, poorly-sorted, variably glauconitic. Color dark gray to dark greenish-gray where fresh, pale-gray to tan in weathered outcrops. In places, the basal Brightseat contains some medium to coarse sand with granules, small pebbles, phosphatic clasts, and scattered fish teeth. The proportions of glauconite in the unit range up to 25%, but are generally much less; molluscan casts are present but uncommon.

The Brightseat is lithologically similar to the overlying lower Aquia Formation, and in most areas, the contact is gradational, marked by coarsening of the sand and an increase in glauconite content. Consequently, the two units are only separable where mapped in considerable detail, a condition not met over most of the County; thus they are here mapped together. Good outcrops of the Brightseat can be seen in the banks of several small streams tributary to the Patuxent River southwest of Staples Corner, and in the Round Bay area of the Severn River. The Brightseat is thought to have accumulated on the inner sublittoral shelf during early Paleocene time.

Thickness 3-65 feet.

Qal

Alluvium

Interbedded sand, silt-clay, and subordinate gravel. Alluvium comprises very heterogeneous sediments with poorly-sorted muddy sand and silt the dominant lithologies. Organic matter, including leaves, branches, and logs, is a common component. In places, thin peats occur. Color generally tan, brown, or gray, depending upon amount of organic debris and dark minerals such as glauconite. Dark-gray organic muds are prevalent in tidal marsh areas. Beach sands are generally well-sorted, fine to medium-grained pale quartzose sands, in places quartz-glauconite sands.

Qal *underlies the flood plains of rivers and steams as well as tidal marsh areas along the Bay and its estuaries. Much of this sediment is soft and water-saturated due to perennially high water-table levels. The composition of the alluvium in a given stream valley reflects the source materials; thus, alluvial sand tends to be glauconitic where the depositing stream heads in one of the greensand units such as the Aquia or Nanjemoy Formations. Similarly, gravel in the floodplain deposits of large streams like the Patapsco and Patuxent Rivers, which head in the Piedmont, may be compositionally diverse and contain clasts of crystalline rock, chiefly mafic. Tidal marsh areas are best developed along the Bay shoreline in the southern third of the County, as are localized sandy beaches. All of the sediments mapped as* Qal *are of relatively recent origin, most of them deposited within the past 10,000 yrs.*

Thickness 3-15 feet.

Qta

Talbot Formation

Interbedded sand, silt, and clay; lower portion contains pebbly sand or gravel in places. Sand in the Talbot Formation is generally clayey or silty, poorly-sorted, and commonly contains glauconite in areas south of the Severn River. Color mostly pale-gray, tan or buff, varying to dark-gray where rich in organic matter. In places, thin peat beds occur, as do black, highly organic clays rich in plant debris, including fossil cypress stumps.

The Talbot Formation underlies low flat areas bordering the Bay and the shores of the larger estuaries, most of these at 20 ft. or less in elevation but rising to 80 ft. in places along their inner margins. The tip of Broad Neck and the wide lowland between West River and Herring Bay are the most extensive of these areas. Much of the Talbot is a graded sequence with the coarser materials concentrated in the basal portion and an upper silt-clay unit. The silt-clay unit provides the surficial sediment over most of the Talbot lowlands bordering the Bay. Drainage is poor and in places swampy conditions prevail. Good outcrops of the Talbot are scarce. In recent years, widespread shoreline protection by bulkheads, revetments, and the like has effectively eliminated excellent exposures formerly visible at Bodkin Point, Gibson Island, Greenbury Point, and Bay Ridge. Radiocarbon dating of organic materials contained in the Talbot in Harford County indicates a minimum age of 35,000 yrs. Moreover, the composition of the fossil flora suggest deposition during interglacial conditions; thus the Talbot is probably Sangamonian or older, perhaps mid-Pleistocene in age.

Thickness 3-35 feet.

Schnabel ENGINEERING

Quiet Waters Retreat

Anne Arundel County, Maryland

Figure Name:	Done:	Figure Number:
GEOLOGIC MAP	S. Ryoo	3
Project Number:	**Reviewed:**	**Date:**
22140028.000	S. Fung	Dec 2022

APPENDIX A

SUBSURFACE EXPLORATION DATA

Subsurface Exploration Procedures
General Notes for Subsurface Exploration Logs
Identification of Soil
Boring Logs (example: BS-1)

- BP-1 to BP-5
- BS-1 to BS-5
- RW-1 to RW-2
- SWM-1 to SWM-6

SUBSURFACE EXPLORATION PROCEDURES

Test Borings – Hollow Stem Augers

The borings are advanced by turning an auger with a center opening of 2¼ or 3¼ inches. A plug device blocks off the center opening while augers are advanced. Cuttings are brought to the surface by the auger flights. Sampling is performed through the center opening in the hollow stem auger by standard methods after removal of the plug. Usually, no water is introduced into the boring using this procedure.

Test Borings – Continuous Flight (Mechanical) Augers

Test borings are advanced using 4½-inch continuous flight solid augers that rotate into the soil and bring cuttings to the surface. The augers are withdrawn from the borehole at each sampling depth, and samples are obtained using standard methods. Augers are used only when the borehole sidewalls will stand without support. No water is introduced into the boring using this procedure.

Standard Penetration Test Results

The Standard Penetration Test (SPT) is performed in the borings at regular depth intervals to collect soil samples. The numbers in the Sampling Data column of the boring logs represent SPT results. Each number represents the blows needed to drive a 2-inch O.D., 1⅜-inch I.D. split-spoon sampler 6 inches, using a 140-pound hammer falling 30 inches. The sampler is typically driven a total of 18 or 24 inches. The first 6 inches are considered a seating interval. The total of the number of blows for the second and third 6-inch intervals is the SPT “N-value.” The Standard Penetration Test is performed according to ASTM D1586.

The SPT samples were obtained using a hydraulically driven automatic trip hammer (ATH). Most correlations with SPT data are based on N-values collected with a safety hammer. The energy applied to the split-spoon sampler using the ATH is about 33 percent greater than that applied using the safety hammer, resulting in lower N-values. The hammer blows shown on the boring logs are uncorrected for the higher energy. However, we correct SPT N-values for the higher energy when using N-values in our analyses.

Soil Classification Criteria

The group symbols on the logs represent the Unified Soil Classification System Group Symbols (ASTM D2487) based on visual observation and limited laboratory testing of the samples. Criteria for visual identification of soil samples are included in this appendix. Some variation can be expected between samples visually classified and samples classified in the laboratory.

Disintegrated rock is defined as residual material with SPT N-values between 60 blows per foot and refusal. Refusal is defined as an N-value of 50 blows for a penetration of one inch or less.

Partially weathered rock (PWR) is defined as residual material with SPT N values between 100 blows per foot and refusal. Refusal is defined as an N-value of 50 blows for a penetration of one inch or less.

Pocket Penetrometer Results

The values following “PP=” in the sampling data column of the logs represent pocket penetrometer readings. Pocket penetrometer readings provide an estimate of the unconfined compressive strength of fine-grained soils.

Boring Locations and Elevations

Boring locations were staked by Brandon Glass, Staff Scientist. Approximate boring locations are shown on Figure 2 and subsurface cross sections are shown on Figure 1. Ground surface elevations at the boring locations were provided by the site topographic plan and are indicated on the boring logs. Locations and elevations should be considered no more accurate than the methods used to determine them.

GENERAL NOTES FOR SUBSURFACE EXPLORATION LOGS

1. Numbers in sampling data column next to Standard Penetration Test (SPT) symbols indicate blows required to drive a 2-inch O.D., 1⅜-inch I.D. sampling spoon 6 inches using a 140 pound hammer falling 30 inches. The Standard Penetration Test (SPT) N-value is the number of blows required to drive the sampler 12 inches, after a 6-inch seating interval. The Standard Penetration Test is performed in general accordance with ASTM D1586.
2. Visual classification of soil is in accordance with terminology set forth in “Identification of Soil.” The ASTM D2487 group symbols (e.g., CL) shown in the classification column are based on visual observations.
3. Estimated water levels indicated on the logs are only estimates from available data and may vary with precipitation, porosity of the soil, site topography, and other factors.
4. Refusal at the surface of rock, boulder, or other obstruction is defined as an SPT resistance of 50 blows for 1 inch or less of penetration.
5. The logs and related information depict subsurface conditions only at the specific locations and at the particular time when drilled or excavated. Soil conditions at other locations may differ from conditions occurring at these locations. Also, the passage of time may result in a change in the subsurface soil and water level conditions at the subsurface exploration location.
6. The stratification lines represent the approximate boundary between soil and rock types as obtained from the subsurface exploration. Some variation may also be expected vertically between samples taken. The soil profile, water level observations and penetration resistances presented on these logs have been made with reasonable care and accuracy and must be considered only an approximate representation of subsurface conditions to be encountered at the particular location.
7. Key to symbols and abbreviations:

S-1, SPT	Sample No., Standard Penetration Test
5+10+1	Number of blows in each 6-inch increment

LL	Liquid Limit
MC	Moisture Content (percent)
PID	Photoionization Detector Reading (ppm)
PL	Plastic Limit
PP	Pocket Penetrometer Reading (tsf)
%Passing#200	Percent by weight passing a No. 200 Sieve

IDENTIFICATION OF SOIL

I. DEFINITION OF SOIL GROUP NAMES (ASTM D2487)

			SYMBOL	GROUP NAME
Coarse-Grained Soils More than 50% retained on No. 200 sieve	Gravels – More than 50% of coarse fraction retained on No. 4 sieve Coarse, ¾" to 3" Fine, No. 4 to ¾"	Clean Gravels Less than 5% fines	GW	WELL GRADED GRAVEL
			GP	POORLY GRADED GRAVEL
		Gravels with fines More than 12% fines	GM	SILTY GRAVEL
			GC	CLAYEY GRAVEL
	Sands – 50% or more of coarse Fraction passes No. 4 sieve Coarse, No. 10 to No. 4 Medium, No. 40 to No. 10 Fine, No. 200 to No. 40	Clean Sands Less than 5% fines	SW	WELL GRADED SAND
			SP	POORLY GRADED SAND
		Sands with fines More than 12% fines	SM	SILTY SAND
			SC	CLAYEY SAND
Fine-Grained Soils 50% or more passes the No. 200 sieve	Silts and Clays – Liquid Limit less than 50 Low to medium plasticity	Inorganic	CL	LEAN CLAY
			ML	SILT
		Organic	OL	ORGANIC CLAY
				ORGANIC SILT
	Silts and Clays – Liquid Limit 50 or more Medium to high plasticity	Inorganic	CH	FAT CLAY
			MH	ELASTIC SILT
		Organic	OH	ORGANIC CLAY
				ORGANIC SILT
Highly Organic Soils	Primarily organic matter, dark in color and organic odor		PT	PEAT

II. DEFINITION OF SOIL COMPONENT PROPORTIONS (ASTM D2487)

			Examples
Adjective Form	GRAVELLY SANDY	>30% to <50% coarse grained component in a fine-grained soil	GRAVELLY LEAN CLAY
	CLAYEY SILTY	>12% to <50% fine grained component in a coarse-grained soil	SILTY SAND
"With"	WITH GRAVEL WITH SAND	>15% to <30% coarse grained component in a fine-grained soil	FAT CLAY WITH GRAVEL
	WITH GRAVEL WITH SAND	>15% to <50% coarse grained component in a coarse-grained soil	POORLY GRADED GRAVEL WITH SAND
	WITH SILT WITH CLAY	>5% to <12% fine grained component in a coarse-grained soil	POORLY GRADED SAND WITH SILT

III. GLOSSARY OF MISCELLANEOUS TERMS

SYMBOLS ..... Unified Soil Classification Symbols are shown above as group symbols. A dual symbol "-" indicates the soil belongs to two groups. A borderline symbol "/" indicates the soil belongs to two possible groups.

FILL ..... Man-made deposit containing soil, rock and often foreign matter.

PROBABLE FILL..... Soils that contain no visually detected foreign matter but which are suspect with regard to origin.

DISINTEGRATED ROCK (DR) ..... Residual materials with a standard penetration resistance (SPT) between 60 blows per foot and refusal. Refusal is defined as an SPT of 100 blows for 2" or less penetration.

PARTIALLY WEATHERED ROCI (PWR) ..... Residual materials with a standard penetration resistance (SPT) between 100 blows per foot and refusal. Refusal is defined as an SPT of 100 blows for 2" or less penetration.

BOULDERS & COBBLES ..... Boulders are considered rounded pieces of rock larger than 12 inches, while cobbles range from 3 to 12-inch size.

LENSES..... 0 to ½-inch seam within a material in a test pit.

LAYERS ..... ½ to 12-inch seam within a material in a test pit.

POCKET..... Discontinuous body within a material in a test pit.

MOISTURE CONDITIONS..... Wet, moist or dry to indicate visual appearance of specimen.

COLOR..... Overall color, with modifiers such as light to dark or variation in coloration.

Schnabel ENGINEERING **TEST BORING LOG**

Project: Quiet Waters Retreat
Annapolis, MD

Boring Number: **BP-1**
Contract Number: 22140028.000
Sheet: 1 of 1

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: J. Lewis
Schnabel Representative: S. Ryoo
Equipment: Diedrich D-70 Turbo (Track)
Method: 3-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 12/1/22 **Finished:** 12/1/22
Location: See Location Plan

Ground Surface Elevation: 43± (ft) **Total Depth:** 10.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	12/1	---	Dry	---	---
Completion ▼	12/1	12:00 PM	Dry	8.5'	---
Casing Pulled ▼	12/1	12:05 PM	Dry	---	5.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	FILL, sampled as poorly graded sand with silt and gravel; moist, grayish brown	FILL		A		S-01, SS 6+4+3 REC=14", 78%		Fill
1.5	SANDY LEAN CLAY; moist, brown	CL	41.3	D		S-02, SS 6+6+6 REC=18", 100%	LL = 46 PI = 28 MC = 17.4% % Passing #200 = 61.9	Aquia Formation
					5	S-03, SS 8+10+12 REC=18", 100%	PP = 4.50 tsf	
8.5	POORLY GRADED SAND; moist, reddish brown	SP	34.3					
10.0			32.8		10	S-04, SS 6+7+4 REC=18", 100%		

Bottom of Boring at 10.0 ft.
Boring backfilled with cuttings upon completion.

Schnabel ENGINEERING **TEST BORING LOG**

Project: Quiet Waters Retreat
Annapolis, MD

Boring Number: **BP-2**
Contract Number: 22140028.000
Sheet: 1 of 1

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: J. Lewis
Schnabel Representative: S. Ryoo
Equipment: Diedrich D-70 Turbo (Track)
Method: 3-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 12/1/22 **Finished:** 12/1/22
Location: See Location Plan

Ground Surface Elevation: 54± (ft) **Total Depth:** 10.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	12/1	---	Dry	---	---
Completion ▼	12/1	11:30 AM	Dry	8.5'	---
Casing Pulled ▼	12/1	11:35 AM	Dry	---	4.5'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.5	Topsoil; 6 inches		53.5					
	CLAYEY SAND; moist, brown, contains organics	SC		D		S-01, SS 3+3+3 REC=15", 83%		Aquia Formation
						S-02, SS 2+3+4 REC=18", 100%	LL = 49 PI = 29 MC = 24.0% % Passing #200 = 48.0	Bulk sample collected from 0 to 4 feet
					5	S-03, SS 4+4+5 REC=18", 100%		
	Change: no organics							
	Change: brownish green					S-04, SS 3+4+4 REC=18", 100%		
10.0			44.0		10			

Bottom of Boring at 10.0 ft.
Boring backfilled with cuttings upon completion.

Schnabel ENGINEERING **TEST BORING LOG**

Project: Quiet Waters Retreat
Annapolis, MD

Boring Number: **BP-3**
Contract Number: 22140028.000
Sheet: 1 of 1

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: J. Lewis
Schnabel Representative: S. Ryoo
Equipment: Diedrich D-70 Turbo (Track)
Method: 3-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 12/1/22 **Finished:** 12/1/22
Location: See Location Plan

Ground Surface Elevation: 44± (ft) **Total Depth:** 10.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	12/1	---	Dry	---	---
Completion ▼	12/1	12:40 PM	Dry	8.5'	---
Casing Pulled ▼	12/1	12:44 PM	Dry	---	4.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.5	Topsoil; 6 inches		43.0					
	CLAYEY SAND; moist, reddish brown	SC				S-01, SS 3+4+6 REC=18", 100%	LL = 38 PI = 21 MC = 13.9% % Passing #200 = 37.7	Aquia Formation Bulk sample collected from 0 to 5 feet
						S-02, SS 3+3+5 REC=18", 100%		
5.0	POORLY GRADED SAND; moist, brown	SP	38.5	D	5	S-03, SS 3+4+6 REC=18", 100%		
						S-04, SS 4+7+6 REC=13", 72%		
10.0			33.5		10			

Bottom of Boring at 10.0 ft.
Boring backfilled with cuttings upon completion.

Schnabel ENGINEERING **TEST BORING LOG**

Project: Quiet Waters Retreat
Annapolis, MD

Boring Number: **BP-4**
Contract Number: 22140028.000
Sheet: 1 of 1

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: J. Lewis
Schnabel Representative: B. Like
Equipment: Diedrich D-70 Turbo (Track)
Method: 3-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 12/2/22 **Finished:** 12/2/22
Location: See Location Plan

Ground Surface Elevation: 40± (ft) **Total Depth:** 10.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	12/2	---	Dry	---	---
Completion ▼	12/2	9:35 AM	Dry	8.5'	5.0'
Casing Pulled ▼	12/2	9:40 AM	Dry	---	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.3	Topsoil; 4 inches		39.7					
	SILTY SAND, fine grained sand; moist, brown	SM				S-01, SS 1+1+2 REC=18", 100%		Aquia Formation
1.3	CLAYEY SAND; moist, brown		38.7					
						S-02, SS 4+6+5 REC=18", 100%	MC = 15.5%	
		SC		D	5	S-03, SS 4+7+8 REC=18", 100%		Bulk sample collected from 5 to 10 feet
8.7	SILTY SAND, fine grained sand; moist, light brown	SM	31.3					
						S-04, SS 8+8+9 REC=18", 100%		
10.0			30.0		10			

Bottom of Boring at 10.0 ft.
Boring backfilled with cuttings upon completion.

Schnabel ENGINEERING **TEST BORING LOG**

Project: Quiet Waters Retreat
Annapolis, MD

Boring Number: **BP-5**
Contract Number: 22140028.000
Sheet: 1 of 1

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: J. Lewis
Schnabel Representative: B. Like
Equipment: Diedrich D-70 Turbo (Track)
Method: 3-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 12/2/22 **Finished:** 12/2/22
Location: See Location Plan

Ground Surface Elevation: 40± (ft) **Total Depth:** 10.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	12/2	---	Dry	---	---
Completion ▼	12/2	11:40 AM	Dry	8.5'	5.0'
Casing Pulled ▼	12/2	11:45 AM	Dry	---	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.3	Topsoil; 3 inches		39.8					
	SANDY LEAN CLAY; moist, brown	CL		D		S-01, SS 1+2+2 REC=18", 100%	PP = 1.50 tsf	Aquia Formation
						S-02, SS 3+4+7 REC=18", 100%	PP = 2.50 tsf	
					5	S-03, SS 3+3+6 REC=18", 100%	LL = 38 PI = 21 MC = 26.7% % Passing #200 = 69.2 PP = 2.50 tsf	Bulk sample collected from 5 to 10 feet
8.5	POORLY GRADED SAND WITH CLAY; moist, greenish gray	SP-SC	31.5					
10.0			30.0		10	S-04, SS 4+4+4 REC=18", 100%		

Bottom of Boring at 10.0 ft.
Boring backfilled with cuttings upon completion.

Schnabel ENGINEERING **TEST BORING LOG**

Project: Quiet Waters Retreat
Annapolis, MD

Boring Number: **BS-1**
Contract Number: 22140028.000
Sheet: 1 of 1

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: J. Lewis
Schnabel Representative: S. Ryoo
Equipment: Diedrich D-70 Turbo (Track)
Method: 3-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 12/1/22 **Finished:** 12/1/22
Location: See Location Plan

Ground Surface Elevation: 39± (ft) **Total Depth:** 20.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	12/1	12:00 AM	Dry	---	---
Completion ▼	12/1	1:10 PM	Dry	18.5'	---
Casing Pulled ▼	12/1	1:15 PM	Dry	---	11.5'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.5	Topsoil; 6 inches		38.0					
	CLAYEY SAND; moist, reddish brown	SC		D		S-01, SS 4+5+6 REC=18", 100%		Aquia Formation
						S-02, SS 2+2+3 REC=14", 78%	LL = 32 PI = 16 MC = 17.5% % Passing #200 = 32.7	
	Change: brown, contains organics				5	S-03, SS 2+3+4 REC=15", 83%		
						S-04, SS 2+3+5 REC=18", 100%		
					10			
	Change: brown with streaks of orange and gray, no organics					S-05, SS 3+3+4 REC=18", 100%		
					15			
18.5	POORLY GRADED SAND; moist, brown	SP	20.0			S-06, SS 4+4+4 REC=18", 100%		
20.0			18.5		20			

Bottom of Boring at 20.0 ft.
Boring backfilled with cuttings upon completion.

TEST BORING LOG; P:QUIET WATERS BORING LOGS.GPJ; D:\L:GINT LIBRARY_2022_05_09(BALTIMORE).GLB; Print:12/20/22

Schnabel ENGINEERING **TEST BORING LOG**

Project: Quiet Waters Retreat
Annapolis, MD

Boring Number: **BS-2**
Contract Number: 22140028.000
Sheet: 1 of 1

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: J. Lewis
Schnabel Representative: B. Like
Equipment: Diedrich D-70 Turbo (Track)
Method: 3-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 12/2/22 **Finished:** 12/2/22
Location: See Location Plan

Ground Surface Elevation: 40± (ft) **Total Depth:** 20.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	12/2	---	Dry	---	---
Completion ▼	12/2	10:35 AM	Dry	18.5'	---
Casing Pulled ▼	12/2	10:40 AM	Dry	---	12.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.2	Topsoil; 2 inches		39.6					
	SANDY LEAN CLAY; moist, brown	CL		D		S-01, SS 2+2+2 REC=18", 100%	PP = 2.00 tsf	Aquia Formation
						S-02, SS 2+3+3 REC=16", 89%	MC = 24.5%	
					5	S-03, SS 2+3+5 REC=18", 100%	PP = 2.50 tsf	
						S-04, SS 3+4+4 REC=18", 100%	PP = 2.50 tsf	
13.5	SILTY SAND; moist, greenish brown	SM	26.3		10			
					15	S-05, SS 5+5+2 REC=15", 83%		
20.0			19.8		20	S-06, SS 5+6+8 REC=18", 100%		

Bottom of Boring at 20.0 ft.
Boring backfilled with cuttings upon completion.

Schnabel ENGINEERING **TEST BORING LOG**

Project: Quiet Waters Retreat
Annapolis, MD

Boring Number: **BS-3**
Contract Number: 22140028.000
Sheet: 1 of 1

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: J. Lewis
Schnabel Representative: B. Like
Equipment: Diedrich D-70 Turbo (Track)
Method: 3-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 12/2/22 **Finished:** 12/2/22
Location: See Location Plan

Ground Surface Elevation: 34± (ft) **Total Depth:** 20.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	12/2	---	Dry	---	---
Completion ▼	12/2	2:55 PM	Dry	18.5'	---
Casing Pulled ▼	12/2	3:00 PM	Dry	---	12.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.5	FILL, sampled as poorly graded sand; moist, contains asphalt	FILL	33.5	A		S-01, SS 3+3+4 REC=18", 100%	MC = 22.1% Resistivity = 1220 Ohms-cm Redox = 395 mv Sulfides = ND pH = 4.18 Sulfates = 46 mg-kg Chlorides = 245 mg-kg LL = 28 PI = 12 MC = 19.6% % Passing #200 = 62.5 PP = 3.50 tsf	Fill
	SANDY LEAN CLAY; moist, brown					S-02, SS 2+2+4 REC=18", 100%		Aquia Formation
	Change: light brown	CL			5	S-03, SS 3+5+7 REC=18", 100%		
	Change: light gray			D	10	S-04, SS 3+4+5 REC=15", 83%	PP = 2.50 tsf	
13.0	SILTY SAND, fine grained sand; moist, gray and tan	SM	21.0		15	S-05, SS 6+8+10 REC=18", 100%		
18.0	POORLY GRADED SAND, fine grained sand; moist, white	SP	16.0		20	S-06, SS 14+23+32 REC=18", 100%		
20.0			14.0					

Bottom of Boring at 20.0 ft.
Boring backfilled with cuttings upon completion.

TEST BORING LOG; P:QUIET WATERS BORING LOGS.GPJ; D:\L:GINT LIBRARY_2022_05_09(BALTIMORE).GLB; Print:12/20/22

Schnabel ENGINEERING **TEST BORING LOG**

Project: Quiet Waters Retreat
Annapolis, MD

Boring Number: **BS-4**
Contract Number: 22140028.000
Sheet: 1 of 2

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: J. Lewis
Schnabel Representative: B. Like
Equipment: Diedrich D-70 Turbo (Track)
Method: 3-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 12/2/22 **Finished:** 12/2/22
Location: See Location Plan

Ground Surface Elevation: 26± (ft) **Total Depth:** 30.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	12/2	---	Dry	---	---
Completion ▼	12/2	1:10 PM	28.8'	28.5'	---
Casing Pulled ▼	12/2	1:15 PM	Dry	---	15.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.3	Topsoil; 4 inches		25.7					
	SANDY LEAN CLAY; moist, brown, contains roots	CL				S-01, SS 1+2+1 REC=18", 100%	PP = 4.00 tsf	Aquia Formation
						S-02, SS 4+5+6 REC=18", 100%	MC = 16.8%	
4.0	SILTY SAND, fine grained sand; moist, greenish brown		22.0					
					5	S-03, SS 5+7+8 REC=18", 100%		
						S-04, SS 6+5+6 REC=18", 100%	MC = 13.5%	
					10			
				D				
		SM				S-05, SS 6+7+8 REC=18", 100%		
					15			Harder drilling at 16'
						S-06, SS 6+6+7 REC=18", 100%		
					20			
						S-07, SS 8+10+11 REC=17", 94%		

(continued)

Schnabel ENGINEERING **TEST BORING LOG**

Project: Quiet Waters Retreat
Annapolis, MD

Boring Number: **BS-4**
Contract Number: 22140028.000
Sheet: 2 of 2

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	SILTY SAND, fine grained sand; moist, greenish brown *(continued)*	SM		D				Auger grinding
						S-08, SS 6+6+7 REC=18", 100%		
30.0			-4.0		30			

Bottom of Boring at 30.0 ft.
Boring backfilled with cuttings upon completion.

Schnabel ENGINEERING **TEST BORING LOG**

Project: Quiet Waters Retreat
Annapolis, MD

Boring Number: **BS-5**
Contract Number: 22140028.000
Sheet: 1 of 2

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: J. Lewis
Schnabel Representative: B. Like
Equipment: Diedrich D-70 Turbo (Track)
Method: 3-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 12/2/22 **Finished:** 12/2/22
Location: See Location Plan

Ground Surface Elevation: 8± (ft) **Total Depth:** 30.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	12/2	---	5.0'	5.0'	---
Completion ▼	12/2	2:00 PM	9.0'	28.5'	---
Casing Pulled ▼	12/2	2:15 PM	5.0'	---	8.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.6	Topsoil; 7 inches		7.4					
	SILTY SAND, fine grained sand; moist, brown	SM		C		S-01, SS 2+2+3 REC=18", 100%		Talbot
						S-02, SS 2+3+4 REC=18", 100%	MC = 15.4%	
	Change: wet, light brown				5	S-03, SS 4+5+6 REC=18", 100%		
8.0	CLAYEY SAND; wet, brown		0.0			S-04, SS 4+4+5 REC=18", 100%		Aquia Formation
					10			
						S-05, SS 5+9+10 REC=18", 100%		
		SC		D	15			
	Change: orangeish brown	SC						Water on rods at 18'
						S-06, SS 6+3+14 REC=18", 100%		
					20			
						S-07, SS 10+13+18 REC=18", 100%		

(continued)

Schnabel ENGINEERING **TEST BORING LOG**

Project: Quiet Waters Retreat
Annapolis, MD

Boring Number: **BS-5**
Contract Number: 22140028.000
Sheet: 2 of 2

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	CLAYEY SAND; wet, brown *(continued)*	SC		D				
					30	S-08, SS 2+3+13 REC=15", 83%		
30.0			-22.0					

Bottom of Boring at 30.0 ft.
Boring backfilled with cuttings upon completion.

Schnabel ENGINEERING **TEST BORING LOG**

Project: Quiet Waters Retreat
Annapolis, MD

Boring Number: **RW-1**
Contract Number: 22140028.000
Sheet: 1 of 1

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: J. Lewis
Schnabel Representative: B. Like
Equipment: Diedrich D-70 Turbo (Track)
Method: 3-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 12/2/22 **Finished:** 12/2/22
Location: See Location Plan

Ground Surface Elevation: 38± (ft) **Total Depth:** 10.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	12/2	---	Dry	---	---
Completion ▼	12/2	12:00 PM	Dry	8.5'	---
Casing Pulled ▼	12/2	12:05 PM	Dry	---	5.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.3	Topsoil; 3 inches		37.3					
	CLAYEY SAND; moist, brown	SC				S-01, SS 2+2+2 REC=18", 100%		Aquia Formation
	Change: contains roots					S-02, SS 1+2+3 REC=18", 100%	MC = 22.9%	
3.3	SANDY LEAN CLAY; moist, tan		34.2					
		CL		D	5	S-03, SS 4+5+6 REC=18", 100%	PP = 3.50 tsf	
	Change: tan and gray					S-04, SS 2+3+4 REC=18", 100%	PP = 2.50 tsf	
10.0			27.5		10			

Bottom of Boring at 10.0 ft.
Boring backfilled with cuttings upon completion.

Schnabel ENGINEERING **TEST BORING LOG**

Project: Quiet Waters Retreat
Annapolis, MD

Boring Number: **RW-2**
Contract Number: 22140028.000
Sheet: 1 of 1

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: J. Lewis
Schnabel Representative: B. Like
Equipment: Diedrich D-70 Turbo (Track)
Method: 3-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 12/2/22 **Finished:** 12/2/22
Location: See Location Plan

Ground Surface Elevation: 37± (ft) **Total Depth:** 10.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	12/2	---	Dry	---	---
Completion ▼	12/2	3:10 PM	Dry	8.5'	---
Casing Pulled ▼	12/2	3:15 PM	Dry	---	4.5'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	FILL, sampled as poorly graded sand with gravel; dry, dark brown	FILL		A		S-01, SS 6+3+4 REC=18", 100%		Fill
2.0			34.5					
	SANDY LEAN CLAY; moist, brown	CL				S-02, SS 2+3+3 REC=18", 100%	LL = 38 PI = 21 MC = 23.1% % Passing #200 = 62.4	Aquia Formation
5.0			31.5		5			
	SANDY SILT; moist, greenish blue with orangeish brown	ML		D		S-03, SS 4+5+6 REC=18", 100%	PP = 3.50 tsf	
						S-04, SS 2+4+6 REC=18", 100%	PP = 3.00 tsf	
10.0			26.5		10			

Bottom of Boring at 10.0 ft.
Boring backfilled with cuttings upon completion.

Schnabel ENGINEERING **TEST BORING LOG**

Project: Quiet Waters Retreat
Annapolis, MD

Boring Number: **SWM-1**
Contract Number: 22140028.000
Sheet: 1 of 1

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: J. Lewis
Schnabel Representative: S. Ryoo
Equipment: Diedrich D-70 Turbo (Track)
Method: 3-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 12/1/22 **Finished:** 12/1/22
Location: See Location Plan

Ground Surface Elevation: 41± (ft) **Total Depth:** 10.5 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	12/1	---	Dry	---	---
Completion ▼	12/1	10:10 AM	Dry	8.0'	---
Casing Pulled ▼	12/1	10:19 AM	Dry	---	5.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.6	Topsoil; 7 inches		40.4			S-01, SS 1+2+4+5 REC=20", 83%	PP = 2.50 tsf	Aquia Formation
	LEAN CLAY WITH SAND; moist, reddish brown	CL						
2.5	CLAYEY SAND; moist, reddish brown	SC	38.5	D		S-02, SS 2+5+7+8 REC=24", 100%		
					5	S-03, SS 2+4+6+8 REC=24", 100%	MC = 16.5% % Passing #200 = 45.2	
6.5	POORLY GRADED SAND WITH CLAY; moist, brown	SP-SC	34.5			S-04, SS 3+3+4+4 REC=21", 88%		
8.5	CLAYEY SAND; moist, brown	SC	32.5					
					10	S-05, SS 5+3+3+4 REC=24", 100%		
10.5			30.5					

Bottom of Boring at 10.5 ft.
Boring backfilled with cuttings upon completion.

Schnabel ENGINEERING **TEST BORING LOG**

Project: Quiet Waters Retreat
Annapolis, MD

Boring Number: **SWM-2**
Contract Number: 22140028.000
Sheet: 1 of 1

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: J. Lewis
Schnabel Representative: S. Ryoo
Equipment: Diedrich D-70 Turbo (Track)
Method: 3-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 12/1/22 **Finished:** 12/1/22
Location: See Location Plan

Ground Surface Elevation: 47± (ft) **Total Depth:** 10.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	12/1	---	Dry	---	---
Completion ▼	12/1	12:30 PM	Dry	8.0'	---
Casing Pulled ▼	12/1	12:33 PM	Dry	---	4.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.3	Topsoil; 4 inches		46.7					
	CLAYEY SAND; moist, reddish brown, contains organics					S-01, SS 1+2+3+4 REC=19", 79%		Aquia Formation
						S-02, SS 2+5+5+5 REC=24", 100%		
	Change: reddish brown	SC		D	5	S-03, SS 3+4+4+3 REC=24", 100%	MC = 20.5% % Passing #200 = 49.7	
						S-04, SS 4+3+4+4 REC=24", 100%		
						S-05, SS 2+3+4+6 REC=24", 100%		
10.0			37.0		10			

Bottom of Boring at 10.0 ft.
Boring backfilled with cuttings upon completion.

Schnabel ENGINEERING **TEST BORING LOG**

Project: Quiet Waters Retreat
Annapolis, MD

Boring Number: **SWM-3**
Contract Number: 22140028.000
Sheet: 1 of 1

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: J. Lewis
Schnabel Representative: S. Ryoo
Equipment: Diedrich D-70 Turbo (Track)
Method: 3-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 12/1/22 **Finished:** 12/1/22
Location: See Location Plan

Ground Surface Elevation: 37± (ft) **Total Depth:** 10.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	12/1	---	Dry	---	---
Completion ▼	12/1	1:43 PM	Dry	8.0'	---
Casing Pulled ▼	12/1	1:46 PM	Dry	---	4.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.5	Topsoil; 6 inches		36.5					
	CLAYEY SAND; moist, brown with streaked black	SC		D		S-01, SS 3+2+4+5 REC=24", 100%		Aquia Formation
						S-02, SS 3+3+4+7 REC=24", 100%		
					5	S-03, SS 2+5+5+7 REC=24", 100%	MC = 18.3% % Passing #200 = 38.4	
	Change: reddish brown					S-04, SS 4+3+3+6 REC=24", 100%		
8.0	SANDY LEAN CLAY; moist, red with gray	CL	29.0			S-05, SS 1+2+3+6 REC=21", 88%	PP = 2.50 tsf	
10.0			27.0		10			

Bottom of Boring at 10.0 ft.
Boring backfilled with cuttings upon completion.

Schnabel ENGINEERING **TEST BORING LOG**

Project: Quiet Waters Retreat
Annapolis, MD

Boring Number: **SWM-4**
Contract Number: 22140028.000
Sheet: 1 of 1

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: J. Lewis
Schnabel Representative: B. Like
Equipment: Diedrich D-70 Turbo (Track)
Method: 3-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 12/2/22 **Finished:** 12/2/22
Location: See Location Plan

Ground Surface Elevation: 29± (ft) **Total Depth:** 10.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	12/2	---	Dry	---	---
Completion ▼	12/2	3:00 PM	Dry	8.0'	---
Casing Pulled ▼	12/2	3:01 PM	Dry	---	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.3	Topsoil; 4 inches		28.7	D				
	SANDY LEAN CLAY; moist, brown	CL				S-01, SS 1+1+2+3 REC=24", 100%	PP = 2.50 tsf	Aquia Formation
						S-02, SS 1+2+5+5 REC=18", 75%	PP = 4.50 tsf	
					5	S-03, SS 7+4+5+5 REC=24", 100%	MC = 14.1% % Passing #200 = 54.3	
	CLAYEY SAND; moist, light gray and tan	SC				S-04, SS 4+4+4+8 REC=24", 100%		
8.0	SANDY LEAN CLAY; moist, brown	CL	21.0			S-05, SS 4+3+4+4 REC=24", 100%	PP = 2.00 tsf	
10.0			19.0		10			

Bottom of Boring at 10.0 ft.
Boring backfilled with cuttings upon completion.

Schnabel ENGINEERING **TEST BORING LOG**

Project: Quiet Waters Retreat
Annapolis, MD

Boring Number: **SWM-5**
Contract Number: 22140028.000
Sheet: 1 of 1

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: J. Lewis
Schnabel Representative: B. Like
Equipment: Diedrich D-70 Turbo (Track)
Method: 3-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 12/2/22 **Finished:** 12/2/22
Location: See Location Plan

Ground Surface Elevation: 40± (ft) **Total Depth:** 10.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	12/2	---	Dry	---	---
Completion ▼	12/2	10:00 AM	Dry	8.0'	---
Casing Pulled ▼	12/2	10:01 AM	Dry	---	4.5'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.5	Topsoil; 6 inches		39.0					
	SANDY LEAN CLAY; moist, light brown and gray	CL				S-01, SS 1+1+3+3 REC=24", 100%	PP = 3.00 tsf	Aquia Formation
						S-02, SS 3+2+3+3 REC=24", 100%	PP = 2.50 tsf	
4.0	CLAYEY SAND; moist, brown		35.5			S-03, SS 2+3+4+4 REC=24", 100%	MC = 23.1% % Passing #200 = 47.4	
				D	5			
	Change: brown to light brown	SC				S-04, SS 2+5+7+7 REC=24", 100%		
						S-05, SS 4+4+5+6 REC=24", 100%		
10.0			29.5		10			

Bottom of Boring at 10.0 ft.
Boring backfilled with cuttings upon completion.

Schnabel ENGINEERING **TEST BORING LOG**

Project: Quiet Waters Retreat
Annapolis, MD

Boring Number: **SWM-6**
Contract Number: 22140028.000
Sheet: 1 of 1

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: J. Lewis
Schnabel Representative: B. Like
Equipment: Diedrich D-70 Turbo (Track)
Method: 3-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)
Dates Started: 12/2/22 **Finished:** 12/2/22
Location: See Location Plan

Ground Surface Elevation: 40± (ft) **Total Depth:** 10.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	12/2	---	Dry	---	---
Completion ▼	12/2	11:10 AM	Dry	8.0'	---
Casing Pulled ▼	12/2	11:15 AM	Dry	---	5.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.3	Topsoil; 4 inches		39.7					
	CLAYEY SAND; moist, light brown	SC		D	5	S-01, SS 1+1+2+3 REC=24", 100%		Aquia Formation
						S-02, SS 3+5+6+6 REC=24", 100%		
						S-03, SS 3+3+4+4 REC=24", 100%	MC = 20.0% % Passing #200 = 49.7	
						S-04, SS 4+7+8+8 REC=24", 100%		
8.5	SILTY SAND; moist, light brown with orange	SM	31.5			S-05, SS 2+3+4+4 REC=24", 100%		
10.0			30.0		10			

Bottom of Boring at 10.0 ft.
Boring backfilled with cuttings upon completion.

APPENDIX B

SOIL LABORATORY TEST DATA

Laboratory Corrosivity Testing
Summary of Laboratory Tests
Summary of Atterberg Limit Testing
Summary of USDA Results
Gradation Curves
USDA Soil Textural Analysis
Moisture-Density Relations
California Bearing Ratio of Laboratory Compacted Soils (CBR)

Laboratory Corrosivity Testing

Quiet Waters Park

Project Number: 22140028.000

Jay Kay Testing, Inc.
(814) 404-9283
DC , MD, PA, VA
www.jaykaytesting.com

Sample ID		Depth			pH[1]		ORP	Resistivity			Chloride[2]		Sulfate[3]		Sulfide[4]	
					ASTM G-51		ASTM D-1498	ASTM G-57			ASTM D-512		ASTM D-516		Methylene Titration	
Boring ID	Sample ID	Top, ft	Bottom, ft	Natural Water Content, %	pH (1:1)	Test Temperature, °C	ORP (Redox), mV (1:1)	As Received, Ω-cm	Minimum, Ω-cm	Saturated, Ω-cm	Chlorides, PPM (mg/kg) (1:1)	Chlorides, µg/kg (1:1)	Sulfates, PPM (mg/kg) (3:1)	Sulfates, % Dry Weight (3:1)	Sulfides Ion Presence (1:1)	Remarks
BS-3	S1-S2	0	4	-	4.18	21.5	395	1,700	-	1,220	245	245,000	46	0.0046	negative	

[1] pH verified with pH paper.

[2] Verified with separate chloride photometer method.

[3] Turbidimetric photometer method. Verified with separate turbidimetric titration method. All dilutions are 1:1 except sulfate, 3:1.

[4] Pomeroy methylene blue method (titration). Verified with separate colorimetric method.

Quiet Waters Park

Project Number: 22140028.000

Location: Annapolis, MD

Sample Date: 12/01-12/02/22

Jay Kay Testing
(814) 404-9283
www.jaykaytesting.com

Summary of Laboratory Testing

Sample Identification		Depth				Atterberg Limits				Compaction					
Boring ID	Sample ID	Top, ft	Bottom, ft	NMC, % (AASHTO T-265)	Organic Matter, % (AASHTO T-267)	Liquid Limit, % (AASHTO T-89)	Plastic Limit, % (AASHTO T-90)	Plasticity Index, % (AASHTO T-90)	Specific Gravity (AASHTO T-100)	Maximum Dry Density, lb/ft³	Optimum Moisture Content, %	AASHTO Classification (M-145)	% < 0.002 mm	% Fines	USCS Classification (ASTM D-2487)
BP-1	S-2	2.5	4	17.4	-	46	18	28	-	-	-	A-7-6	-	61.9	CL
BP-2	S-2	2.5	4	24.0	-	49	20	29	-	-	-	A-7-6	-	48.0	SC
BP-3	Bulk	0	5	13.9	-	38	17	21	-	125.3	10.8	A-6	-	37.7	SC
BP-4	S-2	2.5	4	15.5	-	-	-	-	-	-	-	-	-	-	-
BP-5	Bulk	5 to 10		26.7	-	38	17	21	-	123.3	11.0	A-6	-	69.2	CL
BS-1	S-2	2.5	4	17.5	-	32	16	16	-	-	-	A-2-6	-	32.7	SC
BS-2	S-2	2.5	4	24.5	-	-	-	-	-	-	-	-	-	-	-
BS-3	S-1	0	1.5	22.1	-	-	-	-	-	-	-	-	-	-	-
BS-3	S-2	2.5	4	19.6	-	28	16	12	-	-	-	A-6	-	62.5	CL
BS-4	S-2	2.5	4	16.8	-	-	-	-	-	-	-	-	-	-	-
BS-4	S-4	8.5	10	13.5	-	-	-	-	-	-	-	-	-	-	-
BS-5	S-2	2.5	4	15.4	-	-	-	-	-	-	-	-	-	-	-
HA-1	S-2	2.5	4	22.9	-	-	-	-	-	-	-	-	-	-	-
HA-2	S-2	2.5	4	23.1	-	38	17	21	-	-	-	A-6	-	62.4	CL
SWM-1	S-3	4	6	16.5	-	-	-	-	-	-	-	-	24.8	-	-
SWM-2	S-3	4	6	20.5	-	-	-	-	-	-	-	-	28.8	-	-
SWM-3	S-3	4	6	18.3	-	-	-	-	-	-	-	-	24.0	-	-
SWM-4	S-3	4	6	14.1	-	-	-	-	-	-	-	-	24.6	-	-
SWM-5	S-3	4	6	23.1	-	-	-	-	-	-	-	-	29.7	-	-
SWM-6	S-3	4	6	20.0	-	-	-	-	-	-	-	-	23.1	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Quiet Waters Park

Project Number: 22140028.000

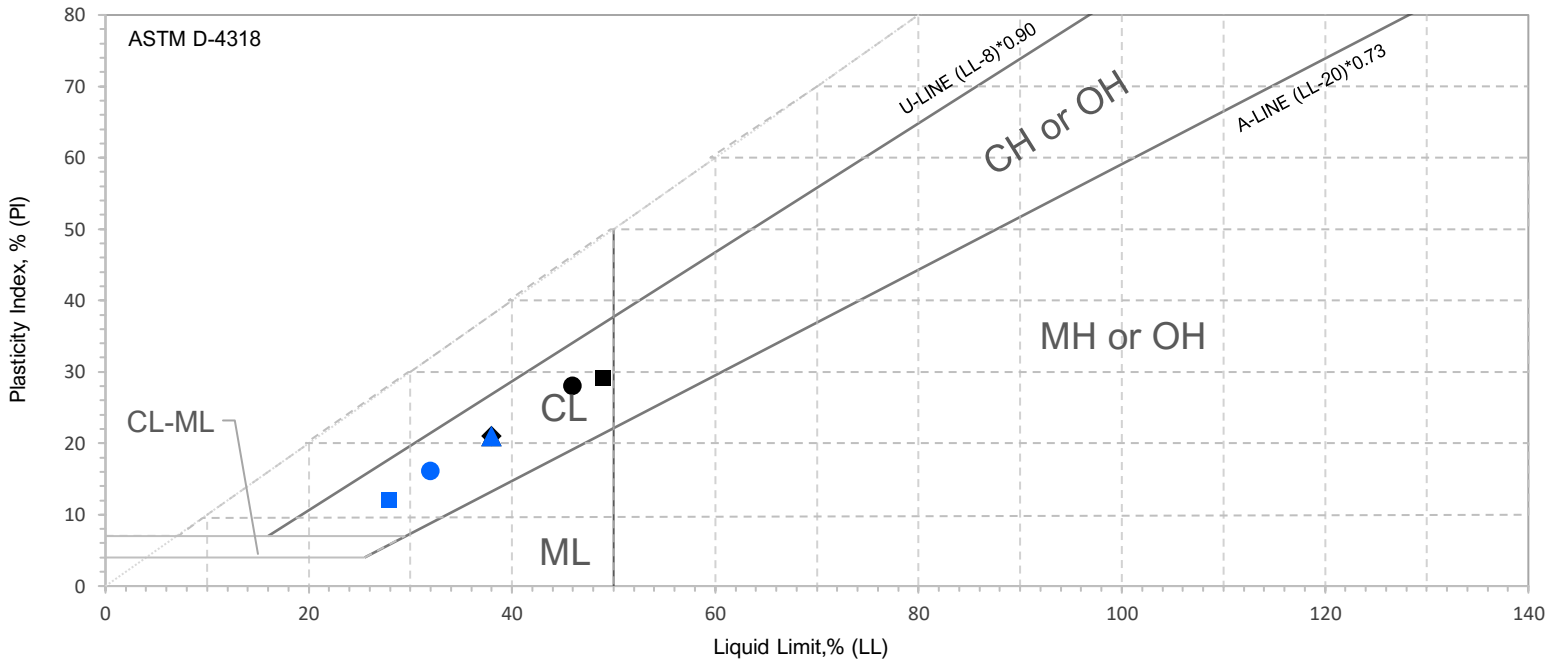
Location: Annapolis, MD

Sample Date: 12/01-12/02/22

Jay Kay Testing
(814) 404-9283
www.jaykaytesting.com

Summary of Atterberg Limit Testing

Atterberg Limit Results



	Boring ID	Sample ID	Top	Btm	LL	PL	PI		Boring ID	Sample ID	Top	Btm	LL	PL	PI
●	BP-1	S-2	2.5	4	46	18	28								
■	BP-2	S-2	2.5	4	49	20	29								
▲	BP-3	Bulk	0	5	38	17	21								
◆	BP-5	Bulk	0	5	38	17	21								
●	BS-1	S-2	2.5	4	32	16	16								
■	BS-3	S-2	2.5	4	28	16	12								
▲	HA-2	S-2	2.5	4	38	17	21								

Quiet Waters Park

Project Number: 22140028.000

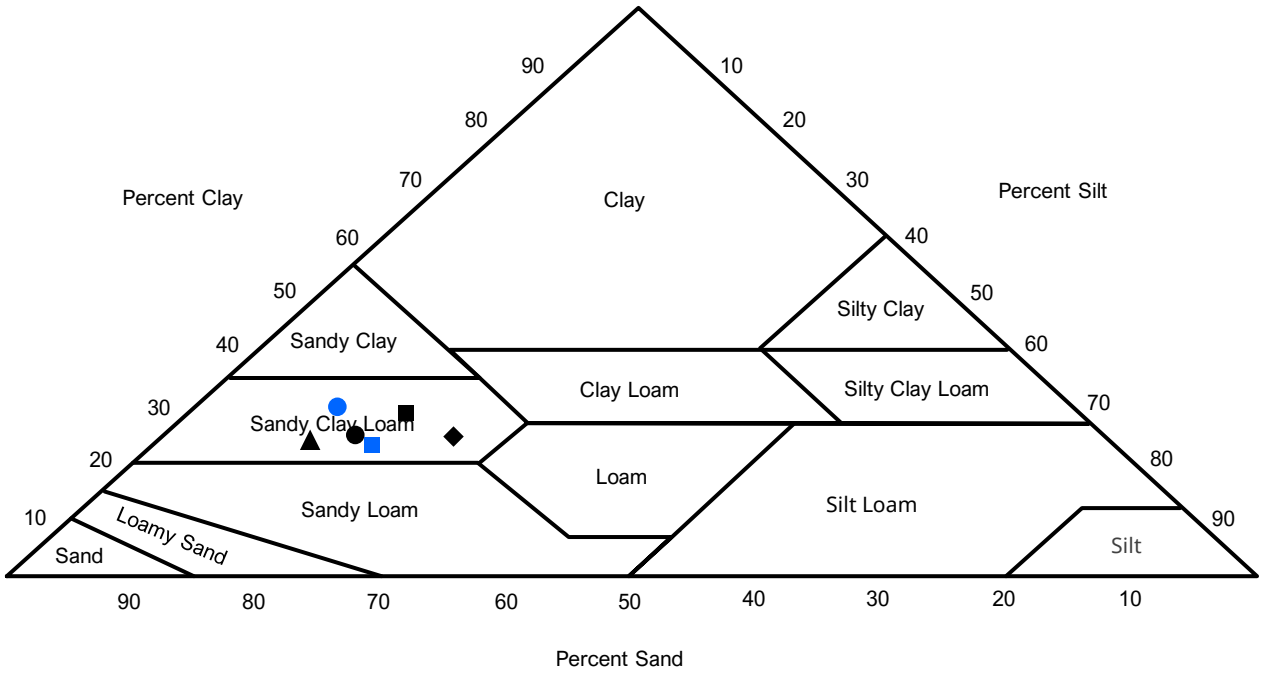
Location: Annapolis, MD

Sample Date: 12/01-12/02/22

USDA Soil Textural Analysis

Jay Kay Testing
(814) 404-9283
www.jaykaytesting.com

Summary of USDA Results



	Boring ID	Sample ID	Top	Btm	% Sand	% Silt	% Clay	USDA Texture
●	SWM-1	S-3	4	6	59.9%	15.3%	24.8%	Sandy Clay Loam
■	SWM-2	S-3	4	6	53.9%	17.3%	28.8%	Sandy Clay Loam
▲	SWM-3	S-3	4	6	63.9%	12.1%	24.0%	Sandy Clay Loam
◆	SWM-4	S-3	4	6	52.1%	23.3%	24.6%	Sandy Clay Loam
●	SWM-5	S-3	4	6	58.9%	11.4%	29.7%	Sandy Clay Loam
■	SWM-6	S-3	4	6	59.4%	17.5%	23.1%	Sandy Clay Loam

Quiet Waters Park

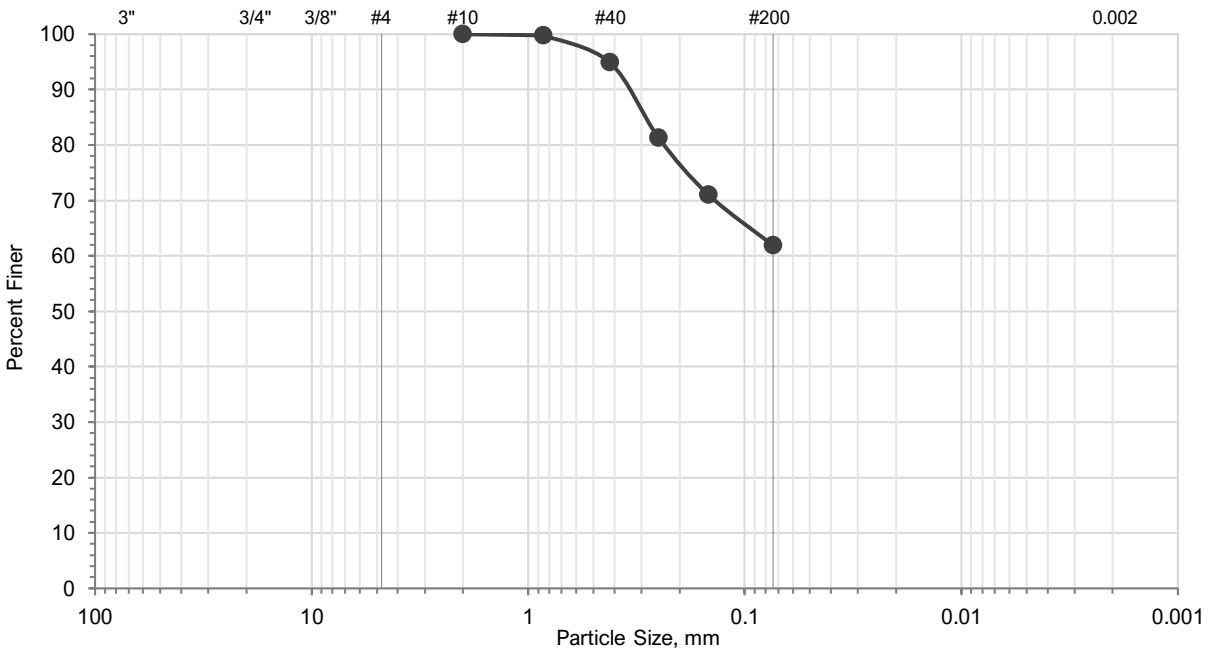
Project Number: 22140028.000

Jay Kay Testing

Boring ID	Sample ID	Top	Btm
BP-1	S-2	2.5'	4'

Location: Annapolis, MD

Sample Date: 12/01-12/02/22

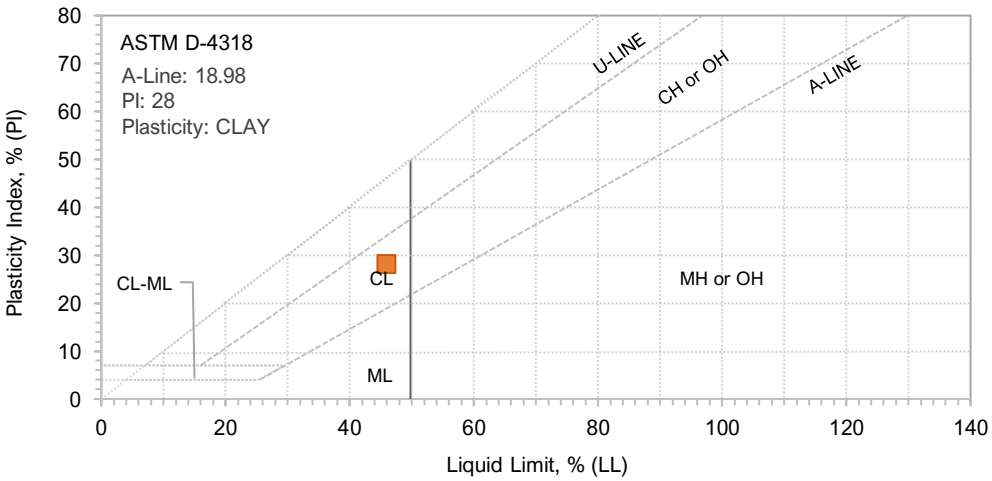


AASHTO T-88

Sieve	Size	Pass, %
-	mm	%
6"	150.0	-
3"	75.0	-
2"	50.8	-
1.5"	37.5	-
1"	25.4	-
3/4"	19.0	-
1/2"	12.7	-
3/8"	9.51	-
#4	4.75	-
#10	2.00	100.0
#20	0.85	99.8
#40	0.42	94.9
#60	0.25	81.3
#100	0.147	71.0
#200	0.074	61.9

% Gravel			% Sand				
Coarse	Fine	Total	Coarse	Medium	Fine	Total	
0.0	0.0	= 0.0	0.0	5.1	33.0	= 38.1	

D10	-		
D30	-	CC	-
D60	-	CU	-



Liquid Limit, %	46
Plastic Limit, %	18
Plasticity Index, %	28

USCS (D-2487)	AASHTO (M-145)
CL	A-7-6

Soil Description (D-2487)

Brown sandy lean CLAY

NMC	17.4%		Sample Type*	Jar	Data 4 -
OM	-		Data 2	-	Data 5 -
			Data 3	-	Data 6 -
+ 3/8"	0.0%				

12/14/22 Tested by: ST/JT Reviewed by: SF Jay Kay Testing

Quiet Waters Park

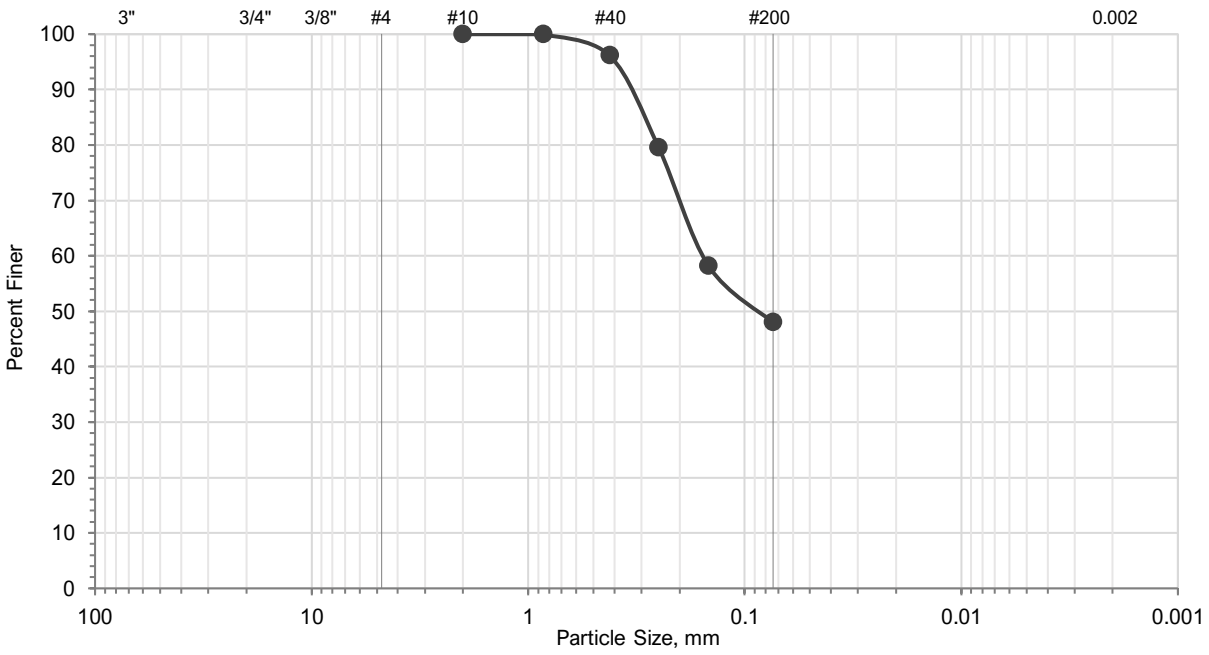
Project Number: 22140028.000

Jay Kay Testing

Boring ID	Sample ID	Top	Btm
BP-2	S-2	2.5'	4'

Location: Annapolis, MD

Sample Date: 12/01-12/02/22

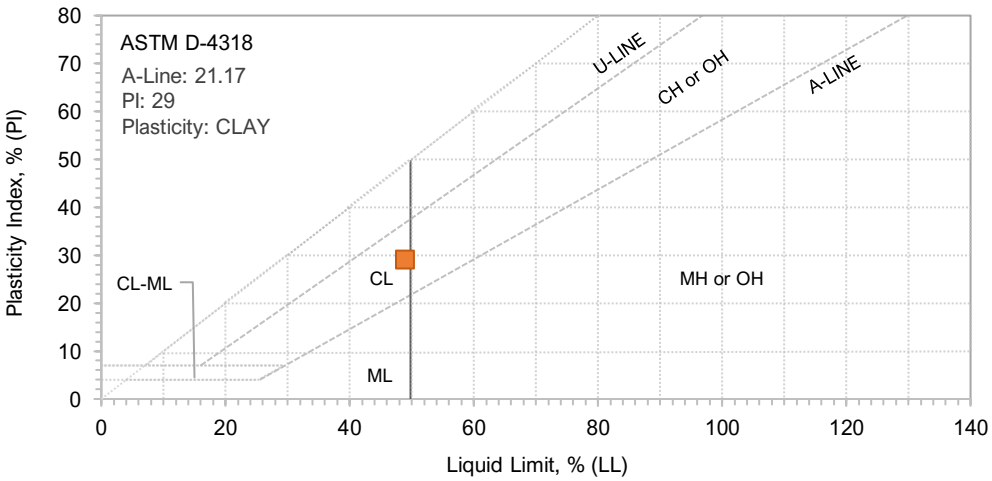


AASHTO T-88

Sieve	Size	Pass, %
-	mm	%
6"	150.0	-
3"	75.0	-
2"	50.8	-
1.5"	37.5	-
1"	25.4	-
3/4"	19.0	-
1/2"	12.7	-
3/8"	9.51	-
#4	4.75	-
#10	2.00	100.0
#20	0.85	99.9
#40	0.42	96.1
#60	0.25	79.6
#100	0.147	58.2
#200	0.074	48.0

% Gravel			% Sand				
Coarse	Fine	Total	Coarse	Medium	Fine	Total	
0.0	0.0	= 0.0	0.0	3.9	48.1	= 52.0	

D10	-		
D30	-	CC	-
D60	-	CU	-



Liquid Limit, %	49
Plastic Limit, %	20
Plasticity Index, %	29

USCS (D-2487)	AASHTO (M-145)
SC	A-7-6

Soil Description (D-2487)

Dark greenish-brown clayey SAND

NMC	24.0%	Sample Type*	Jar	Data 4	-
OM	-	Data 2	-	Data 5	-
		Data 3	-	Data 6	-
+ 3/8"	0.0%				

12/14/22 Tested by: ST/JT Reviewed by: SF Jay Kay Testing

Quiet Waters Park

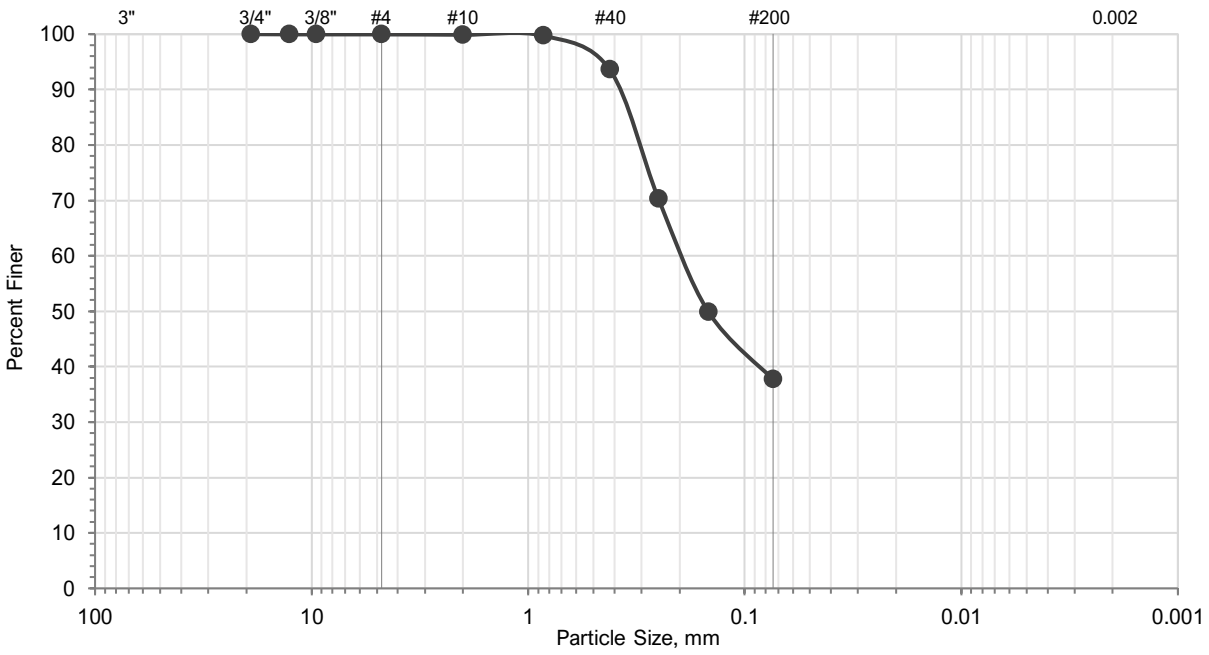
Project Number: 22140028.000

Jay Kay Testing

Boring ID	Sample ID	Top	Btm
BP-3	Bulk	0'	5'

Location: Annapolis, MD

Sample Date: 12/01-12/02/22

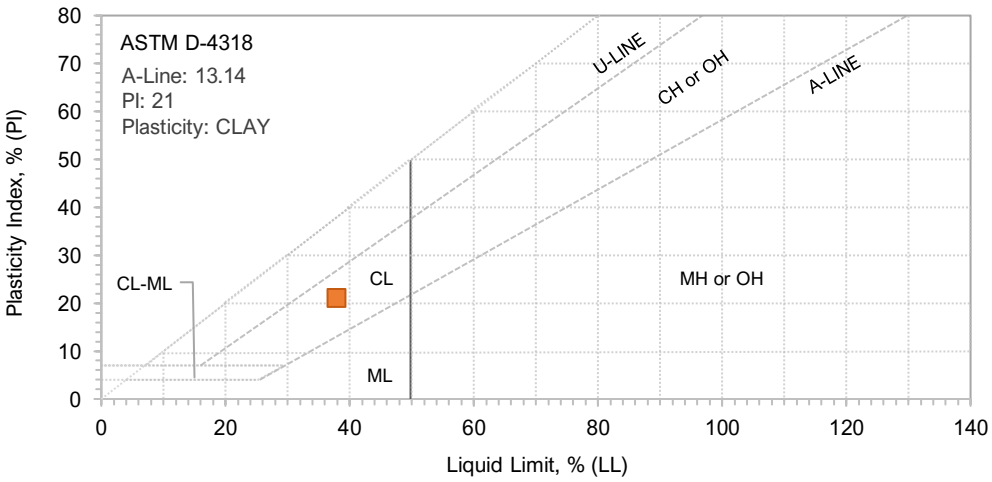


AASHTO T-88

Sieve	Size	Pass, %
-	mm	%
6"	150.0	-
3"	75.0	-
2"	50.8	-
1.5"	37.5	-
1"	25.4	-
3/4"	19.0	100.0
1/2"	12.7	99.9
3/8"	9.51	99.9
#4	4.75	99.9
#10	2.00	99.9
#20	0.85	99.7
#40	0.42	93.6
#60	0.25	70.3
#100	0.147	49.9
#200	0.074	37.7

% Gravel				% Sand				
Coarse	Fine		Total	Coarse	Medium	Fine		Total
0.0	0.1	=	0.1	0.0	6.3	55.9	=	62.2

D10	-		
D30	-	CC	-
D60	-	CU	-



Liquid Limit, %	38
Plastic Limit, %	17
Plasticity Index, %	21

USCS (D-2487)	AASHTO (M-145)
SC	A-6

Soil Description (D-2487)

Dark greenish-brown clayey SAND

NMC	13.9%		Sample Type*	Bulk	Data 4 -
OM	-		Data 2	-	Data 5 -
			Data 3	-	Data 6 -
+ 3/8"	0.0%				

Quiet Waters Park

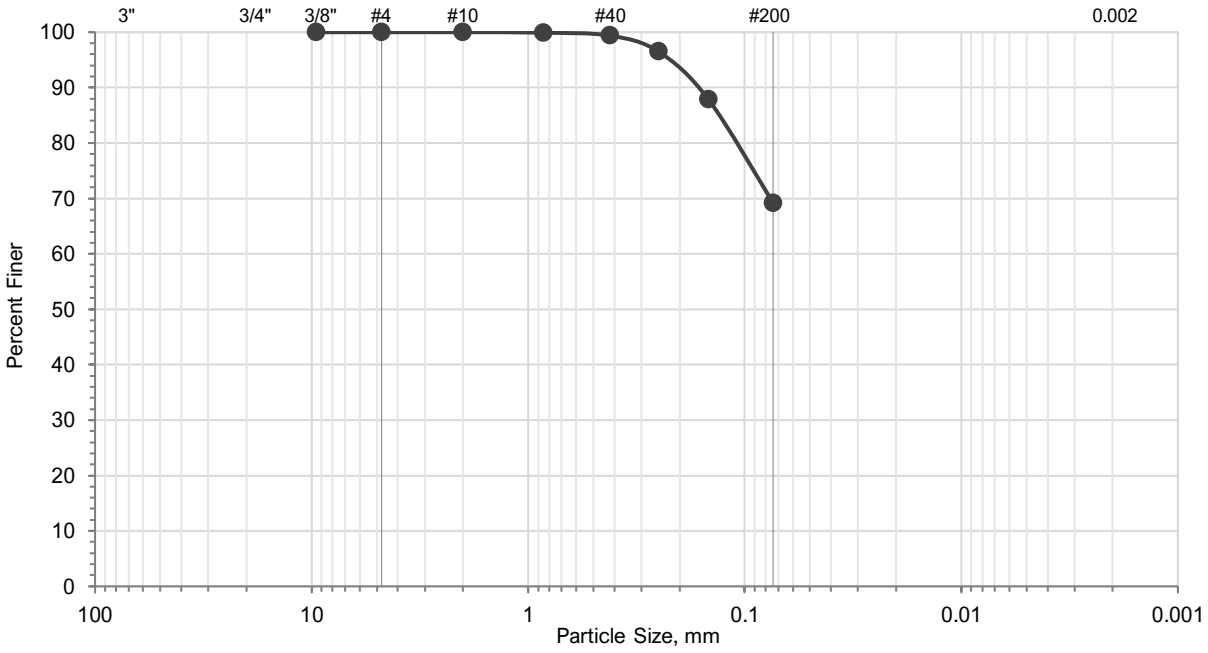
Project Number: 22140028.000

Jay Kay Testing

Boring ID	Sample ID	Top	Btm
BP-5	Bulk	0'	5'

Location: Annapolis, MD

Sample Date: 12/01-12/02/22

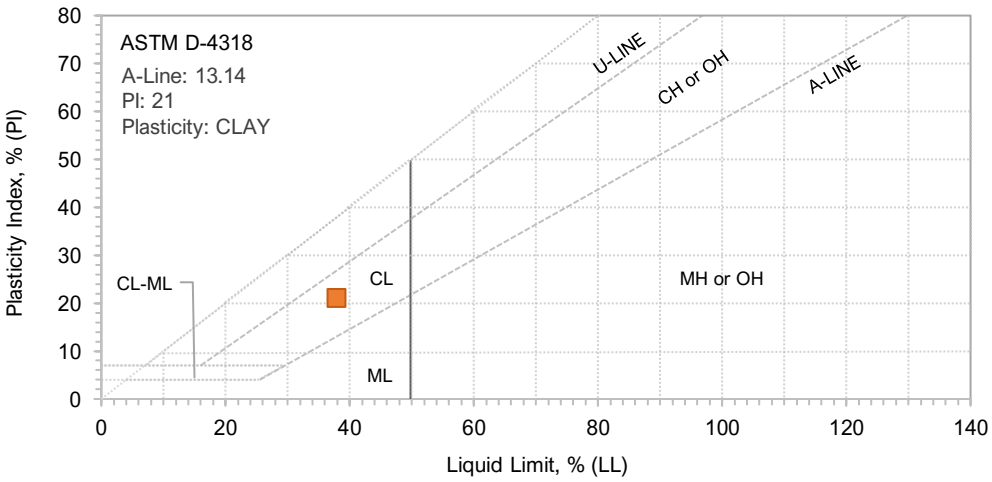


AASHTO T-88

Sieve	Size	Pass, %
-	mm	%
6"	150.0	-
3"	75.0	-
2"	50.8	-
1.5"	37.5	-
1"	25.4	-
3/4"	19.0	-
1/2"	12.7	-
3/8"	9.51	100.0
#4	4.75	99.9
#10	2.00	99.9
#20	0.85	99.9
#40	0.42	99.4
#60	0.25	96.5
#100	0.147	87.8
#200	0.074	69.2

% Gravel				% Sand				
Coarse	Fine		Total	Coarse	Medium	Fine		Total
0.0	0.1	=	0.1	0.0	0.5	30.2	=	30.7

D10	-		
D30	-	CC	-
D60	-	CU	-



Liquid Limit, %	38
Plastic Limit, %	17
Plasticity Index, %	21

USCS (D-2487)	AASHTO (M-145)
CL	A-6

Soil Description (D-2487)

Brown sandy lean CLAY

NMC	26.7%		Sample Type*	Bulk		Data 4	-
OM	-		Data 2	-		Data 5	-
			Data 3	-		Data 6	-
+ 3/8"	0.0%						

Quiet Waters Park

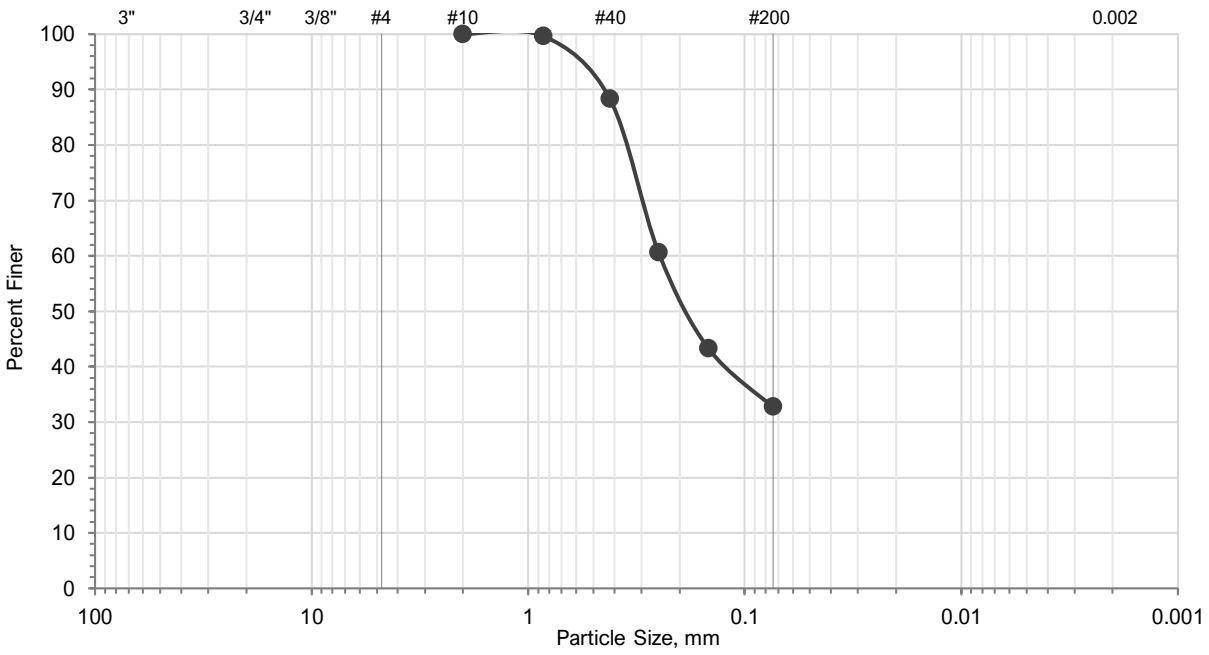
Project Number: 22140028.000

Jay Kay Testing

Boring ID	Sample ID	Top	Btm
BS-1	S-2	2.5'	4'

Location: Annapolis, MD

Sample Date: 12/01-12/02/22

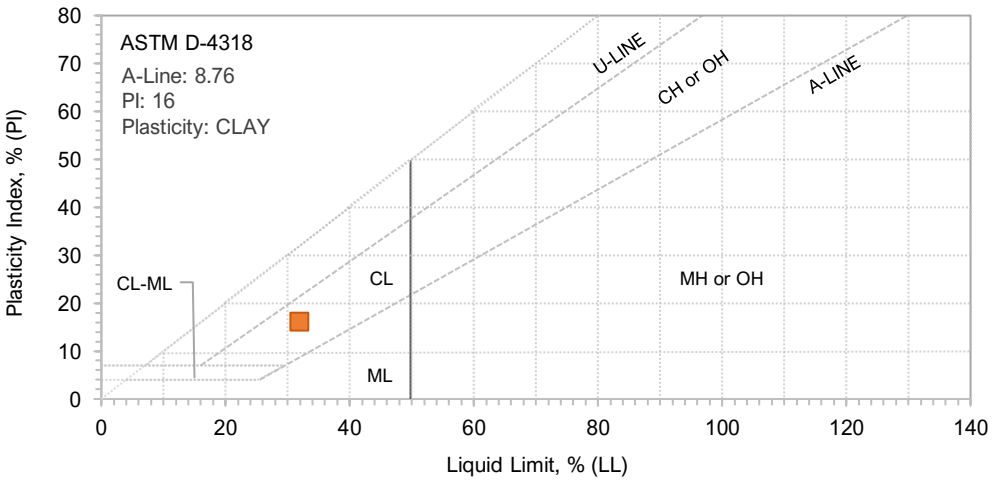


AASHTO T-88

Sieve	Size	Pass, %
-	mm	%
6"	150.0	-
3"	75.0	-
2"	50.8	-
1.5"	37.5	-
1"	25.4	-
3/4"	19.0	-
1/2"	12.7	-
3/8"	9.51	-
#4	4.75	-
#10	2.00	100.0
#20	0.85	99.7
#40	0.42	88.4
#60	0.25	60.6
#100	0.147	43.3
#200	0.074	32.7

% Gravel			% Sand				
Coarse	Fine	Total	Coarse	Medium	Fine	Total	
0.0	0.0	= 0.0	0.0	11.6	55.7	= 67.3	

D10	-		
D30	-	CC	-
D60	-	CU	-



Liquid Limit, %	32
Plastic Limit, %	16
Plasticity Index, %	16

USCS (D-2487)	AASHTO (M-145)
SC	A-2-6

Soil Description (D-2487)

Brown clayey SAND

NMC	17.5%		Sample Type*	Jar	Data 4 -
OM	-		Data 2	-	Data 5 -
+ 3/8"	0.0%		Data 3	-	Data 6 -

Quiet Waters Park

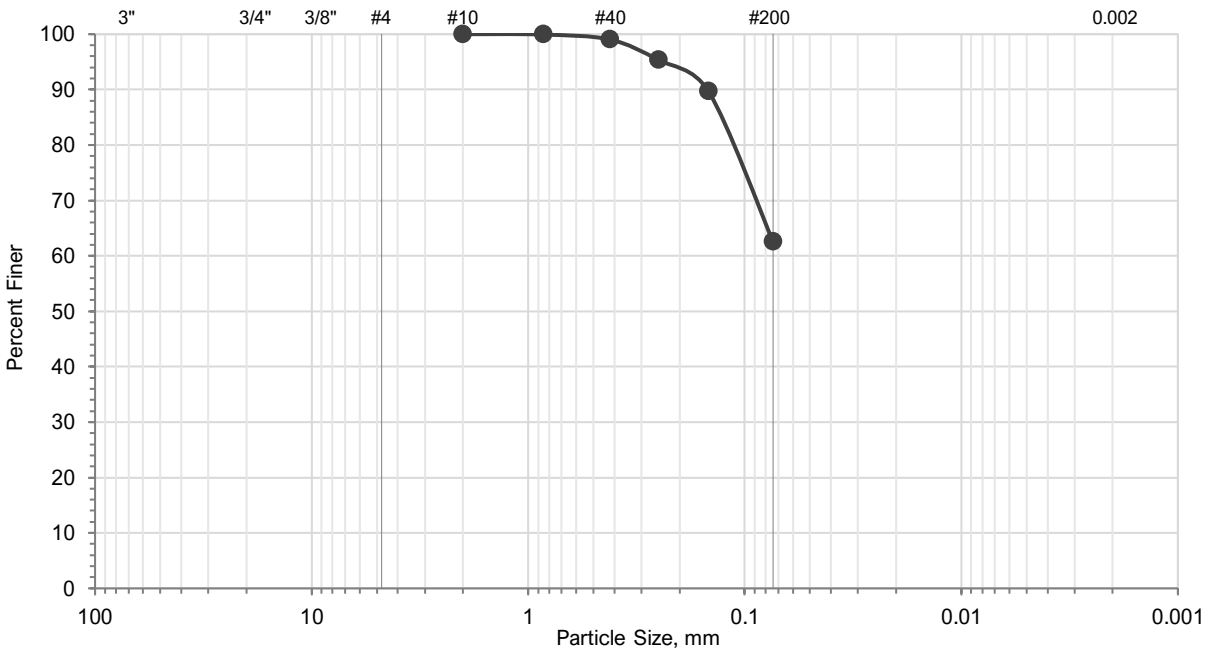
Project Number: 22140028.000

Jay Kay Testing

Boring ID	Sample ID	Top	Btm
BS-3	S-2	2.5'	4'

Location: Annapolis, MD

Sample Date: 12/01-12/02/22

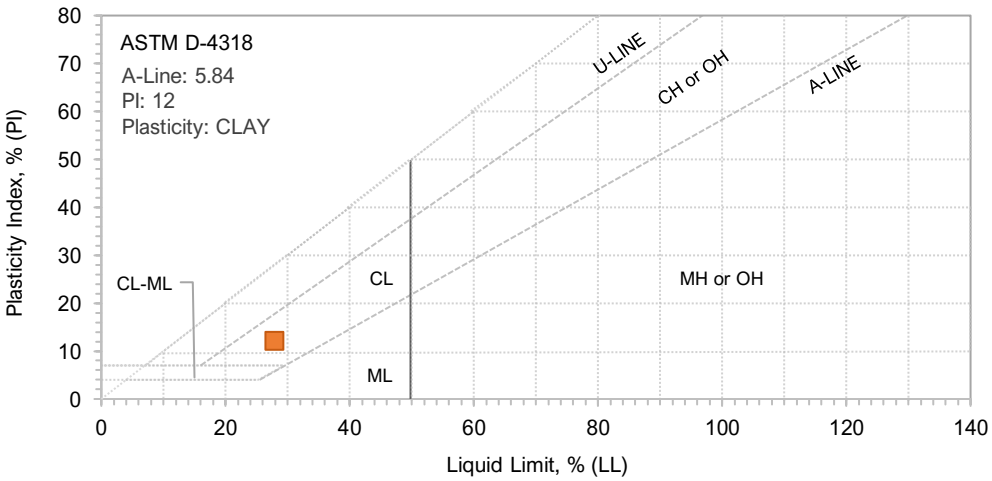


AASHTO T-88

Sieve	Size	Pass, %
-	mm	%
6"	150.0	-
3"	75.0	-
2"	50.8	-
1.5"	37.5	-
1"	25.4	-
3/4"	19.0	-
1/2"	12.7	-
3/8"	9.51	-
#4	4.75	-
#10	2.00	100.0
#20	0.85	99.9
#40	0.42	99.0
#60	0.25	95.3
#100	0.147	89.7
#200	0.074	62.5

% Gravel			% Sand				
Coarse	Fine	Total	Coarse	Medium	Fine	Total	
0.0	0.0	= 0.0	0.0	1.0	36.5	= 37.5	

D10	-		
D30	-	CC	-
D60	-	CU	-



Liquid Limit, %	28
Plastic Limit, %	16
Plasticity Index, %	12

USCS (D-2487)	AASHTO (M-145)
CL	A-6

Soil Description (D-2487)

Light brown sandy lean CLAY

NMC	19.6%		Sample Type*	Jar	Data 4 -
OM	-		Data 2	-	Data 5 -
+ 3/8"	0.0%		Data 3	-	Data 6 -

Quiet Waters Park

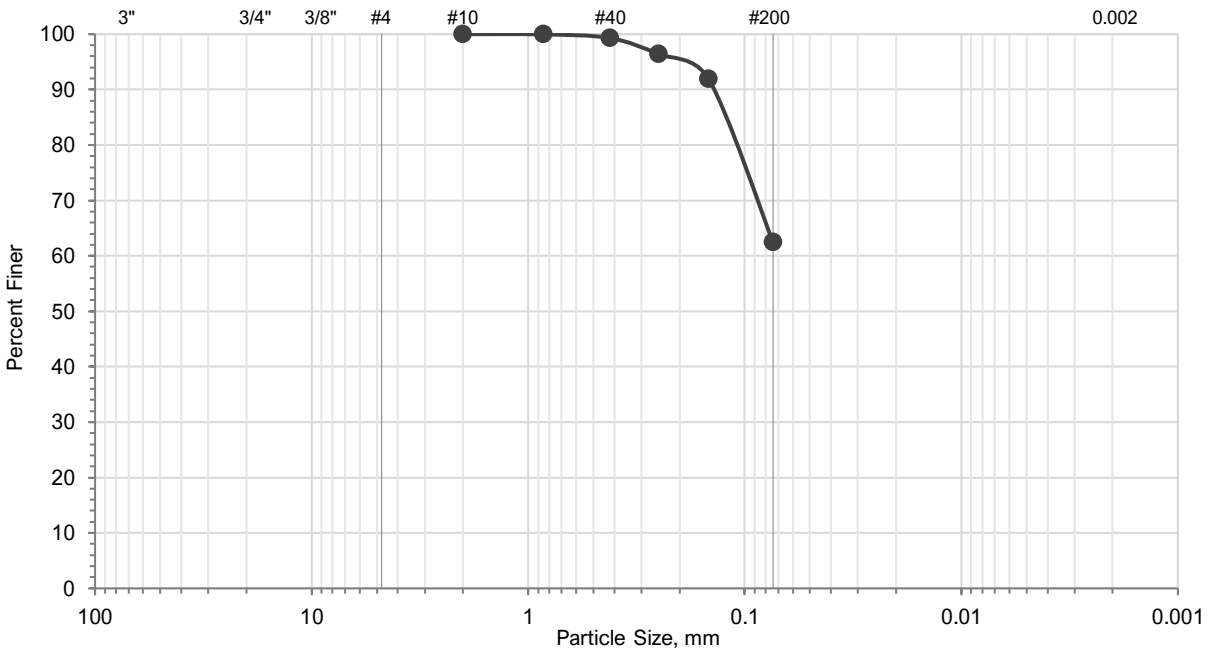
Project Number: 22140028.000

Jay Kay Testing

Boring ID	Sample ID	Top	Btm
HA-2	S-2	2.5'	4'

Location: Annapolis, MD

Sample Date: 12/01-12/02/22

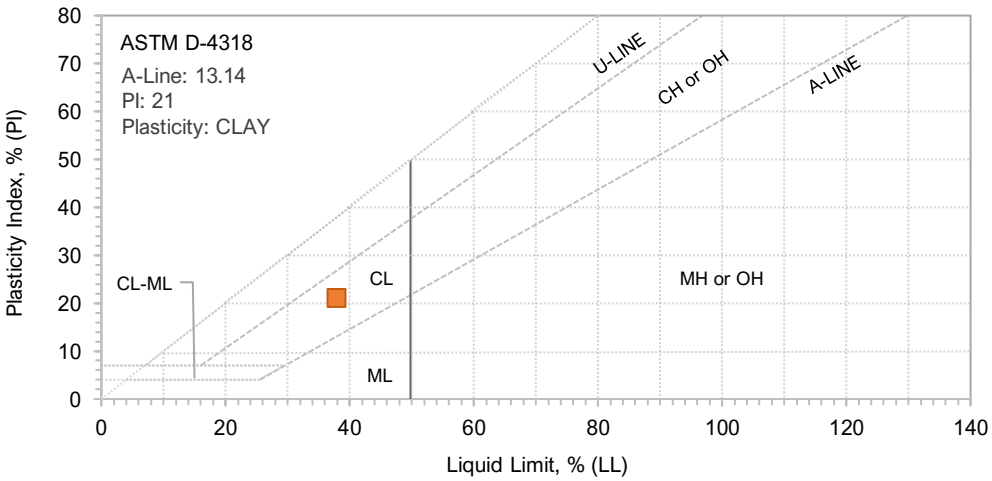


AASHTO T-88

Sieve	Size	Pass, %
-	mm	%
6"	150.0	-
3"	75.0	-
2"	50.8	-
1.5"	37.5	-
1"	25.4	-
3/4"	19.0	-
1/2"	12.7	-
3/8"	9.51	-
#4	4.75	-
#10	2.00	100.0
#20	0.85	99.9
#40	0.42	99.3
#60	0.25	96.4
#100	0.147	91.9
#200	0.074	62.4

% Gravel			% Sand				
Coarse	Fine	Total	Coarse	Medium	Fine	Total	
0.0	0.0	= 0.0	0.0	0.7	36.9	= 37.6	

D10	-		
D30	-	CC	-
D60	-	CU	-



Liquid Limit, %	38
Plastic Limit, %	17
Plasticity Index, %	21

USCS (D-2487)	AASHTO (M-145)
CL	A-6

Soil Description (D-2487)

Brown sandy lean CLAY

NMC	23.1%	Sample Type*	Jar	Data 4	-
OM	-	Data 2	-	Data 5	-
		Data 3	-	Data 6	-
+ 3/8"	0.0%				

12/14/22 Tested by: ST/JT Reviewed by: SF Jay Kay Testing

Quiet Waters Park

Project Number: 22140028.000

Jay Kay Testing

Boring ID	Sample ID	Top	Btm
SWM-1	S-3	4'	6'

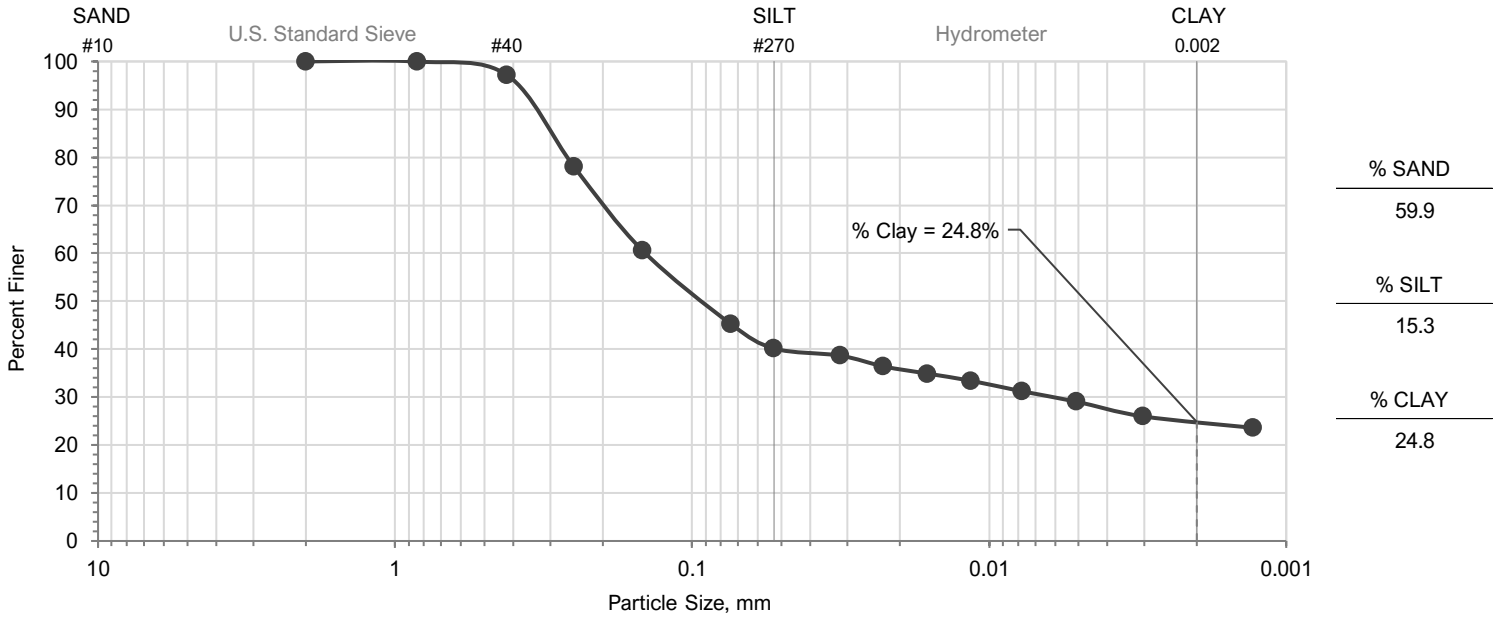
Location: Annapolis, MD

Sample Date: 12/01-12/02/22

USDA Summation Curve

Test Method: AASHTO T-88

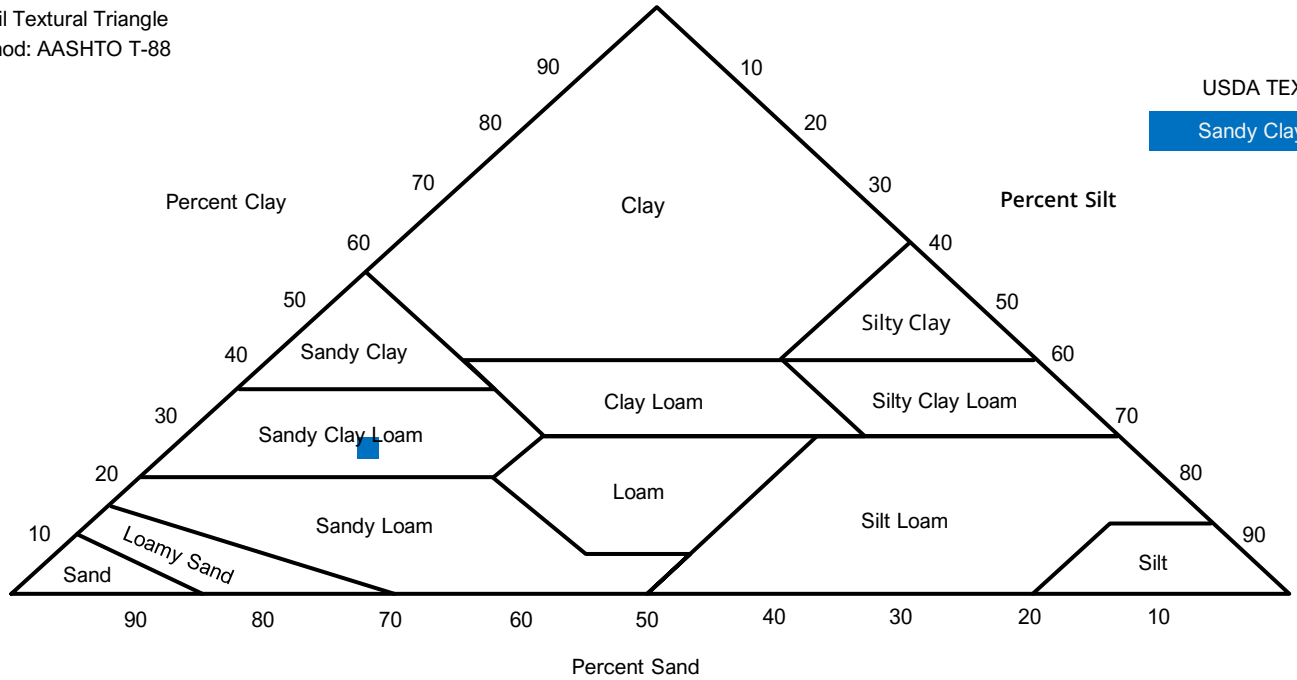
USDA Soil Textural Analysis



% SAND	% SILT	% CLAY
59.9	15.3	24.8

USDA Soil Textural Triangle

Test Method: AASHTO T-88



USDA TEXTURE

Sandy Clay Loam

NMC	LL	PL	PI
16.5%	-	-	-

12/14/22 Tested by: ST/JT Reviewed by: SF Jay Kay Testing

Quiet Waters Park

Project Number: 22140028.000

Jay Kay Testing

Boring ID	Sample ID	Top	Btm
SWM-2	S-3	4'	6'

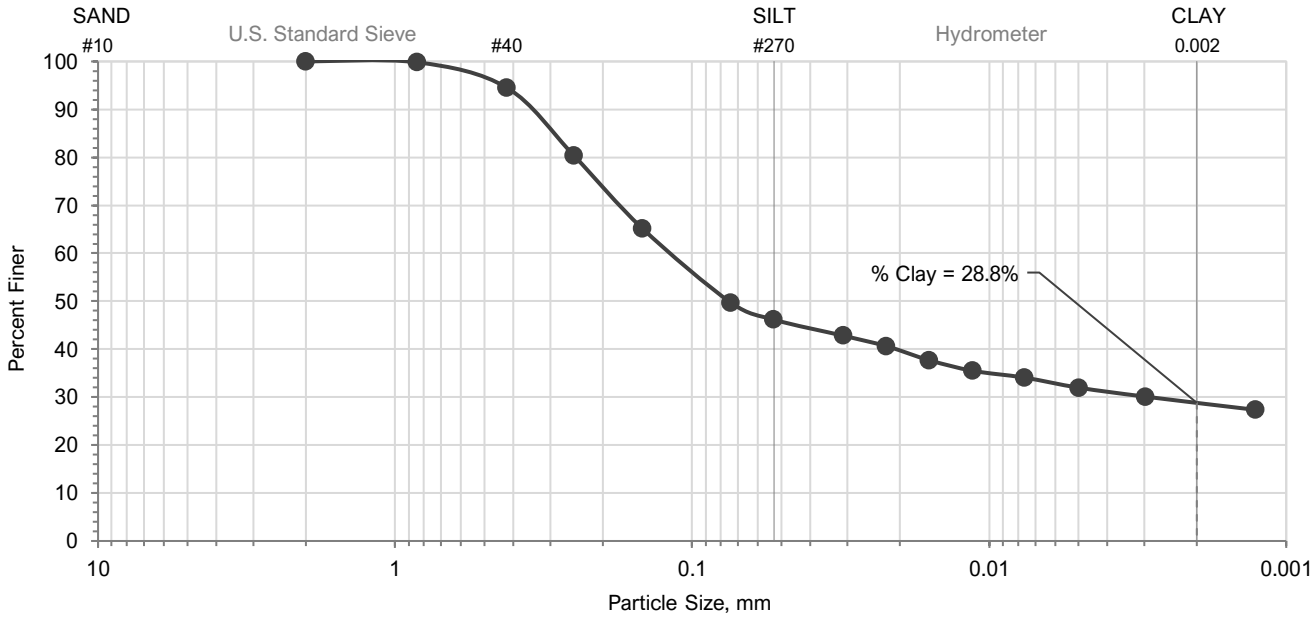
Location: Annapolis, MD

Sample Date: 12/01-12/02/22

USDA Summation Curve

Test Method: AASHTO T-88

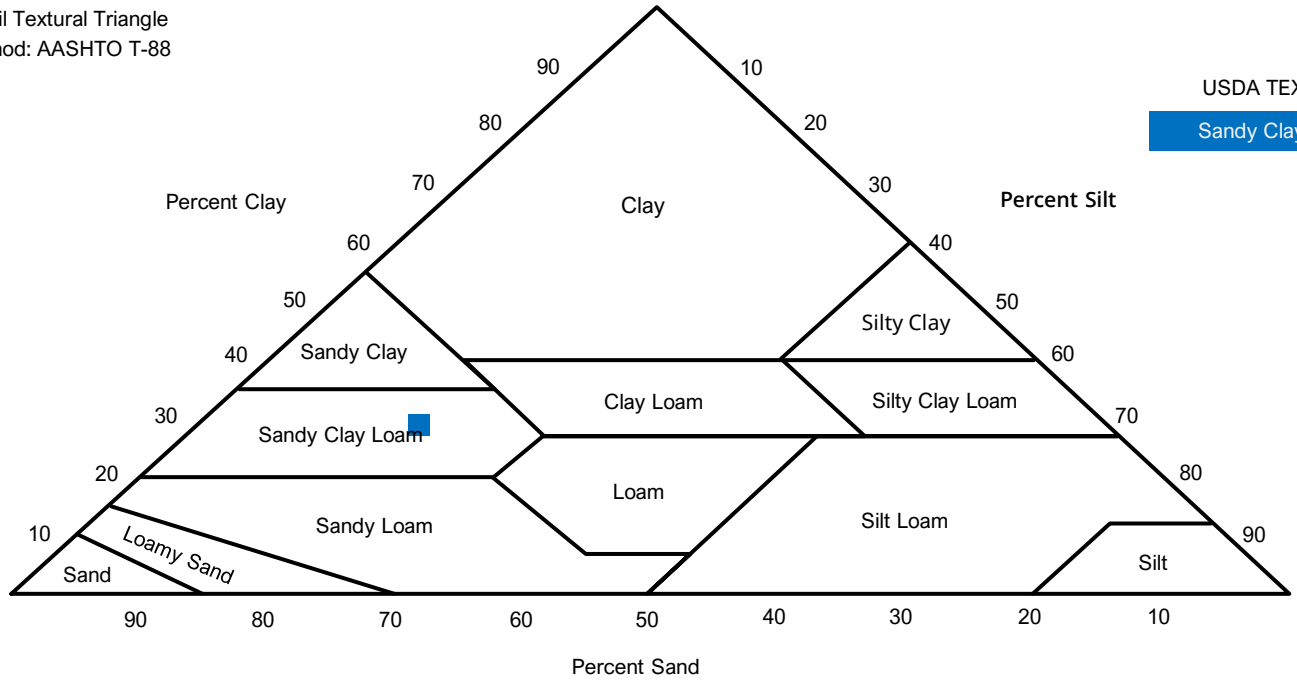
USDA Soil Textural Analysis



% SAND	% SILT	% CLAY
53.9	17.3	28.8

USDA Soil Textural Triangle

Test Method: AASHTO T-88



USDA TEXTURE

Sandy Clay Loam

NMC	LL	PL	PI
20.5%	-	-	-

12/14/22 Tested by: ST/JT Reviewed by: SF Jay Kay Testing

Quiet Waters Park

Project Number: 22140028.000

Jay Kay Testing

Boring ID	Sample ID	Top	Btm
SWM-3	S-3	4'	6'

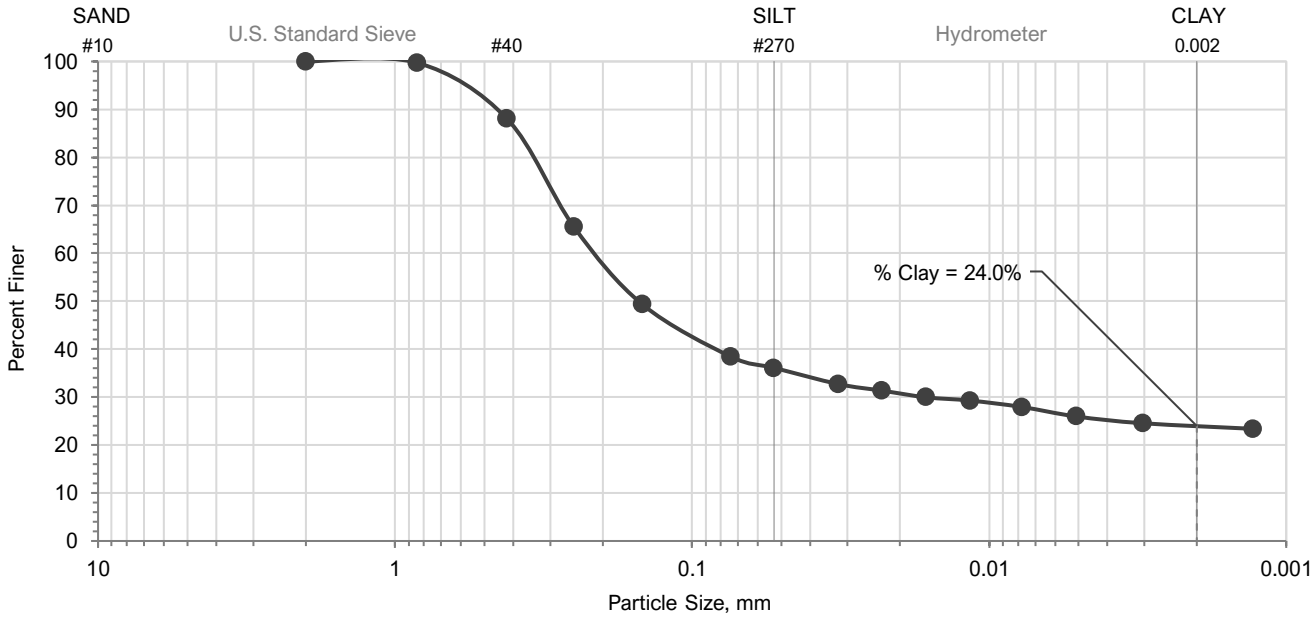
Location: Annapolis, MD

Sample Date: 12/01-12/02/22

USDA Summation Curve

Test Method: AASHTO T-88

USDA Soil Textural Analysis



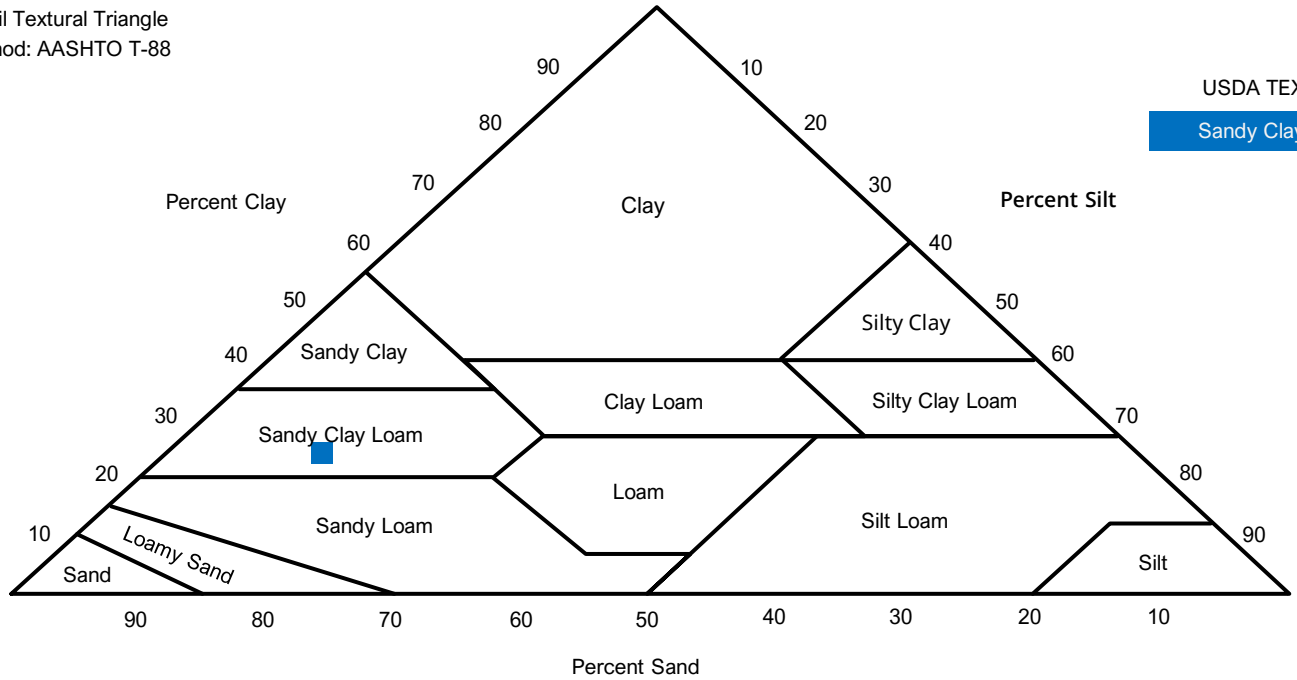
% SAND
63.9

% SILT
12.1

% CLAY
24.0

USDA Soil Textural Triangle

Test Method: AASHTO T-88



USDA TEXTURE

Sandy Clay Loam

NMC	LL	PL	PI
18.3%	-	-	-

12/14/22 Tested by: ST/JT Reviewed by: SF Jay Kay Testing

Quiet Waters Park

Project Number: 22140028.000

Jay Kay Testing

Boring ID	Sample ID	Top	Btm
SWM-4	S-3	4'	6'

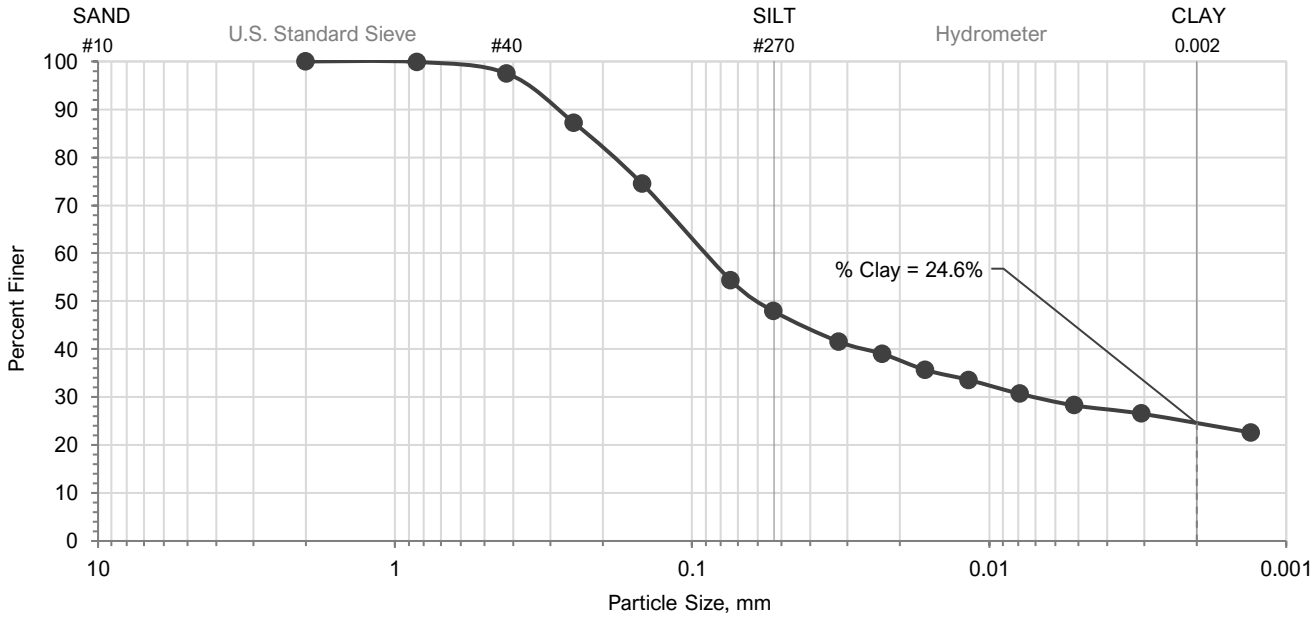
Location: Annapolis, MD

Sample Date: 12/01-12/02/22

USDA Summation Curve

Test Method: AASHTO T-88

USDA Soil Textural Analysis



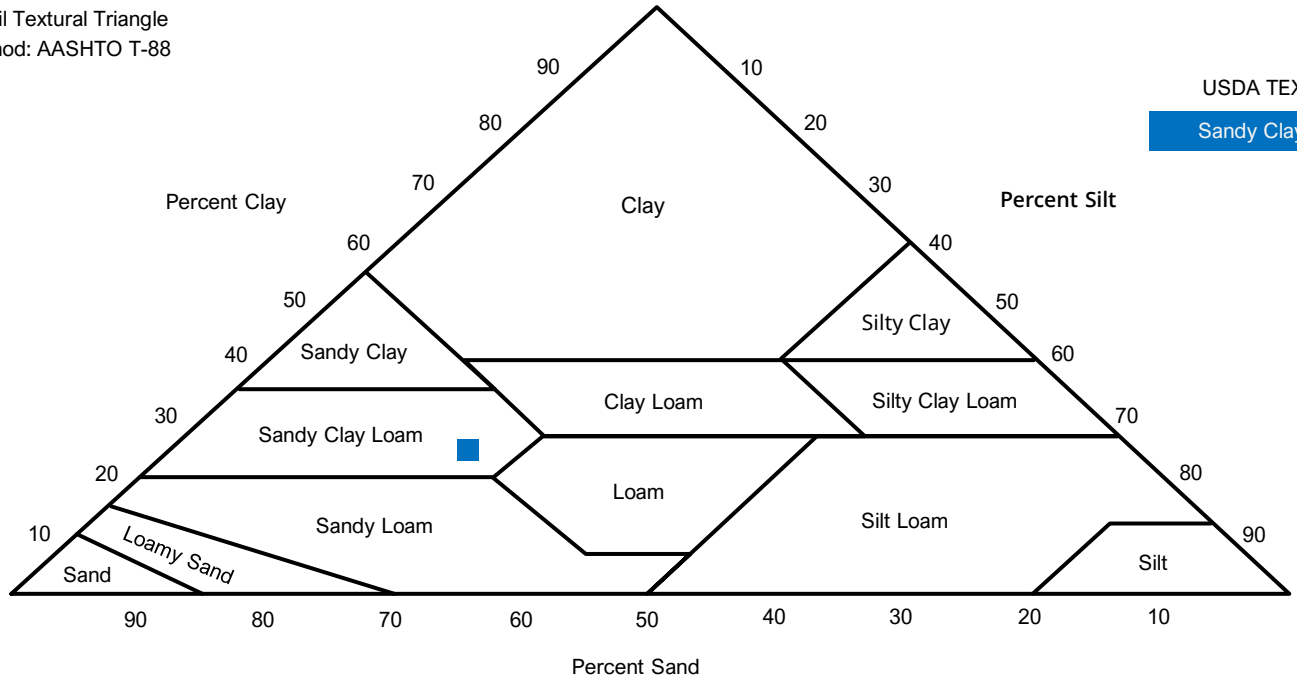
% SAND
52.1

% SILT
23.3

% CLAY
24.6

USDA Soil Textural Triangle

Test Method: AASHTO T-88



USDA TEXTURE

Sandy Clay Loam

NMC	LL	PL	PI
14.1%	-	-	-

12/14/22 Tested by: ST/JT Reviewed by: SF Jay Kay Testing

Quiet Waters Park

Project Number: 22140028.000

Jay Kay Testing

Boring ID	Sample ID	Top	Btm
SWM-5	S-3	4'	6'

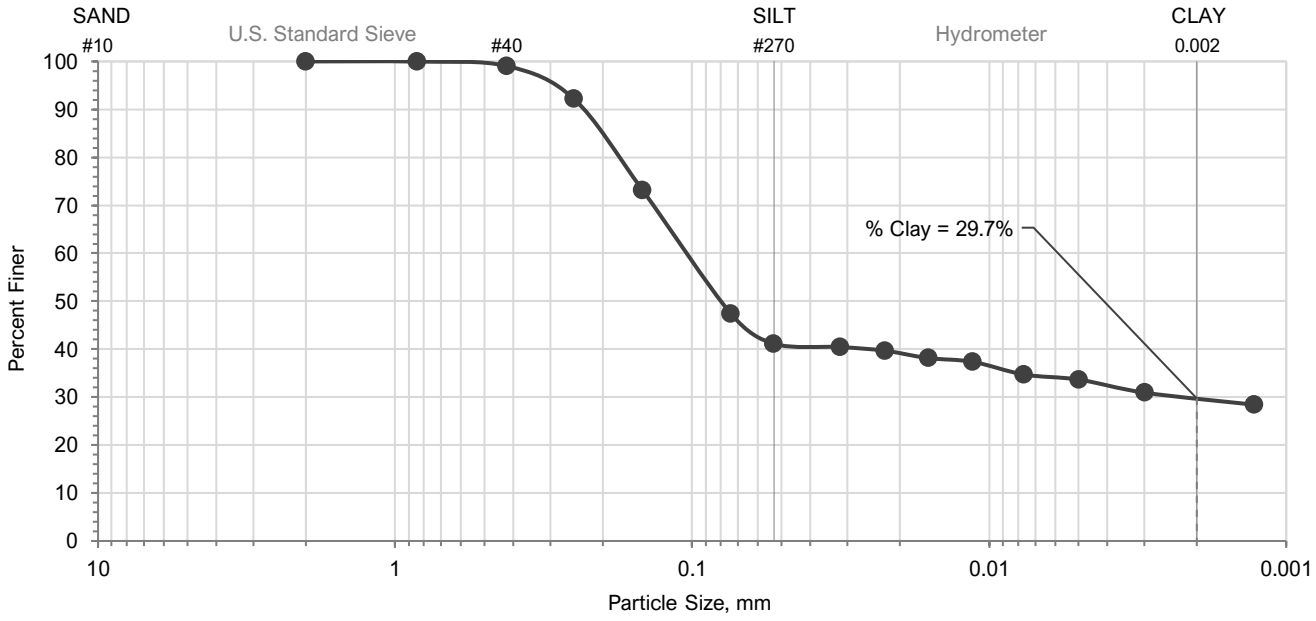
Location: Annapolis, MD

Sample Date: 12/01-12/02/22

USDA Summation Curve

Test Method: AASHTO T-88

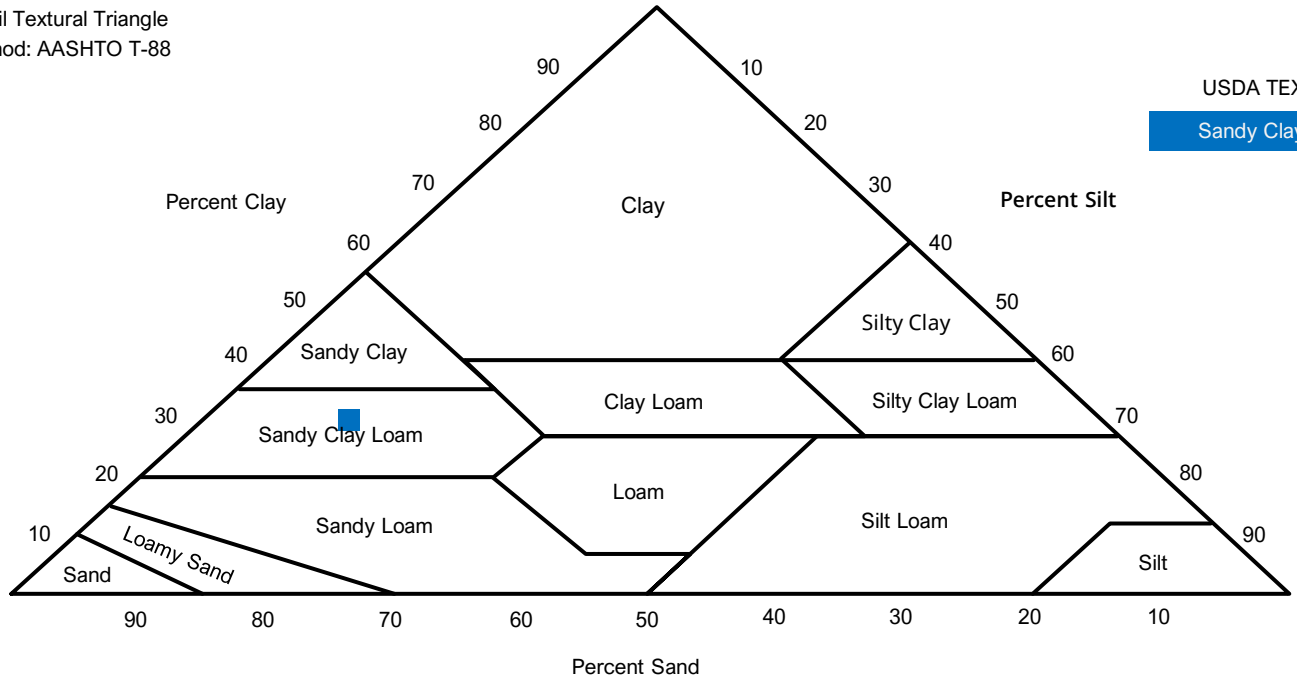
USDA Soil Textural Analysis



% SAND	% SILT	% CLAY
58.9	11.4	29.7

USDA Soil Textural Triangle

Test Method: AASHTO T-88



USDA TEXTURE

Sandy Clay Loam

NMC	LL	PL	PI
23.1%	-	-	-

12/14/22 Tested by: ST/JT Reviewed by: SF Jay Kay Testing

Quiet Waters Park

Project Number: 22140028.000

Jay Kay Testing

Boring ID	Sample ID	Top	Btm
SWM-6	S-3	4'	6'

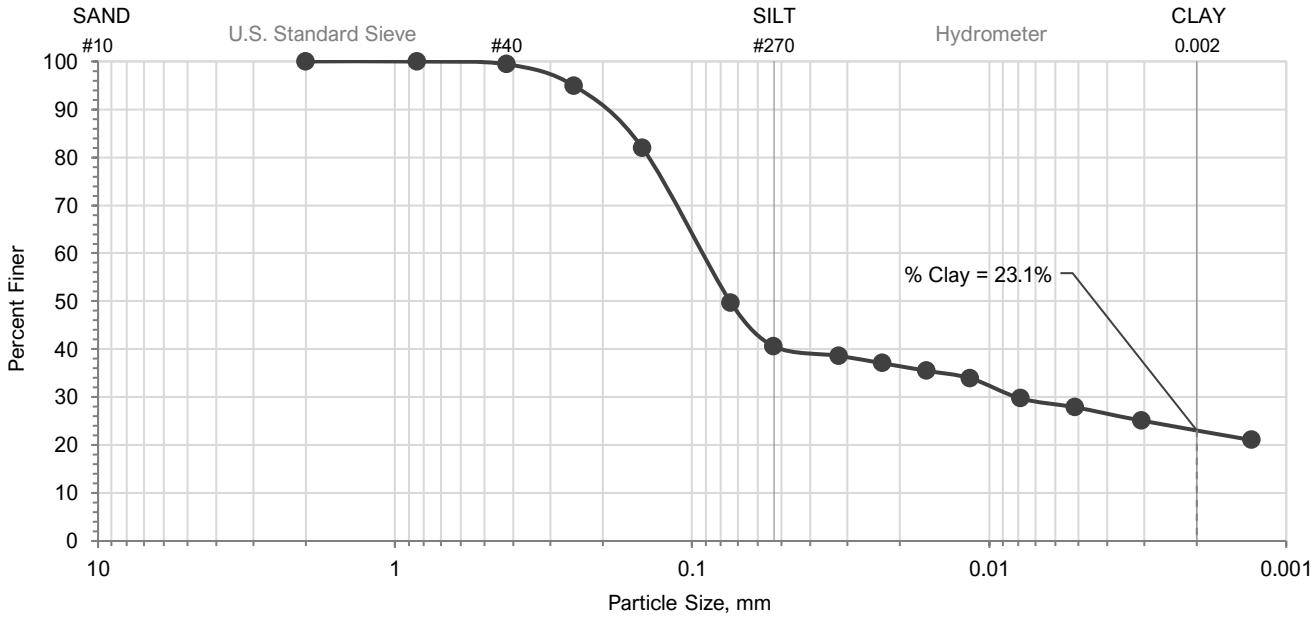
Location: Annapolis, MD

Sample Date: 12/01-12/02/22

USDA Summation Curve

Test Method: AASHTO T-88

USDA Soil Textural Analysis



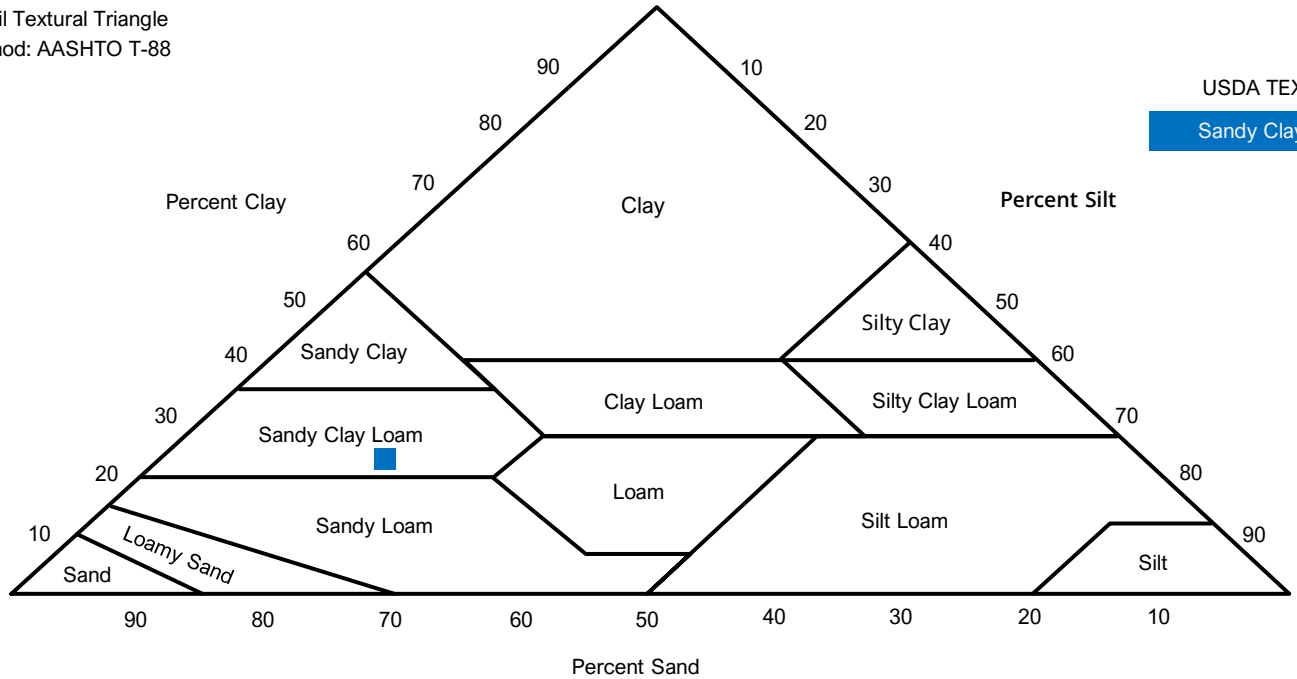
% SAND
59.4

% SILT
17.5

% CLAY
23.1

USDA Soil Textural Triangle

Test Method: AASHTO T-88



USDA TEXTURE

Sandy Clay Loam

NMC	LL	PL	PI
20.0%	-	-	-

12/14/22 Tested by: ST/JT Reviewed by: SF Jay Kay Testing

Quiet Waters Park

Project Number: 22140028.000

Jay Kay Testing

Boring ID	Sample ID	Top	Btm
BP-3	Bulk	0'	5'

Location: Annapolis, MD

Sample Date: 12/01-12/02/22

Moisture-Density Relationship of Soils

MODIFIED PROCTOR

Test Method: AASHTO T-180 (A)

Percent oversize particles: 0.0%

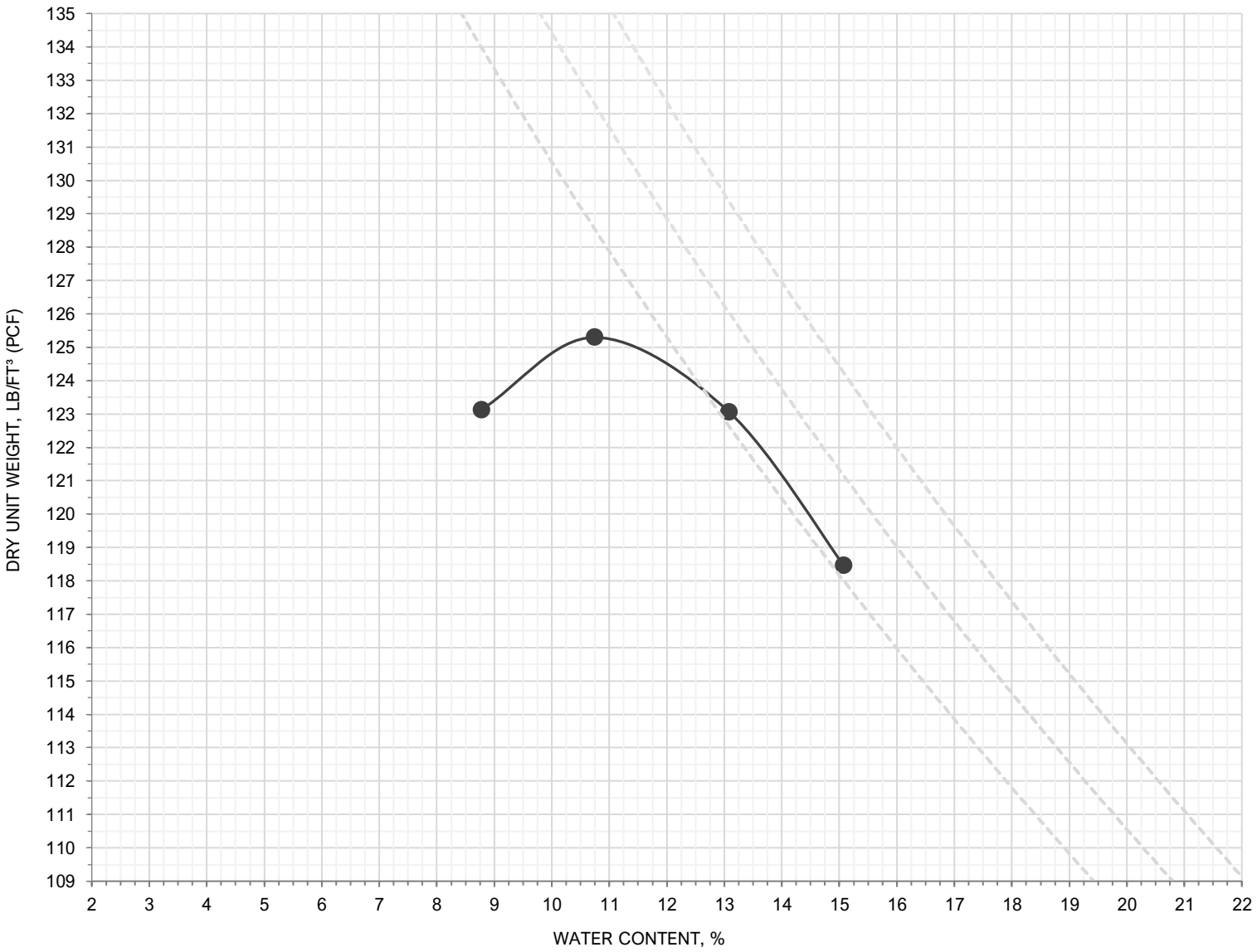
Oversized particles sieve: #4

Threshold for correction: > 5.0%

	Uncorrected	Corrected*
Maximum dry unit weight, lb/ft³	125.3	-
Optimum water content	10.8%	-

*Threshold not met for oversized particle correction.

Maximum Dry Unit Weight	Optimum Water Content
125.3	10.8%
lb/ft³ (PCF)	



Zero Air Voids (100% Saturation)

Zero air voids curves: 2.65, 2.75, 2.85

NMC	LL	PL	PI	% Fines	USCS	AASHTO	Soil Description (D-2487)
13.9%	38%	17%	21%	37.7	SC	A-6	Dark greenish-brown clayey SAND

12/14/22 Tested by: ST/JT Reviewed by: SF Jay Kay Testing

Quiet Waters Park

Project Number: 22140028.000

Jay Kay Testing

Boring ID	Sample ID	Top	Btm
BP-5	Bulk	0'	5'

Location: Annapolis, MD

Sample Date: 12/01-12/02/22

Moisture-Density Relationship of Soils

MODIFIED PROCTOR

Test Method: AASHTO T-180 (A)

Percent oversize particles: 0.0%

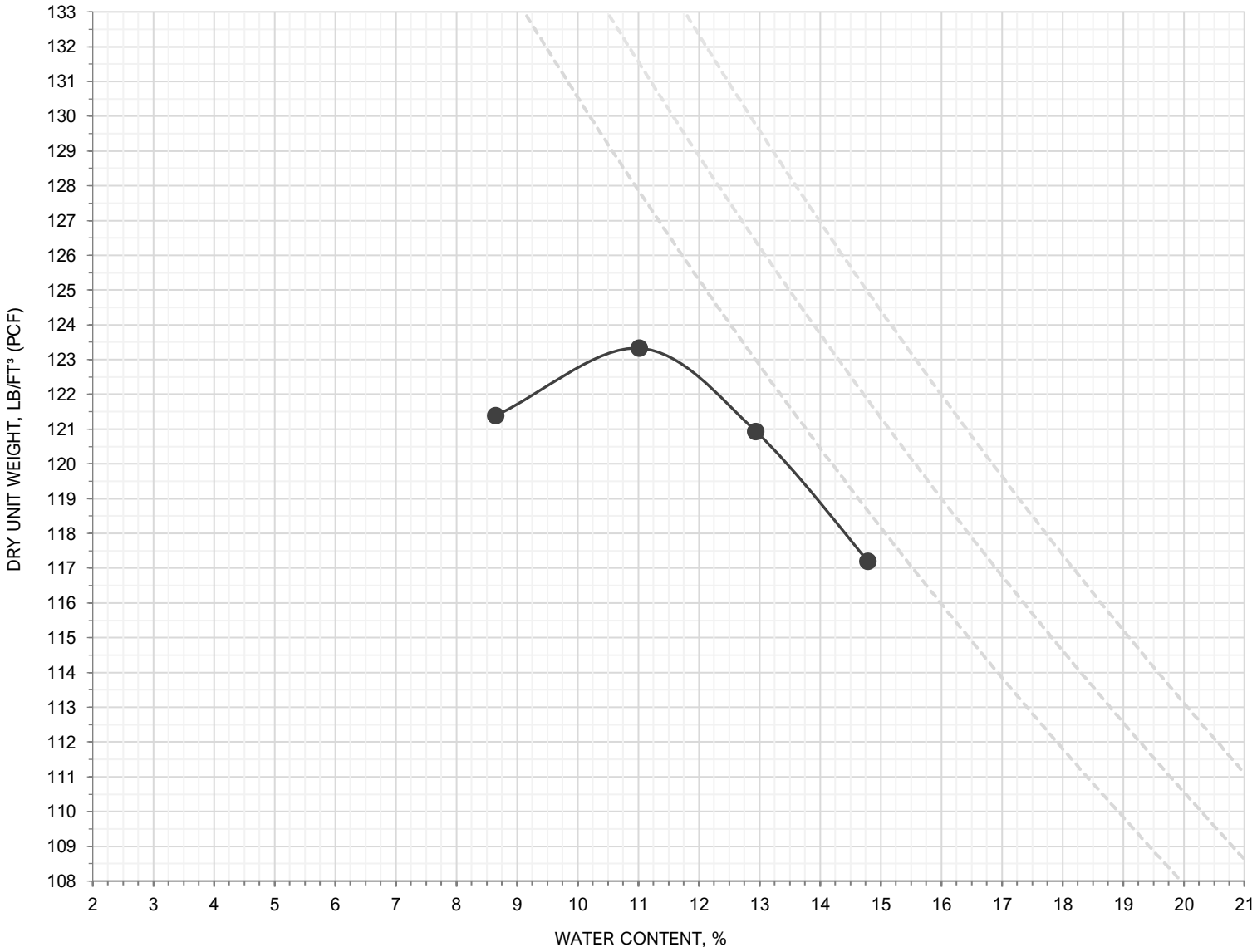
Oversized particles sieve: #4

Threshold for correction: > 5.0%

	Uncorrected	Corrected*
Maximum dry unit weight, lb/ft³	123.3	-
Optimum water content	11.0%	-

*Threshold not met for oversized particle correction.

Maximum Dry Unit Weight	Optimum Water Content
123.3	11.0%
lb/ft³ (PCF)	



Zero Air Voids (100% Saturation)

Zero air voids curves: 2.65, 2.75, 2.85

NMC	LL	PL	PI	% Fines	USCS	AASHTO	Soil Description (D-2487)
26.7%	38%	17%	21%	69.2	CL	A-6	Brown sandy lean CLAY

12/14/22 Tested by: ST/JT Reviewed by: SF Jay Kay Testing

Quiet Waters Park

Project Number: 22140028.000

Jay Kay Testing

Boring ID	Sample ID	Top	Btm
BP-3	Bulk	0'	5'

Location: Annapolis, MD

Sample Date: 12/01-12/02/22

California Bearing Ratio of Laboratory-Compacted Soils (CBR)

Test Method: AASHTO T-193, Compaction Method: AASHTO T-180 (A)

	Uncorrected	Corrected
Soaked (± 96 hours) CBR at 0.1"	4.0%	-
Soaked (± 96 hours) CBR at 0.2"	4.9%	-

Surcharge, lb/ft²	50
Target MDD, lb/ft³	125.3
Target OMC, %	10.8%

CBR at 0.1"	CBR at 0.2"
4.0%	4.9%

Specimen Swell 4.61%

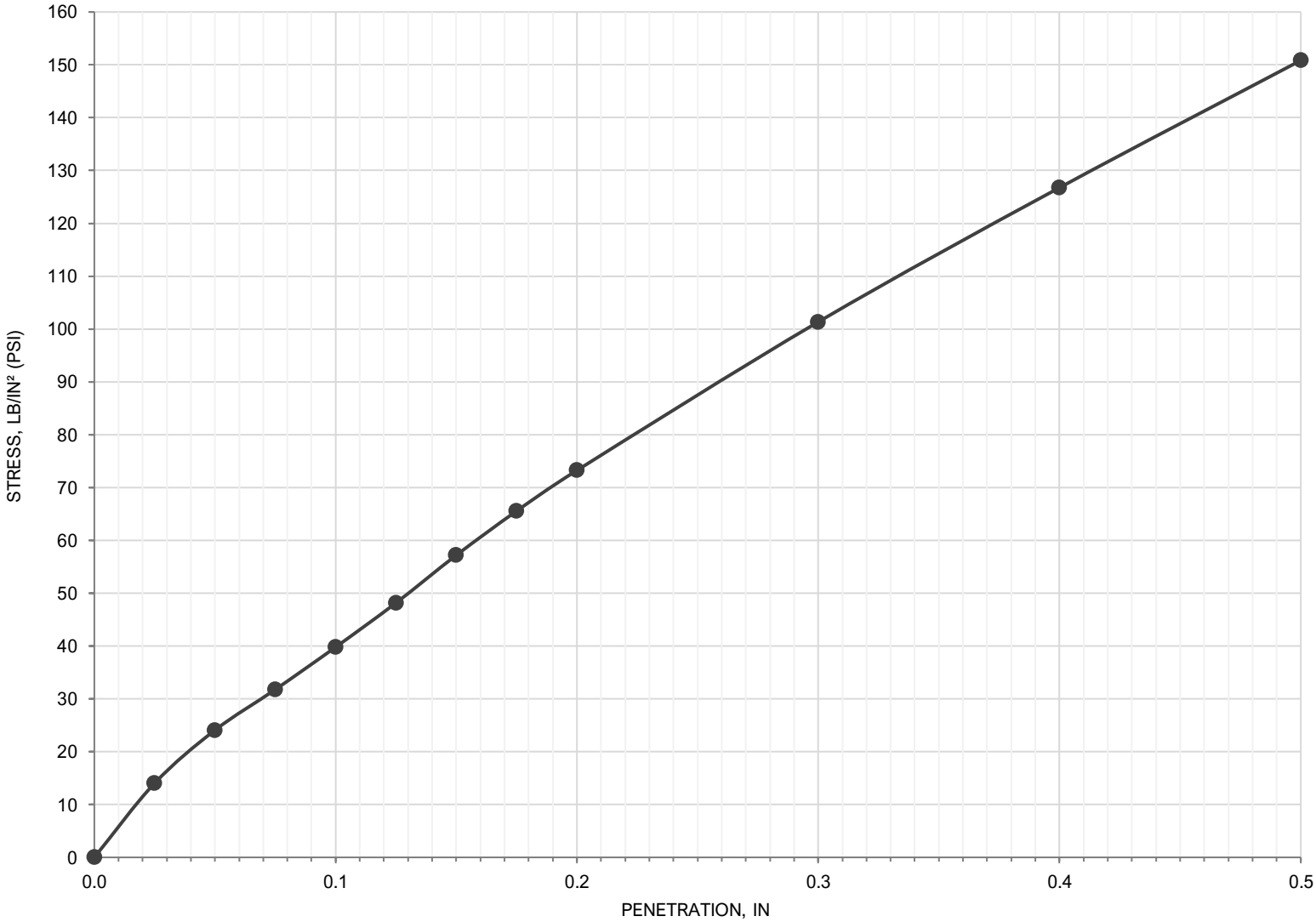
Specimen Data

AS-MOLDED

Dry unit weight, lb/ft³	119.1	Blows per layer, #	30
Water content	11.2%	Achieved compaction	95.0%

AFTER-SOAK

Water content of top 1" layer 21.0%



NMC	LL	PL	PI	% Fines	USCS	AASHTO	Soil Description (D-2487)
13.9%	38%	17%	21%	37.7	SC	A-6	Dark greenish-brown clayey SAND

Quiet Waters Park

Project Number: 22140028.000

Jay Kay Testing

Boring ID	Sample ID	Top	Btm
BP-5	Bulk	0'	5'

Location: Annapolis, MD

Sample Date: 12/01-12/02/22

California Bearing Ratio of Laboratory-Compacted Soils (CBR)

Test Method: AASHTO T-193, Compaction Method: AASHTO T-180 (A)

	Uncorrected	Corrected*
Soaked (± 96 hours) CBR at 0.1"	10.7%	13.8%
Soaked (± 96 hours) CBR at 0.2"	14.2%	15.0%

*Corrected for concave upward shape and/or surface irregularities.

Surcharge, lb/ft²	50
Target MDD, lb/ft³	123.3
Target OMC, %	11.0%

CBR at 0.1"*	CBR at 0.2"*
13.8%	15.0%

Specimen Swell 2.65%

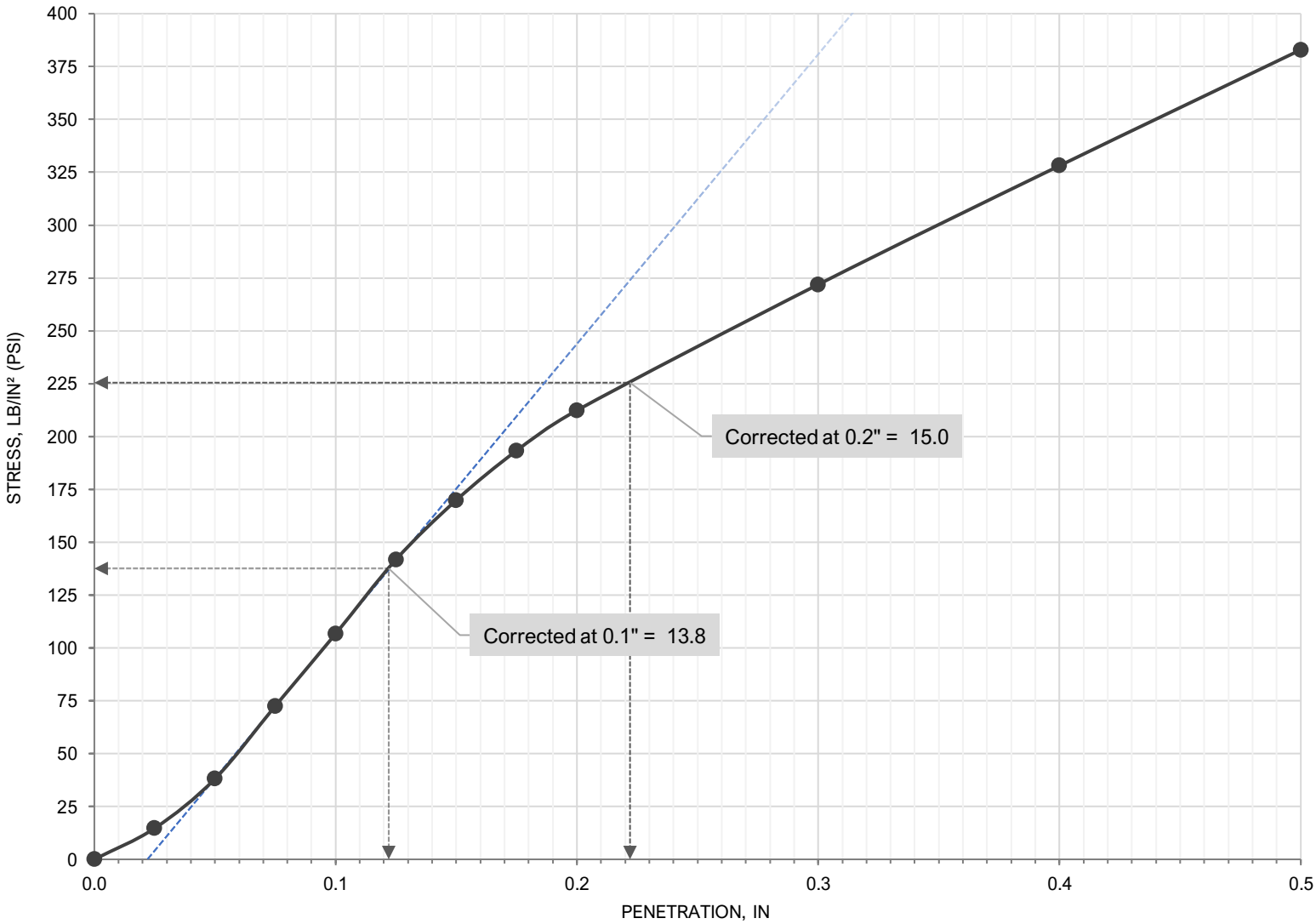
Specimen Data

AS-MOLDED

Dry unit weight, lb/ft³	120.8	Blows per layer, #	32
Water content	11.2%	Achieved compaction	97.9%

AFTER-SOAK

Water content of top 1" layer 19.8%



NMC	LL	PL	PI	% Fines	USCS	AASHTO	Soil Description (D-2487)
26.7%	38%	17%	21%	69.2	CL	A-6	Brown sandy lean CLAY

APPENDIX C

INFILTRATION TEST DATA

Infiltration Test Data

Schnabel ENGINEERING

INFILTRATION TEST DATA SHEET

Project:	Quiet Waters Retreat	Project No:	22140028.00
Test No:	SWM - 1	Date:	12/6/2022
Location:	Annapolis, MD	SE Rep.	SR
Test Depth (ft):	6	Ground EL (ft):	41
Test EL:	35.0		

PRESOAK:

		One Day Reading
Date:	12/5/2022	12/6/2022
Time:	9:15 AM	7:30 AM
Depth of Water:	24 in	14 in
Soil Description:	Sandy Clay Loam	

TEST:

Run	Date	Begin		End		Infiltration Rate (in/hr)
		Time	Depth of Water (in)	Time	Depth of Water (in)	
1	12/6/2022	7:30 AM	24	8:40 AM	24	0.0
2	12/6/2022	8:40 AM	24	9:40 AM	21	3.0
3	12/6/2022	9:40 AM	21	10:40 AM	19	2.0
4	12/6/2022	10:40 AM	28	11:40 AM	27	1.0
Average Infiltration Rate (in/hr)						1.5

Schnabel ENGINEERING

INFILTRATION TEST DATA SHEET

Project:	Quiet Waters Retreat	Project No:	22140028.00
Test No:	SWM - 2	Date:	12/6/2022
Location:	Annapolis, MD	SE Rep.	SR
Test Depth (ft):	6	Ground EL (ft):	47
Test EL:	41.0		

PRESOAK:

		One Day Reading
Date:	12/5/2022	12//2022
Time:	9:25 AM	7:25 AM
Depth of Water:	24 in	19 in
Soil Description:	Sandy Clay Loam	

TEST:

Run	Date	Begin		End		Infiltration Rate (in/hr)
		Time	Depth of Water (in)	Time	Depth of Water (in)	
1	12/6/2022	7:35 AM	31	8:45 AM	31	0.0
2	12/6/2022	8:45 AM	31	9:45 AM	31	0.0
3	12/6/2022	9:45 AM	31	10:45 AM	31	0.0
4	12/6/2022	10:45 AM	31	11:45 AM	31	0.0
Average Infiltration Rate (in/hr)						0.0

Schnabel ENGINEERING

INFILTRATION TEST DATA SHEET

Project:	Quiet Waters Retreat	Project No:	22140028.00
Test No:	SWM - 3	Date:	12/6/2022
Location:	Annapolis, MD	SE Rep.	SR
Test Depth (ft):	6	Ground EL (ft):	37
Test EL:	31.0		

PRESOAK:

		One Day Reading
Date:	12/5/2022	12/6/2022
Time:	9:35 AM	7:42 AM
Depth of Water:	24 in	2 in
Soil Description:	Sandy Clay Loam	

TEST:

Run	Date	Begin		End		Infiltration Rate (in/hr)
		Time	Depth of Water (in)	Time	Depth of Water (in)	
1	12/6/2022	7:45 AM	24	8:50 AM	22	1.8
2	12/6/2022	8:50 AM	22	9:50 AM	18	4.0
3	12/6/2022	9:50 AM	18	10:50 AM	16	2.0
4	12/6/2022	10:50 AM	22	11:50 AM	21	1.0
Average Infiltration Rate (in/hr)						2.2

INFILTRATION TEST DATA SHEET

Schnabel ENGINEERING

Project:	Quiet Waters Retreat	Project No:	22140028.00
Test No:	SWM - 4	Date:	12/6/2022
Location:	Annapolis, MD	SE Rep.	SR
Test Depth (ft):	6	Ground EL (ft):	29
Test EL:	23.0		

PRESOAK:

		One Day Reading
Date:	12/5/2022	12/6/2022
Time:	10:15 AM	8:05 AM
Depth of Water:	24 in	0 in
Soil Description:	Sandy Clay Loam	

TEST:

Run	Date	Begin		End		Infiltration Rate (in/hr)
		Time	Depth of Water (in)	Time	Depth of Water (in)	
1	12/6/2022	8:10 AM	22	9:05 AM	20	2.2
2	12/6/2022	9:10 AM	20	10:10 AM	20	0.0
3	12/6/2022	10:10 AM	20	11:10 AM	17	3.0
4	12/6/2022	11:10 AM	22	12:10 PM	21	1.0
Average Infiltration Rate (in/hr)						1.5

Schnabel ENGINEERING

INFILTRATION TEST DATA SHEET

Project:	Quiet Waters Retreat	Project No:	22140028.00
Test No:	SWM -	Date:	12/6/2022
Location:	Annapolis, MD	SE Rep.	SR
Test Depth (ft):	6	Ground EL (ft):	39.5
Test EL:	33.5		

PRESOAK:

		One Day Reading
Date:	12/5/2022	12/6/2022
Time:	10:20 AM	8:14 AM
Depth of Water:	33 in	27 in
Soil Description:	Sandy Clay Loam	

TEST:

Run	Date	Begin		End		Infiltration Rate (in/hr)
		Time	Depth of Water (in)	Time	Depth of Water (in)	
1	12/6/2022	8:14 AM	27	9:14 AM	27	0.0
2	12/6/2022	9:14 AM	27	10:14 AM	27	0.0
3	12/6/2022	10:14 AM	27	11:14 AM	27	0.0
4	12/6/2022	11:14 AM	27	12:01 PM	27	0.0
Average Infiltration Rate (in/hr)						0.0

Schnabel ENGINEERING

INFILTRATION TEST DATA SHEET

Project:	Quiet Waters Retreat	Project No:	22140028.00
Test No:	SWM - 6	Date:	12/6/2022
Location:	Annapolis, MD	SE Rep.	SR
Test Depth (ft):	6	Ground EL (ft):	40
Test EL:	34.0		

PRESOAK:

		One Day Reading
Date:	12/5/2022	12/6/2022
Time:	10:30 AM	8:14 AM
Depth of Water:	25 in	16 in
Soil Description:	Sandy Clay Loam	

TEST:

Run	Date	Begin		End		Infiltration Rate (in/hr)
		Time	Depth of Water (in)	Time	Depth of Water (in)	
1	12/6/2022	8:20 AM	27	9:20 AM	27	0.0
2	12/6/2022	9:20 AM	27	10:20 AM	25	2.0
3	12/6/2022	10:20 AM	25	11:20 AM	24	1.0
4	12/6/2022	11:20 AM	24	12:20 PM	24	0.0
Average Infiltration Rate (in/hr)						0.8


76° 30' 51" W
76° 29' 46" W
38° 56' 10" N
38° 55' 37" N
368800
368900
369000
369100
369200
369300
369400
369500
369600
369700
369800
369900
370000
370100
370200
370300
4310800
4310700
4310600
4310500
4310400
4310300
4310200
4310100
4310000
4309900
4309800
AsE
AsC
AoB
AuB
DnB
CRD
AsB
AuD
TsB
MZA
W
CSE
CoB
MtaB
CnB
UxB
SME
MtaA
CxA
CxC
Harbor Dr
Tayman Dr
Map Scale: 1:7,180 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0
100
200
400
600
Feet
0
300
600
1200
1800
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Anne Arundel County, Maryland
Survey Area Data: Version 20, Aug 26, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 23, 2020—Nov 28, 2020

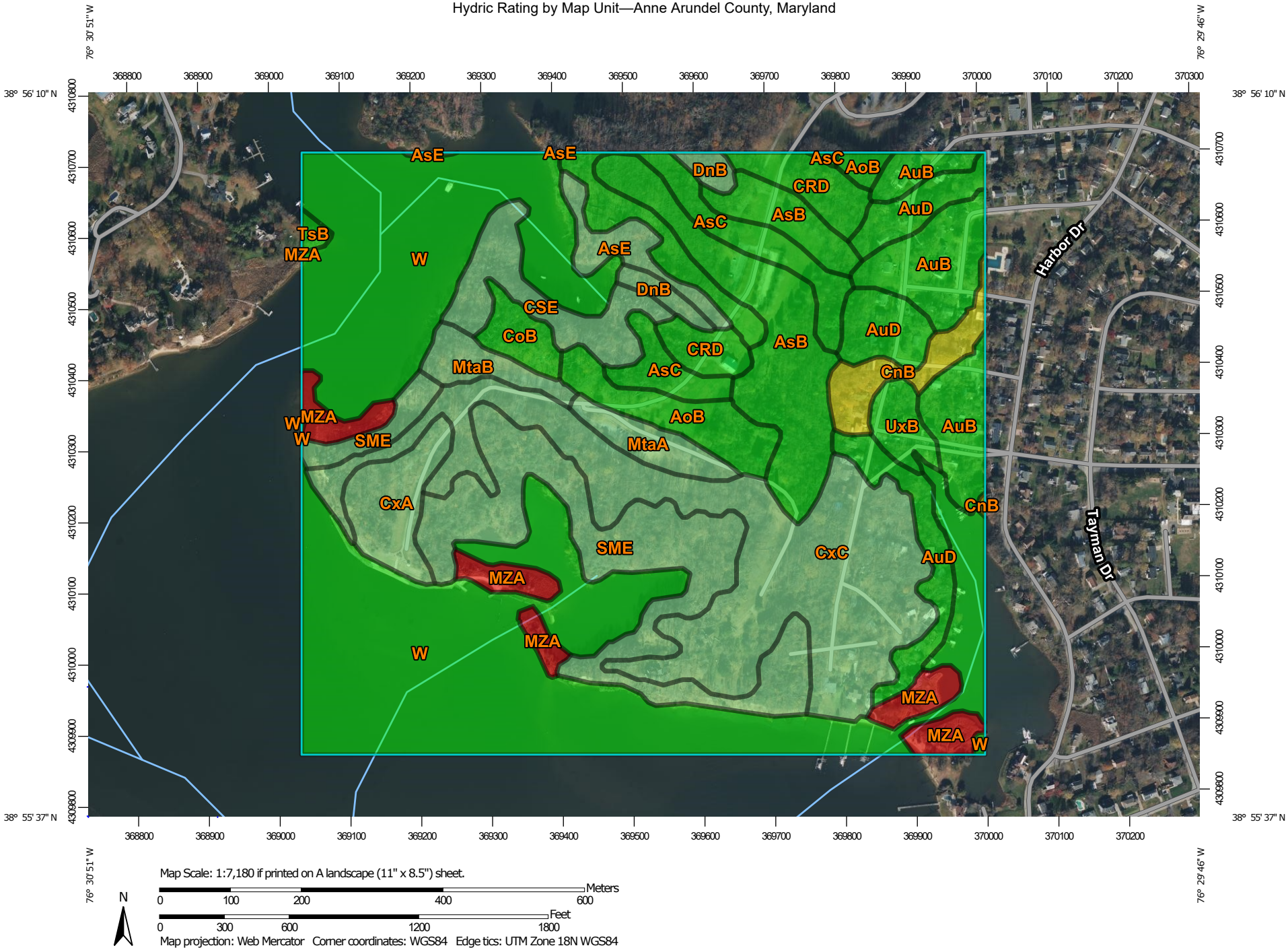
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AoB	Annapolis loamy sand, 2 to 5 percent slopes	5.2	2.6%
AsB	Annapolis fine sandy loam, 2 to 5 percent slopes	14.3	7.1%
AsC	Annapolis fine sandy loam, 5 to 10 percent slopes	9.5	4.7%
AsE	Annapolis fine sandy loam, 15 to 25 percent slopes	2.8	1.4%
AuB	Annapolis-Urban land complex, 0 to 5 percent slopes	10.2	5.0%
AuD	Annapolis-Urban land complex, 5 to 15 percent slopes	9.4	4.6%
CnB	Colemantown-Urban land complex, 0 to 5 percent slopes	3.4	1.7%
CoB	Collington-Wist complex, 2 to 5 percent slopes	2.1	1.0%
CRD	Collington and Annapolis soils, 10 to 15 percent slopes	4.7	2.3%
CSE	Collington, Wist, and Westphalia soils, 15 to 25 percent slopes	5.8	2.9%
CxA	Cumberstone-Mattapex complex, 0 to 2 percent slopes	4.6	2.3%
CxC	Cumberstone-Mattapex complex, 5 to 10 percent slopes	29.9	14.7%
DnB	Donlonton fine sandy loam, 2 to 5 percent slopes	1.8	0.9%
MtaA	Mattapex silt loam, 0 to 2 percent slopes, northern coastal plain	2.6	1.3%
MtaB	Mattapex silt loam, 2 to 5 percent slopes, northern coastal plain	2.4	1.2%
MZA	Mispillion and Transquaking soils, 0 to 1 percent slopes, tidally flooded	6.3	3.1%
SME	Sassafras and Croom soils, 15 to 25 percent slopes	19.4	9.6%
TsB	Tinton loamy sand, 2 to 5 percent slopes	0.4	0.2%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
UxB	Udorthents, loamy, sulfidic substratum, 0 to 5 percent slopes	2.0	1.0%
W	Water	65.9	32.5%
Totals for Area of Interest		**202.9**	**100.0%**

Hydric Rating by Map Unit—Anne Arundel County, Maryland



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Lines

- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Points

- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Anne Arundel County, Maryland
Survey Area Data: Version 20, Aug 26, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 23, 2020—Nov 28, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AoB	Annapolis loamy sand, 2 to 5 percent slopes	0	5.2	2.6%
AsB	Annapolis fine sandy loam, 2 to 5 percent slopes	0	14.3	7.1%
AsC	Annapolis fine sandy loam, 5 to 10 percent slopes	0	9.5	4.7%
AsE	Annapolis fine sandy loam, 15 to 25 percent slopes	5	2.8	1.4%
AuB	Annapolis-Urban land complex, 0 to 5 percent slopes	0	10.2	5.0%
AuD	Annapolis-Urban land complex, 5 to 15 percent slopes	0	9.4	4.6%
CnB	Colemantown-Urban land complex, 0 to 5 percent slopes	50	3.4	1.7%
CoB	Collington-Wist complex, 2 to 5 percent slopes	0	2.1	1.0%
CRD	Collington and Annapolis soils, 10 to 15 percent slopes	0	4.7	2.3%
CSE	Collington, Wist, and Westphalia soils, 15 to 25 percent slopes	5	5.8	2.9%
CxA	Cumberstone-Mattapex complex, 0 to 2 percent slopes	5	4.6	2.3%
CxC	Cumberstone-Mattapex complex, 5 to 10 percent slopes	5	29.9	14.7%
DnB	Donlonton fine sandy loam, 2 to 5 percent slopes	5	1.8	0.9%
MtaA	Mattapex silt loam, 0 to 2 percent slopes, northern coastal plain	5	2.6	1.3%
MtaB	Mattapex silt loam, 2 to 5 percent slopes, northern coastal plain	5	2.4	1.2%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
MZA	Mispillion and Transquaking soils, 0 to 1 percent slopes, tidally flooded	100	6.3	3.1%
SME	Sassafras and Croom soils, 15 to 25 percent slopes	5	19.4	9.6%
TsB	Tinton loamy sand, 2 to 5 percent slopes	0	0.4	0.2%
UxB	Udorthents, loamy, sulfidic substratum, 0 to 5 percent slopes	0	2.0	1.0%
W	Water	0	65.9	32.5%
Totals for Area of Interest			**202.9**	**100.0%**

Description

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

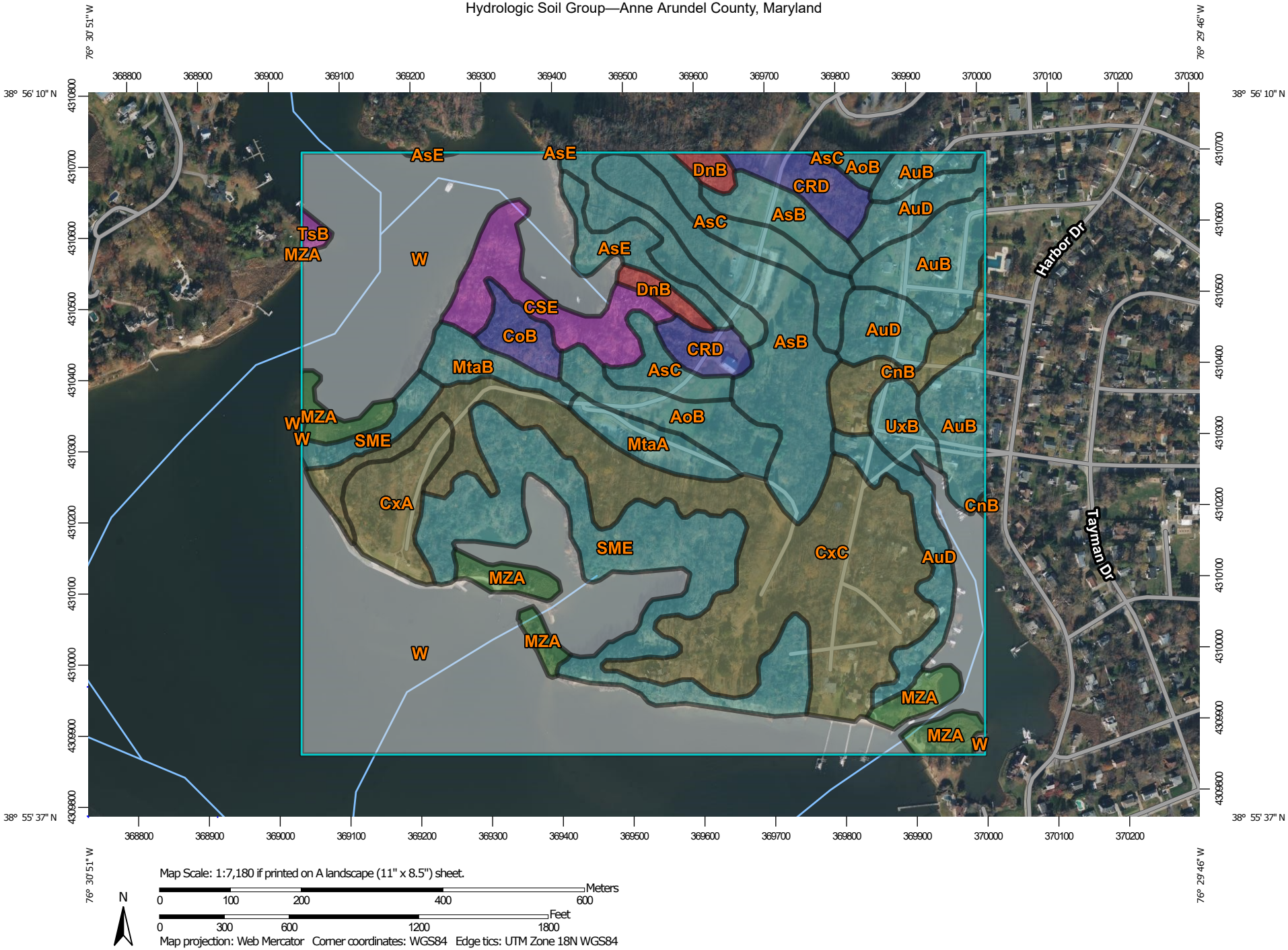
Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Rating Options

Aggregation Method: Percent Present

Component Percent Cutoff: None Specified

Tie-break Rule: Lower


76° 30' 51" W
76° 29' 46" W
38° 56' 10" N
38° 55' 37" N
368800
368900
369000
369100
369200
369300
369400
369500
369600
369700
369800
369900
370000
370100
370200
370300
4310800
4310700
4310600
4310500
4310400
4310300
4310200
4310100
4310000
4309900
4309800
AsE
AsC
AoB
AuB
DnB
CRD
AuD
AsB
TsB
MZA
W
CSE
CoB
MtaB
CnB
UxB
SME
MtaA
CxA
CxC
Harbor Dr
Tayman Dr
Map Scale: 1:7,180 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0
100
200
400
600
Feet
0
300
600
1200
1800
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Anne Arundel County, Maryland
Survey Area Data: Version 20, Aug 26, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 23, 2020—Nov 28, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AoB	Annapolis loamy sand, 2 to 5 percent slopes	C	5.2	2.6%
AsB	Annapolis fine sandy loam, 2 to 5 percent slopes	C	14.3	7.1%
AsC	Annapolis fine sandy loam, 5 to 10 percent slopes	C	9.5	4.7%
AsE	Annapolis fine sandy loam, 15 to 25 percent slopes	C	2.8	1.4%
AuB	Annapolis-Urban land complex, 0 to 5 percent slopes	C	10.2	5.0%
AuD	Annapolis-Urban land complex, 5 to 15 percent slopes	C	9.4	4.6%
CnB	Colemantown-Urban land complex, 0 to 5 percent slopes	C/D	3.4	1.7%
CoB	Collington-Wist complex, 2 to 5 percent slopes	B	2.1	1.0%
CRD	Collington and Annapolis soils, 10 to 15 percent slopes	B	4.7	2.3%
CSE	Collington, Wist, and Westphalia soils, 15 to 25 percent slopes	A	5.8	2.9%
CxA	Cumberstone-Mattapex complex, 0 to 2 percent slopes	C/D	4.6	2.3%
CxC	Cumberstone-Mattapex complex, 5 to 10 percent slopes	C/D	29.9	14.7%
DnB	Donlonton fine sandy loam, 2 to 5 percent slopes	D	1.8	0.9%
MtaA	Mattapex silt loam, 0 to 2 percent slopes, northern coastal plain	C	2.6	1.3%
MtaB	Mattapex silt loam, 2 to 5 percent slopes, northern coastal plain	C	2.4	1.2%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
MZA	Mispillion and Transquaking soils, 0 to 1 percent slopes, tidally flooded	A/D	6.3	3.1%
SME	Sassafras and Croom soils, 15 to 25 percent slopes	C	19.4	9.6%
TsB	Tinton loamy sand, 2 to 5 percent slopes	A	0.4	0.2%
UxB	Udorthents, loamy, sulfidic substratum, 0 to 5 percent slopes	C	2.0	1.0%
W	Water		65.9	32.5%
Totals for Area of Interest			**202.9**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

REPI EASEMENT

NOTICE: THIS DEED OF CONSERVATION EASEMENT CONTAINS COVENANTS THAT INCLUDE RESTRICTIONS ON USE, SUBDIVISION, AND SALE OF LAND AND REQUIRES SPECIFIC REFERENCE IN A SEPARATE PARAGRAPH OF ANY SUBSEQUENT DEED OR OTHER LEGAL INSTRUMENT BY WHICH ANY INTEREST IN THE PROPERTY IS CONVEYED.

DEED OF CONSERVATION EASEMENT

29TH THIS DEED OF CONSERVATION EASEMENT ("Conservation Easement") made this 28 day of September, 2020, by and between Anne Arundel County, Maryland, having an address at 44 Calvert Street Annapolis, MD 21401 ("Grantor") and the UNITED STATES OF AMERICA, acting by and through the Department of the Navy (the "Navy"), Naval Facilities Engineering Command Washington, 1314 Harwood Street SE, Washington Navy Yard, DC 20374, and its assigns (collectively, "Grantees").

WHEREAS, this Conservation Easement is based upon a form that assumes there are multiple Grantors and multiple Grantees. In the event that this assumption is wrong for this Conservation Easement, then, as appropriate, any Provision assuming multiple Grantors or Grantees shall be interpreted to mean only one Grantor or Grantee, as the case may be;

2020 SEP 30 P 3:05 RECEIVED FOR RECORD ANNE ARUNDEL COUNTY MARYLAND

WHEREAS, the United States Navy is a military department of the United States Department of Defense and under 10 U.S.C. §2684a may enter into agreements with eligible entities to address the use or development of real property in the vicinity of, or ecologically related to, a military installation or military airspace for purposes limiting any development or use of the property that would be incompatible with the mission of the installation; or preserving habitat on the property;

Government
ument 0.00
Agency Name: ANNE ARUNDEL COUNTY
Instrument List:
Agreement / Easement
Describe Other:
USA/DEPT OF THE NAVY
Ref:
Total: 0.00
09/30/2020 03:04 CC02-SG
#241317[illegible] CC0501 - Anne Arundel County/CC05.01.08 - Register 08

WHEREAS, the Navy operates out of the Naval Support Activity Annapolis, Maryland (the "Installation"), a set of land, air and sea assets that are critical to supporting the development of Midshipmen into Fleet leaders;

WHEREAS, the Installation provides exceptional security by maintaining a secure environment for 4,400 Midshipmen and over 6,000 employees while managing thousands of special events and over 2 million annual visitors despite increased force protection;

WHEREAS, the Installation promotes high services and quality of life initiatives, meanwhile coordinating closely and communicating openly with city, county, state and community leaders whose well-being is inextricably linked to that of the Installation;

WHEREAS, the Navy has an interest in maintaining and creating the open access of lands in the vicinity of the Installation and associated ranges to protect the public's safety and minimize public access within certain areas of the Installation;

WHEREAS, Anne Arundel County, Maryland, a body corporate and politic of the State of Maryland, has the authority to grant conservation easements;

NO TAXES NECESSARY
9-30-20
CONTROLLER
TAX DIVISION

Tax Recordation

SEP 30 2020

Anne Arundel County Finance

WHEREAS, the Grantor owns in fee simple 19.43 acres, more or less, of certain real property in Anne Arundel County, Maryland, and more particularly described in Exhibit A attached hereto, which was conveyed to Grantor by Deed dated November 27, 2019 and recorded among the Land Records of Anne Arundel County, Maryland in Liber 33897, Folio 490 (the "Property").

NOW, THEREFORE, in consideration of One Million Dollars and No Cents ($1,000,000.00) the facts stated in the above paragraphs and the covenants, terms, conditions and restrictions (the "Terms") hereinafter set forth, the receipt and sufficiency of which are hereby acknowledged by the parties, Grantor unconditionally and irrevocably hereby grants and conveys unto Grantee, its successors and assigns, forever and in perpetuity a Conservation Easement of the nature and character and to the extent hereinafter set forth, with respect to the Property.

ARTICLE I. GRANT AND DURATION OF EASEMENT

The above paragraphs are incorporated as if more fully set forth herein.

This Conservation Easement shall be perpetual. It is an easement in gross and as such it is inheritable and assignable in accordance with Article X, runs with the land as an incorporeal interest in the Property, and is enforceable with respect to the Property by Grantee against the Grantor and its personal representatives, heirs, successors and assigns.

ARTICLE II. CONSERVATION PURPOSE

The conservation of the Property will protect the Conservation Attributes, as set forth in Exhibit B and which include certain natural, forestry, environmental, scenic, cultural, rural, woodland and wetland characteristics of the Property, and which seek to maintain viable resource-based land use and proper management of wooded areas of the Property, and, to the extent hereinafter provided, prevent the use or development of the Property for any purpose or in any manner that would conflict with the maintenance of the Property in its open-space.

The purpose of this Conservation Easement is to preserve and protect in perpetuity the Conservation Attributes of the Property described in Exhibit B, and to prevent the use or further development of the Property in any manner that would conflict with these Conservation Attributes ("Conservation Purpose"). The Conservation Attributes are not likely to be adversely affected to any substantial extent by the continued use of the Property as authorized herein or by the use, maintenance or construction of those Structures (as defined below) that exist on the Property or are permitted herein.

ARTICLE III. LAND USE AND STRUCTURES

A. General. This Article sets forth certain specific restrictions, prohibitions, and permitted activities, uses, and Structures under this Conservation Easement. Other than the specifically enumerated Provisions described below, any activity on or use of the Property that is otherwise consistent with the Conservation Purpose of this Conservation Easement is permitted. All manner of industrial activities and uses is prohibited. If Grantors believe or reasonably

should believe that an activity not expressly prohibited by this Conservation Easement may have a significant adverse effect on the Conservation Purpose of this Conservation Easement, Grantors shall notify Grantees in writing before undertaking such activity.

B. Commercial Uses and Activities. "Commercial" means any use or activity conducted by Grantors or a third party for the purpose of realizing a profit or other benefit to Grantors, their designees, their lessees, or such third party from the exchange of goods or services by sale, barter, or trade. In instances in which the Grantors are a nonprofit corporation or a government entity, Grantors and their lessees may conduct only those Commercial uses or activities that are (i) directly related to or in furtherance of Grantors' and lessees' conservation mission and (ii) do not harm the Conservation Attributes. Commercial activities and uses that are permitted shall be limited in scale to those appropriate to the size and location of the Property. The following Commercial activities and uses are permitted:

(1) Rental of kayaks, canoes, paddleboards, and similar non-motorized water craft for recreational use;

(2) Snacks and beverages from concession stands, temporary carts or vehicles;

(3) The lease of office space and conference room space to nonprofit organizations or other organizations serving similar conservation purposes.

C. Passive Recreational Uses and Activities. "Passive Recreation" means low-impact activities conducted outdoors, including, by way of example and not by way of limitation, nature study, orienteering, hunting, fishing, hiking, horseback riding, beach recreation, kayaking, paddle boarding, canoeing, sailing, non-motorized boating, picnic shelters, camping, and cross country skiing. Passive Recreational uses shall be permitted on the Property and shall be available for public use during normal operating hours of the Property.

D. Active Recreational Uses and Activities. "Active Recreation" means outdoor recreational activities involving special equipment. The only permitted Active Recreational Use shall be playgrounds. Any other Active Recreational Uses and Activities are subject to Grantee's approval in accordance with the provisions of Article XI below.

E. Structures, Buildings, Dwelling Units, and Means of Access. "Structure" means anything constructed or erected with a fixed location on the ground or attached to something having a fixed location on the ground. "Building" means any Structure which is designed, built, or occupied as a shelter for persons, animals, or personal property. "Dwelling Unit" means one or more rooms in a Building arranged for independent housekeeping purposes with: (i) furnishing for eating, living, and sleeping; (ii) the provisions for cooking; and, (iii) the provisions for sanitation. "Means of Access" means gravel or paved driveways, lanes, farm roads, and parking areas meant to carry vehicular traffic to permitted uses and Structures.

Structures, Buildings, Dwelling Units, and Means of Access are prohibited on the Property, except the following:

(1) Structures designed, constructed, or renovated, and utilized for the purpose of serving the Recreational uses and conservation uses of the Property including, but not limited to: piers, hiking trails, restrooms/concession/park office building, pavilions and picnic areas, playgrounds, and space for nonprofit organizations or other organizations serving similar conservation purposes. Structures listed in Exhibit C may be razed, repurposed, renovated, replaced or reconstructed to serve the Recreational or conservation uses of the Property including, but not limited to: restrooms/concession/park office building, pavilions, picnic areas, boat house for non-motorized water craft, educational and environmental advocacy facility, caretaker facility, playgrounds, office space and conference room space for use by nonprofit organizations or other organizations serving a similar conservation purpose. Grantor must obtain approval from Grantee prior to installation of any new structures and any renovation, replacement or reconstruction of existing structures listed in Exhibit C that exceed the limitations set forth in this easement.

(2) Reasonable Means of Access serving the Structures set forth in III.E (1) and other permitted uses.

(3) Fencing, fences, and gates, which may be constructed, maintained, improved, removed, or replaced to mark boundaries, to secure the Property, or as needed in carrying out activities permitted by this Conservation Easement.

(4) The total footprint of any structures, buildings, and dwelling units, not to include pavilions or picnic shelters, on the Property shall never exceed 15,414 square feet.

(5) The total Impervious Surface on the Property shall never exceed two percent (2%) of the total area of the Property, unless otherwise approved by the Grantees. This total Impervious Surface limitation shall not include structures, buildings, and dwelling units. Subject to the above, "Impervious surface" means any surface composed of man-made or man-placed materials that significantly impedes or prevents the natural infiltration of water into the soil such concrete.

F. Height Restrictions. The erection, construction, installation, cultivation, or alteration, whether public or private, of any structure, building, antenna, tower, wire, or other obstruction, whatever its nature, extending more than 120 feet above ground level is prohibited without the expressed written consent of the Navy.

G. Lighting Equipment. Lighting equipment, including floodlights and searchlights, and all protective lighting, such as streetlights, shall have positive optical control so that no direct light is emitted above the horizontal plane of the light fixture and located so that lighting does not interfere with military test and training activities associated with the Installation.

H. Visual Hazards. No operations of any type are permitted that produce smoke, glare or other visual hazards that may pose a danger to aircraft operating from the Installation. Notwithstanding the above, (1) controlled burns for agricultural purposes, habitat improvement and/or mitigation of fire hazards are permitted with Grantor notification of Grantee no less than

forty-eight (48) hours prior to commencement of said activities, and (2) the burning of reasonable amounts of yard debris is permitted without prior notification.

I. Dumping. Dumping or placing of soil or other substance or material as landfill, or dumping or placing of trash, ashes, garbage, waste, abandoned vehicles, appliances, machinery, hazardous or toxic substances, dredge spoils, industrial and commercial byproducts, effluent and other materials on the Property is prohibited, whether by Grantor or third parties. Soil, rock, other earth materials, vegetative matter, or compost may not be placed except when reasonably required for: (1) Landscaping, environmental exhibits, or other permitted uses on the Property; or (2) the construction and/or maintenance of Structures, Buildings, and Means of Access permitted under this Conservation Easement. This Conservation Easement does not permit or require Grantee to become an operator or to control any use of the Property that may result in the treatment, storage, disposal, or release of hazardous materials within the meaning of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended.

J. Utilities. Grantor may repair and replace existing Utilities (as defined below) and may install new Utilities as set forth herein. Utilities must be sized and designed to serve the Property and shall not be installed for the purpose of facilitating development, use, or activities on an adjacent or other property unless said adjacent property is owned by Grantor and the new Utilities are directly in support of Recreational uses and activities as defined in Article III, Sections C and D of this Conservation Easement. "Utilities" includes, but is not limited to, satellite dishes, electric power lines and facilities, sanitary and storm sewers, septic systems, cisterns, wells, water storage and delivery systems, telephone and communication systems and renewable energy systems (including but not limited to solar energy devices on a Structure; geothermal heating and cooling systems, also known as ground source heat pump; wind energy devices, provided they do not create Doppler radar interference to missions at the Installation as determined by Installation; systems based on the use of Agricultural byproducts and waste products from the Property to the extent not prohibited by governmental regulations; and other renewable energy systems that are not prohibited by governmental regulations), but does not include cellular communication structures and systems. To the extent allowed by law, any net excess generation produced by such renewable energy installation(s) may be credited to the Grantors' utility bill or sold to the utility and shall not constitute Commercial activity.

K. Access Across the Property. No right-of-way for utilities or roadways shall be granted across the Property in conjunction with any industrial, commercial, or residential use or development of an adjacent or other property not protected by this Conservation Easement without the prior written approval of Grantees.

L. Wetlands. "Wetlands" means portions of the Property defined by Maryland state law or federal law as wetlands at the time of the proposed activity. Other than the creation and maintenance of man-made ponds with all necessary and appropriate permits, and the maintenance of Agricultural drainage ditches, the diking, draining, filling, dredging or removal of Wetlands by Grantor is prohibited.

M. Excavation; Surface and Sub-surface Extraction. Excavation, dredging, or removal of loam, peat, gravel, soil, rock, sand, surface or sub-surface water or other material substance in

a manner as to affect the surface or otherwise alter the topography of the Property is prohibited, whether by Grantor or third parties, except for: (1) the purpose of combating erosion or flooding, (2) Landscaping or other permitted uses on the Property, (3) Wetlands or stream bank restoration, or (4) the construction and/or maintenance of permitted Structures and associated Utilities, Means of Access, man-made ponds and wildlife habitat. Grantors shall not sell, transfer, lease, or otherwise separate any mineral rights, currently owned or later acquired, from the surface of the Property. All manner of surface mining is prohibited. Sub-surface mining or drilling is permitted only in accordance with Treasury Regulation 1.170A-14(g)(4) and subject to Grantees' approval.

N. Signage. Grantor must install signage-notifying users of the right to public access of the property.

O. Reserved Rights Exercised to Minimize Damage. All rights reserved by the Grantor or activities not prohibited by this Conservation Easement shall be exercised so as to prevent or to minimize damage to the Conservation Attributes identified above and water quality, air quality, land/soil stability and productivity, wildlife habitat, scenic and cultural values, and the natural topographic and open space character of the Property.

ARTICLE IV. GRANT OF UNRESERVED PROPERTY RIGHTS

Grantor retains the right to sell, devise, transfer, lease, mortgage or otherwise encumber the Property subject to the provisions of this Conservation Easement. Grantor hereby grants to the Grantee all rights (except as specifically reserved herein) that are now or hereafter allocated to, implied, reserved or inherent in the Property, and the parties agree that such rights are terminated and extinguished and may not be used or transferred to any other property adjacent or otherwise, and may not be used for the purpose of calculating permissible lot yield of the Property or any other property. Grantor further agrees that the Property shall not be used to provide required open space for the development or subdivision of another property, nor shall it be used in determining any other permissible residential, commercial or agricultural uses of another property.

ARTICLE V. ENFORCEMENT AND REMEDIES

A. Grantee, and their employees and agents, shall have the right to enter the Property at reasonable times for the purpose of inspecting and surveying the Property to determine whether Grantor is complying with the Provisions of this Conservation Easement. Grantee shall provide prior notice to Grantor at their last known address, unless Grantee determines that immediate entry is required to prevent, terminate, or mitigate a suspected or actual violation of this Conservation Easement which poses a serious or potentially permanent threat to Conservation Attributes, in which latter case prior reasonable notice is not required.

In the course of such inspection, Grantee may inspect the interior of Buildings and Structures permitted by this Conservation Easement for the purpose of determining compliance with this Conservation Easement. In the event that a dispute arises between Grantee and Grantor as to whether a Building or Structure is a Dwelling Unit which would not otherwise be permitted

by this Conservation Easement, such Building or Structure shall be deemed to contain a Dwelling Unit unless proven otherwise by the Grantors.

B. Upon any breach of a Provision of this Conservation Easement by Grantors, Grantee may institute suit to enjoin any such breach or enforce any Provision by temporary, *ex parte* and/or permanent injunction, either prohibitive or mandatory, including a temporary restraining order, whether by in rem, quasi in rem or in personam jurisdiction; and require that the Property be restored promptly to the condition required by this Conservation Easement at the expense of Grantors. Before instituting such suit, Grantee shall give notice to Grantor and provide a reasonable time for cure; provided, however, that Grantee need not provide such notice and cure period if Grantee determines that immediate action is required to prevent, terminate or mitigate a suspected or actual breach of this Conservation Easement.

Grantee's remedies shall be cumulative and shall be in addition to all appropriate legal proceedings and any other rights and remedies available to Grantee at law or equity.

C. No failure or delay on the part of Grantee to enforce any Provision of this Conservation Easement shall discharge or invalidate such Provision or any other Provision or affect the right of Grantee to enforce the same in the event of a subsequent breach or default.

D. To the extent permitted by law and subject to appropriation and availability of funds, Grantor shall reimburse Grantee costs Grantee incurs in enforcing this Conservation Easement.

ARTICLE VI. PUBLIC ACCESS

Grantor must make the Property accessible to the public during normal operating hours of Property. Public access may be restricted on Grantor's leased buildings and structures.

ARTICLE VII. BASELINE DOCUMENTATION

The parties acknowledge that Exhibits A – E (collectively, the "Baseline Documentation") reflect the legal description of the Property, existing uses, location, Conservation Attributes and Structures, Buildings, and Dwelling Units on the Property as of the date of this Conservation Easement. Grantor hereby certifies that the attached Exhibits are sufficient to establish the condition of the Property at the time of the granting of this Conservation Easement. All Exhibits are hereby made a part of this Conservation Easement:

A. Exhibit A: Boundary Description and Property Reference is attached hereto and made a part hereof. Exhibit A consists of nine (9) pages.

B. Exhibit B: Conservation Attributes is attached hereto and made a part hereof. Exhibit B consists of one (1) page.

C. Exhibit C: Inventory of Existing Structures is attached hereto and made a part hereof. Exhibit C consists of one (1) page.

D. Exhibit D: Color Digital Images of the Property are not recorded herewith but are kept on file at the principal office of Grantee and are fully and completely incorporated into this Conservation Easement as though attached hereto and made a part hereof. A list of the vantage points, image captions, and image numbers is recorded herewith. Exhibit D consists of twenty-four (24) color digital images and one (1) page.

E. Exhibit E: Aerial Photograph of the Property is not recorded herewith but kept on file at the principal office of the Grantee and is fully and completely incorporated into this Conservation Easement as though attached hereto and made a part hereof. Exhibit E consists of one (1) page.

F. Exhibit F: Tax Map Showing Approximate Location of Property is attached hereto. This is to be used only by Grantee as an aid for locating the Property. It is not a plat or legal description of the Property. Exhibit F consists of one (1) page.

ARTICLE VIII. DUTIES AND WARRANTIES OF GRANTORS

A. Change of Ownership. In order to provide Grantee with notice of a change in ownership or other transfer of an interest in the Property, Grantor agrees to notify Grantee in writing of the names and addresses of any party to whom the Property, or any part thereof, is transferred in accordance with Section 10-705 of Real Property Article, Ann. Code of Maryland, or such other comparable provision as it may be amended from time to time. Grantor, its successors and assigns further agree to make specific reference to this Conservation Easement in a separate paragraph of any subsequent deed or other legal instrument by which any interest in the Property is conveyed.

B. Subordination. Grantor certifies that all mortgages, deeds of trust, or other liens (collectively "Liens"), if any, affecting the Property are subordinate to, or shall at time of recordation become subordinate to, the rights of Grantee under this Conservation Easement. Grantor has provided, or shall provide, a copy of this Conservation Easement to all mortgagees of mortgages and to all beneficiaries and/or trustees of deeds of trust (collectively "Lienholders") already affecting the Property or which will affect the Property prior to the recording of this Conservation Easement, and shall also provide notice to Grantee of all such Liens. Each of the Lienholders has subordinated, or shall subordinate prior to recordation of this Conservation Easement, its Lien to this Conservation Easement either by signing a subordination instrument contained at the end of this Conservation Easement which shall become a part of this Conservation Easement and recorded with it, or by recording a separate subordination agreement pertaining to any such Lien.

C. Warranties. The Grantor who signed this Conservation Easement on the date set forth above ("Original Grantor") is the sole owner of the Property in fee simple and has the right and ability to convey this Conservation Easement to Grantee. The Original Grantor warrants that the Property is free and clear of all rights, restrictions, and encumbrances other than those subordinated to this Conservation Easement or otherwise specifically agreed to in writing by the Grantee. The Original Grantor warrants that they have no actual knowledge of any use or release of hazardous waste or toxic substances on the Property that is in violation of a federal, state, or

local environmental law and will defend, indemnify, and hold Grantee harmless against any claims of contamination from such substances. The Original Grantor warrants that Exhibit C is an exhaustive list of all Dwelling Units on the Property.

D. Continuing Duties of Grantor. For purposes of this Conservation Easement, "Grantor" shall mean only, at any given time, the then current fee simple owner(s) of the Property and shall not include the Original Grantor or other successor owners preceding the current fee simple owner(s) of the Property, except that if any such preceding owners have violated any term of this Conservation Easement, they shall continue to be liable therefor.

ARTICLE IX. CONDEMNATION

By acceptance of this Conservation Easement by Grantee the purposes of the Property as restricted for Agricultural, Recreational, natural and cultural resource preservation are hereby considered to be the highest public use of the Property. Whenever all or part of the Property is taken in the exercise of eminent domain, so as to abrogate, in whole or in part, the restrictions imposed by this Conservation Easement, or this Conservation Easement is extinguished, in whole or in part, by other judicial proceeding, Grantors and Grantees shall be entitled to proceeds payable in connection with the condemnation or other judicial proceedings in an amount equal to the current fair market value of their relative real estate interests. Grantee shall then divide the proceeds as follows: The Navy shall receive one hundred percent (100%) of the proceeds relevant to the value of the Conservation Easement interest. Any costs of a judicial proceeding allocated by a court to Grantors and Grantees shall be allocated in the same manner as the proceeds are allocated.

ARTICLE X. MISCELLANEOUS

A. Assignment. Each Grantee may assign, upon prior written notice to Grantor, its rights under this Conservation Easement to any "qualified organization" within the meaning of Section 170(h)(3) of the IRC or the comparable provision in any subsequent revision of the IRC and only with assurances that the Conservation Purpose will be maintained. If any such assignee shall be dissolved or shall abandon this Conservation Easement or the rights and duties of enforcement herein set forth, or if proceedings are instituted for condemnation of this Conservation Easement, this Conservation Easement and rights of enforcement shall revert to the assigning Grantee. If said assigning Grantee shall be dissolved and if the terms of the dissolution fail to provide a successor, and if there are no other Grantees in place, then Grantor shall institute in a court of competent jurisdiction a proceeding to appoint an appropriate successor as Grantee. Any such successor shall be a "qualified organization" within the meaning of Section 170(h)(3) of the Internal Revenue Code ("IRC") or the comparable provision in any subsequent revision of the IRC. No assignment may be made by any Grantee of its rights under this Conservation Easement unless Grantee, as a condition of such assignment, requires the assignee to carry out the Conservation Purpose.

B. Amendment. Grantor and Grantee recognize that circumstances could arise that justify an amendment of certain of the Provisions contained in this Conservation Easement. To this end, Grantor and Grantee have the right to agree to amendments to this Conservation

Easement; provided, however, that:

(1) Proposed amendments will not be approved unless, in the opinion of each Grantee, the requested amendment satisfies the more stringent of the following: (A) (i) the amendment either enhances or has no adverse effect on the Conservation Purpose protected by this Conservation Easement and (ii) the amendment upholds the intent of the original Grantor and the fiduciary obligation of the Grantee to protect the Property for the benefit of the public in perpetuity; or (B) the amendment complies with such Grantee's amendment policy at the time that the amendment is requested.

(2) The amendment must be in conformity with all of each Grantee's policies in effect at the time of the amendment;

(3) The amendment must be recorded among the Land Records in the county or counties where this Conservation Easement is recorded.

Grantor and Grantee may agree to an amendment in lieu of engaging in full condemnation proceedings; provided that Grantee determines that the exercise of condemnation would be lawful, the best interest of all parties would be better served by negotiating a settlement with the condemning authority, and the Grantee receive and use compensation as set forth in Art. IX above. In such event, an amendment shall only be required to satisfy Art. X.B(3).

C. Compliance with Other Laws. The Provisions of this Conservation Easement do not replace, abrogate or otherwise set aside any local, state or federal laws, requirements or restrictions imposing limitations on the use of the Property.

In the event that any applicable state or federal law imposes affirmative obligations on owners of land which if complied with by Grantor would be a violation of a Provision of this Conservation Easement, Grantor shall: (i) if said law requires a specific act without any discretion on the part of Grantor, comply with said law and give Grantee written notice of Grantor's compliance as soon as reasonably possible, but in no event more than thirty (30) days from the time Grantor begins to comply; or (ii) if said law leaves to Grantor's discretion how to comply with said law, use the method most protective of the Conservation Attributes of the Property listed herein and in Exhibit B and give Grantee written notice of Grantor's compliance as soon as reasonably possible, but in no event more than thirty (30) days from the time Grantor begins to comply.

D. Entire Agreement and Severability. This instrument sets forth the entire agreement of the parties with respect to the Conservation Easement and supersedes all prior discussions, negotiations, understandings or agreements relating to this Conservation Easement. If any Provision is found to be invalid, the remainder of the Provisions of this Conservation Easement, and the application of such Provision to persons or circumstances other than those as to which it is found to be invalid, shall not be affected thereby.

E. Joint and Several. If Grantor at any time own the Property in joint tenancy, tenancy by the entireties or tenancy in common, all such tenants shall be jointly and severally liable for

all obligations set forth in this Conservation Easement.

F. Recordation. Grantee shall record this instrument in a timely fashion among the Land Records of Anne Arundel County, Maryland, and may re-record it at any time as may be required to preserve their rights under this Conservation Easement.

G. Notice to Grantees. Any notices by Grantor to Grantee pursuant to any Provision hereof shall be sent by registered or certified mail, return receipt requested, addressed to:

Commander, Naval Facilities Engineering Command Washington
ATTN: Real Estate Contracting Officer (AM1)
1314 Harwood Street, SE
Washington Navy Yard, DC 20374 - 5018

or to such other addresses as Grantee may establish in writing on notification to Grantor, or to such other address as Grantor know to be the actual location(s) of Grantee.

H. Counterpart Signatures. This document may be executed in multiple counterparts, each of which shall be deemed an original, and all of which together shall constitute one and the same instrument. Signatures, including notary signatures, provided by electronic means including, by way of example and not of limitation, facsimile, Adobe, PDF, and sent by electronic mail, or via an electronic signature program, shall be deemed to be original signatures.

I. Captions. The captions in this Conservation Easement have been inserted solely for convenience of reference and are not a part of this instrument. Accordingly, the captions shall have no effect upon the construction or interpretation of the Provisions of this Conservation Easement.

J. No Unfunded Liabilities (Grantor). Notwithstanding anything contained in this Conservation Easement to the contrary, any and all obligations of Grantor under this Conservation Easement shall be conditioned upon available appropriations, and Grantor shall not be responsible for any unfunded liabilities of any kind whatsoever.

ARTICLE XI. APPROVAL OF GRANTEE

In any case where the Terms of this Conservation Easement require the approval of Grantee, such approval shall be requested by written notice to each of Grantee. Such approval shall be deemed given unless within ninety (90) days after receipt of notice Grantee mails notice to Grantors of disapproval and the reason(s) therefore. Unless Grantee's approval is deemed given in accordance with the prior sentence, any approval shall be written. Grantees will take into account the Terms and purposes of this Conservation Easement in determining whether to give such approval, but their decision shall be final and in their sole discretion.

ARTICLE XII. PROGRAM OPEN SPACE CONVERSION

The Property was purchased, in part, with funds from a local grant from the State of Maryland's Program Open Space, and therefore portions of the Property are subject to the conversion restrictions set forth in Section 5-906(7)&(8) of the Natural Resources Article, Annotated Code of Maryland ("Conversion Restrictions"). In the event of any conflict between the terms of this Conservation Easement and the terms of the Conversion Restrictions, the terms of the Conversion Restrictions shall control.

TO HAVE AND TO HOLD unto the United States Department of the Navy, its successors and assigns, forever. The covenants agreed to and the terms, conditions, and restrictions imposed as aforesaid shall be binding upon Grantor, its successors and assigns, and shall continue as a servitude running in perpetuity with the Property.

AND Grantor covenants that it has not done or suffered to be done any act, matter or thing whatsoever, to encumber the interest in the Property hereby conveyed; that they will warrant specially the Property granted and that it will execute such further assurances of the same as may be requisite.

IN WITNESS WHEREOF, Grantor and Grantee have hereunto set their hands and seals the day and year above written.

[Signature Pages to Follow]

GRANTOR:
ANNE ARUNDEL COUNTY, MARYLAND

DocuSigned by:
9/22/2020
85B4D2942CF3481...

_____(SEAL)
Matthew J. Power
Chief Administrative Officer for
Anne Arundel County, Maryland

AFFIDAVIT OF INTENT TO USE ELECTRONIC SIGNATURE

1. I, Matthew J. Power, am over eighteen years of age and competent to testify.

2. I have signed the document or documents accompanying this affidavit by means of an electronic signature, which is defined in Md. Code, Real Property § 3-701(E) as an "electronic sound, symbol, or process attached to or logically associated with a document and executed or adopted with the intent to sign the document."

3. I have done so with the intent to sign the document.

4. My use of the electronic signature was not done for any illegal or fraudulent purposes.

I solemnly declare under the penalties of perjury that the contents of the foregoing paper is true to the best of my knowledge, information, and belief.

DocuSigned by:

85B4D2942CF3481...

Name of Affiant

ACCEPTED BY GRANTEE:

THE UNITED STATES OF AMERICA, DEPARTMENT OF THE NAVY

By: DocuSigned by: Christine Hays 45833145072D47B... (SEAL)

Christine A. Hays
Asset Management Real Estate Branch
Real Estate Contracting Officer

AFFIDAVIT OF INTENT TO USE ELECTRONIC SIGNATURE

1. I, Christine A. Hays, am over eighteen years of age and competent to testify.

2. I have signed the document or documents accompanying this affidavit by means of an electronic signature, which is defined in Md. Code, Real Property § 3-701(E) as an "electronic sound, symbol, or process attached to or logically associated with a document and executed or adopted with the intent to sign the document."

3. I have done so with the intent to sign the document.

4. My use of the electronic signature was not done for any illegal or fraudulent purposes.

I solemnly declare under the penalties of perjury that the contents of the foregoing paper is true to the best of my knowledge, information, and belief.

Name of Affiant

AFFIDAVIT OF INTENT TO USE ELECTRONIC SIGNATURE

1. I, Christine A. Hays, am over eighteen years of age and competent to testify.

2. I have signed the document or documents accompanying this affidavit by means of an electronic signature, which is defined in Md. Code, Real Property § 3-701(E) as an "electronic sound, symbol, or process attached to or logically associated with a document and executed or adopted with the intent to sign the document."

3. I have done so with the intent to sign the document.

4. My use of the electronic signature was not done for any illegal or fraudulent purposes.

I solemnly declare under the penalties of perjury that the contents of the foregoing paper is true to the best of my knowledge, information, and belief.

DocuSigned by:
Christine Hays
43833145072D47B...

9/23/2020

Name of Affiant

I hereby certify this deed was prepared by or under the supervision of an attorney for one of the parties.

DocuSigned by:

9/21/2020

EB4FE0B0252D459...

Gregory J. Swain
County Attorney

Approved as to legal form and sufficiency this _____ day of _____, 20__. "Approved" means the document meets the legal requirements for a deed of conservation easement; it does not mean approval or disapproval of the transaction.

APPROVED FOR FORM AND LEGAL SUFFICIENCY
GREGORY J. SWAIN, COUNTY ATTORNEY

BY: _____ 9/22/20
Date

Christine B. Neiderer
Assistant County Attorney

AFFIDAVIT OF INTENT TO USE ELECTRONIC SIGNATURE

1. I, Gregory J. Swain, am over eighteen years of age and competent to testify.

2. I have signed the document or documents accompanying this affidavit by means of an electronic signature, which is defined in Md. Code, Real Property § 3-701(E) as an "electronic sound, symbol, or process attached to or logically associated with a document and executed or adopted with the intent to sign the document."

3. I have done so with the intent to sign the document.

4. My use of the electronic signature was not done for any illegal or fraudulent purposes.

I solemnly declare under the penalties of perjury that the contents of the foregoing paper is true to the best of my knowledge, information, and belief.

DocuSigned by:

EB4FE0B0252D459...

Name of Affiant

EXHIBIT A
Boundary Description, Legal Description, Property Reference
(See attached)

Containing 19.43 acres, more or less, as shown and described on that "ALTA/NSPS Land Title Survey of 1700-1711 Quiet Waters Court dated November 1, 2019" recorded among the Land Records of Anne Arundel County, Maryland on 9/30/2020, 2020 in Plat Book F2 Folio 49. Said property being more particularly described below and incorporated herein. PLAT# F249

EXHIBIT A

LEGAL DESCRIPTION
QUIET WATERS RETREAT

SECOND ASSESSMENT DISTRICT
ANNE ARUNDEL COUNTY, MARYLAND

Being a portion of parcels 87 and 88 of Tax Map 56, Blocks 17 and 18; as described in a conveyance from Mary Parker to the Trustees of the Mary E. Parker Foundation by deed dated December 23, 1986 as recorded among the land records of Anne Arundel County, Maryland in Liber 4224 at Folio 711. Being more particularly described as follows;

Beginning for the same at 1" pipe found 8" deep and under a 3" X 3" cedar post, said pipe being at the southwest corner of Lot 44, Block K, as shown on Plat 2 of Section 3 of Hillsmere Estates as recorded among the land records of Anne Arundel County, Maryland in Plat Book 25 at Folio 8, thence along the south line of said Lot 44

1) South 76 degrees 50 minutes 33 seconds East 149.95 feet to an iron pipe found at the southeast corner of said Lot 44, said pipe being under the center of a 2-1/2 foot wide brick sidewalk; thence leaving said Lot 44 and binding on the western right-of-way line of Forest Hill Drive the following two (2) bearings and distances;

2) South 13 degrees 14 minutes 17 seconds West 54.12 feet to a 3/4" pipe found;

3) South 09 degrees 33 minutes 00 seconds West 639.88 feet to a 3/4" pipe found; thence crossing the right-of-way of Deyman Drive as shown on said plat of Hillsmere Estates, and binding on the line between Lots 22 and 23 of Block Z as shown on said plat of Hillsmere Estates;

4) South 01 degrees 59 minutes 57 seconds West 235.16 feet to a concrete monument found 18" deep on the shoreline of South River; thence following the shoreline meanders of South River the following eighteen (18) bearings and distances;

5) North 86 degrees 19 minutes 37 seconds West 61.16 feet;

6) South 87 degrees 31 minutes 03 seconds West 73.91 feet;

7) South 84 degrees 45 minutes 14 seconds West 62.81 feet;

8) North 81 degrees 27 minutes 18 seconds West 52.47 feet;

9) North 79 degrees 14 minutes 53 seconds West 159.31 feet;

10) North 83 degrees 41 minutes 35 seconds West 159.96 feet;

11) South 84 degrees 35 minutes 13 seconds West 107.23 feet to a point on an existing bulkhead; thence following said bulkhead the following four (4) courses

12) North 87 degrees 38 minutes 23 seconds West 50.24 feet;

13) North 68 degrees 01 minutes 46 seconds West 85.87 feet;

14) North 62 degrees 30 minutes 23 seconds West 100.76 feet;

15) South 85 degrees 51 minutes 10 seconds West 122.14 feet;

16) North 11 degrees 57 minutes 04 seconds West 14.95 feet to a point on the shoreline of South River;

17) North 82 degrees 14 minutes 13 seconds West 105.07 feet tot a point on an existing bulkhead; thence following said bulkhead the following six (6) courses;

18) South 30 degrees 53 minutes 01 seconds West 16.84 feet;

19) North 66 degrees 52 minutes 54 seconds West 63.63 feet;

20) North 67 degrees 19 minutes 03 seconds West 60.27 feet;

21) North 29 degrees 25 minutes 57 seconds West 174.91 feet;

22) North 38 degrees 29 minutes 04 seconds West 127.76 feet; thence following the shoreline meanders of Loden Pond the following thirteen (13) bearings and distances;

23) North 64 degrees 55 minutes 37 seconds East 84.75 feet leaving said bulkhead;

24) South 33 degrees 34 minutes 41 seconds East 268.66 feet;

25) North 82 degrees 36 minutes 51 seconds East 71.21 feet;

26) North 63 degrees 29 minutes 19 seconds East 126.88 feet;

27) North 84 degrees 34 minutes 00 seconds East 65.24 feet;

28) North 54 degrees 19 minutes 52 seconds East 104.08 feet;

29) North 16 degrees 56 minutes 16 seconds East 111.28 feet;

30) North 69 degrees 01 minutes 52 seconds East 90.75 feet;

31) North 89 degrees 49 minutes 39 seconds East 17.67 feet;

32) North 57 degrees 15 minutes 05 seconds East 124.00 feet;

33) North 08 degrees 11 minutes 55 seconds East 27.18 feet;

34) North 23 degrees 29 minutes 30 seconds West 51.30 feet;

35) North 50 degrees 12 minutes 37 seconds West 49.79 feet; thence leaving the shoreline meanders of Loden Pond and running through the subject property now or formerly owned by the Trustees of Mary E. Parker as described in Liber 4224 at Folio 711 as recorded among the land records of Anne Arundel County, Maryland the following three (3) bearings and distances;

36) North 32 degrees 23 minutes 26 seconds East 338.21 feet to a No. 5 rebar set;

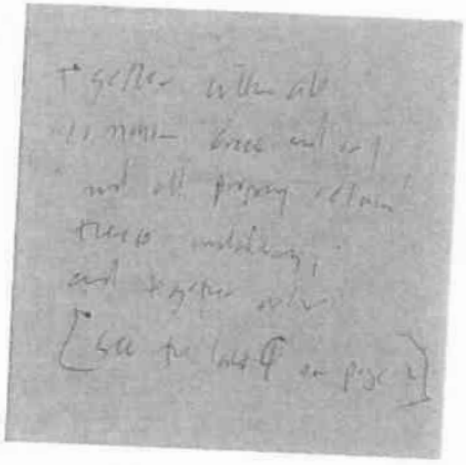
37) North 55 degrees 53 minutes 05 seconds East 339.40 feet to a No. 5 rebar set;

38) South 41 degrees 11 minutes 00 seconds East 272.75 feet to the point of beginning of the parcel herein described. Containing 846,356 square feet or 19.43 acres of land, more or less.

Together with all common areas and any and all property related thereto, including, and together with the buildings and improvements thereon erected, made or being; and all and every, the rights, alleys, ways, waters, privileges, appurtenances and advantages thereto belonging, or in anywise appertaining.

BEING also described as Lots 1-8, Parcel B, Open Space, Roads & Recreation Area as shown on the following plats: Administrative Plat, Quiet Waters Retreat per plats recorded in Book 109 pages 7 and 8 at Plats 5632 and 5633; Minor Subdivision of Lot 3 and Parcel A and Administrative Lot Line Change for Lots 1 and 2 and Parcel B, Quiet Waters Retreat per plat recorded in Book 156 at page 45; Minor Subdivision – Lot 3 and Administrative Lot Line Change Lots 1 and 2, Quiet Waters Retreat per plat recorded in Book 156 at Page 46; and Minor Subdivision Parcel A and Administrative Lot Line Change Parcel B, Quiet Waters Retreat per plat recorded in Book 156 at Page 47.

BEING the same property described in that deed recorded in Liber 4487 at Folio 512.



Tax ID Nos. and Addresses

1705 Quiet Waters Lane	20090059890
0 Quiet Waters Court	20090059891
1710 Quiet Waters Lane	200090083707
1708 Quiet Waters Lane	200090083708
1703 Quiet Waters Court	200090059888
1701 Quiet Waters Court	200090059889
1700 Quiet Waters Court	200090058831
1709 Quiet Waters Lane	200090083702
1711 Quiet Waters Lane	200090083703
1708 Quiet Waters Lane	200090083704
1706 Quiet Waters Lane	200090083705
1704 Quiet Waters Lane	200090083706

	TAX ID	PROPERTY ADDRESS
1	200090059890	1505 Quiet Waters Ln, Annapolis, MD 21403
2	200090059891	0 Quiet Waters Court, Annapolis, MD 21403
3	200090083707	1710 Quiet Waters Lane, Annapolis, MD 21403
4	200090083708	1708 Quiet Waters Lane, Annapolis, MD 21403
5	200090059888	1703 Quiet Waters Court, Annapolis, MD 21403
6	200090059889	1701 Quiet Waters Court, Annapolis, MD 21403
7	200090058831	1700 Quiet Waters Court, Annapolis, MD 21403
8	200090083702	1709 Quiet Waters Lane, Annapolis, MD 21403
9	200090083703	1711 Quiet Waters Lane, Annapolis, MD 21403
10	200090083704	1708 Quiet Waters Lane, Annapolis, MD 21403
11	200090083705	1706 Quiet Waters Lane, Annapolis, MD 21403
12	200090083706	1704 Quiet Waters Lane, Annapolis, MD 21403

EXHIBIT A (Continued)
Lot Descriptions and Addresses

Lot Number	Tax Id Number	Tax map, grid & parcel	Street address, City, State and Zip
1	2000-9005-9888	0056/0012/0087	1703 Quiet Waters Court, Annapolis, MD 21403
2	2000-9005-9889	0056/0012/0087	1701 Quiet Waters Court, Annapolis, MD 21403
3	2000-9005-8831	0056/0012/0087	1700 Quiet Waters Court, Annapolis, MD 21403
4	2000-9008-3702	0056/0018/0087	1709 Quiet Waters Lane, Annapolis, MD 21403
5	2000-9008-3703	0056/0018/0087	1711 Quiet Waters Lane, Annapolis, MD 21403
6	2000-9008-3704	0056/0018/0087	1708 Quiet Waters Lane, Annapolis, MD 21403
7	2000-9008-3705	0056/0018/0087	1706 Quiet Waters Lane, Annapolis, MD 21403
8	2000-9008-3706	0056/0018/0087	1704 Quiet Waters Lane, Annapolis, MD 21403
Recreation Area	2000-9008-3707	0056/0018/0087	1710 Quiet Waters Lane, Annapolis, MD 21403
Open Space	2000-9008-3708	0056/0018/0087	1708 Quiet Waters Court, Annapolis, MD 21403
Parcel B	2000-9005-9890	0056/0012/0087	1705 Quiet Waters Lane, Annapolis, MD 21403
Common R/W	2000-9005-9891	0056/0012/0087	Quiet Waters Court, Annapolis, MD 21403

EXHIBIT B
Conservation Attributes

1. This conservation easement will protect and conserve 19.43 acres of land lying within the Critical Area of the Chesapeake Bay.

2. This property provides forested protection of Loden Pond a unique tidal pond located on the South River, a major tributary of the Chesapeake Bay.

3. This 19.43 acre parcel contains approximately 11 acres of mature deciduous forest which filters storm water that enters Loden Pond, the South River and the Chesapeake Bay.

4. The forest, meadow and a small pond provide a diverse habitat for native flora and fauna.

5. This property has approximately 1570 feet of frontage on the South River and 1200 feet on Loden Pond. County ownership of this property and shoreline will facilitate the stabilization of steep slopes and erodible soils that could impact water quality of the South River and the Chesapeake Bay.

6. County ownership will provide assurances that any recreation amenities will be passive in nature and installed using environmental site design criteria.

7. Providing public water access for canoes, kayaks and other rowing craft will help garner public support for the continuing efforts to protect and enhance the water quality of the Chesapeake Bay.

8. Meadow Habitat – This property contains some non-forested open space areas that can be managed to provide meadow habitat for ground nesting birds, or re-forested depending on the environmental benefits of each alternative.

9. The acquisition of this property will preclude the construction of three to five residential units in the Critical Area of the Chesapeake Bay. Eliminating this expanded residential use will contribute to the health of Loden Pond, the South River and the Chesapeake Bay. The existing 300 acre Quiet Waters Park will also benefit from the elimination of future residential development from both environmental and park management perspectives.

EXHIBIT C
Inventory of Existing Structures

Structure	**County GIS Building Footprint**	**Square Footage** *unverified information
Main residence, frame construction, 3 bed, 3 bath	7,211	6,175
Guest Cottage, frame construction, 1 bed, 1 bath	2,106	1,450
5 car garage, frame and brick construction with above residence having 4 bedrooms, 2 baths	2,204	2,275 (Above Residence 1,650)
3 car garage	1,072	830
Vacant cottage, frame construction, to be razed	1,421	585
Boat House	1,400	1,400
TOTAL	**15,414 square feet**	

Deed of Conservation Easement
Quiet Waters Retreat Property
Color Digital Images of the Property
Exhibit D

All Photos were taken by Anne Arundel County.

Image #	**Image Description**
001	View of subject frontage looking south along Forest Hill Drive
002	View of current entrance to the subject property
003	View of the front and side of the main dwelling
004	View of side and rear of the main dwelling
005	View of interior of the main dwelling
006	View of the kitchen in the main dwelling
007	View of the front of the existing guest cottage
008	View of the rear of the existing guest cottage
009	Interior view of the guest cottage
010	View of the front and side of dwelling in poor condition
011	View of rear of dwelling in poor condition
012	View of three car garage adjacent to the former dwelling
013	View of the boathouse
014	View of the interior of the boathouse
015	View of the front of the five car garage with residential unit on second level
016	View of the rear of the five car garage and residential unit
017	View of interior of the garage
018	Representative view of interior of the residential unit above the garage
019	View of the grounds
020	View of the northern portion of the site
021	View of the South River from the vicinity of the cottage
022	View of Loden Pond
023	View of the South River looking southwest
024	View of the South River from the subject property

Quiet Waters Retreat Property
19.43 Acres Shown in Blue

Legend

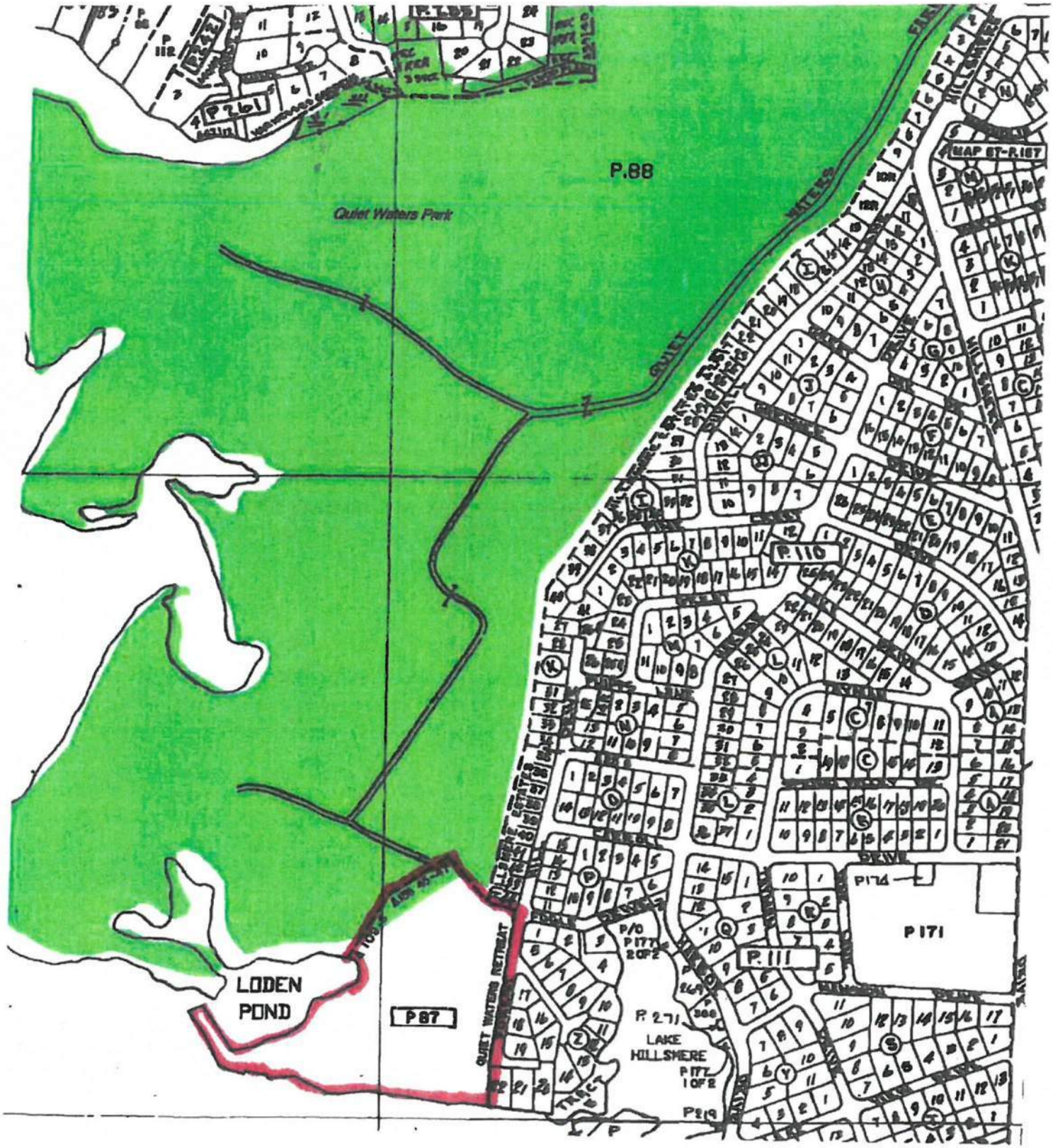
- OPZ Parcels

Notes

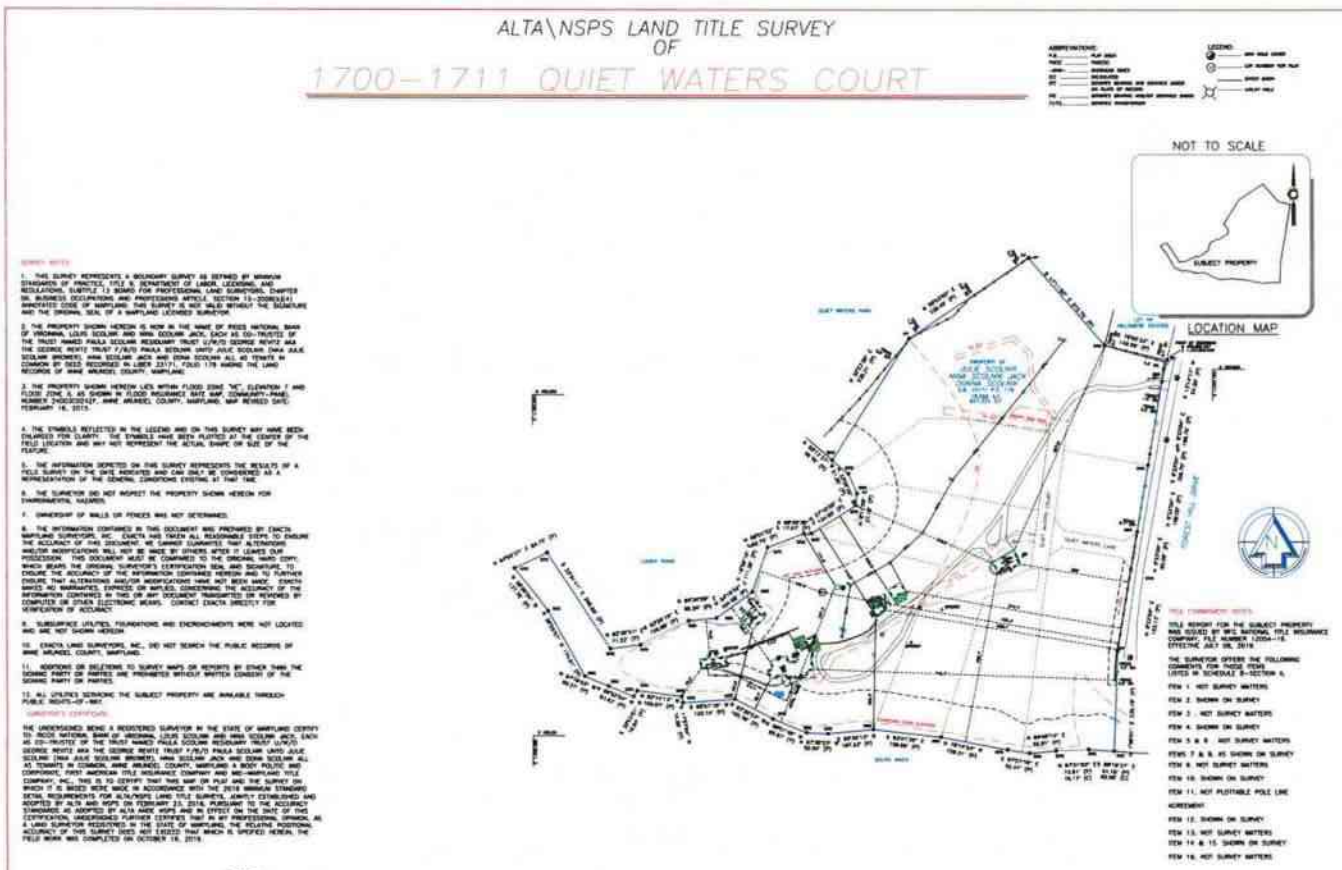
June 10, 2016

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
THIS MAP IS NOT TO BE USED FOR NAVIGATION

EXHIBIT F
Tax Map 56 Grids 17 and 18 Parcel 87



ALTA\NSPS LAND TITLE SURVEY
OF
1700-1711 QUIET WATERS COURT



SURVEY NOTES

1. THIS SURVEY REPRESENTS A BOUNDARY SURVEY AS DEFINED BY MINIMUM STANDARDS OF PRACTICE, TITLE 9, DEPARTMENT OF LABOR, LICENSING, AND REGULATIONS, SUBTITLE 13 BOARD FOR PROFESSIONAL LAND SURVEYORS, CHAPTER 06, BUSINESS OCCUPATIONS AND PROFESSIONS ARTICLE, SECTION 15-206(b)(4) ANNOTATED CODE OF MARYLAND. THIS SURVEY IS NOT VALID WITHOUT THE SIGNATURE AND THE ORIGINAL SEAL OF A MARYLAND LICENSED SURVEYOR.

2. THE PROPERTY SHOWN HEREON IS NOW IN THE NAME OF RIGGS NATIONAL BANK OF VIRGINIA, LOUIS SCOLNIK AND NINA SCOLNIK JACK, EACH AS CO-TRUSTEE OF THE TRUST NAMED PAULA SCOLNIK REVOCABLE TRUST U/W/O GEORGE REVITZ AKA THE GEORGE REVITZ TRUST F/B/O PAULA SCOLNIK (ANTO JULIE SCOLNIK (NKA JULIE SCOLNIK BROWER)), NINA SCOLNIK JACK AND ERIKA SCOLNIK ALL AS TENANTS IN COMMON BY DEED RECORDED IN LIBER 23171, FOLIO 178 AMONG THE LAND RECORDS OF ANNE ARUNDEL COUNTY, MARYLAND.

3. THE PROPERTY SHOWN HEREON LIES WITHIN FLOOD ZONE "AE", ELEVATION 7 AND FLOOD ZONE X, AS SHOWN IN FLOOD INSURANCE RATE MAP, COMMUNITY-PANEL NUMBER 2400030024F, ANNE ARUNDEL COUNTY, MARYLAND, MAP REVISED DATE: FEBRUARY 16, 2013.

4. THE SYMBOLS REFLECTED IN THE LEGEND AND ON THIS SURVEY MAY HAVE BEEN ENLARGED FOR CLARITY. THE SYMBOLS HAVE BEEN PLOTTED AT THE CENTER OF THE FIELD LOCATION AND MAY NOT REPRESENT THE ACTUAL SHAPE OR SIZE OF THE FEATURE.

5. THE INFORMATION DEPICTED ON THIS SURVEY REPRESENTS THE RESULTS OF A FIELD SURVEY ON THE DATE INDICATED AND CAN ONLY BE CONSIDERED AS A REPRESENTATION OF THE GENERAL CONDITIONS EXISTING AT THAT TIME.

6. THE SURVEYOR DID NOT INSPECT THE PROPERTY SHOWN HEREON FOR ENVIRONMENTAL HAZARDS.

7. OWNERSHIP OF WALLS OR FENCES WAS NOT DETERMINED.

8. THE INFORMATION CONTAINED IN THIS DOCUMENT WAS PREPARED BY EXACTA MARYLAND SURVEYORS, INC. EXACTA HAS TAKEN ALL REASONABLE STEPS TO ENSURE THE ACCURACY OF THIS DOCUMENT. WE CANNOT GUARANTEE THAT ALTERATIONS AND/OR MODIFICATIONS WILL NOT BE MADE BY OTHERS, AFTER IT LEAVES OUR POSSESSION. THIS DOCUMENT MUST BE COMPARED TO THE ORIGINAL HARD COPY, WHICH BEARS THE ORIGINAL SURVEYOR'S CERTIFICATION SEAL AND SIGNATURE, TO ENSURE THE ACCURACY OF THE INFORMATION CONTAINED HEREON AND TO FURTHER ENSURE THAT ALTERATIONS AND/OR MODIFICATIONS HAVE NOT BEEN MADE. EXACTA MAKES NO WARRANTIES, EXPRESS OR IMPLIED, CONCERNING THE ACCURACY OF THE INFORMATION CONTAINED IN THIS OR ANY DOCUMENT TRANSMITTED OR RECEIVED BY COMPUTER OR OTHER ELECTRONIC MEANS. CONTACT EXACTA DIRECTLY FOR VERIFICATION OF ACCURACY.

9. SUBSURFACE UTILITIES, FOUNDATIONS AND ENCROACHMENTS WERE NOT LOCATED AND ARE NOT SHOWN HEREON.

10. EXACTA LAND SURVEYORS, INC., DID NOT SEARCH THE PUBLIC RECORDS OF ANNE ARUNDEL COUNTY, MARYLAND.

11. ADDITIONS OR DELETIONS TO SURVEY MAPS OR REPORTS BY OTHER THAN THE SIGNING PARTY OR PARTIES ARE PROHIBITED WITHOUT WRITTEN CONSENT OF THE SIGNING PARTY OR PARTIES.

12. ALL UTILITIES SERVICING THE SUBJECT PROPERTY ARE AVAILABLE THROUGH PUBLIC RIGHTS-OF-WAY.

SURVEYOR'S CERTIFICATE

THE UNDERSIGNED BEING A REGISTERED SURVEYOR IN THE STATE OF MARYLAND CERTIFY TO: RIGGS NATIONAL BANK OF VIRGINIA, LOUIS SCOLNIK AND NINA SCOLNIK JACK, EACH AS CO-TRUSTEE OF THE TRUST NAMED PAULA SCOLNIK REVOCABLE TRUST U/W/O GEORGE REVITZ AKA THE GEORGE REVITZ TRUST F/B/O PAULA SCOLNIK (ANTO JULIE SCOLNIK (NKA JULIE SCOLNIK BROWER)), NINA SCOLNIK JACK AND ERIKA SCOLNIK ALL AS TENANTS IN COMMON, ANNE ARUNDEL COUNTY, MARYLAND A BODY POLITIC AND CORPORATE, FIRST AMERICAN TITLE INSURANCE COMPANY AND MID-MARYLAND TITLE COMPANY, INC., THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS ON FEBRUARY 23, 2016. PURSUANT TO THE ACCURACY STANDARDS AS ADOPTED BY ALTA AND NSPS AND IN EFFECT ON THE DATE OF THIS CERTIFICATION, UNDERSIGNED FURTHER CERTIFIES THAT IN MY PROFESSIONAL OPINION, AS A LAND SURVEYOR REGISTERED IN THE STATE OF MARYLAND, THE RELATIVE POSITIONAL ACCURACY OF THIS SURVEY DOES NOT EXCEED THAT WHICH IS SPECIFIED HEREIN. THE FIELD WORK WAS COMPLETED ON OCTOBER 16, 2019.

WILLIAM HERBERT
PROPERTY LINE SURVEYOR NO. 483
STATE OF MARYLAND
EXACTA LAND SURVEYORS, INC.

EXPIRES:

TITLE COMMITMENT NOTES

TITLE REPORT FOR THE SUBJECT PROPERTY WAS ISSUED BY MFG NATIONAL TITLE INSURANCE COMPANY, FILE NUMBER 12004-116, EFFECTIVE JULY 08, 2019.

THE SURVEYOR OFFERS THE FOLLOWING COMMENTS FOR THOSE ITEMS LISTED IN SCHEDULE B-SECTION II.

ITEM 1: NOT SURVEY MATTERS
ITEM 2: SHOWN ON SURVEY
ITEM 3: NOT SURVEY MATTERS
ITEM 4: SHOWN ON SURVEY
ITEM 5 & 6: NOT SURVEY MATTERS
ITEMS 7 & 8, 45: SHOWN ON SURVEY
ITEM 9: NOT SURVEY MATTERS
ITEM 10: SHOWN ON SURVEY
ITEM 11: NOT PLOTTABLE POLE LINE AGREEMENT
ITEM 12: SHOWN ON SURVEY
ITEM 13: NOT SURVEY MATTERS
ITEM 14 & 15: SHOWN ON SURVEY
ITEM 16: NOT SURVEY MATTERS

NOTE: THE COORDINATE VALUES AS SHOWN HEREON ARE BASED ON NAD83 COORDINATE SYSTEM AS DERIVED FROM ANNE ARUNDEL COUNTY MONUMENTS ID-2342 AND ID-434

Graphic Scale (In Feet)
1 inch = 100 ft.

ALTA/ACSM LAND TITLE SURVEY OF
QUIET WATERS COURT
ANNAPOLIS, MD
ANNE ARUNDEL, MARYLAND

1910.0702

01

01