Hilco Redevelopment Partners

Coordinated Sustainability Strategy (CSS)

Former Potomac River Generating Station Site
Alexandria, Virginia

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Contents

1. Executive Summary

Powerplant Transformation

Hilco Redevelopment Partners (HRP) is proud to submit this Coordinated Sustainability Strategy (or CSS, formerly known as the Sustainability Master Plan) to the City of Alexandria for the redevelopment of the former Potomac River Generating Station (PRGS or Project) site. This plan builds on the voluntary Carbon Neutrality Analysis (CNA) submitted in April 2022 that identifies a path towards carbon reduction at the Project site.

The Project sits on the site of a former coal-fired power plant located in the Old Town North (OTN) neighborhood of Alexandria that was permanently deactivated in 2012 after 63 years of operation. The facility emitted 3.15 million metric tons of CO2e annually, among other contaminants, or nearly 200 million metric tons of CO2e over the course of its operation. A group of concerned citizens hired scientists to study the effects of pollution from the plant, which triggered local and state investigations into the site. Air quality studies showed the plant violated national ambient air quality standards for sulfur dioxide, particular matter, and nitrogen oxide. Though these findings were realized in 2005, it took an additional 7 years for the plant to fully shut down, as some officials argued it was essential to the local power grid. The plant was officially shut down in 2012 after years of fines for not meeting environmental standards where it has sat shuttered, vacant, and fenced off from the community around it.

Building on the success of this advocacy, the City created a process with the Old Town North community to envision the reintegration of this property back into the existing neighborhood fabric, in ways that would benefit the immediate neighborhood, Alexandria, and the region. The Old Town North Small Area Plan (OTNSAP) outlines the vision for the former power plant site as “a generational opportunity to integrate the PRGS site back into the fabric of the neighborhood and to address the environmental issues associated with past uses”.

HRP acquired the 18-acre site from the Potomac Electric Power company (Pepco) in 2020. Upon acquisition, HRP entered the site into the Voluntary Remediation Program (VRP) administered by the Virginia Department of Environmental Quality (VDEQ) in February 2021. Initial soil and groundwater sampling work was completed in the fall of 2021. Soil and groundwater sampling results indicated the presence of metals and petroleum hydrocarbons that were generally below VDEQ screening levels with a few exceptions. Manganese, thallium, and iron were detected above screening levels at a few locations. Petroleum hydrocarbons were detected above VDEQ action levels in the known petroleum release area and rail yard. Results from the Fall 2021 sampling were documented in a Preliminary Site Characterization Report that was submitted to VDEQ in March 2022. Additional sampling will be conducted in currently inaccessible areas (beneath buildings, near active utilities) and documented in a Site Characterization Report. After additional sampling is complete, locations where concentrations exceed VDEQ Screening Levels will be evaluated in a Human Health Risk Assessment. Results of the Human Health Risk Assessment will be used to identify areas where remediation is warranted. Remedial actions will be selected, designed, and implemented in coordination with deconstruction and redevelopment.

HRP is uniquely positioned as a real estate investment and redevelopment company that reimagines, remediates, and redevelops obsolete industrial sites across the United States. This is done with a holistic approach to development that prioritizes economic, community, and environmental sustainability. The transformation of this former industrial property into and vibrant, walkable, and energy-efficient mixed-use district will be reconnected into the surrounding community and revitalized as envisioned in the OTNSAP.

Alexandria City Environmental Policy

The framework established in this CSS is rooted in Alexandria's sustainability policies and guidelines, each building off the other to create an environmental sustainability foundation upon which the redevelopment of this site on a former coal-fired power plant can occur.

Eco-City Charter

Alexandria's Eco-City Charter was adopted by City Council in 2008 to define the City's commitment to ecological, economic, and social sustainability. The Charter outlines guiding principles that reflect goals established in Alexandria's 2015 Strategic Plan and form the basis for the City's Environmental Action Plan (EAP) 2040. They are:

1. **Build Wisely:** Preserve and maximize open space, natural landscapes, historic resources, and recreational opportunities, while protecting and improving public health.
2. **Embraces Natural Beauty:** Create beautiful parks, gardens, streetscapes, trails, and open spaces that embrace Alexandria's natural beauty, preserves biodiversity, increases tree canopy and streamside vegetation, and encourages a healthy and active lifestyle for all Alexandrians.
3. **Improves Water Quality:** Improve the Potomac River waterfront, eliminate sewer overflows, reduce stormwater runoff, and improve the quality of Alexandria's streams.
4. **Cleans the Air:** Reduce significantly air pollution from all sources including vehicles, industrial sources, and power plants.
5. **Moves Smartly:** Travel less by car use and increase use of public transportation, walking, and cycling.
6. **Conserves Energy and Resources:** Reduce energy and water use to minimize environmental footprint.
7. **Minimizes Waste:** Reuse and recycle materials and significantly the volume of waste and toxic chemicals.
8. **Supports Healthy Living:** Create environmental policy and programs not only for a healthier planet but also for a healthier and safer citizenry.
9. **Readies for Change:** Where we foresee and mitigate impacts of environmental threats such as climate change.
10. **Leads Intelligently and Holistically:** Implement change harmoniously and synergistically across interdependent area.
11. **Shares Responsibility:** Individuals take responsibility, decision-making is shared, and the community works together to achieve commons goals.

Green Building Policy (GBP) 2019

Alexandria's Green Building Policy (GBP) identifies the minimum green building practices for new development that require a Development Site Plan (DSP) or Development Special Use Permit (DSUP) and were submitted to City Council on or after March 2, 2020. The GBP relies on LEED, Green Globes, EarthCraft, and National Green Building Standard as third-party rating systems accepted under this policy and sets forth the minimum level of certification under these rating systems. The GBP also identifies "performance points" under energy use reduction and greenhouse gas emission reductions, water efficiency, and indoor environmental quality. The GBP is included in this CSS as Appendix A The PRGS redevelopment will achieve LEED-ND and LEED-NC Silver, at a minimum.

City of Alexandria Environmental Action Plan 2040

The City's Environmental Action Plan (EAP) 2040 is a strategic guide that builds on the 10 principles identified in the City's Eco-City Charter. The EAP identifies City targets for short-term, mid-term, and long-term goals within the policy's 10 guiding principles. The EAP 2040 follows the previous EAP 2030 and expands recommendations to go beyond previously established City programs and policies.

Old Town North Small Area Plan

The Old Town North Small Area Plan (OTNSAP) was adopted in 2017 after a nearly two-year planning and community engagement process that included public meetings, open houses, and design charrettes that were facilitated by the Old Town North Advisory group. The closure of the former Potomac River Generating Station was a motivator to create the OTNSAP and its transformation critical to realizing the goals set forth by these planning efforts between the City of Alexandria (City) and OTN community. The OTNSAP sets forth the community's goals for the redevelopment of the former PRGS site into a mixed-use district into an economic anchor that incorporates arts and innovation includes significant sustainability targets. The OTNSAP was accompanied by Urban Design Standards and Guidelines to create a comprehensive blueprint for implementation of the strategies identified therein.

The vision for the redevelopment of former PRGS site from industrial to mixed-use is described in the OTNSAP as

> *"an opportunity to integrate the site of a former power plant back into the fabric of the neighborhood and to address the environmental issues associated with past uses. Urban development and natural ecosystems need not be mutually exclusive, nor are people and their activities separate from nature. The former power plant site will modify its relationship with the environment by restoring waterfront open spaces, reducing impervious surfaces, remediating the soil, treating stormwater runoff, and restoring portions of the Resource Protection Area (RPA). The site will be accessible through public transportation, the pedestrian and bicycle network, and will engage the adjoining uses and buildings, offering Alexandria the ability to showcase forward thinking urban and sustainable planning and development for the 21st century."* [1]

The OTNSAP set forth a conceptual framework for the redevelopment of the former PRGS to include water quality, stormwater management, green infrastructure, transportation reduction, carbon reduction, and other energy and green building strategies in addition to enhancing the natural ecosystem and integrating open space throughout the site. Specifically, four goals were outlined in the OTNSAP for the former powerplant site: 1) achieve LEED-ND Silver, 2) prioritize renewable and low-carbon energy systems, to the extent feasible, 3) explore the use of district energy systems to reduce energy consumption and carbon emissions, and 4) develop a Sustainability Master Plan (what is now called a Coordinated Sustainability Strategy) that identifies strategies to implement the phased recommendations on a site-wise basis. The OTNSAP also set a goal to strive for a carbon neutral site by 2040 and carbon neutral buildings by 2030. The OTNSAP incorporated the goals and targets established by the EAP and Eco-City Charter.

Coordinated Development District Conditions

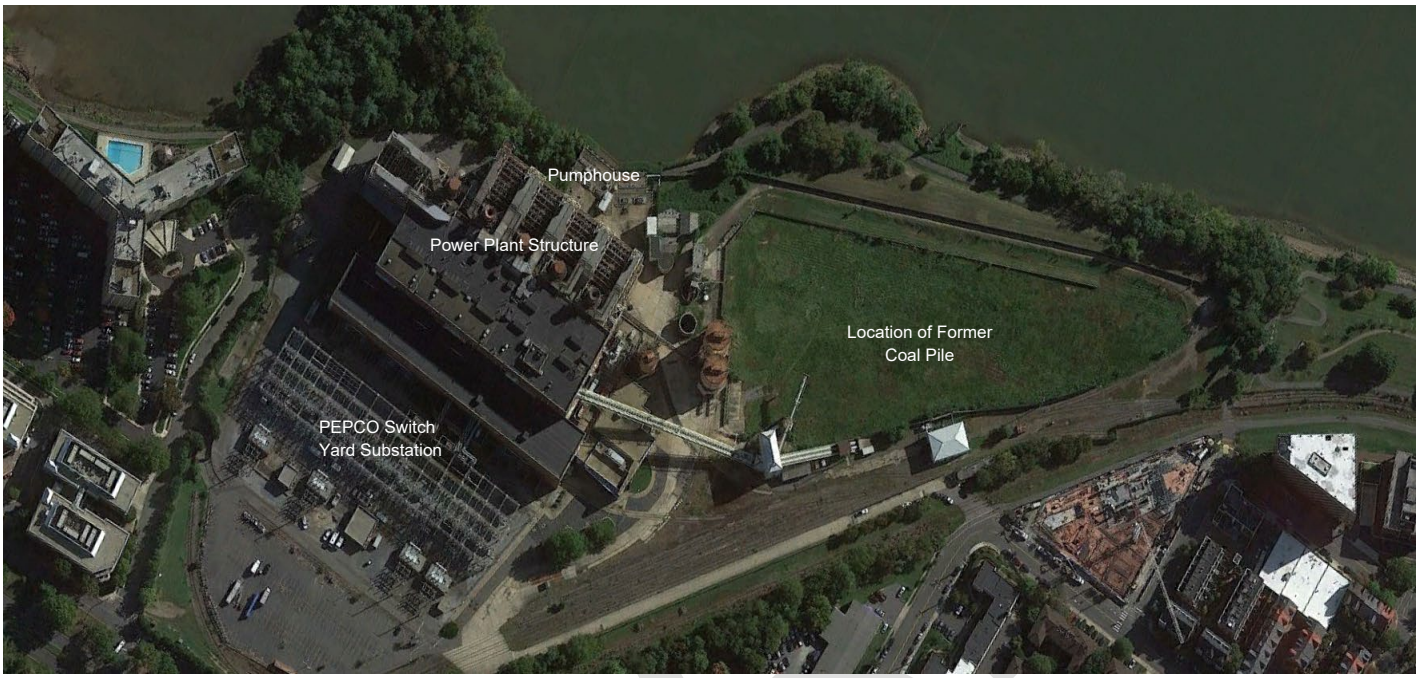
The approval of the Coordinated Development District (CDD) for the redevelopment of the former PRGS site included several conditions specific to sustainability measures. These conditions are attached to this CSS as Appendix B and referenced in the body of this CSS. Specifically, Condition 145 requires the CSS to outline short-, mid-, and long-term strategies to achieve five site and building performance targets (identified in Condition 139) in addition to other sustainability considerations that include:

- Energy and Resilience Planning/Carbon Reduction
- Indoor Environmental Quality
- Site
- Streetscapes
- Water Use Management
- Waste Management
- Resilience
- Reporting and Tracking

[1] *Reference 1: OTN SAP (Section 6.1.II)*

Existing Condition and Redevelopment Vision

The PRGS project is a redevelopment of a decommissioned power plant facility located on 18.8 acres in Old Town North neighborhood of the City of Alexandria. The property contains the decommissioned power plant, transformers and electrical equipment, remnants of a rail yard, areas where coal and coal ash were formerly stored, and various support buildings, including a former pumphouse. See image below.



The development will transform the location from a closed-off former industrial site into a vibrant, urban, mixed-use community that will include office, residential, arts, hotel, entertainment, retail, and restaurant use. The property will be reconnected to the surrounding Old Town North neighborhood through the extension of the existing street network into the new development and the seamless integration of new publicly accessible parks with existing and future public open space. The site will be accessible through public transportation, the pedestrian and bicycle network, and will engage the adjoining uses and buildings, offering Alexandria the ability to showcase forward thinking urban and sustainable planning and development.

The PRGS site will be redeveloped in phases. The phasing information is established to describe the roads and open space improvements associated with each phase of development. The exact order of the block and building development may vary. The full phasing plans can be found in Appendix C

Key components of the site and project are defined below:

- Site area is 18.8 acres, of which approximately 6-7 acres is developable for buildings.
- Adjacent to National Park Service and the Mount Vernon Trail to the east and an existing Pepco substation (to remain) and Norfolk Southern land to the southwest.
- Proposed redevelopment of up to 2.5 million square feet of mixed-use development on six blocks.
- Delivers approximately 5 acres of onsite publicly accessible open space.

Intent of this Coordinated Sustainability Strategy

The OTNSAP recommended a Sustainability Master Plan, now the Coordinated Sustainability Strategy (CSS), to identify strategies that could be implemented across phases on a site-wide basis that will integrate progressive goals and target carbon neutrality. This document identifies sustainable strategies that can be implemented over short-, mid-, and long-term time horizons to demonstrate how these strategies comply with the goals and recommendations of the City's plans and policies. The CSS is consistent with the OTNSAP, the Green Building Policy, and the EAP 2040. The CSS provides an opportunity to establish HRP's commitment to the sustainability goals. This process allows for establishing performance measurement tools and transparency for reporting progress towards the established goals.

The OTNSAP set timeframe for the SMP, now the CSS, of a 20-to-30-year build-out that is not reasonable from a private development perspective. The timeframes established in this CSS are compatible with market rate development and expected investment time horizons. They are:

- **Short-Term** (2022-2026)
  - Readily available technology with an established payback period of 8 years or less.
  - Strategies can be implemented in DSUPs anticipated to be submitted during this timeframe.
- **Mid-Term** (2027-2031)
  - Technology that may not have been technically or financially feasible as a short-term strategy but has seen improved efficiency and/or payback period.
  - Potential process improvements to operational methods.

- **Long-Term** (2032 and beyond)
    - Ambitious or unknown technologies that can adapt to previously constructed buildings
    - Management and operational methods that improve and/or maintain existing equipment and materials.

Identifying strategies that are timeline-based ensures that progress continues, and sustainability is "top of mind" at each phase of development and that strategies will be evaluated to achieve the goals of maximum impact, feasibility of implementation, and market viability. Not every strategy is applicable to every phase or building. Goals, strategies, and targets listed in this document will be reevaluated at each phase of development, and will evolve as technology, demand, and feasibility change.

Sustainability is not solved through a singular strategy; it requires a holistic approach to design that considers the unique site conditions and the challenges and opportunities of evolving technologies at varying levels of financial feasibility. Advancement in sustainability can be achieved through a combination of approaches:

- Incorporation of practices to allow for implementation of known future innovative strategies
- Green Building/LEED Certification at the building and neighborhood level
- Strive for carbon neutrality and continued progress towards this target
- Set performance-based thresholds regularly tracked and reported
- New technology that will improve sustainability and resilience methods and increase energy efficiency savings.
- Electrification of systems to take advantage of Dominion's commitment to a greener grid by 2040

This document is based on information available at the time of authorship of this document relative to the site and conceptual building massing and currently available technology. While this document identifies strategies to achieve sustainability targets in the built environment which HRP and its consultant team will continue to study, it is not possible at this early stage of design to select exactly which materials, methodologies, and technologies will be employed. These strategies will continue to be studied for their impact and feasibility and appropriately incorporated as the project advanced toward building design.

2. Site

Site Sustainability Strategies

This section provides targets for achieving a sustainable site vital to the overall environmental success of the Project. “Site” refers to the exterior fabric of the entirety of the future district to include open space, the layout and linkages of buildings, and vegetated and landscaped areas.

A sustainable site is one that:

- Uses the natural environment to the benefit of the buildings and their occupants.
- Celebrates the local and regional environmental fabric.
- Balances multimodal demands with options that prioritize cyclists, pedestrians, and public transportation.
- Utilizes native and adapted flora and fauna to provide ecosystem habitats as well as programmatic function for users.
- Views precipitation as a resource rather than a waste product.
- Protects waterbodies and ecological communities.

PRGS will prioritize elements that improve resiliency, occupant health and wellbeing, and nature-based solutions through design of the buildings, blocks, and open space across the development.

Open Space

The redevelopment of the former PRGS site is targeting approximately 5.5 acres of publicly accessible open space, nearly double the minimum three (3) acres of on-site open space required by the OTNSAP. This new on-site open space is part of approximately 14 acres of new or improved open space that will include a waterfront park, coordinated with the National Park Service (NPS), and a potential rails-to-trails like park on current Norfolk Southern owned property, in coordination with City staff. The Project will create one contiguous publicly accessible park system designed to provide a variety of open space programs that support a diverse range of active and passive uses accessible to all users, of all ages and abilities.

Strategies

Short-Term

- Continue community outreach on the topic of publicly accessible open to present ideas and receive feedback as part of any open space Development Special Use Permit (DSUP).
- Open space will be designed to be accessible to all ages and abilities to encourage social and physical well-being.
- Design a variety of publicly accessible active spaces such as gathering places, sports courts, and a dog park.
- Design a variety of publicly accessible passive spaces, many in coordination with the National Park Service (NPS), such as overlooks and benches for contemplative space.
- Design and permit in cooperation with the City of Alexandria and NPS for improved pedestrian connections to the waterfront to include potential kayak launch and, if feasible, a day dock for a potential water taxi stop.
- Coordinate with City on timing for design and implementation of Linear Park (on PRGS property) and Rail Corridor (currently owned by Norfolk Southern) anticipated for a rails-to-trails conversion.
- Submit, with stakeholder input, waterfront and linear park DSUPs.

Mid-Term

- Develop a schedule of programs and events for residents, employees, and guests to occur in open spaces.

Long-Term

- Maintain and evolve annual schedule of events with key stakeholders and community feedback.

Stormwater Management and Green Infrastructure

Stormwater management (SWM) is the effort to reduce the quantity and improve the quality of runoff due to rain, snow, and other precipitation events. This is of a key concern in Alexandria where flooding events in neighborhoods along the waterfront struggles to meet demand during extreme weather events. The future buildings contemplated as part of the redevelopment on former PRGS site, except for the existing pumphouse, are at high enough elevations to be protected against potential flooding events. The redevelopment is unique in that all stormwater will be collected and either reused onsite or first filtered and then released to the Potomac River and not enter into the municipal stormwater system. The site will also continue to be responsible, and similarly filter and release, stormwater from other adjacent properties that includes the Pepco substation.

Natural hydrological systems are impacted by impervious surfaces such as compacted soil and hardscape materials. Without thoughtful rainwater management, construction can create a strain on the natural ecosystems in the watershed and increase issues with drainage. Rainwater management is best when imitating the natural hydrology of the site reducing runoff volume and improving the quality of the water that does leave the site. Green infrastructure such as vegetated roofs and bioretention areas mimic the natural hydraulic landscape. Stormwater directed into these green infrastructure treatment areas where the runoff velocity is slowed, particulates and pollutants are filtered through various media and plantings and absorbed in the soil and vegetation.

The PRGS project will be designed to meet a minimum 20% reduction in stormwater phosphorus pollution and include designs to exceed this percentage as required by VADEQ and CDD Conditions 124 through 128 by using potential strategies listed below. Best

Management Practices (BMP's) such as bioretention, tree pits, and vegetated roofs are contemplated in the Stormwater Management Master Plan to be submitted for City review. The development will also seek to implement green infrastructure and Low Impact Development (LID) practices to reduce stormwater runoff volumes to mimic a natural site hydrology not experienced across this site in nearly a century.

Strategies

Short-Term

- BMP systems will be an integral part of the streetscape design and enhance the visual character as well as contribute to stormwater goals.
- All BMP systems shall follow the general principles as described in the City of Alexandria Green Sidewalks and BMP Design Guidelines, including BMP system to have a setback from the road curb by 2 ft, a minimum 6 ft unobstructed sidewalk, and appropriate vision clearance at intersections and pedestrian crossings.
- A minimum 25% of the total roof area will include vegetated roofs balanced with other desirable roof programs uses such as renewable energy systems and amenity space.
- Bioretention systems, in lieu of piping, will be implemented where possible to mimic natural drainage.
- Determine stormwater and condensate capture opportunities based on a water reuse study that could include non-potable water for irrigation, cooling towers, and plumbing for flush fixtures in public restrooms.

Mid-Term

- SWMP design will be reevaluated and evolved to current methods and technologies at each block DSUP in Phases 2 and 3 to improve performance and output.
- An inspection plan to ensure stormwater management systems are operating properly will be developed and implemented as part of site wide property management.
- Implement monitoring activities to ensure the success of the SWM system. Water quality testing, inlet/ outlet function, bioretention plant health, runoff and erosion reduction over time, etc. are all indicators of success.
- Performance of green infrastructure at the block level will be evaluated annually and reported to the City each year for five years post-occupancy for purposes of measuring and tracking performance.

Long-Term

- Performance of green infrastructure at the block level will be evaluated annually and reported to the City each year for five years post-occupancy for purposes of measuring and tracking performance.
- Consider implementing systems not currently feasible as technology and regulation advanced.

Heat Island Effect and Tree Canopy

Heat islands are typically created by urbanization – buildings, streets, vehicles all either emit heat or absorb and remit heat. The amplification of heat can impact occupant comfort and safety, especially in the instance of utility disruption when regulating high temperatures is critical. Heat islands can also increase peak energy demand in summer months and impact air and water quality. One way to combat heat island effect is to rebalance with increased materials that have a higher albedo to reflect solar energy or increase vegetation around paved surfaces and buildings to intercept solar heat and absorb carbon dioxide.

Minimizing the heat island effect and increasing the tree canopy and vegetation on the PRGS site are parallel goals that rely on several strategies. First, nearly one third of the site area is publicly accessible open space, the majority of which is vegetated space. Combined with the approximately 5 acres of open space on the NPS property and 3 acres of open space on adjacent potential Railroad Park on Norfolk Southern property, there is planned to create or improve approximately 14 acres of publicly accessible open space. Additionally, streets will be lined with trees at regular intervals and a significant portion of building roof space will include sustainable practices to reduce the amount of heat absorbed by the development.

Tree canopy and vegetated areas have many sustainability benefits including carbon sequestration, energy efficiency improvements for adjacent buildings, stormwater management, and reduction of heat island impact. Additionally, natural landscape, vegetation and tree canopy provide many health and wellness benefits that include biophilia, safe walking area, connection to nature, shade, and noise mitigation. A preliminary assessment of the carbon sequestration properties of the current open space design estimates that vegetation will sequester 610.7 MT CO2e over a 50-year period.

The preservation and restoration of natural habitats is important to reducing the environmental impacts of development. CDD Condition 130 calls for a landscape management plan that details the removal of invasive species in the RPA and CDD area. Coordination with NPS on the removal of invasive vegetation as part of the NEPA related permitting process continue and the proposed open space plan includes native plants to enhance biodiversity and restore natural ecosystems.

Strategies

Short-Term

- Provide tree canopy over sidewalks at intervals of 30 feet, which is more stringent than the LEED ND requirements of planting street trees no farther than 50 feet along 60% of block length.
- Design to exceed the native planting requirements outlined in the City of Alexandria Landscape Guidelines and could include pollinator pathways.
- Design intensive and extensive green roof systems to include at least 6 species to increase diversity and include pollinator plants where feasible.
- Design for 75% of total surface area of building roof space, after deducting amenity space and any rooftop mechanical equipment, will be committed to sustainable practices to include vegetated roofs or solar panels. (CDD Condition 131)
- Design and implement vegetated and reflective roofs with an average Solar Reflective Index greater than 82 and hardscape paving materials with Solar Reflectance values of 0.33 or greater.
- Analyze and design for shade in open space based on time of day and seasonality and mitigate with building shade and/or shade structures to mitigate hardscape surfaces from absorbing heat from the sun and emitting it to the surrounding area and for the comfort of individuals.
- Design a landscape plan based on layered vegetation that provides sufficient canopy coverage using a mix of early and old growth species.

Mid-Term

- Remove invasive species on PRGS and NPS property. Continue to support organizations like the Friends of the Mount Vernon Trail to remove and minimize invasive species growth on NPS property.
- Regularly maintain landscaped areas to promote healthy development that will contribute to air quality and reduced onsite temperatures.
- Include drought and salt tolerant plantings to minimize or eliminate the need for irrigation.
- Maintain a healthy habitat with short-term landscape management plan until delivery of all blocks.

Long-Term

- Explore intuitive ecological education for visitors and residents in partnership with the NPS and other community stakeholders.
- Establish an adaptive resilient landscaping plan that considers the changing climate.
- Inspect and replace deteriorated hardscape materials that have decreased solar reflectance due to general wear and weatherization.
- Continue to reevaluate landscape and hardscape maintenance protocols to ensure the health of mature plants and the reflectance of hardscape materials.

Circulation and Transportation

The carbon footprint of automobiles and their impact on the heat island effect is significant. Discouraging single occupancy use vehicles (SOVs) and the promotion of other modes of transportation, including public transit, cycling, and walking, are critical to reducing carbon impacts and heat generation in urban settings. Fortunately, mixed-use development encourages these alternative methods of transportation through proximity, complimentary programs, and walkability. When thoughtfully designed, ground level infrastructure that encourages public transportation, cycling, and walking can make positive impacts on the environment and public health.

The PRGS site location is well situated to minimize SOVs. Located in Old Town North, this neighborhood is transforming from an industrial portion of the city to a is highly walkable mixed-use neighborhood that benefits from its proximity to Old Town (from the south) and Northeast Civic neighborhood (to the west). The Mount Vernon Trail (MVT) and Potomac River draw pedestrians and cyclists to the Old Town North neighborhood, which is further encourages these alternate modes.

A design priority for the redevelopment of PRGS is to reknit the site back into the fabric of OTN. The Project team is coordinating with NPS and the City to reconnect this site to the MVT and adjacent park land to encourage non-vehicular modes of transportation. The street network, which is being carried into the site, is designed to encourage drivers to Street A where vehicles have access to the shared underground garage and, once parked, drivers become pedestrians. Public transportation will be accessible from Street A, which will include DASH bus stops and a proposed shuttle that will provide access to Braddock Road and Potomac Yard Metro stations, both within a mile of the site. Dedicated bicycle facilities are located throughout the development and designed for their encouraged use, whether a leisurely bike ride or commuting to or through the future Project. Proposed pedestrian infrastructure, including spacious sidewalks designed to host sidewalk cafes, approximately 14 acres of open space and connections to existing and potential trails, and a woonerf, or living street, that gives pedestrians priority and promotes walkability.

Strategies

Short-Term

- Continue to coordinate with NPS and City staff to design and permit connection points to the existing MVT and broader City bike infrastructure, including potential rails-to-trails like conversion on the Norfolk Southern rail line.
- Continue to coordinate with NPS and City staff on pedestrian and cyclist initiatives to improve safe crossing at the George Washington Memorial Parkway to possibly include leading pedestrian indicators.
- Continue to coordinate with City staff, NPS, and other stakeholders to analyze feasibility of a day dock and water taxi stop.
- Design the woonerf portion of the N. Fairfax extension for pedestrian and cyclist priority as part of future DSUPs.
- Design and construct the Green Street extension of N Royal Street into the property.
- Design and locate by phase cyclist parking and storage at areas where convenient for cyclists to connect with infrastructure.
- Design bicycle parking rooms within buildings with consideration of ease of access, adjacency to shower and changings rooms, and inclusion of bicycle repair stations.
- Design and locate two on-site bike share stations, one in Phase I and the other in Phase III of the development.
- Design for a centrally located multi-mobility hub to limit single use pick-up and drop-off (PUDO) to encourage shared and/or coordinated use of vehicles.
- Design signage, landscaping, and lighting improvements to raise the quality and safety of pedestrian and cyclist connections.
- Design shared underground parking garage with multiple access points across the development to encourage individuals who chose to drive to park their vehicles immediately and enjoy the future redevelopment as pedestrians.

Mid-Term

- Complete on-site pedestrian and bike infrastructure as identified in the CDD to include green street extension of N Royal St, woonerf on a portion of the N Fairfax extension, and dedicated bike facilities.
- Complete shared underground garage across the site with completion of block DSUP and development.
- Continue to coordinate with City staff the location and implementation of four DASH bus stops, with two in either direction, along Road A, to include bus shelters, benches, lighting, and transit information display screens.
- Design and locate two on-site bike share stations, one in Phase I and the other in Phase III of the development.
- Implement a dedicated shuttle that runs between the future district and Braddock Road and Potomac Yard Metro stations.

- Upgrade intersections along the George Washington Memorial Parkway at Slaters Lane and Bashford Lane for improved pedestrian and cyclist crossing.
- Create cyclist and pedestrian safety initiative and support with on-site programs to educate vehicular drives in partnership with community groups including Northern Virginia Families for Safe Streets.

Long-Term

- Continue to support and revisit, as necessary, cyclist and pedestrian safety initiatives and programs.
- Revisit and revise transportation strategy, as necessary, to adopt evolving technology that encourages non-vehicular mode of transportation.

3. Water

Water Sustainability Strategies

The responsible use of water consumption, both outdoors and indoors, is critical to environmental and social health. Reduced consumption decreases demand for potable water supplied by the municipal water system, which in turn reduces the energy required to process, treat, and transport water to and from its destination and the associated carbon footprint of that energy source. Water usage is currently underpriced but could increase depending on climate changes impacts and unforeseen weather events that could impact water supply. Reducing potable water starts with reducing the total water required to maintain and operate landscaped areas and building systems. Multifamily and commercial buildings utilize water for a variety of purposes and ensuring all of these systems are designed and maintained to utilize less water will reduce additional efforts and actions required to conserve potable water. Finding opportunities to reuse water that comes onsite through rainwater or mechanical condensate can reduce the potable water required from the municipal water system. Several water sustainability strategies are addressed in Stormwater Management and Green Infrastructure under the Site section of this CSS and repeated in this section, highlighting the synergies required for a successful sustainability strategy. These synergies will support the Project's targets of 50% reduction in outdoor and 40% reduction in indoor potable water usage as outlined in the Green Building Policy priority Performance Points.

Outdoor Water Use Reduction or Reuse

The use of potable water for irrigation and other unnecessary applications puts a strain on the municipal water system as it depletes freshwater sources and uses energy for water treatment and pumping. The two primary methods for outdoor water use reduction are 1) design open space and plant vegetation that doesn't require irrigation or significant water maintenance and 2) reuse stormwater on site. Using regionally appropriate drought tolerant plantings will limit the amount of water demand needed to help plants survive. Using drip irrigation systems with moisture sensors to the extent feasible will provide a water efficient design to ensure the amount of water only when needed will be applied. Limiting turfgrass and grouping plants that require similar irrigation will limit the amount of wasteful irrigation. Using non-potable water resources available on site from captured rainwater or condensate for irrigation can eliminate the demand on potable water. Rainwater harvesting systems collect stormwater from building rooftops and throughout the site to be stored and used as an irrigation source for open space on the site.

The strategies listed below will support that Project's goal of 50% water reduction in outdoor potable water usage as outlined in the GBP priority Performance Points.

Strategies

Short-Term

- Design stormwater and mechanical systems to capture rainwater and/or mechanical condensate in a dedicated cistern for reuse as non-potable water and identify opportunities for collection and reuse.
- Identify process water uses that can be maintained with non-potable water, such as irrigation, cooling towers, and flush fixtures and incorporate, if feasible.
- Design to incorporate water conservation strategies to include native and drought tolerant plantings, drip lines, and moisture and weather sensors.
- Create an operation and maintenance manual for landscaped areas to include information on irrigation, if any, and follow a 24-month establishment period.
- Evaluate the feasibility of condensate and/or captured rainwater for outdoor irrigation purposes per findings in water reuse analysis. Refer to water use analysis in stormwater section above.

Mid-Term

- Implement captured rainwater and/or condensate water saving measures that could include grey water reuse systems and irrigation, if feasible, and will need to comply with all quality requirements for the reduction of chemical and microbiological contaminants for non-potable end use.

Long-Term

- Evaluate new technologies that are technically and financially feasible to further reduce outdoor water consumption that could include greywater reuse collected from kitchen and shower. The system is currently not feasible from a block level as it requires significant regulatory time to coordinate with local utilities, the environmental protection agency, and other jurisdictional leaders to validate ongoing maintenance of the required treatment system.
- Evaluate technology improvements and price alternatives and identify opportunities to drive potable water use lower.

Indoor Water Use Reduction or Reuse

American households use approximately 82 gallons of water per person each day[2] for daily use in plumbing fixtures. Strategies to reduce potable water use in buildings focus first on reduction measures including low flow plumbing fixtures and water efficient equipment. The US Environmental Protection Agency developed programs including WaterSense Label and Energy Star product label to promote water conservation and efficiency in the market. These labels indicate plumbing fixtures and equipment meet standards for a minimum reduction of 20%.

Other areas for indoor water reduction include reduction of process water needs, especially HVAC heat rejection equipment. Cooling towers and evaporative condensers have a significant impact to the total water balance of the building. Air-cooled systems that do not require water use will be considered and compared against other HVAC systems for overall efficiency. Cooling tower or evaporative condenser systems will be designed with meters, controllers, and alarms per the LEEDv4 BDC prerequisite to ensure optimized operation and water efficiency. Condensate from the HVAC equipment can be collected in a condensate recovery system and reused for cooling tower makeup water.

Though some process water uses within the building require potable water, others do not require the level of treatment provided by potable water from the municipal system. The design team will evaluate water reduction measures first, followed by non-potable reuse opportunities. An early integrative analysis process including a conceptual water balance evaluation will provide the design team with an understanding of the water demand and opportunity for reuse in the buildings. These synergies will support the Project's target of 40% reduction in indoor potable water usage as outlined in the Green Building Policy priority credits.

Strategies

Short-Term

- Evaluate and incorporate advanced water conservation technology, that could include:
    - ENERGY STAR certification for eligible appliances
    - WaterSense labels for eligible plumbing fixtures
    - Automated on/off sensors for faucets and flush valves
    - Strategically selected flush and flow rates to optimize water conservation and occupant comfort
- If advanced water conservation technology is financially infeasible, create a high efficiency condominium selection package to offer as an upgrade to early condominium buyers.
- Evaluate the feasibility of using captured stormwater as greywater for flush fixtures in public restrooms in existing structures, to remain.
- Evaluate the feasibility of utilizing condensate for cooling tower makeup (if applicable HVAC design).
- Create a resident and tenant education program on the impact of water use on water and energy performance.

Mid-Term

- Evaluate market response and technical and financial feasibility of technologies that could further reduce indoor potable water.
- Evaluate detection systems with sensors, alarms, and automatic shutoff to identify leaks and inefficiencies. Locations should include cold branch for each dwelling unit, boiler makeup (if applicable), irrigation, and nonresidential spaces.
- Evaluate water reuse opportunities for flush fixtures in commercial office buildings, which are typically more receptive to greywater reuse in bathrooms than residential users, in later phases.
- Re-evaluate changes in municipal water supply costs that may impact Project's return on investment.

Long-Term

- Evaluate market response and technical and financial feasibility of technologies that could further reduce indoor potable water.
- Re-evaluate and update the resident and tenant education program on the impact of water use on water and energy performance.

4. Energy & Carbon

Energy & Carbon Sustainability Strategies

This section describes operational energy reduction and clean energy strategies that can be implemented from a sitewide perspective and at the individual building level. Energy efficiency and demand reduction lowers the burden on the utility grid, both overall and at peak load times. This section also identifies potential areas for on-site renewable sources, specifically solar photovoltaic (PV) panels, which have limited ability to generate significant percentage of overall energy production in dense areas that have limited roof area available and competing building needs for that space. Off-site energy generation can be costly and sometimes with limited energy reduction impacts for the residents and occupants at the property, who ultimately pay for these additional costs. Buildings with fully electrical systems are carbon-neutral ready and have the biggest energy reduction impacts once the electrical grid relies on 100% clean energy. Reduction strategies and mechanisms can be implemented at various times throughout a project's lifecycle and the feasibility of a strategy depends on several considerations that may include cost, physical limitations, and customer expectations. Some strategies that may be technically and/or financially infeasible today may become feasible in the future as technology evolves and pricing for new materials and methods becomes less expensive with broader market adoption

The OTNSAP sets a goal for the redevelopment of the powerplant site to "strive to achieve carbon neutral buildings by 2030" and the GBP requires a minimum LEED Silver building certification, or a minimum 11% energy reduction for commercial buildings and a 14% reduction for residential buildings from ASHRAE 90.1-2010. HRP voluntarily developed a Carbon Neutrality Analysis (CNA) as a framework for determining and targeting energy usage and carbon reduction measures. The CNA was created during the CDD review process and submitted on April 7, 2022. This framework establishes a path to significantly reduce the Project's carbon footprint that includes 25% energy efficiency reduction over ASHRAE 90.1-2010. Specific energy reduction targets outlined in the CNA align with the goals of the OTNSAP and exceed the GBP energy reduction targets by almost double. When combined with other carbon reduction targets, identified in the CNA and detailed in CDD Condition 139, the Project will be carbon neutral ready when Dominion's grid reaches full clean energy resources, projected by 2045. These additional carbon reduction targets include 3% onsite renewable energy generation, 10% embodied carbon reduction, and full electrification with limited exceptions. Offsite renewable energy sources and off-sets are also identified as solutions; however, costs are passed down to the end user and can be financially infeasible. Energy efficiency and demand reduction is the most critical component established in the carbon neutrality goals for the project. Refer to the CNA for more details.

Onsite Energy Reduction

Building envelope and systems design has the greatest impact on owner-controlled energy efficiency impacts. Once constructed, occupant behavior, which can be influenced by the owner/manager, is the primary method for energy use reduction. Energy Use Intensity, or EUI, is the amount of energy used per square foot, and is used to compare energy use across buildings. A building's EUI depends on its land use, and varies dramatically between residential, office, retail, dining, and hospitality programs. Additionally, the density of development has an impact on EUI, especially in urban residential settings due to the same amount of high energy load areas (i.e., kitchen and laundry appliances, quantity of digital devices) that condensed into smaller spaces relative to single family homes that spread the same amount of energy use within a household across a larger amount of square feet (i.e. more bedrooms and living spaces). Although more urban residential settings have a higher EUI per unit versus suburban or rural counterparts, the overall benefits of dense housing are greater from an environmental perspective when overall land use and transportation considerations are factored in. Therefore, the biggest impacts to onsite energy reduction are at the building-level.

This collection of strategies focuses less on prescriptive solutions for equipment selection and operation, and instead defines a process of strategic considerations, critical review and performance guidelines that will guide the overall PRGS development project towards long-term and sustained energy reductions. One method for onsite energy reduction overlaps with thermal and acoustical comfort and is addressed in the Indoor Environment Section below. These strategies reduce energy transfer through a building's envelope, it's walls and roof, by increasing insulation, limiting or improving glazing area, and preventing air leakage. Specific methods, materials, and costs associated with tightening the building envelope, reducing heat loss, and improving energy savings are in the initial stages of study for the first phases of development and will evolve with the design of buildings with block DSUPs.

The PRGS development team is studying comprehensive site-wide and building-level strategies that target a minimum 25% energy savings from industry baseline ASHRAE 90.1-2010; keeping in mind the owner has a limited ability to influence roughly half of the energy use in the building. The strategies defined in this section seek to reduce operational energy from a building owner-controlled perspective through initial design decisions and from a tenant-controlled perspective, through educational programming and influence.

Strategies

Short-Term

- Design buildings to be operational carbon neutral-ready through full electrification, with limited exceptions that may be changed out in the future depending on evolution in technology and market adoption.
- Evaluate during design stage, and if feasible, incorporate technologies that could include:
    - Air source versus water sourced systems.
    - Enhanced enclosure and enhanced air sealing.
    - High efficiency lighting and daylight optimization.
    - Submetering critical systems and all end uses greater than 10%.
    - Building management system to maximize energy efficiency.
    - Insulation levels that exceed local code.
    - Shade surfaces from direct solar gain to minimize heat load and need for cooling.
- Per the Green Building Policy, show reduction to energy demand as compared to ASHRAE 90.1-2010 of a minimum 14% for residential and 11% for commercial.
- Create a pilot program exclusive to residents and employees that uses an established carbon calculator to define the individual's carbon footprint less PRGS building reductions to energy consumption and individual operational energy reduction measures to create a total estimate of their annual carbon footprint.
- Pair pilot program with aligned community organizations that educate members on carbon reduction measures.
- At building delivery:
    - Conduct a whole building energy model to maximize energy savings
    - Reduce air leakage and conduct blower door and duct blast testing during construction for leakage verification and corrective action in residential buildings.
    - Perform envelope commissioning to evaluate air and moisture leaks of individual building components
    - Engage building occupants for education on energy reduction measures. Examples can include implementing energy dashboards for energy use of individual units, floors, or buildings

- Energy performance at the block level will be evaluated and reported to the City annually for the first five years post-occupancy for purposes of measuring and tracking performance and to inform research and development of new technologies.
- Evaluate additional opportunities further reduce loads such as elevators and lighting.

Mid-Term

- Design buildings to be operational carbon neutral-ready through full electrification, with limited exceptions. Reevaluate exceptions in later phases.
- Consider incorporating new or existing technologies that may have become more widely used and cost effective that may include larger scale heat pumps, dynamic glazing, highly efficient window framing systems, and new advances in window coatings and insulating glass unit design.
- Evaluate an automated continuous commissioning process.
- Evaluate design of buildings and equipment for participation in utility demand response programs through load shedding or shifting, which are fully automated demand response systems. Presently, Dominion Energy does not have a demand response program but may in future phases.
- Energy performance at the block level will be evaluated and reported to the City annually for the first five years post-occupancy for purposes of measuring and tracking performance and to inform research and development of new technologies.

Long-Term

- Design buildings to be operational carbon neutral-ready through full electrification, with limited exceptions. Reevaluate exceptions post-occupancy to incorporate full electric technology.
- Re-evaluate needs, sequences, and schedules of new tenants any time a space is turned over and adjust sequences and equipment.
- Energy performance at the block level will be evaluated and reported to the City annually for the first five years post-occupancy for purposes of measuring and tracking performance and to inform research and development of new technologies.

District Systems

HRP and the project team have been studying the feasibility of district wide systems (central utility plant, GHSP, etc.). District-wide systems provide an opportunity to share heating and cooling loads across multiple buildings in the development. The goal in studying these district wide strategies is to leverage the scale of this development and identify the most feasible path to strive for carbon neutrality. Feasibility for this Project requires a maximum 8-year payback period for any new technology to be financeable from a private market perspective. HRP continues to seek and meet with organizations and entities that provide grants or loans to pay for the significant initial construction costs of district systems. Typically, these shared systems are more efficient when heating and cooling loads are balanced across land use types and can complement their peak loads over a 24-hour cycle. The balance of residential versus commercial land use across the site influences the efficacy of district energy systems and are being studied in the district system analysis.

- A **river water heat exchange system** was explored as a heat sink/source for the HVAC system(s) but was ruled out because shallow depths immediately adjacent to the site produce little temperature differential between the water and the ambient air to provide a meaningful heat exchange. The energy required to overcome this deficiency would offset any energy savings from this system, making this less viable of an option. The initial analysis shows the river water heat exchange system would still require supplemental cooling. In addition, the regulatory hurdles will be high given the system's potential impact on federally owned land and ecosystems managed by the National Park Service.

- Early analysis of **geothermal heat exchange system** identified several trade-offs of the system, the first being a significant initial construction cost that exceeds the financial feasibility threshold of 8 years, with a payback period greater than 24 years as compared to a decentralized heat pump solution. Other potential conflicts with this system include mobilization conflicts and delays with site soil remediation, excavation, and construction of the shared underground parking garage. Efficiency increases

with balanced commercial and residential land uses, which will not be determined until later phases given the poor office market.

- **Sewer water exchange systems** rely on flow through site sewer systems as an energy sink/source similar to an open loop ground source heat pump. This technology requires a considerable and predictable flow through the sewer pipes, more than a singular phase of development, but could be considered once more phases are constructed and delivered. The use of this system at PRGS is currently unknown and is being studied as part of the district energy study.

- **Heat pump technology** was explored for a central ventilation (DOAS) system as an opportunity to electrify the buildings, increase heating energy efficiency, and minimize impact to the electricity grid. Although this technology provides advantages over the gas furnace options typically used, most manufacturers do not manufacture these systems at capacities greater than 70-tons, which limits this system to projects smaller than those proposed at the Project.

While district energy systems will continue to be studied, alternative decentralized solutions determined at the block and building level can achieve similar performance standards while meeting the Project's electrification goals within the required payback period.

Strategies

Short-Term

- Conclude district system analysis prior to finalization of preliminary Infrastructure Development Site Plan (IDSP).
- Continue to evaluate financing incentives available at the time of pre-development during IDSP.

Mid-Term

- Evaluate feasibility of new and evolving technologies and financing incentives that could feasibly be implemented in later phases.

Long-Term

- Evaluate feasibility of new and evolving technologies and financing incentives that could feasibly be implemented post-delivery as part of continued operations and management.

On-Site Renewable

Fossil fuels have high carbon compositions and when burned to create energy, release significant carbon into the atmosphere. On and offsite renewable energy generation looks to broaden the blend of clean energy sources. In dense, urban sites it is challenging for onsite renewable energy systems to generate a substantial portion of a project's energy demand. This is due to the high energy demands of dense settings and the many competing priorities on limited roof space; including green roofs for stormwater collection, space for mechanical and operational systems, and resident/tenant rooftop amenities. Horizontal solar PV panel configuration on rooftops provide the highest electrical generation efficiency due to the optimized exposure angle of the sun over the course of a day. While additional opportunities for PV panel integration exist, there are several trade-offs to these alternatives that decrease their effectiveness, increase the payback period, and reduce their feasibility as an option for on-site renewable energy. Mounting PV panels vertically on structures is one option, but their efficiency is easily halved in comparison to horizontal mounting because they are not optimally configured for maximum exposure to solar rays. Solar panels can also be placed on-site in open space but these installations are impacted by shading of adjacent buildings and tree canopy. Another option is to combine panels with green roofs, but the reduced mounting spacing also reduced panel efficiency.

Incorporation of renewable energy solutions will put the PRGS development on a path to meet aggressive carbon reduction goals and meet the CDD condition of 3% onsite renewable energy but not without its challenges. Preliminary studies of potential available rooftop area, without any conceptual building design and knowledge of actual rooftop location and program requirements, indicate that less than 2% of the total energy for the future development at a base 2.15M square fee can be generated from horizontal solar PV panels.

The PRGS team will continue to study the feasibility of incorporating solar PV panels as building massing, orientation, roof area and mechanical penthouse areas are further defined at each Block DSUP.

A combination of all or some of the following must occur to generate 3% on-site renewable energy:

- Solar PV panel technology improvements to increase panel efficiency.
- Vertical placement of panels on building facades, which are estimated to have 33%-50% efficiency loss due to this placement and may not meet the payback period.
- Use of site area on and adjacent to the Project site for solar PV panel placement.

Strategies

Short-Term

- Estimate the energy generation potential based on the available roof space and photovoltaic (PV) generation capacity for individual buildings as they are designed. Evaluation would occur in partnership with a PV developer and/or engineer to determine projections that will allow the Project team to test the impact from different panel ratings.
- Determine roof area available as part of design development for Phase 1 buildings.
- Identify and evaluate additional location opportunities for PV systems including on open space, shade structures, and building facades.
- Evaluate different PV technologies (i.e. panels, inverters) against applicable incentives and financial returns.

Mid-Term

- Incorporate advancements in technology that increase panel efficiency to maximize PV panel output.
- Continue to evaluate additional opportunities to incorporate renewable energy integration in the buildings and open space areas. The project team will continue to evaluate opportunities for additional renewable energy while striking the balance between generation efficiency, payback, and physical space.
- Determine roof area available as part of design development for buildings in later phases.
- Identify and evaluate additional location opportunities for PV systems including on open space, shade structures, building facades.

Long-Term

- Continue to evaluate additional opportunities to incorporate renewable energy integration in the buildings and open space areas. The project team will continue to evaluate opportunities for additional renewable energy while striking the balance between generation efficiency, payback, and physical space.
- As the installed solar panels near the typical life expectancy develop a phase out plan for upgrading to new technology.

Embodied Carbon

Embodied carbon emissions occur in the course of a material's production during the extraction, manufacture, and transportation to its ultimate destination where it is incorporated into the construction of a building. Embodied carbon emissions are locked in at the end of construction. Whereas strategies can be deployed over time to realize operational carbon emission reductions, similar strategies cannot be deployed to achieve embodied carbon reductions, therefore embodied carbon reductions are not represented on an annual basis. The PRGS Project is targeting a 10% reduction in embodied carbon emissions from an industry accepted baseline (i.e. LEED). The materials and methodologies have yet to be determined and will be selected later in the construction documents stage. Some reduction strategies can incur additional cost premiums and schedule delays, as is the case for some types of embodied-carbon reduction technologies used in asphalt and concrete production, which employ specialized additives or cause longer cure times. Other methodologies, such as mass timber as a structural component, can be highly specialized and require trained construction teams, which also impact Project cost and schedule. At the same time, trade-offs will be evaluated in cases where the benefits are of limited or manageable impact to the development.

Strategies

Short-Term

- Evaluate the feasibility of environmentally preferable asphalt and concrete in horizontal applications like roads, sidewalks, and parking garages.
- Identify embodied carbon reduction opportunities in a life cycle assessment for structural and enclosure materials to understand the cradle to grave impact of materials available to the project.
- Reduce the overall weight and amount of material and identify supplier locations to reduce carbon emissions that result from the transportation of materials.
- Specify products with high recycled content.
- Identify performance specifications for low carbon concrete and steel requirements for recycled content to establish reduction goals.
- Consider transportation distance of the materials, which impact carbon emissions from a transportation perspective.
- Evaluate the feasibility of mass timber as a structural option for Block A.
- Specify products that are adapted to the interior environment in which they are being applied for long- lasting embodied carbon reduction. If installing carpet in an office, use carpet tiles, which can be easily replaced if damaged. For residential buildings, use floor materials that can be easily cleaned to reduce the need for replacement, such as wood flooring or tile.

Mid & Long-Term

- Consider and research new and innovative materials with reduced embodied carbon for later phases.

Electrification

Electrification is the goal of minimizing or eliminating onsite combustion of fossil fuels to reduce greenhouse gas (GHG) emissions. A non-fossil-fuel based energy generation source from the utility provider is the primary step in curbing significant GHG emissions associated with the built environment. It is important that as the built environment moves towards full electrification, electric utility providers make significant strides towards cleaning up the grid, in order to meet aggressive sustainability goals.

The Virginia Clean Economy Act (VCEA) requires Dominion Energy Virginia to be carbon-free by 2045, which will reduce carbon emissions from electrical generation at the source. Cleaning the power grid is one of the most critical changes necessary to achieve carbon neutrality in the built environment. It is important to understand that electrification of buildings in and of itself does not result in an immediate reduction in carbon emissions. Emissions are driven by the site-to-source efficiency of the primary source of that electrical energy generated by the utility company, that will need to meet an increase in demand for electricity while still moving to carbon-neutral power generation. Elected officials will need to encourage and support off-site grid improvements and operational energy reduction in existing structures to meet these aggressive targets. In 2021, Virginia ranked in the top five states for new solar capacity, due to new policy. The broader solar market in the state and nation continues to grow.

The PRGS team is committed to full electrification with limited exceptions for emergency life-safety systems, commercial kitchens, and amenity space use to prepare the buildings and site to be carbon neutral ready.

Strategies

Short-Term

- Design to maximize electrification to be operational carbon neutral ready in anticipation of Dominion's full decarbonization of the electric grid.
- Provide EV and EV ready infrastructure to encourage use of all electric vehicles.

Mid-Term

- Continue to evaluate full electrical systems and their market response for limited exceptions provided in the case of life-safety, commercial kitchens, and amenity space use.

- Measure the use of EV infrastructure and evaluate increasing EV charging stations.

Long-Term

- Dominion Energy target for 100% clean energy is required to meet OTN SAP goals without additional financial burden to this project.

Offsite Renewables

Offsite renewable energy is an opportunity to further clean energy generation dedicated to the Project's energy demand. Clean energy procurement options include Renewable Energy Certificates (RECs) and Power Purchase Agreements (PPAs), which drive new renewable energy sources onto the market and can offset Scope 2 emissions and decarbonize purchased electricity, whereas a carbon offset purchase secures a reduction of carbon emissions someplace to neutralize or offset carbon emissions on site.

Dominion Energy provides several programs to offer customers clean electricity, the costs of which can and will vary overtime and from program to program.

- 100% Renewable Energy: includes solar, biomass, and hydropower renewable energy sourced from Virginia and North Carolina directly contracted or owned by Dominion Energy. This program is only available to customers with a peak demand of 5 MW or less.
- RECs do not represent a direct purchase of renewable energy or the physical delivery of renewable energy to the building, or even to the project's grid. Instead, a REC is a market commodity to verify renewable electricity claims and fuel renewable energy projects by tracking and assigning ownership to renewable energy generation.
- REC Select: sources can include solar, wind, geothermal, biomass and landfill gas.
- Green Power: represents the regional grid of Green-e certified sources, which are required by LEED. This is a month-to-month enrollment program.
- The Virginia Community Solar Pilot Program that allows Dominion Energy customers who enroll to pay a premium to purchase RECs from Virginia solar facilities. Large commercial customers (1,000 kW) are not currently eligible for this program.

Power Purchase Agreements (PPAs) represent a contract with a renewable energy generator. PPAs are currently limited to large-scale projects and entities that use >10 MW of energy There are two types of PPAs:

- A Direct PPA is a direct purchase of renewable energy and the physical delivery of renewable energy to the project through the grid. Since the delivery is through the grid, the full electricity demand of the building may be met by both renewable and non-renewable energy sources.
- A Virtual PPA is a financial instrument whereby renewable energy output and RECs are purchased at a set price but then sold into the wholesale market. The buyer is subject to the fluctuations in wholesale price of electricity on a daily basis and therefore may earn or pay money, also known as a "contract for differences".

Addressing the remaining balance of carbon from the development with offsite renewables can be expensive for the consumer as the costs are typically passed on directly. For these reasons, PRGS relies on existing and future municipal, state, and federal policy to incentivize the gap to reach carbon neutrality, primarily through efforts to green the existing grid.

Strategies

Short-Term

- Evaluate the feasibility of off-site renewable energy opportunities using a clean energy procurement analysis.

Mid & Long-Term

- Re-evaluate off-site renewable energy contract options and pricing as programs evolve.

5. Indoor Environment

Indoor Environment Sustainability Strategies

This section focuses on the importance of occupant health and wellness and strategies to improve the occupant experience in the PRGS development. Sustainability not only includes environmental and economic sustainability, but social sustainability as well. Wellness is a key component of sustainable design, as our environment is directly linked to our health and overall quality of life. Physical fitness, clean air and water, direct and indirect access to natural environment, and the ability to choose conditions that suit our needs, play vital roles in social sustainability. People spend 90% of their lives indoors. An investment in wellness through infrastructure and policy initiatives will benefit the people that occupy the PRGS development. In light of the COVID 19 pandemic, project teams are now facing new challenges in designing and operating spaces that address infectious disease transmission and changing live/work norms.

The PRGS development will take strategies outlined in the wellness certifications, like WELL and Fitwel, to improve the indoor environmental quality for residents. Access to daylight, as well as thermal and acoustical comfort are critical components that will be addressed in the design of future buildings.

Indoor Air Quality

The U.S. Environmental Protection Agency (EPA) defines Indoor Air Quality (IAQ) as “the quality of air within and around buildings and structures especially as it relates to its occupants.” The quality of indoor air is dependent upon the air being delivered from outside, and the maintenance of that air once it is circulated throughout the building. Improving IAQ can be accomplished in a variety of ways including: the introduction of fresh air through ventilation, mechanical system selection and maintenance, and characteristics of materials installed within spaces. Introducing fresh air through natural and mechanical ventilation dilutes pollutants and improves the quality of air inside the building. Materials that emit contaminants in these spaces can recirculate in the building and continue to expose occupants to unhealthy levels of said contaminants. Selection of materials certified through rigorous programs like Green Label Plus is crucial to IAQ. Removal of contaminants and particulates introduced indoors by the occupants can also be accomplished with high filtration material, monitoring strategies, and appropriate ventilation. Good IAQ comes from supplying fresh air, removing contaminants from outdoor air, and controlling polluting sources, at minimum.

Strategies to improve indoor air quality include, but are not limited to:

- Furnish all building entrances with permanently installed walk-off mats.
- Install CO2 sensors in densely occupied rooms to notify occupants when fresh air is needed.
- Provide operable windows for natural ventilation.
- Develop a standard construction phase IAQ management plan.
- Prohibit tobacco use on site during and after construction.
- Conduct regular sustainability and IAQ walkthroughs of the construction site.
- Vent kitchen air outside (vs recirculating within the unit).
- Include outdoor air monitoring equipment.
- Design to balance optimized ventilation with energy usage and performance targets.
- Equip ventilation systems providing outdoor air to occupants with filters rated MERV 13 or high.
- Specify products with reduced emissions and according to rigorous third-party targets.
- Conduct annual air testing based on the parameters outlined in the latest version of ASHRAE 62.1/62.2-Ventilation for Acceptable Indoor Air Quality in Commercial and Residential Buildings.
- Ensure building engineers are given the educational and technological tools to improve building IAQ and performance.

Strategies

Short-Term

- Design to include ventilation strategies and material selection based on LEED, WELL and/or Fitwel standards to improve indoor air quality, several of which are noted above.
- Design to meet or exceed the air leakage requirements established by the International Energy Conservation Code (IECC).
- Create an IAQ management plan to include:
    - Green cleaning protocols that go above and beyond standard green cleaning practices.
    - Mandatory Integrated Pest Management (IPM) plan for all buildings and site area, which utilizes non-hazardous and naturally derived insecticides and herbicides.
    - Pandemic response plan to allow for social distancing, improved filtration, and air treatment protocol to identify under which conditions the project will install air treatment systems.
    - Replacement timeframes for all filters in applicable mechanical systems on an annual basis or once they are loaded.

Mid-Term

- Implement strategies identified in in the IAQ management plan and hold regular training for housekeeping staff to reiterate procedures.
- Regularly conduct visual inspections of HVAC equipment and ductwork for dust, debris, mold growth, and moisture build up and outline standard practices to react to these factors.
- Consider technologies such as UV filtration or Bipolar Ionization to further reduce the spread of airborne diseases.
- Consider the feasibility of continuously monitored IAQ through software-connected remote technologies connected to respond to the Building Automation System. Devices will be able to alert the responsible party if any air quality parameters exceed acceptable thresholds.

- Record instances of IAQ complaints in the building to quantify occupant satisfaction and target areas for improvement.
- Establish an informational program that educates occupants on the mechanical functionality of the buildings and fosters smart practices and habits to maintain a high level of air quality.

Long-Term

- Revisit the IAQ management plan every 5 years to update with new strategies.
- Refine an informational program that educates occupants on the mechanical functionality of the buildings and fosters smart practices and habits to maintain a high level of air quality.

Daylight, Thermal and Acoustic Comfort

The positive impact on daylight to a home's residents are numerous. Sunlight influences the cognitive functions to improve concentration, focus, and productivity; prevent depression, support natural sleep cycles, and overall creates an optimal environment to improve occupant comfort and health. Natural light can also reduce the need for artificial light and impact lighting energy demand and heating and cooling loads when thoughtfully incorporated into early design considerations. Annual sunlight exposure can be modeled with daylight simulation software to help inform design considerations that could benefit from daylight access. Building orientation, massing, and façade design can impact the solar exposure occupants have over the course of a day and varies by season. Daylight sensors and controls can be installed to adjust light levels to reduce energy demand.

Much like natural sunlight, thermal and acoustical comfort impacts individual comfort, health, and productivity. An occupant's temperature preference for the environment around them can be very personal and include factors such as humidity, air temperature, and air movement. Providing occupants individual access to a thermostat, operable window, or other means to control comfort can lead to improved health, focus, and productivity. Acoustical comfort can impact the occupant's ability to thrive in the space they are occupying. Noise levels can impact productivity and wellbeing at critical moments during work and sleep. Effective acoustic design strategies that focus on background noise levels, reverberation time, and sound transmission can improve the occupant experience. Considerations in noise levels associated with HVAC equipment located in the space, the acoustic performance of the walls and ceilings in key rooms, and noise-reducing materials can all be evaluated and balanced when planning systems and indoor spaces. This is particularly true for the Project location, which is located in close proximity to Reagan National Airport and experiences elevated noise planes departing from and arriving at the airport at regular intervals. Acoustical attenuation will be of primary consideration in building design and will impact both thermal and acoustical comfort for residents, employees, and visitors.

Strategies

Short-Term

- Conduct a daylight simulation early in the design process to inform design decisions that are influenced by natural light.
- Locate regularly occupied spaces at perimeter locations to maximize natural light.
- Evaluate dynamic glazing effectiveness to improve the balance of heat load and light level in regularly occupied spaces.
- Design building facades, walls, floors, and ceilings based on acoustical analysis to mitigate outdoor and indoor noise impacts to resident comfort.
- Specify smart thermostats in residential units, which can be personalized, learn behavioral habits to adjust temperature settings, and provide remote control to maximize efficiency.
- Identify key spaces that are critical to acoustical comfort for evaluation on design considerations needed in these spaces.
- Specify insulation to meet the acoustical performance and thermal performance targets.
- Design and develop quiet areas and alcoves inside and outside the building.

Mid & Long-Term

- Evaluate changing technology with synergies to capture the positive impact of daylight.
- Survey occupants on comfort levels annually to provide feedback and inform corrective action and improvements.
- Consider feasibility and usefulness of continuous monitoring sensors that measure humidity, temperature, and air speed in regularly occupied spaces that can be reported to a building automation system to track performance.

6. Materials & Waste

Materials & Waste Sustainability Strategies

Globally, the production of new materials releases emissions detrimental to environmental and individual health. It is therefore important to evaluate the health impacts of materials selected for use in new construction. Interior emissions from materials used onsite can be reduced by specifying low or no volatile organic compound (VOCs) materials. Manufacturer transparency and product disclosures are required for responsible material selection. The demand for materials with lower embodied carbon impacts is growing within the commercial real estate industry, making it easier to find and select materials with a lower carbon footprint. Materials with lower embodied carbon frequently are more expensive than their higher carbon counterparts, however, as the industry continues to evolve and receive broader demand, product prices could decrease. Sustainable material use and disposable can happen at all stages of the development program and include overall waste reduction during construction, achieving a high recycling rate, and offering ample opportunities for occupants to responsibly dispose of their waste.

Healthy Materials

Volatile Organic Compounds (VOCs) and other low-emitting chemicals found in many finish materials escape into the air and can lead to occupant illness and allergic reactions. On the other hand, low-emitting materials do not release of pollutants into the air and therefore do not negatively impact air quality and the health of occupants or environment.

Strategies

Short-Term

- Prioritize products that have disclosed their material ingredients and health impacts. These products have evaluated their ingredients and analyzed how they impact human health over the product's lifetime.
- Prioritize products that have disclosed their emissions content and are compliant with VOC and TVOC emissions standards, which reduce human health impacts from interior off-gassing of harmful chemicals.
- Assign a "materials manager(s)" during the design and construction process when materials are selected, to be responsible for verifying the purchase of all new materials and evaluate materials for their immediate and long-term impacts on human health.

Mid & Long-Term

- Create and implement a material replacement policy for replacing materials in accordance by determining a set of questions to ask the individual or tenant who is requesting the product replacement. Questions include: does the damage impact the functionality of the product? Can the product be easily replaced, or will it require a full replacement of an entire system?
- Continue to evaluate and implement, when feasible, changing industry standards around material health impacts and ensure new materials installed onsite comply with these standards.

Waste Management

Construction projects are large generators of waste, and account for a significant landfill source. Standard practice involves little recycling or reuse of demolition and construction waste. Construction waste includes materials that originate from demolition, excavation, general construction activities and construction trailer operations. Actions taken to develop a comprehensive solid waste management system that results in the reduction of overall waste have a positive environmental impact and also result in reduced costs and resources to manage and dispose of solid waste. Solid Waste Management is an essential service in any community and having an efficient system in place has multiple benefits not only to the local community but to the greater region and world.
The materials in the deconstruction and excavation process may be deemed hazardous and must be disposed of in accordance with federal and local regulations. Materials that are not deemed hazardous will be evaluated for potential reuse onsite or recycled as part of the Project's construction waste management plan. Reducing the volume of waste generated will be key to responsible waste management so there is less to remove, recycle, and process as waste.

Strategies

Short-Term

- Study reuse opportunities for the existing pumphouse and guardhouse.
- Study reuse opportunities for salvaged industrial items from the generating station to be reused in landscape, public art, or interior art installations.
- Evaluate the feasibility of material selections that:
    - evaluate infrastructure supply chain and production processes when making design decision.
    - give preference to materials that have recycling processes in their manufacturing process and have manufacturer take back programs.
    - from manufacturers and producers that have committed to renewable energy production or have offset operations with renewable energy.
- Develop a construction waste management plan that:
    - outlines material reuse opportunities and targets total waste reduction measures

    - identifies total waste reduction measures and companies that recycle, reuse, or property dispose of construction and demolition materials.
    - give preference to material supplies that take back packaging, unused, or scrap materials.
    - educates all contractors on recycling protocol and processes identified in the construction waste management plan.
    - requests waste haulers to have a corporate sustainability report or program in place.
    - requests contractors to provide a material waste factor plan to limit construction waste factor to less than 10%..
- Create a sitewide operations and management program that:
    - provides composting and recycling containers appropriately sized and located for the occupants of the building.
    - provides ample opportunities for recycling bins throughout public space both indoors and outdoors as well as sufficient storage for peak demand.
    - requires landscape maintenance vendors to compost landscaping waste.
    - creates a compost program for food waste generated on-site or provide tenant education about local food waste programs that includes compost drop off locations.
    - Encourages retailers purchase materials or products that can either be recycled or composted.

Mid-Term

- Conduct annual waste audits to determine recycling rates and areas for improvement.
- Evaluate the feasibility and popularity of programs that could include:
    - education programs for residents, employees and visitors in coordination with other site wide waste management programs.
    - coordinate with local farmers markets or composting organizations to develop a collection/drop off point within the project.
    - incorporate infrastructure to support food recovery efforts with local food banks and restaurants.
    - require restaurant and other retail tenants to develop a waste reduction plan including composting food waste and reusable or compostable takeout containers

Long-Term

- Reevaluate compost and waste programs for effectiveness.

7. Climate Resilience

Climate Resilience Strategies

Climate resilience in the built environment requires a design philosophy that allows for designing for likely future climate change impacts instead of designing based on historical data on climate impacts while also building in the adaptability of systems to understand and manage more extreme climate risks with increased impacts, frequency, and magnitude. Climate hazards can pose a severe risk to human life and create a devastating financial burden from property damage. The increasing occurrence of severe weather events have reinforced the need for adaptable building systems. Although emergency response protocols are important, preventative measures are crucial to preparedness when faced with an increased likelihood of future climate challenges.

The majority of the PRGS site is outside the FEMA flood zone and flooding is not a high risk, except at the existing pumphouse structure, which is slated to be repurposed for waterside dining. Early interventions are focused on understanding and designing systems and programs to respond to unknown weather conditions whether increased precipitation or extended heat emergency and heat wave temperatures to keep occupants healthy and safe.

Strategies

Short-Term

- Identify climate hazards that pose a potentially high risk to the project site and building functioning. Design to mitigate and manage these potential hazards, many of which are described within this CSS.
- Evaluate separate critical life support or building functionality systems separately so essential services can be supported via backup generators or battery storage.
- Evaluate battery storage for energy generated by PV systems an opportunity to support critical life safety systems.
- Create a resilience management program that includes resources available in the event of an emergency and encourages residents and occupants to do the same.

Mid & Long-Term

- Evaluate effectiveness and feasibility of sensors and controls to manage distributed energy resources such as solar PV panels and EV chargers during times of electrical service disruption.
- Evaluate the feasibility of battery storage banks to support critical power requirements in building operations in the event of extreme weather events, natural disasters, and loss of power for extended periods of time.
- Re-evaluate the resilience management program regularly to take advantage of new ideas, programs, technologies, and resources.

8. Reporting & Tracking

Implementation of Reporting & Tracking Obligations

A significant amount of performance related strategies that impact the Project's ability to reach the sustainability targets and carbon reduction measures depend on building level design to reduce operational energy use and an electrical grid that relies on clean energy resources. Metrics have been identified to evaluate and track the Project's performance against the goals outlined in this CSS and established by City policies and CDD Conditions in the CSS Dashboard, attached as Appendix E. Performance will be monitored at the block level and also evaluated across the CDD site area.

1. Operational energy performance will be tracked using targeted 25% reduction from ASHRAE 90.1-2010 or EUI target based on table CC103.1 of 2021 IECC. Progress towards the established electrification goals will be tracked.
2. Onsite renewable energy will be tracked using the established annual operational energy performance.
3. Embodied carbon will be tracked against industry-standard construction practices.
4. ENERGY STAR Portfolio Manager will be used to track the EUIs of all blocks and commits to sharing dashboard summaries (Statement of Energy Performance) with City staff.
5. The CSS Dashboard will be developed and updated at building DSUPs, within 12 months of Certificate of Occupancy, and annually for 5 years post-occupancy. The Dashboard will report on progress and track district performance and provide updates on larger site-wide efforts towards sustainability.
6. LEED Scorecard updates will be developed at major permit milestones to track neighborhood and building-level certification. All design phase LEED credits will be approved after receipt of the building permit, and all construction related credits will be approved after receipt of the certificate of occupancy. Proof of certification will be provided within 12 months of each block or building's certificate of occupancy.

The PRGS development team or property manager, master HOA or comparable entity will be responsible for tracking and reporting the site-wide sustainability performance as outlined in this report per the CDD Conditions. The reporting will include LEED Scorecards, an aggregate summary for the combined building achievements towards carbon neutrality in the CSS Dashboard, and progress towards striving for carbon neutrality by 2040 for the building and site targets.

Condition 139 outlines Targets 1-5 to demonstrate building achievements and sitewide progress towards carbon neutrality at specified times in the redevelopment.

- Target 1 Operational carbon –measured at each building at the DSUP submission.
- Target 2 Onsite renewable – achieve across the CDD area, reviewed at Infrastructure DSP and evaluated at each building's DSUP.
- Target 3 Embodied carbon – estimates provided with each new building at the DSUP submission.
- Target 4 Electrification – each building required to comply at each building's DSUP submission.
- Target 5 Offsite renewable – reviewed by phase.

The CSS Dashboard (Appendix E) provides the path towards achieving the goals of the CSS as delineated in the Conditions of the CDD for reporting timelines for each DSUP process:

- 146 - Conceptual DSUP submission – demonstrate consistent with the CSS
- 147 - Final Site Plan – draft sustainability strategy scorecard, drawings must include construction recycling guidance
- 148 - Building Permit – scorecard reflecting final design
- 148 - One year of Certificate occupancy – final scorecard reflecting as-built, including offsite renewable strategies.
- 154 – Public benchmarking results through energy star pm
- 155 – Monitor energy usage and report sustainability target for first 5 years occupancy

Appendix

A. Alexandria Green Building Policy

B. Conditions of the Coordinated Development District (CDD) for the former PRGS site

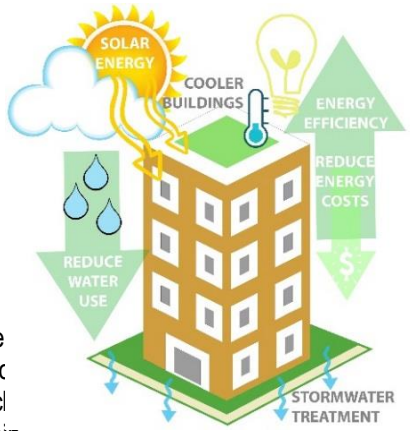
C. Project Phasing Plans

D. LEED Neighborhood Development Scorecard template

E. Coordinated Sustainability Strategy Tracking & Reporting Dashboard

CITY OF ALEXANDRIA

2019 Green Building Policy



POLICY STATEMENT:

Green building is a practice that brings environmental and economic benefits to present and future generations. A green building ensures that sustainable standards are adhered to throughout the design and construction processes to lessen the impacts of the building on the local and global environment, resulting in lower operational costs and a healthy indoor environment for building occupants. The standards of the 2019 City of Alexandria Green Building Policy provided herein establish minimum green building practices for new private development and furthers the City's commitment to lead by example through new development and renovation of its own public buildings. In addition to instituting standards to achieve an overall improvement in building performance, this Green Building Policy includes a cutting-edge, directed-use approach that targets the reduction of energy use and mitigating greenhouse gas emissions, increased water efficiency and improved indoor environmental quality in both new private and public buildings. As a result, implementation of this Green Building Policy will contribute to reduced greenhouse gas emissions, conservation of potable water and improved human health in the City of Alexandria.

DEVELOPMENT STANDARDS:

New private development, new public development (City-owned buildings, including Alexandria City Public Schools) and major renovations that require a Development Site Plan (DSP) or a Development Special Use Permit (DSUP) are subject to comply with the Green Building Policy. The Green Building Policy is in effect as of March 2, 2020 for DSP and DSUP applications submitted on or after this date.

The 2019 Green Building Policy identifies: 1) the pathways to achieve the City's green building performance standards, including certification through four nationally recognized green building rating systems, 2) a minimum level of green building certification for both private and public developments, and 3) priority "Performance Points" within each rating system that a project is expected to achieve.

RATING SYSTEMS & MINIMUM LEVEL OF CERTIFICATION:

LEED, Green Globes, EarthCraft, and National Green Building Standard are the standard third-party green building rating systems accepted under the Green Building Policy. The minimum level of certification for each rating system is provided on the following pages for both public and private development. The latest version of each rating system at the time of the first Final Site Plan submission shall apply.

In addition to the LEED, Green Globes, EarthCraft, or National Green Building Standard green building rating systems, projects may choose an alternative path for certification through an independent, third-party certifier. The independent, third-party certifier must verify that the performance standards of the Green Building Policy are met.

PERFORMANCE POINTS:

Performance Points are defined as specific minimum credit points each project must achieve within the minimum level of certification for the selected green building rating system. Performance Points are identified within the areas of energy use reduction and greenhouse gas emission reductions, water efficiency, and indoor environmental quality. Projects that use LEED should refer to the LEED Credit Library for the specific criteria of each point. Those who utilize Green Globes, EarthCraft, or National Green Building Standard must comply with the Performance Point overlay criteria in Appendix A, B, and C of this Policy, respectively. To maintain alignment with the intent of this Policy, Performance Points may be adjusted over time to correspond with updates to the rating systems, revisions to the building code, and/or updates to state, federal, or other City policies.

In addition to the minimum level of certification and the designated Performance Points, public development will meet the following criteria:

STORMWATER	100% of the required stormwater treatment through green infrastructure.
NET ZERO ENERGY	An energy-efficient building where, on a source energy basis, the actual annual delivered energy is less than or equal to the on-site renewable exported energy.

PUBLIC BUILDING RENOVATIONS:

For renovations of City-owned buildings that do not require a DSP or DSUP, the City will apply LEED Interior Design and Construction (ID+C) and LEED Operations and Maintenance (O&M) rating systems as a guideline for interior design and construction projects and targeted renovations of individual building systems (e.g.; HVAC, roof, windows, plumbing, etc.). Actual third-party certification may be used when technically and financially feasible.

FLEXIBILITY:

Flexibility from the Green Building Policy will be considered on a case-by-case basis. If flexibility is requested, the Director of Planning and Zoning will consider the project size, proposed use and the alternate green building practices the applicant proposes to incorporate into the project to determine if the request is justified. The City will use the data collected from this process over time to establish consistent criteria and thresholds for alternatives to compliance with the Green Building Policy.

2019 GREEN BUILDING POLICY | Leadership in Energy and Environmental Design (LEED)											
RATING SYSTEM	MINIMUM LEVEL OF CERTIFICATION		PERFORMANCE POINTS								
			ENERGY USE REDUCTION			WATER EFFICIENCY			INDOOR ENVIRONMENTAL QUALITY		
	Private	Public	POINTS		CREDIT	POINTS		CREDIT	POINTS		CREDIT
			Private	Public		Private	Public		Private	Public	
LEED BUILDING DESIGN AND CONSTRUCTION (BD+C)	Silver	Gold	5	7	Optimize Energy Performance	4	4	Indoor Water Use Reduction	1	1	Low-Emitting Materials
			2	3	Renewable Energy Production				1	1	Construction Indoor Air Quality Management Plan
			1	1	Advanced Energy Metering[2]	1	1	Outdoor Water Use Reduction	1	1	Thermal Comfort
			Optional	3	Enhanced Commissioning				Optional	2	Daylight
									Optional	1	Indoor Air Quality Assessment

NOTES: 1) Refer to LEED Credit Library for point criteria.
2) Applies to non-residential projects only (excludes hotels).

2019 GREEN BUILDING POLICY | Green Globes

RATING SYSTEM	MINIMUM LEVEL OF CERTIFICATION		PERFORMANCE POINTS								
			ENERGY USE REDUCTION			WATER EFFICIENCY			INDOOR ENVIRONMENTAL QUALITY		
	Private	Public	POINTS Private	POINTS Public	CREDIT	POINTS Private	POINTS Public	CREDIT	POINTS Private	POINTS Public	CREDIT
GREEN GLOBES NEW CONSTRUCTION (NC)	2 Green Globes	3 Green Globes	60	68	**3.3.1.1** Assessing Energy Performance (Path A, B, or C)	24	24	**3.4.1.1** Indoor Water Consumption	11	11	**3.7.1.1** Ventilation Air Quality
			9	9	**3.3.9.1.1** On-site Renewable Energy Feasibility Study				8	8	**3.7.1.2** Air Exchange
			-AND-			6	6	**3.2.4.1** Landscape and Irrigation Plan (LIP) by Certified Professional	10	10	**3.7.2.1** Volatile Organic Compounds
			23	23	**3.3.9.1.2** On- or Off-site Renewable Energy						
			-OR-			3	3	**3.2.4.1.1** Soil Type, Drainage and Light Conditions			
			18	18	**3.3.9.2.1** Off-site Renewable Energy						
			-OR-								
			32	32	**3.3.9.1.2** (Partial) and **3.3.9.2.1** (Partial)	2	2	**3.2.4.3.2** Native/Non-invasive Plant Material	5	5	**3.1.2.4** IAQ During Construction
			COMMISSIONING								
			Optional	4	**3.1.3.2.1.1** HVAC and Refrigeration Systems	3	3	**3.2.4.3.3** Turfgrass Minimalized			
			Optional	3	**3.1.3.2.1.5** Plumbing						
			Optional	1	**3.1.3.2.1.6** Electrical	1	1	**3.4.8.2.2** Drip/low Volume Irrigation[3]	Optional	3	**3.1.2.4.2** IAQ of Occupied Areas During Construction
			Optional	1	**3.1.3.2.1.7** Lighting						
			Optional	1	**3.1.3.2.1.8** Building Automation				2-12	2-12	**3.7.4** Thermal Comfort
			Optional	1	**3.1.3.3.1** Training Requirements						
			Optional	6	**3.1.3.4.1** Operations and Maintenance Manuals	1	1	**3.4.8.2.3** WaterSense/SWAT/Smart Control System[3]	Optional	8	**3.3.5.4** Daylighting
			METERING, MEASUREMENT AND VERIFICATION[2]								
			1	1	**3.3.3.1.1.1** Electricity	0.5	0.5	**3.4.8.2.4** Regulation of Precipitation Rate on Sprinkler[3]	Optional	7	**3.7.3.1.1** Daylighting
			1	1	**3.3.3.1.1.2** Heating Fuels						
			1	1	**3.3.3.1.1.4** Other, with description (as applicable)	0.5	0.5	**3.4.8.2.5** Swing Joints/Flex Pipes on Irrigation Heads[3]	Optional	2	**3.1.2.4.1** IAQ During Construction Indoor Air Quality Test Pathway
			0.5 - 3	0.5 - 3	**3.3.3.1.2** Sub-metering (as applicable)						

NOTES: 1) Refer to Appendix A: "City of Alexandria, VA Performance Design Targets – Directed Use Criteria ("Performance Points") for Green Globes" for Performance Point criteria.
2) Applies to non-residential projects only (excludes hotels).
3) Credit is only applicable if an automated irrigation system is installed.

2019 GREEN BUILDING POLICY | EarthCraft Multifamily

RATING SYSTEM	MINIMUM LEVEL OF CERTIFICATION		PERFORMANCE POINTS								
			ENERGY USE REDUCTION			WATER EFFICIENCY			INDOOR ENVIRONMENTAL QUALITY		
	Private	Public	POINTS Private	POINTS Public	CREDIT	POINTS Private	POINTS Public	CREDIT	POINTS Private	POINTS Public	CREDIT
EARTHCRAFT MULTIFAMILY (ECMF)	Gold	N/A	2-5	N/A	**IN 1.1** Solar, Micro-hydro, Wind Electric **IN 1.2** Solar-ready Design **IN 1.3** Solar Electric System or **IN 1.5** Common Areas Solar Electric Use	INDOOR WATER USE			4	N/A	**IAQ 2.7** VOC Materials and **IAQ 2.12** Zero Carpet in Units
						9-14	N/A	**WE 1.2** Water Treatment **WE 1.3** Water Softeners **WE 1.4** Storage **WE 1.5.1** WaterSense Toilet **WE 1.5.2** WaterSense Urinal **WE 1.5.3** WaterSense Lavatory Faucet **WE 1.5.4** WaterSense Showerhead **WE 1.6** Toilet < 1.1 gallon/flush			
			1-2	N/A	**EO 3.4** Light Commercial Community Center (as applicable) or **EO 3.5** Light Commercial Ready Spaces (as applicable)	-OR-					
						5-10	N/A	**WE 1.2** Water Treatment **WE 1.3** Water Softeners **WE 1.5.1** WaterSense Toilet **WE 1.5.2** WaterSense Urinal **WE 1.5.3** WaterSense Lavatory Faucet **WE 1.5.4** WaterSense Showerhead **40%** Reduction from Baseline	2	N/A	**BE 3.15** Insulation **BE 3.16** Walls **BE 3.17** Exterior Insulation **BE 3.18** Ceilings **BE 3.19** Attic Kneewalls or **BE 3.20** Insulate Roofline
			COMMISSIONING			OUTDOOR WATER USE					
			Optional	N/A	**EO 2.3** Pre-occupancy Briefing	4-9	N/A	**WE 2.4** Turf <40% **WE 2.5** Vegetate 4:1 Slopes **WE 2.7** Drought Tolerant/Native Plants **WE 2.8** Guidebook and **WE 2.6** Irrigation[2]			
			Optional	N/A	**EO 2.4** Post-occupancy Briefing						
			Optional	N/A	**EO 2.5** Environmental Management and Building Maintenance Guidelines for Staff	-OR-					
						3	N/A	**WE 2.10.1** Greywater Irrigation[2]	1	N/A	**IAQ 2.9** Pre-occupancy Flush
			Optional	N/A	High-rise Addendum	-OR-					
			METERING								
			Optional	N/A	**IN 1.7 12** Months Post-Construction Energy Monitoring	3	N/A	**WE 2.10.2** Rainwater Irrigation[2]			

NOTES: 1) Refer to Appendix B-1: "City of Alexandria, VA Performance Design Targets – Directed Use Criteria ("Performance Points") for Earthcraft Multifamily (ECMF)" for Performance Point criteria.
2) Credit is only applicable if an automated irrigation system is installed.

2019 GREEN BUILDING POLICY | EarthCraft Light Commercial

RATING SYSTEM	MINIMUM LEVEL OF CERTIFICATION		PERFORMANCE POINTS								
			ENERGY USE REDUCTION			WATER EFFICIENCY			INDOOR ENVIRONMENTAL QUALITY		
	Private	Public	POINTS Private	POINTS Public	CREDIT	POINTS Private	POINTS Public	CREDIT	POINTS Private	POINTS Public	CREDIT
EARTHCRAFT LIGHT COMMERCIAL (ECLC)[2]	Certified	Gold	1	1	**BE 1A** Envelope Air Tightness Test	INDOOR WATER USE			2	2	**IEQ 5** Certified Flooring **IEQ 6** Composite Wood or **IEQ 7** Product Transparency
			1	1	**ES 5** High Performance Duct System	3	3	**WE 1A** High Efficiency Toilets **WE 1B** Pint Flush or Waterless Urinals **WE 1C** Automatic Faucets, and/or **WE 1D** High Efficiency Showerheads	1	1	**IEQ 1** Decoupled Ventilation **IEQ 2** (DCV) **IEQ 3** Air Filtration Media or **IEQ 4** Radon Exposure Prevention
			-AND-								
			1	1	**IN 1** Renewable Energy Installation						
			-OR-								
			2	2	**IN 2** Renewable Energy Procurement				Optional	1	**BE 7** Daylighting Design Strategies
			COMMISSIONING			OUTDOOR WATER USE					
			Optional	3	**EO 1** Building Systems Commissioning						
			METERING			3	3	**WE 2** Landscape Plan **WE 3** Efficient Irrigation System and/or No Irrigation and/or **WE 4** Non-potable Water Source Used for Irrigation[3]	PR[4]	PR[4]	**IEQ R3** Minimize Indoor Air Contamination
			PR[4]	PR[4]	**EO R1** Utility Tracking						

NOTES: 1) Refer to Appendix B-2: "City of Alexandria, VA Performance Design Targets – Directed Use Criteria ("Performance Points") for Earthcraft Light Commercial (ECLC)" for Performance Point criteria.
2) Applicable to commercial buildings, schools and public facilities up to 80,000 square feet.
3) Credit is only applicable if an automated irrigation system is installed.
4) PR = Program Requirement; no points assigned.

2019 GREEN BUILDING POLICY | National Green Building Standard (NGBS)

RATING SYSTEM	MINIMUM LEVEL OF CERTIFICATION		PERFORMANCE POINTS								
			ENERGY USE REDUCTION			WATER EFFICIENCY			INDOOR ENVIRONMENTAL QUALITY		
			POINTS		CREDIT	POINTS		CREDIT	POINTS		CREDIT
	Private	Public	PRIVATE	PUBLIC		PRIVATE	PUBLIC		PRIVATE	PUBLIC	
NGBS GREEN NATIONAL GREEN BUILDING STANDARD (NGBS)	SILVER	N/A	66	N/A	**702** Performance Path	39 + Additional Documentation of LEED Water Tool Results to demonstrate 40% reduction	N/A	**802.2** Water-conserving Appliances **802.4** Showerheads **802.5** Faucets ***Additional non-NGBS Documentation Required:*** LEED Water Tool Outputs - Demonstrate a 40% reduction in indoor water use relative to baseline water use using the LEED Water Tool	6 - 18 (depending on credits selected)	N/A	**Achieve listed number of points for at least two of the following:** **901.4** Wood Materials: 10 points **901.7** Floor Materials: 8 points **901.9** Interior Architectural Coatings: 8 points **901.10** Interior Adhesives and Sealants: 5 points **901.11** Insulation: 4 Points **901.12** Furniture and Furnishings: 2 points
			2 per kW+ Documentation that onsite generation is projected to meet at least 5% of energy demand	N/A	**706.5** On-Site Renewable Energy System. **706.2** Renewable Energy Service Plan. ***Additional non-NGBS documentation required:*** Proof that the planned on-site renewable energy will exceed 5% of planned demand				9 points required for multi-family 7 points required for townhomes	N/A	**902.2** Building Ventilation Systems -2 points **902.4** HVAC System Protection – 3 points **904.1** Indoor Air Quality (IAQ) During Construction – 2 points **901.15** Non-Smoking Areas – 2 points (only applicable to multi-family projects)
			1 for multifamily projects	N/A	**705.7** Submetering System	5	N/A	**503.5** Landscape Plan	9	N/A	**903.3** Relative Humidity **905.1** Humidity Monitoring System
			14 for multifamily projects	N/A	**705.6** Installation and Performance Verification	Additional Documentation of WaterSense Water Budget tool to demonstrate 50% reduction	N/A	**802.6.1/2/3/4 Irrigation Systems** **Additional non-NGBS Documentation Required:** EPA WaterSense Water Budget Tool - Demonstrate at least a 50% reduction in irrigation water demand using the Water Budget Tool	Optional	N/A	**901.1** Space and Water Heating Options **902.2** Building Ventilation Systems **902.3** Radon Reduction Measures
									Optional	N/A	**904.2** Indoor Air Quality (IAQ) Post Completion **904.12** Indoor Air Quality (IAQ) Post Completion – 3 points

NOTES: 1) Refer to Appendix C: "City of Alexandria, VA Performance Design Targets – Directed Use Criteria ("Performance Points") for National Green Building Standard (NGBS)." for Performance Point criteria.
2) Applicable to residential projects only. Does not apply to public projects.

APPENDIX A: CITY OF ALEXANDRIA, VA PERFORMANCE DESIGN TARGETS – DIRECTED USE CRITERIA ("PERFORMANCE POINTS") FOR **GREEN GLOBES FOR NEW CONSTRUCTION (NC).**

For additional information, refer to the Green Globes for New Construction Technical Reference Manual v1.50.

As part of achieving a minimum certification of Two Green Globes for private projects, or Three Green Globes for public projects in the City of Alexandria, VA, Green Globes projects must fulfill the following Green Globes criteria:

ENERGY

Energy Reduction for Private Projects

Green Globes Criteria: 3.3.1.1: All private projects must achieve a minimum of 60 points under Pathways A, B, or C, identified in criteria 3.3.1.1 for an EUI > 30% (60 points)

Energy Reduction for Public Projects

Criteria 3.3.1.1: All projects must achieve a minimum of 68 points under Pathways A, B, or C, identified in criteria 3.3.1.1 for an EUI ≥ 35% (68 points)

Renewable Energy for Private Projects

3.3.9.1.1.: Perform feasibility study under criteria 3.3.9.1.1 to determine whether 5% onsite renewable energy equipment or 40% off-site renewable energy equipment is achievable for the project (9 points)

Per the result of the feasibility study, achieve these criteria by following one of the three paths below:

PATH 1: Criteria 3.3.9.1.2: Installation of 5% or greater **on-site** renewable energy; or installation of 40% or greater **off-site** renewable energy. (23 points)

OR

PATH 2: Criteria 3.3.9.2.1: Procurement of RECs and/or offsets for 200% of building energy for a minimum of three years (18 points)

OR

PATH 3: Achieve Criteria 3.3.9.1.2 for installation of either 2% on-site or 20% off-site renewable energy equipment (14 points) **AND** achieve 3.3.9.2.1 for procurement of RECs and/or offsets for 100% of building energy for minimum of three years (18 points).

Renewable Energy for Public Projects

3.3.9.1.1.: Perform feasibility study under criteria 3.3.9.1.1 to determine whether a minimum of 10% onsite renewable energy equipment or 60% off-site renewable energy equipment is achievable for the project (9 points)

Per the result of the feasibility study, achieve these criteria by following one of the three paths below:

PATH 1: Criteria 3.3.9.1.2: Installation of 10% or greater **on-site** renewable energy; or installation of 60% or greater **off-site** renewable energy (23 points)

OR

PATH 2: Criteria 3.3.9.2.1: Procurement of RECs and/or offsets for 200% of building energy for a minimum of six years (18 points)

OR

PATH 3: In cases where the onsite/offsite renewable energy goals may be partially achieved, Criteria 3.3.9.1.2 for installation of either a minimum of 5% on-site or 30% off-site renewable energy equipment (14 points) **AND** achieve 3.3.9.2.1 for procurement of RECs and/or offsets for 100% of building energy for minimum of six years (18 points).

Commissioning for Public Projects (Optional for Private Projects)

The City of Alexandria recommends that all private projects attempt to include Commissioning whenever possible, although it is not required for private projects. Public projects must fulfill commissioning criteria related to mechanical systems, plumbing, and electrical, specifically by utilizing the following Green Globes Criteria:

3.1.3.2.1.1., HVAC and refrigeration systems (4 points)
3.1.3.2.1.5., Plumbing (3 points)
3.1.3.2.1.6., Electrical (1 point)
3.1.3.2.1.7., Lighting (1 point)
3.1.3.2.1.8., Building automation (1 point)
3.1.3.3.1., Training requirements (1 point)
3.1.3.4.1., Operations and Maintenance manuals (6 points)
Total points: (17 points)

*Advanced Energy Metering for Public and Private Projects**

All applicable points in the following Green Globes Criteria related to whole building/significant use metering must be fulfilled (*as applicable to the building's systems*):

3.3.3.1.1.1., Electricity (1 point)
3.3.3.1.1.2., Heating Fuels (1 point)
3.3.3.1.1.3., Steam (1 point)
3.3.3.1.1.4., Other, with description (1 point)
Total possible points for this section: (4 points)

And, for the following end uses making up over 10% of the building load, *as applicable to the building*:
3.3.3.1.2.1., Sub-metering on lighting and lighting controls by floors or zones (0.5 points)
3.3.3.1.2.2., Sub-metering on plug loads by floor or zones (0.5 points)
3.3.3.1.2.3., Sub-metering on major electric HVAC equipment (0.5 points)
3.3.3.1.2.4., Sub-metering on chilled water generation (0.5 points)
3.3.3.1.2.5., Sub-metering for onsite renewable energy generation (0.5 points)

3.3.3.1.2.6., Sub-metering for heating water or steam generation (0.5 points)
Total possible points for this section: (3 points)

**Applies to non-residential projects only, excluding hotel projects. Such projects are excluded from being required to comply with these criteria, although the City of Alexandria urges projects to consider compliance with these criteria, where possible.*

WATER EFFICIENCY

Indoor Water Use for Public and Private Projects

The following Green Globes Criteria must be fulfilled:

3.4.1.1, Projected water consumption determined to be less than the baseline by a minimum of 40%
(24 points)

Outdoor Water Use for Public and Private Projects

The following Green Globes Criteria must be fulfilled through a project achievements in both landscaping (Site), and irrigation systems (Water) performance:

3.2.4.1., Landscape Irrigation Plan (LIP) by Landscape Architect (6 points)
3.2.4.1.1., LIP for soil type, drainage and light (3 points)
3.2.4.3.2., Native/Non-invasive plants (2 points)
3.2.4.3.3., Turf grass minimalized (3 points); and
-The following criteria and points are only applicable if an automated irrigation system is installed-
3.4.8.2.2., Drip/low volume irrigation (1 point)
3.4.8.2.3., Watersense/SWAT/Smart Control system (1 point)
3.4.8.2.4., Regulation of precipitation rate on sprinkler systems (0.5 point)
3.4.8.2.5., Swing joints/Flex pipes on irrigation heads (0.5 point)

INDOOR ENVIRONMENTAL QUALITY

Indoor Environmental Quality for Public and Private Projects

The following Green Globes Criteria must be fulfilled:

3.1.2.4 IAQ During Construction (5 points maximum)
3.3.5.4 Daylighting (8 points) (public buildings only)
3.7.3.1.1 Daylighting (7 points) (public buildings only)
3.7.1.1 Ventilation Air Quantity (11 points)
3.7.1.2 Air Exchange (8 points)
3.7.2.1 Volatile Organic Compounds (10 points)
3.7.4 Thermal Comfort (up to 12 points depending on building use/purpose)

Indoor Air Quality for Public Projects

3.1.2.4.1 IAQ During Construction: Indoor Air Quality Test pathway (2 points)
3.1.2.4.2 IAQ of Occupied Areas During Construction (3 points)

APPENDIX B-1: CITY OF ALEXANDRIA, VA PERFORMANCE DESIGN TARGETS ("PERFORMANCE POINTS") – DIRECTED USE CRITERIA FOR **EARTHCRAFT MULTIFAMILY (ECMF).**

For additional information, refer to the EarthCraft Multifamily Technical Guidelines.

The EarthCraft Multifamily rating system is not applicable to public projects. For private projects, as part of achieving the minimum certification requirements for EarthCraft Gold, the following must also be completed projects in the City of Alexandria:

ENERGY:

Renewable Energy

Achieve one of the four paths below:

IN 1.1: Solar, micro-hydro, or wind electric system (4 points)

OR

IN 1.2: Solar-ready design (2 points)

OR

IN 1.3: Solar electric system (5 points)

OR

IN 1.5: Common areas use solar electric system (4 points)

Community Buildings/Commercial Spaces *(as applicable for mixed-use developments with ground floor commercial use and multifamily units above).*

Achieve one of the two following credits:

EO 3.4: EarthCraft Light Commercial for community center (2 points)

OR

EO 3.5: EarthCraft Light Commercial ready spaces (1 point)

Commissioning (optional)

Achieve the following credits:

EO 2.3: Provide pre-occupancy briefing for tenant (2 points)
EO 2.4: Project participates in post-occupancy debriefing (2 points)
EO 2.5: Environmental management and building maintenance guidelines for staff (2 points)
Achieve all applicable items on the High Rise Addendum (applicable for low-, mid-, and high-rise projects)

Advanced Metering (optional)

Achieve the following credit:

IN 1.7: Developer contracts for at least 12 months post-construction energy monitoring (6 points)

WATER EFFICIENCY

Indoor Water Use

Achieve one of the two paths below:

PATH 1: Earn a minimum of 9 points and up to 14 points from any combination of the following credits:

WE 1.2: Water treatment system NSF certified (2 points)
WE 1.3: Water softeners certified to NSF/ANSI Standard 44 (2 points)
WE 1.4: Store < .5 gallons of water between water heater and furthest fixture (2 points)
WE 1.5.1: WaterSense toilet (2 points); WE 1.5.2: WaterSense urinal (1 point)
WE 1.5.3: WaterSense lavatory faucet (1 point);
WE 1.5.4: WaterSense showerhead (2 points) and
WE 1.6: Toilet < 1.1 gallon/flush (2 points)

OR

PATH 2: Earn a minimum of 5 points and up to 10 points from any combination of the following credits:

WE 1.2: Water treatment system NSF certified (2 points)
WE 1.3: Water softeners certified to NSF/ANSI Standard 44 (2 points)
WE 1.5.1: WaterSense toilet (2 points)
WE 1.5.2: WaterSense urinal (1 point);
WE 1.5.3: WaterSense lavatory faucet (1 point)
WE 1.5.4: WaterSense showerhead (2 points); and demonstrate a 40% reduction from the baseline through the Indoor Water Use Calculator

Outdoor Water Use

Achieve one of the three paths below:

PATH 1: Earn a minimum of 4 points and up to 9 points from any combination of the following credits:

WE 2.4: Turf <40% of landscaped area (2 points);
WE 2.5: Vegetate slopes exceeding 4:1 (1 point);
WE 2.7: Drought-tolerant/native landscaping turf and plants (1 point);
WE 2.8: Xeriscape guidebook given to property manager or owners (1 point); and
WE 2.6: Irrigation (4 points) (WE 2.6 is only applicable if automated irrigation is installed)

OR

PATH 2: WE 2.10.1: Greywater irrigation system (3 points) (only applicable if automated irrigation is installed)

OR

PATH 3: WE 2.10.2: Rainwater irrigation system (3 points) (only applicable if automated irrigation is installed)

INDOOR ENVIRONMENTAL QUALITY

Achieve the following:

Earn a total of 4 points between IAQ 2.7: Certified low or no VOC materials and IAQ 2.12: No carpet in all units

AND

Earn a total of 2 points from any combination of the following credits:

BE 3.15: Insulate with foam insulation
BE 3.16: Walls
BE 3.17: Continuous exterior insulation
BE 3.18: Ceilings
BE 3.19: Attic kneewalls, and/or
BE 3.20: Insulate roofline

AND

Achieve IAQ 2.9: Pre-occupancy flush (1 point)

APPENDIX B-2: CITY OF ALEXANDRIA, VA PERFORMANCE DESIGN TARGETS ("PERFORMANCE POINTS") – DIRECTED USE CRITERIA FOR **EARTHCRAFT LIGHT COMMERICAL (ECLC) v2.1.**

For additional information, refer to the EarthCraft Light Commercial Technical Guidelines.

As part of achieving the minimum certification requirements for EarthCraft Light Commercial (ECLC) Certified for private developments and ECLC Gold for public developments, the following must also be completed for projects in the City of Alexandria:

ENERGY:

Energy for Private Projects:

Achieve the following credits:

BE 1A: Measured ELR75 is 0.30 or better (1 point)

AND

ES 5: High Performance Duct System (1 point)

AND

IN 1: Renewable Energy Installation of 5% or greater on-site renewable energy; or installation of 40% or greater off-site renewable energy. (1 point)

OR

IN 2: Renewable Energy Procurement of RECs and/or offsets for 200% of building energy for a minimum of three years (2 points)

Energy for Public Projects:

Achieve the following credits:

BE 1A: Measured ELR_{75} is 0.30 or better (1 point)

AND

ES 5: High Performance Duct System (1 point)

AND

IN 1: Renewable Energy Installation of 10% or greater **on-site** renewable energy; or installation of 60% or greater **off-site** renewable energy. (1 point)

OR

IN 2: Renewable Energy Procurement of RECs and/or offsets for 200% of building energy for a minimum of six years (2 points)

Commissioning for <u>Public Projects</u> (Optional for Private Projects)

Achieve the following credit:

EO 1: Building Systems Commissioning (3 points)

WATER USE:

Indoor Water Use

Earn a total of 3 points from any combination of the following credits:

WE 1A: High Efficiency Toilets
WE 1B: Pint Flush or Waterless Urinals
WE 1C: Automatic Faucets and/or
WE 1D: High Efficiency Showerheads

Outdoor Water Use

Earn a total of 3 points from any combination of the following credits:

WE 2: Xeriscape Landscape Plan
WE 3: Efficient Irrigation System or No Irrigation System and/or
WE 4: Non -Potable Water Source Used for Irrigation (WE 4 is only applicable if an automated irrigation system is installed)

INDOOR ENVIRONMENTAL QUALITY

Achieve 4 points from the following credits:

Earn a total of 1 point from any combination of the following credits:

IEQ 1: Decoupled Ventilation
IEQ 2: Demand Control Ventilation (DCV)
IEQ 3: Air Filtration Media: MERV 11 or Higher or
IEQ 4: Radon Exposure Prevention

AND

Earn a total of 2 points from any combination of the following credits:

IEQ 5: Certified Flooring
IEQ 6: Composite Wood Contains No Added Urea-Formaldehyde or
IEQ 7: Product Transparency Label Material Selection

AND

Earn 1 point from BE 7: Daylighting Design Strategies

APPENDIX C: CITY OF ALEXANDRIA, VA PERFORMANCE DESIGN TARGETS – DIRECTED USE CRITERIA ("PERFORMANCE POINTS") FOR **NATIONAL GREEN BUILDING STANDARD (NGBS).**

For additional information, refer to the 2020 National Green Building Standard Manual.

The National Green Building Standard rating system is not applicable to public projects or commercial projects. For private residential projects, as part of achieving the minimum certification requirement of Silver for National Green Building Standard, the following must also be completed projects in the City of Alexandria:

ENERGY

Optimize Energy Use:

The following criteria must be fulfilled:

- All projects must achieve a minimum of 66 points under the 702 Performance Path. Neither the prescriptive path nor the ERI target path should be used for compliance with the Alexandria Green Building Standard (66 points)

On-Site Renewables:

The on-site renewables must be 5% of the total site energy to meet the Alexandria Green Building Standard. Points allotted are 2 points kW+. The following criteria must be fulfilled:

- 706.5 On-Site Renewable Energy System
- 706.2 Renewable Energy Service Plan
- Additional non-NGBS documentation required: Proof that the planned on-site renewable energy will exceed 5% of planned demand

Measurement and Verification:

The following criteria must be fulfilled:

- Earn 1 point under 705.7 Submetering System (1 point)

Enhanced Commissioning:

The following criteria must be fulfilled:

- Projects must achieve 14 points under 706 Installation and Performance Verification (14 points)

WATER EFFICIENCY

NGBS does have a performance rating for water efficiency under section 804, using Water Rating Index (WRI) methodology. However, the WRI methodology combines indoor and outdoor water use into a single metric.

Indoor Water Use:

In addition to achieving the minimum 39 required points under Water Efficiency for NGBS Silver (across indoor and outdoor use), projects must use the LEED Water Tool to calculate their design water baseline and design water savings and demonstrate a projected reduction of 40% over the baseline.

The following criteria must be fulfilled:

- 802.2 Water-conserving Appliances
- 802.4 Showerheads
- 802.5 Faucets
- Additional non-NGBS Documentation Required: LEED Water Tool Outputs - Demonstrate a 40% reduction in indoor water use relative to baseline water use using the LEED Water Tool

Outdoor Water Use:

In addition to achieving the minimum required 39 required points under Water Efficiency for NGBS Silver (across indoor and outdoor use), projects must use the EPA WaterSense Water Budget to calculate their irrigation water demand baseline, demonstrate a projected reduction of 50% relative to the baseline.

The following criteria must be fulfilled:

- 503.5 Landscape Plan
- 802.6.1/2/3/4 Irrigation Systems
- Additional non-NGBS Documentation Required: EPA WaterSense Water Budget Tool - Demonstrate at least a 50% reduction in irrigation water demand using the Water Budget Tool

INDOOR ENVIRONMENTAL QUALITY

Low Emitting Materials:

Achieve at least the applicable maximum number of points, as listed, *in at least two* of the following six categories:

- 901.4 Wood Materials (10 points)
- 901.7 Floor Materials (8 points)
- 901.9 Interior Architectural Coatings (8 points)
- 901.10 Interior Adhesives and Sealants (5 points)
- 901.11 Insulation (4 points)
- 901.12 Furniture and Furnishings (2 points)

Indoor Air Quality Construction Management:

Achieve the listed number of points for each of the following categories. A total of 9 points are required for multi-family and 7 points required for townhomes.

- 902.2.3 or 902.2.4: Building Ventilation Systems. Indicating MERV Filters must be at least MERV 8 (2 points)
- 902.4 HVAC System Protection (3 points)

- 904.1 Indoor Air Quality (IAQ) During Construction (2 points)
- 901.15 Non-Smoking Areas (2 points)

Thermal Comfort:

Achieve the listed number of points for each of the following categories:

- 903.3 Relative Humidity (7 points)
- 905.1 Humidity Monitoring System (2 points)

Daylighting (Optional):

There is no specific daylighting requirement in NGBS.

Private Projects Enhanced Indoor Air Quality Strategies (Optional):

901.1 Space and Water Heating Options
902.2 Building Ventilation Systems
902.3 Radon Reduction Measures

Indoor Air Quality Assessment (Optional):

904.2 Indoor Air Quality (IAQ) Post Completion
904.12 Indoor Air Quality (IAQ) Post Completion (3 points)

Appendix B
Coordinated Development District (CDD) Conditions specific to sustainability for the former PRGS property

CDD CONCEPT PLAN # 2021-00004

District Carbon Neutrality:

139. The site and each building(s) shall seek to achieve carbon neutrality in compliance with the Old Town North Small Area Plan through application of the targets identified in the Carbon Neutrality Analysis (CNA), dated April 7, 2022, as outlined below:

Site & Building Targets

Target 1

a. Each building(s) shall achieve a minimum 25% reduction in operational carbon emission based on the ASHRAE Standard 90.1-2010 Appendix G – Performance Rating Method baseline established by 2019 Alexandria's Green Building Policy; or achieve an EUI target based the International Energy Conservation Code (IECC) for climate zone 4A based on building type (e.g. table CC103.1of the 2021 IECC);). Each building shall comply with the Green Building Policy at time of DSUP submission.

Target 2

b. The site shall achieve a minimum 3% annual on-site renewable energy generation across the CDD area. Prior to the approval of the infrastructure development site plan (DSP), the applicant shall evaluate strategies to increase the targeted 3% on- site energy generation through approaches such as use of public open space, adjoining properties, or other comparable approaches as part of the Coordinated Sustainability Strategy (CSS). These strategies and analysis will be reviewed as part of the infrastructure DSP. As part of each block's Development Special Use Permit (DSUP) review, the applicant will evaluate strategies to increase the on-site energy generation above 3%.

Target 3

c. Each newly constructed building(s) shall achieve a 10% reduction in embodied carbon compared to industry-standard construction practices. With each preliminary DSUP submission, the Applicant shall provide an estimate of the Embodied Carbon Intensity (ECI) [kgCO2 /m2 or lbCO2/sf], as identified in the CNA, for the proposed redevelopment as part of the development review process. As part of each block's DSUP, the applicant will evaluate reductions in embodied carbon for associated site improvements.

Target 4

d. Each building(s) and all land use(s) permitted herein shall be solely electric with limited exceptions for allowances for natural gas where electric is not feasible. Natural gas shall be prohibited with limited exceptions for: restaurants and retail uses, emergency generators, common area amenities such as common space grilles and common space fireplaces. For these limited accessory elements, the buildings shall be designed to support low cost and available conversion from fossil fuels to electricity in the future. These limited exceptions shall be re-evaluated with each DSUP submission.

Target 5

e. Off-site renewables shall be utilized towards achieving carbon neutrality, to the extent needed in addition to the targets outlined above, by phase. Off-site renewables may include Power Purchase Agreements (PPAs), Renewable Energy Credits (RECs), and/or other comparable approaches as recommended by staff and approved by the City Council. Generally, the Applicant shall design buildings, infrastructure, and open spaces in a manner to maximize on-site carbon reduction targets and minimize the use of off-site renewables, to the extent feasible. (P&Z) (T&ES) (PC)

140. The applicant shall make all good faith efforts to document and achieve the targets outlined above. The efforts to achieve these targets shall be documented by the applicant and evaluated by staff as part of the development review

process. If determined that good faith and reasonable efforts have been made by the applicant to achieve these targets, including consideration of technical and financial feasibility, modifications to these targets may be approved by Planning Commission and City Council as part of the development review process. (P&Z) (T&ES)

141. The applicant, property management entity, BID, or comparable entity shall oversee tracking the targets outlined above. The tools, strategies, and techniques to achieve the targets outlined above shall be submitted with each development special use permit (DSUP) application for each park(s) and/or building(s). (P&Z) (T&ES)

LEED Certification:

142. Achieve LEED for Neighborhood Development (LEED-ND) Silver Certification or comparable certification for the neighborhood. (P&Z) (T&ES)

Green Building:

143. Comply with the City's Green Building Policy in effect at the time of DSUP **submission**. Applicants may use LEED, or equivalent rating systems as identified in the Green Building Policy. (PC)

Coordinated Sustainability Strategy (Sustainability Master Plan):

144. Prior to the 2nd concept submission of the Infrastructure Development Site Plan (Infrastructure DSP), the Applicant shall develop and submit the Coordinated Sustainability Strategy (CSS) and include the evaluation of approaches for on-site energy generation as part of the review of the Infrastructure DSP. This CSS shall be reviewed and endorsed by City Council prior to or concurrent with the approval of the Infrastructure DSP and implemented through DSP/DSUP approvals. If the Council does not endorse the CSS, the applicant shall revise and resubmit the CSS to Council for review and endorsement.

145. The CSS shall outline short-, mid-, and long-term strategies to achieve the five Site and Building performance targets outlined above in addition to other sustainability considerations including:

a. Energy & Resilience Planning/Carbon Reduction strategies as identified in the CNA, including:
    i. District systems
    ii. Building efficiency through energy reduction/EUI targets
    iii. Embodied carbon reduction targets
    iv. On-site/adjoining site energy generation
    v. Electrification strategy
    vi. Off-site renewable/offsets
b. Indoor Environmental Quality
    i. Health
    ii. Ventilation treatment
    iii. Materials
c. Site:
    i. Open Space
    ii. Stormwater Management
d. Public Realm/Streetscapes
e. Water Use Management
f. Waste Management
g. Resilience
h. Reporting & Tracking

146. With each conceptual DSUP submission, the applicant shall demonstrate how the building(s) and site area(s) within that DSUP submission are consistent with the CSS. With each phase, the CSS may be updated to confirm best practices and strategies to achieve the targets to the satisfaction of the Directors of T&ES and P&Z. (P&Z) (T&ES)

147. Prior to the release of the Final Site Plan, the applicant shall provide a draft sustainability strategy scorecard for each DSP/DSUP. The scorecard will demonstrate how the building(s) and site area(s) within that DSP/DSUP submission is consistent with the CSS.
(P&Z) (T&ES)

148. Prior to issuance of a building permit for each permitted DSUP, the Applicant shall provide a scorecard reflecting the final design of the building(s) and site area(s) within that permitted DSUP demonstrating consistency with the CSS. A final scorecard of the as-built building(s) and site area(s) within that permitted DSUP shall be provided within the first year from the date of issuance of the certificate of occupancy and shall include information verifying any off-site renewable strategies used.

Electrification:

149. The CSS shall demonstrate consistency with the Environmental Action Plan 2040 targets, goals, and actions to show how electrification is being implemented with limited exceptions for: restaurants and retail uses, emergency generators, common area amenities such as common space grilles and common space fireplaces. For these limited accessory elements, the buildings shall be designed to support low cost and available conversion from fossil fuels to electricity in the future.

150. All new off-street parking shall provide EV (Level II) stations or consistent with City policies which shall be identified and determined during the time of each DSUP submission. (P&Z) (T&ES)

On-site Energy Generation:

151. Rooftops and/or the building facades for each newly constructed building(s) shall be utilized to provide on-site energy generation to the extent feasible and in alignment with the performance targets as outlined above. All buildings shall be designed to be solar ready to be able to handle the equipment after construction. Pull-wire ready conduit shall be provided for potential future rooftop photovoltaic systems. Space shall be provided for solar related electric panel in or near a building electrical closet. Future installation of solar panels and associated infrastructure, beyond the conduit described in this condition, shall be at the sole discretion of the owner. (P&Z) (T&ES)

Recycling/Construction Waste:

152. With each final site plan in the CDD Conceptual Design Plan area, provide information in the plan drawings for the regional construction recycling guidance and certified resources to the extent possible, https://www.mwcog.org/environment/planning-areas/recyclingand-solid-waste/builders-recycling-guide/builders-recycling/ and/or reuse of the existing building materials as part of the demolition process, including leftover, unused, and/or discarded building materials. (T&ES) (P&Z)

Report & Monitoring:

153. The applicant, owner, property management entity, master HOA, BID or comparable entity shall be responsible for tracking and reporting site-wide sustainability performance as developed and outlined in the Coordinated Sustainability Strategy. The responsible party shall aggregate and verify individual building data annually to demonstrate sitewide performance for the CDD Conceptual Design Plan area as outlined in the Coordinated Sustainability Strategy as buildings within the CDP are constructed.

a. Reporting shall include:
   i. Annual LEED scorecards for each building for the first five years of occupancy;
   ii. An aggregate summary demonstrating the combined building achievements that contribute to achieving the goal of carbon neutrality for the site;
   iii. Sitewide progress towards achieving carbon neutrality by 2040 for buildings and site targets as identified in the CNA and CSS; and
   iv. Any additional updates on sitewide sustainability efforts identified in the CSS. (P&Z) (T&ES).

154. Public benchmarking results for each new building(s) within the CDD plan area will be made available to the City through the ENERGY STAR® Portfolio Manager® platform (or other equivalent systems. This shall be submitted to the satisfaction of the Directors of PZ and T&ES.

155. Monitor the energy usage, report sustainability target performance as outlined in the CSS, and provide tracking documentation following the occupancy of each building(s) system for the first 5 years of occupancy. (P&Z) (T&ES).

156. The applicant may propose additional strategies to the sustainability conditions outlined and these additional sustainability strategies may be incorporated administratively to the satisfaction of the Directors of T&ES and P&Z. (P&Z) (T&ES)

ROADS & OPEN SPACE PHASING:

PHASE 1

NOTE:

① GWMP intersections: Operational and signal improvements (subject to coordination with City's traffic operations)

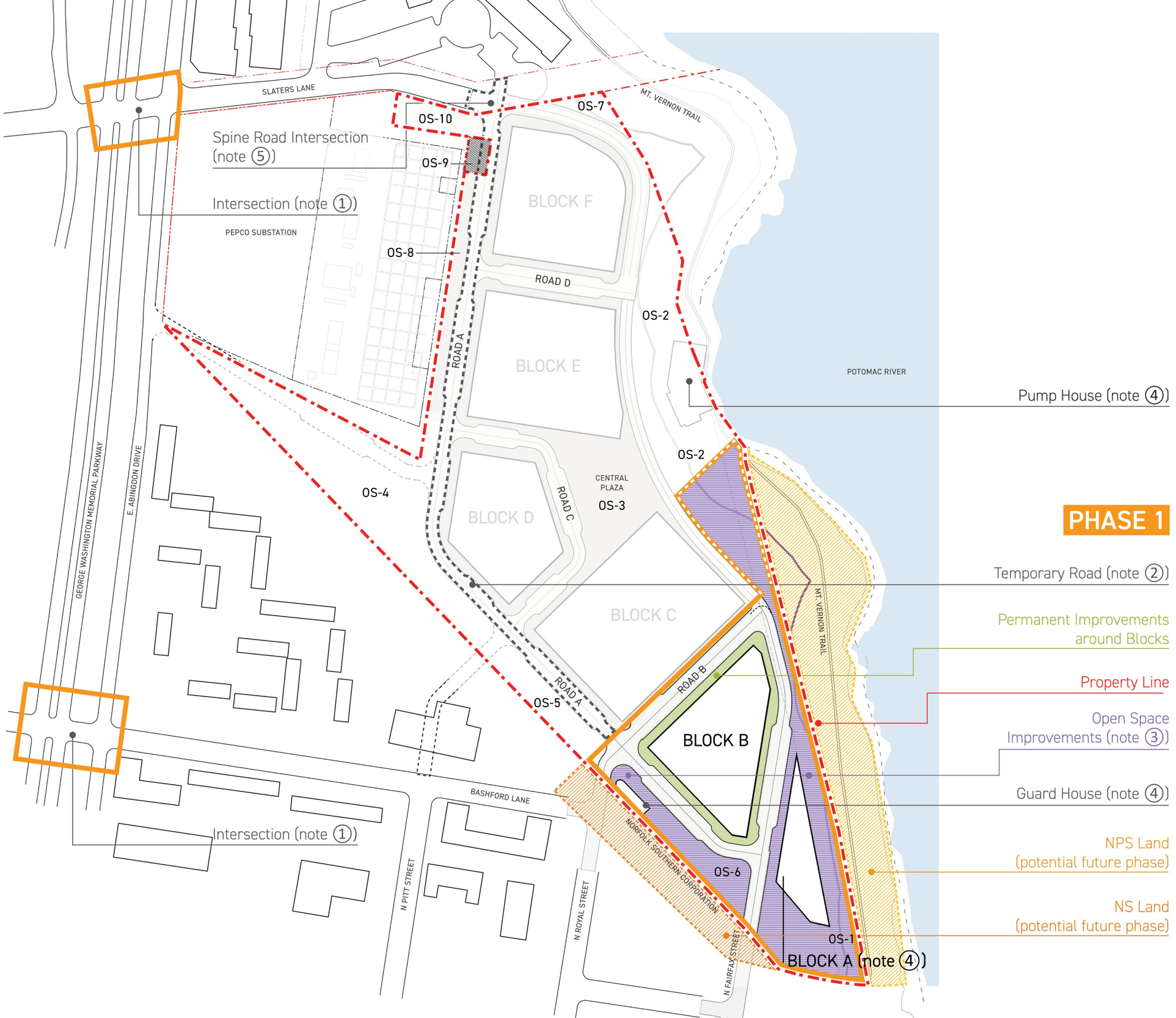
② Temporary road: with temporary sidewalks

③ Open Space improvements:

- Interim improvements may be made at these locations until approval from adjacent landowners allows for coordinated permanent improvements to be implemented.
- Future DSUP's will include detail on proposed final and interim conditions improvements.

④ Block A, Pump House and Guard House may be developed with any Phase.

⑤ Temporary spine road & Slaters Lane intersection: final geometry and interim finish condition



ROADS & OPEN SPACE PHASING:

PHASE 2

NOTE:

① GWMP intersections: Multimodal operational, physical, and signal improvements identified as part of the Phase 2 MTS

- to be completed as part of Phase 2, subject to coordination with City and NPS approval

② The permanent/final condition of improvements to Slaters Lane may be delayed if potential construction traffic impacts make interim conditions more appropriate subject to the determination and satisfaction of the Director of T&ES.

③ Open Space improvements:

- If it is infeasible for the Waterfront Park area north of the Great Lawn area (exclusive of the Pump House) to be fully completed by the end of Phase 2, a revised schedule may be submitted and approved for park delivery to the satisfaction of the Directors of P&Z and RP&CA prior to issuance of the first certificate of occupancy for the last building in Phase 2.
- Interim improvements may be made at these locations until approval from adjacent landowners allows for coordinated permanent improvements to be implemented.
- Future DSUP's will include detail on proposed final and interim conditions improvements.

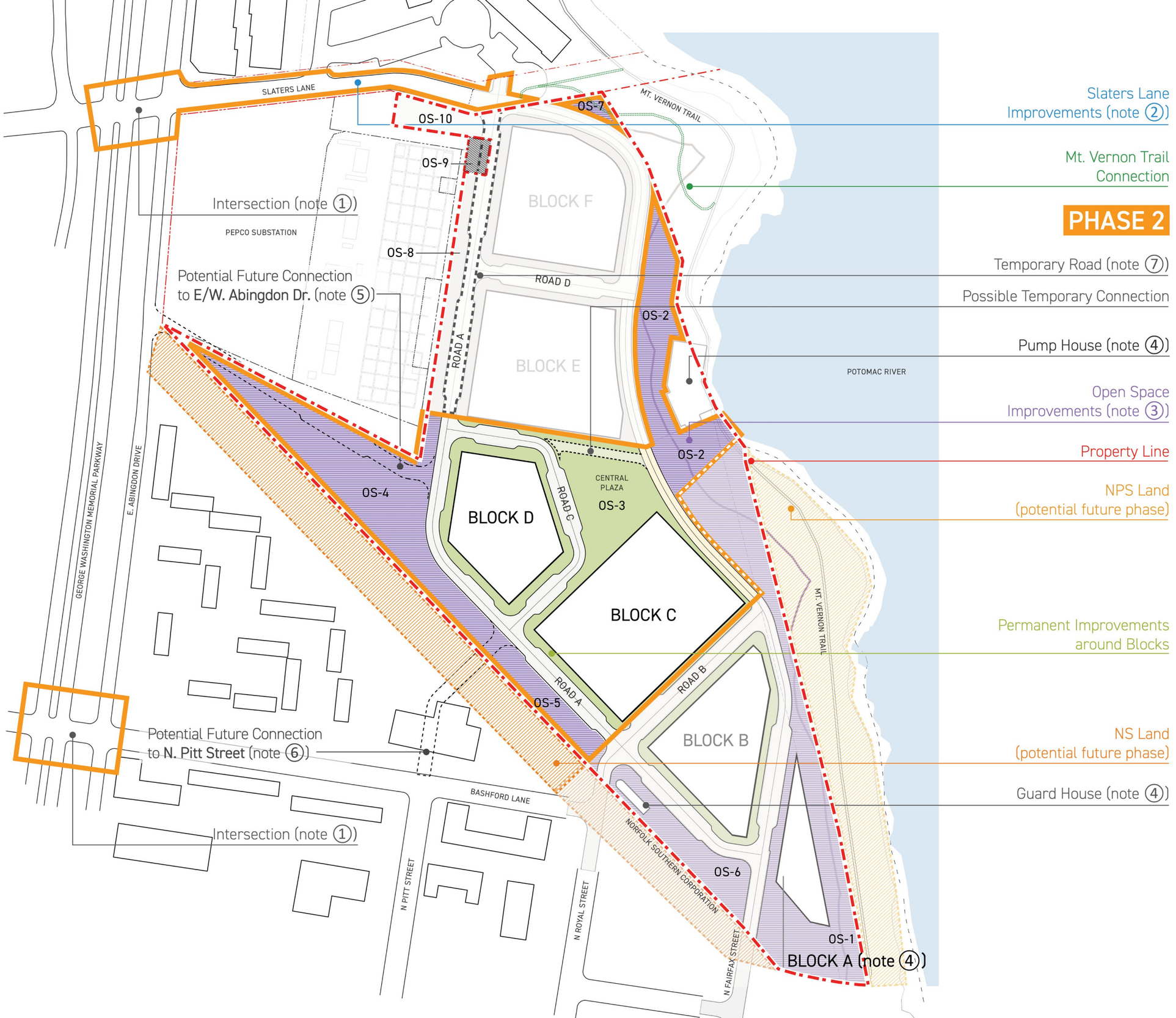
④ Block A, Pump House and Guard House may be developed with any Phase.

⑤ Potential future connection to E/W. Abingdon Dr. is subject to cooperation of abutting property owners. The applicant does not control these parcels.

- Potential improvements to intersections of the George Washington Memorial Parkway will be discussed as part of the overall traffic impact study and will be subject to approval by the National Park Service.

⑥ Potential future connection to North Pitt St. is subject to cooperation of abutting property owners. The applicant does not control these parcels.

⑦ Temporary road: with temporary sidewalks



ROADS & OPEN SPACE PHASING:

PHASE 3

NOTE:

① GWMP intersection improvements completed in previous phases

② Slaters Lane improvements: Subject to coordination with City and adjacent landowners

③ Open Space improvements:

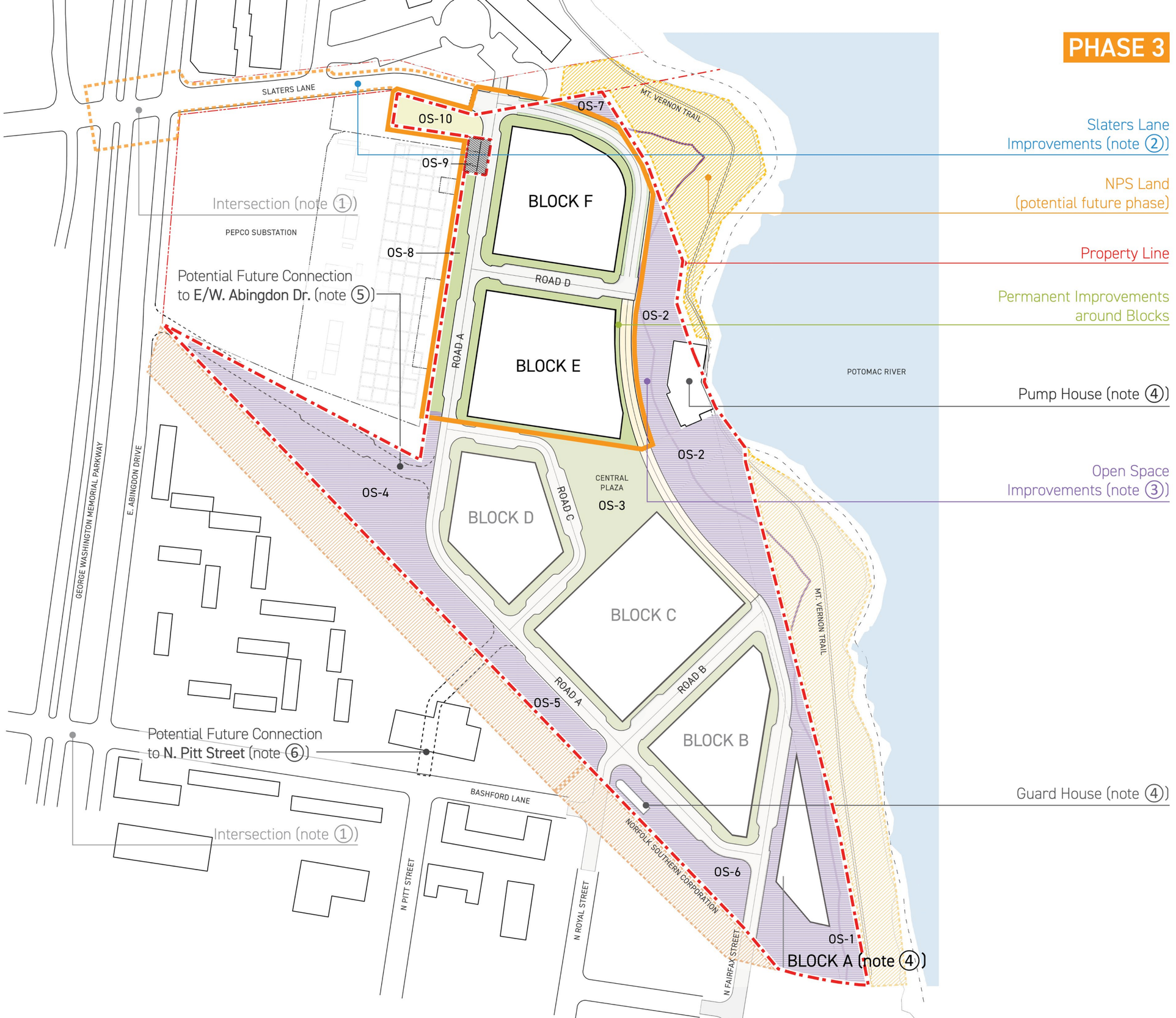
- Interim improvements may be made at these locations until approval from adjacent landowners allows for coordinated permanent improvements to be implemented.
- Future DSUP's will include detail on proposed final and interim conditions improvements.

④ Block A, Pump House and Guard House may be developed with any Phase.

⑤ Potential future connection to E/W. Abingdon Dr. is subject to cooperation of abutting property owners. The applicant does not control these parcels.

- Potential improvements to intersections of the George Washington Memorial Parkway will be discussed as part of the overall traffic impact study and will be subject to approval by the National Park Service.

⑥ Potential future connection to North Pitt St. is subject to cooperation of abutting property owners. The applicant does not control these parcels.



LEED v4 for Neighborhood Development Plan

LEED-ND

SUSTAINABLE BUILDING PARTNERS

0	0	0	Smart Location & Linkage	Possible Points:	28
Yes	?	No			
Y			Prereq 1	Smart Location	
Y			Prereq 2	Imperiled Species and Ecological Communities	
Y			Prereq 3	Wetland and Water Body Conservation	
Y			Prereq 4	Agricultural Land Conservation	
Y			Prereq 5	Floodplain Avoidance	
			Credit 1	Preferred Locations	10
			Credit 2	Brownfield Remediation	2
			Credit 3	Access to Quality Transit	7
			Credit 4	Bicycle Facilities	2
			Credit 5	Housing and Jobs Proximity	3
			Credit 6	Steep Slope Protection	1
			Credit 7	Site Design for Habitat or Wetland and Water Body Conservation	1
			Credit 8	Restoration of Habitat or Wetlands and Water Bodies	1
			Credit 9	Long-Term Conservation Mgmt of Habitat or Wetlands & Water Bodies	1

0	0	0	Neighborhood Pattern & Design	Possible Points:	41
Yes	?	No			
Y			Prereq 1	Walkable Streets	
Y			Prereq 2	Compact Development	
Y			Prereq 3	Connected and Open Community	
			Credit 1	Walkable Streets	9
			Credit 2	Compact Development	6
			Credit 3	Mixed-Use Neighborhoods	4
			Credit 4	Housing Types and Affordability	7
			Credit 5	Reduced Parking Footprint	1
			Credit 6	Connected and Open Community	2
			Credit 7	Transit Facilities	1
			Credit 8	Transportation Demand Management	2
			Credit 9	Access to Civic & Public Space	1
			Credit 10	Access to Recreation Facilities	1
			Credit 11	Visitability and Universal Design	1
			Credit 12	Community Outreach and Involvement	2
			Credit 13	Local Food Production	1
			Credit 14	Tree-Lined and Shaded Streetscapes	2
			Credit 15	Neighborhood Schools	1

0	0	0	Regional Priority Credits	Possible Points:	4
Yes	?	No			
			Credit 1.1	Regional Priority: Brownfield Remediation (th: 1)	1
			Credit 1.2	Regional Priority: Housing and Jobs Proximity (th: 2)	1
			Credit 1.3	Regional Priority: Connected and Open Community (th: 1)	1
			Credit 1.4	Regional Priority: Housing Types & Affordability (th: 4)	1

0	0	0	Green Infrastructure & Buildings	Possible Points:	31
Yes	?	No			
Y			Prereq 1	Certified Green Building	
Y			Prereq 2	Minimum Building Energy Performance	
Y			Prereq 3	Indoor Water Use Reduction	
Y			Prereq 4	Construction Activity Pollution Prevention	
			Credit 1	Certified Green Buildings	5
			Credit 2	Optimize Building Energy Performance	2
			Credit 3	Indoor Water Use Reduction	1
			Credit 4	Outdoor Water Use Reduction	2
			Credit 5	Building Reuse	1
			Credit 6	Historic Resource Preservation and Adaptive Reuse	2
			Credit 7	Minimized Site Disturbance	1
			Credit 8	Rainwater Management	4
			Credit 9	Heat Island Reduction	1
			Credit 10	Solar Orientation	1
			Credit 11	Renewable Energy Production	3
			Credit 12	District Heating and Cooling	2
			Credit 13	Infrastructure Energy Efficiency	1
			Credit 14	Wastewater Management	2
			Credit 15	Recycled and Reused Infrastructure	1
			Credit 16	Solid Waste Management	1
			Credit 17	Light Pollution Reduction	1

0	0	0	Innovation and Design Process	Possible Points:	6
Yes	?	No			
			Credit 1.1	Innovation 1	1
			Credit 1.2	Innovation 2	1
			Credit 1.3	Innovation 3	1
			Credit 1.4	Innovation 4	1
			Credit 1.5	Innovation 5	1
			Credit 2	LEED Accredited Professional	1

0	0	0	Total	110