

GOVERNMENT OF THE DISTRICT OF COLUMBIA
Department of Energy and Environment



MEMORANDUM

TO: Anthony J. Hood
Chairman, DC Zoning Commission

FROM: Jay Wilson, DOEE
Green Building Program Analyst

DATE: May 26, 2017

SUBJECT: [Z.C. CASE NO.](#) 17-05 2100 2nd Street SW, LLC (River Point) - CG Overlay
Design Review on Lot 10 in Square 613

The District's Department of Energy & Environment (DOEE) reviews planned unit development applications for environmental issues that the applicant should be aware of during early stages of planning, as well as to identify opportunities for increasing environmental and urban sustainability benefits during development.

DOEE does not have comments to the applicant's height or setback requests, or for matters that will be fully addressed through any of DOEE's normal regulatory review processes. Rather, the comments contained herein address issues that the applicant should be made aware of in the early stages of design and entitlement. The items mentioned below are by no means comprehensive, but are a summary of specific items related to the site in question and some common issues that come up with many development projects. DOEE is always interested in meeting with developers and construction companies early in the development process in order to identify opportunities and to help avoid future regulatory problems.

The objective of this report is to outline concerns for case number 17-05 for 2100 2nd Street SW, LLC, including the level of commitment to sustainability, the project's design with regard to the floodplain and climate resilience, and the ability of the project to meet stormwater management and air quality requirements.

DOEE recommends that application 17-05 for 2100 2nd Street SW, LLC not move forward until the following changes and considerations that would improve the design and increase environmental performance are considered.

Situated at the southern tip of the Buzzard Point peninsula, the development at 2100 V Street SW is one of the areas at greatest risk of flooding in the District of Columbia. The site's proximity to the Anacostia and Potomac Rivers locate this building firmly and completely within current Special Flood Hazard Area (SFHA), also known as the 100-year floodplain, and at significant risk of riverine and coastal flooding. In addition to the risk of flooding from the river, DOEE modeling indicates that, existing heavy rain events would cause flooding of surrounding streets due to undersized existing storm infrastructure, limiting access to the building during and immediately following storm events.

The District's climate vulnerability assessment completed for Climate Ready DC demonstrated that the current 100-year floodplain does not adequately reflect future flood risks. Due to the combined impact of rising sea levels, more frequent and severe heavy rain events, and coastal storms, Climate Ready DC found that the depth and extent of future floods will increase beyond the area designated by today's 100-year floodplain. Accordingly, Climate Ready DC identified Buzzard Point as one of 5 priority climate risk areas in the District.

DOEE and other District agencies have been working with the applicant to update and improve plans and to consider strategies for enhanced resilience. And while the applicant has made improvements to their design, numerous recommendations have not been incorporated into the current submission. Some of these issues may be further addressed through the regulatory process, but many are land use issues more appropriately addressed early in the schematic design process. Therefore, additional time is necessary to finalize designs that would be acceptable to all parties. Strategies and recommendations for improvement are outlined below and the agency would recommend that this be considered as an integral part of this design review.

Comprehensive Plan policies related to improving the river's edge:

Policy E-1.2.1: River Conservation

Improve environmental conditions along the Anacostia River and other water bodies, including shorelines, wetlands, islands, tributaries, and the rivers themselves. Particular attention should be given to eliminating toxic sediments, improving river edges to restore vegetation and reduce erosion, enhancing wetlands and wildlife habitat, creating new wetlands, and reducing litter. ^{604.3}

Action E-1.2.A: Anacostia River Habitat Improvements

Work collaboratively with federal agencies, upstream jurisdictions, the Anacostia Waterfront Corporation, and environmental advocacy groups to implement conservation measures for the Anacostia River, including:

- Creating naturalized or bio-engineered river edges that maximize habitat value;
- Requiring open space buffers consistent with the recommendations of the Anacostia Waterfront Initiative Framework Plan; and
- Preventing the net loss of parkland and improving access to the waterfront and river trails. ^{604.9}

Floodplain regulations:

Strategies to mitigate flood risk need to be front and center for developments in areas of high flood risk. Not only is the current risk of flooding from heavy rains and severe storms high, but the District’s Climate Ready DC Plan indicates sea level rise and land subsidence will likely increase water levels by additional 40” by 2080 (not including storm surge). This has direct impacts on the long term commercial viability of projects within the floodplain and, if the parcel is sold, the risks and increasing insurance premiums would be passed onto the next owner or to building occupants. Therefore, it is not only a regulatory issue, but one that should be considered by the Zoning Commission during design review.

- The entire site falls within the 100-year floodplain (blue) per the map below (figure 1) and information available on the DOEE [website](#). For point of reference, the 500-year floodplain is shown in orange.



Figure 1: 2010 Floodplain Map

- All projects permitted in the District located within the 100-year floodplain as defined by FEMA are required to comply with floodplain regulations ([DCMR 20-31](#)). Under FEMA’s minimum requirements and 20 DCMR 3105.2, the lowest floor, including basement, of any new construction of, or substantial improvement to, residential structures shall be at least 1.5 feet above the base flood elevation (BFE) or 100-year flood elevation. **The submitted design does not comply with these requirements.**
- Non-compliant projects, including residential uses with below grade parking may be allowed through the approval of a *code modification* request. In order for that request to be granted, the development would need to meet specific criteria, including:
 - Demonstrating a sufficiently large amount of commercial and retail space to be treated as non-residential
 - Provide additional flood protection measures beyond the minimum standards.

- That there is good and sufficient cause to grant the request;
- That the full performance of the requirements result in undue hardship by reason of excessive structural or mechanical difficulty or impracticality of bringing the premises affected into full compliance; and
- Granting the variance/code modification would not result in an unacceptable or prohibited increase in flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on, or victimization of the public or conflict with any other applicable laws and regulations.
- DOEE still has serious concerns about the design of the project; therefore, an assumption that the code modification will be approved is not appropriate at this time. In addition, given the change of use and extent of renovation, the project would not necessarily be allowed to maintain the existing elevation of the first floor. The following design changes are recommended:
 - Elevate non-residential first floor to a minimum elevation of the base flood elevation (BFE) of 10.7 ft + 1.5 ft = 12.1 ft NAVD88
 - Flood proof building to 500-yr elevation = 14.0 ft NAVD88
 - Detail and submit an emergency egress plan that includes a design for flood protection measures that allow for egress in emergency situations and that provide an area of refuge accessible to the highest vehicular roadway, which in this case is V Street SW.
 - The current area of refuge on the river side of the project and with no street access is unacceptable. Additional information is included below.
- In addition to the regulations, there are potentially dramatic flood insurance implications for future property owners and residents because the first floor elevation is below the BFE, with addition parking levels below the first floor. As part of the review of this proposed design and code modification application, quotes from a DC insurance agent with experience with the National Flood Insurance Program (NFIP) of flood insurance premiums for the proposed design and elevated design are required

Flood protection measures:

The current flood protection strategy is problematic and should be reconsidered.

- Flood protection measures should be designed up to the 500-year floodplain, which is the NAVD88 elevation of 14.0 ft. The current design only includes dry flood proofing to 12.7 ft-- 2 feet above the 100-year floodplain.
- The “completely removable” system proposed for flood-proofing (see sheet F7, Appendix C) is not ideal. It maximizes the amount of installation time and manpower required, and increases the likelihood of installation problems. An alternative flood-proofing method that minimizes human intervention as much as possible is the best option.
- The flood protection measures currently proposed block key egress points, including both residential lobby exits, and allow egress only on the river side of the project. During a hurricane or other intense storm event, this is the area where wind and rain would be expected to be greatest and is, therefore, the least desirable location for gathering. The

first floor should be redesigned to allow a gathering space close to the V Street side of the building, which would be closer to the main vehicular access.

- This building currently experiences significant below grade flooding of parking areas. The plans indicate that sump pumps will be installed as the solution to handle seepage. This is an energy intensive solution and pumps often fail. Considerations should be given to how and where the water will be drained or utilized, to how to minimize electrical demand, and to alternative means of dealing with flooding of these areas in the case of power failure.

Climate vulnerability:

Compliance with District flood regulations is of critical concern as detailed above. However, the current regulations are based upon historical data. In June, 2015, DOEE published a study that analyzed the climate projections and scenario development for the District. It found that by 2080, today's 100-year rain event will occur at a frequency similar to the occurrence of a 15-year rain event today. In addition, storm surge and riverine flooding will increase due to rising sea levels and more intense coastal storms. The River Point team was asked to incorporate climate projections into the design. Due to the projects location and the potential number of residents that could be impacted by flooding, this parcel is one of the most at-risk developments within the District. **Therefore, DOEE finds that the solutions and strategies proposed under the current design do not adequately address the increased risk from climate change.**

- DOEE has engaged an engineering and resilience planning consulting firm to perform initial investigations including topographical and hydronic modeling to determine the impacts of flooding on the Buzzard Point neighborhood and identify potential solutions.
 - Initial findings have shown the most significant flooding risk from today's 10-year rain event (10% chance of occurring in a given year) at the intersection of 2nd and V Streets, which would block the planned bus route and make access to the parking garage and commercial spaces more difficult (figure 2).

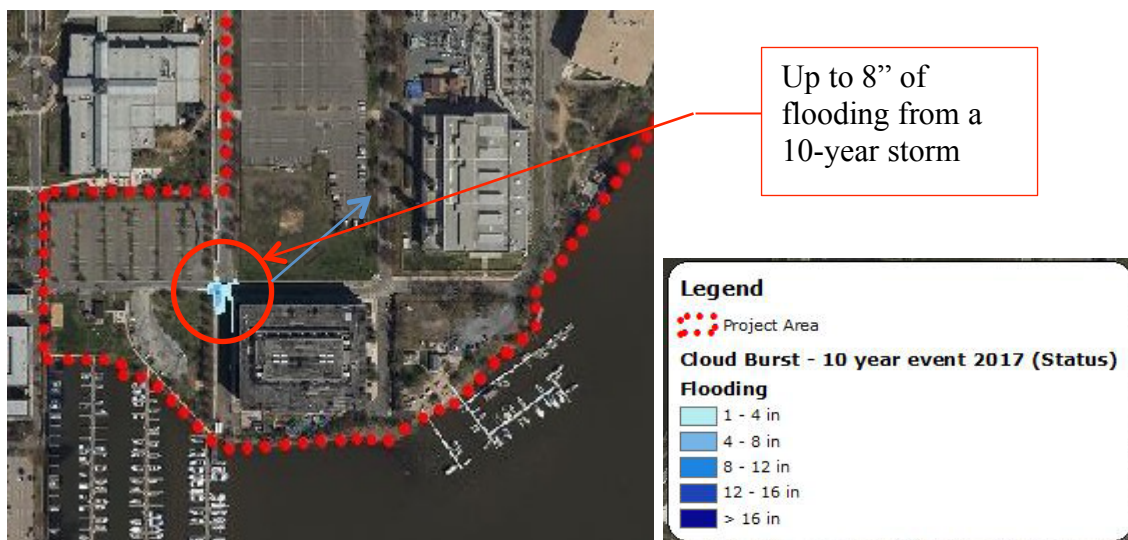


Figure 2: 10-year event under current conditions

- More severe storm events such as today’s 100-year rain event, or a storm with a 1% annual chance of occurring in today’s climate, would cause significant flooding and standing water along 1st and 2nd streets (figure 3).

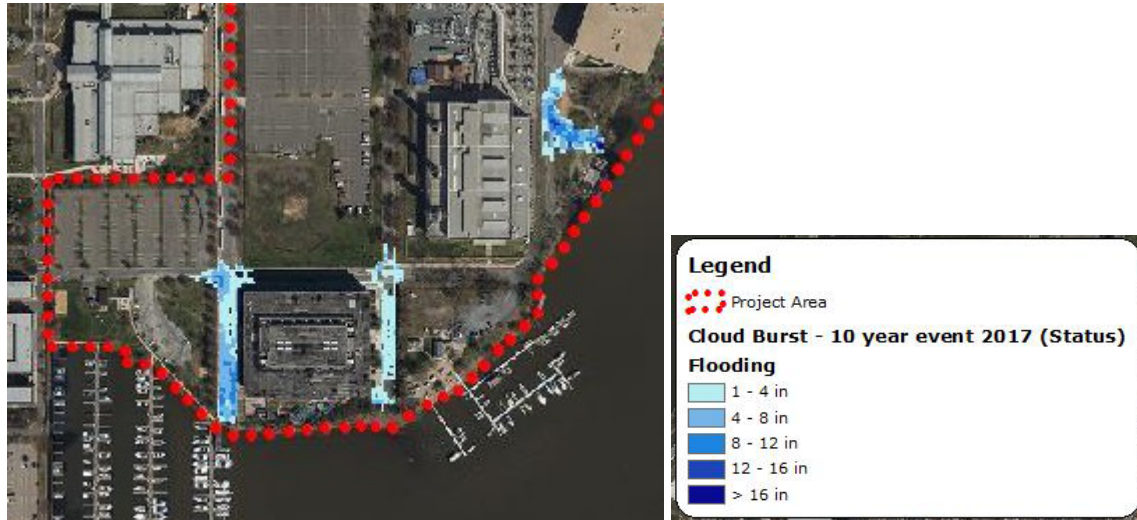


Figure 3: 100-year event under current conditions

- Due to the impacts of climate change, a 100-year rain event is anticipated to be much more intense in the future. That is, a storm with the same probability of occurrence as today’s 100-year rain event would result in significantly more rainfall in the future due to climate change. A storm with a 1% chance of occurring in the year 2100 would leave the River Point building completely surrounded by water with more than 16” of flooding in some areas immediately surrounding the building (figure 4).



Figure 4: 100-year event in 2100

- Storm surge and riverine flooding:**
 - The scenarios above do not include impacts from storm surge and riverine flooding from coastal storms such as Hurricane Sandy or Hurricane Isabel. The following images show the impacts for today's 100-year and 500-year storms and the worst case proposal, a 1000-year storm event (0.1% chance of occurring), which is used as the design case in the Netherlands.



Figure 5: 100-year storm surge



Figure 6: 500-year storm surge

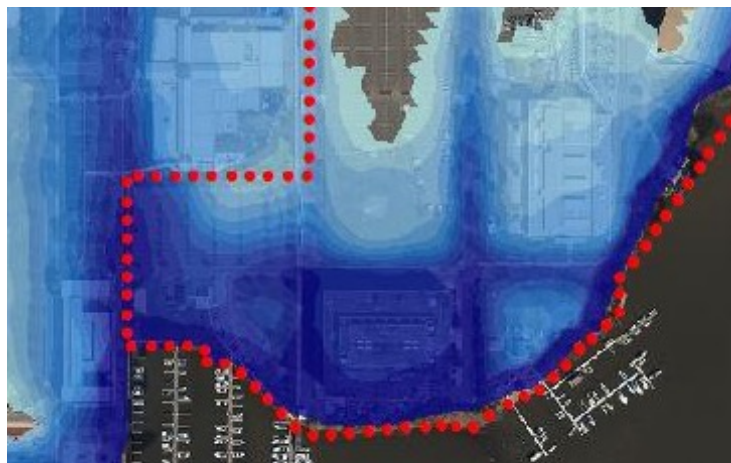
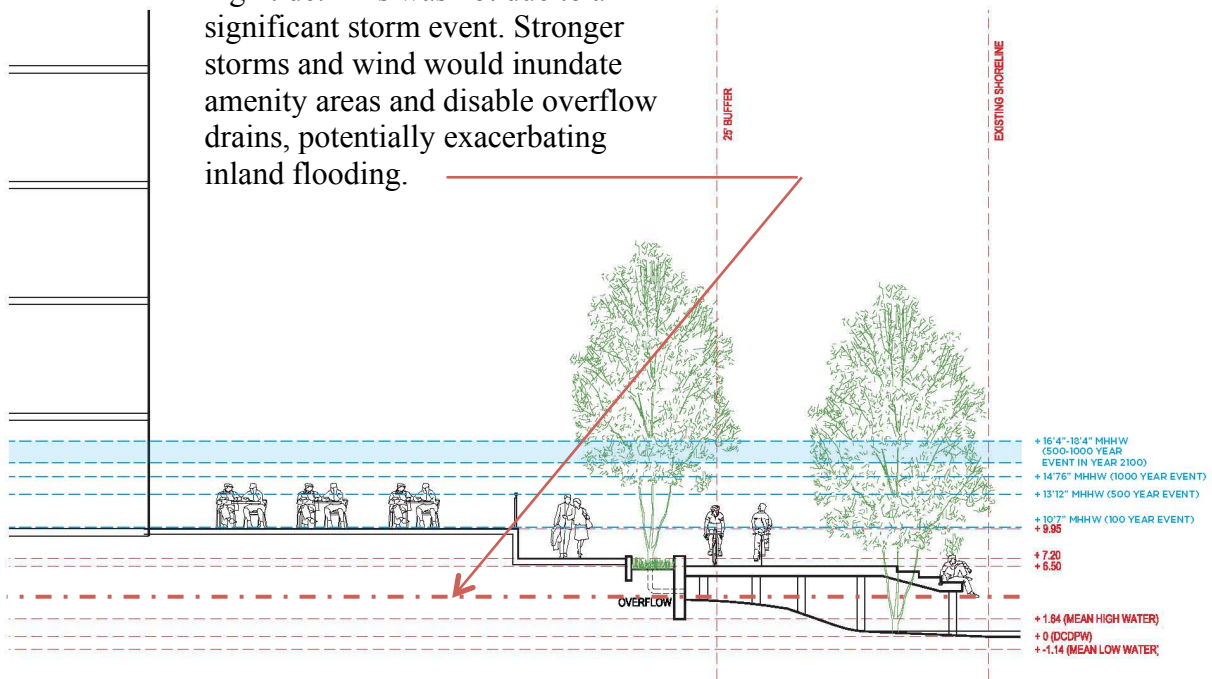


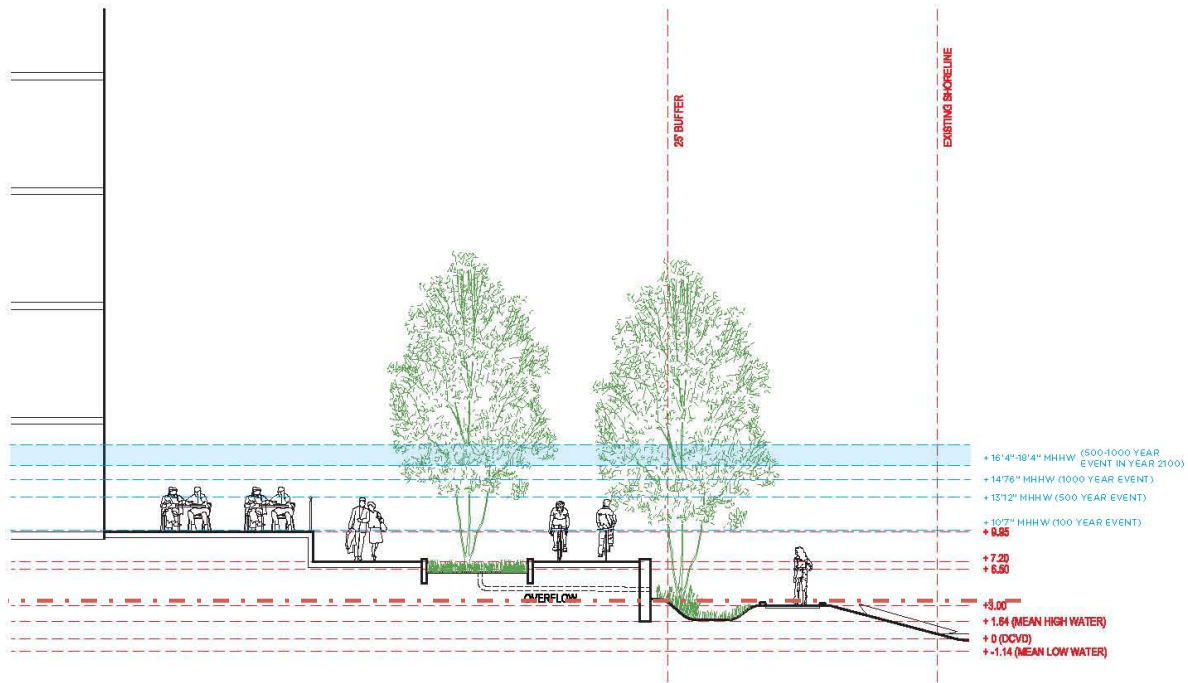
Figure 7: 1000-year storm surge

Although the modeling on the left does not account for climate change and rising sea levels, it is clear to see that the predicted impacts from storms would be severe. Design considerations on a project-by-project basis, as well as planning for neighborhood resiliency through multiple layered strategies, will be necessary.

- Emergency egress doors, loading dock, and parking entrances are shown on sheets A31 and A37 below the 9.95' elevation. This design should be revisited and flood control measures carefully detailed.
- Amenity areas shown at the shoreline and along the Riverwalk trail are subject to frequent flooding, and will occur more frequently in the future due to projected increases in local tide levels resulting from global sea level rise and local land subsidence. Water levels measured at the nearby tide gauge in Washington Channel have already risen more than 11" since 1924. The U.S. Army Corps of Engineers projects further increases of up to 1.4' by 2050 and 3.4 feet by 2080, as outlined in the District's Climate Ready DC Plan. In order to ensure the amenity areas and Riverwalk trail are protected from flooding in the future, they should be elevated as much as possible.
- If we translate the data shown in the plans above to the section renderings included in the submission, the impacts of sea level rise and storm surge on the current design become evident.

As an example of standard conditions, nuisance flooding was observed on May 25, 2017 to be 1.5' higher than the mean high-high tide. This was not due to a significant storm event. Stronger storms and wind would inundate amenity areas and disable overflow drains, potentially exacerbating inland flooding.





- **Recommendations and next steps:**

- The MHHW is the mean of the higher of the two diurnal tides – which is important from a flooding perspective. The plans include a reference to mean high water (MHW) but not MHHW. Additional survey and detail is necessary to locate this datum along with setbacks required under the regulations and to ensure that proposed amenity spaces are designed with topography above daily inundation levels.
 - The required 25-foot natural buffer should be measured from the top of bank and include planted surfaces and steep slopes that help to soften rising flood water and shed debris. Per the Comprehensive Plan Policy E 1.2.1, open spaces should restore vegetation, reduce erosion, and enhance wildlife habitat.
 - Rocky slopes are an improvement over earlier designs but do not maximize flood mitigation effects or habitat benefits.
- Flood mitigation measures cannot be implemented without considering the greater context. More time is necessary to engineer and design flood mitigation and stormwater management strategies throughout the neighborhood and to incorporate strategies to the site design for this project to ensure long-term viability of the commercial space as well as the health and safety of all residents. If manipulation of topography is considered, re-evaluation of the full design with regard to flood protection, egress, and continuation of the Riverwalk Trail is recommended.
- **DOEE recommends that the project take measures that would account for and provide greater resiliency due to the increased flood risks and storm surge resulting from climate change. This would include raising occupied space above the 500-year floodplain, dry flood proofing, locating main exits**

at higher elevations, and finalizing an egress and emergency management plan.

Comprehensive policies related to stormwater management:

Policy E-3.1.1: Maximizing Permeable Surfaces

Encourage the use of permeable materials for parking lots, driveways, walkways, and other paved surfaces as a way to absorb stormwater and reduce urban runoff. ^{613.2}

Policy E-3.1.2: Using Landscaping and Green Roofs to Reduce Runoff

Promote an increase in tree planting and landscaping to reduce stormwater runoff, including the expanded use of green roofs in new construction and adaptive reuse, and the application of tree and landscaping standards for parking lots and other large paved surfaces. ^{613.3}

Stormwater Management and Green Area Ratio (GAR):

- The project is located in the MS4 sewershed and in the Anacostia Waterfront Development Zone (AWDZ). Although not required to meet the increased requirements for projects receiving public funding, stormwater management is critical due to the risks from climate change and storm surge. Therefore, additional stormwater retention is strongly encouraged.
- Given that this parcel is not located in a combined-sewer overflow area, all stormwater is directed outfalls that directly discharge into the river. All efforts to capture and retain stormwater on site must be explored and maximized for the site, public rights of way, and surrounding streets. In addition, DOEE recommends that the project consider rainwater harvesting for water reuse within the building, especially for non-potable uses within the ground level community and commercial space, and for irrigation.
- A conceptual stormwater management plan was not included with the submission.
 - As a renovation, the project is only required to meet the 0.8” stormwater retention volume. However, given the comprehensive scope of the renovation and change of use, DOEE recommends that the zoning commission require the project to retain stormwater based on a 1.2” rain event, the standard for all new construction projects. If properly designed, this will directly benefit the surrounding neighborhood by retaining additional water from intense rain events as detailed above, and by conveying water to minimize flood duration. Any stormwater retained above the 1.2” volume up to 1.7” would qualify for the District’s stormwater retention credit trading program.
 - Applicant must meet the infiltration requirements for any LID practices installed along the riverbanks – refer to Appendix O of the 2013 Stormwater Guidebook.
 - Specific opportunities to increase the stormwater management and retention include:
 - Increase green space in the right of way, particularly on 2nd street as the continuation of the Riverwalk Trail. This would provide a strong urban design benefit and can be used to convey stormwater during an intense rain event.

- Work with the Department of Transportation to incorporate permeable paving into secondary travel areas, including turn-arounds at dead ends and in parking lanes.
 - Locate outfalls and overflow drains to ensure functionality during storm surge events.
 - Direct runoff to integrated intensive green roof areas in building courtyards and the extensive green roof above the penthouse.
- Erosion and sediment control documents were not submitted with the application.
 - Erosion and sediment control measures will be reviewed due to the project location. All construction practices must describe in detail the methods to prevent sedimentation of the river and emergency actions to collect sediment flowing in the river.
- Green Area Ratio (GAR) calculations were not included with the submission.
 - Compliance with GAR is required for a project where any additions, interior renovations, or both within any twelve (12) month period exceed one hundred percent (100%) of the assessed value of the building. The ratio for compliance with the GAR in this area is 0.3 and the applicant should incorporate this into the design.
- **Capturing a higher storm level, as required in the Anacostia Water Development Zone (AWDZ), will benefit the developer’s application as it exhibits commitment to the environment and provides needed relief from stormwater runoff from a currently highly industrialized area. Hence, DOEE’s Watershed Protection Division (WPD) recommends the project capture a 1.7” rain event.**

Comprehensive policies related to air quality and environmental impacts:

Policy E-4.1.3: Evaluating Development Impacts On Air Quality

Evaluate potential air emissions from new and expanded development, including transportation improvements and municipal facilities, to ensure that measures are taken to mitigate any possible adverse impacts. These measures should include construction controls to reduce airborne dust, and requirements for landscaping and tree planting to absorb carbon monoxide and other pollutants. ^{618.8}

Policy E-4.1.4: Stationary Sources

Maintain controls on gaseous and particulate emissions from stationary sources of air pollution in the city, such as power plants and refrigeration plants. Particular attention should be given to monitoring the air quality impacts of local power plants, which are the largest stationary sources of air pollution in the District. ^{618.9}

Air Quality:

The project would primarily impact air quality through construction dust, emissions from fuel-burning equipment, and emissions from traffic resulting from the development. A full evaluation of the project’s environmental impacts with regard to air and environmental quality will be performed during the permitting and approval process. Considerations are discussed below.

- **Fugitive Dust**

- Fugitive dust results from construction. The applicant must comply with 20 DCMR 605, Control of Fugitive Dust, as the project is developed to minimize fugitive dust from the construction operations.
- **Fuel-Burning and Other Stationary Air Pollutant Emitting Equipment**
 - Any air pollutant emitting equipment to be installed must comply with District of Columbia regulations. Any installation of fuel burning equipment (such as boilers) with heat input ratings greater than 5 MMBTU/hour, stationary generators, or other stationary air pollutant emitting equipment will need to go through a separate air quality permitting process prior to their construction being initiated.
 - **In addition to these minimum requirements, the Air Quality Division (AQD) recommends that the applicant consider using lower-emitting technologies to the extent possible to provide power, heating, and cooling.** Renewable technologies such as solar power may help to reduce power demand from the electric grid. Fuel cells or other innovative technologies could be used in lieu of a traditional emergency generator set. If a traditional emergency generator set is selected, cleaner-burning natural gas would be a preferable fuel to diesel fuel. **If a traditional boiler is being considered, AQD recommends that the applicant consider more efficient technologies such as cogeneration or tri-generation.**
- **Traffic**
 - The quality of parking accommodation as well as their design can have a significant impact on pollutant concentrations in the immediate area of the project.
 - Generally, AQD recommends minimizing parking while maximizing access to other types of transportation options (public bus and train routes, bicycle lanes, walking paths, etc.).
 - The design of parking accommodations is also important. Downwind concentrations of pollutants from surface parking and open-sided aboveground parking structures generally result in lower downwind concentrations of pollutants, as do underground garages with high ventilation locations, such as at the rooftop. **AQD does not recommend ground-level or near ground-level ventilation locations for underground parking structures.** Emissions from these types of low-level vents are sometimes found, during required air quality modeling, to result in maximum downwind concentrations of carbon monoxide (CO) approaching or exceeding the National Ambient Air Quality Standard (NAAQS) for CO and **therefore requiring re-design of the ventilation at a later stage of the design process.**

Comprehensive policies related to building design, energy efficiency, and renewable energy:

Policy E-2.2.1: Energy Efficiency

Promote the efficient use of energy, additional use of renewable energy, and a reduction of unnecessary energy expenses. The overarching objective should be to achieve reductions in per capita energy consumption by DC residents and employees. ^{610.3}

Policy E-2.2.4: Alternative Energy Sources

Support the development and application of renewable energy technologies such as active, passive, and photovoltaic solar energy, fuelcells, and other sustainable sources. Such technology should be used to reduce the dependence on imported energy, provide opportunities for economic and community development, and benefit environmental quality. A key goal is the continued availability and access to unobstructed, direct sunlight for distributed-energy generators and passive-solar homes relying on the sun as a primary energy source. ^{610.6}

Policy E-2.2.5: Energy Efficient Building and Site Planning

Include provisions for energy efficiency and for the use of alternative energy sources in the District's planning, zoning, and building standards. The planning and design of new development should contribute to energy efficiency goals. ^{610.7}

Policy E-3.2.1: Support for Green Building

Encourage the use of green building methods in new construction and rehabilitation projects, and develop green building methods for operation and maintenance activities. ^{614.2}

Sustainable design and energy efficiency:

- Well-integrated designs prioritize green building goals in order to hit the LEED Gold target. This is not an unrealistic target for a project of this size in an urban setting. DOEE would ask that this project maximize opportunities to increase its commitment to sustainability and achieve a minimum of LEED Gold certification. Per the LEED Checklist included with the project, there are numerous opportunities where the design could be improved to achieve a higher level of LEED certification. Increased energy and water efficiency beyond the currently projected code required minimum, integration of on-site renewable energy, and enhanced refrigerant management would achieve LEED credits, help the District meet our sustainability goals, and ensure that the project is economically competitive into the future.
- The 2009 LEED rating system is outdated and no longer accepting new projects. Although this project was previously registered under that platform, we would encourage the applicant to upgrade to the LEED v4 platform, which uses the current building codes as the minimum benchmark for energy efficiency. It would also put the project on par with other new developments in the pipeline.
- Per the projected credits under energy efficiency, the project team shows that they are just meeting the current Energy Conservation Code required by the District. Given that the District is continuously updating building codes, additional gains in energy efficiency are possible and encouraged. We would encourage that the project maximize all opportunities for increased energy efficiency. While some strategies could have minimal construction cost impacts, such as improvements to the building envelope, it would also decrease utility cost for residents and lessees of the commercial space. Many energy

conservation measures including additional insulation, LED lighting and controls, high efficiency mechanical systems, and envelope commissioning and air sealing have a return on investment within five years and can be financed with no up-front cost through the DC PACE program (see below).

- **Given market conditions and the District’s goal of net zero energy properties by 2032, it is strongly encouraged that the project team revisit their energy model, commitment to increased energy efficiency, and seek opportunities to incorporate next generation technology.**

Renewable Energy:

- As a building subject to the risks from climate change, the design should showcase best-in-class building design that reduces greenhouse gas emissions and increases the passive survivability of the building during power outages, including reducing energy use with a focus on the building envelop and passive ventilation systems, and incorporating solar photovoltaic technology and battery storage.
- A critical goal of the Sustainable DC Plan is to increase the use of renewable energy to make up 50% of the District’s energy use. This is a major priority of the current District administration, as the Mayor signed legislation in the summer of 2016 to increase the District’s Renewable Portfolio Standard (RPS) to 50% with a local solar carve out of 5.0% by 2032. This legislation has produced significant potential benefits for the business and development community as the District has the best financials for solar energy in the country.
 - In terms of design, giving careful consideration to stormwater management requirements, by reducing green roof areas in lieu of other stormwater solutions, solar panels may be mounted horizontally over mechanical penthouses to reduce profile and maximize efficiency of design.
 - A power purchase agreement may be executed for leased solar panels with zero up front cost. Also, for owner financed solar panels, which can be financed by DC PACE, the typical return on investment is between two and five years. Through the District’s community solar program, the energy generated can be “virtually” net-metered and the residents or commercial tenants can “subscribe” into the system providing mutual benefit for both the property owner and residents. **To create a more resilient and economically progressive project, it is strongly encouraged that the project incorporate solar panels that would generate a minimum of 1% - 3% of the buildings’ total energy use.**

Finance:

- The developer should take advantage of the District’s financial programs and tools, such as the DC Property Assessed Clean Energy (DC PACE) program that provide funding for increases in construction cost for on-site generation, strategies that increase efficiency above the baseline code requirements, or stormwater management strategies that garner return on investment through the District’s Stormwater Retention Credit Trading program. This financing does not increase debt on the property and is repaid over time as a special assessment on the property tax. **DOEE recommends that the applicant investigate opportunities to take advantage of financial tools that would allow increased commitment to sustainability.**

CONCLUSION:

Redesign with respect to flood resilience, increased stormwater retention, better streetscape design that incorporates stormwater retention and conveyance, increasing the commitment to LEED certification including increased energy efficiency, and integration of on-site renewable energy would help the District meet its sustainability goals and ensure that the project is economically competitive into the future.

DOEE recommends that approval of the application 17-05 for 2100 2nd Street SW, LLC not move forward until these concerns and considerations are addressed. Addressing these concerns and considerations will ensure the building is resilient and commercially successful into the future, improve the design, increase environmental performance, and ensure safety of building residents and neighborhood.