

## Environmental Analysis

### Domestic Water Demand

The proposed Project will construct approximately 288,000 square feet of new gross floor area. A 6-inch domestic water service will be extended from the water main at 21<sup>st</sup> Street, NW. The water service will be designed to provide water to the building's fixtures and equipment at a minimum pressure of 35 psig. Maximum pressure will not exceed 80 psig and flow velocity will not exceed 10 fps. The building's service main size is anticipated to be 6-inches in diameter, to serve domestic demands. Design flow demand for the building is 300 gpm. A water pressure booster pump system will be provided as a part of this design.

### Fire Service Demand

A 8-inch fire service entrance pipe will be extended from the main at 21st Street, NW based on the sizing requirements of NFPA-13 and NFPA-14 with a velocity of not more than 15 fps. The flow capacity will be based on the supply demand of the most hydraulically remote sprinkler zone plus inside/outside hose stream demands. For standpipe systems, fire service sizing criteria shall be based on the flow demand of the fire pump capacity at 150% rating, for testing in compliance with NFPA-25. Piping shall be sized to provide at least 10-psig net positive suction head pressure at the full demand.

### Sanitary Sewer Demand

A sanitary waste and vent system will be provided for all domestic fixtures in the building. Plumbing fixtures will be drained by gravity through conventional soil, waste and vent stacks, building drains and building sewers to the street sewer. A sump pump located in mechanical room at the B2 level, will lift up the waste from the B1 and B2 levels and drain it to the main sanitary pipe that is routed under the slab at the first level. All fixtures will be trapped and vented to atmosphere. Vents will be extended through the roof.

The sanitary waste system will be designed to maintain a minimum velocity of 2 fps. The main sanitary pipe discharged from the building will be 8-inches in diameter and will extend to the 18" sanitary main located below grade at 21<sup>st</sup> Street, NW. All design and installation will be in accordance with the International Plumbing Code and will be coordinated with the D.C. Water.

### Stormwater Management

Consistent with the EPA's Municipal Separate Storm Sewer Systems (MS4) program, and in anticipation of the DDOE's adoption of the MS4 requirements, the stormwater management system for Square 77 project will be designed to hold 1.2" of rainfall from the impervious areas of the site. The primary component of the system is an underground cistern. Secondary components of the system, such as absorption systems (e.g. green roofs) will be explored as a potential strategy to reduce the capacity of the cistern. The stored rainwater will be used for a combination of suitable purposes such as irrigation of landscaping, make-up water for mechanical system equipment, or other uses that have not yet been identified by the project's designers. In addition to exceeding the current DDOE requirements, the system will also satisfy LEED credit 6.1 and 6.2 of the sustainable site stormwater management for quantity and quality.

### Solid Waste Services

Solid waste and recycling materials generated by the Project will be collected by a private trash collection contractor.

### Electrical Services

Primary electric service at 13.8KV voltage will be derived from PEPCO grid located at the northwest corner of site and PEPCO will provide (2) transformers to generate 265/460V secondary building utilization voltage. The electrical contractor shall provide the underground 6'x 12' x 10' deep manholes per PEPCO standards to house the transformers and bushole. A total of (3) manholes are required. The primary system service capacity will be designed to serve the calculated connected load of the facility plus an additional 20 % for anticipated future loads. PEPCO will provide primary distribution transformers and make termination at primary side of transformer at a charge to the Owner. Feeders from secondary of PEPCO transformer will be installed through underground ductbanks from transformer vaults into the B2 level electrical space. The feeders will be terminated at two (2) main service entrance rated switchboards, with capacities of 4000A (Residence Hall), & 1200A (Retail Tenants).

All electrical systems will be designed to comply with the D.C. Energy Code. The transformer vaults and underground ductbanks will be installed in accordance with PEPCO's design guidelines.

### Energy Conservation

The Project will be constructed in full compliance with Article 24 (Energy Conservation) of the D.C. Building Code. Conformance to code standards will minimize the amounts of energy needed for the heat, ventilation, hot water, electrical distribution, and lighting

systems contained in the structure. The building will have high efficiency chillers. The HVAC system strategy is to reduce the overall airflow required and thereby the total energy consumed by the building. The ventilation system will employ CO<sub>2</sub> sensors to regulate the outside air brought into the building. Similarly, high efficiency electrical system components will be provided. A daylight control system will be provided to minimize the use of electrical lighting when ambient light is available for illumination. A monitoring system will be provided for utilities for the building.

### Erosion Control

Sediment and erosion control will be implemented during excavation and during construction per the District Department of Environment standards and specifications. Tree protection, inlet protection, construction entrance, sump pump and sediment trap are the methods being used for this Project.