Docket Item #12 A-F
Rezoning #2009-0001
Coordinated Development District #2009-0001
Transportation Management Plan #2009-0061
Street Name Case #2010-0002 - #2010-0006
Text Amendment #2010-0002
Adoption of Design Guidelines

Application	**General Data**	
Project Name: North Potomac Yard	PC Hearing:	June 1, 2010
	CC Hearing:	June 12, 2010
	If approved, CDD Expiration:	June 12, 2035 (25 years)
	Plan Acreage:	Site: 3,008,689 SF (69.07 acres)
Location: 3601 Jefferson Davis Hwy and 3601 Potomac Avenue	Existing Zone:	CDD #10
	Proposed Zone:	CDD #19
	Proposed Use:	Mixed-Use
	Net Floor Area:	Existing: 600,000 SF Proposed: 7,525,000 SF Total: 7,525,000 SF
Applicant: CPYR, inc., represented by Jonathan Rak and Ken Wire, McGuire Woods, LLP	Small Area Plan:	North Potomac Yard
	Historic District:	Old and Historic Alexandria
	Green Building:	Compliance with City's Green Building Policy

Purpose of Application
Rezone an existing retail center to develop North Potomac Yard into an urban, mixed-use community.
Special Use Permits, Modifications and other Approvals Requested
1. Rezone to Create Coordinated Development District 19 (REZ #2009-0001) 2. Coordinated Development District Conceptual Design Plan (CDD #2009-0001) 3. Special Use Permit for a Transportation Management Plan (SUP #2009-0061) 4. Street Names for five new public streets (ST #2010-0002 – ST #2010-0006) 5. Text Amendment to revise Zoning Ordinance Sections 5-602 and 5-610 (TA #2010-0002) 6. Adoption of North Potomac Yard Urban Design Standards

Staff Recommendation: APPROVAL WITH CONDITIONS
Staff Reviewers: Patricia Escher, AICP, **Patricia.Escher@alexandriava.gov** Kristen Mitten, **Kristen.Mitten@alexandriava.gov** Jessica McVary, AICP, LEED AP **Jessica.McVary@alexandriava.gov**


SITE
KEY MAP
NORTH
POTOMAC YARD
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I. SUMMARY

A. Recommendation

Staff recommends approval of the North Potomac Yard Coordinated Development District (CDD) Conceptual Design Plan and associated applications subject to compliance with the *North Potomac Yard Small Area Plan*, *North Potomac Yard Urban Design Standards*, and staff recommendations. The CDD Conceptual Design Plan is consistent with the *North Potomac Yard Small Area Plan*, adopted by Planning Commission and City Council in May, 2010.

B. Significant Topics

This application presents a number of significant topics of importance to the community and the following summary highlights major issues that are discussed in detail in the staff report:

Infrastructure Feasibility and Financing

- A Metrorail station is necessary to support the ultimate development proposed in North Potomac Yard.
- Although the proposed development creates significant new net revenues which will more than cover the debt service obligation of a $275 million bond financing, without developer contributions there is a $9 million projected gap in initial financing.
- City staff and CPYR, the property owner of North Potomac Yard, have developed and negotiated a Memorandum of Understanding (MOU) which outlines mechanisms to finance the design and construction of the station, including new net tax revenues, two special tax districts, developer contributions, bond financing and a $32 million shortfall guarantee which will more than cover the projected gap as well as some downside risk protection.

Phasing and Implementation

- All implementation of the CDD is subject to the MOU noted above.
- Development in North Potomac Yard is phased to ensure that adequate infrastructure, particularly transportation infrastructure, is in place to support proposed development as construction occurs.
- An adequate amount of development near the proposed Metrorail station is necessary to provide projected revenues required to fund the design and construction of the station.
- Prior to Metrorail station construction, a maximum of 2,000,000 square feet of development is permitted (including the existing 600,000 square feet of retail). This additional development must be within ¼ mile of the station entrance and each new block that is submitted for development must be contiguous.
- During construction of the station and after the high capacity transitway planned for the area is fully operational, a maximum of 3,700,000 square feet of development is permitted within ¼ mile of the entrance. Again, each new block that is submitted for development must be contiguous.

- Once the Metrorail Station is operational, the full build-out (7,525,000 square feet) of the site may proceed with the 4,900,000 square feet of development within the ¼ mile radius of the Metrorail station to be developed first.

Transportation and Parking

- An interconnected series of streets and blocks, including a realigned Potomac Avenue, an extended Main Line Boulevard and an east-west connection at East Reed Avenue enable a multi-modal transportation network which accommodates pedestrians, bicyclists, local transit, high-capacity transitway, transitway stations and a new Metrorail station.
- To relieve traffic impacts in neighborhoods adjacent to North Potomac Yard, the applicant is required to design and implement a neighborhood traffic calming plan.
- Maximum parking ratios are proposed to reduce single-occupancy vehicle use and promote alternative modes of transportation.
- The applicant is required to develop a parking management plan which includes mechanisms for shared parking, valet parking, market-rate parking, on-street parking and unbundled residential parking (the cost to purchase or lease a parking space is separate from the cost to purchase or lease a residential unit) as well as a Transportation Management Plan to further reduce single occupancy vehicles.

Water Management and Environmental Sustainability

- The applicant is required to prepare a water management master plan to reduce potable water use by capturing and reusing rainwater and reducing wastewater generation through water conservation and use of low-flow fixtures.
- The applicant is also required to develop a stormwater management plan to reduce stormwater runoff by 30 percent. To reduce stormwater runoff, 25 percent of roofs are required to be vegetated roofs and an additional 25 percent of roofs are required to be pervious bed materials overlain with pavers.
- The neighborhoods within North Potomac Yard will achieve LEED for Neighborhood Development, Silver Certification, subject to the implementation of the Metrorail station and the high-capacity transitway. All office and residential development will achieve LEED Silver and LEED certification, respectively, or will adhere to the City Green Building Policy at the time of development, whichever is more restrictive.
- A water quality facility is proposed to function as an urban amenity in Crescent Park.
- The applicant is required to provide a monetary contribution for the construction of two relief sewers to ensure adequate conveyance capacity to the Alexandria Sanitation Authority (ASA).
- As the proposed development, in conjunction with other projected development in the City, may exceed the City's remaining current capacity at ASA, the applicant is required to continue working with the City to achieve additional capacity.

Open Space, Public Art and Archaeology

- The applicant is required to provide a total of 35 percent of the land area as usable open space on site, while 15 percent of the land area shall be ground level open space.

- The applicant is required to design and construct improvements to Four Mile Run.
- The applicant is required to design and construct or provide the necessary funding to construct an off-site synthetic field.
- There are significant new public open spaces that will be created: Crescent Park, the Four Mile Run Promenade, Market Common, Metro Square, and Potomac Yard Park (Landbay K extension) are required ground-level open spaces which shall be subdivided and dedicated to the City as public open spaces.
- Crescent Park, the Four Mile Run Promenade, Market Common, and Metro Square shall be maintained by the applicant and/or the management entity/business improvement district that will be formed.
- A perpetual public access easement is required for ground-level open spaces on Blocks 2 and 5, and 16 or 21 and the ground level open space on the western side of Block 3 shall be open to the public.

Uses

- As reflected on the zoning chart (Table 1), certain uses and net floor area amounts are fixed for certain blocks. However, an innovative aspect of this project is that there is a maximum of 3,395,000 square feet of net floor area in North Potomac Yard that may be developed as either office or residential.
- For the blocks assigned this flexible category of use, the final amount of development on each block may be transferred between blocks as part of a development special use permit. However, all blocks must still adhere to the *North Potomac Yard Urban Design Standards*.
- Allocation of this flexible category of use shall be evaluated in regard to the intent of the *North Potomac Yard Small Area Plan* occupancy goals. In particular, an overabundance of office use would be a concern from a traffic standpoint and in terms of creating and maintaining a vital neighborhood with activity in the evenings and weekends.
- Community facilities, public buildings and accessory uses are not deducted from the maximum permitted development.

Public Benefits and Community Facilities

- Block 4 shall be reserved for a possible Alexandria City Public School and shall be dedicated to the City. Office and/or residential uses above the school are permitted to be developed by the City.
- Day care facilities shall be permitted on any block.
- A live performance arts theater and cultural or civic use space shall also be provided.

Affordable Housing

- The applicant has agreed to provide a voluntary monetary contribution based on the formula adopted by the City Council (at the time of each building Certificate of Occupancy or as adjusted annually by the Consumer Price Index for all urban consumers). In applying this formula, the base density that will be used to calculate the

Tier 1 residential contribution is the 600,000 square feet possible under the current CDD zoning.

- The Applicant may not apply for an affordable housing density bonus, pursuant to Section 7-700 of the Zoning Ordinance, unless they can demonstrate through the DSUP process, and associated traffic study that the proposed transportation infrastructure and open space amenities can support additional density.
- The applicant has indicated willingness to provide set-aside affordable units on site (to include affordable, workforce and public housing units) within North Potomac Yard. These units, if accepted by the City, shall be an offset to the voluntary monetary contribution.

North Potomac Yard Urban Design Standards

- The *North Potomac Yard Urban Design Standards* expand upon the urban design framework established in the *North Potomac Yard Small Area Plan* by establishing requirements for land use, density, building massing, building and site material, streets, sidewalks, open space, public art, parking and signage.
- Future development applications are required to comply with the Design Standards. Variations from the Design Standards must be recommended by the Potomac Yard Design Advisory Committee and the Planning Commission and approved by City Council.

C. Project Description

The applicant, CPYR, Inc., requests approval of the following applications to develop North Potomac Yard into an urban, mixed-use community:

- Rezoning (Zoning Map Amendment) to modify the zoning designation from Coordinated Development District #10 to Coordinated Development District #19;
- Coordinated Development District conceptual design plan;
- Special Use Permit for a Transportation Management Plan;
- Designation of five public street names; and
- Adoption of the *North Potomac Yard Urban Design Standards*.

Concurrent with this application, staff recommends that Planning Commission initiate a Zoning Text Amendment to revise language included in Section 5-600 of the Zoning Ordinance. Specifically, staff recommends amendments to Section 5-602, which identifies each of the Coordinated Development Districts and Section 5-610, which authorizes and governs the Potomac Yard Design Advisory Committee.

The *North Potomac Yard Small Area Plan*, adopted by City Council in May, 2010, envisions North Potomac Yard as an environmentally and economically sustainable urban, mixed-use community which compliments adjacent neighborhoods and creates a regional destination. To fulfill the vision and guiding principles of the *North Potomac Yard Small Area Plan*, the applicant proposes to construct the network of streets, parks and plazas recommended in the

Plan. In addition, the applicant proposes a mixture of uses including office, residential, hotel, entertainment, retail, restaurant and civic uses.

Development of North Potomac Yard provides many public benefits including:

- Mixture of uses and density sufficient to support a new Metrorail station;
- Network of streets, public open spaces, parks and urban squares;
- Incorporation of sustainable design and green building techniques;
- Community amenities, such as funding for a performing arts center;
- Land and funding for a new school to be sited; and
- Affordable housing.

II. COORDINATED DEVELOPMENT DISTRICT DESCRIPTION

A. Overview - Coordinated Development District Conceptual Design Plan

CPYR, inc. requests approval of a Coordinated Development District (CDD) conceptual design plan to redevelop North Potomac Yard (Landbay F). The overall development program proposed for North Potomac Yard provides for 7,525,000 square feet of development. Within this overall development envelope, there is a minimum of 1,930,000 square feet of office, 930,000 square feet of retail, 170,000 square feet of hotel, 1,100 residential units and nearly 10 acres of open space.

In addition, within the overall development envelope, the proposed CDD provides 3,395,000 square feet that may be developed as either office or residential. The allocation and mixture of the aforementioned uses is determined by the proximity to transit, including a future Metrorail station and a high-capacity transitway, as well as planned surrounding uses, open space and market conditions. To ensure future flexibility due to market conditions, the exact mixture of uses will be determined during the development review process, although all buildings will require adherence to the *North Potomac Yard Urban Design Standards*.

North Potomac Yard is designed with an interconnected series of streets, blocks, parks and a mixture of uses intended to establish true urban neighborhoods. The streets generally form a grid with block sizes typical of other Alexandria neighborhoods including Old Town and Del Ray. Likewise, the streets provide north-south connections from Crystal City to Potomac Yard Landbay G and several east-west connections. Extensions of East Reed Avenue, Evans Lane and Wesmond Drive are proposed to enhance connectivity between North Potomac Yard and neighborhoods located west of Route 1 (Jefferson Davis Highway), such as Lynhaven.

The open space network is an equally significant component of the urban framework in North Potomac Yard. Designed to serve residents, adjacent neighborhoods and visitors, the open space is a defining element of the community and provides connections to local and regional open space systems and trails. The open space includes active and passive spaces, as well as rooftop gardens, urban squares and plazas designed for civic gatherings and events.

B. Neighborhoods

As recommended in the *North Potomac Yard Small Area Plan*, the applicant proposes to create three distinct neighborhoods within the framework of interconnected streets and open spaces. While the individuality of each neighborhood is expressed through architectural character, scale, uses and open spaces, the neighborhoods are visually unified by the street network, consistent streetscape and central theme of sustainability. The three neighborhoods, described in further detail below, are Crescent Gateway, Market, and Metro Square.

Crescent Gateway Neighborhood

Located at a northern gateway to the City, the Crescent Gateway Neighborhood of North Potomac Yard is bordered by Four Mile Run and Potomac Yard Landbay E to the north and a new public street (New Street "B") to the south. The neighborhood is approximately fifteen acres in size and includes Block 1 through Block 6. It is primarily residential in character although hotel, office, ground-floor retail and community facilities are permitted.

A defining feature of the neighborhood is the proposed park, Crescent Park, located on Block 1 in the northeastern portion of the neighborhood. Crescent Park, discussed in greater detail in the staff analysis section of the staff report, is approximately 2.3 acres and provides both active and passive recreation space. Conceptual designs for the park include a large gathering and event space, open space lawn areas and a stormwater management pond designed as a park amenity.

Consistent with the Small Area Plan and the Urban Design Standards, the applicant proposes to construct two new streets within the Crescent Gateway Neighborhood (New Street "A" and New Street "B"). New Street "A" is proposed to curve at Crescent Park, resulting in unique shapes on Blocks 2, 4 and 6. These distinctive shapes offer an opportunity to design curved buildings which reinforce the shape of the public realm.

Market Neighborhood

The Market Neighborhood is located in the central portion of North Potomac Yard and is bordered by New Street "B" to the north and New Street "C" to the south. The neighborhood is approximately 22 acres in size and includes Block 7 through Block 13. A mixture of uses is proposed in the Market Neighborhood including office, residential and ground floor retail. Envisioned as a local and regional shopping and entertainment destination, large scale retail and restaurant uses are proposed in the neighborhood.

Similar to Crescent Gateway, a defining element of the Market Neighborhood is a central open space. Located on Block 13, the open space, envisioned as an urban park, conceivably allows the periodic closure of adjoining East Reed Avenue for events such as farmers markets and festivals.

Consistent with the Small Area Plan, the applicant proposes to construct East Reed Avenue as well as New Street "C". To ensure walkable, pedestrian oriented blocks the applicant has agreed to extend East Reed Avenue from Route 1 to the future Potomac Avenue right-of-way.

Metro Square Neighborhood

Located in the southern portion of North Potomac Yard, the Metro Square Neighborhood is bordered by New Street "C" to the north and Potomac Yard Landbay G to the south. The Neighborhood is approximately 26 acres and includes Blocks 14 through 23. Due to the proximity of the planned Metrorail station, higher densities and continuous building frontages are proposed within the neighborhood. The neighborhood primarily consists of office uses, although small amounts of retail and residential units are envisioned to ensure ground-level and night-time activity. Entertainment and live performance arts are also desired in this neighborhood. An urban park, Metro Square, is located in the heart of the neighborhood on Block 19.

The Metro Square Neighborhood is considered the transit center of North Potomac Yard. In this neighborhood, the planned Metrorail station, dedicated high-capacity transit and local transit converge.

Flexible Metrorail Zone

At this time, the final design and location of the planned Metrorail station requires an environmental study and additional coordination with the Washington Metropolitan Area Transit Authority (WMATA), the National Park Service (NPS) and other applicable Federal and State agencies. Similarly, details of the high-capacity transitway, including the type of vehicle used and the locations of the stations, are not yet finalized – leaving open the option of a rail-based transit system. As the final design and location of the aforementioned infrastructure is likely to alter streets, blocks, buildings and open space, the *North Potomac Yard Small Area Plan* establishes an overlay "flexible zone" in the blocks adjacent to the planned Metrorail station.

As details regarding the Metrorail station and high-capacity transitway are finalized, the recommended design of streets, blocks, buildings and open space in Blocks 14 through 16 and Blocks 18 through 21 will be processed as an amendment to the Coordinated Development District Conceptual Design Plan, subject to review and approval by Planning Commission and City Council prior to submittal of the first development special use permit in the flexible zone.

Although fundamental components of the flexible zone are yet to be determined, the Plan envisions the blocks within the zone as highly urban in character, with maximum building height and office density due to the proximity to Metrorail, high-capacity transit, and local transit service.

Potomac Yard Park

Located on the eastern border of North Potomac Yard, the Potomac Yard Park is 3.5 acres and is bordered by Potomac Avenue on the west and the rail corridor on the east. Potomac Yard Park (Block 24) is an essential component of each of the aforementioned neighborhoods as it serves to unify the neighborhoods of North Potomac Yard with the remainder of the Potomac Yard

development. Furthermore, Potomac Yard Park provides an important extension of the regional park network which connects Four Mile Run to Braddock Road.

III. ZONING

A. Existing Zoning

The Potomac Yard Retail Center was developed in 1995 pursuant to the underlying commercial and industrial zoning provisions of the Potomac Yard / Potomac Greens Coordinated Development District (CDD #10). Although the existing retail center was initially envisioned as an interim use, the Potomac Yard / Potomac Greens CDD Concept Plan, approved by City Council in 1999, incorporated the Retail Center as a continued use. The CDD Concept Plan, and the subsequently approved Alternative Concept Plan, limited development in Potomac Yard Landbay F to 600,000 square feet of retail (refer to Appendix I for additional background information, including a site context, site history and project evolution).

B. Proposed Zoning

The *North Potomac Yard Small Area Plan* specifically recommends the creation of a new Coordinated Development District (CDD #19) to fulfill the vision, guiding principles and recommendations established during the planning process. The Plan notes that approval of a new CDD is contingent upon compliance with the Plan recommendations as well as the *North Potomac Yard Urban Design Standards*.

Consistent with the *North Potomac Yard Small Area Plan*, the applicant requests approval to rezone the site from CDD #10 to CDD #19 and proposes a significant increase in density, from 600,000 square feet of retail development to 7,525,000 square feet of mixed-use development. The following table provides a description of the proposed CDD #19:

Table 1: Proposed Description of North Potomac Yard CDD

CDD#	CDD Name	Without a CDD Special Use Permit	With a CDD Special Use Permit		
			Maximum FAR and/or Development	Maximum Height	Uses
19	North Potomac Yard	The CSL zone regulations shall apply on the first 250 feet east of Route 1, and the I zone regulations shall apply on the remainder of the site. However, in no case shall the development exceed 600,000 square feet.	Maximum development levels will be as depicted in Table 5 of the CDD Conditions. Conversion of square footage between uses may be permitted through the development special use permit process. Refer to Table 3 of the CDD conditions for maximum parking ratios.	Heights shall be as shown in the North Potomac Yard Design Standards dated May 24, 2010.	Mixed-use development to include office, residential, retail and personal service, hotel, parks and open spaces and community facilities.

Many of the City's adopted plans and policies, including the *North Potomac Yard Small Area Plan*, encourage new development to remain compatible with existing neighborhoods. A significant consideration in development review, particularly in rezoning applications, is whether the proposed development is compatible with surrounding neighborhoods. A challenge to compatibility associated with the applicant's request to rezone the site is the increase in density proposed with the rezoning application.

As previously noted, the applicant requests approval to rezone the site from Coordinated Development District #10 to Coordinated Development District #19 and increase the permitted development from 600,000 square feet of retail to 7,525,000 square feet of mixed-use development. Although the increase in density appears substantial, staff supports the applicant's request to rezone the site. Staff believes that the application is consistent with the *North Potomac Yard Small Area Plan*, is compatible with adjacent neighborhoods and offers many public benefits, as discussed below in further detail.

Staff believes that North Potomac Yard is an appropriate location for increased height and density, particularly with the development of a Metrorail station in Potomac Yard. Nearly seventy-acres in size, the site is large enough to accommodate both density and height while also providing adequate transitions to lower-density residential neighborhoods and the George Washington Memorial Parkway. To achieve a balance between density and height sufficient to

support a Metrorail station and compatibility with adjacent neighborhoods, the applicant proposes the highest densities adjacent to the future station and the greatest heights within the center of the site transitioning to lower heights both on the east and the west.

Although the increase in density proposed by the applicant appears substantial, it is important to note that the 7,525,000 square feet of development proposed has an approximate floor area ratio (FAR) of 2.5. The floor area proposed in North Potomac Yard is largely consistent with the FAR approved in Potomac Yard Landbay G and Potomac Yard Arlington, 2.2 and 2.03, respectively.

C. Coordination with Adjoining CDD

As stated in Section 5-600 of the Zoning Ordinance, Coordinated Development Districts (CDD) are intended to encourage cooperation and joint planning to ensure an integration of uses and infrastructure. The applicant, in consultation with City staff through the North Potomac Yard planning process, has proposed to expand the urban infrastructure approved in the southern portion of Potomac Yard, including streets and stormwater management systems. Likewise, the applicant has also proposed uses which are compatible to the uses approved in Potomac Yard Landbay G, including additional ground-level retail, entertainment and office uses.

While the applicant and adjacent property owners in Potomac Yard have coordinated the infrastructure and ensured compatibility of uses, there are several procedural issues which require resolution. Specifically, it is necessary to revise Coordinated Development District #10 to remove Landbay F from the boundaries of CDD #10 as well as update the conditions of approval, the Alternative Concept Plan and the Potomac Yard Urban Design Guidelines to remove references to Landbay F.

Although it is ideal to resolve the procedural issues with this application, staff has determined that it is acceptable to delay these revisions until such time as Potomac Yard Development, LLC submits an application for a CDD Amendment or a Development Special Use Permit for review and approval by Planning Commission and City Council.

D. Text Amendment to Revise Zoning Ordinance Section 5-600

The Potomac Yard Design Advisory Committee (PYDAC), established with the approval of the Potomac Yard and Potomac Greens Coordinated Development District, reviews preliminary development applications for compliance with the Potomac Yard Urban Design Guidelines and provides recommendations to Planning Commission and City Council. The membership requirements, authority and responsibilities of PYDAC are codified in Section 5-610 of the Zoning Ordinance.

As a means by which to ensure consistency between North Potomac Yard, Potomac Yard and Potomac Greens, staff believes that it is necessary to expand the authority of PYDAC to review preliminary development applications in North Potomac Yard for consistency with the *North Potomac Yard Urban Design Standards*. Furthermore, as portions of North Potomac Yard, Potomac Yard and Potomac Greens are located within the Old and Historic District and in close

proximity to the George Washington Memorial Parkway, staff recommends that PYDAC be expanded to ten members to include a representative from the National Park Service. For these reasons, staff requests that Planning Commission initiate a Zoning Text Amendment to amend Section 5-610 of the Zoning Ordinance. The amendments proposed by staff include:

Section 5-610 (B) – "The Potomac Yard design advisory committee shall consist of *ten* members appointed by the city council, pursuant to title 2, chapter 4 of the Code of the City of Alexandria, Virginia, 1981, as amended, for staggered terms of two years. The committee shall include two members representing the Potomac East area; two members representing the Potomac West area; two members representing the Potomac Yard area; *one member with urban design or architectural experience representing the National Park Service*; one member representing the business community, and two qualified professionals skilled in architecture or urban design."

Section 5-610 (C) – "The purpose of the Potomac Yard design advisory committee is to review applications for preliminary development plan special use permit approval under this ordinance, within CDD No. 10 Potomac Yard/Greens and *CDD No. 19 North Potomac Yard*, for compliance with the *respective* urban design guidelines *or design standards* applicable therein, and make recommendation on such applications to the planning commission and city council through the director."

In addition, staff requests that Planning Commission also amend Table 1, Coordinated Development Districts, in Section 5-602 of the Zoning Ordinance to include Coordinated Development District 19, North Potomac Yard.

IV. STAFF ANALYSIS

A. Consistency with the City's Plans and Polices

In the last several years, the City has increasingly recognized the importance of sustainable development and has established sustainability as a primary goal in many recently adopted plans and policies, including the *North Potomac Yard Small Area Plan*, the Environmental Action Plan, the Economic Sustainability Report and the Green Building Policy. The City's Strategic Plan, currently undergoing an update, also emphasized the importance of sustainable development and advocated mixed-use, transit-oriented development to maximize the use of public transit. Elements of sustainable development, such as increased height and density adjacent to Metrorail stations, mixed-use development, balanced land use, green infrastructure and energy efficient buildings are also specified in many of the aforementioned plans and policies.

Staff believes that the North Potomac Yard CDD Conceptual Design Plan is consistent with the City's plans and policies, including the recently adopted *North Potomac Yard Small Area Plan*, and particularly the plans and policies which recommend sustainable building and site design and mixed-use, transit-oriented development. The CDD Conceptual Design Plan proposes a highly-walkable, transit-oriented development which consists of a mixture of uses, a network of open spaces and height and density sufficient to support a Metrorail station as well as a high-capacity transitway. In addition, the applicant proposes an interconnected grid of streets, open

spaces and urban plazas consistent with the framework established in the Plan and required in the Urban Design Standards. Sustainable site design and building techniques, including innovative stormwater management and water use reduction techniques, such as green roofs and reuse of captured rainwater are also proposed to ensure compliance with the recommendations of the Plan and the requirements of the proposed Urban Design Standards.

B. Metrorail Station – Feasibility and Financing

In October 2008, City Council established the Potomac Yard Metrorail Station Feasibility Work Group (Work Group) to assess the technical and financial feasibility of a Metrorail Station in Potomac Yard. The Work Group identified several potential locations for the Metrorail station and evaluated the constructability, cost and ridership estimates associated with each potential location. The results of the evaluation determined that three locations (A, B2 and B3) were acceptable to proceed with further analysis, specifically an environmental analysis to determine the final station location. The findings of the Work Group were documented in the Potomac Yard Metrorail Station Concept Development Study, dated February 3, 2010.

The Work Group and the *North Potomac Yard Small Area Plan* unequivocally stated that, according to the findings of recent traffic studies, the transportation network in the northeastern portion of the City cannot support the ultimate development proposed in North Potomac Yard without a new Metrorail station. Furthermore, the Work Group and the Plan also noted that a financing agreement is a necessary precedent to the North Potomac Yard rezoning.

As noted in the *North Potomac Yard Small Area Plan*, the estimated cost to construct a new Metrorail station in Potomac Yard is estimated at approximately $190 to $270 million, assuming the midpoint of construction in 2015. For ease in financial modeling, the City estimated a midpoint construction cost of $240 million, about the mean of the aforementioned range. In addition to the construction cost, the City also estimated $30 million for capitalized interest during construction and $5 million in related underwriting and bond issuance costs, for a total bond issuance of up to $275 million. In the event the cost to construct a Metrorail station exceeded this, a revised financing plan needs to be developed.

While the proposed development in North Potomac Yard creates significant new net revenues which more than cover the debt service obligation of the Metrorail station bond financing, there is a projected $9 million gap in initial financing. To close this gap and seek to avoid negative cash impact on the City's General Fund, the City has worked closely with representatives of CPYR, the North Potomac Yard property owner, to establish a funding strategy for the design and construction of the Metrorail station. Details of the funding strategy are included within a Memorandum of Understanding (MOU), which the City and CPYR anticipate entering into upon receiving City Council authorization.

As outlined in the MOU, the City will establish the Potomac Yard Metrorail Station Fund to accumulate funds from each of the below-mentioned funding mechanisms. The Station Fund will be a separate fund, the proceeds of which may be used only for the purposes identified in the MOU, specifically to further the design, construction and financing of the Metrorail station in Potomac Yard.

In addition to new net tax revenues, the City and CPYR agreed to specific funding mechanisms in the MOU including the creation of two special tax districts, developer contributions, including a $32 million "shortfall guarantee," and bond issuance to finance environmental review, pre-construction and construction costs. The MOU assumes no State or Federal sources of funding, such as grants or loans, due to the current absence of State and Federal funding opportunities. Each of the aforementioned funding mechanisms is described below in greater detail.

New Net Tax Revenues

New net tax revenues generated from residential, office and non-retail commercial, retail, and hotel uses will be deposited in the Potomac Yard Metrorail Station Fund to finance the design and construction of the Metrorail station. Net new tax revenues represent gross new tax revenues less the estimated cost of providing City and school services to residents and businesses of North Potomac Yard. The following percentages of net new tax revenues will be deposited:

- Residential: 40%
- Office and Non-Retail Commercial: 83%
- Retail: 87%
- Hotel: 94 %

Special Tax District

The City proposes to establish two special tax districts, Tier I and Tier II, in Potomac Yard. A higher density tax district (Tier I) is based on a special assessment of twenty cents ($0.20) per one hundred dollars ($100.00) of assessed value in North Potomac Yard and Potomac Yard Landbays G, H, I (multi-family portion only). In addition, the City proposes a lower density tax district (Tier II) based on a special assessment of ten cents ($0.10) per one hundred dollars ($100.00) for Potomac Yard Landbay I, Landbay J, and Potomac Greens. The City proposes to establish both special tax districts in the fall of 2010; however a zero tax rate for the Tier II tax district is proposed until the Metrorail station commences operation (at the earliest in 2016). Old Town Greens is not subject to a special tax district, as it was approved prior to the Potomac Yard / Potomac Greens Coordinated Development District (CDD #10), when the creation of a special tax district to finance a Metrorail station was first envisioned.

Developer Contributions

The draft Memorandum of Understanding (MOU) and associated financing plan assumes a developer contribution of $10 per square foot of gross floor area (net of structured parking) of new construction within ¼ mile of the Metrorail station entrance (estimated for financial modeling purposes in 2010 dollars at $49 million based on 4.9 million square feet of gross floor area within ¼ mile of the station entrance). The $10 per gross square foot, in 2010 dollars, would escalate annually in accordance with the Consumer Price Index for all Urban consumers (CPI-U) and would be paid by the property owner concurrently with the issuance of the certificate of occupancy for each building.

As Potomac Yard Development and MRP Realty, property owners of the balance of Potomac Yard, have made extensive contributions for transportation, sewer and stormwater management infrastructure, neither would be required to provide developer contributions for a Metrorail station unless a rezoning involving significant increases in density is requested (which is not planned or expected).

Shortfall Guarantee

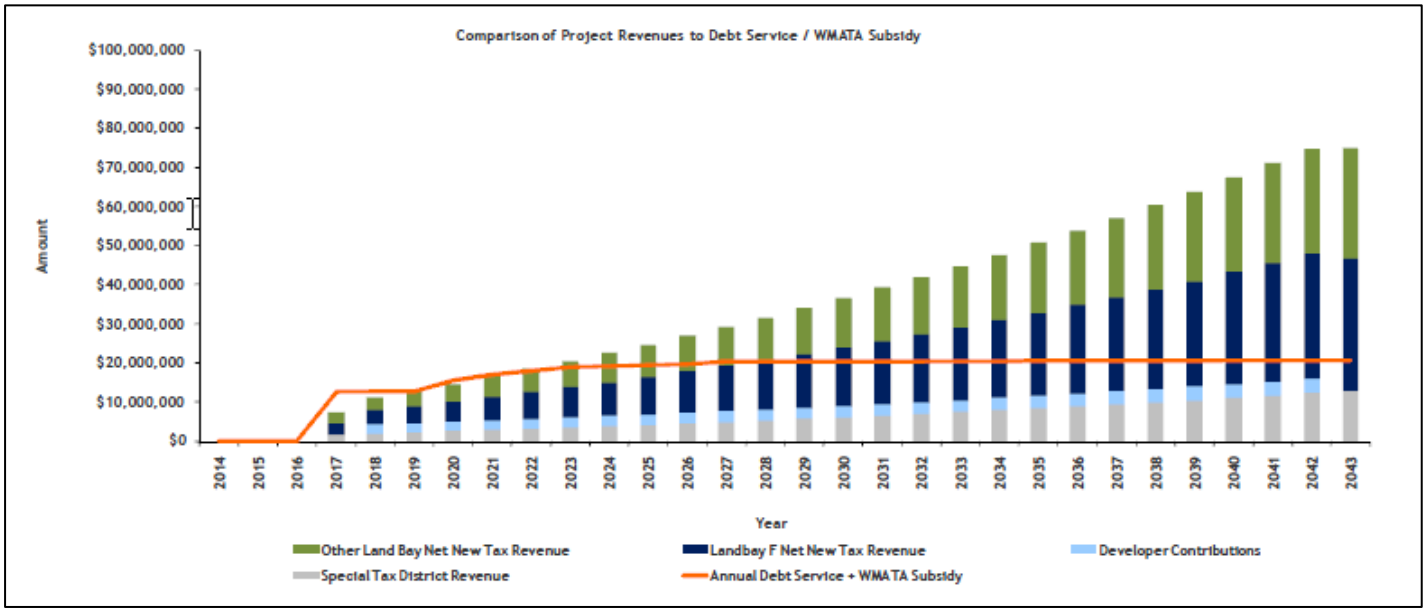
To reduce the risk of the City using General Fund revenues to make payments on the aforementioned Metrorail station bonds, CPYR has agreed, through the MOU, to provide a contingent guarantee of any shortfall between the amount required to be paid each year to service bond indebtedness and the funds within the Potomac Yard Metrorail Station Fund at that time. The shortfall guarantee totals $32 million, although CPYR is not obligated to provide more than $10 million in any calendar year. As noted in the MOU, the shortfall guarantee is considered a public benefit contribution. The amount of the shortfall guarantee not used to fill any debt service funding gap would be eventually paid to the City to pay down some of the Metrorail bond debt, or to be used for other public benefit capital investments in the *North Potomac Yard Small Area Plan* boundaries.

Bond Financing

The City has determined that the long-term benefits of redevelopment in North Potomac Yard, including the Metrorail station, merit the issuance of up to $275 million in new bonds to finance the construction, capitalized interest and issuance costs associated with the Metrorail station. At this time, the City anticipates issuing bonds as tax exempt bonds to the maximum degree feasible, or to utilize the federal Build America Bond program (if remaining authorized at the time the bonds are issued).

The following chart depicts the projected income stream and debt service costs over a 30-year period:

Figure 1: Comparison of Project Revenues to Debt Service / WMATA Subsidy



C. Phasing and Implementation

Staff currently anticipates that each Block and/or building within North Potomac Yard will be reviewed through the development special use permit process. Staff recognizes that alternative options to doing individual development special use permits are plausible and is committed to reviewing the positive and negative aspects of alternative review options in future discussions.

The phasing of development within North Potomac Yard is intended to ensure that adequate infrastructure, particularly transportation infrastructure (including the Metrorail and high capacity transitway), is in place to support the proposed development as it is constructed over a period of years. Additionally, an adequate amount of development needs to be permitted near the proposed Metrorail station so as to provide some of the projected revenues and developer contributions which will each help to fund part of the station. Developing an appropriate phasing plan for a project of this scale and complexity is a challenging effort. The staff recommendations attempt to allow for flexibility and response to market realities, while ensuring the orderly and logical physical growth of the development from the current strip shopping center to the urban, mixed-use community that is envisioned.

In looking at how the project could be phased, not only was the infrastructure capacity taken into account, but there was also recognition that each phase must make planning sense on its own in relation to the existing retail center and adjacent properties. It would be inappropriate for the site to become a series of unconnected new buildings, dropped in amongst the parking lots of the existing retail center. For this reason, there are two very important overarching conditions recommended to govern the development phasing: 1.) initial development must be within a ¼ mile radius of the proposed Metrorail station; and 2.) each new block that is submitted for development must be contiguous (exclusive of public street rights-of-way).

The development phasing is divided into three components: development preceding construction of the Metrorail station, development concurrent with construction of the Metrorail station and development once the Metrorail station is operational. While the staff recommendations discuss each of the development phases in significant detail, a brief overview of each phase is included in the following paragraphs.

Development Preceding Construction of the Metrorail Station

Prior to construction of the Metrorail station, staff recommends a maximum of 2,000,000 square feet of development within ¼ mile of the station, inclusive of the existing retail square footage (i.e. 1.4 million square feet of additional development). Development within the ¼ mile radius must occur within contiguous blocks to facilitate the construction of infrastructure, including streets and parks. Staff further recommends that, if retail square footage is vacated in the existing retail center, it should be replaced on a one-for-one basis in the new development so as to not diminish existing retail tax revenues as well as the importance of this area as a popular retail destination. Finally, the high-capacity transitway must be constructed and in at least partial operation during this development phase to ensure adequate accessibility and connectivity.

In envisioning how this level of development could be built out on the site, staff has looked at a number of possible scenarios. These scenarios are described below so as to demonstrate that the North Potomac Yard area can be developed incrementally and logically – that is, each stage or phase of development can result in a community that can make urban design sense and that can be fully usable.

One option is to focus on completing as much of the Market Neighborhood (Landbay 2) as possible so as to create a viable, urban shopping street along East Reed Avenue (see figure 2).

Figure 2: Development Phasing - One Option

This option has the benefit of being a strong stand-alone development that could focus on the transitway and relate to the existing retail uses. It is not dependent on construction of the Metrorail station in terms of transportation capacity and could function somewhat independently. The downside to this option is that it would maintain the sense of disconnect between Landbay F and the rest of Potomac Yard as it would not address Landbay G.

A second option could be to build out a number of buildings in the Metro Square Neighborhood (Landbay 3), including several near the proposed Metrorail Station. This would have the benefit of providing a strong link to Landbay G, a major incentive for Metro construction, and the potential for more office development. The downside of this option is that it would require a relatively quick resolution of issues related to the layout of the Flexible Metrorail Zone (which may be difficult because of the time needed to undertake the environmental studies associated with the Metrorail construction) and it would require the demolition of portions of the existing retail center with uses that may be hard to replicate in the buildings in the Metro Square Neighborhood.

Finally, a third option could be a combination of the two noted above with some development on the east side of both the Market Neighborhood and the Metro Square Neighborhood. This would have the benefit of allowing for some significant new or relocated retail uses, as well as buildings that could help to make a connection between this development and Landbay G. The downside is that, with the continuing presence of the existing retail center, this scenario could look less cohesive and would be harder to envision as viable without the construction of a Metrorail station.

Development Concurrent with Construction of the Metrorail Station

A maximum of 3,700,000 square feet, inclusive of the existing retail center and Phase 1 development, is permitted when bonds necessary for the Metrorail station have been issued and construction on the station has commenced. Similar to the previous phase, all development concurrent with the construction of the Metrorail station is required within ¼ mile of the station entrance and must occur on contiguous blocks. All retail square footage vacated in the existing retail center must be replaced. Furthermore, the high-capacity transitway must be fully operational in order to provide adequate transportation infrastructure for this level of development. Additional development occurring during this phase should be focused on "filling in" whichever of the scenarios described above have been initiated.

Development once the Metrorail Station is Operational

Consistent with the Metrorail station financial strategy, development within this phase is limited to contiguous blocks within the ¼ mile radius until 4,900,000 square feet of development has occurred. When this level of development has occurred and the Metrorail station is operational, development in other areas of North Potomac Yard can commence in accordance with the *North Potomac Yard Small Area Plan*.

D. Transportation and Parking

While a Metrorail station is necessary to support the development proposed in North Potomac Yard, it is important to note that the transportation network expands beyond Metrorail to include a comprehensive, integrated, multi-modal approach to transportation. The transportation network includes a fine-grained internal street network, a pedestrian-oriented streetscape with direct pedestrian connections, dedicated on-street bike lanes, local and circulator transit service, high-capacity transit and transitway stations. The comprehensive transportation network, including the new Metrorail station is capable of supporting up to 2.5 FAR of development, though it is important to acknowledge that the urban nature of North Potomac Yard combined with background traffic, will create constraints and increased congestion along Route 1.

The proposed foundation for the transportation network in North Potomac Yard is a series of interconnected streets and blocks, with one north-south arterial street (Potomac Avenue) which provides an alternative to Route 1 and two additional north-south streets which provide continuous connections between North Potomac Yard and the southern portion of the Yard. In addition to the north-south streets, several east-west streets are also proposed. The east-west streets range from primarily pedestrian-oriented streets, such as New Street "A," to streets such

as New Street "B", which provides retail service access and East Reed Avenue, which provides an important connection to neighborhoods west of Route 1. The proposed street network is envisioned as a means to facilitate a shift from single occupancy vehicles to alternative modes of transportation, including biking, local and circulator transit service and high-capacity transit.

Potomac Yard Multimodal Transportation Study

A comprehensive, multi-modal transportation analysis was conducted to ensure that the aforementioned transportation network is adequate to support the development proposed in North Potomac Yard. The transportation analysis, the Potomac Yard Multimodal Transportation Study, dated December, 2009, assumed a high percentage of transit ridership, an aggressive transportation management plan (TMP) and the following transportation infrastructure in operation by 2030:

- Potomac Yard Metrorail Station
- Crystal City/Potomac Yard (CCPY) Transitway
- Local and Circulator Transit Service
- Potomac Avenue
- Fine-Grained Internal Street Network
- New Commuter and Recreational Bicycle/Pedestrian Facilities

The transportation analysis demonstrated significant congestion in the Route 1 corridor in the 2030 baseline condition prior to the redevelopment of North Potomac Yard. With the redevelopment of North Potomac Yard and the associated transportation improvements, most notably the Potomac Yard Metrorail station and the high-capacity transitway, the Route 1 corridor deteriorated incrementally from the background condition. The transportation analysis identified a number of constraints in the existing transportation system, including:

- Limited east-west connectivity
- Limited bike and pedestrian facilities
- Future congestion on roadways
- Constrained intersections at Route 1 and East Reed Avenue, Route 1 and East Glebe Road, and Route 1 and Potomac Avenue

The transportation analysis also examined travel time through the Route 1 corridor under existing conditions, background conditions without redevelopment and future conditions with the redevelopment of North Potomac Yard. The following table illustrates changes in travel time and speeds when comparing existing conditions to 2030 background conditions and 2030 build conditions:

Table 2: Changes in Travel Time and Speeds on Route 1

Scenario	Southbound Speed (mph)	Travel Time (min)	Increase in Travel Time (from existing)	Northbound Speed (mph)	Travel Time (min)	Increase in Travel Time (from existing)
Existing	20.9	5	-	22.3	4.5	-
Future Background (no build)	15.4	6.5	30%	19.2	5.5	22%
Future Build	13.6	7.5	50%	17.7	6	33%

Note: The table assumes the construction of a Metrorail station and dedicated high-capacity transit for the Future Build scenario.

To address the constraints identified in the transportation analysis, the staff recommendations require the following improvements to the transportation system:

- Physical improvements at the intersection of East Glebe Road and Route 1
- Maximizing the street grid by configuring East Reed Avenue at Route 1 to allow all movements
- An aggressive Transportation Management Plan and Parking Management Plan designed to limit single occupancy vehicle use
- Dedicated bicycle lanes along East Reed Avenue and Evans Lane
- A shared use path for bicyclists and pedestrians along Potomac Yard Park and Crescent Park, connecting directly to the Four Mile Run Trail, with an indirect connection to the Mt. Vernon Trail via the Four Mile Run Trail

Neighborhood Traffic Calming

The staff recommendations also require the implementation of a neighborhood traffic calming plan in neighborhoods adjacent to North Potomac Yard. As noted in the *North Potomac Yard Small Area Plan*, traffic is not expected to exceed the technical capacity of existing local streets; however residents in adjacent neighborhoods are likely to experience increased traffic volumes.

To protect the character of adjacent neighborhoods as well as address potential impacts to neighborhoods beyond the immediate study area, the staff recommendations require the implementation of a neighborhood traffic calming plan, implemented in the earliest phases of development. The neighborhood traffic calming plan includes installation of speed humps and traffic circles to calm neighborhood traffic west of Route 1 adjacent to the development as depicted in *Attachment #8*. In addition, with subsequent development applications, analysis is required on traffic patterns and impacts to local roadways, and any additional neighborhood issues identified will be addressed with the subsequent development applications.

Transportation Phasing

The Metrorail station and high-capacity transitway represent the most significant transportation investments required to support the development, but there are several other key transportation

infrastructure investments required. Similar to the phasing of the overall development, phasing of transportation infrastructure is necessary to ensure that adequate infrastructure is in position to support development as construction proceeds. Phasing of transportation infrastructure is based on considerations such as traffic volumes, other development in the area, trip-making characteristics of differing levels of development and major road improvements. The staff recommendations require the following transportation improvements designed to support the level of development:

Development Preceding Construction of the Metrorail Station

Prior to the first certificate of occupancy, the following transportation improvements are required:

- Neighborhood Traffic Calming measures
- Open East Reed Avenue to all movements at Route 1 (prior to first Certificate of Occupancy on Reed Avenue)
- Establish and participate in Transportation Demand Management District
- Any additional streets necessary to support each development block/building submitted for development

Prior to exceeding 2,000,000 square feet of development, the following transportation improvements are required:

- Design and construct transitway, including all necessary exclusive transitway lanes, all transitway stations and associated facilities
- Construction of Potomac Avenue (new alignment) from Landbay G to the Four Mile Run Bridge
- East Glebe Road intersection improvements at Route 1
- Any additional streets necessary to support each development block/building submitted for development

Development Concurrent with Construction of the Metrorail Station

Prior to exceeding 3,700,000 square feet of development, the following transportation improvements are required:

- Operational Metrorail station
- Construction of Evans Lane
- Any additional streets necessary to support each development block/building submitted for development.

Development once the Metrorail Station is Operational

Any additional streets necessary to support each development block/building submitted for development.

Parking

To further reduce the number of single occupancy vehicles and increase the use of public transportation, including the future Metrorail station and high-capacity transitway, the *North Potomac Yard Small Area Plan* and Urban Design Standards establish maximum parking ratios for each land use to discourage single occupancy vehicles. Designed to accommodate the parking needs of new development without providing excessive parking, maximum parking ratios encourage increased transit ridership and provide the benefits associated with reduced vehicle miles traveled while also maximizing developable land. The maximum ratios proposed are included in Table 3 of the attached staff recommendations.

In addition to maximum parking ratios, the staff recommendations require the applicant to implement a parking management plan, which includes strategies for shared and valet parking programs. Through the parking management plan, parking for community facilities, movie theaters and performance theaters is provided by adjacent uses through shared parking, unless the facility or theater has considerable parking needs which cannot be accommodated exclusively through shared parking. To further reduce single occupancy vehicle use, the staff recommendations require market rate parking for office and retail use (validation is permitted for retail parking), unbundled parking for residential units and metered parking for on-street spaces.

The *North Potomac Yard Small Area Plan* and Urban Design Standards recommend all parking within North Potomac Yard to be below-grade, to the greatest extent possible. In fact, the Design Standards require each block within North Potomac Yard to provide a minimum of one level of underground parking and further requires all parking for Blocks 2, 5 and 16 or 21 (blocks with significant ground-level open space) to be exclusively below-grade. Although above-grade structured parking is permitted, the Design Standards require that all above-grade parking be located in the center of the block and concealed by active uses for the entire building frontage. In addition to structured parking, the Design Standards also require on-street parking for all streets, excluding park frontages and street segments which accommodate transit stations.

E. Transportation Management Plan

A robust transportation management plan (TMP) for North Potomac Yard is imperative to encourage reduction in single occupancy vehicle (SOV) trips. A key component of the TMP is escalating SOV reduction goals as development density and alternative transportation options increase in North Potomac Yard. The initial goal with the first phase of development is 20 percent SOV reduction. When the transitway becomes operational, the SOV reduction goal increases to 30 percent and once the Metrorail station is operational, the SOV reduction goal increases to the ultimate goal of 50 percent reduction of SOV use within the Coordinated Development District.

A major change from previous transportation management plans is the establishment of a TMP district to ensure cooperation between adjacent property owners, such as owners within CDD #10, to achieve economies of scale and maximize the effectiveness of the TMP program. A second major change from previous TMPs is a shift to variable TMP rates based on success in achieving SOV reduction goals. With each phase of development or every five years, whichever

occurs first, the TMP rates may be increased or decreased up to 25 percent from the base rate, dependent upon the level of success in meeting the stated SOV reduction goals.

F. Water Management Master Plan

With the intent of fully complying with the City's Eco-City Charter and the *North Potomac Yard Small Area Plan*, staff has included a recommendation requiring the applicant to prepare a full Water Management Master Plan (WMMP) that coordinates water supply, stormwater, and wastewater systems. The WMMP integrates the management of stormwater, use of potable water, and generation of municipal wastewater to reduce the use of potable water by capturing and reusing rainwater and reducing wastewater generation through water conservation. The implementation of WWMP minimizes the negative impacts of the development on the sewer infrastructure and improves the instream habitat for Four Mile Run, the Potomac River and the Chesapeake Bay.

Stormwater Management Plan

The project lies in the Four Mile Run watershed and the applicant must develop a Stormwater Management Plan (SWMP) per the requirements of Chesapeake Bay Preservation Act in accordance with Article XIII of the City's Zoning Ordinance for stormwater quality and quantity control. The SWMP must provide pre and post 2, 10 and 100 year storm water computations so that from the site, the post-development peak runoff rate from two-year and ten-year storms, considered individually, shall not exceed the respective predevelopment rates. Since the site may have multiple outfalls, the post-development peak runoff requirements shall not exceed their respective pre-development rate at each outfall. The Director of Transportation and Environmental Services (T&ES) may waive the requirement of providing stormwater detention on site in case the post development runoff exceeds the pre development rate, if the SWMP can demonstrate that providing detention can adversely impact the City's flood control program. The SWMP shall also demonstrate compliance with Section 11-410 (N) Article XI of the City's Zoning Ordinance and Virginia Department of Conservation and Recreation (DCR), Erosion and Sediment Control (ESC) Regulations 4VAC50-30-40.19 Minimum Standard 19 (MS-19) and provide an adequate stormwater outfall.

Stormwater Quality

Environmental sustainability is one of the focus areas for the development as detailed in the recently approved *North Potomac Yard Small Area Plan*. Implementing innovative stormwater management techniques in the Plan area will provide significant environmental benefits for water quality in Four Mile Run and the Potomac River. The goal of the stormwater master plan for this area is to reduce the generation of stormwater runoff 30% over existing conditions, produce an overall post-development total phosphorous load equal to or less than 0.65 lb/ac/yr (which is a 42% reduction from existing conditions) and to creatively reuse some portions of the runoff that is generated. In return for the development meeting these targets which exceed present requirements, the applicant will be permitted to place stormwater management facility in public spaces.

To reduce stormwater generation the applicant proposes to modify 50% of rooftops to absorb increased quantities of rainwater and slow transport of stormwater to City stormsewers. 25% of all rooftop areas will be green roofs with vegetation and another 25% will have a similar underlying "soil" matrix with pervious pavers atop it. This will provide some component of stormwater management and also create amenity green/gathering space for building occupants. Porous pavement systems with underdrains will be used for the on-street parking spaces as well as some plazas subject to site constraints. The applicant will strive to re-use no less than 15% of the total annual runoff volume from the impervious areas of each building for irrigation of street-level and/or green roof landscaping.

The main water quality facility is planned to function as an urban amenity in the form of an urban level II wet pond, which will be the focal feature within an upscale urban park (Crescent Park). The areas not served by Crescent Pond or other presently approved water quality facilities will be served by ultra-urban BMPs placed on private property. Urban oriented rain gardens/bioretention areas will be used where possible throughout North Potomac Yard to manage/clean stormwater and soften the urban hardscape.

Wastewater Management

The Potomac Yard Offsite Sanitary Trunk Sewer (PYTS) was designed to meet the municipal wastewater conveyance requirements of Potomac Yard and meet future needs of the City including the diversion of wet weather flows from the Four Mile Run Pump Station, separation of combined sewer system (CSS) flows in the Old Town area, and limited development along the Route 1 corridor. In the Potomac Yard/Potomac Greens Coordinated Development District, it was anticipated that the redevelopment of North Potomac Yard would contain approximately 600,000 square feet of development, while the current proposed redevelopment of North Potomac Yard is approximately 7.5 million square feet, which greatly affects the wastewater flow conveyance and treatment capacities.

The staff has worked with the applicant to assess the impact of the proposed development in North Potomac Yard and future developments in the PYTS sewershed. The applicant proposed to use the low flow fixtures to conserve the use of potable water and minimize the generation of municipal wastewater from the proposed development. The staff agreed to allow a reduction of 30% in the generation of municipal wastewater from the Sewage Collection and Treatment (SCAT) Regulations and the City standards on account of using low flow fixtures. Using 30% reduction and the additional assumptions that were developed in concurrence with staff, the applicant has estimated the wastewater flow generated from the proposed and future developments along the Potomac Yard trunk sewer (Potomac Yard to ASA plant) as 18.2 Million Gallons per Day (MGD). Using the as-built hydraulic data and a Manning's Roughness Coefficient, n = 0.011, the PYTS was found to be surcharged [i.e., the hydraulic grade line (HGL) was coming out of the pipe or in the manhole the water surface elevation is higher than the crown of the pipe] at a few locations along its route under the as-built conditions. With additional analysis, it was determined that by constructing 24" diameter relief sewers under passing Duke and Franklin Streets will alleviate the surcharging conditions in PYTS. The applicant estimated that their flow contribution to the PYTS from the proposed development will be 21% of the total flow of 18.2 MGD, to which the staff has agreed. The applicant has

estimated a cost of $250,000 to construct these two relief sewers and provide an approximately 21% contribution towards the construction of the relief sewers as provided in the staff recommendations.

Though the conveyance capacity issue is resolved by providing relief sewers, the City is currently evaluating the long-term capacity needs at the ASA treatment facility. Based on the most current development projections, the City will need additional capacity at the ASA plant in the next fifteen years. Staff is currently evaluating the options for obtaining this additional capacity. Due to environmental regulatory requirements and State-mandated caps on the discharge of nutrients (nitrogen and phosphorous) from wastewater treatment facilities, there are several costly challenges to providing this additional capacity.

Because the volume flow projected from this development, along with other projected development will exceed the City's remaining existing capacity at the ASA treatment plant, the project will need to participate in the creation of the necessary additional capacity, as well as buying additional nutrient capacity through the State's new cap and trade program to support this project. The City, in consultation with ASA, is evaluating the necessary technologies and strategies to address this need.

However, no preliminary development site plan for North Potomac Yard, which proposes the construction of a building or buildings pursuant to the conceptual design plan is recommended to be approved by City Council until the requirements of Article XI of the Alexandria Zoning Ordinance and Commonwealth of Virginia, Sewage Collection and Treatment (SCAT) regulations, as described in the Memorandum to Industry 02-07 dated June 1, 2007 on New Sanitary Sewer Connection and Adequate Outfall Analysis, with the exception of 30% reduction in the flow generation, are fulfilled.

G. Open Space, Public Art and Archaeology

The comprehensive network of parks and public open space proposed in North Potomac Yard serves many important functions. As proposed, the parks and open space provide an important connection to local and regional open space systems and trails, offer an opportunity to integrate the proposed community within the City's existing framework and serve as defining elements of the neighborhoods in which they are located.

Consistent with the *North Potomac Yard Small Area Plan*, the applicant's proposal includes several significant ground-level open spaces. Staff recommends that the ground-level open space provide a combination of active and passive recreation uses to accommodate residents, office employees, children and visitors. Active recreation uses include elements such as basketball, tennis, and volleyball courts as well as play areas and dog exercise areas while passive recreation amenities include trails, open space lawns, plazas, gardens and event spaces.

The proposed open spaces, Four Mile Run Park, Crescent Park, Market Common, Metro Square and Potomac Yard Park, result in approximately 10 acres of ground level open space (15 percent of the site area) within North Potomac Yard. In addition to ground-level open space, the Plan recommends that the applicant provide an additional 13.8 acres of open space, through a

combination of ground-level or rooftop space to achieve 35 percent open space on site. The City has consistently pursued a goal of 40 percent open space with new development. To mitigate the five percent gap, the applicant has agreed to provide improvements off-site, including renovating an athletic field and improving Four Mile Run. The potential to create additional roof top open space will be examined with individual development special use permits.

Four Mile Run Park

As recommended in both the *North Potomac Yard Small Area Plan* and the Four Mile Run Restoration Master Plan, Four Mile Run Park (Potomac Yard Landbay E) provides an important connection in the local and regional open space network. Four Mile Run Park extends along the northern border of North Potomac Yard, from Route 1 to the proposed Crescent Park and includes an existing bridge across Four Mile Run (Bridge C), as well as a thin segment of City-owned land north of Four Mile Run. Consistent with the Four Mile Run Restoration Master Plan and the intents and purposes of the Resource Protection Area, staff recommends that Four Mile Run Park include a grand promenade, space for public gatherings and events, performance space, meaningful interaction with Four Mile Run, and a significant link between regional trails, including the Arlington County trail network and the Mount Vernon Trail.

Crescent Park

Crescent Park, which is an approximately 2.3 acre crescent-shaped park, is envisioned to fulfill several important functions. Specifically, Crescent Park is the focal element of the neighborhood which provides a "residential address" and park frontage for a predominantly residential neighborhood. Due to its location and orientation, Crescent Park offers residents and visitors scenic views of the Nation's Capitol. In addition, Crescent Park serves as a gateway to the City on Potomac Avenue and provides a buffer between the George Washington Memorial Parkway and larger scale buildings proposed in the central portion of the Crescent Gateway Neighborhood. Crescent Park also creates a critical junction between Four Mile Run Park and the Potomac Yard Park (Landbay K extension), enabling a vital connection in the existing and planned open space network. Both active and passive uses are proposed in Crescent Park, including a large gathering and event space, pedestrian pathways and a stormwater management pond designed as a park amenity.

Market Common

Market Common, a linear open space that occupies approximately one acre in the center of East Reed Avenue, is consistent with the Potomac Yard Finger Parks planned on Swann, Custis and Howell Avenues. Market Common, similar to the Potomac Yard Finger Parks, creates a cadence of green connections between the existing neighborhoods west of Route 1 and the Potomac Yard Park.

Market Common, divided into two segments at the Main Line Boulevard intersection, is an extension of the retail required on East Reed Avenue. For this reason, Market Common includes flexible space to accommodate farmers markets, special events and festivals and is designed to

enable the periodic closure of adjoining East Reed Avenue for larger events. In addition to flexible space, small spaces for intimate gatherings are also proposed.

Metro Square

Metro Square is envisioned as a vibrant, urban park due to it proximity to the office and entertainment neighborhood, future Potomac Yard Metrorail Station, high capacity transit and local transit service. The park is approximately 0.7 acres in size and occupies an entire block, creating a green core for the Metro Square Neighborhood. Framed by public streets and ground-level retail, the park is intended to accommodate residents, commuters, office workers and retail patrons. For this reason, the park includes hardscape and landscape elements which provide opportunities for public gathering as well as individual use.

Potomac Yard Park Extension

As recommended in the *North Potomac Yard Small Area Plan*, the Potomac Yard Park (Landbay K) provides an important extension of the regional park which enhances the open space network and provides an uninterrupted green spine between Four Mile Run and Braddock Road. Potomac Yard Park is a 3.5 acre extension of the previously approved 24-acre linear park in Landbay K. To ensure consistency with Landbay K, staff recommends that the park extension is designed to accommodate both active and passive uses, including a major north-south multi-use trail.

It is important to note that the applicant's plan proposes a 2.7 acre extension of Landbay K (rather than 3.5 acres), due to the proposed alignment of Potomac Avenue. However, staff believes that a minimum of 3.5 acres, as recommended in the *North Potomac Yard Small Area Plan*, is achievable through the final location, alignment and right-of-way dedication of Potomac Avenue throughout North Potomac Yard including in the Flexible Metrorail Zone.

In addition, when a decision is made on the Flexible Metrorail Zone block and street configuration, it will be important to ensure there will be no negative impacts to the open space in Landbay K within CDD#10. Any areas adversely impacted by a proposed plan should be replaced with open space designed and developed to contribute equal value to the park network within Potomac Yard and/or adjoining neighborhoods.

Rooftop Open Space

In addition to the aforementioned ground-level open spaces, rooftop open space is also proposed to ensure adequate open space is planned. Staff recommends that the rooftop open space include active and passive uses such as recreation courts, dog runs, pools, small synthetic turf fields, gardens, community gardens and green roof technology. Due to the significant proportion of open space located above the ground level, staff recommends public access is provided for some rooftop spaces.

Phasing and Implementation

The ground level open spaces previously discussed are phased with the overall development to ensure that open space amenities are provided for users upon building occupancy. Upon the completion of Four Mile Run Park, Crescent Park, Metro Square and the extension of Potomac Yard Park, staff recommends that the spaces are subdivided and dedicated to the City.

Public Art and Archaeology

As noted in the *North Potomac Yard Small Area Plan*, Potomac Yard has a history which includes tenant farms and plantations, as well as trade and transport, most notably, the site of the Alexandria Canal and the Potomac Rail Yard. North Potomac Yard provides a unique opportunity incorporate elements of the rich and varied history into the overall design of the development, particularly through public art.

To ensure that the history of the site is expressed throughout the development, the staff recommendations require the applicant to develop a public art and historic interpretive plan prior to the submission of any development special use permit. The purpose of the plan is to identify themes and mechanisms by which to incorporate elements of the historical character into the design of open space, buildings, and the public realm. While separate public art installations are encouraged, the heritage and history of the site can also be expressed through the building architecture, landscape, open space, and the streetscape. The *North Potomac Yard Urban Design Standards* require public art to be installed in specific locations including: Crescent Park, Market Common and the intersection of New Street "A" and Main Line Boulevard. The applicant has agreed to provide $4 million (in 2010 dollars) for public art.

H. Uses

The development of North Potomac Yard is grounded on the principle of a dynamic mixture of uses, with significant amounts of retail development and a balance of residential and office uses. The goal is to create three neighborhoods with strong individual characters, but each exhibiting vitality and active street life.

To this end, a great deal of thought has gone into the mix of uses allowed. As reflected on the zoning chart (Table 1), certain uses and floor area amounts are fixed for certain blocks. However, an innovative aspect of this project is that there is a maximum of 3,395,000 square feet of floor area in North Potomac Yard that may be developed as either office or residential.

For the blocks assigned this flexible category of use (generally Blocks 6–21), the final amount of development on each block may be transferred between blocks as part of a development special use permit. However, all blocks must still adhere to the *North Potomac Yard Urban Design Standards*. Additionally, allocation of this flexible category of use shall be evaluated in regard to the intent of the *North Potomac Yard Small Area Plan* occupancy goals. In particular, an overabundance of office use would be a concern from a traffic standpoint and in terms of creating and maintaining a vital neighborhood with activity in the evenings and weekends.

Due to the close proximity of the site to the District of Columbia, the Pentagon and recent Base Realignment and Closure (BRAC) sites, it is plausible that the Federal Government may consider office locations in North Potomac Yard. With a government tenant, certain security issues may arise; however the City has a successful history of resolving security issues with government tenants, such as the Patent and Trademark Office as well as the Federal Courthouse in Carlyle and Eisenhower East, respectively. Security issues can be resolved on a case by case basis to ensure that the overall intent of North Potomac Yard remains as envisioned.

While it is the City's preference for the Federal government to remain a tenant rather than a property owner, the City cannot prohibit the sale of property. Although it is highly unlikely under current federal policy for the Federal government to by an office building in Potomac Yard, to ensure that any property purchased by the Federal government contribute to the City's real estate tax revenues, staff's proposed recommendations would require buildings to remain in private ownership, and therefore subject to real estate taxes, during the initial 30-year lease of buildings on developable blocks (excluding Block 4). The staff recommendations further require the applicant to record a covenant (with language agreeable to the City), prior to the submission of the first final site plan, which requires the seller not otherwise obligated to pay City real estate taxes to either 1.) Provide a lump sum payment equal to the net present value of the estimated real estate tax payments for a 30-year period; or 2.) Enter into an agreement with the City that requires the seller to make semi-annual payments for the balance of the 30-year term, equal to the real estate tax payments otherwise due on the property.

I. Urban Design Standards and Guidelines

With this application, staff recommends the adoption of the *North Potomac Yard Urban Design Standards* (Design Standards) to implement the vision and guiding principles of the *North Potomac Yard Small Area Plan*. The Design Standards expand on the urban design framework established during the planning process and require specific site and building improvements as well as design excellence in North Potomac Yard. Development applications in North Potomac Yard are required to comply with all Design Standards and are strongly encouraged to comply with applicable Design Guidelines to ensure the creation of the vibrant, architecturally significant, sustainable community envisioned in the *North Potomac Yard Small Area Plan*. The Design Standards allow flexibility to enable creative and innovative designs while ensuring that the City achieves the highest quality urban design through elements such as blocks, streets, variety in building heights, and building tops.

Streets and Blocks

Building on the framework established in the Small Area Plan, the Design Standard implement the recently approved plan by requiring specific street locations, right-of-way widths, and a hierarchy of streets to ensure the creation of pedestrian-oriented blocks. The street hierarchy ensures active uses and high-quality design on prominent pedestrian and vehicular streets and garage entrances, access to services and utilities on tertiary streets and in alleys.

Neighborhoods

As previously noted, a defining element of Alexandria is the distinct series of neighborhoods. The Design Standards build on this character defining element of the City by requiring the expression of three distinct neighborhoods - the Crescent Gateway, Market, and Metro Square neighborhoods. Through the development review process, the individuality of each neighborhood is required to be expressed through the architecture, design, and open space, which avoids repetition and reduces the perceived scale of the site.

Metrorail Station

The area surrounding the Metrorail station is anticipated to be one of the most important civic locations within Potomac Yard and also within the City. It is essential that the building forms be memorable, the civic spaces be high-quality, and the areas surrounding the Metrorail station function as an urban, pedestrian-oriented transit hub for the City. Although the final street and block configuration surrounding the Metrorail station has not yet been finalized, the Design Standards include criteria to ensure that the area surrounding the Metrorail station is a well designed civic amenity for the City.

Route 1

The Design Standards recognize the visual importance of Route 1 as a gateway to the City. As such, the Design Standards require a significant variation in height; active uses and entryways on the street frontage; and a larger landscaped setback to reinforce the importance of the street frontage and ensure consistency with the setback required in the remainder of Potomac Yard. A tall (180 feet), angled building is envisioned at the entrance to the City to create a distinctive building and open space form at the gateway. Similarly, taller buildings (90 feet) also demarcate the entry to the retail street, East Reed Avenue, on Route 1.

Land Uses

The Design Standards also specify the land use permitted on each block of North Potomac Yard to achieve an adequate mixture of uses and maximize specific land uses at strategic locations, such as adjacent to the future Metrorail station. The Design Standards also indicate the maximum development permitted for office, hotel, retail and residential uses, though provide flexibility in the square footage and location of office, residential, and retail uses.

The Design Standards establish required and permitted retail square footage on each block to provide a concentration of retail as well as ensure ground-level activity during the day and into the evening. In addition to location, the Design Standards include height, depth and service requirements to ensure that the retail areas can accommodate various retail tenants. The success of the retail is related to the quality of the storefront design as well as signage. As such, the Design Standards are intended to ensure high-quality storefronts and signage, while also enabling variation and creativity in each.

Building Form and Building Tops

An issue often discussed through the development review process is building scale, including elements such as variety in building height and building stepbacks. The Design Standards establish specific building massing requirements including a variation in height and building stepbacks, while also maintaining an urban density and height, particularly adjacent to the Metrorail station. Buildings adjacent to Crescent Park, as well as in the Flexible Metrorail Zone, are required to be curved to reinforce the special nature and location of these buildings as well as offer a variation in building form.

Building tops are an important element in defining the character and scale of a neighborhood. The Design Standards include specific criteria to ensure that building tops are architecturally distinctive and add visual interest to the City's skyline.

Building Design

The Design Standards are not prescriptive with regard to style, but rather require high quality materials and encourage creativity through the development review process. The Design Standards encourage variation in building design to reinforce the unique character of each neighborhood and require use of durable materials that can be appreciated as a component of the skyline and at the pedestrian level. As discussed previously, staff recommends that the Potomac Yard Design Advisory Committee review and provide recommendations on building design in North Potomac Yard as part of the development review process.

Building Heights

Consistent with the heights identified in the *North Potomac Yard Small Area Plan*, the applicant proposes heights which range from 25 to 250 feet. In general, the tallest heights are proposed in the center of North Potomac Yard to denote the symbolic center of the community. To respect the character of the residential neighborhoods located west of Route 1 as well as the memorial character of the George Washington Parkway, buildings step down in height from the center of the site to both Route 1 and the George Washington Parkway. Although the greatest heights are generally proposed in the center of the site, a variety of heights are proposed to demarcate gateways and points of interest as well as to create an interesting skyline for the City.

As the Crescent Gateway neighborhood is primarily residential, the scale of the neighborhood ranges from townhouse scale elements with heights of 30 feet at the street to larger multi-family buildings, with heights up to 250 feet. The tallest building, proposed on Block 2, is 250 feet in height and is designed to screen the electrical substation and provide a visual terminus for Main Line Boulevard. Heights proposed in the Market Neighborhood range in height from 20 feet at the street level to 250 feet in the center of the neighborhood, while heights within the Metro Square Neighborhood are approximately 90 to 110 feet due to Federal Aviation Administration height restrictions.

J. Public Benefits and Community Facilities

The major increase in density recommended in the *North Potomac Yard Small Area Plan* and proposed by the applicant significantly increases the value of the North Potomac Yard property. In addition to the increased density, the value of the property is amplified further with the construction of a Metrorail station. Due to the substantial increase in property value, staff believes that it is necessary for the applicant to provide and contribute to community facilities and services in North Potomac Yard.

Typical of most development projects, the applicant has agreed to construct the infrastructure necessary to serve the proposed development including the streets, streetscape, and related improvements; bus shelters; open space and associated amenities; utilities; and below-grade parking. The applicant has also agreed to provide high-quality architecture and comply with the City's Green Building Policy and to voluntarily follow the Affordable Housing Policy guidelines in place at the time of development special use permit approval.

In addition to this basic infrastructure, staff has requested and the applicant has agreed to contribute funding for the future Metrorail station and the high-capacity transitway, as well as provide improvements to existing intersections, install traffic calming in adjacent neighborhoods, and construct two transitway stations. Furthermore, staff has requested and the applicant has agreed to provide the following:

- Secondary sanitary sewer conveyance, as required by the Department of Transportation and Environmental Services;
- Upgrades to stormwater facilities and provision of pervious paving for parallel parking spaces and sidewalks;
- Improvements to Four Mile Run, including bridge improvements, slope stabilization, landscaping, and construction of amenities as recommended in the Four Mile Run Master Plan and Design Guidelines;
- Access to amenity space on the top floor of a building constructed on Block 2 to the City as well as community and non-profit organizations several times each year to ensure public enjoyment of the viewshed.
- A live performing arts theater within the Metro Square Neighborhood;
- Land for the construction of an urban elementary school; and
- Additional cultural and civic use space, such as a day care facility, a recreation and community center, or similar civic uses.

The staff recommendations require the applicant to reserve Block 4, located on the western side of the site near Crescent Park, for the construction of a new Alexandria City Public School or comparable school facility. The applicant has agreed to contribute $15 million toward the construction of this new school facility. The school facility is envisioned as an urban school, with either residential units or office located on the upper floors. While the school facility is required to comply with the *North Potomac Yard Urban Design Standards*, the school and any accessory uses required are not deducted from the maximum square footage permitted within the

Coordinated Development District (CDD). In the event the City elects not to construct a school on the site, a community facility, public building or comparable use may be located on Block 4.

K. Affordable Housing

With the level of increased density proposed in the CDD, it is possible that approximately 4,500 new residential units will be produced in North Potomac Yard to complement planned commercial, retail, office and other uses as the 70-acre tract is built out to realize the City's vision of a mixed use, transit-oriented urban community. To ensure the long term sustainability of North Potomac Yard's redevelopment, it is critical that a range of housing choices be available for households of diverse age, size, composition and income. To this end, and given the anticipated scale of overall residential development, the City's goal is to secure a substantial number and variety of affordable housing options, including public housing and both affordable and workforce rental and sales housing throughout the CDD area.

While urban design and high-rise construction present first-cost challenges in achieving the level of efficiency required to produce affordable housing, incorporating green features and resource-efficient appliances, systems and infrastructure will yield long term savings which benefit for residents of public, affordable and workforce housing. Locating housing that is affordable to potential employees of the commercial, retail, office and other uses within North Potomac Yard will not only lessen traffic congestion in the immediate area, but will provide a consumer base within walking distance for neighborhood serving retail and service businesses.

To achieve affordability across a diverse mix of housing types, the City will work closely with developers and with the community as specific development plans are brought forward and reviewed through the development special use permit process to ensure significant components of public, affordable and/or workforce housing are provided in new developments throughout North Potomac Yard.

In addition to mixed income developments, which incorporate affordable set aside sales or rental units along with market rate units (in the case of rental units, the affordability is typically committed for a specified term, such as 30 years) when feasible, public-private collaborations may offer a mechanism to efficiently leverage land and both City and non-City resources to underwrite costs associated with producing affordable housing, to increase the potential yield of subsidized units.

At its discretion the City may choose to apply future developer contributions to produce and/or acquire units within the CDD area. The applicant has indicated its willingness to provide public, affordable and/or workforce housing on site within the residential development of North Potomac Yard. As noted in the staff recommendations, the City retains the discretion to select the proportion of the monetary contribution and the proportion of dedicated on-site units, including the mixture of public, affordable and/or workforce units. Public, affordable and/or workforce units provided on-site are credited toward the overall voluntary affordable housing contribution.

Based on the current guidelines for developer affordable housing contributions1, as adjusted for CPI-U, and the planned (gross square footage) future build out envisioned in the CDD, the funds potentially available for affordable housing purposes through contribution may exceed $20 million.

L. Street Names

With this application, staff requests that the Planning Commission officially designate five streets within North Potomac Yard. While designation of streets typically occurs with development special use permits, staff recommends naming the streets with the Coordinated Development District as development of North Potomac Yard is likely to occur over a number of years and similar to infrastructure in Potomac Yard, many streets may be constructed in advance of development at the block level.

The following street names are proposed due to either historical significance to Potomac Yard or to intentionally identify elements of the North Potomac Yard site design. City Departments, including Planning and Zoning, the Department of Building and Fire Code Administration, and the Police Department, have reviewed the proposed street names for originality, context and to eliminate possible duplication of existing street names in the City. The proposed street names are in compliance with the City Code, which requires that streets in an eastward direction be designated as avenues and streets in a north-south direction be designated as streets. The City Code further indicates that streets may be designated as "place" when the Planning Commission is of the opinion that the use of such name is more desirable.

- Street "A" from Route 1 to Crescent Park: Livingstone Avenue
- Street "A" along curve of Crescent Park: Capitol Crescent Place
- Street "B": Tide Lock Avenue
- Street "C" : Silver Meteor Avenue
- Street "D": Aqua Street

The following paragraphs provide a brief justification of the street names proposed.

Livingstone Avenue and Capitol Crescent Place

At the request of both the Department of Building and Fire Code Administration and the Police Department, new street "A" was divided into two separate street names: Livingstone Avenue and Capitol Crescent Place. Proposed to recall the rail history of North Potomac Yard, the David Livingstone was a Pullman railroad car named after the famous explorer.

[1] Voluntary contributions are usually satisfied through the provision of cash to the City's Housing Trust Fund and/or through provision of set aside units as a set off to the monetary contribution based on a mutually agreeable valuation formula depending on the unit type and size and or the affordability term.

Capitol Crescent Place is proposed to recall the rail history as well as relate to the site design in North Potomac Yard. The Southern Crescent, a passenger service train which passed through Potomac Yard, is a genesis for the "Crescent Gateway" neighborhood and the Crescent Park. Capitol Crescent Place is proposed due to the location of the street adjacent to the crescent-shaped park and the views of the Nation's capitol from this location.

Tide Lock Avenue

The Alexandria Canal, located in Potomac Yard, was critical in commercial navigation on the Potomac River. The Canal consisted of four locks, often known as tide locks, which lifted canal boats from the Potomac River to the level of the canal.

Silver Meteor Avenue

The Silver Meteor is an Amtrak passenger train route operating between New York City and Miami, Florida. Originally, the Silver Meteor was a train placed in service in 1939 which operated on the Richmond, Fredericksburg and Potomac Railroad through Potomac Yard.

Aqua Street

Aqua Street is proposed to relate to the site design and recall the innovative and integrated stormwater management features envisioned in the infrastructure, including streets and sidewalks, in North Potomac Yard.

V. COMMUNITY

As noted in the *North Potomac Yard Small Area Plan*, significant community outreach occurred during the development of the Plan as well as the Coordinated Development District Conceptual Design Plan. The Potomac Yard Planning Advisory Group (PYPAG) was established in October 2008 to provide guidance to staff on the Small Area Plan and associated development. PYPAG, as well as PYPAG subcommittees, met regularly for nearly a year and a half to discuss issues including land use, urban design, building height, transportation, sustainability and many other issues identified in the Small Area Plan. The public was invited to attend each PYPAG meeting, as well as PYPAG subcommittee meetings.

In addition to PYPAG meetings, staff also held two community workshops, met with civic leaders and associations throughout the northeastern portion of the City and had several work sessions with both Planning Commission and City Council.

VI. CONCLUSION

Staff recommends **approval** of the Coordinated Development District Conceptual Design Plan and associated applications subject to compliance with the *North Potomac Yard Small Area Plan*, *North Potomac Yard Urban Design Standards*, all applicable codes and the following staff recommendations.

Staff: Mark Jinks, Deputy City Manager;
Faroll Hamer, Director, Planning and Zoning;
Jeffrey Farner, Deputy Director, Planning and Zoning;
Helen McIlvaine, Deputy Director, Housing;
Gwen Wright, Chief, Development;
Rich Baier, Director, Transportation and Environmental Services;
Emily Baker, City Engineer;
James Maslanka, Chief, Transit Services;
Patricia Escher, Principal Planner;
Kristen Mitten, Urban Planner;
Jessica McVary, Urban Planner;
Sandra Marks, Chief, Transportation;
Matt Melkerson, Engineer;
Maria Mercedes White, Transportation Planner;
Pierre Holloman, Urban Planner;
Claudia Hamblin-Katnik, Watershed Program Administer;
Daniel Imig, Civil Engineer;
Satya Singh, Civil Engineer;
Daphne Kott, Civil Engineer
Bethany Carton, Park Planner.

VII. STAFF RECOMMENDATIONS

A. GENERAL

1. CPYR, Inc., a Delaware corporation, hereafter referred to as "the Applicant", has submitted various documents relating to its application for approval of a rezoning, a Transportation Management Plan (TMP), CDD Conceptual Design Plan and associated approvals for the North Potomac Yard Coordinated Development District (CDD#19). All documentation submitted by the Applicant, other than the CDD Conceptual Design Plan noted below, shall be considered background or informational and is not included in the CDD Conceptual Design Plan that is being recommended for approval with conditions. The following conditions are for the approximately 69 acre property that was previously designated Landbay F within CDD#10 - Potomac Yard/Potomac Greens. The document submitted by the Applicant (sheet 4 of 5) entitled "Overall Plan – Potomac Yard North Conceptual Design Plan", dated October 15, 2009, revised April 28, 2010 is the CDD Conceptual Design Plan submitted for approval subject to the following conditions. (P&Z)

2. The conditions of this approval are binding upon the Applicant, its successors and/or assigns. (P&Z)

3. Each block(s) and/or park(s) and/or building(s) shall obtain approval of a Development Special Use Permit (DSUP) and any other applicable approvals. A DSUP may be submitted for a portion of a block when an applicant can provide sufficient information regarding the location, approximate size, type, uses, open space, parking, loading access and additional information as needed for the remainder of the block and adjoining blocks, streets and open space to the satisfaction of the Directors of P&Z, RP&CA and T&ES. Any subsequent use amendments to an approved DSUP for a park shall be done through the Special Use Permit (SUP) process. (P&Z)

4. Any infrastructure plans, preliminary development site plan(s), development special use permit(s) and/or special use permit(s) (hereinafter referred to collectively as a DSUP) for the CDD, filed pursuant to § 5-605 of the Zoning Ordinance, shall be consistent with, and shall meet all requirements which are part of the CDD Conceptual Design Plan, conditions contained herein, and all applicable provisions of the following:
    a. The *North Potomac Yard Small Area Plan*;
    b. The *North Potomac Yard Urban Design Standards*, dated May 24, 2010 (see attached); and
    c. The Transportation Management Plan (TMP). (P&Z)

5. At least 120 days prior to submitting a preliminary DSUP application, unless otherwise waived by the Director of P&Z, the Applicant shall submit a conceptual DSUP for review by the City for each block(s), building(s) and/or park(s) within CDD#19. (P&Z)

6. Notwithstanding any contrary provisions in the Zoning Ordinance, the North Potomac Yard CDD Conceptual Design Plan (CDD#19), shall remain valid until June 12, 2035. (P&Z)

B. CDD CONCEPTUAL DESIGN PLAN

7. The Applicant shall submit a revised CDD Conceptual Design Plan within 90 days from June 12, 2010 for administrative review and approval by the City. The CDD Conceptual Design Plan shall be revised to:
    a. Provide the following note on the plan: "The final alignment of Potomac Avenue adjacent to the Flexible Metrorail Zone shall be subject to the alignment approved within the Flexible Metrorail Zone to coordinate with the location and street section depicted in the *North Potomac Yard Urban Design Standards*;
    b. Remove the entire roadway depicted between Crescent Park and Block 2;
    c. Depict and label how the required 15% ground-level open space (10.36 acres min) exclusive of stormwater features/ponds shall be provided for the site;
    d. Remove the right-of-way dimensions from Route 1. The final right-of-way dedication shall be determined with the final engineering of Route 1 subject to the conditions herein;
    e. Revise development use floor areas to be consistent with the development summary table (Table #3) required herein; and
    f. Re-label Landbays I – IV as (1) Crescent Gateway Neighborhood, (2) Market Neighborhood, (3) Metro Square Neighborhood and (4) Potomac Yard Park. (P&Z)

8. Flexible Metrorail Zone: The Applicant shall submit a revised CDD Conceptual Design Plan to finalize the location of the streets and blocks and other applicable elements defined herein, within the Flexible Metrorail Zone, as depicted within the *North Potomac Yard Small Area Plan*, which shall be approved by the Planning Commission and City Council. The revised CDD Conceptual Design Plan shall be submitted:
    a. Prior to filing any application for development within the Flexible Metrorail Zone; or
    b. Within 90 days of a written request by the City in order to facilitate the design and layout of the Metrorail station and associated planning and design. The revised CDD Conceptual Design Plan shall comply with the CDD conditions of approval herein, the *North Potomac Yard Urban Design Standards* and the following:
        i. An approximately 0.70 acre square-shaped park shall be centrally located within the Flexible Metrorail Zone. The park shall be surrounded on all sides by streets, and framed by buildings on each side;
        ii. Potomac Avenue (new alignment) shall align and connect to the Potomac Avenue right-of-way south of CDD#19 and to the final alignment of the Potomac Avenue (new alignment) right-of-way to the north of the Flexible Metrorail Zone;
        iii. Maintain the overall curvilinear nature of Potomac Avenue (new alignment);

iv. The shape of the buildings in plan and form within the Flexible Metrorail Zone shall create distinct and memorable three dimensional forms;
v. Pedestrian bridge(s) within the Flexible Metrorail Zone that access the Metrorail station shall be fully integrated into the design for the Metrorail station, adjoining buildings, and open space;
vi. The alignment of Potomac Avenue (new alignment) shall be such that Potomac Yard Park (Landbay K extension) is continuous;
vii. Development blocks, east of Potomac Avenue, shall be a sufficient size for market-acceptable building floor plates;
viii. The streets shall be configured to accommodate transit and transit stations.
ix. The streets shall be configured to provide a fine-grained interconnected street grid network and spacing consistent with and connecting to streets outside the Flexible Metrorail Zone;
x. Evans Lane shall connect from Main Line Boulevard to Potomac Avenue (new alignment) to accommodate bicyclists and pedestrians. In addition, a vehicular connection is strongly encouraged to maximize access to the Metrorail station; and
xi. New Street "D" / Aqua Street shall connect from New Street "A" / Capitol Crescent Place to Wesmond Drive. (P&Z) (T&ES)

C. NORTH POTOMAC YARD URBAN DESIGN STANDARDS

9. All DSUP applications, buildings and structures within CDD#19, shall be reviewed by the Potomac Yard Design Advisory Committee (PYDAC) for compliance with the *North Potomac Yard Urban Design Standards*. PYDAC shall make a recommendation on such applications to the Planning Commission and City Council through the Director of P&Z. (P&Z)

10. All streets, blocks, sidewalks, building forms, building volumes, building heights, parking, screening of parking, retail design, signage, open space and associated elements shall comply with the *North Potomac Yard Urban Design Standards*. Any variation from the standards shall require approval by the City Council as part of the DSUP or associated approval application(s). Any variation(s) from the Standards shall also include a recommendation from the Potomac Yard Design Advisory Committee (PYDAC) and Planning Commission regarding the proposed variation(s). (P&Z)

D. DEVELOPMENT PHASING

11. **Phase I - Pre-Development:** DSUPs and/or associated applications shall not be submitted to the City for review until all of the conditions contained herein regarding submissions and improvements required prior to development have been completed. (P&Z)

12. **Phase II - Development Preceding the Metrorail Station:** A maximum of 2.0 million sq.ft of development (inclusive of the retail center in existence as of June 12, 2010) in CDD#19, shall be permitted in advance of the commencement of construction of a

Metrorail station located within or adjacent to CDD#19, provided that the development complies with the conditions required herein and the following:

a. Redevelopment shall be limited to Blocks 7-23 as generally depicted in Attachment #1.
b. A minimum density of 500,000 sq.ft. of contiguous (exclusive of public street right-of-ways) new development (exclusive of the retail center in existence as of June 12, 2010) shall be constructed concurrently, in one or more building(s).
c. The remaining Phase II Development shall be contiguous (exclusive of public street right-of-ways) to the initial 500,000 sq.ft. of development.
d. The development of contiguous (exclusive of public street right-of-ways) building(s) shall be done in a manner that facilitates the development and improvements for each side of the public street(s) and adjacent park(s).
e. If retail square footage in existence as of June 12, 2010 is proposed to be redeveloped, such retail square footage shall be replaced on a one-for-one basis with new retail development.
f. To the maximum extent practical, any development of retail square footage adjacent to Landbay G shall be designed in a manner that connects to the existing retail and the retail planned for Landbay-G. This condition may involve temporary pedestrian and/or street connections and/or other comparable improvements as deemed necessary by the Directors of P&Z and T&ES. (P&Z) (T&ES)

13. **Phase III – Development Concurrent with Metrorail Station Construction:** In the event that bond financing has been issued for purpose of constructing the Metrorail station, and the Metrorail station has commenced construction as determined by the Directors of P&Z and T&ES, a maximum of 3.7 million sq.ft. of contiguous development (inclusive of the retail center in existence as of June 12, 2010 and Phase II as defined herein) in CDD#19 ("Phase III Development"), shall be permitted in advance of the commencement of operation of the Metrorail station, provided that the development complies with the intent and recommendations of the *North Potomac Yard Small Area Plan*, the applicable zoning requirements herein, the *North Potomac Yard Urban Design Standards* and the following:

a. Development shall be limited to Blocks 7-23 as generally depicted in *Attachment #1*.
b. The development shall be contiguous (exclusive of public street right-of-ways) to the Phase II building(s) and shall be done in a manner that facilitates the development and improvements for each side of the public street(s) and adjacent park(s).
c. A minimum of 500,000 sq.ft. of the new development shall be office use, subject to the final design of the Flexible Metrorail Zone.
d. While a building(s) and/or block(s) shall be permitted to obtain preliminary DSUP approval and associated approval(s) by the Planning Commission and City Council prior to of the issuance of bond financing for the Metrorail station, as defined herein, a final site plan and/or permits for construction shall not be released by the City until the construction of the Metrorail station has been funded by the issuance of bonds, and construction of the Metrorail station has

commenced as determined by the Directors of P&Z and T&ES. If the Directors deem the Metrorail station has substantially commenced construction and the necessary bond financing has been issued, a memorandum shall be submitted to the Planning Commission and City Council, providing notification that the issuance of the bonds has been completed and the City has made a determination of substantial construction as defined herein. (P&Z) (T&ES)

14. **Phase IV – Development Once Metrorail Station is Operational:** Development shall be limited to blocks which are located within a ¼ mile radius of the proposed Metrorail station as generally depicted in *Attachment #1*. Once a total of 4.9 million sq.ft. of development has been constructed within a ¼ mile radius of the proposed Metrorail station as defined herein, the remainder of the block(s) may be permitted to construct the remainder of the development within CDD#19 subject to the applicable zoning conditions, a DSUP and other applicable requirements.

15. **Development if No Metrorail Station:** If the City determines in the future or by January 1, 2018, that a new Metrorail station is not feasible, and if the high-capacity transitway is fully functional, then the applicant may be permitted to construct 3,100,000 sq.ft. of new floor area, in addition to the 600,000 sq.ft. of floor area in existence as of June 12, 2010, subject to a future public planning process and contingent on all conditions and requirements as part of the future planning, zoning and development processes. (P&Z)

E. INFRASTRUCTURE

16. **Pre-Development Dedications/Agreements:** Within 90 days of June 12, 2010, the Applicant shall submit the necessary plans and documentation and shall within six months from June 12, 2010 dedicate to the City or as otherwise directed by the City, in fee simple or by easement the following:
    a. ***Sidewalk Trail Easement:*** A 6 ft. wide public access easement and access for any associated grading outside of the easement to the west of the existing western Potomac Avenue right-of-way line for a sidewalk-trail and associated improvements. The easement shall be from East Glebe Road to Landbay E, within CDD#19, to the satisfaction of the Directors of T&ES and P&Z. The easement shall be vacated by the City once Potomac Avenue (new alignment) and New Street "D"/ Aqua Street have been constructed and are operational.
    b. ***Circulation Agreement:*** A written agreement shall be made between the Applicant and the City to permit buses, pedestrians and vehicles on the following drive aisles and adjoining sidewalks as generally depicted in *Attachment #2* to the satisfaction of the Directors of T&ES and P&Z.
    c. ***Interim Route 1 Right-of-Way Dedication:*** Dedicate the necessary amount of right-of-way on the eastern side of Route 1, from the southern CDD#19 boundary to Evans Lane, to accommodate a smooth right-of-way transition on Route 1 from Landbay G to CDD#19, as generally depicted in *Attachment #3*.
    d. ***Pond 2 Maintenance Agreement:*** The applicant shall submit a BMP maintenance agreement to the City to share in the maintenance of Pond 2. The agreement shall remain in place and valid so long as Pond 2 is in operation. (P&Z) (T&ES)

17. **Pre- Development Improvements:** The Applicant shall make the following improvements prior to any development within CDD#19:
    a. ***Traffic Control Modification:*** Prior to the opening of the current alignment of Potomac Avenue, the Applicant shall modify or permit the City to modify the existing intersection of East Reed Avenue and the loading/delivery roadway east of the shopping plaza buildings by removing the stop signs from the eastbound and westbound approaches to the intersection.
    b. ***Landbay G, Block D Access Improvements:*** Within 60 days of the owner of Landbay G, Block D obtaining a final site plan release for the hotel development on Block D, the Applicant shall submit a site plan for administrative approval by the City to provide access easements / written agreements and drive aisles for Block D as generally depicted in *Attachment #4*. Prior to release of the building permit for Block D, the Applicant shall grant the necessary easements / execute the written agreements and construct all necessary improvements required by the City.
    c. ***Main Line Boulevard Connection:*** Within six months of June 12, 2010, the Applicant shall submit a site plan for administrative approval by the City providing a temporary pedestrian and vehicular connection between Main Line Boulevard, at the southern property line of CDD#19 (adjacent to Landbay G), to connect to the existing north/south drive aisle, in front of Target as generally depicted in *Attachment #5*. Within 12 months of June 12, 2010, the Applicant shall begin and diligently pursue until completion, construction of this temporary Main Line Boulevard connection and shall provide all necessary public access easements and agreements upon completion of construction. (P&Z) (T&ES)

18. **Infrastructure, Use & Open Space Plan Submission Requirements** – The Applicant shall submit an Infrastructure, Use & Open Space Plan for review and approval of the Directors of P&Z, RP&CA and T&ES at least 120 days prior to submitting a preliminary DSUP for the development of any block in CDD#19. The Infrastructure, Use & Open Space Plan shall provide the following:
    a. The plan shall include horizontal and vertical profiles for the streets, sanitary sewers, and storm sewers; and shall include all horizontal locations and cross sections for the water lines. The plan shall also include cross sections, construction details, and any other concept design elements identified as necessary by the Director of T&ES;
    b. Depict the new Route 1 right-of-way line necessary to accommodate the Route 1 cross-section (including sidewalks and landscape strips) in the *North Potomac Yard Urban Design Standards*;
    c. Depict the rough grading of the blocks and parks/open space;
    d. Depict all open spaces within the CDD, whether public or private, that are described in the CDD Conceptual Design Plan including programming, active and passive recreation components, utilities and park infrastructure; and
    e. Depict the general locations within the CDD of the uses identified in the CDD Conceptual Design Plan and the anticipated community facilities. (P&Z) (T&ES) (RP&CA)

19. **CDD Phasing Plan** - The Applicant shall submit a CDD Phasing Plan with the first preliminary DSUP and shall update the Phasing Plan concurrently with each subsequent DSUP submission. The Phasing Plan shall be subject to the following to the satisfaction of the Directors of P&Z, T&ES and RP&CA:
    a. Provide, for the entire CDD, a general outline of the site and the Applicant's most up-to-date projection of the dates when construction of the different land uses (i.e., office, retail, hotel, residential, open space and community facilities) for each block shall commence;
    b. Provide, for infrastructure identified below in this subparagraph: (1) the general location and layout of the major components of the infrastructure (such components to be determined by the Director of T&ES), and (2) the dates when construction of the infrastructure shall commence (provided, that the projected dates for the commencement of construction of these components shall be consistent with the triggers noted herein). The infrastructure to be provided shall include:
        i. The street layout;
        ii. Transitway corridors and stations;
        iii. The sanitary sewer system and pump station;
        iv. The stormwater management system;
        v. The utility systems to be constructed within the CDD (e.g., electricity, water, gas, phone/communications and cable); and
        vi. The off-site improvements.
    c. Parks/Open Space - Depict and label for each park/open space area required by the conditions herein: (a) the proposed size and location of the park/open space, and (b) the time frame when construction of the improvements to the park/open space is required and/or projected to commence;
    d. Environmental Sustainability – Provide the timeframe when construction for each system, program or component, identified in the most current Environmental Sustainability Master Plan required herein, is required and/or projected to commence;
    e. Circulation – Provide a circulation plan depicting the temporary pedestrian, bicycle and vehicular circulation during the different construction phases. The plan shall identify temporary sidewalks, fencing around the site and any other features necessary to ensure safe pedestrian and vehicular travel around the site during construction and during the phasing of the development, including methods for constructing the underground parking garages without disturbing pedestrian access from completed portions of the project;
    f. Community Facilities – Depict the location and approximate size for all proposed community facilities throughout the CDD as required herein;
    g. School - Depict and label the block reserved for the possible school as defined herein;
    h. Minimum Performance Standards - The Phasing Plan shall comply with the following criteria:
        i. At all times maintain a continuous, uninterrupted Potomac Avenue with two vehicular travel lanes in each direction from the southern terminus of CDD #19 to the northern terminus of CDD#19.

ii. At all times maintain at least one continuous east/west street in CDD#19 that connects Route 1 to Potomac Avenue. This east/west street shall allow full turning movements at both the Route 1 and Potomac Avenue intersections.
iii. At all times maintain a continuous north/south and continuous east/west bicycle connections through CDD#19.
iv. Sidewalks and street lights as required by the *North Potomac Yard Urban Design Standards* shall be provided on both sides of any new roadway prior to dedication to the City. Prior to development temporary sidewalks shall be required.
v. Adequate circulation capacity shall be maintained for each block and/or phase of development for construction, resident and tenant traffic.
vi. Stormwater treatment shall be provided at all times throughout the redevelopment for drainage areas formerly directed to Pond 2 at a minimum efficiency of 50%.
vii. Safe and convenient access and circulation shall be provided for bicycles and pedestrians through all phases of development.

i. A DSUP shall not be docketed for Planning Commission until the Directors of P&Z, T&ES and RP&CA have approved the CDD Phasing Plan which accompanies the DSUP application(s); and
j. Notwithstanding the above, The Applicant, at its discretion, may submit an updated CDD Phasing Plan from time to time for administrative review and approval by the Directors of P&Z and T&ES; provided, that no such submission shall relieve the Applicant of the requirement that it submit an updated CDD Phasing Plan with each DSUP application that seeks approval of one or more buildings or structures within the CDD. (P&Z) (T&ES) (RP&CA)

20. **Development Phasing Triggers** - During the development of CDD#19, the following infrastructure shall be provided and/or constructed by the Applicant in accordance with the following. The development referenced herein includes all cumulative development within CDD#19:

a. ***Potomac Avenue (new alignment):*** The Applicant shall construct and have the entire length of Potomac Avenue operational prior to the earliest of:
i. The Metrorail station opening to the public;
ii. The issuance of the first Certificate of Occupancy permit for the first building in the Flexible Metrorail Zone;
iii. Prior to the first Certificate of Occupancy permit for 2.0 million sq.ft. of development within CDD#19; or
iv. As determined by site phasing.
b. ***Evans Lane:*** The entire length shall be constructed and operational prior to the Metrorail station opening or as determined by site phasing, whichever is earlier.
c. ***East Reed Avenue:*** Entire length shall be constructed and operational prior to issuance of the second Certificate of Occupancy permit on East Reed Avenue or as determined by site phasing, whichever is earlier.
d. ***New Street "C" / Silver Meteor Avenue:*** Entire length shall be substantially constructed and operational at 1.5 million sq.ft. of development within CDD#19

and shall be entirely completed prior to the first Certificate of Occupancy permit for 2.0 million sq.ft. of development within CDD#19, or as determined by site phasing, whichever is earlier.

e. ***Route 1 between East Glebe Road and New Street "C" / Silver Meteor Avenue:*** Shall be substantially constructed and operational at 1.5 million sq.ft. of development within CDD#19 and shall be entirely completed prior to the first Certificate of Occupancy permit for 2.0 million sq.ft. of development within CDD#19, or as determined by site phasing, whichever is earlier.

f. ***East Glebe Road / Route 1 Intersection Improvements:*** Prior to the first Certificate of Occupancy permit for 2.0 million sq. ft of development within CDD#19, the Applicant shall make improvements to the eastbound approach at the intersection of Route 1 and East Glebe Road to provide an exclusive left-turn lane, through lane, and right-turn lane in the eastbound direction. The Applicant shall be responsible for all necessary improvements. The improvements at a minimum shall include right-of-way acquisition, design, signal modification, street and sidewalk construction, and improvements to the satisfaction of the Director of T&ES. The applicant shall coordinate with the City on the right-of-way acquisition.

g. ***Route 1 from New Street "C" / Silver Meteor Avenue to Four Mile Run:*** Shall be completed prior to the first Certificate of Occupancy permit for 2.0 million sq.ft. of development within CDD#19.

h. ***Transitway Stations:*** Prior to the first Certificate of Occupancy permit for 2.0 million sq.ft. of development within CDD#19, the Applicant shall construct a permanent transitway station on Route 1 and an interim transitway station near the Metrorail station which shall be operational until such time as the 2nd permanent transitway station is constructed concurrently with the development of the receiving block or the Metrorail station.

i. ***Route 1 / East Reed Avenue Intersection:*** Prior to the first Certificate of Occupancy permit within CDD#19 the Route 1 / East Reed Avenue intersection shall be improved to allow full vehicle movements through the intersection.

j. ***TMP District:*** The Applicant shall comply with all applicable TMP conditions, including a TMP District. This district shall be designed to meet the trip reduction goals outlined in the transportation analysis associated with CDD#19.

k. ***Public Parks:***
    i. Metro Square and Market Common parks shall be improved and dedicated to the City prior to the first Certificate of Occupancy permit for the second building with block frontage on the park.
    ii. Crescent Park shall be improved and dedicated to the City once the stormwater management pond in the park has been completed or the first Certificate of Occupancy permit for the second building constructed on Blocks 2, 3 or 5, whichever is earlier.
    iii. Four Mile Run Improvements – Unless the City accepts a fee-in-lieu agreement and contribution from the Applicant as defined herein, Four Mile Run shall be improved by the Applicant and dedicated to the City once the stormwater management pond in Crescent Park has been

completed or the first Certificate of Occupancy permit for the second building constructed on Blocks 2, 3 or 5, whichever is earlier.

iv. Potomac Yard Park (initial phase) - Potomac Yard Park and any required re-design of the existing Landbay K plan north of East Glebe Road shall be fully designed concurrently with Potomac Avenue (new alignment), however only the initial phase (including the trail, utilities, lights, benches, street trees, interim landscaping and any stormwater infrastructure associated with the elimination of Pond 2) shall be required to be constructed, operational and accepted by the City concurrent with the acceptance of Potomac Avenue (new alignment).

v. Potomac Yard Park (final improvements) – Prior to 3.7 million sq.ft. of development in CDD#19, Potomac Yard Park shall be fully constructed by the Applicant and accepted by the City. The park shall be dedicated to the City upon acceptance, excepting the portion of Potomac Yard Park within the area in and around the potential Metrorail station reservation. This area shall be dedicated once the Metrorail station is fully constructed. A public access easement shall be recorded for this portion of the Park at the time of dedication for the remainder of the park.

l. ***Sewer Contribution:*** Prior to the issuance of a Certificate of Occupancy permit for 2.0 million sq.ft. of development, the Applicant shall submit a contribution of $250,000 to be adjusted annually by the CPI-U for each year beyond 2010. This contribution was estimated to be 21% of the current cost of engineering design and construction of parallel relief sewers to alleviate the problem of surcharging in the 30" Potomac Yard Off-Site Trunk Sewer. The contribution shall be made payable to the City of Alexandria.

m. ***School Site:*** Community Facility (Block 4) shall be dedicated to the City prior to the earliest of:

i. The dedication of three of the four surrounding streets to the City;

ii. The City has made provisions to plan and/or build a school, community facility, public building or comparable facility and a formal written request is submitted by the City to the Applicant; or

iii. Earlier than the provisions defined above, if an agreed upon date is reached by the City and the Applicant.

n. ***Neighborhood Traffic Calming Plan:*** shall be evaluated and designed with each DSUP submittal and all improvements shall be fully implemented prior to the first Certificate of Occupancy permit of the associated DSUP.

o. ***Permanent Streetscape Improvements:*** (including streetside bioretention) shall be installed on all frontages of a given block prior to the Certificate of Occupancy permit for each block/building or additional requirements as may be required throughout the DSUP process. (P&Z) (T&ES) (RP&CA)

21. The Directors of T&ES, RP&CA and P&Z may require that infrastructure, open spaces, land uses and other matters outside the Landbay and/or block deemed necessary to review a preliminary DSUP application also be shown and addressed in the application. (P&Z) (T&ES) (RP&CA)

22. The Applicant shall coordinate, to the extent necessary, with adjacent property owners on the design of streets, parks-open spaces, sewer systems and other related infrastructure and construction. (P&Z) (RP&CA) (T&ES)

23. The Applicant shall be responsible for dedicating all necessary rights-of-way and/or public access easement(s) as required herein. Where a public access easement is provided for streets and/or sidewalks, the easement(s) shall be a perpetual public access easement for vehicles and/or pedestrians. Any privately owned open space areas, required to be accessible to the public, shall have a perpetual public open space easement. Construction of all required infrastructure and open space improvements shall be completed in accordance with the dates or events required herein. (P&Z) (T&ES)

24. **FAA:** The Applicant shall obtain approval(s) from the Federal Aviation Administration (FAA) and all other applicable Federal and/or State agencies for all block(s), building(s) or portions thereof subject to the applicable FAA height restrictions prior to the release of the final site plan. The Applicant shall provide to the Directors of P&Z and T&ES a written statement and/or approval by all applicable Federal and/or State agencies that the all block(s), building(s) or portions thereof that are subject to the applicable FAA height restrictions are not a hazard to air navigation or that the project does and is in compliance with all other applicable FAA requirements and/or recommendations. If the FAA and all other applicable Federal and/or State agencies require revisions and/or modifications, the modifications may require subsequent approval by the City Council, if the Director of P&Z determines that the amendments are substantively different that what was approved by City Council. (P&Z)

25. The Applicant shall submit the following with the first preliminary DSUP and shall update each of the following, as necessary, with all subsequent preliminary DSUP submissions:
    a. A CDD Phasing Plan;
    b. A Transportation Study which shall include:
        i. Transportation Management Plan (TMP);
        ii. Neighborhood Traffic Calming Plan and Neighborhood Traffic Analysis; and
        iii. Parking Management Plan.
        iv. Findings in the transportation study may require the design and construction of transportation infrastructure relating to the specific impacts of the preliminary plan submittal.
    c. Environmental Sustainability Master Plan (ESMP);
    d. Comprehensive Open Space Programming Plan;
    e. Public Art & Historic Interpretive Plan;
    f. Water Management Master Plan;
    g. A Noise Study, if residential development is adjacent to Route 1 or Potomac Avenue;
    h. A tracking sheet with the running totals for proposed/approved development floor area by use, open space within each block, and the status of each proposal within the CDD to depict compliance with the development triggers; and

i. A tracking sheet showing the cumulative totals for metered sanitary flows for each occupied building in the CDD. The tracking sheet shall consist of a table denoting a building designation, the Sewage Collection and Treatment (SCAT) Regulations, December 4, 2003 projected design discharge, 70% of the SCAT projected discharge, and the actual metered discharge for each occupied building within the CDD. Also included within the table shall be a running total of the CDD's sanitary discharge. Each preliminary and final site plan shall include the SCAT projected design discharge and 70% of the SCAT projected discharge for the proposed development as well as the current metered CDD's total discharge rate. The flow data shall be presented in mgd (million gallons per day and shall be based on a six month daily average. As a back up information, the metered data shall be provided in tabular and graphical forms including the depth, velocity, and volume of flow with summarized findings. (P&Z)(T&ES)(RP&CA)

F. METRORAIL STATION

26. The Applicant shall fund the construction and assist in the coordination of a new Potomac Yard Metrorail station subject to the conditions contained herein. In addition, the Applicant shall be subject to the terms and conditions set forth in the planned Memorandum of Understanding between the City and the Owner ("MOU") and as may be amended by agreement of the City and the Applicant. The Applicant shall actively cooperate and coordinate with the City, WMATA, and all applicable local, State and Federal agencies and departments to complete and obtain all necessary approvals and processes which are necessary to construct and operate the Potomac Yard Metrorail station. Permitting, design, construction, and payment of debt service on the Potomac Yard Metrorail station will utilize a separate segregated fund, controlled by the City and known as the Potomac Yard Metrorail Station Fund (the "Station Fund") into which the various funds described below will flow and from which they will be disbursed by the City.

a. **Developer Contributions:** The Applicant shall make developer contributions of Ten Dollars ($10.00) per square foot of gross floor area (net of above-grade structured parking) for all construction within Blocks 7, 8, 9, 10, 11, 12, 14, 15, 16, 17, 18, 20, 21, 22 and 23 as depicted on *Attachment #1*, payable concurrently with issuance of each Certificate of Occupancy permit for such building. Developer Contributions shall not exceed $49,000,000 in 2010 dollars. The $10.00 per square foot Developer Contribution shall escalate annually on January 1 of each year, commencing January 1, 2011, in accordance with increases in prior years in the Consumer Price Index for all urban consumers (CPI-U), 1982-1984=100 (not seasonally adjusted) as reported by the United States Department of Labor, Bureau of Labor. The base CPI shall be set as of the date of the rezoning and shall be adjusted as of the first day of January each year thereafter, and the resulting adjusted Developer Contributions per square foot amount shall be in effect for that calendar year. The terms and conditions of the payment of this Developer Contribution shall be detailed in the planned Memorandum of Understanding between the City and the Applicant.

b. **Shortfall Guaranty Contribution**: In connection with the projection of up to $275,000,000 in bond financing anticipated to be issued by the City of Alexandria, to fund the construction of a Metrorail station serving Potomac Yard, the Applicant shall provide a guaranty of shortfalls, not to exceed a total in any year of $10,000,000 or a cumulative total of $32,000,000 between the funds needed to make scheduled payments of principal and interest on such bonds and the funds available in the Station Fund based on terms and conditions of the payment of this Developer Shortfall Guaranty contributions detailed in the planned Memorandum of Understanding between the City and the Applicant. (CAO) (CMO) (P&Z) (T&ES)

27. **Potomac Yard Metrorail Station Site:** The Applicant shall reserve and dedicate to the City all land and easements necessary for the construction of the Potomac Yard Metrorail station and associated amenities and/or structures. The land and/or easements required herein shall be dedicated or granted without cost to the City for the Potomac Yard Metrorail station, by a deed conveying land in fee simple to WMATA or the City, or if applicable by a deed of easement to WMATA or the City, as required by the City, which entitles the grantee to use or authorize the use of the site for a Metrorail station and for any associated amenities and structures. The Applicant shall coordinate with the City regarding all necessary property access, environmental and engineering studies and related coordination deemed necessary by the City for the design of the Metrorail station. The Applicant shall undertake no grading, construction and/or improvements following a grant or dedication of land, including utilities and/or foundations (other than interim staging, and/or routine maintenance required by the City) on the entire area and easements necessary for the construction of the Potomac Yard Metrorail station. All land shall be dedicated and all easement(s) granted upon written request by the City, on a timetable to facilitate orderly permitting, design and construction of the Potomac Yard Metrorail station. The Applicant shall also reserve and dedicate, without cost to the City:
    a. Any easement(s) for pedestrian ingress and egress to and from the rail station and the entrances thereto, by users of the Metrorail station in such reasonable location as determined by the Director of T&ES and P&Z; and
    b. Such additional temporary construction easements necessary for the construction of the Potomac Yard Metrorail station and associated amenities and structures as may be required by the Directors of T&ES and P&Z. (P&Z) (T&ES) (CAO)

28. Environmental Review: The various sites under consideration in the environmental review process (A, B-1, and B-2) shall be identified for future Metrorail station use on the CDD Conceptual Design Plan and other applicable plans and documents as required by the Director of P&Z. The Applicant acknowledges that the environmental review process is not controlled by the City, and that neither the Applicant nor the City can pre-judge the outcome of the environmental review process (currently planned to be conducted by the Federal Transit Administration in cooperation with WMATA, the National Park Service, the City, and other affected stakeholders. In the event the City conclusively determines not to construct a Potomac Yard Metrorail station and associated amenities, or in the event no such Potomac Yard Metrorail station is constructed within 25 years from June 12, 2010, such dedication and easement(s) shall be vacated by the

City in exchange for a public access easement allowing public access for the purposes of open space and/or comparable amenities as determined by the City. (P&Z) (T&ES) (CAO)

29. During the initial 30-year term of the lease of any of the buildings within CDD #19, the blocks which permit development (excluding Block 4) as defined herein shall remain in private ownership and be subject to City of Alexandria real estate taxes. Prior to final site plan approval of the first building, other than the retail buildings in existence as of June 12, 2010, the applicant shall record among the land records of the City of Alexandria, a covenant, approved by the City Attorney, that provides that, before any voluntary and/or involuntary sale of any of the real property that is being leased and/or sold to a purchaser which is not obligated to pay City of Alexandria real estate taxes, the seller of the real property, shall, at the direction of the City of Alexandria either (i) provide to the City a payment equal to the present value of the estimated real estate tax payments (to be calculated pursuant to a mutually agreeable formula to be set forth in the recorded covenant) which would otherwise become due on the Property during the balance of the initial 30-year term of the lease, or (ii) enter into a binding and enforceable agreement with the City, approved by the City Attorney and including such surety as deemed necessary by the City Attorney, that requires the seller to make semi-annual payments to the City during the balance of the 30-year term which shall be equal to and made at the same time as the real estate tax payments that would otherwise have been due on the Property. Such covenant shall expressly provide that (i) its terms and obligations shall run with the land and be an encumbrance upon the Property, for the benefit of the City, and the applicant or the applicant's successors in interest shall ensure that the covenant and the obligation thereof shall have priority over every mortgage, deed of trust, or other lien or encumbrance on the Property, whether created prior to, or subsequent to, the grant of such covenant, and (ii) it shall be released of record in the event of a sale of the Property to a real estate tax exempt purchaser at such time as the foregoing conditions have been satisfied or the expiration of the 30 year term. (P&Z) (CAO)

G. PARKING

30. The maximum parking ratios for each use in Table 3 below shall comply with the following:
    a. All uses shall participate as part of the comprehensive shared parking strategy.
    b. Visitor parking may be required by the City as part of the DSUP process.
    c. Restaurant square footage is based upon the net square footage of the restaurant, excluding the kitchen and storage areas. (P&Z) (T&ES)

Table 3: Parking Maximums

Use	Maximum Ratio
Civic / Community Facilities	2.0 / 1,000 sq. ft.
Theater	0.1 / seat
Hotel (per room)	0.75 / room
Office	1.21 / 1,000 sq. ft.
Residential	1.0 / unit

Restaurant	3.5 / 1,000 sq. ft.
Retail	3.5 / 1,000 sq ft.

31. Each block and building shall provide a minimum of one level of entirely below-grade parking. Each underground and/or structured parking for each block shall be designed and constructed to connect within each block to function as one parking structure facility. All parking for Blocks 2, 5, and 16 or 21 as depicted in the *North Potomac Yard Small Area Plan* shall be located entirely below-grade. (P&Z)

32. To the extent that parking is located above grade, any above grade parking shall conform with the parking screening requirements of the *North Potomac Yard Urban Design Standards* as part of the DSUP process. (P&Z)

33. The Applicant shall submit a Parking Management Plan ("the Plan") for approval by the Director of P&Z and T&ES as part of the first preliminary DSUP. The parking management plan shall be updated and approved with each subsequent block(s), building(s) and/or DSUP submittal. At a minimum, the parking management plan shall include:
    a. Shared Parking: The Parking Management Plan shall outline mechanisms to require the parking to be efficiently used and shared between each of the uses and within multiple garages. The Plan shall demonstrate the minimum amount of parking to adequately support development on each block through shared parking strategies, including any necessary agreements and/or easements.
    b. The Plan shall address parking for community facilities, movie theaters and performance theaters. Parking for these uses shall be provided by adjacent uses through a shared parking program, unless the facility has considerable parking needs above and beyond what can be accommodated exclusively through shared parking.
    c. Any parking spaces designated as shared parking in the Plan shall not be reserved for any individual use, except for office use as permitted herein.
    d. Valet Parking: The Plan shall outline provisions and strategies for valet parking to ensure efficient use of parking resources. These shall include: loading and unloading locations and management, pricing, marketing strategies and wayfinding.
    e. Market rate parking: Office and retail parking rates for all underground and structured parking shall be consistent with comparable office/retail buildings located in the vicinity. A limited number of parking spaces may be reserved for the office use as approved by the Directors of P&Z and T&ES. Validation shall be permitted for retail parking.
    f. Unbundled Parking: All residential parking shall be unbundled (i.e., the cost to purchase or lease a parking space is separate from the cost to purchase or lease the residential unit). Unbundled parking for all other uses is encouraged and shall be explored as part of the Plan.
    g. On-Street Parking: All on-street parking shall be metered as part of a performance parking district.

h. Priority Parking: Priority spaces for carpool/vanpool use shall be provided within all structured parking.
i. Parking wayfinding, performance parking and advanced parking management systems. The Plan shall include a parking wayfinding plan which shall include illuminated wayfinding and advanced parking management signage.
j. The Applicant shall be responsible for the implementation of the Parking Management Plan. The Applicant shall be responsible for the installation of all infrastructure required to support the implementation of the Plan including, but not limited to, parking wayfinding signs, advanced parking management technologies and performance parking metering systems. (P&Z)(T&ES)

34. "Short-term" and "long-term" bicycle parking shall be provided throughout the site. "Long-term" bicycle parking may include lockers, individually locked enclosures or supervised areas within a building providing protection for each bicycle therein from theft, vandalism and weather. "Short-term" bicycle parking is an at-grade rack such as an "Inverted U" or "Bike Circle" that supports a bicycle in a stable, upright position. One bicycle rack shall provide two spaces. Racks are preferably collocated, covered and located within 120 feet (preferably 50 feet) of a building entrance. Directional signage (MUTCD sign D4-3) shall be installed when bike parking facilities are not clearly visible from the street or sidewalk. The City of Alexandria Bicycle Parking Preferred Rack Designs, Placement Standards, Guidelines and Vendors are available at http://www.alexandriava.gov/bicycleparking (T&ES). Minimum bicycle parking ratios are as follows in Table 4 below:

Table 4: Bicycle Parking Requirements

Use	Minimum Ratio
Civic / Community Facilities and Parks	Ratio shall be determined with applicable DSUP
Theater	0.05 spaces / seat
Hotel (per room)	0.05 long-term space/room and 0.025 short-term space/room
Office	0.2 long-term space space/1,000 sq ft and 0.1 short-term space per 1,000 sq ft.
Residential	0.25 long-term spaces/unit if less than 3 bedrooms, 0.5 long-term space/unit if more than 3 bedrooms, plus 0.05 spaces/unit short-term (visitor) parking
Restaurant	0.25 space/seat with first 60 seats exempt
Retail	0.2 long-term space/1,000 sq ft and 0.25 short-term space/1,000 sq ft.

35. For every 250,000 sq.ft. or fraction thereof of office gross floor area, one (1) shower per gender shall be installed, up to a maximum of three (3) showers per gender. Also, a minimum of one (1) clothes storage locker per gender shall be installed for every two (2) long-term bicycle parking spaces. The lockers shall be installed adjacent to the showers in a safe and secured area and both showers and lockers shall be accessible to all tenants of the building. The Applicant may provide joint facilities for office uses located on the

same block. The location, layout and security of the showers and lockers shall be reviewed by T&ES before issuance of the Building Permit. The showers and lockers shall be open during normal working hours. There are no locker or shower facility requirements for retail or residential developments. The ratios set forth in this condition may be amended pursuant to a DSUP approval as necessary to comply with the standards necessary to obtain the associated LEED or equivalent green building/site requirements. (T&ES)

H. STREETS & TRANSPORTATION

36. New Street Names: Refer to *Attachment #6* for the following street locations:
    a. New Street "A" shall be named Livingstone Avenue (straight) and Capitol Crescent Place (curve);
    b. New Street "B" shall be named Tide Lock Avenue;
    c. New Street "C" shall be named Silver Meteor Avenue; and
    d. New Street "D" shall be named Aqua Street. (P&Z)

37. The Applicant shall be responsible for installing all applicable street and associated signage pursuant to the phasing required herein. (T&ES) (P&Z)

38. Any traffic signalization proposed by the Applicant and approved by the Director of T&ES, or required by the Director, shall be depicted on the final infrastructure plan and the final site plan for the portion of the CDD in which or adjacent to which the signalization is to be installed. The Applicant shall be responsible for all costs of traffic signal design, acquisition, and installation. Any signalization approved or required by the Director of T&ES shall be installed and properly operating prior to the issuance of a Certificate of Occupancy permit for any building and/or the acceptance of any street which is to be served by the signalization. The signals shall be City standard black mast arms. (T&ES)

I. TRANSIT

39. If the City has not approved the transitway design vehicle prior to the construction of the transitway through the site and on Route 1, or the construction of 1.5 million sq.ft. of development within CDD #19, the Applicant shall construct the dedicated transit lanes along Route 1, New Street "C" / Silver Meteor Avenue, and Potomac Avenue as depicted in the *North Potomac Yard Urban Design Standards* and in addition shall install elements to accommodate future conversion to rail such as: underground duct banks, conduit and pavement designed with knock-out panels to the satisfaction of the Director of T&ES and with the City's contribution for these upgrades to rail. (T&ES)

40. The permanent transitway stations shall be a minimum size of 75' (L) x 12' (W) and shall include the following amenities: ADA accessibility; large canopies to cover most of station platform area; real time transit information; audio announcements; fare machines; benches to seat a minimum of 12 persons; maps; wayfinding information; illumination; areas for transit information; wireless internet; pedestrian walkway and connections to

the nearest crosswalk; security cameras; possible space for advertisements; barriers from traffic; and environmental sustainable materials and design. The interim transitway station shall be a minimum size of 30' (L) x 8' (W) and shall include the following amenities: ADA accessibility; a covered shelter / canopy area; benches to serve a minimum of 6 persons; real-time transit information; audio announcements; and a fare machine. The installation and equipment shall be provided by the Applicant. Maintenance and operation shall be provided by the City. (T&ES)

J. UTILITIES

41. **Transformers/Utilities:** All electrical transformers and associated utilities shall be located within the central portion of the blocks, alley(s) and screened to the satisfaction of the Director of P&Z or provided in underground vaults which shall comply with all applicable Dominion Virginia Power (DVP) standards. Ventilation grates shall not be located within public open space, including Crescent Park, Market Common, Metro Square, Potomac Yard Park, Four Mile Run Park, sidewalks or streets - public right-of-way. The final location of the transformers and/or vaults shall be approved as part of the preliminary DSUP review for each building/block. (RP&CA) (P&Z) (T&ES)

42. **Terminal Station:** The Applicant shall provide architectural and landscaping screening to the northern Dominion Virginia Power Terminal Station, adjacent to Four Mile Run, to the satisfaction of the Director of P&Z. All improvements shall be completed no later than the first Certificate of Occupancy for the second building on Blocks 2, 3 or 5. (P&Z)

43. **Pump Station:** If it is determined that a pump station is necessary within North Potomac Yard, the Applicant shall design and construct a pump/lift station and force main to transport municipal wastewater from the proposed development to the Potomac Yard Offsite Trunk Sewer (PYTS). The pump/lift station and force main shall be designed in accordance to the City of Alexandria standards, Alexandria Sanitation Authority (ASA) design guidelines, and Commonwealth of Virginia Sewage Collection and Treatment (SCAT) Regulations. ASA at its discretion may hire a third party to review the design of the pump/lift station and inspect the construction. In that instance, the Applicant shall reimburse the ASA for the third party review and construction inspection. The pump station shall be located on the north end of the site (Landbay 1) but not within the RPA, public right-of-way or in dedicated park land. The pump station shall be consistent with the Four Mile Run Restoration Master Plan and shall designed to the satisfaction of the Director of P&Z. (T&ES) (P&Z) (RP&CA)

44. **Pump Station Maintenance:** The Applicant shall coordinate with the City and Alexandria Sanitation Authority (ASA) regarding the terms of the ownership, maintenance, and operation agreement of any new pump/lift station. (T&ES)

45. **Sewer Metering:** Each preliminary DSUP within CDD#19 shall provide and install sanitary sewer meters in the individual sanitary sewer laterals to measure the municipal wastewater flow from each building. The cumulative totals of the flows from all occupied buildings in the CDD shall not exceed an average of 70% of the flows from the

SCAT Regulations (Commonwealth of Virginia State Water Control Board, Sewage Collection and Treatment Regulations 9 VAC 25-790; Adopted December 4, 2003 and Effective February 12, 2004) and Memorandum to Industry 02-07 dated June 1, 2007 . If the cumulative flows are found to exceed this value, modifications to existing or future buildings shall be required to reduce the cumulative average. (T&ES)

46. **Utilities:** All new utilities serving the CDD, whether located within or outside of the CDD, shall be placed underground at the cost of Applicant, excluding the aerial 230 kV lines currently in existence as of June 12, 2010. All utilities with the exception of those having a franchise agreement with the City shall be located outside the public right-of-way; however, no transformers or switch gears shall be placed in the public right-of-way. (T&ES)

K. ENVIRONMENTAL SUSTAINABILITY

47. **Green Building:** Achieve LEED for Neighborhood Development, Silver Certification for the neighborhoods of North Potomac Yard, subject to the implementation of the Metrorail station and high-capacity transitway. Achieve LEED for New Construction, Silver Certification for all office uses, or be consistent with the City's Green Building Policy in effect at the time of DSUP approval, whichever is more restrictive. Achieve a minimum of LEED Certification for all residential uses, with a goal of working toward LEED Silver Certification if feasible, or be consistent with the City's Green Building Policy in effect at the time of DSUP approval, whichever is more restrictive. All other uses shall comply with the City's Green Building Policy in effect at the time of approval. (P&Z)

48. **ESMP:** With each preliminary DSUP submission, the Applicant shall submit an Environmental Sustainability Master Plan (ESMP) detailing the Applicant's proposed goals for achieving Carbon Neutrality by 2030, pursuant to a core principle of the North Potomac Yard Master Plan requiring this area to be a model of sustainability. Each ESMP shall address the following:
    a. Identify methods for reducing carbon emissions;
    b. A Phasing Plan for the implementation of the ESMP;
    c. Provide an estimate of CO2e (carbon dioxide equivalent) emissions utilizing a carbon footprint calculator that focuses on primary sources of CO2 emissions such as buildings, solid waste and transportation. The same calculator shall be used for all submissions for comparative data use;
    d. Identify and provide a narrative outlining the district-wide sustainability, energy and environmental systems that shall be utilized;
    e. Demonstrate that zero or low emission vehicles shall be given priority parking status;
    f. Identify proposed methods of complying with the LEED / Green Building goals noted in the above green building condition;
    g. Identify how per capita energy use shall be reduced;

h. Explore the feasibility of tracking the multi-family residential energy usage and provide tracking documentation with subsequent ESMP submissions following the occupancy of the first residential building(s);
i. Identify any emerging technologies and/or clean, renewable energy sources incorporated into the design;
j. Include a solid waste management plan incorporating reduction, reuse, recycling, recovery (composting, etc.) and proper disposal as priorities per the requirements of Article H to Title 5 (Ordinance No 4438) of the Alexandria City Code;
k. Include a construction and demolition plan incorporating reuse, recycling and proper disposal as priorities;
l. Identify the location and/or programs providing identification, exposure and educational opportunities for building users and pedestrians within the development regarding the implemented sustainable measures; and
m. Summarize sustainable aspects of Water Management Master Plan and the Comprehensive Open Space Plan. (P&Z) (T&ES)

49. Low Flow Fixtures: The development shall use low flow fixtures per the requirements of the *North Potomac Yard Small Area Plan* and shall be granted a reduction of 30% sanitary sewer flow from the SCAT Regulations and Memorandum to Industry 02-07 dated June 1, 2007 for initial developments. (T&ES)

L. STORMWATER

F - 1. In return for innovative measures to reduce stormwater runoff and improve water quality the City agrees to allow stormwater management facilities (specifically Crescent Pond and the BMPs to replace Pond 2) in public spaces and/or public right-of-way as necessary. (T&ES)

50. **Water Management Master Plan (WMMP)**: Each submission of the WMMP shall include the following:
    a. The phosphorus loading in lbs/ac/yr for the preliminary DSUP to be submitted and for each parcel previously planned and/or redeveloped.
    b. The average phosphorus loading in lbs/ac/yr, including the preliminary DSUP to be submitted, for all planned and/or redeveloped parcels.
    c. Stormwater management and low impact design facilities to be included as part of the preliminary DSUP.
    d. Resource Protection Area revegetation measures if appropriate.
    e. Low flow fixtures, water conservation measures or other facilities or infrastructure to be constructed as part of the DSUP to reduce or manage generation of municipal wastewater. (T&ES)

51. Using technologies that are commercially available and commercially reasonable, the Applicant shall implement a coordinated stormwater management plan designed to achieve a maximum overall post-development total phosphorous load equal to or less than 0.65 lb/ac/yr based upon the December 2009 draft VA DCR standards and accompanying worksheet. Individual DSUP submittals shall have a maximum designed

phosphorus loading of 0.70 lbs/ac/yr. At final build-out, Landbays I and 2 shall have a designed phosphorus loading of 0.60 lbs/ac/yr or less and Landbay 3 shall have a designed phosphorus loading of 0.70 lbs/ac/yr or less. With each DSUP submittal, the Applicant shall submit a stormwater master plan update (which is a component of the Water Management Master Plan) to track progress towards achieving the 0.65lbs/ac/yr loading for the entire redevelopment.

a. If new technologies become commercially available, are commercially reasonable and are permitted under applicable law as part of the approval of the individual DSUPs that allow a lower overall phosphorous load to be achieved, the Applicant shall cooperate with the Director of T&ES to determine an appropriate, reduced total phosphorous load for the site.
b. Should local, state, or federal regulations become more stringent throughout the life of the project and require a phosphorous removal requirement more stringent than 0.65 lb/ac/yr there shall be no grand-fathering by this condition. (T&ES) (P&Z)

52. The Applicant shall permit Pond 2 to be constructed. When Pond 2 is removed, the water quality volume previously directed to Pond 2 shall be treated by a stormwater best management practice facility(s) with a minimum phosphorus removal efficiency of 50%. No interruption of water quality treatment below 50% shall occur during or after construction of CDD #19. (T&ES)

53. There shall be a level II stormwater pond in Crescent Park The water surface of the pond shall not exceed 50% of the park acreage (refer to *Attachment #7*) and shall not extend into the RPA greater than 50 feet. The water amenity shall be located on the northern portion of the park to the greatest extent feasible. (T&ES) (RP&CA) (P&Z)

54. Roof areas shall be designed employing sustainable practices. A minimum of 50% of the surface area of each building roof shall be composed of material that has the capacity to capture the first 0.50 inches of rainwater in its void space in order to reduce runoff. A minimum of 25% of the total roof areas shall be green and a minimum of 25% of the total roof areas shall be pervious bed materials overlain with pavers, gravel or equivalent material. (T&ES)

55. Rainwater harvesting and reuse systems for irrigation shall be considered on a block by block basis. Each DSUP shall re-use a minimum of 15% of the average annual runoff from the impervious rooftop areas for irrigation. (T&ES)

56. The Applicant shall install porous pavement systems with underdrains as required, for all on-street parking spaces and porous pavers for public sidewalks, subject to site constraints. Curbside bioretention facilities shall be installed in bulb outs at intersections. These systems shall be regularly maintained by the Applicant, or the Business Improvement District (BID) or comparable entity when established. (T&ES) (P&Z)

57. The RPA adjacent to Four Mile Run shall be revegetated in a manner compatible with riparian buffer areas. Guidance for revegetation can be found in the Riparian Buffers

Modification and Mitigation Guidance Manual, Restoration/Establishment Table B. (T&ES)

58. Maintenance of all BMPs and water quality practices throughout CDD#19 (including Landbay 4 and all public spaces) shall be maintained by the Applicant or the Business Improvement District (BID) or comparable entity when established. (T&ES)

59. Should there be BMPs in private spaces a BMP Maintenance Agreement shall be approved prior to release of each final site plan. Should the private party become a member of the BID or other similar entity, proof of commitment shall be required.(T&ES)

60. A CDD#19 overall maintenance agreement for stormwater facilities located in public spaces shall accompany the infrastructure plan. Agreement shall be finalized and approved prior to the approval of the infrastructure plan. Once the BID is established, a new BMP maintenance agreement naming this entity (or a similar entity) as the responsible party shall be executed. (T&ES)

M. NEIGHBORHOOD TRAFFIC CALMING

61. A comprehensive Neighborhood Traffic Calming Plan shall be initially submitted with the first DSUP for CDD#19 and the plan shall be re-evaluated with a neighborhood traffic analysis that shall be submitted with all subsequent DSUP applications subject to the satisfaction of the Directors of T&ES and P&Z. The initial plan shall be generally consistent with *Attachment #8* and all improvements shall be installed prior to the issuance of the first Certificate of Occupancy permit for CDD#19. Subsequent improvements shall be installed prior to the first Certificate of Occupancy permit issued for the associated DSUP. The area to be evaluated for these off-site improvements shall generally extend from Monroe Avenue to Four Mile Run and Route 1 to Commonwealth Avenue. Other areas may be necessary to include if severe traffic impacts resulting from the proposed development within CDD#19 is noted. The Applicant's total share of the cost for off-site traffic calming improvements (excluding street improvements along Route 1) shall not exceed $1.0 million adjusted annually by the CPI-U for each year beyond 2010 .(T&ES) (P&Z)

62. A baseline traffic study to establish baseline speed and volume data at gateways to the adjacent neighborhoods shall be completed prior to the first Certificate of Occupancy permit within CDD#19 and updated with subsequent development applications to the satisfaction of the Director of T&ES. (T&ES)

N. OPEN SPACE

F - 2. All open space and development adjacent to Four Mile Run shall be coordinated with the Four Mile Run Restoration Master Plan and Four Mile Run Design Guidelines. (RP&CA)

63. The Applicant shall explore the feasibility to provide approximately 400 ft. x 400 ft. area and associated improvements and parking for the use of an interim recreational field as part of the submission of the first DSUP for a residential building(s). The interim recreation field-area shall be operational prior to the first Certificate of Occupancy permit for the first building(s). (P&Z) (RP&CA)

64. The Applicant shall design and construct, or provide a contribution to the City not to exceed $1,500,000, adjusted annually by the CPI-U for each year beyond 2010, to design and construct, a synthetic field in replacement of one of the City's existing fields in the northeast part of the City, to the satisfaction of the Director of RP&CA. The field shall be constructed prior to the release of final site plan for 2.0 million sq.ft. of development in CDD#19. (RP&CA)

65. A total of 35% of the land area (69.07 acres) shall be provided as useable open space. A minimum of 15% of the total land area shall be as ground-level open space. The remainder of the required open space may be ground-level and/or roof-top open space as required through the preliminary DSUP process. Open water and public right-of-ways shall not be counted as open space. (P&Z) (RP&CA)

66. With the first preliminary DSUP submittal, the Applicant shall submit a Comprehensive Open Space Programming Plan, identifying the open space programming for each park. At the request of the Director of RP&CA, this plan shall be amended if necessary with subsequent DSUP applications. The open space programming plan shall provide a mix of active and passive recreation amenities to serve the proposed development subject to the following:
    a. Active recreation amenities may include volleyball courts, tennis courts, basketball courts, playgrounds, climbing walls/gyms, splash grounds, ice skating rinks, pools, and dog exercise areas.
    b. An event space/festival area for small concerts or community events, play areas, and dog exercise areas shall be provided at grade, along with other active amenities determined through the DSUP plans.
    c. Passive recreation amenities shall include trails, promenades, plazas, fountains, restrooms, overlooks, open lawn areas, seating, public art, and gardens.
    d. All parks shall be designed with high quality special paving, furnishings, lighting, electrical service, and irrigation, active and passive amenities to achieve their design intent.
    e. CDD#19 shall incorporate a network of private and public open space that is integrated with adjacent park property and the regional park system.
    f. The design of the open space shall be coordinated with constructed and approved plans for adjacent open space in Landbays E, G and K. (RP&CA)

67. The following parks shall be provided by the Applicant:
    a. **Crescent Park** in Landbay 1 shall be a minimum of 2.3 acres (inclusive of the stormwater pond) and be designed, developed and dedicated to the City. The design of the park shall integrate active and passive uses including a large gathering space and shade structure/pavilion for events and/or gatherings and

special features and/or amenities shall be provided to create a sense of arrival into Alexandria along Potomac Avenue. Stormwater management may be incorporated into the park design to the satisfaction of the Directors of P&Z, T&ES and RP&CA, however, the stormwater amenity may occupy no more than 50% of the park. The stormwater amenity shall be integrated into the design of the park and shall be consolidated in the northeastern portion of the park to enable consolidation of the ground-level open space and to provide a meaningful connection to the Four Mile Run pedestrian/open space bridge. Sufficient room for a minimum 20 ft. promenade with associated amenities and landscaping shall be allowed within the level space above top of bank between Four Mile Run and the pond pursuant to the Four Mile Run Design Guidelines.

i. Within Crescent Park, the Applicant shall design and construct a civic-park pavilion and/or comparable amenity in an amount not to exceed $1,375,000 adjusted annually by the CPI-U for each year beyond 2010.

b. **Four Mile Run Promenade** - In Landbay 1 provide a promenade, associated amenities and landscaping along Four Mile Run in coordination with the Four Mile Run Restoration Master Plan, Four Mile Run Design Guidelines and the *North Potomac Yard Urban Design Standards*.

c. **Market Common** park in Landbay 2 shall be a minimum of 1.0 acre with a minimum continuous width of 64 feet. The Common shall be designed to accommodate large gatherings such as farmers markets, art shows, special events and heavy use. The design of the Common shall incorporate water features, public art, lighting, landscape furnishings and other amenities associated with such use.

d. **Metro Square Park** in Landbay 3 shall be designed as a passive urban park with a minimum size of 0.7 acres. The design shall include hardscape and landscape materials to respond to its built environment, including the Metrorail station. The park shall include a fountain or other comparable water element and other passive recreation amenities.

e. **Potomac Yard Park** in Landbay 4 shall be a minimum of 3.5 acres and shall be designed, developed and dedicated to the City as a regional public park with active and passive uses. The park shall incorporate similar uses, materials and finishes, and connect with the adjacent Landbay K. Stormwater management may be incorporated into the park design if innovative techniques are utilized in the remainder of the CDD and the options proposed can be located completely under pavement and do not limit park use, planting, and programming. (A maximum of 8 stormwater structures may be located in Landbay 4.) If the required acreage for Potomac Yard Park cannot be met due to the configuration of the Dedicated High-Capacity Transitway, the Applicant shall provide funds in lieu of the deficit. (RP&CA) (P&Z)

68. The following open spaces shall be subdivided and dedicated to the City as individual parcels:

a. Crescent Park;
b. Four Mile Run Connection;
c. Potomac Yard Park/Landbay 4;
d. Metro Square; and

e. Market Common. (RP&CA) (P&Z)

69. Route 1 Gateway – An open space area (of approximately 15,000 sq.ft.) shall be provided in front of the hotel on Block 3 and shall be designed as high quality open space with features such as fountains, public art, special paving and landscaping to create a sense of arrival into Alexandria. The open space shall be accessible to the public. (P&Z) (RP&CA)

70. The ground-level open space centrally located within Blocks 2, 5 and 16 or 21 shall include a perpetual public access easement that shall enable the open space to be fully accessible to the public for the hours and guidelines approved by the Directors of RP&CA and P&Z. Additionally, the Applicant shall provide a perpetual public access easement on Block 3 for the open space fronting on Route 1. The easements shall include provisions to close portions of the open space for repair and maintenance and shall permit utilities to be located under the open space. (P&Z) (RP&CA)

71. The Applicant shall design and construct the following improvments in Landbay E pursuant to the Four Mile Run Restoration Master Plan, Four Mile Run Design Guidelines and the *North Potomac Yard Urban Design Standards* to the satisfaction of the Directors of RP&CA and P&Z:
    a. Bridge "C" (*Attachment #7*) – An urban, green open space and plaza shall be constructed on the east pedestrian bridge. The open space shall include an architectural focal element, permanent structural facilities for recreational uses, restrooms, lighting, special paving, interpretive or educational components, public art and plantings that incorporate a water theme. Provide a meaningful connection to Crescent Park.
    b. Banks – A linear promenade with a minimum continuous width of twenty feet on both the north and south banks. The promenades shall include high quality special paving, thematic elements, lighting, site furnishings, shade trees and plantings. The design shall incorporate low-impact development (LID) techniques and stormwater filtration buffers.
    c. Banks – Improvements to the stream banks, including bank stabilization and riparian edge plantings, amphitheater terracing, canoe/kayak launch, performance pontoon, trail connections and ramps.
    d. Trail – A new 10 ft. wide shared-use path and associated amenities at the toe of Four Mile Run along the south bank of Four Mile Run. The trail shall connect to the existing Four Mile Run Trail (west of Route 1), the shared-use path in CCD #19 and the Mount Vernon Trail to the east. The new path shall be built to standards approved in the Four Mile Run Restoration Master Plan and Four Mile Run Design Guidelines which shall be constructed and operational prior to the first Certificate of Occupancy permit for the second building constructed on Blocks 2, 3 or 5.
    e. Four Mile Run improvements in Landbay E as noted above shall be a maximum of $8,700,000 adjusted annually by CPI-U for each year beyond 2010. (P&Z)(RP&CA)

f. As part of the approval of the first DSUP within CDD#19, the applicant may propose an agreement regarding a fee in lieu of designing and constructing the Four Mile Run improvements conditioned herein; the agreement will include timing requirements and the fee will be payable to the City of Alexandria, subject to the satisfaction of the Directors of RP&CA and P&Z. (RP&CA) (P&Z) (T&ES)

72. Crescent Park, the Four Mile Run Promenade, Market Common, Metro Square shall be privately maintained by the Applicant or the Business Improvement District (BID) when established. Maintenance and applicable requirements of the Director of RP&CA shall comply with the City of Alexandria Landscape Guidelines. (RP&CA)

73. Roof top open space shall be designed as high-quality open space with active and passive uses for residents and building tenants. Roof top open space on office buildings may be accessible to the public if compatible with the building use as determined by the Directors of RP&CA and P&Z in consultation with the Applicant as part of the DSUP process. Roof top open space shall be physically and/or visually accessible. (RP&CA)

74. All additional ground-level open space, including courtyards, plazas, and private internal courtyards shall be designed as high-quality open space for residents, building tenants and the public where appropriate. (RP&CA)

75. National Park Service: To minimize impacts to the George Washington Memorial Parkway, the Applicant shall be responsible for ensuring that the landscaping, open space, signage and lighting shall comply with the following to the satisfaction of the Directors of P&Z and RP&CA:
    a. Prior to the issuance of the first Certificate of Occupancy permit within CDD#19, the Applicant shall provide a one-time monetary contribution of $200,000, adjusted annually by the CPI-U for each year following 2010, to the National Park Service for trees and landscaping on National Park Service land located between the George Washington Memorial Highway and CDD#19.
    b. Retail, residential and/or office sign(s) shall be limited to a maximum height of 25 feet above the grade of the adjoining sidewalk for the building frontages depicted on *Attachment #9*.
    c. The lighting for the tops of buildings generally depicted on *Attachment #9* shall be done in a manner which is consistent with the intent and character of the George Washington Memorial Parkway.
    d. A perpetual open space easement shall be placed on Landbay 4 and Crescent Park (Block 1 and Block 24 as depicted in the *North Potomac Yard Small Area Plan*), other than the area necessary for the Metrorail station and associated amenities as defined herein. The buildings within the Flexible Metrorail Zone adjacent to the Metrorail station shall be located outside the Old and Historic District Height Zone. (P&Z) (RP&CA)

O. USES

76. For purposes of these CDD conditions, "Retail" is defined to include retail, personal service uses, amusement enterprises, and restaurants, as defined in the Zoning Ordinance, with the exceptions identified below:
    a. Retail shopping establishments shall not include appliance stores and auto parts stores;
    b. Personal service uses shall not include appliance repair and rental, contractors' offices, laundromats, and pawnshops;
    c. Personal service uses on the ground floor, shall be limited to a frontage less than 30 feet within required retail areas, unless additional frontage is permitted with an approved Special Use Permit;
    d. Ground floor "retail" uses along East Reed Avenue shall only be utilized for retail and restaurant uses as defined by the Zoning Ordinance with the exclusions stated in subparagraph (a) above; and
    e. Other similar pedestrian-oriented uses as approved by the Director of P&Z to meet the intent of providing active pedestrian-oriented neighborhood-serving retail uses are allowed. (P&Z)

77. An administrative Special Use Permit may be permitted for all restaurants pursuant to section 11-513 of the Zoning Ordinance. In addition to the DSUP approval, restaurants that do not comply with section 11-513 of the Zoning Ordinance, shall obtain a separate Special Use Permit, pursuant to section 11-500 of the Zoning Ordinance. (P&Z)

78. The locations of required and preferred retail and the height, depth and design of the retail shall conform to the *North Potomac Yard Urban Design Standards*. Additional retail may be provided outside the specified retail areas; however the retail shall be deducted from the permitted floor area. The retail shall require approval as part of the preliminary DSUP. (P&Z)

79. A movie theater use shall only be permitted south of East Reed Avenue and shall be developed to enhance the office/entertainment district within Landbay 3. (P&Z)

80. In the event the City Code is changed to permit street vendors, the Applicant shall permit, at the City's request, vendors to operate within Metro Square and/or Market Common (i.e. Landbay 2). Any such program shall be coordinated by the North Potomac Yard Business Improvement District (or comparable entity) per the City's guidelines for the program. (P&Z)

81. The allowable floor area, units and uses shall be governed by the following table, subject to the following:

Table 5: Development Summary Table

	1	2	3	4	5	
Block #	**Office**	**Residential (Units)**	**Office or Residential**	**Retail**	**Hotel**	**Total**
1	(Cresent Park)					
2	0	500,000 (500)	0	0	0	500,000
3	0	0	0	0	170,000	170,000
4	(Possible School Site)					
5	0	600,000 (600)	0	0	0	600,000
6	110,000	0	250,000 (250)	35,000	0	395,000
Landbay I Crescent Gateway TOTAL	**110,000**	**1,100,000 (1,100)**	**250,000 (250)**	**35,000**	**170,000**	**1,665,000**
7	0	0	320,000 (320)	90,000	0	410,000
8	0	0	690,000 (690)	110,000	0	800,000
9	55,000	0	260,000 (260)	40,000	0	355,000
10	0	0	330,000 (330)	160,000	0	490,000
11	0	0	700,000 (700)	120,000	0	820,000
12	55,000	0	295,000 (295)	50,000	0	400,000
13	(Market Park)					
Landbay II Market District TOTAL	**110,000**	**0**	**2,595,000 (2,595)**	**570,000**	**0**	**3,275,000**
***Metro Flex Zone* (Blocks 14,15,16, 18,20 & 21)**	1,100,000	0	300,000 (300)	190,000	0	1,590,000
17	60,000	0	250,000 (250)	50,000	0	360,000
19	(Metro Square Park)					
22	370,000	0	0	65,000	0	435,000
23	180,000	0	0	20,000	0	200,000
Landbay III Metro Square TOTAL	**1,710,000**	**0**	**550,000 (550)**	**325,000**	**0**	**2,585,000**
24	(Potomac Yard Park - Landbay IV - Landbay K Extension)					
SITE TOTAL	**1,930,000**	**1,100,000**	**3,395,000**	**930,000**	**170,000**	**7,525,000**

a. For purposes of CDD#19, floor area is defined as the sum of all gross horizontal areas under a roof or roofs. These areas are measured from the exterior faces of walls or from the centerline of party walls. Elevator and stair bulkheads, multi-story atriums and similar volumetric construction, not involving floor space are excluded.

b. The floor area defined for each block within CDD#19 is a maximum floor area subject to compliance with the *North Potomac Yard Small Area Plan,* the *North Potomac Yard Urban Design Standards*, the CDD conditions required herein, and applicable requirements of the Zoning Ordinance.

c. Community facilities, public buildings and associated accessory uses may be provided on any block and shall not be deducted from the maximum permitted floor area; however the uses shall be subject to height requirements, the *North*

Potomac Yard Urban Design Standards and other applicable elements as part of the DSUP process. Block 4 is reserved as a possible school, community facility and/or public building.

d. For blocks that permit office and/or residential uses, the amount of development shall be governed by the floor area. In addition, the number of dwelling units noted in parentheses in Table 5 is a maximum.
e. Residential development for buildings on Blocks 2 and 5 is limited to the maximum number of dwelling units and floor area identified in Table 5; however, if the Applicant demonstrates a legitimate need to increase the floor area permitted on Blocks 2 and 5 to achieve an advantageous mixture of unit types and sizes, the total floor area can increase a maximum of 10% through the DSUP process subject to compliance with the *North Potomac Yard Urban Design Standards*.
f. Any conversions between residential units and commercial floor area shall occur in the conversion of one residential unit to 1,000 sq.ft. commercial.
g. The mix of office and residential uses shall be consistent with the intent of the *North Potomac Yard Small Area Plan*.
h. The final block configuration and the block numbers for the blocks located within the Flexible Metrorail Zone shall be approved by City Council when the CDD Conceptual Design Plan is revised as required herein.
i. Accessory retail may be provided on any block but shall be deducted from the permitted floor area. (P&Z)

82. The Applicant may propose to transfer floor area within Column #3 of the Development Summary Table (Table 5) from one block to another, with an application for a DSUP, subject to the following:
    a. No transfer shall cause the office/residential floor area or the number of dwelling units, in any block/Landbay to increase or decrease by more than 20%;
    b. No transfer shall decrease the office floor area for Blocks 14, 15, 16, 17, 18, 20, 21, 22 and/or 23; and
    c. The Applicant shall submit all necessary massing studies with each proposed transfer to demonstrate that both the sending and receiving blocks shall be meet the bulk, height and form requirements/restrictions pursuant to the *North Potomac Yard Urban Design Standards*. (P&Z)

83. As buildings in the existing retail center become vacant, the Applicant shall make the buildings available to the City, for an interim use for police and fire training or other comparable use until such time as the block(s) redevelop provided that the City and the Applicant reach an agreement on the terms and conditions of such use. (P&Z)

P. RETAIL MANAGEMENT & BUSINESS IMPROVEMENT DISTRICT

84. As part of the submission of the first DSUP, the Applicant shall be responsible for submitting the proposed governance structure for CDD #19, which addresses the need for a master developer, retail as required herein, maintenance, programming and other associated elements for review and approval by City Council as part of the DSUP. (P&Z)

85. To ensure a comprehensive and coordinated approach for the retail leasing, the required retail, as defined herein, and depicted in the *North Potomac Yard Urban Design Standards* shall be operated through a coordinated management agreement, entity or district (such as a business improvements district) which is separate from the ownership and management of the offices, hotel and residential uses within each of the mixed-use buildings and blocks. The retail entity as required herein shall be responsible for selecting and controlling the location and mix of retail and personal service uses for the location where retail and / or personal service uses are required. The final role and composition of the retail management entity and overall governance shall be approved as part of the first DSUP. (P&Z)

86. Retail signage shall comply with all applicable provisions of the *North Potomac Yard Urban Design Standards*, the Zoning Ordinance and the restrictions stated herein. (P&Z)

87. Prior to the release of the first final site plan containing the first building within CDD#19, the Applicant shall establish a Business Improvement District (BID) or comparable entity to be responsible for the following items to the satisfaction of the Directors of P&Z, T&ES, RP&CA and City Attorney:
    a. Open Space – Repair and maintenance of Metro Square, Market Common, Crescent Park and the Four Mile Run promenade.
    b. Open Space – The BID shall be responsible to work in coordination with the City to establish the appropriate programming within the City parks and open space.
    c. Parking – Coordination and management of the shared parking management plan between the owner(s) in CDD#19.
    d. Residential Statements – The Applicant, the BID or a comparable entity shall be responsible for ensuring that all residential tenants and property owners sign a statement (at the time of lease or sale) affirming they are familiar with the *North Potomac Yard Small Area Plan* and the requirements of the CDD staff report and conditions of approval. The BID or comparable entity shall keep a copy of these signed statements on file and shall provide to the City upon request. The statements shall be required until CDD#19 is fully constructed.
    e. Signage – maintenance, repair, and coordination of locations and messaging for all identification signs, wayfinding signs, directional signs, and seasonal/event banners.
    f. Porous Pavement / Special Paving on Public Streets and Sidewalks – Maintenance and repair of porous pavement or special paving on public streets and sidewalks.
    g. Any streets, alleys, walkways, common areas, and open spaces, not defined herein, shall be maintained by the BID.
    h. Valet parking: coordination of any valet management plan between the owners in CDD#19. (P&Z) (T&ES) (RC&PA)

Q. COMMUNITY FACILITIES

88. For purposes of these CDD conditions, "Community Facilities" is defined to include day care facilities, schools, community/youth/senior centers, performing arts theatre, education centers, neighborhood reading rooms, libraries, community spaces and any similar use that contributes a significant benefit to the community, as determined by the Director of P&Z. (P&Z)

89. Space for which floor area has been allocated and approved as a community facility, public building or day care facility, using an exclusion from the development floor area maximums established in the development summary table, shall remain devoted to uses that qualify as day care facilities, community facilities or public buildings at all times, subject to the satisfaction of the Director of P&Z. Additionally, any accessory uses approved using the development exclusion shall retain the originally approved use, unless amended with a special use permit by Planning Commission and City Council. (P&Z)

90. **School:** The Applicant shall dedicate Block 4 as depicted in the *North Potomac Yard Small Area Plan* to the City for a possible school, community facility and/or a public building.
    a. The site shall be reserved and made available for the construction of a new Alexandria City Public Schools (ACPS) and/or comparable school facility if, in the future, it is jointly determined by the City Council and School Board to locate a school at this site. Alternately if determined by the City, the site may be utilized for open space, community facilities, public building and/or comparable use.
    b. The reservation shall also permit collocated uses which may include but is not limited to office and/or residential uses above the school.
    c. The school, community facility, public building, and associated uses shall be subject to all applicable provisions of the *North Potomac Yard Small Area Plan*, *North Potomac Yard Urban Design Standards* and other applicable requirements and be subject to a DSUP. The school, community facility, public building, and accessory uses shall not be deducted from or counted against the maximum permitted square footage of development within CDD#19.
    d. Block 4 shall have an approximate block size of 30,000 sq.ft., excluding the public right-of-way.
    e. Prior to dedication of the land to the City, the Applicant shall be responsible for construction of all necessary streets and infrastructure adjacent to the site.
    f. Subsequent to the dedication to the City and until the commencement of construction for a school and/or comparable building for the site, the site may be used as an interim open space to the joint satisfaction of the Superintendent of ACPS and the Director of RP&CA.
    g. In the event that the City elects not to construct a school on the site, the City may utilize the site for a community facility and/or public building and accessory uses as defined herein or for use as a public park-open space.
    h. If the City does not use Block 4 for a school site, public park-open space or other community facility, the property shall be offered to the Applicant for purchase at

its then appraised value less 15% prior to offering the site to any third party for purchase.

i. As part of the redevelopment of Blocks 5, 7 and/or 8, the City reserves the right for potential shared parking to accommodate possible school and/or community facilities located on Block 4. Adequate parking shall be determined as part of the DSUP process for Blocks 5, 7 and/or 8.

j. The Applicant shall provide a monetary contribution of $15,000,000 adjusted annually by the CPI-U for each year beyond 2010, to contribute to the construction of a school in Potomac Yard or a location that serves Potomac Yard students. The contribution shall be made payable to the City prior to the Certificate of Occupancy permit for 2000 units within CDD#19. In the event the school, community facility and / or public building(s) is constructed by the City or ACPS prior to payment by the Applicant of the amount due, the monetary amount required herein shall be to reimburse the City or ACPS. (P&Z) (ACPS) (RP&CA)

91. Applicant shall provide at no charge, an amenity space on the top floor of Block 2, overlooking the Potomac River and Washington D.C., to community and non-profit organizations located in adjacent Alexandria neighborhoods in addition to Alexandria City government agencies at least 24 times per year during the hours of 8:00 a.m. to 10:00 p.m. on weekdays and 8:00 a.m. to 6:00 p.m. on Saturdays on a space-available basis, upon request by the City. (P&Z)

92. The Applicant shall construct or contribute to a live performance arts theater, cultural/civic use space and/or comparable amenities as determined by City Council an amount not to exceed $10,000,000 adjusted annually by the CPI-U for each year beyond 2010, or an equivalent area within a building as part of the DSUP process. The location of the theater shall be depicted an approved as part of the phasing condition required herein. The theater shall be constructed or the monetary contribution shall be made payable to the City prior to the first Certificate of Occupancy permit for the block in which the theater is located. If applicable, the Applicant shall participate in the rental management of the space(s) to the satisfaction of the Director of P&Z. (P&Z)

93. **Recycling Center:** To recycle the Municipal Solid Waste (MSW) products, the Applicant shall provide an area of 500 sq.ft. for the construction of a community recycling center, entirely enclosed within a building, architecturally screened to be integrated with the remainder of the building and accessed from a C Street as defined by the *North Potomac Yard Urban Design Standards*, within CDD#19. The facility must be accessible by standard City vehicles that will collect the recycling. The location of which shall be mutually agreeable to the City and the Applicant. The Applicant shall also develop a solid waste management plan per the City's "Solid Waste and Recyclable Materials Storage Space Guidelines". Roll off dumpster containers for recycling newspaper, paper towels, aluminum, plastic, glass, soft drink containers, steel cans, and plastic detergent bottles shall be provided in this Community Recycling Center by the Applicant; however, the Community Recycling Center shall be maintained by the City of Alexandria. The facilities require by this condition shall be provided prior to the release of the Certificate of Occupancy permit for 3.7 million sq.ft. of development. (T&ES)

R. AFFORDABLE HOUSING

94. A voluntary affordable housing contribution shall be provided pursuant to the formula contained in the "Developer Housing Contribution Work Group Report" dated May 2005 and accepted by the City Council on June 14, 2005, and calculated as follows:
    a. For commercial: $1.50 per sq.ft. of gross floor area
    b. For residential development:
        i. For the "base square footage," which shall be defined as the first 600,000 sq.ft. of residential gross floor area (divided proportionally between rental and for sale use if provided simultaneously):
            1. $1.50 per sq.ft. of multifamily rental gross floor area
            2. $2.00 per sq.ft. of for sale residential gross floor area
        ii. $4.00 per sq.ft. of residential gross floor area after the base square footage has been satisfied.
    c. As contributions become payable, the Applicant shall receive an initial credit of $300,000 as an offset for the affordable housing contribution provided in connection with the current development on the site pursuant to DSP #2005-0020.
    d. The amount of the voluntary contribution for each individual DSUP submittal shall be adjusted by the CPI-U for every year beyond 2010 or shall be consistent with the City's current affordable housing policy in effect at the time of DSUP approval, whichever is greater. Sales and/or rental units will be discounted to the City's specified affordability levels in effect at the time of DSUP approval. (HOUSING)

95. The Applicant has indicated its willingness to provide discounted set-aside affordable units on site (to include affordable, workforce and public housing) within residential developments in CDD#19. The City retains the discretion to select the proportion of the contribution provided as a monetary contribution and the proportion dedicated for on-site units. Additionally, it shall be the City's discretion to select the mixture of unit types (affordable, workforce and public housing) provided on-site and whether some or all of such units may be sold to a designated non-profit entity or to the Alexandria Redevelopment and Housing Authority at a discounted price. (HOUSING)

96. The Applicant may not apply for an affordable housing density bonus, pursuant to Section 7-700 of the Zoning Ordinance, unless they can demonstrate through the DSUP process, and associated traffic study that the proposed transportation infrastructure and open space amenities can support additional density. Any development within CDD#19 requesting approval of a density bonus shall also comply with the *North Potomac Yard Urban Design Standards*. (P&Z)

S. ARCHAEOLOGY & PUBLIC ART

F - 3. Historically, this property was part of the Preston Plantation and may have contained the Preston family grave yard. It was traversed by the Alexandria Canal in the 19th century and contained a turning basin. In the 20th Century, it served as the southbound receiving

yard and northbound classification yard for the railroad. Additional railroad buildings (including car inspection buildings and a laborer's bunk house) were located on the property. Archaeological work was conducted on the property in the 1990s. It revealed extensive grading, which has been corroborated by documentary studies comparing landscape modifications associated with the creation of Potomac Yard. No additional archaeological work is required, but the rich history provides an opportunity to incorporate elements of the history into the design of the development.

97. Prior to the submission of the first DSUP for CDD#19, the Applicant shall submit a current Public Art and Historic Interpretive Plan for the entire site that satisfies the following:
    a. Hire a professional consultant to prepare the Historical Interpretive portion of the Plan to identify themes and methods to incorporate and interpret elements of the heritage and historical character into the design of the open space, buildings, the public realm and to prepare interpretive signs, which shall be erected as part of future development projects;
    b. Identify locations, such as gateways, corridors, historically significant sites, highly visible sites, open space, and others, for opportunities for public art;
    c. Describe forms of public art desired, such as stand-alone pieces or integration into the architecture, landscape, open space and/or public streetscape;
    d. The process for the selection of the artist or artwork;
    e. Funding and maintenance considerations;
    f. Provide a presentation of the historical significance of the place and recommendations for methods to interpret the site through public art, open space design and interior design;
    g. The Public Art and Historic Interpretive Plan shall be subject to the approval by the Office of the Arts, Office of Historic Alexandria / Alexandria Archaeology and the Directors of P&Z and RP&CA;
    h. Prior to release of any final site plan, the consultant shall provide text and graphics for any interpretive signage to be displayed within the site area, to the satisfaction of the Office of Historic Alexandria/Alexandria Archaeology and the Directors of P&Z and RP&CA.
    i. Public art (exclusive of interpretive signage) shall at a minimum of $4,000,000 adjusted annually by CPI-U for each year beyond 2010, or shall be consistent with the City's Public Art Policy in effect at the time of DSUP approval, whichever is greater. The location and design of the public art shall be determined through the DSUP process. (Arts)(Archaeology)(P&Z)(RP&CA)

98. Each preliminary DSUP, filed or pursued under § 5-605 of the Zoning Ordinance, shall meet or exceed the City's current Public Art Policy that is in place at the time the application is heard by City Council. (P&Z)

T. CODE ADMINISTRATION

C - 1 The Applicant shall provide fire hydrant spacing of a maximum distance of 300 feet throughout this portion of the development unless otherwise mitigated to the satisfaction of the Director of Code Administration. (CODE)

U. TRANSPORTATION MANAGEMENT PLAN

99. According to Article XI of the City's Zoning Ordinance, a Transportation Management Plan is required to implement strategies to persuade residents and employees to take public transportation or share a ride, as opposed to being a sole occupant of a vehicle. The details of the Plan are included in the TMP Annex in the general staff conditions. Below are the basic conditions from which other details originate. (T&ES)

100. Any special use permit granted by City Council under this section 11-700, unless revoked or expired, shall run with the land and shall be mandatory and binding upon the Applicant, all owners of the land and all occupants and upon all of their heirs, successors and assigns. Any use authorized by a special use permit granted under this section 11-700 shall be operated in conformity with such permit, and failure to do so shall be deemed grounds for revocation of such permit for the use violating the permit, after notice and hearing, by the City Council. (T&ES)

101. Prior to any lease/purchase agreements, the Applicant shall prepare appropriate language to inform tenants/owners of the transportation management plan special use permit and conditions therein, as part of its leasing/purchasing agreements; such language to be reviewed and approved by the City Attorney's office. (T&ES)

102. North Potomac Yard shall participate in any future Transportation Management Program District established by the City. (T&ES)

103. The North Potomac Yard TMP district shall participate with the adjacent Potomac Yard District TMP, known as CDD #10 with any future approved amendments to CDD #10 TMP to the satisfaction of the Director of T&ES. (T&ES)

104. If required by the Director of T&ES, the North Potomac Yard TMP District shall incorporate future or existing TMPs into their TMP District as required herein. (T&ES)

105. If a stand-alone district is established, a District Coordinator shall be designated for the Potomac Yard North district. The District Coordinator shall be appointed upon application for the initial building permit. The name, location and telephone number of the coordinator shall be provided to the City at that time, as well as of any changes occurring subsequently. This person shall be responsible for implementing and managing all aspects of the district and the parking management program for the project. (T&ES)

106. When the North Potomac Yard District participates in any future District established by the City, a joint District Coordinator shall be appointed to the satisfaction of the Director

of T&ES and funded by the required fees of each District participant. Should the TMP District not assign a District Coordinator agreeable to the Director of T&ES, the City shall assign a Coordinator to be wholly funded by the required fees of each District participant. The function of the Coordinator is to carry out the transportation strategies that shall make possible the goals outlined below. (T&ES)

107. An annual TMP fund shall be created, based on an initial TMP reduction goal of 20% of single occupant vehicles (SOV), and phased increments of 30% and 50% per Table 6 provided below. The rate to be charged for this development shall start at $200.00 per occupied residential unit and $0.30 per usable square foot of office and/or retail space per year. The rate shall continue to increase by an amount equal to the rate of inflation (Consumer Price Index – CPI-U of the United States) for the previous year. The TMP fund shall be used exclusively for the approved transportation activities detailed in the TMP *Attachment #10*. (T&ES)

108. The initial SOV goal of 20% shall be escalated for Potomac Yard North to reflect the three phases of development which encompass the construction and improvement of roads, the implementation of the transitway, and the construction of a Metrorail station. The table below shows the escalation projections: (T&ES)

Table 6: Single Occupancy Vehicle Goals

Phase	Trigger	Goal
Phase I- Pre Development	N/A	N/A
Phase II – Development Preceding Metrorail Station	First Certificate of Occupancy permit before transitway	20% Non-SOV
	Transitway operational	30% Non-SOV
Phase III – Development Concurrent with Metrorail Station Construction	Metrorail under construction	30% Non-SOV
Phase IV –Metrorail Station Operational	Metrorail operational	50% Non-SOV

109. The TMP rates shall be adjusted annually by an amount equal to the rate of inflation (Consumer Price Index – CPI-U of the United States) for the previous year. (T&ES)

110. The TMP rates and program shall be evaluated and adjusted (if appropriate) with each phase or every five years, whichever comes first. The rates shall be evaluated and increased or decreased (as appropriate) based on factors including: ability to achieve goals, varying transit costs, mix of uses etc. The annual rate may be increased up to a maximum of $250 per dwelling unit or $0.38 per square foot plus all CPI-U adjustments to the rate). All adjustments to the rates and programs shall be approved by the Director of T&ES. The TMP fund shall be used exclusively for the approved transportation activities detailed in the *TMP Attachment #10*.

111. The Director of T&ES may require that the funds be paid to the City upon determination that the TMP District has not made a reasonable effort to use the funds for TMP

activities. As so determined, any unencumbered funds remaining in the TMP account at the end of each reporting year may be either reprogrammed for TMP activities during the ensuing year or paid to the City for use in transportation support activities which benefit the site.

112. Any modifications to any parking policies or other conditions of CDD#19 relating to the TMP requirements for North Potomac Yard CDD shall require approval from the City Council.

113. The TMP District shall submit annual reports, fund reports and modes of transportation surveys to the Office of Transit Services and Programs (OTS&P) as detailed in the *TMP Attachment #10*.

VIII. APPENDIX – BACKGROUND

A. Site Context

Potomac Yard and Potomac Greens occupy a 295-acre tract in the northeastern portion of the City. A former rail yard, the tract is linear in nature and is divided into two main areas, Potomac Yard, located west of the CSX rail corridor and Potomac Greens, located east of the rail corridor. The site, previously known as Landbay F, is approximately 70 acres and is located in the northern portion of Potomac Yard. The site consists of two large parcels, separated by the existing Potomac Avenue right-of-way, and is bordered by Four Mile Run and Landbay E to the north, the rail corridor to the east, the recently approved Potomac Yard Landbay G to the south and Route 1 to the west. Currently occupied by the Potomac Yard Retail Center, the site includes large scale retail establishments, a movie theater and a number of restaurants.

B. Site History

With the approval of the 1992 Master Plan, the City approved a new zoning designation for the Potomac Yard / Potomac Greens tract: Coordinated Development District (CDD) #10. The CDD encouraged a mixture of uses and increased the development potential of the district. Despite this zoning designation, the property owner proposed to construct a large retail center, pursuant to the underlying provisions of the CDD zoning.

In 1995, City Council approved a site plan for the Potomac Yard Retail Center, which consisted of approximately 600,000 square feet of retail development and 3,600 parking spaces. The site plan was amended in 1997 to accommodate a sixteen-screen movie theater on the eastern portion of the site. The retail center and associated movie theater were presented and approved as interim uses to be redeveloped in approximately twenty years, as the redevelopment in other areas of Potomac Yard progressed.

The Potomac Yard Retail Center includes several freestanding structures adjacent to Route 1 which are primarily occupied by restaurants, retail and neighborhood serving uses, including a dry cleaner and a hair salon. In addition to the freestanding structures, there are also two large structures located in the center of the site, approximately 450 feet from Route 1 which are occupied by large scale retail tenants including Target, Staples, PetSmart, Shoppers Food Warehouse and similar establishments. A sixteen screen cinema is located on the eastern portion of the site, between the Potomac Avenue right-of-way and the rail corridor.

C. Project Evolution

In 2008, a combination of events in Potomac Yard resulted in the authorization of the North Potomac Yard planning process by City Council. These events included:

- CPYR, Inc. expressed interest in rezoning the Potomac Yard Retail Center and submitted a Coordinated Development District Conceptual Design Plan to propose increased density to accommodate an urban, mixed-use community;

- Interest in a Metrorail station at Potomac Yard intensified and City Council authorized funding for a Metrorail Station Feasibility Study; and
- City Council approved the transfer of office density from Potomac Yard Landbays J and L to Landbay H, in addition to an increase in height in Landbay H.

City Council agreed with staff that the redevelopment of an approximately 70-acre site coupled with a potential Metrorail station and increased height and density in a non-metro proximate location required a comprehensive analysis to ensure consistency with the City's adopted plans and policies.

Subsequent to the authorization of the *North Potomac Yard Small Area Plan*, City Council established the Potomac Yard Planning Advisory Group (PYPAG) to identify issues, challenges and opportunities with the redevelopment of North Potomac Yard and assist staff in the development of policy recommendations, amongst other functions. The City Manager appointed residents, property owners, business owners and representatives of other interest groups to the advisory group. A representative of the applicant, McCaffery Interests, Inc. served as a member of PYPAG and participated in the overall planning process.

In the early fall of 2009, the applicant submitted a Coordinated Development District (CDD) conceptual design plan based on concepts identified through the North Potomac Yard planning process and discussions with staff. In the concept plan, the applicant proposed a mixed-use community including office, hotel, retail and residential uses as well as ground level open space. Although the concept plan was largely consistent with the vision and guiding principles of the *North Potomac Yard Small Area Plan*, several issues, including sewer conveyance and capacity, stormwater retention and traffic circulation required further consideration.

In November 2009, the applicant submitted a revised plan to address the previously identified issues of sewer conveyance, sewer capacity and stormwater retention. Although the revised submission largely complied with the *North Potomac Yard Small Area Plan* recommendations, the concept plan continued to differ from the framework established in the *North Potomac Yard Small Area Plan* in the following areas:

- Design and location of Potomac Avenue;
- Configuration of streets and blocks in the flexible Metrorail zone adjacent to the future Metrorail station;
- Design and location of a transit center for access to the future Metrorail station, high-capacity transit and local transit service; and
- Extension of East Reed Avenue and configuration of blocks within the Market Neighborhood.

To demonstrate compliance with the framework established in the *North Potomac Yard Small Area Plan*, the applicant submitted a revised concept plan in May 2010, which depicted the flexible Metrorail Zone. As the design and location of Potomac Avenue and the transit center are largely dependent upon the final configuration of streets and blocks within the flexible zone, the applicant agreed to amend the Coordinated Development District Conceptual Design Plan to depict the streets, blocks, buildings, and open space within the flexible zone as details regarding

the Metrorail station and high-capacity transitway are finalized. In addition, the applicant revised the concept plan to extend East Reed Avenue from Route 1 to Potomac Avenue, to create two distinct blocks in the Market Neighborhood.

IX. ATTACHMENTS

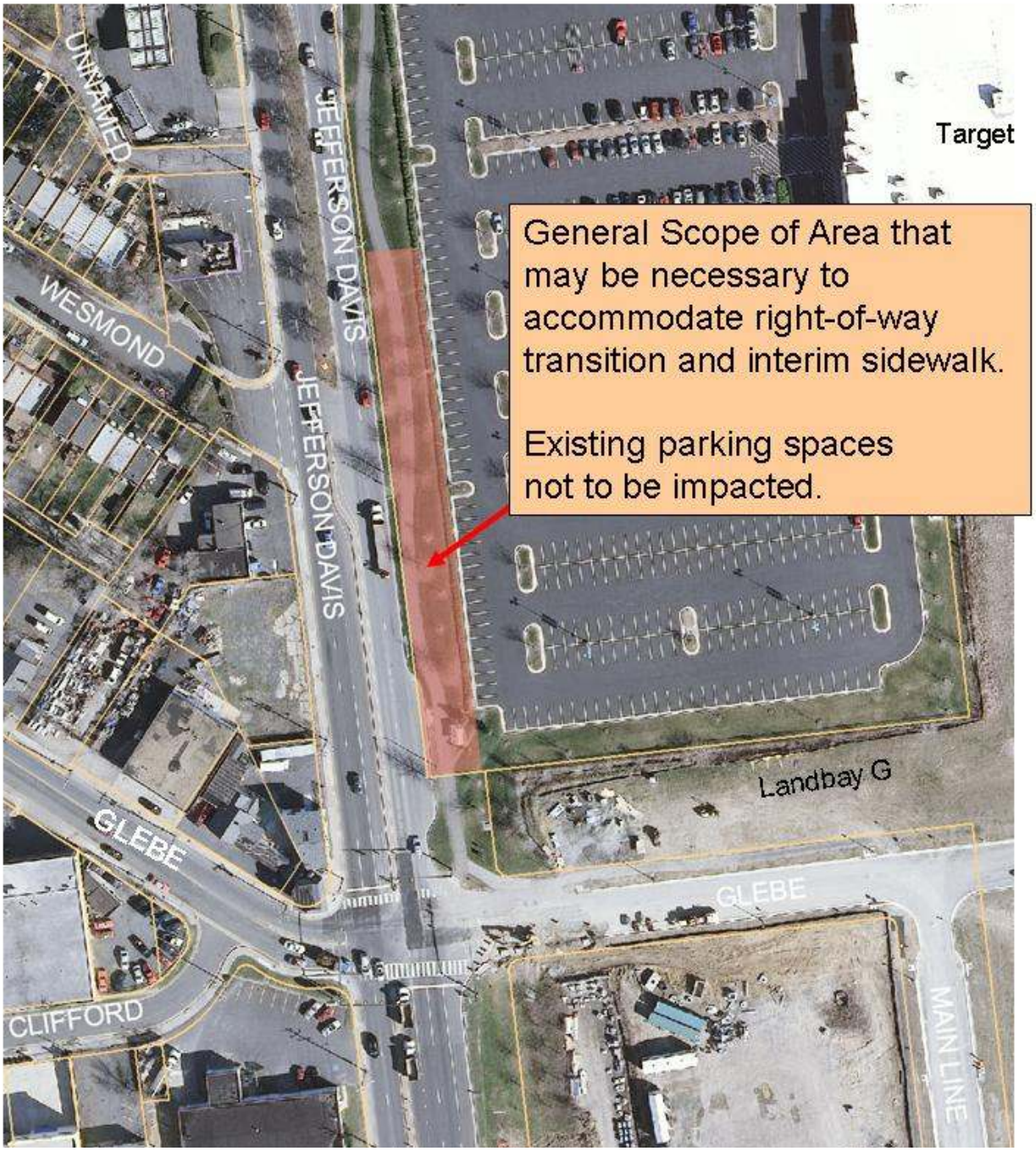
Attachment #1

Attachment #2

INTERIM CIRCULATION ROUTE

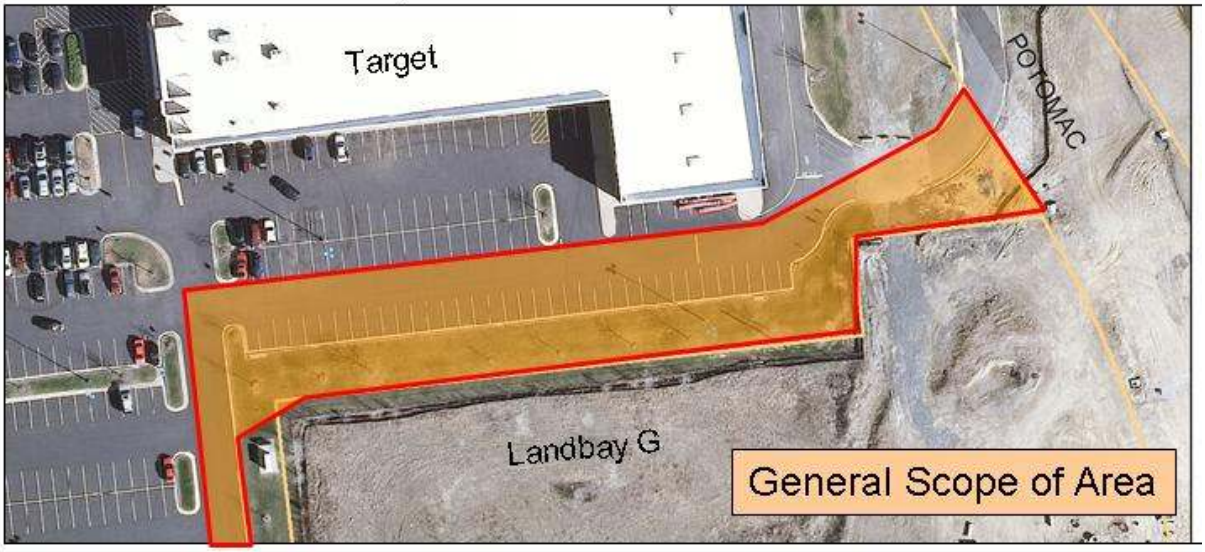
Attachment #3

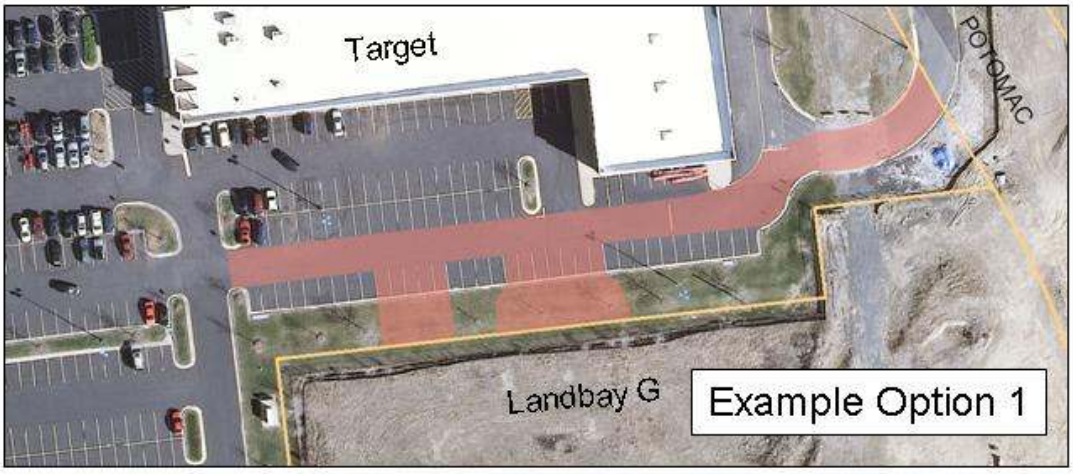
INTERIM ROUTE 1 - ROW TRANSITION

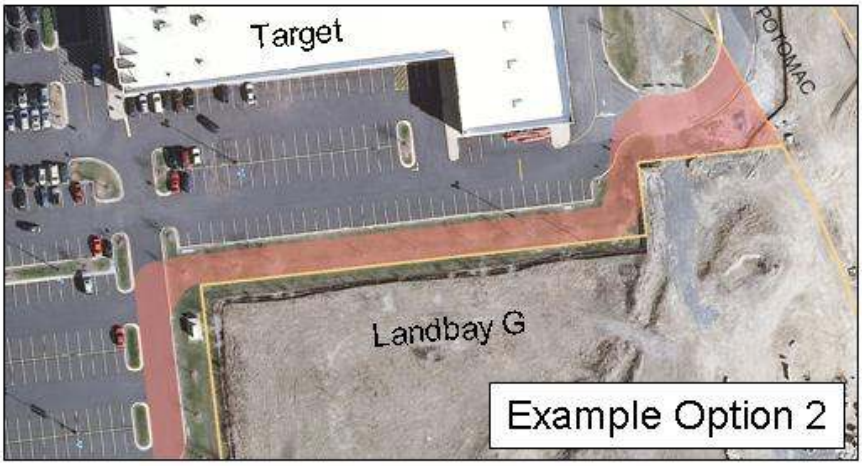


Attachment #4

LANDBAY G, BLOCK D INTERIM ACCESS

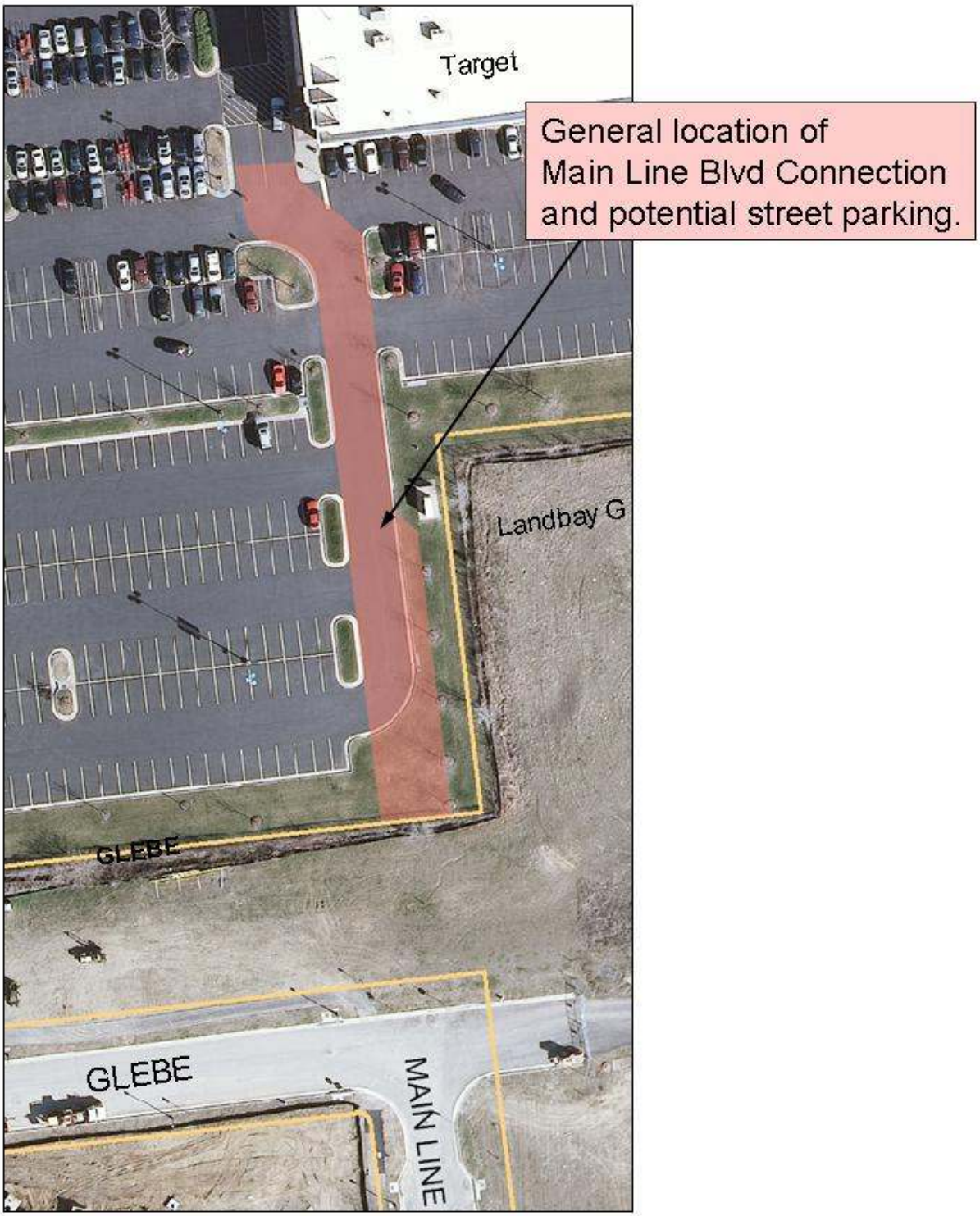






Attachment #5

INTERIM MAIN LINE BLVD CONNECTION



Attachment #6

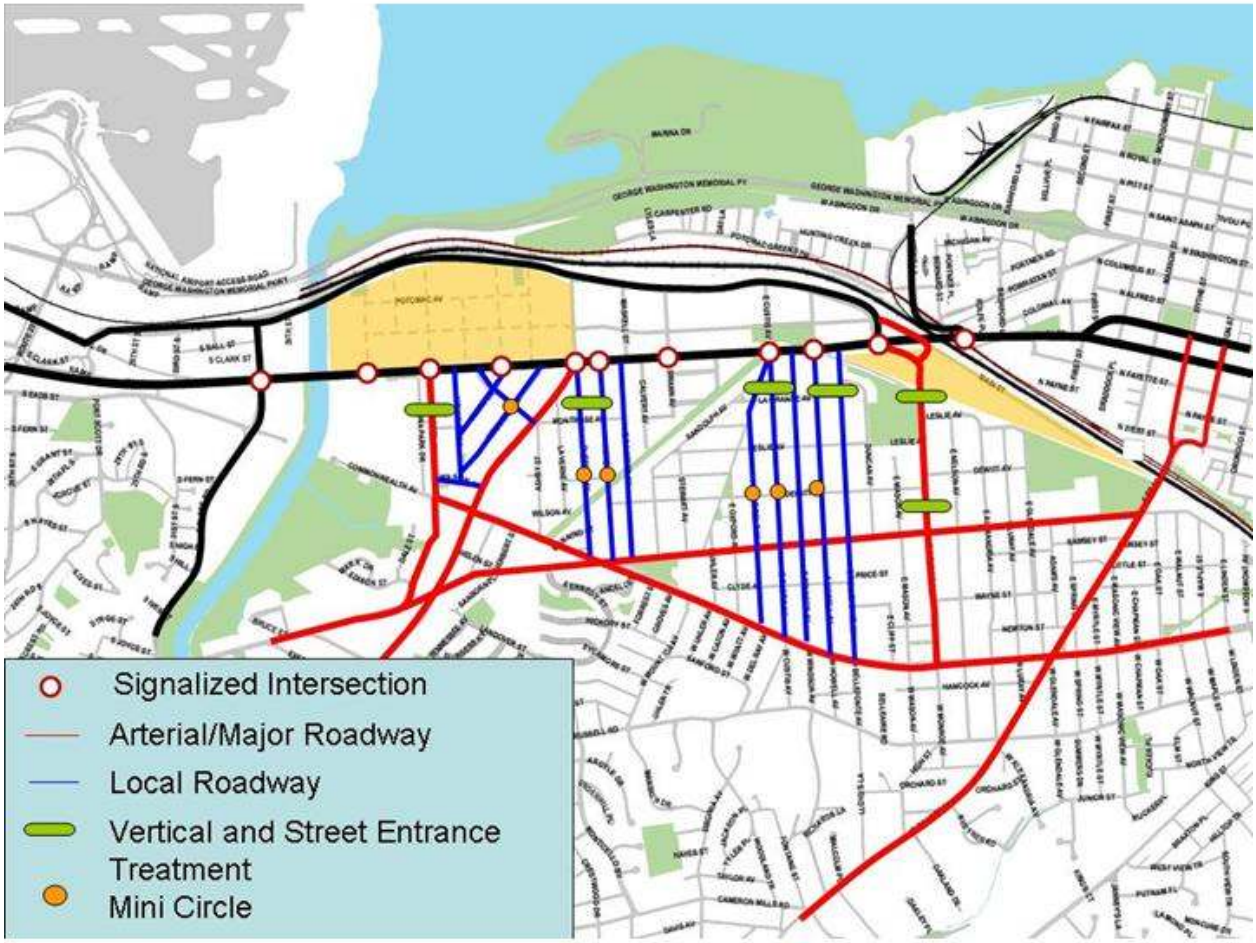
PROPOSED STREET NAMES

Attachment #7

CRESCENT PARK BOUNDARIES

Attachment #8

NEIGHBORHOOD TRAFFIC CALMING



Attachment #9

Attachment #10

Transportation Management Plan (TMP) Attachment

North Potomac Yard - TMP # 2009-00061

3601 Jefferson Davis Highway
3601 Potomac Avenue
Alexandria, VA 22301

The City of Alexandria is studying the feasibility of a transitway system along Route 1 and a Metro Station to serve the Potomac Yard area. Joined to the existing local bus service, these two facilities make North Potomac Yard an ideal location for transit use and the lowering of single occupant vehicles that could be generated by the development. In view of this location, below are the Transportation Management Plan (TMP) conditions that the Transportation Planning Division proposes for North Potomac Yard mixed use:

The Transportation Management Plan (TMP) program was enacted by the Alexandria City Council on May 16, 1987 and is now part of the Alexandria Zoning Code (Chapter 6, Title 7). The ordinance requires that office, retail, residential and industrial projects which achieve certain square footage thresholds submit a special use permit application which must include a traffic impact analysis and a transportation management plan (TMP). The Planning Commission and the City Council consider all special use permit applications, and the City Council makes the final decision on the approval of the applications. Any project requiring a TMP must receive the TMP special use permit, before the project can proceed. The TMP Program is a comprehensive effort to increase the use of transit and reduce the number of single occupant vehicles (SOVs) in the City.

The Transportation Management Program for North Potomac Yard consists of 5 parts:

1) Goal and Evaluation of the TMP
2) Organization and Funding
3) Transportation Management Plan
4) Evaluation of the Effectiveness of the TMP
5) Permanence of the TMP Ordinance

1. Goal and Evaluation of the TMP

a. The initial reduction goal of 20% in SOV will be escalated for Potomac Yard North to reflect the four phases of construction which encompass the construction and improvement of roads, the implementation of a transitway, and the construction of a metro station. The table below shows the escalation projections:

PHASE	TRIGGER	GOAL
Phase I- Pre Development	N/A	N/A
Phase II – Development Preceding Metrorail Station	First certificate of occupancy permit before transitway	20% Non-SOV
	Transitway operational	30% Non-SOV
Phase III – Development Concurrent with Metrorail Station Construction	Metrorail under construction	30% Non-SOV
Phase IV – Metrorail Station Operational	Metrorail operational	50% Non-SOV

b. The achievement of all goals will be demonstrated by the transportation strategies implemented and financed by the TMP fund and the annual survey that are requirements of this special use permit. The fund report should demonstrate that enough activities are being conducted to persuade residents and tenants, as well as retail employees, to switch to other modes of transportation as opposed to using their personal vehicles. The survey should progressively show that the strategies financed through the TMP fund are increasing the number of transit users in the site up to the goal. The fund report and survey are covered under paragraph 3, sections c., d. and e.

2. **TMP Organization and Funding**

a. The developer has agreed to establish a governing entity or comparable entity to manage the shared parking programs, the Transportation Management Plan, the maintenance of the BMP's and the open space. The City of Alexandria Transportation Planning Division may assist the governing entity.

b. An Annual Work Plan will be developed by the governing entity and approved by the Transportation Planning Division. This work plan will be due on January 15 of every year. To fund the ongoing operation and management of the TMP, the governing entity will assess each owner of property within the development following issuance of each building's certificate of occupancy. The annual rates for the fund are established in paragraph 3.c. of this same document. The rates will be adjusted yearly as per the consumer price index (CPI-U).

3. **Transportation Management Plan**

a. According to the guidelines of Zoning Ordinance Chapter 11-700, the proposed level of development requires a Transportation Management Plan (TMP). Such plan shall include the following elements:

i. A TMP District Coordinator shall be designated by the governing entity, for the entire project ***upon application for the initial building permit***. The name, location and telephone number of the coordinator will be provided to the City at that time, as well as of any changes occurring subsequently. This person will be responsible for implementing and managing all aspects of the TMP and the parking management program for the project.

ii. Transit, ridesharing, staggered work hours/compressed work weeks, parking restrictions, market rate parking and the other program elements shall be promoted to prospective tenants and to employers and their employees.

iii. Printed information about transit, ridesharing, and other TMP elements shall be distributed and displayed to residents — including transit schedules, rideshare applications and information, incentive information, parking information, etc. This information shall be kept current. Displays of these brochures and applications shall be placed in a prominent location in the building and a web site with this information and appropriate links to transit providers will be provided and maintained.

iv. A ridesharing program shall be established that includes not only participation in the regional Metropolitan Washington Council of Governments Commuter Connections Program, but also site-specific matching efforts.

v. Establish and promote a Guaranteed Ride Home Program as part of the ridesharing and transit marketing efforts.

vi. A carshare program shall be established as part of the ridesharing and transit marketing efforts for the building. The TMP District Coordinator will arrange with any of the carshare companies for the use vehicles in this project. Currently, Zipcar has vehicles in the Alexandria area. For those individuals who take transit, carpool, vanpool, walk, or bike to work, the TMP program will pay the registration and annual membership fees (not the usage fees) to use the carshare vehicles.

vii. Discounted bus and rail fare media shall be sold on-site to residents of the project including during hours that are convenient for them. The fare media to be sold will include, at a minimum, fare media for Metrorail, Metrobus, DASH and any other public transportation system fare media requested by residents and/or the Transportation Planning division. The availability of this fare media will be prominently advertised. At a minimum, the initial discount will be 20%.

b. **TMP Fund**: An annual TMP Fund shall be created based on an initial TMP reduction goal of 20% of single occupant vehicles (SOV), and phased increments of 30% and 50% per the table provided herein. The rate to be charged for this

development shall start at $200.00 per occupied residential unit and $0.30 per usable square foot of office and/or retail space per year. The TMP fund shall be used exclusively for the approved transportation activities detailed in this attachment. ***The first payment to the fund shall be made with the issuance of initial Certificate of Occupancy (CO).*** Payments shall be the responsibility of the developer until this responsibility is transferred by lease or other legal arrangement to the governing entity. Annually, to begin one year after the initial CO is issued, the rate shall increase by an amount equal to the rate of inflation in the Consumer Price Index (CPI-U) of the United States for the previous year.

The TMP rates and program shall be evaluated and adjusted (if appropriate) with each phase or every five years, whichever comes first. The rates will be evaluated based on factors including, ability to achieve goals, varying transit costs, mix of uses, etc. The annual rate may be adjusted up to a maximum of 25% of the base rate noted above ($250 per dwelling unit, or $0.38 per square foot). All adjustments to rates and programs shall be approved by the director of T&ES.

The TMP fund shall be used exclusively for the approved activities listed below:

i. Discounting the cost of bus and transit fare media for on-site employees and residents, not to exceed the actual cost of their monthly transportation as employer subsidies may not cover an employees full commuting costs.

ii. Subsidies to transit providers.

iii. Marketing activities, including advertising, promotional events, etc.

iv. Bicycle lockers for residents.

v. Membership and application fees for carshare vehicles.

vi. Participate in air quality/ozone action day programs.

vii. Any other TMP activities as may be proposed by the governing entity and approved by the Director of T&ES as meeting goals similar to those targeted by the required TMP measures.

c. Unencumbered Funds: As determined by the Director of T&ES, any unencumbered funds remaining in the TMP account at the end of each reporting year may be either reprogrammed for TMP activities during the ensuing year or paid to the City for use in transit and/or ridesharing programs and activities.

d. The governing entity will provide semi-annual TMP Fund reports to the Transportation Planning Division. These reports will provide a summary of the contributions to the fund and all expenses and should be accompanied by supporting documentation. The first report will be due six months following the

issuance of the first certificate of occupancy. The Director of T&ES may require that the funds be paid to the City upon determination that the governing entity has not made reasonable efforts to use the funds for TMP activities.

e. The governing entity shall provide annual reports to the Transportation Planning Division, including an assessment of the effects of TMP activities on walking, biking, carpooling, vanpooling, transit ridership, driveway counts for structured parking, peak hour traffic, the summary results of the annual survey, together with the raw data, and a work program for the following year. The initial report shall be due 1 year after the issuance of the first certificate of occupancy for North Potomac Yard. The annual report shall identify, as of the end of the reporting period, the amount of square footage of occupied office and retail space. In conjunction with the survey, the governing entity shall provide an annual report of the TMP program to the Director of T&ES, reviewing this TMP condition as well as compliance with the approved parking management plan for the project.

f. **Administrative Fee for Non-Compliance:** An administrative fee shall be assessed to the governing entity for lack of timely compliance with the submission of the TMP mandatory reports (fund reports with supporting documentation, annual reports, survey results and submission of raw data). The fee shall be in the amount of five hundred dollars ($500.00) for the first thirty (30) days late and two hundred and fifty dollars ($250.00) for every subsequent month late. The amount of these administrative fees is for the base year in which the TMP is approved and shall increase according to the Consumer Price Index (CPI-U) going forward.

4. **Evaluation of the Effectiveness of the TMP**

a. The goals for transit mode share and auto occupancy established in paragraph 1.a of this document, will be used in evaluating the performance and effectiveness of the TMP. The annual survey will be used to continually determine whether the development is meeting these targets.

b. The City of Alexandria, in conjunction with the governing entity, will identify performance standards and objectives to measure the cost effectiveness and develop methodologies to monitor the performance of each element of the TMP. The performance of the development in meeting these objectives will be evaluated in the annual report prepared by the governing entity, and will be used in developing the Annual Work Plan for the association.

c. This TMP has been designed to be flexible and responsive to the inputs of these annual evaluations in prescribing Transportation Demand Management (TDM) strategies to be implemented in the Annual Work Program. The combination of size, scale of buildings, mixed-uses and phasing of development and transportation infrastructure requires that the TMP have flexibility to respond to

the various challenges posed by changes in tenant mix, supply of parking, transit system capacity, transit fares, construction staging and traffic, fuel prices, regional transportation policies and projects, and changes in travel behaviors, prevalence of public transportation subsidies, telework and flexible work hours, and changes in surrounding developments. By linking evaluation to work planning, the TMP standards of performance will also change throughout the development cycle as the "right" solutions are adjusted in response and anticipation of changes in transportation conditions.

5. **District Transit Management Program**

a. North Potomac Yard shall participate in any future Transportation Management Program District established by the City. All TMP holders in the Potomac Yard area will be part of this District. The objective of this district is to make optimum use of transportation resources for the benefit of residents and employees through economies of scale.

b. The North Potomac Yard TMP district shall participate with the adjacent Potomac Yard District TMP, known as CDD #10 with any future approved amendments to CDD #10 to the satisfaction of the Director of T&ES.

c. If required by the Director of T&ES, the North Potomac Yard TMP District shall incorporate future or existing TMPs into their TMP District as required herein.

6. **Permanence of the TMP Ordinance**

a. ***Prior to any lease/purchase agreements***, the applicant shall prepare appropriate language to inform tenants/owners of the transportation management plan special use permit and conditions therein, as part of its leasing/purchasing agreements; such ***language to be reviewed and approved by the City Attorney's office***.

b. The Director of T&ES may approve modifications to agreed TMP activities, provided that any changes are consistent with the goals of the TMP.

MEMORANDUM OF UNDERSTANDING

BY AND BETWEEN

CITY OF ALEXANDRIA, VIRGINIA

AND

CPYR, INC.

FINAL AT MAY 25, 2010

MEMORANDUM OF UNDERSTANDING BETWEEN THE CITY OF ALEXANDRIA, VIRGINIA AND CPYR, INC. REGARDING POTOMAC YARD METRORAIL STATION FINANCING

This Memorandum of Understanding is entered into the ___ day of May, 2010 between the City of Alexandria, Virginia, a municipal corporation ("**City**") and CPYR, Inc., a Delaware corporation ("**CPYR**" or "**Owner**"). The City and CPYR are collectively referred to as the "Parties".

Recitals

1. CPYR is the owner of Landbay F at Potomac Yard and wishes to redevelop the existing retail center generally in conformance with the draft North Potomac Yard Small Area Plan. RREEF America L.L.C., ("**RREEF**") is the investment adviser to CPYR` and McCaffery Interests, Inc. is the development consultant to CPYR;

2. The City and the Owner through RREEF and McCaffery have engaged in a cooperative planning process which has produced the North Potomac Yard Small Area Plan adopted by the Alexandria City Council May 15, 2010 ("**SAP**"). The critical element of the SAP is the proposed Potomac Yard Metrorail Station ("**Metrorail Station**").

3. The City and CPYR both wish to facilitate the design, funding and construction of the new Metro Station to serve Potomac Yard and have engaged in discussions regarding the funding of the Metro Station.

4. At its Monday December 15, 2009, meeting, the Metrorail Station Feasibility Work Group (which includes the City's Mayor, Vice-Mayor, former Chair of the Planning Commission and Chair of the Transportation Commission) unanimously adopted certain guidance for City staff in relation to the proposed Metrorail Station. Critical policy statements from this include the following:

   - Construction of the Metrorail Station is required to support the level of development proposed in Landbay F.

   - Amendments to the Master Plan and the rezoning of Landbay F cannot go forward until the City is satisfied that an acceptable financing plan has been developed and agreed to.

   - Paragraphs 4, 5 and 6 require a clear, detailed and conservative financial plan with no negative cash impact on the City's General Fund in any given year.

   - The projected "gap" between the anticipated tax revenues from the special tax district, per square foot developer contributions, plus additional incremental net new revenues generated by the project, will be "bridged" by "firm and sufficient upfront Landbay F payments."

5. The Parties wish to set forth their mutual understanding of the next steps in the process for planning development of the Metrorail Station and redevelopment of Landbay F and wish to set forth their respective commitments and obligations to each other.

Agreement

Now, therefore, in consideration of the material undertakings set forth hereafter, the City and CPYR, each pursuant to due and proper authority, agree to the following, which shall govern the Parties' actions with respect to the matters contained herein.

1. Effect of Agreement. This Memorandum of Understanding ("MOU") sets forth the Parties' mutual expectations to proceed with various material undertakings and the negotiation of binding agreements in the future. If either Party fails to perform as set forth in this MOU, the other Party may terminate this MOU, but shall have no additional remedy against the other based solely on this MOU. The Parties expect that future agreements and actions will include binding agreements, including remedies for default where applicable and as provided in such agreements, and subject to the legislative discretion of the City Council and all municipal immunities enjoyed by the City, as well as legislative and administrative approvals of development proposals for Land Bay F. These future agreements and actions include, but are not limited to:

   a. Approval of North Potomac Yard Small Area Plan;

   b. Rezoning of Land Bay F;

   c. Approval of CDD conceptual design plan;

   d. Creation of twoSpecial Tax Districts.

   e. Approval of preliminary development plan special use permits;

   f. Shortfall Guaranty Documentation and Shortfall Deposit Agreement;

   g. Environmental studies and regulatory approvals;

   h. Funding of predevelopment expenses prior to bond issuance.

   i. Design process for Metrorail station;

   j. Award of a contract for construction of the Metrorail Station; and

   k. Issuance of bonds (the "Bonds") sufficient for construction of the Metrorail station.

   The Parties anticipate that the land use approvals for development of Land Bay F will proceed in the ordinary course for such reviews, including staff review, public notice and comment, Planning Commission review and recommendations, and City Council review and action. The Shortfall Guaranty Deposit Agreement will set forth the terms contemplated by this MOU in greater detail and will be executed prior to issuance of bonds for the Metrorail Station.

2. Establishment of Potomac Yard Metrorail Station Fund ("Station Fund"). Concurrently with the approval of a rezoning of Landbay F, the City will establish a fund for purposes of accumulating the following flow of funds, each of which is described in more detail below. All cash contributions by the Owner to the Station Fund shall be payable without offset, deduction or counterclaim of any kind, except as expressly set forth herein. The Station Fund will be a separate segregated fund, the proceeds of which may be used only for the purposes stated herein, i.e., furthering the design, construction and financing of the Metrorail Station. Funds may not be diverted from the Station Fund for other purposes, except as described in this Section below.

   a. Net New Tax Revenues. Net new tax revenues generated by the several Landbays at Potomac Yard ("Net New Tax Revenues"), commencing as of the final effective date of the rezoning but in any case no earlier than June 15, 2011 for real property tax revenues, and July 1, 2011 for other tax revenues. Net New Tax Revenues shall include all new real property taxes (i.e., increased ad valorem real estate taxes over and above the base year in which the rezoning occurs, whether due to increased assessed values, new construction or development, or changes in the tax rates, including the real estate tax rate, in effect in the base year) payable to the City from all Landbays at Potomac Yard, less the percentage amount of gross tax receipts for each type of use representing the estimated cost of providing services required by such use, as follows, such percentage to remain in effect so long as the Bonds are outstanding unless a different percentage for cost of services is agreed upon by the City and the landowners of the various Landbays at Potomac Yard. Net New Tax Revenues shall also include increased business tangible, sales (1% City levy), meals, transient occupancy and business licenses tax receipts from net new development in Potomac Yard; the same percentages described below will be applied to such other types of taxes, depending on the source of the tax, i.e. net new sales taxes will be subject to the retail percentage, net new transient occupancy tax shall be subject to the Hotel/Hospitality percentage, and so forth. Excluded from net new taxes would be: (1) any new tax category or new classification not in place and approved by the Alexandria City Council as of January 1, 2010, including but not limited to the commercial transportation add-on real estate tax for transportation purposes, and (2) any taxes restricted by federal or state law or regulation which would be inconsistent with the payment of debt service on the bonds issued to finance the Metrorail Station in Potomac Yard.

      i. Residential: 59.85 % of revenues utilized for services, leaving 40.15 % percent of gross new tax revenues to be utilized as Net New Tax Revenues and placed in the Station Fund (Source for all: USPTO Study 1999).

      ii. Office and other non-retail commercial: 17 % of revenues utilized for services, leaving 83 % percent of gross new tax revenues to be utilized as Net New Tax Revenues and placed in the Station Fund.

iii. Retail: 12.9 % of revenues utilized for services, leaving 87.1 % percent of gross new tax revenues to be utilized as Net New Tax Revenues and placed in the Station Fund.

iv. Hotel/Hospitality: 6.5 % of revenues utilized for services, leaving 93.5 % percent of gross new tax revenues to be utilized as Net New Tax Revenues and placed in the Station Fund.

b. Special Tax Districts. Special Tax District revenues generated by the several Landbays at Potomac Yard, based on the projected establishment (effective January 1, 2011) of a special tax district to apply to all assessed value (current and future) of real property and improvements in the Landbays at Potomac Yard, based on a planned special assessment of twenty cents ($0.20) per one hundred dollars ($100.00) of assessed valuation on Landbays F, G, H, I, and J ("Special Tax District Revenues"). Old Town Greens will not be subject to the Special Tax District. Potomac Greens, and portions of Potomac Yard landbays other than Landbay F which are to be developed for single family attached development (or alternatively, areas within such other land bays zoned for lower density residential and at a further distance from the Metro Station); will be included in a second Special Tax District when established, with a rate of zero until the Metro Station commences operation, and thereafter with a yet to be determined tax rate that is planned to be equal to or less than ten cents ($0.10) per $100.

c. Developer Contributions. Developer contributions of Ten Dollars ($10.00) per square foot of gross floor area (net of structured parking) of new construction within one quarter (1/4) mile of the entrance to the Metrorail Station ("Developer Contributions"), payable concurrently with issuance of each certificate of occupancy for such new improvements, and which shall be paid by the then-owner of such improvements. This in Landbay F has been estimated for financial modeling purposes in 2010 dollars at $49 million based on 4.9 million square feet of gross floor area within ¼ mile of the Metrorail Station entrance. This $10.00 per square foot Developer Contribution would be as of the date of final approval of the rezoning of Landbay F, and, in order to retain a $10 real dollar equivalent in 2010 dollars, would escalate annually thereafter on January 1 of each year in accordance with increases in prior years in the Consumer Price Index for all urban consumers (CPI-U), 1982-1984=100 (not seasonally adjusted) as reported by the United States Department of Labor, Bureau of Labor Statistics. The base CPI will be set as of the date of the rezoning and will be adjusted as of the first day of January each year thereafter, and the resulting adjusted Developer Contribution per square foot amount shall be in effect for that calendar year. It is understood that Potomac Yard Development LLC ("PYD") and MRP Realty ("MRP") as the owners of other landbays at Potomac Yard, are not seeking a rezoning with substantial additional density and have made extensive public benefit contributions for transportation, sewer, storm water management, and will not be required to make Developer Contributions. However, it is acknowledged that if in the future PYD or MRP or any successor of either initiates a rezoning of all or a

portion of their respective properties, involving significant increases in density of development, then mitigation of transportation impacts, including potential contributions to the Metrorail station, would be a part of the rezoning contribution negotiation. As our discussions have evolved and we have considered issues of administrative simplicity, it has been agreed that although the Developer Contribution was initially to be based on new construction within ¼ mile from the Metrorail Station, the Developer Contribution will, in final documentation, (i) be based on any new development within Blocks 7, 8, 9, 10, 11, 13, 14, 15, 17, 18, 19 and 20**;** (ii) be collected based on the gross floor area of improvements constructed and for which a certificate of occupancy is issued, net only of area devoted to structured parking; (iii) shall be collected on the first 4.9 million square feet of such improvements after which no further Developer Contributions shall be payable for any development thereafter in Landbay F.

d. Interest earned on funds deposited in the Station Fund, including interest earned by any investment of bond principal will be invested by the City as per Code of Virginia investment laws for short-term cash investments and shall remain in the Fund and may be used for any purposes allowed by the Station Fund.

e. In the event that bonds for the Metrorail Station are not issued by January 1, 2018 and the City and CPYR or the then controlling owner of Landbay F determine that financing and construction of a Metrorail Station is no longer feasible, any Developer Contributions then remaining in the Station Fund may be withdrawn from the Station Fund by the Owner. In determining the extent of Developer Contributions remaining in the Station Fund, the use of funds expended shall be deemed to have been spent in proportion to the source of the funds. The parties will cooperate to develop a schedule for all predevelopment processes and approvals preceding the closing of bond financing and construction of the Metrorail station, with milestones against which progress can be measured.

3. Bond Financing of Metrorail Station Construction. The City has determined that the long term benefits to the City from redevelopment of Potomac Yard, including the construction of a Metrorail Station serving Potomac Yard, merit the incurrence by the City of bonded indebtedness of approximately $275 million (the "Bond Financing") to pay hard and soft costs of construction, capitalized interest, and issuance costs necessary to place in service an operating Metrorail Station serving Potomac Yard. The bonds may be issued as general obligation bonds, revenue bonds, lease-revenue bonds, certificates of participation, or other municipal debt instruments, or a combination of these instruments. The bonds may be issued in one or more tranches. The bonds are likely to be fixed rate, but some or a portion of the bonds may be issued as variable rate.

4. Utilization of Funds from Potomac Yard Metrorail Station Fund. The City may use funds accumulated in the Station Fund to cover debt service on the Bonds issued to finance the Metrorail Station, to cover that portion of any annual operating expense deficit specifically allocable to the Potomac Yard Metrorail Station by WMATA and chargeable to the City pursuant to the terms of the WMATA Compact to which the City is a party, to pay expenses incurred in the establishment of the Fund, costs of design of the Metrorail

Station, including architectural, engineering, design, and construction document costs, costs of land acquisition, costs of permit or grant applications and processing, environmental studies, legal and other professional service costs, and all other costs reasonably incurred by or on behalf of the City in connection with the final location approval, design, and preparation for commencement of construction of the Metrorail Station. Funds accumulated in the Station Fund could be used to pay ongoing costs of construction, or accumulated as a debt service reserve, as determined pursuant to the terms of the Bond Financing. Funds may also be used to reimburse the City for Metrorail Station related expenses incurred prior to initiation of the Fund. If any funds accumulated in the Station Fund prior to the closing of Bond Financing and commencement of construction of the Metrorail Station, are insufficient to pay ongoing predevelopment expenses, either party shall have the right, but not the obligation, to contribute funds to the Station Fund to pay such expenses, such additional advance contributions to be eligible to be repaid from the proceeds of the Bond Financing. The parties shall immediately commence the development of a detailed checklist of predevelopment tasks and anticipated costs, including development of an overall multi-year budget showing total anticipated costs that are expected starting in 2010 up until the closing of Bond Financing and commencement of construction.

5. Financing Plan. The financing plan for the construction of the Metrorail Station (the "Financing Plan") has evolved so that the following general principles are agreed upon:

a. The projected cost of construction of the Metrorail Station, using the highest cost alternative B-2 to construct a "mid-point" cost and debt service projection, is approximately $240 million in 2015 dollars (mid point of construction). Capitalized interest and bond issuance costs are estimated at $35 million.

b. The City will issue bonds ("Bonds"), in an amount not to exceed $275 million, to fund construction of the Metrorail Station. The plan is to issue the Bonds as tax exempt bonds to the maximum degree feasible, or to utilize the federal Build America Bond program if authorized at the time the bonds are issued.

c. Construction period interest will be capitalized during the first three years after issuance of the Bonds.

d. Bonds will provide that repayment will be of interest only during years four through six (4-6), with repayment of principal commencing in year seven (7).

e. Depending on market conditions at the time of issuance, all or a portion of the Bonds may be callable at the end of the tenth year. This may increase borrowing costs slightly in the first ten years, but will provide an opportunity for refinancing of the Bonds, after the first ten years, or through an advance refunding prior to the end of the first ten years through a new bond issuance and defeasance of the original Bonds.

f. Although neither the Owner nor the current City Council can bind future Councils, the present intent is that when the debt incurred to finance the

construction of the Metrorail Station has been fully paid off, and any funds advanced by the City due to shortfalls in the Station Fund have been repaid, the Special Tax Districts would be terminated. This is projected to be 30 years after the issuance of the Bonds.

g. The City plans to submit a preliminary Financing Plan to the City's bond counsel and financial advisors, and to discuss this proposed financing with the applicable rating agencies during the first half of 2010, to obtain early evaluation and comment of the feasibility of the Financing Plan (which the City's financial advisors have already provided input to) and to identify issues that need to be addressed. Adjustments to the plan may be required as a result of this review, to ensure that the Financing Plan is conservative, with a sound financing structure and shared risk, and that it will not put at risk the City's AAA/Aaa bond ratings.

h. The City shall have no obligation to actually issue the Bonds until certain conditions have been met, including but not limited to (i) approval of the final bond financing plan and underwriting prospectus by the City's financial advisors (and any underwriters if the bond sale is negotiated and not a competitive transaction) and counsel; (ii) issuance of all necessary permits for commencement of construction of the Metrorail Station (iii) the Owner has fulfilled all of its obligations with respect to cash contributions and the documentation of the Shortfall Guaranty in a manner sufficient to the City, its underwriters and counsel; (iv) confirmation that based on the final plans for the Metrorail Station and the construction cost estimates provided as part of the design build process, the Metrorail Station can be constructed and placed in service for a total cost not to exceed $240 million; (v) a court validation of the planned Bond issue, or issues, if deemed necessary by the City; and (vi) the attainment of at least a AA bond rating for the Bonds from Moody's and S&P. If a condition to the City's obligation to issue the Bonds is not satisfied and the Bond financing does not close, the Shortfall Guarantor shall not be obligated to make the Shortfall Guaranty Deposit, or if such Deposit has previously been made, it will be returned to the Shortfall Guarantor.

i. Once the Bonds are issued, the City will be obligated in some fashion to make payments of principal and interest on the Bonds, as and when the same come due, or to suffer the consequences of a default in payment, including adverse effects on the City's bond ratings. If the various development and financial projections are not met, the City will still need to service the Bond indebtedness. The Shortfall Guaranty and Shortfall Guaranty Deposit provide comfort that cash shortfalls in servicing the bonds (including principal and interest) will be met by the Owner, deferring any loss to the City. However, inasmuch as the City is primarily liable on the Bonds, if the Shortfall Guaranty is exhausted or the Guarantor defaults in its obligation to make or reimburse the Shortfall Guaranty Deposit or to otherwise make payments of shortfalls as and when due, the City will have to make up the difference. Should this occur interest shall accrue on any amounts paid by the City other than from the Station Fund, at the Applicable Federal Rate from the

time incurred and paid out by the City until the time such funds are returned to the City, such amounts to be repaid to the City when funds in the Station Fund are available to do so (including from the $10 per square foot CPI-U adjusted payments or net new taxes). If the Shortfall Guarantor defaults in its obligation to make payments under the Shortfall Guaranty or to timely replenish the Shortfall Guaranty Deposit, the City shall have no obligation to issue building permits for new development in Landbay F until the default is cured.

j. All parties recognize that the Financing Plan is based on current projections of cost, and timing of construction, and that if the projected costs increase materially or the timing of construction is significantly delayed prior to finalization and closing of the Bond financing, all terms and conditions of financing will need to be reassessed and renegotiated. However, in no event will the City be obligated to issue bonds in excess of $275,000,000 principal amount.

6. State or Federal Funding. The Financing Plan has been developed on the assumption that no State or Federal sources of funding, whether through grants, loans, or otherwise, will be specifically available for this project. Should State or Federal funds become available, such funds will be utilized as authorized. No State or Federal funds received shall reduce the amount of the Developer Contribution or the Shortfall Guaranty, although it is recognized that any available state or federal funding should reduce risk for all parties and will likely reduce the amount needed to be borrowed.

7. Shortfall Guaranty. In order to reduce the risk that the City will draw upon general fund revenue to make payments on the bonds for the Metrorail Station, CPYR will provide a contingent guaranty of any shortfall in any given year (the "Shortfall Guaranty"), between amounts required to be paid to service Bond Indebtedness (including both principal and interest, in accordance with the terms of the approved Bond Financing), and funds on hand in the Station Fund. The Shortfall Guaranty will be made by the landowner (currently CPYR, Inc.) (the "Shortfall Guarantor"), the financial assets and condition of which are approved by the City and must be reapproved at the time of bond financing by the City's bond underwriters in accordance with the terms of the bond financing. The Shortfall Guarantee shall total $32 million, with the Shortfall Guarantor, not obligated to pay more than $32 million cumulatively over a multi-year period to cover any debt service shortfall, nor more than $10 million in any single calendar year. The City shall give the Shortfall Guarantor at least six-months notice of any estimated shortfall amount due, and provide detailed calculations of how that shortfall was estimated to the Shortfall Guarantor, and upon what date the Shortfall payments would be due.

a. Concurrently with the closing of the Bond Financing, the Shortfall Guarantor will deposit into a separate fund controlled by the City the sum of $10 million in Shortfall Guaranty funds to cover possible draws under the Shortfall Guaranty (the "Shortfall Guaranty Deposit"). Interest earned on the Shortfall Guaranty Deposit will remain with such Deposit. The City may draw upon the Shortfall Guaranty Deposit to make Shortfall Guaranty payments as and when payments are due on the Bonds. The Shortfall Guarantor shall be obligated to replenish,

within ninety (90) days, any funds drawn from the Shortfall Guaranty Deposit, so that at all times the sum of $10 million will be available for use to cover Shortfall Guaranty obligations. However, the obligation to replenish the Shortfall Guaranty Deposit shall be subject to the same annual cap of $10 million and overall Shortfall Guaranty cap of $32 million.

b. Excluding the planned first three years of capitalized interest to pay bond debt service, subsequent to the City fiscal year in which the last debt service payment of capitalized interest is paid, if after three subsequent consecutive fiscal years of no Shortfalls requiring the use of any Shortfall Guaranty funds, any remaining Shortfall Guaranty Deposit funds may be credited against future $10.00 per square foot (as annually adjusted by the CPI-U) Developer Contributions due from Landbay F. Any credits against Developer Contributions must be to the Shortfall Guarantor, or if credits are proposed to be allowed to a third party other than the Shortfall Guarantor, the granting of such credits must be approved in writing by the Shortfall Guarantor. In addition, if after the first three years of capitalized interest and the amortization of principal amount of indebtedness has stabilized at its ultimate level, there shall occur three consecutive years in which the total of collections from the Special Tax District and Net New Tax Revenues exceed the annual debt service, any funds remaining in the Shortfall Guaranty Deposit will be released to the Shortfall Guarantor. The City shall annually produce a reconciliation of the Station Fund and make it publicly available to all parties who request a copy.

c. The Shortfall Guaranty, and other terms and conditions of the Metrorail station financing participation by CPYR, Inc. or other acceptable Shortfall Guarantor, shall be affirmed in writing as a “best efforts” planned pledge by an authorized agent for CPYR, Inc. prior to the time of the adoption of the North Potomac Yard Small Area Plan, affirmed as a legally binding commitment at the time of the rezoning of Landbay F, but the binding Shortfall Guaranty shall be contingent upon the initiation of construction of the Metrorail station, or the bond financing for that station, whichever comes first.

d. If any Shortfall Guaranty amount becomes due and is not paid by CPYR, Inc. or other acceptable Shortfall Guarantor at the time requested by the City, the City shall have the right to record a lien against any and all parcels within Landbay F that are owned by CPYR, Inc, such lien to have the priority of a deed of trust recorded at the time the lien notice is filed by the City among the Land Records of Alexandria, Virginia. The City’s right to record a lien for any unpaid Shortfall Guaranty amount shall be memorialized in a document recorded in the Land Records of the City of Alexandria, encumbering all property owned by CPYR, concurrently with the closing of the bond financing.

e. After the Developer’s requirements to pay any Shortfall Guarantee have been satisfied, the City may deposit into the Station Fund only some or none of the net new tax revenues generated by Landbay F or other Potomac Yard Landbays, if the City determines, in its sole discretion, that those amounts are not projected to be

reasonably required to pay projected future debt service on bonds issued to finance the Potomac Yard Metrorail station. It is recognized by all parties that Special Tax District revenues under the Code of Virginia limit use of Special Tax District Funds to those purposes for which the Special Tax District was created.

f. The Parties recognize that transfer of Net New Tax Revenues into the Station Fund are subject to annual appropriations and the current City Council cannot bind future Councils to make such appropriations. However, if in any calendar year the City Council does not authorize the transfer of Net New Tax Revenues into the Station Fund, the obligation of the Shortfall Guarantor to make Shortfall Guaranty payments in that calendar year shall be reduced by an amount equal to the amount of Net New Tax Revenues that would have been paid into the Station Fund but for the City Council's decision not to authorize such transfer.

g. In the event that the $32,000,000 Shortfall Guaranty is not utilized to pay debt service on the bonds issued for the Potomac Yard Metrorail Station, any unused portion thereof shall be paid to the City, for bond repayment, or for public improvements or amenities recommended by the North Potomac Yard Small Area Plan, as determined by the City Council. Such funds shall be paid to the City subject to the following: Upon the occurrence of the Shortfall Guaranty Release Date, the Director of Planning & Zoning will determine the total amount of floor area remaining pursuant to the CDD concept design plan for which a final site plan has not been approved as of the Shortfall Guaranty Release Date. The Applicant shall pay the unused portion of the Shortfall Guaranty (adjusted to reflect increases in the CPI subsequent to January 1, 2020) on a pro rata basis for each remaining square foot of floor area upon approval of each final site plan subsequent to the Shortfall Guaranty Release Date. However, if after the passage of five (5) years from the Shortfall Guaranty Release Date, final site plans have not been approved for all floor area authorized by the CDD concept design plan, the final payment of the unused portion of the Shortfall Guaranty (adjusted to reflect increases in the CPI subsequent to January 1, 2020) shall be due and payable in full on such fifth anniversary of the Shortfall Guaranty Release Date. In the event final site plans have been approved for all floor area authorized by the CDD concept design plan prior to the Shortfall Guaranty Release Date, the Applicant will make full payment of the unused portion of the Shortfall Guaranty (adjusted to reflect increases in the CPI subsequent to January 1, 2020) to the City within six months of the Shortfall Guaranty Release Date.

8. Final Approval of Metrorail Station Location. The parties will work together and with WMATA and other affected regulatory agencies and stakeholders such as the National Park Service ("NPS"), to resolve the final location of the Metrorail Station as expeditiously as feasible, taking into consideration the requirements of federal law with respect to required environmental analyses. The parties recognize the positive benefits as well as the issues related to the current preferred locations "B-2" and "B-3." The current reserved site "A," along with site "B-2" and "B-3," will continue to be studied for the purpose of future NEPA environmental studies in order to select a preferred alternative

among those options. The parties acknowledge and agree that the financial structure set forth herein as well as the North Potomac Yard Small Area Plan and related rezoning will only work if either location B-2 or B-3 (either in their current location or with minor adjustments due to environmental studies or final engineering) is designated for the Metrorail Station, and that if site "A" is chosen, or if the "no build" alternative is chosen, CPYR shall have no obligation for financial contributions or undertakings contemplated by this Agreement. The parties also acknowledge that the redevelopment of Landbay F will be subject to zoning conditions requiring the Landbay F Developer Contributions and Shortfall Guaranty and that the City may withhold subsequent development approvals and permits if payments are not made as timely required.

9. Metrorail Station Design Process. The parties will work with WMATA and NPS to develop an approved schematic design of the Metrorail Station. The current plan is for the Metrorail Station to have two entrances on or crossing Potomac Avenue, so as to expand pedestrian access to Metrorail to the maximum possible degree. Following the determination of the station design, the Station Fund will finance from revenues available and paid into the Fund, the development of detailed construction drawings for the Metrorail Station. The construction of the Metrorail Station may be done on a "design build" basis in which the final design of construction documents will proceed concurrently with early phases of construction. However, to minimize change order and related construction risk, if design build is used, the parties shall seek to advance the development of detailed construction documents to the greatest possible degree prior to the commencement of construction.

10. Comprehensive Plan Process. The North Potomac Yard Small Area Plan was adopted by the City Council on May 15, 2010. Nothing contained as part of this letter modifies or limits the ability of the Planning Commission and/or City Council to amend, approve, defer or deny the North Potomac Yard Small Area Plan, or any future rezoning. Also the plan including the Metrorail station construction is subject to regulation by NPS, FAA and other state and federal agencies.

11. Rezoning Process. The Owner has initiated an application for the rezoning of Landbay F of Potomac Yard to be known as CDD#19 (REZ #2009-0001; CDD#2009-0001; TMP#2009-0061). By letter dated December 8, 2009, the Owner was advised that these related applications were deemed complete for review by the City, conditioned on the applicant continuing to work with the City to address various items, including the Metrorail Station Financing. The City plans to continue its review of these applications. Nothing contained as part of this Memorandum modifies or limits the ability of the Planning Commission and/or City Council to amend, approve, defer or deny the rezoning, CDD Concept Plan and accompanying approvals.

12. Redevelopment Preceding Metrorail Station Construction. In order to reduce the City's risk of diverting general fund revenues to pay for debt service on the bonds for the Metrorail Station and accelerate the Developer's ability to contribute to the Metrorail Station, the City will allow redevelopment of Landbay F to proceed prior to the opening of the Metrorail Station in phases as specified in the CDD Concept Development Plan #2009-0001.

13. Conditions of Development Approval. The Owner's ability to proceed with redevelopment and to provide the Developer Contributions and Shortfall Guaranty is affected by the financial impact of the public benefit contributions and development conditions that will be imposed in the rezoning, CDD conceptual design plan and preliminary development special use permits (collectively "Land Use Approval Conditions"). The parties intend that obligations imposed in subsequent Land Use Approval Conditions will generally be consistent with the conditions approved with Rezoning #2009-0001, CDD Conceptual Design Plan #2009, and TMPSUP #2009-0061 as to extent and financial impact.

14. Vested Rights. The Owner has raised the issue of vesting development rights as part of an agreement for funding of the Metrorail Station. The City will work with the Owner during the comprehensive plan amendment and rezoning process, to provide commercially reasonable assurances acceptable to the City of Alexandria Attorney's office and the Owner, against arbitrary actions by the City subsequent to the approval of the rezoning that would deprive the Owner of approved uses, heights and densities. The Owner seeks to obtain the protections available pursuant to section 15.2-2307 of the Virginia Code. This may take the form of a post-rezoning DSUP process. However, any Owner protection involving vested rights must take into consideration the fundamental proposition that (i) phasing of development is conditioned as set forth in the conditions for CDD Concept Development Plan #2009-0001; (ii) any default by the Owner under the Shortfall Guaranty or in making cash contributions for the Metrorail Station would expose the City to significant financial liabilities and would be a basis for denying a request for vested rights, or for revoking a prior determination of vesting.

15. Terms Not Evergreen. All parties recognize that the financing plan discussed in this MOU is based on current projections of cost and timing of construction, and that if material adverse changes occur prior to finalization and closing of the Bond financing, all terms and conditions of financing and Developer Contributions will need to be reassessed and renegotiated.

Nothing contained in this MOU shall be construed to bind the current or any future City Council, until such time as the City Council takes actions that would be binding on future City Councils (such as the issuance of general obligation bonds).

In Witness whereof, the Parties have executed this Memorandum of Understanding on _____ __, 2010.

CITY OF ALEXANDRIA, VIRGINIA

By: _____

CPYR, INC., a Delaware Corporation

By: _____

Table of Contents
Potomac Yard Village (Previously Land Bay F of CDD #10)
Rezoning and CDD Concept Plan Application
05/20/10 Public Hearing Copies

APPLICATION

[ ] Master Plan Amendment MPA# _____
[X] Zoning Map Amendment REZ# _____

PROPERTY LOCATION: 3601 Jefferson Davis Highway and 3601 Potomac Avenue

APPLICANT

Name: CPYR Inc.
Address: c/o RREEF, 875 North Michigan Avenue, 41st Floor, Chicago, IL 60611-1901

PROPERTY OWNER:

Name: CPYR Inc.
Address: c/o RREEF, 875 North Michigan Avenue, 41st Floor, Chicago, IL 60611-1901

Interest in property:

[X] Owner [ ] Contract Purchaser

[ ] Developer [ ] Lessee [ ] Other _____

If property owner or applicant is being represented by an authorized agent such as an attorney, a realtor, or other person for which there is some form of compensation, does this agent or the business in which they are employed have a business license to operate in Alexandria, VA:

[x] yes: If yes, provide proof of current City business license.

[ ] no: If no, said agent shall obtain a business license prior to filing application.

THE UNDERSIGNED certifies that the information supplied for this application is complete and accurate, and, pursuant to Section 11-301B of the Zoning Ordinance, hereby grants permission to the City of Alexandria, Virginia, to post placard notice on the property which is the subject of this application.

Jonathan P. Rak, Esquire, Agent
Kenneth W. Wire, Esquire, Agent
Print Name of Applicant or Agent

Jonathan P. Rak
Signature

McGuireWoods LLP
1750 Tysons Boulevard, Suite 1800
Mailing/Street Address

(JPR) (703) 712-5411 (703) 712-5231
(KWW) (703) 712-5362 (703) 712-5222
Telephone # Fax #

McLean, VA 22102
City and State Zip Code

May 19, 2010
Date

DO NOT WRITE IN THIS SPACE – OFFICE USE ONLY

Application Received: _____ Fee Paid: $ _____
Legal advertisement: _____
ACTION – PLANNING COMMISSION _____ ACTION – CITY COUNCIL: _____

MPA # _____
REZ # _____

SUBJECT PROPERTY

Provide the following information for each property for which an amendment is being requested. (Attach separate sheets if needed.)

Address **Tax Map – Block Lot**	**Land Use** Existing - Proposed		**Master Plan Designation** Existing – Proposing		**Zoning Designation** Existing – Proposing		**Frontage (ft.)** **Land Area (acres)**
1. 016.01-05-01 3601 Jefferson Davis Highway	Retail center	Mixed use	Commercial	Mixed use	CDD#10	CDD#19	2,716.45 linear feet --- 45.43 Acres
2. 016.02-01-02 3601 Potomac Avenue	Retail center	Mixed use	Commercial	Mixed use	CDD#10	CDD#19	N/A --- 19.17 Acres
3. _____ _____							_____ _____
4. _____ _____							_____ _____

PROPERTY OWNERSHIP

[ ] Individual Owner [x] Corporation or Partnership Owner

Identify each person or individual with ownership interest. If corporation or partnership owner, identify each person with more than 10% interest in such corporation or partnership.

1. Name: Roundhouse Alexandria, Inc. Extent of Interest: 100%
   Address: 101 California Street, 26th Floor, San Francisco, CA 94111
2. Name: _____ Extent of Interest: _____
   Address: _____
3. Name: _____ Extent of Interest: _____
   Address: _____
4. Name: _____ Extent of Interest: _____
   Address: _____

MPA # _____
REZ # _____

JUSTIFICATION FOR AMENDMENT
(attach separate sheets if needed)

1. Explain how and why any proposed amendment(s) to the Master Plan are desirable, beneficial to surrounding properties, in character with the applicable Small Area Plan and consistent with City policies:

See attached.

2. Explain how and why the proposed amendment to the Zoning Map(s) is consistent with the proposed amendment to the Master Plan, or, if no amendment to the Master Plan is being requested, how the proposed zoning map amendment is consistent with the existing Master Plan:

See attached.

3. Explain how the property proposed for reclassification will be served adequately by essential public facilities and services such as highways, streets, parking spaces, police and fire, drainage structures, refuse disposal, water and sewers, and schools.

See attached.

4. If this application is for conditional zoning approval pursuant to Section 11-804 of the Zoning Ordinance, identify all proffered conditions that are to be considered part of this application (see Zoning Ordinance Section 11-804 for restrictions on conditional zoning):

N/A

Statement of Justification
Zoning Map Amendment (Rezoning)
Potomac Yard Retail Center

The applicant requests that the subject property be rezoned and the Zoning Map be amended to change the zoning designation for the subject property from Coordinated Development District #10 to Coordinated Development District #19.

1. Explain how and why any proposed amendments to the Master Plan are desirable, beneficial to surrounding properties, in character with the applicable Small Area Plan and consistent with city policies.

The City of Alexandria (City) and the owner of the subject property are in agreement that additional density at the existing location of the Potomac Yard retail center may be beneficial to the economic health and welfare of the City. The retail center existing on the subject property is a successful retail center, however given the size and location of the site this is not likely the best future use of the property. A redevelopment of this existing center with additional density would provide the needed density to facilitate the construction of an additional Metro station within Alexandria which will benefit the entire city. Additionally, the increased tax revenue from additional density at this location will benefit the surrounding community and the city as a whole.

The proposed redevelopment is an urban, mixed-use development that will include office, residential, hotel, entertainment, retail and restaurant uses. When completed, these uses will be situated along a new, vibrant street grid that will connect three unique urban neighborhoods know as Crescent Park, Market Common and Metro Park. Additionally, the mix of uses, density and heights have been sculpted to accommodate a dynamic urban design that places sufficient density in strategic locations to help facilitate the creation of a Metro station and enhance the existing plan for the Bus Rapid Transit (BRT) adjacent to the site that will serve this neighborhood and the greater Potomac Yard area. Further, the project will provide open space, parks and urban squares in locations that are connected by landscaped streets, as well as usable green roof gardens which will result in a vibrant green neighborhood plan. Lastly, the

Lastly, the project is proposing innovative storm water management and water use reduction techniques that will ensure that this development is utilizing the best technology available at the time of development.

2. Explain how and why the proposed amendment to the Zoning Map(s) is consistent with the proposed amendment to the Master Plan.

This application for a rezoning of the property is, in large part, consistent with the Master Plan Amendment proposed by the staff to amend the Potomac Yard/Potomac Greens small area plan. The applicant has worked closely with the staff to prepare a consistent application for the rezoning and CDD Concept Plan. The applicant's proposal includes a similar street grid, and proposes the same total size of the development and proportions of uses, amount of open space, and transit modes. Further, the staff and applicant are working together to prepare design guidelines that will ensure that the future development of this site will be consistent with the goals of the Master Plan.

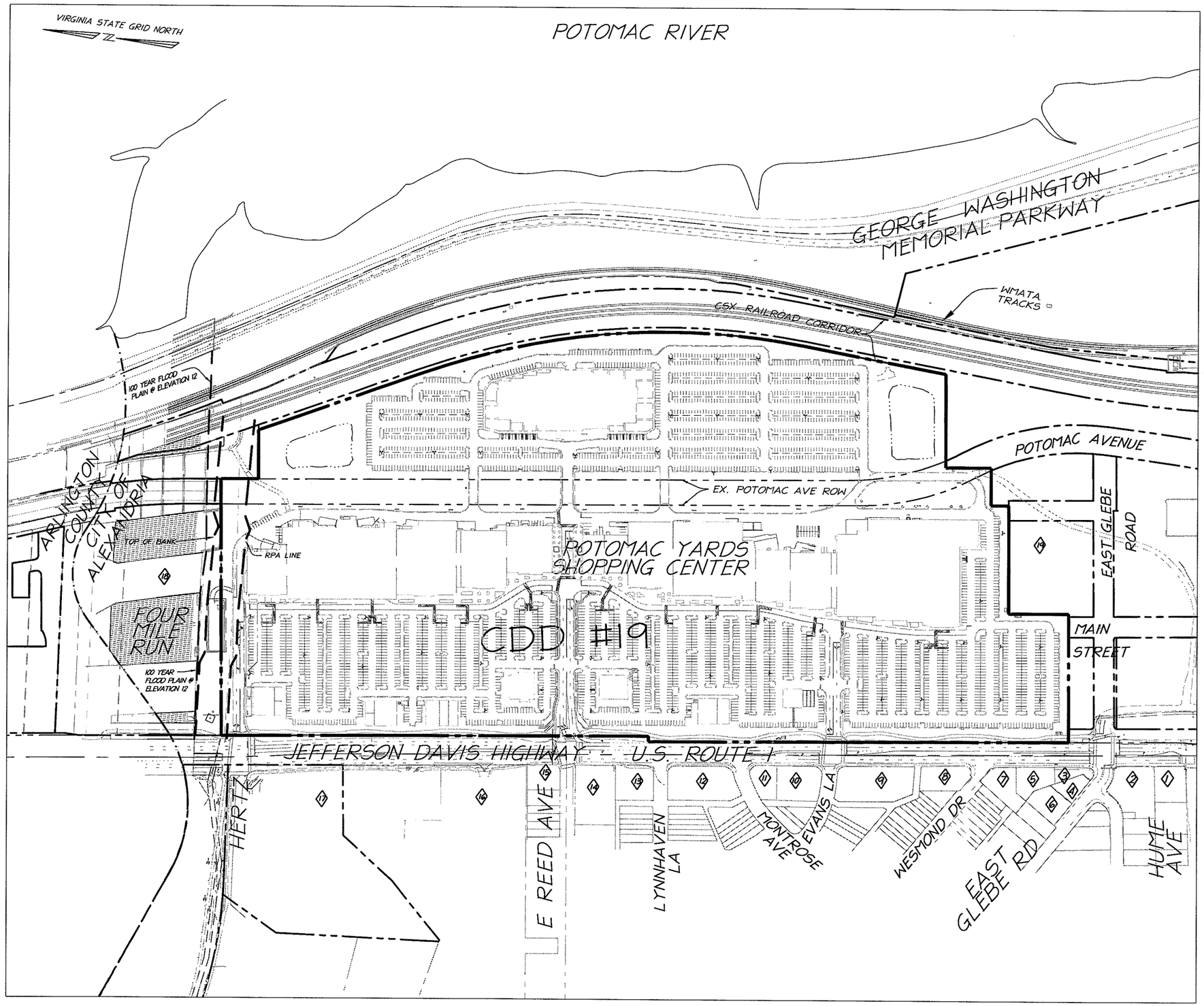
However, the applicant's proposal for the CDD Concept Plan proposes a slightly different street grid in order to provide a more compact, connected development. First, the applicant proposes to locate Potomac Avenue on the eastern most portion of the site between the development and the rail lines. The applicant believes that this is the best location because it provides a landscaped buffer between the new buildings and the rail lines, it connects the BRT and the Metro in a centralized location, and it respects the Old and Historic District that surrounds the George Washington Parkway by placing the development outside of the district. Second, the applicant proposes to terminate the main retail street, Reed Avenue, at Water Street, in order to provide a primary, signature building at the end of the retail corridor. The applicant believes that this is important to provide a retail experience that has proven to be a success historically and commercially. The signature building at the end of Reed Avenue will itself be pedestrian friendly and provide a view from Route 1 that will let users know that this is the retail oriented market common.

3. Explain how the property proposed for reclassification will be served adequately by essential public facilities and services such as highways, streets,

as shown on the plans, owned by CPYR, Inc. The realignment of Potomac Avenue to the location shown in this CDD Concept Plan application is dependent on the City Council revising the planned alignment for Potomac Avenue through Landbay K and through Landbay E. The applicant understands that unless the City Council revises the alignment of Potomac Avenue to the north and south of this CDD, the alignment of Potomac Avenue must be revised to connect with the current planned alignment of Potomac Avenue at the boundaries of this CDD.

Active\9973174.3

CDD No.	CDD Name	Without a CDD Special Use Permit	With a CDD Special Use Permit		
			Maximum F.A.R. and/or Development Levels	Maximum Height	Uses
19	Potomac Yards North	the CSL zone regulations shall apply on the first 250 feet east of Rte 1, and the I zone regulations shall apply on the remainder of the site;	Maximum development levels will be as shown in the CDD Concept Plan. Conversion of square footage between uses may be permitted through the special use permit process	Heights shall be as shown on the CDD Concept Plan	Mixed Use development to include office, residential, retail and service, hotel, parks and open spaces, and community facilities.



DATE	REVISION

ADJACENT PROPERTY INFORMATION

1. USE: COMMERCIAL ZONE: R2-5
2. USE: REPAIR SERVICES ZONE: R2-5
3. USE: COMMERCIAL ZONE: CSL
4. USE: COMMERCIAL ZONE: CSL
5. USE: SUB-PARCEL ZONE: CSL
6. USE: OFFICE/ COMMUNITY HOUSE ZONE: CSL
7. USE: REPAIR SERVICES ZONE: CSL
8. USE: RESTAURENT/FASTFOOD ZONE: CSL
9. USE: RESTAURENT/FASTFOOD ZONE: CSL
10. USE: RESTAURENT/FASTFOOD ZONE: CSL
11. USE: COMMERCIAL ZONE: CSL
12. USE: REPAIR SERVICES ZONE: CSL
13. USE: VACANT LAND ZONE: CSL
14. USE: THE PRESTON CONDOMINIUM ZONE: CRMU/M
15. USE: VACANT LAND ZONE: CDD#7
16. USE: LINCOLN AT ALEXANDRIA ALEXANDRIA ZONE: CDD#7
17. USE: JACK TAYLOR'S TOYOTA AUTO DEALERSHIP ZONE: CDD#7
18. USE: 4 MILE RUN ZONE: CDD#10
19. USE: VACANT LAND ZONE: CDD#10

150 75 0 150 300
GRAPHIC SCALE
1" = 150'

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT CITY OF ALEXANDRIA AND VIRGINIA DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS.

christopher consultants
engineering · surveying · land planning
9900 main street (fourth floor) · fairfax va. 22031-3907
703.273.6820 · fax 703.273.7636

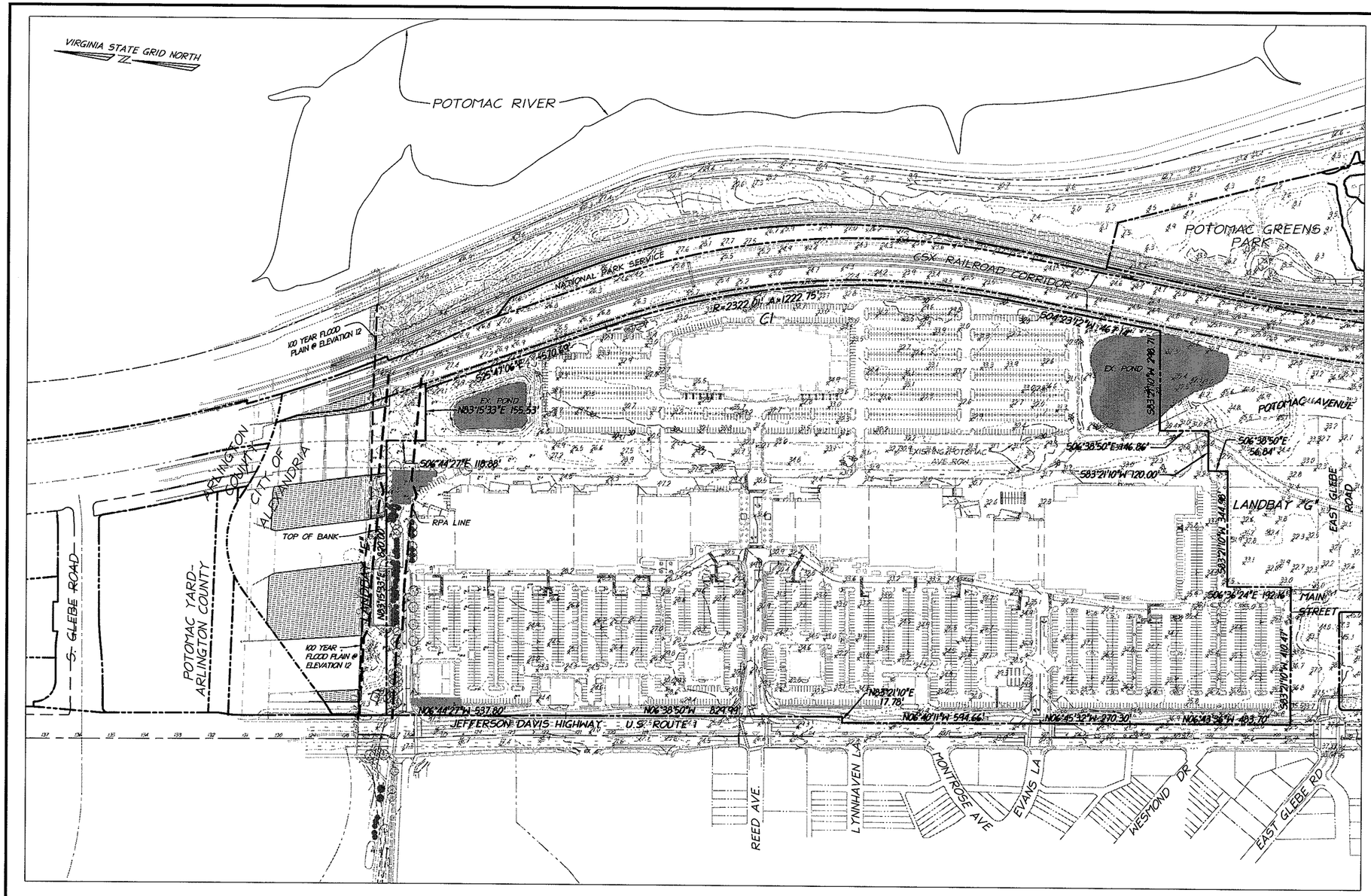
CONTEXTUAL SITE EXHIBIT

POTOMAC YARD NORTH
CONCEPTUAL DESIGN PLAN

CITY OF ALEXANDRIA, VIRGINIA

PROJECT NO:8824F6.00
SCALE: 1" = 150'
DATE: 10-15-09
DESIGN:
DRAWN: PK
CHECKED: KMW
SHEET No.
1 OF 1

C-5863



CURVE TABLE

CURVE	RADIUS	LENGTH	DELTA	CHORD	BEARING	TANGENT
C1	2322.01'	1222.75'	30°10'17"	1208.67'	S10°41'57"E	625.91'

TOTAL AREA 69.07 ACRES

DATE	REVISION

LEGEND

- SITE BOUNDARY
- EXISTING STREET RIGHT OF WAYS BY OTHERS
- RPA LINE & TOP OF BANK

NOTES:

1. SEE D.B 3628, PG. 514 & D.B 4161, PG. 31 FOR POTOMAC AVENUE ARLINGTON
2. SEE INST#080018802 & INST# 060033375 FOR POTOMAC AVE ALEXANDRIA
3. ALL BOUNDARY INFORMATION TAKEN FROM ALTA / ACSM LAND TITLE SURVEY PREPARED BY christopher consultants ltd. DATED 5-18-2004
4. TOP OF BANK SHOWN FIELD VERIFIED WITH CITY STAFF ON 9-24-09.

150 75 0 150 300
GRAPHIC SCALE
1" = 150'

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT CITY OF ALEXANDRIA AND VIRGINIA DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS.

christopher consultants
engineering · surveying · land planning
9900 main street (fourth floor) · fairfax va. 22031-3907
703.273.6820 · fax 703.273.7536

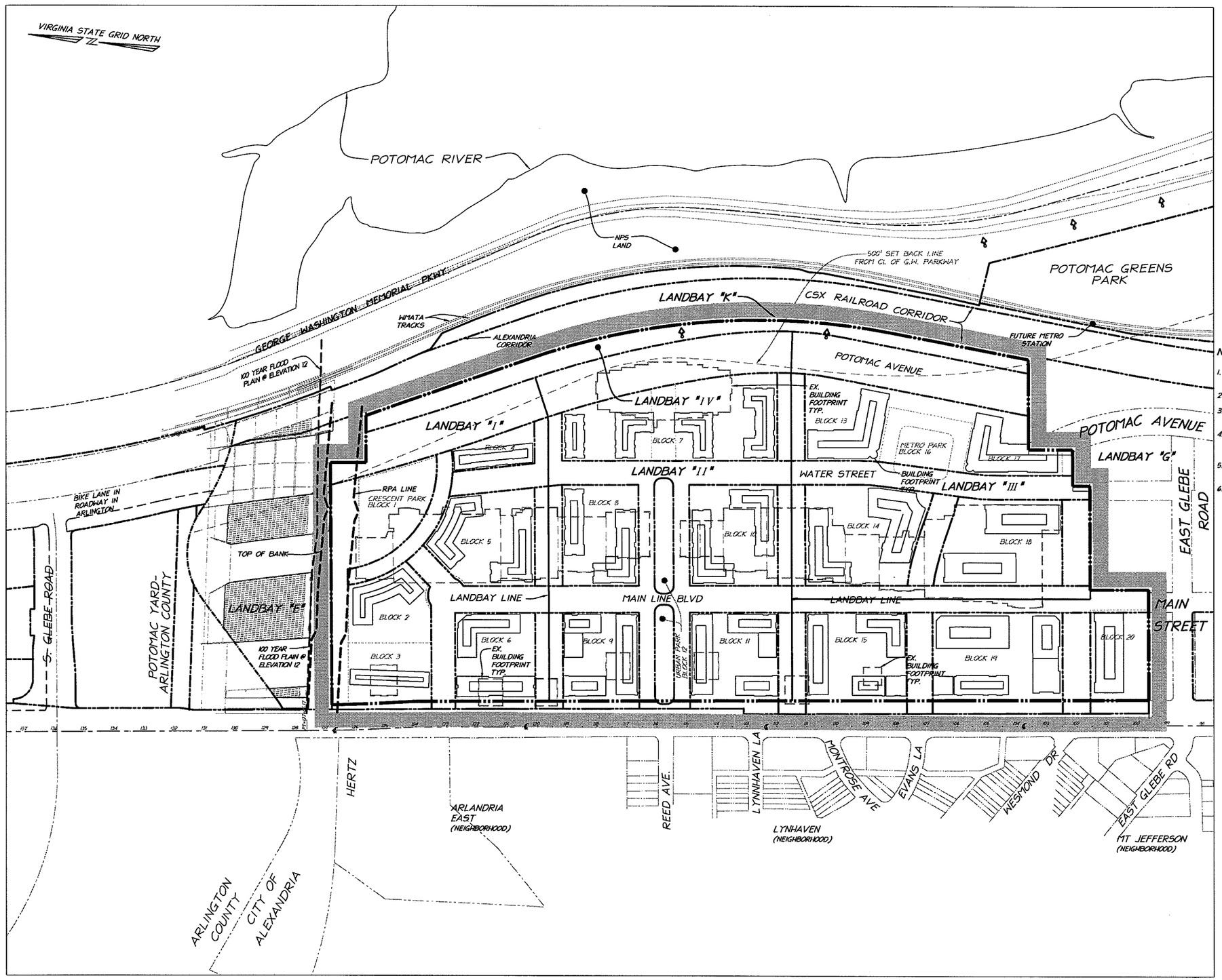
EXISTING CONDITIONS PLAN

POTOMAC YARD NORTH
CONCEPTUAL DESIGN PLAN

CITY OF ALEXANDRIA, VIRGINIA

PROJECT NO:8824F6.00
SCALE: 1" = 150'
DATE: 10-15-09
DESIGN:
DRAWN: PK
CHECKED: K.M.J
SHEET No. 1 OF 1

C-5862



DATE	REVISION
11-25-09	CITY COMMENTS

LEGEND

- SITE BOUNDARY
- LANDBAY LINES
- EXISTING STREET RIGHT OF WAYS BY OTHERS
- COUNTY LINE
- APPROX ℄ FUTURE STREET
- RPA LINE & TOP OF BANK

NOTES:

1. TOP OF BANK SHOWN FIELD VERIFIED WITH CITY STAFF ON 9-24-09.
2. TOTAL SITE AREA IS 69.07 Ac.
3. THE FUTURE USES ON SITE WILL BE OFFICE/COMMERCIAL, RETAIL AND RESIDENTIAL.
4. BUILDING FOOTPRINTS SHOWN ARE FOR ILLUSTRATIVE PURPOSES ONLY AND ARE SUBJECT TO CHANGE WITH FINAL PLANS.
5. THE EXISTING USE ON THE SITE IS A SHOPPING CENTER.
6. MAXIMUM BUILDING HEIGHT FOR FUTURE BUILDINGS=250 FEET.

150 75 0 150 300
GRAPHIC SCALE
1" = 150'

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT CITY OF ALEXANDRIA AND VIRGINIA DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS.

christopher consultants
engineering · surveying · land planning
9900 main street (fourth floor) · fairfax va. 22031-3907
703.273.6820 · fax 703.273.7636

EXISTING & PROPOSED BUILDING EXHIBIT

POTOMAC YARD NORTH
CONCEPTUAL DESIGN PLAN

CITY OF ALEXANDRIA, VIRGINIA

PROJECT NO:	8824F6.00
SCALE:	1" = 150'
DATE:	10-15-09
DESIGN:	
DRAWN:	PK
CHECKED:	KMJ
SHEET No.	1 OF 1

C-5861

APPLICATION

COORDINATED DEVELOPMENT DISTRICT (CDD) DEVELOPMENT CONCEPT PLAN

_____ **Filing Fee**

_____ **Filing Deadline**

June 1, 2010 **Planning Commission Hearing**

June 12, 2010 **City Council Hearing**

REQUIREMENTS FOR MAILING NOTICES:

Applicants must send written notice of public hearings by certified or registered mail to all abutting property owners at least 10 days prior to the Planning Commission hearing, and not more than 30 days prior to the City Council hearing. See detailed instructions on "Notice Requirements."

Mail certified or registered notice of hearings between

May 13, 2010 and May 22, 2010 .

Return notice materials to Department of Planning and Zoning by

May 26, 2010.

APPLICATION

CDD DEVELOPMENT CONCEPT PLAN

CDD #_____

[*must use black ink or type*]

PROPERTY LOCATION: 3601 Jefferson Davis Highway and 3601 Potomac Avenue

TAX MAP REFERENCE: 016.01-05-01 and 016.02-01-02 **ZONE:** CDD#10

APPLICANT'S NAME: CPYR Inc
ADDRESS: c/o RREEF 875 N. Michigan Avenue, 41st Floor, Chicago, IL 60611

PROPERTY OWNER NAME: CPYR Inc.
ADDRESS: c/o RREEF 875 N. Michigan Avenue, 41st Floor, Chicago, IL 60611

REQUEST Request for a CDD Concept Plan for a mixed use development including residential, office, hotel, and retail uses.

THE UNDERSIGNED hereby applies for CDD Development Concept Plan approval in accordance with the provisions of Section 5-600 of the 1992 Zoning Ordinance of the City of Alexandria, Virginia.

THE UNDERSIGNED, having obtained permission from the property owner, hereby grants permission to the City of Alexandria to post placard notice on the property for which this application is requested, pursuant to Article XI, Section 11-301(B) of the 1992 Zoning Ordinance of the City of Alexandria, Virginia.

THE UNDERSIGNED hereby attests that all of the information herein provided and specifically including all surveys, drawings, etc., required to be furnished by the applicant are true, correct and accurate to the best of their knowledge and belief. The applicant is hereby notified that any written materials, drawings or illustrations submitted in support of this application and any specific oral representations made to the Planning Commission or City Council in the course of public hearings on this application will be binding on the applicant unless those materials or representations are clearly stated to be non-binding or illustrative of general plans and intentions, subject to substantial revision, pursuant to Article XI, Section 11-207(A)(10), of the 1992 Zoning Ordinance of the City of Alexandria, Virginia.

Jonathan P. Rak, Esquire, Agent Kenneth W. Wire, Esquire, Agent Print Name of Applicant or Agent		Jonathan P. Rak Signature	
McGuireWoods LLP	(JPR)	(703) 712-5411	(703) 712-5231
1750 Tysons Boulevard, Suite 1800 Mailing/Street Address	(KWW)	(703) 712-5362 Telephone #	(703) 712-5222 Fax #
McLean, VA City and State		22102 Zip Code	May 19, 2010 Date

DO NOT WRITE IN THIS SPACE – OFFICE USE ONLY

Application Received: _____ Date and Fee Paid: _____ $ _____

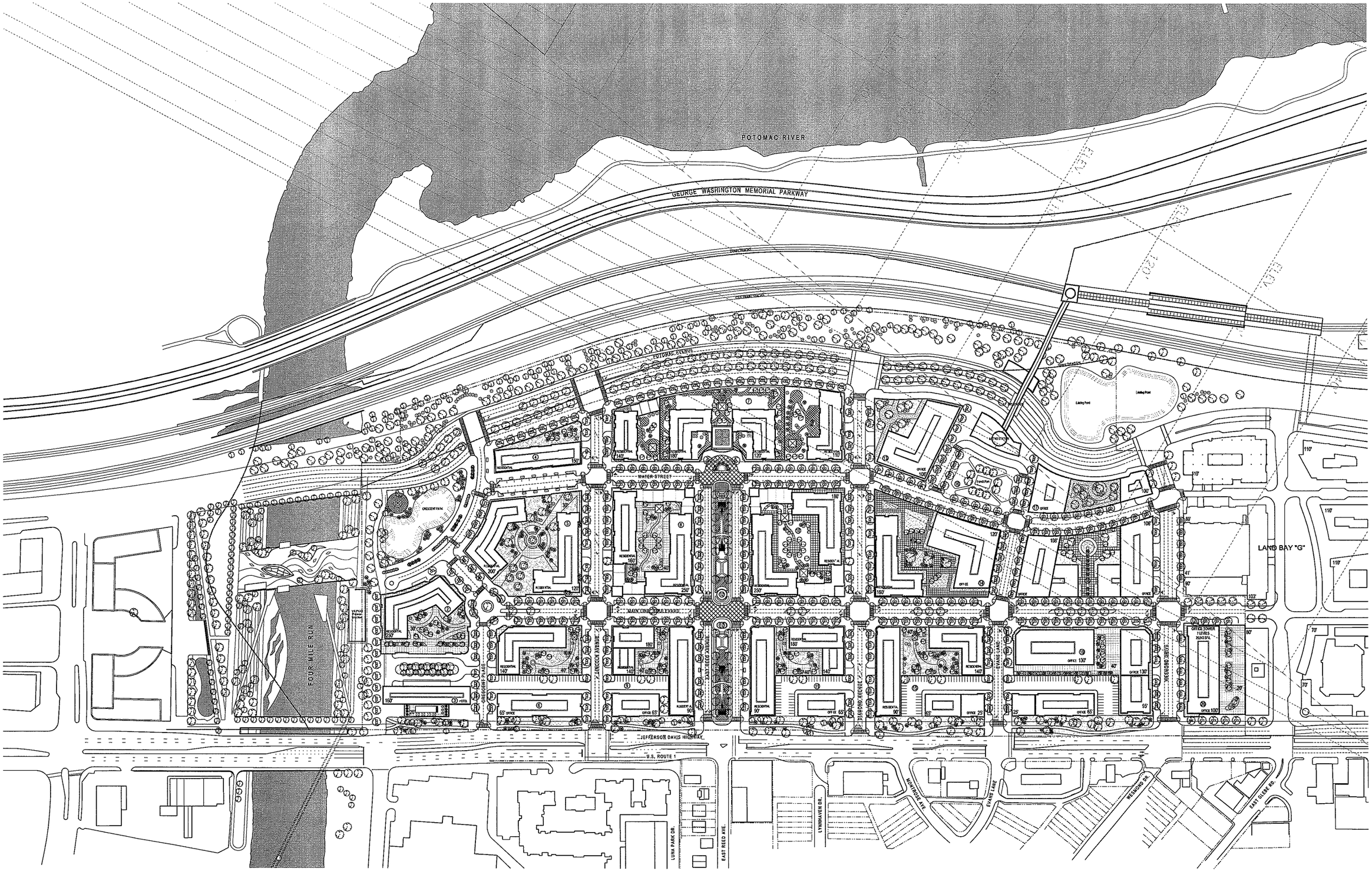
ACTION – PLANNING COMMISSION: _____ ACTION – CITY COUNCIL: _____

Statement of Ownership

The Subject property is owned by CPYR, Inc., 101 California Street, 26th Floor, San Francisco, CA 94111

CPYR, Inc. is owned 100% by Roundhouse Alexandria, Inc, 101 California Street, 26th Floor, San Francisco, CA 94111.

\9967458.3



POTOMAC VILLAGE ALEXANDRIA, VIRGINIA

S: 1" = 120'-0" 0 60' 120' 240'

Alternative Illustrative Master Plan

November 24th, 2009

RREEF Investment Advisor | McCaffery Interests Developer | Artsencick Associates Architects & Planners | Christopher Consultants Engineering,Surveying,Land Planning | The Traffic Group, Inc. | McGuire Woods

APPLICATION
SPECIAL USE PERMIT

SPECIAL USE PERMIT #_____

PROPERTY LOCATION: 3601 Jefferson Davis Highway and 3601 Potomac Avenue

TAX MAP REFERENCE: 016.01-05-01 and 016.02-01-02 **ZONE:** CDD #10

APPLICANT:
Name: CPYR, Inc.

Address: c/o RREEF, 875 North Michigan Avenue, 41st Floor, Chicago, IL 60611-1901

PROPOSED USE: Transportation Management Plan.

[ ]**THE UNDERSIGNED**, hereby applies for a Special Use Permit in accordance with the provisions of Article XI, Section 4-11-500 of the 1992 Zoning Ordinance of the City of Alexandria, Virginia.

[ ]**THE UNDERSIGNED**, having obtained permission from the property owner, hereby grants permission to the City of Alexandria staff and Commission Members to visit, inspect, and photograph the building premises, land etc., connected with the application.

[ ]**THE UNDERSIGNED**, having obtained permission from the property owner, hereby grants permission to the City of Alexandria to post placard notice on the property for which this application is requested, pursuant to Article IV, Section 4-1404(D)(7) of the 1992 Zoning Ordinance of the City of Alexandria, Virginia.

[ ]**THE UNDERSIGNED**, hereby attests that all of the information herein provided and specifically including all surveys, drawings, etc., required to be furnished by the applicant are true, correct and accurate to the best of their knowledge and belief. The applicant is hereby notified that any written materials, drawings or illustrations submitted in support of this application and any specific oral representations made to the Director of Planning and Zoning on this application will be binding on the applicant unless those materials or representations are clearly stated to be non-binding or illustrative of general plans and intentions, subject to substantial revision, pursuant to Article XI, Section 11-207(A)(10), of the 1992 Zoning Ordinance of the City of Alexandria, Virginia.

Jonathan P. Rak, Esquire, Agent
Kenneth W. Wire, Esquire, Agent
Print Name of Applicant or Agent

Jonathan P. Rak
Signature

May 19, 2010
Date

McGuireWoods LLP
1750 Tysons Boulevard, Suite 1800
Mailing/Street Address

(JPR) (703) 712-5411
(KWW)(703) 712-5362
Telephone #

(703) 712-5231
(703) 712-5222
Fax #

McLean, VA 22102
City and State Zip Code

jrak@mcguirewoods.com
kwire@mcguirewoods.com
Email address

ACTION-PLANNING COMMISSION: _____ **DATE:** _____

ACTION-CITY COUNCIL: _____ **DATE:** _____

SUP # _____

PROPERTY OWNER'S AUTHORIZATION

As the property owner of N/A (Property Address) I, hereby

grant the applicant authorization to apply for the Transportation Management Plan (use) use as

described in this application.

Name: _____ Phone: _____
Please Print

Address: _____ Email: _____

Signature: _____ **Date:** _____

1. Floor Plan and Plot Plan. As a part of this application, the applicant is required to submit a floor plan and plot or site plan with the parking layout of the proposed use. The SUP application checklist lists the requirements of the floor and site plans. The Planning Director may waive requirements for plan submission upon receipt of a written request which adequately justifies a waiver.

[ ] **Required floor plan and plot/site plan attached.**

[ ] **Requesting a waiver. See attached written request.**

2. The applicant is the (check one):

[X] Owner
[ ] Contract Purchaser
[ ] Lessee or
[ ] Other: Developer of the subject property.

State the name, address and percent of ownership of any person or entity owning an interest in the applicant or owner, unless the entity is a corporation or partnership, in which case identify each owner of more than ten percent.

Roundhouse Alexandria, Inc. – 100%

101 California Street, 26th Floor

San Francisco, CA 94111

SUP # _____

If property owner or applicant is being represented by an authorized agent such as an attorney, realtor, or other person for which there is some form of compensation, does this agent or the business in which the agent is employed have a business license to operate in the City of Alexandria, Virginia?

[X] **Yes.** Provide proof of current City business license

[ ] **No.** The agent shall obtain a business license prior to filing application, if required by the City Code.

NARRATIVE DESCRIPTION

3. The applicant shall describe below the nature of the request **in detail** so that the Planning Commission and City Council can understand the nature of the operation and the use. The description should fully discuss the nature of the activity. (Attach additional sheets if necessary.)

See TMP attached.

SUP # _____

USE CHARACTERISTICS

4. The proposed special use permit request is for (check one):
[ ] a new use requiring a special use permit,
[ ] an expansion or change to an existing use without a special use permit,
[ ] an expansion or change to an existing use with a special use permit,
[X] other. Please describe: Transportation Management Plan

5. Please describe the capacity of the proposed use:

A. How many patrons, clients, pupils and other such users do you expect? Specify time period (i.e., day, hour, or shift).

N/A

B. How many employees, staff and other personnel do you expect? Specify time period (i.e., day, hour, or shift).

N/A

6. Please describe the proposed hours and days of operation of the proposed use:

Day:	Hours:
N/A	

7. Please describe any potential noise emanating from the proposed use.

A. Describe the noise levels anticipated from all mechanical equipment and patrons.

N/A

B. How will the noise be controlled?

N/A

SUP # _____

8. Describe any potential odors emanating from the proposed use and plans to control them:

N/A

9. Please provide information regarding trash and litter generated by the use.

A. What type of trash and garbage will be generated by the use? (i.e. office paper, food wrappers)

N/A

B. How much trash and garbage will be generated by the use? (i.e.# of bags or pounds per day or per week)

N/A

C. How often will trash be collected?

D. How will you prevent littering on the property, streets and nearby properties?

N/A

10. Will any hazardous materials, as defined by the state or federal government, be handled, stored, or generated on the property?

[ ] Yes. [ ] No.

If yes, provide the name, monthly quantity, and specific disposal method below:

N/A

SUP # _____

11. Will any organic compounds, or example paint, ink, lacquer thinner, or cleaning or degreasing solvent, be handled, stored, or generated on the property?

[ ] Yes. [ ] No.

If yes, provide the name, monthly quantity, and specific disposal method below:

N/A

12. What methods are proposed to ensure the safety of nearby residents, employees and patrons?

ALCOHOL SALES

13.

A. Will the proposed use include the sale of beer, wine, or mixed drinks?

[ ] Yes [ ] No

If yes, describe existing (if applicable) and proposed alcohol sales below, including if the ABC license will include on-premises and/or off-premises sales.

N/A

SUP # _____

PARKING AND ACCESS REQUIREMENTS

The CDD concept plan application provides information about the total maximum number of parking spaces for this CDD. The specific information about parking will be determined at the DSUP stage.

14. A. How many parking spaces of each type are provided for the proposed use:

_____ Standard spaces
_____ Compact spaces
_____ Handicapped accessible spaces
_____ Other.

Planning and Zoning Staff Only

Required number of spaces for use per Zoning Ordinance Section 8-200A_____

Does the application meet the requirement?
[ ] Yes [ ] No

B. Where is required parking located? *(check one)*
[ ] on – site
[ ] off – site

If the required parking will be located off-site, where will it be located?

_____

PLEASE NOTE: Pursuant to Section 8-200 (C) of the Zoning Ordinance, commercial and industrial uses may provide off-site parking within 500 feet of the proposed use, provided that the off-site parking is located on land zoned for commercial or industrial uses. All other uses must provide parking on-site, except that off-street parking may be provided within 300 feet of the use with a special use permit.

C. If a reduction in the required parking is requested, pursuant to Section 8-100 (A) (4) or (5) of the Zoning Ordinance, complete the PARKING REDUCTION SUPPLEMENTAL APPLICATION.

[ ] Parking reduction requested; see attached supplemental form

15. Please provide information regarding loading and unloading facilities for the use:

A. How many loading spaces are available for the use? _____

Planning and Zoning Staff Only

Required number of loading spaces for use per Zoning Ordinance Section 8-200 _____

Does the application meet the requirement?

[ ] Yes [ ] No

SUP # _____

B. Where are off-street loading facilities located? _____

_____

C. During what hours of the day do you expect loading/unloading operations to occur?

_____

_____

D. How frequently are loading/unloading operations expected to occur, per day or per week, as appropriate?

_____

_____

16. Is street access to the subject property adequate or are any street improvements, such as a new turning lane, necessary to minimize impacts on traffic flow?

_____

_____

SITE CHARACTERISTICS

17. Will the proposed uses be located in an existing building? [ ] Yes [ ] No

Do you propose to construct an addition to the building? [ ] Yes [ ] No

How large will the addition be? _____ square feet.

18. What will the total area occupied by the proposed use be?

_____ sq. ft. (existing) + _____ sq. ft. (addition if any) = _____ sq. ft. (total)

19. The proposed use is located in: *(check one)*

[ ] a stand alone building
[ ] a house located in a residential zone
[ ] a warehouse
[ ] a shopping center. Please provide name of the center: _____
[ ] an office building. Please provide name of the building: _____
[ ] other. Please describe: _____

End of Application
\10034273.2

Transportation Management Plan

POTOMAC VILLAGE – POTOMAC YARDS

City of Alexandria, Virginia

October 15, 2009

Merging Innovation and Excellence®

The Traffic Group

Corporate Office
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Virginia

Prepared by: Wes Guckert, PTP

JWG:smb:jew
(F:\2009\2009-0808\wp\Report - TMP.doc)

INTRODUCTION TO TMP

Transportation Management Plan

POTOMAC VILLAGE – POTOMAC YARDS

City of Alexandria, Virginia

TMP PURPOSE

The primary purpose of a Transportation Management Plan (TMP) is to reduce the number of vehicles using the road system while providing a variety of mobility options to those who wish to travel by vehicle.

There are many TMP measures which can be implemented for employment-type uses, residential uses and mixed use such as those proposed for the Potomac Village at Potomac Yards, in the City of Alexandria. Looking at the Potomac Village mixed-use project as a whole allows the project to reduce the number of vehicles along the roadways based on many key elements, including:

- ***LOCATION*** – The mixed-use components of this property are such that each are located within easy walking distance of the uses and, therefore, in and of itself, will help to reduce the number of vehicles that would be generated by this type of development by automobiles. Vehicle Miles Traveled (VMT) will be reduced by virtue of the mixed-use characteristics of this development.

  The latest New Urban News report by the National Center for Smart Growth has challenged the ITE Guidelines for vehicle counts in mixed-use developments. The National Center for Smart Growth has stated that among other things, the residential portions of mixed-use developments generate 44% fewer trips than the ITE Manual suggests.

- ***PEDESTRIAN PATHWAYS*** – Due to the close proximity of the property to other adjoining land uses, north and south, and the future Metro Station and future BRT Station, the vision of pedestrian pathways and sidewalks will encourage pedestrian activity versus the need for use of an automobile. There will be generous sidewalks to and from transit stations and all land uses. This project is a Transit Oriented Development that will be walkable and bikeable.

- ***TRANSIT SERVICE*** – One of the main goals of the development project is to provide enough density at this site to allow for a future WMATA Metro Station.' Having the WMATA Metro Station located immediately to the east of the property will minimize the number of automobiles generated by Potomac Village. In addition, there is a Bus Rapid Transit (BRT) Line proposed to be located in the median of Potomac Avenue connecting to Route 1, with a major transit and transfer station connecting the BRT to the future Metro station. Additionally, local bus service will continue along US 1 and there will likely be bus service within the confines of Potomac Village mixed-use community. With these improvements, this site will have AAA availability of transit and, therefore, in and of itself, will reduce VMT and single occupant vehicles.

In addition to the benefits already gained by the location and type of project, the applicant proposes the following Comprehensive Transportation Management Plan:

COMPREHENSIVE TMP - The TMP will include the following techniques and processes:

1. Reduced and shared parking.
2. Accommodations for bicycles
3. On Street Parking rates
4. Car Sharing
5. Cash Out Program
6. Car sharing and car pooling opportunities and incentives.
7. Public Transit Incentive Program
8. Bicycle and pedestrian Incentives
9. Live near your work program
10. Telework and Flex Hour programs
11. Transit Store
12. On site Local Bus service
13. On site Advertising of TMP.

TRANSPORTATION MANAGEMENT PLAN

The following is a list and description of the TMP processes that are proposed for Potomac Village – Potomac Yards project.

PARKING SPACES

1. **Reducing the number of Parking Spaces:** Perhaps the most significant way to reduce SOV's and VMT deals with provision of parking.

   We have reduced the overall Parking Supply (less parking) from that in the City Zoning Code to take into consideration adjustments for this Transit Oriented Development (T.O.D.) and the proximity to the Bus Rapid Transit System and the WMATA Metro System. Additionally, we have adjusted the parking ratios to take into consideration intra-site trips between uses for walking and biking due to the high mixed-use character of this project.

   Overall, we are reducing parking availability and parking supply substantially. We recommend a Parking Maximum of 10,000 spaces. This maximum will have the greatest impact on reducing SOV's and VMT.

   Charging Market Rate prices for parking: All parking will be paid – unbundled – to reflect the fact that there is no such thing as "free" parking. Paid parking encourages fewer S.O.V.'s.

   It should be encouraged that higher parking prices and shorter payment periods should exist for the more convenient parking spaces on-street and within the garage. For

example, in prime central locations, we will consider a charge of $.25 to $.50 for each 15-minute period. Parking in the higher levels of the garage, the charge should be no less than $2.00 for four hours.

The National Urban Transit Institute at the Center for Urban Transportation Research has found that in a Central Business District (like this project), a $4.00 daily parking charge can reduce vehicle trips by up to 50%.

BICYCLES

2. Accommodations for bicycles – In each parking garage, there will be bicycle racks or bicycle lockers available. Bicycle lockers will be available in areas where it is believed weather impacts will be a factor and bicycle racks can occur in areas where there will be cover for the bicycles. There are two general categories for bicycle parking.

   a) Short Term (Class 2) parking is needed where bicycles would be left for short stops. It requires a higher degree of convenience (as close to destinations as possible). At least some short term bicycle parking should be protected from the weather.

   b) Long Term (Class 1) parking is needed where bicycles will be left for hours at a time. It requires a high degree of security and weather protection with well designed racks and covered areas, lockers, storage rooms or fenced areas with restricted access.

   Racks should be highly visible so cyclists can spot them immediately when they arrive from the street. A visible location also discourages theft and vandalism. Adequate lighting and surveillance is essential for the security of bicycles and the users. Bicycle racks and lockers must be well anchored to the ground to avoid vandalism and theft.

   We will locate bicycle parking in visible and prominent locations – because, if cyclists are unaware of the parking, it will not be used.

ON-STREET PARKING

3. We recommend metered on street parking. Parking durations on street should be limited for things such as 5-minute loading zones, and a range of say 30-45 minute and up to 2 hours parking adjacent to shop entrances, on the streets

within the mixed-use community. These limitations are to encourage turnover and favor short term users (since higher priority trips such as deliveries and shopping tend to park for shorter durations than lower priority trips).

An EPA Study conducted in 1997 (Opportunities to Improve Air Quality Through Transportation Pricing) indicates that $1.50 to $2.75 increase in parking fees reduces auto commuting 12% to 39% and if matched with transit and ride share subsidies, can further reduce auto trips and VMT

CAR SHARING

4. Within all of the garages, there will be a location dedicated for "zip cars" or other similar type of car sharing services. Car sharing is an important element for both employees and residents and this dedication of spaces, the best spaces in the closest location to the exit, will be key to encouraging a reduction in automobile ownership.

   Also, within each of the garages, the best and closest parking will be dedicated for carpools, vanpools, and hybrid vehicles and the Guaranteed Ride Home program.

   The employers within each of the office buildings will be required to set up a Guaranteed Ride Home program (GRH) for carpoolers, transit riders, and vanpoolers.

OTHER INCENTIVE PROGRAMS

5. The TMP will encourage a parking "Cash-Out" program that will help to reduce single occupant vehicles. This type of program is one where employers pay the employees not to drive in an S.O.V. The "cash out" could vary from $55 to $100 per employee/month. This encourages reduced S.O.V.'s, reduced VMT's and reduced CO^2. Employers are able to ultimately build, buy or lease fewer parking spaces. (Wes add more details from library)

6. Rideshare incentive programs may include activities to encourage and assist in the formation of car, van, and buspools, cash payments or subsidies, and preferential parking charges and parking space location and other incentive programs. The ridesharing program shall include the formation of two-person carpools and vanpools and vanpools of three or more persons. The applicant will coordinate this effort for the TMPC with the City's Office of Transit & Services Programs.

7. Public transit incentive programs may include the provision of transit services to and from convenient public transit sites and to accommodate mid-day and evening excursions, the construction of transit shelters and amenities, the construction of bus/rail transit stations and related facilities, and the dedication of land and the provision of other subsidies for the construction and operation

of public transit facilities. The provision of transit fare media subsidies and marketing programs and the provision of other analogous incentive programs will be undertaken.

8. Bicycle and pedestrian incentive measures could include provision of bicycle parking and storage facilities, the construction and extension of bicycle paths and pedestrian walkways, the provision of shower and locker facilities and similar incentive features will be included in the buildings.

9. Work with the City to establish a "live near your work" program that could provide cash subsidies to the employees and residents.

10. The encouragement of telework options and flex work hours options for employees. The encouragement of after work recreation options on-site is another great way to reduce travel during peak commuting hours.

11. The applicant will provide space of approximately 500 sq ft for a transit store in, or near, the area designated near the BRT Transit station.

12. The applicant will work with the City and transit companies to encourage bus service within the site and along the streets within Potomac Village.

13. The applicant will prepare, as part of its sales/leasing agreement, appropriate language to inform perspective buyers/tenants/residents of the TMP conditions that will be approved by the City.

TRANSPORTATION COORDINATOR (TMPC)

14. The on-site Transportation Coordinator will be the administrator of all of the TMP programs. The Transportation Management Plan Coordinator (TMPC) will promote the use of transit, carpooling and vanpooling, bicycling, telecommuting, and the regional Guaranteed Ride Home program and other components of the TMP with prospective residents/tenants/employees during the marketing/leasing/new employee orientation.

    The TMPC shall display and distribute information about transit, carpool/vanpool, bicycling, telecommuting and other TMP programs and services to residents, tenants, employees of the project, including maintaining on-site stock of appropriate bus schedules, Metro schedules, and other information on Metro Rail and VRE. The TMPC will coordinate with the Office of Transit Services & Programs to distribute transportation brochures and applications to the regional rideshare program. The TMPC will provide this information and display it in a central location in all commercial buildings and in all of the common areas of the residential buildings.

TRANSPORTATION FUND AND REPORTING

FUND

The applicant shall fund or shall require that individual builders and owners within the development provide a transportation fund at an annual rate equal to $60 per occupied residential unit and $.10 per occupied net sq ft of commercial office and retail space. The first payment shall be made with the issuance of the initial certificate of occupancy. The rate shall increase annually by the amount equal to the rate of inflation for the previous year unless a waiver has been obtained.

The TMP fund shall be used exclusively for the following activities:

a) *discounting the cost of transit fare media for residents and employees*
b) *marketing and promotional materials to promote the TMP*
c) *subsidizing the cost of carpool/vanpool spaces*
d) *installation of bike racks, lockers, and transit displays*
e) *any other TMP activities that may be proposed and approved by the Director of T&ES.*

Any funded remaining in the TMP account at the end of each reporting year may either be reprogrammed for TMP activities during the following year, or may be paid to the City for use in TMP support activity which benefits the site.

The director of T&ES may require that the funds be paid to the City upon determination that the applicant has not made reasonable effort to use the funds for the TMP program. The applicant shall provide annual reports to OTS&P, including an assessment of the effects of TMP activities of carpooling, vanpooling, transit ridership, and peak hour traffic, the results of the annual survey and a work program for the following year.

REPORTING

The TMPC will provide semi-annual reports to the Office of Transit Services & Programs. These reports will provide a summary of the contributions to the fund and all expenses. The first report will be due six months following the issuance of the first certificate of occupancy.

This report and each subsequent report, shall identify the sq ft of commercial and retail floor area space and the number of occupied dwelling units, and the number of employees or residents occupying such space.

Counting vehicle trips and identifying occupancy of those cars (in and out of the site) is perhaps the best way to establish the fact that the TMP is effectively reducing peak hour trips and, therefore, VMT on and off-site.

Preliminary FAA Obstacle Evaluation:
Land Bay F Project

Prepared for Antunovich and Associates by:

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Reston, VA 02191
(703) 773-3100

Preliminary FAA Obstacle Evaluation: Land Bay F Project

Overview:

The intent of this evaluation is to survey potential airspace issues that may affect decisions regarding the development of the Land Bay F parcel. Results of the analysis are based on standards outlined in "Title 14 CFR Part 77 - Code of Federal Regulations: Obstacles Effecting Navigable Airspace" as applied to landing facilities in the vicinity. Results also analyze the possible impact of TERPS (US Terminal Instrument Procedures) criteria that are specific to Reagan Washington National Airport (DCA).

Since this is a preliminary analysis, results are based on an approximation of the parcel location. Site boundaries were estimated by comparing a "Flight Path Overlay" drawing (provided by Antunovich and Associates) to Google Earth images. Five sample points were selected from within these approximate Land Bay F boundaries. Sample point coordinates are presented below:

- Northeast Corner: 38°50'23.85"N, 77° 2'56.13"W
- Northwest Corner: 38°50'23.92"N, 77° 3'6.63"W
- Central Point: 38°50'14.30"N, 77° 2'57.39"W
- Southeast Corner: 38°50'4.75"N, 77° 2'49.96"W
- Southwest Corner: 38°50'3.87"N, 77° 3'3.89"W

These coordinates were selected to provide representative mock structure locations for obstacle evaluation purposes. By examining the impact of structures in the corners and center of the property, general statements can be made concerning the airspace impact of tall buildings at various site locations.

Method:

Each of the five points and coordinates listed above were evaluated at a height of 200 feet AMSL using *Federal Airways and Airspace* obstacle evaluation software. This specialty program analyses a proposed structure's Part 77 and TERPS impacts on navigable airspace. This analysis thus provides information about the likely outcome of the FAA's initial determination, as well as any "further study" that may be required during the approval process. It also provides initial estimates for the highest structure height that might be allowed at each sample location.

Since Land Bay F is very close to DCA, it is to be expected that new buildings of any substantial height will have a presumed impact on the airport's navigable airspace. Other structures in the area, both existing and those that have been granted FAA approval but have not yet been built, provide the strongest mitigations if proposed structures on Land Bay F penetrate regulatory imaginary surfaces. These prior FAA approved structures

were reviewed to determine how they might serve as precedents for FAA Determinations on Land Bay F.

FAA Part 77 Analysis:

Part 77 imaginary surfaces provide the FAA with general guidelines for determining whether a structure may be a hazard, and in isolation do not definitively determine what structures will or will not adversely impact air navigation. Penetration of any Part 77.23 standards or any Part 77.25 surfaces will generate an automatic "Notice of Presumed Hazard" from the FAA, and will require further study and circularization for public comment. The discussion of Part 77 results below applies only to DCA. No airspace impact was found during the software analysis to any other landing facility or heliport in the area.

Part 77.13 - Notice Requirements: Software results confirm that proposed buildings on the site that are planned to be greater than a range of 36 feet (northeast corner) to 53 feet (southwest corner) in height will penetrate the airport's "Notice Slope" of 100:1 and be subject to the FAA filing process. Depending on the final height proposed, other less stringent imaginary surfaces may also be penetrated.

Part 77.23(a) (2) - Obstruction Standards: These standards state that a structure would be a hazard to air navigation if it either exceeds 200 feet Above Ground Level (AGL) or rises more than 200 feet above the Airport Reference Point (ARP) within three miles of the airport, whichever is higher. Under this standard, buildings on the Land Bay F parcel would be restricted to a height of approximately 215 feet based on airport elevation standard. Dozens of buildings, towers and monuments within a three mile radius of DCA exceed 200 feet AGL, however, and provide a mitigating argument if this standard surface is penetrated.

FAR 77.23(a) (3) – Departure Surface Criteria (40:1 TERPS departure surface): Buildings greater than the heights listed below would penetrate the TERPS 40:1 departure surface. This instrument procedure standard provides for a climb gradient of 200 feet per nautical mile (fpnm) and implies minimum obstacle clearances of 48 fpnm. Maximum heights allowable under the 40:1 standard are:

- Northeast Corner: 74 feet
- Northwest Corner: 88 feet
- Central Point: 88 feet
- Southeast Corner: 95 feet
- Southwest Corner: 114 feet

Mitigations of any building penetrations under this standard are discussed below under "DCA Instrument Procedures (TERPS)".

Part 77.25- Civil Airport Imaginary Surfaces: The "Horizontal Surface" is established 150 feet above airport elevation (165 feet for DCA) and extends arcs 10,000 feet beyond the end of each runway. Buildings on the Land Bay F site are likely to generate "Notice of Presumed Hazard" (NPH) determinations from the FAA if they exceed this height. As with the 200 foot standard cited above, there are multiple structures near DCA that penetrate this surface, thus providing mitigating arguments for any penetration by buildings on Land Bay F.

DCA Instrument Procedures (TERPS):

Penetrations of imaginary surfaces established by instrument procedures are often difficult the most difficult to mitigate. These are designed specifically for the airport, may be expensive to change, and it is necessary to negotiate changes with airport involvement in the process.

Runway 04 Instrument Approach Procedures: There is one published arrival procedure for DCA Runway 4 (GPS RWY 04). Our software analysis indicates that there would be no practical impact to this approach since the Land Bay F site is outside the final visual approach segment of this procedure.

Runway 01 Instrument Approach Procedures: There are four approach procedures for Runway 01, and these were also analyzed to assess their possible impact on building heights in Land Bay F. Results indicate that only one approach would be impacted, and would restrict structure heights to 290 feet (based on assessment at the SE Corner coordinates).

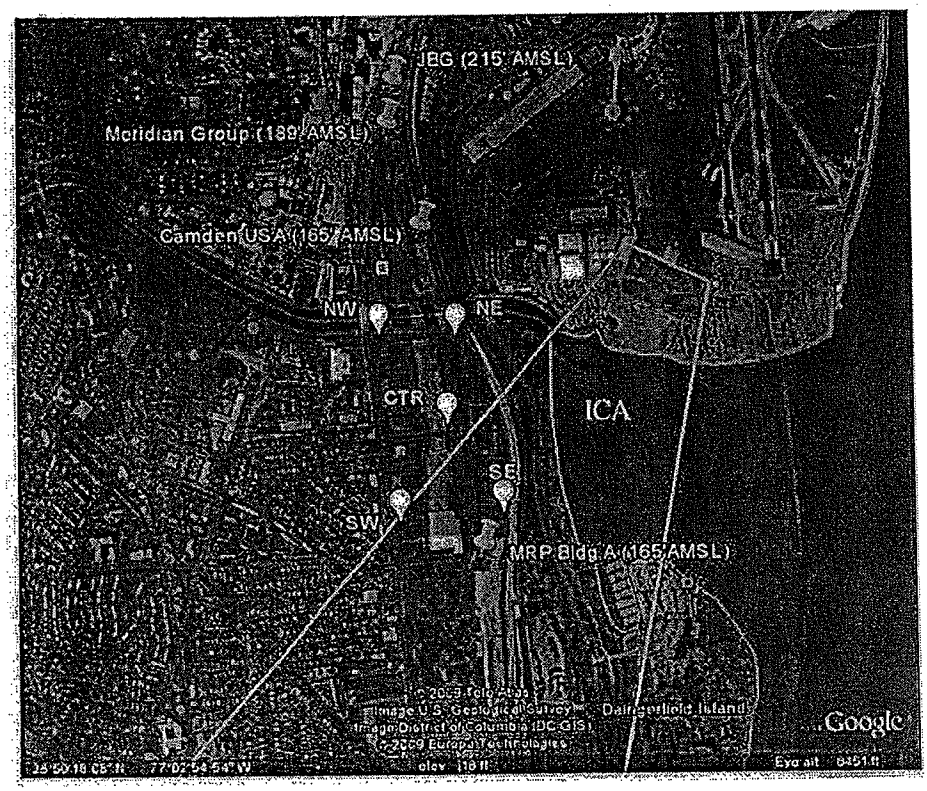
- ILS RWY 01: Parcel is outside the approach surface.
- RNAV (RNP) RWY 01: Parcel is outside the approach surface.
- VOR RWY 01: Maximum structure height allowed would be 290 feet AMSL (based on SE Corner).
- LOC RWY 01: Parcel is outside the approach surface.

Missed Approach Procedures: No instrument approaches to Runway 22 are allowed and as a result there are no missed approach procedures that would be affected by buildings in Land Bay F. Of the four missed approach procedures to Runway 19, the lowest minimum decent altitude is 475 feet, the height at which a missed approach climb would be initiated. Missed approach surfaces in the proximity of Land Bay F would have no practical impact on building heights.

Runway 04 Instrument Departure Procedures: DCA does not have published departure restrictions for Runway 22[1], so diverse departure procedures are assumed. Our software analysis indicates that structures within the 40:1 Initial Climb Area (ICA) - a trapezoid that extends two miles beyond the departure end of the runway - would be the most

[1] Under diverse departures, aircraft may turn in any direction following takeoff. Runway 22 does have a minimum climb gradient of 210 fpnm, which is superseded as noted.

restrictive. More than half of the parcel lies outside the ICA trapezoid in the "Diverse A" area, however, and higher building heights should be possible here. The Table below outlines the heights that may be allowed within and outside the ICA based on the TERPS criteria.



	Surface Affected	Max Possible Structure Height at 200 fpnm
SW Corner	ICA	111'
SE Corner	ICA	94'
CTR	Diverse A	320'
NW Corner	Diverse A	346'
NE Corner	Diverse A	334'

For the portion of Land Bay F that would be restricted by the Initial Climb Area surface, the strongest supporting argument for higher structures than those listed above is found in the FAA Determination for MRP Realty's Building "A". This building has been proposed for Land Bay G and recently received a "Determination of No Hazard" from the FAA at 165 feet AMSL. The Determination of No Hazard concluded that no instrument procedures would be impacted by this structure and there would be no interference with visual flight rules at this height. Most important, the DCA Runway 22 departure climb gradient will be increased to 325 fpnm as a result of this Determination, a significant increase over the 40:1 (200 fpnm) standard. The Determination requires that MRP provide 2C survey verification which eliminates the FAA "penalty" that adds 50 feet vertically to the structure and moves the study point 250 feet closer to the airport for the FAA analysis. Allowable heights for Land Bay F sample points within the ICA if a 2C survey and a 325 fpnm climb gradient are assumed are tabled below.

"2C" Survey Equivalent Heights

	Climb Gradient / Distance from DER[2]	200 fpnm	325 fpnm
MRP "A"	3700	107'	164'
SW Corner	3959	111'	178'
SE Corner	3296	94'	146'

Heights higher than these may be difficult to achieve, although climb gradients as great as 500 feet per NM could conceivable be allowed. The "Determination of No Hazard" for MRP Building "A" suggests that this change as allowed by the FAA will be the maximum allowable climb gradient for Runway 22, stating that "any height exceeding 127 feet above ground level (165 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation."

Other Prior FAA Determinations near Land Bay F:

Three additional prior "Determinations of No Hazard" (ranging from a quarter to a half mile north of Land Bay F) were found in the FAA archives that provide supporting information to predict the outcomes of Land Bay F filings. These include a building currently under construction by JBG at the south end of Crystal City (215' AMSL), a building proposed by Meridian Group (189' AMSL), and one by Camden USA (165'AMSL). None of these structures were found to impact any instrument procedures, and though two of them penetrated the 165' horizontal surface, they were nonetheless approved. In the case of the Meridian building, there was an additional impact on navigational aids for DCA that presented issues that required resolution:

> "The most serious issue was a very significant adverse effect it would have on the Radio Communication Link (LDRCL) between the equipment located at DCA Air Traffic Control Tower and the Potomac Terminal Radar Approach Control (TRACON) facility. The proposed development was also found to interfere with the system performance of

[2] DER is the acronym for Departure End of Runway, the point from which TERPS measurements are made.

the Terminal Surveillance Radar (ASR-9). Both the LDRCL and the ASR-9 are absolutely critical to the operation of the Air Traffic Control system and any interference with their operation is highly objectionable and unacceptable."[3]

As a condition of the "Determination of No Hazard", Meridian was required to pay for the relocation of equipment necessary to mitigate this impact, presumably a solution negotiated with the airport to ensure approval. The impact of Land Bay F buildings on navigation facilities can only be determined through FAA study.

Additional Considerations:

A 2007 plan to modify Runway 4-22 has been proposed that will shorten the runway to comply with FAA safety zone requirements. Other modifications/limitations will be made to allow use of an overflow parking lot at the touchdown end of Runway 4. The expected result is a significant reduction in DCA traffic that will be able to utilize Runway 4-22 (estimated at about 250 operations per year). Though changes are characterized as temporary (runway mods are linked to a five year parking garage construction project), there is implicit reference to the possibility that this runway may soon be more for show than for handling air traffic.

"An ALP change to close the runway is also not an option; there is considerable pressure for high-rise development near DCA, and closing the runway could lead to permanent loss of airspace."[4]

Although beyond the scope of this preliminary analysis, MWAA might be challenged in their apparent effort to "reserve" airspace without the intention to use it, thus providing another avenue to achieve higher building heights, particularly in the Runway 22 ICA. It is important to note that other possible restrictions that are not runway dependent (i.e. NAVAID interference) would not be mitigated by closing Runway 4-22.

Conclusion:

The heights tabled below are estimated maximums that would be allowable current FAA regulations as they apply to DCA. There is a possibility that greater heights are possible in the southeastern section of the site which is impacted by the Runway 4 Initial Climb Area surface, noting there are no mitigations to support more height other than asserting that a climb gradient greater that 325 fpnm is possible. The maximum heights estimated for the northwest two thirds of the parcel are allowable under TERPS but still penetrate Part 77 surfaces to a much greater degree than other buildings in the proximity of DCA, particularly those in Crystal City. According to the FAA database, 5 buildings west of DCA reach above 200' ASML, and none are greater than 280 feet in height. At these

[3] Excerpt from FAA Determination of No Hazard 2006-AEA-4035-OE.
[4] From "Runway 4-22 Modifications: Environmental Assessment and Federal Consistency Certification". Produced for MWAA by Engineering, Science, and Technology, Inc., Nov, 2007.

heights, the argument would likely be more political than a matter of regulatory compliance.

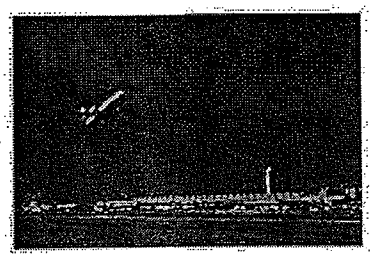
	Max Structure Height at 325' fpnm
SW Corner	173'
SE Corner	146'
CTR	320'
NW Corner	346'
NE Corner	334'

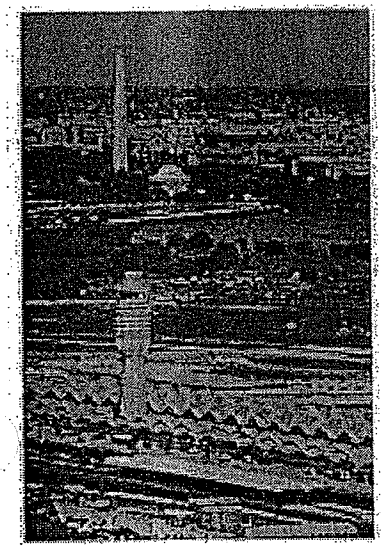
At a minimum, building heights on Land Bay F outside the ICA should be approved at heights up to 200' AGL. Since the assumed height of structures was limited to 200 feet AMSL in this preliminary analysis, additional work should be completed if heights greater than this are to be considered. Buildings within the ICA surface are more likely to be restricted to between 145' and 175' AMSL, depending upon their distance from Runway 4-22.

When likely building site coordinates become available, it would be prudent to file for FAA Determinations to test maximum desired building heights on Land Bay F. The approval process averages approximately 6 months including the circularization and "further study" period. A Determination of No Hazard, once issued for specific building coordinates, would remain in force for 18 months, with an automatic 18 month extension available if needed. This allows a window of three and one half years to begin construction.

Related Study FAA Airspace Study Numbers (ASN)

2007-AEA-5620-OE	MRP Realty Building "A" (165' AMSL)
2006-AEA-4034-OE	JBG Companies (215' AMSL)
2004-AEA-3587-OE	Camden USA (165' AMSL)
2006-AEA-4035-OE	Meridian (189' AMSL)





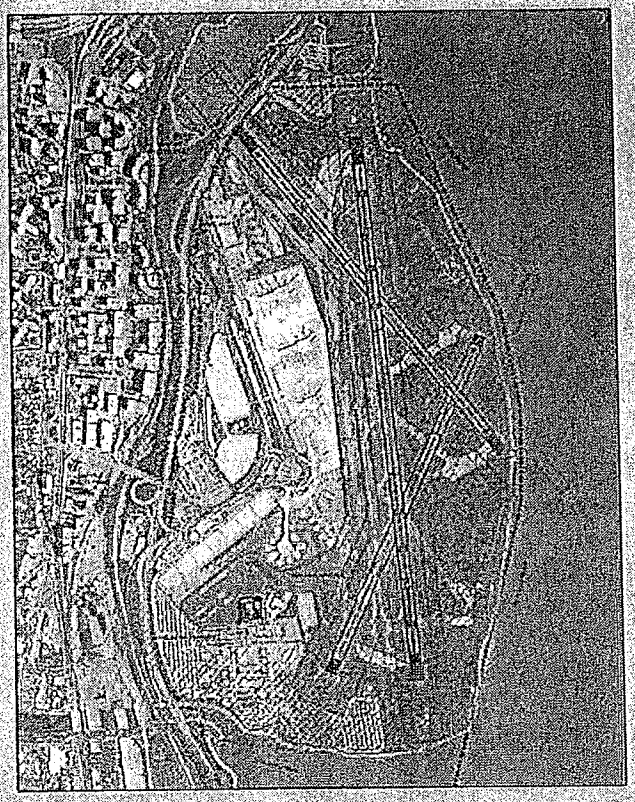
METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

EA Engineering, Science, and Technology, Inc.

RONALD REAGAN WASHINGTON NATIONAL AIRPORT (DCA)

RUNWAY 4-22 MODIFICATIONS

ENVIRONMENTAL ASSESSMENT AND FEDERAL CONSISTENCY CERTIFICATION



Prepared for:
Metropolitan Washington Airports Authority
One Aviation Circle
Washington, D.C., 20001

Prepared by:
EA Engineering, Science, and Technology, Inc.
15 Loveton Circle
Sparks, Maryland 21152

November 2007

EA Project 13840.07

RONALD REAGAN WASHINTON NATIONAL AIRPORT (DCA)

RUNWAY 4-22 MODIFICATIONS

ENVIRONMENTAL ASSESSMENT AND FEDERAL CONSISTENCY CERTIFICATION

Prepared for:
Metropolitan Washington Airports Authority
One Aviation Circle
Washington, D.C., 20001

Prepared by:
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15 Loveton Circle
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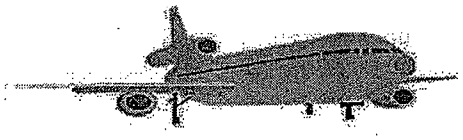
November 2007

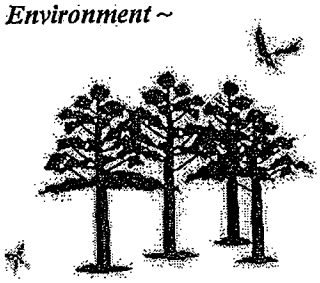
EA Project 13840.07

C

ENVIRONMENTAL EVALUATION FORM "C" (Short Environmental Assessment) for AIRPORT DEVELOPMENT PROJECTS



~ Aviation in Harmony with the Environment ~



FEDERAL AVIATION ADMINISTRATION
EASTERN REGION
AIRPORTS DIVISION

Airport Name: Ronald Reagan Washington National Airport (DCA) Proposed Project: Runway 4-22 Modifications

This Environmental Assessment becomes a Federal document when evaluated and signed by the responsible FAA official.

Responsible FAA Official: _____ Date: _____

C

Note: The form on which this document is based is a modification of the Form C developed by FAA Eastern Region dated March 22, 1999. The original form contained references to specific paragraphs of FAA Order 5050.4A. In the modified form, these references were replaced with references to the corresponding paragraphs of FAA Order 5050.4B, which replaced Order 5050.4A effective April 28, 2006, and FAA Order 1050.1E.

C

FAA EASTERN REGION AIRPORTS DIVISION ENVIRONMENTAL EVALUATION FORM "C" FOR SHORT ENVIRONMENTAL ASSESSMENTS

Environmental Evaluation Form "C," Short Environmental Assessment (EA), is based upon the guidance in Federal Aviation Administration (FAA) Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions For Airport Actions* or subsequent revisions, which incorporates the Council on Environmental Quality's (CEQ) regulations for implementing the National Environmental Policy Act (NEPA), as well as the U.S. Department of Transportation environmental regulations (including FAA Order 1050.1E or subsequent revisions), and many other federal statutes and regulations designed to protect the Nation's natural, historic, cultural, and archeological resources. It was prepared by FAA Eastern Region Airports Division, and is intended to be used for proposed Airports projects in this region only. If you wish to use it for projects in other regions or divisions, you must first coordinate with that region or division to determine whether they approve of its use.

Form C is intended to be used when a project cannot be categorically excluded (CATEX) from formal environmental assessment, but when the environmental impacts of the proposed project are expected to be insignificant and a detailed EA would not be appropriate. Accordingly, Form C is intended to meet the intent of a short EA while satisfying the regulatory requirements of an EA. Proper completion of Form C would allow the FAA to determine whether the proposed airport development project can be processed with a short EA, or whether a more detailed EA must be prepared. FAA normally intends to use a properly completed Form C to support a Finding of No Significant Impact (FONSI).

Applicability

Form C should be used if the sponsor's proposed project meets the following two (2) criteria:

1) The proposed project involves conditions ("extraordinary circumstances") identified in Order 5050.4B paragraph 903 (projects normally requiring an EIS); paragraph 702 (projects normally requiring an EA); Table 6-3 (extraordinary circumstances); or paragraph 706.h (cumulative impacts), and the sponsor shall demonstrate that involvement with, or impacts to, the extraordinary circumstances are not notable in number or degree of impact, and that any significant impacts can be mitigated below threshold levels.

2) The proposed project must fall under one of the following categories of Federal Airports Program actions noted with an asterisk (*):

(a) Approval of an airport location (new airport).
*(b) Approval of a project on an airport layout plan (ALP).
*(c) Approval of federal funding for airport development.
*(d) Requests for conveyance of government land.
*(e) Approval of release of airport land.
*(f) Approval of the use of passenger facility charges (PFC).
*(g) Approval of development or construction on a federally obligated airport.

Do any of these listed Federal Airports program action(s), 2(b) - (g), apply to your project?
Yes __X__ No** _____ If "yes," list them here (there can be more than one).

2 (b) Approval of a project on an airport layout plan (ALP);
2(g) Approval of development or construction on a federally obligated airport.
If "no," see (**) below.

**** If the proposed project does not meet 1) or 2) above, i.e., one or more answers to the questions resulted in a (**), do not complete this Form. Rather, contact the appropriate official (listed at the end of this form) for additional instructions.**

Directions
Prior to completing Form C, FAA recommends that you contact the environmental specialist in the appropriate office listed at the end of this Form to insure that the proper Form (A, B, or C) is used for your proposed action. Once you have completed the Form in accordance with the following instructions, submit it to that office for review.

To complete Form C, the preparer should describe the proposed project and provide information on any potential impacts of the proposed project. Accordingly, it will be necessary for the preparer to have knowledge of the environmental features of the airport. Although some of this information may be obtained from the preparer's own observations, previous environmental studies and associated documents, or research, the best sources are the jurisdictional federal, state and local resource agencies responsible for protecting specially-protected resources, such as wetlands, coastal zones, floodplains, endangered or threatened species, properties in or eligible for National Register status, DOT Section 303/4(f) lands, etc.. As appropriate, these agencies should be consulted prior to submitting information to the FAA. It is important to note that in addition to fulfilling the requirements of NEPA through this evaluation process, the FAA is responsible for ensuring that airport development projects comply with the many laws and orders administered by the agencies protecting specially-protected resources. Moreover, the Form is not meant to be a stand-alone document. Rather, it is intended to be used in conjunction with applicable Orders, laws, and guidance documents, and in consultation with the appropriate resource agencies.

An electronic version of this Evaluation Form is available on-line at **http://www.faa.gov/arp/aea.** In addition, some of the guidance and regulatory documents referenced in this Evaluation Form are available on-line at **http://www.faa.gov/arp/arphome.htm.** A document entitled "Tips for Airport Sponsors and their Consultants" is also available at **http://www.faa.gov/asw/asw600/envreq.html.** We encourage the preparer to complete the Form electronically, rather than by hand. It may then be submitted via e:mail, with a copy of the completed signature page sent by fax or mail; or, a hard copy of the completed Form may be submitted by fax or mail. The contact list should be removed from the completed Form prior to its submittal. Those responses requiring further explanation, or separate project plans or maps, should be attached at the end of the Form. In the attachment, identify the issue by its associated number/title (e.g., response to Item 13., Coastal Zone Impacts).

C

Complete the following information:

1. Project Location:

Airport Name: Ronald Reagan Washington National Airport (DCA)

Airport Address: Washington, D.C. 20001-4901

City: _____ County: Arlington State: Virginia

2 . Airport Sponsor Information:

Point of Contact: Stephan G. Smith, Deputy Vice President for Engineering

Address: Room 155 West Building, Ronald Reagan Washington National Airport
Washington, DC 20001-4901

Telephone: (703) 417-8140 Fax: (703) 417-8199

E-mail: Stephan.Smith@MWAA.com

3. Evaluation Form Preparer Information:

Point of Contact: Renee Bartnik, Senior Environmental Planner

Address: Parsons Management Consultants
45045 Aviation Dr., Suite 200, Dulles, VA 20166-7528

Telephone: (703)-572-1250 Fax: (703) 572-1279

E-mail: Renee.Bartnik@MWAA.com

4. Proposed Development Action (describe **ALL** associated projects that are involved):
Ronald Reagan Washington National Airport (DCA) is located on a peninsula in the Potomac River in Arlington County, Virginia (Figure 1). The Metropolitan Washington Airports Authority (the Authority) is responsible for the day-to-day operation of DCA. The Authority is proposing to take a number of actions in regard to Runway 4-22 at DCA. The net impact of all proposed changes is to temporarily reduce the declared distances for departing aircraft on Runway 4, to reduce the largest category of aircraft permitted on the runway from Category C to Category A and/or B, and to eliminate departures and arrivals on Runway 22 as well as arrivals to Runway 4 per discussions between the Airport Manager and representatives of the FAA Washington Airports District Office (ADO). The change would be temporary (effective winter 2007) and is expected to last for a period of 2-5 years, at which time a decision will be made by the Authority whether to apply for an extension of the temporary designation or to make the changed designation permanent.

The modifications proposed for implementation of the temporary change in Runway 4-22 classification and reduction in approach category include full safety areas at both approach ends to the runway. Because of the proximity of the Potomac River to the threshold of Runway 22, the Safety Area associated with the runway will be established by relocating the threshold of Runway 22 approximately 600 feet to the southwest, effectively shortening the runway by 600 feet (Figure 2). The pavement affected by the shift will be reclassified as a taxiway. The runway edge lights will be relamped to correspond to the new threshold, and blue lenses installed on the 600-ft segment being reclassified as a taxiway. The Runway End Identifier Lights (REIL's) and the runway threshold lights will be relocated and the Visual Approach Slope Indicator (VASI) associated with Runway 22 will be temporarily placed out of service for the duration of the threshold relocation.

The Runway 4 threshold will be unaffected, and the lighting and instrumentation associated with the threshold will not change. However, the Runway end lights at the opposite end will be relocated to match the relocated threshold for Runway 22 (Figure 3).

Procedural modifications include the reclassification of Runway 4-22 as limited to Visual Approaches of no less than ¾-mile visibility by aircraft in Approach Categories A, B, as defined in FAA Advisory Circular AC 150/5300-13. The Safety Area for Runway 4 will be changed from 500 feet in width to 300 feet in width. The Object Free Area for both runways will be reduced from 1,000 feet to 600 feet in length beyond the runway threshold. The relocation of the threshold for Runway 22 will allow the establishment of a permanent safety area before the threshold of the runway as desired by FAA. As a result of the 600-ft relocation of the Runway 22 threshold, the declared distance for Runway 4-22 in both arrival and departure directions will be reduced from 4,911 feet available to 4,311 feet available.

An analysis of data on aircraft operations for the first five months of 2007 showed a total of 725 operations by all aircraft types in all directions on Runway 4-22 resulting in an average of slightly less than 5 operations per day. Of these, 477 arrivals and departures were performed by aircraft in Approach Category C averaging 3 per day. Reclassification of Runway 4-22 will require a shift of these operations from Runway 4-22 to either Runway 1-19 or Runway 15-33. Impacts to airfield and airspace as a result of the proposed changes are expected to be minimal.

For the time that Runway 4-22 is reclassified for departures by aircraft in Approach Category B and below, the Authority expects to gain as many as 560 additional public parking spaces in a remote lot

located beyond the runway end (south of Runway 4) (Figure 4). These spaces will be created in the space between the Approach Category C Object-Free Area and the Approach Category B Object-Free Area.

5. Describe the Purpose of and Need for the Project:
The proposed activities are intended to provide additional public parking space at DCA during construction of an additional parking deck on each of Garages A and B/C. Construction of the additional parking decks will result in a temporary loss of approximately 350-400 parking spaces. The proposed activities would allow the establishment of up to 560 additional parking spaces in an existing inactive temporary lot at the south end of Runway 4-22 (Figure 4) to replace those lost during construction of the additional parking decks for Garages A and B/C.

6. Alternatives to the Project: Describe any other reasonable actions that may feasibly substitute for the proposed project, and include a description of the "No Action" alternative. If there are no feasible or reasonable alternatives to the proposed project, explain why:
There are no feasible or reasonable action alternatives for the proposed action. There is no land available at DCA for additional parking, and there is no off-airport parking available. An ALP change to close the runway is also not an option; there is considerable pressure for high-rise development near DCA, and closing the runway could lead to permanent loss of airspace.

Alt #1

Alt. #2

No Action Alt.
Explanation The "No Action" Alternative would not offset the 350-400 public parking spaces estimated to be lost during construction of additional decks on the existing parking Garages A, and B/C. Parking at DCA would be available only in remaining designated spaces. Parking at DCA is already beyond capacity and is creating the necessity for expansion of the existing parking garages. Although the additional decks on the existing parking Garages A and B/C project is designed to be implemented in phases and phasing of the construction of the decks will minimize disturbances to public parking, traffic circulation, and rental car operations, phasing will not eliminate disruption to these operations and would still result in a temporary loss of approximately 350-400 parking spaces. Creating temporary parking south of Runway 4 would reduce the disruptions further by allowing the establishment of up to 560 additional parking spaces.

In addition, the loss of public parking spaces would increase the number of passengers using taxis and to a much lesser extent, Metrorail. Metrorail is not convenient for passengers coming to the airport from locations that do not have Metrorail service or for passengers with large quantities of luggage. The additional taxi traffic would add to the congestion on roads serving DCA.

7. Describe the affected environment of the project area (terrain features, level of urbanization, sensitive populations, etc). Attach a map or drawing of the area with the location(s) of the proposed action(s) identified. Attachment? Yes X No _____

Ronald Reagan Washington National Airport is the closest airport to Washington, D.C. and as such is located in a highly urban environment. The DCA property is approximately 860 acres adjacent to the Potomac River in Arlington County, Virginia (Figure 5). The area was once the site of Abingdon Plantation and much of the shoreline area was filled during construction of the airport facilities. The proposed project activities would be entirely within the DCA property boundary and in areas already developed and impervious (inactive parking lot and the existing ends of Runway 4-22).

8. Are there attachments to this Form? Yes X No _____ If "yes," identify them below.

Figure 1. Ronald Reagan Washington National Airport Location
Figure 2. Recommended Action Plan Runway 4-22
Figure 3. Recommended Action Plan Runway 22 End
Figure 4. Runway Protected Areas and Parking Area Runway 4 End
Figure 5. Project Area
Figure 6. 2004 Noise Exposure Contours
Figure 7. 2008 Noise Exposure Contours – No Action
Figure 8. 2013 Noise Exposure Contours – No Action
Figure 9. 2008 Noise Exposure Contours – Proposed Action
Figure 10. 2013 Noise Exposure Contours – Proposed Action
Figure 11. Noise Grid Analysis

Attachment A. Coastal Zone Management Act Consistency Certification
Attachment B. Comments Received Regarding the Draft Environmental Assessment (to be prepared)

9. Environmental Consequences – Special Impact Categories (refer to corresponding sections in 5050.4A , or subsequent revisions, for more information and direction to complete each category, including discussions of Thresholds of Significance).

(1) NOISE

1) Does the proposal require a noise analysis per Order 5050.4A? Explain. (Note: Noise sensitive land uses are defined in Table 1 of FAR Part 150). Yes X No _____

2) If "yes," determine whether the proposed project is likely to have a significant impact on noise levels over noise sensitive areas within the DNL 65 dBA noise contour.

In accordance with FAA Orders 5050.4B and 1050.1E, aircraft noise exposure in the Airport vicinity was analyzed for projected conditions in 2008 and 2013. The primary metric used in the noise analysis is the day-night average sound level (DNL), which is the average sound pressure level

in A-weighted decibels (dBA) for an average day of the year.[1] DNL is calculated using the sound energy generated by individual aircraft operations (arrivals or departures), the number of operations occurring during a theoretical average 24-hour period, and the times of day the operations occur. A 10-decibel (dB) weighting penalty is added for aircraft operations occurring during nighttime hours (between 10:00 p.m. and 6:59 a.m.). The 10-dB penalty represents the added intrusiveness of sounds that occur during sleeping hours, both because of the increased sensitivity to noise during sleep, and because ambient sound levels during nighttime hours are typically about 10 dB lower than during daytime hours. With the penalty, each operation during nighttime hours is considered to be equivalent to 10 operations of the same aircraft type during daytime hours (between 7:00 a.m. and 9:59 p.m.). As specified in FAA Orders 5050.4B and 1050.1E, DNL 65, 70, and 75 are the criterion levels for noise exposure analyses included in EAs for proposed airport improvement projects. The FAA defines a significant change in aircraft noise exposure as a DNL difference of 1.5 dBA over noise-sensitive land uses within an area exposed to aircraft noise of DNL 65 or higher.

The Integrated Noise Model (INM) is a computer model developed by the FAA and required for use in developing aircraft noise exposure maps. The INM contains aircraft operational and noise data in an aircraft database that reflect average aircraft operating conditions at an airport. Version 7.0 of the INM[2]—the latest accepted, state-of-the-art tool for determining the total effect of aircraft noise at and around airports at the time the noise exposure maps for this Environmental Evaluation Form "C" were prepared—was used for the 2008 and 2013 noise analysis. The INM Version 7.0 aircraft database contains representative data for commercial, general aviation, and military aircraft powered by turbojet, turbofan, or propeller-driven engines. For each aircraft type in the database, the following information is provided: (1) a set of departure profiles for each applicable trip length, (2) a set of approach parameters, and (3) sound exposure level (SEL) versus distance curves for several thrust settings. This information is needed to develop the noise exposure maps based on the DNL metric.

Environmental Setting

The existing conditions (2004) noise exposure map for Ronald Reagan Washington National Airport (the Airport) is presented on Figure 6. 2004 aircraft operations data, fleet mix information, and runway and flight track use data are documented in a May 4, 2005, memorandum by Wyle Laboratories entitled, *Washington National Airport (DCA) 2004 DNL Contours*. The FAA accepted the existing conditions and future (2009) noise exposure maps contained in the Airport's FAR Part 150 Noise Compatibility Program Update in August 2007.

As shown on Figure 6, the majority of the area exposed to DNL 65 and higher is located on Airport property or within the Potomac River. No population or noise-sensitive land uses are exposed to aircraft noise of DNL 65 and higher. Two land areas are exposed to aircraft noise of DNL 65 and higher: the first area is north of the Airport and includes Roaches Run Waterfowl Sanctuary and portions of the Pentagon. The second land area is directly south of the Airport and includes Daingerfield Island Marina.

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[1] A-weighted sound pressure level is a frequency-weighted sound level that correlates with the way sound is perceived by the human ear.

[2] Version 7.0 of the INM was released on April 30, 2007.

C

Environmental Consequences

Noise exposure in 2008 and 2013 under the No Action and Proposed Action alternatives is described in the following sections.

No Action Alternative

Under the No Action alternative, there would be no change to existing facilities at the Airport and no change to airport operational procedures including runway use and flight track use. Figures 7 and 8 show the 2008 and 2013 aircraft noise exposure contours for the No Action alternative superimposed on a map of generalized existing land use. As shown on Figures 7 and 8, the noise exposure contours for the Airport are anticipated to grow slightly in the future compared to the existing conditions contours. No population or noise-sensitive land uses would be exposed to aircraft noise of DNL 65 and higher in 2008 or 2013 under the No Action Alternative.

Proposed Action Alternative

Under the Proposed Action, the Metropolitan Washington Airports Authority would make temporary modifications to Runway 4-22 in 2008. The temporary modifications of the runway would require the closure of Runway 22, and Runway 4 would only accommodate departure operations by approach category A and B aircraft. It was assumed for noise modeling purposes that aircraft that currently use Runway 4-22 for arrivals and departures would be redirected to Runway 1-19.

Figures 9 and 10 show the 2008 and 2013 aircraft noise exposure contours for the Proposed Action alternative superimposed on a map of generalized existing land use. The noise contours depicted on Figures 9 and 10 are virtually identical to the noise contours presented on Figures 7 and 8 for the No Action alternative. No population or noise-sensitive land uses would be exposed to aircraft noise of DNL 65 and higher in 2008 or 2013 under the Proposed Action Alternative.

A noise grid analysis was conducted to determine differences in noise levels at specific locations in the vicinity of the Airport under the Proposed Action and No Action alternatives. The noise grid points that were modeled in the INM, depicted on Figure 11, represent residential communities that are outside the DNL 65 noise contour, Daingerfield Island, and Roaches Run Waterfowl Sanctuary. As presented in Table 1, predicted noise levels at these grid point locations would be virtually identical in 2008 and 2013 under the Proposed Action and No Action alternatives. It is anticipated that noise levels at Point 2, Point 4, and Point 5 would be slightly lower (0.1 dB) in 2008 under the Proposed Action alternative when compared to the No Action alternative.

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Table 1. Noise Grid Analysis – Runway 4-22 Modifications

Point	Land Use	Noise Exposure Level (DNL)			
		2008 No Action	2008 Proposed Action	2013 No Action	2013 Proposed Action
1	Park and Recreation	66.4	66.4	66.5	66.5
2	Park and Recreation	63.9	63.8	64.0	64.0
3	Residential	60.2	60.2	60.3	60.3
4	Residential	61.6	61.5	61.7	61.7
5	Residential	58.0	57.9	58.1	58.1
6	Residential	50.9	50.9	51.0	51.0

Notes: DNL = Day-night average sound level.
Source: Ricondo & Associates, Inc
Prepared by: Ricondo & Associates, Inc.

Summary of Findings

No population or noise-sensitive land uses would be exposed to aircraft noise of DNL 65 and higher in 2008 or 2013 under the Proposed Action or No Action alternatives. Noise levels south of the Airport in the vicinity of Daingerfield Island are anticipated to be 0.1 dB lower under the Proposed Action alternative when compared to the No Action alternative. The results of the noise analysis demonstrate that there would be no significant noise impacts in 2008 or 2013 under the Proposed Action.

(2) COMPATIBLE LAND USE

(a) Would the proposed project result in other (besides noise) impacts exceeding thresholds of significance that have land use ramifications, such as disruption of communities, relocation of residences or businesses, or impact natural resource areas? Yes____ No _X_ Explain.
No. The proposed activities resulting in the reclassification of Runway 4-22 and the creation of temporary replacement public parking spaces will utilize already developed land within the DCA property boundary and would not impact communities, businesses or natural resources.

(b) Would the proposed project be located near or create a wildlife hazard as defined in FAA Advisory Circular 150/5200-33, "Wildlife Hazards on and Near Airports"? Yes____ No _X_ Explain.

(3) SOCIAL IMPACTS

(a) Would the proposed project cause relocation of any homes or businesses? Yes____ No _X_
Explain.
No. The proposed actions are within the existing DCA property boundaries and would not cause any relocation of residences or businesses (See 2(a) above).

(b) If "yes," describe the availability of adequate relocation facilities

(c) Would the proposed project cause an alteration in surface traffic patterns, or cause a noticeable increase in surface traffic congestion? Yes_X__ No ____ Explain.
The construction of an additional deck on Garages A and B/C will result in the temporary loss of approximately 350-400 parking spaces. The changes proposed for Runway 4-22 would result in the establishment of a maximum of 560 temporary public parking spaces to offset those lost during construction. Some minor, temporary changes to airport roadway traffic patterns and parking operations would be expected as a result of the proposed project activities at DCA; however, traffic congestion is not expected.

(4) INDUCED SOCIOECONOMIC IMPACTS

Would the proposed project cause induced, or secondary, socioeconomic impacts to surrounding communities, such as change business and economic activity in a community; impact public service demands; induce shifts in population movement and growth, etc.?
Yes____ No _X_ Explain.
See 2(a) and 3(a) above.

(5) AIR QUALITY

(a) Does the proposed project have the potential to increase airside or landside capacity, including an increase in capacity to handle surface vehicles? Explain. No. The proposed project involves temporary relocation of existing automobile parking, but not a permanent increase in parking capacity.

(b) Identify whether the project area is in a non-attainment or maintenance area for any of the six (6) criteria air pollutants having National Ambient Air Quality Standards (NAAQS) established under the Clean Air Act Amendments (CAAA), and identify which pollutant(s) apply. If the proposed project is in an attainment area, no further air quality analysis is needed; skip to item (6). See EPA Green Book at www.epa.gov/oar/oaqps/greenbk for current attainment areas.
DCA is located in the Washington Metropolitan area. This area is currently in attainment for all criteria pollutants except ozone (O_3) and fine particulate matter ($PM_{2.5}$). The Washington Metropolitan area is classified as moderate nonattainment for the new 8-hr ozone standard (0.08ppm), and as nonattainment for fine particulate matter (particles smaller than 2.5 microns) for which the standard is 35 micrograms per cubic meter as a 24-hr average, or 15 micrograms

per cubic meter as an annual average. The Metropolitan Washington Council of Governments is preparing State Implementation Plans (SIPs) for both ozone and $PM_{2.5}$. Actions to be taken by VDEQ to reduce pollution to levels at or below the NAAQS are outlined in a CAA-mandated State Implementation Plan.

(c) Is an air quality analysis needed with regard to indirect source review requirements or levels of aircraft activity (See Order 5050.4A and the 1997 FAA Handbook "Air Quality Procedures for Civilian Airports and Air Force Bases"). Explain. If "yes," comply with state requirements. No. Indirect source review requirements are state-specific and are not required in Virginia, where the project area is located.

(d)(1) Would the proposed action be an "exempted action," as defined in 40 C.F.R Part 51.853(c)(2) of the General Conformity Rule? If exempt, skip to item (6). List exemption claimed. No.

(d)(2) Would the increase in the emission level of the regulated air pollutants for which the project area is in non-attainment or maintenance exceed the de minimis standards?

Yes _____ No X

Indirect emissions resulting from the project will be insignificant. Direct emissions associated with construction are estimated at 0.41 tons CO, 0.60 tons NO_X, 1.0 tons VOC, 0.08 tons PM, and 0.05 tons SO_X (Table 2). Thus, total direct and indirect emissions are well below *de minimis* standards and are not regionally significant.

(d)(3) If "no," would the proposed project cause a violation of any NAAQS, delay the attainment of any NAAQS, or worsen any existing NAAQS violation? Explain. Total direct and indirect emissions are well below *de minimis* standards and are not large enough to be regionally significant. At these emissions levels air quality impact modeling is not required under General Conformity because it is assumed that the emissions will not cause a violation or delay in attainment of the applicable NAAQS.

(d)(4) Would the proposed project conform to the State Implementation Plan (SIP) approved by the state air quality resource agency? Explain, and provide supporting documentation. Yes. Because total direct and indirect emissions from the proposed project are well below *de minimis* standards and are not regionally significant it can be presumed to conform to the applicable SIP.

Table 2. Estimated Air Quality Emissions for Runway 4/22 Modifications

Construction Equipment	Usage (hrs)	Emissions (lbs)				
		CO	NOx	VOC	PM	SOx
Asphalt Pavers	54	21.49	69.18	4.12	6.05	6.25
Plate Compactors		0.00	0.00	0.00	0.00	0.00
Concrete Pavers		0.00	0.00	0.00	0.00	0.00
Rollers		0.00	0.00	0.00	0.00	0.00
Scrapers		0.00	0.00	0.00	0.00	0.00
Paving Equipment		0.00	0.00	0.00	0.00	0.00
Signal Boards		0.00	0.00	0.00	0.00	0.00
Trenchers		0.00	0.00	0.00	0.00	0.00
Bore/Drill Rigs	27	85.84	102.73	13.46	13.44	8.68
Excavators		0.00	0.00	0.00	0.00	0.00
Concrete/Indust. Saw		0.00	0.00	0.00	0.00	0.00
Cement Mixers	27	1.69	4.04	0.38	0.33	0.34
Cranes	27	20.86	51.15	6.42	7.15	4.62
Graders		0.00	0.00	0.00	0.00	0.00
Off-Highway Trucks		0.00	0.00	0.00	0.00	0.00
Crushing/Proc. Equipment		0.00	0.00	0.00	0.00	0.00
Rough Terrain Lifts		0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders		0.00	0.00	0.00	0.00	0.00
Rubber Tired Dozer		0.00	0.00	0.00	0.00	0.00
Tractor/Loader/Backhoe	54	34.28	50.92	7.22	5.29	4.29
Crawler Tractors		0.00	0.00	0.00	0.00	0.00
Skid Steer Loader		0.00	0.00	0.00	0.00	0.00
Off-Highway Tractor		0.00	0.00	0.00	0.00	0.00
Dumpers/Tenders	1080	58.27	199.77	17.96	29.97	18.52
Forklifts		0.00	0.00	0.00	0.00	0.00
Other Construction Equipment	297	601.31	719.61	94.31	94.12	60.78
Paving Emissions	---	---	---	1,854.92	---	---
TOTAL (lbs):		823.73	1,197.40	1,998.80	156.34	103.47
(tons):		0.41	0.60	1.00	0.08	0.05
***de minimis* levels** (tons/yr):		100	100	50	100	100

Source: The above estimates were calculated using the methodology and information provided in the *Non-road Engine and Vehicle Emission Study--Report*, US EPA Doc 21A-2001, 1991.

(6) WATER QUALITY

Describe the potential of the proposed project to impact water quality, including ground water, surface water bodies, any public water supply systems, etc. Provide documentation of consultation with agencies having jurisdiction over such water bodies, as applicable.

The proposed project involves two main construction activities: repaving an existing but unused parking lot and cutting grooves into the existing asphalt for the electrical conduit for parking lot lighting. Because these activities are not expected to disturb the underlying soil, no construction related runoff is expected. Therefore, no adverse effects to the water quality of Fourmile Run, located adjacent to the proposed parking area, and the nearby Potomac River are anticipated.

In the event that unanticipated soil disturbance would be needed for the proposed project, then construction activities will be under the restrictions identified in DCA's Virginia Pollutant Discharge Elimination System (VPDES) stormwater discharge permit, as well as pertinent state guidance such as the *Northern Virginia Best Management Practices (BMPs) Handbook* and the *Virginia Stormwater Management Handbook*. In addition to the management of stormwater runoff, the construction aspects of the project would be required to have an individual erosion and sediment control plan reviewed an approved by the Authority's Building Codes/Environmental Department. As required under Title 10.1, Chapter 6, Article 1.1 of the Code of Virginia and Section 4 VAC50-60-380 of the Virginia Administrative Code, MWAA's contractor will obtain registration coverage under the General Permit for Discharges of Stormwater From Construction Activities. Currently, the proposed project will be below the threshold for which an erosion and sediment control plan would be required.

(7) DEPARTMENT OF TRANSPORTATION SECTION 303/4(f)

Does the proposed project require the use of any publicly owned land from a public park, recreation area, or wildlife or waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance? Yes____ No _X_

Provide justification for your response. Include concurrence of appropriate officials having jurisdiction over such land regarding the use determination. The proposed project is entirely within the DCA property boundary and would not require the use of any publicly owned lands, recreation area, or wildlife or waterfowl refuge. There are identified historic resources at DCA; however, the project will not be located in an area where it could impact historical resources (See 8(a) below).

(8) HISTORIC, ARCHITECTURAL, ARCHEOLOGICAL, AND CULTURAL RESOURCES

(a) Describe any impact the proposed project might have on any properties in or eligible for inclusion in the National Register of Historic Places. Provide justification for your response, and include a record of your consultation with the State Historic Preservation Officer (SHPO), if applicable (attach correspondence with SHPO).

As stated in the *Metropolitan Washington Airports Authority Design Manual*, the Authority is responsible for the protection of the historic and archeological resources contained on MWAA-owned property. Historic resources have been identified at DCA and include the Abingdon Plantation Site; the Main Terminal and South hangar Line; the Abingdon Research Station; and the George Washington Memorial Parkway (see Figure 5). The project and its related activities will not impact historic resources at DCA; no consultation with VA SHPO is required.

(b) Describe whether there is reason to believe that significant scientific, prehistoric, historic, archeological, or paleontological resources would be lost or destroyed as a result of the proposed project. Include a record of consultation with persons or organizations with relevant expertise, including the SHPO, if applicable.

Since the proposed project will occur on developed/paved surfaces and the project area is located on fill material, it will not affect any significant prehistoric, historic, archeological or paleontological resources.

(9) BIOTIC COMMUNITIES

Describe the potential of the proposed project to directly or indirectly impact plant communities and/or the displacement of wildlife. This answer should also reference Section 6, Water Quality, if jurisdictional water bodies are present.

DCA is located in a highly urban environment adjacent to the Potomac River. The project is proposed for an area that has previously been developed and is entirely paved or disturbed. There are no natural plant communities or wildlife habitat at the project site; therefore the project will not have an impact on plant communities or wildlife habitat. Measures to prevent impact to the aquatic habitat of the Potomac River are described in Section 6.

(10) FEDERAL and STATE-LISTED ENDANGERED AND THREATENED SPECIES

Would the proposed project impact any federally- or state-listed or proposed endangered or threatened species of flora and fauna, or impact critical habitat? Yes____ No _X_

Explain, and discuss and attach records of consultation efforts with jurisdictional agencies, if applicable.

No. There are no known federal or state listed endangered or threatened species or designated critical habitat within the project area; therefore the proposed project will not have an impact on any known or suspected threatened or endangered species or designated critical habitat.

(11) WETLANDS

Does the proposed project involve the modification of delineated wetlands (wetlands must be delineated using methods in the US Army Corps of Engineers (ACE) 1987 Wetland Delineation Manual; delineations must be performed by a person certified in wetlands delineation).

Yes____ No _X_ Provide justification for your response.

No. The nearest wetland is the Fourmile Run shoreline, located directly south of the proposed parking area. Fourmile Run is classified as "waters of the US" by the US Army Corps of Engineers. The proposed project will not affect this wetland since construction activities are limited to the existing but unused parking lot.

(12) FLOODPLAINS

(a) Would the proposed project be located in, or would it encroach upon, any 100-year floodplains, as designated by the Federal Emergency Management Agency (FEMA)?

Yes_X_ No_____

(b) Would the proposed project be located in a 500-year floodplain, as designated by FEMA?

Yes_X___ No__

(c) If "yes," is the proposed project considered a "critical action", as defined in the Water Resources Council Floodplain Management Guidelines? (see FR Vol. 43, No. 29, 2/10/78)

Yes____ No_X__

(d) You must attach the corresponding FEMA Flood Insurance Rate Map (FIRM) or other documentation showing the project area. Map attached? Yes__X_ No_____ If "no," why not? The Federal Emergency Management Agency (FEMA) has not mapped floodplains at Ronald Reagan Washington National Airport. However, according to FEMA, the airport is located in Zone D, areas of undetermined, but possible flood hazards (FEMA 1992) and the

100-year base flood elevation for the airport and surrounding water bodies is 11.4 feet above Mean Sea Level (MSL) (FEMA 1985). Figure 5 shows areas below the 100-year floodplain elevation at DCA. These floodplain areas were based on airport elevations from 1997 Air Survey topographic data and the 100-year base flood elevation for the airport of 11.4 feet.

(e) If the proposed project would cause an encroachment of a base floodplain (the base floodplain is the 100-year floodplain for non-critical actions and the 500-year floodplain for critical actions), what measures would be taken to provide an opportunity for early public review, in accordance with Order 5050.4A Par. 47 (g)(6)?
DCA is bounded on three sides by Roaches Run to the north, the Potomac River to the east, and Fourmile Run to the south. The 100-year floodplain elevation for these waterbodies at DCA is 11.4 ft above mean sea level. Approximately 200 acres of DCA are below the 100-year floodplain. Even though the proposed project is located within the 100-year floodplain there will be no change to the flooding potential of DCA as a result of project activities.

MWAA will inform the public of the proposed project by publishing a Public Notice that the Draft EA is available for review and information on the public comment period. See Public Involvement at the end of this form for more details on the public involvement process.

(13) COASTAL ZONE MANAGEMENT PROGRAM

(a) Would the proposed project occur in, or affect, a coastal zone, as defined by a state's Coastal Zone Management Plan (CZMP)? Yes_X__ No __Explain.
DCA is located in Arlington County which is within Virginia's designated Coastal Zone Management Area. Virginia implements the federal Coastal Zone Management Act (CZMA) through its Coastal Resources Management Program (VCP). A Federal Consistency Certification for the project is attached (Attachment B).

(b) If "yes," is the project consistent with the State's CZMP? Explain. If applicable, attach the sponsor's consistency certification and the state's concurrence of that certification. Early coordination is recommended. Yes_X_ No ___
Yes. The project is consistent with the State's CZMP. Nine enforceable regulatory programs comprise the VCP: Tidal and non-tidal Wetlands, Fisheries Management, Subaqueous Lands Management, Dunes Management, Point Source Air Pollution Control, Point Source Water Pollution Control, Non-Point Source Water Pollution Control, Shoreline Sanitation, and Coastal Lands Management. The proposed project was determined to be in compliance with all nine programs therefore, there would be no impacts to the coastal zone. Attachment B contains a copy of the sponsor's consistency certification that will be sent to Virginia's Department of Environmental Quality (VDEQ) for review and concurrence.

(14) COASTAL BARRIERS

Is the location of the proposed project within the Coastal Barrier Resources System, as delineated by the US Fish and Wildlife Service (FWS) or FEMA coastal barrier maps? Explain. Yes___ No_X_
No. DCA is located inland of the Atlantic Coast and because of its location, is not within the Coastal Barrier Resource System.

(15) WILD AND SCENIC RIVERS

Would the proposed project affect any portion of the free-flowing characteristics of a Wild and Scenic River or a Study River, or any adjacent areas that are part of such rivers, listed on the Wild and Scenic Rivers Inventory? Yes__ No X

Consult the (regional) National Parks Service (NPS), U.S. Forest Service (FS), or other appropriate federal authority for information. Early consultation is recommended.

No. Although DCA is located adjacent to the Potomac River, the river is not designated as a Wild and Scenic River.

(16) FARMLAND

(a) Would the proposed project involve the use of federal financial assistance or conversion of federal government land? Yes__ No X Explain.

No. DCA is located in a highly urban environment. The proposed project area has previously been developed. Therefore, no prime or unique farmland would be affected by the proposed project.

(b) If "yes" would it convert farmland protected by the Farmland Protection Policy Act (FPPA) (prime or unique farmland) to non-agricultural uses? Yes_____ No_____

(c) If "yes," determine the extent of project-related farmland impacts by completing (and submitting to the Natural Resources Conservation Service) the "Farmland Conversion Impact Rating Form" (NRCS Form AD 1006). Coordinate with the state or local agricultural authorities. Explain your response, and attach the Form AD 1006, if applicable.

(17) ENERGY SUPPLY AND NATURAL RESOURCES

What effect would the proposed project have on energy or other natural resource consumption? Would demand exceed supply? Yes__ No X Explain. Letters from local public utilities and suppliers regarding their abilities to provide energy and resources needed for large projects may be necessary.

The project is a modification of Runway 4-22 and would not increase consumption of energy or other natural resources. Any materials required for the project would be readily available.

(18) LIGHT EMISSIONS

Would the proposed project have the potential for airport-related lighting impacts on nearby residents? Yes__ No X Explain, and, if necessary, provide a map depicting the location of residences in the airport vicinity in relation to the proposed lighting system.

The project proposed includes the modification of runway lighting; however, the relamping, lens installations and relocation of some lighting will not affect residences in the airport vicinity.

(19) SOLID WASTE

Would the proposed project generate solid waste? Yes_____ No_X_

If "yes," are local disposal facilities capable of handling the additional volumes of waste resulting from the project? Explain.

No. The project is a modification of Runway 4-22 and as such would not generate solid waste that would affect the current solid waste handling program at DCA.

NOTE: A sanitary landfill is incompatible with airport operations if the landfill is located within 10,000 feet of a runway serving turbo-powered aircraft, or 5,000 feet of a runway serving piston-powered aircraft. Refer to FAA Advisory Circular 150/5200.33 " Hazardous Wildlife Attractants on or Near Airports," and FAA Order 5200.5B, "Guidance Concerning Sanitary Landfills on or Near Airports."

(20) CONSTRUCTION IMPACTS

Would construction of the proposed project: 1) increase ambient noise levels due to equipment operation; 2) degrade local air quality due to dust, equipment exhausts and burning debris; 3) deteriorate water quality when erosion and pollutant runoff occur; 4) or disrupt off-site and local traffic patterns? Explain.

1)Noise impacts are expected but would be localized to the vicinity of the project site within the DCA property boundary. Construction equipment and vehicles will create localized increases in noise levels, but these temporary noise impacts will not disrupt normal airport operations.

2) Air quality degradation is not expected. Emissions related to construction activities will be limited to the duration of the proposed project and are below the *de minimis* level (see paragraph 5 – Air Quality). The State Implementation Plan (SIP) includes an allowance for construction emissions region-wide. Dust control is important for airport construction activities since light reflecting off of dust particles at night may jeopardize aircraft safety. Best Management Practices (BMPs) will be used to keep this to a minimum. No burning of debris will occur.

3) If uncontrolled, construction activities have the potential to cause erosion and sedimentation that can impact water quality. Since the proposed project involves two main construction activities that are not expected to disturb the underlying soil, repaving an existing but unused parking lot and cutting grooves into the existing asphalt for the electrical conduit for parking lot lighting, no construction related runoff is expected. In the event that unanticipated soil disturbance would be needed for the proposed project, erosion control measures required by the Authority Design Manual (2006) would be implemented to minimize erosion and sedimentation from the construction area. The Department of Conservation and Recreation (DCR) published the *Virginia Erosion and Sediment Control Handbook* (Third Edition, 1992) to provide guidance for all state erosion and sediment control programs. It covers basic concepts, design measures, installation, maintenance, plan review procedures and administrative guidelines to support compliance with the Virginia Erosion and Sediment Control Law and regulations. In addition, the project would be implemented with the appropriate erosion and sediment control plans consistent with State Erosion and Sediment Control Law. Contractors would be required to provide an erosion and sediment control plan that complies with the Virginia Erosion and Sediment Control Law (Title 10.1, Chapter 5, Article 4 of the Code of Virginia) and regulations, including the *Virginia Erosion and Sediment Control Handbook*. Currently, the proposed project will be below the threshold for which an erosion and sediment control plan would be required.

4) Construction of the proposed project will not result in changes to the level of service of area roads. According to MWAA Design Manual Section 2.14 AIRPORT OPERATIONS DURING CONSTRUCTION, paragraph 2.14.1, the Authority must safely conduct airport operations during the construction phase of the project. The project will be designed to consider passenger check-in, security screening, passenger departures, and passenger arrivals. The design will consider the continued operational needs of Airport Operations, airlines tenants, and concessionaires. Additionally it will ensure the continuity of services, maintenance of vehicular access, maintenance of pedestrian access, and security and safety requirements. During the construction period, construction-related vehicles will be traversing the airport access roads and internal roadways to deliver materials and equipment. Large or bulky construction equipment that is slow moving could temporarily congest roadway traffic. This congestion is likely to be intermittent and infrequent. This increase in roadway use will be managed to avoid impact to normal airport operations. The access roads and internal roadways may experience a slight increase in traffic volume; the increase should be easily accommodated on the existing roadways. The Authority will incorporate the provisions of Advisory Circular (AC) 150/5370-10A, standards for Specifying Construction of Airports, into the project specifications. This AC provides information to reduce airport-related construction impacts.

(21) OTHER CONSIDERATIONS

(a) Is the proposed project likely to be highly controversial on environmental grounds? Explain.

No. The project is a modification of an existing runway to enable the creation of additional parking spaces during the expansion of the existing parking garages. No controversy should result.

(b) Is the proposed project likely to be inconsistent with any federal, state or local law or administrative determination relating to the environment? Explain.

No. The proposed project would be consistent with all federal, state and local laws or administrative determinations related to the environment.

(c) Is the proposed project reasonably consistent with plans, goals, policies, or controls that have been adopted for the area in which the airport is located? Explain.

Yes. The proposed project is consistent with the following:

Arlington County Comprehensive Plan, 2003.

Arlington County Department of Community Planning, Housing, and Development, 2004. *Arlington County Comprehensive Plan.*

Arlington County Department of Environmental Services, 2001. Watershed Management Plan.

Coastal Zone Management Act, Arlington Co., VA (County Program).

District of Columbia. Comprehensive Plan, Revised 2006.

National Capital Planning Commission (NCPC). 2004. *Comprehensive Plan for the National Capital: Federal Element.* 2004.

Federal Aviation Administration (FAA) Metropolitan Washington Airports. Master Plan Ronald Reagan Washington National Airport. April 1990.

Metropolitan Washington Airports Authority (MWAA). 2003. Consolidated Spill Contingency Plan. Ronald Reagan Washington National Airport. March.

Metropolitan Washington Airports Authority (MWAA). 1987. Programmatic Memorandum of Agreement Among the Advisory Council on Historic Preservation, the Virginia State Historic Preservation Officer, and the Federal Aviation Administration Metropolitan Washington Airports.

(22) HAZARDOUS SITES/MATERIALS

Would the proposed project require the use of land that may contain hazardous substances or may be contaminated? Explain your response and describe how such land was evaluated for hazardous substance contamination. Early consultation with appropriate expertise agencies (e.g., US Environmental Protection Agency (EPA), EPA-certified state and local governments) is recommended.

The proposed project area has been previously developed and disturbed and does not involve any Solid Waste Management Units or areas of concern that are the subject of RCRA Corrective Action. A review of the regulatory list search and airport files determined that a portion of the parking area was included in a CERCLIS investigation. A "solvent disposal area" located in the southwestern corner of the parking area is a component of a larger CERCLIS site. A "Focused Site Inspection Report" (Weston 1994) indicated that the results of two soil vapor surveys conducted in the "solvent disposal area" were inconclusive. The report was submitted to EPA with a request that "no further action" be required. Any hazardous material encountered throughout the project activities will be disposed of in accordance with applicable laws and regulations.

In 2007, FAA prepared a sampling and analysis plan for a Supplemental Site Investigation (SSI) of the CERCLIS site. The sampling and analysis plan includes a soil boring to be performed in the southwest corner of the proposed temporary parking lot. The area of the soil boring site will be closed to parking during sampling.

The proposed project will not disturb the soil that is the subject of the SSI. Electrical conduit for parking lot lighting will be laid in grooves cut into the existing asphalt paving, rather than in trenches. Thus no soil beneath the parking lot will be brought to the surface during implementation of the proposed action.

(23) PERMITS

List all required permits for the proposed project. Indicate whether any difficulties are anticipated in obtaining the required permits. This project will not require any specific environmental permits.

NOTE: Even though the airport sponsor has/shall obtain one or more permits from the appropriate federal, state, and/or local agencies for the proposed project, initiation of such project shall NOT be approved until FAA has issued its environmental determination.

(24) ENVIRONMENTAL JUSTICE

Would the proposed project impact minority and/or low-income populations? Consider human health, social, economic, and environmental issues in your evaluation. Explain.

No. The project is a modification of Runway 4-22 to allow for the creation of temporary parking spaces during the expansion of the existing parking garages and is located entirely within the DCA property boundary. No minority and/or low income populations would be affected.

(25) CUMULATIVE IMPACTS

When considered together with other past, present, and reasonably foreseeable future development projects on or off the airport, federal or non-federal, would the proposed project produce a cumulative effect on any of the environmental impact categories above? You should consider projects that are connected, cumulative and similar (common timing and geography). Provide a list of such projects considered. For purposes of this Evaluation Form, generally use 3 years for past projects and 5 years for future foreseeable projects.

No. The proposed project is not expected to produce a cumulative effect on any of the environmental impact categories listed above. No substantive changes in the environment would result from implementation of the proposed project and other development projects in the vicinity of the airport. The following projects are under construction at DCA:

ARFF Station 301 – The project consists of a new Airport Rescue and Fire Fighting (ARFF) Facility Station 301 to replace the existing ARFF facility in the southern area of DCA. The new ARFF station will provide facilities crucial to the support of fire and rescue activities both in areas where aviation operations occur and in those public areas used by air travelers. The station will house ARFF equipment and staff required to respond to aircraft emergencies. In addition, the station will house both structural and Emergency Medical Service (EMS) units that support the landside and terminal areas of the airport. This project was found to qualify for a Categorical Exclusion from preparation of a formal environmental assessment.

Authority Office Building Expansion – The project consists of an expansion of the Authority Office Building (AOB) and an enclosed pedestrian connector bridge between the AOB and Hangar 11. The expansion will provide 5,000 square feet of office space at ground level and a 5,000-square foot second story. This project was found to qualify for a Categorical Exclusion from preparation of a formal environmental assessment.

The following projects are planned in the foreseeable future:

Regional Carrier Concourse - The project includes an airside concourse building and related apron and supporting facilities to serve regional airlines. The concourse facility was designed to accommodate up to 10 regional aircraft parking positions that will be served via passenger loading bridges. The facility is being constructed north of Terminals B and C and east of Hangar 11 and the MWAA offices. Access to the facility is provided via an underground pedestrian tunnel equipped with moving walkways.

In-Line Baggage Screening – Building Modifications – The project includes the installation of an In-Line Baggage Screening System at DCA to expedite passenger check-in and enhance security measures. The project will be constructed as an expansion on the landside of the terminal, and will consist of building modifications of a new landside baggage room.

Additional Levels Garages A and B/C - The proposed project consists of the addition of new parking decks to the existing Garages A and B/C located at DCA. The purpose of the project is to create additional parking at DCA due to the projected parking demands from an increase in passenger traffic at DCA.

Each of these projects, the Regional Carrier Concourse, In-Line Baggage Screening – Building Modifications, and Additional Levels Garages A and B/C was found to qualify for a Categorical Exclusion from preparation of a formal environmental assessment.

Potential Cumulative Impacts from construction:

Construction of the proposed project could cause environmental effects that would add to the expected environmental impacts of other development projects in that area of the airport. Cumulative effects that may occur include increased air emissions from construction vehicles, higher noise levels during construction, and additional vehicular traffic during the construction period. The proposed project would generate air emissions from use of vehicles and equipment at the site during construction. Compared with air emissions from vehicle use in the vicinity, the proposed project would generate a minimal contribution to the current and expected amount of air pollutants from other development. The cumulative impact on air quality would be not be significant and would not result in violation of NAAQS. During construction of the proposed project, noise levels would temporarily increase in the vicinity of the site. Similarly, construction traffic would add to existing traffic volumes on the airport roads. Construction traffic generated by the project would be minor compared with existing traffic levels in the area and to traffic volumes generated by other development. Cumulative noise and traffic impacts from development of the proposed project would not be significant and would amount to only a small portion of the increase in noise and traffic of development.

10. MITIGATION

(a) Describe those mitigation measures to be taken to avoid creation of significant impacts to a particular resource as a result of the proposed project, and include a discussion of any impacts that cannot be mitigated, or that cannot be mitigated below the threshold of significance (TOS) (See 5050.4A).

(b) Provide a description of the resources that are in or adjacent to the project area that must be avoided during construction. **Note:** The mitigation measures should be incorporated into the project's design documents. The proposed parking area is adjacent to Fourmile Run; however, construction activities for the parking area is not expected to disturb the underlying soil. Therefore, no construction related runoff is expected resulting in no effect to Fourmile Run. However, in the event that unanticipated soil disturbance would be needed for the proposed project, erosion control measures required by the Authority Design Manual (2006) will be implemented to minimize erosion and sedimentation from the construction areas to prevent

impacts to water quality. The project will then be implemented with the appropriate erosion and sediment control plans consistent with State Erosion and Sediment Control Law. Contractors will then be required to provide an erosion and sediment control plan that complies with the Virginia Erosion and Sediment Control Law (Title 10.1, Chapter 5, Article 4 of the Code of Virginia) and regulations, including the *Virginia Erosion and Sediment Control Handbook*.

11. PUBLIC INVOLVEMENT

Describe what efforts would be made to involve the public with this proposed project. Discuss the appropriateness of holding public meetings and/or public hearings, making the draft document available for public comment, or the preparation of a public involvement plan, etc.

MWAA will inform the public of the proposed project by publishing a Public Notice that the Draft EA is available for review and information on the public comment period. The Public Notice will appear in the *Washington Post*. The Draft EA will be made available to the public in several public libraries near DCA (to be listed in the Public Notice) and will be posted on MWAA's website. In addition, MWAA will distribute copies of the Draft EA to federal, state, and local government agencies. Comments will be accepted for a 30 day period. Comments received will be presented in Attachment C and will be summarized in the Final Environmental Assessment (EA). The Final EA will be revised in response to comments received.

References

Federal Emergency Management Agency (FEMA), 1985. Flood Insurance Study. District of Columbia, Washington DC. Federal Emergency Management Agency. November 15, 1985.

Federal Emergency Management Agency (FEMA), 1992. Flood Insurance Rate Map, Arlington County, Virginia, Community Panel Number 515520 0010 B Federal Emergency Management Agency. May 1982.

Roy F. Weston, Inc. 1994. Focused Site Inspection, Washington National Airport, South Investigation Site.

12. PREPARER CERTIFICATION

I certify that the information I have provided above is, to the best of my knowledge, correct.

Renee Bartnik — Nov 21, 2007

Signature — Date

Renee Bartnik, Senior Environmental Planner

Name, Title

Parsons Management Consultants/ Metropolitan Washington Airports Authority

Affiliation

13. AIPORT SPONSOR CERTIFICATION

I certify that the information I have provided above is, to the best of my knowledge, correct. I also recognize and agree that except as otherwise approved by the Manager of the FAA Washington Airports District Office, no construction activity, including but not limited to site preparation, demolition, or land disturbance, shall proceed for the above proposed project(s) until FAA issues a final environmental decision for the proposed project(s), and until compliance with all other applicable FAA approval actions (e.g., ALP approval, airspace approval, grant approval) has occurred.

Signature — 11/21/07 Date

Stephan G. Smith, Deputy Vice President for Engineering

Name, Title

Metropolitan Washington Airports Authority

Affiliation

C

Note: This page to be completed by FAA only

14. FAA DECISION:
Having reviewed the above information, certified by the responsible airport official, it is the FAA decision that the proposed project(s) of development warrants environmental processing as indicated below.

☐ The proposed development action has been found to qualify for a Short Environmental Assessment.

☐ The proposed development action exhibits conditions that require the preparation of a detailed Environmental Assessment (EA).

☐ The following additional documentation is necessary for FAA to perform a complete environmental evaluation of the proposed project: _____

*Action Reviewed/Recommended by:

_____ _____
(FAA Environmental Specialist) Date

*Approved: _____ _____
(FAA Approving Official) Date

* The above FAA approval only signifies that the proposed development action(s), as described by the information provided in this Evaluation Form, initially appears to qualify for the indicated environmental processing action. This may be subject to change after more detailed information is made known to the FAA by further analysis, or though additional federal, state, local or public input, etc.

FIGURES

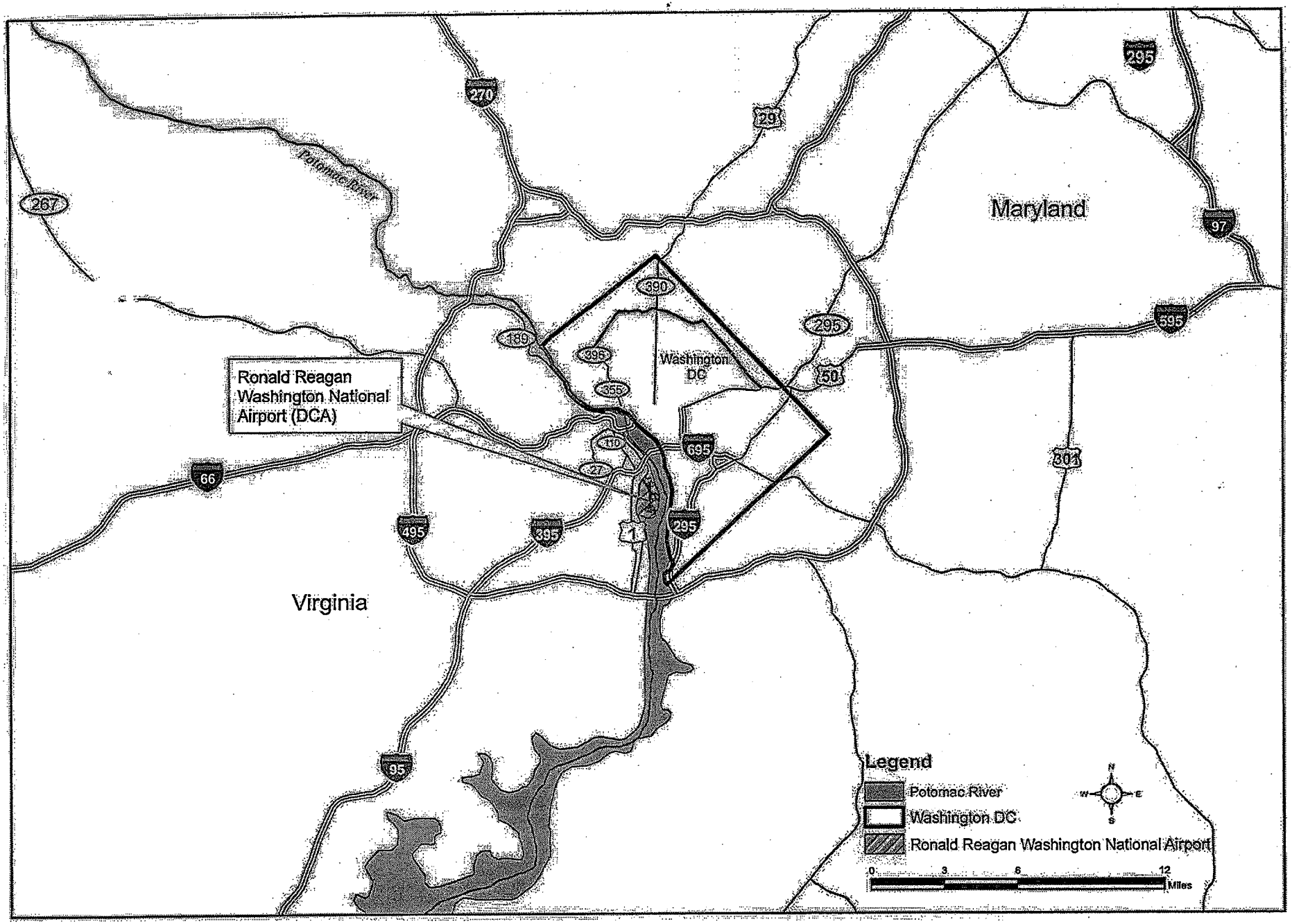
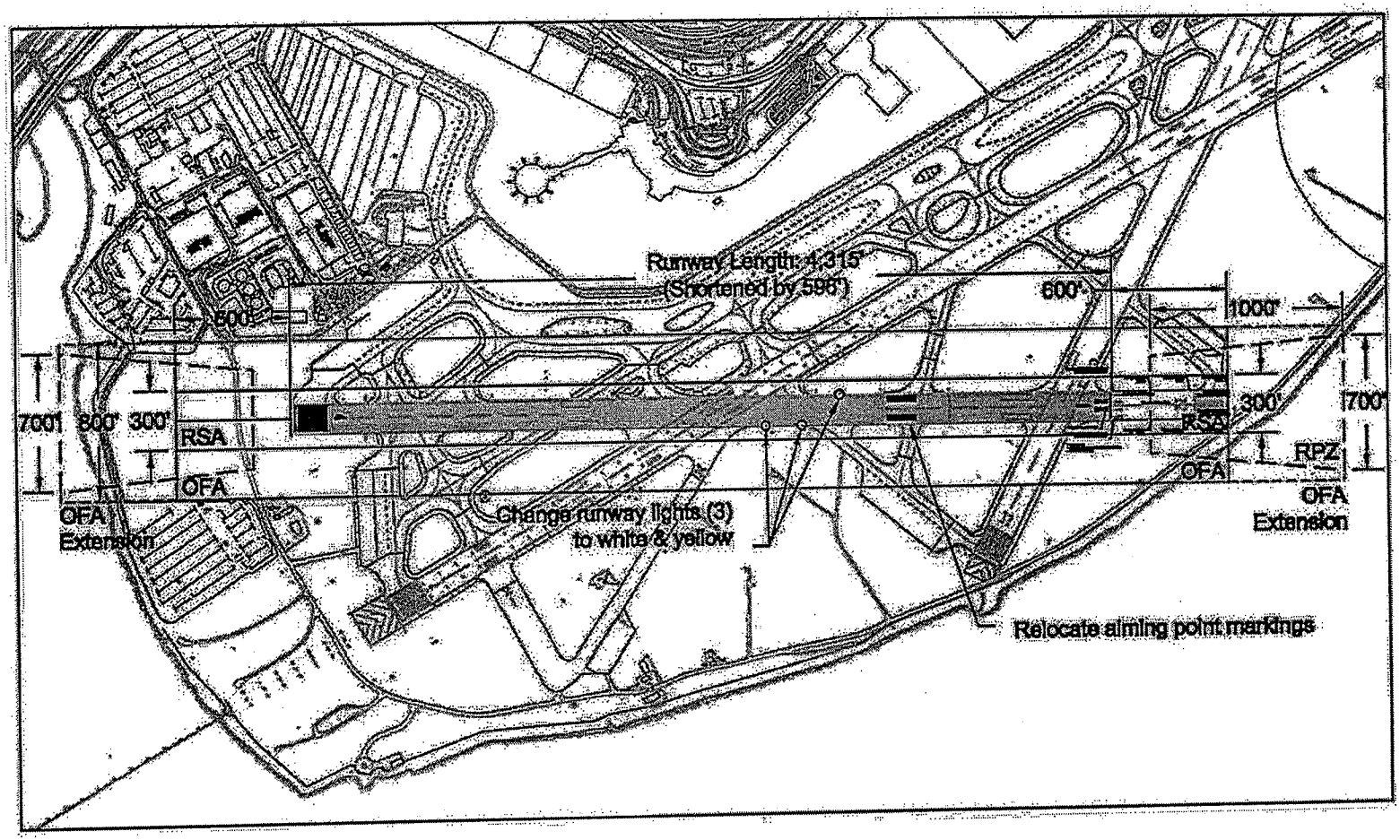


Figure 1. Ronald Reagan Washington National Airport (DCA)

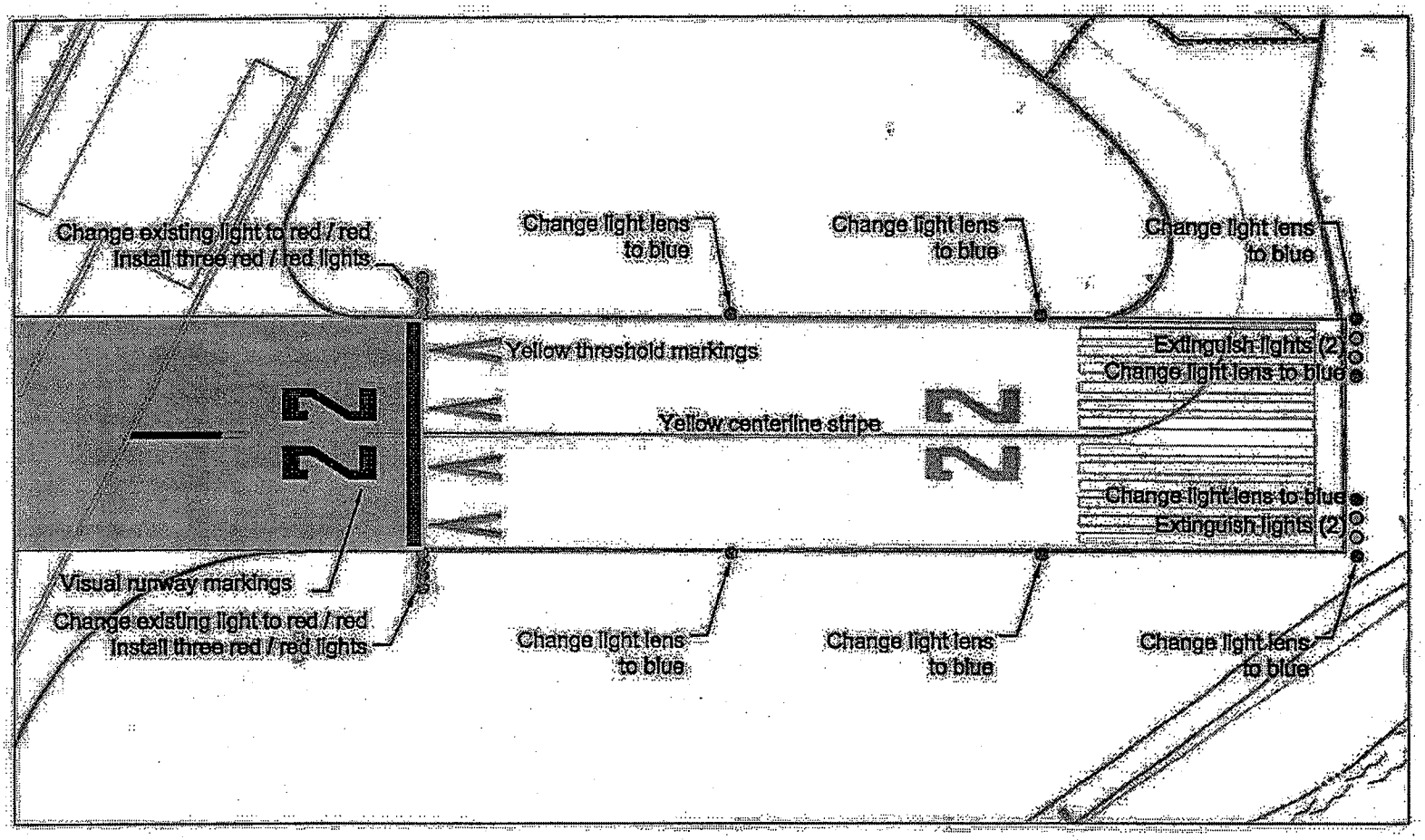


Source: Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc.

0 800 feet

north

Figure 2 Recommended Action Plan
Runway 4-22

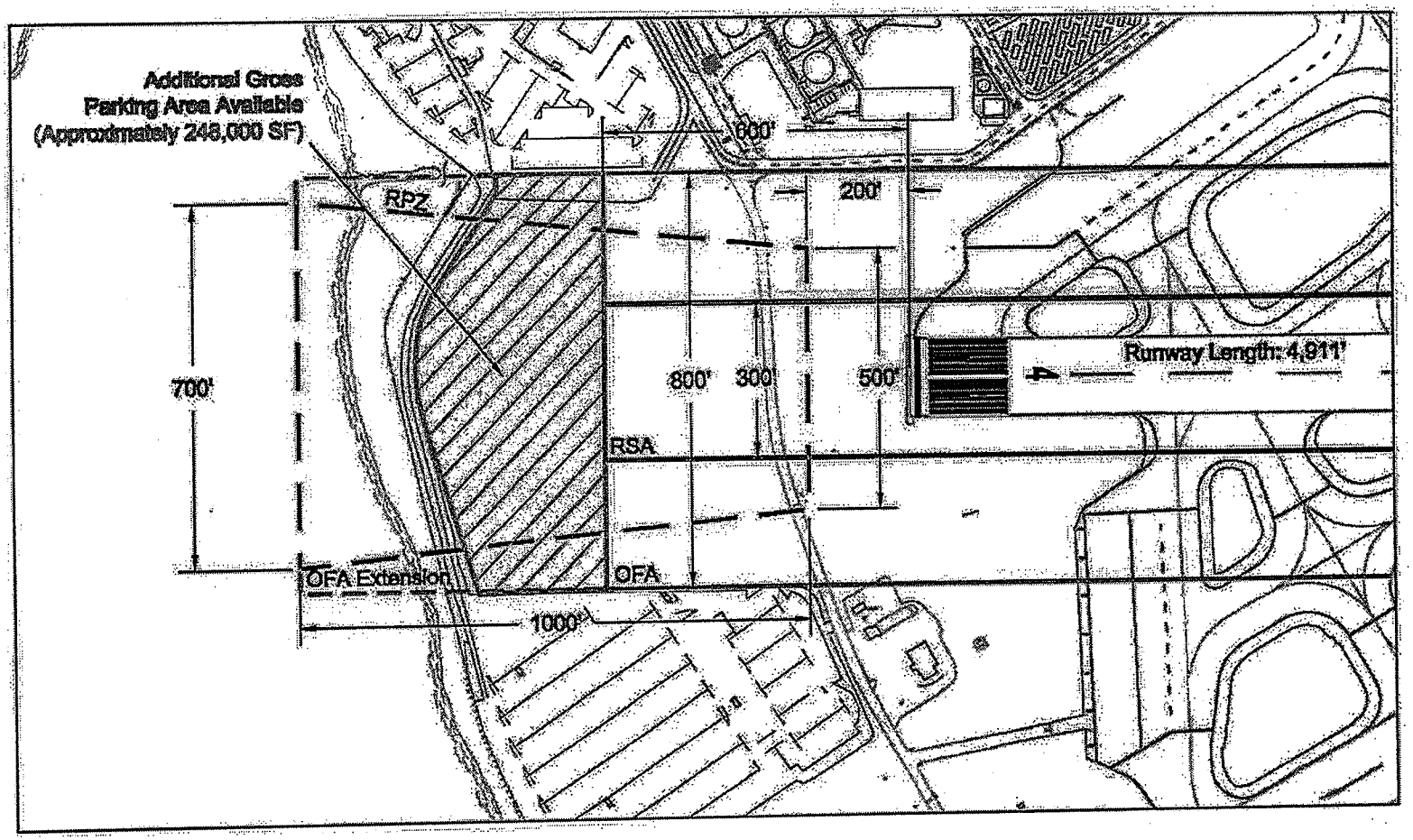


Source: Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc.

0 100 feet

north

Figure 3 Recommended Action Plan
Runway 22 End



Source: Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc.

0 300 feet

north

Figure 4 B-III Runway Protected Areas and Parking Area Runway 4 End

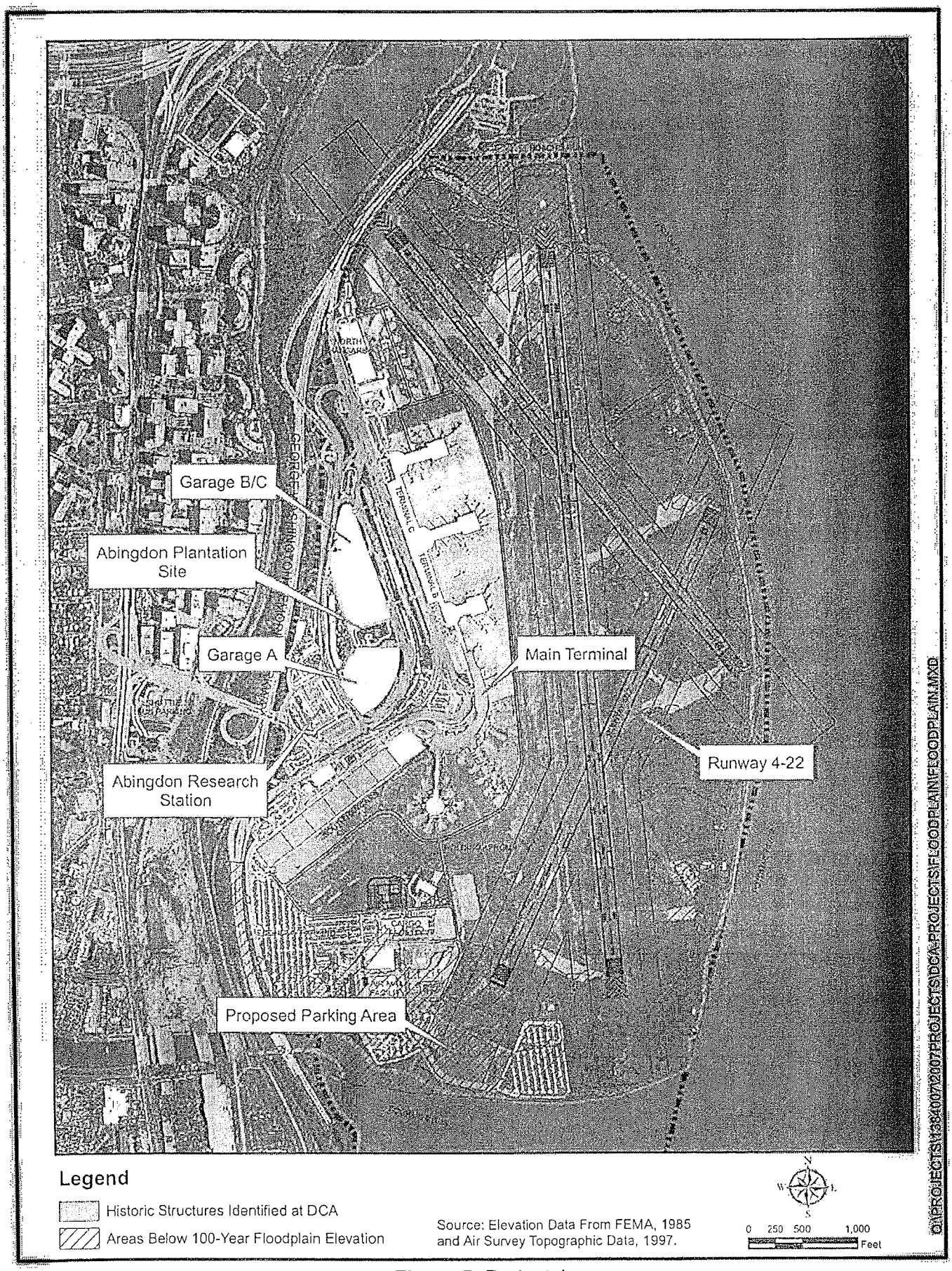
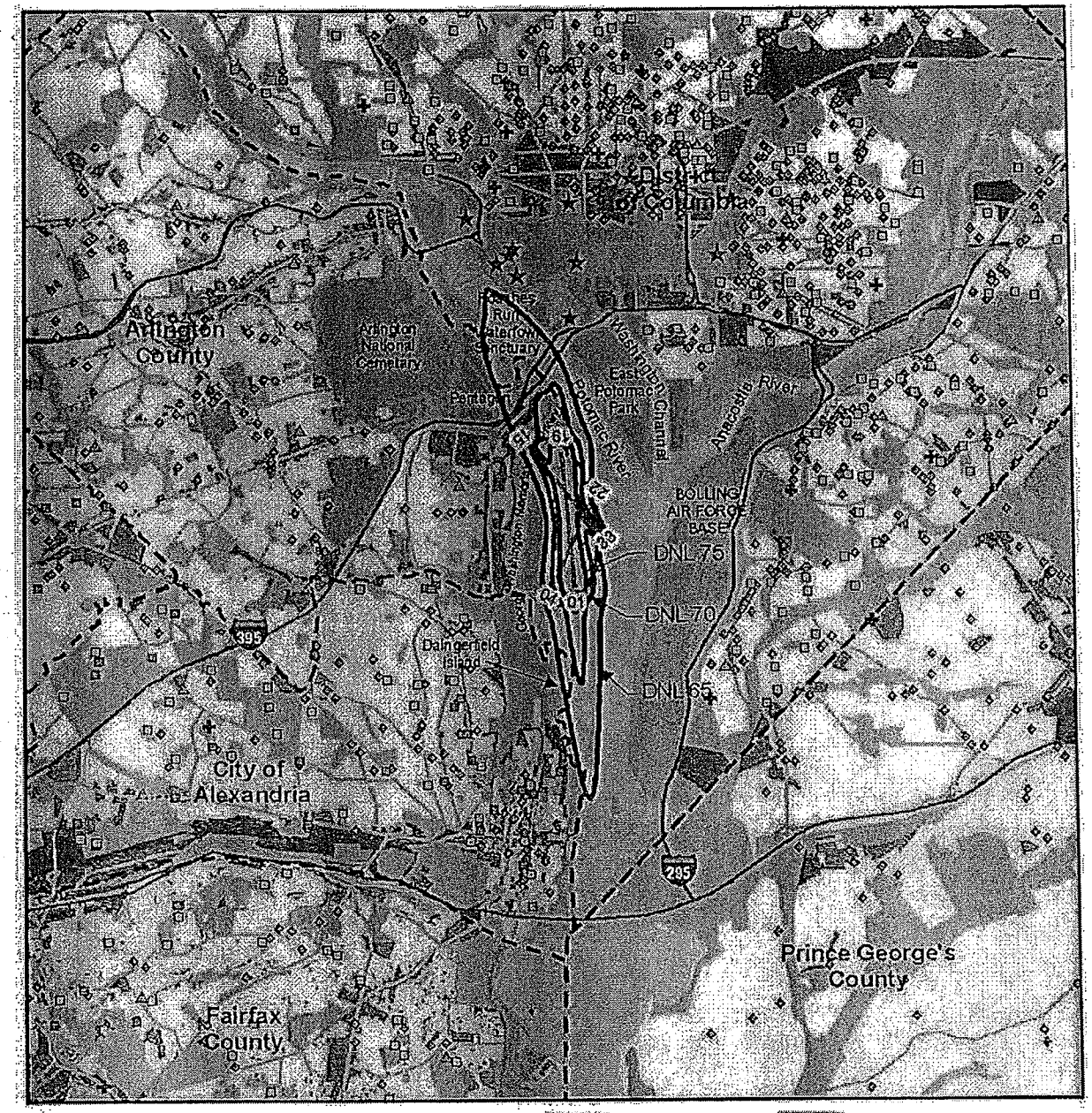


Figure 5. Project Area.



Source: Wyle Laboratories
Prepared by: Ricondo & Associates, Inc.

north

0 8,000 feet

Figure 6. 2004 Noise Exposure Contours
Ronald Reagan Washington National Airport

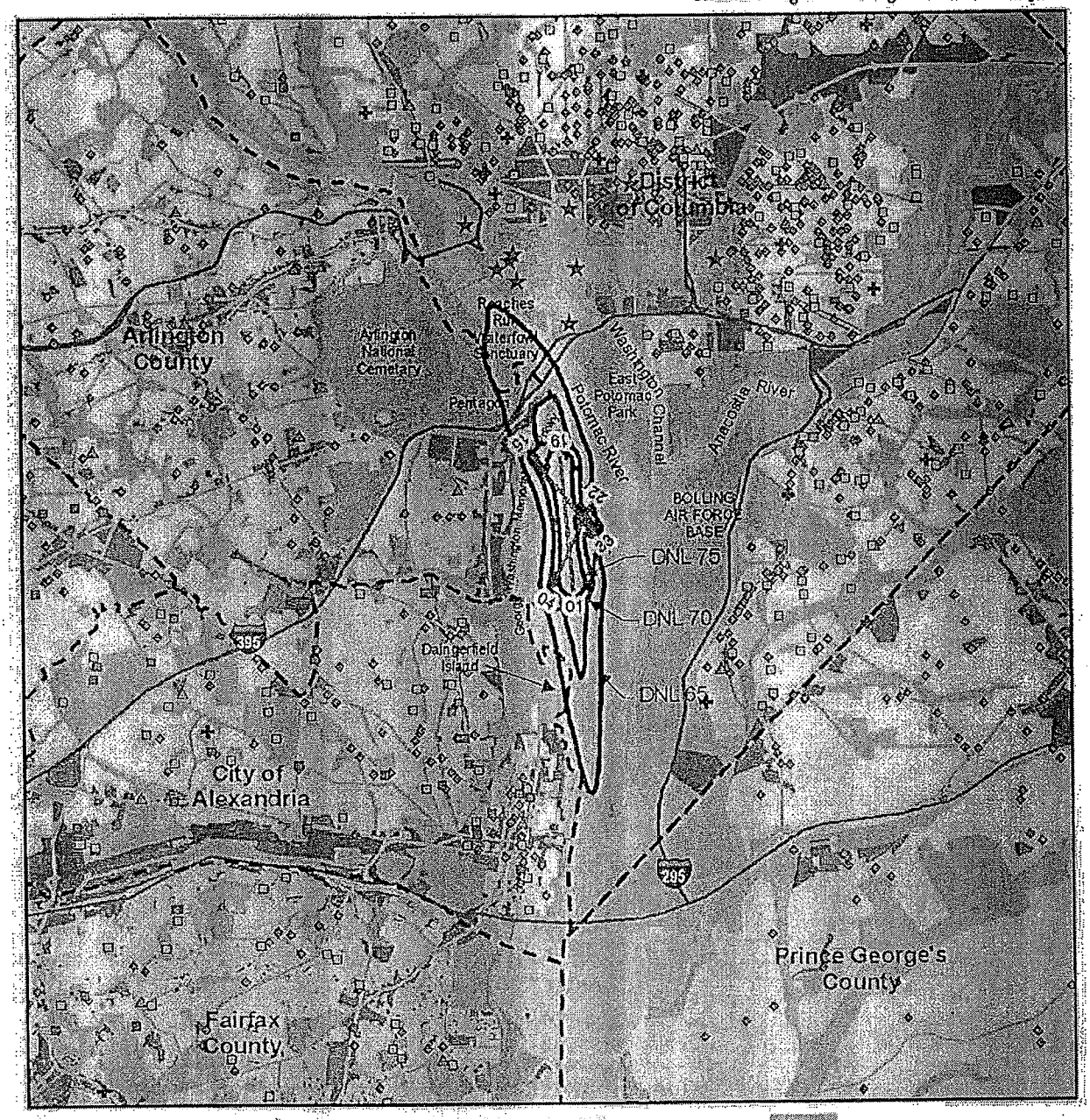
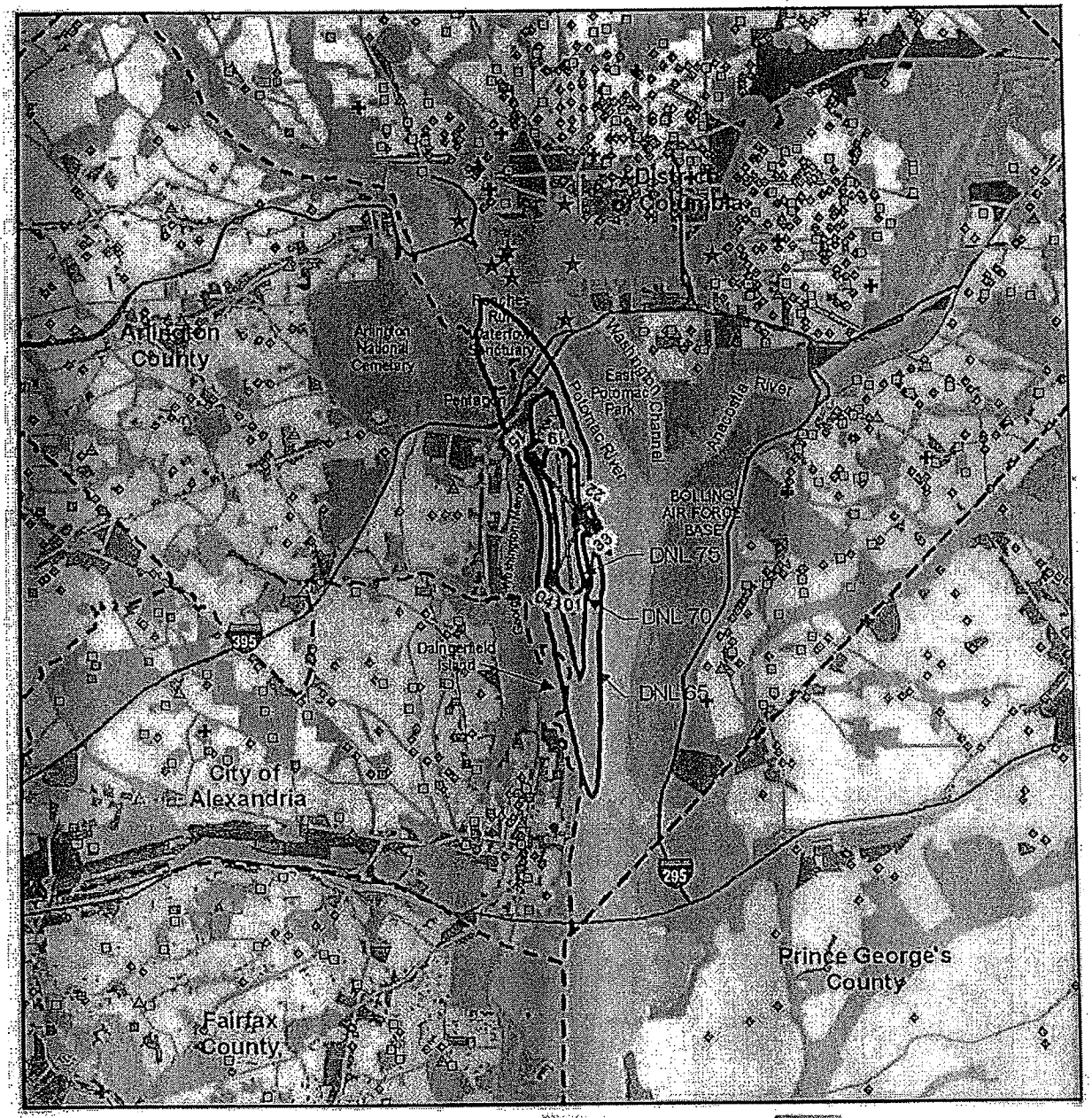


Figure 7. 2008 Noise Exposure Contours - No Action
Ronald Reagan Washington National Airport



Source: Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc.

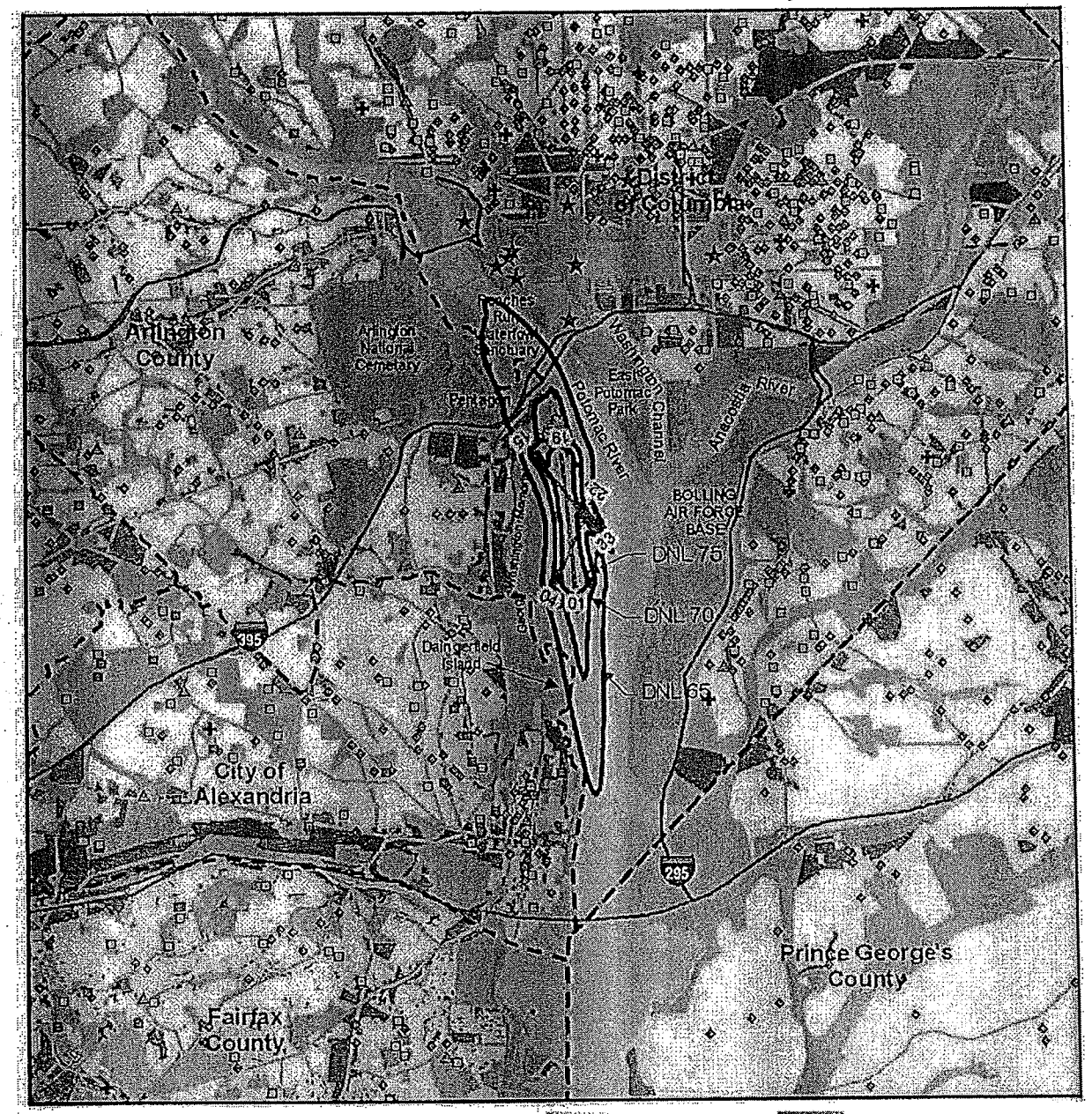
Figure 8. 2013 Noise Exposure Contours - No Action
Ronald Reagan Washington National Airport

Source: Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc.

north

0 8,000 feet

Figure 9. 2008 Noise Exposure Contours - Proposed Action
Ronald Reagan Washington National Airport

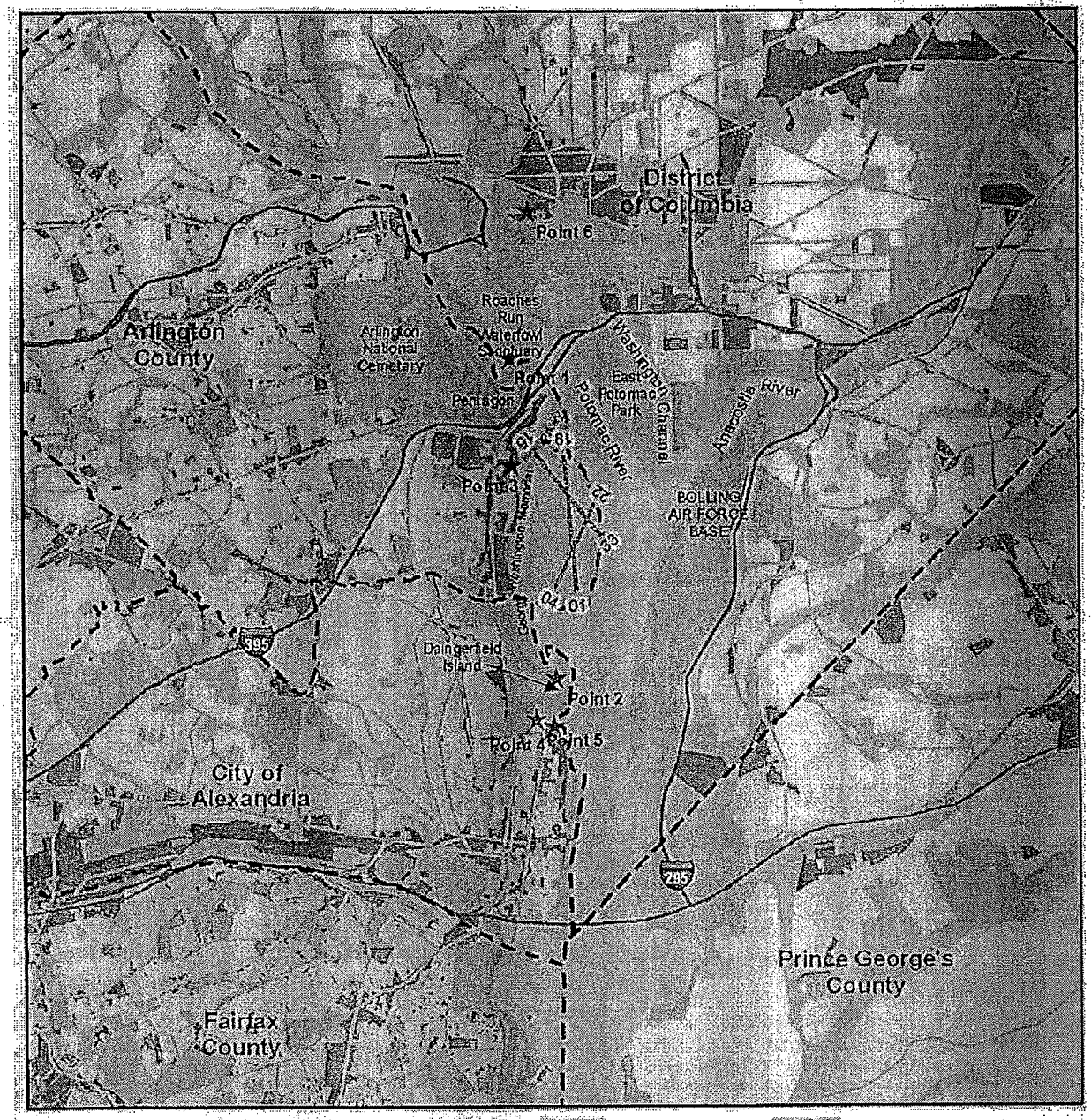


Source: Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc.

north

0 8,000 feet

Figure 10. 2013 Noise Exposure Contours - Proposed Action
Ronald Reagan Washington National Airport



Source: Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc.

north

0 8,000 feet

Figure 11. Noise Grid Analysis
Ronald Reagan Washington National Airport

ATTACHMENT A

COASTAL ZONE MANAGEMENT ACT CONSISTENCY CERTIFICATION

RUNWAY 4-22 MODIFICATIONS PROJECT
COASTAL ZONE MANAGEMENT ACT (CZMA) CONSISTENCY CERTIFICATION

This document provides the Commonwealth of Virginia with the Metropolitan Washington Airports Authority's (the Authority) Consistency Certification and necessary data and information under CZMA Section 307(c)(3)(A) and 15 CFR Part 930, sub-part D, for the Runway 4-22 Modifications Project at Ronald Reagan Washington National Airport (DCA), Arlington County, Virginia.

Certification:

The Authority certifies that the proposed activity complies with the enforceable programs of Virginia's Coastal Resources Management Program (VCP) and will be conducted in a manner consistent with the VCP.

Necessary Data and Information:

1. The proposed action that is the subject of this certification includes modifications to Runway 4-22 and the re-opening of an existing but inactive public parking lot at DCA. The purpose of the proposed action is to offset the loss of 350-400 parking spaces due to the construction of another proposed project at DCA – the addition of new parking decks atop the existing Garages A and B/C. To offset the loss of parking spaces, the Authority will re-open, on a temporary basis, an existing but inactive paved parking lot south of Runway 4-22. Because the inactive parking lot lies within the runway safety area of Runway 4-22, modifications to the runway are also needed. Proposed modifications to the runway include line painting, adjusting fences, and relocating lights (i.e., Runway End Identifier Lights and Visual Approach Slope Indicators). In addition some minor restoration of the existing inactive parking lot pavement would be required to make it suitable for auto parking. This CZMA certification addresses the re-opening of the parking lot and the runway modifications. The project is described in the Runway 4-22 Modifications Draft Form C Environmental Assessment (EA).

2. The project site is located in Arlington County which is located within Virginia's Designated Coastal Zone Management Area.

   The proposed Runway 4-22 Modifications project will incorporate a number of actions that will take place in an area that has been previously disturbed and developed. Specific activities include relocating and relamping runway lighting and the refurbishing/construction of public parking spaces to replace those lost during public parking garage expansion.

3. An evaluation of the probable effects of the proposed actions in relation to the enforceable policies of the Virginia Coastal Resources Management Program is provided below:

a. Tidal and Non-Tidal Wetlands

The purpose of the wetlands management program is to preserve tidal wetlands and non-tidal wetlands, prevent their despoliation, and accommodate economic development in a manner consistent with wetlands preservation.

There are no tidal wetlands or non-tidal wetlands located on the project site.

b. Fisheries Management

The Fisheries Management Program stresses the conservation and enhancement of finfish and shellfish resources and the promotion of commercial and recreational fisheries to maximize food production and recreational opportunities.

There are no commercial or recreational fishery activities at DCA. The proposed action would not impact the fishery resources in the Potomac River.

c. Subaqueous Lands Management

The management program for subaqueous lands established conditions for granting or denying permits to use state-owned bottomlands based on considerations of potential effects on marine and fisheries resources, tidal wetlands, adjacent or nearby properties, anticipated public and private benefits, and water quality standards.

There are no state-owned bottom lands within the project area at DCA.

d. Dunes Management

Dune protection is intended to prevent the destruction or alteration of primary dunes.

There are no primary dunes that are within the project site at DCA.

e. Non-Point Source Pollution Control

The Department of Conservation and Recreation (DCR) administers Virginia's Erosion and Sediment Control Law, which requires soil-disturbing projects to be designed to reduce soil erosion and to decrease inputs of chemical nutrients and sediments to the Chesapeake Bay, its tributaries, and other rivers and waters of the Commonwealth.

The Authority's erosion and sediment control program requires any project that involves excavation, landfilling or disturbance of the ground to include erosion and sediment control measures in accordance with the Virginia Erosion and Sediment Control Law and General Criteria, including the *Virginia Erosion and Sediment Control Handbook.* Individuals who are certified by DCR as Program Administrators, Inspectors and Plan Reviewers administer the Authority's program. In addition, the Authority has in place a Stormwater Pollution

Prevention Plan (SPPP) under its VPDES permit that includes all major tenants as co-permittees.

The proposed project will not require excavation, landfilling or disturbance of the ground. The project has two main construction activities - repaving an existing but unused parking lot and cutting grooves into the existing asphalt for the electrical conduit for parking lot lighting.

Additional non-point source pollution control is achieved through the VCP Coastal Lands Management Program discussed below and in Paragraph (i). The Coastal Lands Management program is a state-local cooperative program administered by the Chesapeake Bay Local Assistance Department and localities in Tidewater Virginia including Arlington County.

All construction and subsequent operational activities at DCA is under restrictions embodied in DCA's Virginia Pollutant Discharge Elimination System (VPDES) stormwater discharge permit, as well as pertinent State guidance such as the *Northern Virginia BMP Handbook* and *Virginia Stormwater Management Handbook.* In addition to the management of stormwater runoff via existing and future temporary facilities, each applicable separate construction project is required to have individual erosion and sediment control plans approved by the Authority's Building Codes/Environmental Department.

The land disturbance from the proposed project will be below the threshold for which an erosion and sediment control plan would be required since the construction activities are not expected to disturb the underlying soil. In the event that unanticipated soil disturbance would be needed for the proposed project, then construction activities will be under the restrictions identified in DCA's VPDES stormwater discharge permit, as well as pertinent state guidance such as the *BMPs Handbook* and the *Virginia Stormwater Management Handbook.* In addition to the management of stormwater runoff, the construction aspects of the project will then be required to have an individual erosion and sediment control plan.

f. Point Source Pollution Control

VDEQ regulates discharges into state waters through the Virginia Pollutant Discharge Elimination System (VPDES) and Virginia Pollution Abatement permits. The latter are accomplished through the implementation of the National Pollutant Discharge Elimination System permit program established pursuant to Section 402 of the federal Clean Water Act.

All discharges at DCA are covered by the airport's VPDES permit. Since the proposed project involves repaving an existing but unused parking lot, there will be no new point source discharge.

g. Shoreline Sanitation

The Virginia Department of Health regulates the installation of septic tanks, sets standards, concerning soil types suitable for septic tanks, and specifies minimum distances that tanks must be placed away from streams, rivers, and other waters of the Commonwealth.

The project does not include the installation of a septic tank.

h. Air Pollution Control

VDEQ implements the federal Clean Air Act and its Amendments to provide a legally enforceable State Implementation Plan (SIP) for the attainment and maintenance of the National Ambient Air Quality Standards (NAAQS).

Total direct and indirect emissions for the proposed project are well below *de minimis* standards and are not large enough to be regionally significant. At these emissions levels, air quality impact modeling is not required under General Conformity because it is assumed that the emissions will not cause a violation or delay in attainment of the applicable NAAQS. Because total direct and indirect emissions from the proposed project are well below *de minimis* standards and are not regionally significant the project can be presumed to conform to the applicable SIP.

i. Coastal Lands Management

The Chesapeake Bay Local Assistance Department regulates activities in Chesapeake Bay Resource Management Areas (RMAs) and Resource Protection Areas (RPAs) within 84 localities in Virginia's coastal zone including Arlington County thorough a state-local cooperative program established pursuant to the Chesapeake Bay Preservation Act. All of Arlington County is designated a Chesapeake Bay Preservation Area and is legislated in Arlington County's Chesapeake Bay Preservation Ordinance, Chapter 61. According to the Arlington County map of RPAs, DCA is within an adopted RPA.

Project activities include the repaving of an existing but unused parking lot and cutting grooves into the existing asphalt for the electrical conduit for parking lot lighting. All project activities occur on previously developed/paved areas. Even though the proposed project is located within an RPA there will be no change to the function of the RPA at DCA as a result of project activities. The Runway 4-22 Modifications project is consistent with The Chesapeake Bay Preservation Act and the Chesapeake Bay Preservation Area Designation and Management regulations, implemented by the "Chesapeake Bay Preservation Ordinance" in the Code of the County of Arlington.

By this certification that the Runway 4-22 Modifications Project at Ronald Reagan Washington National Airport is consistent with the Virginia Coastal Resources Management Program, Virginia is notified that it has 6 months from the receipt of this letter and accompanying information in which to concur with or object to the Metropolitan Washington Airports

Authority's certification. Pursuant to 15 CFR section 930.63 (b), if Virginia has not issued a decision within 3 months following commencement of State agency review, it shall notify the Authority and the Federal Aviation Administration of the status of the matter and the basis for further delay. The State's concurrence, objection, or notification of review status shall be sent to:

Mr. William C. Lebegern
Metropolitan Washington Airports Authority, MA-32
West Building Room 155
Ronald Reagan Washington National Airport
Washington, D.C. 20001

and

Ms. Jennifer Mendelsohn
Federal Aviation Administration
Washington Airports District Office
23723 Air Freight Lane, Suite 210
Dulles Virginia 20166

CERTIFIED BY

Stephan G. Smith
Deputy Vice President for Engineering

12/5/07
Date

ATTACHMENT B

COMMENTS RECEIVED REGARDING THE DRAFT ENVIRONMENTAL ASSESSMENT
(to come)

RADAR ANALYSIS REPORT

Potomac Yard Development Project

Prepared by:
CAVOK – an Oliver Wyman Company
720 Whitley Rd.
Keller, TX 76248

Prepared for:
McCaffery Interests
2690 Clarendon Blvd.
Suite 200
Arlington, VA
Texas 75261-1516

Date:
September 21st, 2009

Executive Summary

BACKGROUND AND SCOPE

This report has been generated for the purpose of determining if the Potomac Yards Development project may be affected by radar considerations, given its close proximity to the Ronald Reagan National Airport (DCA). Unlike airspace requirements, such ensuring clearance from approach paths where definitive regulations exist, there are no FAA published regulations, criteria, limitations or algorithms for determining the acceptability of a given structure or group of structures with respect to potential radar impact. Additionally, the radar issue involves not only the FAA but also the Department of Defense as well as Homeland Security.

Because of this lack of definitive, regulatory guidance the approach taken in this report is to do generate a relative comparison between the area in which the Potomac Yards project will be located with other areas surrounding DCA. The area examined was the hemisphere from due north of the airport going counter clockwise to due south of the airport or as it might be viewed, the Virginia side of the airport area. Please note the report discusses many of the technical issues related to radar affects in more detail including shadowing of areas and creation of phantom targets.

SUMMARY OF FINDINGS

The following summarizes our findings:

- The Potomac Yard project will very likely cause the FAA to raise the issue of potential radar impact. This is due to the projects close proximity to the DCA radar facility and the relative height (angle from radar to top of structure) of many of the structures.
- However, the number of large structure and relative height in the area northwest to west of DCA (Crystal City Area) is more 'dense' with more structures some of which have approximately the same relative angle to the radar as the most severe buildings in the Potomac Yard project.
- Unlike the Crystal City area, the area of radar coverage arc which 'sees' the Potomac Yard project is narrower with most significant structures within a 20 degree arc of radar coverage.
- Because of the orientation and varied height of the proposed structures for the Potomac Yard project, the radar affect will be different from either a monolithic structure, or large structures arranged adjacent to each other on streets aligned in a straight path as is the case in much of the Crystal City area. The 'campus' type design should have a mitigating factor on the overall impact.
- Unlike the Crystal City area, the Potomac Yard area is not positioned between the radar unit and the primary approach paths used by the airport. We believe this to be a significant difference.
- There are several mitigating strategies that can be employed without having a serious impact on the overall project. Frequent methods used involve the use of specific materials, such as special glass on surfaces to reduce radar reflectance as well as slight reorientation of buildings to reduce radar reflectance. Similarly,

reorientation of buildings even a small amount can reduce reflectance as well as reduce the size of the surface presented to the radar. Having control over the design and position of so many structures is a great advantage over a situation where a single building is attempting to be positioned on a single plot not much larger than the building.

- None of these mitigation methods should be considered until receiving an official FAA position regarding the project.
- This issues going forward will be to get a determination from the FAA that the presence of these structures does not generate any anomalies with the DCA radar system such as ghost images or false targets. Secondly, to get a determination that any shadowing effect that might exist because of the complex is minimal and does not create any operational impact.

RECOMMENDATIONS

We recommend the submission of the project to be FAA be done quickly so an initial FAA position can be determined as quickly as possible and dialogue can begin to resolve any perceived issues. Assuming the FAA's finds that radar issues will need to be examined, it is reasonable to expect the Department of Defense and Homeland Security will become involved, though the interfacing with these other entities will be handled by the FAA. However, all of this interagency work as well as the studies within each, will have an impact on the timeline for achieving approval. This is our basis for the recommendation for proceeding with the submission and establishment of this dialogue with the FAA should be as soon as practicable.

Radar Analysis Report for Potomac Yards Development Project

SCOPE

This report has been generated for the purpose of determining if the Potomac Yards Development project may be affected by radar considerations, given its close proximity to the Ronald Reagan National Airport (DCA). This analysis is focused solely on this aspect of the project.

BACKGROUND

Unlike the process for the determination of the interference of a structure with airport operations such as instrument approaches, the process for determining the impact on radar from a structure is not a direct process. For a single structure the effect is determined by factors including: structure size, including height and 'width' as seen by the radar; the reflectivity of the object which is effected by the materials used in construction; and how the structure is 'seen' by the radar based upon the distance from the radar as well as the radar frequency spectrum used. While a single structure is difficult, multiple structures – each with all of it own characteristics – significantly increases the complexity of the process.

Because of this complexity there is a lack of definitive, regulatory guidance. This is further complicated by the fact that the concerned parties from the government include not only the FAA, but also the Department of Defense as well as Homeland Security. An example of the sometimes vague nature of this process is indicated by a link off of the FAA website relating to obstacle determination. This link goes to a Department of Defense tool for 'screening' potential radar impact for various types of radar systems including Long Range, NEXRAD and Military Operations. Any point entered into the Long Range radar study along the Mid Atlantic States region within several hundred miles of the coast will return it as a 'red' flag indicating a study will be required – and height of the structure is not even an input to this analysis. It should be noted that this tool indicates no difficulty with NEXRAD or Military Operations.

APPROACH TAKEN IN THIS STUDY

Within the industry, a very conservative criteria for screening for structure that may require study, is to consider those objects which have an angle between the radar facility and the top of the object of one degree or greater. In this report we will periodically refer to this as the 'relative height'. Additionally, in an area such as the DCA airport, the FAA has a tremendous amount of operational experience at this airport..

In view of this FAA experience we have approached this analysis by comparing the relative 'density' (number of objects within an area) and relative 'height' of the structures located in the hemisphere to the west side of DCA airport. By taking this approach we look to develop an overall strategy to aid in addressing potential FAA concerns regarding the radar issue allowing us to draw comparisons that are directly relevant as well a contrasting the differences as they relate to the Potomac Yard project.

METHODOLOGY AND TOOLS USED IN THIS ANALYSIS

The data and most computations used in this analysis were derived from use of the Federal Airways and Airspace software tool which is a standard within the industry. While this tool provides a powerful database of structures as well as navigation aids (such as radar) it does not have the ability to provide a 'ruling' or 'opinion' on any potential radar impact, for reasons previously described.

The analysis methodology used made use of this software in both its conventional manner for analyzing the potential airports and airways impact of a proposed structure, as well as in a 'reverse method' from that normally used for analysis of existing structures with respect to DCA Radar. A total of 28 geographic points were taken from the Potomac Yards data provided and were used as the study points. The selected points all generated heights of 130' AMSL or higher. The normal analysis was run on these points and this produced the heights, distances and angles from the DCA radar facility.

> NOTE: The material provided for analysis did not include precise coordinates for the corners of all of the structures which we would consider as 'high rise' which in this analysis is an elevation of over 130' AMSL. Consequently, the nearest set of geographic coordinates was used for the cited elevation. Experimenting with the coordinates to slightly reposition them to determine what effect this might have indicated there was no substantial effect to the data that would affect this analysis.

To study the existing structures in the DCA studied area, the radar location and elevation were used in the software as the 'study point' and a report for the current surrounding obstacles was generated. This report provided the location (latitude and longitude), distance from the radar facility and the AMSL height of each of the structures. The 'angle' from the DCA radar facility to the top of the structures was then computed. Structures without significant radar impact such as smoke stacks and antennas were removed from the data output to simplify and more focus the analysis. The resulting data was then placed in tables and divided into sectors of 30 degrees of arc starting from due north and moving in a westerly (counter clockwise) direction until reaching due south. Within each of these sectors, the values were sorted by bearing from the radar facility (heading DEG), distance from the facility (heading RANGE) and the relative height (heading ANGLE). All of the information listed above is provided in tables included in the Appendix to this report on pages 1 through 4 of the Appendix. The Appendix title page provides a legend of the headers used in the data tables.

ILLUSTRATION OF DATA WITH GOOGLE EARTH

In an effort to illustrate the height and distribution of the various structures, the data was formatted and uploaded to Google Earth. Several saved images from this exercise are presented on Appendix pages 5 through 11. Also transmitted with this report is a file entitled DCA EarthPointExcel.kml. When loaded onto a computer which supports Google Earth, double click on this file and it will open Google Earth and load all of the present obstacles as well as the study points.

When viewing the obstacles in Google Earth, the following should be noted:

- Existing structures from the data tables are depicted as BLUE balloon icons, while the study points for the Potomac Yard project are depicted in RED with a small square in the center.
- The 'numbers' which appear as the name of each structure indicates the angle between the structure and the DCA radar facility.
- When zooming into lower altitudes and viewing the structures at an angle, Yellow lines will appear between the balloon icons and the ground. The ground point of the line is the actual coordinate the line length reflects the actual height of the object.

ANALYSIS AND INTERPRETATION OF DATA

- The Potomac Yard project will very likely cause the FAA to raise the issue of potential radar impact due to the following:
  - Of the 28 study points within the Potomac Yard project, all are between 4,500' and 6,800 feet of the radar antenna at DCA.
  - All 28 study points had an angular position of greater than 1 degree between the structures elevation and the radar facility.
  - 17 of these points were 1.5 degrees or greater
  - 8 were 2.0 degrees or greater.
  - Consequently, it is reasonable to believe the FAA will want to do radar analysis of this project.
  - See Appendix Pages 7 and 9 for graphical illustration of Potomac Yard project to radar and associated angles.

- However, the number of large structure and relative height in the area northwest to west of DCA (Crystal City Area) is more 'dense' with many structures some of which have approximately the same relative angle to the radar as the most severe buildings in the Potomac Yard project.
  - Within the sector between 300 and 329 degrees, there are a total of 63 structures
  - 37 with an angle greater than 1.0 degrees
  - 14 with an angle greater than 1.5 degrees
  - 5 points with an angle greater than 2.0 degrees
  - See Appendix Pages 6, 7, 8 and 10 for graphical illustration of this area and associated radar angles.

- Unlike the Crystal City area, the area of radar coverage which 'sees' the Potomac Yard project is much narrower with most significant structures within a 20 degree arc.
  - All study points fall within a 22 degree arc.
  - All points with an angle greater than 2.0 degrees are within a 16 degree arc.
  - All points with an angle greater than 1.5 degrees are within an 18 degree arc.
  - See Appendix Pages 6 and 7.

- Because of the orientation and varied height of the proposed structures for the Potomac Yard project, the radar affect is will be different from either a monolithic structure, or large structures arranged adjacent to each other on streets aligned in a straight path as is the case in much of the Crystal City area. The 'campus' type design should have a mitigating factor on the overall impact.

  - Many, though not all, of the largest structures are oriented in a manner that reduces their profile to the radar signal.

  - While many of the structures will be shadowed from the radar effect by closer and larger building, for study purposes we have assumed the ratio of such structures is equivalent to that experienced in the comparison areas. However, there is no question the campus style format, along with the lack of other existing structures of size in this area, should provide a mitigating effect.

- Unlike the Crystal City area, the Potomac Yard area is not positioned between the radar unit and the primary approach paths used by the airport. We believe this to be a significant difference. The following is a review of the DCA Arrival Routes as well as relevant instrument and visual approaches for DCA. All of the Arrival Routes and Instrument Approach procedures cited here are contained in the Appendix to this report.

  - BILLIT ONE ARRIVAL – Appendix Page 12
    - Routes traffic from the east of the airport to the airport. Traffic never travels through the Potomac Yard area.
  - CLIPER ONE ARRIVAL – Appendix Page 13
    - Routes traffic from the northeast of the airport to the airport. Traffic that will be landing on Runway 1 (to the north) will be vectored south to intercept the final approach course from the southeast and consequently not near the Potomac Yard area.
  - ELDEE FOUR ARRIVAL – Appendix Page 14
    - This arrival route would direct traffic near the Potomac Yard area, however when passing this area that would be farther west of the project an at an altitude of between 4,000' and 5,000'. The project should have no affect on radar for these operations.
  - IRONS FOUR ARRIVAL – Appendix Page 15
    - This arrival procedure is designed to position aircraft arriving in the DC area, however the procedure ends at a point 20 miles south of DCA and consequently is not a factor.
  - MOUNT VERNON VISUAL RUNWAY 1 (Visual Approach) - Appendix Page 16
    - This approach does involve an arrival from the south with the aircraft normally positioned on the approach at a point in the center of the river at a point approximately 10 nautical miles (approximately 11.5 statute miles) south of the airport. While no required or recommended altitude is provided for this point, the suggested altitude at a point approximately 6 statute miles south of the airport is 1,600'. From the point at which the aircraft is

established on this approach anywhere along its path, it is outside the radar signal that would pass through the Potomac Yard area.

- OKAAY ONE ARRIVAL – Appendix Page 17
  - This arrival is used for aircraft arriving from the south. If runway 1 is in use, the aircraft will be vectored east at IRONS intersection – over 20 miles south of DCA – and when runway 19 is in use, the aircraft will be turning north at a point that is southwest of the Potomac Yard project.
  - The arrival indicates aircraft should expect to cross the OJAAY intersection at 10,000' when landing on Runway 1. It is realistic to expect that aircraft landing on runway 19, which will have to travel much farther prior to be established on the approach, will be at a similar altitude when approach SAMMO intersection which is the nearest point to this project. Consequently, radar interference should not be a factor.
- RIVER VISUAL RWY 19 – Appendix Page 18
  - This visual approach, which one of the most frequently used arrivals at DCA, brings aircraft in from the northwest quadrant of the airport to establish them on the route where they follow the Potomac river to the airport. This path is outside any area related to the Potomac Yard project.
- WZRRD TWO ARRIVAL – Appendix Page 19
  - This arrival route ends well west of the DCA area and is not a factor.
- SKILS ONE ARRIVAL – Appendix Page 20
  - This route takes traffic east of the airport and therefore is not a factor.
- VOR RWY 1 – Appendix Page 21
  - This instrument approach has the aircraft pass between Potomac Yard and the radar facility but does not place the project between the landing aircraft and radar facility.
  - This approach plate illustrates the large number of high obstacles located to the northwest of the airport as compared with those located to the south in the area of the project. The 223' obstacle noted south of the airport is a power plant and the 462' obstacle is the Masonic Temple. Both of these items are labeled on the Mount Vernon Visual Runway 1 approach plate.
- RNAV (RNP) RWY 1 – Appendix Page 22
  - This approach has the aircraft established on its final approach course at a point almost 12 statue miles south of the airport and in a position where it is on the eastern side of the Potomac river at an altitude of 2,500'. The aircraft remain east of the project at all times.
- ILS RWY 1 (CAT I and CAT II Approaches – only CAT 1 in Appendix) – Appendix Page 23
  - This approach has the aircraft established on its final approach course at a point 5 miles south of the airport and on the east side of the river. The aircraft remain east of the project at all times.
- COPTER ILS OR LOC RWY 1 – Appendix Page 24
  - This approach is functionally the same as the ILS RWY 1 approach with respect to the project consideration.

GOING FORWARD

The issues going forward will be a) to get a determination from the FAA that the presence of these structures does not generate any anomalies with the DCA radar system such as ghost images or false targets and b) to obtain a determination that any shadowing that might exist due to this project, is minimal and does not create any operational impact.

When working with the FAA on the first issue, there are several mitigation strategies that can be used should there be a concern regarding disturbance to normal radar operation. Properly thought out and negotiated, these can be accomplished with little serious impact to the project, however mitigating that impact requires discussions with the FAA begin before the project progresses to a point where small changes become very expensive.

The most frequent methods of mitigation for these issues related anomalies generated by radar reflectance involve the use of materials to minimize radar reflect that might present a problem as well as potentially reorienting buildings to reduce not only the the building impact, but also the cumulative effect. Having control over a complex this large presents tremendous opportunities to mitigate these conditions. With virtually no existing structure in the existing area, the ability to adjust yet remain innovative with the initial design intent is far easier then working to position a single building in a previously built-up area. Issues with respect to shadowing can also be addressed with slight reorientation, however we believe the arrival procedures which exist today should in themselves aid in demonstrating any effect here will not have an operational impact.

However, none of these mitigation methods or strategies should be considered until The FAA has issued an official FAA position regarding the project. Therefore, the sooner this project is filed, the soon the FAA's studies (and those of DoD and Homeland Security as necessary) can begin.

APPENDIX

Legend for Obstacle Tables In Appendix Pages 1 - 4

STATUS – "O" indicates it is an object which the FAA has confirmed and studied, a "U" indicates it is unconfirmed (potentially grandfathered). "P" indicates proposed and is used in the final table to indicate all study points used in this analysis.

TYPE OBSTACLE – Normally obvious as a building, or building with tower or bridge. Those items which were classified as 'stacks' or as only a tower were removed from the data tables to make the study more relevant.

CITY – City in which obstacle is located.

ST – State in which the city is located

LATITUDE and LONGITUDE – In degrees, minutes and seconds. All latitudes are North and all longitudes are west.

RANGE – Distance in feet from the DCA radar facility to the base of the obstacle.

DEG – Bearing from the DCA radar facility (based upon true north) to the cited obstacle.

QUANTITY – Indicates the quantity of obstacles of that type at the cited location.

AMSL – The elevation Above Mean Sea Level to the highest point of the cited obstacle in feet.

ANGLE – The angle formed from the base of the radar facility from a horizontal plane and a line projected up to the highest point of the obstacle.

Columns to the left are used to arrange the various obstacles by their distance (in feet) from the radar facility to the obstacle. The intent is to provide a visual indication of the distribution of these obstacles and their height.

The tables are created to reflect 'sectors' of 30 degrees beginning with due north and rotating in a counter clockwise fashion. The exception to this is the last table which contains all of the proposed project study points.

Points with Angle > than (degrees) – This includes adjustments for multiple structures and consequently may total more than a straight count of the line entries unless the QUAN field is also evaluate simultaneously.

Notes Regarding Google Earth Imagines

- Blue 'Tear Drop' icons are existing obstacles and Red icons indicated the proposed project icons.
- Number associate with object indicate angle to the DCA Radar Facility.

Obstacles Plotted from DCA Radar

V 2.2 STATUS	TYPE OBSTACLE	CITY	ST	LATITUDE	LONGITUDE	All Distances in Feet RANGE	DEG	QUAN	AMSL	Degrees ANGLE	Up To 5000	5001 to 7500	7501 to 10000	10000 to 12500	12500 to 15000	15001 to 17500	17501 to 20000	20000 to 25000	> 25000'
O	BLDG-TWR	WASHINGTON	DC	38-54-08.00	077-02-06.00	20776	359	1	236	0.62								236	
O	BLDG-TWR	WASHINGTON	DC	38-54-17.00	077-02-21.00	21748	355	1	250	0.63								250	
O	BLDG	WASHINGTON	DC	38-53-56.00	077-02-33.00	19737	352	1	280	0.78							280		
O	BRIDGE	WASHINGTON	DC	38-52-27.00	077-02-20.00	10679	351	4	63	0.28				63					
U	BLDG	WASHINGTON	DC	38-54-18.00	077-02-47.00	22107	350	1	182	0.45								182	
O	BLDG	WASHINGTON	DC	38-56-16.53	077-03-29.30	34516	348	1	323	0.52									323
O	BLDG	WASHINGTON	DC	38-53-45.00	077-03-20.00	19519	341	1	147	0.40							147		
O	BLDG	WASHINGTON	DC	38-55-51.00	077-04-15.00	32987	341	1	678	1.16									678
O	BLDG	ALEXANDRIA	VA	38-53-48.30	077-04-08.50	21381	331	1	264	0.68								264	
O	BLDG	ROSSLYN	VA	38-53-51.40	077-04-12.92	21825	331	1	361	0.92								361	
O	BLDG-TWR	ARLINGTON	VA	38-53-38.00	077-04-08.00	20453	330	2	395	1.08								395	
O	BLDG	ROSSLYN	VA	38-53-42.00	077-04-12.00	20961	330	1	275	0.72								275	
O	BLDG	ROSSLYN	VA	38-53-43.00	077-04-11.00	21010	330	1	320	0.85								320	
O	BLDG	ROSSYLN	VA	38-53-52.80	077-04-19.82	22217	330	1	374	0.94								374	
U	BLDG	ARLINGTON	VA	38-53-59.00	077-04-22.00	22847	330	1	210	0.50								210	
														63			214	287	501
Sector 360 to 330 degrees				Number of Multiple Structure		2		Average AMSL											
				Total Additional Multiple Structures		4		Number of Structures			0	0	0	1	0	0	2	10	2
				Total Structures Including Multiples		19													

Points with Angle > than (degrees)	1	3
	1.5	0
	2	0

O	BLDG	ARLINGTON	VA	38-53-43.00	077-04-19.00	21331	329	1	360	0.94								360	
O	BLDG	ROSSLYN	VA	38-53-49.26	077-04-21.99	21995	329	1	422	1.07								422	
O	BLDG	ROSLYN	VA	38-53-39.00	077-04-21.00	21070	328	1	324	0.85								324	
O	BLDG	ARLINGTON	VA	38-53-37.00	077-04-22.00	20941	327	1	358	0.95								358	
O	BLDG	WASHINGTON	DC	38-56-10.00	077-06-31.00	39476	327	1	325	0.46									325
U	BLDG	WASHINGTON	VA	38-52-10.86	077-03-15.72	10780	326	1	142	0.70				142					
O	BLDG	ROSSLYN	VA	38-53-33.00	077-04-27.00	20821	326	1	336	0.90								336	
O	BLDG	ARLINGTON	VA	38-53-44.00	077-04-34.00	22053	326	1	323	0.81								323	
O	BLDG	ROSSLYN	VA	38-53-38.28	077-04-33.72	21562	325	1	407	1.05								407	
O	BLDG	ARLINGTON	VA	38-51-45.00	077-03-00.00	7929	323	4	254	1.76			254						
O	BLDG	ARLINGTON	VA	38-51-36.00	077-02-53.00	6870	322	2	188	1.48		188							
O	BLDG-TWR	ALEXANDRIA	VA	38-51-50.35	077-03-10.06	8848	321	1	220	1.36			220						
O	BLDG	ARLINGTON	VA	38-51-40.00	077-03-05.81	7835	318	1	224	1.56			224						
O	BLDG	ARLINGTON	VA	38-51-43.00	077-03-09.00	8229	318	1	269	1.80			269						
O	BLDG	ARLINGTON	VA	38-51-46.00	077-03-12.00	8614	318	1	235	1.50			235						
O	BLDG	ARLINGTON	VA	38-53-24.00	077-05-04.00	21908	318	1	380	0.97								380	
O	BLDG	ARLINGTON	VA	38-53-20.00	077-05-09.00	21878	317	1	407	1.04								407	
O	BLDG	ARLINGTON	VA	38-51-40.00	077-03-09.00	8007	316	1	168	1.13			168						
O	BLDG	ARLINGTON	VA	38-53-17.00	077-05-12.00	21824	316	1	390	1.00								390	
O	BLDG	ARLINGTON	VA	38-51-26.00	077-02-55.00	6220	315	2	174	1.51		174							
O	BLDG	ARLINGTON	VA	38-51-30.00	077-03-01.00	6842	314	5	227	1.82		227							
O	BLDG	ARLINGTON	VA	38-51-37.00	077-03-11.00	7903	314	1	214	1.48			214						
O	BLDG	ARLINGTON	VA	38-51-48.00	077-03-30.00	9760	313	2	204	1.14			204						
U	BLDG	PENTAGON CIT	VA	38-51-40.18	077-03-20.84	8692	312	1	247	1.56			247						
U	BLDG	ARLINGTON	VA	38-53-05.00	077-05-18.00	21320	312	1	328	0.85								328	
O	BLDG	ALEXANDRIA	VA	38-51-19.52	077-02-53.10	5663	311	1	226	2.18		226							

Obstacles Plotted from DCA Radar

V 2.2 STATUS	TYPE OBSTACLE	CITY	ST	LATITUDE	LONGITUDE	All Distances in Feet RANGE	DEG	QUAN	AMSL	Degrees ANGLE	Up To 5000	5001 to 7500	7501 to 10000	10000 to 12500	12500 to 15000	15001 to 17500	17501 to 20000	20000 to 25000	> 25000'
O	BLDG	ARLINGTON	VA	38-51-26.00	077-03-02.00	6625	311	5	199	1.63		199							
O	BLDG	ARLINGTON	VA	38-51-31.00	077-03-10.00	7434	311	1	279	2.07		279							
U	BLDG	PENTAGON CIT	VA	38-51-37.00	077-03-20.00	8430	311	1	233	1.52			233						
U	BLDG	ARLINGTON	VA	38-51-21.66	077-02-59.02	6160	310	1	260	2.32		260							
O	BLDG	ARLINGTON	VA	38-51-47.00	077-03-36.00	10049	310	1	253	1.39				253					
O	BLDG	ARLINGTON	VA	38-53-11.00	077-05-43.00	23206	310	1	484	1.17								484	
O	BLDG	ARLINGTON	VA	38-51-44.00	077-03-37.00	9917	309	1	252	1.40			252						
O	BLDG	ARLINGTON	VA	38-51-16.00	077-02-54.00	5492	308	1	225	2.24		225							
O	BLDG	ARLINGTON	VA	38-51-24.00	077-03-10.00	6989	307	1	223	1.75		223							
U	BLDG	ALEXANDRIA	VA	38-51-40.00	077-03-38.10	9739	307	1	258	1.46			258						
O	BLDG	ARLINGTON	VA	38-51-41.22	077-03-43.85	10179	306	1	216	1.16				216					
O	BLDG	ARLINGTON	VA	38-52-00.68	077-04-22.87	13836	305	1	345	1.39					345				
U	BLDG	ARLINGTON	VA	38-52-58.00	077-06-13.00	24299	304	1	459	1.06								459	
O	BLDG	ARLINGTON	VA	38-51-11.00	077-02-55.00	5263	303	3	224	2.33		224							
O	BLDG-TWR	ARLINGTON	VA	38-52-55.00	077-06-19.00	24526	303	1	550	1.26								550	
O	BLDG	ARLINGTON	VA	38-52-49.00	077-06-29.00	24876	301	1	489	1.10								489	
U	BLDG-TWR	ARLINGTON	VA	38-52-51.60	077-06-32.90	25275	301	1	515	1.14									515
O	BLDG	ARLINGTON	VA	38-52-50.65	077-06-43.58	25955	300	1	577	1.25									577
O	BLDG	ARLINGTON	VA	38-52-52.00	077-06-46.00	26189	300	2	490	1.05									490
O	BLDG	ARLINGTON	VA	38-53-00.00	077-07-06.00	27963	300	1	508	1.02									508
Sector 300 to 329 degrees		Number of Multiple Structure				8		Average AMSL				223	232	204	345			401	483
		Total Additional Multiple Structures				17		Number of Structures			0	10	12	3	1	0	0	15	5
		Total Structures Including Multiples				63													

Points with Angle > than (degrees)		
	1	54
	1.5	29
	2	7

O	BLDG	ARLINGTON	VA	38-52-43.36	077-06-37.45	25170	299	1	351	0.78									351
O	BLDG	ARLINGTON	VA	38-52-42.00	077-06-42.00	25420	298	1	507	1.12									507
O	BLDG	ARLINGTON	VA	38-52-19.00	077-06-14.00	22389	296	1	412	1.03								412	
O	BLDG	ARLINGTON	VA	38-50-58.48	077-03-11.78	5962	286	1	214	1.96		214							
O	BLDG	ARLINGTON	VA	38-50-56.00	077-03-06.00	5456	284	1	246	2.48		246							
O	BLDG	ARLINGTON	VA	38-50-52.47	077-03-03.28	5168	281	1	210	2.22		210							
O	BLDG	FALLS CHURCH	VA	38-50-41.00	077-06-57.00	23565	270	1	590	1.41								590	
O	BLDG	ALEXANDRIA	VA	38-50-44.00	077-07-06.00	24277	270	2	571	1.32								571	
Sector 270 to 299 degrees		Number of Multiple Structure				1		Average AMSL				223						524	429
		Total Additional Multiple Structures				1		Number of Structures			0	3	0	0	0	0	0	3	2
		Total Structures Including Multiples				9													

Points with Angle > than (degrees)		
	1	8
	1.5	21
	2	2

Obstacles Plotted from DCA Radar

V 2.2 STATUS	TYPE OBSTACLE	CITY	ST	LATITUDE	LONGITUDE	All Distances in Feet RANGE	DEG	QUAN	AMSL	Degrees ANGLE	Up To 5000	5001 to 7500	7501 to 10000	10000 to 12500	12500 to 15000	15001 to 17500	17501 to 20000	20000 to 25000	> 25000'
U	BLDG	ARLINGTON	VA	38-50-35.00	077-03-01.39	4984	261	1	165	1.78	165								
O	BLDG	ALEXANDRIA	VA	38-49-58.50	077-07-02.50	24415	259	1	554	1.28								554	
U	BLDG	ALEXANDRIA	VA	38-50-02.30	077-03-44.60	9290	244	1	242	1.43			242						
Sector 240 to 269 degrees				Number of Multiple Structure		0			Average AMSL		165		242					554	
				Total Additional Multiple Structures		0			Number of Structures		1	0	1	0	0	0	0	1	0
				Total Structures Including Multiples		3													

Points with Angle > than (degrees)	
1	3
1.5	1
2	0

O	BLDG	ALEXANDRIA	VA	38-49-09.00	077-04-41.00	15934	233	1	265	0.92						265			
U	BLDG	ALEXANDRIA	VA	38-49-51.22	077-03-00.88	7140	223	1	144	1.08		144							
U	BLDG	ALEXANDRIA	VA	38-49-00.00	077-03-59.00	14068	222	1	370	1.47					370				
O	BLDG	ALEXANDRIA	VA	38-48-27.00	077-03-58.00	16642	214	1	462	1.56						462			
O	BLDG	ALEXANDRIA	VA	38-48-06.00	077-04-00.00	18515	211	1	275	0.82							275		
O	BLDG	ALEXANDRIA	VA	38-48-04.39	077-03-49.62	18247	209	1	226	0.68							226		
O	BLDG-TWR	ALEXANDRIA	VA	38-48-54.00	077-03-09.00	12308	207	1	241	1.08				241					
Sector 210 to 239 degrees				Number of Multiple Structure		0			Average AMSL			144		241	370	363.5	250.5		
				Total Additional Multiple Structures		0			Number of Structures		0	1	0	1	1	2	2	0	0
				Total Structures Including Multiples		7													

Points with Angle > than (degrees)	
1	4
1.5	1
2	0

U	BLDG	ALEXANDRIA	VA	38-48-47.00	077-02-32.00	11991	193	1	191	0.86				191					
O	BLDG	ALEXANDRIA	VA	38-48-45.00	077-02-33.00	12206	193	1	267	1.21				267					
U	BRIDGE	ALEXANDRIA	VA	38-47-30.00	077-02-30.00	19648	187	1	210	0.58							210		
Sector 180 to 209 degrees				Number of Multiple Structure		0			Average AMSL					229			210		
				Total Additional Multiple Structures		0			Number of Structures		0	0	0	2	0	0	1	0	0
				Total Structures Including Multiples		3													

Points with Angle > than (degrees)	
1	3
1.5	1
2	1

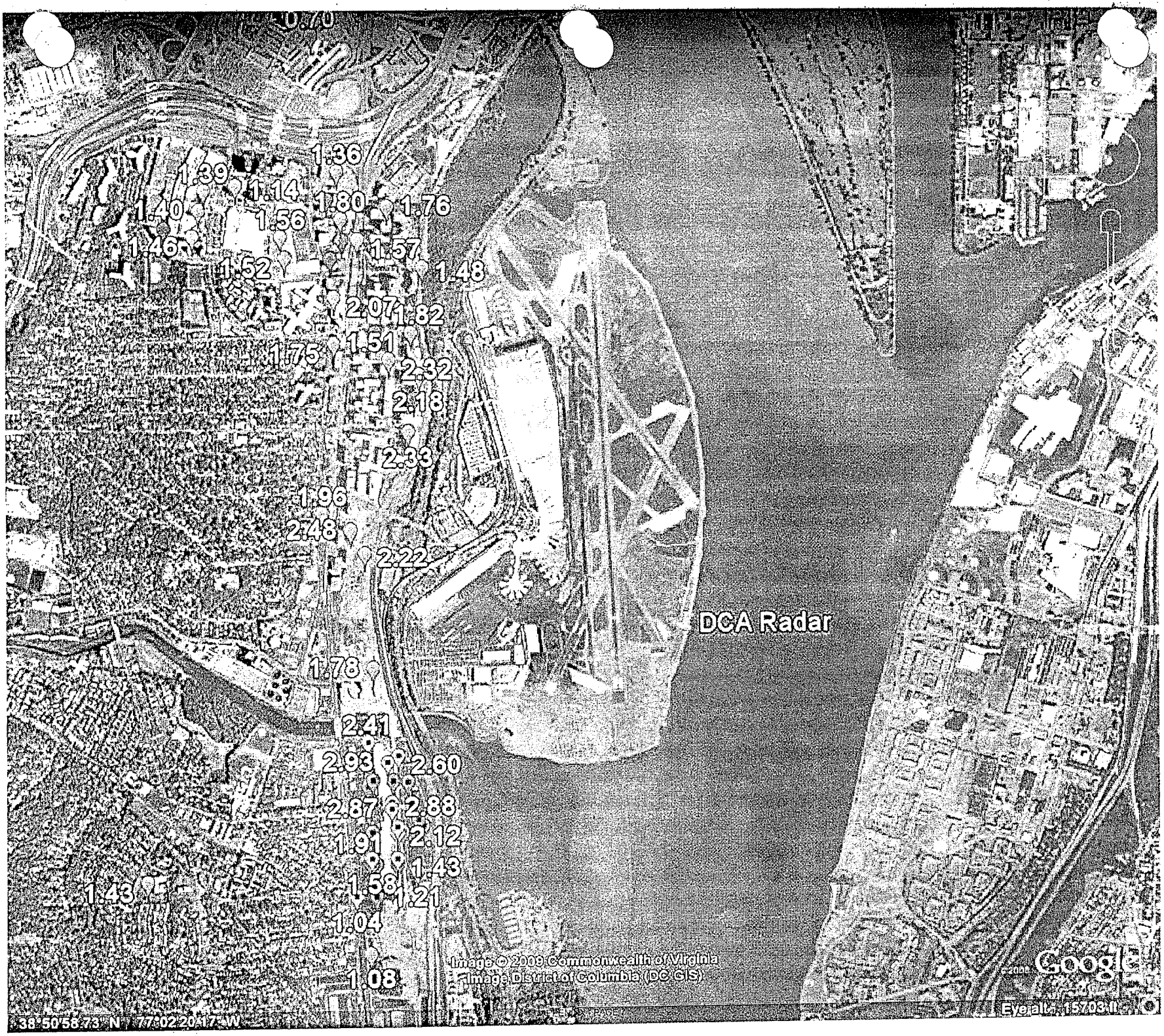
Obstacles Plotted from DCA Radar

V 2.2 STATUS	TYPE OBSTACLE	CITY	ST	LATITUDE	LONGITUDE	All Distances in Feet RANGE	DEG	QUAN	AMSL	Degrees ANGLE	Up To 5000	5001 to 7500	7501 to 10000	10000 to 12500	12500 to 15000	15001 to 17500	17501 to 20000	20000 to 25000	> 25000'
P	C1	Potomac Yard	VA	38-50-24	77-03-02	5316	249	1	234	2.41		234							
P	C6	Potomac Yard	VA	38-50-21	77-03-06	5723	247	1	181	1.71		181							
P	D1	Potomac Yard	VA	38-50-21	77-03-03	5504	246	1	166	1.62		166							
P	A1	Potomac Yard	VA	38-50-22	77-02-56	4958	245	1	235	2.60	235								
P	B1	Potomac Yard	VA	38-50-21	77-02-58	5144	245	1	273	2.93		273							
P	B3	Potomac Yard	VA	38-50-18	77-03-01	5491	243	1	198	1.96		198							
P	G1	Potomac Yard	VA	38-50-17	77-03-02	5608	242	1	169	1.62		169							
P	F1	Potomac Yard	VA	38-50-18	77-02-57	5211	241	1	207	2.17		207							
P	E1	Potomac Yard	VA	38-50-18	77-02-54	5004	240	1	249	2.73		249							
P	K1	Potomac Yard	VA	38-50-13	77-03-02	5216	239	1	125	1.13		125							
P	F2	Potomac Yard	VA	38-50-15	77-02-57	5368	239	1	280	2.88		280							
P	K2	Potomac Yard	VA	38-50-10	77-03-01	5903	236	1	180	1.65		180							
P	N1	Potomac Yard	VA	38-50-09	77-03-01	5961	235	1	130	1.15		130							
P	J2	Potomac Yard	VA	38-50-11	77-02-56	5521	234	1	214	2.12		214							
P	M1	Potomac Yard	VA	38-50-10	77-02-56	5580	234	1	196	1.91		196							
P	E2	Potomac Yard	VA	38-50-12	77-02-52	5205	233	1	154	1.58		154							
P	L10	Potomac Yard	VA	38-50-10	77-02-55	5517	233	1	145	1.40		145							
P	J1	Potomac Yard	VA	38-50-14	77-02-57	5417	233	1	282	2.87		282							
P	N2	Potomac Yard	VA	38-50-06	77-03-01	6139	233	1	179	1.58		179							
P	R1	Potomac Yard	VA	38-50-05	77-03-01	6201	232	1	170	1.48		170							
P	Q4	Potomac Yard	VA	38-50-05	77-03-00	6139	232	1	148	1.29		148							
P	R2	Potomac Yard	VA	38-50-05	77-03-00	6139	232	1	167	1.46		167							
P	E3	Potomac Yard	VA	38-50-11	77-02-51	5142	231	1	146	1.52		146							
P	M2	Potomac Yard	VA	38-50-06	77-02-56	5829	230	1	156	1.43		156							
P	R3	Potomac Yard	VA	38-50-00	77-03-04	6184	230	1	132	1.04		132							
P	Q1	Potomac Yard	VA	38-50-05	77-02-56	5894	230	1	146	1.32		146							
P	S2	Potomac Yard	VA	38-50-00	77-03-00	6465	228	1	129	1.05		129							
P	L3	Potomac Yard	VA	38-50-04	77-02-52	5725	227	1	131	1.21		131							
												135							
Potomac Yards - 249 to 227 Degrees		Number of Multiple Structure				0	Average AMSL				1	27	0	0	0	0	0	0	0
		Total Additional Multiple Structures				0	Number of Structures												
		Total Structures Including Multiples				28													

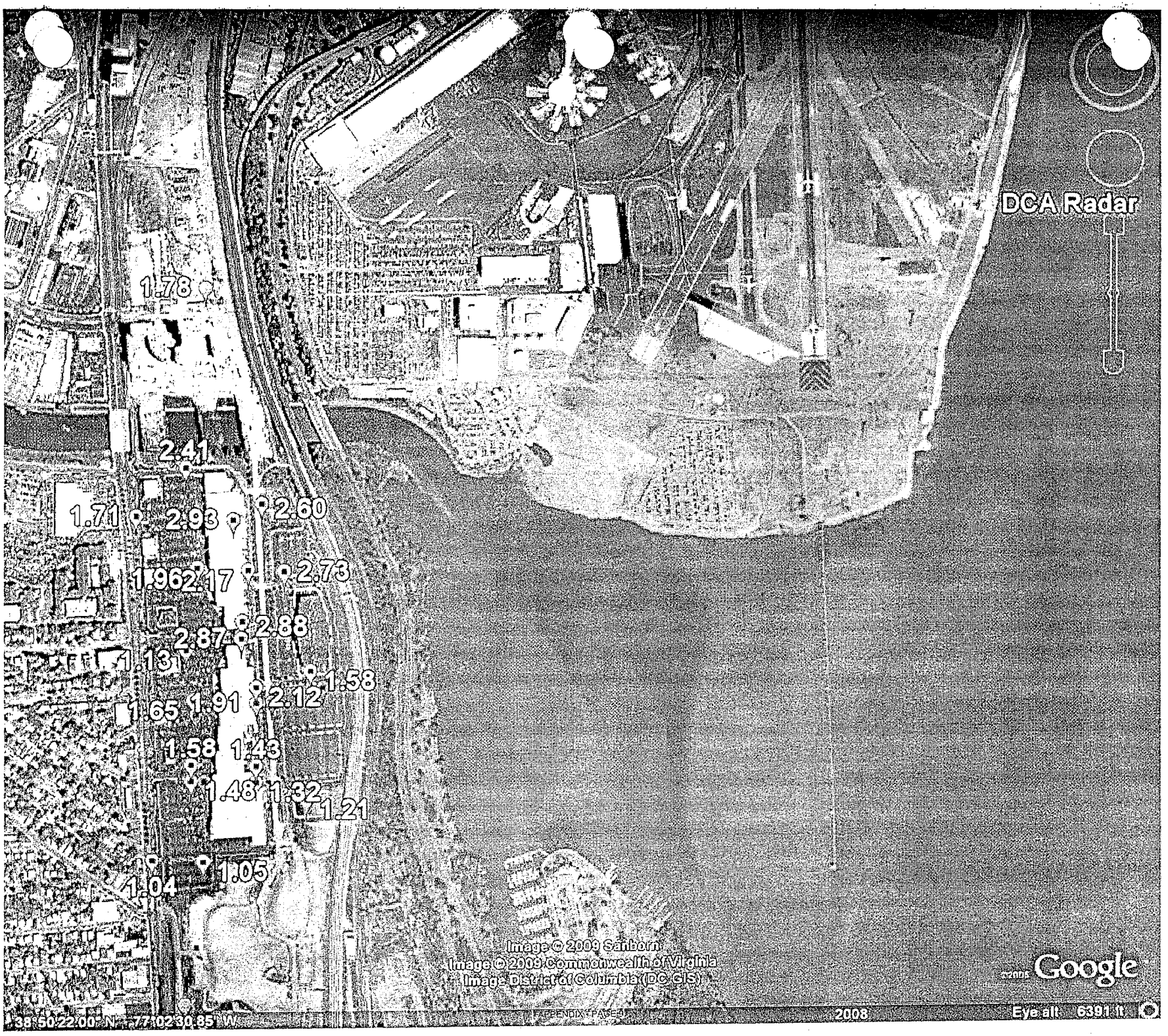
Points with Angle > than (degrees)	1	28
	1.5	17
	2	8

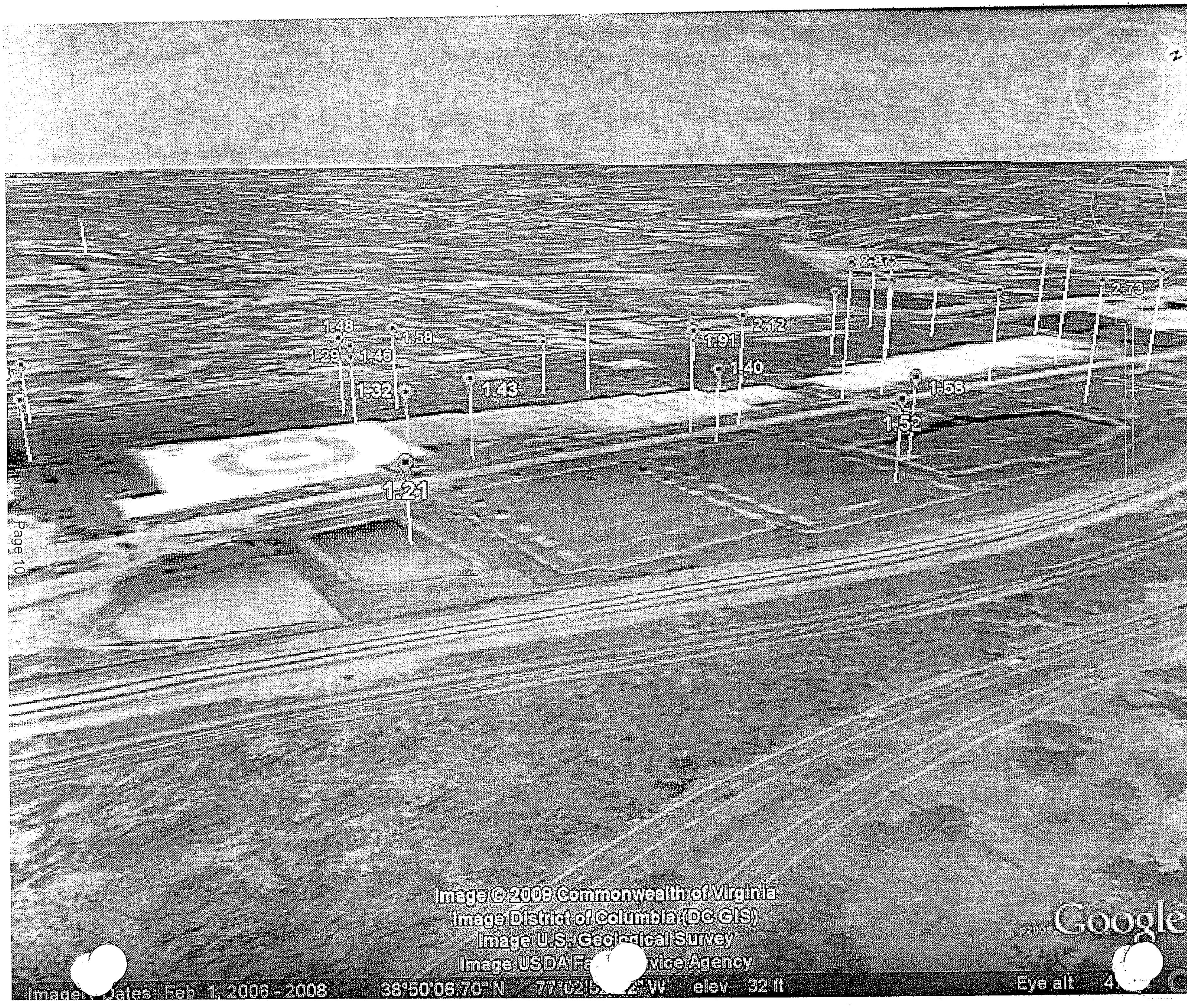
DCA
Radar

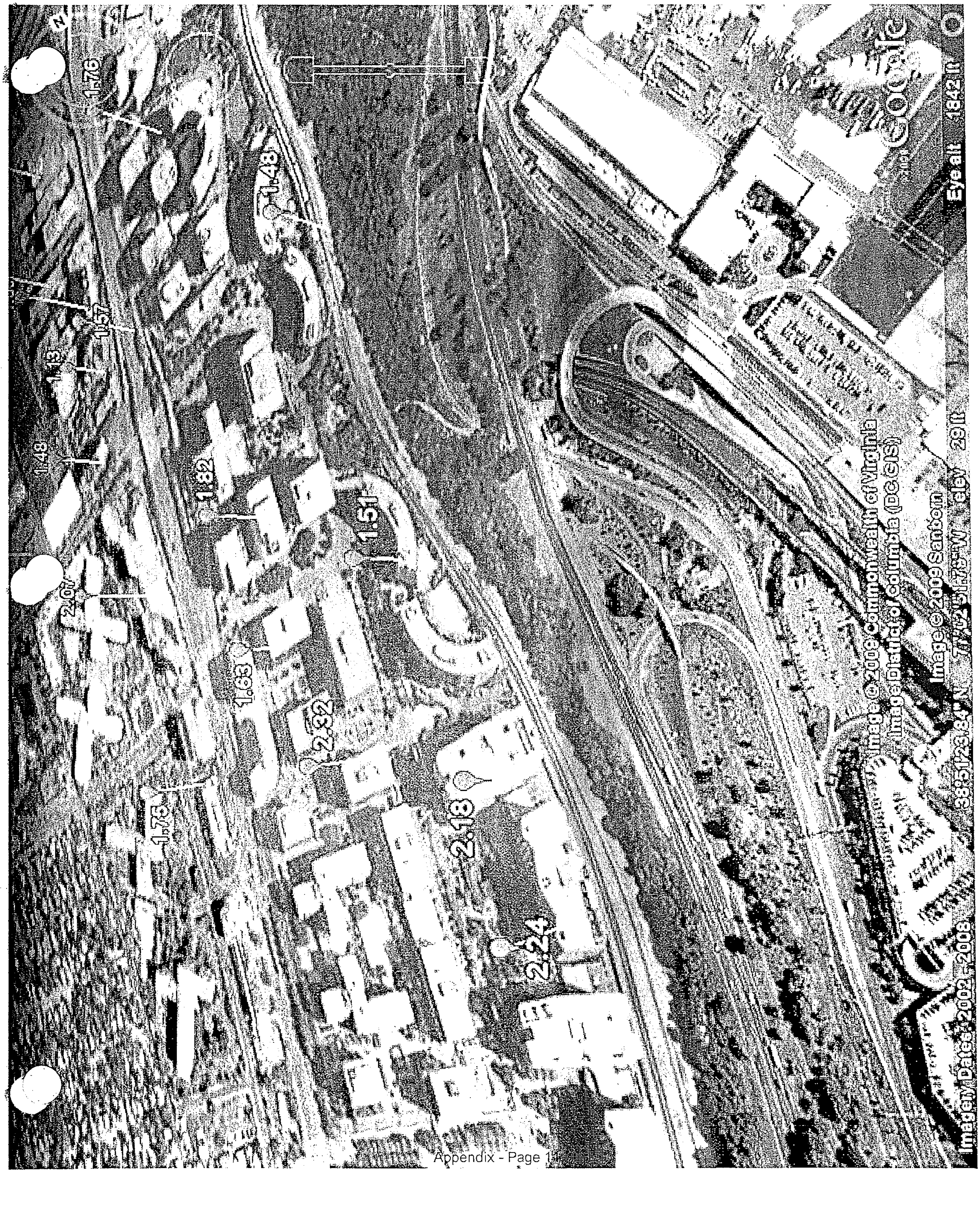

0.45
0.63
0.50
0.62
0.94
1.07
0.78
1.06
0.40
1.08
0.95
0.97
1.17
1.04
0.85
0.28
0.70
1.39
1.39
1.80
1.76
1.46
1.48
2.07
2.32
2.18
2.33
2.48
2.22
DCA Radar
1.78
2.41
2.93
2.87
2.88
1.43
1.58
2.12
1.21
1.08
Image U.S. Geological Survey
Image © 2008 Commonwealth of Virginia
Image District of Columbia (DC GIS)
Google
38° 52' 17.86" N 77° 01' 50.72" W
Eye alt 33843 ft
N


0.70
1.36
1.39
1.14
1.80
1.76
1.40
1.56
1.46
1.57
1.52
1.48
2.07
1.82
1.75
1.51
2.32
2.18
2.33
1.96
2.48
2.22
DCA Radar
1.78
2.41
2.93
2.60
2.87
2.88
1.91
2.12
1.43
1.43
1.58
1.21
1.04
1.08
Image © 2009 Commonwealth of Virginia
Image District of Columbia (DC GIS)
Google
38°50'58.73" N 77°02'20.17" W
Eye alt 15703 ft


1.36
1.39
1.14
1.50
1.80
1.76
1.40
1.56
1.16
1.46
1.48
1.57
1.52
1.48
2.07
1.82
1.63
1.51
1.75
2.32
2.18
2.24
2.33
1.96
2.48
2.22
DCA Radar
1.78
Image © 2009 Commonwealth of Virginia
Image District of Columbia (DC GIS)
2.41
Google
38°5 .75" N 77°02'53.04" W
Eye alt 10207 ft


DCA Radar
1.78
2.41
1.71
2.93
2.60
1.96
2.17
2.73
2.87
2.88
1.13
1.58
1.65
1.91
2.12
1.58
1.43
1.48
1.32
1.21
1.04
1.05
Image © 2009 Sanborn
Image © 2009 Commonwealth of Virginia
Image © 2009 District of Columbia (DC GIS)
38°50'22.00" N 77°02'30.85" W
2008
Eye alt 6391 ft
Google


1.48
1.29
1.46
1.58
1.32
1.43
1.21
1.91
2.12
1.40
2.87
1.58
1.52
2.73
Image © 2009 Commonwealth of Virginia
Image District of Columbia (DC GIS)
Image U.S. Geological Survey
Google
Dates: Feb 1, 2006 - 2008
38°50'06.70" N
elev 32 ft
Eye alt


1.76
1.48
1.57
1.13
1.48
1.82
1.51
2.07
1.63
2.32
1.75
2.18
2.24
Image © 2009 Commonwealth of Virginia
Image District of Columbia (DC GIS)
Image © 2009 Sanborn
Imagery Dates: 2002 - 2008
Eye alt 1842 ft

(BILIT.BILIT1) 09071
ST-443 (FAA)
BILIT ONE ARRIVAL (RNAV)
WASHINGTON/ RONALD REAGAN WASHINGTON NATIONAL
WASHINGTON, DC
POTOMAC APP CON
124.55 317.425
WASHINGTON NATIONAL ATIS
132.65
NOTE: RADAR Required.
NOTE: PROHIBITED AREA (P-56) 1.5 NM
NORTH of DCA - AVOID - SURFACE
TO 18,000 MSL.
NOTE: 1. DME/DME/IRU or GPS required.
2. RNAV 1.
N
RIDGY
14000
238°
(17)
14000
274°
(26)
LAFLN
BILIT
4 NM
286°
(22)
DEALE
Expect to cross
at 10,000.
282°
(12)
EDDGY
318°
(7)
THANE
324°
(13)
MEGGS
325°
(8)
NAYES
325°
P-56
RONALD REAGAN
WASHINGTON NATIONAL
AIRPORT
HITEK
CAVDI
ARRIVAL ROUTE DESCRIPTION
LAFLN TRANSITION (LAFLN.BILIT1):
RIDGY TRANSITION (RIDGY.BILIT1):
. . . From BILIT WP via 286° track to DEALE WP, thence as depicted to NAYES WP, depart NAYES WP heading 325° for vectors to final approach course.
LANDING RWY 1: After EDDGY WP, expect radar vectors to final approach course.
LANDING RWY 19: Depart NAYES WP heading 325° for vectors to final approach course.
NOTE: Chart not to scale
NE-3, 27 AUG 2009 to 24 SEP 2009
NE-3, 27 AUG 2009 to 24 SEP 2009
BILIT ONE ARRIVAL (RNAV)
WASHINGTON, DC
WASHINGTON/ RONALD REAGAN WASHINGTON NATIONAL
(BILIT.BILIT1) 09071

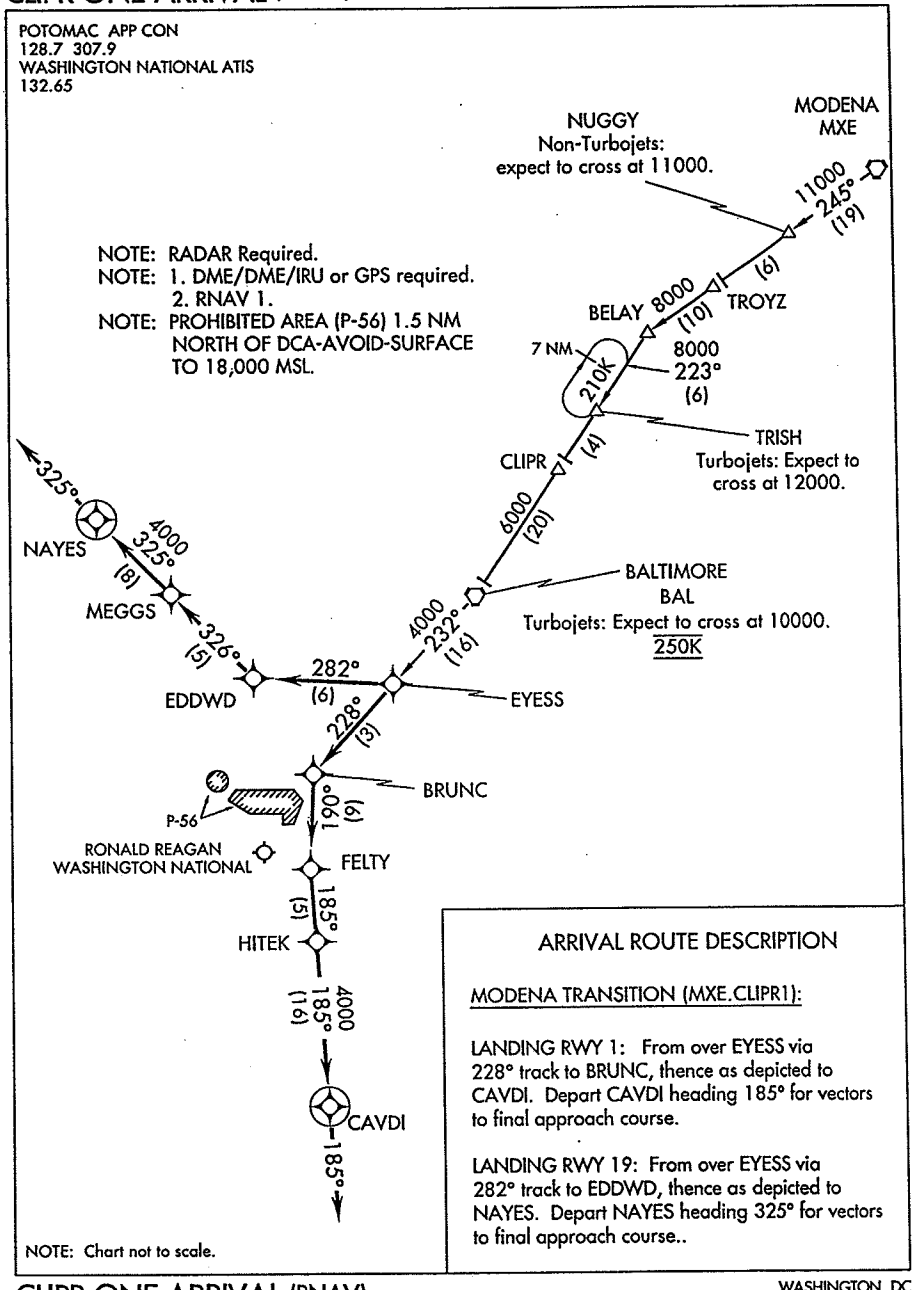
(CLIPR.CLIPR1) 09071

ST-443 (FAA)

WASHINGTON/ RONALD REAGAN WASHINGTON NATIONAL

WASHINGTON, DC

CLIPR ONE ARRIVAL (RNAV)



ARRIVAL ROUTE DESCRIPTION

MODENA TRANSITION (MXE.CLIPR1):

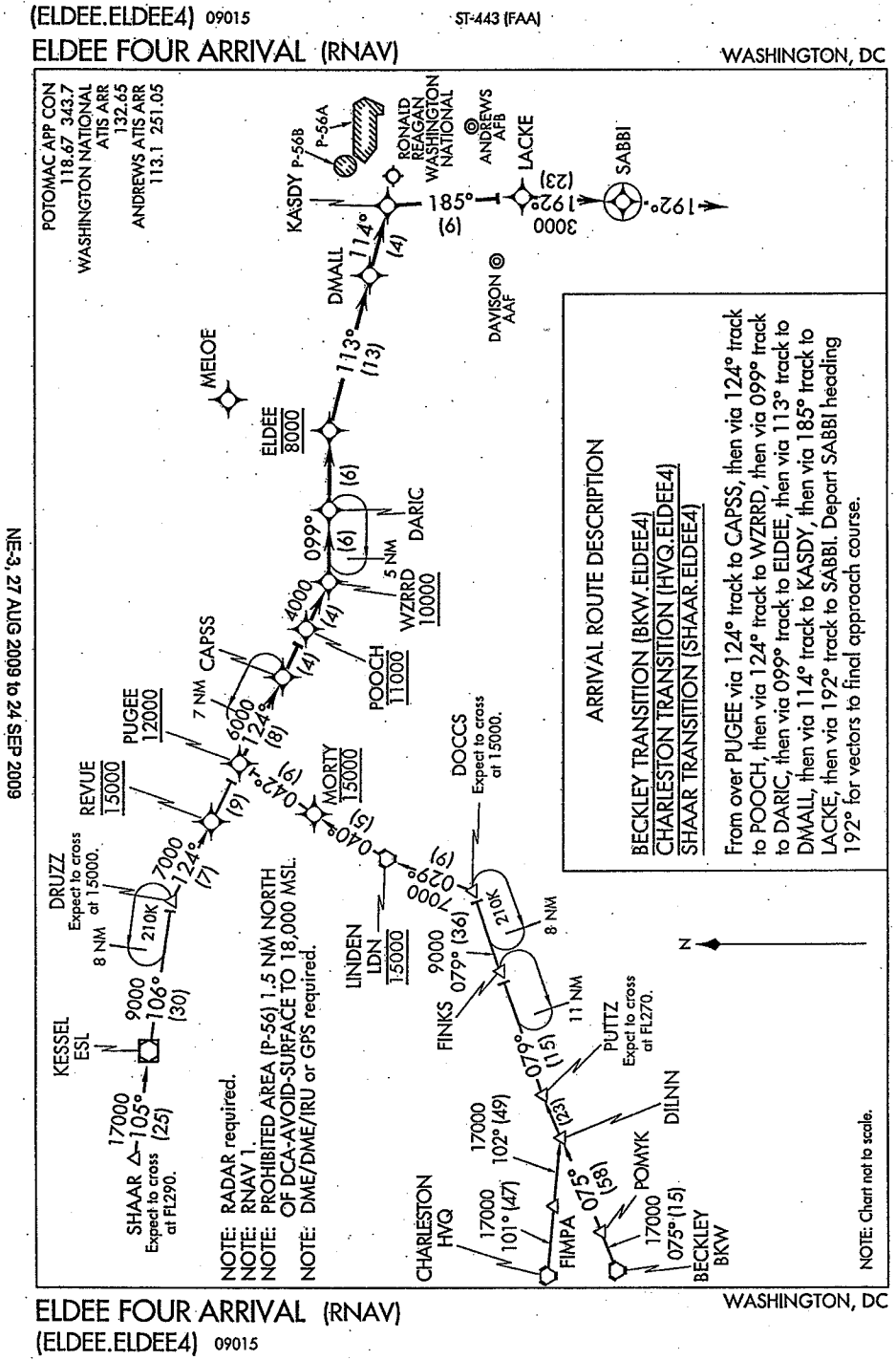
LANDING RWY 1: From over EYESS via 228° track to BRUNC, thence as depicted to CAVDI. Depart CAVDI heading 185° for vectors to final approach course.

LANDING RWY 19: From over EYESS via 282° track to EDDWD, thence as depicted to NAYES. Depart NAYES heading 325° for vectors to final approach course..

NE-3, 27 AUG 2009 to 24 SEP 2009

NE-3, 27 AUG 2009 to 24 SEP 2009

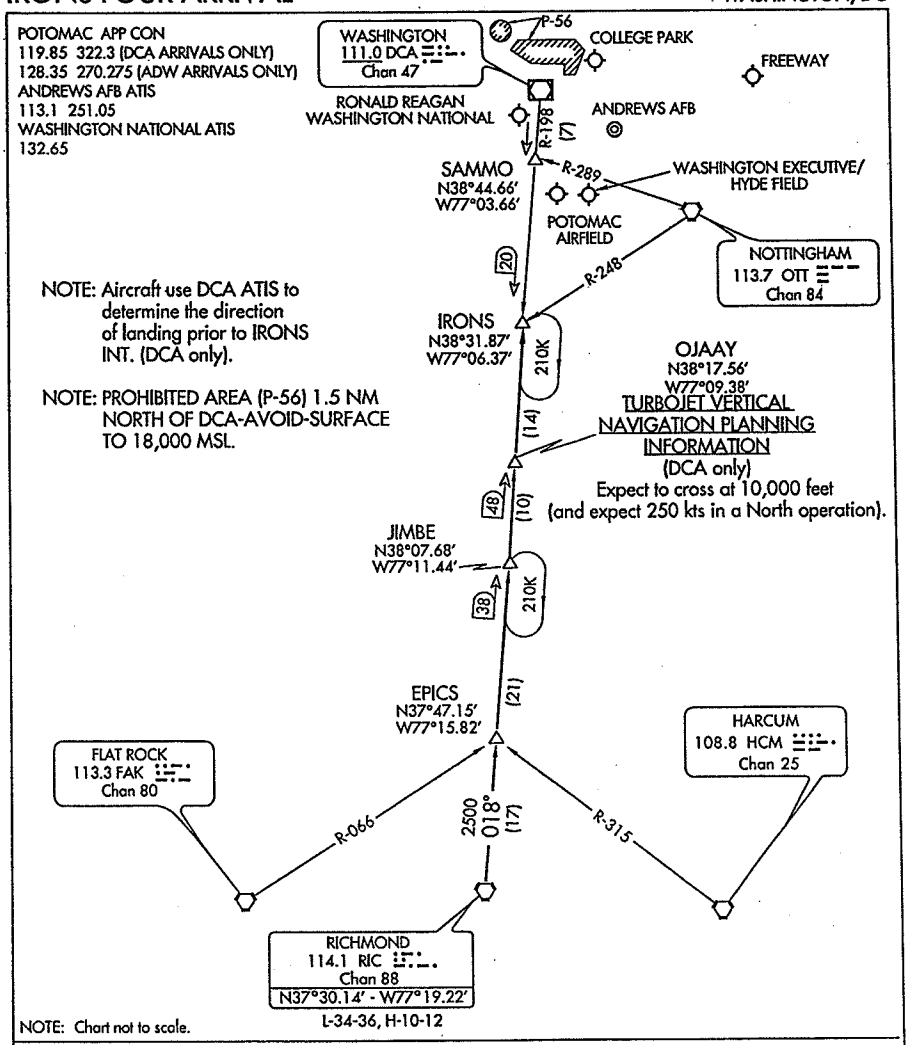
CLIPR ONE ARRIVAL (RNAV)
(CLIPR.CLIPR1) 09071
WASHINGTON, DC
WASHINGTON/ RONALD REAGAN WASHINGTON NATIONAL


(ELDEE.ELDEE4) 09015
ST-443 (FAA)
ELDEE FOUR ARRIVAL (RNAV)
WASHINGTON, DC
POTOMAC APP CON 118.67 343.7
WASHINGTON NATIONAL ATIS ARR 132.65
ANDREWS ATIS ARR 113.1 251.05
RONALD REAGAN WASHINGTON NATIONAL
ANDREWS AFB
DAVISON AAF
KASDY P-56B
P-56A
LACKE
SABBI
DMALL
MELOE
ELDEE 8000
DARIC
WZRRD 10000
POOCH 11000
CAPSS
PUGEE 12000
REVUE 15000
DRUZZ Expect to cross at 15000.
MORTY 15000
DOCCS Expect to cross at 15000.
LINDEN LDN 15000
KESSEL ESL
SHAAR Expect to cross at FL290.
FINKS
PUTTZ Expect to cross at FL270.
DILNN
POMYK
FIMPA
CHARLESTON HVQ
BECKLEY BKW
NOTE: RADAR required.
NOTE: RNAV 1.
NOTE: PROHIBITED AREA (P-56) 1.5 NM NORTH OF DCA-AVOID-SURFACE TO 18,000 MSL.
NOTE: DME/DME/IRU or GPS required.
NOTE: Chart not to scale.
ARRIVAL ROUTE DESCRIPTION
BECKLEY TRANSITION (BKW.ELDEE4)
CHARLESTON TRANSITION (HVQ.ELDEE4)
SHAAR TRANSITION (SHAAR.ELDEE4)
From over PUGEE via 124° track to CAPSS, then via 124° track to POOCH, then via 124° track to WZRRD, then via 099° track to DARIC, then via 099° track to ELDEE, then via 113° track to DMALL, then via 114° track to KASDY, then via 185° track to LACKE, then via 192° track to SABBI. Depart SABBI heading 192° for vectors to final approach course.
NE-3, 27 AUG 2009 to 24 SEP 2009
NE-3, 27 AUG 2009 to 24 SEP 2009
ELDEE FOUR ARRIVAL (RNAV)
WASHINGTON, DC
(ELDEE.ELDEE4) 09015

(IRONS.IRONS4) 08269 ST-443 (FAA)

IRONS FOUR ARRIVAL

WASHINGTON, DC



NE-3, 27 AUG 2009 to 24 SEP 2009

NE-3, 27 AUG 2009 to 24 SEP 2009

RICHMOND TRANSITION (RIC.IRONS4): From over RIC VORTAC via RIC R-018 and DCA R-198 to IRONS INT. Thence. . . .

. . . .From over IRONS INT:
Ronald Reagan Washington National Airport (DCA only):
LANDING SOUTH: Then via DCA R-198 to SAMMO INT, heading for vectors to the final approach course.
LANDING NORTH: Expect vectors to final approach course.
All other airports: Expect vectors.

IRONS FOUR ARRIVAL

WASHINGTON, DC

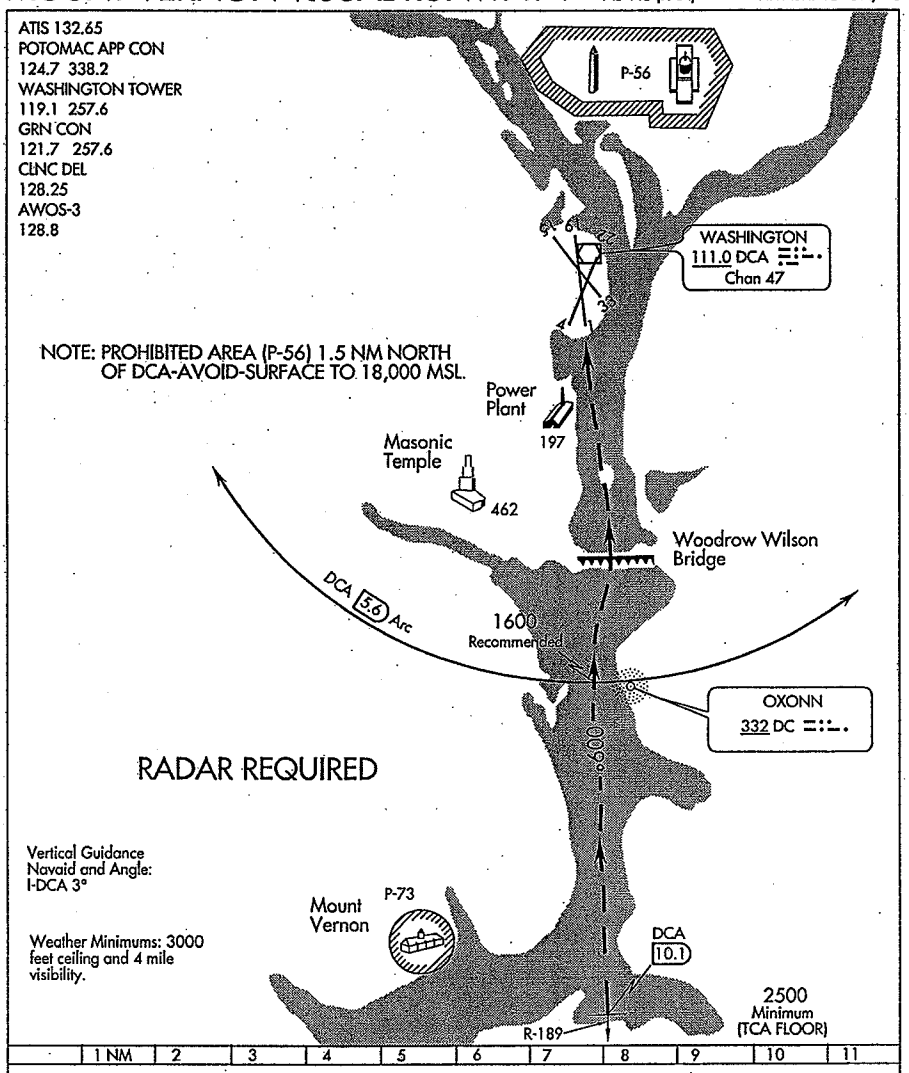
(IRONS.IRONS4) 08269

Amdt 3 09015

WASHINGTON/RONALD REAGAN WASHINGTON NATIONAL (DCA)

MOUNT VERNON VISUAL RUNWAY 1

AL-443 (FAA) WASHINGTON, DC



Aircraft may proceed via DCA VOR/DME R-189 (009° inbound) to DCA 5.6 DME, then follow the Potomac River to the airport.

NE-3, 27 AUG 2009 to 24 SEP 2009

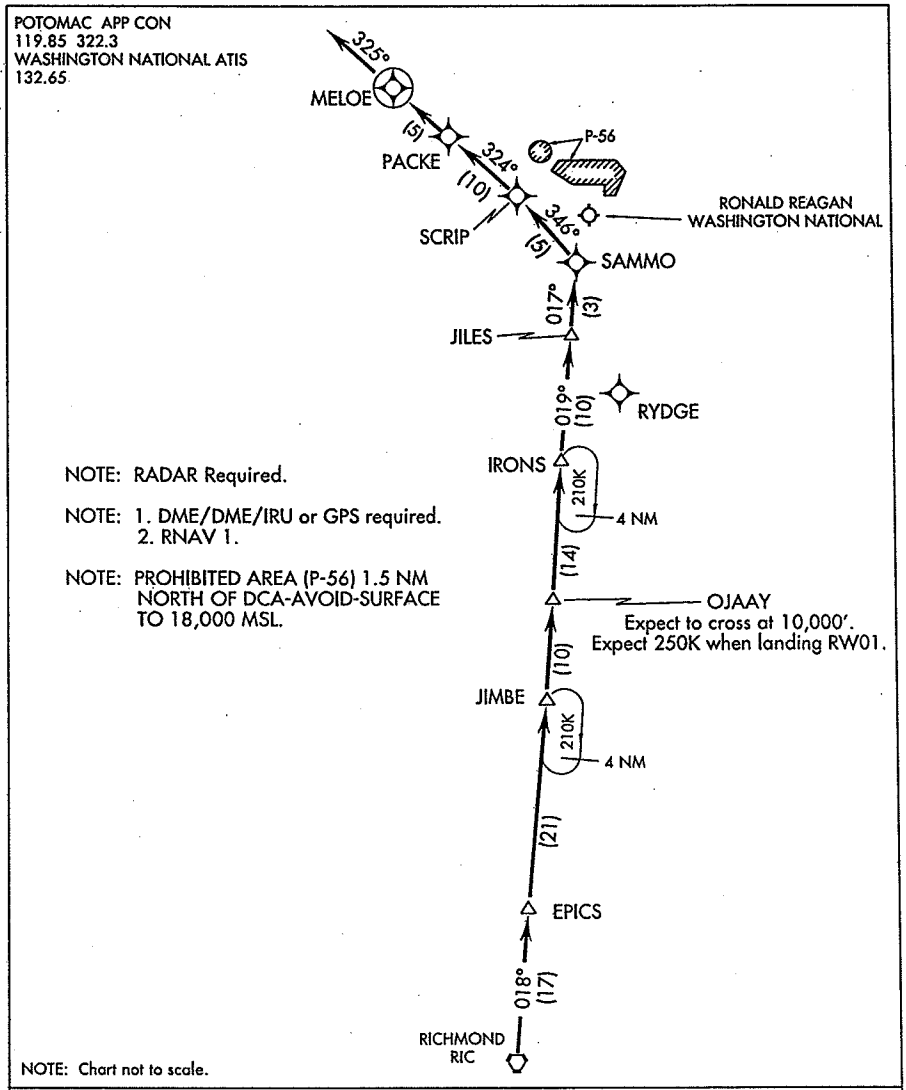
NE-3, 27 AUG 2009 to 24 SEP 2009

MOUNT VERNON VISUAL RUNWAY 1 38°51'N-77°02'W WASHINGTON, DC

Amdt 3 09015 WASHINGTON/RONALD REAGAN WASHINGTON NATIONAL (DCA)

(OJAAY.OJAAY1) 09183 ST-443 (FAA)
WASHINGTON/ RONALD REAGAN WASHINGTON NATIONAL
WASHINGTON, DC

OJAAY ONE ARRIVAL (RNAV)



NE-3, 27 AUG 2009 to 24 SEP 2009

NE-3, 27 AUG 2009 to 24 SEP 2009

ARRIVAL ROUTE DESCRIPTION

From RIC VORTAC via 018° track to EPICS WP, thence as depicted to MELOE WP, depart MELOE WP heading 325° for vectors to final approach course.

LANDING RWY 1: After IRONS, expect radar vectors to final approach course.

LANDING RWY 19: Depart MELOE WP heading 325° for vectors to final approach

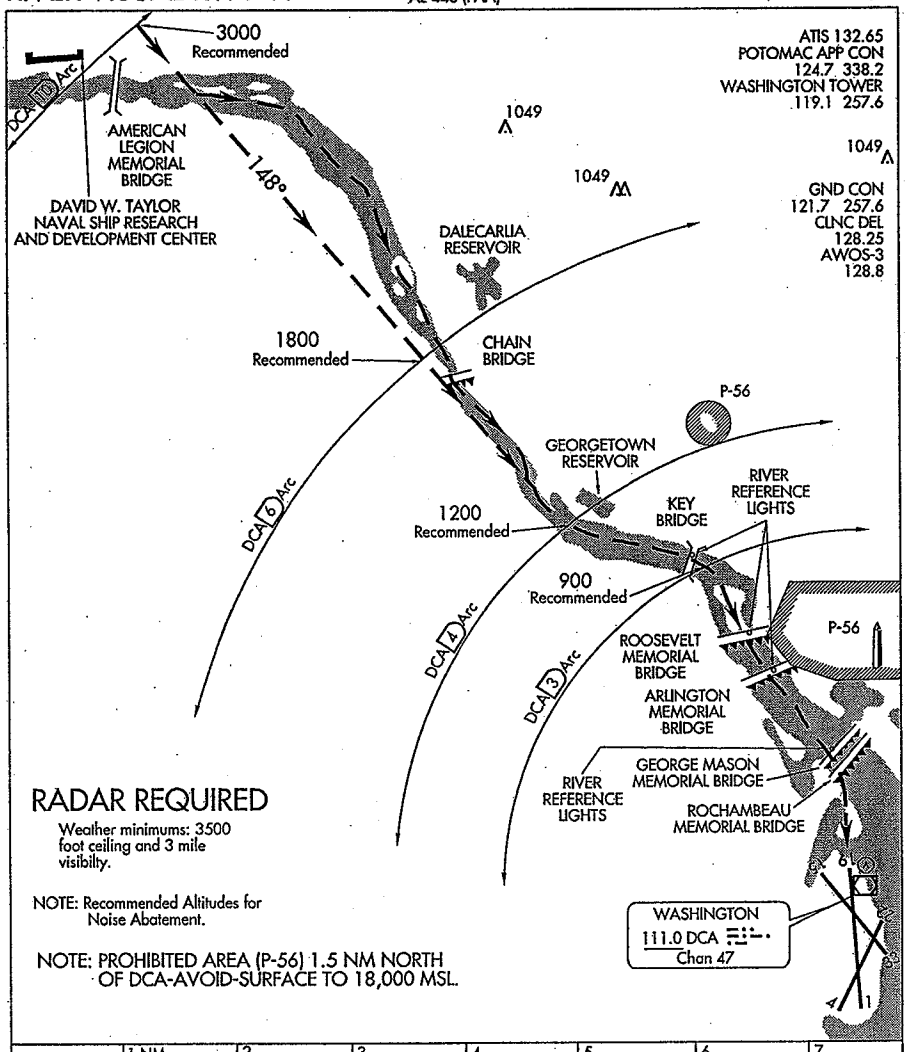
OJAAY ONE ARRIVAL (RNAV) WASHINGTON, DC
(OJAAY.OJAAY1) 09183 WASHINGTON/ RONALD REAGAN WASHINGTON NATIONAL

Amdt 4 09015

RIVER VISUAL RWY 19

WASHINGTON/ RONALD REAGAN WASHINGTON NATIONAL (DCA)
AL-443 (FAA)
WASHINGTON, DC

NE-3, 27 AUG 2009 to 24 SEP 2009



NE-3, 27 AUG 2009 to 24 SEP 2009

RIVER VISUAL RWY 19

Aircraft may visually follow the river to the airport, or may proceed via the DCA VOR/DME R-328 (148° inbound) or via the Rosslyn LDA Rwy 19 Approach to abeam Georgetown Reservoir or the DCA 4 NM DME fix, then follow the river to the airport.

NOTE: Clearance for visual approach does not authorize penetration of P-56.

RIVER VISUAL RWY 19
Amdt 4 09015

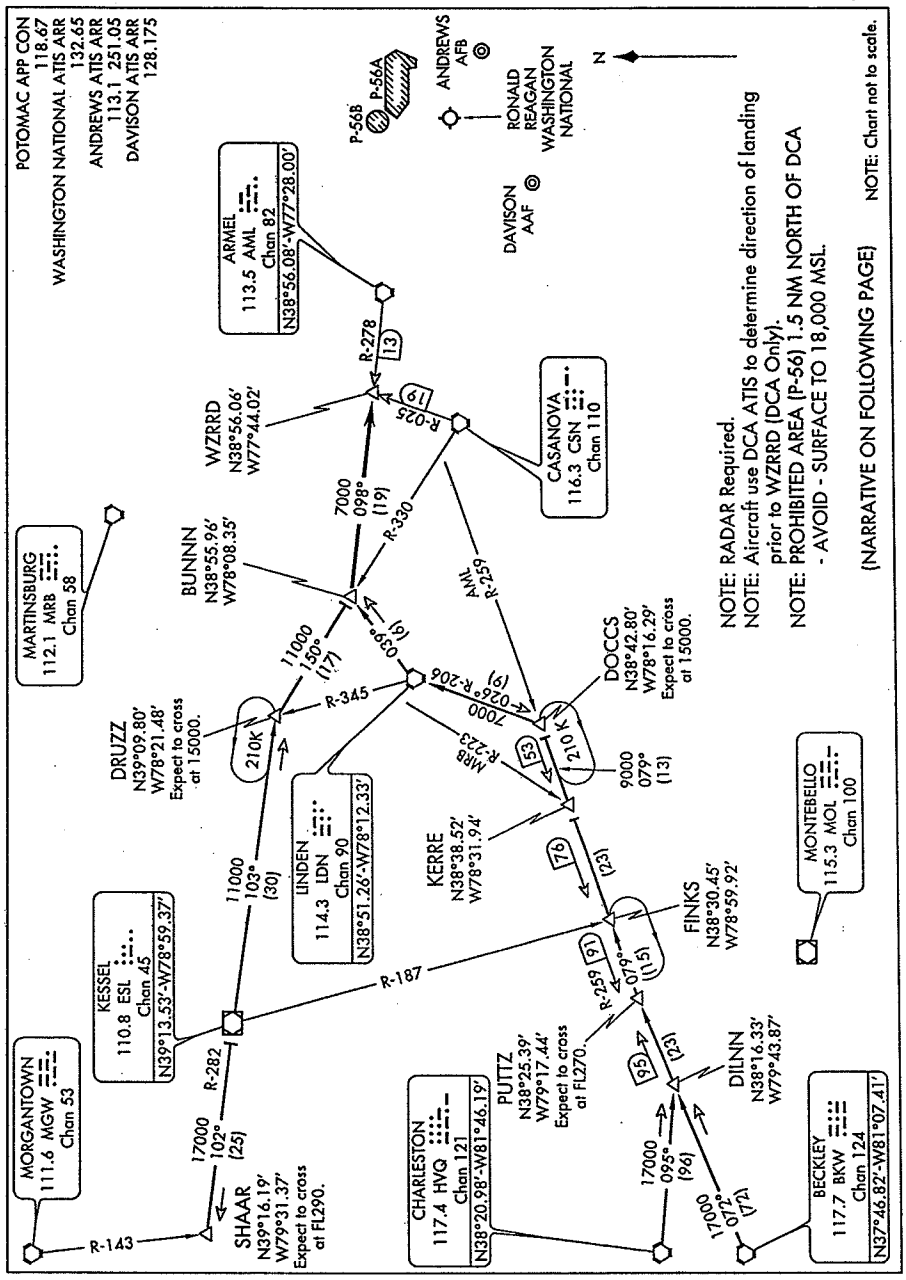
38°51'N-77°02'W

WASHINGTON, DC
WASHINGTON/ RONALD REAGAN WASHINGTON NATIONAL (DCA)

(WZRRD.WZRRD2) 09071 ST-443 (FAA)

WZRRD TWO ARRIVAL

WASHINGTON, DC

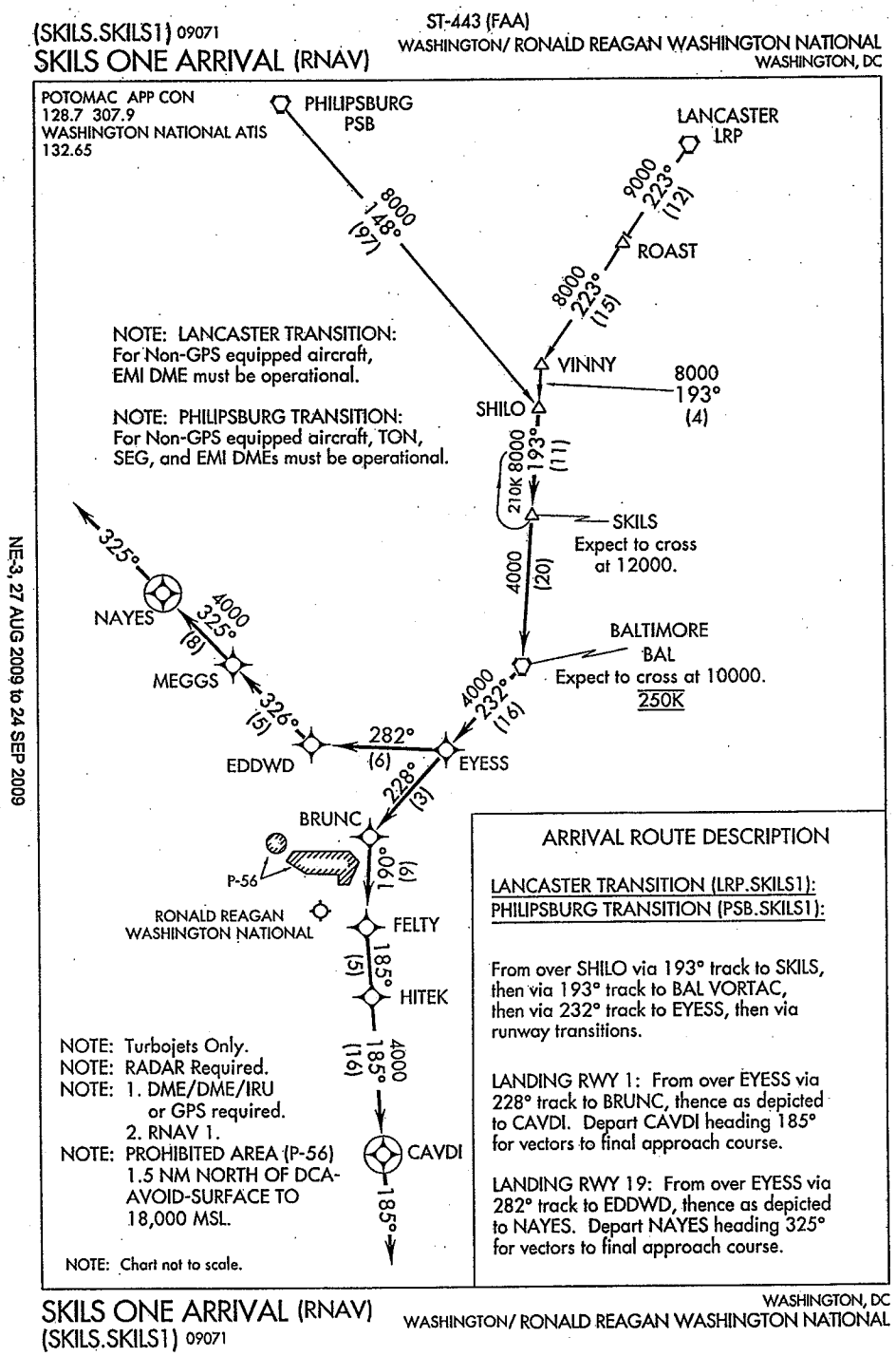


NE-3, 27 AUG 2009 to 24 SEP 2009

WZRRD TWO ARRIVAL

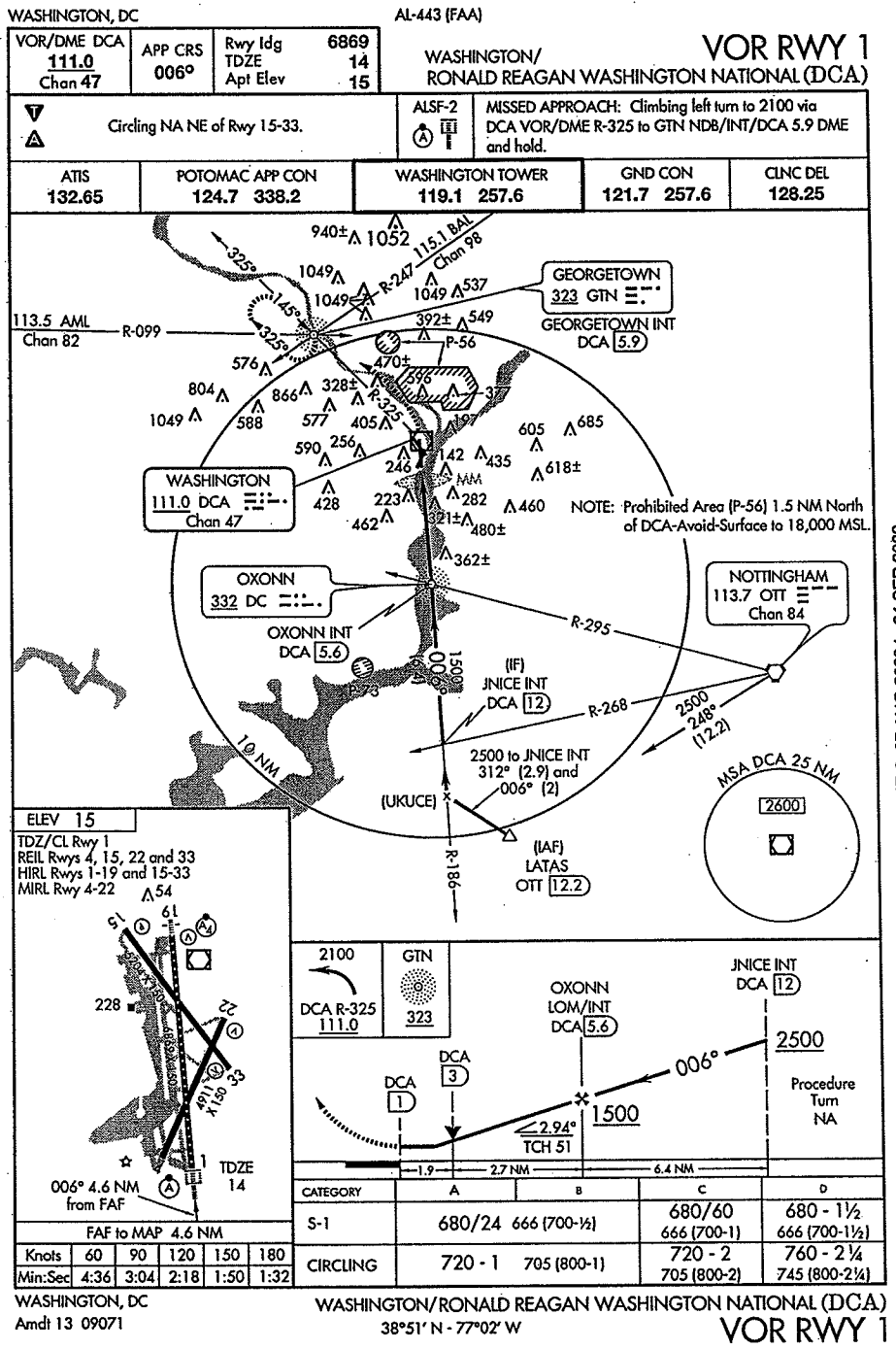
WASHINGTON, DC

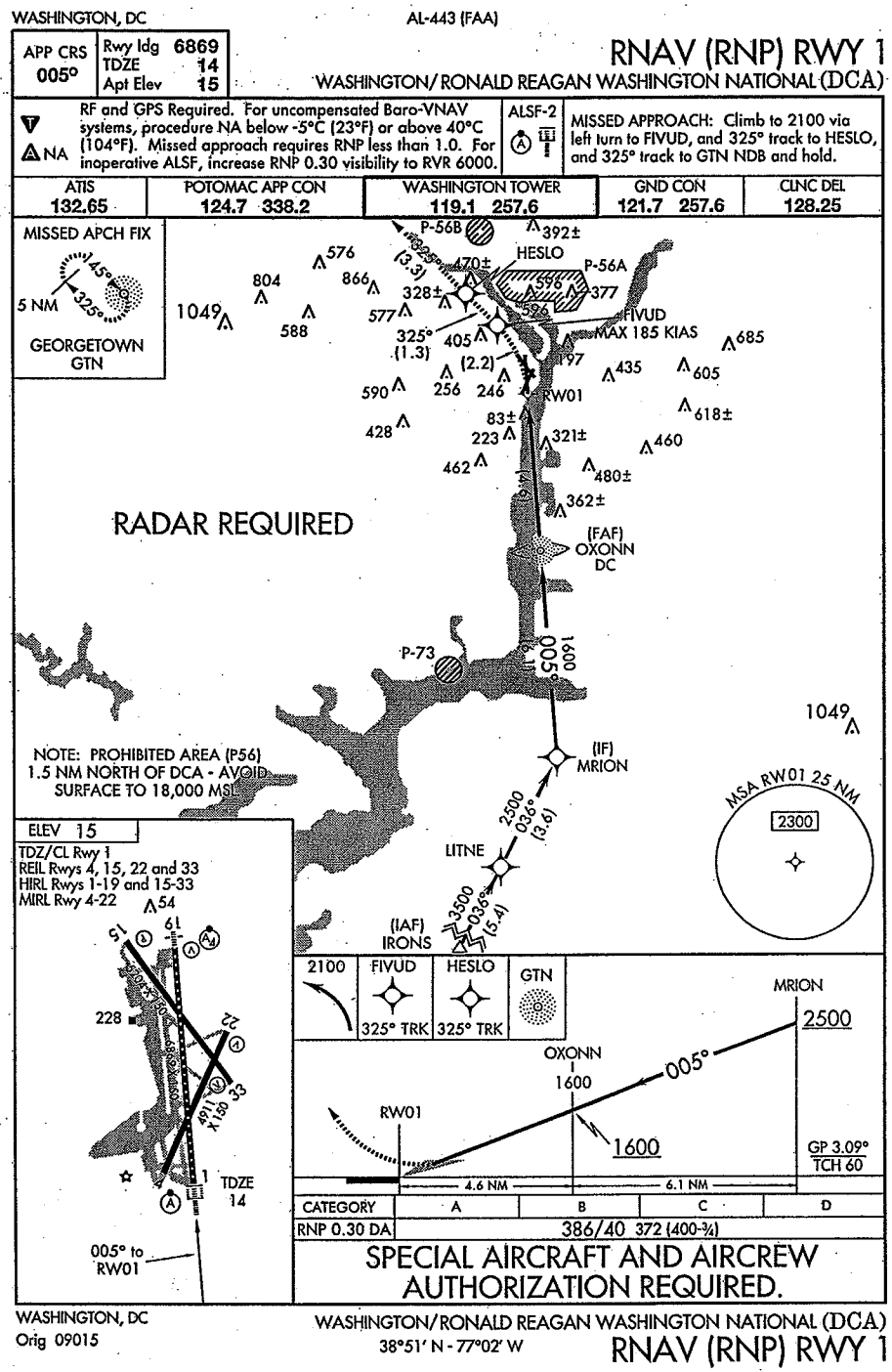
(WZRRD.WZRRD2) 09071



NE-3, 27 AUG 2009 to 24 SEP 2009

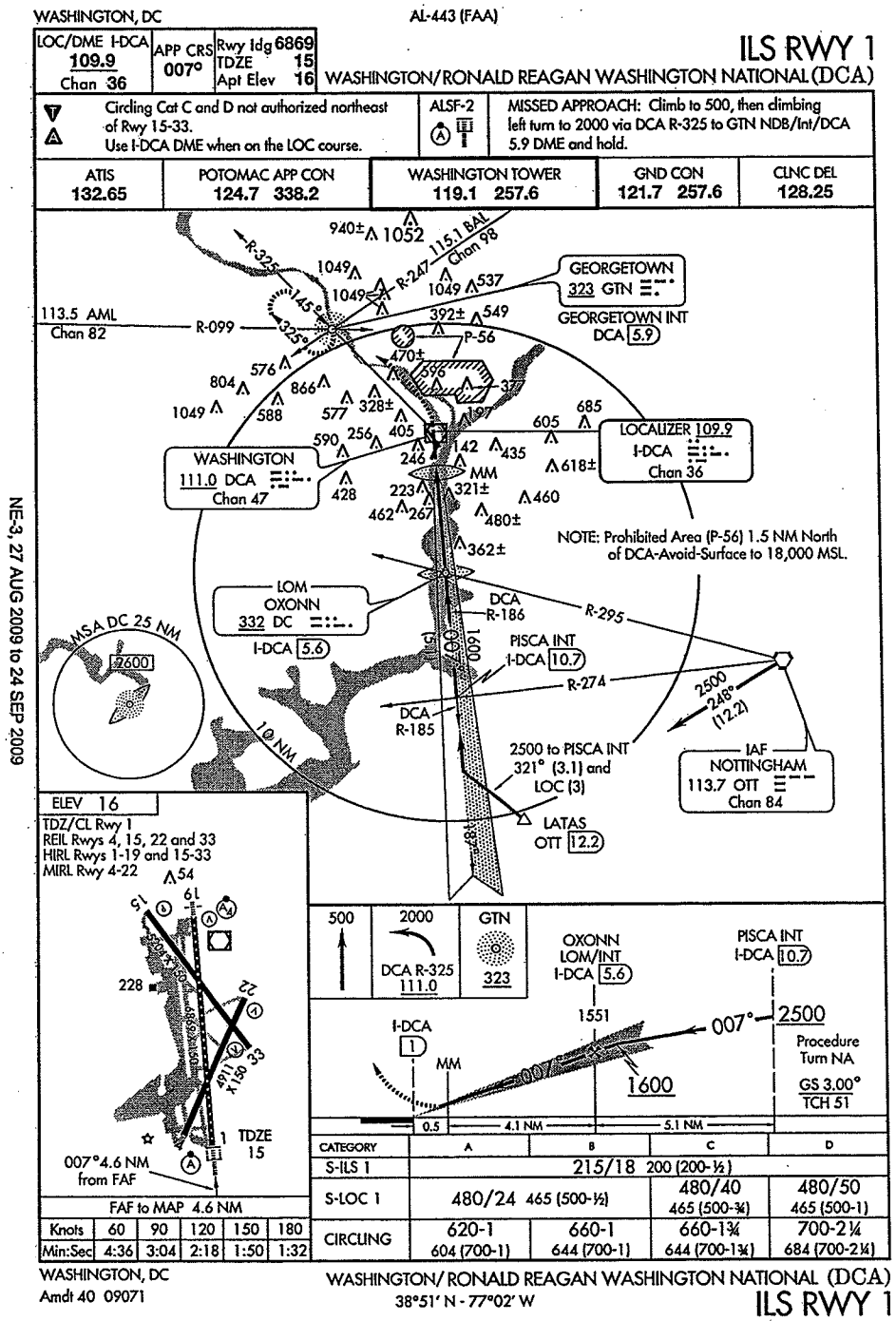
NE-3, 27 AUG 2009 to 24 SEP 2009

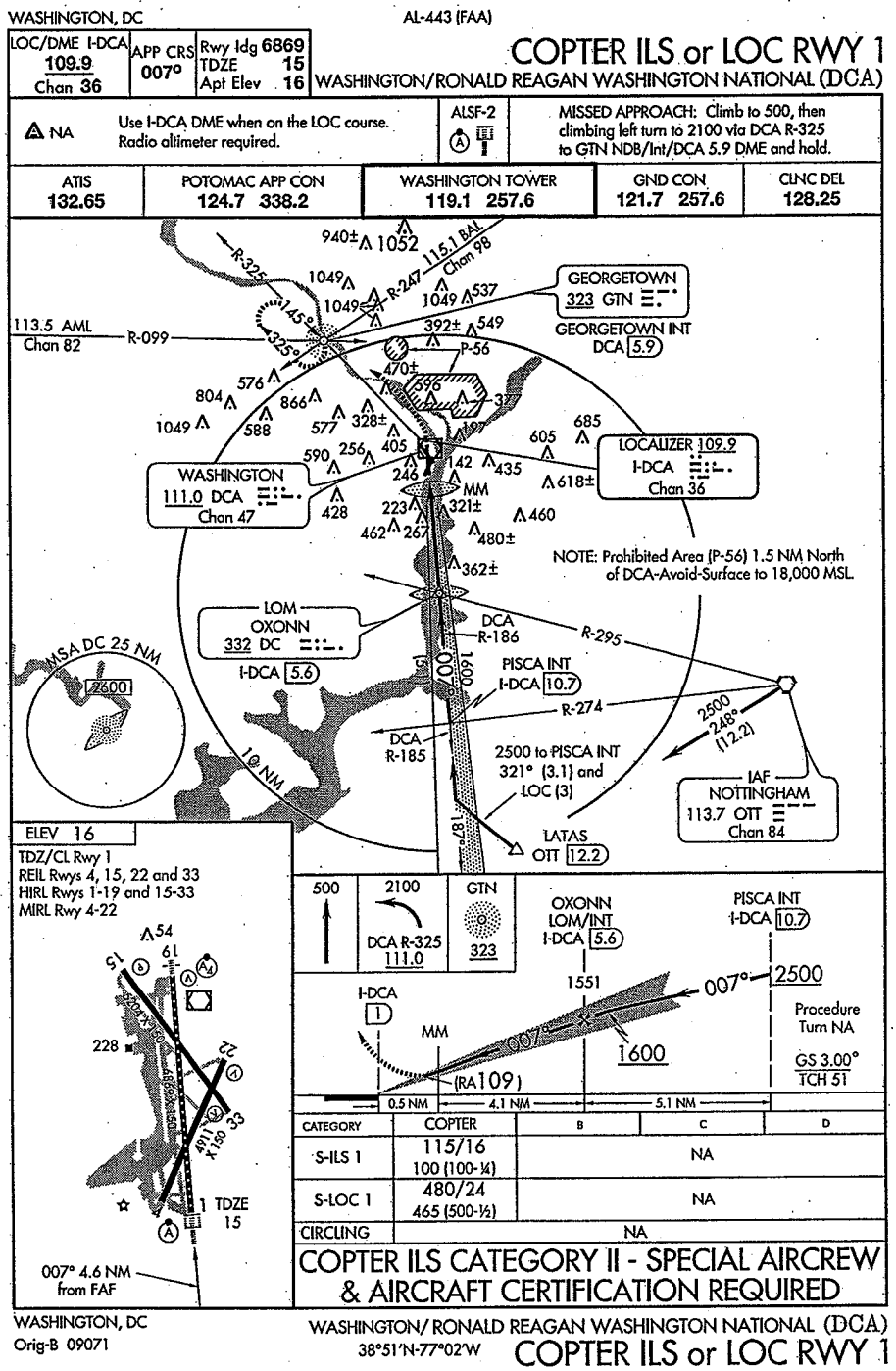

WASHINGTON, DC
AL-443 (FAA)
VOR/DME DCA 111.0 Chan 47
APP CRS 006°
Rwy Idg 6869
TDZE 14
Apt Elev 15
WASHINGTON/ RONALD REAGAN WASHINGTON NATIONAL (DCA)
VOR RWY 1
Circling NA NE of Rwy 15-33.
ALSF-2
MISSED APPROACH: Climbing left turn to 2100 via DCA VOR/DME R-325 to GTN NDB/INT/DCA 5.9 DME and hold.
ATIS 132.65
POTOMAC APP CON 124.7 338.2
WASHINGTON TOWER 119.1 257.6
GND CON 121.7 257.6
CLNC DEL 128.25
115.1 BAL Chan 98
GEORGETOWN 323 GTN
GEORGETOWN INT DCA 5.9
113.5 AML Chan 82
R-099
R-325
R-247
P-56
WASHINGTON 111.0 DCA Chan 47
NOTE: Prohibited Area (P-56) 1.5 NM North of DCA-Avaid-Surface to 18,000 MSL.
OXONN 332 DC
OXONN INT DCA 5.6
NOTTINGHAM 113.7 OTT Chan 84
R-295
(IF) JNICE INT DCA 12
R-268
2500 248° (12.2)
2500 to JNICE INT 312° (2.9) and 006° (2)
(UKUCE)
(IAF) LATAS OTT 12.2
R-186
10 NM
MSA DCA 25 NM
2600
ELEV 15
TDZ/CL Rwy 1
REIL Rwys 4, 15, 22 and 33
HIRL Rwys 1-19 and 15-33
MIRL Rwy 4-22
TDZE 14
006° 4.6 NM from FAF
FAF to MAP 4.6 NM
Knots 60 90 120 150 180
Min:Sec 4:36 3:04 2:18 1:50 1:32
2100
DCA R-325 111.0
GTN 323
OXONN LOM/INT DCA 5.6
JNICE INT DCA 12
2500
006°
Procedure Turn NA
DCA 1
DCA 3
1500
2.94°
TCH 51
1.9
2.7 NM
6.4 NM
CATEGORY A B C D
S-1 680/24 666 (700-½) 680/60 666 (700-1) 680 - 1½ 666 (700-1½)
CIRCLING 720 - 1 705 (800-1) 720 - 2 705 (800-2) 760 - 2¼ 745 (800-2¼)
WASHINGTON, DC
Amdt 13 09071
WASHINGTON/RONALD REAGAN WASHINGTON NATIONAL (DCA)
38°51' N - 77°02' W
VOR RWY 1
NE-3, 27 AUG 2009 to 24 SEP 2009
NE-3, 27 AUG 2009 to 24 SEP 2009



NE-3, 27 AUG 2009 to 24 SEP 2009

NE-3, 27 AUG 2009 to 24 SEP 2009


WASHINGTON, DC
AL-443 (FAA)
LOC/DME I-DCA 109.9 Chan 36
APP CRS 007°
Rwy Idg 6869
TDZE 15
Apt Elev 16
ILS RWY 1
WASHINGTON/RONALD REAGAN WASHINGTON NATIONAL (DCA)
Circling Cat C and D not authorized northeast of Rwy 15-33.
Use I-DCA DME when on the LOC course.
ALSF-2
MISSED APPROACH: Climb to 500, then climbing left turn to 2000 via DCA R-325 to GTN NDB/Int/DCA 5.9 DME and hold.
ATIS 132.65
POTOMAC APP CON 124.7 338.2
WASHINGTON TOWER 119.1 257.6
GND CON 121.7 257.6
CLNC DEL 128.25
115.1 BAL Chan 98
GEORGETOWN 323 GTN
GEORGETOWN INT DCA 5.9
113.5 AML Chan 82
R-099
R-325
R-247
P-56
LOCALIZER 109.9 I-DCA Chan 36
WASHINGTON 111.0 DCA Chan 47
NOTE: Prohibited Area (P-56) 1.5 NM North of DCA-Avoid-Surface to 18,000 MSL.
LOM OXONN 332 DC
I-DCA 5.6
DCA R-186
R-295
PISCA INT I-DCA 10.7
R-274
DCA R-185
2500 to PISCA INT 321° (3.1) and LOC (3)
IAF NOTTINGHAM 113.7 OTT Chan 84
LATAS OTT 12.2
MSA DC 25 NM
2600
10 NM
ELEV 16
TDZ/CL Rwy 1
REIL Rwys 4, 15, 22 and 33
HIRL Rwys 1-19 and 15-33
MIRL Rwy 4-22
TDZE 15
007° 4.6 NM from FAF
FAF to MAP 4.6 NM
Knots 60 90 120 150 180
Min:Sec 4:36 3:04 2:18 1:50 1:32
500
2000
DCA R-325 111.0
GTN 323
OXONN LOM/INT I-DCA 5.6
PISCA INT I-DCA 10.7
I-DCA 1
MM
1551
1600
007°
2500
Procedure Turn NA
GS 3.00° TCH 51
0.5
4.1 NM
5.1 NM
CATEGORY A B C D
S-ILS 1 215/18 200 (200-½)
S-LOC 1 480/24 465 (500-½) 480/40 465 (500-¾) 480/50 465 (500-1)
CIRCLING 620-1 604 (700-1) 660-1 644 (700-1) 660-1¾ 644 (700-1¾) 700-2¼ 684 (700-2¼)
WASHINGTON, DC
Amdt 40 09071
WASHINGTON/ RONALD REAGAN WASHINGTON NATIONAL (DCA)
38°51' N - 77°02' W
ILS RWY 1
NE-3, 27 AUG 2009 to 24 SEP 2009
NE-3, 27 AUG 2009 to 24 SEP 2009


WASHINGTON, DC
AL-443 (FAA)
LOC/DME I-DCA
109.9
Chan 36
APP CRS
007°
Rwy Idg 6869
TDZE 15
Apt Elev 16
COPTER ILS or LOC RWY 1
WASHINGTON/RONALD REAGAN WASHINGTON NATIONAL (DCA)
NA
Use I-DCA DME when on the LOC course.
Radio altimeter required.
ALSF-2
MISSED APPROACH: Climb to 500, then climbing left turn to 2100 via DCA R-325 to GTN NDB/Int/DCA 5.9 DME and hold.
ATIS 132.65
POTOMAC APP CON 124.7 338.2
WASHINGTON TOWER 119.1 257.6
GND CON 121.7 257.6
CLNC DEL 128.25
GEORGETOWN
323 GTN
GEORGETOWN INT
DCA 5.9
113.5 AML
Chan 82
R-099
R-325
R-247
115.1 BAL
Chan 98
P-56
WASHINGTON
111.0 DCA
Chan 47
LOCALIZER 109.9
I-DCA
Chan 36
NOTE: Prohibited Area (P-56) 1.5 NM North of DCA-Avoid-Surface to 18,000 MSL
LOM
OXONN
332 DC
I-DCA 5.6
DCA
R-186
R-295
PISCA INT
I-DCA 10.7
R-274
DCA
R-185
2500 to PISCA INT
321° (3.1) and
LOC (3)
IAF
NOTTINGHAM
113.7 OTT
Chan 84
LATAS
OTT 12.2
MSA DC 25 NM
2600
10 NM
ELEV 16
TDZ/CL Rwy 1
REIL Rwys 4, 15, 22 and 33
HIRL Rwys 1-19 and 15-33
MIRL Rwy 4-22
TDZE 15
007° 4.6 NM
from FAF
500
2100
DCA R-325
111.0
GTN
323
OXONN
LOM/INT
I-DCA 5.6
PISCA INT
I-DCA 10.7
I-DCA
1
MM
1551
007°
2500
1600
(RA109')
Procedure
Turn NA
GS 3.00°
TCH 51
0.5 NM
4.1 NM
5.1 NM
CATEGORY
COPTER
B
C
D
S-ILS 1
115/16
100 (100-¼)
NA
S-LOC 1
480/24
465 (500-½)
NA
CIRCLING
NA
COPTER ILS CATEGORY II - SPECIAL AIRCREW & AIRCRAFT CERTIFICATION REQUIRED
WASHINGTON, DC
Orig-B 09071
WASHINGTON/ RONALD REAGAN WASHINGTON NATIONAL (DCA)
38°51'N-77°02'W
COPTER ILS or LOC RWY 1
NE-3, 27 AUG 2009 to 24 SEP 2009
NE-3, 27 AUG 2009 to 24 SEP 2009

christopher consultants
engineering · surveying · land planning

Potomac Village
Storm Water Master Plan Concepts
August 27, 2009
Revised: November 25, 2009

Purpose

The purpose of this document is to summarize the approach to stormwater design for the Potomac Village Development team is considering to comply with the City of Alexandria Chesapeake Bay Act utilizing Conventional, Low Impact Development (LID) and Integrated Management Practice (IMP) methodologies. LID, as defined by the LID Center in Beltsville Maryland is "an innovative stormwater management approach with a basic principle that is modeled after nature: manage rainfall at the source and using uniformly distributed decentralized micro-scale controls." The design techniques used include infiltration, filtering, storage, reuse, evaporation and detention of the stormwater. Additional studies prepared by the US EPA and others can be found at www.epa.gov and www.lowimpactdevelopment.org. A primary component of the LID design effort is the implementation of IMP's. IMP's are landscape features that form the building blocks of LID. Many components of the urban environment have the potential to serve as IMP's. They can include open spaces, sidewalks, streetscapes, roof tops, medians and parking lots.

The five basic tools of the LID system include:

1. Conservation measures
2. Impervious surface reductions
3. Slowing water flow using the landscape
4. Implementation of IMP's to reduce runoff and clean the water
5. Advocate pollution prevention measures to reduce the introduction of pollutants to the environment.

During the Coordinated Development District (CDD) process, the owners of Potomac Village are considering the implementation of a variety of BMP's, LID's and IMP's concepts to manage stormwater runoff as outlined below.

Storm Water Management

Storm Water Management quantity has not been required by the City of Alexandria for the Potomac Yard Project as a whole subject to the availability of adequate outfalls to the Potomac River and Four Mile Run. In 1995, studies were conducted, submitted and approved by the City and appropriate infrastructure was constructed to collect and convey storm water to the Potomac River and Four Mile Run. If water quantity was controlled in the conventional sense, by detaining the 2 and 10 year storm events, it is likely that the peak flows resulting from the detention would coincide with peak events of the Potomac River and Four Mile Run thus

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fairfax, virginia 22031-3907

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fax 703.273.7636
web site www.christopherconsultants.com

aggravating previously existing flood conditions. This is documented with the Four Mile Run Channel Improvement project where the Army Corps of Engineers specifically requests that storm water detention not be provided in the lower reaches of Four Mile Run. Portions of Potomac Yard and all of Potomac Village drain directly into the Four Mile Run.

Water Quality is regulated by the Chesapeake Bay Act. Implementation of the CBA was delegated to the local authorities in the State of Virginia. Therefore, in 1990, the City of Alexandria developed their version of the CBA. It is now standard procedure in the City to treat storm water and to reduce the pollutant loads draining into waterways by implementing (designing and constructing) Best Management Practice systems into a site. This regulation is what mandates the need for water quality treatment.

Existing Conditions

As most know, the land on which the proposed Potomac Village project is sited was developed from an operating railroad yard in the late 80's and early 90's into a 69 acre, 650,000 square foot Retail Center. This site is located at the north end of the Alexandria portion of Potomac Yard. Design started on the center in 1994 and construction on the various phases was completed in 1997 and 1998. When the site was developed, several techniques were developed and implemented to comply with the Chesapeake Bay Act for water quality control. Two underground infiltration systems were designed to treat the first flush of runoff from a portion of the site. One extended detention dry pond and one wet pond were also part of the solution. Several large diameter storm water conveyance pipes were designed and constructed to convey the storm water to Four Mile Run and the Potomac River. These pipes were sized to convey future flows from lands south of the Retail Center. See the existing conditions plan for the locations of these features. These features all still exist and are functioning as designed.

When the CDD plan for the Potomac Yard south of the Retail Center was developed and approved, the large diameter storm water conveyance pipes were planned to be used as was the large wet pond south of the existing movie theater and east of the planned Potomac Avenue. The design solution anticipated with the approved CDD plan included an expansion of the Retail Center Wet Pond with the pond being integrated into the proposed Landbay K Park and open space system as an open space amenity. There was also another wet pond planned further south near Monroe Avenue and the incorporation of bioretention facilities (later approved with sand filters) into the Landbay K park. These additional systems along with the expansion and upgrade to the existing wet pond south of the movie theatre would bring the site into compliance with the City's CBA ordinance.

Design Approach

We have prepared the attached plan and handouts which will identify conceptually, the technical approach to our solution to providing water quality treatment for this project. In addition, the design team has been enhanced by adding WSSI to the team to enhance our approach to stormwater. We have included with this effort a brief history of the project, a written description of the existing conditions (both noted above) and included as part of the plan set an existing condition plan for the project. We have provided an overview of the design requirements and what a LID/IMP system is. We have provided existing and proposed drainage divide maps, an

overall grading plan, a detailed grading plan of the new wet pond designed as a Level II facility as described by the proposed Virginia stormwater regulations and the "older" water quality work sheets as currently required by the City. The purpose of including the worksheet is to show that we can comply with the City's current CBA. We have also included a supplemental memorandum by WSSI which establish new performance standards that meet or exceed the currently proposed storm water regulations in Virginia.

Potomac Village

We are considering the following solutions to treat the stormwater quality for this site in compliance with the CBA:

1. Design of an open space amenity at the north end of the site adjacent to Four Mile Run that includes a storm water feature. This facility will include a Level II wet pond and will treat approximately 2/3 of the sites runoff. See the drainage divide map for the area being treated by this facility. The water quality volume is provided in the BMP narrative and is based upon the site drainage areas overall impervious cover. The calculations are of course subject to final engineering and confirmation of site impervious cover. See WSSI memorandum for performance standards.
2. All of the building on this site will be designed with "green roofs" with 6" of soil. For our purposes, the following forms the foundation for our calculations:
    a. 50% of each building block will be considered impervious.
    b. Of the 50 % that is pervious, half will be green and half will have porous surface materials, i.e. pavers, bricks, etc.
    c. "C" values used to calculate storm water runoff and water quality volume will be reduced to 0.7 or less from the conventional 0.9 for roof tops.
3. The southern portion of the Potomac Village project cannot drain by gravity to the proposed wet pond. We therefore propose to implement a variety of LID/IMP, both modern and conventional, to treat this area. These systems could include any of the ones detailed in the attached backup information in addition but not limited to:
    a. Bioretention basins and filters (rain gardens)
    b. Sand filters
    c. Cartridge filtering systems
    d. Tree box filtering systems (a Filterra type of system)
    e. Bioretention Curb Extensions and Sidewalk Planters
4. We are considering using a block by block rainwater harvesting system that may reuse storm water from the 50% impervious roof tops for irrigation purposes. This concept will be subject to an irrigation supply and demand study but we intend to meet the goals proposed by WSSI.
5. The use of porous pavement (brick pavers or other material) for parallel parking in the public right of way.
6. The use of Rain Gardens in the open spaces within each block.
7. The use of a significant number of tree wells that will be 5' by 10' along all city streets. (see open space plan by others)
8. The use of green spaces within public rights of way at street intersections, bus stops, etc (see open space plan by others)
9. Implementation of a variety of structured systems at each inlet to begin to treat the water at the source and to slow it down.

10. As the project proceeds to be developed over the next several years, technology will change and improve. We do not want to limit ourselves at this time to whatever technology will make itself available in the future.

We do not think the following are applicable systems to be used on this site for a variety of reasons:

1. Systems relying solely on infiltration – limited by existing soil conditions, but bioretention systems with engineered soils and sub-surface pipe drainage systems may be used.
2. Bioretention and vegetated swales (grass swales are not applicable in this dense urban environment unless permitted by the City to be incorporated into the linear park system).

Landbay G (offsite water)

This Landbay was planned and designed to drain to an expanded wet pond on the southern edge of Landbay F. The expansion area has been planned on land to be dedicated by Potomac Yard Development for Landbay K. As mentioned above, this pond was to be expanded in size and upgraded to be an open space amenity in Landbay K, the linear park. If the alignment of Potomac Avenue is revised as proposed in the applicant's preferred alternative, space on the surface for this facility will be eliminated. We have developed a unique solution to this problem. The concept is to divert the first ½ inch of runoff from Landbay G into an underground storage vault. Once this vault is full, the larger storm events will be diverted into the existing large diameter storm water conveyance system which drains to Four Mile Run. We will then have designed into the storage tank, a pumping system (with backup generator) to elevate the storm water to the linear park adjacent to the railroad corridor. This water will flow in an underground drainage system, vegetated or hardscaped swale to a series of treatment systems. These systems will be made of a variety of IMP's as outlined above but most likely an underground treatment system. The possible systems can include a vegetated swale, a cartridge treatment system, tree wells, rain gardens or sand filters within Potomac Avenue or the new Park to treat the water. In addition, it is possible that this water could also be used completely or partially to irrigate the portions of the Landbay K park system

Conclusion

Let us now review once again the principal tools used in a LID/IMP storm water system and how we measure up:

1. Conservation measures:
   Given that his site is highly developed as a retail center, that Four Mile Run is a gabion flood control project designed by the Corp in the late 70's, and that until 1995, this was an operating railroad, there are not many natural features if any to protect. So this tool is not applicable.
2. Impervious surface reductions:
   As an operating retail center and a previous operating railroad yard, this site, as it stands today has a significant amount of impervious surface (parking and roof tops). With this redevelopment, over 25% of this site is planned to be pervious. See open space plan by others. This is a good tool for us.

3. Slowing water flow using the landscape

   We are considering the use of a variety of IMP systems described above, including biofiltration, green roofs, bioretetion systems being integrated into the public and open spaces that are hardscaped and water reuse for landscape irrigation purposes.

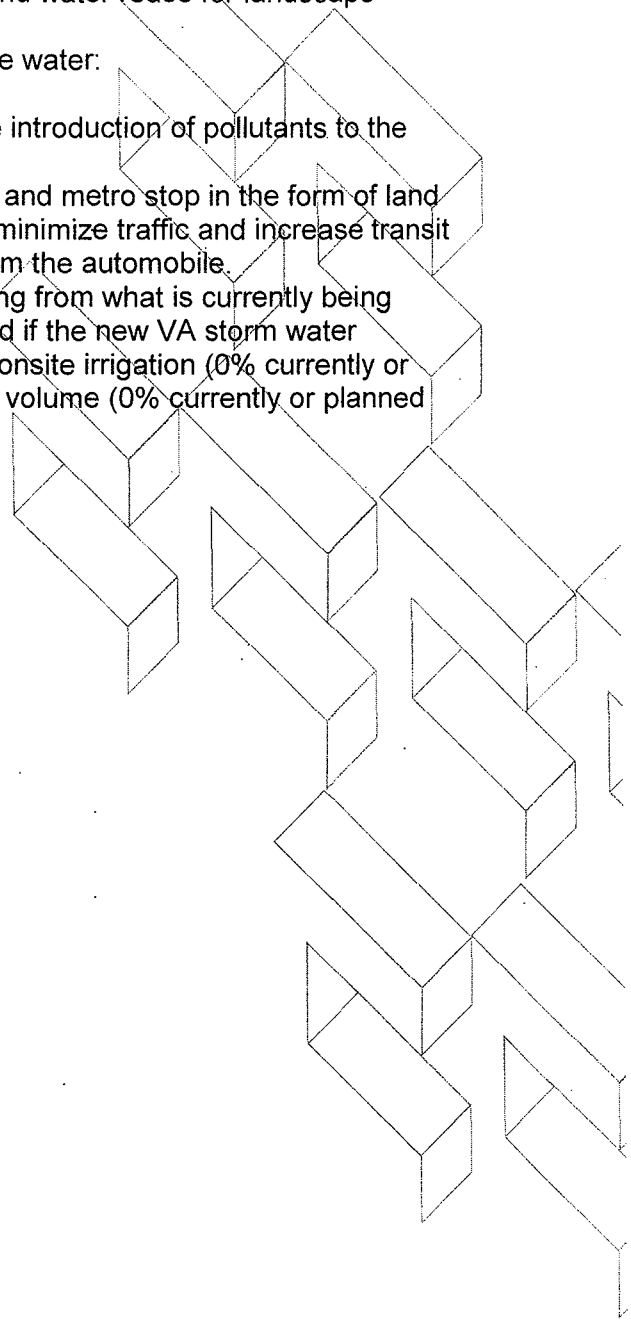
4. Implementation of IMP's to reduce runoff and clean the water:

   See above

5. Advocate pollution prevention measures to reduce the introduction of pollutants to the environment

   a. The owner is helping to finance a BRT system and metro stop in the form of land donations, financial contributions, etc that will minimize traffic and increase transit ridership, thus reducing pollutant discharge from the automobile.

6. This plan proposes a 60%+ reduction in nutrient loading from what is currently being generated on the site (40% below what will be required if the new VA storm water regulations are approved), a 15% rainwater reuse for onsite irrigation (0% currently or planned to be required) and a 30% reduction in runoff volume (0% currently or planned to be required).



Wetland Studies and Solutions, Inc.

MEMORANDUM

To: **Bill Zink (via e-mail: billzink@ccl-eng.com)**

From: **Jennifer Brophy-Price**

Date: **November 24, 2009**

Re: **Potomac Village Stormwater Concepts**
Performance Specifications
WSSI #21812.01

Cc: **Mike Rolband, WSSI (via e-mail: mrolband@wetlandstudies.com)**
Morgan McCaffrey, McCaffrey Interests
(via e-mail: mmccaffery@mccafferyinterests.com)

Pursuant to Task B of the October 21, 2009, Agreement between Wetland Studies and Solutions, Inc. (WSSI) and McCaffrey Interests (the "Client"), this memo details the draft stormwater-related performance specifications for the Potomac Village project (the "Project").

WSSI has developed three performance specifications for the Project: Nutrient Loading, Water Harvesting and Reuse, and Total Runoff Volume Reduction. The specifications were developed after modeling various scenarios with the Virginia Runoff Reduction Method (VRRM) Worksheet (revision 9/30/2009). Based on the models, the performance specifications below are achievable using currently technology and allow for flexibility for future technologies.

Performance Specifications and Discussion

1. *Nutrient Loading*
   The Project shall achieve an overall post-development TP load less than or equal to 0.65 lb/ac/yr. The post-development load shall be calculated using the Virginia Runoff Reduction Method (VRRM) Worksheet (revision 9/30/2009), published by the Virginia Department of Conservation and Recreation (DCR). The loading calculations shall be performed on a block-by-block basis and shall include the effects of community-wide BMP's (such as the wet pond) that are proposed in the Plan Set titled, "Potomac Village BMP Exhibit," and dated August 28, 2009, as they apply to the subject block. For the purposes of the loading calculations, a block shall be defined as the area enclosed by the centerlines of adjacent streets; blocks shall include the portion of each adjacent street that falls within the area bounded by the centerlines.

   Those blocks served by the proposed Level II wet pond (as defined in Virginia DCR Stormwater Design Specification No. 14, Version 1.6, dated September 30, 2009) shall maintain a TP load less than or equal to 0.60 lb/ac/yr, and those blocks not served by the proposed Level II wet pond shall maintain a TP load less than or equal to 0.80 lb/ac/yr, to achieve an overall total TP load less than or equal to 0.65 lb/ac/yr.

   During the construction phase of the project, the TP load from all portions of the site shall be less than or equal to 0.80 lb/ac/yr. "Construction phase" shall be defined as any point in

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time that the proposed wet pond is in use as an erosion and sediment control BMP for purposes of constructing any portion of the Potomac Village site. Once all erosion and sediment control bonds for the project have been released, those blocks served by the wet pond shall achieve a TP load less than or equal to 0.65 lb/ac/yr.

Discussion:
Article XIII, Section 13-1036(S), of the Zoning Ordinance of the City of Alexandria (the "City"), codified through Ordinance No. 4609, adopted June 23, 2009, defines redevelopment as, "the process of developing land that is or has been previously developed." This definition applies to the Project site; therefore, the proposed DCR stormwater regulations require that the site achieve a 20% reduction in Total Phosphorus (TP) from the previous development (from approximately 1.70 lb/ac/yr to approximately 1.36 lb/ac/yr). The Project, however, seeks to go well beyond the requirements of the proposed regulations by reducing TP by over 60% to 0.65 lb/ac/yr.

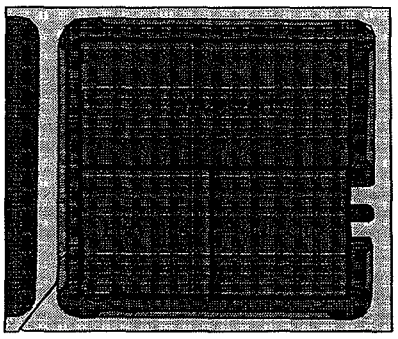
The project's construction phase presents a unique issue with regards to the proposed wet pond. It is anticipated that, during project construction, the wet pond will act as a sediment basin to control erosion and sediment runoff and will not effectively serve as a stormwater management BMP. Therefore, those areas served by the wet pond will require a TP loading goal equal to the loading required by the areas not served by the wet pond until such time as the wet pond is taken offline as an erosion and sediment control.

Calculating all post-development loads with the VRRM Worksheet (revision 9/30/2009) will ensure that all calculations are done on "equal footing" and are based on the most up-to-date regulations at the time of Master Plan approval.

2. *Water Harvesting for Reuse as Irrigation*
The Project shall re-use no less than 15% of the total annual runoff volume from the roof of each building, not to include the "green" or "pervious" portions of each roof, for irrigation of street-level and/or green roof landscaping. "Green roof" shall be defined as all rooftops that are deliberately covered with planting media and vegetation. "Pervious roof" shall be defined as all rooftops that are deliberately covered with pervious pavers or other pervious surfaces underlain by at least 6" of soil or drainage media. The storage tank size(s) for each block shall be calculated using at least 10 years of historic data from Reagan National Airport to ensure 15% annual reuse during a typical year. A typical year shall be defined as any year whose annual precipitation falls within one standard deviation of the mean annual precipitation of the historic data set used for the sizing calculation.

Discussion:
WSSI used the Cistern Design MS-Excel Spreadsheet, v. 1.0[1], to determine the runoff reduction credit for rainwater harvesting with the assumption that runoff from one-half of the total roof area would be harvested to irrigate of 6,000 square feet per block (see below). The Mechanical, Electrical, and Plumbing engineer for each block will need to design the rainwater harvesting system and determine the actual runoff reduction achieved.

[1] Available at the Virginia Stormwater BMP Clearinghouse website: http://www.vwrrc.vt.edu/swc/.



Typical Block Layout
Total area = 4.02 ac.
Total roof area (red) = 2.30 ac.
Harvested roof area = 1.15 ac.
Irrigated area (assumed) = 0.14 ac.

Other areas (assumed):
Yellow = asphalt
Blue = sidewalk
Green = pervious parking

Please note that roof delineations in the above graphic are for the sole purpose of illustrating the percentage of rooftops assumed to be harvested in the VRRM model and do not indicate or illustrate the actual layout of any roof.

The 1" storm accounts for approximately 93% of the total rainfall in the Washington, DC area; therefore; to achieve a reduction of 15% of the total annual rainfall volume from each roof (not including the "green" or "pervious" portions), a minimum of 16.2% of the first 1" of rainfall must be harvested and re-used from each roof (not including the "green" or "pervious" portions). This can be achieved using the area assumptions above.

3. *Total Runoff Volume Reduction*
The Project shall reuse, evapotranspirate, or infiltrate a minimum of 30% of the total volume generated on the site by 1" of rainfall. Runoff volume reduction will be calculated on a block-by-block basis using the VRRM Worksheet (revision 9/30/2009). For the purposes of the loading calculations, a block shall be defined as the area enclosed by the centerline of adjacent streets; blocks shall include the portion of each adjacent street that falls within the area bounded by the centerlines.

Discussion:
Because the VRRM does not give runoff reduction credit for wet ponds, Specification 3 does not require different achievement goals based on whether or not certain blocks are serviced by the proposed wet pond (unlike Specification 1, Nutrient Loading).

Calculating all post-development loads with the VRRM Worksheet (revision 9/30/2009) will ensure that all calculations are done on "equal footing" and are based on the most up-to-date regulations at the time of Master Plan approval.

Conclusion

This memo has presented three performance specifications for the Potomac Village project. The specifications were developed after WSSI modeled several scenarios using the VRRM Worksheet (revision 9/30/2009); we believe that these specifications give flexibility in the BMP's required to achieve the goals outlined in the specifications.

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Low Impact Development Design Strategies

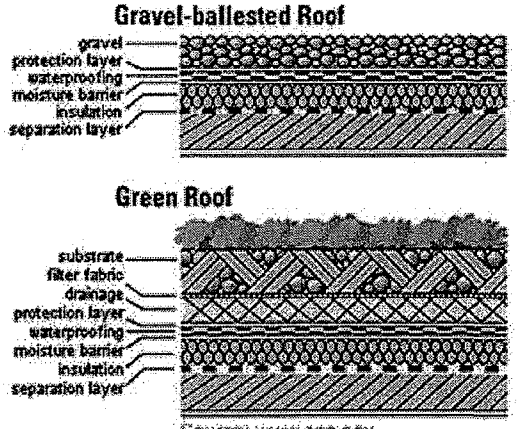
Revised: November 25, 2009

Potomac Village

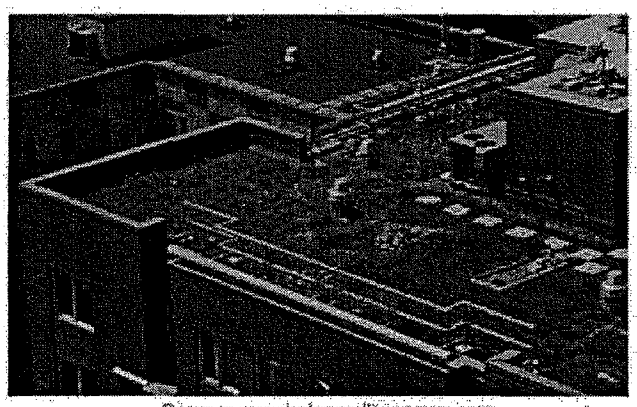
Green Roofs

Green roofs are designed to support plants and mitigate the effects of urbanization on water quality by filtering, absorbing, and detaining rainfall. There are two basic types of green roofs: extensive and intensive. Extensive roofs form a thin vegetated sheath. Their low profile allows them to be added to existing buildings. By contrast, intensive roofs are integral to the roof structure, permitting the use of trees and walkways. A greater depth of media and a greater roof structural capacity may be required to accommodate larger vegetation and surface features.

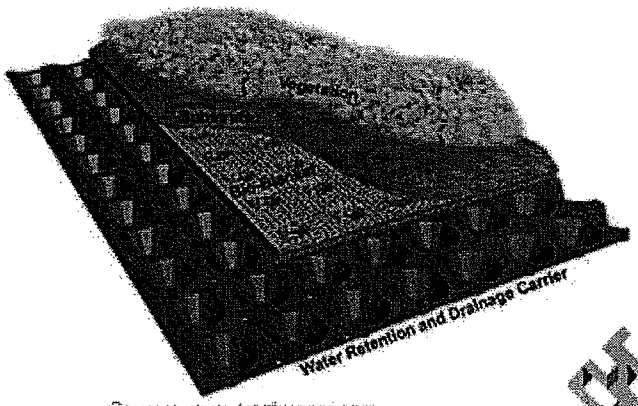
Source: lowimpactdevelopment.org; August 2009



Source: www.epa.gov



Source: www.balancedlivingmag.com



Source: www.treehugger.com

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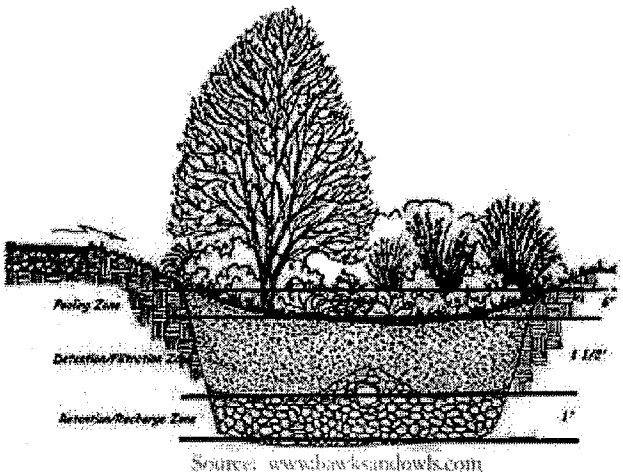
August 2009

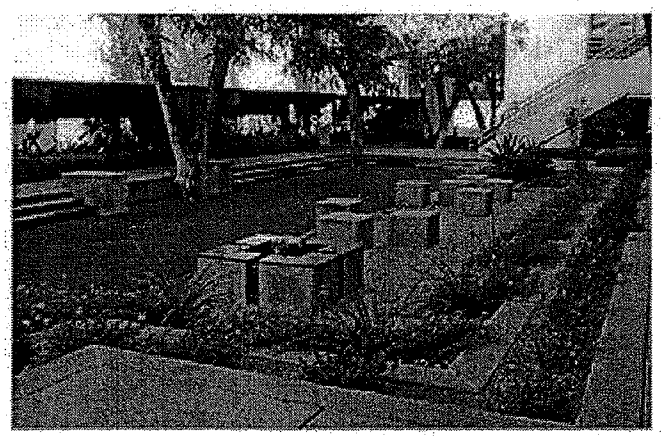
Rain Garden

Rain gardens, also known as bioretention cells, are vegetated depressions that store and infiltrate runoff. Rain gardens are designed to encourage vegetative uptake of stormwater to reduce runoff volume and pollutant concentrations. A well design rain garden has an engineered soil which maximizes infiltration and pollutant removal while avoiding stormwater ponding for longer than 24 hours.

Source: lowimpactdevelopment.org; August 2009



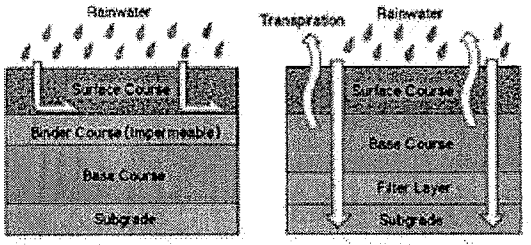
Source: www.bowlsandbowls.com



Porous Pavement

Porous pavement includes pavers, asphalt, and concrete that allow stormwater to pass through voids in the surface and infiltrate into the subbase. The subbase provides storage for stormwater. In unlined systems, infiltration into the underlying soil may also be possible.

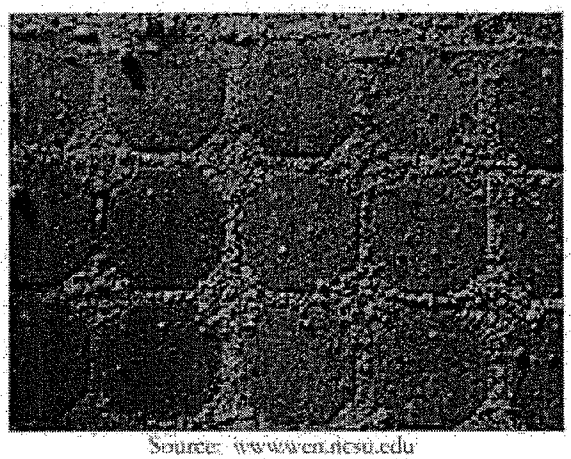
Source: lowimpactdevelopment.org; August 2009



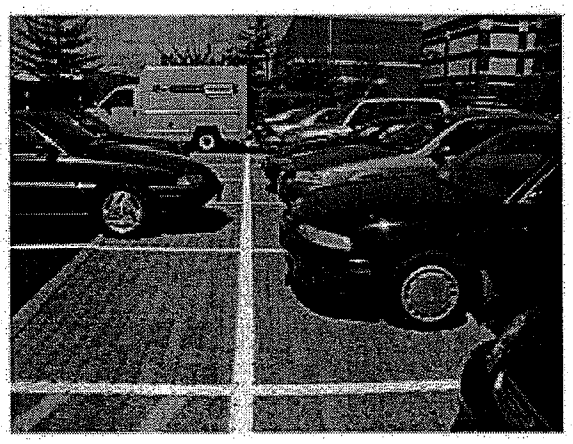
Drainage Pavement
Rainwater penetrate into voids in the porous surface layer and is **drained out** to the roadside drainage system. Rainwater doesn't penetrate into Binder Course and lower layers. This pavement is mainly applicable to roads in a city area and highways.

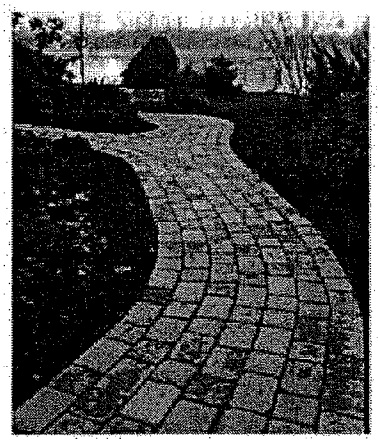
Permeable Pavement
Rainwater penetrate into porous surface layer, base course layer and subgrade. Water is **retained** in the pavement structure and **returned to underground.** This pavement is mainly applicable to the sidewalk pavement, parking lot and light traffic roads in a city

Source: www.nipponroad.co.jp



Source: www.wcn.nesu.edu

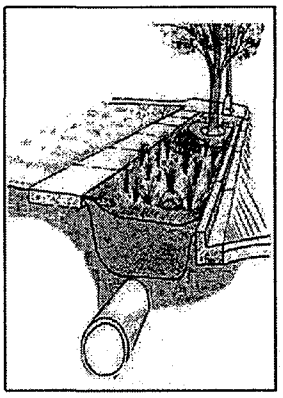




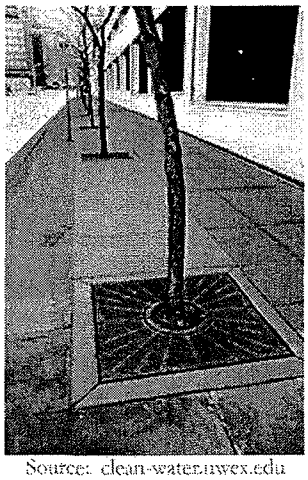
Tree Box Filters

Tree box filters are in-ground containers typically filled with bioretention type soil media containing street trees in urban areas. Runoff is directed to the tree box, where it is filtered by vegetation and soil before entering a catch basin. Tree box filters enhance pollutant removal and are ideal for ultra urban settings and spaces where rain gardens are not practicable.

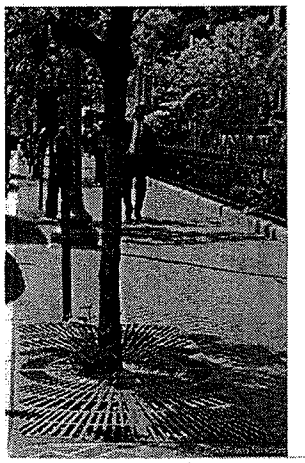
Source: lowimpactdevelopment.org; August 2009



Source: www.lowimpactdevelopment.org



Source: clean-water.uwex.edu



Source: www.coolfownstudios.com

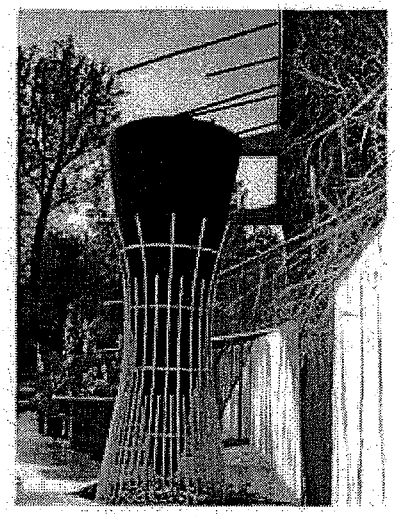
Filterra

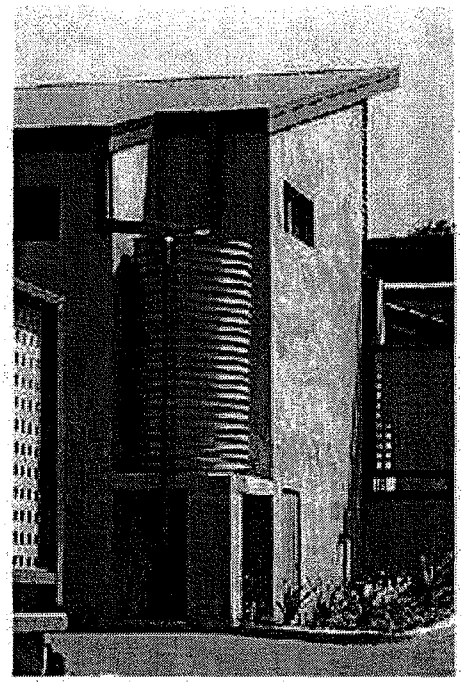
Filterra Bioretention Systems capture, cycle and immobilize stormwater pollutants to treat urban runoff. For effective stormwater management, the combination of landscape vegetation and a specially designed filter media allows bacteria, metals, nutrients and total suspended solids (TSS) to be removed naturally. Filterra is well suited for the ultra-urban environment with a high removal efficiency for many stormwater pollutants. Its small footprint allows it to be used in highly developed sites such as landscaped areas, green space, parking lots, and streetscapes.

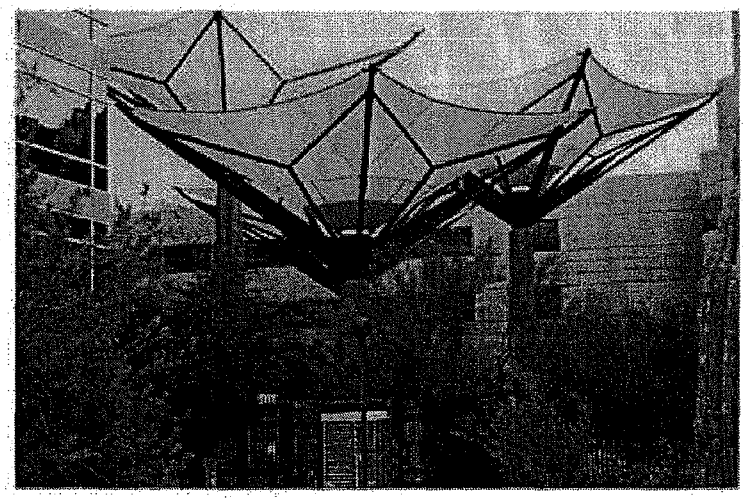
Source: filterra.com; August 2009

Rainwater Catchment

Rainwater Catchment Facilities can collect and store rainwater, which can be reused for irrigation purposes.







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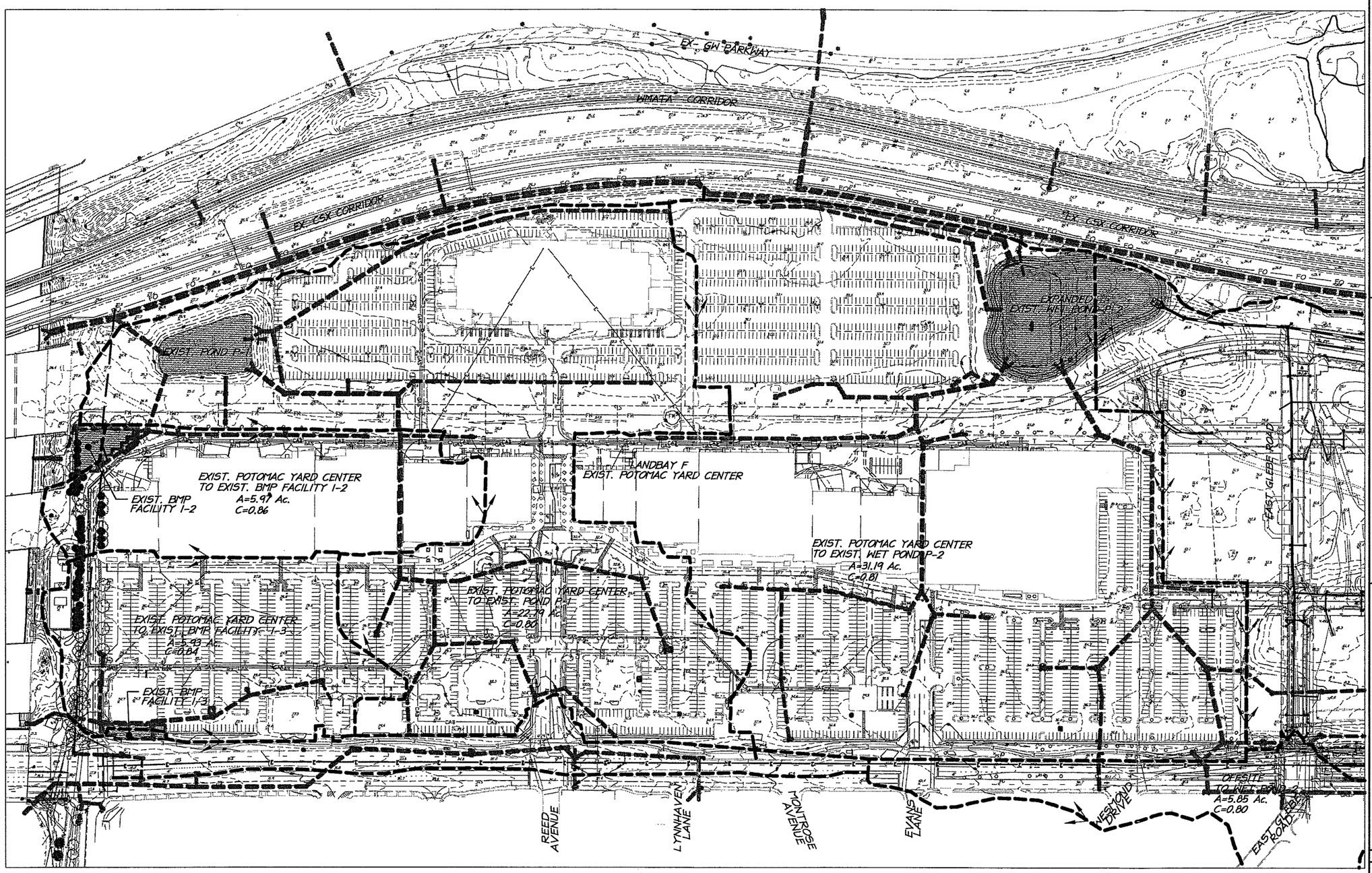

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703.273.6820 · fax 703.273.7636

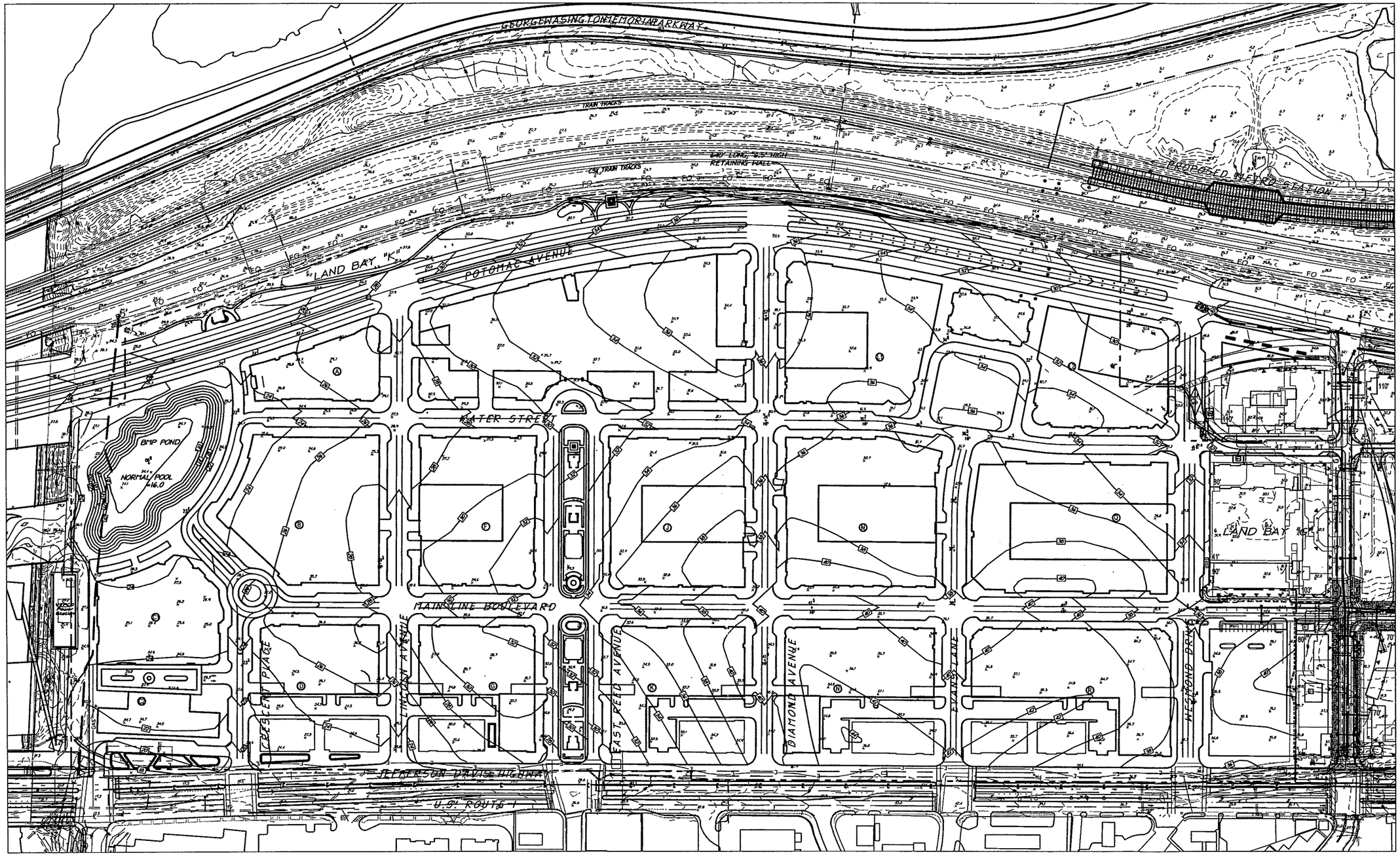
BMP EXHIBIT
EXISTING CONDITIONS

POTOMAC VILLAGE

THE CITY OF ALEXANDRIA, VIRGINIA

PROJECT NO:	8824F6.00
SCALE:	1" = 100'
DATE:	8/28/2009
DESIGN:	MAC
DRAWN:	MAC
CHECKED:	KAU
SHEET No.	1 OF 5

C-5844



LEGEND

- PROPOSED CONTOUR
- PROPOSED SPOT LOCATION
- EXISTING SPOT LOCATION
- PROPERTY LINE

NOTES:

1. EXHIBIT DOES NOT SHOW 500' NATIONAL PARK SERVICE BUILDING RESTRICTION LINE.
2. PROPOSED GRADES ARE BASED ON GRADES TIEING INTO THE EXISTING ROUTE 1 CURBLINE.

100 75 50 0 100 200
GRAPHIC SCALE
1" = 100'

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703.273.6820 · fax 703.273.7636

BMP EXHIBIT
PROPOSED GRADING
CONCEPT II

POTOMAC VILLAGE

THE CITY OF ALEXANDRIA, VIRGINIA

PROJECT NO:	8824F6.00
SCALE:	1" = 100'
DATE:	8/28/2009
DESIGN:	MAC, JL, DJ
DRAWN:	MAC
CHECKED:	KmL
SHEET No.	2 OF 5

C-5844

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703.273.6820 · fax 703.273.7636

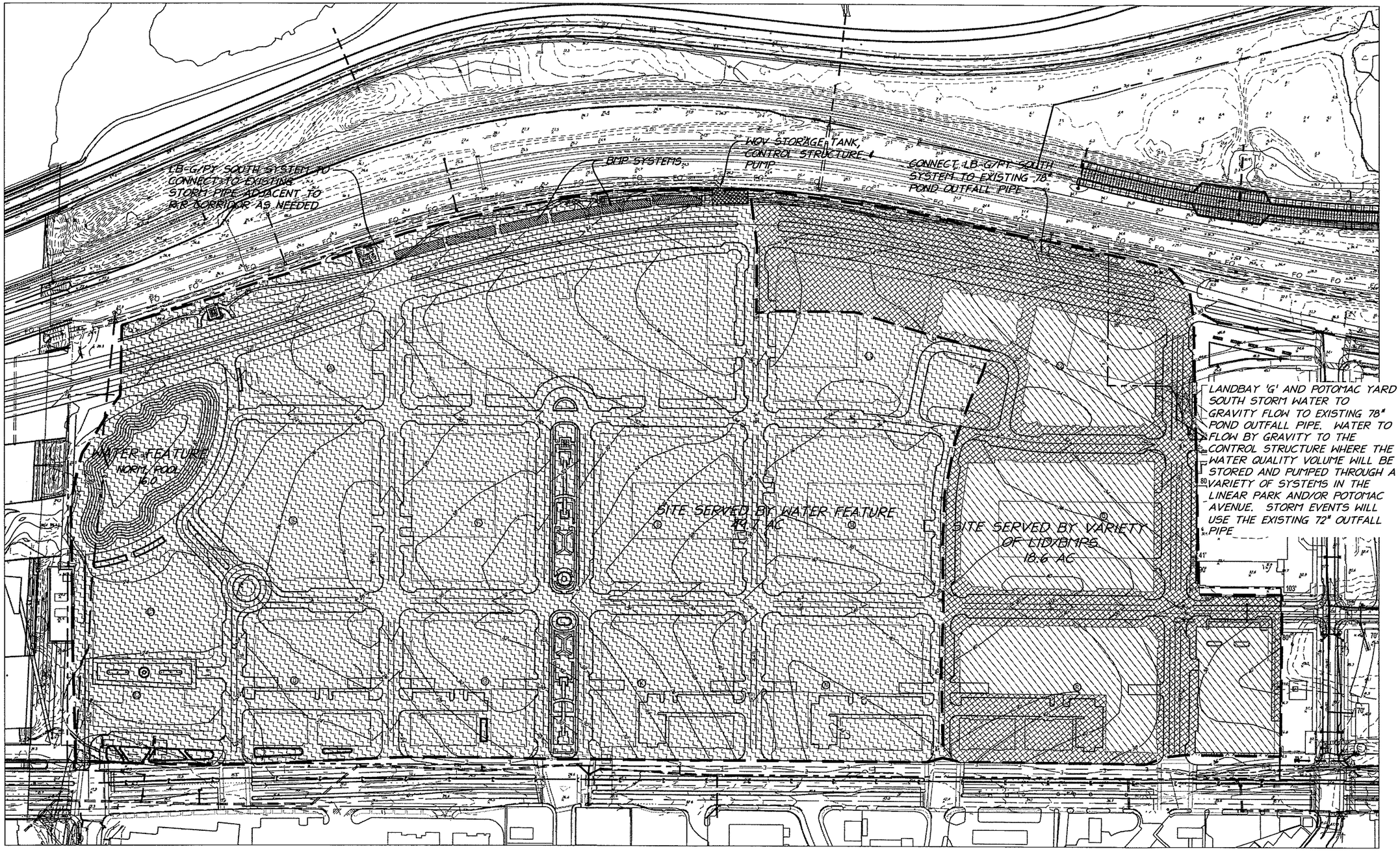
BMP EXHIBIT
PROPOSED GRADING
CONCEPT II
POND DETAIL - LEVEL I DESIGN

POTOMAC VILLAGE

THE CITY OF ALEXANDRIA, VIRGINIA

PROJECT NO:	8824F6.00
SCALE:	1" = 25'
DATE:	8/28/2009
DESIGN:	JL, MAC
DRAWN:	MAC
CHECKED:	KMW
SHEET No.	3 OF 5

C-5844



LEGEND

- PROPOSED CONTOUR
- PROPOSED SPOT LOCATION
- PROPERTY LINE
- PROPOSED BMP DIVIDE
- SERVICED BY 60% EFFICIENCY SYSTEM
- SERVICED BY A VARIETY OF SYSTEMS (MIN. 15% EFFICIENCY)
- SERVICED BY WATER FEATURE

GRAPHIC SCALE 1" = 100'

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703.273.6820 · fax 703.273.7636

BMP EXHIBIT
PROPOSED BMP MAP

POTOMAC VILLAGE

THE CITY OF ALEXANDRIA, VIRGINIA

PROJECT NO. 88246.00
SCALE: 1" = 100'
DATE: 8/28/2009
DESIGN: JL, MAC
DRAWN: MAC
CHECKED: KMJ
SHEET No.

4 OF 5

C-5844

BEST MANAGEMENT PRACTICES (BMP) NARRATIVE

THIS PROJECT, POTOMAC VILLAGE, CONCEPTUALLY PROPOSES TO TREAT THE STORMWATER QUALITY VOLUME FOR THIS SITE FOR COMPLIANCE WITH THE CHESAPEAKE BAY ACT (CBA) AND THE CITY OF ALEXANDRIA REQUIREMENTS THROUGH THE USE OF AN OPEN SPACE AMENITY AT THE NORTH END OF THE SITE ADJACENT TO FOUR MILE RUN THAT INCLUDES A STORM WATER FEATURE. APPROXIMATELY 2/3 OF THE 69.14 ACREA SITE WILL DRAIN TO THIS WATER FEATURE. THE REMAINING 1/3 OF THE SITE WILL BE TREATED WITH A VARIETY OF LOW IMPACT DEVELOPMENT (LIDs) AND INTERGRATED MANAGEMENT PRACTICE (IMPs) FACILITIES. IN ADDITION TO THE BMP DEVICES EMPLOYED FOR THIS PROJECT, 50% OF ALL THE BUILDINGS ON THIS SITE WILL BE DESIGNED WITH GREEN ROOFS. C VALUES USED TO CALCULATE WATER QUALITY VOLUME FROM THE GREEN ROOFS WAS REDUCED TO 0.7 FROM THE CONVENTIONAL 0.9 USED FOR ROOF TOPS.

AS MENTIONED ABOVE, 2/3 OF THE SITE OR 49.7 ACRES WILL DRAIN TO THE WATER FEATURE AT THE NORTH END OF THE SITE. THE TOTAL WET STORAGE VOLUME REQUIRED FOR THE WATER FEATURE IS 299,592 CF AND CAN BE MET IN THE FACILITY AS CURRENTLY PLANNED. OF THE REMAINING 18.6 ACRES, 10.4 ACRES WILL BE TREATED WITH A VARIETY OF LIDs AND IMPs AND 8.2 ACRES WILL BE TREATED WITH SANDFILTERS OR SIMILAR SYSTEMS LOCATED WITHIN THE BUILDING BLOCK. WE HAVE ASSUMED THE LOWEST EFFICIENCY OF 15% THAT IS RECOGNIZED BY THE CITY OF ALEXANDRIA FOR OUR COMPLIANCE CHECK CALCULATIONS FOR LIDs AND IMPs. THE REMAINING 0.84 ACRES FROM THE SITE WILL BE UNTREATED.

IN ADDITION TO THE BMP FACILITIES EMPLOYED FOR THIS SITE, APPROXIMATELY 33 ACRES FROM THE SOUTH WILL NEED TO BE TREATED WITH THIS PROJECT BECAUSE OF THE PROPOSED REMOVAL OF THE EXISTING/PLANNED WET POND EXPANSION (REFERRED TO AS P-2) AT THE SOUTH END OF THE SITE DUE TO THE NEW METRO STATION. AN UNDERGROUND FACILITY IS PROPOSED TO STORE THE WATER QUALITY VOLUME TO ALLOW FOR A PUMP TO ELEVATE THE FLOW TO A MAN-MADE CONVEYANCE SYSTEM. THE SYSTEM WILL PERIODICALLY DRAIN THE STORM WATER INTO A WATER TREATMENT SYSTEM (BIORETENTION, SAND FILTER, OR CARTRIDGE SYSTEM WHERE THE RUNOFF CAN BE TREATED TO MEET THE POLLUTANT REMOVAL REQUIREMENTS).

THE CITY OF ALEXANDRIA'S WORKSHEET A (NEW DEVELOPMENT) HAS BEEN USED TO CALCULATE THE POLLUTANT REMOVAL REQUIREMENT FOR THIS 69.14 ACRE PROJECT. THIS WORKSHEET WAS USED BECAUSE THE EXISTING RETAIL CENTER IS SERVED BY SEVERAL WATER QUALITY FACILITIES AND IS PREDOMENTLY IMPERVIOUS. THE POLLUTANT REMOVAL REQUIRED FOR THIS PROJECT IS 171 LBS/YEAR. AS SHOWN WITH COMPLIANCE WORK SHEET C, 192 LBS/YEAR WILL BE REMOVED WITH THE MEASURES BEING CONSIDERED FOR THIS SITE.

ALEXANDRIA, VIRGINIA
PHOSPHOROUS
LOADING COMPUTATIONS

WORKSHEET A: NEW DEVELOPMENT

1. Compile site-specific data and determine site imperviousness (I site).
POST DEVELOPMENT

A*	= 69.14	Acres	R_v post = 0.05 + (0.009 x I site)
I_a structures	= 0		= 0.698 unitless
parking lot	= 0		
roadway	= 0		
other	= 0		
Total I_a	= 50.11	Acres	

I site = (Total I_a /A) x 100

= 72% expressed in whole numbers

*A is the total area of the site
** I_a is the total impervious cover on the site

2. Determine need to continue.

I site	= 72%	(from step 1)
I watershed	= 41%	

If *I site* is ≤ I *watershed*, STOP and submit analysis to this point. WQV default prevails. see p.I-8 of the Alexandria Supplement.

If *I site* is ≥ I *watershed* CONTINUE.

3. Select C-values (C pre and post)

C = 0.26 mg/l when I ≤ 20
= 1.08 mg/l when I ≥ 20

Since I watershed is > 20%, C pre = [redacted] mg/l

4. Calculate the pre-development load (L pre)

L pre = 3.69 x A (acres)

= 255.13 pounds per year

5. Calculate the post-development load (L post)

L post = 8.16 x R_v x C x A

= 425.30 pounds per year

6. Calculate the pollutant removal requirement (RR).

RR = L post - L pre

= 170.18 pounds per year.

To determine the overall BMP efficiency required (%RR) when selecting BMP options :

%RR = (RR/L post) x 100

= 40.01%

ALEXANDRIA, VIRGINIA
PHOSPHOROUS
LOADING COMPUTATIONS

WORKSHEET C: COMPLIANCE POTOMAC VILLAG 5/1/2009

Select BMP options using screening tools and list them below. Then calculate the load removed for each option. **DO NOT LIST BMPs IN SERIES HERE.**

Selected Option	Removal* Efficiency (100%)	x	Fraction of CBPA Drainage Area served (expressed in decimal form)	x	B: L post (lbs/yr) A	=	Load Removed (lbs/yr)
[redacted]	[redacted]		0.719		425.30		152.8606598
			0.150		425.30		9.596081664
			0.119		425.30		30.26456525
			0.012		425.30		0
Total						=	192.7213068

* For conventional BMPs, see section IIa of the Northern Virginia BMP Handbook (VNBMPHB) published by the Northern Virginia Planning District Commission or Chapter 1 of the Alexandria Supplement to the NVBMPHB. For non-conventional BMPs, see section IV, Chapter 1 of the Alexandria Supplement.

Potomac Village – North Pond Volume Computations

Drainage Area = 49.7 ac

Assumes 95% impervious area for the conceptual layout as shown:
= 48.7*0.95= 47.2 ac imp. area
Reduce impervious area to account for green roof and pervious roof open space:
Impervious Area Reduction =
(block by block tally of pervious roof area within pond drainage area)=

0.385+.095+0.870+0.665+2.250+0.955+0.675+0.765+1.125
0.73+1.255+0.845
= 11.59 ac.

Impervious area reduction = 11.6 ac
Adjusted impervious area = 47.2 – 11.6 = 35.6

C-value calculation (see note at bottom):
C_v = [35.6*0.9 + 11.5*0.7 + 2.5*0.35]/49.7 = 0.83

Per acre volumes required:
Vol/ac = 1816*C_v = 1816*0.83 = 1507 cf/ac

BMP volume V_r required:
V_r = 1507*49.7 = 74,898 cf

Total pond wet storage required:
Wet stor. = 4*V_r
= 4*74,898 = 299,592 cf

Note: C value of 0.70 used for green roof area in accordance with discussions with Alexandria TES (S.P. Singh)

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BMP EXHIBIT COMPUTATIONS

POTOMAC VILLAGE

THE CITY OF ALEXANDRIA, VIRGINIA

PROJECT NO: 8824F6.00
SCALE: N/A
DATE: 8/28/2009
DESIGN: JL
DRAWN: MAC
CHECKED: KAL
SHEET No. 5 OF 5

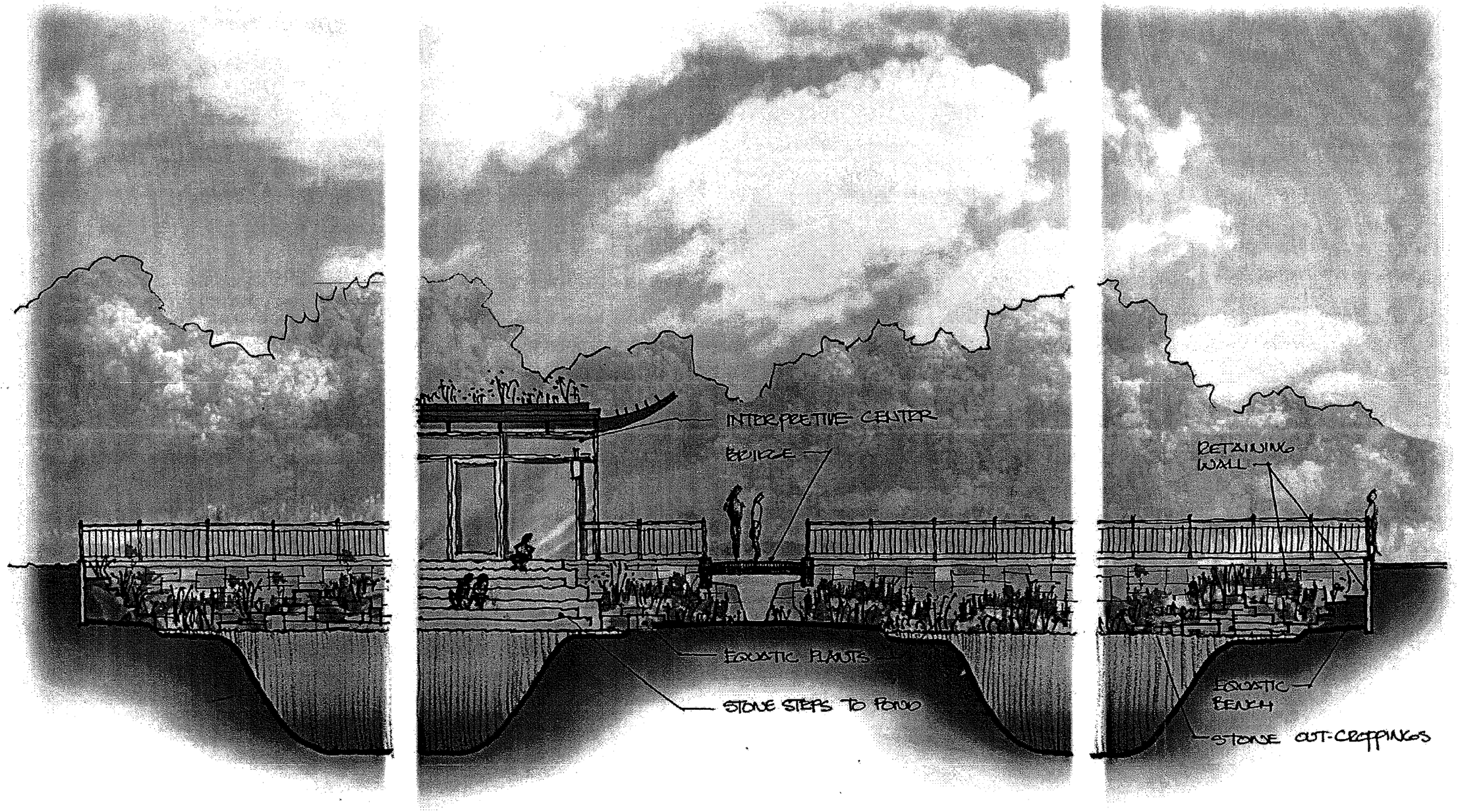
C-5844

POTOMAC VILLAGE

Crescent Pond Plan

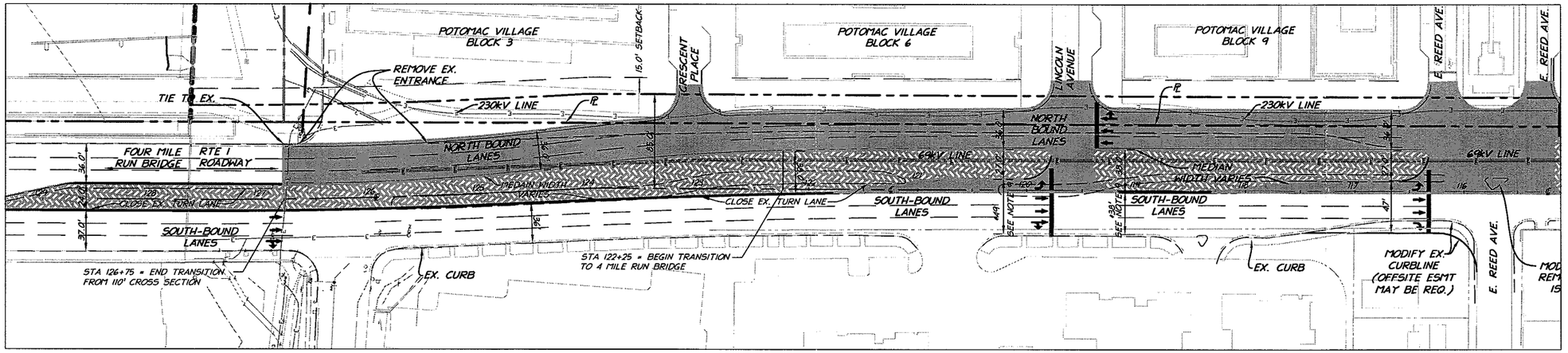
RREEF Investment Advisor | **McCaffery Interests** Developer | **Antunovich Associates** Architects & Planners

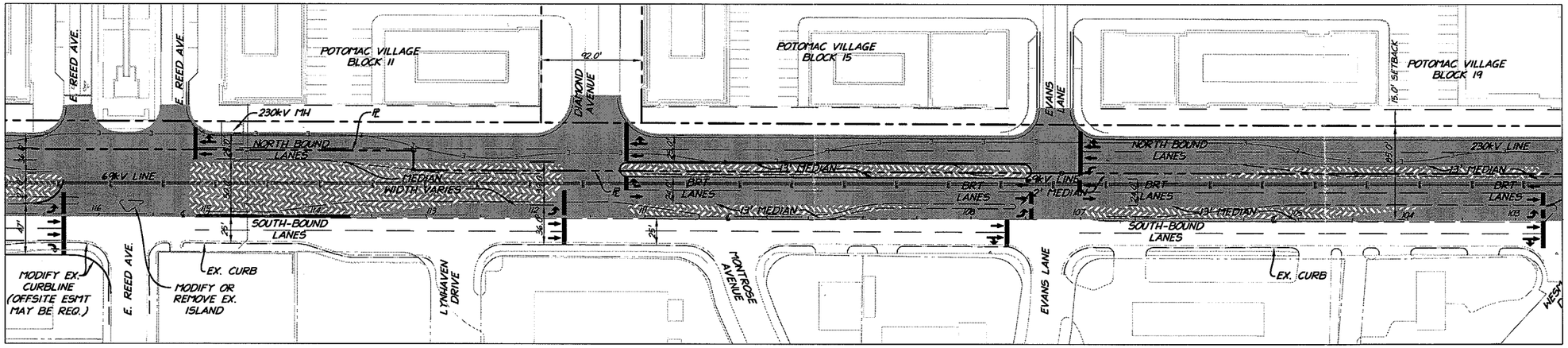
Alexandria, Virginia | **November 25, 2009**

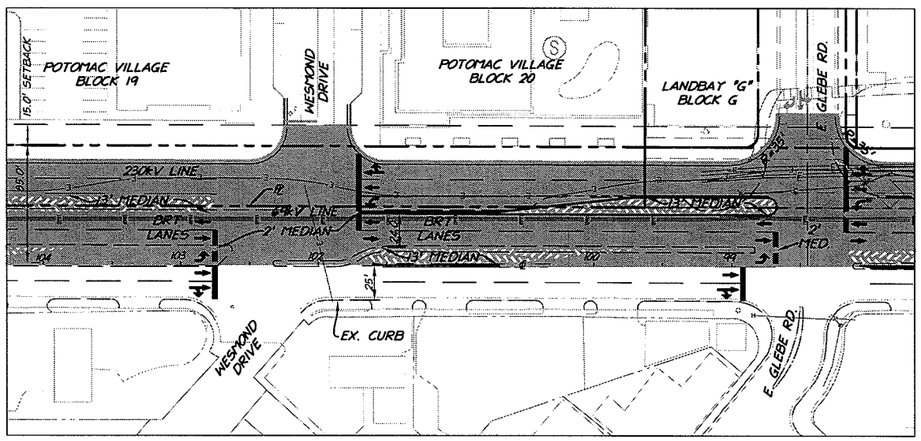


POTOMAC VILLAGE

Crescent Pond Section







SEE POTOMAC YARD, LANDBAY G FOR CONTINUATION

NOTES:

1. ROUTE 1 SECTIONS PROVIDED BY CITY OF ALEXANDRIA, T&ES, NOVEMBER 17, 2009.
2. ROUTE 1 SECTION DOES NOT MATCH SECTION SHOWN ON APPROVED PRELIMINARY PLAN DSUP 2007-0022 LANDBAY "G".
   A. LANDBAY G (101' FC TO FC):
      2-24' TRAVELWAYS
      2-12' MEDIANS
      1-29' BRT
   B. POTOMAC VILLAGE (100' FC TO FC)
      2-25' TRAVELWAYS
      2-13' MEDIANS
      1-24' BRT
3. INTERSECTIONS HAVE NOT BEEN ANALYZED FOR TURNING MOVEMENTS.
4. ROADWAY DIMENSIONS SHOWN ARE FACE OF CURB TO FACE OF CURB
5. PROPOSED WESTERN MEDIAN WILL VARY BETWEEN 12' AND 13' DEPENDING ON EXISTING LOCATION OF WESTERN CURB LINE.
6. R.O.W. SHOWN ON THE EAST SIDE OF RTE 1 WAS TAKEN FROM TAX MAP RECORDS
7. LOCATION OF BUS LANES AND LAYBYS ARE NOT KNOWN AT THIS TIME.
8. ROAD DESIGN IS CONCEPTUAL AND DOES NOT TAKE INTO ACCOUNT GRADING AND UTILITY CONSIDERATIONS UTILITY LOCATIONS AND THE PROXIMITY OF THE 230kV LINE TO THE EASTERN CURB. COORDINATION WITH DOMINION/VIRGINIA POWER WILL BE REQUIRED TO ESTABLISH FINAL DESIGN CRITERIA WITH RELATIONSHIP TO THE 230kV LINE.
9. DIMESIONS MARKED WITH "*" DENOTE AREAS WHERE EXISTING WEST CURB LINE DOES NOT FOLLOW ROUTE 1 CENTERLINE.

LEGEND:

PROPOSED PAVEMENT

PROPOSED MEDIAN

GRAPHIC SCALE
50 25 0 50 100
1" = 50'

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CONCEPTUAL
ROUTE 1
BRT AND MEDAIN EXHIBIT
BRT TO ARLINGTON

POTOMAC VILLAGE

THE CITY OF ALEXANDRIA, VIRGINIA

PROJECT NO:8824F6.00
SCALE: 1" = 50'
DATE: NOV. 30, 2009
DESIGN: MAC
DRAWN: MAC
CHECKED:
SHEET No. 1 OF 1

C-5876

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November 25, 2009

Ms. Emily Baker, P.E.
City Engineer
City of Alexandria
Transportation & Environmental Services
City Hall – Room 4130
301 King Street
Alexandria, Virginia 22314

RE: Potomac Village Sanitary Sewer Conveyance
ccl Project #8824F6.00

Dear Ms. Baker:

In preparation for the redevelopment of the existing Potomac Yard Retail Center to a mixed-use development referred to as Potomac Village, an analysis on the existing and/or future sanitary sewer conveyance systems was performed to establish the ability of these sewers to convey the waste water from the proposed development program for Potomac Village to the Alexandria Sanitation Authority (ASA) Waste Water Treatment Plant (WWTP). As part of this exercise, three different scenarios were analyzed for these systems which consist of a 24" diameter PVC pipe, a 27" diameter PVC pipe and a 30" diameter Centrifugally Cast Fiberglass Pipe (CCFP). The 24" and 27" conveyance systems are located south of the Potomac Village Site on Potomac Yard and the 30" conveyance system is located offsite within dedicated easements or the public right-of-way.

In coordination with your staff, the base line for the analysis included all anticipated sewerage flows from Potomac Village, Potomac Yard, Potomac Greens, existing development parcels, the City's CSO and future development parcels such as Jack Taylor/Hertz, Oakville Triangle, Braddock Fields and the Braddock Metro Neighborhood Plan. In addition, it was determined that the future development sites and Potomac Village be analyzed using low flow plumbing fixtures and the remaining sites be analyzed with standard plumbing fixtures. Low flow fixtures offer a reduction in water usage and are commonly associated with the Leadership in Energy and Environmental Design (LEED) program. Water savings in excess of 35% can be achieved by using low flow fixtures. The analysis utilized a conservative estimate 35% below the City's recommended average design flows for all future development parcels and standard average design flows for the remaining parcels. The analysis also took into account "n" values for the pipe's material of 0.0105 and 0.011, with 0.011 being the worst case.

In closure, the analysis performed using an "n" value (worst case) and low flow fixtures for Potomac Village and all future development parcels shows that the three sanitary conveyance systems mentioned above have the capacity to convey all sewerage flows to the WWTP. The 24" and 27" sanitary conveyance systems experienced no surcharging while the 30" sanitary conveyance system experienced minimum surcharging in six runs of the system with a

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maximum surcharge of 0.55' and minimum surcharge of 0.06' above the crown of the pipe. It is our opinion that this system is adequate to convey the proposed sewerage flows from Potomac Village, from the CSO diversion, all currently planned flows and future flows from the anticipated redevelopment of this area of the City.

Very truly yours,

Kevin M. Washington
Director of Design

Enclosures

cc: Ed Woodbury, McCaffery Interests, Inc.
Morgan Ziegenhein, McCaffery Interests, Inc.
Jonathan Rak, McGuire Woods
Joanna Frizzell, McGuire Woods
Joe Antunovich, Antunovich Associates
William R. Zink, christopher consultants

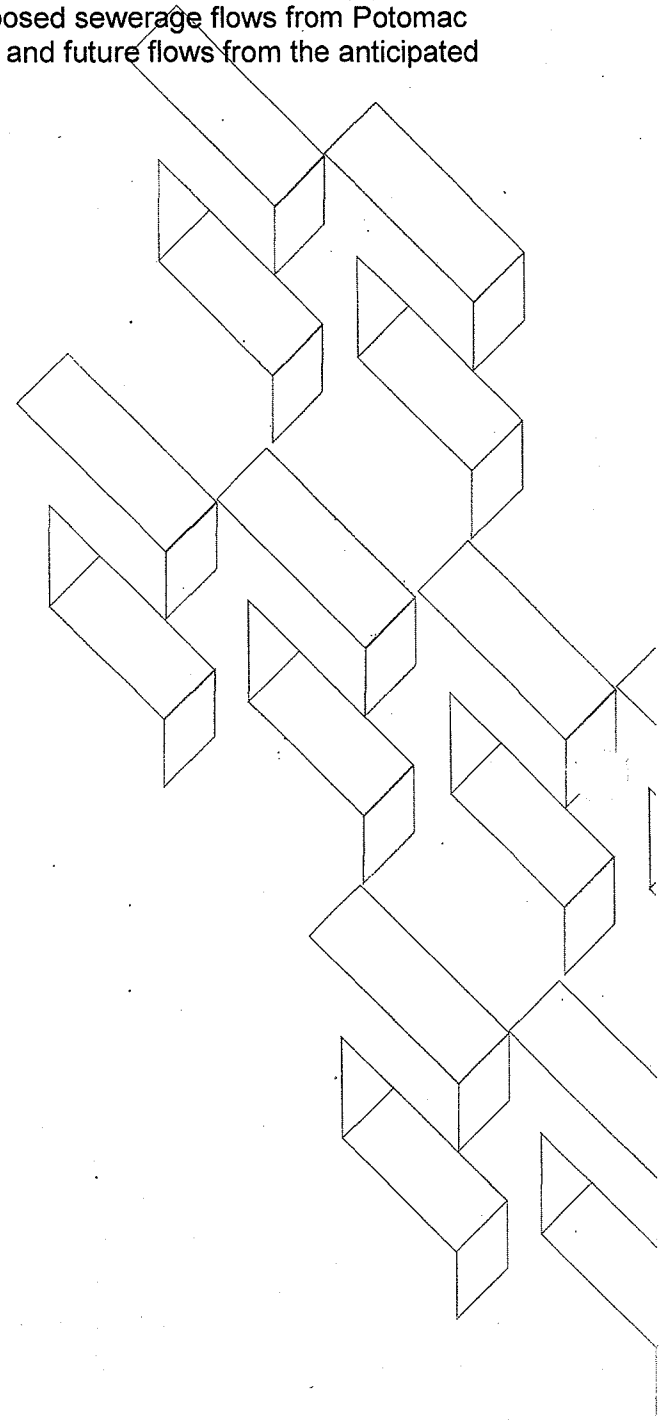


EXHIBIT 1

SANITARY SEWER FLOW SUMMARY

10-26-09

Potomac Yard	City of Alexandria's Estimate (MGD)	Applicant's Estimate (MGD)	Applicant's Estimate Low Flow Fixtures-PV (MGD)[1]	Applicant's Estimate Low Flow Fixtures All Future (MGD)[2]
Landbay F (in process)	2.1310	2.1433	1.3932	1.3932
Landbay G DSUP (nsf)	0.4966	0.4332	0.4332	0.4332
Fire Station DSUP (nsf)	0.0195	0.0263	0.0263	0.0263
Landbay H CDD	0.2356	0.2360	0.2360	0.2360
Partial I/J East DSUP (gsf)	0.2637	0.2659	0.2659	0.2659
I - CDD Balance				
J - CDD Balance				
L - CDD	0.1094	0.1100	0.1100	0.1100
A - Potomac Greens	0.0795			
K - Landbay		0.0400	0.0400	0.0400
Total	**3.3352**	**3.2547**	**2.5046**	**2.5046**
West Side Route 1, COG Round 8 preliminary projections				
Jack Taylor, Hertz	0.2420	0.2420	0.2420	0.1580
Oakville Triangle	0.1400	0.1400	0.1400	0.0910
Total West Side Rt. 1	**0.3820**	**0.3820**	**0.3820**	**0.2490**
Total Potomac Yard Area	**3.7172**	**3.6367**	**2.8866**	**2.7536**
Braddock Fields				
Braddock Fields	**0.3107**	**0.3107**	**0.3107**	**0.2039**
Braddock Metro Neighborhood Plan (MNP)				
Braddock MNP	**1.2029**	**1.2030**	**1.2030**	**0.7819**
Combined Sewer Separation				
CSO District	**0.5500**	**0.5500**	**0.5500**	**0.5500**
Existing Developments				
Clayborne	0.0231	0.0225	0.0225	0.0225
GW Club	0.0024	0.0024	0.0024	0.0024
Prescott	0.0192	0.0192	0.0192	0.0192
Monarch	0.0507	0.0504	0.0504	0.0504
Payne St	0.0627	0.0618	0.0618	0.0618
Fannon (Duke)	0.0174	0.0174	0.0174	0.0174
Total	**0.1755**	**0.1737**	**0.1737**	**0.1737**
Peaked Totals:[3]				
Potomac Yard Area	9.2931	9.0918	7.2165	6.8840
Braddock Fields	0.9321	0.9321	0.9321	0.6117
Braddock Metro Neighborhood Plan	3.6086	3.6090	3.6090	2.3457
Combined Sewer Separation	1.6500	1.6500	1.6500	1.6500
Existing Developments	0.5265	0.5211	0.5211	0.5211
Four Mile Run Pump Station	4.0000	4.0000	4.0000	4.0000
River Road Pump Station	0.5200	0.5200	0.5200	0.5200
Slater's Lane Pump Station	0.7500	0.7500	0.7500	0.7500
Total	21.2802	21.0740	19.1987	17.2825

Notes:

1. Uses Low Flow Fixtures in Potomac Village
2. Uses Low Flow Fixtures for Potomac Village, Jack Taylor/Hertz, Oakville Triangle, Braddock Fields, and Braddock MNP
3. Potomac Yard Area peaked at 2.5, all other contributing areas are peaked at 3.0

EXHIBIT 2

LDC LEHMAN DESIGN CONSULTANTS INCORPORATED

180 West Washington Boulevard
Suite 500
Chicago, Illinois 60602
Voice: (312) 201-9733
Fax: (312) 201-9734
Email: lehmandesigninc.com

October 07, 2009

Joseph Antunovich, AIA
ANTUNOVICH ASSOCIATES
224 West Huron Street, 7th Floor
Chicago, Illinois 60610

RE: **POTOMAC VILLAGE**
Alexandria, Virginia

Dear Joe,

We have reviewed the potential for water savings using low flow plumbing fixtures for the Potomac Village Redevelopment project and offer the following.

As you know, we have collaborated with McCaffery Interests and your office, as well as others, on several "High Performance" or "Green" buildings over the last few years. Many of them have been or will be certified by the United States Green Building Council (USGBC) under their Leadership in Energy and Environmental Design (LEED) program.

One of the items that all these projects had in common was water use savings in excess of **35%** achieved by use of low flow plumbing fixtures and fittings. We have attached information for typical Kohler and Grohe products used for these projects, all of which contributed to these savings as they each meet or exceed the stated goal, including:.

Fixture	Base Design	Proposed Design	Savings
WC	1.6 GPF	1.0 GPF	37.5%
Lav	2.5 GPM	1.5 GPM	40%
Shower	2.5 GPM	1.5 GPM	40%
Kit. Sink	2.5 GPM	1.5 GPM	40%

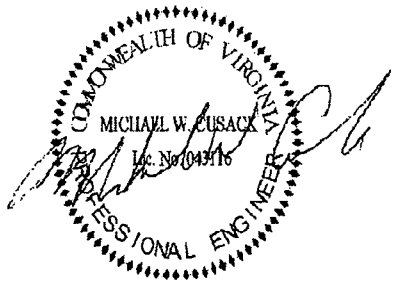
The projected water savings of 35% mentioned above is a conservative estimate as the actual savings does depend on programmatic issues, including building use, occupancy and size. Furthermore, the fixtures listed are typically residential and commercial fixtures could fare better.

If there are any questions or comments, please contact us.

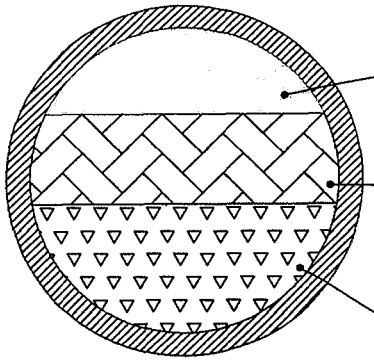
LEHMAN DESIGN CONSULTANTS, Inc.

David A. Lehman

David A. Lehman, President
Michael W. Cusack, PE



DESIGN FLOW CAPACITY 30" VCP
12.95 MGD = TOTAL AVAILABLE CAPACITY

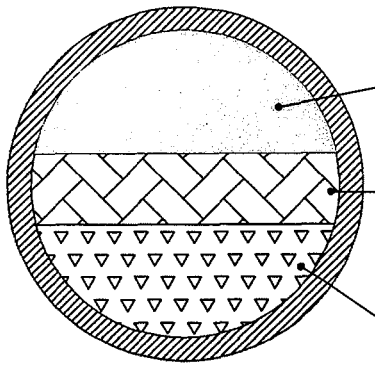


3.53 MGD EXTRA CAPACITY DUE TO PIPE MATERIAL

4.52 MGD FOUR MILE RUN & RIVER ROAD PUMP STATIONS (CITY OF ALEXANDRIA APPROVAL REQUIREMENTS)

4.90 MGD FROM POTOMAC YARD DEVELOPMENT (INCLUDING POTOMAC YARD CENTER)

DESIGN FLOW CAPACITY 30" CCFP
17.68 MGD = TOTAL AVAILABLE CAPACITY



8.26 MGD EXTRA CAPACITY DUE TO PIPE MATERIAL

4.52 MGD FOUR MILE RUN & RIVER ROAD PUMP STATIONS (CITY OF ALEXANDRIA APPROVAL REQUIREMENTS)

4.90 MGD FROM POTOMAC YARD DEVELOPMENT (INCLUDING POTOMAC YARD CENTER)

NOTES:

VCP - VITRIFIED CLAY PIPE
CCFP - CENTRIFUGALLY CAST FIBERGLASS PIPE
MGD - MILLIONS OF GALLONS PER DAY

DATE: APRIL, 2003

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POTOMAC YARD
OFFSITE
SANITARY TRUNK SEWER
EXHIBIT 3

DATE	REVISION

christopher consultants
engineering · surveying · land planning
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703.273.6820 · fax 703.273.7636

FAYETTE STREET
FEDERAL EXPRESS
SHAFT 22
SHAFT 21
SHAFT 20
SHAFT 19
SHAFT 18
SHAFT 17
SHAFT 16
SHAFT 15
1ST STREET
BRADDOCK PLACE
MADISON STREET
WYTHE STREET
PENDLETON STREET
ORONOCO STREET
D.C.S.
SHAFT 23
PAYNE STREET
W.M.A.T.A. CORRIDOR
C.S.X. RAIL CORRIDOR
SHAFT 24
TOTAL FLOW TO SHAFT 20=0.336 MGD
BRADDOCK METRO NEIGHBORHOOD PLAN
TOTAL FLOW TO SHAFT 18=0.299 MGD
BRADDOCK METRO NEIGHBORHOOD PLAN
TOTAL FLOW TO SHAFT 15=0.676 MGD
1. BRADDOCK METRO NEIGHBORHOOD PLAN
2. EX. PAYNE STR.
3. EX. MONARCH
MATCHLINE 'A' SEE BELOW
VIRGINIA STATE GRID NORTH

NOTES:
1. SANITARY SEWER FLOWS SHOWN ARE AVERAGE DAILY FLOWS

MATCHLINE 'A' SEE ABOVE
PRINCESS STREET
SHAFT 14
SHAFT 13
SHAFT 11
SHAFT 10
SHAFT 9
SHAFT 8
SHAFT 7
SHAFT 12
QUEEN STREET
CAMERON STREET
KING STREET
COMMERCE STREET
PRINCE STREET
DUKE STREET
MATCHLINE 'B' SEE BELOW
TOTAL FLOW TO SHAFT 10=0.019 MGD
1. EX. PRESCOTT
TOTAL FLOW TO SHAFT 8=0.5923 MGD
1. EX. CLAYBORNE
2. EX. GW CLUB
3. EX. FANNON (DUKE)
4. CITY'S CSO

MATCHLINE 'B' SEE ABOVE
WILKES STREET
GIBBON STREET
FRANKLIN STREET
JEFFERSON STREET
SHAFT 5
SHAFT 4
SHAFT 3
SHAFT 2
SHAFT 1
ALEXANDRIA NATIONAL CEMETERY
ALEXANDRIA NATIONAL CEMETERY
ALEXANDRIA SANITATION AUTHORITY

LEGEND:
EX. SANITARY TRUNK SEWER

250 125 0 250 500
GRAPHIC SCALE
1" = 250'

EXISTING 30" OFFSITE SANITARY TRUNK SEWER EXHIBIT 4

POTOMAC VILLAGE
SANITARY ALTERNATIVES
THE CITY OF ALEXANDRIA, VIRGINIA

PROJECT NO: 882416.00
SCALE: 1" = 250'
DATE: OCT. 30, 2009
DESIGN: MAC
DRAWN: MAC
CHECKED:
SHEET No.
1 OF 1

A-832

DATE	REVISION
5-8-09	UPDATE DWG. PER
	MTG. WITH CITY
	STAFF
10/23/09	UPDATED WITH NEW
	FLOWS

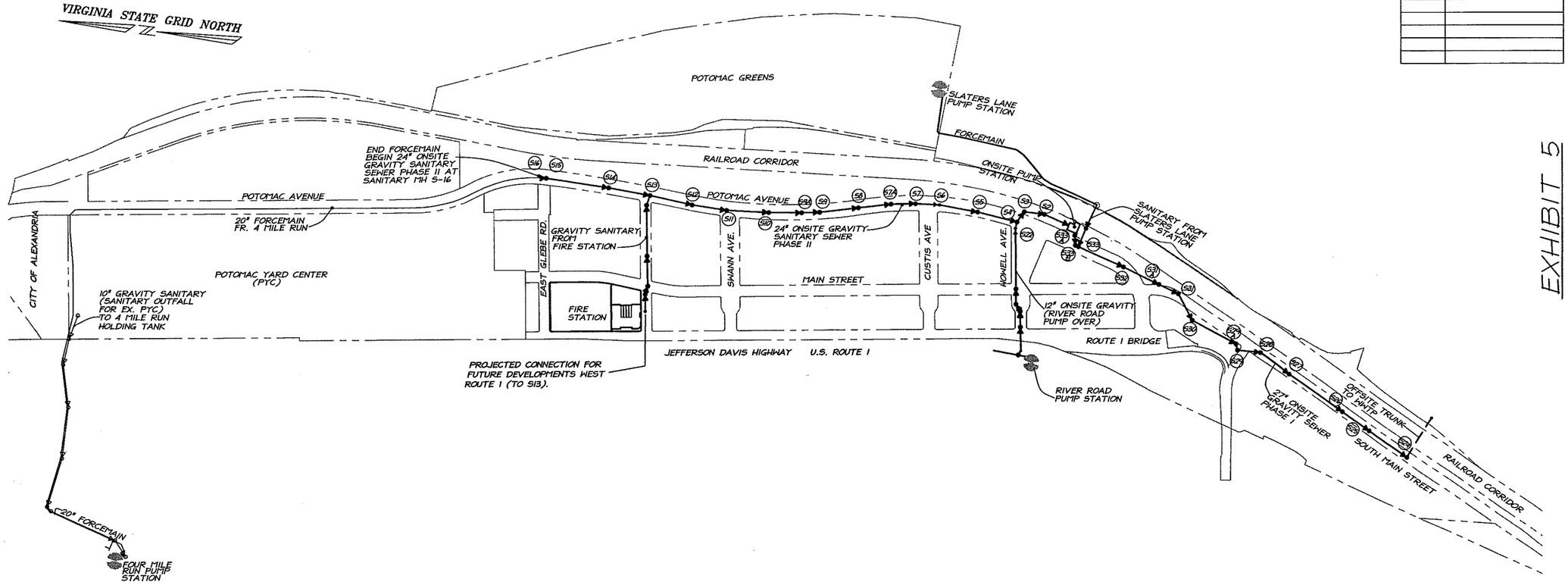

EXHIBIT 5

SANITARY SEWAGE FLOWS TO VARIOUS MANHOLES SHOWN ABOVE

WITH STANDARD WASTEWATER FLOW RATES				WITH MODIFIED WASTEWATER FLOW RATES (35%) FOR POTOMAC VILLAGE		WITH MODIFIED WASTEWATER FLOW RATES (35%) FOR POTOMAC VILLAGE & WEST SIDE OF RTE.1	
FLOWS FROM	TO MANHOLE NUMBER	AVERAGE DAILY FLOW RATE	FLOW RATE (PEAKED/APPROVED)	AVERAGE DAILY FLOW RATE	FLOW RATE (PEAKED/APPROVED)	AVERAGE DAILY FLOW RATE	FLOW RATE (PEAKED/APPROVED)
1. FOUR MILE RUN PUMP STATION	S16	NA	4.0000 MGD	NA	4.0000 MGD	NA	4.0000 MGD
2. POTOMAC VILLAGE REDEVELOPMENT	S15	2.1433 MGD	5.3583 MGD	1.3932 MGD	3.4830 MGD	1.3932 MGD	3.4830 MGD
3. POTOMAC YARD WITH DENSITY TRANSFER LANDBAYS G,H,I & J	S15	0.9351 MGD	2.3378 MGD	0.9351 MGD	2.3378 MGD	0.9351 MGD	2.3378 MGD
4. POTOMAC YARD FIRE STATION	S13	.02630 MGD	0.0657 MGD	.02630 MGD	0.0657 MGD	.02630 MGD	0.0657 MGD
5. RIVER ROAD PUMP STATION	S4	0.1300 MGD	0.5200 MGD	0.1300 MGD	0.5200 MGD	0.1300 MGD	0.5200 MGD
6. SLATER'S LANE PUMP STATION	S33	NA	0.7500 MGD	NA	0.7500 MGD	NA	0.7500 MGD
7. LANDBAYS K & L WITH DENSITY TRANSFER	S27	0.1500 MGD	0.3750 MGD	0.1500 MGD	0.3750 MGD	0.1500 MGD	0.3750 MGD
8. WEST SIDE RTE. 1 (JACK TAYLOR, HERTZ &OAKVILLE TRIANGLE)	S13	0.3820 MGD	0.9550 MGD	0.3820 MGD	0.9550 MGD	0.2490 MGD	0.6225 MGD
9. TOTAL			14.3618 MGD		12.4865 MGD		12.1540 MGD

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christopher consultants, ltd.
9800 main street (fourth floor) · fairfax va. 22031-3907
703.273.6820 · fax 703.273.7636

POTOMAC YARD ONSITE/OFFSITE SANITARY SEWER

CITY OF ALEXANDRIA, VIRGINIA

OVERALL SANITARY SEWER LAYOUT

SCALE: 1"=250'

DATE: 05-01-09

DESIGN: NA
DRAWN: KMW
CHECKED:

SHEET No. 1 OF 1

C- 5874

Name	Upstream Node Name	Downstream Node Name	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Length (ft)	Conduit Slope (%)	Roughness	Diameter (ft)	Max. Depth (ft)	Free Board (ft)	Design Full Flow (cfs)	Design Full Flow (MGD)	Max Flow (cfs)	Max Flow (MGD)	Max Flow/Design Flow (%)
30-inch Offsite Trunk Sewer															
Link41	Node1	Node0	-7.28	-7.50	80.3	0.274	0.0105	2.50	2.12	0.38	26.58	17.15	33.70	21.74	127%
Link40	Node2	Node1	-6.38	-7.14	326.6	0.233	0.0105	2.50	2.66	-0.16	24.50	15.81	33.70	21.74	138%
Link39	Node3	Node2	-4.74	-5.89	408.7	0.281	0.0105	2.50	2.73	-0.23	26.94	17.38	33.70	21.74	125%
Link38	Node4	Node3	-3.83	-4.64	399.0	0.203	0.0105	2.50	3.54	-1.04	22.88	14.76	33.70	21.74	147%
Link37	Node5	Node4	-2.24	-3.78	561.1	0.274	0.0105	2.50	4.41	-1.91	26.60	17.16	33.70	21.74	127%
Link42	Node7	Node5	0.01	-2.17	587.2	0.371	0.0105	2.50	4.71	-2.21	30.94	19.96	33.70	21.74	109%
Link34	Node8	Node7	0.46	0.05	400.9	0.102	0.0105	2.50	6.00	-3.50	16.24	10.48	33.70	21.74	208%
Link33	Node9	Node8	1.72	0.53	351.3	0.339	0.0105	2.50	6.03	-3.53	29.56	19.07	30.94	19.96	105%
Link32	Node10	Node9	2.98	1.77	431.2	0.281	0.0105	2.50	6.34	-3.84	26.90	17.35	30.94	19.96	115%
Link31	Node11	Node10	4.39	3.21	434.6	0.272	0.0105	2.50	6.50	-4.00	26.46	17.07	30.85	19.90	117%
Link30	Node12	Node11	5.55	4.49	326.4	0.325	0.0105	2.50	6.52	-4.02	28.94	18.67	30.85	19.90	107%
Link29	Node13	Node12	6.52	5.60	315.4	0.292	0.0105	2.50	6.69	-4.19	27.43	17.70	30.85	19.90	112%
Link28	Node14	Node13	7.43	6.62	340.8	0.238	0.0105	2.50	7.02	-4.52	24.76	15.97	30.85	19.90	125%
Link27	Node15	Node14	8.66	7.49	430.1	0.272	0.0105	2.50	7.34	-4.84	26.49	17.09	30.85	19.90	116%
Link26	Node16	Node15	9.71	8.97	416.8	0.178	0.0105	2.50	7.50	-5.00	21.40	13.81	27.70	17.87	129%
Link25	Node17	Node16	10.75	10.06	410.9	0.168	0.0105	2.50	7.65	-5.15	20.81	13.43	27.70	17.87	133%
Link24	Node18	Node17	12.12	11.01	424.4	0.262	0.0105	2.50	7.51	-5.01	25.97	16.75	27.70	17.87	107%
Link23	Node19	Node18	13.46	12.47	427.0	0.232	0.0105	2.50	7.29	-4.79	24.45	15.77	26.31	16.97	108%
Link22	Node20	Node19	14.67	13.73	394.3	0.238	0.0105	2.50	7.12	-4.62	24.80	16.00	26.31	16.97	106%
Link21	Node21	Node20	15.85	14.84	376.3	0.266	0.0105	2.50	6.95	-4.45	26.31	16.97	23.49	15.15	89%
Link20	Node22	Node21	16.83	15.94	253.2	0.351	0.0105	2.50	6.62	-4.12	30.11	19.43	23.99	15.48	80%
Link19	Node23	Node22	17.51	16.97	221.8	0.243	0.0105	2.50	6.11	-3.61	25.06	16.17	23.51	15.17	94%
Link18	Node24	Node23	18.26	17.70	281.2	0.199	0.0105	2.50	5.86	-3.36	22.66	14.62	23.30	15.03	103%
27-inch Onsite Trunk Sewer															
Link17	Node25	Node24	19.21	18.28	276.0	0.337	0.0105	2.25	5.91	-3.66	22.26	14.36	23.30	15.03	105%
Link16	Node26	Node25	19.90	19.33	197.5	0.289	0.0105	2.25	5.94	-3.69	20.60	13.29	23.30	15.03	113%
Link15	Node27	Node26	21.09	20.10	402.0	0.246	0.0105	2.25	6.20	-3.95	19.03	12.28	23.30	15.03	122%
Link14	Node28	Node27	21.93	21.14	209.5	0.377	0.0105	2.25	6.15	-3.90	23.55	15.19	23.90	15.42	101%
Link13	Node29	Node28	22.60	22.08	140.0	0.371	0.0105	2.25	5.93	-3.68	23.37	15.08	23.63	15.25	101%
Link12	Node29A	Node29	23.29	22.57	39.5	1.823	0.0105	2.25	5.92	-3.67	51.77	33.40	23.45	15.13	45%
Link11	Node30	Node29A	24.30	23.34	295.0	0.325	0.0105	2.25	5.35	-3.10	21.87	14.11	23.40	15.10	107%
Link10	Node31	Node30	24.89	24.41	173.0	0.277	0.0105	2.25	5.35	-3.10	20.20	13.03	23.45	15.13	116%
Link9	Node31A	Node31	25.45	25.02	133.0	0.323	0.0105	2.25	5.25	-3.00	21.80	14.06	23.04	14.86	106%
Link8	Node32	Node31A	26.28	25.56	237.5	0.303	0.0105	2.25	5.24	-2.99	21.11	13.62	23.05	14.87	109%
Link44	Node33	Node32	27.23	26.37	300.5	0.286	0.0105	2.25	5.33	-3.08	20.51	13.23	22.98	14.83	112%
Link43	Node34	Node33	28.74	28.20	118.0	0.458	0.0105	2.25	4.36	-2.11	25.94	16.74	22.94	14.80	88%
ONSITE PUMP STATION															
24-inch Onsite Trunk Sewer															
Link47	Node2	LS	13.87	13.38	151.9	0.323	0.0105	2.00	2.07	-0.07	15.91	10.26	21.56	13.91	136%
Link46	Node3	Node2	14.44	13.97	124.2	0.378	0.0105	2.00	2.20	-0.20	17.23	11.12	21.56	13.91	125%
Link38	Node4	Node3	15.05	14.54	155.8	0.327	0.0105	2.00	2.45	-0.45	16.03	10.34	21.56	13.91	134%
Link37	Node5	Node4	15.96	15.15	244.4	0.331	0.0105	2.00	2.86	-0.86	16.12	10.40	20.76	13.39	129%
Link42	Node6	Node5	16.82	16.06	230.3	0.330	0.0105	2.00	3.26	-1.26	16.09	10.38	20.76	13.39	129%
Link34	Node7	Node6	17.40	16.92	144.0	0.333	0.0105	2.00	3.46	-1.46	16.17	10.43	20.76	13.39	128%
Link33	Node7A	Node7	17.98	17.50	146.9	0.327	0.0105	2.00	3.68	-1.68	16.01	10.33	20.76	13.39	130%
Link32	Node8	Node7A	18.72	18.08	195.0	0.328	0.0105	2.00	4.00	-2.00	16.05	10.35	20.76	13.39	129%
Link31	Node9	Node8	19.61	18.82	237.0	0.333	0.0105	2.00	4.40	-2.40	16.17	10.43	20.76	13.39	128%
Link30	Node9A	Node9	20.06	19.71	107.8	0.325	0.0105	2.00	4.53	-2.53	15.96	10.30	20.76	13.39	130%
Link29	Node10	Node9A	20.83	20.16	203.4	0.329	0.0105	2.00	4.86	-2.86	16.07	10.37	20.76	13.39	129%
Link28	Node11	Node10	21.75	20.93	246.4	0.333	0.0105	2.00	5.27	-3.27	16.16	10.43	20.76	13.39	128%
Link27	Node12	Node11	22.54	21.85	210.1	0.328	0.0105	2.00	5.61	-3.61	16.05	10.35	20.76	13.39	129%
Link26	Node13	Node12	23.48	22.64	254.2	0.331	0.0105	2.00	6.03	-4.03	16.10	10.39	20.76	13.39	129%
Link25	Node14	Node13	24.41	23.58	251.8	0.330	0.0105	2.00	6.25	-4.25	16.08	10.37	19.17	12.37	119%
Link24	Node15	Node14	27.86	24.66	379.2	0.849	0.0105	2.00	6.00	-4.00	25.81	16.65	19.63	12.66	76%
Link45	Node16	Node15	28.57	27.98	14.3	4.123	0.0105	2.00	4.42	-2.42	39.28	25.34	6.23	4.02	16%

EXHIBIT 6

Low Flow Fixt - Potomac Village

Name	Upstream Node Name	Downstream Node Name	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Length (ft)	Conduit Slope (%)	Roughness	Diameter (ft)	Max Depth (ft)	Free Board (ft)	Design Full Flow (cfs)	Design Full Flow (MGD)	Max Flow (cfs)	Max Flow (MGD)	Max Flow/Design Flow (%)
30-inch Offsite Trunk Sewer															
Link41	Node1	Node0	-7.28	-7.50	80.3	0.274	0.0105	2.50	2.00	0.50	26.58	17.15	30.50	19.68	115%
Link40	Node2	Node1	-6.38	-7.14	326.6	0.233	0.0105	2.50	2.31	0.19	24.50	15.81	30.50	19.68	124%
Link39	Node3	Node2	-4.74	-5.89	408.7	0.281	0.0105	2.50	2.23	0.27	26.94	17.38	30.50	19.68	113%
Link38	Node4	Node3	-3.83	-4.64	399.0	0.203	0.0105	2.50	2.71	-0.21	22.88	14.76	30.50	19.68	133%
Link37	Node5	Node4	-2.24	-3.78	561.1	0.274	0.0105	2.50	2.99	-0.49	26.60	17.16	30.50	19.68	115%
Link42	Node7	Node5	0.01	-2.17	587.2	0.371	0.0105	2.50	2.92	-0.42	30.94	19.96	30.50	19.68	99%
Link34	Node8	Node7	0.46	0.05	400.9	0.102	0.0105	2.50	3.68	-1.18	16.24	10.48	30.50	19.68	188%
Link33	Node9	Node8	1.72	0.53	351.3	0.339	0.0105	2.50	3.61	-1.11	29.56	19.07	27.74	17.90	94%
Link32	Node10	Node9	2.98	1.77	431.2	0.281	0.0105	2.50	3.48	-0.98	26.90	17.35	27.74	17.90	103%
Link31	Node11	Node10	4.39	3.21	434.6	0.272	0.0105	2.50	3.36	-0.86	26.46	17.07	27.65	17.84	104%
Link30	Node12	Node11	5.55	4.49	326.4	0.325	0.0105	2.50	3.26	-0.76	28.94	18.67	27.65	17.84	96%
Link29	Node13	Node12	6.52	5.60	315.4	0.292	0.0105	2.50	3.12	-0.62	27.43	17.70	27.65	17.84	101%
Link28	Node14	Node13	7.43	6.62	340.8	0.238	0.0105	2.50	3.20	-0.70	24.76	15.97	27.65	17.84	112%
Link27	Node15	Node14	8.66	7.49	430.1	0.272	0.0105	2.50	3.24	-0.74	26.49	17.09	27.65	17.84	104%
Link26	Node16	Node15	9.71	8.97	416.8	0.178	0.0105	2.50	3.11	-0.61	21.40	13.81	24.50	15.81	114%
Link25	Node17	Node16	10.75	10.06	410.9	0.168	0.0105	2.50	2.94	-0.44	20.81	13.43	24.58	15.86	118%
Link24	Node18	Node17	12.12	11.01	424.4	0.262	0.0105	2.50	2.68	-0.18	25.97	16.75	25.11	16.20	97%
Link23	Node19	Node18	13.46	12.47	427.0	0.232	0.0105	2.50	2.18	0.32	24.45	15.77	23.60	15.23	97%
Link22	Node20	Node19	14.67	13.73	394.3	0.238	0.0105	2.50	1.90	0.60	24.80	16.00	23.53	15.18	95%
Link21	Node21	Node20	15.85	14.84	376.3	0.268	0.0105	2.50	1.73	0.77	26.31	16.97	21.09	13.61	80%
Link20	Node22	Node21	16.83	15.94	253.2	0.351	0.0105	2.50	1.64	0.87	30.11	19.43	21.91	14.14	73%
Link19	Node23	Node22	17.51	16.97	221.8	0.243	0.0105	2.50	1.74	0.76	25.06	16.17	21.27	13.72	85%
Link18	Node24	Node23	18.26	17.70	281.2	0.199	0.0105	2.50	1.80	0.70	22.66	14.62	20.77	13.40	92%
27-inch Onsite Trunk Sewer															
Link17	Node25	Node24	19.21	18.28	276.0	0.337	0.0105	2.25	1.78	0.47	22.26	14.36	20.74	13.38	93%
Link16	Node26	Node25	19.90	19.33	197.5	0.289	0.0105	2.25	1.77	0.48	20.60	13.29	20.70	13.35	100%
Link15	Node27	Node26	21.09	20.10	402.0	0.246	0.0105	2.25	1.91	0.34	19.03	12.28	20.46	13.20	108%
Link14	Node28	Node27	21.93	21.14	209.5	0.377	0.0105	2.25	1.86	0.39	23.55	15.19	22.03	14.21	94%
Link13	Node29	Node28	22.60	22.08	140.0	0.371	0.0105	2.25	1.69	0.56	23.37	15.08	21.33	13.76	91%
Link12	Node29A	Node29	23.29	22.57	39.5	1.823	0.0105	2.25	1.72	0.53	51.77	33.40	20.76	13.39	40%
Link11	Node30	Node29A	24.30	23.34	295.0	0.325	0.0105	2.25	1.77	0.48	21.87	14.11	20.72	13.37	95%
Link10	Node31	Node30	24.89	24.41	173.0	0.277	0.0105	2.25	1.79	0.46	20.20	13.03	20.77	13.40	103%
Link9	Node31A	Node31	25.45	25.02	133.0	0.323	0.0105	2.25	1.69	0.56	21.80	14.06	20.17	13.01	93%
Link8	Node32	Node31A	26.28	25.56	237.5	0.303	0.0105	2.25	1.74	0.51	21.11	13.62	20.18	13.02	96%
Link44	Node33	Node32	27.23	26.37	300.5	0.286	0.0105	2.25	1.80	0.46	20.51	13.23	19.97	12.88	97%
Link43	Node34	Node33	28.74	28.20	118.0	0.458	0.0105	2.25	1.61	0.64	25.94	16.74	19.53	12.60	75%
ONSITE PUMP STATION															
24-inch Onsite Trunk Sewer															
Link47	Node2	LS	13.87	13.38	151.9	0.323	0.0105	2.00	1.75	0.25	15.91	10.26	18.36	11.85	115%
Link46	Node3	Node2	14.44	13.97	124.2	0.378	0.0105	2.00	1.70	0.30	17.23	11.12	18.17	11.72	105%
Link38	Node4	Node3	15.05	14.54	155.8	0.327	0.0105	2.00	1.74	0.26	16.03	10.34	18.02	11.63	112%
Link37	Node5	Node4	15.96	15.15	244.4	0.331	0.0105	2.00	1.73	0.27	16.12	10.40	17.19	11.09	107%
Link42	Node6	Node5	16.82	16.06	230.3	0.330	0.0105	2.00	1.73	0.27	16.09	10.38	17.31	11.17	108%
Link34	Node7	Node6	17.40	16.92	144.0	0.333	0.0105	2.00	1.67	0.33	16.17	10.43	17.15	11.06	106%
Link33	Node7A	Node7	17.98	17.50	146.9	0.327	0.0105	2.00	1.67	0.33	16.01	10.33	17.14	11.06	107%
Link32	Node8	Node7A	18.72	18.08	195.0	0.328	0.0105	2.00	1.69	0.31	16.05	10.35	17.04	10.99	106%
Link31	Node9	Node8	19.61	18.82	237.0	0.333	0.0105	2.00	1.68	0.32	16.17	10.43	16.92	10.92	105%
Link30	Node9A	Node9	20.06	19.71	107.8	0.325	0.0105	2.00	1.65	0.35	15.96	10.30	16.88	10.89	106%
Link29	Node10	Node9A	20.83	20.16	203.4	0.329	0.0105	2.00	1.67	0.33	16.07	10.37	16.99	10.96	106%
Link28	Node11	Node10	21.75	20.93	246.4	0.333	0.0105	2.00	1.67	0.33	16.16	10.43	16.84	10.86	104%
Link27	Node12	Node11	22.54	21.85	210.1	0.328	0.0105	2.00	1.66	0.34	16.05	10.35	16.81	10.85	105%
Link26	Node13	Node12	23.48	22.64	254.2	0.331	0.0105	2.00	1.67	0.33	16.10	10.39	16.82	10.85	104%
Link25	Node14	Node13	24.41	23.58	251.8	0.330	0.0105	2.00	1.57	0.43	16.08	10.37	15.24	9.83	95%
Link24	Node15	Node14	27.88	24.66	379.2	0.849	0.0105	2.00	1.31	0.69	25.81	16.65	15.59	10.06	60%
Link45	Node16	Node15	28.57	27.98	14.3	4.123	0.0105	2.00	1.05	0.95	39.28	25.34	6.73	4.34	17%

EXHIBIT 7

STANDARD FACTORS
30-inch Offsite and 27-inch Onsite Trunk - Applicant Estimate (n = 0.0105)
Day [0] Time 00:01:00 Step 2

ONSITE 27" GRAVITY SEWER
&
30" OFFSITE TRUNK SEWER

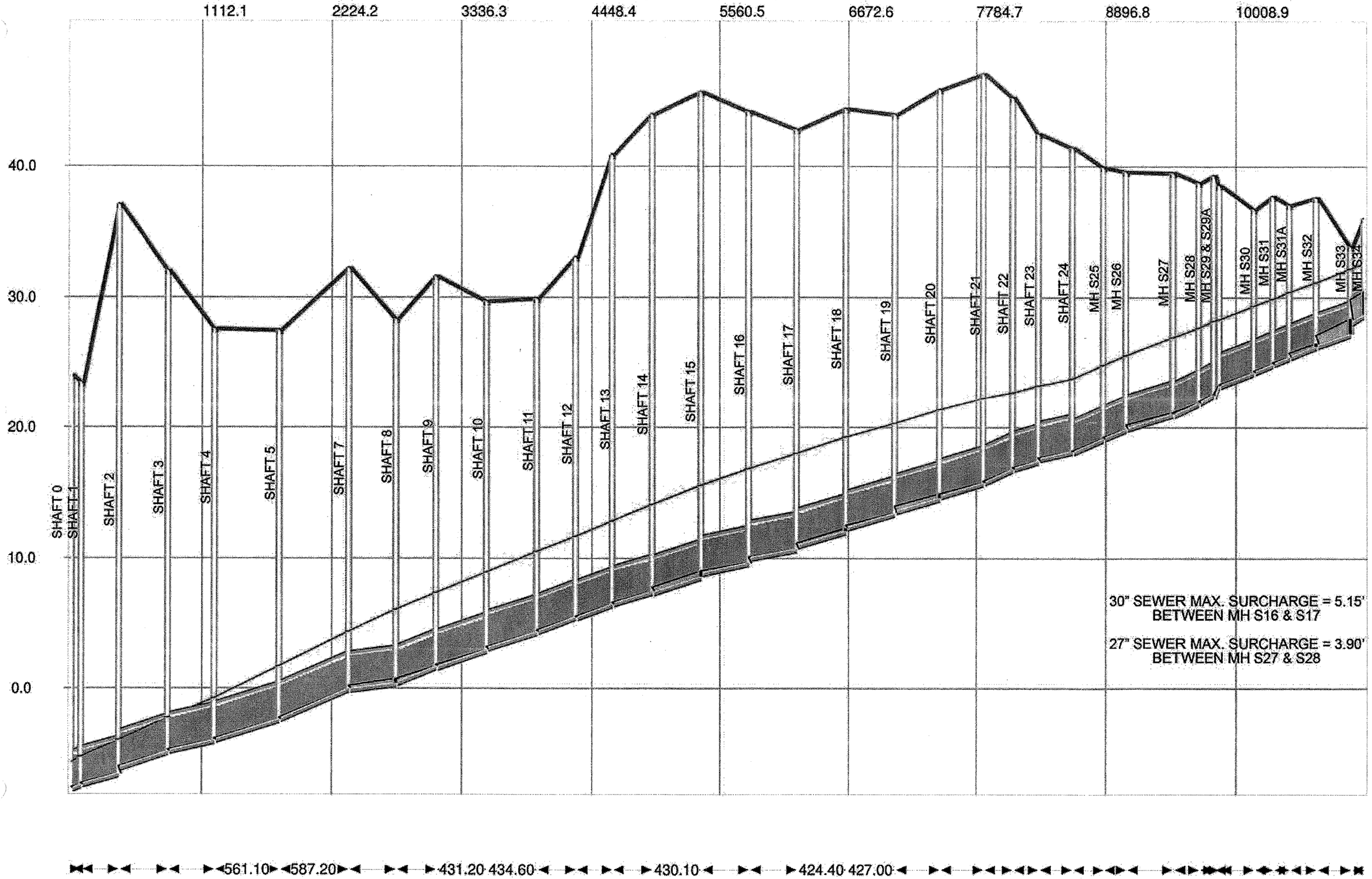


EXHIBIT 6

Low Flow Fixt - All Future

Name	Upstream Node Name	Downstream Node Name	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Length (ft)	Conduit Slope (%)	Roughness	Diameter (ft)	Max Depth (ft)	Free Board (ft)	Design Full Flow (cfs)	Design Full Flow (MGD)	Max Flow (cfs)	Max Flow (MGD)	Max Flow/Design Flow (%)
30-inch Offsite Trunk Sewer															
Link41	Node1	Node0	-7.28	-7.50	80.3	0.274	0.0105	2.50	1.90	0.60	26.58	17.15	27.84	17.96	105%
Link40	Node2	Node1	-6.38	-7.14	326.6	0.233	0.0105	2.50	2.14	0.37	24.50	15.81	27.84	17.96	114%
Link39	Node3	Node2	-4.74	-5.89	408.7	0.281	0.0105	2.50	2.05	0.45	26.94	17.38	27.84	17.96	103%
Link38	Node4	Node3	-3.83	-4.64	399.0	0.203	0.0105	2.50	2.31	0.19	22.88	14.76	27.84	17.96	122%
Link37	Node5	Node4	-2.24	-3.78	561.1	0.274	0.0105	2.50	2.26	0.24	26.60	17.16	27.84	17.96	105%
Link42	Node7	Node5	0.01	-2.17	587.2	0.371	0.0105	2.50	2.15	0.35	30.94	19.96	27.84	17.96	90%
Link34	Node8	Node7	0.46	0.05	400.9	0.102	0.0105	2.50	2.69	**-0.19**	16.24	10.48	27.84	17.96	171%
Link33	Node9	Node8	1.72	0.53	351.3	0.339	0.0105	2.50	2.62	**-0.12**	29.56	19.07	25.09	16.19	85%
Link32	Node10	Node9	2.98	1.77	431.2	0.281	0.0105	2.50	2.14	0.36	26.90	17.35	25.20	16.26	94%
Link31	Node11	Node10	4.39	3.21	434.6	0.272	0.0105	2.50	1.92	0.59	26.46	17.07	25.10	16.19	95%
Link30	Node12	Node11	5.55	4.49	326.4	0.325	0.0105	2.50	1.82	0.69	28.94	18.67	25.15	16.23	87%
Link29	Node13	Node12	6.52	5.60	315.4	0.292	0.0105	2.50	1.86	0.64	27.43	17.70	25.17	16.24	92%
Link28	Node14	Node13	7.43	6.62	340.8	0.238	0.0105	2.50	1.98	0.52	24.76	15.97	25.16	16.23	102%
Link27	Node15	Node14	8.66	7.49	430.1	0.272	0.0105	2.50	1.94	0.56	26.49	17.09	25.28	16.31	95%
Link26	Node16	Node15	9.71	8.97	416.8	0.178	0.0105	2.50	2.02	0.48	21.40	13.81	22.95	14.81	107%
Link25	Node17	Node16	10.75	10.06	410.9	0.168	0.0105	2.50	2.05	0.46	20.81	13.43	23.02	14.85	111%
Link24	Node18	Node17	12.12	11.01	424.4	0.262	0.0105	2.50	1.86	0.64	25.97	16.75	23.47	15.14	90%
Link23	Node19	Node18	13.46	12.47	427.0	0.232	0.0105	2.50	1.87	0.63	24.45	15.77	22.52	14.53	92%
Link22	Node20	Node19	14.67	13.73	394.3	0.238	0.0105	2.50	1.84	0.66	24.80	16.00	22.43	14.47	90%
Link21	Node21	Node20	15.85	14.84	376.3	0.268	0.0105	2.50	1.71	0.79	26.31	16.97	20.94	13.51	80%
Link20	Node22	Node21	16.83	15.94	253.2	0.351	0.0105	2.50	1.62	0.88	30.11	19.43	21.68	13.99	72%
Link19	Node23	Node22	17.51	16.97	221.8	0.243	0.0105	2.50	1.73	0.76	25.06	16.17	21.06	13.59	84%
Link18	Node24	Node23	18.26	17.70	261.2	0.199	0.0105	2.50	1.79	0.71	22.66	14.62	20.56	13.26	91%
27-inch Onsite Trunk Sewer															
Link17	Node25	Node24	19.21	18.28	276.0	0.337	0.0105	2.25	1.77	0.48	22.26	14.36	20.56	13.26	92%
Link16	Node26	Node25	19.90	19.33	197.5	0.289	0.0105	2.25	1.76	0.49	20.60	13.29	20.50	13.23	100%
Link15	Node27	Node26	21.09	20.10	402.0	0.246	0.0105	2.25	1.89	0.36	19.03	12.28	20.24	13.06	106%
Link14	Node28	Node27	21.93	21.14	209.5	0.377	0.0105	2.25	1.84	0.41	23.55	15.19	21.81	14.07	93%
Link13	Node29	Node28	22.60	22.08	140.0	0.371	0.0105	2.25	1.68	0.57	23.37	15.08	21.13	13.63	90%
Link12	Node29A	Node29	23.29	22.57	39.5	1.823	0.0105	2.25	1.71	0.54	51.77	33.40	20.56	13.26	40%
Link11	Node30	Node29A	24.30	23.34	295.0	0.325	0.0105	2.25	1.76	0.50	21.87	14.11	20.51	13.23	94%
Link10	Node31	Node30	24.89	24.41	173.0	0.277	0.0105	2.25	1.78	0.47	20.20	13.03	20.55	13.26	102%
Link9	Node31A	Node31	25.45	25.02	133.0	0.323	0.0105	2.25	1.68	0.57	21.80	14.06	19.97	12.88	92%
Link8	Node32	Node31A	26.28	25.56	237.5	0.303	0.0105	2.25	1.73	0.53	21.11	13.62	19.97	12.88	95%
Link44	Node33	Node32	27.23	26.37	300.5	0.286	0.0105	2.25	1.78	0.47	20.51	13.23	19.73	12.73	96%
Link43	Node34	Node33	28.74	28.20	118.0	0.458	0.0105	2.25	1.59	0.66	25.94	16.74	19.92	12.46	74%
ONSITE PUMP STATION															
24-inch Onsite Trunk Sewer															
Link47	Node2	LS	13.87	13.38	151.9	0.323	0.0105	2.00	1.74	0.26	15.91	10.26	18.15	11.71	114%
Link46	Node3	Node2	14.44	13.97	124.2	0.378	0.0105	2.00	1.68	0.32	17.23	11.12	17.92	11.56	104%
Link38	Node4	Node3	15.05	14.54	155.8	0.327	0.0105	2.00	1.72	0.28	16.03	10.34	17.78	11.47	111%
Link37	Node5	Node4	15.96	15.15	244.4	0.331	0.0105	2.00	1.71	0.29	16.12	10.40	16.96	10.94	105%
Link42	Node6	Node5	16.82	16.06	230.3	0.330	0.0105	2.00	1.71	0.29	16.09	10.38	17.01	10.97	106%
Link34	Node7	Node6	17.40	16.92	144.0	0.333	0.0105	2.00	1.65	0.35	16.17	10.43	16.99	10.96	105%
Link33	Node7A	Node7	17.98	17.50	146.9	0.327	0.0105	2.00	1.65	0.35	16.01	10.33	16.84	10.86	105%
Link32	Node8	Node7A	18.72	18.08	195.0	0.328	0.0105	2.00	1.66	0.34	16.05	10.35	16.74	10.80	104%
Link31	Node9	Node8	19.61	18.82	237.0	0.333	0.0105	2.00	1.66	0.34	16.17	10.43	16.60	10.71	103%
Link30	Node9A	Node9	20.06	19.71	107.8	0.325	0.0105	2.00	1.62	0.38	15.96	10.30	16.50	10.65	103%
Link29	Node10	Node9A	20.83	20.16	203.4	0.329	0.0105	2.00	1.64	0.36	16.07	10.37	16.63	10.73	103%
Link28	Node11	Node10	21.75	20.93	246.4	0.333	0.0105	2.00	1.64	0.36	16.16	10.43	16.49	10.64	102%
Link27	Node12	Node11	22.54	21.85	210.1	0.328	0.0105	2.00	1.63	0.37	16.05	10.35	16.40	10.58	102%
Link26	Node13	Node12	23.48	22.64	254.2	0.331	0.0105	2.00	1.64	0.36	16.10	10.39	16.39	10.57	102%
Link25	Node14	Node13	24.41	23.58	251.8	0.330	0.0105	2.00	1.55	0.45	16.08	10.37	15.29	9.86	95%
Link24	Node15	Node14	27.88	24.66	379.2	0.849	0.0105	2.00	1.30	0.70	25.81	16.65	15.59	10.06	60%
Link45	Node16	Node15	28.57	27.98	14.3	4.123	0.0105	2.00	1.05	0.95	39.28	25.34	6.73	4.34	17%

EXHIBIT 7

STANDARD FACTORS
Manhole 16 to LS - Applicants Estimate (n = 0.0105)
Day [0] Time 00:01:00 Step 2

ONSITE 24" GRAVITY SEWER
MH S16 TO PUMP STATION

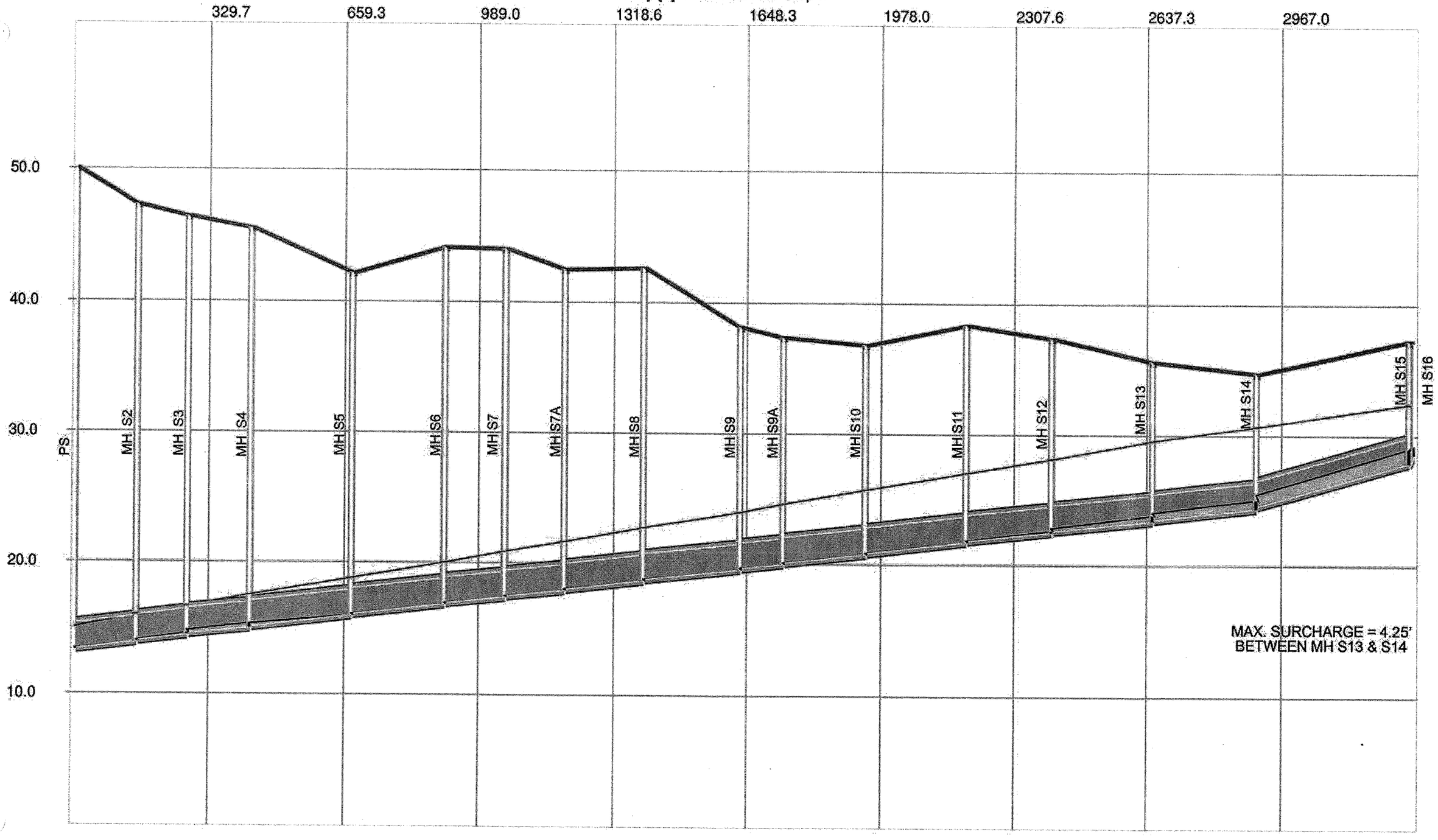


EXHIBIT 7

LOW FLOW FIXTURES - POTOMAC VILLAGE
30-inch Offsite and 27-inch Onsite Trunk - Low Flow - PV (n = 0.0105)
Day [0] Time 00:01:00 Step 2

ONSITE 27" GRAVITY SEWER
&
30" OFFSITE TRUNK SEWER

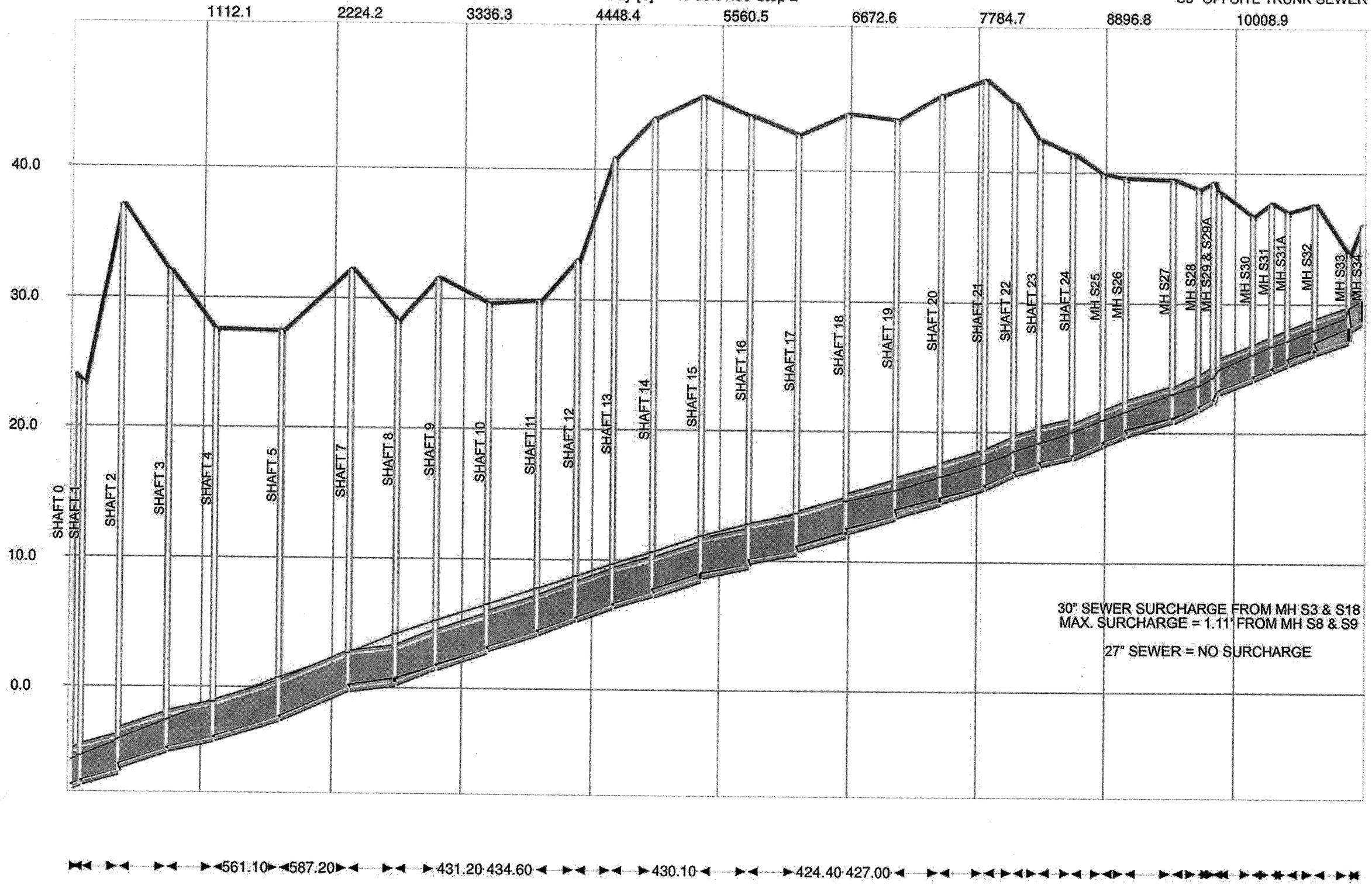


EXHIBIT 7

LOW FLOW FIXTURES - POTOMAC VILLAGE
Manhole 16 to LS - Low Flow - Potomac Village (n = 0.0105)
Day [0] Time 00:01:00 Step 2

ONSITE 24" GRAVITY SEWER
MH S16 TO PUMP STATION

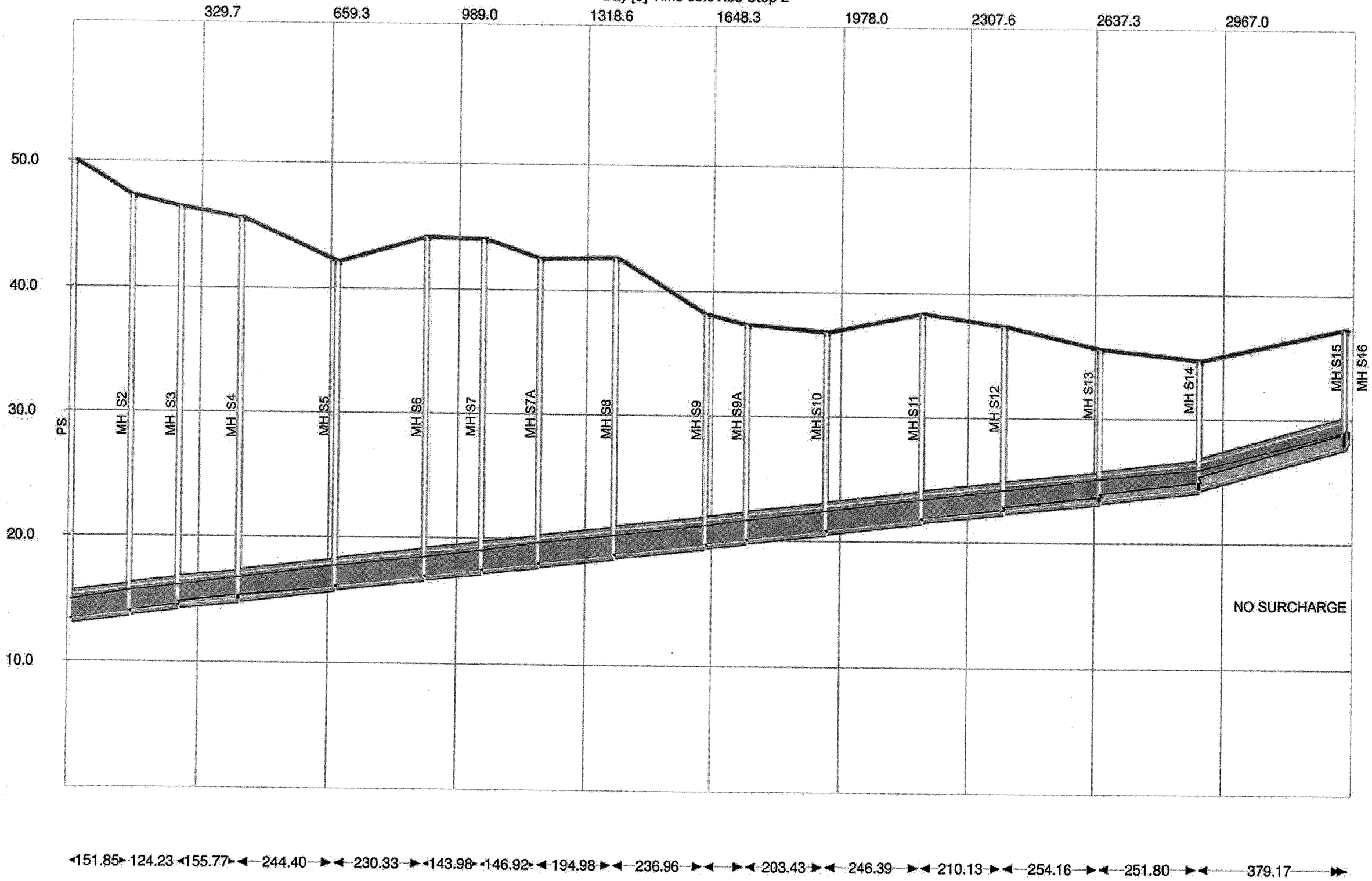


EXHIBIT 7

LOW FLOW FIXTURES - ALL FUTURE DEVELOPMENTS
30-inch Offsite and 27-inch Onsite Trunk - Low Flow - PV (n = 0.0105)
Day [0] Time 00:01:00 Step 2

ONSITE 27" GRAVITY SEWER
&
30" OFFSITE TRUNK SEWER

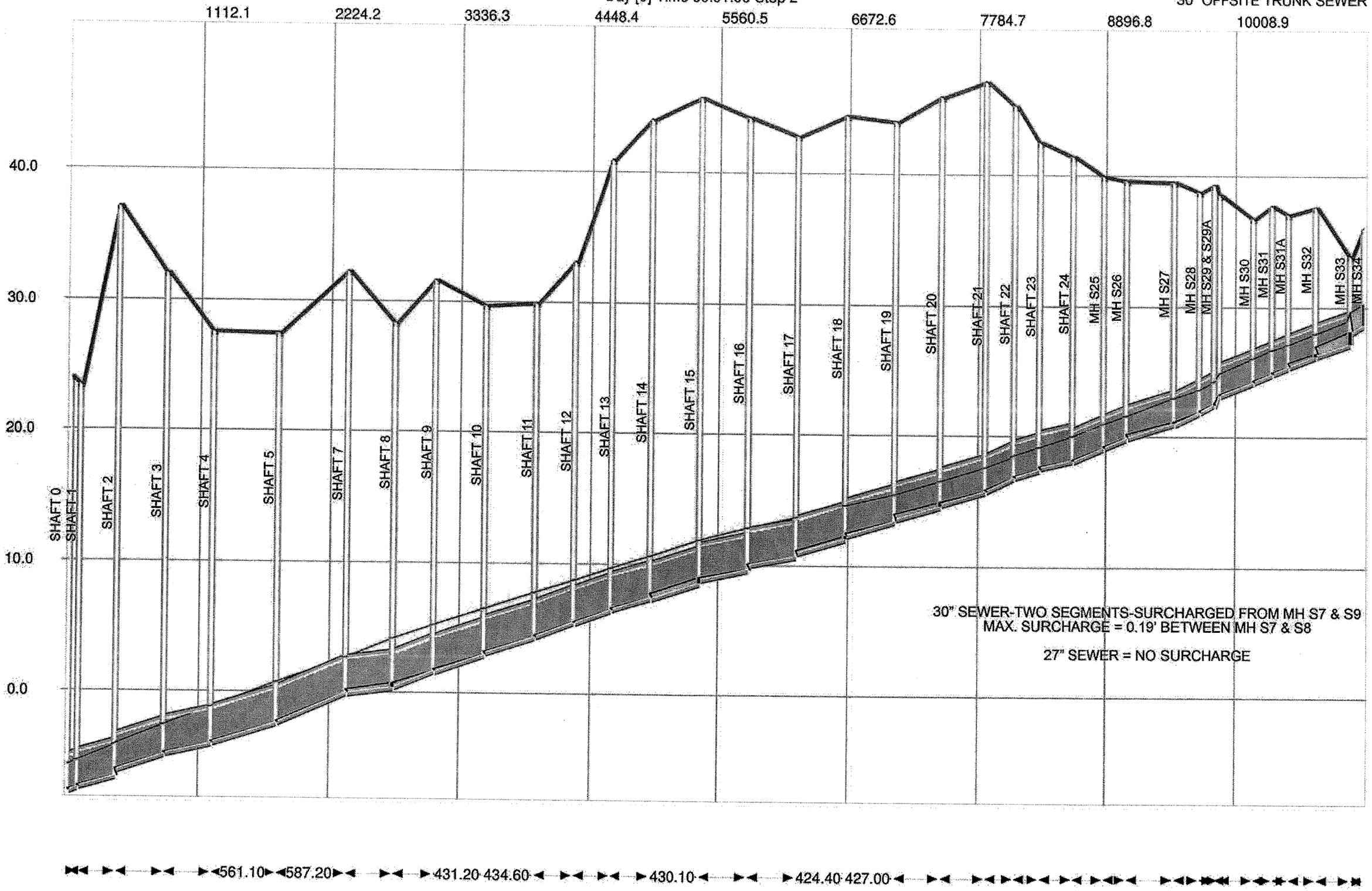
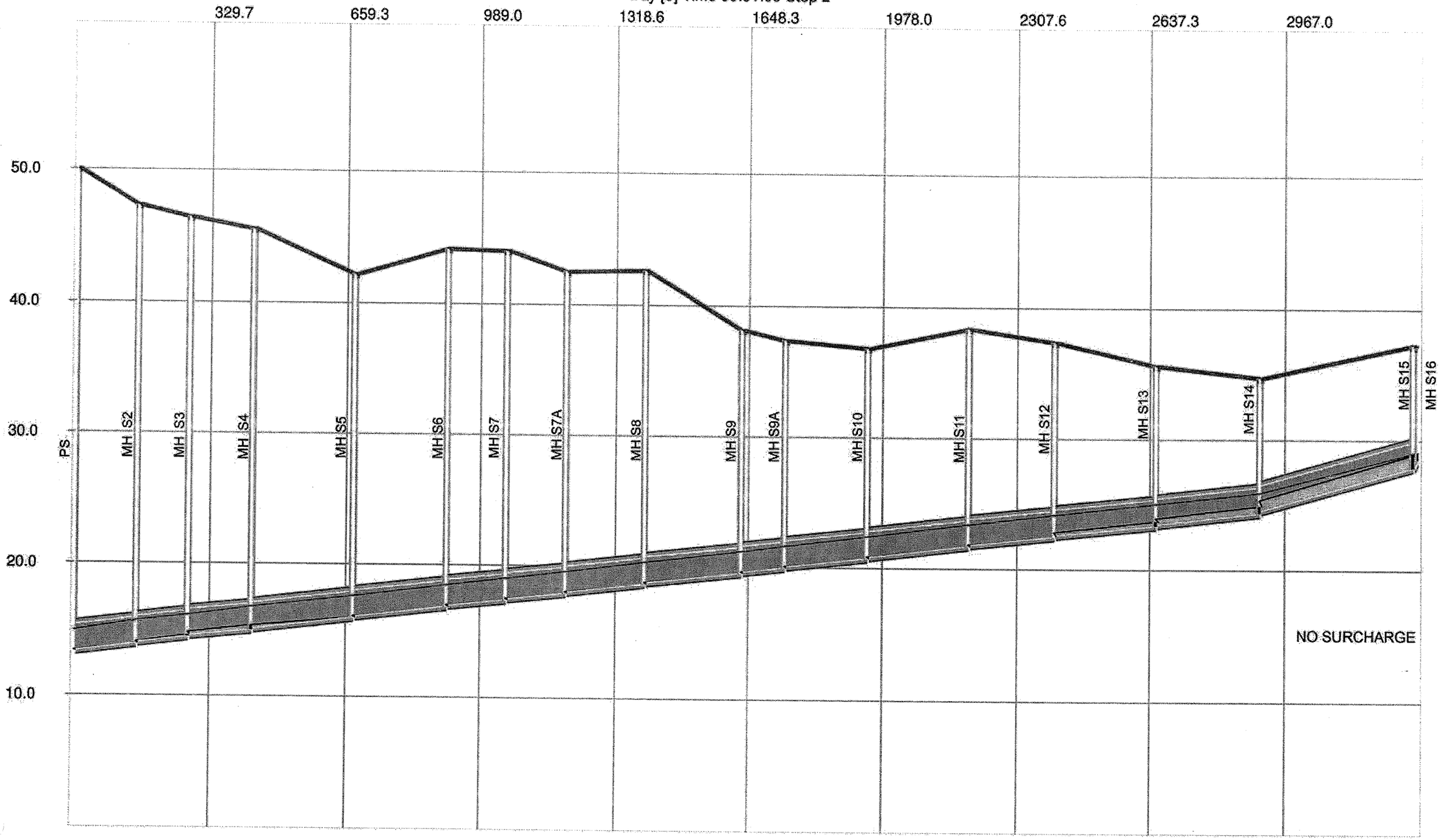


EXHIBIT 7

LOW FLOW FIXTURES - ALL FUTURE DEVELOPMENTS
Manhole 16 to LS - Low Flow - All Future (n = 0.0105)
Day [0] Time 00:01:00 Step 2

ONSITE 24" GRAVITY SEWER
MH S16 TO PUMP STATION



151.85 | 124.23 | 155.77 | 244.40 | 230.33 | 143.98 | 146.92 | 194.98 | 236.96 | 203.43 | 246.39 | 210.13 | 254.16 | 251.80 | 379.17

EXHIBIT 8

Low Flow Fixt - Potomac Village
n = 0.011

Name	Upstream Node Name	Downstream Node Name	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Length (ft)	Conduit Slope (%)	Roughness	Diameter (ft)	Max Depth (ft)	Free Board (ft)	Design Full Flow (cfs)	Design Full Flow (MGD)	Max Flow (cfs)	Max Flow (MGD)
30-inch Offsite Trunk Sewer														
Link41	Node1	Node0	-7.28	-7.50	80.3	0.274	0.0110	2.50	2.03	0.47	25.37	16.37	30.50	19.68
Link40	Node2	Node1	-6.38	-7.14	326.6	0.233	0.0110	2.50	2.51	-0.01	23.38	15.08	30.50	19.68
Link39	Node3	Node2	-4.74	-5.89	408.7	0.281	0.0110	2.50	2.38	0.12	25.71	16.59	30.50	19.68
Link38	Node4	Node3	-3.83	-4.64	399.0	0.203	0.0110	2.50	2.94	-0.44	21.84	14.09	30.50	19.68
Link37	Node5	Node4	-2.24	-3.78	561.1	0.274	0.0110	2.50	3.54	-1.04	25.40	16.39	30.50	19.68
Link42	Node7	Node5	0.01	-2.17	587.2	0.371	0.0110	2.50	3.60	-1.10	29.54	19.06	30.50	19.68
Link34	Node8	Node7	0.46	0.05	400.9	0.102	0.0110	2.50	4.72	-2.22	15.50	10.00	30.50	19.68
Link33	Node9	Node8	1.72	0.53	351.3	0.339	0.0110	2.50	4.65	-2.15	28.21	18.20	27.74	17.90
Link32	Node10	Node9	2.98	1.77	431.2	0.281	0.0110	2.50	4.74	-2.24	25.68	16.57	27.74	17.90
Link31	Node11	Node10	4.39	3.21	434.6	0.272	0.0110	2.50	4.73	-2.23	25.26	16.30	27.65	17.84
Link30	Node12	Node11	5.55	4.49	326.4	0.325	0.0110	2.50	4.63	-2.13	27.62	17.82	27.65	17.84
Link29	Node13	Node12	6.52	5.60	315.4	0.292	0.0110	2.50	4.66	-2.16	26.18	16.89	27.65	17.84
Link28	Node14	Node13	7.43	6.62	340.8	0.238	0.0110	2.50	4.85	-2.35	23.63	15.25	27.65	17.84
Link27	Node15	Node14	8.66	7.49	430.1	0.272	0.0110	2.50	5.00	-2.50	25.28	16.31	27.65	17.84
Link26	Node16	Node15	9.71	8.97	416.8	0.178	0.0110	2.50	5.01	-2.51	20.43	13.18	24.50	15.81
Link25	Node17	Node16	10.75	10.06	410.9	0.168	0.0110	2.50	5.00	-2.50	19.86	12.81	24.50	15.81
Link24	Node18	Node17	12.12	11.01	424.4	0.262	0.0110	2.50	4.74	-2.24	24.79	15.99	24.50	15.81
Link23	Node19	Node18	13.46	12.47	427.0	0.232	0.0110	2.50	4.36	-1.86	23.34	15.06	23.11	14.91
Link22	Node20	Node19	14.67	13.73	394.3	0.238	0.0110	2.50	4.06	-1.56	23.67	15.27	23.11	14.91
Link21	Node21	Node20	15.85	14.84	376.3	0.268	0.0110	2.50	3.84	-1.34	25.11	16.20	20.35	13.13
Link20	Node22	Node21	16.83	15.94	253.2	0.351	0.0110	2.50	3.38	-0.88	28.74	18.54	20.76	13.39
Link19	Node23	Node22	17.51	16.97	221.8	0.243	0.0110	2.50	2.79	-0.29	23.92	15.43	20.30	13.10
Link18	Node24	Node23	18.26	17.70	281.2	0.199	0.0110	2.50	2.41	0.09	21.63	13.95	20.16	13.01
27-inch Onsite Trunk Sewer														
Link17	Node25	Node24	19.21	18.28	276.0	0.337	0.0110	2.25	2.25	0.00	21.25	13.71	20.13	12.99
Link16	Node26	Node25	19.90	19.33	197.5	0.289	0.0110	2.25	1.96	0.29	19.66	12.68	20.12	12.98
Link15	Node27	Node26	21.09	20.10	402.0	0.246	0.0110	2.25	1.97	0.28	18.16	11.72	20.14	12.99
Link14	Node28	Node27	21.93	21.14	209.5	0.377	0.0110	2.25	1.92	0.33	22.48	14.50	20.92	13.50
Link13	Node29	Node28	22.60	22.08	140.0	0.371	0.0110	2.25	1.68	0.57	22.31	14.39	20.44	13.19
Link12	Node29A	Node29	23.29	22.57	39.5	1.823	0.0110	2.25	1.71	0.54	49.42	31.88	20.19	13.03
Link11	Node30	Node29A	24.30	23.34	295.0	0.325	0.0110	2.25	1.77	0.49	20.88	13.47	20.16	13.01
Link10	Node31	Node30	24.89	24.41	173.0	0.277	0.0110	2.25	1.79	0.46	19.28	12.44	20.04	12.93
Link9	Node31A	Node31	25.45	25.02	133.0	0.323	0.0110	2.25	1.71	0.54	20.81	13.43	19.85	12.81
Link8	Node32	Node31A	26.28	25.56	237.5	0.303	0.0110	2.25	1.77	0.48	20.15	13.00	19.88	12.83
Link44	Node33	Node32	27.23	26.37	300.5	0.286	0.0110	2.25	1.83	0.42	19.58	12.63	19.83	12.79
Link43	Node34	Node33	28.74	28.20	118.0	0.458	0.0110	2.25	1.63	0.62	24.76	15.97	19.51	12.59
ONSITE PUMP STATION														
24-inch Onsite Trunk Sewer														
Link47	Node2	LS	13.87	13.38	151.9	0.323	0.0110	2.00	1.72	0.28	15.19	9.80	17.61	11.36
Link46	Node3	Node2	14.44	13.97	124.2	0.378	0.0110	2.00	1.69	0.31	16.44	10.61	17.61	11.36
Link38	Node4	Node3	15.05	14.54	155.8	0.327	0.0110	2.00	1.75	0.25	15.30	9.87	17.61	11.36
Link37	Node5	Node4	15.96	15.15	244.4	0.331	0.0110	2.00	1.76	0.24	15.39	9.93	16.80	10.84
Link42	Node6	Node5	16.82	16.06	230.3	0.330	0.0110	2.00	1.76	0.24	15.36	9.91	16.80	10.84
Link34	Node7	Node6	17.40	16.92	144.0	0.333	0.0110	2.00	1.73	0.27	15.44	9.96	16.80	10.84
Link33	Node7A	Node7	17.98	17.50	146.9	0.327	0.0110	2.00	1.72	0.28	15.28	9.86	16.80	10.84
Link32	Node8	Node7A	18.72	18.08	195.0	0.328	0.0110	2.00	1.74	0.27	15.32	9.88	16.80	10.84
Link31	Node9	Node8	19.61	18.82	237.0	0.333	0.0110	2.00	1.75	0.25	15.44	9.96	16.80	10.84
Link30	Node9A	Node9	20.06	19.71	107.8	0.325	0.0110	2.00	1.72	0.28	15.23	9.83	16.80	10.84
Link29	Node10	Node9A	20.83	20.16	203.4	0.329	0.0110	2.00	1.73	0.27	15.34	9.90	16.80	10.84
Link28	Node11	Node10	21.75	20.93	246.4	0.333	0.0110	2.00	1.75	0.25	15.42	9.95	16.80	10.84
Link27	Node12	Node11	22.54	21.85	210.1	0.328	0.0110	2.00	1.75	0.25	15.32	9.88	16.80	10.84
Link26	Node13	Node12	23.48	22.64	254.2	0.331	0.0110	2.00	1.76	0.24	15.37	9.92	16.80	10.84
Link25	Node14	Node13	24.41	23.58	251.8	0.330	0.0110	2.00	1.66	0.34	15.35	9.90	15.22	9.82
Link24	Node15	Node14	27.88	24.66	379.2	0.849	0.0110	2.00	1.39	0.61	24.64	15.90	15.62	10.08
Link45	Node16	Node15	28.57	27.98	14.3	4.123	0.0110	2.00	1.08	0.92	37.49	24.19	6.22	4.01

EXHIBIT 9

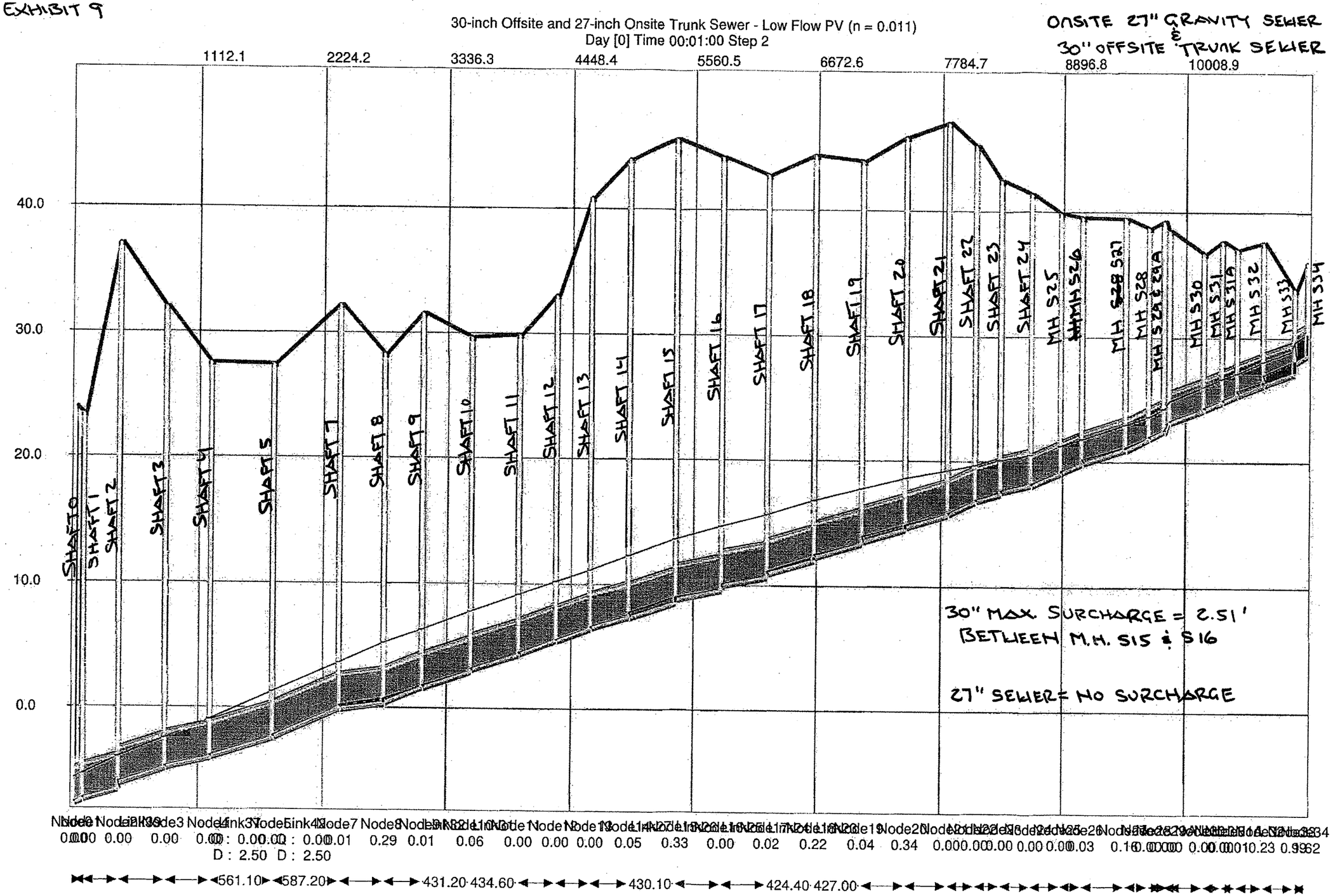

30-inch Offsite and 27-inch Onsite Trunk Sewer - Low Flow PV (n = 0.011)
Day [0] Time 00:01:00 Step 2
ONSITE 27" GRAVITY SEWER & 30" OFFSITE TRUNK SEWER
1112.1
2224.2
3336.3
4448.4
5560.5
6672.6
7784.7
8896.8
10008.9
40.0
30.0
20.0
10.0
0.0
SHAFT 0
SHAFT 1
SHAFT 2
SHAFT 3
SHAFT 4
SHAFT 5
SHAFT 7
SHAFT 8
SHAFT 9
SHAFT 10
SHAFT 11
SHAFT 12
SHAFT 13
SHAFT 14
SHAFT 15
SHAFT 16
SHAFT 17
SHAFT 18
SHAFT 19
SHAFT 20
SHAFT 21
SHAFT 22
SHAFT 23
SHAFT 24
MH S25
MH S26
MH S27
MH S28
MH S29 & S29A
MH S30
MH S31
MH S31A
MH S32
MH S33
MH S34
30" MAX. SURCHARGE = 2.51'
BETWEEN M.H. S15 & S16
27" SEWER = NO SURCHARGE
D : 2.50
D : 2.50
561.10
587.20
431.20
434.60
430.10
424.40
427.00

EXHIBIT 9

ONSITE 24" GRAVITY SEWER MH S16 TO PUMP STATION

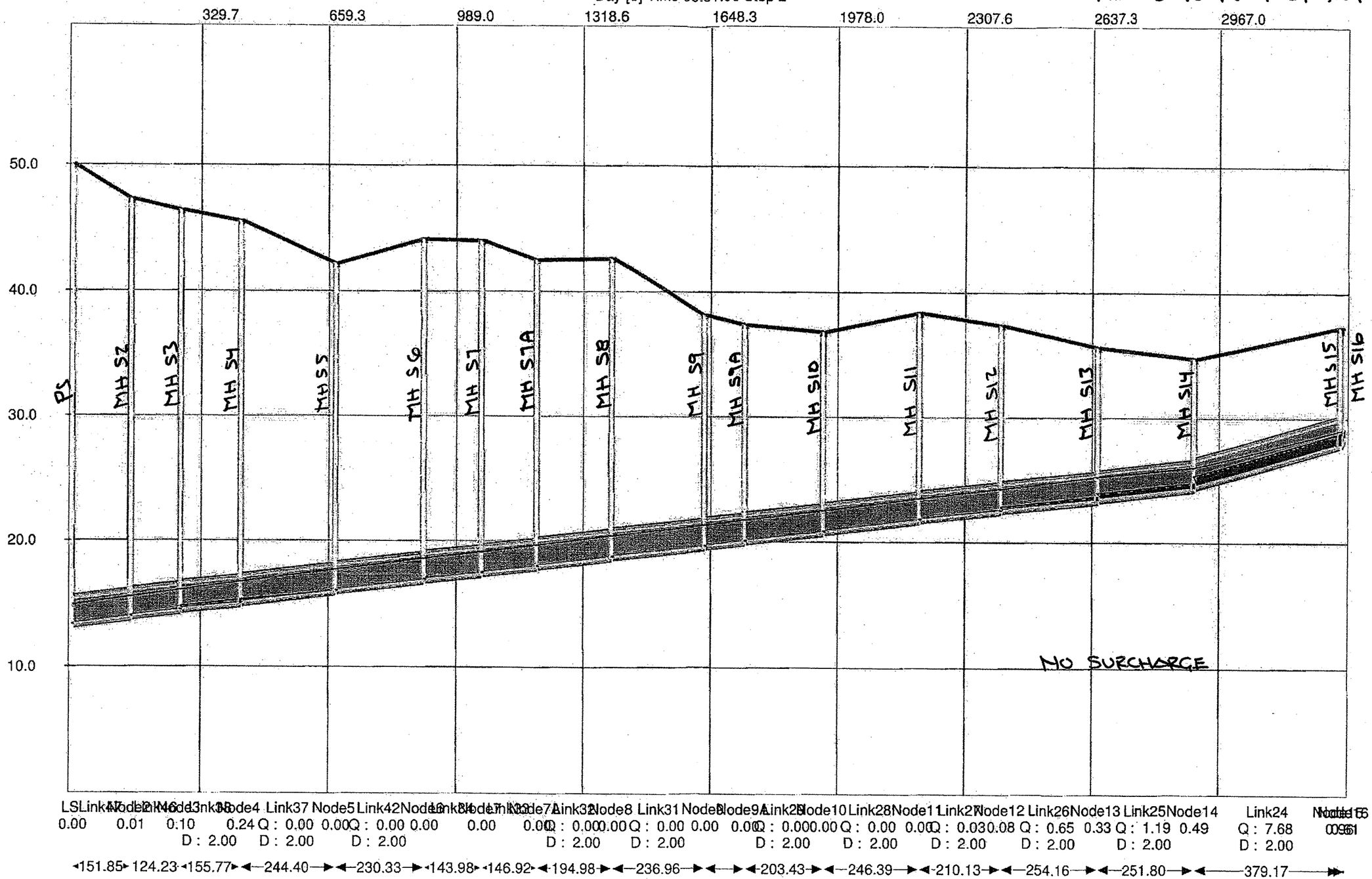


EXHIBIT 9

ONSITE 24" GRAVITY SEWER
MH. S16 TO PUMP STATION

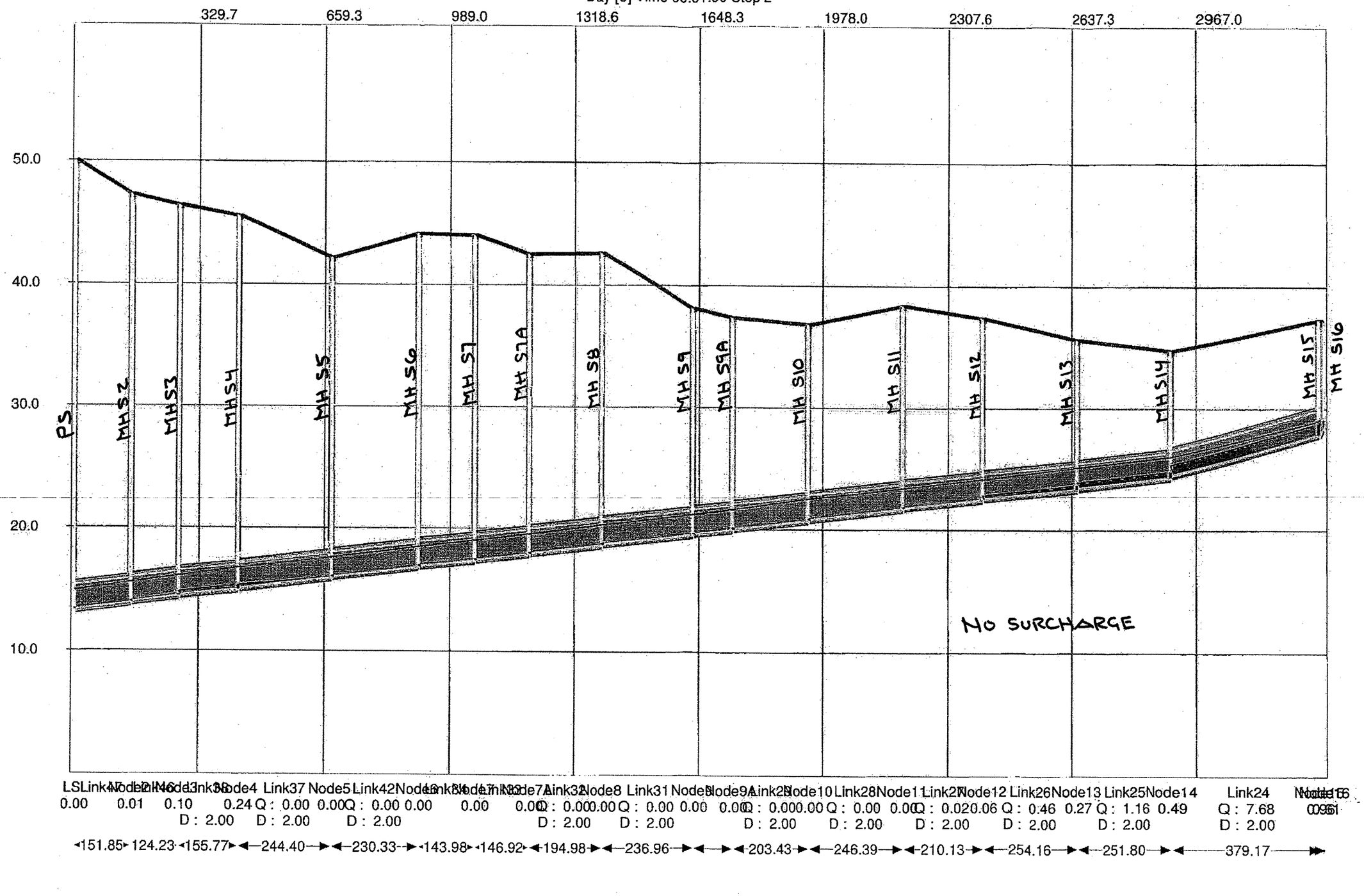


EXHIBIT 9

30-inch Offsite and 27-inch Onsite Trunk Sewer - Low Flow Future (n = 0.011)
Day [0] Time 00:01:00 Step 2

ONSITE 27" GRAVITY SEWER & 30" OFFSITE TRUNK SEWER

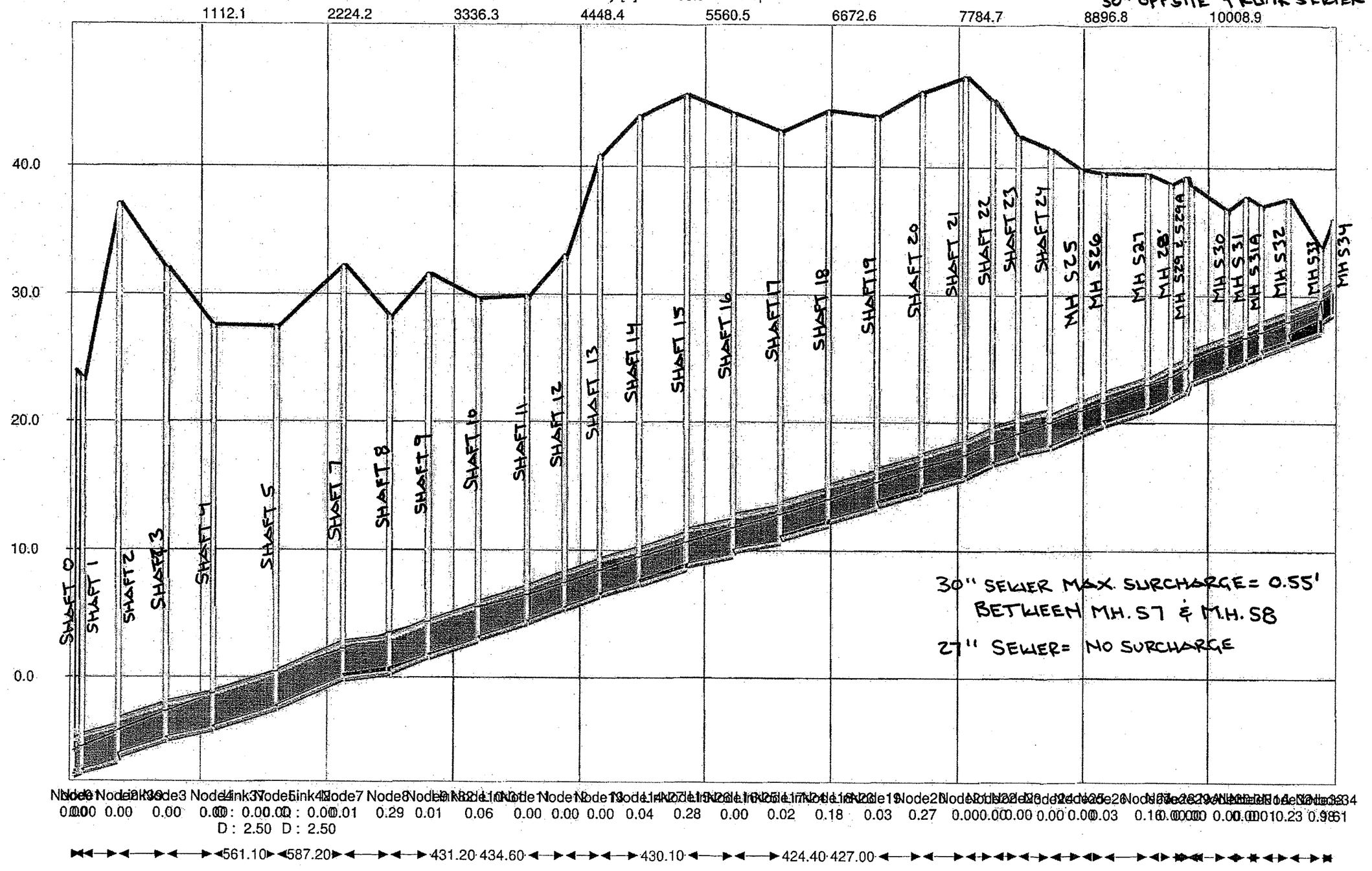


EXHIBIT 8

Low Flow Fixt - All Future
n = 0.011

Name	Upstream Node Name	Downstream Node Name	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Length (ft)	Conduit Slope (%)	Roughness	Diameter (ft)	Max Depth (ft)	Free Board (ft)	Design Full Flow (cfs)	Design Full Flow (MGD)	Max Flow (cfs)	Max Flow (MGD)
30-inch Offsite Trunk Sewer														
Link41	Node1	Node0	-7.28	-7.50	80.3	0.274	0.0110	2.50	1.93	0.57	25.37	16.37	27.84	17.96
Link40	Node2	Node1	-6.38	-7.14	326.6	0.233	0.0110	2.50	2.21	0.29	23.38	15.08	27.84	17.96
Link39	Node3	Node2	-4.74	-5.89	408.7	0.281	0.0110	2.50	2.13	0.37	25.71	16.59	27.84	17.96
Link38	Node4	Node3	-3.83	-4.64	399.0	0.203	0.0110	2.50	2.56	-0.06	21.84	14.09	27.84	17.96
Link37	Node5	Node4	-2.24	-3.78	561.1	0.274	0.0110	2.50	2.74	-0.24	25.40	16.39	27.84	17.96
Link42	Node7	Node5	0.01	-2.17	587.2	0.371	0.0110	2.50	2.67	-0.17	29.54	19.06	27.84	17.96
Link34	Node8	Node7	0.46	0.05	400.9	0.102	0.0110	2.50	3.05	-0.55	15.50	10.00	27.84	17.96
Link33	Node9	Node8	1.72	0.53	351.3	0.339	0.0110	2.50	2.98	-0.48	28.21	18.20	25.09	16.19
Link32	Node10	Node9	2.98	1.77	431.2	0.281	0.0110	2.50	2.61	-0.11	25.68	16.57	25.09	16.19
Link31	Node11	Node10	4.39	3.21	434.6	0.272	0.0110	2.50	2.30	0.20	25.26	16.30	25.00	16.13
Link30	Node12	Node11	5.55	4.49	326.4	0.325	0.0110	2.50	2.05	0.45	27.62	17.82	25.00	16.13
Link29	Node13	Node12	6.52	5.60	315.4	0.292	0.0110	2.50	1.94	0.57	26.18	16.89	25.00	16.13
Link28	Node14	Node13	7.43	6.62	340.8	0.238	0.0110	2.50	2.05	0.45	23.63	15.25	25.00	16.13
Link27	Node15	Node14	8.66	7.49	430.1	0.272	0.0110	2.50	2.02	0.48	25.28	16.31	25.00	16.13
Link26	Node16	Node15	9.71	8.97	416.8	0.178	0.0110	2.50	2.08	0.42	20.43	13.18	22.77	14.69
Link25	Node17	Node16	10.75	10.06	410.9	0.168	0.0110	2.50	2.11	0.40	19.86	12.81	22.77	14.69
Link24	Node18	Node17	12.12	11.01	424.4	0.262	0.0110	2.50	1.88	0.62	24.79	15.99	22.93	14.79
Link23	Node19	Node18	13.46	12.47	427.0	0.232	0.0110	2.50	1.88	0.62	23.34	15.06	21.94	14.15
Link22	Node20	Node19	14.67	13.73	394.3	0.238	0.0110	2.50	1.86	0.64	23.67	15.27	21.93	14.15
Link21	Node21	Node20	15.85	14.84	376.3	0.268	0.0110	2.50	1.70	0.80	25.11	16.20	20.16	13.01
Link20	Node22	Node21	16.83	15.94	253.2	0.351	0.0110	2.50	1.61	0.89	28.74	18.54	20.60	13.29
Link19	Node23	Node22	17.51	16.97	221.8	0.243	0.0110	2.50	1.70	0.80	23.92	15.43	20.15	13.00
Link18	Node24	Node23	18.26	17.70	281.2	0.199	0.0110	2.50	1.79	0.71	21.63	13.95	19.98	12.89
27-inch Onsite Trunk Sewer														
Link17	Node25	Node24	19.21	18.28	276.0	0.337	0.0110	2.25	1.77	0.48	21.25	13.71	19.93	12.86
Link16	Node26	Node25	19.90	19.33	197.5	0.289	0.0110	2.25	1.77	0.48	19.66	12.68	19.93	12.86
Link15	Node27	Node26	21.09	20.10	402.0	0.246	0.0110	2.25	1.93	0.33	18.16	11.72	19.94	12.86
Link14	Node28	Node27	21.93	21.14	209.5	0.377	0.0110	2.25	1.88	0.38	22.48	14.50	20.69	13.35
Link13	Node29	Node28	22.60	22.08	140.0	0.371	0.0110	2.25	1.67	0.58	22.31	14.39	20.22	13.05
Link12	Node29A	Node29	23.29	22.57	39.5	1.823	0.0110	2.25	1.70	0.55	49.42	31.88	20.00	12.90
Link11	Node30	Node29A	24.30	23.34	295.0	0.325	0.0110	2.25	1.75	0.50	20.88	13.47	19.97	12.88
Link10	Node31	Node30	24.89	24.41	173.0	0.277	0.0110	2.25	1.78	0.47	19.28	12.44	19.88	12.83
Link9	Node31A	Node31	25.45	25.02	133.0	0.323	0.0110	2.25	1.70	0.55	20.81	13.43	19.64	12.67
Link8	Node32	Node31A	26.28	25.56	237.5	0.303	0.0110	2.25	1.76	0.50	20.15	13.00	19.68	12.70
Link44	Node33	Node32	27.23	26.37	300.5	0.286	0.0110	2.25	1.82	0.43	19.58	12.63	19.61	12.65
Link43	Node34	Node33	28.74	28.20	118.0	0.458	0.0110	2.25	1.62	0.64	24.76	15.97	19.30	12.45
ONSITE PUMP STATION														
24-inch Onsite Trunk Sewer														
Link47	Node2	LS	13.87	13.38	151.9	0.323	0.0110	2.00	1.69	0.31	15.19	9.80	17.09	11.03
Link46	Node3	Node2	14.44	13.97	124.2	0.378	0.0110	2.00	1.65	0.35	16.44	10.61	17.09	11.03
Link38	Node4	Node3	15.05	14.54	155.8	0.327	0.0110	2.00	1.70	0.30	15.30	9.87	17.09	11.03
Link37	Node5	Node4	15.96	15.15	244.4	0.331	0.0110	2.00	1.70	0.30	15.39	9.93	16.29	10.51
Link42	Node6	Node5	16.82	16.06	230.3	0.330	0.0110	2.00	1.70	0.31	15.36	9.91	16.29	10.51
Link34	Node7	Node6	17.40	16.92	144.0	0.333	0.0110	2.00	1.67	0.33	15.44	9.96	16.29	10.51
Link33	Node7A	Node7	17.98	17.50	146.9	0.327	0.0110	2.00	1.66	0.34	15.28	9.86	16.29	10.51
Link32	Node8	Node7A	18.72	18.08	195.0	0.328	0.0110	2.00	1.68	0.33	15.32	9.88	16.29	10.51
Link31	Node9	Node8	19.61	18.82	237.0	0.333	0.0110	2.00	1.68	0.32	15.44	9.96	16.29	10.51
Link30	Node9A	Node9	20.06	19.71	107.8	0.325	0.0110	2.00	1.66	0.34	15.23	9.83	16.29	10.51
Link29	Node10	Node9A	20.83	20.16	203.4	0.329	0.0110	2.00	1.67	0.33	15.34	9.90	16.29	10.51
Link28	Node11	Node10	21.75	20.93	246.4	0.333	0.0110	2.00	1.69	0.31	15.42	9.95	16.29	10.51
Link27	Node12	Node11	22.54	21.85	210.1	0.328	0.0110	2.00	1.69	0.31	15.32	9.88	16.29	10.51
Link26	Node13	Node12	23.48	22.64	254.2	0.331	0.0110	2.00	1.70	0.30	15.37	9.92	16.29	10.51
Link25	Node14	Node13	24.41	23.58	251.8	0.330	0.0110	2.00	1.62	0.38	15.35	9.90	15.22	9.82
Link24	Node15	Node14	27.88	24.66	379.2	0.849	0.0110	2.00	1.37	0.63	24.64	15.90	15.62	10.08
Link45	Node16	Node15	28.57	27.98	14.3	4.123	0.0110	2.00	1.08	0.92	37.49	24.19	6.22	4.01

Potomac Village

Master Utility (Storm, Sanitary & Water) Concept Plan

Supplemental Data/Revised Executive Summaries

Submitted as part of the
Concept Design Plan for CDD # 19

Prepared by

christopher consultants
engineering · surveying · land planning

ANTUNOVICH ASSOCIATES

Wetland Studies and Solutions, Inc.

BAXTER & WOODMAN
Consulting Engineers

Prepared for

McCAFFERY Interests

January 25, 2010
Revised: February 11, 2010

ccl Project # 8824F6.00

Potomac Village

Storm Water Executive Summary

In preparation for the redevelopment of the existing Potomac Yard Retail Center to a mixed-use development referred to as Potomac Village, christopher consultants, ltd. (ccl), Wetland Studies and Solutions, Inc (WSSI) and Antunovich Associates (AA) have worked with City staff to establish a conceptual storm water master plan. The purpose of the plan is to outline how the redevelopment of the site will not only comply with the City of Alexandria's current Chesapeake Bay Act, but exceed the published performance standards. In order to accomplish this goal the conceptual storm water master plan was developed using the methodologies and calculations proposed in the December 2009 Virginia Department of Conservation and Recreation (DCR) draft storm water regulations. The City staff has asked that the redevelopment of this site exceed these newly published performance standards. This executive summary and backup material will show how the property owner plans to accomplish these lofty goals and to what levels.

The storm water master plan proposes to use several methodologies to treat the storm water quality for the site. Subject to final engineering and planning, all or some of these systems will be implemented to meet the proposed performance specifications described below. The systems can include but may not be limited to the following:

1. Design of an open space amenity at the north end of the site adjacent to Four Mile Run (Crescent Park) that includes a storm water feature. The storm water feature will be a wet pond and will be designed as a Level I or II wet pond in accordance with the draft DCR standards. The facility is proposed to treat approximately 2/3 of the sites storm water runoff.
2. The remainder of the site does not drain to the proposed facility described in 1. Above. Therefore the storm water will be treated with a variety of LID/IMP systems that are both modern and conventional as outlined below and detailed in the backup provided to the City in previous submissions. In general the development will incorporate green roofs, pervious pavements and rooftops, water reuse for irrigation and the occasional bioretention facility should it be needed and site constraints allow.
3. All buildings on this site will be designed with "green roofs". 50% of each building roof will be impervious and the remaining 50% will be pervious. 25% of the pervious area will be green and 25% will be pervious surfaces like pavers or brick (see calculations by WSSI and graphics/narrative provided by AA).
4. Rainwater harvesting systems for irrigation are being considered on a block by block basis. Storm water from the 50% impervious roof tops may be used for irrigation purposes to the extent it is needed.
5. Porous pavement systems with under drains will be used for the on-street public parking spaces subject to site constraints. As well, the porous systems will be used on some rooftops and plazas as feasible.
6. Rain Gardens will be used in the open spaces as needed. It is possible that the "green" areas of the public right of ways will also be used for some form of treatment system.

Implementing the systems described above, Performance Specifications for the project have been established. The Performance Specifications focus on three areas of stormwater: Nutrient Loading; Rain Water Harvesting and Reuse; and Total Runoff Volume Reduction.

1. Nutrient Loading: In accordance with the City of Alexandria's Zoning Ordinance (Article XIII, Section 13-1036-S) the proposed activities on this site are considered "redevelopment". The

existing site generates approximately 1.70 lb/ac/yr of Total Phosphorous (TP) assuming no existing BMPs. With the existing BMPs, the site generates 1.13 lb/ac/yr. The current CBA requires that the site achieve a 10% reduction in TP after it is redeveloped. The proposed DCR storm water regulations require that the site achieve a 20% reduction in Total Phosphorus (TP) from pre-developed conditions. Using the current regulations the site needs to reduce the TP to approximately 1.0 lb/ac/yr. The proposed DCR regulations will require that the TP be reduced from approximately 1.13 lb/ac/yr to approximately 0.90 lb/ac/yr. The owner has agreed to the above site strategies that will produce an overall post-development TP load equal to 0.65 lb/ac/yr which is a **42% reduction** from existing conditions. When development occurs, the loading calculations will be provided on a block-by-block basis. The 2/3 of the site that will be served by the Level II wet pond will maintain a TP less than or equal to 0.60 lb/ac/yr (unless the Level I option is selected) and the remaining portion of the site not served by the wet pond will maintain a TP load less than or equal to 0.80 lb/ac/yr. If the city desires a Level I pond, the overall TP load will increase and the performance standard will increase to something higher than the 0.65 lb/ac/yr currently proposed by the owner.

It is anticipated the construction of this site will occur over many years in order to reach full build out. This will have an impact on the ultimate function of the wet pond. During construction, the wet pond will act as a sediment basin to control erosion and sediment runoff and will not effectively serve as a BMP facility until construction is finished and the site is stabilized. Therefore, those areas served by the wet pond will require a TP loading equal to the loading (0.80lb/ac/yr) required by the areas not served by the wet pond until such time as the wet pond is converted into the permanent BMP facility.

2. Rain Water Harvesting and Reuse: The project will strive to re-use no less than 15% of the total annual runoff volume from the impervious areas of each building for irrigation of street-level and/or green roof landscaping.

3. Total Runoff Volume Reduction: The project will strive to reuse, evapotranspirate, or infiltrate a minimum of 30% of the total volume generated onsite by 1" of rainfall and will be calculated on a block-by-block basis.

We have included the WSSI calculations for a variety of scenarios as requested by the City. You will see that the TP loading could be reduced to approximately 0.53 lb/ac/yr utilizing the systems outlined by the owner above. We have recommended to the owner that we target 0.65 lb/ac/yr as the target goal. This well exceeds current and proposed regulations for a redevelopment site. The reason for this is that site conditions may minimize our ability to implement all of the systems described across the site uniformly. The site constraints include possible perched ground water, high and or variable ground water, environmental constraints and inadequate permeability of existing soils. In addition, the December 2009 DCR standards have established performance standards for the systems proposed. The owner does NOT have control over those standards and they could be modified making it infeasible for this project to realize the additional reductions.

There is an existing wet pond at the southeast corner of the site. This pond was planned to be expanded and upgraded to be an open space amenity in Landbay "K" by the adjoining property owner, Potomac Yard Development. The expansion of the pond was intended to serve Landbay "G", portions of Landbay H and a portion of Potomac Yard Center (now Potomac Village) so that it can meet the current BMP requirements. With the relocation of the planned Metro Station Bridge/entrance and Potomac Avenue, **in order to accommodate the density at the proposed Metro station**, this facility may be eliminated and

replaced. To account for the elimination of the pond, this plan proposes a unique solution. The concept is to divert the first ½ inch of runoff from Landbay G into an underground storage vault. Once this vault is full, the larger storm events will be diverted into the existing large diameter storm water conveyance system which drains to Four Mile Run. We will then have designed into the storage tank, a pumping system (with backup generator) to elevate the storm water to the linear park adjacent to the railroad corridor. This water will flow in an underground drainage system, vegetated or hardscaped swale to a series of treatment systems. These systems will be made of a variety of IMP's as outlined in document A but most likely an underground treatment system to meet the same performance standards as existed prior to the elimination of the wet pond and using the current CBA regulations. The possible systems can include a vegetated swale, a cartridge treatment system, tree wells, rain gardens or sand filters within Potomac Avenue or the new Park to treat the water. The timing of Metro construction and the relocation of Potomac Avenue will dictate the timing of construction of this system. Current phasing schemes have Potomac Avenue being constructed in Phase I. At this time, the vault and treatment systems will be designed and installed. Appropriate upstream sediment control features will be needed in order to protect these systems until the site is stabilized.

AA has provided backup which evaluates the size of the open space in Crescent Park. AA provided plans that show the pond in two locations. The first (shown with the previous submissions) has the pond completely outside of the RPA. The second scenario which is new shows an approximate encroachment of 50 feet into the RPA. The first scenario adequately represents what a 10-15 foot encroachment into the RPA might look like. The increase in usable open space adjacent to the residential buildings between the two scenarios is only a few thousand square feet. The City will need to coordinate a response on which scenario should be considered as we move forward with this project but both scenarios work from a technical aspect.

Wetland Studies and Solutions, Inc.

MEMORANDUM

To: **Bill Zink (via e-mail: billzink@ccl-eng.com)**

From: **Jennifer Brophy-Price**

Date: **February 8, 2010**

Re: **Potomac Village Stormwater Concepts**
Stormwater Calculations and Specifications
WSSI #21812.01

Cc: **Mike Rolband, WSSI (via e-mail: mrolband@wetlandstudies.com)**
Morgan Ziegenhein, McCaffery Interests
(via e-mail: mziegenhein@mccafferyinterests.com)

Pursuant to our telephone conversation on January 27, 2010, this memo provides further details about WSSI's stormwater calculations for the Potomac Village project, specifically regarding:

- An analysis of the existing site conditions using the Virginia Runoff Reduction Methodology (VRRM) worksheets;
- WSSI's VRRM results for each of the scenarios simulated;
- Green roof specifications; and
- "Pervious" roof specifications.

Existing Site Conditions
WSSI's original estimate of the existing site's TP loading (1.70 lb/ac/yr) was based on site imperviousness (i.e, post-development/pre-BMP) and did not account for existing site BMPs. Per your request, WSSI has modeled the existing development using the VRRM spreadsheets using existing BMP data supplied by christopher consultants, ltd[1]. The existing total phosphorus (TP) loading is 1.13 lb/ac/yr. (See Appendix A.) Therefore, this project's proposed TP loading rate of 0.65 lb/ac/yr is a 42% TP reduction beyond existing conditions.

Article XIII, Section 13-1036(S), of the Zoning Ordinance of the City of Alexandria (the "City"), codified through Ordinance No. 4609, adopted June 23, 2009, defines redevelopment as, "the process of developing land that is or has been previously developed." This definition applies to the Project site; therefore, the proposed DCR stormwater regulations[2] require that the site achieve a 20% reduction in Total Phosphorus (TP) from the previous development (from approximately 1.13 lb/ac/yr to approximately 0.90 lb/ac/yr), vs. a 10% reduction under the current regulations.

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[1] christopher consultants, ltd, the original designer of the Potomac Yard Center project, supplied WSSI with electronic copies of the approved Potomac Yard Center stormwater BMP plans and calculations (Sheets 60-68 of 78) for this analysis.
[2] See discussion in WSSI's memo dated October 27, 2009

Proposed Site Conditions

WSSI has provided six (6) 24x36" sheets showing our Virginia Runoff Reduction Methodology results for the referenced site, as well as a table detailing the stormwater management steps used for each scenario. (See Appendix B.) Based on the scenarios, which involve the development of a "typical" block (see Appendix B), a TP loading rate of 0.45 lb/ac/yr is only achievable with both enhanced rainwater harvesting[3] and the proposed Level II wet pond. Similarly, a volume reduction greater than 33% requires the use of enhanced rainwater harvesting. See the following scenario results:

- Scenario 1. With rainwater harvesting (from 50% of each roof as proposed) for irrigation only and with a Level I wet pond, the loading rate achieved is 0.77 lb/ac/yr, and the volume reduction is 33%.

- Scenario 2. With rainwater harvesting (from 50% of each roof as proposed) for irrigation only and with the proposed Level II wet pond, the loading rate achieved is 0.53 lb/ac/yr, and the volume reduction is 33%.

- Scenario 3. With enhanced rainwater harvesting (from 50% of each roof as proposed) and with a Level I wet pond, the loading rate is 0.54 lb/ac/yr, and the volume reduction is 52%.

- Scenario 4. With enhanced rainwater harvesting (from 50% of each roof as proposed) and with the proposed Level II wet pond, the loading rate is 0.36 lb/ac/yr, and the volume reduction is 52%.

- Scenario 5. With enhanced rainwater harvesting (from 100% of each roof) and with a Level I wet pond, the loading rate is 0.47 lb/ac/yr, and the volume reduction is 57%.

- Scenario 6. With enhanced rainwater harvesting (from 100% of each roof) and with the proposed Level II wet pond, the loading rate is 0.31 lb/ac/yr, and the volume reduction is 57%.

Please note that all of the modeled TP loadings are less than the proposed DCR requirements for redevelopment. The Potomac Village project commits to a TP loading rate less than or equal to 0.65 lb/ac/yr (rather than the 0.53 lb/ac/yr achieved above) based on the current versions of the VRRM spreadsheets and BMP guidelines[4] to ensure that the rate can be met in the event that some blocks are less conducive to LID features than the "typical" block (i.e., smaller roof-to-road ratio) or other unforeseen circumstances (i.e., insufficient depth to groundwater, which would preclude the use of pervious pavements nearby or heavy in-situ soils which would not allow the site to design Level II permeable pavements[5]).

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[3] i.e., allowing interior uses (such as toilets and laundry) for harvested rainwater.

[4] VRRM Spreadsheets Revision 12/7/09; Vegetated Roof specification Version 2.0 (September 30, 2009); Rainwater Harvesting specification Version 1.6 (September 30, 2009); Cistern Design Spreadsheet Version 1.0; and Permeable Pavement specification Version 1.6 (September 30, 2009).

[5] Level II permeable pavements require an infiltration rate of 0.5 in/hr. In the scenarios herein, WSSI modeled some of the permeable pavements on the site as Level I and some as Level II.

The Potomac Village project also commits to reducing 30% of the site's stormwater volume. This will be achieved through the use of green roofs, permeable pavements, and rainwater harvesting for irrigation.

Irrigation Specifications.
Irrigation for Potomac Village is calculated to receive 20% runoff reduction credit (using the Virginia Rainwater Harvesting Spreadsheet). WSSI assumed a harvested area of 1.15 ac/block (one-half of the "typical" roof) and an irrigated area of 6,000 s.f. per block (which may include green roof or street-level turf). Larger areas of irrigation will result in a higher reuse percentage, as long as the cistern is sized accordingly.

Green Roof Specifications and Benefits
Based on the VRRM, green roofs (Level II) receive 60% runoff reduction credit and 0% nutrient reduction credit. WSSI modeled all of this project's green roofs as Level II green roofs under the assumption that the architect will meet the Virginia BMP Clearinghouse Level II Green Roof specifications[6] and the additional specification that the each green roof be designed with at least a 6" depth of soil media.

To qualify as Level II, each roof must:

- Have a media depth of at least 4";
- Have a 2" stone drainage layer (as opposed to drainage mats);
- Have no more than 10% organic matter in the soil media; and
- Be in conformance to ASTM (2005) International Green Roof Standards[7].

Level II green roofs provide treatment for 1.1" of rainfall. The treatment volume calculation is:

- Tv = (1.1") (Rv) (A) / 12
  Where:
  Rv = the runoff coefficient for a conventional roof (typically 0.95)
  A = roof area

Pervious Roof Specifications
To receive VRRM credit as modeled, non-green, "pervious" rooftops must be covered in pervious pavers (i.e., pavers with either gaps or interconnected voids) underlain by at least 6" of green roof soil media or gravel. Non-green, "pervious" rooftops were modeled as Level I pervious pavements because they will work in a similar manner. Please note that "pervious" rooftops consisting of pavers with void space underneath will not filter the rainwater in the same manner as pavers underlain with soil; any such roofs would need to be modeled in a different manner[8].

[6] Available online at the Virginia Stormwater BMP Clearinghouse: http://www.vwrrc.vt.edu/swc/
[7] Available at http://www.astm.org
[8] Such a rooftop would likely be modeled as Level I extended detention, which receives no runoff reduction credit and 15% TP removal credit under the VRRM guidelines.

Appendix A

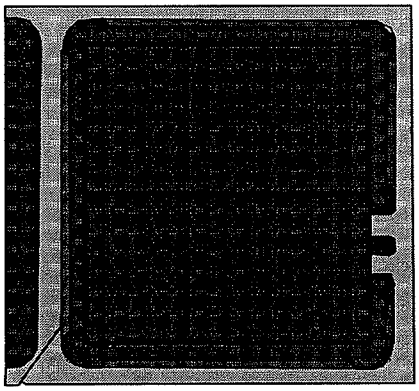
Results of Virginia Runoff Reduction Method (VRRM) Modeling
Existing Site Conditions

Appendix B

Results of Virginia Runoff Reduction Method (VRRM) Modeling
Proposed Site Conditions Scenarios

Parameters of the Virginia Runoff Reduction Method (VRRM) Modeling

WSSI modeled several combinations of BMPs using a "typical block" as a base with the assumption that results can be extrapolated to the Potomac Village site as a whole.



Typical Block
Total area = 4.02 ac.
Total roof area = 2.30 ac.
Harvested roof area = 1.15 ac.
Irrigated area (assumed) = 0.14 ac.

Note: Roof delineations in this graphic are for the sole purpose of illustrating the percentage of rooftops assumed to be harvested in the VRRM model and do not indicate or illustrate the actual layout of any roof.

The results on the following page show the TP load and volume reduction for each of the scenarios. WSSI used combinations of the following BMPs (and design parameters for each) to define the scenarios:

- Rainwater harvesting:
  1. 50% of roof surface, for irrigation only
  2. 50% of roof surface, for irrigation and interior uses (i.e., "enhanced rainwater harvesting")
  3. 100% of roof surface, for irrigation and interior uses
- Wet pond:
  1. Level I
  2. Level II
- Green roof:
  1. 25% of roof surface
  2. 50% of roof surface
- Pervious roof:
  1. 25% of roof surface
  2. 50% of roof surface
- Pervious pavement:
  1. 100% of parking areas

Results of the Virginia Runoff Reduction Method (VRRM) Modeling

The scenarios modeled by WSSI achieved a TP loading between 0.31 and 0.77 lb/ac/yr and a runoff volume reduction between 33% and 57%. In order to achieve a loading of 0.45 lb/ac/yr, both enhanced rainwater harvesting and a Level II wet pond must be employed in the design.

Appendix B: Results of Virginia Runoff Reduction Method (VRRM) Modeling

Scenario (Note 1)	Design Parameters					Results (Note 5)	
	Rainwater harvesting (Note 2)	**Wet pond**	**Green roof** (Note 3)	**"Pervious" roof** (Note 4)	**Pervious pavement**	**TP load (lb/ac/yr)**	**Volume reduction (%)**
1	For irrigation only, from 50% of roof surface (note 6), assuming 20% reuse efficiency	Level I	25% of roof surface	25% of roof surface	100% of parking areas	0.77	33%
2	For irrigation only, from 50% of roof surface (note 6), assuming 20% reuse efficiency	Level II	25% of roof surface	25% of roof surface	100% of parking areas	0.53	33%
3	For irrigation and interior uses, from 50% of roof surface (note 6), assuming 80% reuse efficiency	Level I	25% of roof surface	25% of roof surface	100% of parking areas	0.54	52%
4	For irrigation and interior uses, from 50% of roof surface (note 6), assuming 80% reuse efficiency	Level II	25% of roof surface	25% of roof surface	100% of parking areas	0.36	52%
5	For irrigation and interior uses, from 100% of roof surface, assuming 80% reuse efficiency	Level I	25% of roof surface	25% of roof surface	100% of parking areas	0.47	57%
6	For irrigation and interior uses, from 100% of roof surface, assuming 80% reuse efficiency	Level II	25% of roof surface	25% of roof surface	100% of parking areas	0.31	57%

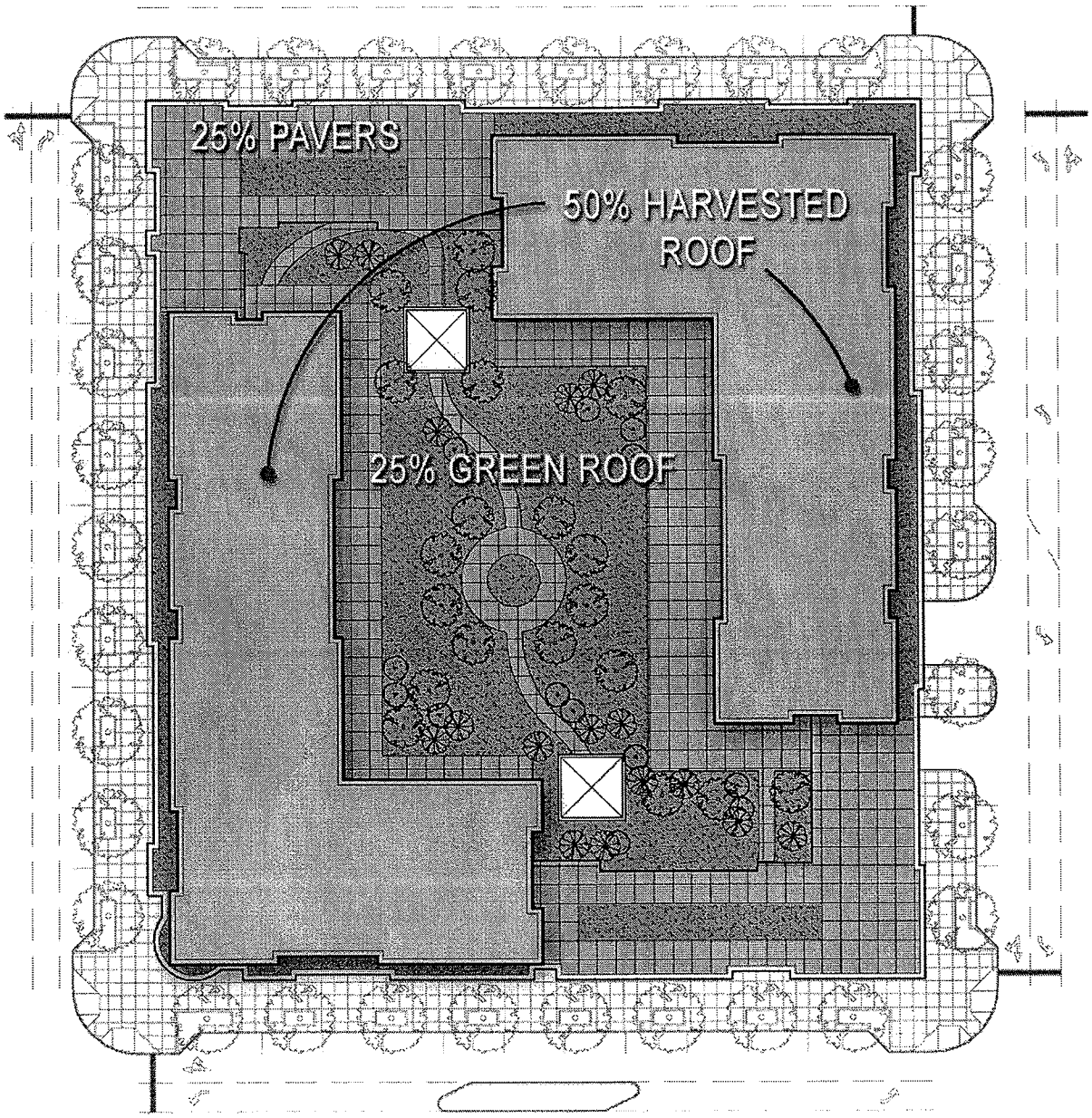
Notes:

1. These scenarios are separate from those presented in WSSI's November 11, 2009, memo.
2. Rainwater harvesting reuse efficiency will be determined by the final design of the system (including storage tank size and allowed uses).
3. These calculations assume that green roofs will be designed to Level II standards and will incorporate at least 6" of soil media into the design.
4. "Pervious" roof is rooftop covered in pervious pavers and at least 6" of soil media which is not planted. For these calculations, "pervious" roof has been modeled as pervious pavement.
5. Results were obtained from the Virginia Runoff Reduction Method (VRRM) Worksheet (revision 9/30/2009) using the Design Parameters listed herein for each scenario.
6. "50% of roof surface" indicates the non-pervious, non-green portion of the roof.

The Potomac Village project commits to a loading rate less than or equal to 0.65 lb/ac/yr and a volume reduction of 30%, which can be achieved with a Level II wet pond, rainwater harvesting for irrigation, 25% green roof, 25% pervious roof, and 100% pervious pavements on parking areas and plazas.

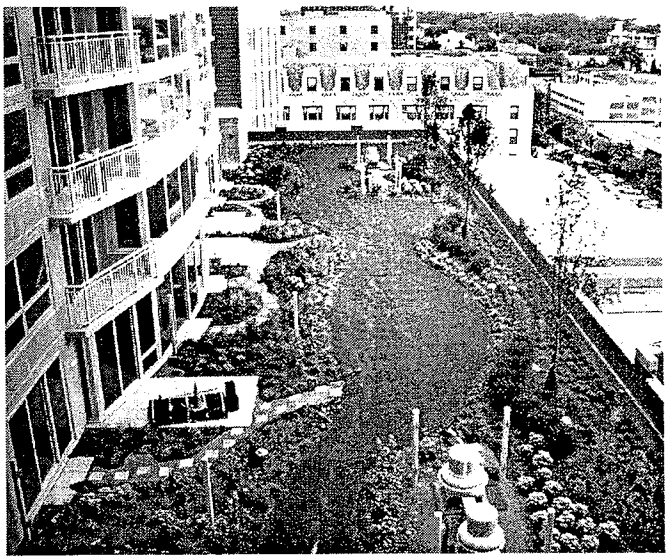
Potomac Village Typical Block Roof Breakdown (BLOCK 10 EXAMPLE)

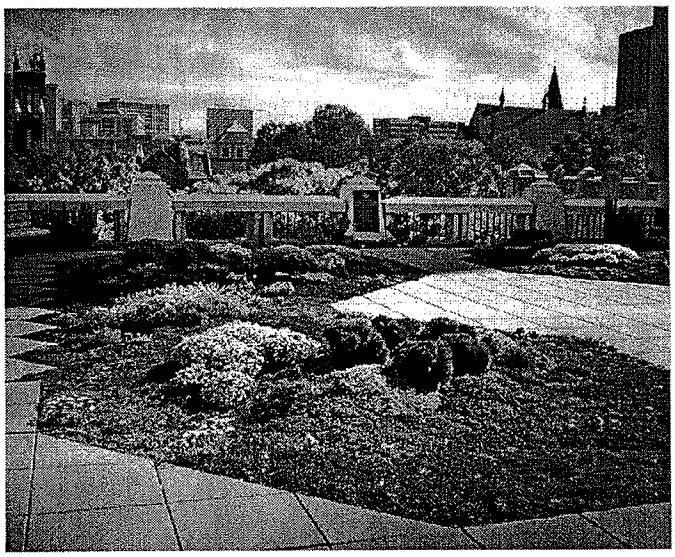
The roof areas of a typical block within Potomac VIllage will be planned consistent with the guidelines outlined in the diagram below (proposed block 10). Approximately 50% of a block's roof area is comprised of an impervious roofing system that will allow, if needed, for water harvesting that can be stored and re-used for the irrigation of site landscaping. Approximately 25% of our roof area is comprised of a "green roof" that is fully vegetated with a minimum of 6" of soil media. Approximately 25% of our roof area is comprised of "permeable pavers" integrated with the "green roof".



Green Roof

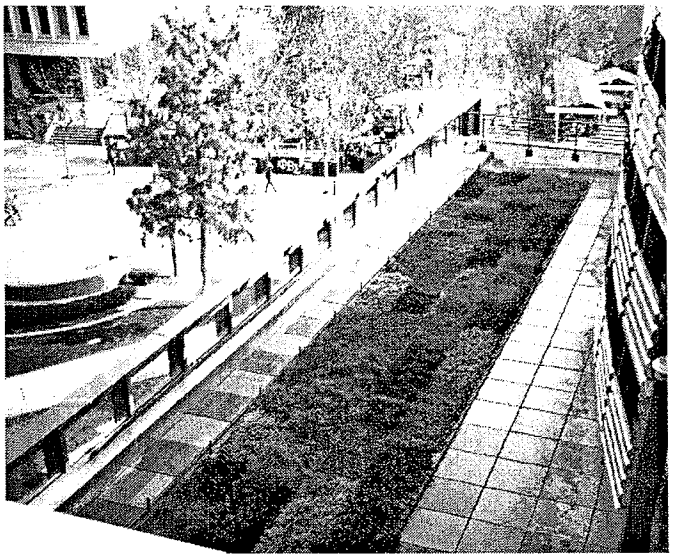
A Green Roof is wholly or partially covered in vegetation, offering the building several benefits. The layer of vegetation provides the building with better insulation, reducing energy costs. It absorbs rainwater, lowering the production of waste water and minimizing the need for complex water drainage systems. The green roof improves air quality by reducing heat reflection, and can provide the building's users with a peaceful retreat. The green roof proposed for Potomac Village is fully vegetated and contains a minimum of 6" of soil.

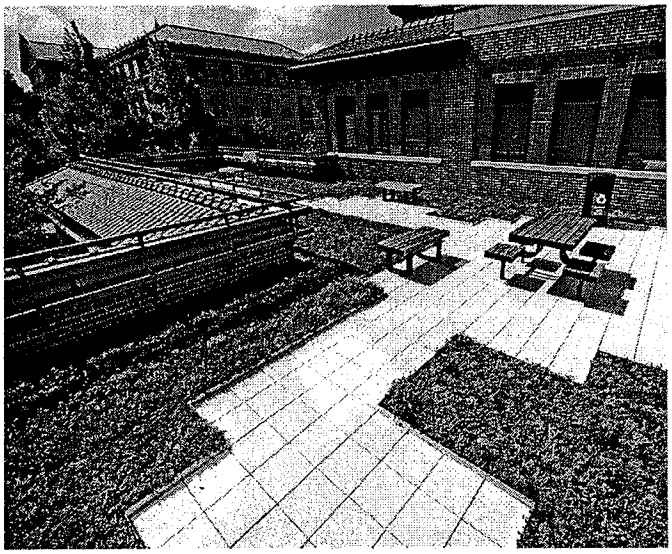


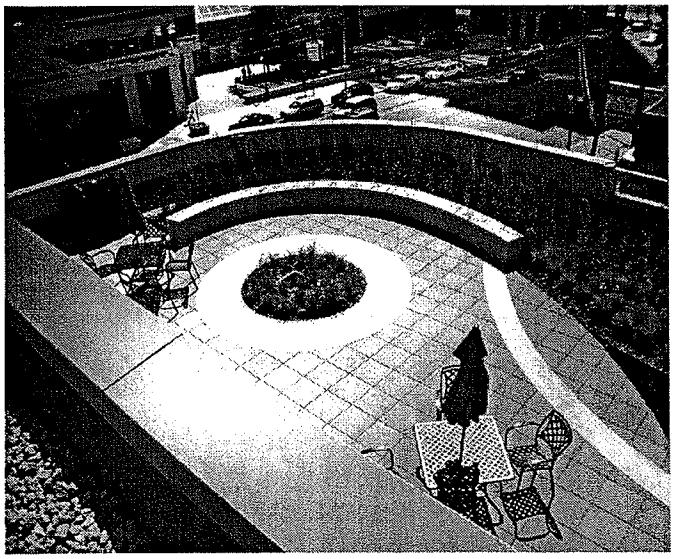


Pervious Pavers

Pervious Pavers create a breathable paved walking surface that allows for the free movement of water. On an elevated deck this paving system is composed of sub-surface layers that filter the water as it drains through first the paver surface, and successive underlying levels of gravel and sand. The remaining water runoff is free of the usual contaminants, and promotes the healthy growth of surrounding areas of green roof. It also helps treat and absorb storm water runoff before it enters the City's natural waterways. Pervious Pavers are easy to maintain and repair, and can, if desired, be made of recycled materials.

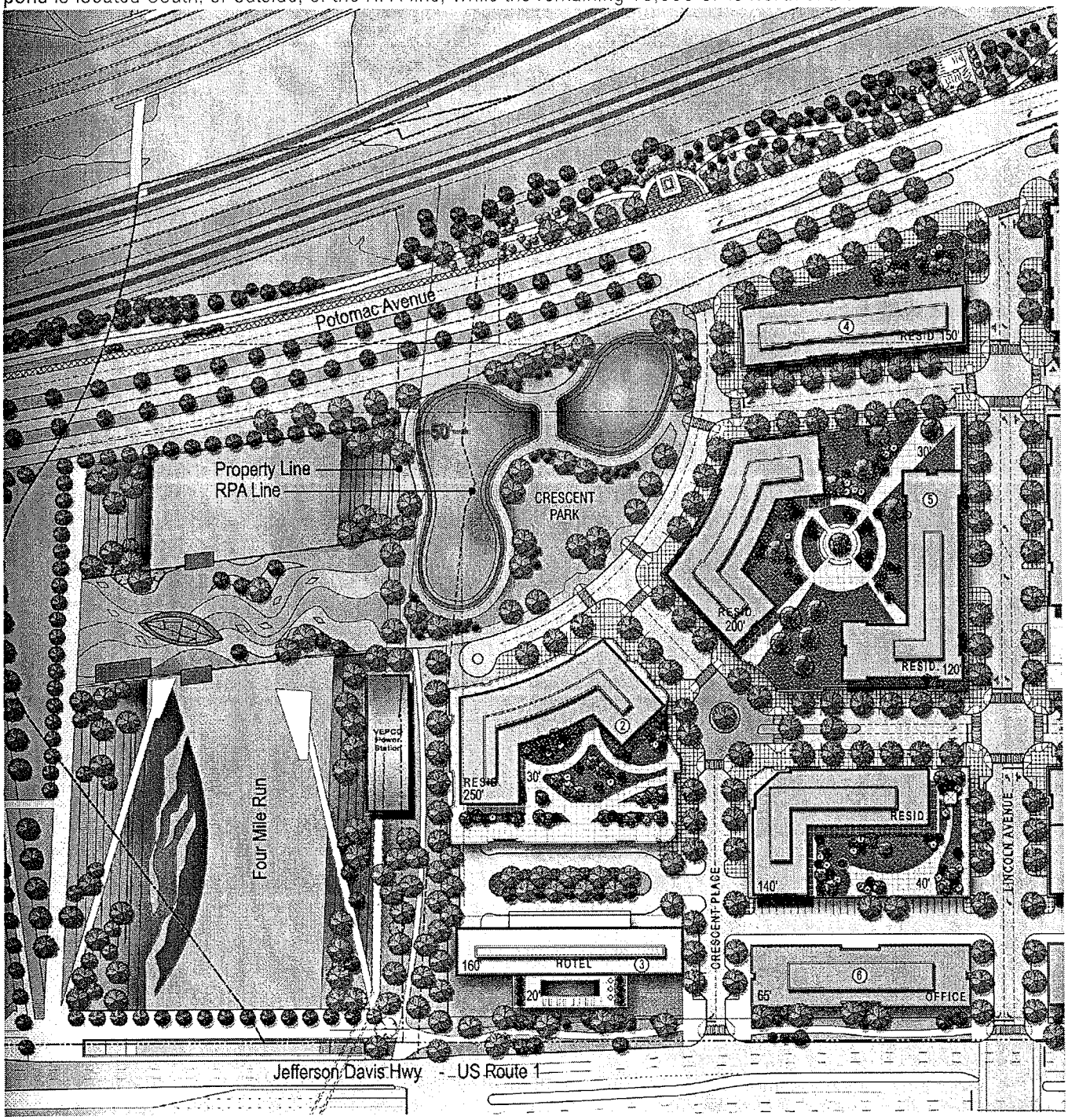






Crescent Park- February 1st, 2010

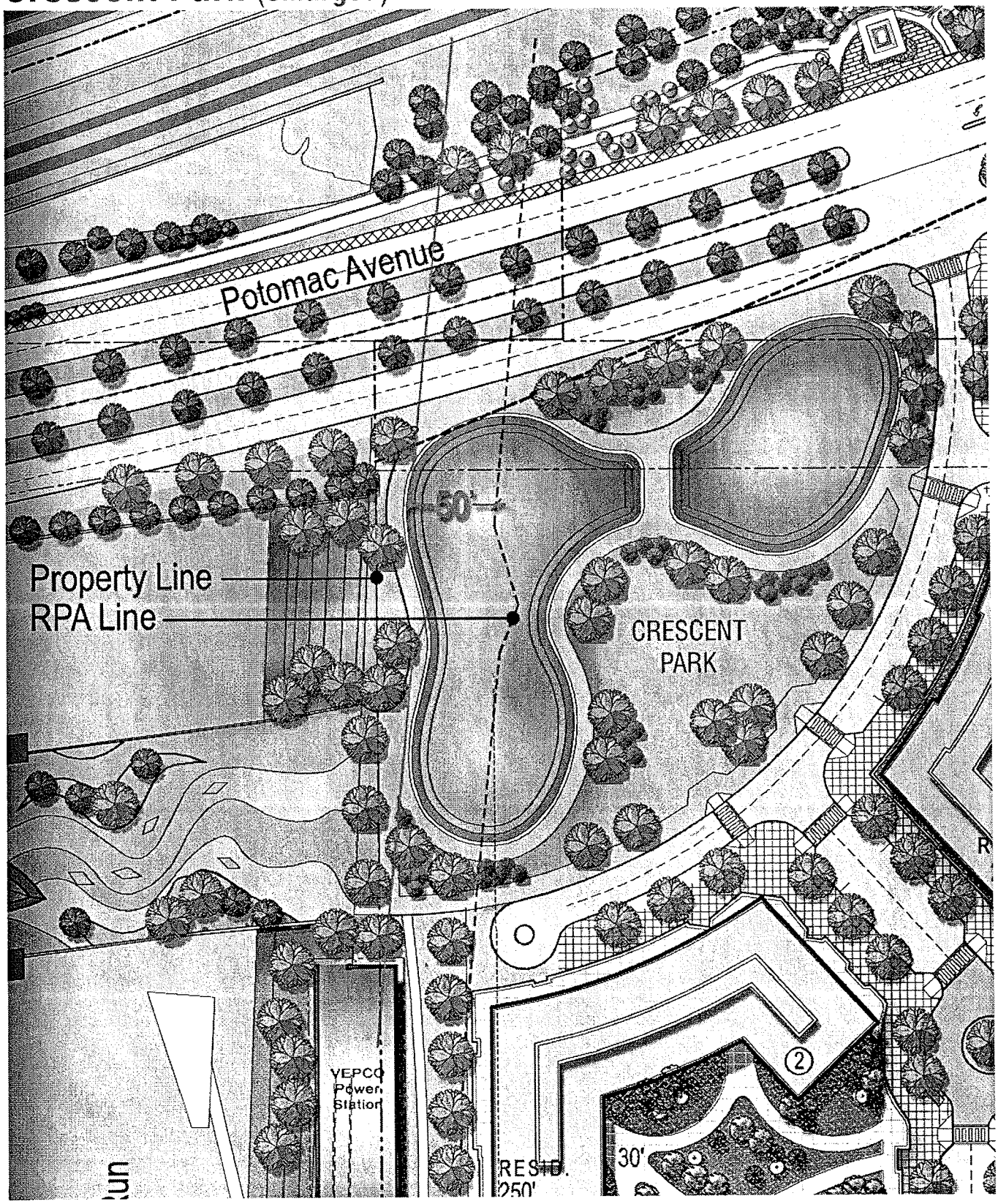
Crescent Park as illustrated, is comprised of a site area of approximately 100,000 SF, of which 76,000 SF is outside the RPA boundary. Shifting the retention pond North, within the RPA line, opens up usable open space closer to the proposed residential district, and away from Potomac Avenue. Of the 100,000 SF park area, the pond occupies 45,000 SF, leaving 55,000 SF for open space. 47,000 SF of open space is located between the RPA line and the southern boundary of Crescent Park. 8,000 SF is located between the RPA line and the northern property line. 29,000 SF of the pond is located South, or outside, of the RPA line, while the remaining 16,000 SF is North of the RPA line.



Potomac Village, Alexandria, VA

N Crescent Park

Crescent Park (enlarged)

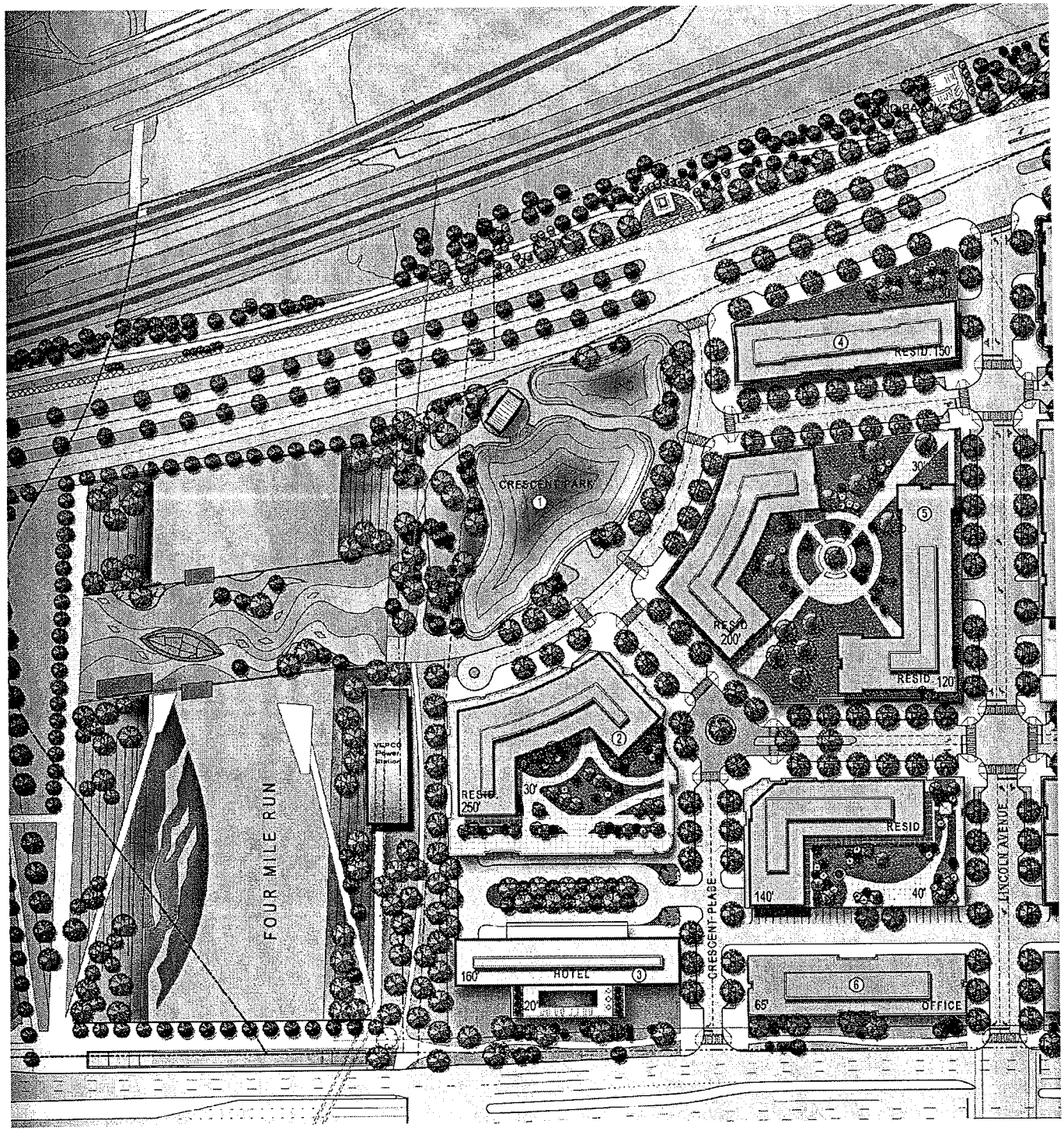


Potomac Village, Alexandria, VA

N Crescent Park

Crescent Park- November 25th, 2009

Crescent Park as illustrated, is comprised of a site area of approximately 100,000 SF, of which 76,000 SF is outside the RPA boundary. Of the 100,000 SF park area, the pond occupies 45,000 SF, leaving 55,000 SF for open space. 31,000 SF of open space is located between the RPA line and the southern boundary of Crescent Park. 24,000 SF of open space is located between the RPA line and the northern property line. 45,000 SF of the pond is located South, or outside, the RPA line.



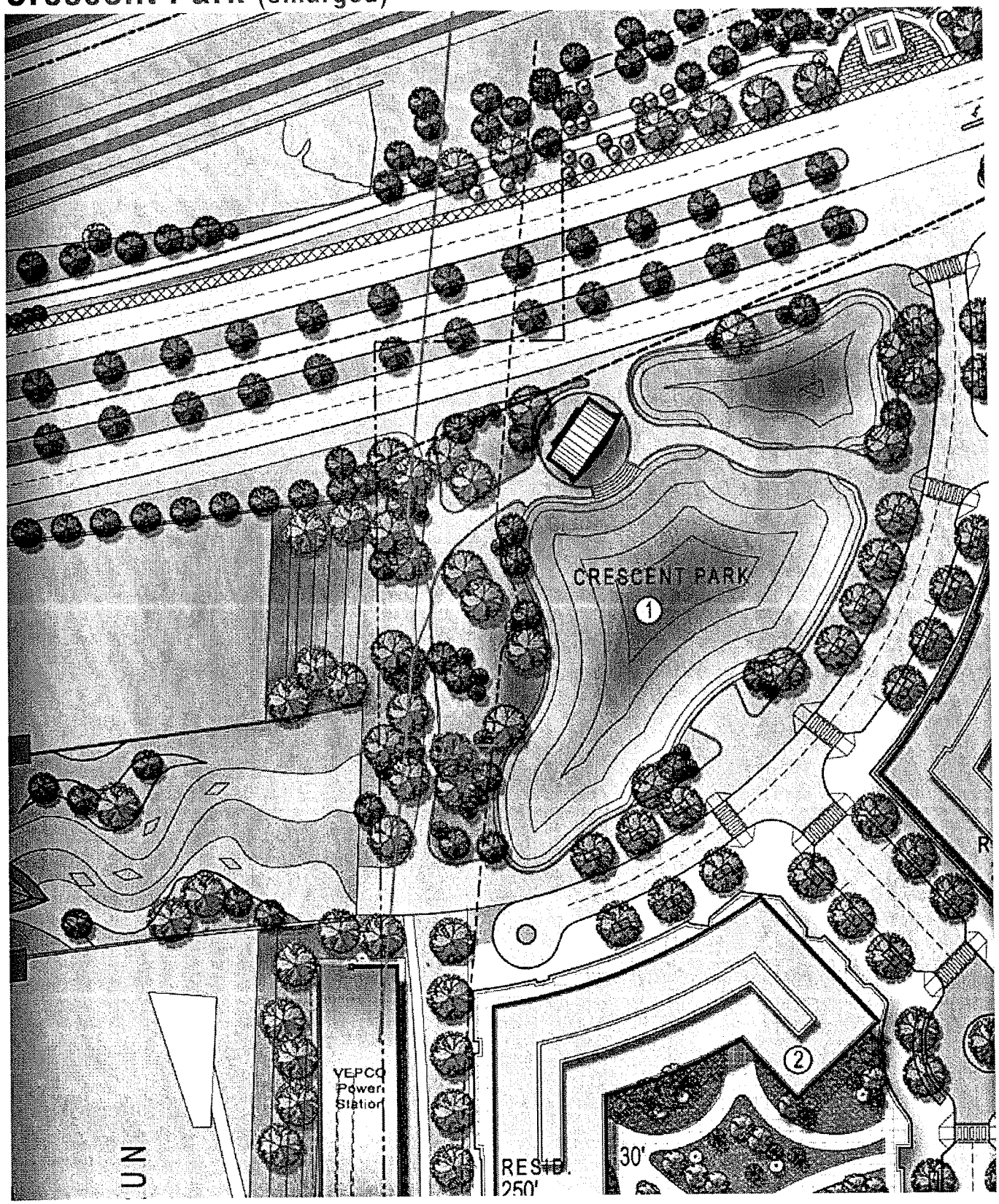
Potomac Village, Alexandria, VA

N Crescent Park

RREEF Investment Advisor | **McCaffery Interests** Developer | **Antunovich Associates** Architects & Planners

February 1st, **2010**

Crescent Park (enlarged)



Potomac Village, Alexandria, VA

N Crescent Park

RREEF Investment Advisor | **McCaffery Interests** Developer | **Antunovich Associates** Architects & Planners

February 1st, **2010**

Potomac Village

Sanitary Sewer Executive Summary

In preparation for the redevelopment of the existing Potomac Yard Retail Center to a mixed-use development referred to as Potomac Village, an analysis of the existing and future sanitary sewer conveyance systems was performed to confirm that these sewers could convey the waste water generated from the proposed development program to the Alexandria Sanitation Authority (ASA) Waste Water Treatment Plant (WWTP). As part of this exercise, several models were created to analyze the existing sanitary system which consists of a 24" diameter PVC pipe, a 27" diameter PVC pipe, an existing pump station and a 30" diameter Centrifugally Cast Fiberglass Pipe (CCFP). The 24" and 27" conveyance systems and pump station are located south of the Potomac Village Site on Potomac Yard and the 30" conveyance system is located offsite within dedicated easements or in the public right-of-way.

In coordination with the City of Alexandria, the base line for the analysis included very conservative models that anticipated flows from Potomac Village, Potomac Yard, Potomac Greens, existing development parcels between the site and the WWTP, separation needs for the City's CSOs, and future development parcels such as Jack Taylor/Hertz, Oakville Triangle which are west of Route 1, Braddock Fields and the Braddock Metro Neighborhood Plan. In addition, it was determined that the future development sites and Potomac Village be analyzed using low flow plumbing fixtures and the remaining sites be analyzed with standard plumbing fixtures. Low flow fixtures offer a reduction in water usage and are commonly associated with the Leadership in Energy and Environmental Design (LEED) program. Water savings in excess of 35% can be achieved by using low flow fixtures in accordance with manufacturer specifications. The analysis utilized a conservative estimate 35% below the City's recommended average design flows for all future development parcels and standard average design flows for the remaining parcels. The analysis also took into account "n" values for the pipe's material ranging from 0.0105 to 0.011 with 0.011 being the worst case. We have agreed to use the 0.011 for all final computations. All modeling has been performed by Baxter and Woodman (BW).

The initial analysis performed use an "n" value of 0.011, assume the City's CSO would connect to the 30" conveyance system at shaft 8 and low flow fixtures for Potomac Village and all future development parcels. This analysis showed that the sanitary conveyance systems mentioned above have the capacity to convey all sewerage flows to the WWTP. The 24" and 27" sanitary conveyance systems experienced no surcharging. The 30" sanitary conveyance system experienced minimum surcharging as previously submitted to the City. The City as dictated that there will be NO surcharging. Subsequently, additional modeling has occurred. In addition, the City is requesting that the CSO flow numbers previously provided to us be increased by over 21%. All work to date has taken into consideration extremely conservative assumptions. For example, in the Braddock Road area, all development has been assumed to be residential (the highest generation of flows). A true mixed use will reduce the flows even more. A conceptual evaluation of the existing pump station indicated that for the increase in flows, modifications to the station's impellers and possible changes to pump elevations will be required. It is our opinion that this system is adequate to convey the proposed sewer from Potomac Village, as well as the other flows being considered.

In addition to the conveyance systems mentioned above, there will be a new pump station, force main and onsite collection system to support the development. There is also an existing 20" force main onsite. Approximately 900' of the force main will need to be relocated based upon current conceptual layouts. It is anticipated that the new pump station, force main and relocation of the existing force main will occur with phase 1 of construction. The onsite collection system will be installed with several phases of construction.

Attached to this Executive Summary is a supplemental memorandum and modeling from BW that includes the 21% + increase in CSO diversion, the final models showing the surcharge and proposed solutions and costs to eliminate the surcharge.

MEMORANDUM

BAXTER WOODMAN
Consulting Engineers

Mokena Office

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Mokena, IL 60452
Phone: 708.478.2090
Fax: 708.478.8710

Corporate Website: www.baxterwoodman.com
e-mail:info@baxterwoodman.com

DATE: February 4, 2010
TO: Bill Zink
FROM: Derek Wold
SUBJECT: Potomac Yard - Sanitary Sewer Evaluation

We have analyzed the capacity of the 24-inch onsite trunk sewer, 27-inch onsite trunk sewer and 30-inch offsite trunk sewer to evaluate whether there is adequate capacity for the ultimate build-out of the entire tributary area. The results are summarized in our memo dated September 5, 2009 and the Master Utility Concept Plan prepared by Christopher Consultants, dated January 25, 2010. Despite identifying only 0.04 feet of surcharging at one manhole along the 30-inch offsite sewer, at our meeting on January 25, the City stipulated that the criteria for acceptance would be no surcharging in any manholes. In addition, the City expressed concern about the possibility of exceeding the flow rates predicted with the use of low flow fixtures and for future I/I to decrease the reserve capacity.

In order to address these concerns, we recommend consideration of the following:

Surcharging

At our meeting on January 25, the City indicated that the CSO flow should be allocated to five different shaft locations. In subsequent correspondence, the City requested that the CSO flow be increased by 120,000 gpd, from 0.55 to 0.67 mgd. This results in surcharging of 0.28 feet at shaft 8, 0.21 feet at shaft 9 and 0.13 feet at shaft 10. Table 1 contains the modeling results for the onsite and offsite sewers. The sanitary sewer profile and hydraulic grade line are shown on Exhibits 1 and 2.

The surcharging can be eliminated by either reducing the flow from the site or increasing the capacity of the downstream trunk sewer as described below. Both alternatives were modeled with low flow fixtures (35 percent flow reduction) and the increased CSO flow (0.67 mgd) input at shafts specified by the City.

Alternative 1: Reduce flow from site

The surcharging in the offsite sewer can be eliminated if the average daily flow is reduced by 0.75 mgd. This corresponds to a 54 percent decrease in flow from Potomac Yard.

Alternative 2: Increase capacity

The second alternative to eliminating surcharging would be to increase the capacity of the offsite trunk sewer. This could be accomplished by several different methods. The first method would be to replace sections of pipe that are under capacity. We have determined that approximately 1,340 lineal feet of 30–inch sewer between shafts 5 and 9 would need to be replaced. Table 2 contains the modeling results for the onsite and offsite sewers. The sanitary sewer profile and hydraulic grade line are shown on Exhibits 3 and 4. The opinion of probable construction cost for this is approximately $2,100,000.

The second alternative to increase the capacity would be to install a parallel relief sewer. We have determined that approximately 400 LF of 24-inch sewer would be required between shafts 7 and 8. Table 3 contains the modeling results for the onsite and offsite sewers. The sanitary sewer profile and hydraulic grade line are shown on Exhibits 5 and 6. The opinion of probable construction cost for this alternative is approximately $500,000. Another alternative to a parallel pipe would be to replace the 30-inch diameter pipe with a 36-inch diameter pipe. However, this would likely be more costly than a smaller diameter relief sewer.

The third alternative is to install a storage tank that connects to shaft 8 and stores the peak flow to prevent surcharging. A storage tank of approximately 75,000 gallons would be needed to eliminate surcharging. The storage tank would also require cleaning and system to return the flow back to the sewer. Due to the cost and maintenance concerns, this option is not recommended.

Thus, we would recommend installing a 24-inch parallel relief sewer between shafts 7 and 8. Potomac Yard should be responsible for the percentage of this cost that is proportional to the flow that is generated by the site, which is equivalent to 20 % or $100,000.

Monitoring

The City has expressed concern about the possibility of the flows generated from the site to exceed the projected flows with low flow fixtures. We recommend a two phased monitoring program to verify that the flows are at or below the projected values.

Pump Station Metering

Flow at the pump station should be metered to record flow from the tributary area. It is unclear from the available drawings whether the pump station has a meter installed. However, it is likely that a pump station of this size would have a meter that could be utilized to record data. If a meter does not exist, we would recommend installing a meter prior to construction at Potomac Yard.

Sewer Flow monitoring

Should the pump station meter indicate the flow from Potomac Yard exceeds the projected flow, we would recommend installing a flow meter in the gravity trunk sewer at the furthest downstream point of Potomac Yard (near manhole S16). This would determine whether the additional flow was generated from Potomac Yard or another offsite area.

If the flow monitoring indicates that the excess flow is from Potomac Yard, then each building should be isolated to determine the source of the increase in flow. The first task of this analysis would be to start with water meter records to compare the actual water usage to the projected usage. If the source of additional flow is not identified, then the next step would be to install a sanitary sewer flow meter at each building to record wastewater flow rates.

Another consideration would be to require that a sanitary sewer flow meter be installed for each building. Incorporating a building sewer meter and low flow fixtures as requirements for buildings sold to other developers would help ensure that the projected peak flow is not exceeded.

Future Infiltration / Inflow

The Potomac Yard project will be required to install a sanitary sewer system that meets the requirements of the City of Alexandria. After the infrastructure is accepted by the City, the responsibility for operating and maintaining the sanitary sewers is the responsibility of the City. This also includes preventing Infiltration and Inflow from entering the sewers and increasing the peak flow. We recommend presenting the following to the City to ensure that the sewers are installed as watertight as possible, using the best available technology for construction, to reduce the potential for future I/I.

1. **Construct sewers using materials specified by the City**. The onsite sanitary sewers should be constructed with pvc pipe, meeting SDR 26, ASTM D3034. The sanitary sewers may also be constructed with pressure rated pipe complying with ASTM D2241 to further reduce the potential for I/I.

2. **Air test sanitary sewer mains.** All sanitary sewer mains shall be air tested for watertightness in accordance with latest ASTM and as required by the City.

3. **Vacuum test manholes.** All sanitary sewer manholes shall be air tested for watertightness in accordance with ASTM C144-93.

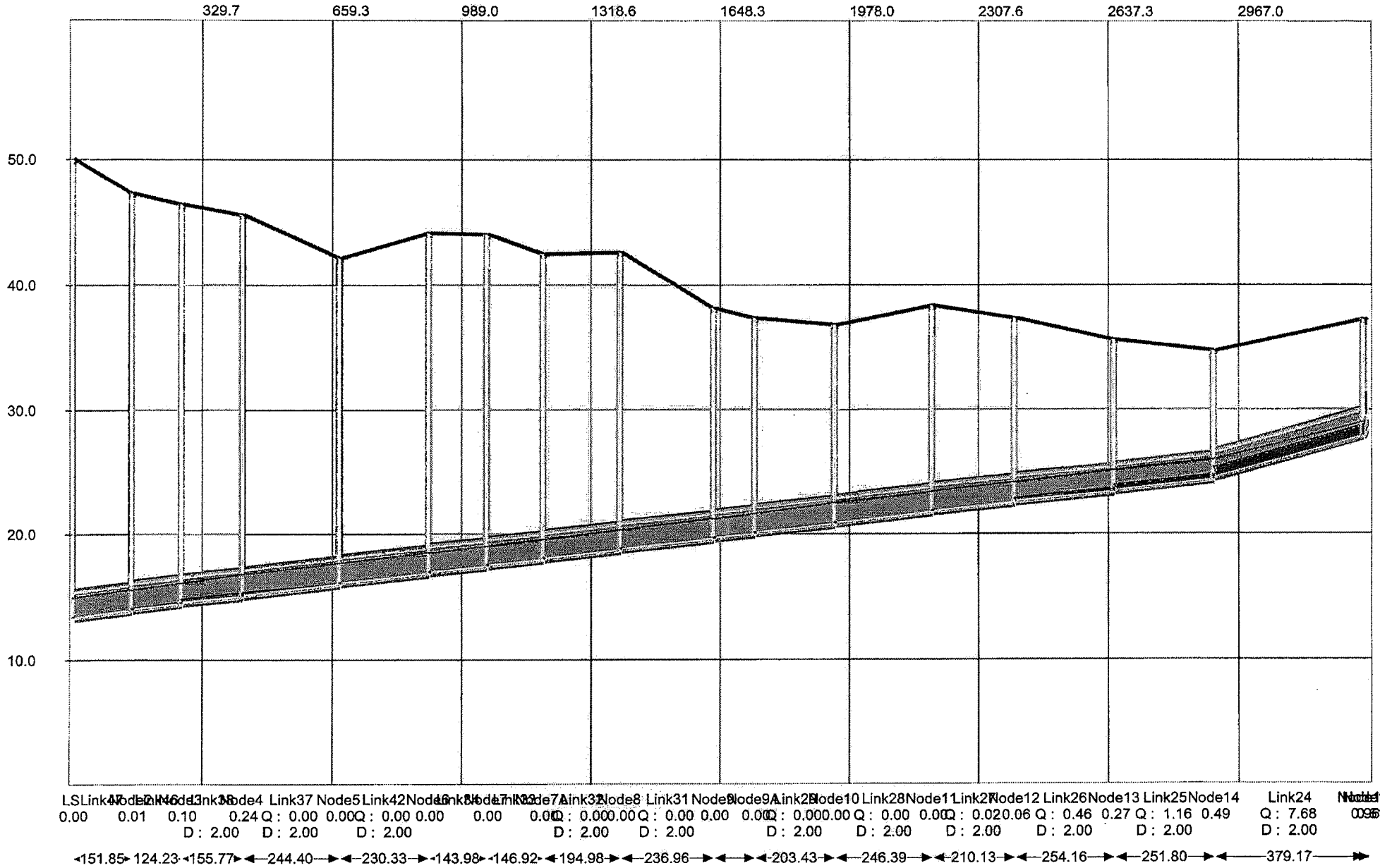
4. **Air test services.** Although not required by the City, we would recommend testing the building sanitary services for watertightness to further reduce the potential for I/I and reinforce the commitment to generate the lowest wastewater flow possible from the site.

Name	Upstream Node Name	Downstream Node Name	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Length (ft)	Conduit Slope (%)	Roughness	Diameter (ft)	Max Depth (ft)	Free Board (ft)	Design Full Flow (cfs)	Design Full Flow (MGD)	Max Flow (cfs)	Max Flow (MGD)
30-inch Offsite Trunk Sewer														
Link41	Node1	Node0	-7.28	-7.50	80.3	0.274	0.0110	2.50	1.91	0.60	25.37	16.37	27.34	17.64
Link40	Node2	Node1	-6.38	-7.14	326.6	0.233	0.0110	2.50	2.17	0.33	23.38	15.08	27.34	17.64
Link39	Node3	Node2	-4.74	-5.89	408.7	0.281	0.0110	2.50	2.10	0.41	25.71	16.59	27.34	17.64
Link38	Node4	Node3	-3.83	-4.64	399.0	0.203	0.0110	2.50	2.39	0.11	21.84	14.09	27.34	17.64
Link37	Node5	Node4	-2.24	-3.78	561.1	0.274	0.0110	2.50	2.36	0.14	25.40	16.39	27.34	17.64
Link42	Node7	Node5	0.01	-2.17	587.2	0.371	0.0110	2.50	2.29	0.21	29.54	19.06	27.34	17.64
Link34	Node8	Node7	0.46	0.05	400.9	0.102	0.0110	2.50	2.78	**-0.28**	15.50	10.00	27.34	17.64
Link33	Node9	Node8	1.72	0.53	351.3	0.339	0.0110	2.50	2.71	**-0.21**	28.21	18.20	27.15	17.51
Link32	Node10	Node9	2.98	1.77	431.2	0.281	0.0110	2.50	2.63	**-0.13**	25.68	16.57	27.15	17.51
Link31	Node11	Node10	4.39	3.21	434.6	0.272	0.0110	2.50	2.40	0.10	25.26	16.30	26.75	17.26
Link30	Node12	Node11	5.55	4.49	326.4	0.325	0.0110	2.50	2.27	0.23	27.62	17.82	26.44	17.05
Link29	Node13	Node12	6.52	5.60	315.4	0.292	0.0110	2.50	2.05	0.46	26.18	16.89	25.35	16.35
Link28	Node14	Node13	7.43	6.62	340.8	0.238	0.0110	2.50	2.09	0.41	23.63	15.25	25.35	16.35
Link27	Node15	Node14	8.66	7.49	430.1	0.272	0.0110	2.50	2.05	0.45	25.28	16.31	25.35	16.35
Link26	Node16	Node15	9.71	8.97	416.8	0.178	0.0110	2.50	2.07	0.43	20.43	13.18	22.49	14.51
Link25	Node17	Node16	10.75	10.06	410.9	0.168	0.0110	2.50	2.09	0.42	19.86	12.81	22.49	14.51
Link24	Node18	Node17	12.12	11.01	424.4	0.262	0.0110	2.50	1.83	0.67	24.79	15.99	22.04	14.22
Link23	Node19	Node18	13.46	12.47	427.0	0.232	0.0110	2.50	1.83	0.68	23.34	15.06	21.00	13.55
Link22	Node20	Node19	14.67	13.73	394.3	0.238	0.0110	2.50	1.80	0.70	23.67	15.27	20.94	13.51
Link21	Node21	Node20	15.85	14.84	376.3	0.268	0.0110	2.50	1.65	0.85	25.11	16.20	19.21	12.39
Link20	Node22	Node21	16.83	15.94	253.2	0.351	0.0110	2.50	1.56	0.94	28.74	18.54	19.67	12.69
Link19	Node23	Node22	17.51	16.97	221.8	0.243	0.0110	2.50	1.66	0.84	23.92	15.43	19.25	12.42
Link18	Node24	Node23	18.26	17.70	281.2	0.199	0.0110	2.50	1.74	0.77	21.63	13.95	19.04	12.28
27-inch Onsite Trunk Sewer														
Link17	Node25	Node24	19.21	18.28	276.0	0.337	0.0110	2.25	1.72	0.54	21.25	13.71	19.03	12.28
Link16	Node26	Node25	19.90	19.33	197.5	0.289	0.0110	2.25	1.70	0.55	19.66	12.68	18.95	12.23
Link15	Node27	Node26	21.09	20.10	402.0	0.246	0.0110	2.25	1.85	0.41	18.16	11.72	18.94	12.22
Link14	Node28	Node27	21.93	21.14	209.5	0.377	0.0110	2.25	1.80	0.46	22.48	14.50	19.57	12.62
Link13	Node29	Node28	22.60	22.08	140.0	0.371	0.0110	2.25	1.62	0.64	22.31	14.39	19.32	12.46
Link12	Node29A	Node29	23.29	22.57	39.5	1.823	0.0110	2.25	1.65	0.61	49.42	31.88	19.04	12.28
Link11	Node30	Node29A	24.30	23.34	295.0	0.325	0.0110	2.25	1.69	0.56	20.88	13.47	19.01	12.27
Link10	Node31	Node30	24.89	24.41	173.0	0.277	0.0110	2.25	1.72	0.53	19.28	12.44	18.96	12.23
Link9	Node31A	Node31	25.45	25.02	133.0	0.323	0.0110	2.25	1.63	0.62	20.81	13.43	18.62	12.02
Link8	Node32	Node31A	26.28	25.56	237.5	0.303	0.0110	2.25	1.68	0.57	20.15	13.00	18.62	12.01
Link44	Node33	Node32	27.23	26.37	300.5	0.286	0.0110	2.25	1.74	0.51	19.58	12.63	18.52	11.95
Link43	Node34	Node33	28.74	28.20	118.0	0.458	0.0110	2.25	1.55	0.70	24.76	15.97	18.24	11.77
ONSITE PUMP STATION														
24-inch Onsite Trunk Sewer														
Link47	Node2	LS	13.87	13.38	151.9	0.323	0.0110	2.00	1.69	0.31	15.19	9.80	17.09	11.03
Link46	Node3	Node2	14.44	13.97	124.2	0.378	0.0110	2.00	1.65	0.35	16.44	10.61	17.09	11.03
Link38	Node4	Node3	15.05	14.54	155.8	0.327	0.0110	2.00	1.70	0.30	15.30	9.87	17.09	11.03
Link37	Node5	Node4	15.96	15.15	244.4	0.331	0.0110	2.00	1.70	0.30	15.39	9.93	16.29	10.51
Link42	Node6	Node5	16.82	16.06	230.3	0.330	0.0110	2.00	1.70	0.31	15.36	9.91	16.29	10.51
Link34	Node7	Node6	17.40	16.92	144.0	0.333	0.0110	2.00	1.67	0.33	15.44	9.96	16.29	10.51
Link33	Node7A	Node7	17.98	17.50	146.9	0.327	0.0110	2.00	1.66	0.34	15.28	9.86	16.29	10.51
Link32	Node8	Node7A	18.72	18.08	195.0	0.328	0.0110	2.00	1.68	0.33	15.32	9.88	16.29	10.51
Link31	Node9	Node8	19.61	18.82	237.0	0.333	0.0110	2.00	1.68	0.32	15.44	9.96	16.29	10.51
Link30	Node9A	Node9	20.06	19.71	107.8	0.325	0.0110	2.00	1.66	0.34	15.23	9.83	16.29	10.51
Link29	Node10	Node9A	20.83	20.16	203.4	0.329	0.0110	2.00	1.67	0.33	15.34	9.90	16.29	10.51
Link28	Node11	Node10	21.75	20.93	246.4	0.333	0.0110	2.00	1.69	0.31	15.42	9.95	16.29	10.51
Link27	Node12	Node11	22.54	21.85	210.1	0.328	0.0110	2.00	1.69	0.31	15.32	9.88	16.29	10.51
Link26	Node13	Node12	23.48	22.64	254.2	0.331	0.0110	2.00	1.70	0.30	15.37	9.92	16.29	10.51
Link25	Node14	Node13	24.41	23.58	251.8	0.330	0.0110	2.00	1.62	0.38	15.35	9.90	15.22	9.82
Link24	Node15	Node14	27.88	24.66	379.2	0.849	0.0110	2.00	1.37	0.63	24.64	15.90	15.62	10.08
Link45	Node16	Node15	28.57	27.98	14.3	4.123	0.0110	2.00	1.08	0.92	37.49	24.19	6.22	4.01

Name	Upstream Node Name	Downstream Node Name	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Length (ft)	Conduit Slope (%)	Roughness	Diameter (ft)	Max Depth (ft)	Free Board (ft)	Design Full Flow (cfs)	Design Full Flow (MGD)	Max Flow (cfs)	Max Flow (MGD)
30-inch Offsite Trunk Sewer														
Link41	Node1	Node0	-7.28	-7.50	80.3	0.274	0.0110	2.50	1.91	0.60	25.37	16.37	27.34	17.64
Link40	Node2	Node1	-6.38	-7.14	326.6	0.233	0.0110	2.50	2.17	0.33	23.38	15.08	27.34	17.64
Link39	Node3	Node2	-4.74	-5.89	408.7	0.281	0.0110	2.50	2.10	0.41	25.71	16.59	27.34	17.64
Link38	Node4	Node3	-3.83	-4.64	399.0	0.203	0.0110	2.50	2.39	0.11	21.84	14.09	27.34	17.64
Link37	Node5	Node4	-2.24	-3.78	561.1	0.274	0.0110	2.50	2.36	0.14	25.40	16.39	27.34	17.64
Link42	Node7	Node5	0.01	-2.17	587.2	**0.291**	0.0110	2.50	2.29	0.21	26.13	16.86	27.34	17.64
Link34	Node8	Node7	0.46	0.05	400.9	**0.290**	0.0110	2.50	2.23	0.27	26.12	16.85	27.34	17.64
Link33	Node9	Node8	1.72	0.53	351.3	**0.290**	0.0110	2.50	2.21	0.30	26.12	16.85	27.15	17.51
Link32	Node10	Node9	2.98	1.77	431.2	0.281	0.0110	2.50	2.18	0.32	25.68	16.57	27.15	17.51
Link31	Node11	Node10	4.39	3.21	434.6	0.272	0.0110	2.50	2.12	0.38	25.26	16.30	26.75	17.26
Link30	Node12	Node11	5.55	4.49	326.4	0.325	0.0110	2.50	2.02	0.48	27.62	17.82	26.44	17.05
Link29	Node13	Node12	6.52	5.60	315.4	0.292	0.0110	2.50	1.97	0.53	26.18	16.89	25.35	16.35
Link28	Node14	Node13	7.43	6.62	340.8	0.238	0.0110	2.50	2.08	0.42	23.63	15.25	25.35	16.35
Link27	Node15	Node14	8.66	7.49	430.1	0.272	0.0110	2.50	2.05	0.45	25.28	16.31	25.35	16.35
Link26	Node16	Node15	9.71	8.97	416.8	0.178	0.0110	2.50	2.07	0.43	20.43	13.18	22.49	14.51
Link25	Node17	Node16	10.75	10.06	410.9	0.168	0.0110	2.50	2.09	0.42	19.86	12.81	22.49	14.51
Link24	Node18	Node17	12.12	11.01	424.4	0.262	0.0110	2.50	1.83	0.67	24.79	15.99	22.04	14.22
Link23	Node19	Node18	13.46	12.47	427.0	0.232	0.0110	2.50	1.83	0.68	23.34	15.06	21.00	13.55
Link22	Node20	Node19	14.67	13.73	394.3	0.238	0.0110	2.50	1.80	0.70	23.67	15.27	20.94	13.51
Link21	Node21	Node20	15.85	14.84	376.3	0.268	0.0110	2.50	1.65	0.85	25.11	16.20	19.21	12.39
Link20	Node22	Node21	16.83	15.94	253.2	0.351	0.0110	2.50	1.56	0.94	28.74	18.54	19.67	12.69
Link19	Node23	Node22	17.51	16.97	221.8	0.243	0.0110	2.50	1.66	0.84	23.92	15.43	19.25	12.42
Link18	Node24	Node23	18.26	17.70	281.2	0.199	0.0110	2.50	1.74	0.77	21.63	13.95	19.04	12.28
27-inch Onsite Trunk Sewer														
Link17	Node25	Node24	19.21	18.28	276.0	0.337	0.0110	2.25	1.72	0.54	21.25	13.71	19.03	12.28
Link16	Node26	Node25	19.90	19.33	197.5	0.289	0.0110	2.25	1.70	0.55	19.66	12.68	18.95	12.23
Link15	Node27	Node26	21.09	20.10	402.0	0.246	0.0110	2.25	1.85	0.41	18.16	11.72	18.94	12.22
Link14	Node28	Node27	21.93	21.14	209.5	0.377	0.0110	2.25	1.80	0.46	22.48	14.50	19.57	12.62
Link13	Node29	Node28	22.60	22.08	140.0	0.371	0.0110	2.25	1.62	0.64	22.31	14.39	19.32	12.46
Link12	Node29A	Node29	23.29	22.57	39.5	1.823	0.0110	2.25	1.65	0.61	49.42	31.88	19.04	12.28
Link11	Node30	Node29A	24.30	23.34	295.0	0.325	0.0110	2.25	1.69	0.56	20.88	13.47	19.01	12.27
Link10	Node31	Node30	24.89	24.41	173.0	0.277	0.0110	2.25	1.72	0.53	19.28	12.44	18.96	12.23
Link9	Node31A	Node31	25.45	25.02	133.0	0.323	0.0110	2.25	1.63	0.62	20.81	13.43	18.62	12.02
Link8	Node32	Node31A	26.28	25.56	237.5	0.303	0.0110	2.25	1.68	0.57	20.15	13.00	18.62	12.01
Link44	Node33	Node32	27.23	26.37	300.5	0.286	0.0110	2.25	1.74	0.51	19.58	12.63	18.52	11.95
Link43	Node34	Node33	28.74	28.20	118.0	0.458	0.0110	2.25	1.55	0.70	24.76	15.97	18.24	11.77
ONSITE PUMP STATION														
24-inch Onsite Trunk Sewer														
Link47	Node2	LS	13.87	13.38	151.9	0.323	0.0110	2.00	1.69	0.31	15.19	9.80	17.09	11.03
Link46	Node3	Node2	14.44	13.97	124.2	0.378	0.0110	2.00	1.65	0.35	16.44	10.61	17.09	11.03
Link38	Node4	Node3	15.05	14.54	155.8	0.327	0.0110	2.00	1.70	0.30	15.30	9.87	17.09	11.03
Link37	Node5	Node4	15.96	15.15	244.4	0.331	0.0110	2.00	1.70	0.30	15.39	9.93	16.29	10.51
Link42	Node6	Node5	16.82	16.06	230.3	0.330	0.0110	2.00	1.70	0.31	15.36	9.91	16.29	10.51
Link34	Node7	Node6	17.40	16.92	144.0	0.333	0.0110	2.00	1.67	0.33	15.44	9.96	16.29	10.51
Link33	Node7A	Node7	17.98	17.50	146.9	0.327	0.0110	2.00	1.66	0.34	15.28	9.86	16.29	10.51
Link32	Node8	Node7A	18.72	18.08	195.0	0.328	0.0110	2.00	1.68	0.33	15.32	9.88	16.29	10.51
Link31	Node9	Node8	19.61	18.82	237.0	0.333	0.0110	2.00	1.68	0.32	15.44	9.96	16.29	10.51
Link30	Node9A	Node9	20.06	19.71	107.8	0.325	0.0110	2.00	1.66	0.34	15.23	9.83	16.29	10.51
Link29	Node10	Node9A	20.83	20.16	203.4	0.329	0.0110	2.00	1.67	0.33	15.34	9.90	16.29	10.51
Link28	Node11	Node10	21.75	20.93	246.4	0.333	0.0110	2.00	1.69	0.31	15.42	9.95	16.29	10.51
Link27	Node12	Node11	22.54	21.85	210.1	0.328	0.0110	2.00	1.69	0.31	15.32	9.88	16.29	10.51
Link26	Node13	Node12	23.48	22.64	254.2	0.331	0.0110	2.00	1.70	0.30	15.37	9.92	16.29	10.51
Link25	Node14	Node13	24.41	23.58	251.8	0.330	0.0110	2.00	1.62	0.38	15.35	9.90	15.22	9.82
Link24	Node15	Node14	27.88	24.66	379.2	0.849	0.0110	2.00	1.37	0.63	24.64	15.90	15.62	10.08
Link45	Node16	Node15	28.57	27.98	14.3	4.123	0.0110	2.00	1.08	0.92	37.49	24.19	6.22	4.01

Name	Upstream Node Name	Downstream Node Name	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Length (ft)	Conduit Slope (%)	Roughness	Diameter (ft)	Max Depth (ft)	Free Board (ft)	Design Full Flow (cfs)	Design Full Flow (MGD)	Max Flow (cfs)	Max Flow (MGD)
30-inch Offsite Trunk Sewer														
Link41	Node1	Node0	-7.28	-7.50	80.3	0.274	0.0110	2.50	1.91	0.60	25.37	16.37	27.34	17.64
Link40	Node2	Node1	-6.38	-7.14	326.6	0.233	0.0110	2.50	2.17	0.33	23.38	15.08	27.34	17.64
Link39	Node3	Node2	-4.74	-5.89	408.7	0.281	0.0110	2.50	2.10	0.41	25.71	16.59	27.34	17.64
Link38	Node4	Node3	-3.83	-4.64	399.0	0.203	0.0110	2.50	2.39	0.11	21.84	14.09	27.34	17.64
Link37	Node5	Node4	-2.24	-3.78	561.1	0.274	0.0110	2.50	2.36	0.14	25.40	16.39	27.34	17.64
Link42	Node7	Node5	0.01	-2.17	587.2	0.371	0.0110	2.50	2.29	0.21	29.54	19.06	27.34	17.64
Link48	**Bypass**	**Node7**	0.46	0.25	200.0	0.102	0.0110	2.00	1.81	0.20	8.56	5.52	10.28	6.63
Link47	**Node8**	**Bypass**	0.66	0.46	200.0	0.102	0.0110	2.00	1.86	0.14	8.56	5.52	10.30	6.64
Link34	Node8	Node7	0.46	0.05	400.9	0.102	0.0110	2.50	2.06	0.44	15.50	10.00	27.34	17.64
Link33	Node9	Node8	1.72	0.53	351.3	0.339	0.0110	2.50	1.99	0.51	28.21	18.20	27.15	17.51
Link32	Node10	Node9	2.98	1.77	431.2	0.281	0.0110	2.50	2.11	0.39	25.68	16.57	27.15	17.51
Link31	Node11	Node10	4.39	3.21	434.6	0.272	0.0110	2.50	2.11	0.39	25.26	16.30	26.75	17.26
Link30	Node12	Node11	5.55	4.49	326.4	0.325	0.0110	2.50	2.01	0.49	27.62	17.82	26.44	17.05
Link29	Node13	Node12	6.52	5.60	315.4	0.292	0.0110	2.50	1.97	0.53	26.18	16.89	25.35	16.35
Link28	Node14	Node13	7.43	6.62	340.8	0.238	0.0110	2.50	2.08	0.42	23.63	15.25	25.35	16.35
Link27	Node15	Node14	8.66	7.49	430.1	0.272	0.0110	2.50	2.05	0.45	25.28	16.31	25.35	16.35
Link26	Node16	Node15	9.71	8.97	416.8	0.178	0.0110	2.50	2.07	0.43	20.43	13.18	22.49	14.51
Link25	Node17	Node16	10.75	10.06	410.9	0.168	0.0110	2.50	2.09	0.42	19.86	12.81	22.49	14.51
Link24	Node18	Node17	12.12	11.01	424.4	0.262	0.0110	2.50	1.83	0.67	24.79	15.99	22.04	14.22
Link23	Node19	Node18	13.46	12.47	427.0	0.232	0.0110	2.50	1.83	0.68	23.34	15.06	21.00	13.55
Link22	Node20	Node19	14.67	13.73	394.3	0.238	0.0110	2.50	1.80	0.70	23.67	15.27	20.94	13.51
Link21	Node21	Node20	15.85	14.84	376.3	0.268	0.0110	2.50	1.65	0.85	25.11	16.20	19.21	12.39
Link20	Node22	Node21	16.83	15.94	253.2	0.351	0.0110	2.50	1.56	0.94	28.74	18.54	19.67	12.69
Link19	Node23	Node22	17.51	16.97	221.8	0.243	0.0110	2.50	1.66	0.84	23.92	15.43	19.25	12.42
Link18	Node24	Node23	18.26	17.70	281.2	0.199	0.0110	2.50	1.74	0.77	21.63	13.95	19.04	12.28
27-inch Onsite Trunk Sewer														
Link17	Node25	Node24	19.21	18.28	276.0	0.337	0.0110	2.25	1.72	0.54	21.25	13.71	19.03	12.28
Link16	Node26	Node25	19.90	19.33	197.5	0.289	0.0110	2.25	1.70	0.55	19.66	12.68	18.95	12.23
Link15	Node27	Node26	21.09	20.10	402.0	0.246	0.0110	2.25	1.85	0.41	18.16	11.72	18.94	12.22
Link14	Node28	Node27	21.93	21.14	209.5	0.377	0.0110	2.25	1.80	0.46	22.48	14.50	19.57	12.62
Link13	Node29	Node28	22.60	22.08	140.0	0.371	0.0110	2.25	1.62	0.64	22.31	14.39	19.32	12.46
Link12	Node29A	Node29	23.29	22.57	39.5	1.823	0.0110	2.25	1.65	0.61	49.42	31.88	19.04	12.28
Link11	Node30	Node29A	24.30	23.34	295.0	0.325	0.0110	2.25	1.69	0.56	20.88	13.47	19.01	12.27
Link10	Node31	Node30	24.89	24.41	173.0	0.277	0.0110	2.25	1.72	0.53	19.28	12.44	18.96	12.23
Link9	Node31A	Node31	25.45	25.02	133.0	0.323	0.0110	2.25	1.63	0.62	20.81	13.43	18.62	12.02
Link8	Node32	Node31A	26.28	25.56	237.5	0.303	0.0110	2.25	1.68	0.57	20.15	13.00	18.62	12.01
Link44	Node33	Node32	27.23	26.37	300.5	0.286	0.0110	2.25	1.74	0.51	19.58	12.63	18.52	11.95
Link43	Node34	Node33	28.74	28.20	118.0	0.458	0.0110	2.25	1.55	0.70	24.76	15.97	18.24	11.77
ONSITE PUMP STATION														
24-inch Onsite Trunk Sewer														
Link47	Node2	LS	13.87	13.38	151.9	0.323	0.0110	2.00	1.69	0.31	15.19	9.80	17.09	11.03
Link46	Node3	Node2	14.44	13.97	124.2	0.378	0.0110	2.00	1.65	0.35	16.44	10.61	17.09	11.03
Link38	Node4	Node3	15.05	14.54	155.8	0.327	0.0110	2.00	1.70	0.30	15.30	9.87	17.09	11.03
Link37	Node5	Node4	15.96	15.15	244.4	0.331	0.0110	2.00	1.70	0.30	15.39	9.93	16.29	10.51
Link42	Node6	Node5	16.82	16.06	230.3	0.330	0.0110	2.00	1.70	0.31	15.36	9.91	16.29	10.51
Link34	Node7	Node6	17.40	16.92	144.0	0.333	0.0110	2.00	1.67	0.33	15.44	9.96	16.29	10.51
Link33	Node7A	Node7	17.98	17.50	146.9	0.327	0.0110	2.00	1.66	0.34	15.28	9.86	16.29	10.51
Link32	Node8	Node7A	18.72	18.08	195.0	0.328	0.0110	2.00	1.68	0.33	15.32	9.88	16.29	10.51
Link31	Node9	Node8	19.61	18.82	237.0	0.333	0.0110	2.00	1.68	0.32	15.44	9.96	16.29	10.51
Link30	Node9A	Node9	20.06	19.71	107.8	0.325	0.0110	2.00	1.66	0.34	15.23	9.83	16.29	10.51
Link29	Node10	Node9A	20.83	20.16	203.4	0.329	0.0110	2.00	1.67	0.33	15.34	9.90	16.29	10.51
Link28	Node11	Node10	21.75	20.93	246.4	0.333	0.0110	2.00	1.69	0.31	15.42	9.95	16.29	10.51
Link27	Node12	Node11	22.54	21.85	210.1	0.328	0.0110	2.00	1.69	0.31	15.32	9.88	16.29	10.51
Link26	Node13	Node12	23.48	22.64	254.2	0.331	0.0110	2.00	1.70	0.30	15.37	9.92	16.29	10.51
Link25	Node14	Node13	24.41	23.58	251.8	0.330	0.0110	2.00	1.62	0.38	15.35	9.90	15.22	9.82
Link24	Node15	Node14	27.88	24.66	379.2	0.849	0.0110	2.00	1.37	0.63	24.64	15.90	15.62	10.08
Link45	Node16	Node15	28.57	27.98	14.3	4.123	0.0110	2.00	1.08	0.92	37.49	24.19	6.22	4.01

Exhibit 1 - 24-inch Onsite Trunk Sewer
Day [0] Time 00:01:00 Step 2



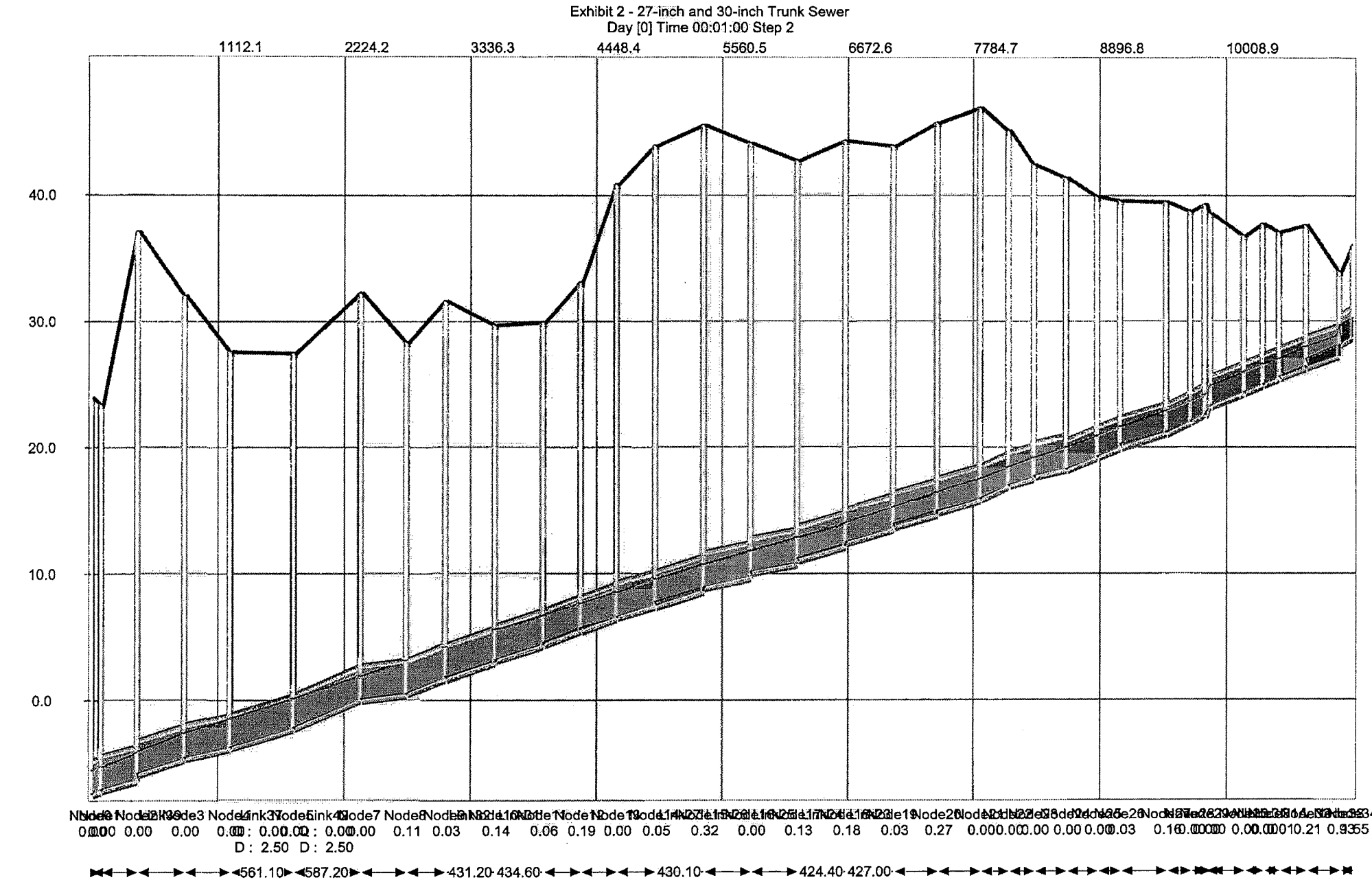


Exhibit 2 - 27-inch and 30-inch Trunk Sewer
Day [0] Time 00:01:00 Step 2
1112.1
2224.2
3336.3
4448.4
5560.5
6672.6
7784.7
8896.8
10008.9
40.0
30.0
20.0
10.0
0.0
D : 2.50
D : 2.50
561.10
587.20
431.20
434.60
430.10
424.40
427.00

Exhibit 3 - 27-inch and 30-inch Trunk Sewer: Replace Shaft 5 to 9
Day [0] Time 00:01:00 Step 2

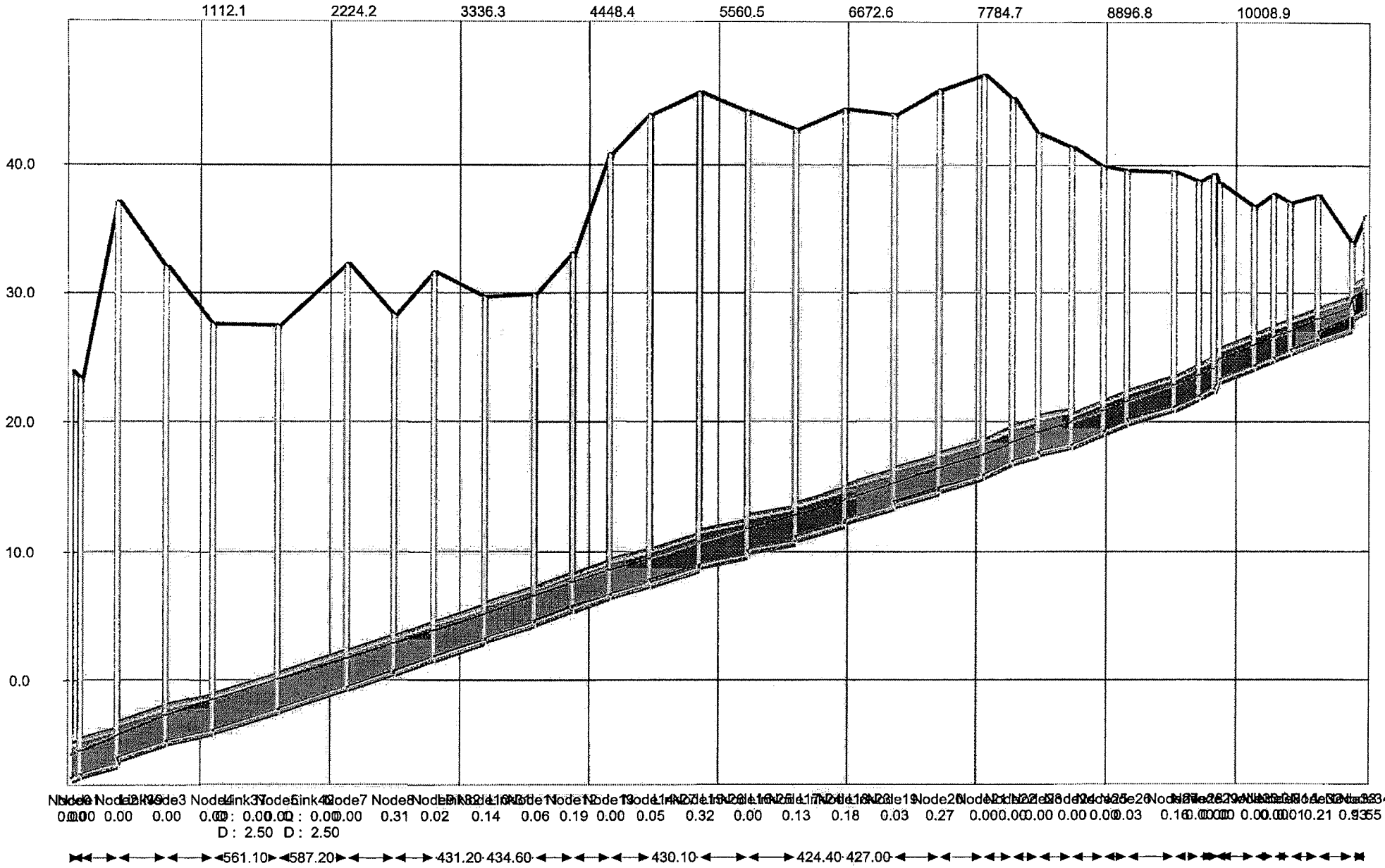


Exhibit 4 - Blowup of Shaft 4 to 11: Replace Shaft 5 to 9
Day [0] Time 00:01:00 Step 2

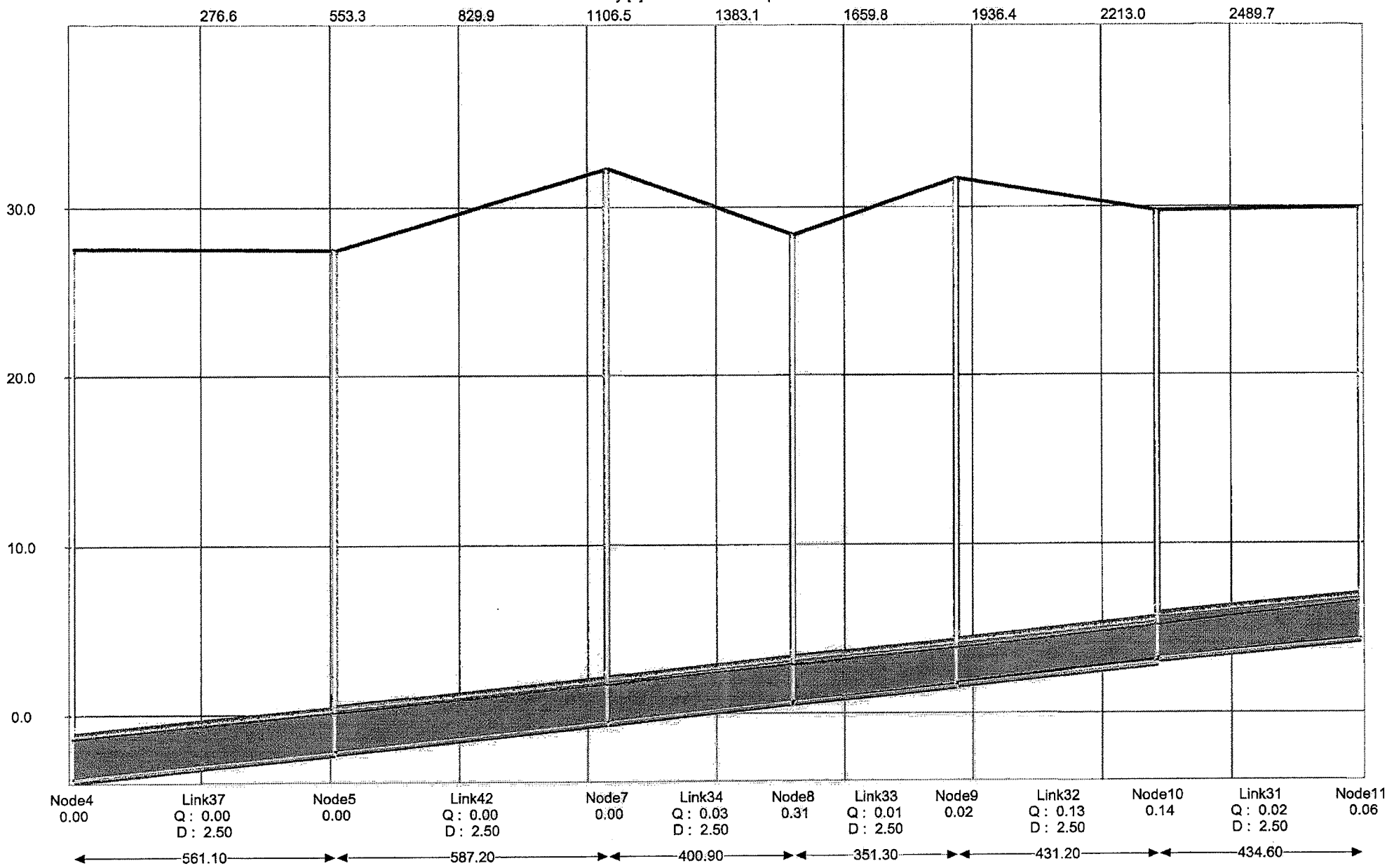


Exhibit 5 - 30-inch Trunk Sewer: Shaft 7 to 8 Relief Sewer
Day [0] Time 00:01:00 Step 2

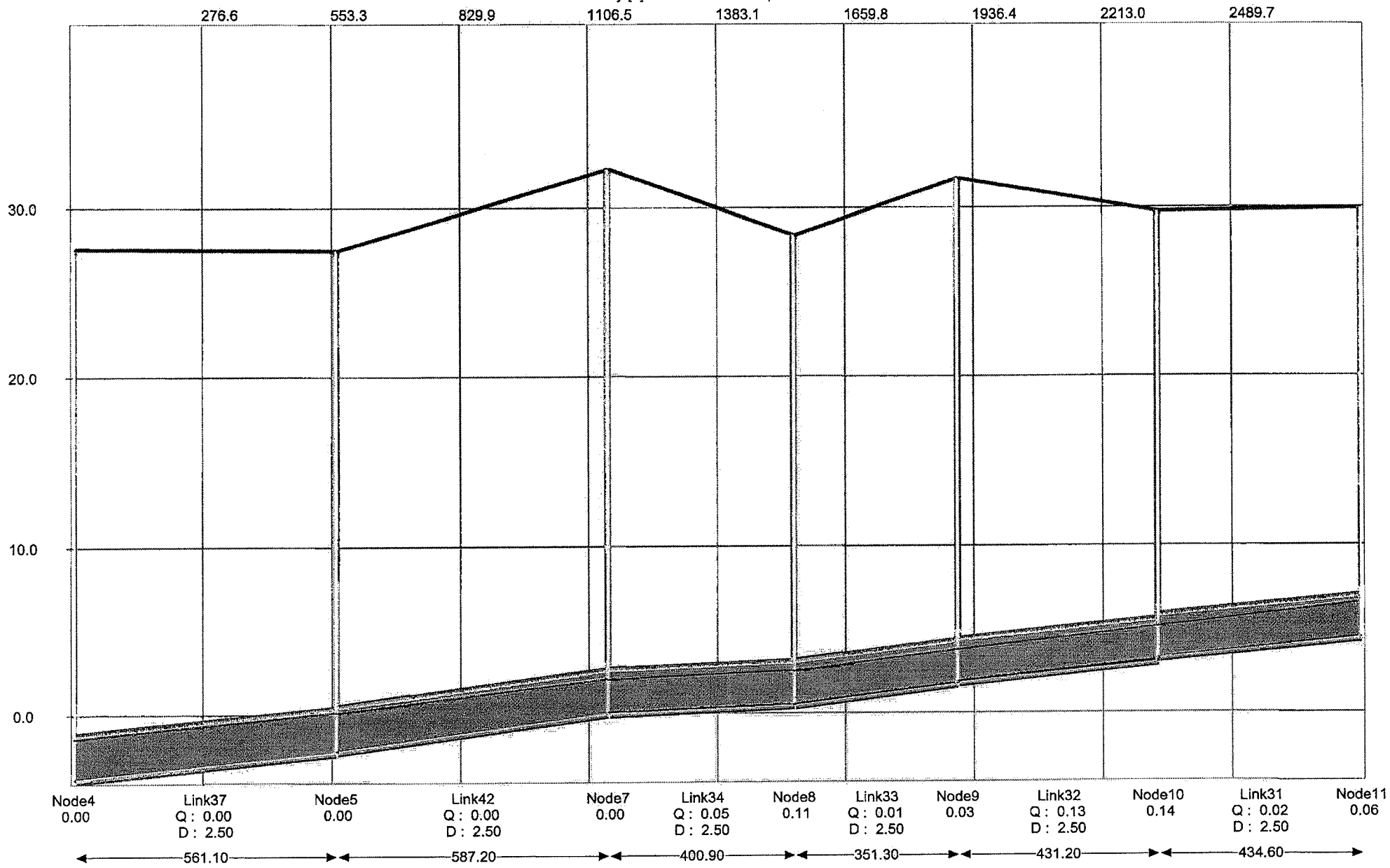
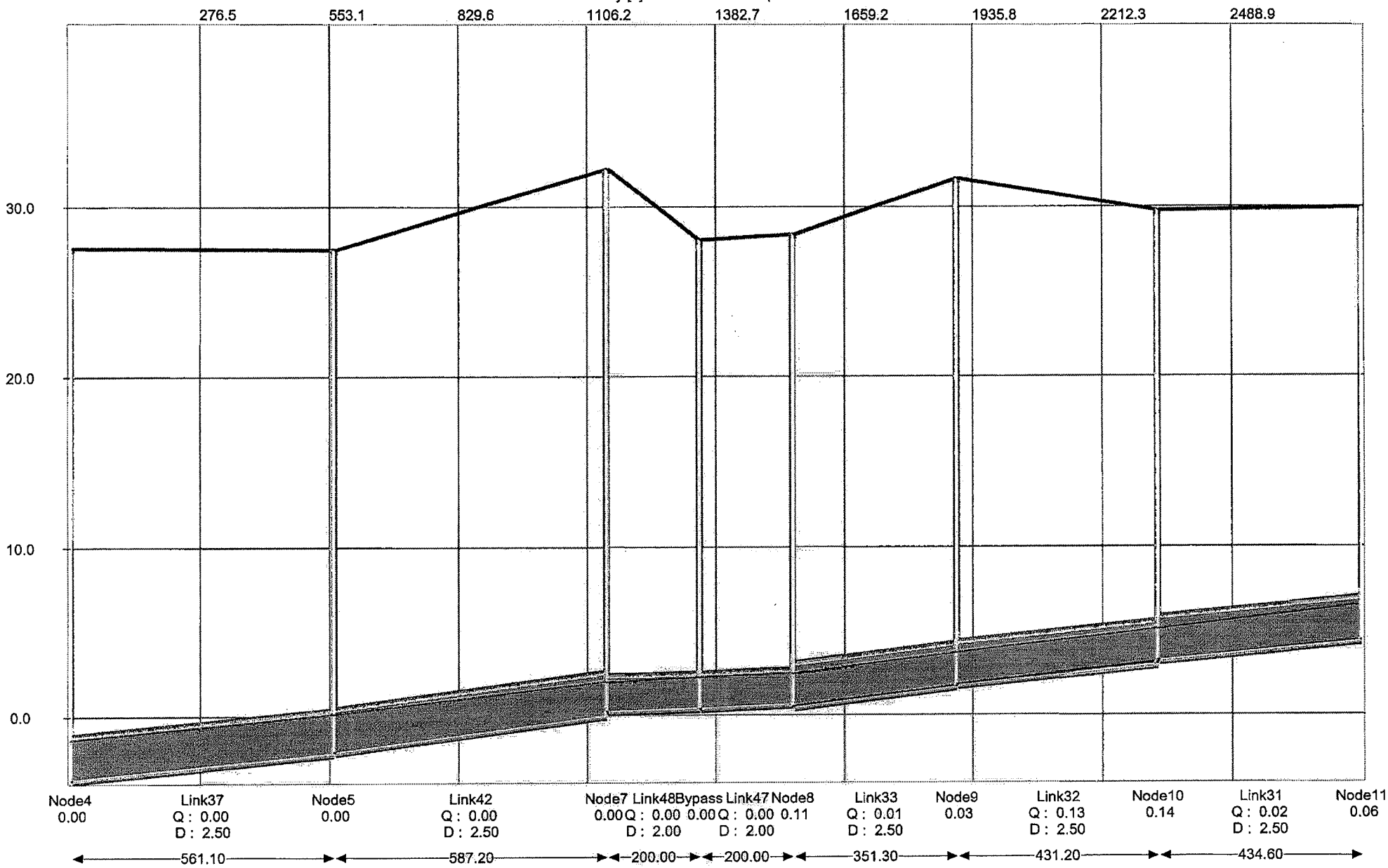


Exhibit 6 - 24-inch Relief Sewer: Shaft 7 to 8 Relief Sewer
Day [0] Time 00:01:00 Step 2



Potomac Village

Domestic Water Executive Summary

Virginia American Water Company (VAWC) has provided christopher consultants with a letter stating that the project is within the company's franchised area and that fire and domestic water is available to serve the proposed developed. With further conversations with VAWC, we prepared a conceptual water service layout for the project. The plan shows a looped 12" water service throughout the project and tying into existing infrastructure at the south and north ends of the site. It is anticipated that booster pumps will be in the buildings to meet fire service requirements. It is also anticipated that project will experience a reduction in water demand by implementing Water Harvesting and Reuse for irrigation purposes and only the use of low flow plumbing fixtures.

Comparative Parking Study
City of Alexandria
for
Potomac Village – Potomac Yards

November 19, 2009

Prepared for:
McCaffery Interests

Merging Innovation and Excellence®

The Traffic Group

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Other Office Locations
Delmarva Region
Virginia

TABLE OF CONTENTS & EXHIBITS

APPENDICES

APPENDIX A - Data Sheets - Hour by Hour
Data Sheets - Project Descriptions

APPENDIX B - Bock by Block Share Parking Spreadsheets

Prepared by: Wes Guckert, PTP

JWG:smb
(F:\2009\2009-0808\wp\Parking Study.doc)

STUDY RESULTS

Comparative Parking Study

CITY OF ALEXANDRIA
For
POTOMAC VILLAGE –POTOMAC YARDS

Prepared for
McCaffery Interests

The Traffic Group, Inc. was requested by the City of Alexandria, as part of the approval process for the Potomac Village project in Potomac Yards, to conduct parking lot occupancy studies for various sites in both Alexandria and Arlington.

The Appendix to this report contains the individual data sheets and back-up information for each of the projects studied.

Exhibit A is a summary of the findings that details the project name, address, type of development, size of the development, and the number of parking spaces provided.

There is a column that provides peak demand, peak percent occupancy, peak parking ratio, and the distance from the Metro Station for the development.

Additionally, we contacted the City of Alexandria to obtain information on the Transportation Demand Management (TDM) measures that are required for each of the developments studied.

We believe this information is very helpful for the City of Alexandria to analyze the proposed parking ratios for the Potomac Village project.

1) *Overall, percentage of peak occupancy is less than available parking for all projects we reviewed.*

2) *Overall, peak demand ratios are for less than standards.*

3) *All of the sites are within a ¼ mile distance of a Metro Station, similar to Potomac Village.*

Potomac Village will be served by local bus, BRT and a Metro Station and our proposed ratios are as follows:

Office	1.21 space/1,000 sq ft
Theatre	0.20 space/seat
Retail	3.5 space/1,000 sq ft
Hotel	1.0 space/room
Residential	1 space/unit

Exhibit B details the number of spaces proposed in the garages on a block by block basis. Appendix B contains the shared parking block by block.

Overall, the Potomac Village site is proposing a maximum 10,000 spaces in the garage, not including surface spaces.

Exhibit C provides back-up details for our parking ratio for the theater. We are proposing 0.20/seat for our site. The Exhibit C details and findings are for suburban sites with similar ratios.

Summary Of Findings
Parking Study Prepared for Potomac Village
Comparison of T.O.D. Sites in Region

EXHIBIT A

PROJECT		Demand Peak % Occupancy	Peak Ratio	Provided Ratio	Dist from METRO	TDM Measures
Name	Whole Foods Store	67%	3.97	5.95	0.20	controlled parking
Address	1700 Duke Street		per 1000	per 1000	Miles	promote rideshare
Type	Grocery Retail		SF	SF		designated TMP Coordinator
Size	40,000 SF - 100 %					promote transit;on site bike facilities
# Spaces	238					
Name	Royalton Condos	79%	1.00	1.27	0.2	controlled parking
Address	309 Holland Lane		per unit	per unit	Miles	SUP not required for less than 250 units
Type	Residential Condominiums					TDM not required
Size	116 - 100 %					
# Spaces	147					
Name	Carlyle Place Retail	38%	2.68	7.1	0.19	controlled parking
Address	2251 Eisenhower Ave		per 1000	per 1000	Miles	SUP not required
Type	Retail portion		SF	SF		less than 40,000 sf
Size	14,000 SF- 70 %					
# Spaces	103					
Name	Carlyle Place Residential	86%	2.04	2.38	0.19	controlled parking
Address	2251 Eisenhower Ave		per unit	per unit	Miles	No record of SUP on City GIS
Type	Resid. 2 Towers East & West					
Size	326 units 91 %					
# Spaces	779					
Name	Fashion Centre @ Pentagon City	68%	3.83	5.67	0.22	Paid Parking
Address	S.Hayes & Army - Navy Drive		per 1000	per 1000	Miles	Site plan pre datesCounty TDM Policy
Type	Regional Mall		SF	SF		
Size	821,024 SF - 100 %					
# Spaces	4656					

Name	Meridian @ Carlyle	63%	0.81	1.29	0.26	controlled parking
Address	401 Holland Lane		per unit	per unit	Miles	No info on DSP /SUP
Type	Residential					
Size	403 units - 93 %					
# Spaces	521					

Name	The Market Common	69%	N/A	N/A	0.27	some metered parking
Address	2800 Clarendon Blvd				Miles	Shared parking analysis
Type	Mixed Use					compited to limit # spaces
Size	240k -99% , 300 apts -93 %					
# Spaces	1084 (about 14 % less than reqd)					

NOTE: 240k @4.0/1000=960;300 apts@1/du=300 ; TOTAL = 1260 spaces required

Name	Pentagon Row	63%	N/A	N/A	0.22	some metered parking
Address	S.Joyce Street				Miles	controlled parking
Type	Mixed use					
Size	296k retail + 490 Apts-DU's 96%					
# Spaces	1223 (about 27 % less than reqd)					

NOTE: 296k @4.0/1000=1184 ; 490 apts@1/du=490 ; TOTAL = 1674 spaces required

Name	Carlyle Overlook Office Bldg	60%	0.6	1.54	0.19	controlled parking - market rate
Address	2318 Mill Road		per 1000	per 1000	Miles	TMP coordinator promotes rideshare
Type	Office		SF	SF		and trnnsit use, GRH program
Size	250,000 SF 64 %					car share program, discounted
# Spaces	389					transit fares

N/A for Ratio is because of the mixed use and shared parking A single ratio for mixed land use is Not Applicable

Occupancy rates are listed as 100 % if they are 90 % or more occupied. There is typically some vacancy in all types of developments for various reasons including tenant rehabilitation , move in + move out , etc.

TO the best of my knowledge , no one built MORE parking than required by their approval

The Traffic Group

Potomac Village - Potomac Yards Parking Comparison

BLOCK	PROPOSED SPACES
A	340
B	752
C-1	377
C-2	319
D	290
E	1343
F	1047
G	420
J	1149
K	571
L-1	431
L-2	406
M	852
N	236
Q	598
R	692
S	299
TOTAL	**10122**

NOTE: assumes no sharing of residential spaces + does not include any surface spaces

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EXHIBIT B

Movie Theater Parking Demand Survey

SOURCE	DATE	FRIDAY	SATURDAY
ITE	2004	0.26 /seat	0.19/seat
		8:00 PM	2pm +7 pm
ULI + ICSC	2005	0.20/seat	0.27/seat
Portland, Or	2005	0.09 to 0.19/seat	
Study results			

NOTE: all of the above survey results and codes are based on SUBURBAN SITES, not Urban near LTR or METRO RAIL type transit

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EXHIBIT C

APPENDIX A

Data Sheets

Hour by Hour

The Traffic Group®

POTOMAC VILLAGE
COMPARABLE STUDY – PARKING

Site Name: Pentagon Row – South Joyce Street

Number of Spaces Existing: 1223 :296k retail, 500 apts

Distance to Metro: 0.22 miles to Pentagon City Station

Weekday Time Thursday, 10/21/09	# Cars Park	% Occupancy
10 AM	463	38%
12 Noon	646	53%
1 PM	644	53%
2 PM	600	49%
7 PM	627	51%
Saturday Time **Saturday, 10/24/09**		
10 AM	437	36%
12 Noon	627	51%
1 PM	709	58%
2 PM	766	63%
7 PM	497	41%

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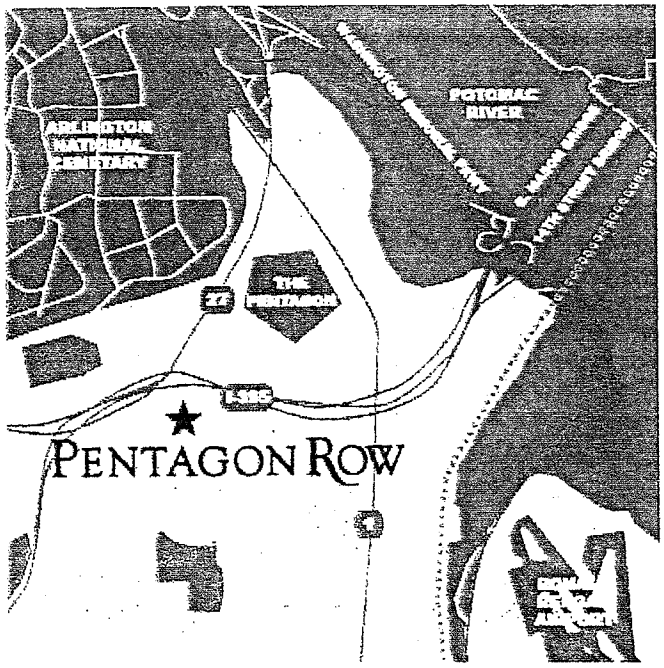
★★★★★
PENTAGON ROW

CONTACT US

SHOPPING | DINING | EVENTS | DIRECTIONS & PARKING

Find it. Know it.

Pentagon Row is conveniently located off I-395 at the corner of Army Navy Drive and South Joyce Street in Arlington, Virginia.



BECOME A FAN OF PENTAGON ROW facebook

FOLLOW US ON twitter

Sign up today for up-to-date Pentagon Row event information and exclusive shopping discounts!

From the VA I-95 corridor: Take I-95 north to Shirley Highway (I-395) north to Exit 8C (Route 1 south/Pentagon City). Turn right onto Army Navy Drive (heading west) and proceed past the Fashion Centre at Pentagon City. Turn left onto South Joyce Street. Pentagon Row is immediately on your left.

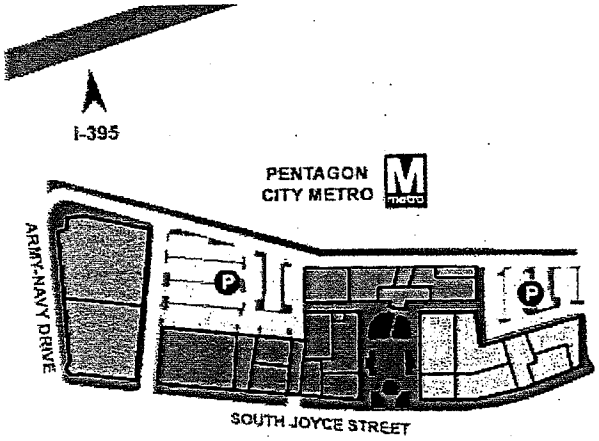
From the VA I-66 corridor: Take I-66 east toward Washington DC. Merge onto Jefferson Davis Hwy/Va-110 S via Exit 75 to Pentagon/Alexandria. Merge onto Washington Blvd via the Washington Blvd/I-395 S Exit to Columbia Pike. Exit at Columbia Pike/VA-244 W toward Navy Annex. Turn left at South Joyce Street. Cross over Army Navy Drive to Pentagon Row, which will be on your left.

From DC: Take I-395 south and cross over the 14th Street Bridge toward Virginia. Get in the left lane and take Exit 8C (15th Street/Pentagon City). Turn right onto 15th Street. Proceed past the Fashion Centre at Pentagon City on your right. 15th Street turns into South Joyce Street. Pentagon Row is immediately on your right.

From MD: From I-495 take the George Washington Parkway south. Exit right to I-395 south and merge onto Washington Boulevard (Route 27). Pass the Pentagon building on your left and immediately exit right onto the

VA 244 west/Columbia Pike ramp toward the Navy Annex. Merge onto Columbia Pike. Turn left at the light onto South Joyce Street. Cross over Army Navy Drive to Pentagon Row on your left.

From Metro: Take the Yellow or Blue line to the Pentagon City station. Upon arrival at the Pentagon City station, proceed to the mall food court. Walk straight past the food court, which will be on your right-hand side. Walk through the parking garage, up the stairs and cross the street to Pentagon Row.



★★★★★
PENTAGON ROW

PENTAGON ROW PARKING INFORMATION

Garage Entrances:
Army Navy Drive (behind Harris Teeter)
Parking lot by Post Properties Leasing Office Parking lot by Eckerd Drugs

Garage Weekday Rates:

0-2 hr	$2.00
3 hr	$3.00
4 hr	$4.00
5 hr	$5.00
6 hr	$6.00
6-8 hr	$10.00
8-10 hr	$14.00
max	$16.00 all day
Lost ticket	$16.00

Garage Weekend rates:

2 hr	$2.00
2-4 hr	$4.00
4-10 hr	$6.00
all day	$16.00

Garage Hours of Operation:

Mon - Wed	6:00 am till 11:00 pm
Thurs - Fri	6:00 am till 12:00 am
Sat - Sun	7:00 am till 12:00 am

Monthly Parking is Available

To apply please visit the Colonial Parking web site at www.ecolonial.com or contact a Colonial Parking monthly accounts representative at 202-295-8080.

No overnight parking in the metered spaces at all: You will be towed!

CONTACT US

★★★★★
PENTAGON ROW

SHOPPING | DINING | EVENTS | DIRECTIONS & PARKING

Love it. Have it.

Pentagon Row is not your typical shopping center-it's an experience. In one visit you can pick up a new outfit, buy a new pair of shoes, work out at the gym, buy your groceries, stop by the dry cleaners, grab a bite to eat, and more! With over 45 restaurants and retail shops, you'll be sure to find the perfect outfit from head to toe, and still have time for dessert!

- A VISUAL AFFAIR
- AMERICAN EXPRESS TRAVEL
- ANN TAYLOR LOFT
- ARLINGTON CONVENTION & VISITORS SERVICE
- ASIA BISTRO
- BAJA FRESH
- BALLY TOTAL FITNESS
- BANNER'S HALLMARK
- BED BATH & BEYOND
- BEST FOOT FORWARD
- CHAMPPS AMERICANA
- CHICO'S
- COLORWORKS SALON
- DENIM BAR
- DESI LIVING INNOVATIONS
- DSW SHOE WAREHOUSE
- ELIZABETH ARDEN RED DOOR SPA & SALON
- GOTTA RUN
- HARRIS TEETER
- HUDSON TRAIL OUTFITTERS
- ICE SKATING RINK
- JOUVENCE AVEDA
- LA CREPERIE
- LA'VAND
- LEBANESE TAVERNA
- LUCY
- MAGGIE MOO'S ICE CREAM AND TREATERY
- MATTRESS WAREHOUSE
- MORE SPACE PLACE
- NOODLES & COMPANY
- PENTAGON ROW CLEANERS
- PIZZA MILANO
- POST PENTAGON ROW
- PR GRILL
- REVEAL
- RISTORANTE MURALI
- RITE AID
- SAIGON SAIGON
- SANDELLA'S FLATBREAD
- SINÉ IRISH PUB
- SMOOTHIE KING
- SOLAR PLANET
- SPRINT
- STARBUCKS
- SUBWAY
- SUR LA TABLE
- TASTEFUL DELIGHT CHINESE CAFé
- THAI PHOON
- THE VITAMIN SHOPPE
- WORLD MARKET
- ZEN BISTRO AND WINE BAR

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Sign up today for up-to-date Pentagon Row event information and exclusive shopping discounts!

Location	**Army Navy Drive & South Joyce** **Arlington, Virginia 22202**
Anchor Stores	Harris Teeter, Bed, Bath & Beyond, DSW, Elizabeth Arden Red Door, Chicos, Sur La Table, Hudson Trail Outfitters, Bally Total Fitness, PR Steakhouse, Denim Bar, Bank of America, Lebanese Taverna and Ann Taylor Loft
Leasing Info	› Click here for Additional Information

Square Feet

296,000

Wes Guckert

Wes Guckert, PTP
President

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wguckert@trafficgroup.com
www.trafficgroup.com

Pentagon Row's Photos - Profile Pictures

PENTAGON ROW

Pentagon Row is a vibrant shopping and entertainment destination with a unique combination of specialty retailers, exciting restaurants and amenities that include Harris Teeter, Bally Total Fitness, a central plaza with outdoor cafes, and an ice-skating rink (November through March) that provides a neighborhood gathering spot for residents of more than 500 apartment homes. Pentagon Row also offers exciting outdoor events, including a 10-week Summer Concert Series. Come and discover Pentagon Row for yourself!

From the album:
"Profile Pictures" by Pentagon Row

Added January 27

POTOMAC VILLAGE
COMPARABLE STUDY – PARKING

Site Name: Fashion Centre @ Pentagon City

Number of Spaces Existing: 4656 : 821,024 SF

Distance to Metro: 0.22 miles to Pentagon City Station

Provided Ratio: 5.67 sp / 1000 sf

Demand Ratio : 3.83 sp/ 1000 sf

Weekday Time *Weds 10/14/2009*	*# Cars Park*	*% Occupancy*
10 AM	2261	49%
12 Noon	2721	58%
1 PM	3146	68%
2 PM	2984	64%
7 PM	1778	38%
Saturday Time *10/17/2009*		
10 AM	1042	22%
12 Noon	2179	47%
1 PM	2780	60%
2 PM	3130	67%
7 PM	2440	53%

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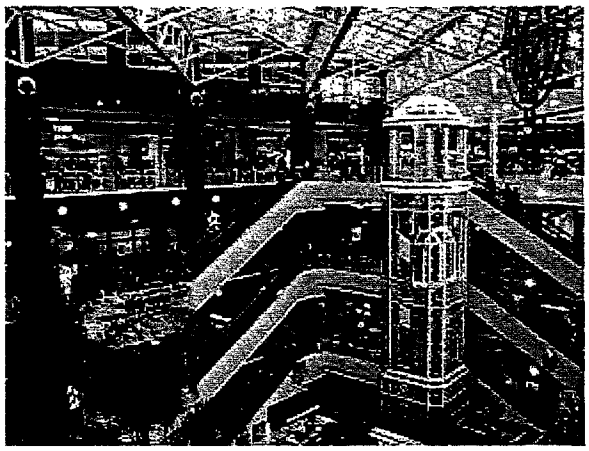
Fashion Centre at Pentagon City

Coordinates: 38°51′47.6″N 77°3′38.6″W

From Wikipedia, the free encyclopedia

The Fashion Centre at Pentagon City, also known as **Pentagon City Mall**, is an upscale shopping mall in Arlington, Virginia. It is situated in the Pentagon City neighborhood on the lower levels of the Washington Tower office building, former home of MCI's Consumer Markets headquarters, near Interstate 395 and Hayes Street. The mall takes its logo from the architectural design of Washington Tower. Its Metro level is directly connected to the Pentagon City station on the Blue and Yellow Lines of the Washington Metro.

The Fashion Centre at Pentagon City

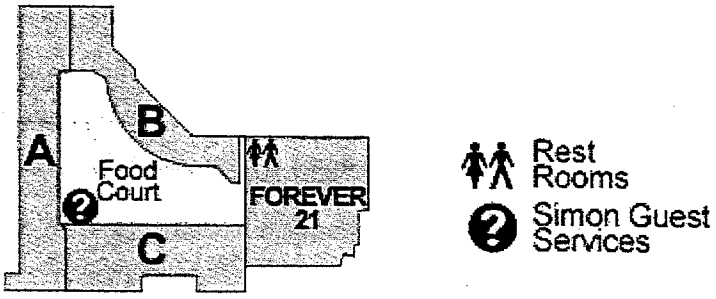


Pentagon City Mall, showing all four floors

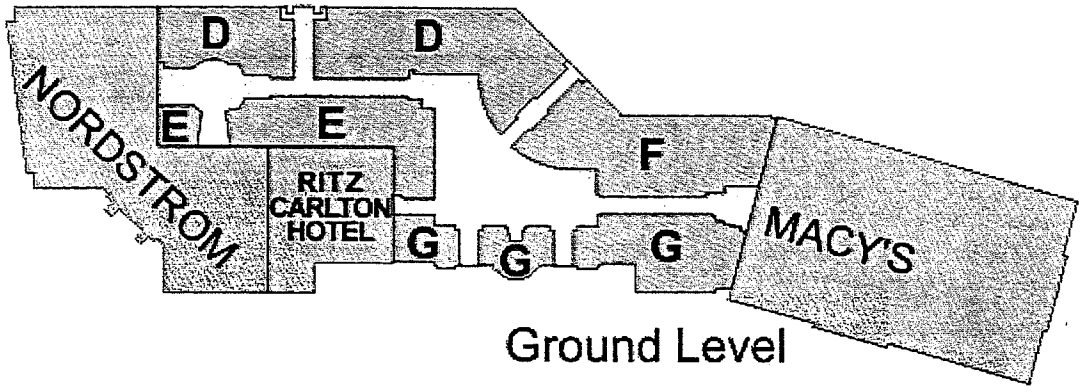
Location	Arlington, Virginia, USA
Opening date	October 5, 1989
Developer	Melvin Simon & Associates & Rose Associates
Management	Simon Property Group
Owner	Simon Property Group & CalPERS [1] (http://phx.corporate-ir.net/phoenix.zhtml?c=113968&p=irol-newsArticle_Print&ID=225518&highlight=)
No. of stores and services	170
No. of anchor tenants	2
Total retail floor area	821,024 sq ft (76,275.6 m^2) retail & 169,089 ft^2 office [2] (http://www.sec.gov/Archives/edgar/data/1063761/000104746907001496/a2176251z10-k.htm)
No. of floors	4
Website	simon.com/157 (http://www.simon.com/mall/default.aspx?ID=157)

Completed in October 1989, the Fashion Centre is the largest enclosed shopping mall in Arlington, housing 170 retailers and restaurants catering to the upper-middle class. It is anchored by department stores Macy's and

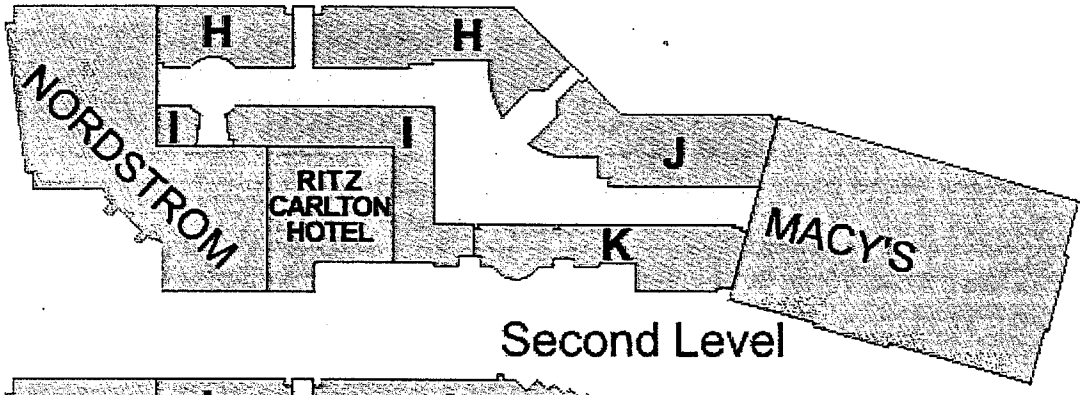
The Fashion Centre at Pentagon City Floorplan



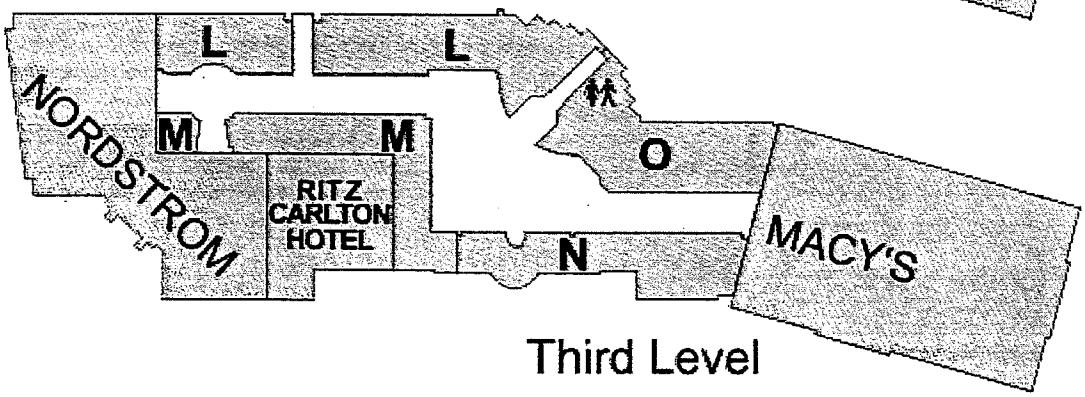
Metro Level



Ground Level



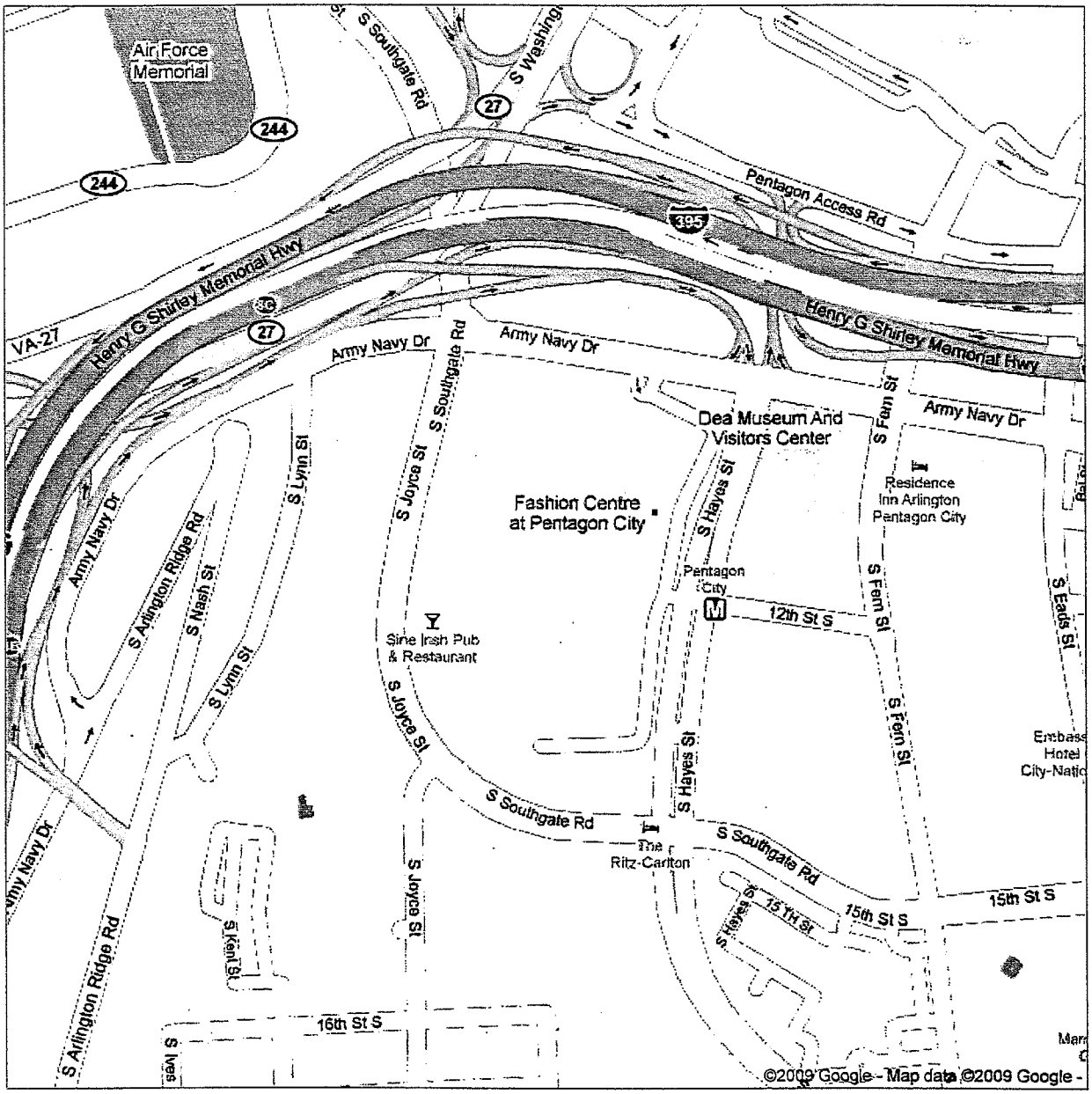
Second Level



Third Level

STORE	LOCATION	PHONE
Pea In The Pod	H	(703) 418-2900
Armani Exchange	Second Level, located at the top of the escalator	(703) 418-0263
Abercrombie & Fitch	J	(703) 415-4210
Aeropostale	G	(703) 415-3636
Alamo Flags	On Metro Level near Guest Services	(703) 415-2144
Aldo Accessories	Section I	(703) 418-9714
Aldo Shoes	F	(703) 412-5890

Google maps



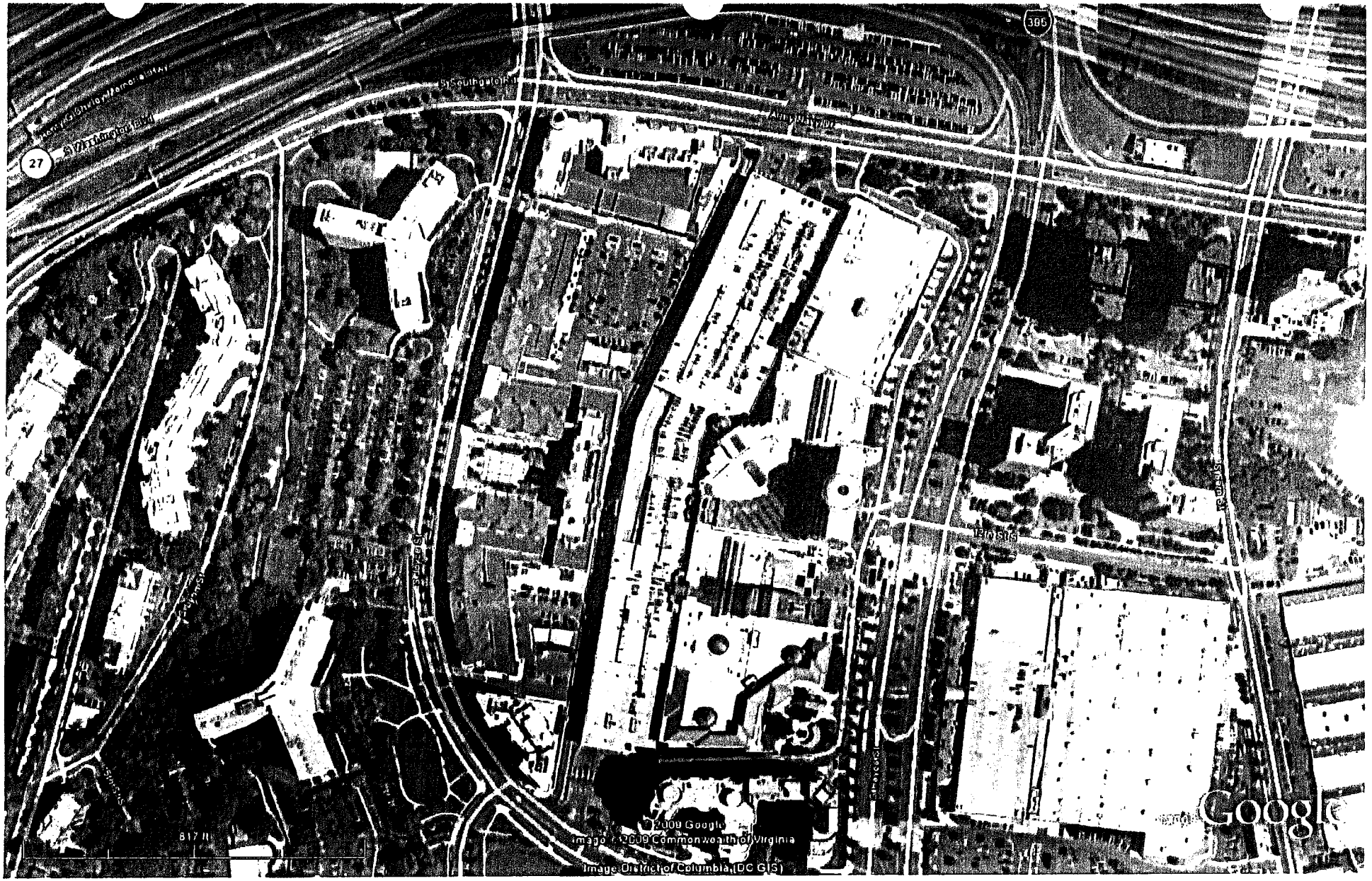

395
27
S Washington Blvd
S Scott St
Army Navy Dr
Columbia Pike
Joyce St
Eads St
Crystal Dr
Fern St
12th St S
817 ft
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Image ©2009 Commonwealth of Virginia
Image District of Columbia (DC GIS)
Google

POTOMAC VILLAGE
COMPARABLE STUDY – PARKING

Site Name: Whole Foods – 1700 Duke Street , Alexandria

Number of Spaces Existing: 238 : Assume 40,000 SF

Distance to Metro: 0.20 miles to King Street Station

Provided Ratio : 5.95 /1000 SF

Demand Ratio: 3.97 / 1000 SF

Weekday Time *Wednesday, 10/7/09*	*# Cars Park*	*% Occupancy*
10 AM	144	61%
12 Noon	155	65%
1 PM	159	67%
2 PM	141	59%
7 PM	129	54%
Saturday Time *Saturday, 10/10/09*		
10 AM	70	29%
12 Noon	117	49%
1 PM	126	53%
2 PM	130	55%
7 PM	118	50%

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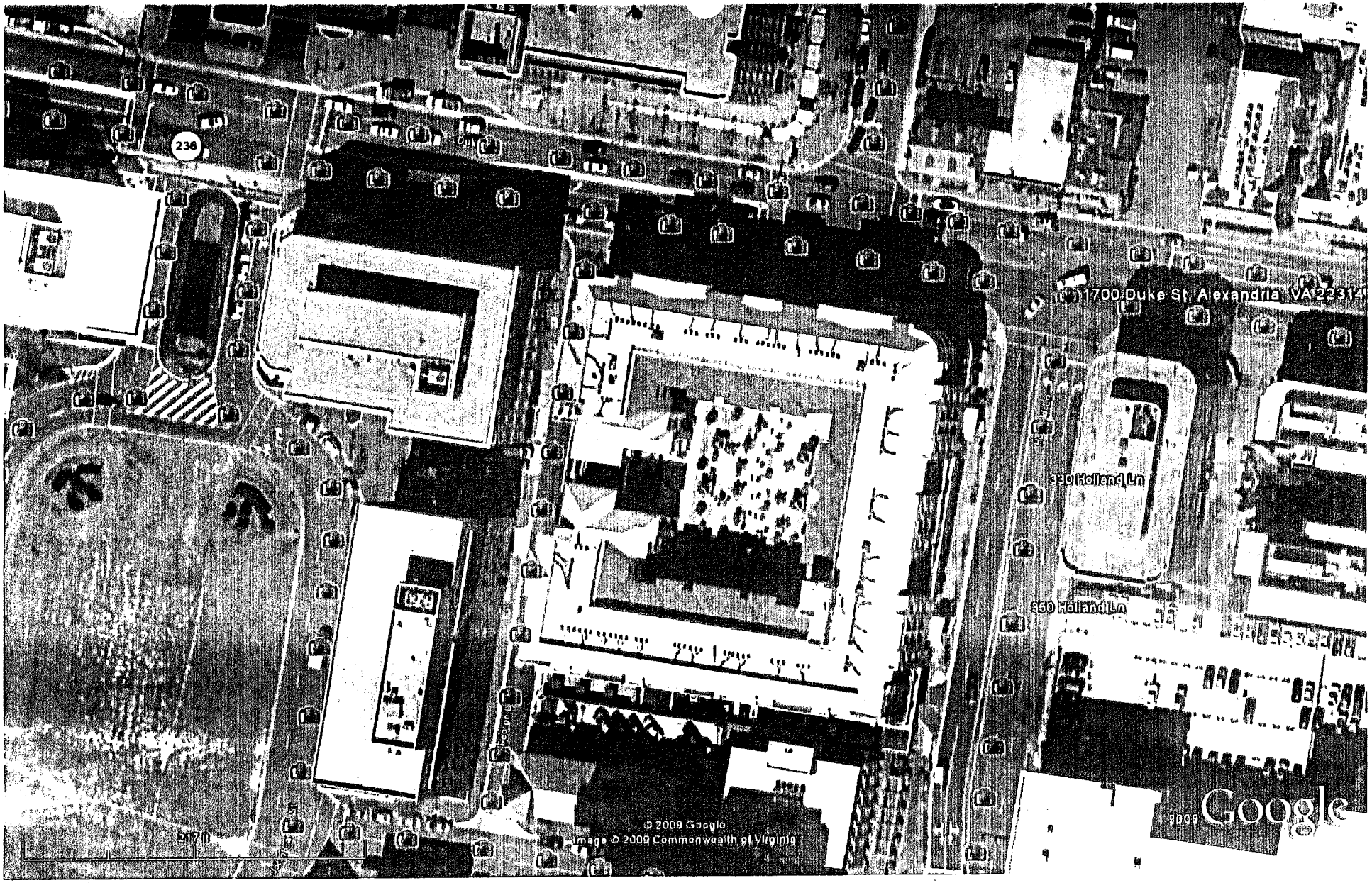
236
11700 Duke St, Alexandria, VA 22314
330 Holland Ln
350 Holland Ln
© 2009 Google
Image © 2009 Commonwealth of Virginia
2009 Google

Stores » Virginia » **Old Town**

Welcome to the Old Town store

MAKE THIS MY STORE

1700 Duke St
Alexandria, VA 22314 USA
map, directions & nearby stores

Phone 703.706.0891
Store contact form

Store hours:
8:00 a.m. to 10:00 p.m. seven days a week.

Store Leadership

Mike Ameg: Store Team Leader
John Volpe: Assistant Store Team Leader
Cisse Kane: Assistant Store Team Leader
Aamir Mughal: Assistant Store Team Leader
Ann Beisel: Marketing Specialist/Community Liaison

Follow us on Twitter!

Click on Me: https://twitter.com/Alexandria_WFM

Emeril Green

POTOMAC VILLAGE
COMPARABLE STUDY – PARKING

Site Name: The Royalton Condos – Alexandria- Top of Whole Foods Store – 309 Holland Lane

Number of Spaces Existing: 147 : 116 Condo Units

Distance to Metro: 0.20 miles to King Street Station

Provided Ratio: 1.27/unit

Demand Ratio: 1.0 / unit

Weekday Time *Wednesday, 10/7/09*	*# Cars Park*	*% Occupancy*
5 AM	109	74%
10 AM	83	56%
2 PM	84	57%
8 PM	100	68%
10 PM	103	70%
Saturday Time *Saturday, 10/10/09*		
6 AM	116	79%
12 Noon	82	56%
4 PM	80	54%
8 PM	86	59%

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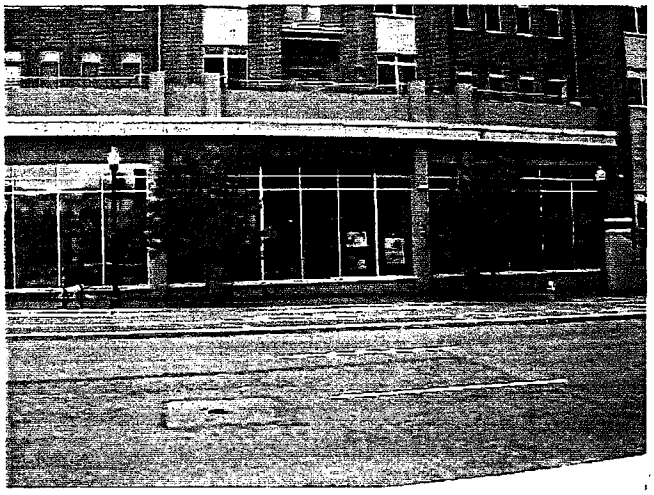
Merging Innovation and Excellence

The Royalton of Alexandria--Fine Condo Living

The Royalton of Alexandria

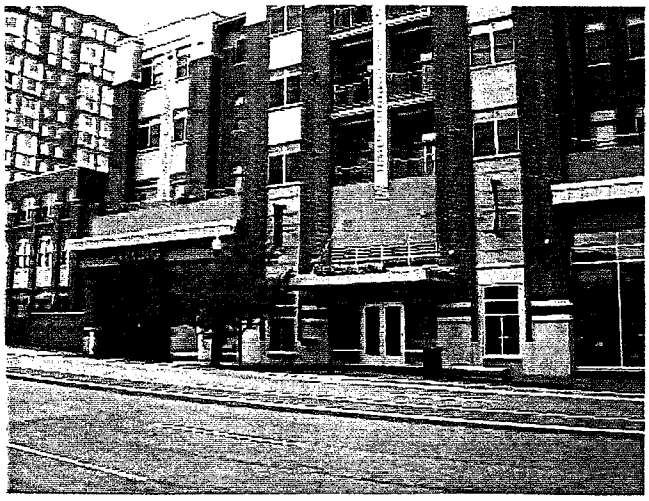
The Royalton of Old Town Alexandria

The Royalton of Alexandria is located in the heart of Old Town Alexandria. Steps away from the King Street Metro, Amtrak and the VRE. The Royalton condos are a commuters dream! These high-ceiling units offer granite counters and stainless steel appliances. The Royalton of Alexandria has a fitness room and underground parking. The Royalton of Old Town Alexandria is conveniently located atop of the brand new Whole Foods.



The Royalton of Alexandria is close to all the major employment and transportation centers--Washington, Arlington, Falls Church, Springfield, Crystal City. The Royalton is located just a few miles away from Reagan National Airport.

Contact Brian and ask about his "buy with me, move for free program." Click the Royalton for a look at prices and listings at the Royalton.



CLARK CONSTRUCTION

SEARCH CLARK

CURRENT NEWS

Sunday, May 16, 2004

Search News By Keyword

Search

SUPERSTRUCTURE

COMMUNITY CONNECTION

NEWS ARCHIVE

To receive email news releases, or to subscribe to our Superstructure and Community Connection mailing lists, please contact corporatecommuncations@clarkconstruction.com.

Clark Residential Builds New Condos for JBG Near Alexandria's Carlyle Development

ALEXANDRIA, VA. — A joint venture of The JBG Companies and their equity partner Rockwood Capital, LLC awarded a $28 million contract to Clark Residential to build The Royalton Condominiums at 1700 Duke Street in Alexandria, Va. The property is situated near the entrance of the expansive Carlyle residential and commercial development outside of Old Town.

Adjacent to the King Street Metro, this new condominium offers both historic charm and modern convenience. Cast stone, pre-cast, and EIFS compliment The Royalton's brick facade. Designed by Mushinsky Associates/MR+A of Bethesda, Md., the four-story building will feature 116 condominiums, with efficiency, one- and two-bedroom floor plans.

Each unit includes a chef-caliber kitchen with 42-inch cabinets, granite countertops, and premium appliances. Two-and-a-half levels of below-grade parking also will be built. Enclosed by dramatic walls of windows, the residences feature 10-foot ceilings and an abundance of closet space.

The ground floor of the building will be home to a Whole Foods Market, as well as a beautiful lobby, cutting edge fitness center, and high-tech residential library. The anticipated completion date for the project is Summer 2005.

Located in Bethesda, Md., Clark Residential is a subsidiary of The Clark Construction Group, Inc.

###

Back to 2004 News Archive

POTOMAC VILLAGE
COMPARABLE STUDY – PARKING

Site Name: Carlyle Place – Alexandria – Retail

Spaces Existing: 103 : 14,500 SF

Distance to Metro: 0.19 miles to Eisenhower Avenue Station

Provided Ratio: 7.1 / 1000 SF

Demand Ratio: 2.68 /1000 SF

Weekday Time Thursday, 10/8/09	# Cars Park	% Occupancy
10 AM	31	30%
12 Noon	34	33%
1 PM	36	35%
2 PM	39	38%
7 PM	17	17%
Saturday Time **Saturday, 10/10/09**		
10 AM	17	17%
12 Noon	24	23%
1 PM	20	19%
7 PM	13	13%

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POTOMAC VILLAGE
COMPARABLE STUDY – PARKING

Site Name: Carlyle Place Apts – Alexandria –2251 Eisenhower Ave.(east and west towers.)

Number of Spaces Existing: 779 : 326 units

Distance to Metro: 0.19 miles to Eisenhower Avenue Station

Provided Ratio: 2.38 /unit

Demand Ratio : 2.04 /unit

Weekday Time Thursday, 10/8/09	# Cars Park	% Occupancy
5 AM	666	86%
10 AM	430	55%
2 PM	413	53%
8 PM	550	71%
10 PM	627	81%
Saturday Time **Saturday, 10/10/09**		
6 AM	599	77%
12 Noon	441	57%
4 PM	459	60%
8 PM	497	64%

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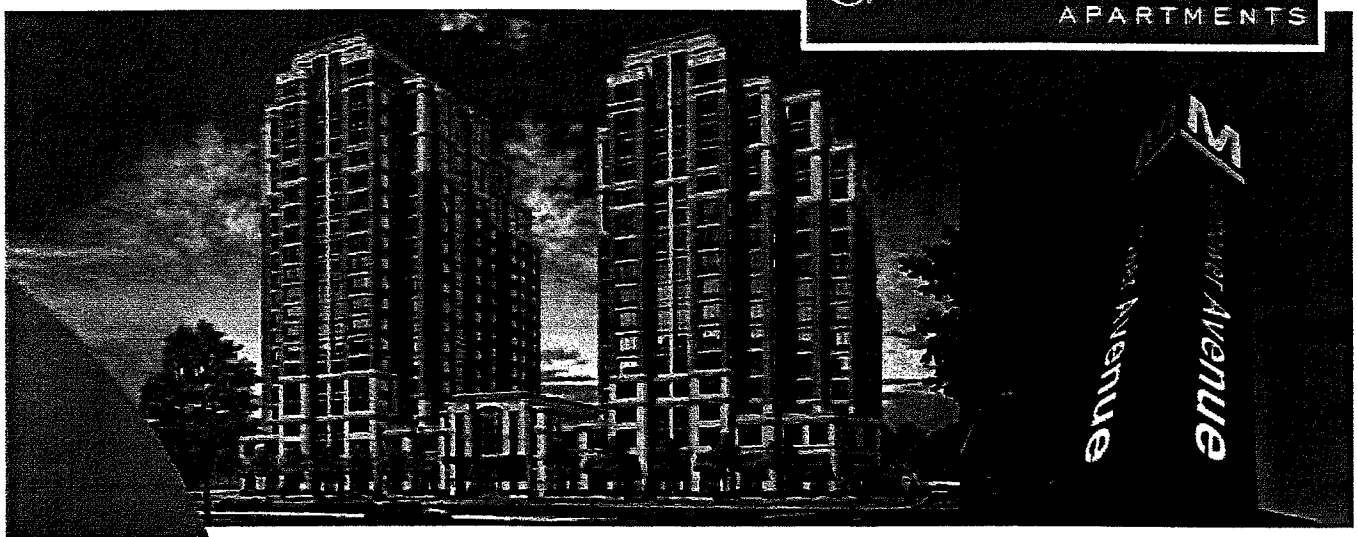
CARLYLE PLACE APARTMENTS



HOME
FEATURES
AMENITIES
FLOOR PLANS
LOCATION
CONTACT US

The Advantage of Carlyle Place

Unparalleled Residence. Unparalleled Location.

Welcome to Carlyle Place Apartments. Surround yourself with the distinct character of Alexandria at a location that offers the contemporary luxuries and convenient amenities you desire.

Alexandria is known for its fashionable shopping, unique dining and Old Town charm. Living in this neighborhood, you'll find it all outside your door. Discover a residence that blends this eclectic atmosphere with your lifestyle.

FLOOR PLANS

CHECK OUT OUR FLOOR PLANS
Click for More Information

CONTACT A LEASING CONSULTANT TODAY | SEND TO A FRIEND

RENTAL APPLICATION | OCCUPANT APPLICATION

2251 Eisenhower Avenue • Alexandria, VA 22314
877.869.5860 • Email Carlyle_Place@paradigmcos.com

Paradigm MANAGEMENT LP

CARLYLE PLACE
APARTMENTS

HOME
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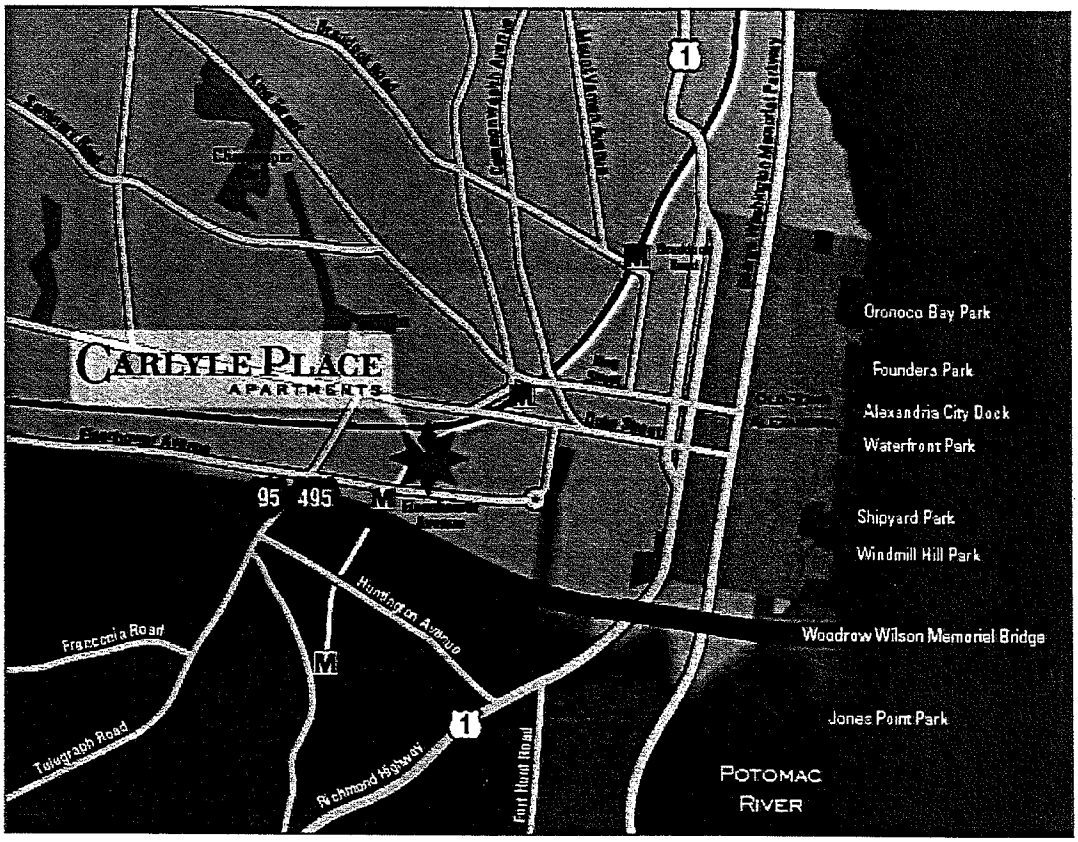
The Advantage of Carlyle Place

Unparalleled Residence. Unparalleled Location.



2251 Eisenhower Avenue • Alexandria, VA 22314
877.869.5860 • Email Carlyle_Place@paradigmcos.com

CONTACT A LEASING CONSULTANT TODAY

Paradigm
MANAGEMENT LP

« Back to Search Results

Carlyle Place Apartments

2251 Eisenhower Avenue Alexandria, VA 22314 Map

View Floor Plans | View 360° Tou

PREV Main Image (1 of 11) NEXT

CALL PROPERTY DIRECTLY

(866) 486-1427 ext. 5796

Check Availability

Property Details | Map & Directions | Get Moving Quotes

Floor Plan	Beds	Baths	Rent	Square Ft	Deposit	Availability	Specials
Madison	1	1	$1775 - $1850	777	Call for Details	Check Availability	See Details
Pendleton	1	1	$1850 - $1950	736	Call for Details	Check Availability	See Details
Washington	1	1	$1875	791	Call for Details	Check Availability	See Details
King	1	1	$2000	826	Call for Details	Check Availability	See Details
Jefferson	2	1	$2050 - $2425	1057	Call for Details	Check Availability	See Details

Show all floor plans (15)

Most Units Feature

Amenities

- ✓ Air conditioning
- ✓ Cable ready
- ✓ Carpeting
- ✓ High speed internet available
- ✓ Walk-in closets

Kitchen

- ✓ Dishwasher
- ✓ Garbage disposal
- ✓ Microwave
- ✓ Refrigerator

Laundry

- ✓ Washer/dryer in unit

Property Features

Parking

- ✓ Attached garage

Leisure

- ✓ Fitness center
- ✓ Pool

Entry

- ✓ Controlled access
- ✓ Handicap access

Convenience

- ✓ Elevator
- ✓ Extra storage units
- ✓ Furnished units available

Property Description

Property Type: Apartment
Total units at property: 326

Brand new luxury building...Walk to metro

Welcome to Carlyle Place Apartments. Surround yourself with the distinct character of Alexandria at a location that offers the contemporary luxuries and convenient amenities you desire.

Leasing Information

Pet policy

Cats & Dogs OK
Call for service animal policy

Terms

9-15 month leases available. For more information, please call toll free at **(866) 486-1427 ext. 5796** or check availability.

Office hours:

Monday-Friday: 10:00am to 6:00pm; Saturday: 10:00am to

Carlyle Place Apartments

2251 Eisenhower Avenue Alexandria, VA 22314

View Floor Plans | View 360° Tour

PREV Main Image (1 of 11) NEXT

Claim reward now! (what reward?)

– OR –

Remind me to claim my $100...

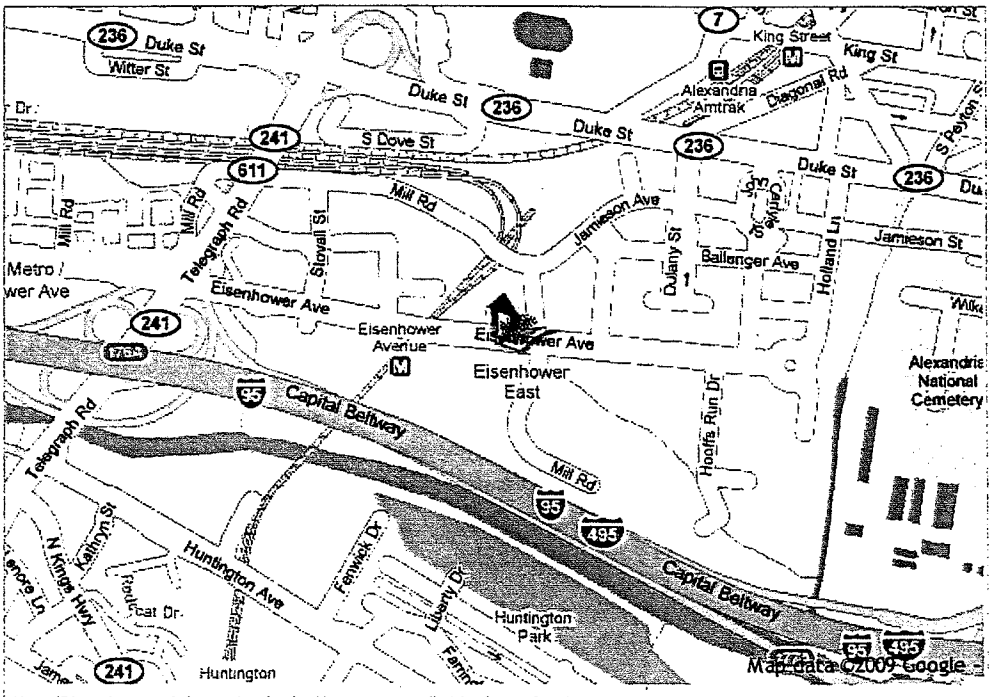
CALL PROPERTY DIRECTLY

(866) 486-1427 ext. 5796

Check Availability

Property Details | Map & Directions | Get Moving Quotes

When you visit, have the leasing office note that you found the property on Rent.com!



Maps/Directions are informational only. User assumes all risk of use. Google, Rent.com, and their suppliers make no representations about content, road conditions, route usability, or speed. Use subject to Google license/copyright.

Driving Directions

Starting Point:

Address	City	State	Zip Code

VIEW DIRECTIONS

POTOMAC VILLAGE
COMPARABLE STUDY – PARKING

Site Name: Carlyle Overlook Office Bldg.= 2318 Mill Rd.

Number of Spaces Existing: 389 : 250,000 sf Office SPace

Distance to Metro: 0.19 miles to Eisenhower Avenue Station

Weekday Time *Thursday, 10/8/09*	*# Cars Park*	*% Occupancy*
10 AM	231	59%
12 Noon	235	60%
1 PM	223	57%
2 PM	226	58%
Saturday Time *Saturday, 10/17/09*		
6 AM		
10 AM		
12 Noon	GARAGE CLOSED	
1 PM		
2 PM		
4 PM		
7 PM		
8 PM		

(G:\potomac village compare Parking Data.doc)

POTOMAC VILLAGE
COMPARABLE STUDY – PARKING

Site Name: Meridian @ Carlyle – Alexandria 401 Holland Lane

Number of Spaces Existing: 521 : 403 units

Distance to Metro: 0.26 miles to King Street Station

Provided Ratio:1.29 / unit

Demand Ratio: 0.81 / unit

Weekday Time *Thursday, 10/21/09*	*# Cars Park*	*% Occupancy*
5 AM	330	63 %
10 AM	234	45 %
2 PM	249	48 %
8 PM	291	56 %
10 PM	318	61 %
Saturday Time *Saturday, 10/24/09*		
6 AM	323	62%
12 Noon	239	46%
4 PM	246	47%
8 PM	258	50%

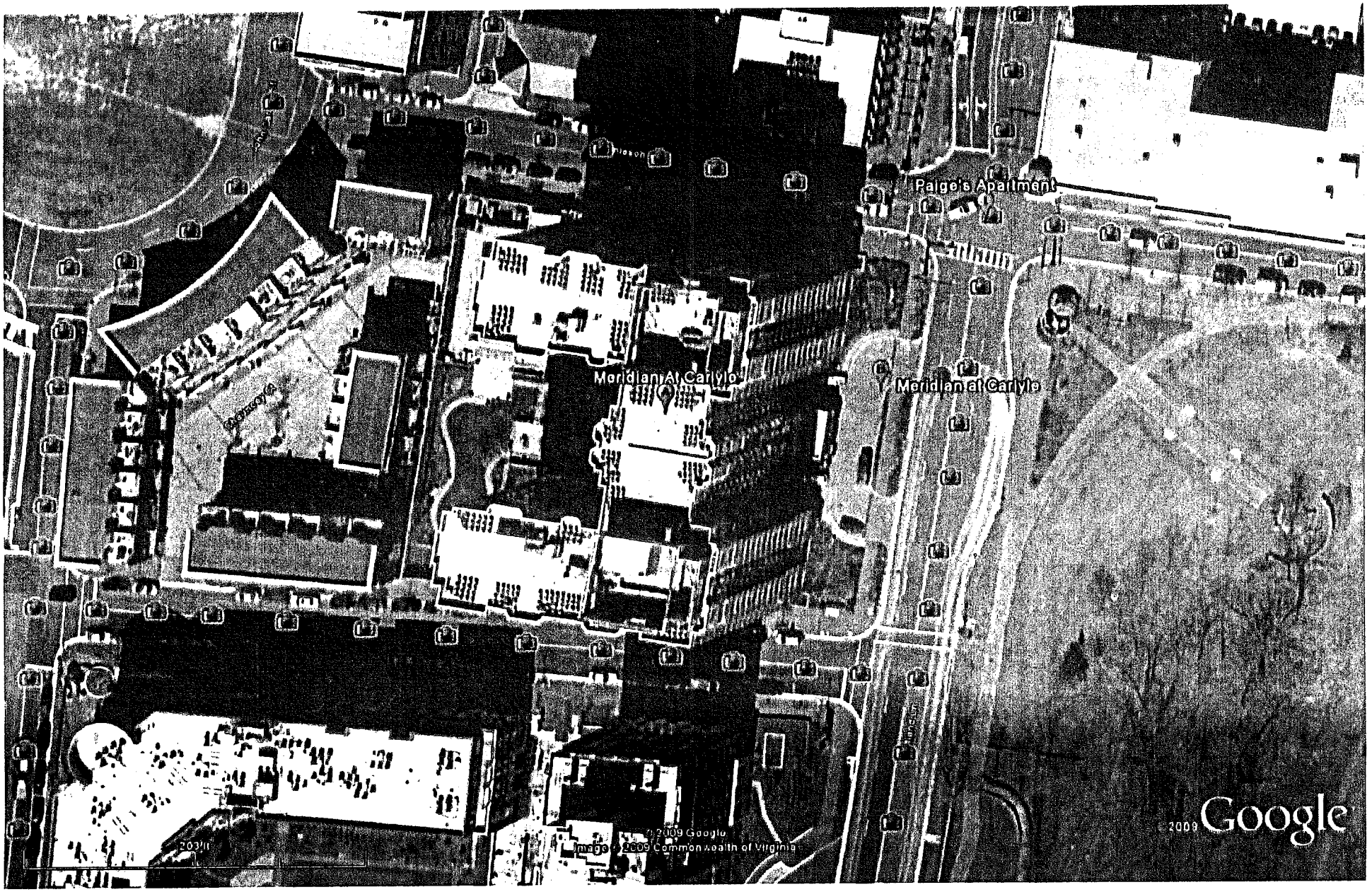

Paige's Apartment
Meridian At Carlyle
Meridian at Carlyle
Google
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Image © 2009 Commonwealth of Virginia

Meridian At Carlyle

401 Holland Lane Alexandria, VA 22314 Map

View Floor Pla

PREVPreview (1 of 11)NEXT

Claim reward now! (what reward?)

– OR –

Remind me to claim my $100...

CALL PROPERTY DIRECTLY

(866) 301-6359 ext. 4058

Check Availability

Property Details | Map & Directions | Get Moving Quotes

Floor Plan	Beds	Baths	Rent	Square Ft	Deposit	Availability	Specials
Studio	Studio	1	$1385 - $1750	565	Call for Details	Check Availability	See Details
1 Bedroom	1	1	$1590 - $2000	620 - 695	Call for Details	Check Availability	See Details
1 BR with den	1	1	$1940 - $2220	870	Call for Details	Check Availability	See Details
2 Bedroom	2	2	$2175 - $2700	970 - 1100	Call for Details	Check Availability	See Details

Most Units Feature

Amenities
- ✓ Air conditioning
- ✓ Cable ready
- ✓ Carpeting
- ✓ Ceiling fan
- ✓ High speed internet available
- ✓ Walk-in closets

Kitchen
- ✓ Dishwasher
- ✓ Garbage disposal
- ✓ Microwave
- ✓ Refrigerator

Laundry
- ✓ Washer/dryer in unit

Property Features

Parking
- ✓ Covered

Leisure
- ✓ Clubhouse
- ✓ Fitness center
- ✓ Pool

Entry
- ✓ Controlled access
- ✓ Handicap access

Convenience
- ✓ Elevator
- ✓ Furnished units available

Property Description

Property Type: Apartment
Total units at property: 403

Top Floor Clubroom with Billiards Table, Full Kitchen and TV/DVD/VCR...Private Courtyard with Putting Green and Swimming Pool...2 Blocks To King Street Metro Station (Blue and Yellow Lines)...

Come to Old Town Alexandria's premier high-rise apartment community. You will find everything you have been looking for...located 2 blocks to the King Street Metro (Blue and Yellow Lines), easy access to shops,

Leasing Information

Pet policy

Cats OK
Call for service animal policy

Terms

Lease Terms: standard lease term 13 months, 7-11 month leases are available with a premium. Pet Policy: Cats only, 2 cats maximum, $300 non-refundable pet fee and $30/month pet rent required. Storage available for additional fee. For more information, please call toll free at **(866) 301-6359 ext. 4058** or check availability.

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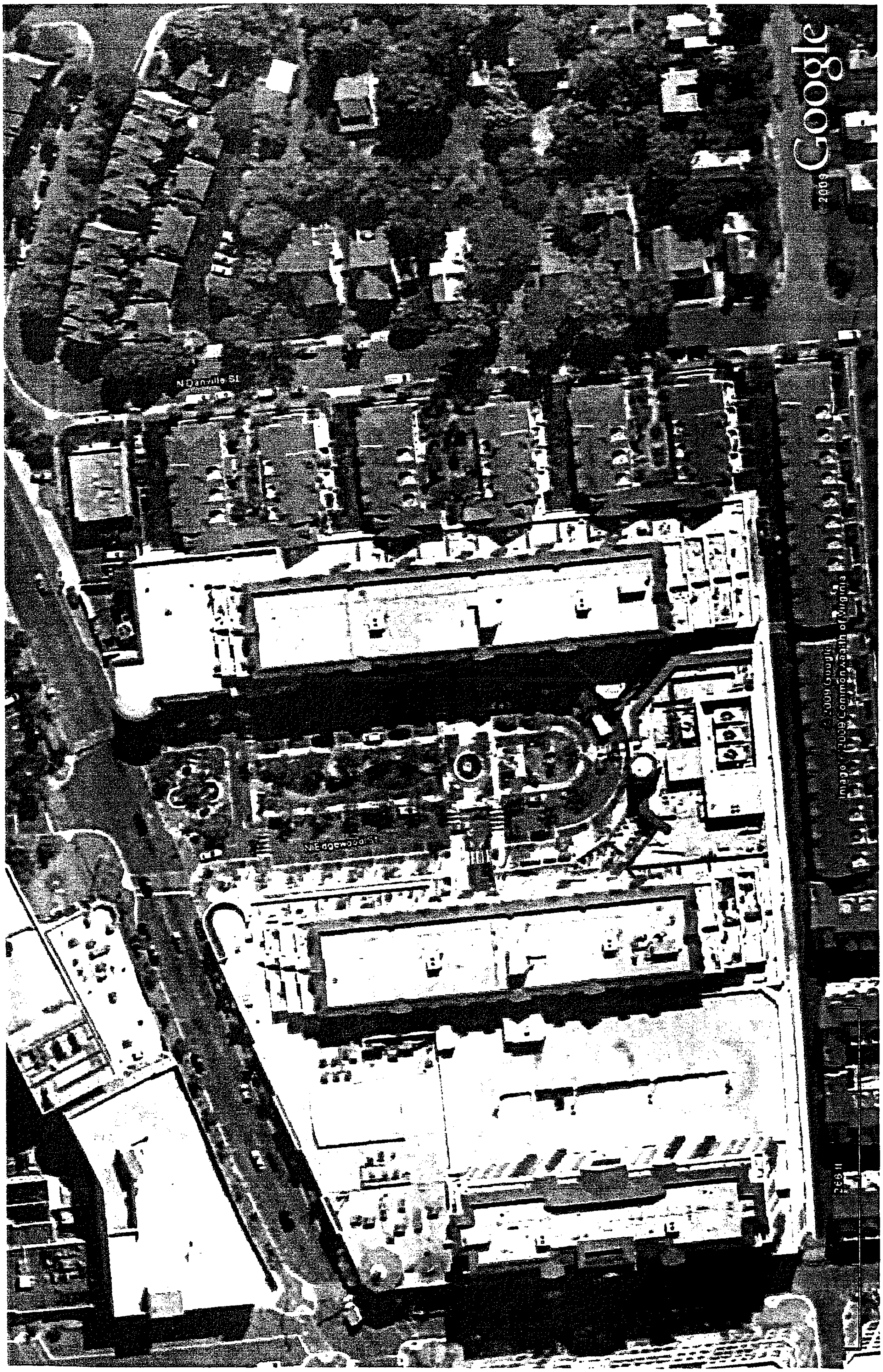
POTOMAC VILLAGE
COMPARABLE STUDY – PARKING

Site Name: Clarendon Mkt Commons-2800 Clarendon Blvd.

Number of Spaces Existing: 1084: 240k retail, 300 apts

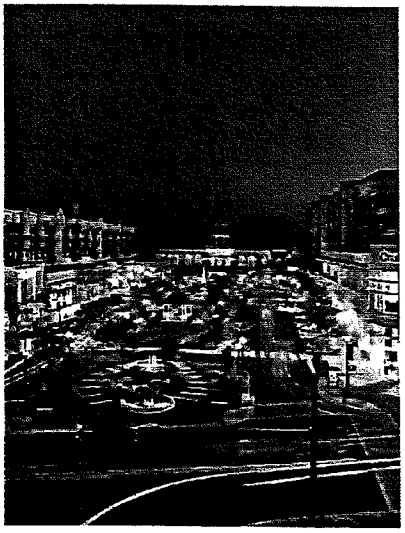
Distance to Metro: 0.27 miles to Clarendon Station

Weekday Time Thursday, 10/8/09	# Cars Park	% Occupancy
5 AM	358	33%
10 AM	675	62%
12 Noon	710	65%
1 PM	712	66%
2 PM	651	60%
7 PM	699	65%
10 PM	438	40%
Saturday Time **Saturday, 10/17/09**		
6 AM	386	36%
10 AM	630	58%
12 Noon	743	69%
1 PM	750	69%
2 PM	730	67%
4 PM	717	66%
7 PM	613	57%
8 PM	669	62%


Google
N Danville St

McCAFFERY | Interests Thoughtful and Creative Real Estate Solutions

The Market Common Clarendon
ARLINGTON, VIRGINIA



The Market Common, Clarendon is located on approximately ten (10) acres in the Clarendon neighborhood of Arlington, Virginia, just outside Washington, D.C. In addition to the more than 240,000 SF of prime retail, the project includes 300 Class A apartments, 87 townhomes, 100,000 square feet of office space and nearly 1,200 parking spaces. In an attractive, walkable, visually stimulating and architecturally timeless street front setting, tenants are treated to the full service amenities of a true master planned, mixed-use facility.

The opening of The Market Common, Clarendon in November 2001 represented the successful collaboration between McCaffery Interests, RREEF, Arlington County Officials and the citizens of the Clarendon neighborhood. The 100% leased project attracted prominent national retailers such as Pottery Barn, Williams-Sonoma Grande Cuisine, Barnes & Noble Booksellers, Apple Computer, The Container Store, Imaginarium, Eastern Mountain Sports, Myer-Emco, Jos. A. Bank Clothiers, and Washington Sports Club in what stood as an empty parking lot for more than a decade. Phase II opened in early 2002 with Crate & Barrel Home Store, Ann Taylor Loft, and South Moon Under.

Enjoying the characteristics commonly associated with 24-hour cities and surrounded by the upper income neighborhoods of Georgetown, Northwest Washington, Capitol Hill, Potomac, Maryland, McLean and Alexandria, Virginia, Clarendon is an infill project within one of the strongest retail demographics markets in the United States. 800 new residential units and 210,000 square feet of Class A office space within a two block radius of the project makes The Market Common, Clarendon an extremely desireable asset to the community.

APPENDIX B

Block by Block

Shared Parking Spreadsheets

The Traffic Group®

POTOMAC VILLAGE - POTOMAC YARDS Parking Analysis BLOCK A

Hour of Day	Hourly Distributions (1) Office	Residential Rental	Fine/Casual Dining	Retail	Hotel (Business)	Grocery	Cinema	Health Club	Max Parking Demand Office	Residential UNITS	Sit Dn ,Fast+ casual	Retail	Hotel Business	Grocery	Cinema	Health Clb	Total	Surplus/ Deficit	Percent Sur/Def
									GBA SF	340	GBA SF	GLA SF	ROOMS	GLA SF	GLA	GLA			
Max. Parking Index - includes visitors and employees										1.00									
Max. Parking Demand - based on above ratios									-	340							340		
										340							340		
M-F																			
6:00 AM	3%	100%	0%	1%	95%	25%	0%	25%	-	340	-	-	-	-	-	-	340	(112)	-49%
7:00 AM	30%	90%	0%	5%	90%	45%	0%	45%	-	306	-	-	-	-	-	-	306	(78)	-34%
8:00 AM	75%	85%	0%	15%	80%	50%	0%	50%	-	289	-	-	-	-	-	-	289	(61)	-27%
9:00 AM	95%	80%	0%	35%	70%	60%	0%	60%	-	272	-	-	-	-	-	-	272	(44)	-19%
10:00 AM	100%	75%	15%	55%	60%	75%	0%	75%	-	255	-	-	-	-	-	-	255	(27)	-12%
11:00 AM	100%	70%	40%	75%	60%	75%	0%	50%	-	238	-	-	-	-	-	-	238	(10)	-4%
12:00 PM	90%	65%	75%	75%	55%	75%	10%	90%	-	221	-	-	-	-	-	-	221	7	3%
1:00 PM	90%	70%	75%	90%	55%	25%	35%	90%	-	238	-	-	-	-	-	-	238	(10)	-4%
2:00 PM	100%	70%	65%	85%	60%	45%	45%	40%	-	238	-	-	-	-	-	-	238	(10)	-4%
3:00 PM	100%	70%	40%	80%	60%	50%	45%	40%	-	238	-	-	-	-	-	-	238	(10)	-4%
4:00 PM	90%	75%	50%	80%	65%	60%	45%	50%	-	255	-	-	-	-	-	-	255	(27)	-12%
5:00 PM	50%	85%	75%	85%	70%	75%	70%	60%	-	289	-	-	-	-	-	-	289	(61)	-27%
6:00 PM	25%	90%	95%	85%	75%	75%	70%	70%	-	306	-	-	-	-	-	-	306	(78)	-34%
7:00 PM	10%	97%	100%	85%	75%	75%	70%	80%	-	330	-	-	-	-	-	-	330	(102)	-45%
8:00 PM	7%	98%	100%	70%	80%	85%	90%	90%	-	333	-	-	-	-	-	-	333	(105)	-46%
9:00 PM	3%	99%	100%	50%	85%	90%	90%	70%	-	337	-	-	-	-	-	-	337	(109)	-48%
10:00 PM	1%	100%	95%	30%	95%	85%	70%	25%	-	340	-	-	-	-	-	-	340	(112)	-49%
11:00 PM	0%	100%	75%	10%	100%	65%	55%	5%	-	340	-	-	-	-	-	-	340	(112)	-49%
12:00 AM	0%	100%	25%	0%	100%	70%	30%	5%	-	340	-	-	-	-	-	-	340	(112)	-49%

Max. Demand **340** spaces

Parking Supply **228** spaces Not including on street parking estimated at 410 spaces + 125 surface = 535 extra Based upon

[redacted]

Notes: (1) Hourly distributions and parking indices "Shared Parking Second Edition" published by ULI, 2005.

Forecasted Parking Demand Based on WMATA Studies - Typical Weekday Conditions & Hourly distributions and parking indices form ULI's "Shared Parking Second Edition" published by ULI, 2005

POTOMAC VILLAGE - POTOMAC YARDS Parking Analysis BLOCK B FINAL

ur of Day	Hourly Distributions (1) Office	Residential Rental	Fine/Casual Dining	Retail	Hotel (Business)	Grocery	Cinema	Health Club	Max Parking Demand Office	Residential UNITS	Sit Dn ,Fast+ casual	Retail	Hotel Business	Grocery	Cinema	Health Clb	Total	Surplus/ Deficit	Percent Sur/Def
													168,715		64,000	50,000			
									GBA SF	752	GBA SF	GLA SF	ROOMS	GLA SF	GLA	GLA			
ax. Parking Index - includes visitors and employees										1.00									
ax. Parking Demand - based on above ratios										752							752		
									-	752							752		
M-F																			
6:00 AM	3%	100%	0%	1%	95%	25%	0%	25%	-	752	-	-	-	-	-	-	752	46	6%
7:00 AM	30%	90%	0%	5%	90%	45%	0%	45%	-	677	-	-	-	-	-	-	677	121	15%
8:00 AM	75%	85%	0%	15%	80%	50%	0%	50%	-	639	-	-	-	-	-	-	639	159	20%
9:00 AM	95%	80%	0%	35%	70%	60%	0%	60%	-	602	-	-	-	-	-	-	602	196	25%
10:00 AM	100%	75%	15%	55%	60%	75%	0%	75%	-	564	-	-	-	-	-	-	564	234	29%
11:00 AM	100%	70%	40%	75%	60%	75%	0%	50%	-	526	-	-	-	-	-	-	526	272	34%
12:00 PM	90%	65%	75%	75%	55%	75%	10%	90%	-	489	-	-	-	-	-	-	489	309	39%
1:00 PM	90%	70%	75%	90%	55%	25%	35%	90%	-	526	-	-	-	-	-	-	526	272	34%
2:00 PM	100%	70%	65%	85%	60%	45%	45%	40%	-	526	-	-	-	-	-	-	526	272	34%
3:00 PM	100%	70%	40%	80%	60%	50%	45%	40%	-	526	-	-	-	-	-	-	526	272	34%
4:00 PM	90%	75%	50%	80%	65%	60%	45%	50%	-	564	-	-	-	-	-	-	564	234	29%
5:00 PM	50%	85%	75%	85%	70%	75%	70%	60%	-	639	-	-	-	-	-	-	639	159	20%
6:00 PM	25%	90%	95%	85%	75%	75%	70%	70%	-	677	-	-	-	-	-	-	677	121	15%
7:00 PM	10%	97%	100%	85%	75%	75%	70%	80%	-	729	-	-	-	-	-	-	729	69	9%
8:00 PM	7%	98%	100%	70%	80%	85%	90%	90%	-	737	-	-	-	-	-	-	737	61	8%
9:00 PM	3%	99%	100%	50%	85%	90%	90%	70%	-	744	-	-	-	-	-	-	744	54	7%
10:00 PM	1%	100%	95%	30%	95%	85%	70%	25%	-	752	-	-	-	-	-	-	752	46	6%
11:00 PM	0%	100%	75%	10%	100%	65%	55%	5%	-	752	-	-	-	-	-	-	752	46	6%
12:00 AM	0%	100%	25%	0%	100%	70%	30%	5%	-	752	-	-	-	-	-	-	752	46	6%

ax. Demand **489** spaces

arking Supply **798** spaces

Not including on street parking estimated at 410 spaces + 125 surface = 535 extra

Based upon 232,715

[redacted]

Notes: (1) Hourly distributions and parking indices "Shared Parking Second Edition" published by ULI, 2005.

orecasted Parking Demand Based on WMATA Studies - Typical Weekday Conditions & Hourly distributions and parking indices form ULI's "Shared Parking Second Edition" published by ULI, 2005

POTOMAC VILLAGE - POTOMAC YARDS Parking Analysis BLOCK C-1

our of Day	Hourly Distributions (1) Office	Residential Rental	Fine/Casual Dining	Retail	Hotel (Business)	Grocery	Cinema	Health Club	Max Parking Demand Office	Residential UNITS	Sit Dn ,Fast+ casual	Retail	Hotel Business	Grocery	Cinema	Health Clb	Total	Surplus/ Deficit	Percent Sur/Def
															64,000	50,000			
									GBA SF	377	GBA SF	GLA SF	ROOMS	GLA SF	GLA	GLA			
lax. Parking Index - includes visitors and employees										1.00									
lax. Parking Demand - based on above ratios										377							377		
										377	-						377		
M-F																			
6:00 AM	3%	100%	0%	1%	95%	25%	0%	25%	-	377	-	-	-	-	-	-	377	35	8%
7:00 AM	30%	90%	0%	5%	90%	45%	0%	45%	-	339	-	-	-	-	-	-	339	73	18%
8:00 AM	75%	85%	0%	15%	80%	50%	0%	50%	-	320	-	-	-	-	-	-	320	92	22%
9:00 AM	95%	80%	0%	35%	70%	60%	0%	60%	-	302	-	-	-	-	-	-	302	110	27%
10:00 AM	100%	75%	15%	55%	60%	75%	0%	75%	-	283	-	-	-	-	-	-	283	129	31%
11:00 AM	100%	70%	40%	75%	60%	75%	0%	50%	-	264	-	-	-	-	-	-	264	148	36%
12:00 PM	90%	65%	75%	75%	55%	75%	10%	90%	-	245	-	-	-	-	-	-	245	167	41%
1:00 PM	90%	70%	75%	90%	55%	25%	35%	90%	-	264	-	-	-	-	-	-	264	148	36%
2:00 PM	100%	70%	65%	85%	60%	45%	45%	40%	-	264	-	-	-	-	-	-	264	148	36%
3:00 PM	100%	70%	40%	80%	60%	50%	45%	40%	-	264	-	-	-	-	-	-	264	148	36%
4:00 PM	90%	75%	50%	80%	65%	60%	45%	50%	-	283	-	-	-	-	-	-	283	129	31%
5:00 PM	50%	85%	75%	85%	70%	75%	70%	60%	-	320	-	-	-	-	-	-	320	92	22%
6:00 PM	25%	90%	95%	85%	75%	75%	70%	70%	-	339	-	-	-	-	-	-	339	73	18%
7:00 PM	10%	97%	100%	85%	75%	75%	70%	80%	-	366	-	-	-	-	-	-	366	46	11%
8:00 PM	7%	98%	100%	70%	80%	85%	90%	90%	-	369	-	-	-	-	-	-	369	43	10%
9:00 PM	3%	99%	100%	50%	85%	90%	90%	70%	-	373	-	-	-	-	-	-	373	39	9%
10:00 PM	1%	100%	95%	30%	95%	85%	70%	25%	-	377	-	-	-	-	-	-	377	35	8%
11:00 PM	0%	100%	75%	10%	100%	65%	55%	5%	-	377	-	-	-	-	-	-	377	35	8%
12:00 AM	0%	100%	25%	0%	100%	70%	30%	5%	-	377	-	-	-	-	-	-	377	35	8%

lax. Demand **245** spaces

'arking Supply **412** spaces

Not including on street parking estimated at 410 spaces + 125 surface = 535 extra

Based upon 64,000

[redacted]

Notes: (1) Hourly distributions and parking indices "Shared Parking Second Edition" published by ULI, 2005.

'orecasted Parking Demand Based on WMATA Studies - Typical Weekday Conditions & Hourly distributions and parking indices form ULI's "Shared Parking Second Edition" published by ULI, 2005

POTOMAC VILLAGE - POTOMAC YARDS Parking Analysis BLOCK C-2

Hour of Day	Hourly Distributions (1) Office	Residential Rental	Fine/Casual Dining	Retail	Hotel (Business)	Grocery	Cinema	Health Club	Max Parking Demand Office	Residential UNITS	Sit Dn ,Fast+ casual	Retail	Hotel Business	Grocery	Cinema	Health Clb	Total	Surplus/ Deficit	Percent Sur/Def
															64,000	50,000			
									GBA SF		GBA SF	GLA SF	ROOMS	GLA SF	GLA	GLA			
Max. Parking Index - includes visitors and employees													319 1.00						
Max. Parking Demand - based on above ratios										-			319				319		
										-	-		319				319		
M-F																			
6:00 AM	3%	100%	0%	1%	95%	25%	0%	25%	-	-	-	-	303	-	-	-	303	22	7%
7:00 AM	30%	90%	0%	5%	90%	45%	0%	45%	-	-	-	-	287	-	-	-	287	38	12%
8:00 AM	75%	85%	0%	15%	80%	50%	0%	50%	-	-	-	-	255	-	-	-	255	70	21%
9:00 AM	95%	80%	0%	35%	70%	60%	0%	60%	-	-	-	-	223	-	-	-	223	102	31%
10:00 AM	100%	75%	15%	55%	60%	75%	0%	75%	-	-	-	-	191	-	-	-	191	134	41%
11:00 AM	100%	70%	40%	75%	60%	75%	0%	50%	-	-	-	-	191	-	-	-	191	134	41%
12:00 PM	90%	65%	75%	75%	55%	75%	10%	90%	-	-	-	-	175	-	-	-	175	150	46%
1:00 PM	90%	70%	75%	90%	55%	25%	35%	90%	-	-	-	-	175	-	-	-	175	150	46%
2:00 PM	100%	70%	65%	85%	60%	45%	45%	40%	-	-	-	-	191	-	-	-	191	134	41%
3:00 PM	100%	70%	40%	80%	60%	50%	45%	40%	-	-	-	-	191	-	-	-	191	134	41%
4:00 PM	90%	75%	50%	80%	65%	60%	45%	50%	-	-	-	-	207	-	-	-	207	118	36%
5:00 PM	50%	85%	75%	85%	70%	75%	70%	60%	-	-	-	-	223	-	-	-	223	102	31%
6:00 PM	25%	90%	95%	85%	75%	75%	70%	70%	-	-	-	-	239	-	-	-	239	86	26%
7:00 PM	10%	97%	100%	85%	75%	75%	70%	80%	-	-	-	-	239	-	-	-	239	86	26%
8:00 PM	7%	98%	100%	70%	80%	85%	90%	90%	-	-	-	-	255	-	-	-	255	70	21%
9:00 PM	3%	99%	100%	50%	85%	90%	90%	70%	-	-	-	-	271	-	-	-	271	54	17%
10:00 PM	1%	100%	95%	30%	95%	85%	70%	25%	-	-	-	-	303	-	-	-	303	22	7%
11:00 PM	0%	100%	75%	10%	100%	65%	55%	5%	-	-	-	-	319	-	-	-	319	6	2%
12:00 AM	0%	100%	25%	0%	100%	70%	30%	5%	-	-	-	-	319	-	-	-	319	6	2%

Max. Demand 319 spaces
Parking Supply 325 spaces

Not including on street parking estimated at 410 spaces + 125 surface = 535 extra

Based upon

[redacted]

Notes: (1) Hourly distributions and parking indices "Shared Parking Second Edition" published by ULI, 2005.
Forecasted Parking Demand Based on WMATA Studies - Typical Weekday Conditions & Hourly distributions and parking indices form ULI's "Shared Parking Second Edition" published by ULI, 2005

POTOMAC VILLAGE - POTOMAC YARDS Parking Analysis BLOCK D FINAL

our of Day	Hourly Distributions (1) Office	Residential Rental	Fine/Casual Dining	Retail	Hotel (Business)	Grocery	Cinema	Health Club	Max Parking Demand Office	Residential UNITS	Sit Dn ,Fast+ casual	Retail	Hotel Business	Grocery	Cinema	Health Clb	Total	Surplus/ Deficit	Percent Sur/Def
															64,000	50,000			
									GBA SF	190	GBA SF	GLA SF	ROOMS	GLA SF	GLA	GLA			
									92,020			33,777							
Max. Parking Index - Includes visitors and employees									1.21	1.00		3.50							
Max. Parking Demand - based on above ratios									111	190		118					420		
									111	190	-	118					420		
M-F																			
6:00 AM	3%	100%	0%	1%	95%	25%	0%	25%	3		-	1	-	-	-	-	5	457	99%
7:00 AM	30%	90%	0%	5%	90%	45%	0%	45%	33		-	6	-	-	-	-	39	423	91%
8:00 AM	75%	85%	0%	15%	80%	50%	0%	50%	84		-	18	-	-	-	-	101	361	78%
9:00 AM	95%	80%	0%	35%	70%	60%	0%	60%	106		-	41	-	-	-	-	147	315	68%
10:00 AM	100%	75%	15%	55%	60%	75%	0%	75%	111		-	65	-	-	-	-	176	286	62%
11:00 AM	100%	70%	40%	75%	60%	75%	0%	50%	111		-	89	-	-	-	-	200	262	57%
12:00 PM	90%	65%	75%	75%	55%	75%	10%	90%	100		-	89	-	-	-	-	189	273	59%
1:00 PM	90%	70%	75%	90%	55%	25%	35%	90%	100		-	106	-	-	-	-	207	255	55%
2:00 PM	100%	70%	65%	85%	60%	45%	45%	40%	111		-	100	-	-	-	-	212	250	54%
3:00 PM	100%	70%	40%	80%	60%	50%	45%	40%	111		-	95	-	-	-	-	206	256	55%
4:00 PM	90%	75%	50%	80%	65%	60%	45%	50%	100		-	95	-	-	-	-	195	267	58%
5:00 PM	50%	85%	75%	85%	70%	75%	70%	60%	56		-	100	-	-	-	-	156	306	66%
6:00 PM	25%	90%	95%	85%	75%	75%	70%	70%	28		-	100	-	-	-	-	128	334	72%
7:00 PM	10%	97%	100%	85%	75%	75%	70%	80%	11		-	100	-	-	-	-	112	350	76%
8:00 PM	7%	98%	100%	70%	80%	85%	90%	90%	8		-	83	-	-	-	-	91	371	80%
9:00 PM	3%	99%	100%	50%	85%	90%	90%	70%	3		-	59	-	-	-	-	62	400	86%
10:00 PM	1%	100%	95%	30%	95%	85%	70%	25%	1		-	35	-	-	-	-	37	425	92%
11:00 PM	0%	100%	75%	10%	100%	65%	55%	5%	-		-	12	-	-	-	-	12	450	97%
12:00 AM	0%	100%	25%	0%	100%	70%	30%	5%	-		-	-	-	-	-	-	-	462	100%

Max. Demand **263** spaces

Parking Supply **462** spaces

Not including on street parking estimated at 410 spaces + 125 surface = 535 extra

Based upon 189,797

FINAL 290

[redacted]

Notes: (1) Hourly distributions and parking indices "Shared Parking Second Edition" published by ULI, 2005.

Forecasted Parking Demand Based on WMATA Studies - Typical Weekday Conditions & Hourly distributions and parking indices form ULI's "Shared Parking Second Edition" published by ULI, 2005

POTOMAC VILLAGE - POTOMAC YARDS Parking Analysis BLOCK E

Hour of Day	Hourly Distributions (1) Office	Residential Rental	Fine/Casual Dining	Retail	Hotel (Business)	Grocery	Cinema	Health Club	Max Parking Demand Office	Residential UNITS	Sit Dn ,Fast+ casual	Retail	Hotel Business	Grocery	Cinema	Health Clb	Total	Surplus/ Deficit	Percent Sur/Def
															64,000	50,000			
									GBA SF	678	GBA SF	GLA SF	ROOMS	GLA SF	GLA	GLA			
												211,000							
ax. Parking Index - includes visitors and employees										1.00		3.50							
ax. Parking Demand - based on above ratios										678		739					1,417		
										678	-	739					1,417		
M-F																			
6:00 AM	3%	100%	0%	1%	95%	25%	0%	25%	-		-	7	-	-	-	-	7	1,069	99%
7:00 AM	30%	90%	0%	5%	90%	45%	0%	45%	-		-	37	-	-	-	-	37	1,039	97%
8:00 AM	75%	85%	0%	15%	80%	50%	0%	50%	-		-	111	-	-	-	-	111	965	90%
9:00 AM	95%	80%	0%	35%	70%	60%	0%	60%	-		-	258	-	-	-	-	258	818	76%
10:00 AM	100%	75%	15%	55%	60%	75%	0%	75%	-		-	406	-	-	-	-	406	670	62%
11:00 AM	100%	70%	40%	75%	60%	75%	0%	50%	-		-	554	-	-	-	-	554	522	49%
12:00 PM	90%	65%	75%	75%	55%	75%	10%	90%	-		-	554	-	-	-	-	554	522	49%
1:00 PM	90%	70%	75%	90%	55%	25%	35%	90%	-		-	665	-	-	-	-	665	411	38%
2:00 PM	100%	70%	65%	85%	60%	45%	45%	40%	-		-	628	-	-	-	-	628	448	42%
3:00 PM	100%	70%	40%	80%	60%	50%	45%	40%	-		-	591	-	-	-	-	591	485	45%
4:00 PM	90%	75%	50%	80%	65%	60%	45%	50%	-		-	591	-	-	-	-	591	485	45%
5:00 PM	50%	85%	75%	85%	70%	75%	70%	60%	-		-	628	-	-	-	-	628	448	42%
6:00 PM	25%	90%	95%	85%	75%	75%	70%	70%	-		-	628	-	-	-	-	628	448	42%
7:00 PM	10%	97%	100%	85%	75%	75%	70%	80%	-		-	628	-	-	-	-	628	448	42%
8:00 PM	7%	98%	100%	70%	80%	85%	90%	90%	-		-	517	-	-	-	-	517	559	52%
9:00 PM	3%	99%	100%	50%	85%	90%	90%	70%	-		-	369	-	-	-	-	369	707	66%
10:00 PM	1%	100%	95%	30%	95%	85%	70%	25%	-		-	222	-	-	-	-	222	854	79%
11:00 PM	0%	100%	75%	10%	100%	65%	55%	5%	-		-	74	-	-	-	-	74	1,002	93%
12:00 AM	0%	100%	25%	0%	100%	70%	30%	5%	-		-	-	-	-	-	-	-	1,076	100%

lax. Demand 1,055 spaces
arking Supply 1,076 spaces

Not including on street parking estimated at 410 spaces + 125 surface = 535 extra

Based upon

FINAL 1,343

[redacted]

Notes: (1) Hourly distributions and parking indices "Shared Parking Second Edition" published by ULI, 2005.

orecasted Parking Demand Based on WMATA Studies - Typical Weekday Conditions & Hourly distributions and parking indices form ULI's "Shared Parking Second Edition" published by ULI, 2005

POTOMAC VILLAGE - POTOMAC YARDS Parking Analysis BLOCK F

Hour of Day	Hourly Distributions (1) Office	Residential Rental	Fine/Casual Dining	Retail	Hotel (Business)	Grocery	Cinema	Health Club	Max Parking Demand Office	Residential UNITS	Sit Dn ,Fast+ casual	Retail	Hotel Business	Grocery	Cinema	Health Clb	Total	Surplus/ Deficit	Percent Sur/Def
															64,000	50,000			
									GBA SF		GBA SF	GLA SF	ROOMS	GLA SF	GLA	GLA			
										686	103,020								
Max. Parking Index - includes visitors and employees										1.00	3.50								
Max. Parking Demand - based on above ratios										686	361						1,047		
										686	361						1,047		
M-F																			
6:00 AM	3%	100%	0%	1%	95%	25%	0%	25%	-		-	-	-	-	-	-	-	524	100%
7:00 AM	30%	90%	0%	5%	90%	45%	0%	45%	-		-	-	-	-	-	-	-	524	100%
8:00 AM	75%	85%	0%	15%	80%	50%	0%	50%	-		-	-	-	-	-	-	-	524	100%
9:00 AM	95%	80%	0%	35%	70%	60%	0%	60%	-		-	-	-	-	-	-	-	524	100%
10:00 AM	100%	75%	15%	55%	60%	75%	0%	75%	-		54	-	-	-	-	-	54	470	90%
11:00 AM	100%	70%	40%	75%	60%	75%	0%	50%	-		144	-	-	-	-	-	144	380	72%
12:00 PM	90%	65%	75%	75%	55%	75%	10%	90%	-		270	-	-	-	-	-	270	254	48%
1:00 PM	90%	70%	75%	90%	55%	25%	35%	90%	-		270	-	-	-	-	-	270	254	48%
2:00 PM	100%	70%	65%	85%	60%	45%	45%	40%	-		234	-	-	-	-	-	234	290	55%
3:00 PM	100%	70%	40%	80%	60%	50%	45%	40%	-		144	-	-	-	-	-	144	380	72%
4:00 PM	90%	75%	50%	80%	65%	60%	45%	50%	-		180	-	-	-	-	-	180	344	66%
5:00 PM	50%	85%	75%	85%	70%	75%	70%	60%	-		270	-	-	-	-	-	270	254	48%
6:00 PM	25%	90%	95%	85%	75%	75%	70%	70%	-		343	-	-	-	-	-	343	181	35%
7:00 PM	10%	97%	100%	85%	75%	75%	70%	80%	-		361	-	-	-	-	-	361	163	31%
8:00 PM	7%	98%	100%	70%	80%	85%	90%	90%	-		361	-	-	-	-	-	361	163	31%
9:00 PM	3%	99%	100%	50%	85%	90%	90%	70%	-		361	-	-	-	-	-	361	163	31%
10:00 PM	1%	100%	95%	30%	95%	85%	70%	25%	-		343	-	-	-	-	-	343	181	35%
11:00 PM	0%	100%	75%	10%	100%	65%	55%	5%	-		270	-	-	-	-	-	270	254	48%
12:00 AM	0%	100%	25%	0%	100%	70%	30%	5%	-		90	-	-	-	-	-	90	434	83%

Max. Demand **802** spaces

Parking Supply **524** spaces

Not including on street parking estimated at 410 spaces + 125 surface = 535 extra

Based upon 167,020

FINAL 1,047

[redacted]

Notes: (1) Hourly distributions and parking indices "Shared Parking Second Edition" published by ULI, 2005.

Forecasted Parking Demand Based on WMATA Studies - Typical Weekday Conditions & Hourly distributions and parking indices form ULI's "Shared Parking Second Edition" published by ULI, 2005

POTOMAC VILLAGE - POTOMAC YARDS Parking Analysis BLOCK G

	Hourly Distributions (1)							Max Parking Demand										
ur of Day	Office	Residential Rental	Fine/Casual Dining	Retail	Hotel (Business)	Grocery	Cinema	Health Club	Office	Residential UNITS	Sit Dn ,Fast+ casual	Retail	Hotel Business	Grocery	Cinema	Health Clb	Total	Surplus/ Deficit	Percent Sur/Def
															64,000	50,000			
									GBA SF	235	GBA SF	GLA SF	ROOMS	GLA SF	GLA	GLA			
									50,575			41,320							
x. Parking Index - includes visitors and employees									1.21	1.00		3.50							
x. Parking Demand - based on above ratios									61	235		145					441		
									61	235	-	145					441		
M-F																			
6:00 AM	3%	100%	0%	1%	95%	25%	0%	25%	2		-	1	-	-	-	-	3	508	99%
7:00 AM	30%	90%	0%	5%	90%	45%	0%	45%	18		-	7	-	-	-	-	26	485	95%
8:00 AM	75%	85%	0%	15%	80%	50%	0%	50%	46		-	22	-	-	-	-	68	443	87%
9:00 AM	95%	80%	0%	35%	70%	60%	0%	60%	58		-	51	-	-	-	-	109	402	79%
10:00 AM	100%	75%	15%	55%	60%	75%	0%	75%	61		-	80	-	-	-	-	141	370	72%
11:00 AM	100%	70%	40%	75%	60%	75%	0%	50%	61		-	108	-	-	-	-	170	341	67%
12:00 PM	90%	65%	75%	75%	55%	75%	10%	90%	55		-	108	-	-	-	-	164	347	68%
1:00 PM	90%	70%	75%	90%	55%	25%	35%	90%	55		-	130	-	-	-	-	185	326	64%
2:00 PM	100%	70%	65%	85%	60%	45%	45%	40%	61		-	123	-	-	-	-	184	327	64%
3:00 PM	100%	70%	40%	80%	60%	50%	45%	40%	61		-	116	-	-	-	-	177	334	65%
4:00 PM	90%	75%	50%	80%	65%	60%	45%	50%	55		-	116	-	-	-	-	171	340	67%
5:00 PM	50%	85%	75%	85%	70%	75%	70%	60%	31		-	123	-	-	-	-	154	357	70%
6:00 PM	25%	90%	95%	85%	75%	75%	70%	70%	15		-	123	-	-	-	-	138	373	73%
7:00 PM	10%	97%	100%	85%	75%	75%	70%	80%	6		-	123	-	-	-	-	129	382	75%
8:00 PM	7%	98%	100%	70%	80%	85%	90%	90%	4		-	101	-	-	-	-	106	405	79%
9:00 PM	3%	99%	100%	50%	85%	90%	90%	70%	2		-	72	-	-	-	-	74	437	85%
10:00 PM	1%	100%	95%	30%	95%	85%	70%	25%	1		-	43	-	-	-	-	44	467	91%
11:00 PM	0%	100%	75%	10%	100%	65%	55%	5%	-		-	14	-	-	-	-	14	497	97%
12:00 AM	0%	100%	25%	0%	100%	70%	30%	5%	-		-	-	-	-	-	-	-	511	100%

ax. Demand **275** spaces

arking Supply **511** spaces

Not including on street parking estimated at 410 spaces + 125 surface = 535 extra

Based upon 155,895

FINAL 420

[redacted]

Notes: (1) Hourly distributions and parking indices "Shared Parking Second Edition" published by ULI, 2005.

orecasted Parking Demand Based on WMATA Studies - Typical Weekday Conditions & Hourly distributions and parking indices form ULI's "Shared Parking Second Edition" published by ULI, 2005

POTOMAC VILLAGE - POTOMAC YARDS Parking Analysis BLOCK J

Hour of Day	Hourly Distributions (1) Office	Residential Rental	Fine/Casual Dining	Retail	Hotel (Business)	Grocery	Cinema	Health Club	Max Parking Demand Office	Residential UNITS	Sit Dn ,Fast+ casual	Retail	Hotel Business	Grocery	Cinema	Health Clb	Total	Surplus/ Deficit	Percent Sur/Def
															64,000	50,000			
									GBA SF		GBA SF	GLA SF	ROOMS	GLA SF	GLA	GLA			
										770		120,300							
Max. Parking Index - includes visitors and employees									0.83	1.00		3.50							
Max. Parking Demand - based on above ratios									-	770		421					1,191		
									-	770	-	421					1,191		
M-F																			
6:00 AM	3%	100%	0%	1%	95%	25%	0%	25%	-		-	4	-	-	-	-	4	634	99%
7:00 AM	30%	90%	0%	5%	90%	45%	0%	45%	-		-	21	-	-	-	-	21	617	97%
8:00 AM	75%	85%	0%	15%	80%	50%	0%	50%	-		-	63	-	-	-	-	63	575	90%
9:00 AM	95%	80%	0%	35%	70%	60%	0%	60%	-		-	147	-	-	-	-	147	491	77%
10:00 AM	100%	75%	15%	55%	60%	75%	0%	75%	-		-	232	-	-	-	-	232	406	64%
11:00 AM	100%	70%	40%	75%	60%	75%	0%	50%	-		-	316	-	-	-	-	316	322	51%
12:00 PM	90%	65%	75%	75%	55%	75%	10%	90%	-		-	316	-	-	-	-	316	322	51%
1:00 PM	90%	70%	75%	90%	55%	25%	35%	90%	-		-	379	-	-	-	-	379	259	41%
2:00 PM	100%	70%	65%	85%	60%	45%	45%	40%	-		-	358	-	-	-	-	358	280	44%
3:00 PM	100%	70%	40%	80%	60%	50%	45%	40%	-		-	337	-	-	-	-	337	301	47%
4:00 PM	90%	75%	50%	80%	65%	60%	45%	50%	-		-	337	-	-	-	-	337	301	47%
5:00 PM	50%	85%	75%	85%	70%	75%	70%	60%	-		-	358	-	-	-	-	358	280	44%
6:00 PM	25%	90%	95%	85%	75%	75%	70%	70%	-		-	358	-	-	-	-	358	280	44%
7:00 PM	10%	97%	100%	85%	75%	75%	70%	80%	-		-	358	-	-	-	-	358	280	44%
8:00 PM	7%	98%	100%	70%	80%	85%	90%	90%	-		-	295	-	-	-	-	295	343	54%
9:00 PM	3%	99%	100%	50%	85%	90%	90%	70%	-		-	211	-	-	-	-	211	427	67%
10:00 PM	1%	100%	95%	30%	95%	85%	70%	25%	-		-	126	-	-	-	-	126	512	80%
11:00 PM	0%	100%	75%	10%	100%	65%	55%	5%	-		-	42	-	-	-	-	42	596	93%
12:00 AM	0%	100%	25%	0%	100%	70%	30%	5%	-		-	-	-	-	-	-	-	638	100%

Max. Demand **843** spaces

Parking Supply **638** spaces

Not including on street parking estimated at 410 spaces + 125 surface = 535 extra

Based upon 184,300

FINAL 1,149

[redacted]

Notes: (1) Hourly distributions and parking indices "Shared Parking Second Edition" published by ULI, 2005.

Forecasted Parking Demand Based on WMATA Studies - Typical Weekday Conditions & Hourly distributions and parking indices form ULI's "Shared Parking Second Edition" published by ULI, 2005

OTOMAC VILLAGE - POTOMAC YARDS Parking Analysis BLOCK K

ur of Day	Hourly Distributions (1) Office	Residential Rental	Fine/Casual Dining	Retail	Hotel (Business)	Grocery	Cinema	Health Club	Max Parking Demand Office	Residential UNITS	Sit Dn ,Fast+ casual	Retail	Hotel Business	Grocery	Cinema	Health Clb	Total	Surplus/ Deficit	Percent Sur/Def
															64,000	50,000			
									GBA SF	100	GBA SF	GLA SF	ROOMS	GLA SF	GLA	GLA			
												45,500			2000 SEATS				
x. Parking Index - includes visitors and employees										1.00		3.50			0.20				
x. Parking Demand - based on above ratios										100		159			400		659		
										100	-	159			400		659		
M-F																			
6:00 AM	3%	100%	0%	1%	95%	25%	0%	25%	-		-	2	-	-	-	-	2	353	100%
7:00 AM	30%	90%	0%	5%	90%	45%	0%	45%	-		-	8	-	-	-	-	8	347	98%
8:00 AM	75%	85%	0%	15%	80%	50%	0%	50%	-		-	24	-	-	-	-	24	331	93%
9:00 AM	95%	80%	0%	35%	70%	60%	0%	60%	-		-	56	-	-	-	-	56	299	84%
10:00 AM	100%	75%	15%	55%	60%	75%	0%	75%	-		-	88	-	-	-	-	88	267	75%
11:00 AM	100%	70%	40%	75%	60%	75%	0%	50%	-		-	119	-	-	-	-	119	236	66%
12:00 PM	90%	65%	75%	75%	55%	75%	10%	90%	-		-	119	-	-	40	-	159	196	55%
1:00 PM	90%	70%	75%	90%	55%	25%	35%	90%	-		-	143	-	-	140	-	283	72	20%
2:00 PM	100%	70%	65%	85%	60%	45%	45%	40%	-		-	135	-	-	180	-	315	40	11%
3:00 PM	100%	70%	40%	80%	60%	50%	45%	40%	-		-	127	-	-	180	-	307	48	13%
4:00 PM	90%	75%	50%	80%	65%	60%	45%	50%	-		-	127	-	-	180	-	307	48	13%
5:00 PM	50%	85%	75%	85%	70%	75%	70%	60%	-		-	135	-	-	280	-	415	(60)	-17%
6:00 PM	25%	90%	95%	85%	75%	75%	70%	70%	-		-	135	-	-	280	-	415	(60)	-17%
7:00 PM	10%	97%	100%	85%	75%	75%	70%	80%	-		-	135	-	-	280	-	415	(60)	-17%
8:00 PM	7%	98%	100%	70%	80%	85%	90%	90%	-		-	111	-	-	360	-	471	(116)	-33%
9:00 PM	3%	99%	100%	50%	85%	90%	90%	70%	-		-	80	-	-	360	-	440	(85)	-24%
10:00 PM	1%	100%	95%	30%	95%	85%	70%	25%	-		-	48	-	-	280	-	328	27	8%
11:00 PM	0%	100%	75%	10%	100%	65%	55%	5%	-		-	16	-	-	220	-	236	119	34%
12:00 AM	0%	100%	25%	0%	100%	70%	30%	5%	-		-	-	-	-	120	-	120	235	66%

ax. Demand **360** spaces
arking Supply **355** spaces

Not including on street parking estimated at 410 spaces + 125 surface = 535 extra

Based upon 109,500

FINAL 571

[redacted]

Notes: (1) Hourly distributions and parking indices "Shared Parking Second Edition" published by ULI, 2005.

precasted Parking Demand Based on WMATA Studies - Typical Weekday Conditions & Hourly distributions and parking indices form ULI's "Shared Parking Second Edition" published by ULI, 2005

POTOMAC VILLAGE - POTOMAC YARDS Parking Analysis BLOCK L - 1

Hour of Day	Hourly Distributions (1) Office	Residential Rental	Fine/Casual Dining	Retail	Hotel (Business)	Grocery	Cinema	Health Club	Max Parking Demand Office	Residential UNITS	Sit Dn ,Fast+ casual	Retail	Hotel Business	Grocery	Cinema	Health Clb	Total	Surplus/ Deficit	Percent Sur/Def
															64,000	50,000			
									GBA SF		GBA SF	GLA SF	ROOMS	GLA SF	GLA	GLA			
									221,386			54,733							
Max. Parking Index - includes visitors and employees									1.21			3.50							
Max. Parking Demand - based on above ratios									268	-		192					459		
									268	-	-	192					459		
M-F																			
6:00 AM	3%	100%	0%	1%	95%	25%	0%	25%	8	-	-	2	-	-	-	-	10	638	98%
7:00 AM	30%	90%	0%	5%	90%	45%	0%	45%	80	-	-	10	-	-	-	-	90	558	86%
8:00 AM	75%	85%	0%	15%	80%	50%	0%	50%	201	-	-	29	-	-	-	-	230	418	65%
9:00 AM	95%	80%	0%	35%	70%	60%	0%	60%	254	-	-	67	-	-	-	-	322	326	50%
10:00 AM	100%	75%	15%	55%	60%	75%	0%	75%	268	-	-	105	-	-	-	-	373	275	42%
11:00 AM	100%	70%	40%	75%	60%	75%	0%	50%	268	-	-	144	-	-	-	-	412	236	36%
12:00 PM	90%	65%	75%	75%	55%	75%	10%	90%	241	-	-	144	-	-	-	-	385	263	41%
1:00 PM	90%	70%	75%	90%	55%	25%	35%	90%	241	-	-	172	-	-	-	-	413	235	36%
2:00 PM	100%	70%	65%	85%	60%	45%	45%	40%	268	-	-	163	-	-	-	-	431	217	34%
3:00 PM	100%	70%	40%	80%	60%	50%	45%	40%	268	-	-	153	-	-	-	-	421	227	35%
4:00 PM	90%	75%	50%	80%	65%	60%	45%	50%	241	-	-	153	-	-	-	-	394	254	39%
5:00 PM	50%	85%	75%	85%	70%	75%	70%	60%	134	-	-	163	-	-	-	-	297	351	54%
6:00 PM	25%	90%	95%	85%	75%	75%	70%	70%	67	-	-	163	-	-	-	-	230	418	65%
7:00 PM	10%	97%	100%	85%	75%	75%	70%	80%	27	-	-	163	-	-	-	-	190	458	71%
8:00 PM	7%	98%	100%	70%	80%	85%	90%	90%	19	-	-	134	-	-	-	-	153	495	76%
9:00 PM	3%	99%	100%	50%	85%	90%	90%	70%	8	-	-	96	-	-	-	-	104	544	84%
10:00 PM	1%	100%	95%	30%	95%	85%	70%	25%	3	-	-	57	-	-	-	-	60	588	91%
11:00 PM	0%	100%	75%	10%	100%	65%	55%	5%	-	-	-	19	-	-	-	-	19	629	97%
12:00 AM	0%	100%	25%	0%	100%	70%	30%	5%	-	-	-	-	-	-	-	-	-	648	100%

Max. Demand **345** spaces

Parking Supply **648** spaces

Not including on street parking estimated at 410 spaces + 125 surface = 535 extra

Based upon 340,119

[redacted]

Notes: (1) Hourly distributions and parking indices "Shared Parking Second Edition" published by ULI, 2005.

Forecasted Parking Demand Based on WMATA Studies - Typical Weekday Conditions & Hourly distributions and parking indices form ULI's "Shared Parking Second Edition" published by ULI, 2005

POTOMAC VILLAGE - POTOMAC YARDS Parking Analysis BLOCK L - 2

Hour of Day	Hourly Distributions (1) Office	Residential Rental	Fine/Casual Dining	Retail	Hotel (Business)	Grocery	Cinema	Health Club	Max Parking Demand Office	Residential UNITS	Sit Dn ,Fast+ casual	Retail	Hotel Business	Grocery	Cinema	Health Clb	Total	Surplus/ Deficit	Percent Sur/Def
															64,000	50,000			
									GBA SF		GBA SF	GLA SF	ROOMS	GLA SF	GLA	GLA			
Max. Parking Index - includes visitors and employees									236,218			40,439							
Max. Parking Demand - based on above ratios									1.21			3.50							
									286	-		142					427		
									286	-	-	142					427		
M-F																			
6:00 AM	3%	100%	0%	1%	95%	25%	0%	25%	9	-	-	1	-	-	-	-	10	376	97%
7:00 AM	30%	90%	0%	5%	90%	45%	0%	45%	86	-	-	7	-	-	-	-	93	293	76%
8:00 AM	75%	85%	0%	15%	80%	50%	0%	50%	214	-	-	21	-	-	-	-	236	150	39%
9:00 AM	95%	80%	0%	35%	70%	60%	0%	60%	272	-	-	50	-	-	-	-	321	65	17%
10:00 AM	100%	75%	15%	55%	60%	75%	0%	75%	286	-	-	78	-	-	-	-	364	22	6%
11:00 AM	100%	70%	40%	75%	60%	75%	0%	50%	286	-	-	106	-	-	-	-	392	(6)	-2%
12:00 PM	90%	65%	75%	75%	55%	75%	10%	90%	257	-	-	106	-	-	-	-	363	23	6%
1:00 PM	90%	70%	75%	90%	55%	25%	35%	90%	257	-	-	127	-	-	-	-	385	1	0%
2:00 PM	100%	70%	65%	85%	60%	45%	45%	40%	286	-	-	120	-	-	-	-	406	(20)	-5%
3:00 PM	100%	70%	40%	80%	60%	50%	45%	40%	286	-	-	113	-	-	-	-	399	(13)	-3%
4:00 PM	90%	75%	50%	80%	65%	60%	45%	50%	257	-	-	113	-	-	-	-	370	16	4%
5:00 PM	50%	85%	75%	85%	70%	75%	70%	60%	143	-	-	120	-	-	-	-	263	123	32%
6:00 PM	25%	90%	95%	85%	75%	75%	70%	70%	71	-	-	120	-	-	-	-	192	194	50%
7:00 PM	10%	97%	100%	85%	75%	75%	70%	80%	29	-	-	120	-	-	-	-	149	237	61%
8:00 PM	7%	98%	100%	70%	80%	85%	90%	90%	20	-	-	99	-	-	-	-	119	267	69%
9:00 PM	3%	99%	100%	50%	85%	90%	90%	70%	9	-	-	71	-	-	-	-	79	307	79%
10:00 PM	1%	100%	95%	30%	95%	85%	70%	25%	3	-	-	42	-	-	-	-	45	341	88%
11:00 PM	0%	100%	75%	10%	100%	65%	55%	5%	-	-	-	14	-	-	-	-	14	372	96%
12:00 AM	0%	100%	25%	0%	100%	70%	30%	5%	-	-	-	-	-	-	-	-	-	386	100%

Max. Demand **315** spaces

Parking Supply **386** spaces

Not including on street parking estimated at 410 spaces + 125 surface = 535 extra

Based upon 340,667

[redacted]

Notes: (1) Hourly distributions and parking indices "Shared Parking Second Edition" published by ULI, 2005.

Forecasted Parking Demand Based on WMATA Studies - Typical Weekday Conditions & Hourly distributions and parking indices form ULI's "Shared Parking Second Edition" published by ULI, 2005

POTOMAC VILLAGE - POTOMAC YARDS Parking Analysis BLOCK M

Hour of Day	Hourly Distributions (1) Office	Residential Rental	Fine/Casual Dining	Retail	Hotel (Business)	Grocery	Cinema	Health Club	Max Parking Demand Office	Residential UNITS	Sit Dn ,Fast+ casual	Retail	Hotel Business	Grocery	Cinema	Health Clb	Total	Surplus/ Deficit	Percent Sur/Def
															64,000	50,000			
									GBA SF	308	GBA SF	GLA SF	ROOMS	GLA SF	GLA	GLA			
									273,408			71,800							
Max. Parking Index - Includes visitors and employees									1.21	1.00		3.50							
Max. Parking Demand - based on above ratios									331	308		251					890		
									331	308	-	251					890		
M-F																			
6:00 AM	3%	100%	0%	1%	95%	25%	0%	25%	10		-	3	-	-	-	-	12	574	98%
7:00 AM	30%	90%	0%	5%	90%	45%	0%	45%	99		-	13	-	-	-	-	112	474	81%
8:00 AM	75%	85%	0%	15%	80%	50%	0%	50%	248		-	38	-	-	-	-	286	300	51%
9:00 AM	95%	80%	0%	35%	70%	60%	0%	60%	314		-	88	-	-	-	-	402	184	31%
10:00 AM	100%	75%	15%	55%	60%	75%	0%	75%	331		-	138	-	-	-	-	469	117	20%
11:00 AM	100%	70%	40%	75%	60%	75%	0%	50%	331		-	188	-	-	-	-	519	67	11%
12:00 PM	90%	65%	75%	75%	55%	75%	10%	90%	298		-	188	-	-	-	-	486	100	17%
1:00 PM	90%	70%	75%	90%	55%	25%	35%	90%	298		-	226	-	-	-	-	524	62	11%
2:00 PM	100%	70%	65%	85%	60%	45%	45%	40%	331		-	214	-	-	-	-	544	42	7%
3:00 PM	100%	70%	40%	80%	60%	50%	45%	40%	331		-	201	-	-	-	-	532	54	9%
4:00 PM	90%	75%	50%	80%	65%	60%	45%	50%	298		-	201	-	-	-	-	499	87	15%
5:00 PM	50%	85%	75%	85%	70%	75%	70%	60%	165		-	214	-	-	-	-	379	207	35%
6:00 PM	25%	90%	95%	85%	75%	75%	70%	70%	83		-	214	-	-	-	-	296	290	49%
7:00 PM	10%	97%	100%	85%	75%	75%	70%	80%	33		-	214	-	-	-	-	247	339	58%
8:00 PM	7%	98%	100%	70%	80%	85%	90%	90%	23		-	176	-	-	-	-	199	387	66%
9:00 PM	3%	99%	100%	50%	85%	90%	90%	70%	10		-	126	-	-	-	-	136	450	77%
10:00 PM	1%	100%	95%	30%	95%	85%	70%	25%	3		-	75	-	-	-	-	79	507	87%
11:00 PM	0%	100%	75%	10%	100%	65%	55%	5%	-		-	25	-	-	-	-	25	561	96%
12:00 AM	0%	100%	25%	0%	100%	70%	30%	5%	-		-	-	-	-	-	-	-	586	100%

Max. Demand **579** spaces

Parking Supply **586** spaces

Not including on street parking estimated at 410 spaces + 125 surface = 535 extra

Based upon 409,208

FINAL 852

[redacted]

Notes: (1) Hourly distributions and parking indices "Shared Parking Second Edition" published by ULI, 2005.

Forecasted Parking Demand Based on WMATA Studies - Typical Weekday Conditions & Hourly distributions and parking indices form ULI's "Shared Parking Second Edition" published by ULI, 2005

OTOMAC VILLAGE - POTOMAC YARDS Parking Analysis BLOCK N

ur of Day	Hourly Distributions (1) Office	Residential Rental	Fine/Casual Dining	Retail	Hotel (Business)	Grocery	Cinema	Health Club	Max Parking Demand Office	Residential UNITS	Sit Dn ,Fast+ casual	Retail	Hotel Business	Grocery	Cinema	Health Clb	Total	Surplus/ Deficit	Percent Sur/Def
															64,000	50,000			
									GBA SF		GBA SF	GLA SF	ROOMS	GLA SF	GLA	GLA			
									63,950			52,880							
x. Parking Index - includes visitors and employees									1.21			3.50							
x. Parking Demand - based on above ratios									77	-		185					262		
									77	-	-	185					262		
M-F																			
6:00 AM	3%	100%	0%	1%	95%	25%	0%	25%	2	-	-	2	-	-	-	-	4	560	99%
7:00 AM	30%	90%	0%	5%	90%	45%	0%	45%	23	-	-	9	-	-	-	-	32	532	94%
8:00 AM	75%	85%	0%	15%	80%	50%	0%	50%	58	-	-	28	-	-	-	-	86	478	85%
9:00 AM	95%	80%	0%	35%	70%	60%	0%	60%	74	-	-	65	-	-	-	-	138	426	75%
10:00 AM	100%	75%	15%	55%	60%	75%	0%	75%	77	-	-	102	-	-	-	-	179	385	68%
11:00 AM	100%	70%	40%	75%	60%	75%	0%	50%	77	-	-	139	-	-	-	-	216	348	62%
12:00 PM	90%	65%	75%	75%	55%	75%	10%	90%	70	-	-	139	-	-	-	-	208	356	63%
1:00 PM	90%	70%	75%	90%	55%	25%	35%	90%	70	-	-	167	-	-	-	-	236	328	58%
2:00 PM	100%	70%	65%	85%	60%	45%	45%	40%	77	-	-	157	-	-	-	-	235	329	58%
3:00 PM	100%	70%	40%	80%	60%	50%	45%	40%	77	-	-	148	-	-	-	-	225	339	60%
4:00 PM	90%	75%	50%	80%	65%	60%	45%	50%	70	-	-	148	-	-	-	-	218	346	61%
5:00 PM	50%	85%	75%	85%	70%	75%	70%	60%	39	-	-	157	-	-	-	-	196	368	65%
6:00 PM	25%	90%	95%	85%	75%	75%	70%	70%	19	-	-	157	-	-	-	-	177	387	69%
7:00 PM	10%	97%	100%	85%	75%	75%	70%	80%	8	-	-	157	-	-	-	-	165	399	71%
8:00 PM	7%	98%	100%	70%	80%	85%	90%	90%	5	-	-	130	-	-	-	-	135	429	76%
9:00 PM	3%	99%	100%	50%	85%	90%	90%	70%	2	-	-	93	-	-	-	-	95	469	83%
10:00 PM	1%	100%	95%	30%	95%	85%	70%	25%	1	-	-	56	-	-	-	-	56	508	90%
11:00 PM	0%	100%	75%	10%	100%	65%	55%	5%	-	-	-	19	-	-	-	-	19	545	97%
12:00 AM	0%	100%	25%	0%	100%	70%	30%	5%	-	-	-	-	-	-	-	-	-	564	100%

ax. Demand **214** spaces

arking Supply **564** spaces

Not including on street parking estimated at 410 spaces + 125 surface = 535 extra

Based upon 180,830

[redacted]

Notes: (1) Hourly distributions and parking indices "Shared Parking Second Edition" published by ULI, 2005.

orecasted Parking Demand Based on WMATA Studies - Typical Weekday Conditions & Hourly distributions and parking indices form ULI's "Shared Parking Second Edition" published by ULI, 2005

POTOMAC VILLAGE - POTOMAC YARDS Parking Analysis BLOCK Q

Hour of Day	Hourly Distributions (1) Office	Residential Rental	Fine/Casual Dining	Retail	Hotel (Business)	Grocery	Cinema	Health Club	Max Parking Demand Office	Residential UNITS	Sit Dn ,Fast+ casual	Retail	Hotel Business	Grocery	Cinema	Health Clb	Total	Surplus/ Deficit	Percent Sur/Def
															64,000	50,000			
									GBA SF		GBA SF	GLA SF	ROOMS	GLA SF	GLA	GLA			
									350,640			58,275							
Max. Parking Index - Includes visitors and employees									1.21			3.50							
Max. Parking Demand - based on above ratios									424	-		204					628		
									424	-	-	204					628		
M-F																			
6:00 AM	3%	100%	0%	1%	95%	25%	0%	25%	13	-	-	2	-	-	-	-	15	549	97%
7:00 AM	30%	90%	0%	5%	90%	45%	0%	45%	127	-	-	10	-	-	-	-	137	427	76%
8:00 AM	75%	85%	0%	15%	80%	50%	0%	50%	318	-	-	31	-	-	-	-	349	215	38%
9:00 AM	95%	80%	0%	35%	70%	60%	0%	60%	403	-	-	71	-	-	-	-	474	90	16%
10:00 AM	100%	75%	15%	55%	60%	75%	0%	75%	424	-	-	112	-	-	-	-	536	28	5%
11:00 AM	100%	70%	40%	75%	60%	75%	0%	50%	424	-	-	153	-	-	-	-	577	(13)	-2%
12:00 PM	90%	65%	75%	75%	55%	75%	10%	90%	382	-	-	153	-	-	-	-	535	29	5%
1:00 PM	90%	70%	75%	90%	55%	25%	35%	90%	382	-	-	184	-	-	-	-	565	(1)	0%
2:00 PM	100%	70%	65%	85%	60%	45%	45%	40%	424	-	-	173	-	-	-	-	598	(34)	-6%
3:00 PM	100%	70%	40%	80%	60%	50%	45%	40%	424	-	-	163	-	-	-	-	587	(23)	-4%
4:00 PM	90%	75%	50%	80%	65%	60%	45%	50%	382	-	-	163	-	-	-	-	545	19	3%
5:00 PM	50%	85%	75%	85%	70%	75%	70%	60%	212	-	-	173	-	-	-	-	386	178	32%
6:00 PM	25%	90%	95%	85%	75%	75%	70%	70%	106	-	-	173	-	-	-	-	279	285	50%
7:00 PM	10%	97%	100%	85%	75%	75%	70%	80%	42	-	-	173	-	-	-	-	216	348	62%
8:00 PM	7%	98%	100%	70%	80%	85%	90%	90%	30	-	-	143	-	-	-	-	172	392	69%
9:00 PM	3%	99%	100%	50%	85%	90%	90%	70%	13	-	-	102	-	-	-	-	115	449	80%
10:00 PM	1%	100%	95%	30%	95%	85%	70%	25%	4	-	-	61	-	-	-	-	65	499	88%
11:00 PM	0%	100%	75%	10%	100%	65%	55%	5%	-	-	-	20	-	-	-	-	20	544	96%
12:00 AM	0%	100%	25%	0%	100%	70%	30%	5%	-	-	-	-	-	-	-	-	-	564	100%

Max. Demand **463** spaces

Parking Supply **564** spaces

Not including on street parking estimated at 410 spaces + 125 surface = 535 extra

Based upon **472,915**

[redacted]

Notes: (1) Hourly distributions and parking indices "Shared Parking Second Edition" published by ULI, 2005.

Forecasted Parking Demand Based on WMATA Studies - Typical Weekday Conditions & Hourly distributions and parking indices form ULI's "Shared Parking Second Edition" published by ULI, 2005

POTOMAC VILLAGE - POTOMAC YARDS Parking Analysis BLOCK R

Hour of Day	Hourly Distributions (1) Office	Residential Rental	Fine/Casual Dining	Retail	Hotel (Business)	Grocery	Cinema	Health Club	Max Parking Demand Office	Residential UNITS	Sit Dn ,Fast+ casual	Retail	Hotel Business	Grocery	Cinema	Health Cib	Total	Surplus/ Deficit	Percent Sur/Def
															64,000	50,000			
									GBA SF		GBA SF	GLA SF	ROOMS	GLA SF	GLA	GLA			
									428,397			58,400							
ax. Parking Index - includes visitors and employees									1.21			3.50							
ax. Parking Demand - based on above ratios									518	-		204					723		
									518	-	-	204					723		
M-F																			
6:00 AM	3%	100%	0%	1%	95%	25%	0%	25%	16	-	-	2	-	-	-	-	18	833	98%
7:00 AM	30%	90%	0%	5%	90%	45%	0%	45%	156	-	-	10	-	-	-	-	166	685	81%
8:00 AM	75%	85%	0%	15%	80%	50%	0%	50%	389	-	-	31	-	-	-	-	419	432	51%
9:00 AM	95%	80%	0%	35%	70%	60%	0%	60%	492	-	-	72	-	-	-	-	564	287	34%
10:00 AM	100%	75%	15%	55%	60%	75%	0%	75%	518	-	-	112	-	-	-	-	631	220	26%
11:00 AM	100%	70%	40%	75%	60%	75%	0%	50%	518	-	-	153	-	-	-	-	672	179	21%
12:00 PM	90%	65%	75%	75%	55%	75%	10%	90%	467	-	-	153	-	-	-	-	620	231	27%
1:00 PM	90%	70%	75%	90%	55%	25%	35%	90%	467	-	-	184	-	-	-	-	650	201	24%
2:00 PM	100%	70%	65%	85%	60%	45%	45%	40%	518	-	-	174	-	-	-	-	692	159	19%
3:00 PM	100%	70%	40%	80%	60%	50%	45%	40%	518	-	-	164	-	-	-	-	682	169	20%
4:00 PM	90%	75%	50%	80%	65%	60%	45%	50%	467	-	-	164	-	-	-	-	630	221	26%
5:00 PM	50%	85%	75%	85%	70%	75%	70%	60%	259	-	-	174	-	-	-	-	433	418	49%
6:00 PM	25%	90%	95%	85%	75%	75%	70%	70%	130	-	-	174	-	-	-	-	303	548	64%
7:00 PM	10%	97%	100%	85%	75%	75%	70%	80%	52	-	-	174	-	-	-	-	226	625	73%
8:00 PM	7%	98%	100%	70%	80%	85%	90%	90%	36	-	-	143	-	-	-	-	179	672	79%
9:00 PM	3%	99%	100%	50%	85%	90%	90%	70%	16	-	-	102	-	-	-	-	118	733	86%
10:00 PM	1%	100%	95%	30%	95%	85%	70%	25%	5	-	-	61	-	-	-	-	67	784	92%
11:00 PM	0%	100%	75%	10%	100%	65%	55%	5%	-	-	-	20	-	-	-	-	20	831	98%
12:00 AM	0%	100%	25%	0%	100%	70%	30%	5%	-	-	-	-	-	-	-	-	-	851	100%

ax. Demand **527** spaces

arking Supply **851** spaces

Not including on street parking estimated at 410 spaces + 125 surface = 535 extra

Based upon 550,797

[redacted]

Notes: (1) Hourly distributions and parking indices "Shared Parking Second Edition" published by ULI, 2005.

orecasted Parking Demand Based on WMATA Studies - Typical Weekday Conditions & Hourly distributions and parking indices form ULI's "Shared Parking Second Edition" published by ULI, 2005

POTOMAC VILLAGE - POTOMAC YARDS Parking Analysis BLOCK S

Hour of Day	Hourly Distributions (1) Office	Residential Rental	Fine/Casual Dining	Retail	Hotel (Business)	Grocery	Cinema	Health Club	Max Parking Demand Office	Residential UNITS	Sit Dn ,Fast+ casual	Retail	Hotel Business	Grocery	Cinema	Health Clb	Total	Surplus/ Deficit	Percent Sur/Def
															64,000	50,000			
									GBA SF		GBA SF	GLA SF	ROOMS	GLA SF	GLA	GLA			
Max. Parking Index - includes visitors and employees									188,880			23,568							
Max. Parking Demand - based on above ratios									1.21			3.50							
									229	-		82					311		
									229	-	-	82					311		
M-F																			
6:00 AM	3%	100%	0%	1%	95%	25%	0%	25%	7	-	-	1	-	-	-	-	8	283	97%
7:00 AM	30%	90%	0%	5%	90%	45%	0%	45%	69	-	-	4	-	-	-	-	73	218	75%
8:00 AM	75%	85%	0%	15%	80%	50%	0%	50%	171	-	-	12	-	-	-	-	184	107	37%
9:00 AM	95%	80%	0%	35%	70%	60%	0%	60%	217	-	-	29	-	-	-	-	246	45	15%
10:00 AM	100%	75%	15%	55%	60%	75%	0%	75%	229	-	-	45	-	-	-	-	274	17	6%
11:00 AM	100%	70%	40%	75%	60%	75%	0%	50%	229	-	-	62	-	-	-	-	290	1	0%
12:00 PM	90%	65%	75%	75%	55%	75%	10%	90%	206	-	-	62	-	-	-	-	268	23	8%
1:00 PM	90%	70%	75%	90%	55%	25%	35%	90%	206	-	-	74	-	-	-	-	280	11	4%
2:00 PM	100%	70%	65%	85%	60%	45%	45%	40%	229	-	-	70	-	-	-	-	299	(8)	-3%
3:00 PM	100%	70%	40%	80%	60%	50%	45%	40%	229	-	-	66	-	-	-	-	295	(4)	-1%
4:00 PM	90%	75%	50%	80%	65%	60%	45%	50%	206	-	-	66	-	-	-	-	272	19	7%
5:00 PM	50%	85%	75%	85%	70%	75%	70%	60%	114	-	-	70	-	-	-	-	184	107	37%
6:00 PM	25%	90%	95%	85%	75%	75%	70%	70%	57	-	-	70	-	-	-	-	127	164	56%
7:00 PM	10%	97%	100%	85%	75%	75%	70%	80%	23	-	-	70	-	-	-	-	93	198	68%
8:00 PM	7%	98%	100%	70%	80%	85%	90%	90%	16	-	-	58	-	-	-	-	74	217	75%
9:00 PM	3%	99%	100%	50%	85%	90%	90%	70%	7	-	-	41	-	-	-	-	48	243	83%
10:00 PM	1%	100%	95%	30%	95%	85%	70%	25%	2	-	-	25	-	-	-	-	27	264	91%
11:00 PM	0%	100%	75%	10%	100%	65%	55%	5%	-	-	-	8	-	-	-	-	8	283	97%
12:00 AM	0%	100%	25%	0%	100%	70%	30%	5%	-	-	-	-	-	-	-	-	-	291	100%

Max. Demand **226** spaces

Parking Supply **291** spaces

Not including on street parking estimated at 410 spaces + 125 surface = 535 extra

Based upon **276,448**

[redacted]

Notes: (1) Hourly distributions and parking indices "Shared Parking Second Edition" published by ULI, 2005.

Forecasted Parking Demand Based on WMATA Studies - Typical Weekday Conditions & Hourly distributions and parking indices form ULI's "Shared Parking Second Edition" published by ULI, 2005

City of Alexandria

MEMORANDUM

DATE: MAY 28, 2010

TO: CHAIRMAN AND MEMBERS, PLANNING COMMISSION

FROM: MARK JINKS, DEPUTY CITY MANAGER

SUBJECT: POTOMAC YARD METRORAIL STATION PROJECTIONS

As requested by the Planning Commission at its May 4 meeting, when it discussed the subsequently approved the North Potomac Yard Small Area Plan, City staff requested that Parsons Brinkerhoff Consulting, which developed the Potomac Yard Metrorail Station financing projection model, run two more analyses with more severe assumptions. The model was also updated to reflect the 2010 real estate tax rate adopted by Council.

The four cases that were run were:

1. **Development Base Case** with a 30-year build out of all of Potomac Yard by 2040,

2. **Slower Development Case** with a 33-year build out of Potomac Yard by 2043, but no development in Landbay F until 2017,

3. **Slower and Less Development Case** with no development in Landbay F prior to 2020, and then just 80% build out achieved by 2043.

4. **Accelerated Development Case** with1.4 million square feet of development in Landbay F by 2017, full build of Landbay F by 2032, and other landbay full buildout by 2040.

The varied build out assumptions for these cases are depicted on Attachment A, and while development cycles are likely to cause more development in some years and less in others, the end result will likely even out over time. This straight line approach to modeling recognizes that projections of development cycles (timing, intensity and length cycles) are subjective, and that over time the annual results often revert to a mean trend line.

These projections assume the agreed-upon to Landbay F contribution of $10 per square foot (in 2010 dollars) for 4.9 million feet of development in Landbay F. The projections do not include the $32 million shortfall guarantee which the developer of Landbay F has agreed to provide.

How that shortfall guarantee reduces or eliminates the projected gaps between revenues and project debt service is detailed below.

1. **Development Base Case**: The results (Attachment B) indicate that this scenario produces a gap of $5.9 million in the early years after station completion. The breakeven year is 2019. This small $5.9 million gap would be 100% closed by the shortfall guarantee.

2. **Slower Development Case**: The results (Attachment C) indicate that this scenario produces a gap of $8.8 million in the early years after station completion. The breakeven year is 2022. This somewhat larger gap would be 100% closed by the shortfall guarantee.

3. **Slower and Less Development Case**: The results (Attachment D) indicate that this scenario produces a gap of $52.8 million. The breakeven year is 2026. This much larger gap would be 61% narrowed by the shortfall guarantee, and leave $20.8 million remaining to be covered by the City over a 10-year period.

4. **Accelerated Development Case**: The results (Attachment E) indicate that there is no gap between projected revenues and debt service. In fact the projections indicate a $58.6 million surplus in the first 10 years. This underscores the value of allowing a certain amount of development to be permitted to occur prior to the Metrorail station construction starting because not only does the tax revenue get generated earlier, but also the $10 per square foot developer contribution gets paid earlier.

In any development scenario, the projections of the Development Base Case and the Slower Development Case represent the best informed assumptions. However, they are projections of future events, with reality certainly to be different in some way. This means that these two projection models could be too optimistic or too pessimistic, which was the impetus at the request of Planning Commission members for the creation of the Slower and Less Development Case and the Accelerated Development Case. These two new cases show the relative risks and rewards if reality varies from the best informed assumptions.

Risk Mitigation: For the City to be protected on the down side Slower and Less Development Case scenario (above and beyond the application of the $32 million shortfall guarantee), there are a number of risk mitigation factors that the City can undertake to protect itself on the downside. These include factors that can be taken singly or in combination:

1. Not issuing the bonds to finance the Metrorail station nor authorizing the "triggering event" (i.e., construction of the station in 2014 (at the earliest) until projections are rerun and the economic and development situation present at that time is carefully reassessed).

2. While the adoption of the North PotomacYard Small Area Plan and the CDD for Landbay F indicate intent, it will be at the City's discretion to determine in 2014 or later if it wants to proceed to undertake the obligation, risks and rewards that the financing of a new Metrorail station brings. If development is proceeding slowly, then the City could

delay the construction of the Metrorail station until development was at a level that makes the risks lower to the City. A delay will increase the cost of the station due to construction inflation, but also increase the amount of revenues being generated annually, as well as collected and reserved in the Station Fund.

3. Judging the plans of the developers of all landbays (RREEF/McCaffrey, MRP, PYD) plans and their financial and organizational ability and intent to deliver by assessing those factors prior to the triggering event. In particular, the status of RREEF/McCaffrey is more important given their agreed upon contribution of $10 per square foot towards the Metrorail station.

4. Assessing the development progress and market demand that is evident by development activity that occurs between 2010 and 2014. If development activity evidenced by construction, sales and leasing is slow that will help project future development rates. If activity is moving at a fast pace that will also help project future development rates.

5. The financing plan can be restructured with the payment of bond principal set at a lower payback rate, with the issuance of variable rate bonds, or with other financing structures that would have the effect of reducing early year debt service.

6. Federal and State transit aid is uncertain, but likely in some amount. Since it is not built into the projections, any amounts which may be known and more certain by 2014 can potentially used to help close a projected gap.

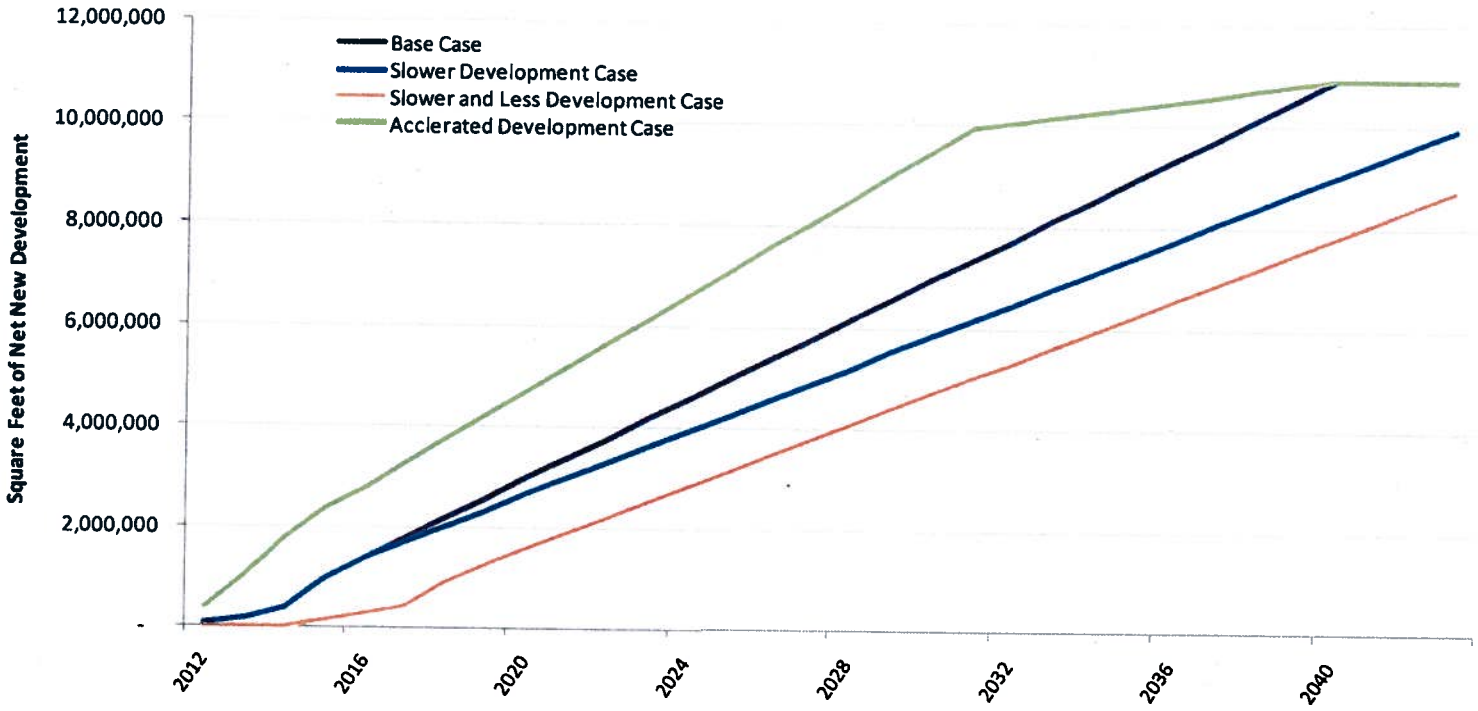
7. If in 2014 the current $32 million shortfall guarantee appears not to be able to cover any projected gap, then discussions and renegotiations with the owner of Landbay F would need to occur. Given the current level of developer contributions, increasing that amount may not be possible.

8. The City could decide to plan to cover the projected shortfall guarantee from other City sources, but given the City fiscal status at that time, this may or may not be possible.

In the end, one can conclude that the projected gaps are manageable by the utilization of the shortfall guarantee, as well as implementing, if needed, one or more of the eight risk mitigation options detailed above. Most importantly, with the final decision on building the station not being made until 2014 at the earliest, there will be time to reassess the situation, as well as to incorporate into that reassessment updated data and knowledge (taxes generated, actual development status, refined station costs, etc.). The Memorandum of Understanding, negotiated with and agreed to by the developer and the City, recognizes that if "material adverse changes occur" that the terms and conditions of the Metrorail financing would need to be renegotiated. Finally, the agreement does not bind the City to finance and construct the station.

Attachments

Comparison of Cases Build Out

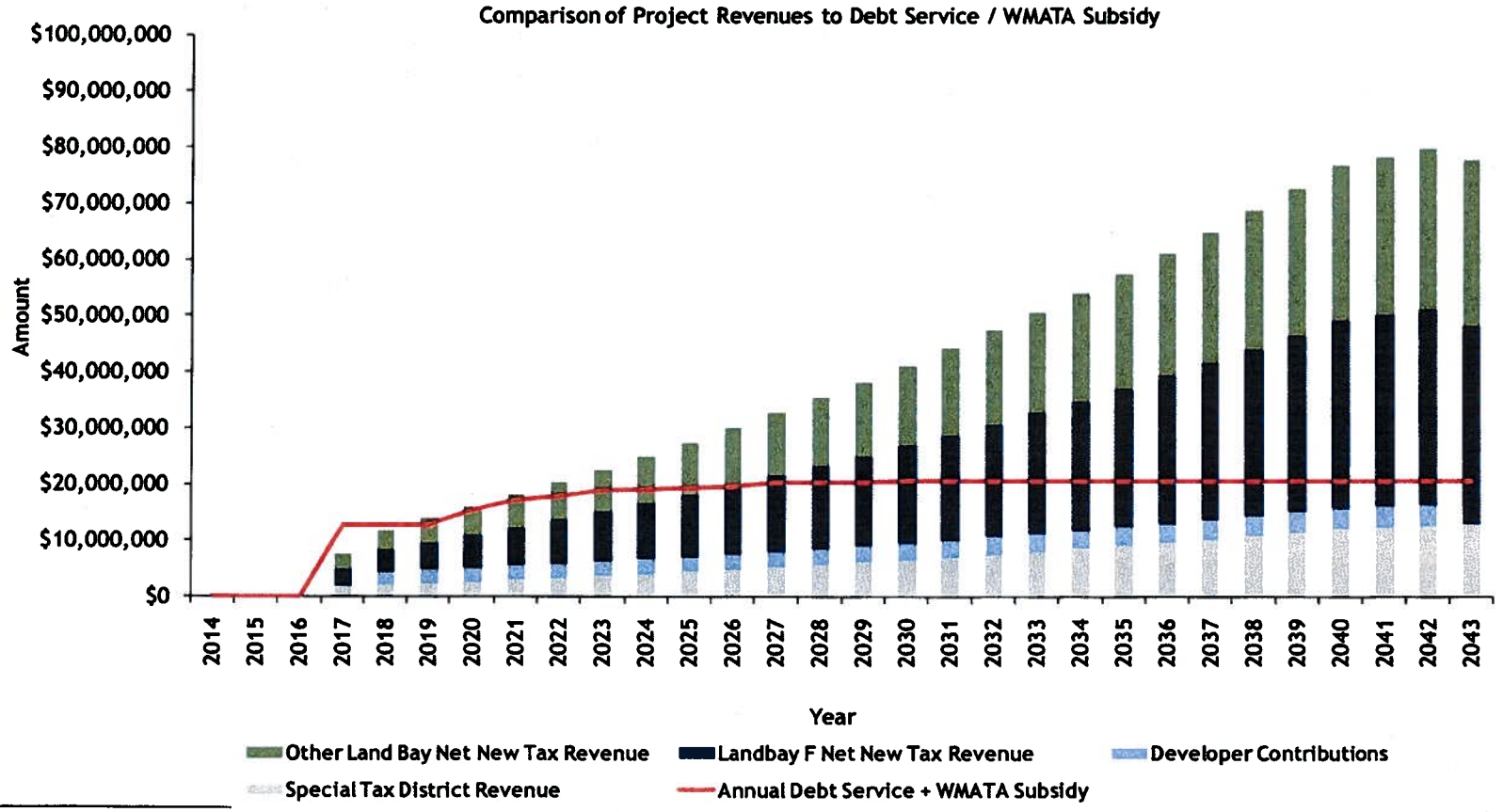


Attachment A

Base Case Summary

Key Metrics

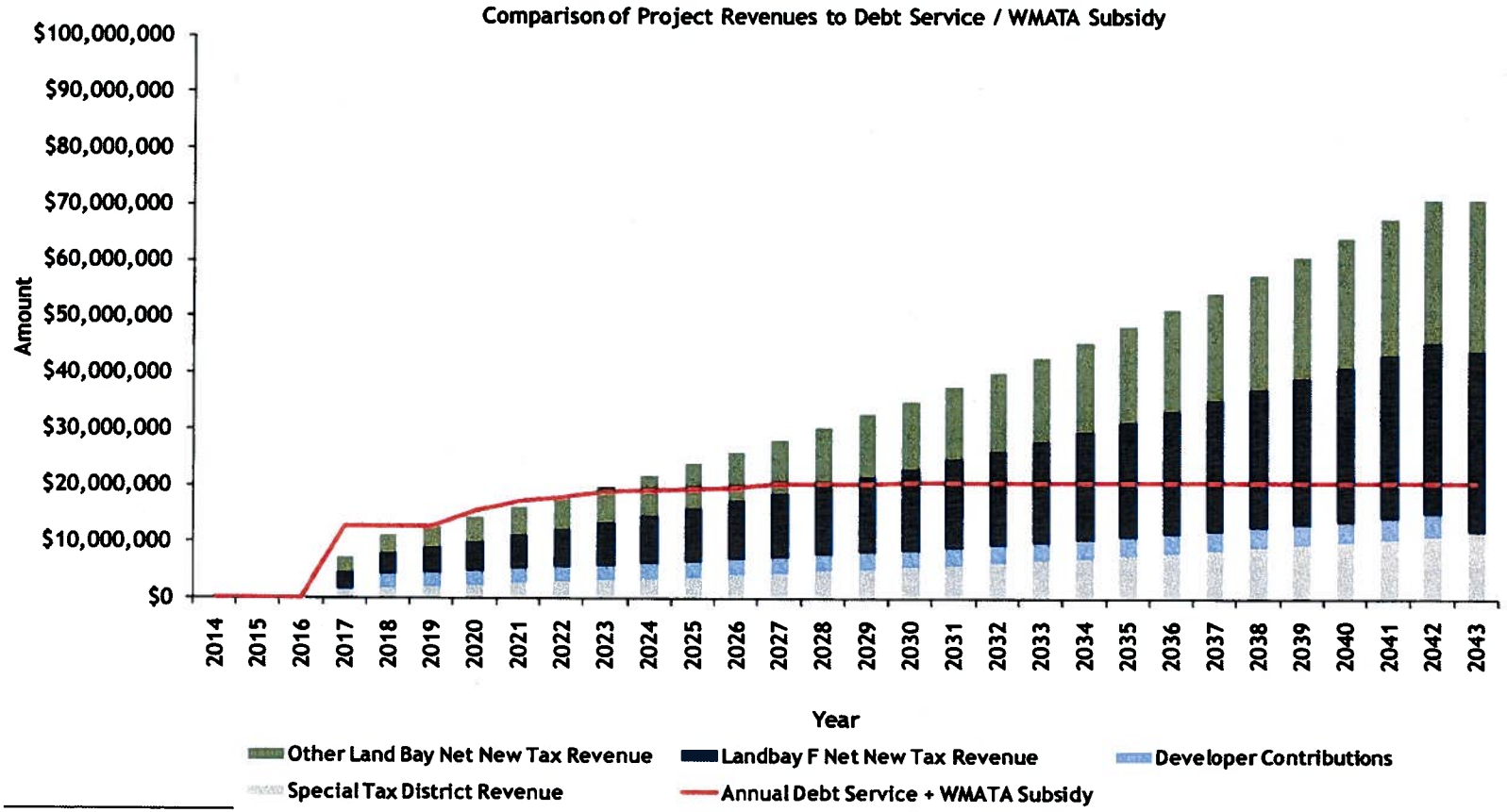
- Required Bond Issuance: **$275 million**
- Size of Funding Gap: **$5.9 million**
- Breakeven Year: **2019**
- Maximum Annual Debt Service Payment: **$19.8 million**



Slower Development Case

Key Metrics

- Required Bond Issuance: **$275 million**
- Size of Funding Gap: **$8.8 million**
- Breakeven Year: **2022**
- Maximum Annual Debt Service Payment: **$19.8 million**

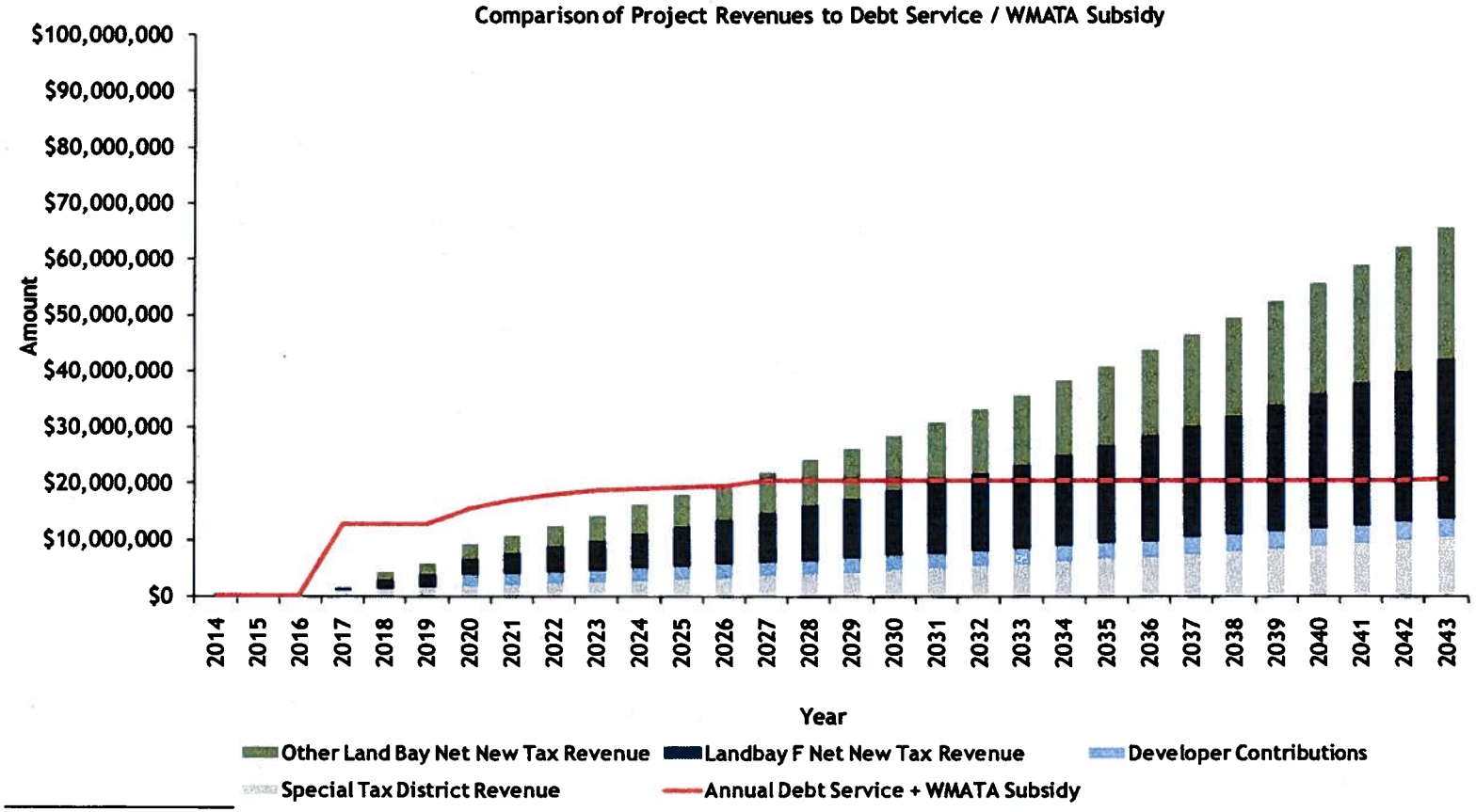


Attachment C

Slower and Less Development Case

Key Metrics

- Required Bond Issuance: **$275 million**
- Size of Funding Gap: **$52.8 million**
- Breakeven Year: **2026**
- Maximum Annual Debt Service Payment: **$19.8 million**



Attachment D

Accelerated Development Case

Key Metrics

- Required Bond Issuance: **$275 million**
- Size of Funding Gap: **No Gap**
- Breakeven Year: **2017**
- Maximum Annual Debt Service Payment: **$19.8 million**