James J. Rowley Training Center
Master Plan
Laurel, Maryland

Prepared for:
United States Secret Service,
Department of Homeland Security

By:
HGA Mid-Atlantic, Inc.

Project Number:
GS-11P-12-MK-C-0012

Final Submission
September 2012

This page intentionally left blank

Table of Contents

1.0 Introduction

1.1	Purpose and Need	1-1
1.2	Project Overview	1-1
1.3	Site Overview	1-2
1.4	Master Plan Process and Methodology	1-4
1.5	Relationship to Comprehensive Plan	1-6
1.6	NEPA Process	1-9
1.7	Community Involvement	1-10

2.0 Existing Conditions

2.1	Overview	2-1
2.2	Existing Site Development	2-1

3.0 Planning Considerations

3.1	Overview	3-1
3.2	Reinforce RTC Campus Identity: Precinct Organization	3-3
3.3	Reinforce RTC Campus Identity: Architectural Design Guidelines	3-5
3.4	Reinforce RTC Campus Identity: Landscape	3-7
3.5	Update Campus Access, Security, and Circulation: Campus Access	3-9
3.6	Update Campus Access, Security, and Circulation: Perimeter Security	3-11
3.7	Update Campus Access, Security, and Circulation: Internal Circulation	3-13
3.8	Enhance Infrastructure: Utilities Improvements	3-17
3.9	Promote Stewardship of Resources: Stormwater Management	3-23
3.10	Promote Stewardship of Resources: Wetlands Management	3-25
3.11	Promote Stewardship of Resources: Sustainability Initiatives	3-27
3.12	Promote Stewardship of Resources: Human Activities Impacts	3-27

4.0 Program Requirements

4.1	Overview	4-1
4.2	Mission and Organization of the USSS Office of Training	4-1
4.3	Population	4-5
4.4	Parking Requirements	4-5
4.5	Security Requirements	4-6
4.6	Sustainability Requirements	4-7
4.7	Stormwater Management Criteria	4-9
4.8	Wetlands Management Criteria	4-11
4.9	Comprehensive Plan for the National Capital	4-12
4.10	RTC Proposed Development Precincts	4-16
4.11	Program Table	4-49

5.0 Master Plan Implementation

5.1	Overview	5-1
5.2	RTC Master Plan Summary	5-5
5.3	Policies and Regulations	5-6
5.4.	Design Guidelines: Removal of Existing Structures	5-7
5.5	Design Guidelines: Architectural	5-7
5.6	Design Guidelines: Landscape	5-15
5.7	Design Guidelines: Internal Circulation	5-16
5.8	Design Guidelines: Access and Transportation	5-17
5.9	Design Guidelines: Parking	5-18
5.10	Design Guidelines: Security	5-19
5.11	Design Guidelines: Utilities	5-22

5.12 Design Guidelines: Water Management 5-25
5.13 Design Guidelines: Sustainability and Conservation 5-27
5.14 Project Implementation: Coordination with Local and State Planning Agencies 5-30
5.15 Project Implementation: Development Plan Staging 5-31
5.16 Project Implementation: Estimate of Probable Costs 5-32

6.0 Appendix

6.1 RTC Space Standards 6-5
6.2 RTC Area Requirements 6-13
6.3 Development Alternatives 6-37
6.4 Traffic Impact Study/ Transportation Management Guidelines 6-39
6.5 Environmental Assessment (Under Separate Cover) 6-141
6.6 Stormwater Management Plan 6-143

Figures

Figure 1-1 Regional Context 1-2
Figure 1-2 Project Location 1-2
Figure 1-3 2012 RTC Development Plan 1-6
Figure 2-1 Existing Buildings 2-3
Figure 3-1 RTC Precinct Plan 3-3
Figure 3-2 Merletti Building 3-5
Figure 3-3 Materials & Forms in Current Use 3-5
Figure 3-4 Canopy Cover 3-7
Figure 3-5 Typical RTC Landscapes 3-7
Figure 3-6 Campus Courtyard Concept 3-7
Figure 3-7 RTC Main Entrance 3-9
Figure 3-8 Perimeter Security 3-11
Figure 3-9 Circulation Plan 3-13
Figure 3-10 Natural Gas Distribution 3-17
Figure 3-11 Sanitary System, Phase 1 3-19
Figure 3-12 Sanitary System, Phase 2 3-21
Figure 3-13 Stormwater Management 3-23
Figure 3-14 Wetlands 3-25
Figure 4-1 Security Fence Concept 4-7
Figure 4-2 Administrative Precinct 4-17
Figure 4-3 Shared Campus Facilities Precinct 4-23
Figure 4-4 Firearms Training Precinct 4-29
Figure 4-5 PODC Facilities Precinct 4-33
Figure 4-6 Tactical Training Precinct 4-37
Figure 4-7 Existing Facilitates Precinct 4-45
Figure 5-1 RTC Master Plan 5-3
Figure 5-2 Materials and Forms in Current Use 5-9
Figure 5-3 Typical Wall System Materials 5-11
Figure 5-4 Typical Roof System Forms and Materials 5-12
Figure 5-5 Campus Courtyard Concept 5-16
Figure 5-6 RTC Main Entrance 5-17
Figure 5-7 Administrative Precinct 5-20
Figure 5-8 Perimeter Fence Diagram 5-21

Tables

Table 2-1 RTC Existing Structures 2-5
Table 3-1 Existing and Proposed RTC Parking 3-15
Table 4-1 USSS Office of Training Branches and Units 4-2

Table 4-2	RTC Population	4-5
Table 4-3	RTC Parking Requirement	4-6
Table 4-4	Administrative Precinct	4-19
Table 4-5	Shared Campus Facilities Precinct	4-25
Table 4-6	Firearms Training Precinct	4-31
Table 4-7	PODC Facilities Precinct	4-35
Table 4-8	Tactical Training Precinct	4-39
Table 4-9	Existing Facilitates Precinct	4-47
Table 4-10	RTC Summary of Area Requirements	4-50
Table 5-1	RTC 2012 Master Plan Summary	5-5
Table 5-2	Existing and Proposed RTC Parking	5-19
Table 5-3	Estimate of Probable Costs	5-33

This page intentionally left blank

1.0 Introduction

This page intentionally left blank.

1.0 Introduction

1.1 Purpose and Need

The 2012 James J. Rowley Training Center Master Plan (2012 RTC Master Plan) documents the physical requirements and proposed engineering and architectural direction for the development of a world-class training campus for the U.S. Secret Service (USSS). The programs and services offered through the training center are intended to equip all USSS law enforcement professionals with the skills, knowledge, and abilities needed to carry out the agency's critical mission. The evolution of the national security environment has placed greater demands on the USSS and law enforcement professionals across the country. This Master Plan lays the groundwork for phased improvements to the USSS's principal training venue to ensure that the campus keeps pace with the needs of the agency and can expand to serve the specialized training needs of state, local, and private law enforcement professionals. Such enhancements will further the sense of institutional pride and shared experience for USSS personnel who first pass through the campus for Basic Training and then return for In-Service Training throughout their careers.

Planning objectives for the 2012 RTC Master Plan include the following:

- Ensure efficient use of campus resources;
- Provide facilities that support the most advanced and effective law enforcement and national security training possible, including arms, tactical, situational, and classroom training;
- Provide adequate recreational and physical fitness facilities;
- Accommodate inter-campus transportation;
- Distinguish and differentiate secured areas from non-secured, public areas;
- Provide facilities to support concurrent Basic Training of new recruits and on-going In-Service Training of current agents;
- Establish architectural design guidelines to achieve coherent campus-wide architectural and environmental development;
- Identify near-term and long-term development objectives;
- Develop probable costs for phased development; and
- Coordinate with regional review agencies, including NCPC and the Maryland-National Capital Park and Planning Commission (M-NCPPC).

1.2 Project Overview

In 1970, the U.S. Department of the Treasury established the Consolidated Federal Law Enforcement Training Center (CFLETC) in Laurel, Maryland, to satisfy a growing need in the federal law enforcement community for high quality, cost-effective, and standardized training. Several years later, CFLETC transferred operations from Laurel to its current location in Glynco, Georgia. In 1978, the United States Secret Service (USSS) took ownership of the Laurel campus, which was later renamed the James J. Rowley Training Center (RTC) in honor of the former director of the USSS. The mission of the USSS is to safeguard the nation's financial infrastructure and payment systems to preserve the integrity of the economy, and to protect national leaders, visiting heads of state and government, designated sites and National Special Security Events.

The original RTC Master Plan was approved by the National Capital Planning Commission (NCPC) in 1982, and subsequent updates to the plan were approved in 1985 and again in 1996. In 2006, the USSS began an effort to make much-needed updates to the 1996 RTC Master Plan. The update would guide needed campus improvements in light of the post-9/11 national security environment and the USSS's transition from the U.S. Department of the Treasury to the U.S. Department of Homeland Security (DHS). Funding constraints halted this effort in 2009, but work resumed in 2012 upon the restoration of funding. With the 2012 RTC Master Plan and Environmental Assessment (EA), the USSS seeks to complete the work begun in 2006.

An Executive Summary Master Plan was completed by Wisnewski Blair and Associates, Ltd. (now HGA Mid-Atlantic, Inc.) in February 2006 in order to introduce the academic organizational model of training, operations, and support branches and units, describe their physical requirements, and develop architectural concepts for the RTC campus. The 2012 RTC Master Plan incorporates pertinent information from the earlier master plan reports, updated facilities and environmental assessments, and selected information found in the Executive Summary Master Plan to provide a guide for continued incremental development of the RTC campus over the next 10 to 15 years.

1.3 Site Overview

Regional Context

RTC is located in Laurel, Maryland in the greater Washington, DC area. Vehicular access to RTC is primarily provided by the Baltimore Washington Parkway (I-295) as shown in *Figure 1-1 Regional Context*.

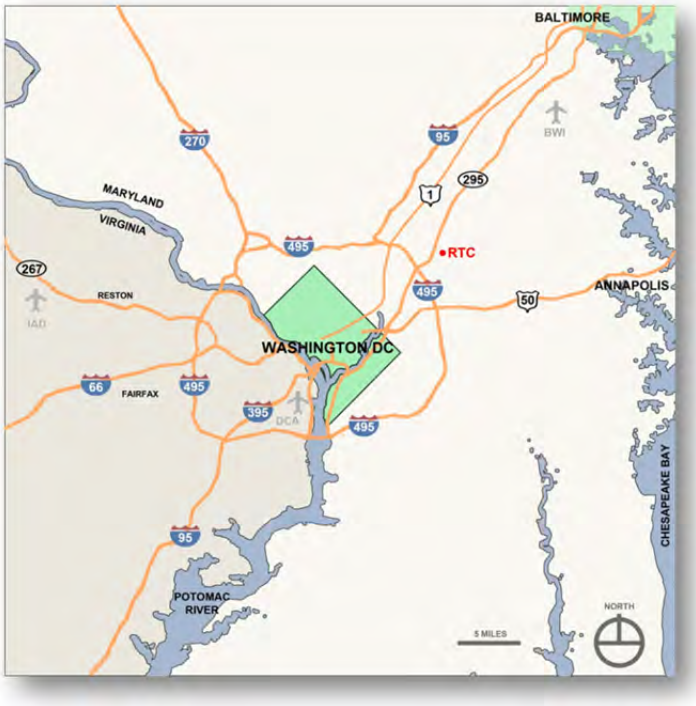


Figure 1-1 Regional Context

Local Context

The RTC is located on approximately 439 acres of federally-owned land in the eastern portion of Prince George's County, Maryland. Approximately 15 miles from the U.S. Capitol, the site is approximately 2.5 miles north of the Capital Beltway, at the northeast corner of the intersection of the Baltimore-Washington Parkway (State Highway 295) and Powder Mill Road. The main access point for the RTC is located off of Powder Mill Road, which connects with Maryland Route 197 (Laurel Bowie Road) near the eastern edge of the RTC. The RTC is adjacent to the northern boundary of the Beltsville Agricultural Research Center (BARC), operated by the U.S. Department of Agriculture (USDA). A portion of the Patuxent National Wildlife Research Center operated by the U.S. Geological Survey (USGS) is located northeast of the RTC. The closest concentrations of commercial development are in the Maryland towns of Beltsville and Greenbelt. The closest public transportation stop is approximately 2.5 miles away from the campus entry. The location of the RTC is illustrated in *Figure 1-2 Project Location*.

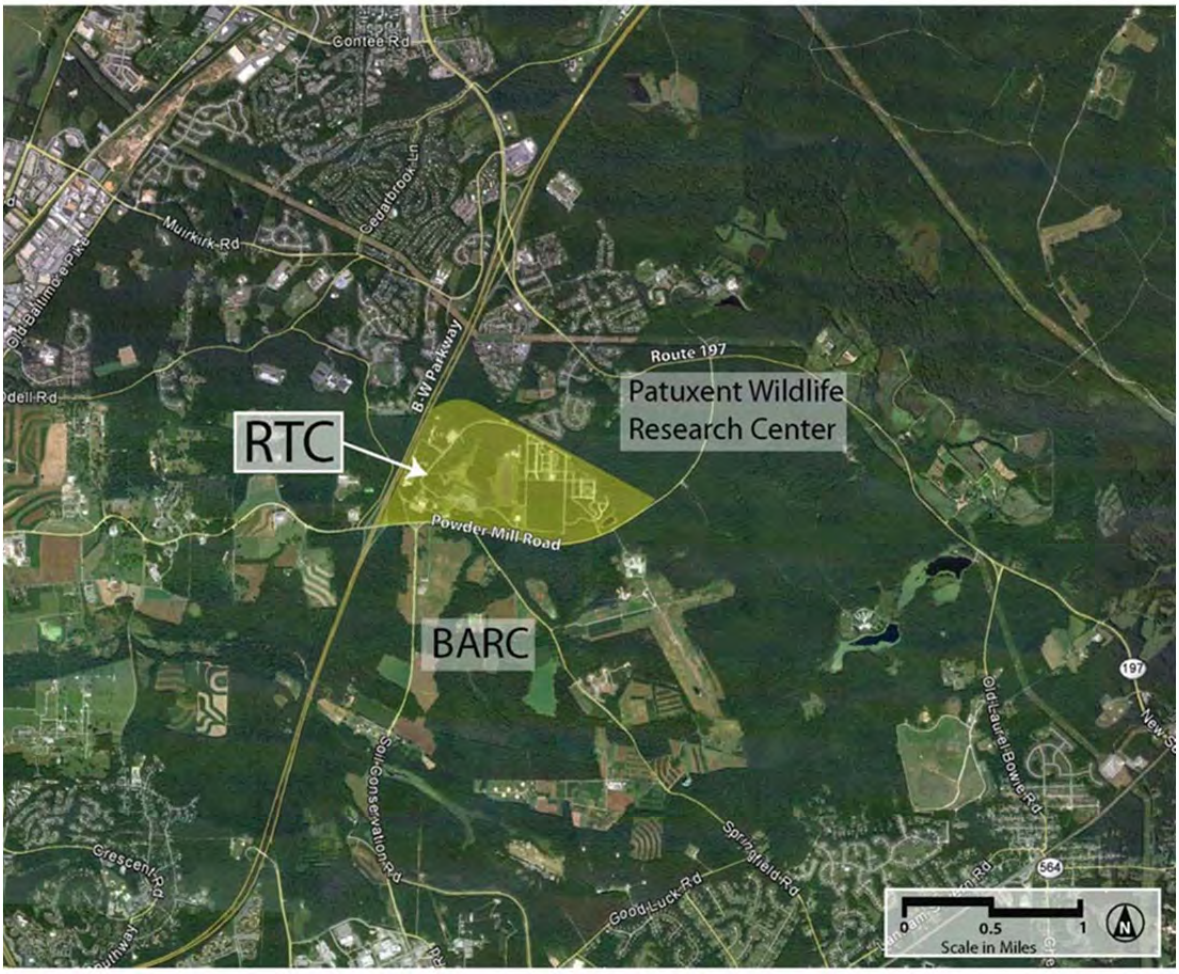


Figure 1-2 Project Location
Source: AECOM

Surrounding Land Use

In addition to these federal lands used for research purposes, other local land uses include transportation corridors and residential development. The Baltimore-Washington Parkway borders the western side of the campus. Residential developments, accessed from Maryland Route 197, are located to the north of the RTC. A single-family housing subdivision, Snowden Pond, approximately 200 acres in size, is located immediately northeast of the RTC, and a 60-acre multi-family residential development is located near the B-W Parkway to the northwest of the RTC. Incorporated cities located in the vicinity of the RTC include Laurel, Beltsville, Greenbelt, and Bowie. The 2009 amended Sub-Region I Master Plan for Prince George's County, prepared by the Maryland-National Capital Park and Planning Commission and the Prince George's County Planning Department, does not propose changes in the current land use for the area near the RTC.

1.4 Master Plan Process and Methodology

This Master Plan was informed by the National Environmental Policy Act (NEPA) Environmental Assessment (EA) Process. The USSS has prepared an EA to review the potential impacts from implementation of the Master Plan on the natural and man-made environment. The EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, the Council on Environmental Quality (CEQ) regulations implementing NEPA [40 CFR 1500-1508 (1986)], and the Department of Homeland Security's (DHS) NEPA implementing procedures, DHS Management Directive 5100.1, Environmental Planning Program.

In 2003, the USSS was formally transferred from the U.S. Department of the Treasury to the newly created U.S. Department of Homeland Security (DHS), along with 22 other federal agencies and entities. At this time, the USSS began considering how the RTC could support anticipated organizational changes and modifications to its training mission. It was determined that these changes and modifications necessitated an update to the RTC Master Plan, last approved in 1996. In late 2004, the USSS hosted a Visioning Meeting. It was followed over several weeks by a series of interviews with representatives from the several units currently or planned to be located at RTC:

<u>Training Management Branch</u>
Mission Research and Development
Policy Development
Administrative Supervision
Registrar
External/Internal Service Training
Student Affairs

<u>Use of Force Branch</u>
Firearms Policy Development
Firearms Range Operations
Control Tactics

<u>Campus Services Branch</u>
Facilities Services
Supply/Property
Operations/Scheduling
Academic Process Branch
Instructor Management Process
Employee Development
Technology Based Training
Executive Development
Needs Assessment and Analysis
Federal Law Enforcement Training Center Training and Operations

<u>Physical Skills Branch</u>
Fitness Coordinator
Emergency Services

Mission Training Branch
Investigations
Legal
Protective Transportation
Protective Detail Training
Canine Training
General Protection
Counter Surveillance Intelligence
Special Operations Training (SOTS)

Once the functional requirements for the individual units were documented, the design team worked with the USSS to establish the overall space needs for the facility. Space Standards (see *Section 6.1 RTC Space Standards*) were developed specifically for RTC campus buildings; these were applied to the functional requirements of each unit as shown in *Section 6.2 RTC Area Requirements*.

Next, in an effort to promote efficient use of the facilities, opportunities for consolidation of space between USSS units were identified based on the following considerations:

- Reuse of Existing Facilities – An inventory of the existing structures on the campus was taken and opportunities for reuse or re-assignment were considered;
- Adjacency – Where individual units expressed the requirement for immediate or proximate adjacency to other units, opportunities to share similar spaces were explored;
- Utilization – Within units as well as across units, utilization rates of similar required spaces were discussed and, where possible, shared space was provided; and
- Tactical and Functional Synergies – Spaces were identified that could meet functional requirements and, with minor changes, serve as tactical training locations as well.

The total interior space requirement was calculated at approximately 708,000 assignable square feet (SF). Once the space requirements for RTC were determined, two alternative development options were developed by the design team and presented to USSS (see *Section 6.3 Development Alternatives*).
The stated development goal for RTC is a world-class training facility that efficiently uses the 439 acre campus. The approved Development Plan, described in detail in *Chapter 5.0 Master Plan Implementation* and shown in *Figure 1-3 RTC Development Plan*, is an amalgam of the preliminary development options. It consists of several precincts, each somewhat formally grouped as on a traditional campus, that correspond to the functional needs of the several USSS Branches with a presence at RTC.

Figure 1-3 2012 RTC Development Plan

The 2012 RTC Master Plan report consists of six chapters. This *Chapter1.0 Introduction*, explains the project, its background, and the process by which information was collected and incorporated into the proposed Master Plan. *Chapter 2.0 Existing Conditions*, analyzes the history, physical condition, land use, natural features, and potential opportunities of the RTC site. *Chapter 3.0 Planning Considerations* communicates the general Master Plan objectives as they regard campus layout, access, parking, security, infrastructure and water quality management. *Chapter 4.0 Program Requirements* describes the USSS Office of Training and Organization and the organization of the RTC and summarizes program area requirements. *Chapter 5.0 RTC Master Plan Implementation* includes design guidelines for campus and buildings to achieve coherent development of the campus over a multi-phase implementation of the Master Plan, discusses the planned phasing of development, and provides an estimate of probable costs; Finally, *Chapter 6.0 Appendix* provides additional background information used in the planning process.

1.5 Relationship to Comprehensive Plan

The National Capital Planning Commission (NCPC) oversees the development of federal lands and the federal interest in the National Capital Region, which includes the District of Columbia and the surrounding counties in Maryland and Virginia, including Montgomery, Prince George's, Arlington, Fairfax, Loudoun, and Prince William, and the incorporated cities therein. The *Comprehensive Plan for the National Capital, Federal Elements* (1977-1984, updated 2004) is the principal planning document adopted by NCPC for the planning of federal facilities. The Plan contains goals, objectives, and policies to direct and manage growth throughout the metropolitan area. Of particular relevance to the 2012 RTC Master Plan, as reported in the underlying Environmental Assessment (EA), are policies outlined within *The Federal Workplace Element*, *The Transportation Element*, *The Parks and Open Space Element*, and *The Federal Environment Element*.

The goal of *The Federal Workplace Element* is to "locate the federal workforce to enhance the efficiency, productivity, and public image of the federal government; to strengthen the economic well-being and

expand employment opportunities of the region and the localities therein; and to give emphasis to the District of Columbia as the seat of the national government." Policies specifically relevant to the proposed 2012 RTC Master Plan include:

- Utilize available federally owned land or space before purchasing or leasing additional land or building space. Agencies should continuously monitor utilization rates of land and building space to ensure their efficient use.
- Establish the level of employment that can be accommodated on installations where more than one principal building, structure, or activity is located or proposed through the master planning process as established by the Commission. Agencies should continually monitor the employment levels at installations and revise installation master plans as necessary to reflect changed conditions and provide an up-to-date plan for the development of the installation.

The Parks and Open Space Element establishes policies to uphold the symbolic, recreational, social, and ecological values of national capital parks, waterfronts, and other open spaces. Policies specifically relevant to the 2012 RTC Master Plan include:

- Maintain and conserve trees and other vegetation in the landscaped buffer areas on federal installations in a natural condition. Perimeter roads and cleared areas on these sites should be kept to a minimum, carefully landscaped, and managed in a manner that addresses security, aesthetics, and natural character; and
- Maintain parkways as scenic landscape corridors, and protect their historic aspects.

The Transportation Element states that "it is the goal of the federal government to develop and maintain a multi-modal regional transportation system that meets the travel needs of residents, workers, and visitors, while improving regional mobility and expanded transportation alternatives and transit-oriented development." Several policies are particularly relevant to the 2012 RTC Master Plan. Policies regarding parking include:

- Provide parking for official vehicles and visitors in accordance with Federal Property Management Regulations;
- Place parking in structures, preferably below ground, in the interest of efficient land use and good urban design;
- Position parking facilities so as not to obstruct pedestrian and bicycle access to buildings;
- Provide parking for disabled persons in accordance with federal law; and
- Give priority for carpool and vanpool parking over that for single-occupant vehicles.

Further, *The Transportation Element* identifies parking ratios for federal facilities located beyond 2,000 feet of a Metrorail station. For these facilities, the goal is to provide one parking space for every 1.5 employees (1:1.5 ratio). According to *The Transportation Element*, federal agencies should use a Transportation Management Plan (TMP) to document an employer's active program to foster more efficient employee commuting patterns. The plan should include specific strategies to encourage change in employee travel modes, trip timing, frequency and length, and travel routes so as to reduce traffic congestion and improve air quality. Specifically, federal agencies should:

- Prepare Transportation Management Plans to encourage employee commuting by modes other than single-occupant vehicle; and

- Submit their most recent TMP with all master plans and with all projects that increase employment on site by 100 or more.

Additional applicable policies within *The Transportation Element* include:

- Provide sidewalks among buildings on federal campuses as well as between federal buildings and transit stations;
- Encourage ridesharing, biking, walking, and other non-single-occupant vehicle modes of transportation for federal commuters; and
- Maximize telecommuting strategies for employees in accordance with federal law; employ compressed and variable work schedules for employees, consistent with agency mission.

According to *The Federal Environment Element*, it is the federal government's goal to "conduct its activities and manage its property in a manner that promotes the National Capital Region as a leader in environmental stewardship and preserves, protects, and enhances the quality of the region's natural resources, providing a setting that benefits the local community, provides a model for the country, and is worthy of the nation's capital." The policies outlined below are directly applicable to the 2012 RTC Master Plan.

The Federal Environment Element states that, in an effort to reduce mobile and stationary sources of air pollutants, federal agencies should:

- Minimize power generation requirements by utilizing best available "green" building systems and technologies; and
- Promote indoor air quality by using environmentally friendly ("green") building materials, construction methods, and building designs.

With respect to water quality, federal actions in the region should conform to the following policies:

- Avoid thermal pollution of waterways and provide and maintain adequate vegetated buffers adjacent to bodies of water, to protect fish and other aquatic life and to reduce sedimentation and pollutants.
- Minimize tree cutting and other vegetation removal to reduce soil disturbance and erosion, particularly in the vicinity of waterways. When tree removal is necessary, trees should be replaced to prevent a net tree loss.
- Use pervious surfaces and retention ponds to reduce stormwater runoff and impacts on off-site water quality.
- Encourage the use of innovative and environmentally friendly "Best Management Practices" in site and building design and construction practice to reduce erosion and avoid pollution of surface waters.

In order to maintain an adequate water supply throughout the region, federal actions in the region should conform to the following policy:

- Encourage the natural recharge of groundwater and aquifers by limiting the creation of impervious surfaces, avoiding disturbance to wetlands and floodplains, and designing stormwater swales and collection basins on federal installations.

In an effort to preserve land resources, federal actions in the region should conform to the following policies:

- Avoid destruction of or damage to wetlands.
- Encourage only compatible land uses adjacent to wetlands.
- Coordinate wetland activities with federal, state, and local government programs and regulations, and with special programs, such as the Chesapeake Bay 2000 Agreement.
- Utilize the best engineering practices available to minimize adverse impacts when project construction in a wetland is deemed to be the only practical alternative.
- Discourage development in areas of identified high erosion potential, on slopes with a gradient of 15 percent and above, and on severely eroded soils. Excessive slopes (25 percent and above) should remain undeveloped.
- Maintain and preserve woodlands and vegetated areas on steep slopes and adjacent to waterways, especially to aid in the control of erosion and sediment.
- Discourage locating intensive land uses within or adjacent to designated and important wildlife habitats.
- Employ "Best Management Practices" to reduce the potential for soil erosion.
- Preserve existing vegetation, especially large stands of trees.

With regard to human activities, the federal government should:

- Avoid locating activities that produce excessive noise near sensitive natural resources and sensitive human uses, such as residential areas, hospitals, and schools.
- Ensure that noise-generating activities at federal facilities, such as loading dock operations, festivals, and concerts, are sited and scheduled with sensitivity to the surrounding environment and the community.
- Evaluate the possibilities for joint-use of antennas and collocating antennas to reduce aesthetic impacts and limit the area of radiofrequency (RF) exposure. Federal agencies should also evaluate the cumulative effect of multiple transmitters at one location to ensure that the combined radiofrequency emissions continue to meet Federal Communications Commission guidelines.

1.6 NEPA Process

The National Environmental Policy Act of 1969 (NEPA), requires federal agencies to evaluate, disclose and consider environmental impacts of their projects during federal agency planning and decision-making. For RTC, an "Environmental Assessment" (EA) has been prepared. The EA has reviewed the environmental consequences of the work proposed under the 2012 RTC Master Plan and determined that the proposed action will not have a significant effect on the human environment; a Finding of No Significant Impact (FONSI) has been prepared. Public involvement is an important part of the NEPA process. By involving citizens, stakeholder groups, and local, state, and federal agencies, the Federal Government can make better informed decisions. Through the NEPA process, the public has had, and will continue to have, opportunities to comment on the RTC Master Plan and the EA.

1.7 Community Involvement

The USSS has made a concerted effort to coordinate with affected citizens groups. In March 2007, letters were sent to agencies, organizations, public officials, and area residents requesting comments or concerns on the proposed project. In November 2009, scoping letters were again sent to these organizations and individuals updating them on the process and requesting comments on the Development Plan. The scope of the project has not changed since the 2007 and 2009 scoping efforts. The thirty-day scoping period began on November 25, 2009 with letters being sent out to the following organizations:

National Capital Planning Commission (NCPC)
National Park Service (NPS)
U.S. Department of Homeland Security (DHS)
National Aeronautics and Space Administration (NASA)/Goddard Space Flight Center
U.S. Army Corps of Engineers (USACE)
U.S. Department of Agriculture (USDA)
Maryland Department of Planning (MDP)
Maryland Department of Natural Resources (MDNR)
Maryland Historical Trust (MHT)
Maryland National Capital Parks and Planning Commission (M-NCPPC)
Prince George's County Police
Prince George's County Fire/EMS
Prince George's County Department of Public Works and Transportation
Prince George's County Department of Environmental Resources
Snowden Pond at Montpelier Homeowners Association
Local, State, and Federal Government Officials

In December 2009, USSS and EDAW/AECOM (EA Consultant) met with the Snowden Pond at Montpelier Homeowners Association to discuss the NEPA process and the proposed Master Plan. The USSS considered all comments received during the scoping process in the preparation of the EA. Comments received during the scoping period in 2009 are included in the 2012 EA, Appendix E: Scoping Letters. The 2012 RTC EA completed a 30-day period of public review in August 2012.

2.0 Existing Conditions

This page intentionally left blank.

2.0 Existing Conditions

2.1 Overview

The 2012 RTC Master Plan represents a continuation of development on the campus. The existing conditions establish a framework for the proposed development. The regional and local context for RTC and characteristics of the campus, including existing buildings, land use, circulation, parking, infrastructure and natural features have all been considered.

2.2 Existing Site Development

The RTC is a low-density campus used for specialized training by the USSS. Facilities are spread out across the campus. Campus facilities include space for administrative support, classroom training, physical training, firearms training, canine training, driver training, scenario based exercises, and other specialized training functions.

This page intentionally left blank

Existing Buildings and Land Uses

RTC was originally constructed as the Consolidated Federal Law Enforcement Center beginning in 1969. In 1978, the consolidated federal law enforcement programs were moved to Glynco, Georgia and the site was transferred to the USSS.

A Master Plan for the development of RTC was originally approved by NCPC on April 1, 1982. Revisions to the original plan were approved by NCPC on March 7, 1985. The program of that November 1984 Master Plan has been implemented through phased construction. Development under the 1985 Master Plan included the Security and Computer Building, much of the Protective Driver Practical Exercise roadway network, the Water Tower, the Tactical Response Training Area, the Counter-Sniper Range, the Observation Tower, the Physical Training Building, the Canine Building, and the Vehicle Storage Building. Full build-out of this plan took place in the years after its approval.

The Master Plan was again updated in 1996. By 2003, much of the proposed build -out in the 1996 Master Plan had been completed, most notably the Bowron Administration Building, the Merletti Classroom Building, and the Magaw Tactical Training Facility. Two additional projects called for in the 1996 Master Plan are currently in design, including an annex to the Merletti Classroom Building and a new facility to the west of the Bowron Administration Building. *Figure 2-2 Existing Buildings* shows the current development Of the site.

Existing Facilities

1. Gatehouse & Site Access Control
6. Merletti Building
8. Drummond Airport Building
10. Canine Training Facility
16. Moran Building
21. Simpson Building
23. Knight Building
42. Wilkie Firearms Building
43. Ammunition Storage Depot
44. Wilson PT Building
45. Baughman Outdoor Firing Range
46. Beltsville Judgmental Range (BJR)
47. Magaw Tactical Training Facility
48. Existing Maintenance Yard
49. Bowron Administrative Building
50. Vehicle Storage Buildings
51. Tactical Village
52. Bell Raid House
53. Munitions Bunkers

James J. Rowley Training Center
Laurel, Maryland

N

0′ 300′ 600′ 1200′

Figure 2-1 Existing Buildings

This page intentionally left blank

Table 2-1 identifies and indicates the current use of existing RTC facilities:

BUILDING NAME	BLDG #	CURRENT USE	
Existing Gatehouse	1	Security and Site Access, Information Technology	
Merletti Building	6	Classroom Building, Student Center, Departmental Offices	
Wilkie Firearms Building	42	Armory, 25 yd Range, Firearms	Photo Not Available
Ammunition Storage Depot	43	Secure Ammunition Storage	
Canine Training Facility	10	Canine Training and Kennels	
Wilson PT Building	44	Physical Training	
Baughman Outdoor Firing Range	45	Outdoor Firing Range	
Drummond Airport	8	Classroom Building	
Beltsville Judgmental Range	46	Tactical Training Venue	
Tactical Training Facility	47	Live-Fire Training	
Maintenance Yard	48	Building and Site Maintenance	
Bowron Administrative Building	49	General Office	
Vehicle Storage Building	50	Vehicle Storage	
Tactical Village	51	Tactical Training Venue	
Bell Raid House	52	Tactical Training Venue	
Munitions Bunkers	53	Secure Munitions Storage	Photo Not Available

Table 2-1 RTC Existing Structures

Access, Circulation, and Parking

Campus Access

Three entrance driveways are currently located along Powder Mill Road. Only the middle driveway, located between Soil Conservation Road and Springfield Road, is open and available for use by employees, visitors and delivery vehicles to the RTC. The other access points are typically closed for security reasons but are occasionally opened for specific functions. The primary access is controlled by a manned gatehouse but the configuration of the entry does not meet current DHS requirements for secure facilities.

Internal Circulation

Roads

An internal roadway network serves traffic inside the RTC boundaries. The internal network serves three purposes: it provides an internal vehicular circulation route; it serves as a physical training venue for biking, running, and other conditioning activities; and it serves as a tactical training venue for skill-building activities, such as protective driver training and public bikeway simulations.

Sidewalks and Paths

The system of sidewalks is currently fairly limited on the RTC campus. Since development is widely dispersed over the site, employees generally use vehicles rather than walk to get from one area of campus to another. Paths have been worn in some unpaved areas between buildings and, notably, just inside the perimeter fence where ATVs perform security patrols and rough-terrain physical training exercises are conducted.

Parking

The RTC is currently served by 688 on-site parking spaces. Parking is provided in several surface parking lots located near existing buildings. In addition, vehicles are often parked alongside roadways for convenience due to the size of the campus.

Security

Three entrance driveways are currently located along Powder Mill Road. Only the middle driveway, located between Soil Conservation Road and Springfield Road, is open and available for use by employees, visitors and delivery vehicles to the RTC. The other access points are typically closed for security reasons but are occasionally opened for specific functions. The primary access is controlled by a manned gatehouse but the configuration of the entry does not meet current DHS requirements for secure facilities.

Infrastructure

The existing natural gas piping system has sufficient capacity to serve all of the current RTC campus needs and all of the additional buildings described in the 2012 RTC Master Plan.
Volumetrically, the existing eight-inch water line is sufficient to supply water for future expansion. The water booster pumping system infrastructure is insufficient but replacement is currently being designed and is expected to be undertaken in 2012.

The sanitary system infrastructure would require extensive upgrades to fully implement the RTC Master Plan. The water table on this site is very close to the ground surface. This limits how deep in the ground the sewers can be installed and, by extension, severely limits how far the sewers can run dependent on gravity flow.

Electrical power is provided to RTC by BG&E. The primary service and distribution to the existing facilities is currently being replaced by BG&E.

Stormwater Management

In the developed areas of the campus, stormwater is conveyed through closed conduits, roadside ditches, and natural channels. Water drains off buildings and paved areas following the site's topography, generally flowing to the south. The current total impervious area on the site is approximately 2,303,476 square feet (52.88 acres), or 11 percent of the total site. Much of the balance of the site is wooded. Two ponds exist on the RTC; one approximately 12 acres in area lies on the west side of the campus, while another roughly four acres in size lies along the property's southeast edge. It is unclear whether these ponds were intended to serve a stormwater management function.

Portions of the site currently exhibit poor drainage and signs of standing water, in particular an area south of the Merletti parking lot across the southern perimeter road. In addition, there are four stretches of roadway that have roadside ditches that are in poor condition and thus collect water. These include an area south of the maintenance yard, an area north of the Wilson Physical Training Building, an area north of the vehicle storage buildings on the northern perimeter road, and an area east of the Merletti parking lot along the southern perimeter road.

Natural Features

Forest, consisting primarily of hardwood and pine stands currently covers well over half of the RTC campus. There are two ponds and delineated wetlands on the campus. RTC is home to a variety of birds, small mammals and deer. The natural features of the campus have been documented in the Environmental Assessment.

This page intentionally left blank

3.0 Planning Considerations

This page intentionally left blank.

3.0 Planning Considerations

3.1 Overview

The planning considerations shown in this section communicate the general RTC Master Plan. They address the campus layout, the campus environment and landscape, access and circulation to and within the campus, parking, security, infrastructure, stormwater management and sustainability. The planning considerations help set the framework for design of future projects at RTC over the next 10 to 15 years.

The USSS has identified several broad planning objectives for the 2012 RTC Master Plan:

- Support the wider range of course offerings anticipated by the USSS by providing a variety of training and instructional venues;
- Accommodate the planned increase in the number of students by providing a net increase in the number of classroom seats, training opportunities, and appropriate support services or access to such services in the surrounding community; and
- Provide a campus environment that enhances the training experience and establishes RTC as a training destination across public and private sector law enforcement and security organizations.

The 2012 RTC Master Plan addresses these objectives using the following strategies:

Reinforce RTC Campus Identity

- Precinct organization to co-locate similar functions
- Architectural design guidelines to build cohesive campus character
- Landscaping to maintain natural wooded campus and create signature outdoor space

Update Campus Access, Security, and Circulation

- Campus Access
  - Traffic Management
  - Campus Entrance
- Perimeter Security
- Internal Circulation
  - Roads
  - Sidewalks and Paths
  - Parking

Enhance Infrastructure

- Utilities Improvements

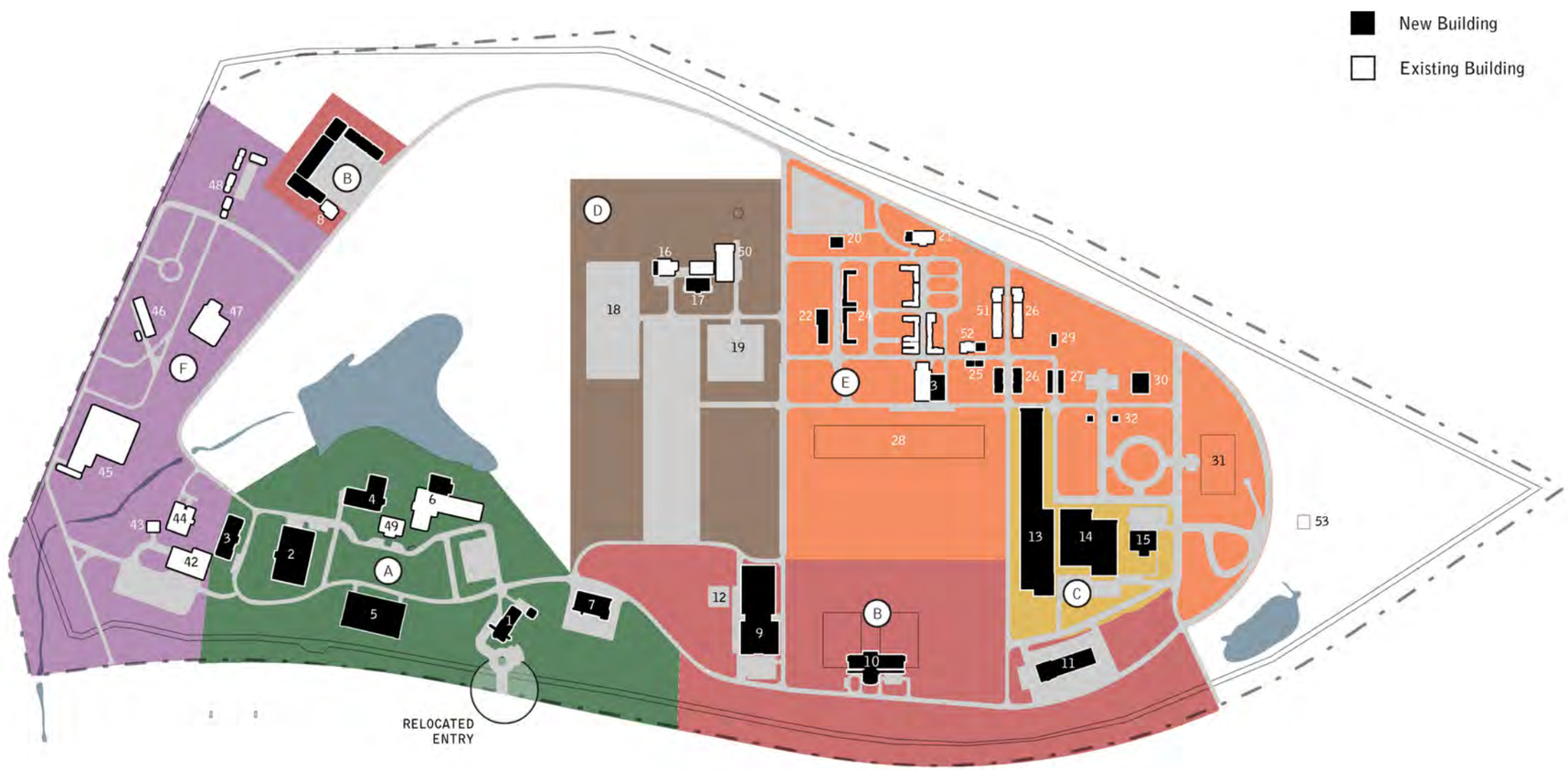
Promote Stewardship of Resources

- Stormwater Management
- Wetlands Management
- Sustainability
- Human Activities Impact

This page intentionally left blank

3.2 Reinforce RTC Campus Identity: Precinct Organization

The RTC Development Plan consists of several precincts of development each somewhat formally grouped as on a traditional campus, that correspond to the functional needs of the RTC projected for the next 10 to 15 years.



Campus Precincts

A. ADMINISTRATIVE
1. Gatehouse & Site Access Control
2. Multipurpose Building & ROC Facility
3. SPD Office Building
4. Administration & Classroom Building
5. Parking Structure
6. Merletti Building Addition & Renovation
7. Supply Center

B. SHARED CAMPUS FACILITY
8. Maintenance Yard
9. Physical Training Building
10. Canine Training Facility
11. EMT/OPR Facility
12. Helicopter Pad

C. FIREARMS TRAINING
13. SOTS Range Building
14. Firearms Training Complex
15. SPD Office Building

D. PODC
16. Moran Building Addition
17. Static Display Building
18. PODC Expansion
19. PODC Skid Pad

E. TACTICAL TRAINING
20. Airport Building & Apron
21. Simpson Building Addition
22. Non-Tactical Village & Mock Field Office
23. Knight Building Renovation
24. East Tactical Village
25. Residential Scenario - Single Family Home
26. Residential Scenario - Townhomes
27. Beltsville Judgmental Range
28. Confidence/Obstacle Course
29. Cover Course
30. Flexible Shoothouse
31. Tactical Obstacle Course
32. White House Lawn Mockup

F. OTHER EXISTING FACILITIES
42. Wilkie Firearms Building
43. Ammunition Storage Depot
44. Wilson PT Building
45. Baughman Outdoor Firing Range
46. Beltsville Judgmental Range (BJR)
47. Magaw Tactical Training Facility
48. Existing Maintenance Yard

ADDITIONAL FACILITIES TO REMAIN
49. Bowron Administrative Building
50. Vehicle Storage Buildings
51. Tactical Village
52. Bell Raid House
53. Munitions Bunkers

James J. Rowley Training Center
Laurel, Maryland

Figure 3-1 RTC Precinct Plan

This page intentionally left blank

3.3 Reinforce RTC Campus Identity: Architectural Design Guidelines

The architectural form and materials of the Merletti Building, completed in 1997, can inspire direction for the future at RTC to achieve coherent architectural and environmental development campus-wide over the long-term phased design and construction of the proposed buildings.

Office/Support, General Classroom and General Training Facilities

The Bowron Building and the Merletti Building are the exemplars for future buildings of similar function on campus. Their contemporary Arts and Crafts design features the following:

- Decorative masonry exterior skin;
- Pitched, standing-seam metal roof; dormers are used to mask air louvers for attic mechanical units and to visually breakup expansive roof areas;
- Deep overhangs;
- Copper or bronze color metal, including windows, gutters and downspouts; and
- Clerestory windows tucked under substantial roof overhangs to visually separate the mass of the exterior walls from the roof, and to maximize daylighting of interior spaces.

Storage and Maintenance Buildings

Coordination with the sand/bronze/verdigris color palette used in the major campus buildings will help unify utilitarian buildings with other campus buildings and the natural surroundings.

Special Function Buildings

The existing tactical training venues feature a range of building forms and materials selected primarily to serve functional rather than aesthetic criteria. Coordination with the common materials and palette of the newer campus buildings should be undertaken.

Figure 3-2 Merletti Building

Figure 3-3 Materials and Forms In Current Use

This page intentionally left blank

3.4 Reinforce RTC Campus Identity: Landscape

The wooded character of the campus should be maintained for tactical training as well as aesthetic and environmental reasons.

A formal landscaped area is planned for a courtyard framed by the existing Merletti and Bowron buildings along with the new Classroom/Administration building currently in design. This area, shown in *Figure 3-6 Campus Courtyard Concept*, is intended to serve as a gathering place day-to-day and for such occasions as graduation exercises from the RTC training programs.

Figure 3-5 Typical RTC Landscapes

Figure 3-6 Campus Courtyard Concept

Figure 3-4 Canopy Cover

This page intentionally left blank

3.5 Update Campus Access, Security, and Circulation: Campus Access

Traffic Management

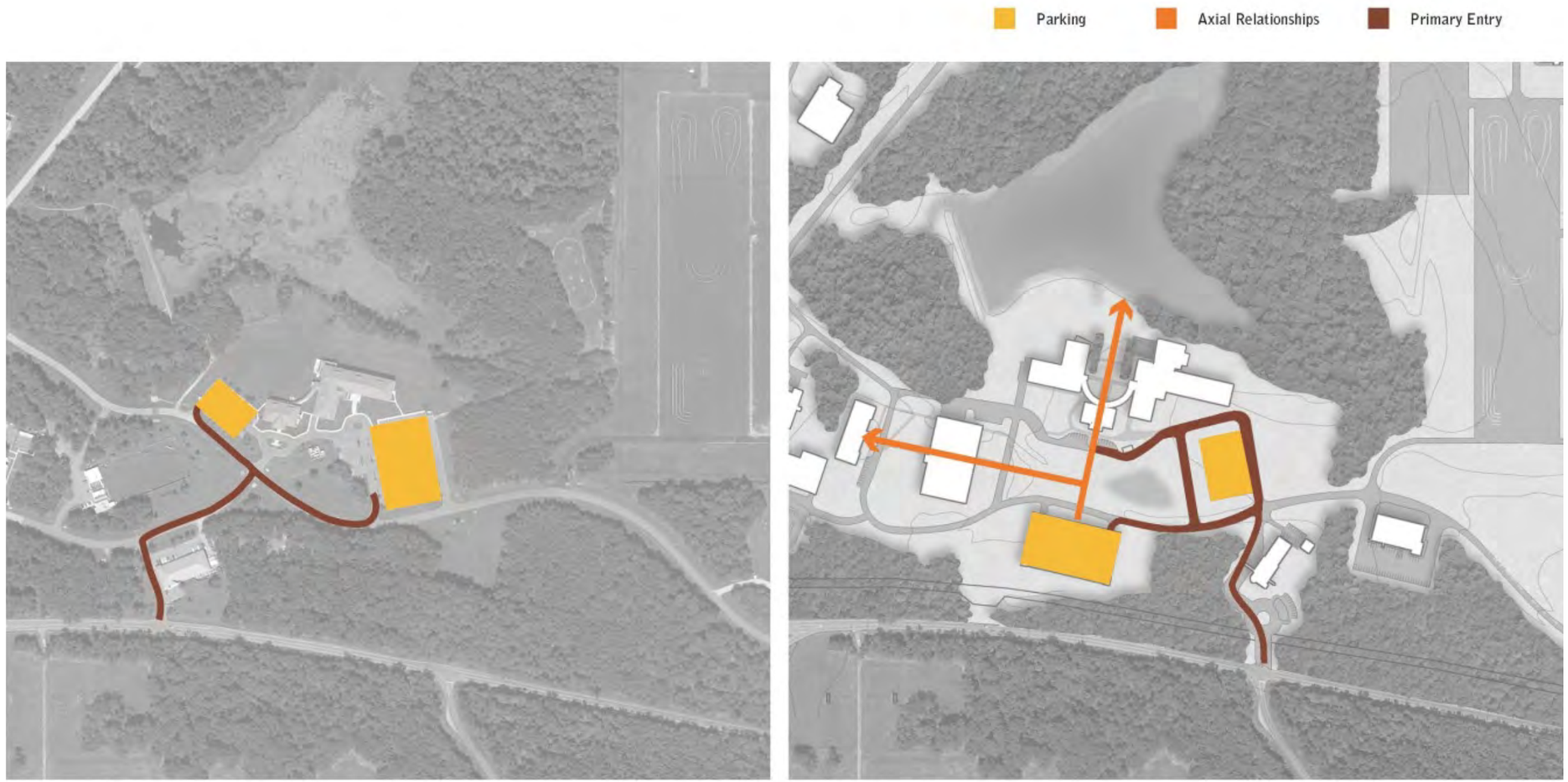
Minimize traffic impact from projected growth at RTC. The Transportation Management Guidelines (TMG) have been included in their entirety in *Section 6.4 Traffic Impact Study and Traffic Management Guidelines*. The recommended actions are summarized as follows:

- Continue to provide shuttle service from the local hotels to the site and consider the expansion of the shuttle to include stops at the closest Metrorail and/or Marc stations;
- Encourage parking management in order to promote transit use and discourage auto use;
- Encourage those who use automobiles to carpool;
- Encourage the implementation of alternative work schedules, such as flextime, compressed workweek, and/or staggered work hours; and
- Continue the use of Telecommuting as an option for those employees who qualify.

Incremental development over 10 to 15 years is anticipated under the 2012 Master Plan; Traffic impact would be studied and a Transportation Management Plan would be developed and refined as each phase of development is undertaken.

Campus Entrance

Relocation of the main entrance from the west end to a more central location on Powder Mill Road is desirable to provide a better interface with local traffic and provide space for improved security.



Existing Condition Entry & Parking

Proposed New Entry & Parking

Figure 3-7 RTC Main Entrance

This page intentionally left blank

3.6 Update Campus Access, Security, and Circulation: Perimeter Security

The proposed new gatehouse and controlled site access would provide a three-lane entry with adequate queuing space for incoming and outgoing traffic and curved configuration of the entry road for traffic calming.

Upgrades to perimeter security are proposed to include the construction of a double fence. The fence would have barbed wire to prevent scaling and electronic sensors to remotely alert security of potential breaches.

Upgrades to the perimeter trail would include paving it with a layer of small gravel and repairing or replacing the wooden bridges over wetlands as required.

Service

Service vehicles currently access the campus at the main gatehouse entrance and then share the same internal road network and parking areas with other vehicles and with individuals participating in training exercises. Under the 2012 RTC Master Plan, a central receiving building would be located adjacent to the re-located gatehouse so that the number of non-government vehicles traveling the internal roadways would be substantially reduced. The Supply Center would also receive mail.

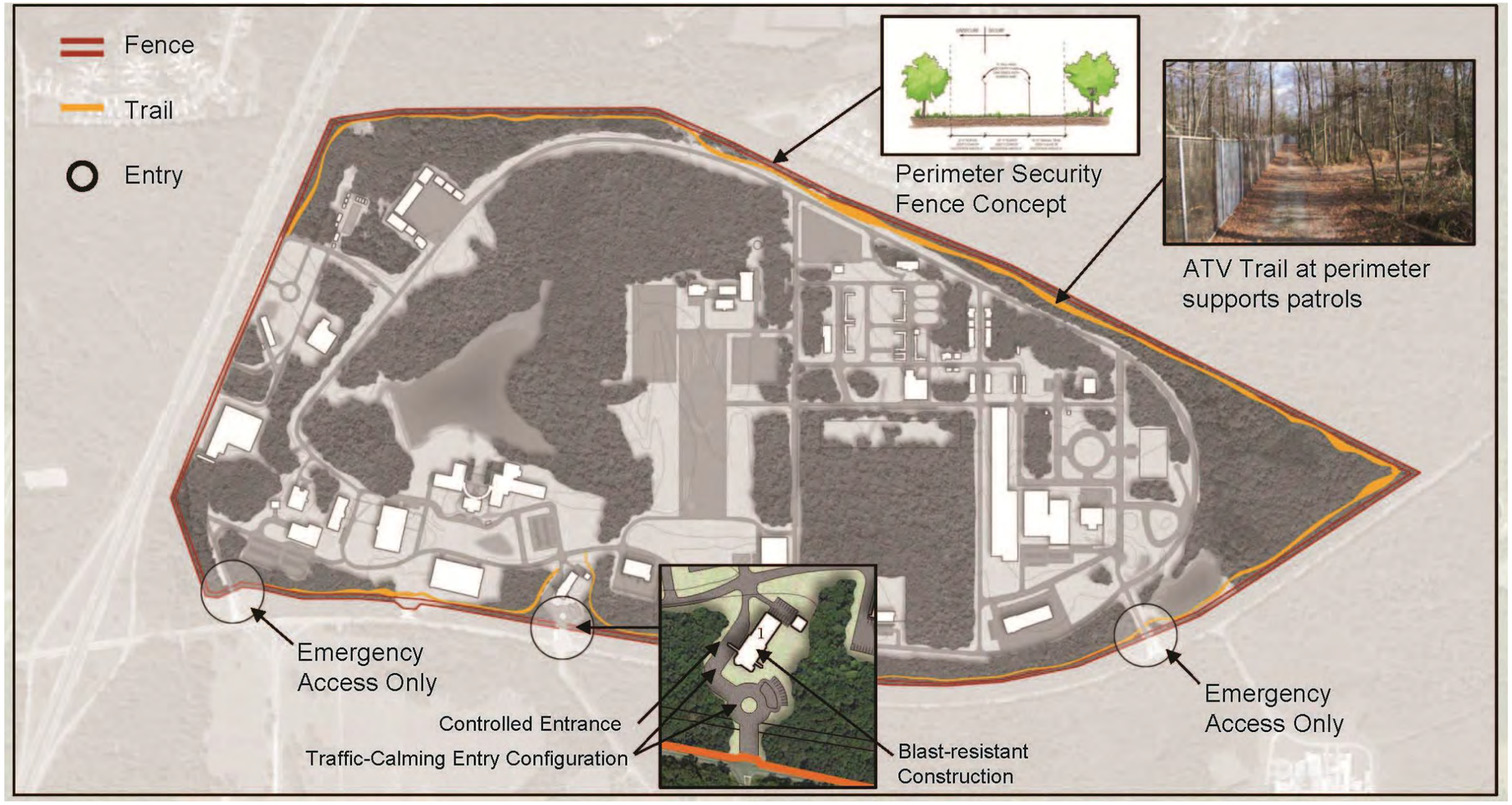


Figure 3-8 Perimeter Security

This page intentionally left blank

3.7 Update Campus Access, Security and Circulation: Internal Circulation

Enhanced site circulation, completing the perimeter road and providing sidewalks and dedicated pedestrian paths to connect all buildings and areas of the site will improve safety and support physical training.

Roads

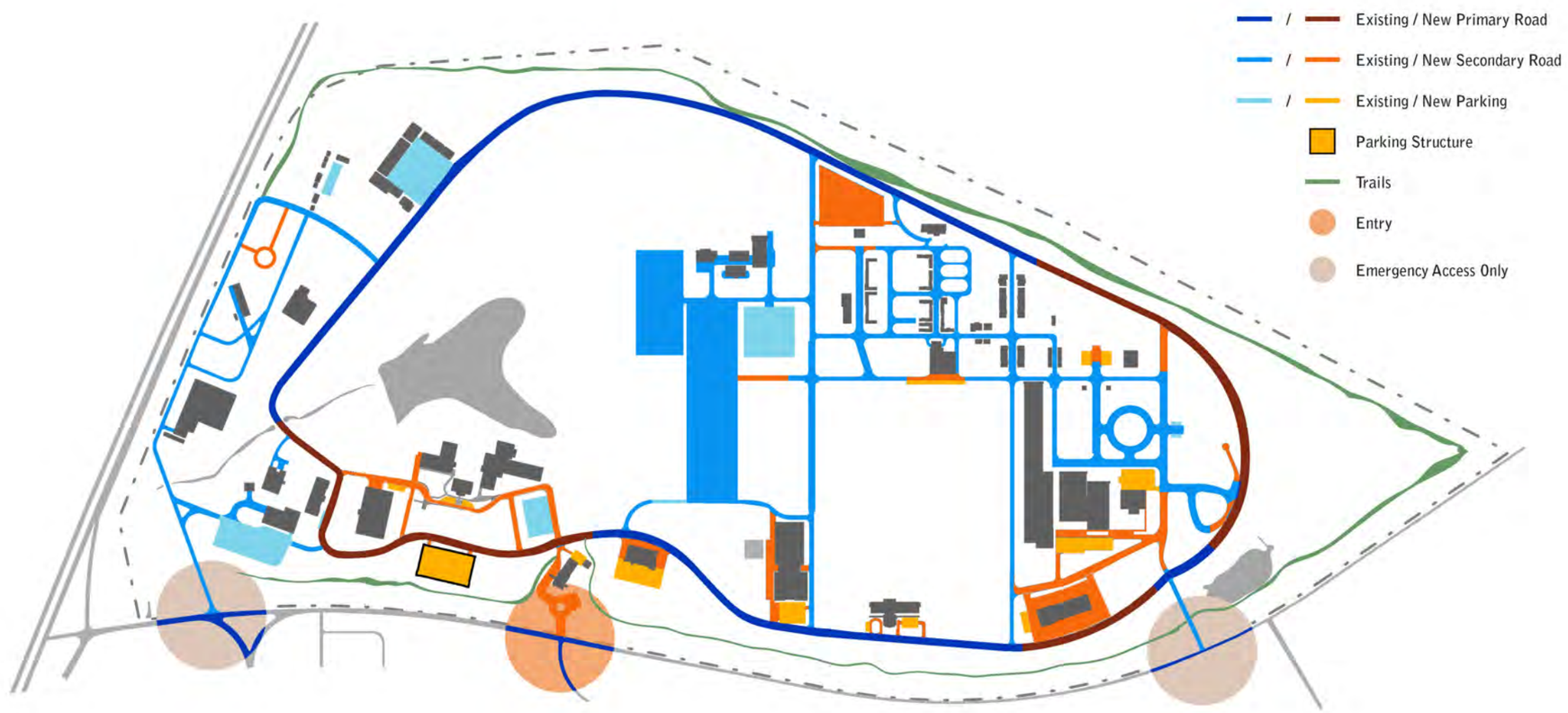
Inside the RTC boundaries, the internal network serves three purposes: it provides an internal vehicular circulation route; it serves as a physical training venue for biking, running, and other conditioning activities; and it serves as a tactical training venue for skill-building activities, such as protective driver training and public bikeway simulations. Generally, secondary roadways would be built to serve new development as it occurs. However, two road projects have been identified as immediately necessary.

Loop Road Addition

This proposed project would complete the campus loop road in the eastern portion of the site. The completion of the loop road would enable efficient perimeter circulation. Currently, vehicle circulation runs through areas that are often closed due to frequent tactical training exercises held on or near the interior campus road system.

Roadway Realignment

The realignment of the roadways and parking areas at the new entry and Administrative Precinct would improve circulation at the critical juncture between public and secure areas of the campus, as well as provide symmetry to reinforce the new axial relationships that the proposed projects would bring to this area of the campus.



May 7, 2012
1" = 600'

Figure 3-9 Circulation Plan

Circulation
James J. Rowley Training Center
Laurel, Maryland

This page intentionally left blank

Sidewalks and Paths

As development occurs under the 2012 RTC Master Plan, sidewalks between buildings and along nearby roadways would be planned as part of site design to link all areas of the campus for pedestrian use within and between adjacent precincts. Paths have been worn in some unpaved areas between buildings and, notably, just inside the perimeter fence where ATVs perform security patrols and rough-terrain physical training exercises are conducted. The paths between buildings would help to inform the design of the sidewalk system. The perimeter trail would be upgraded for continued use in security patrols as part of the perimeter security
fence design.

Parking

A proposed parking structure would provide 350 parking spaces and serve as a training venue. It would be located near the campus entry and would serve the primary administrative and classroom facilities on campus. The increased number of parking spaces meets the demand that accompanies the expansion of campus programs and populations as shown in this calculation:

The relatively high number of proposed visitor spaces is due to the primary training function of the RTC and the anticipated growth in non-USSS law enforcement short-term training programs.

		Existing	Proposed
RTC Parking	Number of Parking Spaces**	688	1,038
	Less Number of Fleet/Training Vehicles	-294	-441
	Number of Non-Fleet Parking Spaces	394	597
	Number of Employee Parking Spaces		440
	Number of Visitor Parking Spaces		157
	Ratio of Employee Parking Spaces to RTC Employees		1:1.5
	**Assumptions 1. Future Parking assumes that loss of spaces in the Bowron lot would be offset by new parking adjacent to new buildings. 2. Growth in Fleet/Training Vehicles would not directly correspond to population growth. A factor 1.5 has been used.		

Table 3-1 Existing and Proposed RTC Parking

This page intentionally left blank

3.8 Enhance Infrastructure: Utilities Improvements

Natural Gas Distribution

Extend natural gas distribution to facilitate the RTC campus expansion. The existing gas piping system has sufficient capacity to serve all of the current RTC campus needs and all of the additional buildings described in the 2012 RTC Master Plan, but piping will need to be extended to currently unserved areas as phased development occurs.

Water Distribution

Extend domestic water distribution to facilitate the RTC campus expansion.

Currently there is a project in the planning stage to upgrade the water distribution system designed to accommodate all of the facilities envisioned in this Master Plan.

Electrical Site Distribution

Currently the main electric utility (BG&E) serving RTC is upgrading both the electric service to and distribution on the Campus. The improvements to the electrical distribution system are being designed to accommodate all of the facilities envisioned in this Master Plan.

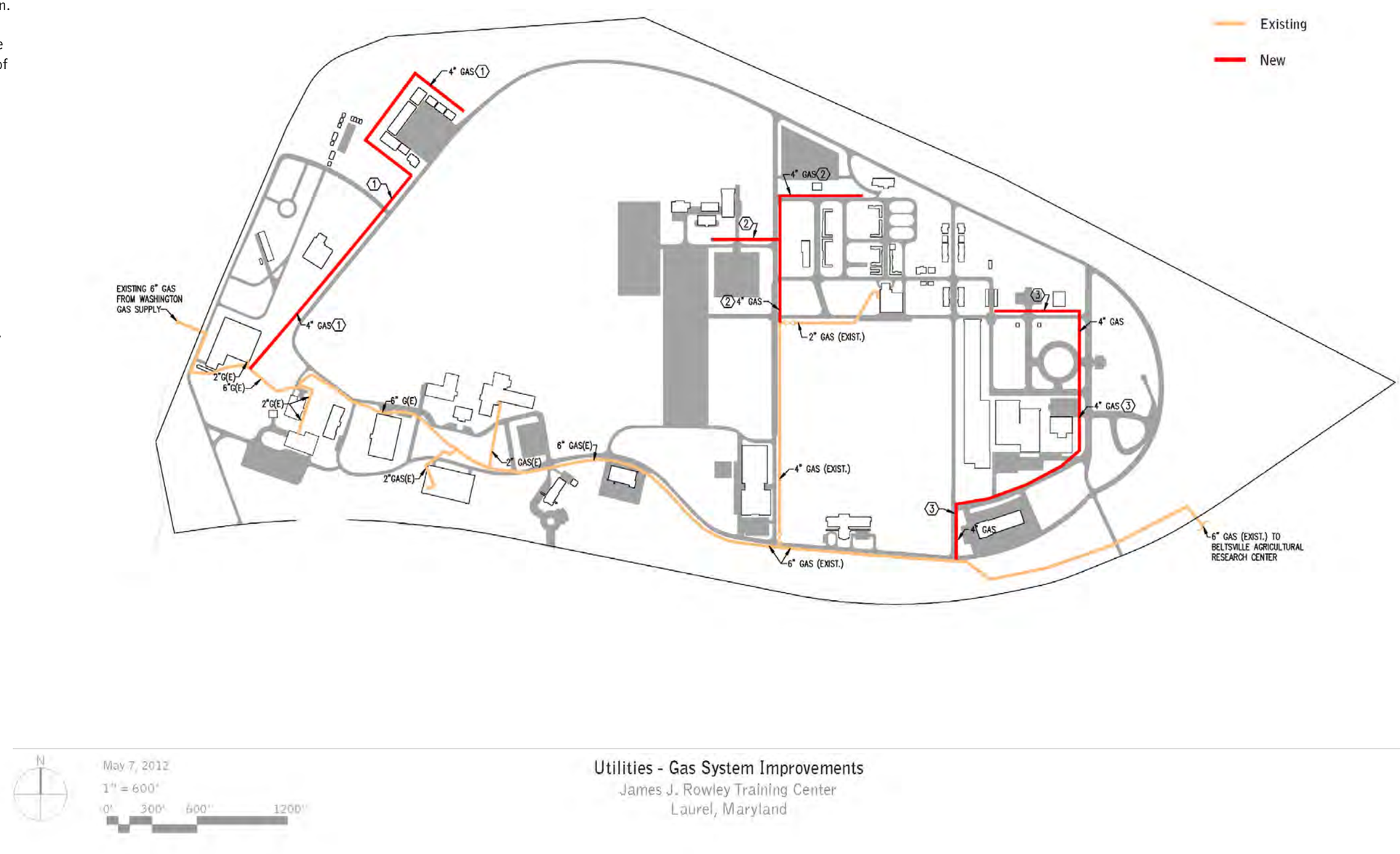


Figure 3-10 Natural Gas Distribution

This page intentionally left blank

Sanitary System (Phase 1 of 2)

Phase 1: Upgrade sanitary system by providing a system of sanitary sewer pumping stations and sanitary force to support the planned development at the RTC. Individual buildings would drain by gravity to these sanitary sewer pump stations. The new sanitary sewer pump stations would then pump the sewage to the existing main Sanitary Sewer Pump Station.

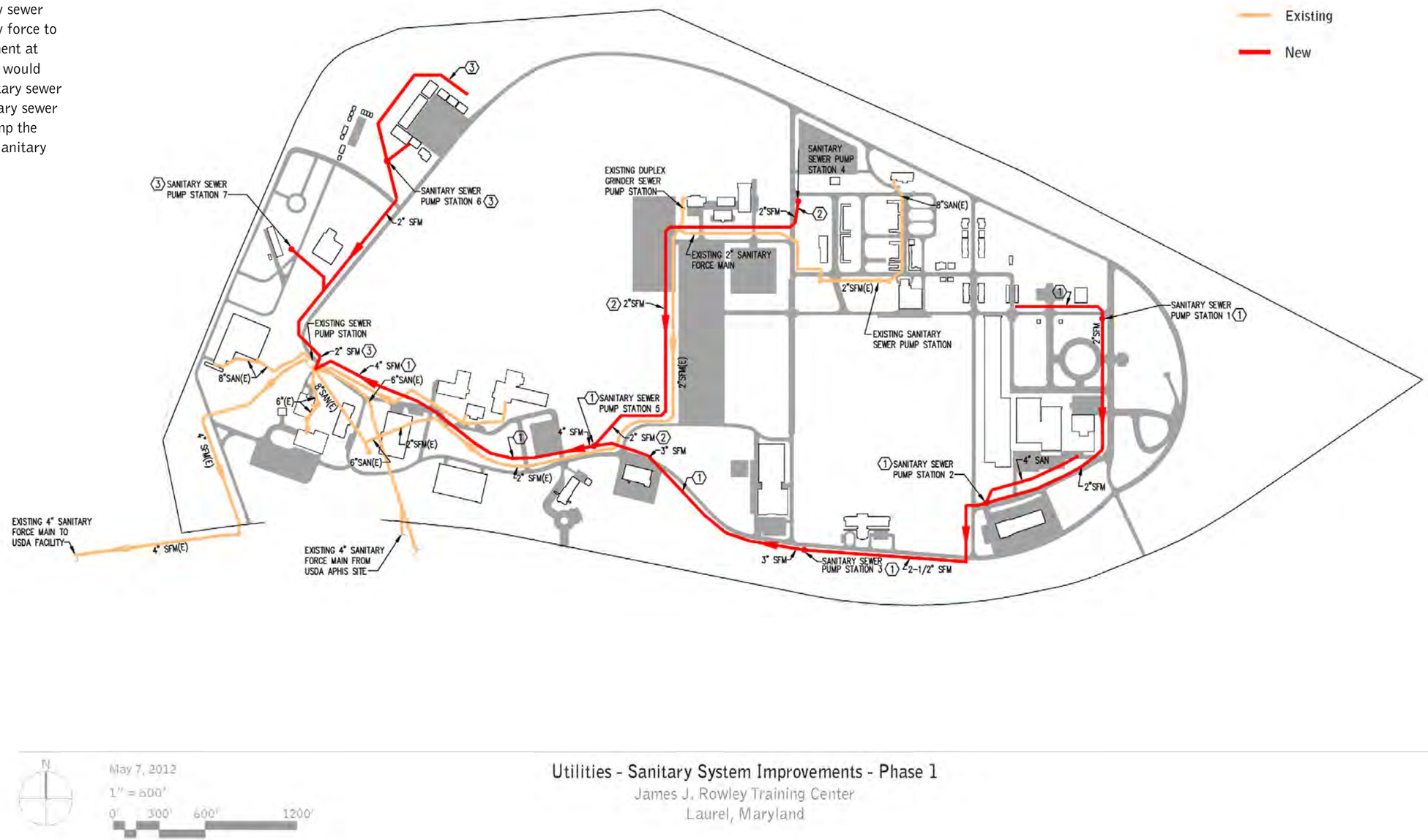


Figure 3-11 Sanitary System Improvements, Phase 1

This page intentionally left blank

Sanitary System (Phase 2 of 2)

Phase 2: Replace the existing sewage pumps at Sanitary Sewer Pump Station and increase the size of the sanitary force main from Sanitary Sewer Pump Station – 1 to the neighboring USDA facility.

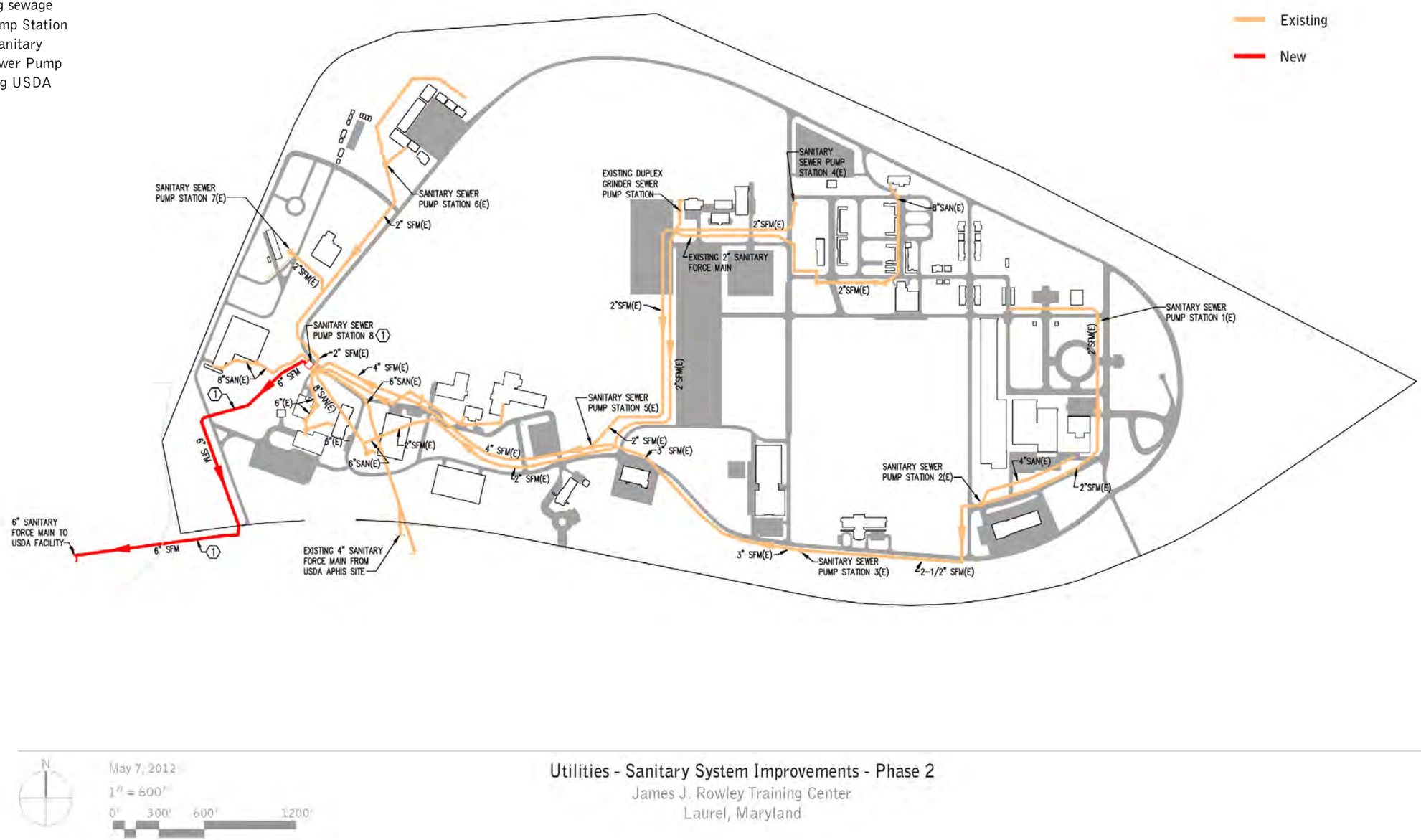


Figure 3-12 Sanitary System Improvements, Phase 2

This page intentionally left blank

3.9 Promote Stewardship of Resources: Stormwater Management

Using Maryland Department of the Environment *Maryland Stormwater Management Guidelines for State and Federal Projects,* Environmental SiteDesign (ESD), develop"a comprehensive design strategy for maintaining pre-development runoff characteristics and protecting natural resources."

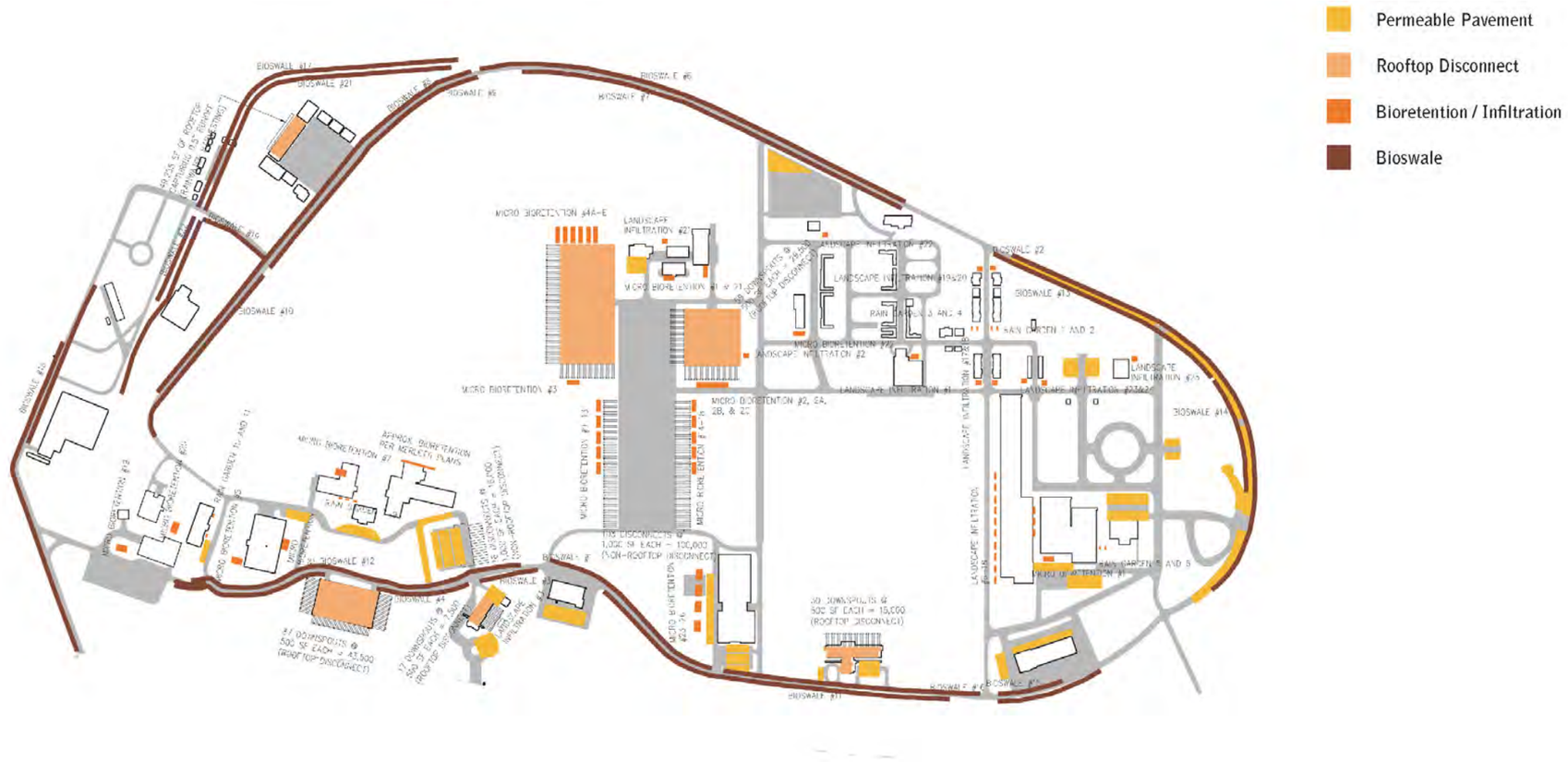


Figure 3-13 Stormwater Management Plan

This page intentionally left blank

3.10 Promote Stewardship of Resources: Wetlands Management

Overall, long-term adverse impacts to wetlands as a result of the implementation of the 2012 RTC Master Plan are anticipated to be minor, as impacts are anticipated to be limited to small sections of isolated wetlands.

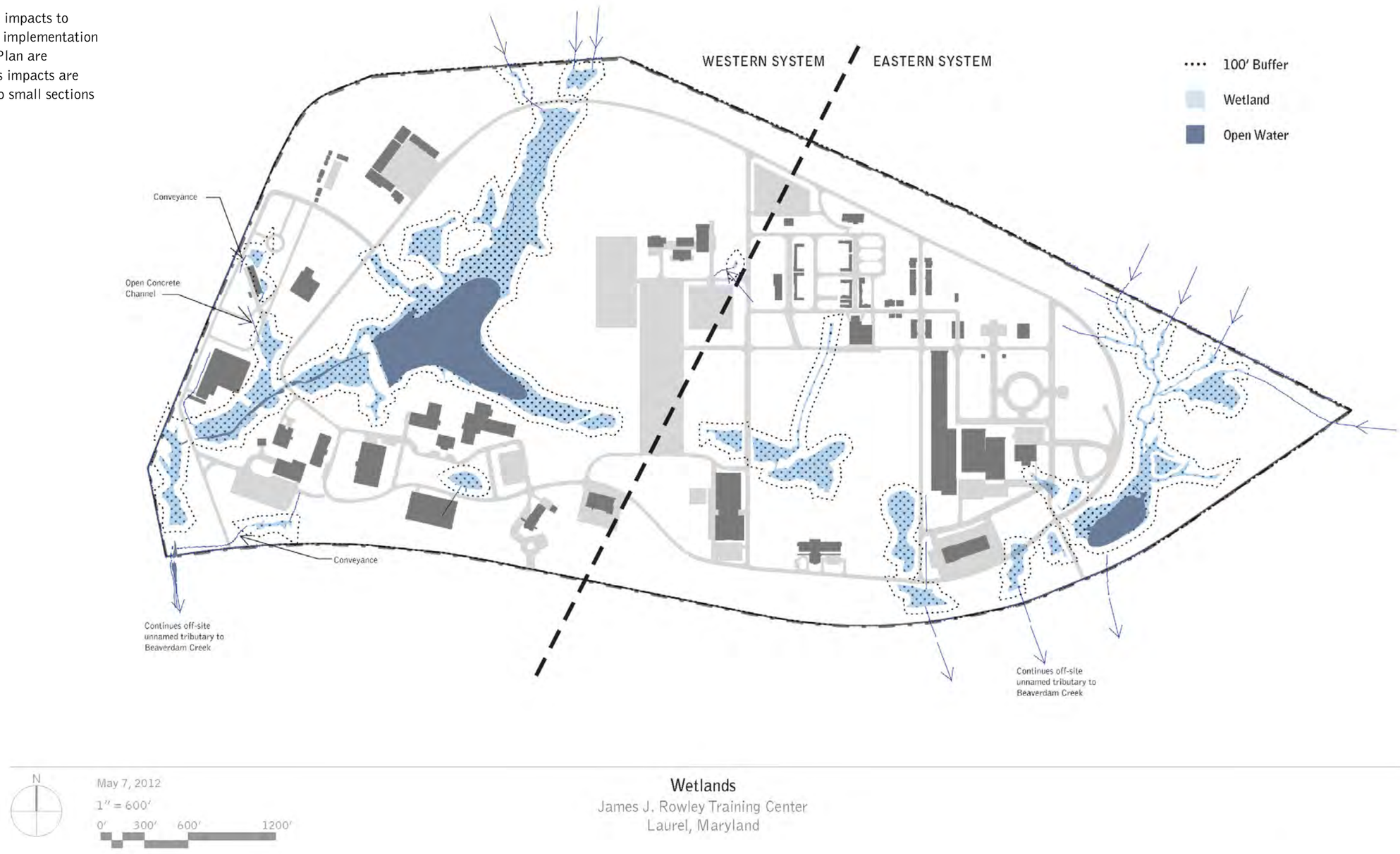


Figure 3-14 Wetlands

This page intentionally left blank

3.11 Promote Stewardship of Resources: Sustainability Initiatives

DHS Strategic Sustainability Performance Plan and the "Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings" Memorandum of Understanding is the framework for evaluation of potential building projects. The Leadership in Energy and Environmental Design (LEED®) Green Building Rating System of the U.S. Green Building Council (USGBC) is a tool for evaluating and measuring achievements in sustainable design. For individual projects, LEED Silver would be considered the minimum required certification. For more information, see *Section 4.6 Sustainability Requirements*.

3.12 Promote Stewardship of Resources: Human Activities Impacts

Avoid locating activities that produce excessive noise near sensitive natural resources and sensitive human uses, such as residential areas, hospitals, and schools.
Ensure that noise-generating activities at federal facilities are sited and scheduled with sensitivity to the surrounding environment and the community.

This page intentionally left blank

4.0 Program Requirements

This page intentionally left blank.

4.0 Program Requirements

4.1 Overview

The RTC will serve as the primary location for USSS In-Service and Basic Training for the foreseeable future. It is anticipated that the number of students served will continue to increase along with the range of courses offered during the next 10 to 15 years. Creation of a world-class training campus, the stated goal of this Master Plan, will foster a sense of institutional pride and shared experience for USSS personnel who pass through the campus during their initial training and then return for continuing education throughout their careers.

In addition, the mission of the training center is expanding to attract a broader audience for threat assessment and protection offerings, from local and regional law enforcement professionals to private security contractors and the academic community. Continued development of the RTC campus will support expanded training and reinforce the leadership position of the USSS in these areas.

4.2 Mission and Organization of the USSS Office of Training

RTC is the primary location for the USSS Office of Training. The protective, investigative, specialized tactical, and executive/managerial training conducted there is unique among federal law enforcement instructional entities. The USSS provides a wide range of courses utilized by its personnel throughout their careers. The core curriculum provided is designed for special agents, Uniformed Division officers, special officers, and physical security specialists. In a single year, hundreds of training recruits undergo extensive training in firearms marksmanship, use-of-force/control tactics, emergency medical techniques, financial crimes detection, physical/site/event protection, and water survival training. At the other end of the professional spectrum, scores of veteran law enforcement, executive/managerial, administrative, and technical personnel are offered a comprehensive curriculum of specialized and technology-based training courses. Advanced computer-driven methodologies enable the facility to reach beyond its Washington, DC metropolitan location to provide "on-site" educational experiences to personnel across the USSS's domestic and international field offices. The USSS supports its valued law enforcement partners from across the country by providing protective security, financial crimes, specialized tactical, and weapons training to other federal, state, and local law enforcement agencies.

The mission of the USSS Office of Training is to develop, administer, and coordinate all training programs of the USSS Uniformed Division. There are currently six branches operating at RTC under the direct supervision of a Special Agent-in-Charge (SAIC). Each of the branches is headed by an Assistant Special Agent-in-Charge (ASAIC). The branches and their units are listed in *Table 4-1 USSS Office of Training Branches and Units* with a description of their functional responsibilities.

USSS Office of Training

Training Management Branch	The Training Management Branch provides administrative as well as student and curriculum support to all training activities at RTC. Units of the TMB include:	Mission Research and Development
		Mission Research and Development aids in the analysis and initial development of new training and administrative programs for the campus.
		Policy Development
		The Policy Development Division provides analysis, recommendations, and development of current training policies and procedures. It liaisons and coordinates with internal training programs and other Secret Service units for formulation of new and revised policies. It serves as a liaison to the academic community on curriculum design and implementation.
		Administrative Support
		Administrative Support provides the necessary support to ensure that the training center administration is able to carry out their responsibilities with maximum effectiveness and efficiency and to provide general student and curriculum support.
		Registrar
		The Registrar coordinates the assembly of support records and completion of all course folders for the Special Agent and Uniformed Division recruit training, continuing training for all personnel as well as external training.
		External / In-Service Training
		The External / In-Service Training Division coordinates all external training, In-Service, and continuing training requests entities within the Secret Service as well as requests from Federal, state, and local agencies. It coordinates all aspects of facilities and classroom scheduling for RTC.
		Student Affairs
		Student Affairs coordinates and facilitates logistics and training for all basic Special Agent and Uniformed Division recruit training programs. It coordinates all training programs. It coordinates the forecasting and scheduling for all basic classes.

Use of Force Branch	The Use of Force Branch administers all firearms training activities for both range operations and policy development units. It is responsible for weapons issuance, armor repair, testing and research of firearms. The units of the Use of Force Branch are:	Firearms Policy Development
		The Firearms Policy Development Division researches and procures all Secret Service weaponry systems and ammunition. It develops and maintains all policies and directives relating to firearms.
		Firearms Range Operations
		The Firearms Range Operations Division develops and instructs all firearms training programs. It coordinates with investigative and protective divisions, external federal and state agencies, and other law enforcement entities to determine curriculum content.
		Control Tactics
		The Control Tactics Division coordinates, develops, and instructs all defensive measures classes to include the integration of the Secret Service Use of Force and Policy Model for both lethal and intermediate weapons and tactics.

Mission Training Branch	The Mission Training Branch is responsible for coordination of the investigative and protective training programs, legal jurisdiction and responsibilities and Basic Training for both Special "Agents and Uniformed Division officers. MTB coordinates and administers training for support programs within the investigative and protective arenas. Support programs include protective transportation driving, detail training, and special operations.	Investigations
		The Investigations Division develops and instructs all investigative training programs. It coordinates with investigative units, external federal and state agencies and other law enforcement entities, as well as governmental and private financial entities to determine curriculum content.
		Legal
		The Legal Division researches, identifies and instructs all current and emerging legal principles relevant to the Secret Service mission. It maintains liaison with headquarters entities regarding law-related matters.
		Protective Transportation
		The Protective Transportation Division develops and instructs defensive and evasive driving tactics, emulating high-risk situations relative to protective and investigative emergencies. It maintains liaison with protective units and details as well as other external entities to determine curriculum content.
		Protective Detail Training
		The Protective Detail Training Division coordinates and instructs standardized physical and protective training to all permanent and temporary details and their support entities. It provides protective training to select federal, state and local law enforcement agencies. PDT maintains oversight, coordination and operational direction of Special Operations Training as it relates to interaction with protective details.
		Canine Training
		The Canine Training Program develops and implements instruction for tactical and explosive detection canine training courses.
		General Protection
		The General Protection Division develops and instructs basic student protective training programs. It conducts external and In-Service Training as required.
		Counter Surveillance and Protective Intelligence
		The Counter Surveillance and Protective Intelligence Division develops, coordinates and instructs all protective intelligence and counter surveillance programs. It coordinates with protective units, investigative field offices, and military and select federal agencies to determine curriculum content.
		Special Operations Training
		The Special Operations Training Division coordinates, develops and instructs basic and cycle training for the Counter Assault Team (CAT), Emergency Response Team (ERT), Counter Sniper Unit (CSU). It maintains liaison with protective units and details as well as other external entities to determine curriculum content. It oversees the operation of SimLab, utilized to simulate training scenarios.

Campus Services Branch		Facilities
		The Facilities Division coordinates and conducts all facilities operations related to maintenance, renovation, and new construction.
		Supply / Property
		The Supply/Property Division coordinates the ordering of inventory for all uniform items and office supplies for the facility. It maintains all records for RTC-accountable property and personal property issued by the Service.

		Access Control
		Access Control monitors and manages access to the RTC campus. It monitors perimeter and on-site activities.
		Information Technology Support
		The Information Technology Support Division is responsible for the upgrade and servicing of all computers, telephones, and radios at RTC.
		Operations and Fleet Management
		The Operations and Fleet Management Division coordinates and maintains all administrative work schedules. It organizes and conducts special events and tours. It coordinates, maintains and assigns all vehicles at RTC. It coordinates RTC interface with headquarters in the COOP Plan implementation. It oversees the security operations of the facility in conjunction with the SSD Uniformed Division Detail.
		Visual Productions
		The Visual Productions Division coordinates the acquisition, testing, maintenance, and distribution of new and existing campus audio/visual equipment. It facilitates the production of audio/visual presentations for special events and distance learning.

Academic Process Branch	The Academic Process Branch coordinates both formal and informal instructional management processes to identify emerging training needs, job tasks and responsibilities. It develops instructional methods, training materials and delivery strategies for all programs. It administers and supervises all training programs in the areas of employee development, management, executive development, technology-based, in-Service and Basic Training.	Instructional Management
		The Instructional Management Division supports all training programs by defining organizational needs, establishing performance-based training objectives and recommending appropriate instruction and evaluation strategies. It coordinates staff development and manages the accreditation process.
		Employee Development
		The Employee Development program develops, coordinates and teaches administrative, executive, management and language training programs.
		Technology Based Training
		The Technology Based Training program develops, coordinates and instructs all standardized and specialized technology-based training to include computer-based, self-study, intranet, web-based and distance-learning delivery systems. It administers, coordinates, develops and implements all facets of the distance-learning program to include applicable methodologies, technical aspects and delivery of related training, service-wide to personnel in the field.
		Simulation Laboratories (SimLab)
		The Simulation Laboratories develop, coordinate and operate computer-based simulation programs for tactical and non-tactical training.
		Executive Management
		The Executive Development program develops, coordinates and teaches all executive, management and language training programs.
		Needs Assessment and Analyses
		No Description Provided
		Federal Law Enforcement Training Center Training and Operations (FLETC)
		FLETC Training and Operations coordinates course scheduling and Secret Service instructors for the Secret Service and FLETC-related courses. Identifies and coordinates all training administration, statistics and forecasting for the scheduling and allocation of Secret Service student logistics and support relative to these Secret Service and FLETC courses.

Physical Skills Branch		Physical Fitness / Water Safety
		The fitness program operates in conjunction with the Mandatory Medical Examination Program to ensure that all affected personnel are: - Physically able to perform assigned duties - In a good stat of physical health and well-being to prevent unwarranted disability - Able to meet or surpass the minimum performance level of Secret Service fitness standards. The Water Safety Program trains and prepares the Agent/Officer to perform the necessary skills to survive in a water environment, ranging from basic individual safety to advanced lifesaving skills. In conjunction with select federal agencies, the program provides specialized training and support for the Secret Service.
		Emergency Services
		The Water Safety Program trains and prepares the Agent/Officer to perform the necessary skills to survive in a water environment, ranging from basic individual safety to advance lifesaving skills. In conjunction with select federal agencies, the program provides specialized training and support for the Secret Service.

Table 4-1 USSS Office of Training Branches and Units

4.3 Population

The population at RTC is expected to grow over the course of the 10 to 15 year incremental build-out of the facilities shown in the Master Plan as they address the increasing need for concurrent training programs. The growth in employee population would be related to the growth in the average daily trainee population.

		Current Population	Projected Population (Full Build-out of Proposed MP)
RTC Population	Average Daily Employee Population	285	460
	Average Daily Trainee Population	48	200
	Total	333	660

Table 4-2 RTC Population

4.4 Parking Requirements

The RTC parking requirement is expected to grow as the incremental construction of the facilities in the Master Plan takes place. However, the parking growth would not correspond directly to population growth due to the lower projected growth in fleet and training vehicles. The ratio of employee parking spaces to RTC employees meets the NCPC requirement for facilities that are remotely located from public transportation. Due to its remote location from public transportation, transient population of trainers, and

regularly scheduled special events, the facility needs to provide spaces for a potentially large visitor population.

RTC Parking		Current Parking	Projected Parking (Full Build-out of Proposed MP)
	Number of Parking Spaces**	688	1,038
	Less Number of Fleet/Training Vehicles	-294	-441
	Number of Non-Fleet Parking Spaces	394	597
	Number of Employee Parking Spaces		440
	Number of Visitor Parking Spaces		157
	Ratio of Employee Parking Spaces to RTC Employees		1: 1.5

** Assumptions
1. Future Parking assumes that loss of spaces in the Bowron lot will be offset by new parking adjacent to new buildings.
2. Growth in Fleet/Training Vehicles will not directly correspond to population growth. A factor of 1.5 has been used.

Table 4-3 RTC Parking Requirement

4.5 Security Requirements

Definitive standards to describe proper vehicular approach and processing at secure access points for DHS facilities have not been provided. However, the USSS has developed site-specific design criteria for site access at RTC:

- Provide an unsecured drive long enough to allow for a queue of vehicles before the vehicle inspection point. A 90-degree bend should be placed in the drive to slow traffic between the entry gate and the inspection point.
- Ensure that the gatehouse structure is no less than 150 feet from Powder Mill Road and that unprotected portions of the building are no less than 30 feet from the unsecured visitor parking area or approach roadway.
- Provide eight visitor parking spaces on the unsecured side of the fence and 15 spaces for employee parking on the secure side.
- Provide one entry aisle with badge swipe equipment for employee entry and one entry aisle for use by visitors, delivery, and construction traffic. The exit lane should allow for reverse traffic as needed; all three lanes should allow for badge swipe technology.
- Allow an extended waiting area on the unsecured side of the gate for delivery trucks to park in case of an extended inspection.
- Provide one guard booth to service the entry point and wedge and swing barriers for all lanes, in and out.
- Provide raised planting beds and masonry walls between the gatehouse and main drive aisle to prevent vehicles from accelerating as they approach the building.
- Provide a mechanically-raised hydraulic vehicle barrier; locate controls inside the gatehouse and inside the guard booth.
- The fence separating secure and unsecured sides of the entry shall be an extension of the campus perimeter fence. Provide decorative iron fence in lieu of standard perimeter fence for the entire fence line within the visual range of the entry access point.

Perimeter Fence and Trail

A double fence is currently planned for the RTC perimeter as shown in *Figure 4-1, Security Fence Concept*. It would feature two 8′-0″ tall, high-security chain link fences with barbed wire, spaced 10′-0″ apart. An 8′-0″ minimum clear buffer on either side would be provided, including limbs reaching into the buffer zone from above.

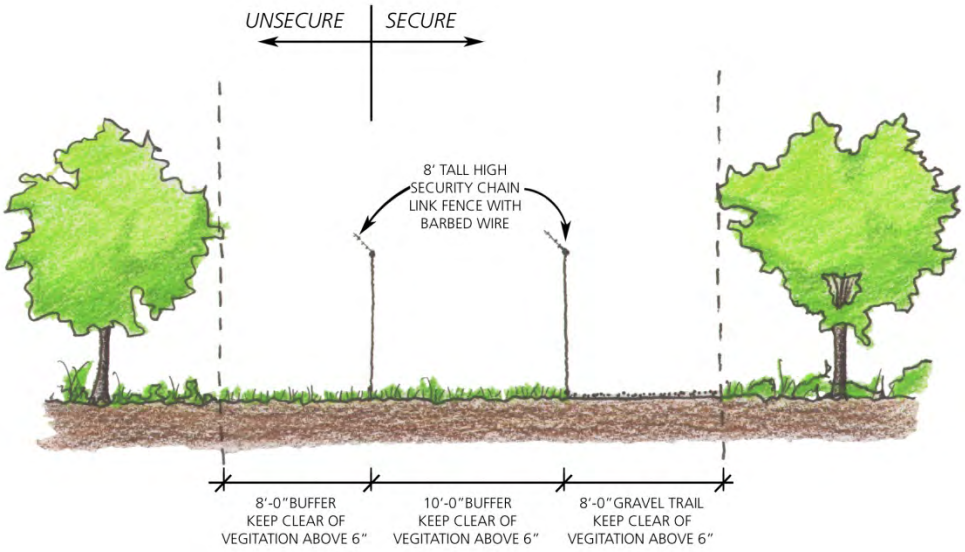


Figure 4-1 Security Fence Concept

Other considerations for perimeter fence and trail design include:

- Where the perimeter fence passes over a body of water or wetland, ensure that the top of the fence remains relatively consistent and provide secure stop gap measures, such as metal grates or additional fencing, to close the remaining space below the fence and prevent underwater access or access by excavation of wetland soils.
- The perimeter security trail must remain adjacent to the perimeter fencing. Provide 8′-0″ wide, pressure-treated wood bridges over water or wetlands. Bridges are to be supported by treated wood piers to minimize the impact on these areas.
- Provide security call boxes, fed by fiber optic cables, every 500 yards along perimeter fence. Additional lighting and detection systems, such as sensors or cameras, may be required as determined by the USSS.

4.6 Sustainability Requirements

Government agencies intending to pursue new building projects or renovations of existing buildings within their portfolio are subject to the sustainable design requirements and expectations set forth in Executive Order 13514 (dated October 8, 2009), and DHS's own internal Sustainability Plan as required by the aforementioned Executive Order.

For purposes of this Master Plan, the DHS Strategic Sustainability Performance Plan and the "Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings" Memorandum of Understanding is the framework for evaluation of potential building projects. The Leadership in Energy and Environmental Design (LEED®) Green Building Rating System of the U.S. Green Building Council (USGBC) is a tool for evaluating and measuring achievements in sustainable design. The use of LEED ensures that sustainable strategies are considered in the development of building projects. As the individual projects are undertaken, LEED Silver would be considered the minimum required certification and Gold or better the goal.

The LEED rating system breaks projects into seven distinct planning categories as noted below. Guiding principles for the design team to integrate into design solutions are identified within each category.

Sustainable Sites

Sitework for the project(s) would be performed with focus on minimizing impact on the surrounding site by reducing the development footprint where possible, implementing plans to mitigate construction activity pollution, maximizing the amount of open space surrounding the project, incorporating light-colored and reflective hardscape and roofing materials to lessen the heat island effect on the site, and implementing technologies to retain or treat stormwater on-site, thereby reducing the impact on the storm drainage infrastructure and native watersheds.

Water Efficiency

Plumbing design for the project would employ strategies that, in aggregate, use at least 20% less potable water than Energy Policy Act of 1992 fixture requirements. Landscaping and irrigation strategies would target reduction in potable water use of 50% or more over traditional means through use of high efficiency irrigation systems and appropriate plant species selection.

Energy & Atmosphere

HVAC, lighting, and other energy-using systems in the project would be designed to target 30% energy-use reduction compared to American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) 90.1-2004 energy standards and would earn the Energy Star designation where feasible. In accordance with guidelines established under the Energy Policy Act of 2005, building level utility meters would be designed into the project in order to continuously track and optimize performance. Commissioning of building systems to ensure peak operational efficiency, tailored to the size and complexity of each subject building, would be planned.

Materials & Resources

Selection of materials for each project would take into account targets for recycled content quantities (10% based on cost); preferred use of bio-based (rapidly renewable) materials and elimination of ozone-depleting compounds in materials specified for the project. Additionally, the project team would require that the contractor divert at least 50% of construction, demolition, and land clearing debris to local recycle or salvage facilities rather than to landfill.

Indoor Environmental Quality

There are multiple opportunities available to designers to ensure a healthy and productive indoor work environment for RTC personnel. Typically, designs would target achievement of current ASHRAE 55-2004

thermal condition standards and ASHRAE A 62.1-2004 ventilation rates for acceptable indoor air quality. Moisture control strategies would be implemented to prevent mold and other contamination. Daylighting would be implemented where feasible to reduce dependence on supplementary electrical lighting with appropriate overrides and glare control devices to ensure maximum flexibility. Materials specified for the project would be evaluated for compliance with current Volatile Organic Compounds (VOC) emission standards to ensure a low rate of pollutant emissions within the project space. During construction, an indoor air quality plan would be implemented to minimize contaminants from the construction process and, once construction is complete, a building flush-out can be implemented to minimize exposure of new building occupants to contaminants from new building materials.

Innovation & Design

The LEED Innovation and Design category provides an opportunity to implement innovative or alternative policies or procedures which enhance the sustainability focus of the project. Some suggestions for achievement of these credits follow:

- Employment of integrated design principles throughout the lifecycle of the project;
- Implementation of a Green Education program which uses the building's case study and integrated site signage to publicize the sustainable design strategies employed;
- Documentation of a Sustainable Purchasing Policy, as mandated by Executive Order 13514 for all Federal agencies;
- Documentation of a Green Pest Control and Landscaping Program utilizing environmentally preferable pest control products and processes (this qualifies for a point under Innovation in Design);
- Documentation of a Green Cleaning Program utilizing environmentally preferable cleaning products and processes (this qualifies for a point under Innovation in Design);
- LEED Accredited Professional: A LEED Accredited Professional (LEED AP) can be involved in the project throughout the design and construction process, earning this point.

Regional Priority Credits

There are no prerequisite requirements and up to four points available in this category. These bonus points are based on the ability to meet previously specified credits and are based on the location of the project (by zip code).

4.7 Stormwater Management Criteria

USSS has undertaken a Stormwater Management Plan in conjunction with the 2012 RTC Master Plan. The Stormwater Management Plan (see *Section 6.6 Stormwater Management Plan*) provides the background information for the following discussion.

In the developed areas, stormwater is conveyed through closed conduits, roadside ditches, and natural channels. Water drains off buildings and paved areas following the site's topography, generally flowing to the south. The total impervious area on the site is approximately 2,303,476 square feet (52.88 acres), or 11 percent of the total site. Much of the balance of the site is wooded. Two ponds exist on the RTC; one approximately 12 acres in area lies on the west side of the campus, while another roughly four acres in size

lies along the property's southeast edge. It is unclear whether these ponds were intended to serve a stormwater management function.

Portions of the site currently exhibit poor drainage and signs of standing water, in particular an area south of the Merletti parking lot across the southern perimeter road. In addition, there are four stretches of roadway that have roadside ditches that are in poor condition and thus collect water. These include an area south of the maintenance yard, an area north of the Wilson Physical Training Building, an area north of the vehicle storage buildings on the northern perimeter road, and an area east of the Merletti parking lot along the southern perimeter road.

As a federal property in the state of Maryland, the local governing authority is MDE; the *Maryland Stormwater Management Guidelines for State and Federal Projects* (April 2010) outlines the review and approval process for projects, such as those proposed in the 2012 RTC Master Plan. All projects undertaken after May 2010 are required to utilize Environmental Site Design (ESD) to the maximum extent practicable. ESD is defined as "a comprehensive design strategy for maintaining pre-development runoff characteristics and protecting natural resources."

In addition, as a federal facility, development at the RTC must meet the requirements of Section 438 of the Energy Independence and Security Act of 2007 (EISA). These requirements are that "the sponsor of any development or redevelopment project involving a federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the pre-development hydrology of the property with regard to temperature, rate, duration and flow."

As develpoment under the 2012 RTC Master Plan takes place, there could be short-term construction-related impacts to stormwater due to increased sediment flows, however this would be minimized by implementing best management practices.

Over the long term, impervious surface area on the site would increase from approximately 2,303,476 square feet (11 percent of the total site area) to 3,996,708 square feet (19 percent of the total site area). This would include roads, sidewalks, other paved areas, and buildings.
In order to meet the requirements for achieving ESD, a concept plan for stormwater controls has been developed in the SMP. As outlined in the plan, specific methods for reducing runoff and improving stormwater quality include the following:

- *Permeable pavements* – proposed for newly paved areas; best suited for areas where soil type will allow infiltration and where the water table is not too high.
- *Disconnection of rooftop runoff* – best suited for areas which are currently vegetated and would remain vegetated under the 2012 RTC Master Plan.
- *Disconnection of non-rooftop runoff* – best suited for areas of mild slopes and adjacent to areas of existing vegetation that would remain under the 2012 RTC Master Plan.
- *Rainwater harvesting* – best suited for areas where there is a significant need for nonpotable water.
- *Landscape infiltration* – best suited for areas where sufficient space is available to provide pretreatment to the facility, as well as necessary facility footprint size for proper infiltration of stormwater being treated.
- *Rain gardens* – could be added where feasible.

- *Micro-bioretention* – due to adaptability, this could be used at all of the proposed development sites in the 2012 RTC Master Plan.
- *Swales* – best suited alongside new roadways that would connect sub-areas.
- *Enhanced filters* – could be added where feasible to provide for a greater degree of infiltration.

Analysis of this preliminary concept undertaken as part of the Stormwater Management Plan indicates that sufficient controls can be implemented to comply with the requirements of ESD. Under the 2012 RTC Master Plan, the deteriorated roadside ditches would be improved through conversion to bio-swales or the installation of turf reinforcing mats. Overall, long-term impacts to stormwater are anticipated to be beneficial.

Mitigation strategies include:

- BMPs would be implemented during construction in order to minimize sediment loads in stormwater runoff;
- USSS would coordinate with MDE through the detailed design of individual projects to facilitate the implementation of ESD to the maximum extent practicable and to ensure stormwater management controls meet established requirements and that post-development runoff characteristics mimic pre-development characteristics; and
- As detailed design progresses for individual elements of the 2012 RTC Master Plan, USSS would consider additional soil testing as necessary to determine suitability of underlying soils for specific stormwater management elements.

4.8 Wetlands Management Criteria

In August 2009, a non-tidal wetland delineation was conducted to identify and delineate the limits of jurisdictional wetlands and streams at the RTC. A jurisdictional determination (JD) was prepared and submitted to USACE in January 2010. Supplemental survey of a limited area was undertaken in the spring of 2010 following review by USACE and a revised JD was submitted. The JD has been reviewed by USACE and concurrence has been obtained by EPA. USSS is waiting for the final notice of approval from USACE. The wetlands delineation and study provides the foundation for the following discussion.

The 2009 delineation identified several wetland areas within the RTC. Additionally, non-vegetated "Waters of the United States" were identified in the form of streams and man-made ponds. There are two primary drainage systems on the site, one on the east side and one on the west. The western drainage system includes all wetlands and waters that drain west and south towards the intersection of Powder Mill Road and Route 295. The eastern drainage system drains to the south and east across the site. There are two ponds on the campus, one four-acre pond in the eastern portion of RTC and a 12-acre pond in the western portion of the RTC. Several small, isolated wetland areas were also identified throughout the property, mainly in the eastern half of the RTC.

Several wetland areas are bisected by roadways. Both USACE and the Maryland Department of the Environment (MDE) have jurisdiction over wetlands and waters in Maryland. In addition, MDE regulates a 25-foot upland buffer around wetlands and a 100-foot buffer around areas designated as "Wetlands of

Special State Concern" (WSSC). All wetlands located within the RTC have been designated as WSSC by the Maryland Department of Natural Resources (DNR) due to the presence of high quality, complex wetland resources. Existing buildings, roadways and parking lie within the 100-foot buffer.

Generally, indirect impacts to wetlands are assessed based on potential changes to water quality, quantity, and/or flow rates. Indirect impacts may occur as a result of a change to impervious surface area and consequently, increased stormwater and pollutant runoff. Development constraints due to the presence of wetlands have been considered in the placement of buildings under the 2012 RTC Master Plan. Stormwater management and erosion and sediment control measures would be implemented to minimize possible impacts to wetlands from erosion, sedimentation, or contamination during construction and operation of the proposed facilities.

A small portion of the loop road at the southeast side of the site may directly impact wetlands (see *Figure 3-14 Wetlands*). In addition, the perimeter fence and trail may cross wetland areas, depending on its final alignment. Internal roadways may lie within or encroach upon the 100-foot wetlands protection buffer.

During site design and engineering, site surveys would be conducted to confirm the 100-foot buffer for Wetlands of Special State Concern throughout the property. New construction within wetlands or the 100-foot wetland buffer would be evaluated based on detailed site plans in order to minimize potential indirect and direct impacts to wetlands. Design and engineering modifications to roadways and buildings would be undertaken, recognizing these boundaries as necessary, in coordination with federal and State review agencies. Potential modifications could include constructing a raised roadway or using culverts and drains to assist water movement.

Overall, long-term adverse impacts to wetlands as a result of the implementation of the 2012 RTC Master Plan are anticipated to be minor, as impacts are anticipated to be limited to small sections of isolated wetlands.

4.9 Comprehensive Plan for the National Capital

The National Capital Planning Commission (NCPC) oversees the development of federal lands and the federal interest in the National Capital Region, which includes the District of Columbia and the surrounding counties in Maryland and Virginia, including Montgomery, Prince George's, Arlington, Fairfax, Loudoun, and Prince William, and the incorporated cities therein. The *Comprehensive Plan for the National Capital, Federal Elements* (1977-1984, updated 2004) is the principal planning document adopted by NCPC for the planning of federal facilities. The Plan contains goals, objectives, and policies to direct and manage growth throughout the metropolitan area. Of particular relevance to the 2012 RTC Master Plan, as reported in the underlying Environmental Assessment (EA), are policies outlined within *The Federal Workplace Element*, *The Transportation Element*, *The Parks and Open Space Element*, and *The Federal Environment Element*.

The goal of *The Federal Workplace Element* is to "locate the federal workforce to enhance the efficiency, productivity, and public image of the federal government; to strengthen the economic well-being and expand employment opportunities of the region and the localities therein; and to give emphasis to the District of Columbia as the seat of the national government." Policies specifically relevant to the proposed 2012 RTC Master Plan include:

- Utilize available federally owned land or space before purchasing or leasing additional land or building space. Agencies should continuously monitor utilization rates of land and building space to ensure their efficient use.
- Establish the level of employment that can be accommodated on installations where more than one principal building, structure, or activity is located or proposed through the master planning process as established by the Commission. Agencies should continually monitor the employment levels at installations and revise installation master plans as necessary to reflect changed conditions and provide an up-to-date plan for the development of the installation.

The Parks and Open Space Element establishes policies to uphold the symbolic, recreational, social, and ecological values of national capital parks, waterfronts, and other open spaces. Policies specifically relevant to the 2012 RTC Master Plan include:

- Maintain and conserve trees and other vegetation in the landscaped buffer areas on federal installations in a natural condition. Perimeter roads and cleared areas on these sites should be kept to a minimum, carefully landscaped, and managed in a manner that addresses security, aesthetics, and natural character; and
- Maintain parkways as scenic landscape corridors, and protect their historic aspects.

The Transportation Element states that "it is the goal of the federal government to develop and maintain a multi-modal regional transportation system that meets the travel needs of residents, workers, and visitors, while improving regional mobility and expanded transportation alternatives and transit-oriented development." Several policies are particularly relevant to the 2012 RTC Master Plan. Policies regarding parking include:

- Provide parking for official vehicles and visitors in accordance with Federal Property Management Regulations;
- Place parking in structures, preferably below ground, in the interest of efficient land use and good urban design;
- Position parking facilities so as not to obstruct pedestrian and bicycle access to buildings;
- Provide parking for disabled persons in accordance with federal law; and
- Give priority for carpool and vanpool parking over that for single-occupant vehicles.

Additionally, *The Transportation Element* identifies parking ratios for federal facilities located beyond 2,000 feet of a Metrorail station. For these facilities, the goal is to provide one parking space for every 1.5 employees (1:1.5 ratio). The 2012 RTC Master Plan currently includes 440 employee-designated parking spaces for a projected population of 660, meeting the target ratio of 1:1.5.

According to *The Transportation Element*, federal agencies should use a Transportation Management Plan (TMP) to document an employer's active program to foster more efficient employee commuting patterns. The plan should include specific strategies to encourage change in employee travel modes, trip timing, frequency and length, and travel routes so as to reduce traffic congestion and improve air quality. Specifically, federal agencies should:

- Prepare Transportation Management Plans to encourage employee commuting by modes other than single-occupant vehicle; and

- Submit their most recent TMP with all master plans and with all projects that increase employment on site by 100 or more.

For the 2012 RTC Master Plan, Transportation Management Guidelines (TMG) have been prepared (see *Section 6.4 Traffic Impact Study and Traffic Management Guidelines*). The implementation of the proposed work will be incremental; beyond the two projects shown in the 1996 RTC Master Plan, it is unknown when and in what order work will be undertaken. As part of predesign, the impact of each initiated project on the prevailing traffic conditions at that time would be studied and an appropriate Traffic Management Plan developed.

Additional applicable policies within *The Transportation Element* include:

- Provide sidewalks among buildings on federal campuses as well as between federal buildings and transit stations;
- Encourage ridesharing, biking, walking, and other non-single-occupant vehicle modes of transportation for federal commuters; and
- Maximize telecommuting strategies for employees in accordance with federal law; employ compressed and variable work schedules for employees, consistent with agency mission.

According to *The Federal Environment Element*, it is the federal government's goal to "conduct its activities and manage its property in a manner that promotes the National Capital Region as a leader in environmental stewardship and preserves, protects, and enhances the quality of the region's natural resources, providing a setting that benefits the local community, provides a model for the country, and is worthy of the nation's capital." The policies outlined below are directly applicable to the 2012 RTC Master Plan.

The Federal Environment Element states that, in an effort to reduce mobile and stationary sources of air pollutants, federal agencies should:

- Minimize power generation requirements by utilizing best available "green" building systems and technologies; and
- Promote indoor air quality by using environmentally friendly ("green") building materials, construction methods, and building designs.

With respect to water quality, federal actions in the region should conform to the following policies:

- Avoid thermal pollution of waterways and provide and maintain adequate vegetated buffers adjacent to bodies of water, to protect fish and other aquatic life and to reduce sedimentation and pollutants.
- Minimize tree cutting and other vegetation removal to reduce soil disturbance and erosion, particularly in the vicinity of waterways. When tree removal is necessary, trees should be replaced to prevent a net tree loss.
- Use pervious surfaces and retention ponds to reduce stormwater runoff and impacts on off-site water quality.

- Encourage the use of innovative and environmentally friendly "Best Management Practices" in site and building design and construction practice to reduce erosion and avoid pollution of surface waters.

In order to maintain an adequate water supply throughout the region, federal actions in the region should conform to the following policy:

- Encourage the natural recharge of groundwater and aquifers by limiting the creation of impervious surfaces, avoiding disturbance to wetlands and floodplains, and designing stormwater swales and collection basins on federal installations.

In an effort to preserve land resources, federal actions in the region should conform to the following policies:

- Avoid destruction of or damage to wetlands.
- Encourage only compatible land uses adjacent to wetlands.
- Coordinate wetland activities with federal, state, and local government programs and regulations, and with special programs, such as the Chesapeake Bay 2000 Agreement.
- Utilize the best engineering practices available to minimize adverse impacts when project construction in a wetland is deemed to be the only practical alternative.
- Discourage development in areas of identified high erosion potential, on slopes with a gradient of 15 percent and above, and on severely eroded soils. Excessive slopes (25 percent and above) should remain undeveloped.
- Maintain and preserve woodlands and vegetated areas on steep slopes and adjacent to waterways, especially to aid in the control of erosion and sediment.
- Discourage locating intensive land uses within or adjacent to designated and important wildlife habitats.
- Employ "Best Management Practices" to reduce the potential for soil erosion.
- Preserve existing vegetation, especially large stands of trees.

With regard to human activities, the federal government should:

- Avoid locating activities that produce excessive noise near sensitive natural resources and sensitive human uses, such as residential areas, hospitals, and schools.
- Ensure that noise-generating activities at federal facilities, such as loading dock operations, festivals, and concerts, are sited and scheduled with sensitivity to the surrounding environment and the community.
- Evaluate the possibilities for joint-use of antennas and collocating antennas to reduce aesthetic impacts and limit the area of radiofrequency (RF) exposure. Federal agencies should also evaluate the cumulative effect of multiple transmitters at one location to ensure that the combined radiofrequency emissions continue to meet Federal Communications Commission guidelines.

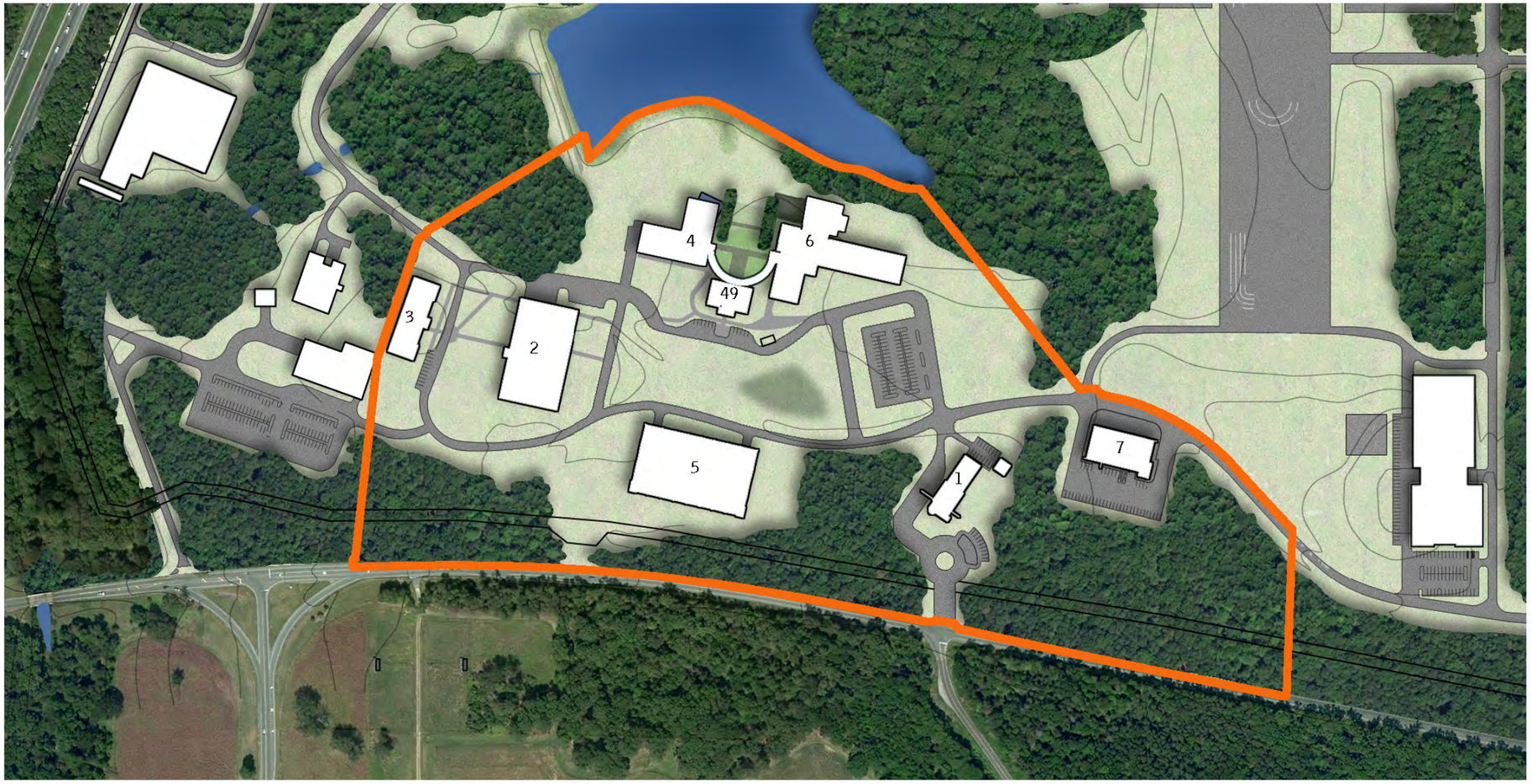
4.10 RTC Proposed Development Precincts

There are six development precincts proposed in the 2012 RTC Master Plan:

- Administrative Precinct
- Shared Campus Facility Precinct
- Firearms Training Precinct
- Protective Operations Driving Course (PODC)
- Tactical Training Precinct
- Existing Facilities Precinct

Administrative Precinct

Centrally located, the Administrative Precinct is adjacent to the newly realigned site entrance at Powder Mill Road. This precinct contains shared classroom facilities, student resource spaces, the primary visitor facilities, and buildings related to campus administration and operations.



Administrative Precinct

1. Gatehouse & Site Access Control
2. Multipurpose Building & ROC Facility
3. SPD Office Building
4. Administration & Classroom Building
5. Parking Structure
6. Merletti Building Addition & Renovation
7. Supply Center
49. Bowron Administrative Building

James J. Rowley Training Center
Laurel, Maryland

N

0' 300' 600' 1200'

Figure 4-2 Administrative Precinct

This page intentionally left blank

Proposed buildings associated with the Administrative Precinct include:

Building Number	**Administrative Precinct** Building Name & Description
1	**GATEHOUSE & SITE ACCESS CONTROL 7,850 SF** The existing Hazen Security Building is outdated, too small, and does not meet federally mandated force protection criteria. Cost analysis revealed that it is more economical to build a new facility than renovate the existing. The new building will provide an opportunity to upgrade existing security technology with state-of-the-art equipment, allow greater monitoring of perimeter and on-site activity, and support secure access control procedures. The curved, extended entry drive from Powder Mill Road will serve to slow incoming traffic, is long enough to meet current security requirements, and provides flexible queuing space for graduations and busy delivery periods. *Program* The front area of the new Gatehouse would provide public reception, processing areas, and the primary visual security booth. Office and workspace will be provided for as many as 10 Uniformed Division (UD) personnel with associated office support spaces, including file and copy rooms as well as a break room. The facility would provide more storage for specialized security equipment and weapons than the existing building. A covered parking area would be provided at the rear of the building for the ATVs used to patrol the campus perimeter. *Design Considerations* To minimize the extent of blast-proof construction, the building should be oriented to expose one narrow elevation. The public parking area should be separated, physically and visually, from the secure campus. The control booth should permit unimpeded observation of the main vehicle entry, the visitor parking area, and the vehicle inspection post located to the east.
2	**MULTIPURPOSE BUILDING/ROC (RELOCATION OPERATIONS CENTER) 106,350 SF** The new Multipurpose Building is sited in a visually prominent location near the new entry gate and would serve as the iconic image of the campus. The Multipurpose Building would provide large formal gathering spaces for such functions as student graduations as well as a state-of-the-art conference center. The large footprint planned for the auditorium level presents an ideal lower-level location for the secure emergency relocation center (ROC) identified in the program space requirements for RTC. Also, the substantial construction of the ROC, its central location and proximity to campus operational functions make it an appropriate location for the main IT center on the RTC campus. *Program* A large pre-function space would surround a 400 fixed-seat auditorium on the building's entry level. A café with basic food service facilities would be located behind these spaces, situated to provide ready access from the proposed new classroom building to the northeast. A catering kitchen would be provided to support formal functions and the conference center planned for the second floor. The conference center should be designed to flexibly accommodate groups of any size up to 400 people. The program provides seven dividable multipurpose rooms complemented by support spaces, such as break-out rooms and furniture storage closets. The new ROC would be located below grade next to the IT operational space. The ROC would include an operational control center and wired conference rooms to be used in the event of emergency relocation of government officials. Secure temporary living arrangements would also be provided below grade and may be supplemented by above-grade conference room spaces depending on the length of the relocation and the size of the relocation population. *Design Considerations* A pre-function area and formal gathering space with abundant natural light and unimpeded views to the surrounding campus would be provided. Grand, vertical circulation elements would be provided to accommodate large groups. Auditorium and conference spaces would be centrally located within the building. *Materials* Due to its visual prominence and ceremonial function, the Multipurpose Building would be sheathed in limestone panels rather than the decorative concrete block used elsewhere on campus. The stone color would be selected to approximate nearby masonry colors. Interior finish materials, such as wood and stone would be unique to this facility, enhancing the formal character of the Multipurpose Building.

Building Number	**Administrative Precinct** Building Name & Description
3	**SPECIAL OPERATIONS DIVISION (SPD) OFFICE BUILDING 44,100 SF** The Special Operations Division (SPD) is an operational unit currently located in a leased building in Washington, DC However, due to the need for continual In-Service Training and the desire to increase deployment efficiency, they require a presence at RTC. A new three-story office building is proposed to accommodate SPD personnel and their specialized operational requirements. The building would be located in the western portion of the Administrative Precinct, providing desired adjacency to campus administration functions. This location would allow the SPD to maintain a desired separation from the primary training functions on campus. Once new training venues are built elsewhere on the campus in accordance with the 2012 RTC Master Plan, the existing training facilities adjacent to the new SPD building can be used for In-Service Training. *Program* The building would largely be dedicated to general office and associated support space. At the second and third floors, half of the open office space is dedicated to temporary, drop-in workstations. These workstations accommodate the large segment of SPD personnel who do not require permanent office locations. For personnel permanently assigned to RTC, standard workstations and enclosed supervisory offices would be provided. In addition, typical office support spaces, such as conference rooms, supply storage, and break rooms would be located in the core of the building. In addition to a visitor lobby, the first floor would house necessary operational program spaces for the SPD, including a large equipment storage room, a secure operational control room, a seminar room, and a flexible training space that would accommodate up to 250 people. *Design Considerations* To maximize flexibility, all office and training spaces in the SPD would have raised access flooring to provide flexible functional arrangements and enable diverse training programs to be offered in the common spaces.
4	**ADMINISTRATION AND CLASSROOM BUILDING 52,200 SF** The RTC currently has a shortage of classroom space. In addition, many of the existing classrooms are too small to efficiently accommodate the current training class size. Consequently, overall training capacity is substantially reduced due to scheduling conflicts. Additional general classrooms are required to meet current needs and accommodate the projected growth of training programs. *Program* A two-story educational wing would provide four 48-person dividable classrooms and eight 24-person classrooms. These classrooms would feature raised access flooring to maximize flexibility for training programs. Nearby cubbies would be provided for the temporary storage of student equipment that currently crowds classroom space. The administration wing would accommodate the desired centralization of training personnel in the adjacent Bowron Building by housing the projected expansion of campus administration offices and a state-of-the-art campus operations center. *Design Considerations* The new building would be located adjacent to the existing Bowron Administration Building/No. 49 and Merletti Building/No. 6. Together with those buildings, a formal outdoor space overlooking the pond would be defined. The form and finish of the two existing buildings would inform the appearance of the new Classroom Building. The three buildings, together with the outdoor space, would form the symbolic heart of the campus. *Materials* The finish materials used in the design of this building would be chosen to complement the finishes of the Bowron Administration Building and Merletti Building.

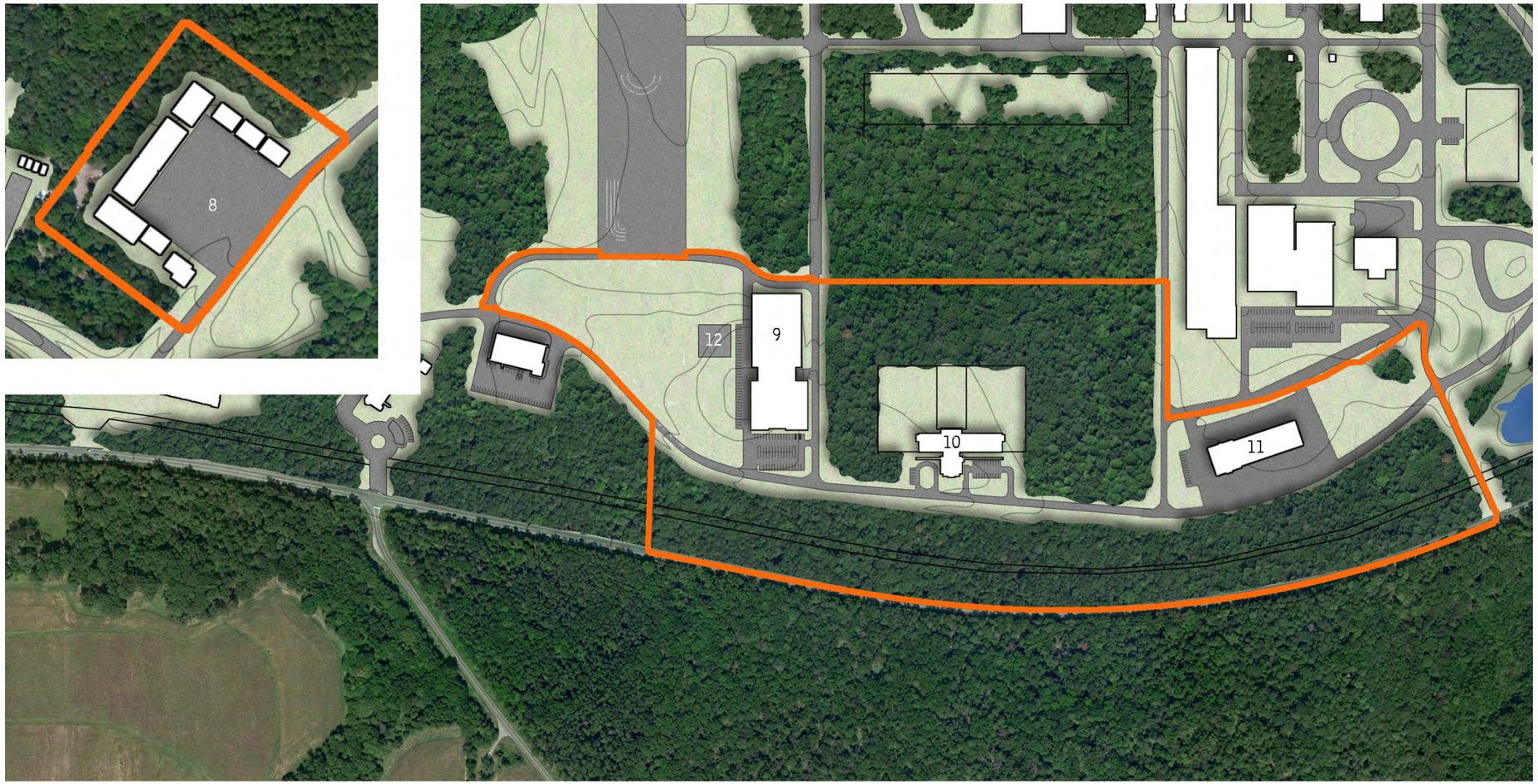
Building Number	Administrative Precinct Building Name & Description
5	**PARKING STRUCTURE 112,000 SF** The new 350-space parking structure has been located to best serve the primary administrative and classroom facilities on campus. Sited appropriately near the gatehouse, its purpose is to efficiently meet the increased parking demand that accompanies the expansion of campus programs and population. Additionally, like many of the campus buildings, the parking structure would be employed as a training venue. *Program* 350 parking spaces would be provided on two levels of parking structure. *Design Considerations* To minimize the visual impact of the structure, the garage and its vertical circulation elements would be softened by integrated landscape elements. *Materials* The garage design would feature precast concrete structural tees and architectural precast spandrel panels.
6	**MERLETTI BUILDING RENOVATION AND ADDITION 36,250 SF** The existing Merletti Building houses most of the RTC's training and operations personnel and classrooms. The number of Basic Training students and In-Service trainees is projected to substantially increase over the next 10-15 years. This anticipated growth in training programs would be accompanied by training personnel increases. The Merletti Building requires renovation to increase the number of classroom spaces, align the character of existing classrooms with current training requirements, and accommodate future personnel. Design for an addition that was shown in the 1996 RTC Master Plan housing an auditorium is nearly complete.
7	**SUPPLY CENTER 13,250 SF** A new and expanded Supply Center would permit the consolidation of various supply and storage buildings around the campus. The central location would optimize distribution patterns to all parts of the campus. In addition, it would be sited near the primary vehicle access point to reduce the number of delivery trucks driving to other areas of the campus, improving safety and security for USSS personnel on campus. *Program & Design Considerations* The Supply Center would be a large open warehouse space with modular shelving. A shipping and receiving area would be located adjacent to the loading docks. A mezzanine above the shipping area would provide secure storage spaces and a small office with support space for 10 staff members. A centralized campus mail and copy center would also be provided adjacent to the shipping and receiving areas. The loading dock would be provided with high and low docks to accommodate a variety of delivery vehicles. *Materials* The building would be a pre-engineered metal structure with insulated metal panel walls. A base course and details of decorative concrete block, consistent with the campus palette, would be incorporated to allow this utilitarian facility to respect the campus aesthetic without compromising function or economic viability.
49	**BOWRON ADMINISTRATION BUILDING 14,950 SF** The Bowron Administrative Building was completed in 2000. It is expected to remain in use as a general office building. No work is proposed under the 2012 RTC Master Plan.

Table 4-4 Administrative Precinct

This page intentionally left blank

Shared Campus Facility Precinct

The shared campus services are intended to support the operations of the other precincts.



Shared Campus Facility

8. Maintenance Yard
9. Physical Training Building
10. Canine Training Facility
11. EMT/OPR Facility
12. Helicopter Pad

James J. Rowley Training Center
Laurel, Maryland

N

0' 300' 600' 1200'

Figure 4-3 Shared Campus Facilities

This page intentionally left blank

Proposed projects associated with the Shared Campus Facilities Precinct include:

BUILDING NUMBER	**Shared Campus Facilities** Building/Area Name & Description
8	**MAINTENANCE YARD 38,100 SF** Under the 2012 RTC Master Plan, the training functions of the existing Drummond Building and airport apron are relocated to the Tactical Training Core. With the addition of new pre-engineered metal buildings, the existing Drummond facility and apron are ideally located and configured for conversion to a maintenance yard. The new pre-engineered metal buildings would surround the existing paved yard to provide expanded storage and workshop space. The expanded facilities would permit consolidation of storage currently spread out among several buildings on campus. *Program* Warehouse and workshop space would be located in a series of modular metal buildings with a combined total area of approximately 36,000 SF. The administrative functions for the maintenance staff would be located in the Drummond building which would receive a 2,000 SF addition to accommodate additional office programmatic needs. *Design Considerations* The maintenance yard is located on the campus loop road allowing quick response to all areas of the campus for maintenance services yet its relatively isolated location permits day-to-day operations to remain behind the scenes. The existing concrete pad would be an improvement over the gravel yard currently in use. *Materials* The warehouse and workshop structures are pre-engineered metal buildings with insulated metal panel walls. The addition to the Drummond Building would be a continuation of the existing metal building.
9	**PHYSICAL TRAINING BUILDING 71,600 SF** In order to meet the demanding standards of the USSS, physical training is a core requirement for special agents and special agents-in-training. The existing Wilson Physical Training Building/No. 44, which this building would replace, is undersized to support the current campus population and inadequate to support the projected increase of staff and students on campus. Renovation and expansion of the existing Wilson Building to meet program requirements would require functional compromises, disrupt training programs, and cost more than new construction. A new facility with customized training facilities meeting current requirements and sized to meet projected growth is proposed. *Program* A one-story structure, the new Physical Training Building would provide instructional spaces, including expanded classrooms, mat training rooms, and a state-of-the-art weight training room. Sufficient storage would be provided for specialized training equipment that supports the various training programs. Expanded office and support spaces for personnel would be provided with workstations and associated support space to accommodate the projected growth. Locker rooms would be designed to accommodate the projected increase in campus population. A 50-meter pool with bulkheads to divide the space and a deep water pool at one end would allow concurrent training exercises to occupy the pool. Wide pool decks with bleacher style seating would enable poolside instruction prior to and following wet-training exercises. After the new Physical Training Building becomes operational, the existing Wilson Physical Training Building could be refurbished, and along with other existing training facilities on the western edge of the campus, used to support expanded In-Service Training programs in the future. However, these changes are not currently anticipated within the 10 to 15 year scope of the 2012 RTC Master Plan. *Design Considerations* The new Physical Training Building would be sited in a prominent location on the campus loop road, central to the other training facilities on campus. The training spaces and classrooms in the building would be grouped around a core of mat rooms with skylights to create an efficient building layout that would enhance the training experience for users. *Materials* The materials to be used in this building would include decorative concrete block exterior walls and a standing seam metal roof selected from the campus building palette described in ***Section 5.5 Design Guidelines: Architectural***.

BUILDING NUMBER	Shared Campus Facilities Building/Area Name & Description
10	**CANINE TRAINING FACILITY 20,100 SF BUILDING, OUTDOOR TRAINING AREA** The new Canine Training Facility would be designed to replace the existing, undersized Maloney Canine Building located in the southwest portion of the campus. The program meets the projected long-term needs of the Canine Training unit, including as many as 10 full-time personnel and facilities to accommodate 75 Explosive Detection dogs and 15 Tactical dogs at one time. The facility would provide the necessary tools for intensive Basic Training programs, concurrent In-Service Training programs, and would offer a secure location for basic canine maintenance and long-term kenneling of animals. *Program* In addition to the office functions necessary for the administration of the Canine Training programs, dedicated and separate classrooms would be provided for Explosive Detection and Tactical training programs to minimize distractions for dogs in Training. Each program would be provided with a fenced exercise yard separated by a shared wooded yard. The kennels would meet military canine handling standards and include an outdoor covered area, an indoor space, and sleeping space. Primary veterinary care would continue to be performed at Fort Belvoir but the new facility would provide space for basic canine care and grooming. In addition, an isolation kennel would be provided for short-term emergency needs. *Design Considerations* Due to the sensory sensitivity of dogs in the program, the new canine training facility would be located in a relatively remote area of the campus. This would minimize distractions caused by vehicle and pedestrian traffic as well as firearms or tactical training exercises. The one-story building would be divided into three functional wings: office space, Explosive Device dog kennels, and Tactical dog kennels. These three wings would radiate from a central hub containing shared program spaces, such as restrooms, classrooms, storage, and canine maintenance facilities. This arrangement would provide visual and sound separation between program areas in an effort to reduce distractions between humans and dogs and between the two canine training programs.

.

BUILDING NUMBER	Shared Campus Facilities Building/Area Name & Description
11	**EMERGENCY MEDICAL TRAINING FACILITY 38,600 SF** The Emergency Services unit provides both training and operational services to RTC. Emergency Medical Training is responsible for providing Basic Training as well as In-Service Emergency Training. On the operations side, the Emergency Services unit responds to campus emergencies. The existing Wilkie Building houses an Emergency Services clinic but space limitations restrict instruction capability. Further, limited storage capacity for emergency equipment restricts the level of emergency service provided on-site. As a result, the campus sometimes relies on local, municipal emergency services. There is currently no garage storage for emergency vehicles, requiring Emergency Medical Training personnel to unload sensitive equipment for indoor storage when the vehicles are not in use. *Program* The ideal facility is similar to the program for a large firehouse. The two-story portion of the new building would contain training and operational spaces, including an expanded medical clinic, two 24-person classrooms, a "dirty" classroom for simulation training exercises and adequately sized locker rooms on the first floor; office and support space would be located on the upper floor. The office space would be sized to accommodate projected growth in personnel and trainees for the Emergency Medical Training unit: 34 open workstations, 12 enclosed offices and 48 drop-in workstations for USSS personnel stationed at the Washington, DC USSS headquarters. The attached vehicle bay would provide conditioned garage storage for the 15 environmentally sensitive emergency and operational vehicles expected to be housed at the facility. The vehicles include ambulances, a fire truck, and emergency tactical vehicles. Large storage bays would be located adjacent to the vehicle bays for ready access to equipment. The decontamination facility (DECON) for the campus, currently remotely located in a modular village on the campus, would be relocated to this facility. Dedicated storage would be provided at the far end of the building and the concrete apron around the building would be sized to support a temporary DECON operation. In addition, the last vehicle bay would be equipped with wash-down equipment and a dedicated water collection system for potential vehicle decontamination needs. *Design Considerations* The new building would be sited in the proposed location for three reasons: 1. Proximity to areas most likely to require emergency services, such as the Firearms Complex and the Tactical Training Precinct; 2. Location on the campus loop road, at the convergence of multiple secondary roads, is central to the rest of the campus; 3. Finally, to offset concerns of limited water supply and potential contamination of the municipal supply, the new building would be located such that water from an adjacent, existing storm water pond would be available as needed. The building would be organized to maintain separation of functions and minimize conflicts during training exercises or emergency conditions. The clinic would be located in an outside corner of the building and provided with a dedicated entry. There would be a second entry provided for student access to instructional spaces and a third entry for access to the office area. *Materials* The materials used in this building would include decorative concrete block exterior walls and a standing-seam metal roof selected from the campus palette (see *Section 5.5 Design Guidelines: Architectural*). These systems are easily adapted to meet blast protection criteria without compromising visual appeal. The inherently durable character of these materials would increase the life of the building and lower long-term maintenance costs.
12	**HELICOPTER PAD (NEW OUTDOOR AREA)** The 10,000SF concrete helipad would be located at the center of campus. A designated parking area would be located between the helipad and the adjacent new Physical Training Building. In the event of emergency helicopter evacuation, during which a larger staging area may be required, temporary mobile facilities would be located on the adjacent existing PODC pad.

Table 4-5 Shared Campus Facilities Precinct

This page intentionally left blank

Firearms Training Precinct

The Firearms Training Core is adjacent to the Tactical Training Core to maximize cross-training efficiency. The Firearms Training Core includes facilities that support firearms training. This area also houses weapons and ammunition maintenance and distribution.

Figure 4-4 Firearms Training Precinct

This page intentionally left blank

Proposed projects associated with the Firearms Training Precinct include:

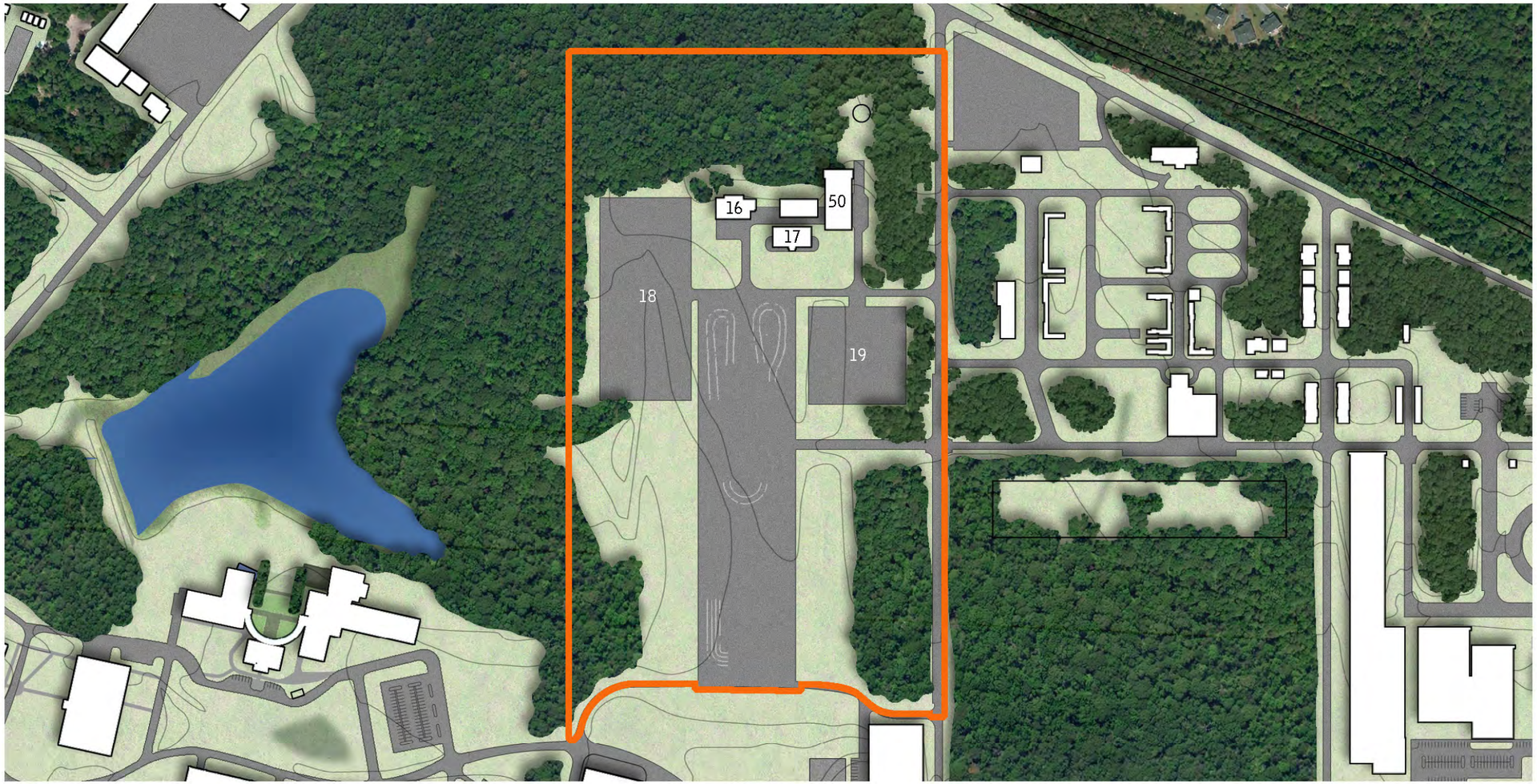
Building Number	**Firearms Training** Building Name & Description
13	**SOTS RANGE BUILDING 142,450 SF** The Knight Hotel Building, which currently houses the SOTS unit personnel, would be restricted to training functions with the implementation of the 2012 RTC Master Plan. The campus is unable to support specialized weapons training programs at this time. These programs are currently conducted at an off-site facility. In order to meet current needs for SOTS office and support spaces and on-site specialized weapons training, these functions would be consolidated in the new SOTS Range Building. The building would combine office and associated support space with a state-of-the-art rifle range and weapons center. The Firearms Training precinct is located adjacent to the Tactical Training precinct for proximity to the tactical training facilities where most of the SOTS Basic Training exercises are held. *Program and Design Considerations* The office space would accommodate an expanded technical staff of 21 with associated support staff. The shared classroom space would be provided for Basic Training. Approximately 150 CAT and ERT agents are expected to use the classrooms for their cycle training programs. A simulated control room for tactical exercises would also be included in the building's educational spaces. The enclosed, conditioned ranges would include a 20-point, 274,320 mm range for SOTS training and weapons research and development and a 12-point, 91,400 mm range. Range support spaces would include a weapons cleaning facility, CS (counter-sniper) calibration room, and a small armory. State-of-the-art bullet traps would mitigate environmental contamination concerns and simplify range maintenance. Overhead doors located to the side of the ranges would enable the addition of obstacles on the range during selected training exercises. *Materials* The weapons range portion of the building would incorporate precast concrete panels to minimize required maintenance, while decorative concrete block for the classroom/office portion would relate the structure to the rest of the campus.
14	**FIREARMS TRAINING COMPLEX 79,350 SF** The demand for Basic Weapons Training, In-Service Training, and firearms qualification is far greater than the existing ranges are able to accommodate. With the projected growth of training programs and a greater emphasis on In-Service Training, expanded range facilities are needed. Together with the proposed adjacent SOTS Range Building, the new Firearms Training Complex would provide a consolidated firearms complex. *Program and Design Considerations* The new building would group the unit offices with three classrooms and a weapons library. An enclosed 30-point, 45,720 mm range and a 24-point, 22,860 mm range would be provided for the Basic Firearms Training program. Adjacent to the ranges, support spaces would include weapons and ammunition storage, weapons cleaning, control towers for each range, and locker facilities for instructors and students. State-of-the-art bullet traps would mitigate environmental contamination concerns and simplify range maintenance. Existing ranges would remain operational to meet demand for In-Service Training and weapons qualifications. *Materials* The weapons range portion of the building would incorporate precast concrete panels to minimize required maintenance, while decorative concrete block for the classroom/office portion would relate the structure to the rest of the campus.

Building Number	**Firearms Training** Building Name & Description
15	**ARMORY 14,700 SF** The relocation and consolidation of firearms training facilities from the western to the eastern portion of the campus would require relocation of basic firearms support programs. A new Armory Building would be located immediately adjacent to the new range buildings. The Armory would centralize weapons and ammunition distribution and weapons maintenance facilities for the campus and weapons repair services for the USSS. Office space with associated support space would be provided for 15 personnel. *Program and Design Considerations* The distribution and repair functions would be located in warehouse space with adjacent loading docks. The office area would contain 15 workstations in an open-office setting and typical office support space. The primary design considerations for the development of the Armory are focused on efficient centralization of programs and services to effectively support the various firearms training programs at RTC. *Materials* The warehouse portion of the building would feature concrete panels to minimize weapons safety concerns. The office portion of the armory would use typical office finishes and the exterior walls would incorporate decorative concrete block selected from the campus palette (see *Section 5.5 Design Guidelines: Architectural*).

Table 4-6 Firearms Training Precinct

Protective Operations Driving Course (PODC)

Contains training and operational facilities related to Driver Training programs.



PODC Core

16. Moran Building Addition
17. Static Display Building
18. PODC Expansion
19. PODC Skid Pad
50. Vehicle Storage Buildings

James J. Rowley Training Center
Laurel, Maryland

N

0′ 300′ 600′ 1200′

Figure 4-5 PODC Facilities Precinct

This page intentionally left blank

Buildings and projects associated with the PODC Precinct include:

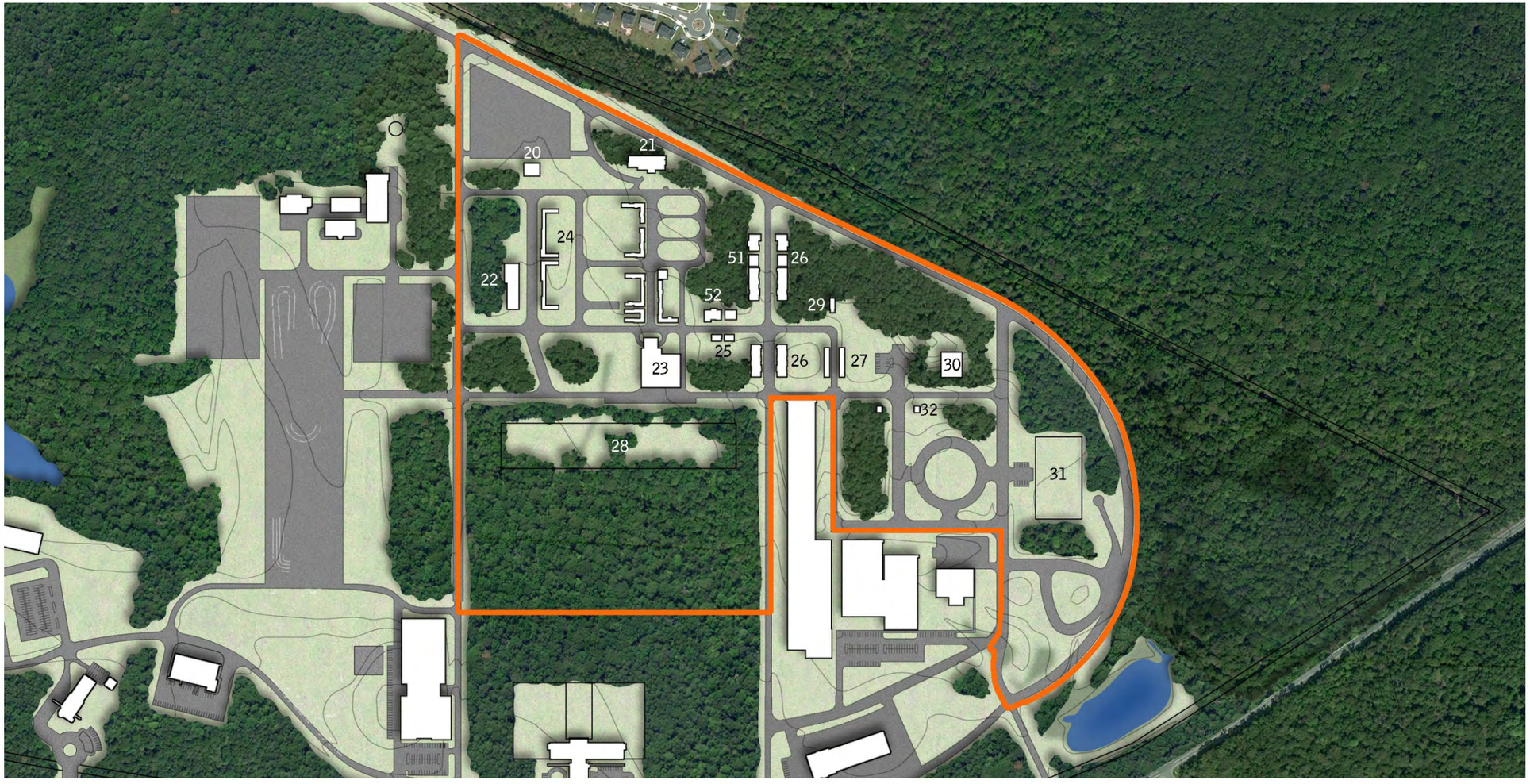
Building Number	**Protective Operations Driving Course** Building/Area Name & Description
16	**MORAN BUILDING & ADDITION 4,100 SF** A recent renovation of the existing Moran Building solved many functional concerns but did not address the projected expansion of the training program. The Moran Building addition would alleviate overcrowding caused by a projected increase in the size of the instruction staff as well as the expansion of Basic and Advanced Driver Training, Bicycle Training, and Motorcycle Training programs. The expanded space would also accommodate the administration of additional In-Service Training programs to refresh the perishable skills of on-duty agents. *Program* The new addition would add a 24-person classroom as well as additional workstations to accommodate the expansion of the training staff. A second roof deck would be added above the new construction to provide an observation platform for the new PODC pad which would be located immediately west of the building. *Design Considerations* The exterior design would be primarily influenced by the effort to maximize added space and minimize construction costs, working within the color and materials palette of *Section 5.5 Design Guidelines: Architectural*. The addition would be located on the western side of the existing building to coordinate with the existing interior layout to minimize the amount of work required to integrate existing and new construction. *Materials* The exterior would be detailed to match the existing building.
17	**STATIC DISPLAY 6,600 SF** The new Static Display Building would address three campus and Protective Transportation unit needs: • It would provide a finished space suitable for displaying the collection of past presidential vehicles, currently stored in a metal warehouse. These vehicles are maintained as part of the historic record and are of much interest to visiting dignitaries. • A covered roof deck would improve the ability of instructors to oversee training exercises on the adjacent PODC pad. • Finally, it would provide an additional training venue by its proposed resemblance to a commercial car dealership. *Program and Design Considerations* The new building would require few program spaces beyond the large open display room that would house the vehicles. Other program spaces would be located along the back wall, including a seminar room, restroom facilities, and mock offices for use during tactical training exercises. Curtain wall would enclose the double height display space, providing day lighting to the entire interior. Its proposed location at the head of the PODC pad, in front of the other PODC buildings, would make this building the central architectural feature of the Protective Transportation Training unit. *Materials* The front of the building would employ storefront, including curtain wall construction to simulate a car dealership; the trim, side and rear walls would feature materials and finishes selected from the campus palette (see *Section 5.5 Design Guidelines: Architectural*).

Building Number	**Protective Operations Driving Course** Building/Area Name & Description
18	**PODC PAD EXPANSION (EXPANDED OUTDOOR AREA)** In order to relieve scheduling conflicts and expand protective transportation training, space for an additional asphalt driving pad has been designated to the west of the existing pad and building complex. The new pad would be accessed from the far north edge of the existing pad to minimize conflicts. Its location would allow an unobstructed view of the new driver course from the proposed Moran Building observation platform.
19	**PODC SKID PAD (NEW OUTDOOR AREA)** Located adjacent to the existing PODC pad, this new concrete pad would be used to practice wet maneuvers without disrupting exercises on the main pad or creating hazardous conditions on the adjacent pavement with water overflow from these exercises. Water service and a hose storage building would be provided with the construction of the skid pad.
50	**EXISTING VEHICLE STORAGE BUILDING 6,400 SF** The Vehicle Storage Building was completed in 2006. It is expected to remain in use. No work is proposed under the 2012 RTC Master Plan.

Table 4-7 PODC Facilities Precinct

Tactical Training Precinct

The tactical training precinct includes specialized training facilities and simulated buildings for scenario training exercises.



Tactical Training

25. Residential Scenario - Single Family Home
26. Residential Scenario - Townhomes
27. Beltsville Judgmental Range
28. Confidence/Obstacle Course
29. Cover Course
30. Flexible Shoothouse
31. Tactical Obstacle Course
32. White House Lawn Mockup

51. Tactical Village
52. Bell Raid House

James J. Rowley Training Center
Laurel, Maryland

N

0′ 300′ 600′ 1200′

Figure 4-6 Tactical Training Precinct

This page intentionally left blank

Buildings and/or projects associated with the Tactical Training Precinct include:

Building Number	**Tactical Training** Building/Area Name & Description
20	**AIRPORT BUILDING & APRON 3,000 SF BUILDING, CONCRETE APRON** The proposed new, relocated Airport Building and apron reflect the desire to consolidate tactical training venues into one area of the campus. The small Airport Building would double as a classroom space for briefings and as an additional scenario training facility. The apron would be sized such that the fuselage of an out-of-service Air Force One plane and a Marine One helicopter can be located there for simulation exercises. *Program* The conditioned Airport Building would contain an open lobby space to be used as a classroom. Restroom facilities as well as equipment storage would be provided along with a few smaller spaces, such as mock offices to enable a broader range of training simulations. *Design Considerations* The design of the one-story building would mimic a small, rural airport terminal for use in tactical simulations. The building would also serve as remote classroom space for student briefings and review. *Materials* The materials used in the new airport building would include decorative concrete block exterior walls and a standing seam metal roof selected to coordinate with the unified image of the campus. Concrete would be used for the apron. The inherent durability of these materials would withstand the heavy use that training facilities receive, would maximize the life of the building, and minimize maintenance costs.
21	**SIMPSON BUILDING 4,000 SF** The Simpson Embassy Building is at the north end of the existing Tactical Village. The existing building is constructed of concrete masonry units inside and out, built to withstand the abuse of extreme tactical training exercises that employ flash-bang explosives and paint guns. However, limited space and flexibility hinder many potential training uses of the space; the lack of restroom facilities and briefing space make the building the least popular training venue on campus. The proposed two-story addition is intended to address these concerns and would revitalize the building, making it more functional as a scenario training facility. *Program and Design Considerations* The lower level of the addition would contain a new briefing space, restrooms, and a utility space within a conditioned envelope. The remainder of the addition would contain vertical circulation elements and long hallways to support additional tactical training exercises. *Materials* The new addition would incorporate materials found in the existing building, including split-face block for the exterior skin, painted concrete masonry unit interior walls and concrete floors, all appropriately durable materials. The conditioned spaces would include office-typical finish materials, such as painted gypsum walls, acoustical ceiling tiles, and floor tiles to make the instructional and support areas comfortable for the instructors and students who use them.

Building Number	Tactical Training Building/Area Name & Description
22	**NON-TACTICAL VILLAGE & MOCK FIELD HOUSE 49,000 SF** The non-tactical investigative training programs, such as those offered in the general protective training do not typically employ live-fire for exercises; however, they currently share training space with the more hazardous tactical training programs. A separate area for non-tactical training programs is required due to scheduling conflicts and incompatible, potentially dangerous training conditions. A new, simulated streetfront adjacent to the existing tactical village would be provided for non-tactical simulations. Use-of-Force training and live-fire would be prohibited in this area. Some of the structures would contain conditioned spaces and would be designed to accommodate training equipment, including a printing press. A modular building immediately adjacent to the tactical village structures currently a mock Field Office. The mock field office is used for training in operational procedures specific to USSS field offices. However, due to changes in operational procedures and the increase in the number of students who participate in the training, the existing mock field office no longer accurately represents typical field office conditions. A new, up-to-date mock field office is proposed as part of the non-tactical simulated commercial streetscape. *Program* The facility would provide three 24-person classrooms to improve the educational efficiency of the training units that would use the building. Specialized secure spaces for sensitive training equipment would be provided. The building would also provide full mockup simulations of various real-life functions, such as a bank lobby, restaurant, retail store, and office space. The new mock field office would be located on an upper floor of a simulated office building and would provide program spaces with a layout similar to what is found in a typical USSS field office. *Design Considerations* A variety of simulated commercial buildings would expand the range of simulated training spaces that currently exist on the campus. One section of simulated buildings would be 10 to 12 feet deep, unconditioned structures of two to three stories. Others, such as the new mock field office, classrooms and other specialized spaces to support training programs, would contain fully conditioned training spaces. *Materials* The materials used for the tactical village structures would represent the wide range of commercial construction systems in general use for the offered simulations, such as glass storefront for retail simulation or decorative insulated metals panels and strip windows for an office building.
23	**KNIGHT BUILDING HANGAR RENOVATION 9,600 SF** The Knight Building currently serves multiple uses: a mock hotel for tactical simulations as well as overflow office space for the Tactical Training and Physical Training units. A large hangar space is attached to the eastern side of the main building and contains an inefficient layout of training scenarios, storage, and maintenance areas. Under the 2012 RTC Master Plan, the offices would be relocated to the expanded Administrative Precinct. What is now office space in the Knight Building would then be renovated for drop-in workstations, additional classroom space, and physical training rooms. The existing hangar would be reorganized and space maximized by the addition of a mezzanine to house operational programs, such as weapons maintenance and equipment storage. The collection of Basic Training simulations would be expanded to include additional long hallway and stairwell scenarios.

Building Number	**Tactical Training** Building/Area Name & Description
24	**EAST TACTICAL VILLAGE 18,000 SF** Along with construction of the Non-Tactical Village, an expansion of the Tactical Village is planned to provide increased training capacity. The new East Tactical Village would relieve the current scheduling conflicts that limit practical training opportunities; these facilities would be designed to meet the needs of the expanded training program. *Program & Design Considerations* The two and three-story masonry structures of the East Tactical Village would feature facades representing a variety of common city and suburban commercial streetscapes. The unconditioned buildings, ten to twelve feet deep, would be organized to provide tactical positions along the building fronts and additional indoor scenario training spaces. The buildings would be sited on a wide asphalt road lined with sidewalks and planting beds to approximate streetscape conditions. *Materials* Many of the tactical training programs employ paint ball guns to simulate gunfire and flash bangs to simulate explosions. Masonry and concrete construction would limit damage during exercises; true windows and doors would not be provided in the building facades.
25 26 52	**RESIDENTIAL SCENARIOS – SINGLE FAMILY HOUSING 3,000 SF** **RESIDENTIAL SCENARIOS – TOWNHOUSES 21,600 SF** **BELL RAID HOUSE 2,500 SF** The existing single-family house scenario, the Bell Raid House, limits the type and number of tactical training exercises that can be offered. Also, as students quickly become familiar with the layout, the opportunity to test skills under the disadvantage of unfamiliarity is lost. To supplement the existing Bell Raid House, the construction of three new single-family houses and 12 townhouses would increase the variety of training scenarios and the capacity to accommodate the growing student population. *Program and Design Considerations* The interior layout and exterior appearance of the new units would be selected from standard developer-built housing models to minimize construction cost and time. Specific models would be chosen to maximize flexibility. The new houses would be conditioned and fitted with video surveillance for remote observation. Running water would not be provided to limit initial cost and future maintenance. *Materials* The existing residential scenario has shown that vinyl siding is easily damaged during typical training exercises. To address this concern, the new structures would be finished with Hardiboard or masonry. Interior partitions would be constructed of plywood sheeting to minimize interior damage.

Building Number	**Tactical Training** Building/Area Name & Description
27	**BELTSVILLE JUDGMENTAL RANGE (BJR) 4,500 SF** As part of the consolidation of Tactical Training venues, the Beltsville Judgmental Range (BJR) Basic Training program would be relocated from the existing judgmental range in the western portion of the site to a new, expanded BJR adjacent to the Tactical Training Villages. The arrangement and construction of the new judgmental range would be similar to the tactical villages but would be dedicated to a specific training program. These facilities and the adjacent cover courses are in constant use and require the presence of instructional staff. *Program and Design Considerations* A conditioned building adjacent to the mock commercial streetscapes would be provided for the instructors. The building would contain office and associated support space, a 24-person classroom, and a projection room for visual simulation exercises, such as FATS (Firearm Automated Training System). The construction of the new commercial streetscapes would feature heavy duty, resilient materials designed to withstand hard use. Pop-up targets would be provided at façade openings. *Materials* Like other tactical training venues, the Judgmental Range training program employs the use of paint ball guns to simulate gunfire and flash bangs to simulate explosions. In order to reduce damage during exercises, the structures would be constructed of masonry and concrete, without true windows and doors in the building facades.
28	**CONFIDENCE/OBSTACLE COURSE (EXPANDED OUTDOOR AREA)** To address the expressed need for an Confidence/Obstacle course, a 3.5 acre site would be created immediately south of the Knight Hotel Building. The adjacent building would provide a staging area during training and conditioning exercises for students and instructors using the course. A portion of the fenced area would remain wooded for installation of a ropes course. The relatively low cost associated with the limited scope of work, partial clearing of the site and an eight-foot high perimeter fence, makes this course among the most cost-effective training venues.
29	**COVER COURSE (RELOCATED OUTDOOR AREA)** The new Cover Course would replace the existing courses located near the current Beltsville Judgmental Range on the western side of the campus. This is part of the overall effort to consolidate all tactical training venues in one area of the site. The current facility would remain available to serve the In-Service Training programs without disrupting Basic Training exercises. The course would be composed of an unconditioned 200 SF wooden pavilion with Plexiglas walls overlooking two paved, cover courses located on opposite sides of the pavilion.

Building Number	Tactical Training Building/Area Name & Description
30	**FLEXIBLE SHOOT HOUSE 7,200 SF** A new shoot house, similar to the existing Magaw Tactical Training Facility located on the western side of the campus, is planned as part of the effort to consolidate the tactical training venues. The dual facilities would relieve scheduling conflicts anticipated with the growth of the Basic Training and In-Service Training programs. Unlike the Magaw facility, the new shoot house would have the capability to easily reconfigure interior ballistics-rated walls, permitting a nearly unlimited number of spatial arrangements. *Program* Due to the relative remoteness of the new facility, a 24-person classroom would be included in the program to provide a staging area for the exercises. A conditioned observation deck, located above the classroom would permit instructional observation during training exercises. The training room would be fully enclosed and conditioned to allow for year-round exercises. The plywood and sand modular interior wall panels would be designed to catch fired ammunition and minimize ricochets. A motorized track system suspended from the ceiling would allow instructors to arrange these panels into multiple room and hallway simulations. *Design Considerations* The building would be designed to maximize flexibility by simplifying circulation and observation and by incorporating movable walls. It would be located in one corner of the tactical training core to promote safety while maintaining a practical proximity to the other tactical facilities. *Materials* The classroom and observation section of the shoot house would be clad in modular metal panels to reduce long-term maintenance requirements and blend with the overall design of the campus. The live-fire space behind the classroom, would be constructed of precast walls and ceiling panels to confine bullets within the training space. Plywood and sand panels would line the interior space to reduce the risk of ricochet.
31	**TACTICAL OBSTACLE COURSE (NEW OUTDOOR AREA)** In addition to the Confidence/Obstacle Course, another tactical course is needed. This course would allow the use of paint guns and flash-bangs during obstacle course exercises. A solid masonry wall would surround the entire perimeter.
32	**WHITE HOUSE LAWN MOCKUP (EXPANDED OUTDOOR AREA)** Providing realistic training scenarios for the Uniformed Division Officers is vital to the USSS's ability to perform the duties charged to them. One such duty is the operation and protection of entry points to the South Lawn of the White House. The acquisition of the old White House gatehouses provides an opportunity to build a mockup of the South Lawn and entry sequence on the campus. A to-scale model of the lawn and entry gates would be created with the construction of a simulated South portico on the back of the Firearms Training Complex. The gates would be located along the existing roadways in this area. The mockup would address a number of training needs ranging from tactical training to protective driver motorcade training.
53	**MUNITIONS BUNKERS 1,250 SF** The Munitions Bunkers are located at the eastern tip of the campus. They are expected to remain in use.

Table 4-8 Tactical Training Precinct

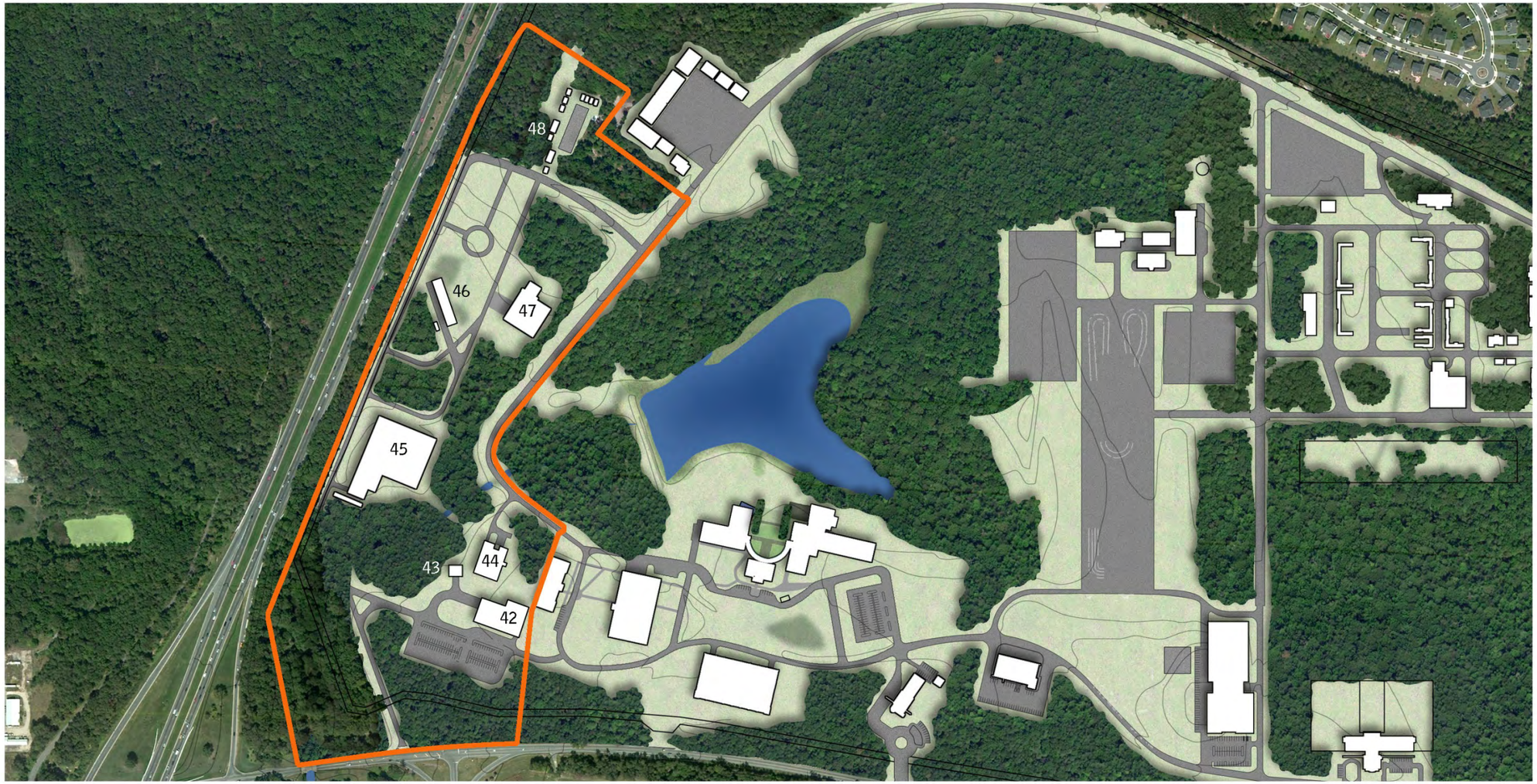
Existing Facilities Precinct

As facilities are developed elsewhere on campus providing new training facilities for the Basic Training programs, the existing facilities located on the western-most end of the site become available for a dedicated In-Service Training precinct, tentatively called the West Campus. Re-positioning these buildings offers an important benefit: separation between Basic Training operations and a future expanded In-Service Training program. This separation addresses current operational and scheduling conflicts between these distinct programs. Furthermore, the buildings included in this precinct offer diverse In-Service Training options.

Most of these existing facilities require little work, beyond general maintenance, to prepare them for reuse by a future In-Service Training program. The two exceptions included in the 2012 RTC Master Plan focus on upgrades to the existing Judgmental Range and include:

- New water and sewer service to the existing BJR complex;
- Roof replacement over the eastern building facades of the judgmental range before catastrophic failure occurs.

It should be noted that due to the age of many of these facilities, it is likely that additional critical upgrades and repairs may be required by the time the new Basic Training facilities become operational. These will be considered on a case-by-case basis in outlying years and are outside the scope of the 2012 RTC Master Plan.



Existing Facilities

42. Wilkie Firearms Building
43. Ammunition Storage Depot
44. Wilson PT Building
45. Baughman Outdoor Firing Range
46. Beltsville Judgmental Range (BJR)
47. Magaw Tactical Training Facility
48. Existing Maintenance Yard

James J. Rowley Training Center
Laurel, Maryland

N

0′ 300′ 600′ 1200′

Figure 4-7 Existing Facilities Precinct

This page intentionally left blank

Those facilities that will be retained for reuse in the Existing Facilities Precinct include:

Building Number	Existing Facilities Precinct Building/Area Name & Description
42/43	**THE WILKIE FIREARMS BUILDING 40,900 SF** **AMMUNITION STORAGE BUILDING 2,000 SF** The Wilkie Firearms Building currently houses firearms training functions, staff, and support spaces; Emergency Services and the Weapons Library occupy some of the first floor area. It is a two-story building built in 1971-72, originally constructed as the RTC administrative building. After a fire incident, a major interior renovation project was completed in 2005. First floor spaces include classrooms, firearms staff offices, office support spaces, and a training mat room; the Weapons Library has office space, classroom, secured storage, and weapons display off of the entrance lobby. Emergency Services, also on the first floor, includes a clinic and offices. The lower level contains a 75 ft. indoor pistol firing range, weapons distribution center, and the primary USSS armory facility. A one-story ammunition storage depot is located east of the Wilkie Firearms Building; they are connected by an exterior walkway. Both buildings have truck loading bays for delivery and distribution of weapons and ammunition.
44	**WILSON PHYSICAL TRAINING BUILDING 31,650 SF** The Wilson Physical Training Building is the primary physical fitness training facility for the RTC; it holds offices for the Physical Training staff and the Special Operations Training Section (SOTS). It is a two-story building with a basement built in 1989-90. The building includes weight and aerobic training rooms, a mat room, locker rooms with showers, staff offices and support spaces, a heated 75 ft. training pool with observation deck and storage spaces for training equipment. The existing locker and shower facilities are inadequate to support the current Basic Training program and staff requirement for the campus.
45	**THE BAUGHMAN OUTDOOR RANGE COMPLEX 68,750 SF** The outdoor ranges include a 300 ft. rifle range and a 150 ft. pistol range; they currently serve as the primary ranges for training and agent qualifications and were built in the early 1970s. Adjacent to the ranges are staff offices and support space, classrooms and restrooms with lockers. There are a series of stand-alone buildings, totaling nearly 1,185 SF within the range complex which include a temporary trailer with staff offices, a secure storage bunker and a warehouse building that contains armory storage, a weapons cleaning space and storage for spent ammunition shells.

Building Number	Existing Facilities Precinct Building/Area Name & Description
46	**EXISTING JUDGMENTAL RANGE BUILDINGS 11,100 SF** *Cover Courses* Cover courses are an integral part of Basic and In-Service Training. The two cover courses consist of an outdoor pad with various sized objects used for cover exercises. There is a protected station located at the end of the course occupied by the instructors during the exercise. These are typically simmunition drills, separation from the active areas is required. *Classroom Building* The classroom building contains video control equipment for the Firearms Automated Training System (FATS) and is used for simulated tactical training. It is a one-story, 500 SF structure with a classroom and control booth used to operate the Range 2000 computer simulation system. *Judgmental Range Office Building* This structure is a two-story, 1,240 SF building containing the office and support spaces for the Judgmental Range instructors. Along with the instructors' offices, there is a storage room containing a secured storage locker for weapons and a covered porch on the south side that serves as an observation post for the cover course behind the building and as a weapons cleaning station. The building also operates as the control center for the adjacent tactical facilities targeting system. The primary deficiency for all of the Judgmental Range facilities is the lack of running water and sanitary sewer infrastructure. Restrooms currently consist of two (male and female) port-o-potties located in close proximity to the classroom building. New permanent restroom facilities are proposed to address this deficiency before re-positioning as part of the In-Service Training program. *Judgmental Range Tactical Facades (BJR)* Located adjacent to the office building, these facades are used for tactical training exercises. They consist of two rows of structures (total area 9,330 SF) separated by a roadway. The eastern row of building facades includes a large overhang backed by an earth berm designed to capture ammunition when the facility was used for live-fire exercises. Mechanical targets are located at openings, but are currently out of operation. The eastern facades have fallen into disrepair and the covered roof requires replacement. The western facades are newer and appear to be adequate for continued use.
47	**MAGAW TACTICAL TRAINING FACILITY 8,100 SF** The Magaw Tactical Training Facility serves as the close quarters, live-fire tactical facility for the campus. It is a two-story, open-air structure built in 1999. The lower floor consists primarily of scenario rooms with plywood and sand walls. Doors are provided with replaceable hardware panels; a CMU (concrete masonry unit) lined stairwell scenario occupies a central location and extends up to the second level. A second level observation deck covers only the southern third of the building; walkways are provided above the walls of the main tactical space to provide observation positions for instructors during an exercise.
48	**EXISTING MAINTENANCE YARD 6,000 SF (TOTAL AREA OF SEVERAL BUILDINGS)** The current Maintenance Facility is a series of workshop and storage buildings arranged around a maintenance yard. The inventory of structures includes: a one-story masonry building currently serving as the campus armory and containing a male and female shower facility, two prefabricated metal buildings containing the maintenance staff offices, support spaces, and a workshop space, a trailer containing additional maintenance staff offices, a prefabricated metal garage currently used for general storage and Continuity of Operations Plan (COOP) supply storage, and seven wooden storage sheds bordering the east and north edge of the maintenance yard. Vehicle storage is located on the western edge of the yard. The grounds contractor occupies a wooden shed nearby. A number of landscaping components, such as sand, soil and large scale maintenance supplies are dispersed in various outdoor locations on the campus.

Table 4-9 Existing Facilities Precinct

4.11 Program Table

Area requirements were confirmed by USSS in 2011 for each of the units with a planned presence at RTC. These area requirements are summarized in *Table 4-10 Summary of Area Requirements*. It should be noted that these requirements will be subject to verification as the phased implementation of the proposed build-out under the Master Plan is undertaken.

Summary of Area Requirements

	Office, Branch, Section	Assignable Area (SF)	Usable Area (SF)	Approximate Gross Area Required (SF)
Office of the SAIC – Training Management Board	Office of the ASAIC			
	Mission Research and Development	860	1118	1342
	Policy Development	860	1118	1342
	Administrative Support	2850	3705	4446
	Finance	1025	1333	1599
	Registrar	1350	1755	2106
	External / In-Service Training	960	1248	1498
	Student Affairs	1045	1359	1630
	Subtotal	**8950**	**11635**	**13962**
Use of Force Branch	Office of the ASAIC		0	0
	Firearms Policy Development	2760	3588	4306
	Firearms Range Operations*	244960	318448	382138
	Control Tactics	29650	38545	46254
	Subtotal	**277370**	**360581**	**432697**
Mission Training Branch	Office of ASAIC		0	0
	Investigations	12800	16640	19968
	Legal	3165	4115	4937
	Protective Transportation	22120	28756	34507
	Protective Detail Training	6950	9035	10842
	Canine Training**	11875	15438	18525
	General Protection	8525	11083	13299
	Counter-surveillance & Protective Intelligence	11925	15503	18603
	Special Operations Training	18800	24440	29328
	Subtotal	**96160**	**125008**	**150010**
Campus Services Branch	Office of ASAIC		0	0
	Facilities	15500	20150	24180
	Supply / Property	10475	13618	16341
	Gatehouse	4975	6468	7761
	Information Technology Support	2530	3289	3947
	Operations Fleet Management	2260	2938	3526
	Visual Productions	2070	2691	3229
	Subtotal	**37810**	**49153**	**58984**
Academic Process Branch	Office of ASAIC		0	0
	Instructional Management	6915	8990	10787
	Employee Development	3980	5174	6209
	Technology-based Training	4005	5207	6248
	Simulation Labs	14855	19312	23174
	Executive Development		0	0
	Needs Assessment and Analysis		0	0
	Subtotal	**29755**	**38682**	**46418**
Physical Skills Branch ***	Office of ASAIC		0	0
	Physical Fitness / Water Safety	41770	54301	65161
	Emergency Services	13060	16978	20374
	Subtotal	**54830**	**71279**	**85535**
	Total Space Requirement	**504,875**	**656,338**	**787,605**
	* Includes covered outdoor ranges **Does not include outdoor training area ***Substantial outdoor requirements not included			

Table 4-10 Summary of RTC Area Requirements

The continued use of many of the existing buildings as well as the proposed new construction described in the Master Plan addresses these area requirements.

5.0 K_qrcp Nj_l Implementation

This page intentionally left blank.

5.0 Master Plan Implementation

5.1 Overview

The proposed construction in this Master Plan represents the next phase in the on-going development of the RTC campus. Much of the significant new construction proposed in the last approved Master Plan (1996) has been completed with the addition of the Merletti and Bowron buildings to the campus.

The 2012 RTC Master Plan does not require the acquisition or lease of any additional land. The proposed new buildings are compatible with existing uses on the campus and are needed to support improvements to existing programs as well as requirements for proposed new programs. Guidelines for the development of the campus are provided to support

- Establishment of a coherent campus architecture based on forms, materials, and colors used in the signature buildings;
- Completion of a signature heart of the campus consisting of key campus buildings surrounding a formal outdoor space;
- Reinforcement of RTC's character as a wooded campus;
- Improvement of campus access and security;
- Achievement of sustainability and resource management goals through reuse of existing buildings and equipment and prescriptive guidelines for performance of new systems and buildings;
- Management of stormwater and delineated wetlands.

This page intentionally left blank

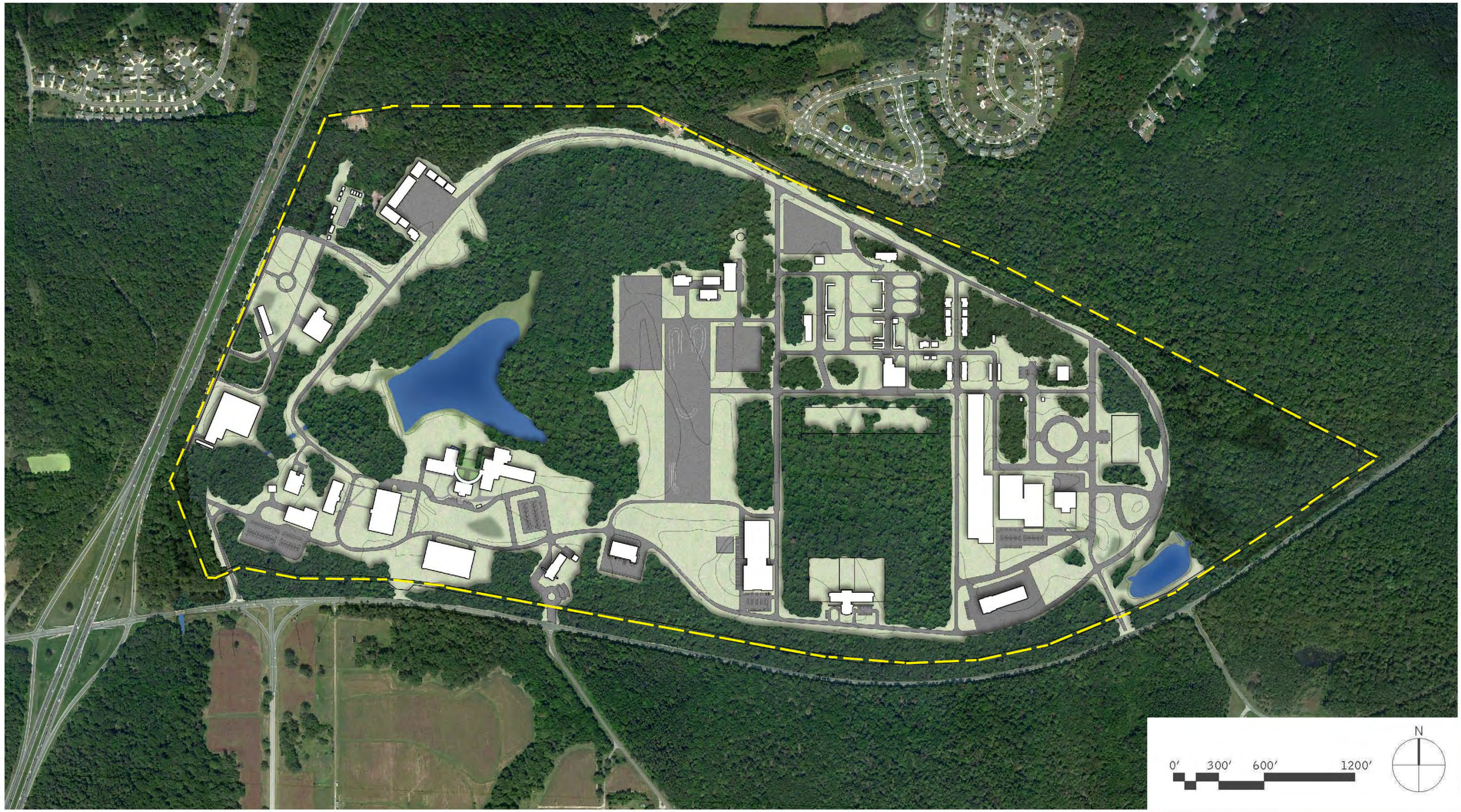


Figure 5-1 RTC Master Plan

This page intentionally left blank

5.2 RTC Master Plan Summary

Table 5-1 summarizes data associated with the proposed development under the 2012 RTC Master Plan:

RTC 2012 MASTER PLAN SUMMARY

		Bldg. No.	Existing Conditions	Projections (Full Build-out per the MP)
RTC Area (Acres)	Precinct A: Administrative		*	56
	Precinct B: Shared Campus Facilities (Support)		*	67
	Precinct C: Firearms Training		*	17
	Precinct D: Protective Operations Driver Training (PODC)		*	50
	Precinct E: Tactical Training		*	84
	Precinct F: Existing Facilities (Training & Support)		56	56
	Undeveloped			109
	TOTAL		**439**	**439**
	*Current development is not organized in precincts. Areas of existing buildings are shown below.			
RTC Population	Average Daily Employee Population		285	460
	Average Daily Trainee Population		48	200
	TOTAL		**333**	**660**
		Bldg. No.	Area (SF)	Area (SF)
Building Floor Area	Precinct A: Administrative	Gatehouse & Site Access Control	1	6,500	7,850
		Multipurpose Building and ROC	2		106,350
		SPD Office Building	3		44,100
		Administration and Classroom	4		52,200
		Parking Structure[d]	5		112,000
		Merletti Building Addition and	6	16,600	36,250
		Bowron Administration Building	49	14,950	14,950
		Supply Center	7		13,250
	Precinct B: Shared Campus Facilities (Support)	Drummond Airport Building /	8	2,500	38,100
		Physical Training Building[d]	9		71,600
		Canine Training Facility	10	8,000	20,100
		Emergency Medical Training Facility	11		38,600
		Helicopter Pad	12		New Outdoor
	Precinct C: Firearms Training	SOTS Range Building (300 yd	13		142,450
		Firearms Training Complex	14		79,350
		Armory	15		14,700
	Precinct D: PODC Training	Moran Building	16	3,300	4,100
		Static Display Building	17		6,600
		PODC Expansion	18		Expanded
		PODC Skid Pad	19		New Outdoor[d]
		Vehicle Storage Facility	50	6,400	6,400
	Precinct E: Tactical Training	Airport Building & Apron	20		3,000
		Simpson Building	21	4,000	4,000
		Non-Tactical Village & Mock Field Office	22	41,750	49,000

		Knight Building	23	9,600	9,600
		East Tactical Village	24	18,000	18,000
		Bell Raid House, Residential	52	2,500	3,000
		Residential Scenarios –	26		21,600
		Judgmental Range	27	3,500	4,500
		Confidence/Obstacle Course	28		expanded
		Cover Course	29		relocated
		Flexible Shoot House	30		7,200
		Tactical Obstacle Course	31		new outdoor
		White House Lawn Mock-up	32		expanded
	Precinct F: Existing Facilities (Training and Support)	Wilkie Firearms Building	42	40,900	40,900
		Ammunition Storage	43	2,000	2,000
		Wilson PT Building	44	31,650	31,650
		Baughman Outdoor Firing Range	45	68,750	68,750
		Existing Judgmental Range	46	11,100	11,100
		Magaw Tactical Training Facility	47	8,100	8,100
		Existing Maintenance Yard	48	6,000	6,000
		Munitions Bunker	53	1,250	1,250
		TOTAL		**303,000**	**1,059,250**
RTC Parking	Number of Parking Spaces**			688	1,038
	Less Number of Fleet/Training Vehicles			-294	-441
	Number of Non-Fleet Parking Spaces			394	597
	Number of Employee Parking Spaces				440
	Number of Visitor Parking Spaces				157
	Ratio of Employee Parking Spaces to RTC Employees				1:1.5
	**Assumptions 1. Future Parking assumes that loss of spaces in the Bowron lot would be offset by new parking adjacent to new buildings. 2. Growth in Fleet/Training Vehicles would not directly correspond to population growth. A factor of 1.5 has been used.				

Table 5-1 RTC 2012 Master Plan Summary

5.3 Policies and Regulations

Code and Regulatory Requirements

The following is a partial list of codes and standards which may be applicable for projects on the RTC campus. For any project, which of these are relevant will depend on the scope of the work and the terms of agreement with the contracting authority.

- The current editions of nationally recognized model building codes, including, but not limited to: International Building Code (IBC), National Fire Protection Association (NFPA), National Electrical Code (NEC), International Mechanical Code (IMC), and International Plumbing Code (IPC);
- Applicable local codes and regulations;
- Applicable contract authority regulations;

- Environmental Protection Agency (EPA) regulations;
- Maryland Department of Natural Resources (MDDNR) regulations;
- American with Disabilities Act Accessibility Guidelines (ADAAG);
- Occupational Safety and Health Standards (OSHA);
- American National Standards Institute (ANSI) Publications;
- American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) standards;
- Energy Policy Act (EPACT) standards;
- Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) standards; and
- Leadership in Energy and Environmental Design (LEED) Green Building Rating System.

Environmental Design Policy

The construction and operation of US Government-owned facilities are also governed by the implementation of numerous policies that address the environmental impact of such facilities. These policies are outlined in, but not limited to Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance, October 5, 2009.

5.4 Design Guidelines: Removal of Existing Structures

The existing RTC campus buildings would largely remain under the Master Plan. Only two existing buildings would be removed. The canine program would relocated to a larger site to support its current and future needs, eliminating the need for the existing Canine Facility. The Gatehouse would be relocated to a site that would support the physical requirements for security at the entrance to the campus.

5.5 Design Guidelines: Architectural

Planning Strategy: Reinforce RTC Campus Identity

Creation of a world-class training campus, the stated goal of the RTC 2012 Master Plan, would foster a sense of institutional pride and shared experience for USSS alumnae who pass through the campus during their initial training and then return for continuing education opportunities throughout their careers. Further, as the mission of the training center expands to attract a broader audience from local and regional law enforcement professionals as well as private security contractors and the academic community, the appearance of the growing campus takes on additional importance.

The Master Plan develops a phased building program for the next 10 to 15 years; comprehensive attention to the aesthetic character of the campus as it develops incrementally is appropriate. These Design Guidelines provide such overall aesthetic guidance. In the mid-1990s, the Merletti and Bowron buildings were added to the campus. The architectural form and materials of these buildings and their relatively formal arrangement around an outdoor space has enhanced the campus character of the RTC and has influenced both the Development Plan and these Design Guidelines.

In addition to the aesthetic, there are practical reasons for such a unified vision; by general use of similar materials and systems, long-term maintenance is simplified, requiring a smaller maintenance staff with more general skills. Using common building materials throughout the campus allows efficient stockpiling

of replacement materials, reducing the time for repairs, and permitting bulk purchase of these materials. Similar HVAC, plumbing, and electrical equipment campus-wide promotes mastery of systems by personnel. This consistency also benefits future designs, as continued refinement to systems design takes place.

Development Program Guidelines

General

As each of the buildings proposed in the RTC 2012 Master Plan is undertaken, a study of the particular site and interior space requirements for that project would be conducted. However, there are general development program precepts, in addition to the particular functional space requirements for each proposed project, which have influenced the Development Plan for RTC and should be revisited as implementation of the 2012 RTC Master Plan progresses:

- A central main entrance on Powder Mill Road is desirable to provide a better interface with local traffic and provide space for improved security.
- Pedestrian amenities should be enhanced, with sidewalks and dedicated pedestrian paths connecting all buildings and areas of the site.
- Training programs for local, state, and other federal law enforcement agencies should be expanded as campus amenities are improved and built out, thus promoting resource and cost sharing.
- The wooded character of the campus should be maintained for tactical training as well as aesthetic and environmental reasons. The woods maintain visual privacy from surrounding road systems and residential development. They control sound transmission on and off-site and provide necessary natural buffers between administrative and training venues. Environmentally, they are relatively easy to maintain, reduce operating expenses, reduce stress on the water supply and protect groundwater on site and downstream.

Site Design Criteria

To realize advantages related to orientation, connectivity, and entry, develop site design at the earliest stage of the design process. Taken together with site-specific conditions, general design considerations include:

- Provide a clear primary building entry to avoid confusion and minimize visitor interaction with potentially sensitive areas. Secondary entries should be clearly identified, employing signage at a lower hierarchal level than that used at the primary entry.
- Provide pedestrian walkways to connect separate buildings that are functionally or geographically related. Formal exterior walkways or frequently used walkways should provide weather protection. Materials for covered walkways include: Masonry and steel vertical supports, exposed, decorative tube steel roof trusses, and standing-seam, pitched metal roof to match the adjacent building in color and scale.

- Provide outdoor, paved gathering spaces adjacent to employee activity and lounge spaces; they are perceived as amenities and are a relatively inexpensive way to provide additional program space in good weather.
- Place outdoor equipment, such as emergency generators and condensing units away from public view and building entrances. Screen exterior equipment with decorative masonry or metal walls and landscaping.

Types of Buildings

The proposed building inventory at the RTC may be categorized by building use for the purpose of discussing general and system design guidelines. Broad categories of facilities on the campus include:

- Office/Support, General Classroom, and General Training Facilities
- Storage and Maintenance Buildings
- Special Function Buildings

Office/Support, General Classroom and General Training Facilities

Many of the proposed buildings in the RTC 2012 Master Plan fall into this broad category. The Bowron Building and the Merletti Building, the most recent new facilities, constructed in late 1997 to house the RTC administrative functions (Bowron) and classrooms, technology training and research, and general office space (Merletti) are the exemplars for future buildings of similar function on campus. Their contemporary Arts and Crafts design features the following:

Figure 5.2 Materials & Forms in Current Use

- Decorative masonry exterior skin;
- Pitched, standing-seam metal roof; dormers are used to mask air louvers for attic mechanical units and to visually breakup expansive roof areas;
- Deep overhangs;
- Copper or bronze color metal, including windows, gutters and downspouts; and
- Clerestory windows tucked under substantial roof overhangs to visually separate the mass of the exterior walls from the roof, and to maximize daylighting of interior spaces.

Storage and Maintenance Buildings

The existing storage and maintenance buildings located in the maintenance yard and at the PODC are primarily pre-manufactured metal buildings customized for their specific functions. Ammunition and explosive storage is currently located in reinforced masonry or concrete structures remote from the training functions they support. Design criteria, including exterior materials selection, for such buildings will be necessarily influenced by campus location, function, and construction budget. Coordination with the sand/bronze/verdigris color palette used in the major campus buildings will help unify these utilitarian buildings with other campus buildings and the natural surroundings.

Special Function Buildings

The existing tactical training venues feature a range of building forms and materials selected primarily to serve functional rather than aesthetic criteria. Design criteria for future tactical training facilities will, likewise, be developed on a case by case basis. Where possible, coordination with the common materials and palette of the newer campus buildings should be undertaken.

Interior Space Planning Principles

There are a wide variety of functional requirements for the various buildings proposed in the 2012 RTC Master Plan. Some general guidelines for development of their diverse space requirements include:

- Where possible, group program areas by similar function and appropriate adjacencies.
- Seek opportunities to share support spaces between units to maximize efficiency.
- Other than administrative, dedicated classroom or formal public areas, spaces will be co-opted from time to time for tactical training or simulated training exercises for the Basic Training program. Consequently, interior layouts should be flexible and finishes durable.
- One large (2400 SF) classroom with an operable divider wall is, in general, preferred to two smaller (1200 SF) classrooms located next to each other to maximize flexibility.
- Place non-program spaces, such as restrooms and vertical circulation, in the center of buildings so that occupied spaces benefit form perimeter windows. Similarly, regularly occupied spaces where privacy is important, such as locker rooms, or where daylight is not desirable, such as computer based training rooms should be located away from the perimeter.
- Place program spaces that require access to water and sewer lines together to reduce plumbing construction, maintenance costs and to minimize roof penetrations for vent stacks. In buildings where future expansion is likely, consider the location of plumbing to minimize the impact of future construction on the existing building. If a building is more than one story, stack the plumbing.
- Directly connect primary horizontal circulation to primary building entrances. Provide effective signage.
- Consider privacy and sound transmission when placing program spaces.
- Anticipate future changes in the function of spaces by designing large, flexible spaces with demountable partitions. In general, plan for reconfiguration of data and power wiring and air distribution.

Exterior Building Systems

Wall Systems

Among the primary purposes for the development of design guidelines as part of the 2012 RTC Master Plan is the desire by the USSS to achieve coherent architectural and environmental development, campus-wide. Aesthetically, the contemporary interpretation of Arts and Crafts architectural style and materials of the Bowron and Merletti Buildings have formed the basis for the exterior building systems guidelines. Functionally, materials selection has been influenced by environmental and security considerations:

Primary material for building exteriors:	Decorative masonry in natural colors. Introduce articulation by color or texture banding and highlighting.
"Signature" Building Upgrade:	Stone veneer in similar colors and patterns (used selectively for campus public buildings).
Performance characteristics:	Exterior walls shall have a continuous air barrier unless incompatible with program requirements. Insulate exterior walls to a minimum assembly R-value of 13.
Security Considerations:	Buildings located within 100 feet of the secure perimeter are subject to DHS blast requirements for walls, windows, and exterior doors.
Daylight:	Window openings should be proportionally large to maximize interior daylight. Use clear glass and bronze aluminum frames and mullions. Glazing shall be "Low-e" coated.

It should be noted that these are general guidelines and will not be suited to all buildings. Tactical training facilities designed to represent certain building types, specialty buildings, such as firing ranges and maintenance facilities will necessarily have different requirements. In general, performance requirements should be implemented where feasible even when alternate materials have been selected. Many of the facilities that deviate from the general materials guidelines will be pre-fabricated metal buildings with insulated walls and roofs. Color selection of such construction should match or complement the natural palette of the masonry construction. Where these buildings front primary roadways or the central area of the campus, consider opportunities to completely or partially clad the metal building in the decorative masonry used elsewhere.

Figure 5-3 Typical Wall System Materials

Roof Systems

Standing Seam Metal Pitched Roof (preferred)

Color:	Weathered copper
Pitch:	No less than 4:12, determined by the scale and mass of the building
Dormers:	Use dormers to visually break up long expanses of roofing and to mask louvered air intakes and exhausts for attic mounted mechanical equipment.
Overhangs:	Provide deep overhangs (proportional to wall height) for all standing seam, pitched roof conditions.
Ice guards and rain diverters:	Provide ice guards and rain diverters for all pitched roofs above building entries, pedestrian circulation adjacent to the building, and at roofs adjacent to exterior equipment or personal property storage.
Performance:	Provide a continuous air barrier with the exterior walls below unless contrary to individual project requirements. Insulate roofs to minimum assembly R-value of 38.

Low Slope Roof

Utilize low-slope roofs as a design tool to help break up building mass or to provide emphasis to certain building elements, such as entries or atrium spaces. Low-slope roofs shall be white colored membrane roofs.

Gutters and Downspouts

Use copper or bronze colored gutters and downspouts. Place in inconspicuous locations when possible and, if unable to do so, ensure that downspouts are considered a design element and placed accordingly.

Figure 5-4 Typical Roof System Forms and Materials

Interior Building Systems

Except for administrative, classroom, office, and formal gathering spaces, facilities located on the RTC campus are often used for operational training exercises in addition to their primary purposes. This dual use increases wear and tear on interior surfaces so durability and ease of maintenance are important selection criteria for interior materials and finishes.

Environmental Criteria for Interior Materials and Finishes

- All architectural paints, coatings and primers applied to interior surfaces should not exceed the Volatile Organic Compound (VOC) limit established in Green Seal Standard GS-11, First Edition, May 20, 1993.
- Anti-rust paints applied to interior ferrous substrates should not exceed the VOC limit established in Green Seal Standard GS-03, Second Edition, January 7, 1997.
- Clear wood finishes, stains, sealers, and floor coatings applied to interior surfaces should not exceed VOC limits established in South Coast Air Quality Management District (SCAQMD) Rule 1113, January 1, 2004.
- All adhesives and sealants used throughout building interiors should not exceed the VOC limits established by SCAQMD Rule 1168, July 1, 2004 and rule amendment of January 7, 2005.
- Avoid the use of vinyl and PVC-based finishes to reduce occupant exposure to airborne carcinogens and to minimize environmental degradation from the manufacturing process as well as the waste stream cycle.
- Resilient Floors – Environmentally sensitive choices include linoleum or rubber. Avoid the use of vinyl unless cost is a critical selection concern.
- Carpet – Meet the testing and product requirements of the Carpet and Rug Institute Green Label Program and ensure that any adhesive used has a maximum VOC content of 50g/L. Choose a carpet manufacturer that uses a recycled rubber backing and whose product can be subsequently recycled at the end of its useful life.

Walls/Partitions

Criteria for interior wall systems selection include:

- Code requirements;
- Function of surrounding spaces;
- Flexibility;
- Cost effectiveness;
- Appearance; and
- Durability/Ease of Maintenance.

Passive Activity Areas

Non-tactical training areas, such as offices and support spaces, classrooms, public spaces, and passive training rooms.

Primary Wall System: Metal stud walls and painted gypsum board.

High Flexibility Areas

Where the prevailing criteria for design is a high degree of flexibility, demountable, modular walls allow for simple reconfiguration of space over time without major construction activity or the generation of waste.

High Activity Areas

Spaces used (whether primary or secondary use) for tactical training, major corridors.

Primary Wall System: Painted or decorative concrete masonry units (CMU).

Alternative Wall System: Wear-resistant gypsum board, painted or a double layer of standard gypsum board, painted.

High Moisture Areas

Restrooms, showers, locker rooms, kitchens, or 'dirty' classrooms where spray-down cleaning is utilized.

Primary Wall System: CMU walls, epoxy paint.

Alternative Wall System: Moisture-resistant gypsum, epoxy paint or ceramic/stone tile finish.

Ceilings

Primary Ceiling System: Suspended acoustical ceiling tile (ACT).

Alternate Ceiling Systems: Gypsum board ceilings or moisture resistant tiles – Active training areas, rooms where constant moisture may be present, or covered exterior spaces.

No Finish Ceiling: Where aesthetics are not important, such as in maintenance or equipment rooms.

Floors

Criteria for interior flooring selection include:

- Function of floor area;
- Flexibility;
- Cost effectiveness;
- Appearance; and
- Durability/Ease of maintenance.

Passive Activity Areas

Non-tactical training areas, such as offices and support spaces, public spaces, and passive training rooms.

Primary Floor Finish: Resilient floor tile or sheet goods.

Alternate Floor Finishes: Carpeting in office areas and conference rooms to dampen sound transmission throughout the space as well as to provide a measure of comfort to the users. Exposed, colored concrete or terrazzo may be used in public areas.

Raised Access Floor Areas

Primary Floor Finish: Floor tile of carpet or resilient flooring.

Classrooms

Primary Floor Finish: Loop carpet.

Alternate Floor Finish: Resilient floor tiles or sheet goods.

Equipment and Maintenance Areas

Primary Floor Finish: Exposed slab-on-grade concrete, sealed, and/or painted with epoxy paint to protect the surface.

Wet Areas

Rest rooms, locker rooms, kitchen, and spaces where hoses are used for wash-down.

Primary Floor Finish: Ceramic tile

Alternate Floor Finishes: Resilient sheet goods with sealed seams. Sealed concrete where aesthetic concerns are minimal.

Active Training Spaces

Primary Floor Finish: Exposed sealed or painted concrete.

Alternate Floor Finishes: Use linoleum or rubber floor tiles. Avoid sheet goods for ease of partial replacement.

Special Floor Finish: Thick, padded mats in human physical training spaces and gymnasium-type flooring in exercise rooms to protect the occupants from injury during training.

5.6 Design Guidelines: Landscape

Planning Strategy: Reinforce RTC Campus Identity

The 2012 RTC Master Plan would not modify the largely wooded character of the campus beyond what is necessary in the immediately surrounding areas of proposed development. In general, landscape plans for individual projects would be developed as part of the site design package. It should be noted that USSS makes campus-wide use of both natural and designed landscape features in outdoor physical training using native species. Typical landscaping features for existing development include trimmed lawn adjacent to buildings and outdoor training venues, planted shade trees, shrubs, site lighting, and signage. No visual impact on any area surrounding the campus is anticipated, with the exception of the entrance, which will be visible from Powder Mill Road. The proposed new development is low-rise and largely located well within the perimeter tree cover.

A formal landscaped area is planned for a courtyard framed by the existing Merletti and Bowron buildings along with the new Classroom/Administration building currently in design. This area, shown in *Figure 5-5 Campus Courtyard Concept*, is intended to serve as a gathering place day-to-day and for such occasions as graduation exercises from the RTC training programs.

Figure 5-5 Campus Courtyard Concept

5.7 Design Guidelines: Internal Circulation

Planning Strategy: Update Campus Access, Security, and Circulation

Campus Roadways

An internal roadway network serves traffic inside the RTC boundaries. The internal network serves three purposes: it provides an internal vehicular circulation route, it serves as a physical training venue for biking, running, and other conditioning activities, and it serves as a tactical training venue for skill-building activities, such as protective driver training and public bikeway simulations. The distance between campus facilities ensures that vehicular circulation will remain the primary purpose of campus roads but alternate uses will also continue. Guidelines to address the multiple uses of the internal road system include:

- Complete the campus loop road to divert primary vehicle circulation from the central campus roads in the tactical training precinct of the campus to the perimeter.
- Group similar functions for future building development to encourage pedestrian circulation. Provide walkways to further facilitate a pedestrian-friendly environment.
- Create internal trails, used by pedestrians as well as bicycles, to link the different areas of the campus.
- Upgrade the existing perimeter trail with gravel surfaces better suited to the variety of off-road vehicles that use it for security patrols and for training.

- Centralize vehicle parking within each of the new precinct areas. Provide these parking areas adjacent to the loop road to minimize vehicle/pedestrian conflicts.

Sidewalks

The system of sidewalks is currently fairly limited on the RTC campus; since development is widely dispersed over the site, employees generally use vehicles rather than walk to get from one area of campus to another. As development occurs under the 2012 RTC Master Plan, sidewalks between buildings and along nearby roadways would be planned as part of site design to link all areas of the campus for pedestrian use within and between adjacent precincts.

Paths

Paths have been worn in some unpaved areas between buildings and, notably, just inside the perimeter fence where ATVs perform security patrols and rough-terrain physical training exercises are conducted. The paths between buildings would help to inform the design of the sidewalk system. The perimeter trail would be upgraded for continued use in security patrols as part of the perimeter security fence design.

5.8 Design Guidelines: Access and Transportation

Planning Strategy: Update Campus Access, Security, and Circulation

Campus Access

Relocation of the main entrance from the west end to a more central location on Powder Mill Road is desirable to provide a better interface with local traffic and provide space for improved security.

Figure 5-6 RTC Main Entrance

Service

Service vehicles currently access the campus at the main gatehouse entrance and then share the same internal road network and parking areas with other vehicles and with individuals participating in training exercises. Under the 2012 RTC Master Plan, a central receiving building (Building 7) would be located adjacent to the re-located gatehouse so that the number of non-government vehicles traveling the internal roadways would be substantially reduced. The Supply Center would also receive mail.

Traffic

For the 2012 RTC Master Plan, Transportation Management Guidelines (TMG) have been prepared. The Transportation Management Guidelines (TMG) have been included in their entirety in *6.4 Traffic Impact Study and Traffic Management Guidelines*. The guidelines are summarized as follows:

- Continue to provide shuttle from the local hotels to the site and consider the expansion of the shuttle to include stops at the closest Metrorail and/or Marc stations;
- Encourage parking management in order to promote transit use and discourage auto use;
- Encourage those who use automobiles to carpool;
- Encourage the implementation of alternative work schedules, such as flextime, compressed workweek, and/or staggered work hours; and
- Continue the use of Telecommuting as an option for those employees that qualify.

Incremental development over 10 to 15 years is anticipated under the 2012 Master Plan; Traffic impact would be studied and a TMP would be developed and refined as each phase of development is undertaken.

5.9 Design Guidelines: Parking

Planning Strategy: Update Campus Access, Security, and Circulation

Parking for fleet vehicles and visitors is planned in accordance with Federal Property Management Regulations. A parking structure is planned; however, due to the rural/suburban location of the RTC campus, below-grade parking is not economically feasible. A two-level structure with the lower level approximately on-grade is proposed. It would have vegetated facades. Unobstructed access to the proposed buildings by pedestrians and bicyclists and parking for disabled persons would be provided. The transportation management guidelines prepared as part of the 2012 RTC Master Plan includes recommendations for priority carpool and vanpool parking.

Parking Quantities

The Transportation Element of the NCPC Comprehensive Plan for the National Capital identifies parking ratios for federal facilities located beyond 2,000 feet of a Metrorail station. For these facilities, the goal is to provide one parking space for every 1.5 employees (1:1.5 ratio). The 2012 RTC Master Plan currently includes 440 employee-designated parking spaces for a projected population of 660, meeting the

target ratio of 1:1.5. The relatively high number of proposed visitor spaces is due to the primary training function of the RTC and the anticipated growth in non-USSS law enforcement short-term training programs.

		Existing	Proposed
RTC Parking	Number of Parking Spaces**	688	1,038
	Less Number of Fleet/Training Vehicles	-294	-441
	Number of Non-Fleet Parking Spaces	394	597
	Number of Employee Parking Spaces		440
	Number of Visitor Parking Spaces		157
	Ratio of Employee Parking Spaces to RTC Employees		1:1.5
	**Assumptions 1. Future Parking assumes that loss of spaces in the Bowron lot would be offset by new parking adjacent to new buildings. 2. Growth in Fleet/Training Vehicles would not directly correspond to population growth. A factor 1.5 has been used.		

Table 5-2 Existing and Proposed RTC Parking

5.10 Design Guidelines: Security

Planning Strategy: Update Campus Access, Security, and Circulation

Campus Access

Definitive standards to describe proper vehicular approach and processing at secure access points for DHS facilities have not been provided. However, the USSS has developed site-specific design criteria for site access at RTC:

- Provide an unsecured drive long enough to allow for a queue of vehicles before the vehicle inspection point. A 90 degree bend should be placed in the drive to slow traffic between the entry gate and the inspection point.
- Ensure that the gatehouse structure is no less than 150 feet from Powder Mill Road and that unprotected portions of the building are no less than 30 feet from the unsecured visitor parking area or approach roadway.
- Provide eight visitor parking spaces on the unsecured side of the fence and 15 spaces for employee parking on the secure side.
- Provide one entry aisle with badge swipe equipment for employee entry and one entry aisle for use by visitors, delivery, and construction traffic. The exit lane should allow for reverse traffic as needed; all three lanes should allow for badge swipe technology.
- Allow an extended waiting area on the unsecured side of the gate for delivery trucks to park in case of an extended inspection.
- Provide one guard booth to service the entry point and wedge and swing barriers for all lanes, in and out.

- Provide raised planting beds and masonry walls between the gatehouse and main drive aisle to prevent vehicles from accelerating as they approach the building.
- Provide a mechanically-raised hydraulic vehicle barrier; locate controls inside the gatehouse and inside the guard booth.
- The fence separating secure and unsecured sides of the entry shall be an extension of the campus perimeter fence. Provide decorative iron fence in lieu of standard perimeter fence for the entire fence line within the visual range of the entry access point.

Verify security requirements during predesign of individual facilities.

Security and Campus Precincts

The Administrative Precinct would include the Gatehouse (Building 1) and would cluster facilities, such as the Supply Center (Building 7) and the Parking Structure (Building 5), that regularly receive commercial, private and non-USSS visitors near the entry.

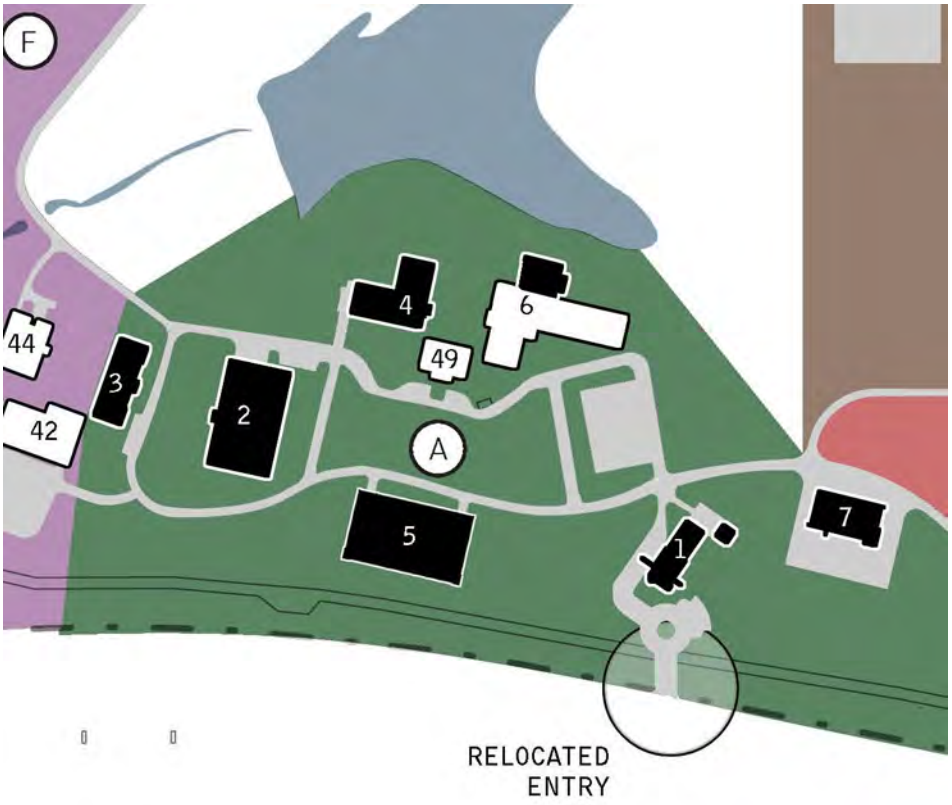


Figure 5-7 Administrative Precinct

Perimeter Security

Upgrades to perimeter security are proposed to include the construction of a double fence. The fence would have barbed wire to prevent scaling and electronic sensors to remotely alert security of potential

breaches. Upgrades to the trail would include paving it with a layer of small gravel and repairing or replacing the wooden bridges over wetlands as required.

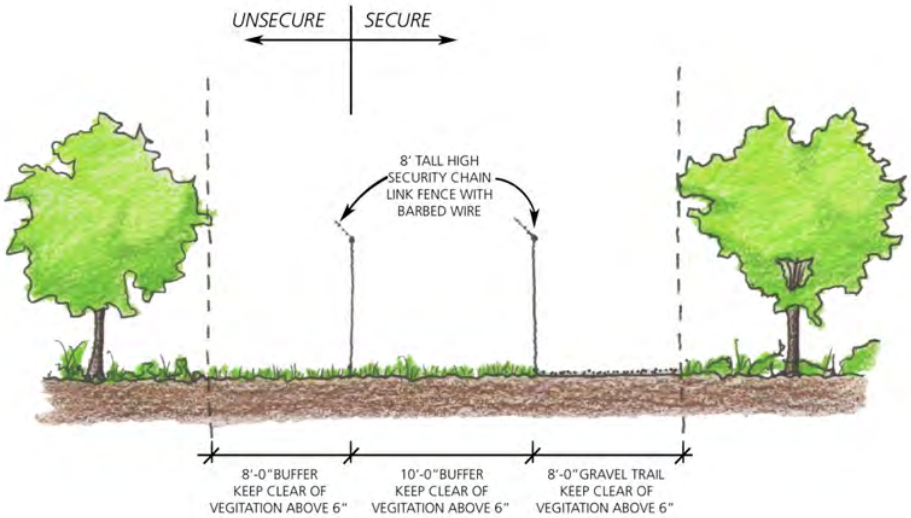


Figure 5-8 Perimeter Fence Diagram

Verify configuration and characteristics of perimeter security fence during Predesign. Some considerations for perimeter fence and trail design include:

- Where the perimeter fence passes over a body of water or wetland, ensure that the top of the fence remains relatively consistent and provide secure stop gap measures, such as metal grates or additional fencing, to close the remaining space below the fence and prevent underwater access or access by excavation of wetland soils.
- The perimeter security trail must remain adjacent to the perimeter fencing. Provide 8′-0″ wide, pressure-treated wood bridges over water or wetlands. Bridges are to be supported by treated wood piers to minimize the impact on these areas.
- Provide security call boxes, fed by fiber optic cables, every 500 yards along perimeter fence. Additional lighting and detection systems, such as sensors or cameras, may be required as determined by the USSS.

5.11 Design Guidelines: Utilities

Planning Strategy: Enhance Infrastructure to Support Programs

The campus utilities discussed include electric, water, natural gas, and sanitary systems.

Electrical Site Distribution

Currently the main electric utility (BG&E) serving RTC is upgrading both the electric service to the Campus and the distribution on the campus. BG&E is providing two independent feeders to the campus to provide RTC with redundant electric service. These feeders will be connected to two sectionalizing switches. One switch will be located at the Main Entry and the second at the east emergency access gate. On the campus, BG&E will be installing electrical distribution lines to provide RTC with a loop distribution system. As part of this upgrade, the existing street and parking lot lights will be replaced and additional street and parking lot lighting will be provided.

The improvements to the electrical distribution system are being designed to accommodate all of the facilities envisioned in this Master Plan.

Water Distribution

Currently, there is a project in the planning stage to upgrade the water distribution system. The improvements include a new 12-inch supply line run from the Beltsville Agricultural Research Center (BRAC) to RTC. The 12-inch water line from BRAC will be extended through the Canine (Building 10) area and along Perimeter Road from the Bowron Building to the Maintenance Yard (Building Area 8). From this point, an eight-inch line will run along the perimeter road past the Drummond Building to 18th Street and then down 18th Street to the existing eight-inch line at Auto Lane. The existing eight-inch water line connected to the Animal and Plant health Inspection Service (APHIS) complex on the other side of Powder Mill Road will remain in place.

As part of the work, the existing water tower will be removed and the existing water pressure booster pumps will be abandoned. The existing water tower is not tall enough to provide sufficient water pressure and has not been in use for many years. With the new, larger water distribution piping, the pressure booster pumps will no longer be required.

The improvements to the water distribution system are being designed to accommodate all of the facilities envisioned in this Master Plan.

Natural Gas Distribution

The existing gas piping system has sufficient capacity to serve all of the current RTC campus needs and all of the additional buildings described in the 2012 RTC Master Plan. The following three extensions to the existing natural gas distribution infrastructure are prescribed to facilitate the RTC campus expansion:

1. A four-inch underground gas line from the existing gas main to north of the Maintenance Yard. This line would serve the existing Beltsville Judgmental Range, existing maintenance yard building, proposed Maintenance Yard and possible future expansion further north;
2. Extension of the existing four-inch gas line located at the central part of the campus would serve the proposed Static Display Building, the Airport Building, the Simpson Building and possible future expansion in the area; and

3. A four-inch extension from the existing main traveling north would serve the proposed Emergency Medical Training Facility, SOTS Range Building, Firearms Training Complex, Armory, Tactical Obstacle Course, Flexible Shoothouse and the re-located Beltsville Judgmental Range.

They are shown in *Figure 3-10 Natural Gas Distribution*.

Sanitary System – Phase 1

The sanitary system infrastructure would require extensive upgrades to fully implement the RTC Master Plan. The water table on this site is very close to the ground surface. This limits how deep in the ground the sewers can be installed and, by extension, severely limits how far the sewers can run dependent on gravity flow. To support the planned development at RTC, a system of sanitary sewer pumping stations and sanitary force mains would be utilized. Individual buildings would drain by gravity to the sanitary sewer pump stations. The new sanitary sewer pump stations would pump the sewage to the existing main Sanitary Sewer Pump Station – 1. The following upgrades are recommended as noted in *Figure 3-11 Sanitary System, Phase 1.*

1. Originating at a new Sanitary Sewer Pump Station – 4, adjacent to the proposed new Beltsville Judgmental Range (No. 27) in the northeast quadrant of the campus, this leg would start as a three-inch sanitary force main and route through three additional new sanitary sewer pumping stations serving 11 of the proposed new buildings and facilities. This new line would run south and then west to a new Sanitary Sewer Pump Station – 5, located to the south of the future SOTS Range Building (No. 13). The three-inch sanitary force main discharging from this sanitary pump station would run west to a new Sanitary Sewer Pump Station – 6, near the proposed new Canine Building (No. 10). The four-inch sanitary force main discharging from this pump station would run west to a new Sanitary Sewer Pump Station – 7, near the proposed new Main Gate Building (No. 1). A four-inch sanitary force main would continue west from this pump station to the existing main Sewer Pump Station – 1.

2. Beginning at a new Sanitary Sewer Pump Station – 8, in the north central area of the campus, this two-inch force main would travel west then south to connect to the above-referenced Sanitary Sewer Pump Station – 7. This leg of the sanitary system would have one new pump station and serve three buildings.

3. This leg of the sanitary system has two new pump stations and would serve the Maintenance Yard (No. 8) and the existing Beltsville Judgmental Range (No. 46). This leg would start at a new Sanitary Sewer Pump Station – 9, just south of the proposed Maintenance Yard; a three-inch sanitary force main would run south to connect to the existing main Sanitary Sewer Pump Station – 1. A new Sanitary Sewer Pump Station – 10 would serve the proposed new Beltsville Judgmental Range (No. 27). The discharge line from Sanitary Sewer Pump Station –10 would run west and connect to the three-inch sanitary force main from Sanitary Sewer Pump Station – 9.

Sanitary System – Phase 2

Before its current capacity is exceeded, the pumping capacity of the main Sanitary Sewer Pump Station–1 would need to be increased to handle the entire capacity of the campus into the foreseeable future. In addition, the approximately half-mile long existing four-inch sanitary force main to the USDA facility would have to be increased to six inches. These upgrades to the sanitary system infrastructure would allow

the campus to be developed to the full extent of the 2012 RTC Master Plan. The work described is noted in *Figure 3-12 Sanitary System, Phase 2.*

1. Replace the existing sewage pumps at Sanitary Sewer Pump Station – 1 with a new duplex pumping system installed in the existing sump pit. Each pump would have a capacity of approximately 200-gallons-per-minute. To handle the increased pumping capacity, the existing four-inch sanitary force main from Sanitary Sewer Pump Station – 1 to the USDA facility would have to be increased to a six-inch line.

As individual projects are undertaken, the following are guidelines for systems selection and design:

Mechanical Systems Guidelines

- Optimize energy performance. Minimum of LEED Silver certification; design for LEED Gold certification where feasible.
- Explore the use of ground source heat pump to determine feasibility for each remote project.
- Provide MERV 13 or better filters where feasible.
- Include commissioning in all projects.
- Meet or exceed ASHRAE Standard 62.1 for ventilation.
- Meet the thermal comfort recommendations of ASHRAE Standard 55.

Electrical Systems Guidelines

- Optimize power and lighting. Minimum of LEED Silver certification; design for LEED Gold certification where feasible.
- Provide illumination levels in accordance with IESNA standards.
- Provide high-efficiency LED fixtures for general lighting.
- Reduce general lighting in open office spaces to minimum levels and provide task lighting at each workstation for the balance (maximize personal control).
- Provide daylight sensors to maximize effect of daylighting in the perimeter zones of classroom and office buildings.

Plumbing System Guidelines

- Optimize water use. Minimum of LEED Silver certification; design for LEED Gold certification where feasible.
- Encourage the use of waterless urinals.
- Provide hose bibs or other water source in 'dirty' training rooms.

5.12 Design Guidelines: Water Management

Planning Strategy: Promote Stewardship of Resources

USSS has undertaken a Stormwater Management Plan in conjunction with the 2012 RTC Master Plan. The Stormwater Management Plan (see *Section 6.6 Stormwater Management Plan*) provides the background information for these guidelines.

As a federal property in the state of Maryland, the local governing authority is MDE; the *Maryland Stormwater Management Guidelines for State and Federal Projects* (April 2010) outlines the review and approval process for projects, such as those proposed in the 2012 RTC Master Plan. All projects undertaken after May 2010 are required to utilize Environmental Site Design (ESD) to the maximum extent practicable. ESD is defined as "a comprehensive design strategy for maintaining pre-development runoff characteristics and protecting natural resources."

In addition, as a federal facility, development at the RTC must meet the requirements of Section 438 of the Energy Independence and Security Act of 2007 (EISA). These requirements are that "the sponsor of any development or redevelopment project involving a federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the pre-development hydrology of the property with regard to temperature, rate, duration and flow."

As develpoment under the 2012 RTC Master Plan takes place, there could be short-term construction-related impacts to stormwater due to increased sediment flows, however this would be minimized by implementing best management practices.

Over the long term, impervious surface area on the site would increase from approximately 2,303,476 square feet (11 percent of the total site area) to 3,996,708 square feet (19 percent of the total site area). This would include roads, sidewalks, other paved areas, and buildings.

In order to meet the requirements for achieving ESD, a concept plan for stormwater controls has been developed in the SMP. As outlined in the plan, specific methods for reducing runoff and improving stormwater quality include the following:

- *Permeable pavements* – proposed for newly paved areas; best suited for areas where soil type will allow infiltration and where the water table is not too high.
- *Disconnection of rooftop runoff* – best suited for areas which are currently vegetated and would remain vegetated under the 2012 RTC Master Plan.
- *Disconnection of non-rooftop runoff* – best suited for areas of mild slopes and adjacent to areas of existing vegetation that would remain under the 2012 RTC Master Plan.
- *Rainwater harvesting* – best suited for areas where there is a significant need for nonpotable water.
- *Landscape infiltration* – best suited for areas where sufficient space is available to provide pretreatment to the facility, as well as necessary facility footprint size for proper infiltration of stormwater being treated.
- *Rain gardens* – could be added where feasible.

- *Micro-bioretention* – due to adaptability, this could be used at all of the proposed development sites in the 2012 RTC Master Plan.
- *Swales* – best suited alongside new roadways that would connect sub-areas.
- *Enhanced filters* – could be added where feasible to provide for a greater degree of infiltration.

Analysis of this preliminary concept undertaken as part of the 2012 RTC Stormwater Management Master Plan indicates that sufficient controls can be implemented to comply with the requirements of ESD. Under the 2012 RTC Master Plan, the deteriorated roadside ditches would be improved through conversion to bio-swales or the installation of turf reinforcing mats. Overall, long-term impacts to stormwater are anticipated to be beneficial.

Mitigation strategies include:

- Implementation of Best Management Practices (BMPs) during construction in order to minimize sediment loads in stormwater runoff;
- Coordination with MDE through the detailed design of individual projects to facilitate the implementation of ESD to the maximum extent practicable and to ensure stormwater management controls meet established requirements and that post-development runoff characteristics mimic pre-development characteristics; and
- As detailed design progresses for individual elements of the 2012 RTC Master Plan, consideration by USSS of additional soil testing as necessary to determine suitability of underlying soils for specific stormwater management interventions.

Wetlands Management

In August 2009, a non-tidal wetland delineation was conducted to identify and delineate the limits of jurisdictional wetlands and streams at the RTC. A jurisdictional determination (JD) was prepared and submitted to USACE in January 2010. Supplemental survey of a limited area was undertaken in the spring of 2010 following review by USACE and a revised JD was submitted. The JD has been reviewed by USACE and concurrence has been obtained by EPA. USSS is waiting for the final notice of approval from USACE. The wetlands delineation and study provides the foundation for the following discussion.

The 2009 delineation identified several wetland areas within the RTC. Additionally, non-vegetated "Waters of the United States" were identified in the form of streams and man-made ponds. There are two primary drainage systems on the site, one on the east side and one on the west. The western drainage system includes all wetlands and waters that drain west and south towards the intersection of Powder Mill Road and Route 295. The eastern drainage system drains to the south and east across the site. There are two ponds on the campus, one four-acre pond in the eastern portion of RTC and a 12-acre pond in the western portion of the RTC. Several small, isolated wetland areas were also identified throughout the property, mainly in the eastern half of the RTC.

Several wetland areas are bisected by roadways. Both USACE and the Maryland Department of the Environment (MDE) have jurisdiction over wetlands and waters in Maryland. In addition, MDE regulates a 25-foot upland buffer around wetlands and a 100-foot buffer around areas designated as "Wetlands of

Special State Concern" (WSSC). All wetlands located within the RTC have been designated as WSSC by the Maryland Department of Natural Resources (DNR) due to the presence of high quality, complex wetland resources. Existing buildings, roadways and parking lie within the 100-foot buffer.

Generally, indirect impacts to wetlands are assessed based on potential changes to water quality, quantity, and/or flow rates. Indirect impacts may occur as a result of a change to impervious surface area and consequently, increased stormwater and pollutant runoff. Development constraints due to the presence of wetlands have been considered in the placement of buildings under the 2012 RTC Master Plan. Stormwater management and erosion and sediment control measures would be implemented to minimize possible impacts to wetlands from erosion, sedimentation, or contamination during construction and operation of the proposed facilities.

A small portion of the loop road at the southeast side of the site may directly impact wetlands (see *Figure 3-14 Wetlands*). In addition, the perimeter fence and trail may cross wetland areas, depending on its final alignment. Internal roadways may lie within or encroach upon the 100-foot wetlands protection buffer.

During site design and engineering, site surveys would be conducted to confirm the 100-foot buffer for Wetlands of Special State Concern throughout the property. New construction within wetlands or the 100-foot wetland buffer would be evaluated based on detailed site plans in order to minimize potential indirect and direct impacts to wetlands. Design and engineering modifications to roadways and buildings would be undertaken, recognizing these boundaries as necessary, in coordination with federal and State review agencies. Potential modifications could include constructing a raised roadway or using culverts and drains to assist water movement.

Overall, long-term adverse impacts to wetlands as a result of the implementation of the 2012 RTC Master Plan are anticipated to be minor, as impacts are anticipated to be limited to small sections of isolated wetlands.

5.13 Design Guidelines: Sustainability and Conservation

Planning Strategy: Promote Stewardship of Resources

All projects at RTC would strive to optimize energy performance, protect and conserve water and other resources, enhance indoor environmental quality and reduce the environmental impact of building materials. The following are the design guidelines related to sustainability:

General Environmental Design Goals and Objectives

- Make design decisions with protection and revitalization of the natural environment in mind – protection of habitat for flora and fauna and protection of wetlands and ground water quality.
- Minimize the impact of development on the local and regional microclimate and air quality.
- Minimize the impact of development - reduce the use of resources, such as building materials, energy and potable water. Reduce waste by utilizing efficient construction methods and recycling programs.
- Improve the indoor environmental quality of facilities – maximize interior daylight, provide individual comfort control to building occupants, and reduce the off-gassing of harmful chemicals and pollutants by choosing inert interior finishes and practicing healthy housekeeping procedures.

Government agencies intending to pursue new building projects or renovations of existing buildings within their portfolio are subject to the sustainable design requirements and expectations set forth in Executive Order 13514 (dated October 8, 2009), and the Agency's own internal Sustainability Plan as required by the aforementioned Executive Order.

For purposes of this Master Plan, the DHS Strategic Sustainability Performance Plan and the "Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings" MOU is the framework for evaluation of potential building projects. The Leadership in Energy and Environmental Design (LEED®) Green Building Rating System of the U.S. Green Building Council (USGBC) is a tool for evaluating and measuring achievements in sustainable design. The use of LEED ensures that sustainable strategies are considered in the development of building projects. As the individual projects are undertaken, LEED Silver would be considered the minimum required certification and Gold or better the goal.

LEED Rating System

The LEED rating system breaks projects into seven distinct planning categories as noted below. Guiding principles for the design team to integrate into design solutions have been identified within each category.

Sustainable Sites

- Minimize impact on the surrounding site by reducing the development footprint where possible;
- Implement plans to mitigate construction activity pollution;
- incorporate light-colored and reflective hardscape and roofing materials to lessen the heat island effect on the site; and
- Implement technologies to retain or treat stormwater on-site, reducing the impact on the storm drainage infrastructure and native watersheds.

Water Efficiency

- Employ plumbing design strategies that, in aggregate, use at least 20% less potable water than Energy Policy Act (EPAct) of 1992 fixture requirements;
- Develop landscaping and irrigation strategies to target reduction in potable water use of 50% or more over traditional means through use of high efficiency irrigation systems and appropriate plant species selection.

Energy & Atmosphere

- Design HVAC, lighting, and other energy-using systems in the project to target 30% energy-use reduction compared to ASHRAE 90.1-2004 energy standards and would earn the Energy Star designation where feasible;
- In accordance with guidelines established under EPAct 2005, include building level utility meters in project designs in order to continuously track and optimize performance;

- Commission building systems to ensure peak operational efficiency, tailored to the size and complexity of each subject building.

Materials & Resources

- Select materials for each project to target for recycled content quantities (10% based on cost);
- Target use of bio-based (rapidly renewable) materials and elimination of ozone-depleting compounds in materials specified for the project;
- Stipulate that the contractor divert at least 50% of construction, demolition, and land clearing debris to local recycle or salvage facilities rather than to landfill.

Indoor Environmental Quality

- Target achievement of current ASHRAE 55-2004 thermal condition standards and ASHRAE A 62.1-2004 ventilation rates for acceptable indoor air quality;
- Employ moisture control strategies to prevent mold and other contamination;
- Maximize daylighting where feasible to reduce dependence on supplementary electrical lighting with appropriate overrides and glare control devices to ensure maximum flexibility;
- Evaluate materials specified for the project for compliance with current VOC emission standards to ensure a low rate of pollutant emissions within the project space;
- During construction, implement an indoor air quality plan to minimize contaminants from the construction process and, once construction is complete, a building flush-out to minimize exposure of new building occupants to contaminants from new building materials.

Innovation & Design

The LEED Innovation and Design category provides an opportunity to implement innovative or alternative policies or procedures which enhance the sustainability focus of the project. Some suggestions for achievement of these credits:

- Employ integrated design principles throughout the lifecycle of the project;
- Implement a Green Education program which uses the building's case study and integrated site signage to publicize the sustainable design strategies employed;
- Document a Sustainable Purchasing Policy, as mandated by Executive Order 13514 for all Federal agencies;
- Document a Green Pest Control and Landscaping Program utilizing environmentally preferable pest control products and processes;
- Document a Green Cleaning Program utilizing environmentally preferable cleaning products and processes;
- Involve a LEED Accredited Professional (LEED AP) in the project throughout the design and construction process;

Energy Conservation Strategies and Policies

Energy conservation strategies have been considered in the development of the RTC Master Plan:

Siting and Design of New Buildings

- Planned building orientations would, in general, promote natural daylighting;
- Precinct planning would locate related functions together to promote ready pedestrian access;
- The site is planned to retain its natural, wooded character;
- LEED Silver is the minimum certification with Silver as the minimum sustainable design certification for new construction.

Retrofitting of Existing Buildings

- Re-positioning of existing buildings to accommodate new programs would minimize the demolition of existing construction;
- LEED Silver is the minimum certification with Gold or better as the preferred sustainable design goal for any major renovation.

Use of Transportation

- Internally, completion of the Campus Loop would allow more efficient transport to all areas of the campus;
- Development of sidewalks and paths would encourage pedestrian travel between precincts;
- Continued use of the existing shuttle would efficiently transport trainees to campus;

Noise Management

An Operational Noise Survey was conducted by the US Army Center for Health Promotion and Preventive Medicine in 2009. It measured several noise-producing activities at RTC, determined that noise levels for some activities at RTC were potentially high enough to warrant mitigation and discussed the relative merits of several mitigation strategies. The build-out of the 2012 RTC Master Plan will be incrementally completed; during the design of potentially noise-producing training venues proposed under the Plan, the impact of noise generated by the new development and potential mitigation measures should be studied. A double perimeter security fence is proposed under the 2012 RTC Master Plan; during the design of the fence, the incorporation of a noise barrier wall along sections of the inside perimeter should be studied.

5.14 Project Implementation: Coordination with Local and State Planning Agencies

Local and State planning agencies are aware of the plans for expansion at RTC. Scoping letters were addressed to local authorities and officials and opportunities for review of the EA and the Development Plan have occurred in 2007, 2009 and once again in August 2012.

The Stormwater Management Plan (see *Section 6.6 Stormwater Management Plan*) has been driven by the local governing authority and their most recent requirements as indicated in Section 3 of the SMP.

During the development of the Traffic Impact Study/Traffic Management Guidelines (see *Section 6.4 Traffic Impact Study/Traffic Management Guidelines*), a preliminary meeting and subsequent coordination took place with a representative of M-NCCPC (Prince George's) and Maryland Department of Public Works & Transportation.

The Maryland Historic Trust responded to their scoping letter in February 2010, stating that "there are no historic properties affected by this undertaking." The proposed development at RTC is located well outside of the historic plan of Washington, DC. The proposed development maintains the natural, wooded visual buffer between the campus and the Baltimore Washington Parkway.

5.15 Project Implementation: Development Plan Staging

The proposed Development Plan for RTC will necessarily be implemented in phases over several years as funding becomes available. The order in which projects are undertaken will depend on levels of funding and periodic assessment of USSS mission-critical needs.

Several projects have been identified for early, high-priority implementation:

- Classroom/Administration Building (Building 4)

  Status: Design Development

- Canine Training Facility (Building 10)

  Status: 15% Design

- Merletti Renovation & Addition (Building 6)

  Status: Construction Documents

- Utilities Infrastructure Upgrade

  Status: Construction Documents (NOTE: USSS is moving forward with part of this work, upgrades of the water distribution and electrical site distribution in 2012)

Generally, site improvements would be implemented area-by-area as the individual projects proposed in this Master Plan are undertaken. However, some improvements to the infrastructure of the RTC are needed in order to support the overall level of growth proposed in the 2012 RTC Master Plan. Consequently, these campus-wide projects are considered to be high priority and can be expected to be implemented early in the on-going development of the campus. They include:

- Completion of the campus Loop Road and the proposed roadway realignment in the Administrative Precinct;
- Upgrades to the campus perimeter trail and security fencing;
- Elements of the Stormwater Management Plan that serve existing roadways and development; and
- Relocation of the main Gatehouse & Site Access Control.

5.16 Project Implementation: Estimate of Probable Costs

An estimate of probable cost was prepared for the 39 projects described in the Development Plan. They are expressed in 2012 US dollars in *Table 5-3 Estimate of Probable Costs*.

USSS-RTC Date: 30-May-12

EXECUTIVE SUMMARY MASTER PLAN - (UPDATED 2012)

		Project	Type	New Area	UOM	* 2006 Base Construction Costs	Escalation to 2012	* 2012 Base Construction Costs	Adjustment Factor	Revised 2012 Base Construction Costs	Unit Cost	GSA Markup (12%)	Conceptual Cost Totals	Construction Duration
Administrative Precinct	1	Gatehouse & Site Access Control	New	7850	SF	$2,349,755	19.00%	$2,796,232	1.13	$3,151,219	402	$378,146	**$3,529,365**	11 Months
	2	Multipurpose Building & ROC Facility	New	106350	SF	$46,271,091	19.00%	$55,063,061	1.13	$62,053,423	634	$7,446,411	**$69,499,834**	18 Months
	3	OPO Office	New	44100	SF	$14,021,379	19.00%	$16,685,582	1.13	$18,803,849	418	$2,256,462	**$21,060,310**	10 Months
	4	Administration and Classroom Building	New	52200	SF	$15,673,452	19.00%	$18,651,565	1.13	$21,019,417	403	$2,522,330	**$23,541,747**	12 Months
	5	Parking Garage	New	350	EA	$7,749,315	19.00%	$9,221,762	1.13	$10,392,483	29,693	$1,247,098	**$11,639,581**	13 Months
	6	Merletti Building Addition and Renovation	New/Renovation	20000	SF	$4,743,692	19.00%	$5,645,041	1.19	$6,700,000	335	$804,000	**$7,504,000**	8 Months
	7	Supply Center	New	13250	SF	$2,841,196	19.00%	$3,381,052	1.13	$3,810,283	167	$457,234	**$4,267,517**	5 Months
Shared Campus Facility Precinct	8	Maintenance Yard	New	38100	SF	$3,313,753	19.00%	$3,943,399	1.13	$4,444,021	117	$533,283	**$4,977,304**	6 Months
	9	Physical Training Building	New	71600	SF	$33,100,510	19.00%	$39,389,938	1.13	$44,390,567	620	$5,326,868	**$49,717,435**	17 Months
	10	Canine Training Facility	New	20100	SF	$7,045,030	19.00%	$8,383,656	1.13	$9,447,978	468	$1,133,757	**$10,581,735**	12 Months
	11	EMT/OPR and Gas Exposure Facility	New	38600	SF	$12,514,903	19.00%	$14,892,860	1.13	$16,783,537	435	$2,014,024	**$18,797,562**	12 Months
	12	Helicopter Pad	New	10000	SF	$293,196	19.00%	$348,906	1.13	$393,200	39	$47,184	**$440,385**	2 Months
Firearms Training Precinct	13	SOTS Range Building (300 yd range)	New	142450	SF	$37,557,448	19.00%	$44,693,738	1.13	$50,367,695	393	$6,044,123	**$56,411,818**	10 Months
	14	Firearms Training Complex	New	79350	SF	$18,282,473	19.00%	$21,756,326	1.13	$24,518,334	300	$2,942,200	**$27,460,534**	9 Months
	15	Armory	New	14400	SF	$3,370,478	19.00%	$4,010,903	1.13	$4,520,094	314	$542,411	**$5,062,506**	5 Months
PODC Precinct	16	Moran Building Addition	Addition	4100	SF	$1,395,343	19.00%	$1,660,472	1.19	$1,970,785	493	$236,494	**$2,207,279**	6 Months
	17	Static Display Building	New	6600	SF	$1,046,916	19.00%	$1,245,840	1.13	$1,404,002	219	$168,480	**$1,572,482**	7 Months
	18	PODC Expansion	New	4	ACRE	$1,669,271	19.00%	$1,986,449	1.13	$2,238,633	559,658	$268,636	**$2,507,269**	3 Months
	19	PODC Skid Pad	New	2	ACRE	$834,636	19.00%	$993,225	1.13	$1,119,317	559,659	$134,318	**$1,253,635**	2 Months
Tactical Training Precinct	20	Airport Building & Apron	New	3000	SF	$1,539,502	19.00%	$1,832,023	1.13	$2,064,602	688	$247,752	**$2,312,354**	4 Months
	21	Simpson Building	Addition/Renovat	4000	SF	$1,028,879	19.00%	$1,224,376	1.19	$1,453,191	363	$174,383	**$1,627,574**	3 Months
	22	Non-Tactical Village & Mock Field Office	New	49000	SF	$4,994,025	19.00%	$5,942,940	1.13	$6,697,407	137	$803,689	**$7,501,096**	4 Months
	23	Knight Building Renovation	Renovation	9600	SF	$1,338,761	19.00%	$1,593,139	1.19	$1,890,869	197	$226,904	**$2,117,773**	5 Months
	24	East Tactical Village	New	18000	SF	$1,135,281	19.00%	$1,350,996	1.13	$1,522,507	85	$182,701	**$1,705,208**	3 Months
	25	Residential Scenarios- Single Family Homes	New	5500	SF	$913,558	19.00%	$1,087,143	1.13	$1,225,158	223	$147,019	**$1,372,177**	9 Months
	26	Residential Scenarios-Townhouses	New	21600	SF	$3,587,790	19.00%	$4,269,506	1.13	$4,811,528	223	$577,383	**$5,388,911**	9 Months
	27	Beltsville Judgmental Range	New	4500	SF	$2,474,073	19.00%	$2,944,172	1.13	$3,317,940	948	$398,153	**$3,716,093**	9 Months
	28	Confidence/Obstacle Course	New	2100	SF	$54,010	19.00%	$64,272	1.13	$72,432	34	$8,692	**$81,124**	3 Months
	29	Cover Course	New	200	SF	$12,002	19.00%	$14,283	1.13	$16,096	80	$1,931	**$18,027**	4 Months
	30	Flexible Shoot House	New	7200	SF	$1,665,197	19.00%	$1,981,602	1.13	$2,233,170	319	$267,980	**$2,501,150**	7 Months
	31	Tactical Obstacle Course	New	1000	SF	$826,675	19.00%	$983,752	1.13	$1,108,641	1,109	$133,037	**$1,241,678**	2 Months
	32	White House Lawn Mockup	New	1	LS	$107,162	19.00%	$127,524	1.13	$143,713	143,713	$17,246	**$160,959**	2 Months
Site Improvements	33	Loop Road Addition/Roadway realignment	New	321700	SF	$6,288,071	19.00%	$7,482,867	1.13	$8,432,832	26	$1,011,940	**$9,444,772**	4 Months
	34	Utilities Infrastructure Upgrades		1	LOT	$5,358,109	19.00%	$6,376,203	1.13	$7,185,675	7,185,675	$862,281	**$8,047,956**	5 Months
	35	Perimeter Security Upgrade – Trail & Fence	Trail	14210	LF	$3,229,612	19.00%	$3,843,271	1.13	$7,185,675	506	$862,281	**$8,047,956**	3 Months
			Fence	38140	LF									
	36	Stormwater Management Upgrade & Wetlands Mitigation		127	ACRE	$12,201,678	0.00%	$12,201,678	1.00	$12,201,678	95,827	$1,464,201	**$13,665,879**	NA

Project Total: **$308,069,753** **$349,091,948** **$390,982,981**

a) Escalation rates : Compounded annually (see exhibit A - Escalation Calculation Analysis)

2006	1.93%
2007	1.37%
2008	6.21%
2009	-2.12%
2010	3.93%
2011	3.24%
2012	3.26%
	19.00%

Note: Asterisk denotes revised estimated cost based on new areas provided.

b) Adjustment Factor (Renovation Works)

Merletti Bldg Actual Const Cost	$	6,700,000
Const Cost	$	5,645,041
		1.19

c) Adjustment Factor (New Works)

Use 50% less for Labor	0.71	Material
	0.24	Labor
	0.95	
% Adjustment	1.13	

Table 5-3 Estimate of Probable Costs

This page intentionally left blank

6.0 Appendix

This page intentionally left blank.

6.0 Appendix

6.1 RTC Space Standards

6.2 RTC Area Requirements

6.3 Development Alternatives

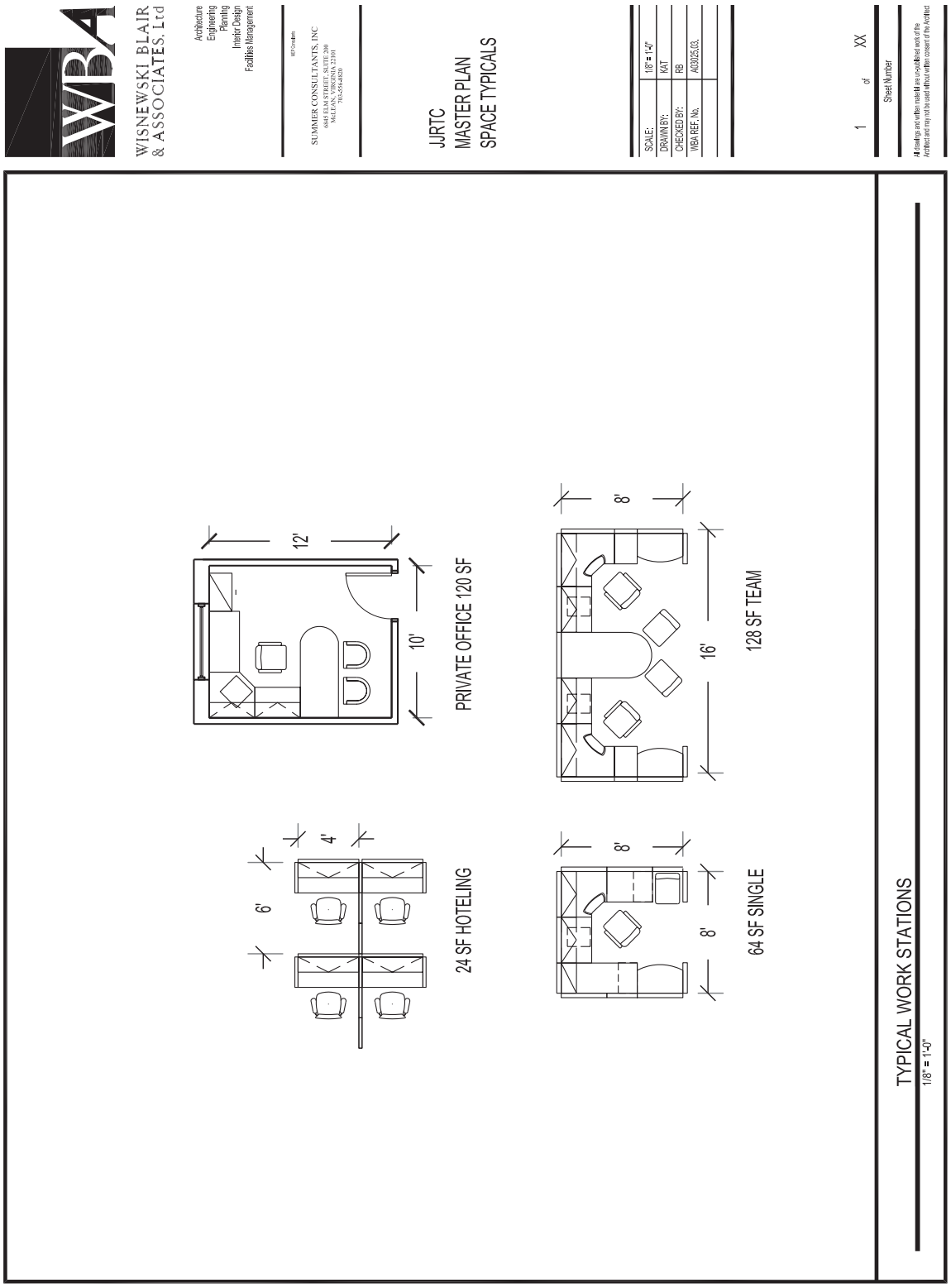
6.4 Traffic Impact Study/Transportation Management Guidelines

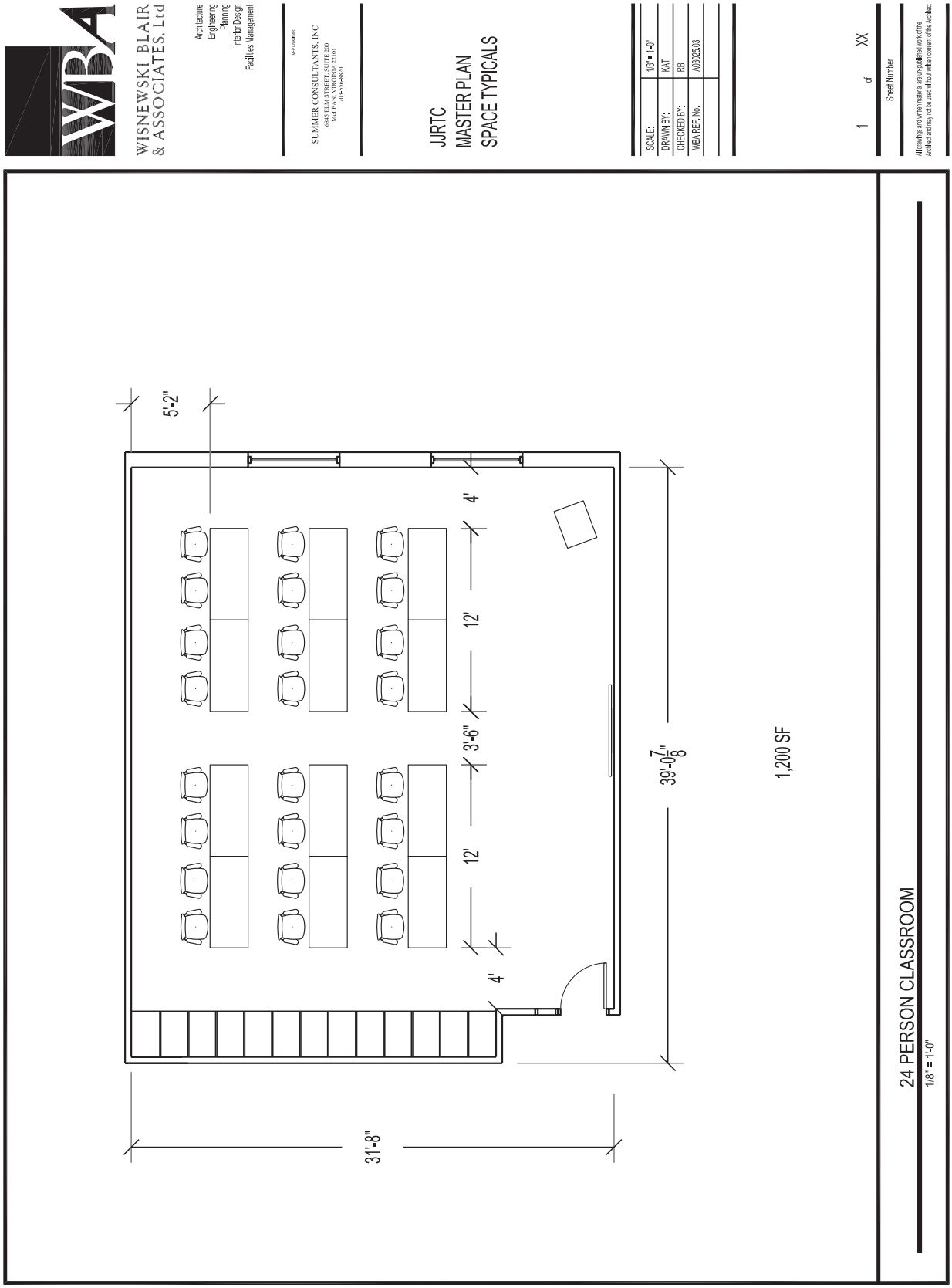
6.5 Environmental Assessment (Under Separate Cover)

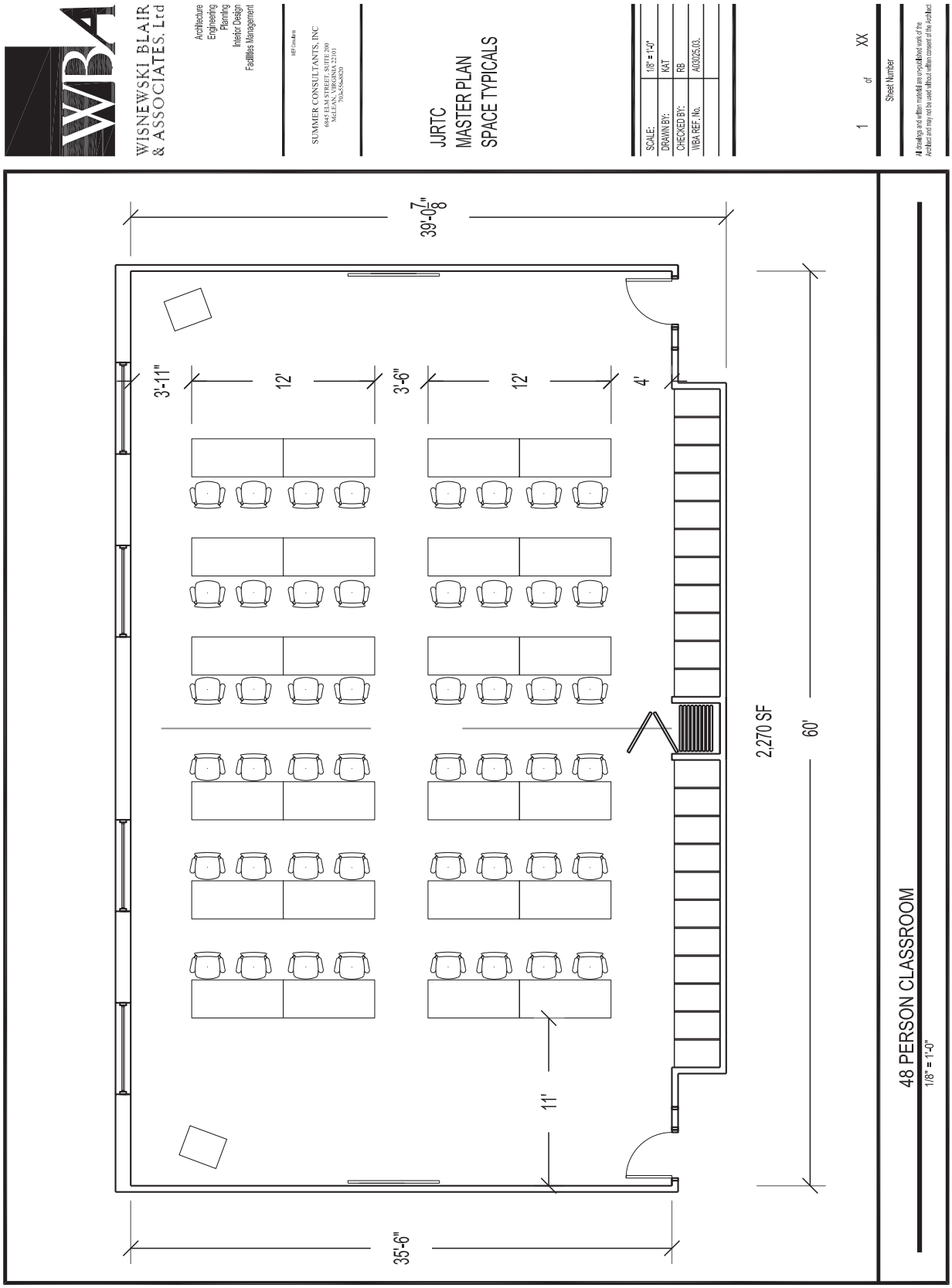
6.6 Stormwater Management Plan

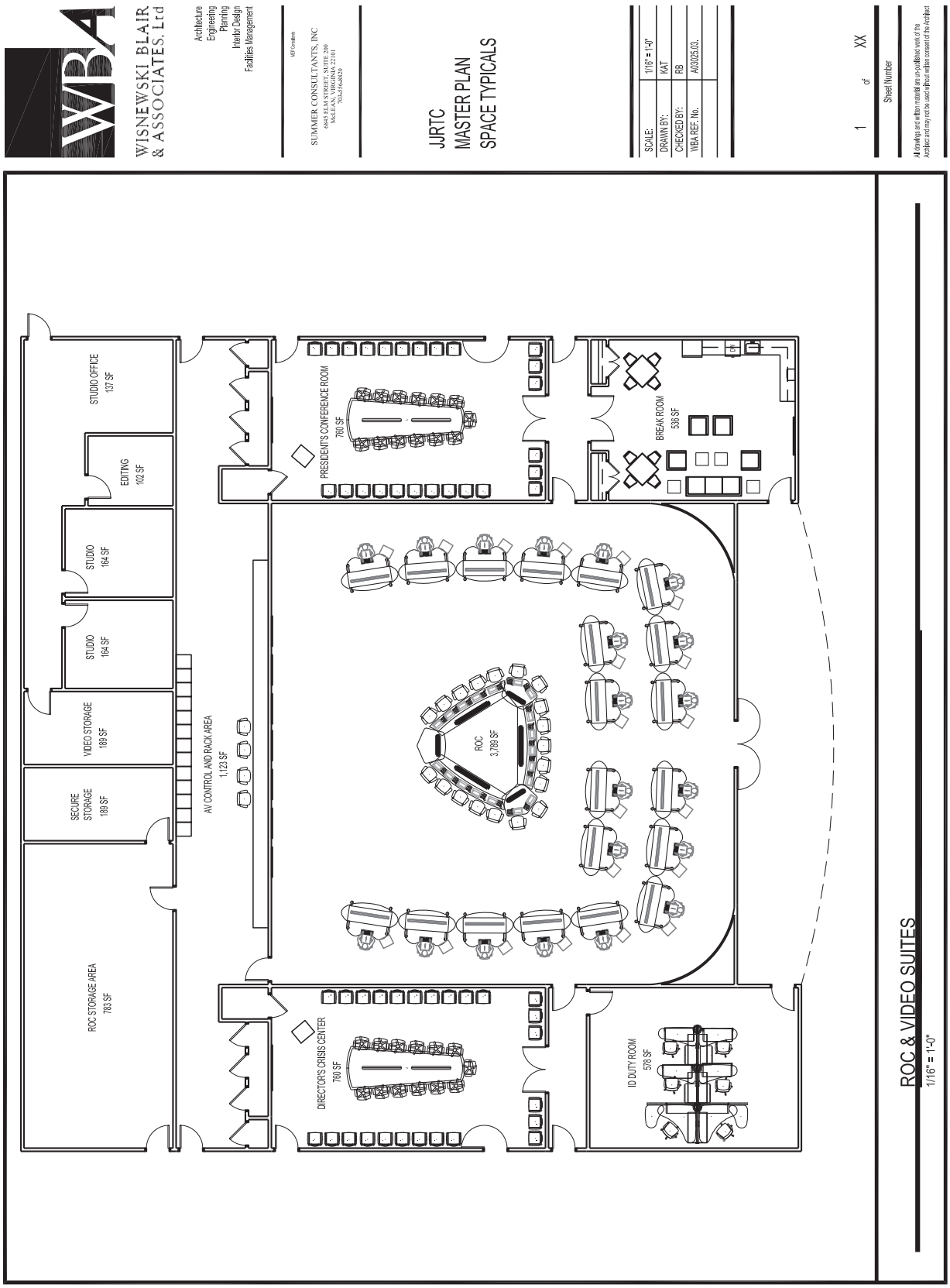
This page intentionally left blank.

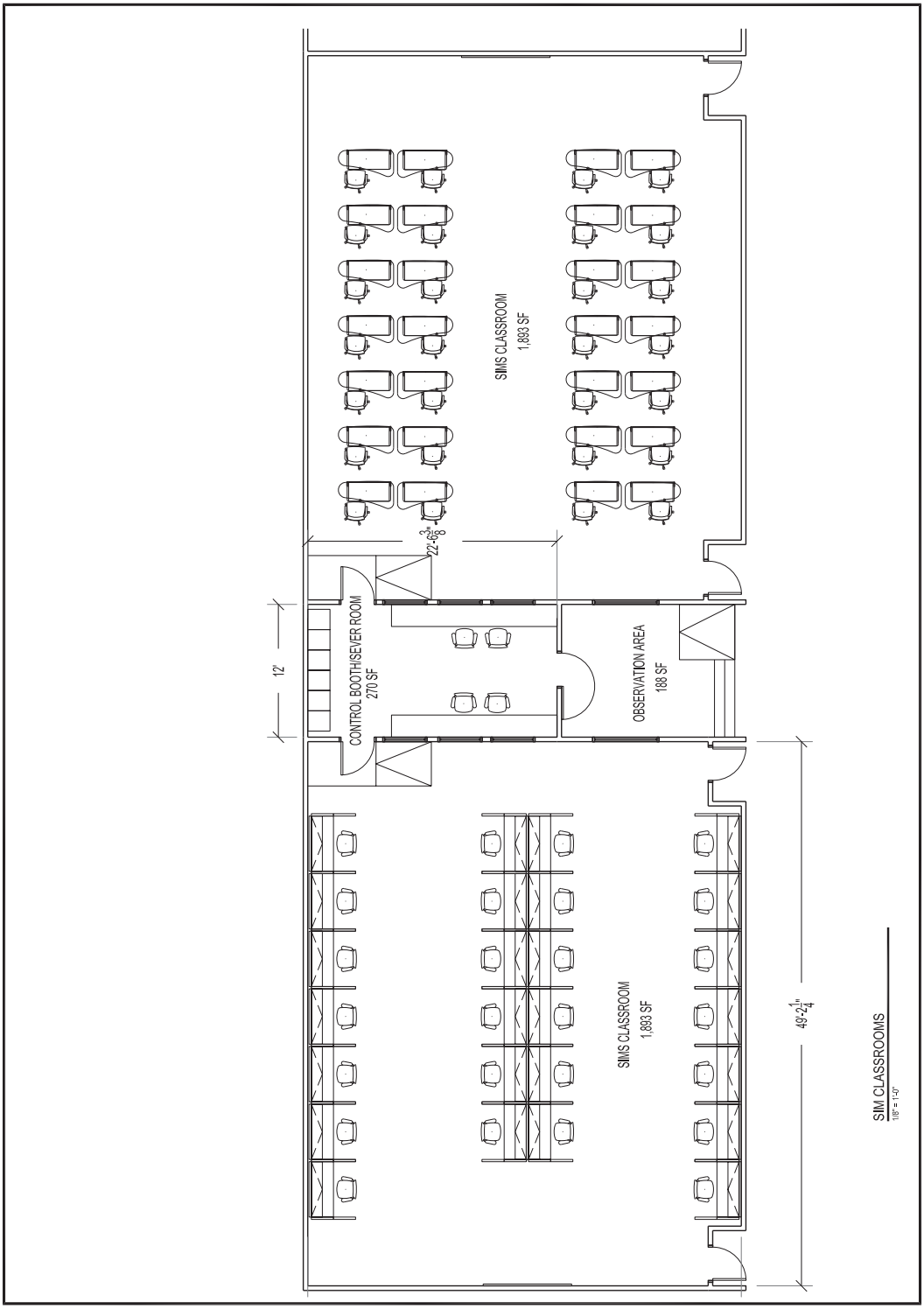
6.1 RTC Space Standards



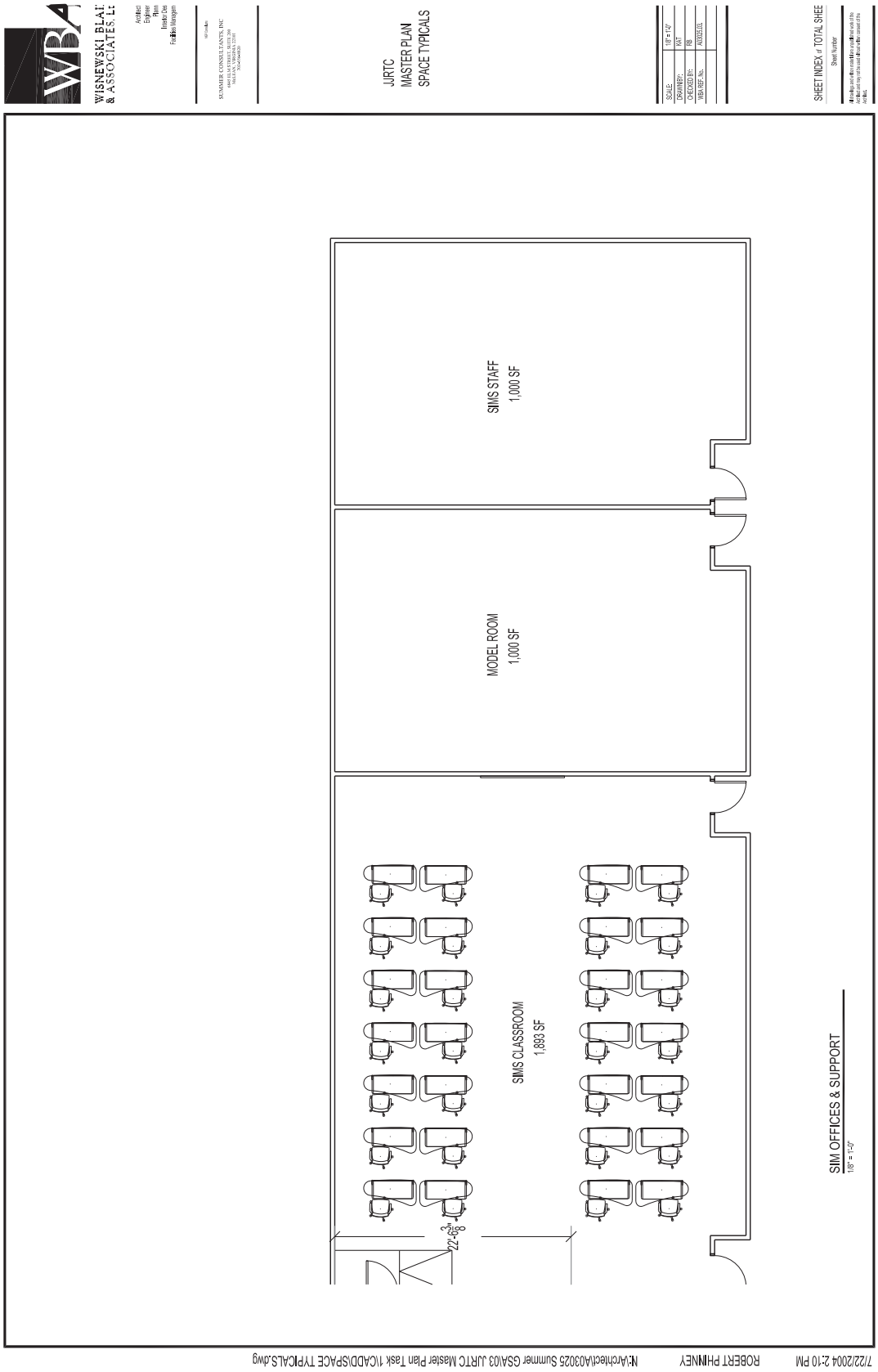

WISNEWSKI BLAIR & ASSOCIATES, Ltd
Architecture
Engineering
Planning
Interior Design
Facilities Management
MEP Consultants
SUMMER CONSULTANTS, INC
6845 ELM STREET, SUITE 200
McLEAN, VIRGINIA 22101
703-556-8820
JJRTC
MASTER PLAN
SPACE TYPICALS
SCALE: 1/8" = 1'-0"
DRAWN BY: KAT
CHECKED BY: RB
WBA REF. No. A03025.03.
1 of XX
Sheet Number
All drawings and written material are un-published work of the Architect and may not be used without written consent of the Architect.
5'-2"
4'
12'
3'-6"
12'
4'
39'-0 7/8"
31'-8"
1,200 SF
24 PERSON CLASSROOM
1/8" = 1'-0"
7/22/2004 2:10 PM ROBERT PHINNEY N:\Architect\A03025 Summer GSA\03 JJRTC Master Plan Task 1\CADD\SPACE TYPICALS.dwg

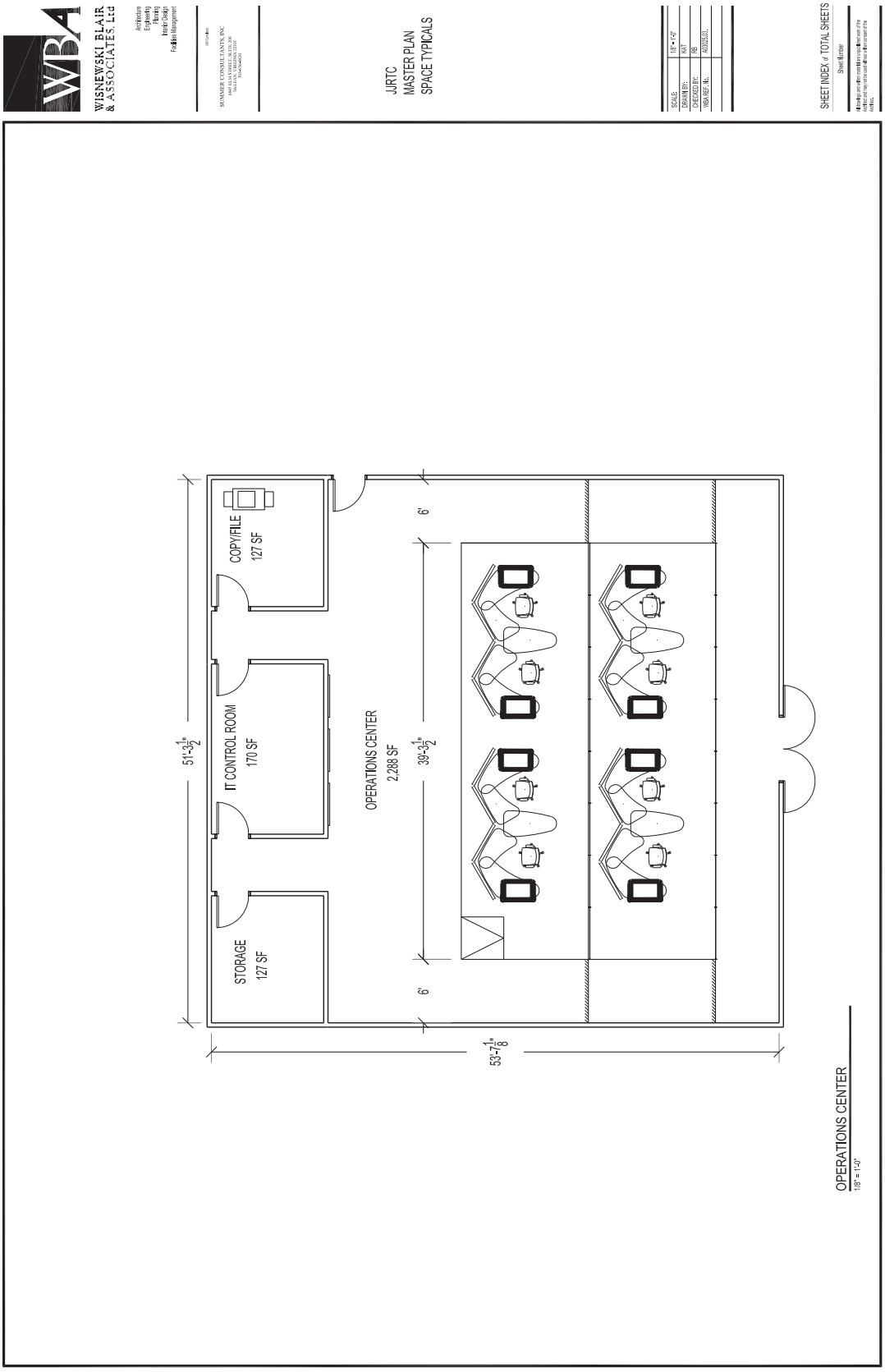

WISNEWSKI BLAIR & ASSOCIATES, Ltd
Architecture
Engineering
Planning
Interior Design
Facilities Management
SUMMER CONSULTANTS, INC
6845 ELM STREET, SUITE 200
McLEAN, VIRGINIA 22101
703-556-0020
JJRTC
MASTER PLAN
SPACE TYPICALS
SCALE: 1/8" = 1'-0"
DRAWN BY: KAT
CHECKED BY: RB
WBA REF. No. A030/25.03.
1 of XX
Sheet Number
39'-0 7/8"
3'-11"
12'
3'-6"
12'
4'
2,270 SF
60'
11'
35'-6"
48 PERSON CLASSROOM
1/8" = 1'-0"
7/22/2004 2:10 PM ROBERT PHINNEY N:\Architect\A030/25 Summer GSA\03 JJRTC Master Plan Task 1\CADD\SPACE TYPICALS.dwg


WISNEWSKI BLAIR & ASSOCIATES, Ltd
Architecture
Engineering
Planning
Interior Design
Facilities Management
MEP Consultants
SUMMER CONSULTANTS, INC
6845 ELM STREET, SUITE 200
MCLEAN, VIRGINIA 22101
703-556-0020
JURTC
MASTER PLAN
SPACE TYPICALS
SCALE: 1/16" = 1'-0"
DRAWN BY: KAT
CHECKED BY: RB
WBA REF. No. A03025.03.
1 of XX
Sheet Number
All drawings and written material are copyrighted work of the Architect and may not be used without written consent of the Architect
STUDIO OFFICE 137 SF
EDITING 102 SF
STUDIO 164 SF
STUDIO 164 SF
VIDEO STORAGE 189 SF
SECURE STORAGE 189 SF
ROC STORAGE AREA 783 SF
AV CONTROL AND RACK AREA 1,123 SF
PRESIDENT'S CONFERENCE ROOM 780 SF
DIRECTOR'S CRISIS CENTER 780 SF
ROC 3,789 SF
BREAK ROOM 536 SF
ID DUTY ROOM 578 SF
ROC & VIDEO SUITES
1/16" = 1'-0"
7/22/2004 2:10 PM ROBERT PHINNEY N:\Architect\A03025 Summer GSA\03 JURTC Master Plan Task 1\CADD\SPACE TYPICALS.dwg



7/22/2004 2:10 PM ROBERT PHINNEY N:\Architect\A03025 Summer GSA\03 JJRTC Master Plan Task 1\CADD\SPACE TYPICALS.dwg


WISNEWSKI BLAI
& ASSOCIATES, LI
Architect
Engineer
Planner
Interior Design
Facilities Managem
not to scale
SUMMER CONSULTANTS, INC.
6660 ELLA STREET, SUITE 200
MALL VIEW, VIRGINIA 22017
703-549-6620
JURTC
MASTER PLAN
SPACE TYPICALS
SCALE:
1/8" = 1'-0"
DRAWN BY:
NAT
CHECKED BY:
RB
WBA REF. No.
A03025.03.
SHEET INDEX # TOTAL SHEE
Sheet Number
SIMS STAFF
1,000 SF
MODEL ROOM
1,000 SF
SIMS CLASSROOM
1,893 SF
22'-6 3/4"
SIM OFFICES & SUPPORT
1/8" = 1'-0"
7/22/2004 2:10 PM
ROBERT PHINNEY
N:\Architect\A03025 Summer GSA03 JURTC Master Plan Task 1\CADD\SPACE TYPICALS.dwg



7/22/2004 2:10 PM ROBERT PHINNEY N:\Architect\A03025 Summer GSA\03 JJRTC Master Plan Task 1\CADD\SPACE TYPICALS.dwg

This page intentionally left blank.

6.2 RTC Area Requirements

Gatehouse & Access Control

Program Space	Qty	Area (SF)
Personnel Space		
Supervisory Agents	2	276
Officers	6	480
Security Specialists	2	230

Gatehouse & Access Control

Program Space	Qty	Area (SF)
Office Wide Support Space		
Team Room	1	250
Copy/Work Room	1	250
Secure Storage		200
Building Storage	1	175
Protest Gear Storage	1	195
Security Equipment Storage	1	195
Ready Room	1	535
Specialized Space		
Control Room	1	745
Holding and Interview Room	1	100
Male Locker rooms & shower	1	438
Female Locker rooms & shower	1	438
Public and Assembly Space		
Reception/Visitor Lobby	1	687
Assignable Area		**5,194**
Gross Area		**7,850**

Multipurpose Building & ROC Facility

Program Space	Qty	Area
Personnel Space		
Facility Office	1	330
Assembly Space		
Auditorium - 400 Seats	1	6,800
Pre-function Lobby		13,400
Coat Closet	1	180
Auditorium Support		1,200
Audio/Visual Control Room	1	140
Conference Center		
Conference Rooms	8	10,000
Breakout Rooms	6	995
Furniture Storage	4	760
Conference Lounge	1	850
Copier room	1	100
Audio/Visual Control Room	1	150
Special Space		
Campus Gift Store	1	380
Store Storage	1	300
Food Service		
Campus Café	5	950
Food Vender	5	950
Vender Storage	5	1,300
Kitchen receiving & waste	1	1,000
Catering Kitchen	1	350
Catering Storage	1	300

SPD Office

Program Space	Qty	Area
Personnel Space		
Supervisory Agents	28	6,160
Non Supervisory & Admin	45	4,050
Temporary Workstations	90	3,600

SPD Office

Program Space	Qty	Area
Office Wide Support Space		
Conference	4	2,500
Copier Mail room	2	400
Secured Storage	2	1,000
Personnel Equipment Storage	1	4,500
File Room	2	600
General Storage	2	600
Break Room	2	600
Operations Center	1	1,200
Restroom Men	3	600
Restroom Women	3	600
Public and Assembly Space		
Seminar Room	1	1,200
Break Out Room	1	500
Classroom	2	2,400
Reception/Visitor Lobby	3	2,000
Net Area		**32,510**
Gross Area		**44,100**

Administrative & Classroom Building

Program Spaces	Qty	Area
Personnel Space		
SAIC	1	225
ATSAIC	6	900
Supervisory Agents	12	1,440
Non Supervisory & Admin	60	3,840
Office Wide Support Space		
Conference	6	2,100
Copier Mail room	1	400
File Room	1	400
General Storage	2	300
Secure Storage	3	300
IT Control Room	1	170
Special Space		
Break Room	2	300
Entry Lobby	1	2,000
Assembly Space		
Classroom - 24 Person	8	9,600
Classroom - 48 Person	4	9,600
Student Lounge	1	1,400
Operations Control Room	1	1,100
Administrative Seminar Room	1	1,200
Gross Area		**35,275**

Program Space	Qty	Area
Personnel Space		
Supervisory Agent	10	1,200
Non Supervisory & Admin	60	3,840
Office Wide Support Space		
Conference	3	1,500
Copier Mail room	2	200
General Storage	3	300
File Room	3	300
Break Room	1	150
Assembly Space		
Classrooms	6	7,200
Classroom Storage	6	600
Net Area		**15,290**
Gross Area		**20,250**
Building Renovations		
Classroom Enlargements	1	8,000
Student Resource Center	1	8,000
Renovated Area Total		**16,000**

Supply Center

Program Space		Qty	Area
Personnel Space			
Supervisory Agent		1	100
Non Supervisory & Admin		5	320
Office Wide Support Space			
Copy Center		1	750
Mail Room		1	500
Special Space			
Break Room		1	150
Restroom	Men	1	451
Restroom	Women	1	217
Warehouse Type Storage			
Campus Storage		1	6,000
Shipping & Receiving		1	2,500
Secured Storage		1	1,100
Shipping Waste		1	120
Assignable Area			**12,208**

Maintenance Yard

Space Description			Area
Drummond Building Addition			
Personnel Space			
Supervisory Agents		1	120
Non Supervisory & Admin		6	384
Non Supervisory & Admin		8	Existing
Office Wide Support Space			
Conference		1	Existing
File Room		1	200
General Storage		1	100
Special Space			
Break Room		1	Existing
Rest room	Men	1	Existing
Rest room	Women	1	Existing
Net Area			**804**
Gross Area			**1,005**
Warehouse Facilities			
Workshop		2	4,800
General Storage		1	19,000
Secured Storage		5	4,000
Grounds Storage		3	6,000
Net Area			**33,800**
Gross Area			**38,100**

Physical Training Building

Program Space	Qty	Area
Personnel Space		
Supervisory Agent	2	240
Non Supervisory & Admin	13	832
Temporary Workstations	9	216
Office Wide Support Space		
Conference	1	500
Conference	1	325
File Room	1	100
General Storage	1	100
Copier Mail Room	1	100
Special Space		
Break Room	1	150
Locker Room Male 75	1	1,500
Locker Room Female 15	1	475
Locker Room Male 10	1	475
Locker Room Women 5	1	342
Locker Room Male 25	1	475
Locker Room Women 5	1	342
Assembly Space		
Classrooms	1	2,270
Classrooms	1	1,200
Tactical Training Space		
Strength Training	1	2,300
Mat Room	1	2,300
Weight Training	1	4,000
Pool	1	34,520
Mat Room Storage	4	600
Pool Equipment Room	4	2,000
Net Area		**55,362**

Canine Training Facility

Program Space	Qty	Area
Personnel Space		
Supervisory Agents	2	240
Non Supervisory & Admin	10	640
Office Wide Support Space		
Conference Room	1	500
Copier Mail room	1	100
Secured Storage	1	100
File Room	1	100
General Storage	2	200
Break Room	1	150
Restroom Men	1	451
Restroom Women	1	342
Assembly Space		
Classrooms	2	2400
Kennel		
Kennel Pens	35	8070
Canine Maintenance	1	150
Veterinary	1	225
Tack Room	1	120
Food Storage/Prep	1	150
Yard Storage	2	400
Net Area		**14,338**
Gross Area		**20,100**
Outdoor Training Space		
Bomb Dog Yard	1	1 Acre
Tactical Dog Yard	1	1 Acre
Wooded Training Yard	1	1 Acre

EMT/OPR Facility

Program Space		Qty	Area
Personnel Space			
Supervisory Agents		12	1,440
Non Supervisory & Admin		34	2,176
Temporary Workstations		48	4,320
Office Wide Support Space			
Conference		2	800
Copier Mail room		1	150
Secured Storage		2	100
File Room		1	150
General Storage		2	200
Special Space			
Break Room		1	150
Restroom	Men	1	451
Restroom	Women	1	342
Restroom	*Unisex*	1	175
EMS	Exam Room	1	120
EMS	Waiting area	1	100
EMS	MED Clean area	1	150
Laundry		1	120
OPR Mission Storage		1	1,500
OPR Personnel Equipment		1	1,450
OPR Equipment Testing & Repair		1	400
Clean Room		1	350

EMT/OPR Facility

Program Space	Qty	Area
Personnel Space		
Assembly Space		
Classroom:	2	2,400
Classroom: Dirty	1	1,000
EMS Storage	1	400
DECON Storage	1	600
Fire House Requirements		
Drive through bays	10	10,100
Drying Tower	1	100
Net Area		**29,244**
Gross Area		**36,600**

SOTS Range Building

Program Space	Qty	Area
Personnel Space		
Supervisory Agents	2	240
Non Supervisory & Admin	8	512
Office Wide Support Space		
Copier Mail room	1	100
General Storage	2	180
Special Space		
Break Room	1	150
Armory	1	150
Locker room Men	1	451
Locker room Women	1	451
Control Tower	2	550
CS Calibration Room	1	375
20-Point, 300 yd Rifle Range	1	93,000
12-Point, 100 yd Rifle Range	1	20,000
Weapons Cleaning Room	1	625
Weapons Storage	2	350
Ammunition Storage	2	350
Assembly Space		
Classrooms	1	1,200
Net Area		**118,684**
Gross Area		**142,450**

Firearms Training Complex

Program Space	Qty	Area
Personnel Space		
Supervisory Agents	6	720
Weapons Library Office	2	240
Non Supervisory & Admin	52	3,328
Office Wide Support Space		
Conference Room	2	1,100
Copy/Mail Room	2	250
File Room	1	100
General Storage	3	300
Secure Storage	3	300
Weapons Library File Room	1	200
Weapons Library Copy Room	1	100
Weapons Library Storage	1	100
Special Space		
Ready Room	1	575
Locker Room - Men	1	620
Locker Room - Women	1	620
Control Tower	2	580
30-Point, 50 yd Pistol Range	1	30,000
24-Point, 25 yd Pistol Range	1	13,500
Weapons Cleaning Room	2	800
Weapons Storage	2	300
Ammunition Storage	2	300
Weapons Library Display	1	1,000
Assembly Space		
Classrooms, 24-Person	1	1,200
Classrooms, 48-person Dividable	2	4,800
Weapons Seminar Room	1	800
Net Area		**61,033**
Gross Area		**79,350**

Armory

Program Space	Qty	Area
Personnel Space		
Supervisory Agents	1	160
Non Supervisory & Admin	12	900
Office Wide Support Space		
Conference	1	350
Copy/File Room	1	100
General Storage	1	100
Break Room	1	150
Warehouse Storage		
Armory	1	4,000
Weapons Distribution	1	1,600
Ammunition Distribution	1	3,500
Shipping & Receiving	1	200
Net Area		**11,060**
Gross Area		**14,700**

Moran Building

Space Description	Qty	Area
Personnel Space		
Supervisory Agents	2	Existing
Instructor & Technical	2	Existing
Instructor & Technical	10	640
Office Wide Support Space		
Conference	1	350
Copier Mail room	1	Existing
Secured Storage	1	Existing
File Room	1	Existing
General Storage	1	Existing
Special Space		
Break Room	1	150
Model Room	1	800
Assembly Space		
Classrooms	1	1,200
Net Area		**3,140**
Gross Area		**4,100**

Program Space	Qty	Area
Vehicle Display		
Display Space	1	4,200
Conference Room	1	325
General Storage	1	250
Tactical Space		
Mock Office	2	300
Net Area		**5,075**

Program Space	Qty	Area
Assembly Space		
Briefing Room/Mock Terminal	1	1,200
Equipment Storage	1	200
Tactical Space		
Mock Office	2	300
Mock Conference Room	1	200
Flexible Program Space	1	250
Net Area		**2,150**

Program Space	Qty	Area
Conditioned Space		
Classroom	1	1,200
AV/IT Room	1	200
Restroom	2	240
Tactical Space		
Flexible Program Space	1	1,700
Elevator Shaft Scenario	2	130
Net Area		**3,470**

Program Space	Qty	Area
Mock Field Office		
Personnel Space		
Supervisor Office	2	240
Student Workstations	12	768
Office Wide Support		
Reception Area	1	400
Proisoner Processing	1	250
Duty Desk	1	500
Interview Room	3	240
Conference	1	500
Copier/Mail Room	1	100
Case Management	1	400
Secure Storage	1	100
Evidence Storage	1	100
File Room	1	100
General Storage	2	200
Undercover Equipment Room	1	100
ECSAP Lab	1	145
Break Room	1	150
Special Space		
Fake ID Production	1	100
Control/Observation Room	1	300
Restroom	2	300
Net Area		**4,993**

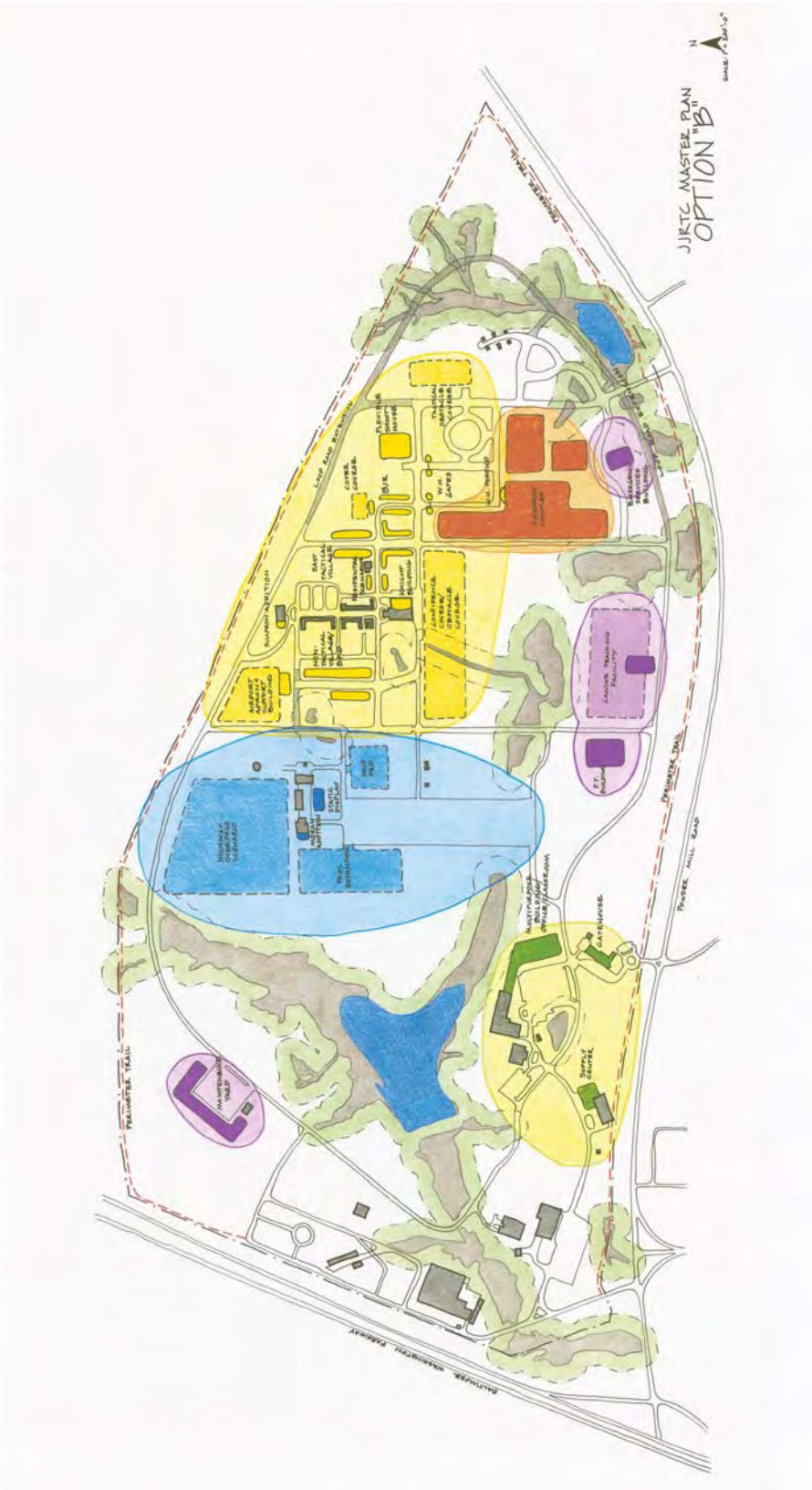
Program Space		Qty	Area
Personnel Space			
Supervisory Agent		1	120
Non Supervisory & Admin		10	640
Office Wide Support Space			
Conference		1	500
Weapons Storage		1	100
General Storage		1	100
Special Space			
Break Room		1	150
Restroom	Men	1	285
Restroom	Women	1	342
Weapons Cleaning		1	300
Assembly Space			
Classroom		1	1,200
Net Area			**3,737**

Program Space	Qty	Area
Assembly Space		
Classroom	1	1,200
Observation Room	1	700
Support Space		
Equipment Storage	1	100
Restroom	2	156
Tactical Space		
Shoothouse	1	4,100
Net Area		**6,256**

This page intentionally left blank.

6.3 Development Alternatives

6.3 Development Alternatives



6.4 Traffic Impact Study/Transportation Management Guidelines

JAMES J. ROWLEY TRAINING CENTER
MASTER PLAN 2012, UPDATE
(2012 RTC MASTER PLAN)
TRAFFIC IMPACT STUDY
AND
TRANSPORTATION MANAGEMENT GUIDELINES
PRINCE GEORGE'S COUNTY, MARYLAND

CONFIDENTIAL

Prepared for:
United States Secret Service (USSS)

Department:
United States Department of Homeland Security (DHS)

Contracting Agency:
United States General Services Administration (GSA)

Prepared by:
Wells + Associates, Inc.

August 25, 2009
Revised
June 19, 2012

JAMES J. ROWLEY TRAINING CENTER MASTER PLAN 2012
TRAFFIC IMPACT STUDY
AND
TRANSPORTATION MANAGEMENT GUIDELINES
PRINCE GEORGE'S COUNTY, MARYLAND

TABLE OF CONTENTS

	Page
TRAFFIC IMPACT STUDY	
Introduction	1
Background Data	5
Definition of Study Area	5
Public Road Network	5
Site Access Concept	8
Existing Traffic Volumes	8
Analysis	10
Level of Service Standard	10
Existing Levels of Service	10
Background Traffic Growth	12
Background Traffic Forecasts	15
Site Generated Traffic	18
Site Traffic Distribution	18
Total Future Traffic Forecasts	18
Future Levels of Service Without RTC Master Plan Update	23
Future Levels of Service With RTC Master Plan Update	23
Recommended Intersection Improvements	26
Conclusions	29

JAMES J. ROWLEY TRAINING CENTER MASTER PLAN, 2012 UPDATE
TRAFFIC IMPACT STUDY
AND
TRANSPORTATION MANAGEMENT GUIDELINES
PRINCE GEORGE'S COUNTY, MARYLAND

TABLE OF CONTENTS CONTINUED

TRANSPORTATION MANAGEMENT GUIDELINES

Introduction 30

Overview 30
Mission Statement 30
RTC Development Program 30

Existing Worksite Analysis 31

Public Transportation Availability 31

TMG Strategies 31

Overview 31
Public Transportation 32
Parking Management 32
Carpool Program 33
Alternative Work Schedules 33

Summary 33

JAMES J. ROWLEY TRAINING CENTER MASTER PLAN, 2012 UPDATE
TRAFFIC IMPACT STUDY
AND
TRANSPORTATION MANAGEMENT GUIDELINES
PRINCE GEORGE'S COUNTY, MARYLAND

LIST OF FIGURES

Figure	Title	Page
1	Site Location Map	4
2	Existing Lane Use and Traffic Control	7
3	Existing Peak Hour Traffic Volumes	9
4	Background Development Location Map	13
5	Combined Approved Development Peak Hour Traffic Forecasts	16
6	Background Peak Hour Traffic Forecasts	17
7	Site Generated Peak Hour Traffic Forecasts	20
8	Total Future Peak Hour Traffic Forecasts	21
9	Proposed Lane Use and Traffic Control	22
10	Suggested Future Lane Use and Traffic Control	28

LIST OF TABLES

Table	Title	Page
1	Existing Intersection Levels of Service	11
2	Background Development Trip Generation	14
3	Site Trip Generation	19
4	Intersection Levels of Service	25

APPENDICES

A	Scoping Letter and Correspondence
B	Existing Peak Hour Traffic Counts
C	Existing Intersection Levels of Service Analysis
D	Traffic Forecasting Worksheets
E	Background Future Intersection Levels of Service Analysis
F	Total Future Intersection Levels of Service Analysis

INTRODUCTION

In 2009, Wells + Associates conducted a traffic impact analysis for the proposed expansion of the James J. Rowley Training Center (RTC) to support an updated master plan. This report is an update of that previous report. The update includes a review of the Maryland State Highway Administration (SHA) regional growth as indicated in the Average Daily Traffic Volume maps and a review of the Maryland National Capital Park and Planning Commission data files to determine if any projects in the vicinity of the RTC facility have been approved since 2009. Recognizing that the traffic conditions change overtime, and the Master Plan will be implemented in phases over a 10-15 year period, the Transportation Study and Transportation Management Guidelines will be updated at key phases.

The SHA maintains a data history of the Average Daily Traffic Volumes (ADT) on State Roadways. A review of SHA ADT data indicates that there has been a decrease of .6 percent in the regional traffic over the last seven years. MNCPPC Prince George's County provides information on the MNCPPC Planning Department web site about development activity throughout the county. The information is located in the Development Activity Monitoring System (DAMS). A review of the DAMS reports revealed that no new projects have been approved in the vicinity of the site since the previous study conducted in 2009. Therefore, based on the SHA and MNCPPC data files, the study conducted in 2009 is still valid and is presented below.

The RTC is located on approximately 439 acres of federally-owned land in the eastern portion of Prince George's County, Maryland. The site is approximately 2.5 miles north of the Capital Beltway, at the northeast corner of the intersection of the Baltimore-Washington Parkway (State Highway 295) and Powder Mill Road, as shown in Figure 1. The main access point for the RTC is located off Powder Mill Road, which connects with Maryland Route 197 (Laurel Bowie Road) near the eastern edge of the RTC. The RTC is adjacent to the northern boundary of the BARC, operated by the U.S. Department of Agriculture (USDA). A portion of the Patuxent National Wildlife Research Center operated by the U.S. Fish and Wildlife Service (USFWS) abuts the east side of the RTC on the north side of Powder Mill Road.

Under the ten-year master plan, the United States Secret Service (USSS) projects that the student/staff population will double from the current numbers. For purposes of this revised traffic analysis, this increase is assumed to take place by the year 2021.

This impact study has been conducted in accordance with National Capital Planning Commission (NCPC), Maryland-National Capital Park and Planning Commission

(MNCPPC) and Maryland State Highway Administration (SHA) guidelines for traffic impact studies. Conversations outlining the study area and assumptions were held with the MNCPPC staff. A copy of the scoping letter and related correspondence is contained in Appendix A.

Tasks undertaken in this study included the following:

1. Review of RTC Master Plan Executive Summary and other background data.

2. A field reconnaissance of the area and observation of current peak period traffic conditions.

3. Conversations with the MNCPPC staff outlining the study scope of work.

4. Identification of a study area, approved pipeline developments, and the anticipated growth in vehicular traffic within the study area.

5. Counts of existing peak hour traffic volumes at the six (6) study intersections.

6. Analyses of existing AM and PM peak hour levels of service at the key intersections.

7. Background future traffic volumes were forecasted based on existing traffic counts and local and regional background traffic growth.

8. Background levels of service were calculated at the six (6) study intersections based on background traffic forecasts, existing traffic controls, and existing intersection geometrics.

9. The number of AM peak hour and PM peak hour trips that will be generated by the expansion of the RTC were estimated based on the projected increase in student and staff population.

10. Total future levels of service were calculated at the six (6) study intersections, based on total future traffic forecasts, planned lane use and traffic controls, and intersection geometrics.

11. Traffic management strategies are identified.

Sources of data for this analysis included traffic counts conducted by Wells & Associates, the Highway Capacity Manual (HCM), the Institute of Transportation Engineers (ITE), MNCPPC Guidelines, the Maryland State Highway Administration (SHA), the files of Wells + Associates, Inc., and Wisnewski Blair & Associates, LLC.

3

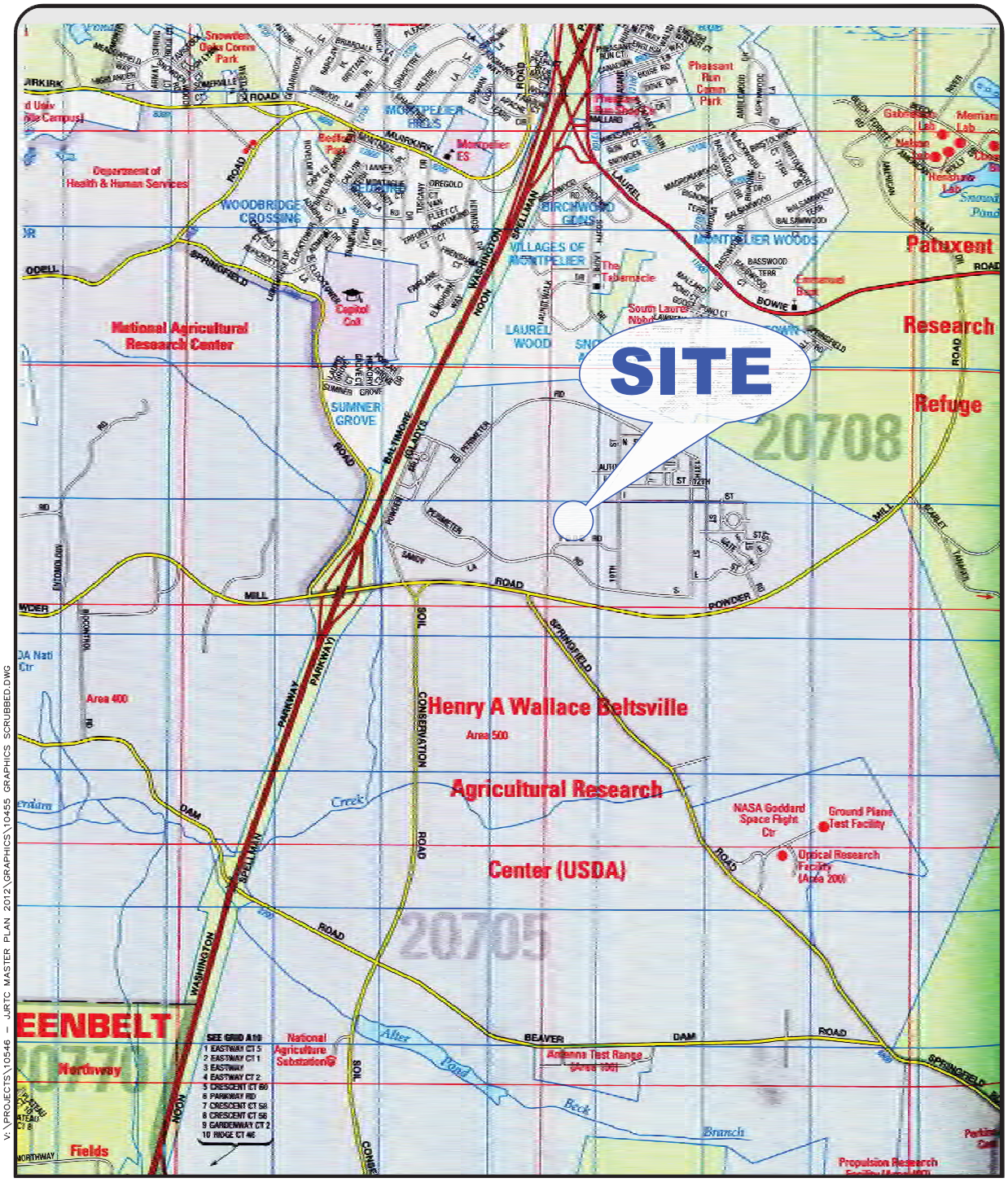


Figure 1
Site Location Map

North

2012 RTC Master Plan
Prince George's County, Maryland

4

Wells + Associates, INC

BACKGROUND DATA

Definition of Study Area

In accordance with the 2009 MNCPPC scoping letter, the study area for the subject analysis includes the following intersections:

1. Baltimore-Washington Parkway (B-W Parkway) Southbound Ramps/Powder Mill Road,
2. B-W Parkway Northbound Ramps/Powder Mill Road,
3. Powder Mill Road/Soil Conservation Road,
4. Powder Mill Road/Site Access,
5. Powder Mill Road/Springfield Road,
6. Powder Mill Road/Laurel-Bowie Road (MD 197), (this is not a critical intersection since less than 20 percent of the site traffic will affect this intersection).

Public Road Network

Regional access to the proposed property is provided by B-W Parkway, Powder Mill Road and Laurel-Bowie Road. Local access is provided by Soil Conservation Road and Springfield Road.

Baltimore-Washington Parkway (B-W Parkway) (MD 295) is a generally north-south highway that extends from I-295 in Washington D.C. to Baltimore. The roadway in the vicinity of the site is maintained by the National Park Service. The B-W Parkway is a four-lane divided freeway with interchanges provided at Powder Mill Road and Laurel-Bowie Road. The speed limit is 55 mph.

Powder Mill Road (MD 212A) is a east-west roadway that extends from New Hampshire Avenue (MD 650) to Laurel-Bowie Road. It is a two-lane road with a posted speed limit of 40 miles per hour (mph) in the vicinity of the site. The road is a Federally owned roadway.

Laurel-Bowie Road (MD 197) is a northwest-southeast roadway that extends from MD 198 in Laurel to US 301 in Bowie. The posted speed limit is 45 mph and the intersection with Powder Mill Road is controlled by a traffic signal. It is a two-lane roadway in the vicinity of the site. This roadway is owned and maintained by the State

Soil Conservation Road is a north-south, two-lane roadway that extends from Powder Mill Road and ends at MD 193 (Greenbelt Road). The speed limit is 40 mph and the intersection with Powder Mill Road is controlled by a traffic signal. This roadway is owned by the Federal Government.

Springfield Road is a County owned roadway that runs generally northwest to southeast. It is a two-lane local roadway that extends from Powder Mill Road to MD 564 (Lanham-Severn Road). Springfield Road has a posted speed limit of 30 mph and is STOP controlled at Powder Mill Road.

The existing lane use and traffic control for each of the study intersections is shown on Figure 2.

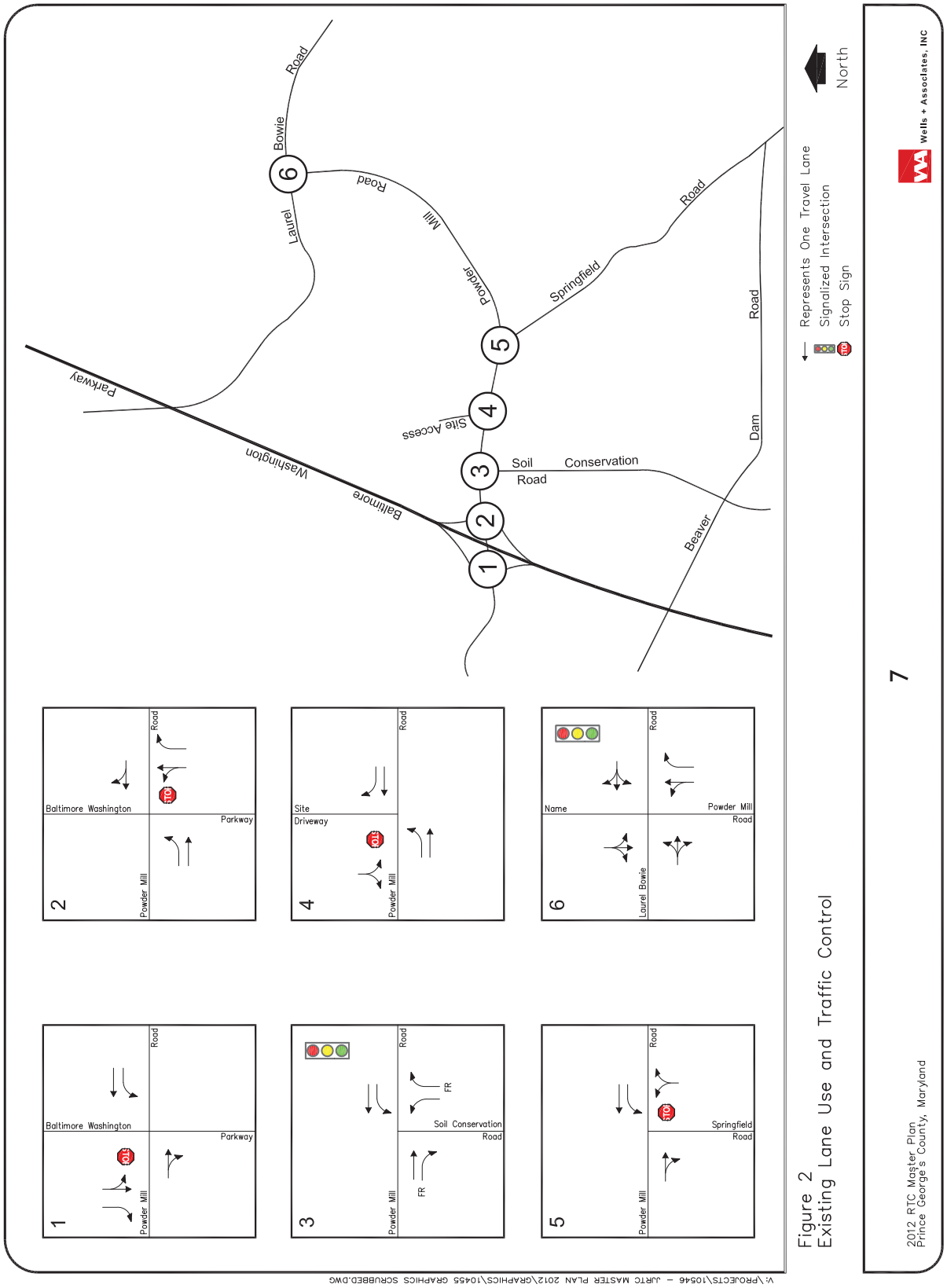


Figure 2
Existing Lane Use and Traffic Control

V:\PROJECTS\10546 - JJRTC MASTER PLAN 2012\GRAPHICS\10455 GRAPHICS SCRUBBED.DWG

Site Access Concept

The existing site access is located on the north side of Powder Mill Road between Soil Conservation Road and Springfield Road. There are service road entrances at two other locations along Powder Mill Road; however those access points are controlled and closed due to security reasons. The main entrance will be relocated to align directly across from Springfield Road with the implementation of the 2012 Master Plan.

Existing Traffic Volumes

Existing AM and PM peak hour traffic counts were conducted from 6:30 to 9:30 AM and 3:00 to 7:00 PM on Tuesday, April 28, 2009 by Wells & Associates at the following existing study intersections:

1. B-W Parkway Southbound Ramps/Powder Mill Road,
2. B-W Parkway Northbound Ramps/Powder Mill Road,
3. Powder Mill Road/Soil Conservation Road,
4. Powder Mill Road/Springfield Road,
5. Powder Mill Road/Laurel-Bowie Road (MD 197).

At the intersection of Powder Mill Road and the site access point, a 12-hour traffic count was conducted from 6:00 AM to 7:00 PM.

The results are included in Appendix B and summarized on Figure 3.

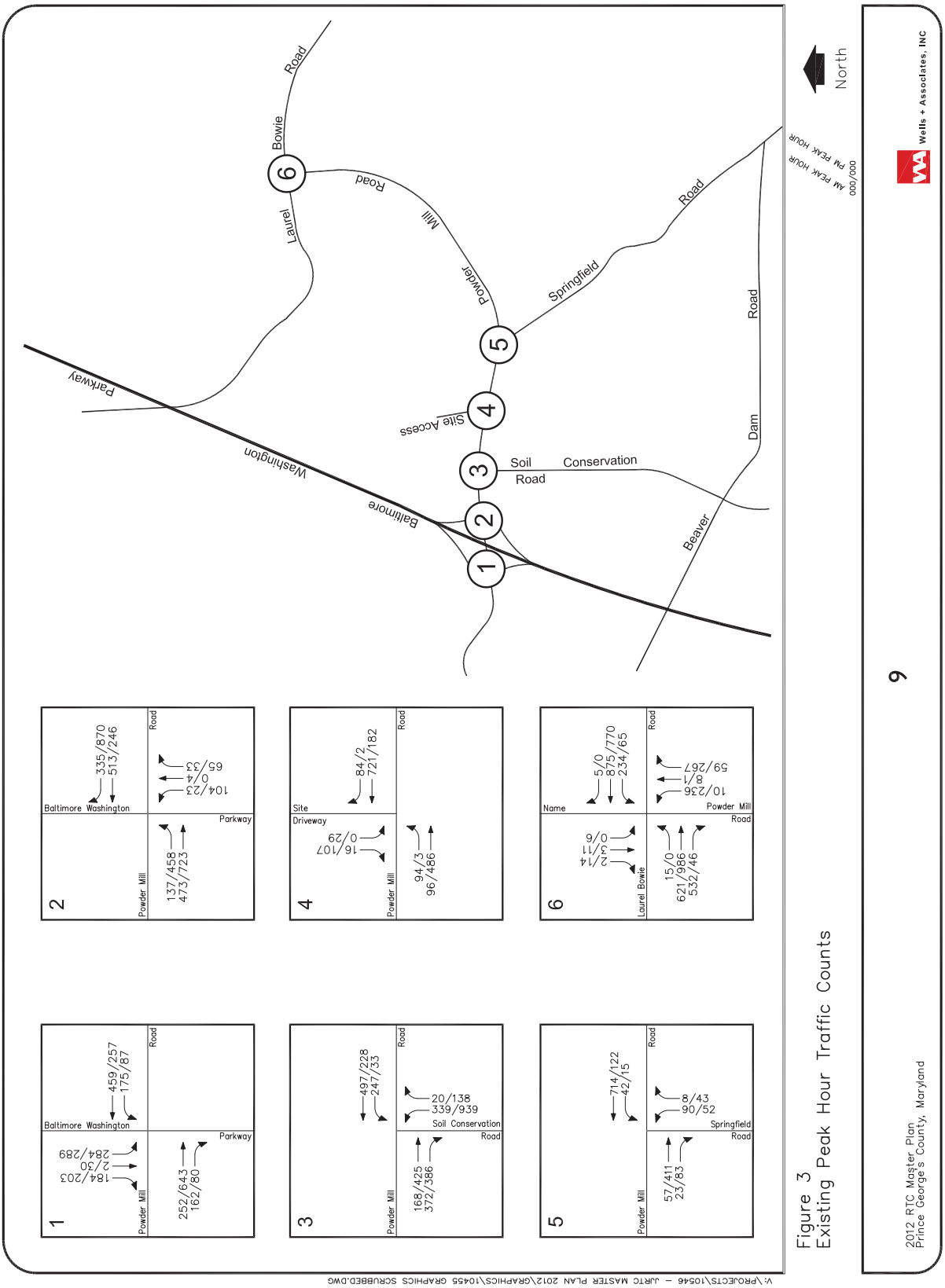


Figure 3
Existing Peak Hour Traffic Counts

ANALYSIS

Level of Service Standard

The proposed site is located in the Developing Tier of Prince George's County. The MNCPPC level of service standard in this policy area is Level of Service (LOS) "D" for signalized intersections and 50.0 seconds of delay or less for unsignalized intersections.

Existing Levels of Service

Existing peak hour levels of service were calculated at the six (6) existing study intersections based on the existing lane usage and traffic control shown on Figure 2, the existing peak hour traffic volumes shown on Figure 3, the MNCPPC critical lane analysis procedure for signalized intersections and the Highway Capacity Manual (HCM) method for unsignalized intersections, in accordance with the MNCPPC guidelines. The results are presented in Appendix C and summarized in Table 1.

Table 1 indicates that the intersection of Powder Mill Road/B-W Parkway Southbound Ramp is operating with 250.0 seconds of delay in the AM peak hour and 195.1 seconds of delay in the PM peak hour. The intersection of Powder Mill Road/B-W Parkway Northbound Ramps is operating with 103.2 seconds of delay during the AM peak hour and over 999.9 seconds of delay during the PM peak hour. The intersection of Soil Conservation Road/Powder Mill Road is operating at level of service (LOS) "A" during the AM peak hour and LOS "D" during PM peak hour. The intersection of Powder Mill Road/Site Driveway is operating with 14.2 seconds of delay during the AM peak hour and 11.6 seconds of delay during the PM peak hour. The intersection of Powder Mill Road/Springfield Road is operating with a delay of 22.0 seconds during the AM peak hour and 14.6 seconds during the PM peak hour. The intersection of Powder Mill Road/Laurel-Bowie Road is operating at LOS "F" during the AM peak hour and LOS "D" during the PM peak hour.

Table 1
2012 RTC Master Plan
Existing Intersection Level of Service Summary

Intersection	Operating Condition	Approach/ Movement	Existing AM	Existing PM
1: BW Parkway SB Off-Ramp/Powder Mill Road	Unsignalized	WBL	A [8.8]	A [9.7]
		SB	F [250.0]	F [195.1]
2: BW Parkway NB On-Ramp/Powder Mill Road	Unsignalized	EBL	B [10.8]	D [31.8]
		NB	F [103.2]	F [*]
3: Powder Mill Road/Soil Conservation Road	Signalized	Overall	A (836)	D (1397)
4: Powder Mill Road/Site Driveway1	Unsignalized	EBL	B [10.2]	A [7.6]
		SB	B [14.2]	B [11.6]
5: Powder Mill Road/Springfield Road2	Unsignalized	WBL	A [7.5]	A [8.6]
		NB	C [22.0]	B [14.6]
6: Powder Mill Road/Laurel-Bowie Road	Signalized	Overall	F (2119)	D (1370)

Notes : Numbers in parentheses ( ) represent critical lane volume in vehicles for signalized intersections.
Numbers in square brackets [ ] represent delay at unsignalized intersections in seconds per vehicle.
* - indicates that the calculated delay exceeds 999.9 seconds

Background Traffic Growth

As required by the MNCPPC Guidelines for Traffic Impact Studies, growth in through traffic that would be generated by approved, but unbuilt, developments in the vicinity of the site, as well as the regional growth attributable to development outside the study area, should be included in the analyses. A regional growth rate of 2.0% had been applied to all movements of the study intersections with the exception of the site driveway through the build-out year 2019 in the 2009 report. With the decrease in volume over the last seven years, no additional growth was added to develop the 2021 regional growth.

Review of the MNCPPC DAMS files show no additional approved pipeline developments have been approved since 2009. In 2009, the MNCPPC staff indicated that there were four approved pipeline developments in the immediate vicinity of the site. The 2009 approved developments included in this study are:

1. Rosso Property – 31 Single Family Homes,
2. Glen Dale North – 31 Single Family Homes,
3. Emmanuel Baptist Church – 18,600 SF Church,
4. Sylla Business Park – 72 Room Hotel and 16,000 SF Office.

The locations of the background developments are shown on Figure 4.

Review of MNCPPC files showed no additional approved pipeline developments. The number of peak hour trips that will be generated by the approved pipeline projects was estimated based on Prince George's County trip generation rates. As shown in Table 2, it is estimated that the approved projects will generate a total of 112 AM peak hour trips and 134 PM peak hour trips to the area road system.

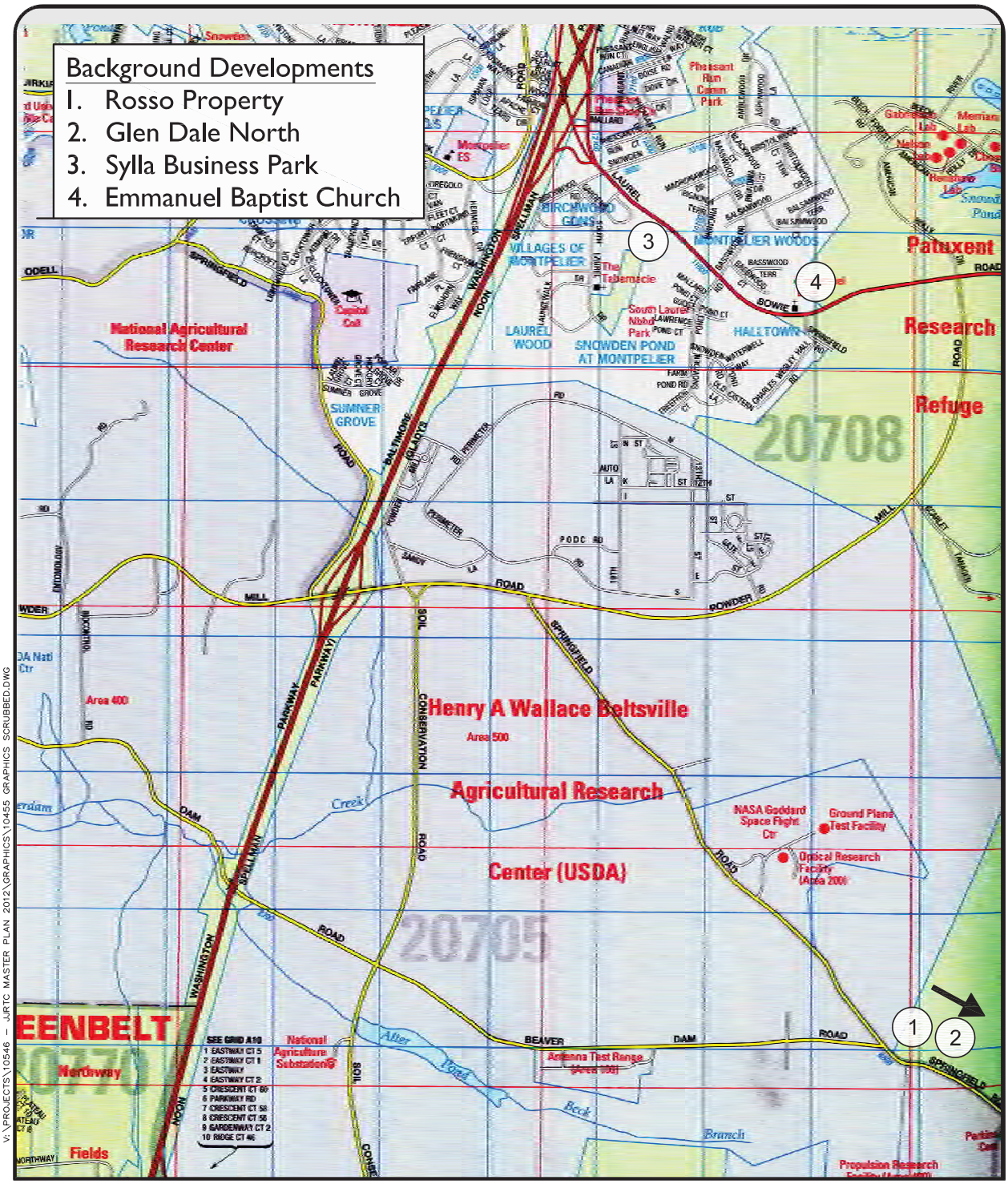


Figure 4
Background Development Location Map

North

Table 2
2012 RTC Master Plan
Background Development Trip Generation

	Development/Land Use	ITE Land Use Code	Amount	Unit	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
Rosso Property	Single Family Homes	MNCPPC	31	DU	5	19	24	18	10	28
Glen Dale North	Single Family Homes	MNCPPC	31	DU	5	19	24	18	10	28
Sylla Business Park	Office	MNCPPC	16,000	SF	29	3	32	6	24	30
	Hotel	310	72	Rooms	16	11	27	22	20	42
	Subtotal				45	14	59	28	44	72
Emmanuel Baptist Church	Church	MNCPPC	18,600	SF	3	2	5	3	3	6
Total Background Development Trip Generation					**58**	**54**	**112**	**67**	**67**	**134**

Note: Trip generation is based on Prince George's County Trip Generation Rates.

Background Traffic Forecasts

The approved development trips, shown in Table 2, were distributed to the area road network based on the existing traffic patterns and local knowledge of the roadway system. The individual development site trip distributions are shown in Figures D-1 through D-5 in Appendix D. The resulting combined approved development trips are shown in Figure 5.

The combined approved development peak hour trips were then added to the existing peak hour volumes, shown in Figure 3, and the regional growth to yield the future background traffic volumes as shown on Figure 6.

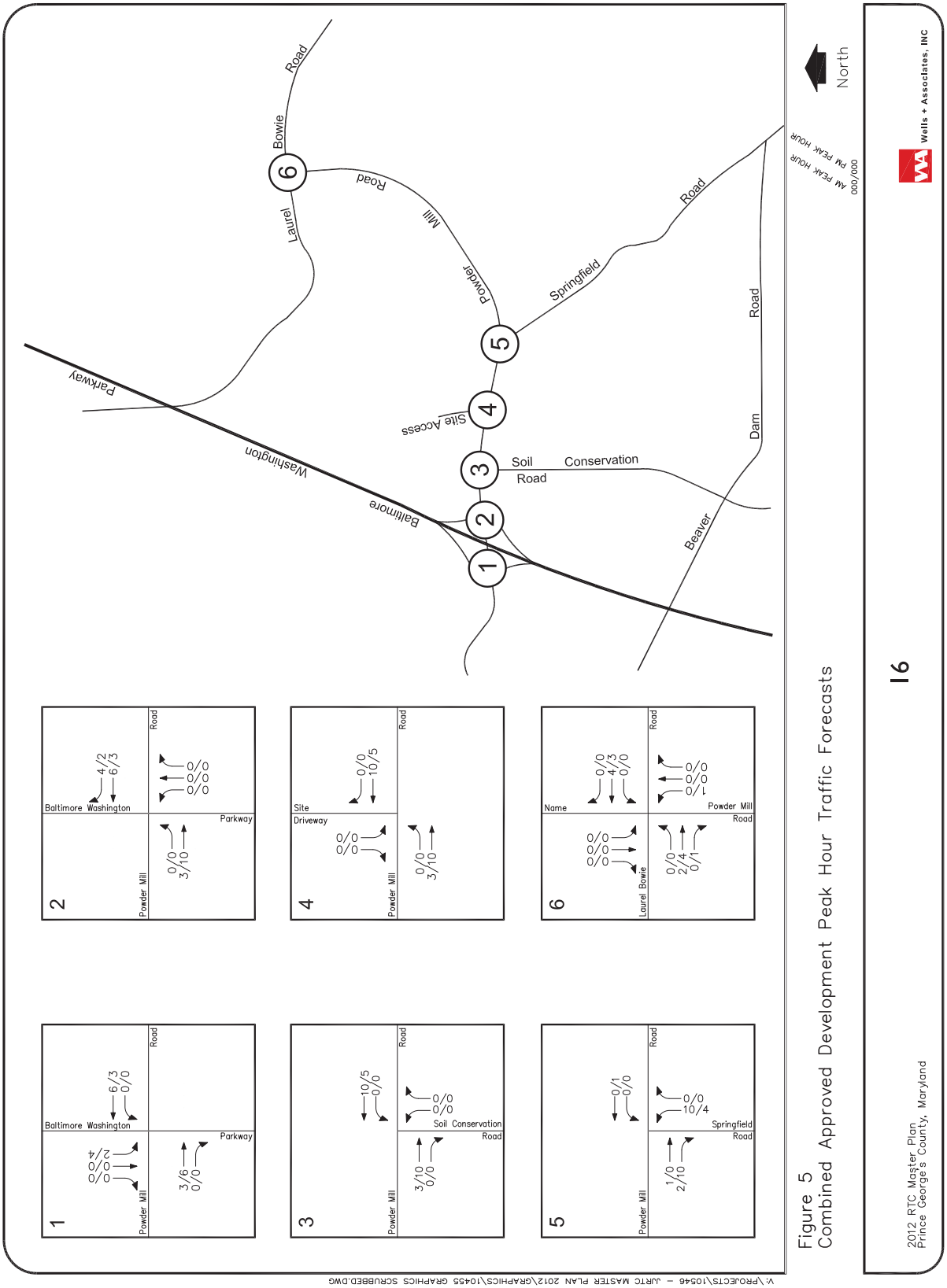


Figure 5
Combined Approved Development Peak Hour Traffic Forecasts

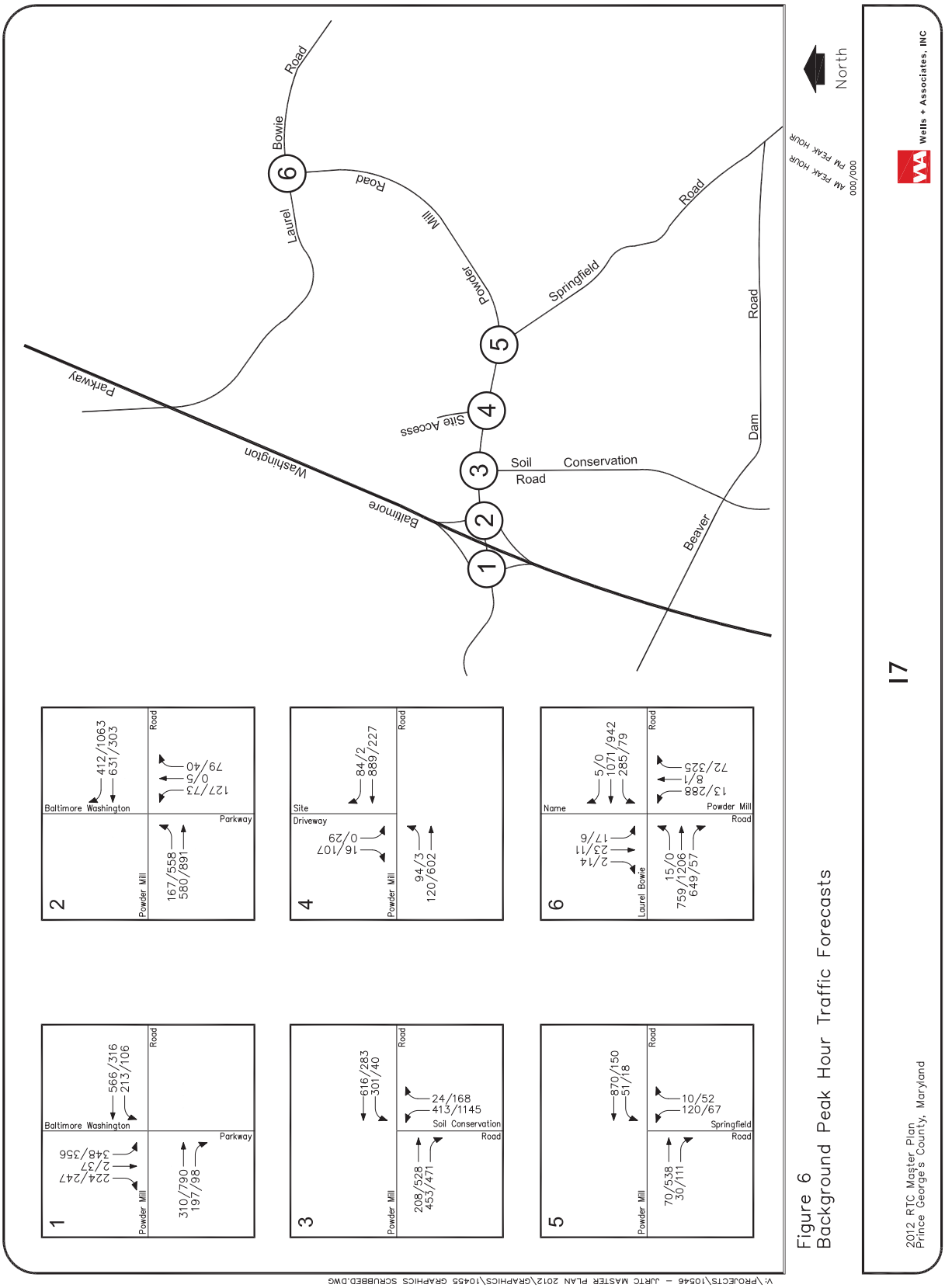


Figure 6
Background Peak Hour Traffic Forecasts

Site Generated Traffic

The proposed expansion includes the projected doubling of the student and staff populations. The existing and projected average daily population figures are as follows:

	Current	Projected
Average Daily Employee Population	285	460
Average Daily Trainee Population	48	200
Total	333	660

The current trip generation was determined from the existing site peak traffic volumes collected at the existing site access point in 2009, which are detailed in the traffic count sheet included in Appendix B and summarized on Table 3. This volume was then doubled to obtain the future site generated volume. As shown on Table 3, this project will generate 194 new AM peak hour trips, and 148 new PM peak hour trips, upon completion.

Site Traffic Distribution

Based on previous studies for the RTC, the directional distributions for the trips that will be generated are as follows:

- 10% to/from the east via Laurel-Bowie Road,
- 5% to/from the southeast via Springfield Road,
- 5% to/from the south via Soil Conservation Road,
- 50% to/from the south via the Baltimore-Washington Parkway,
- 20% to/from the north via the Baltimore-Washington Parkway, and
- 10% to/from the west via Powder Mill Road.

Total Future Traffic Forecasts

The site-generated trips shown in Table 3 were assigned to the public road network according to the directional distribution described above and with consideration of the relocated site access. The resulting site traffic assignments are shown on Figure 7. These assignments were added to the background traffic volumes shown on Figure 6 to yield the total future traffic forecasts shown on Figure 8, and contained in Appendix D. The proposed lane use with the relocated site access is shown in Figure 9.

Table 3
2012 RTC Master Plan
Site Trip Generation

Development/Use	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
Existing Site Trip Generation	178	16	194	5	143	148
Future Site Trip Generation	356	32	388	10	286	296
Trip Increase	178	16	194	5	143	148

Notes: Existing site trips based on counts conducted by Wells + Associates on April 29, 2009 and contained in Appendix B.
Trip increase based on doubling the site staff and students as per UGA

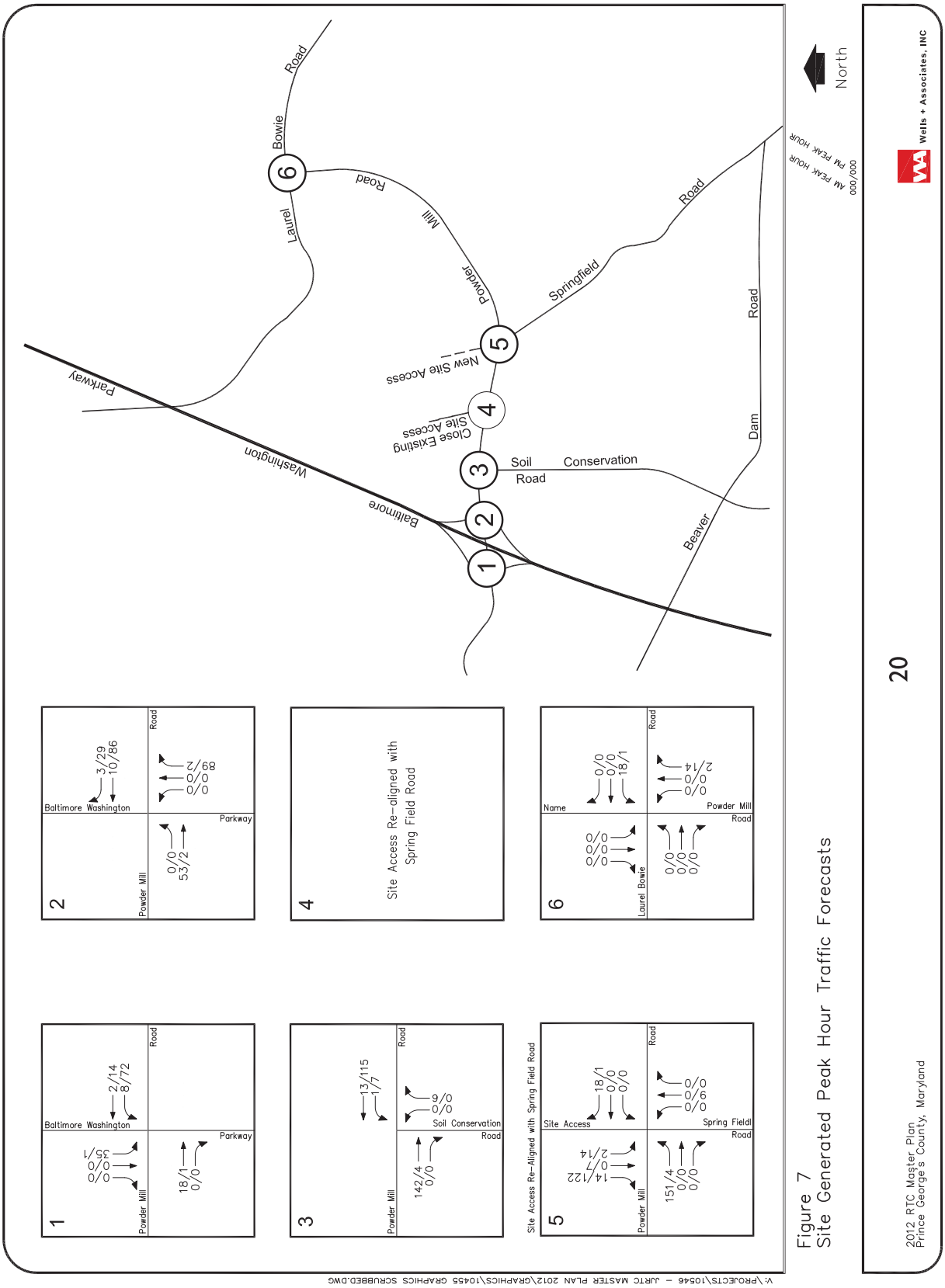


Figure 7
Site Generated Peak Hour Traffic Forecasts

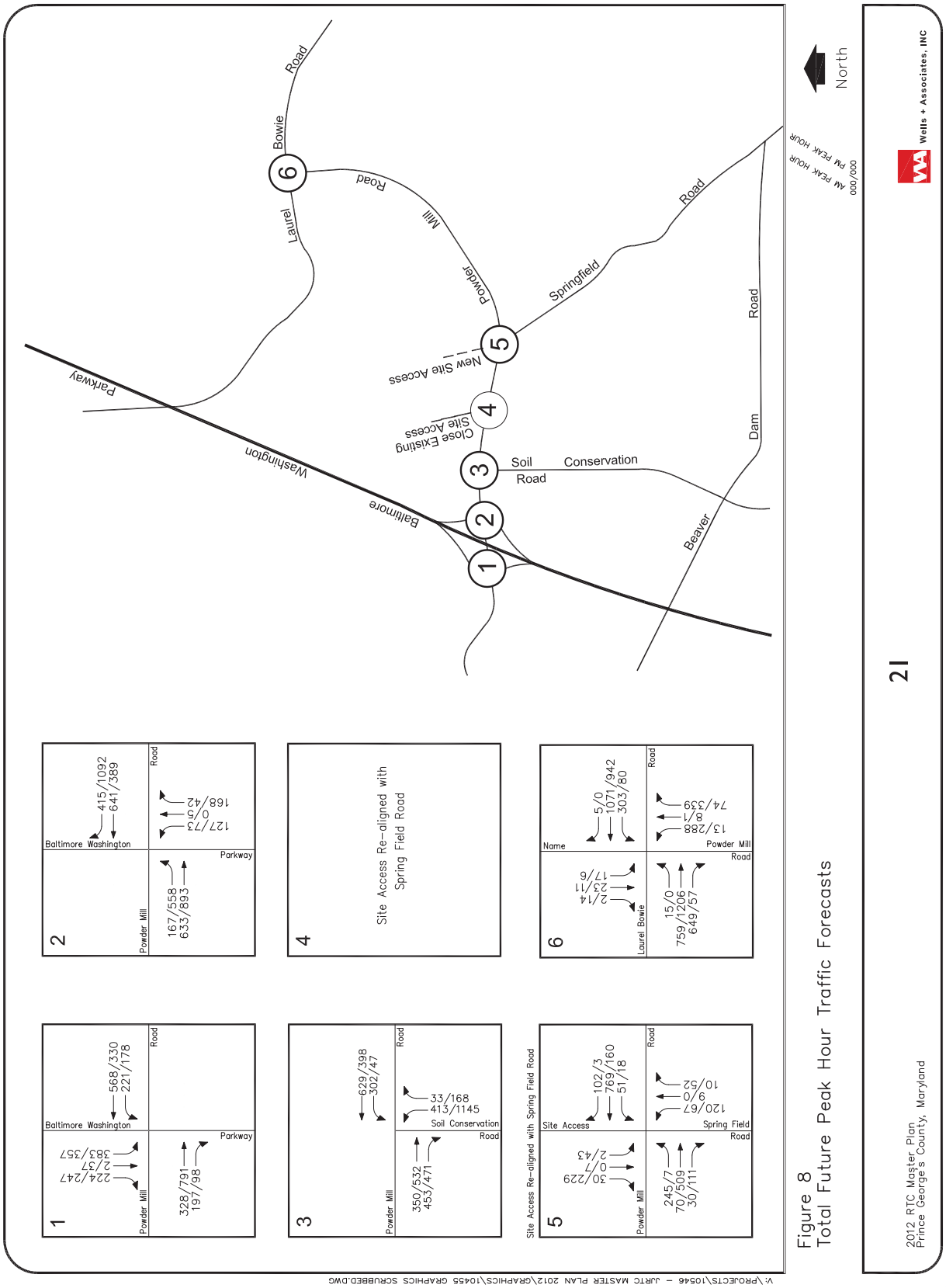


Figure 8
Total Future Peak Hour Traffic Forecasts

V:\PROJECTS\10546 – JJRTC MASTER PLAN 2012\GRAPHICS\10455 GRAPHICS SCRUBBED.DWG

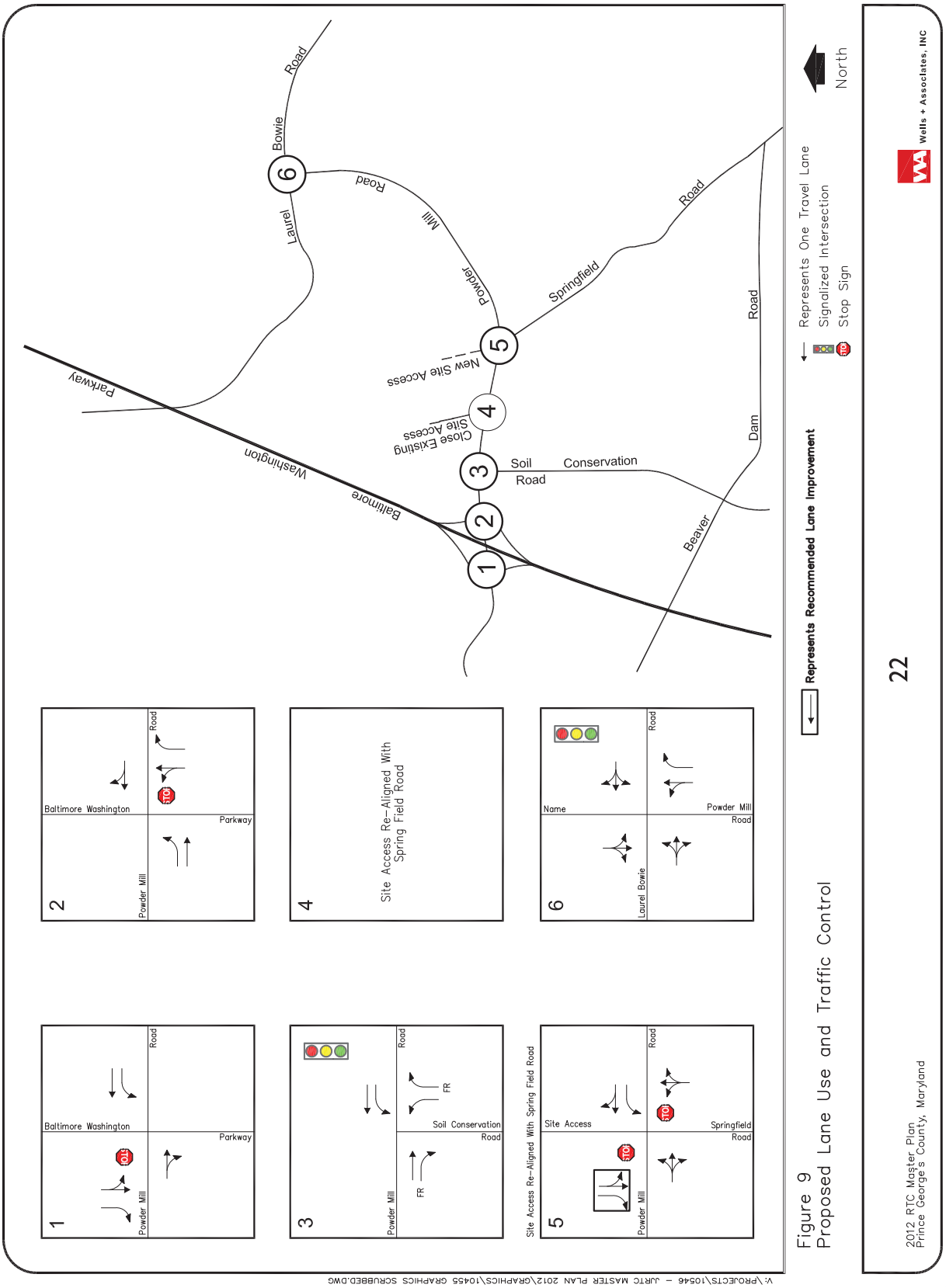


Figure 9
Proposed Lane Use and Traffic Control

Background Future Levels of Service (Without the RTC Expansion)

Background future peak hour levels of service **without** the RTC Expansion were calculated at the six (6) study intersections based on the existing lane use and traffic control shown on Figure 2, the background traffic volumes shown on Figure 6, the MNCPPC critical lane analysis procedure for signalized intersections and the Highway Capacity Manual (HCM) method for unsignalized intersections, in accordance with the MNCPPC guidelines. The results are presented in Appendix E and summarized in Table 4.

Table 4 indicates that the intersections of B-W Parkway Ramp SB/Powder Mill Road, B-W Parkway Ramp NB/Powder Mill Road, Powder Mill Road/Soil Conservation Road and Powder Mill Road/Laurel-Bowie Road will fail to meet the MNCPPC standards for unsignalized intersections under background conditions. The southbound approach of the intersection of B-W Parkway Southbound Ramps/Powder Mill Road will operate with a delay that will exceed MNCPPC Standards during AM peak hours and PM peak hours. The northbound approach of the intersection of B-W Parkway Northbound Ramps/Powder Mill Road will operate with a delay that will exceed MNCPPC Standards during AM peak hours and PM peak hours. Additionally, the east bound approach will operate with a delay that will exceed MNCPPC standards during the PM peak hour.

The intersection of Powder Mill Road/Soil Conservation Road will operate at LOS "B" during the AM peak hour and LOS "F" during the PM peak hour. The intersection of Powder Mill Road/Laurel-Bowie Road will operate at LOS "F" during the AM and PM peak hours. Without the RTC expansion the site access would not be relocated. The intersection of Powder Mill Road/Site Driveway and the intersection of Powder Mill Road/Springfield Road will continue to operate with acceptable levels of delay.

Total Future Levels of Service (With the RTC Expansion)

Total future peak hour levels of service **with** the RTC Expansion were calculated for the study intersections based on the proposed lane usage and traffic control shown on Figure 9, the total future traffic forecasts shown on Figure 8, the MNCPPC critical lane analysis procedure for signalized intersections and the Highway Capacity Manual (HCM) method for unsignalized intersections, in accordance with the MNCPPC guidelines. The results are presented in Appendix F and summarized in Table 4.

Table 4 indicates that the intersections of B-W Parkway Ramp SB/Powder Mill Road, B-W Parkway Ramp NB/Powder Mill Road, Powder Mill Road/Soil Conservation Road and Powder Mill Road/Laurel-Bowie Road will continue to fail to meet the MNCPPC standard under total future conditions. The intersections of Powder Mill Road/B-W Parkway Southbound Ramps and the intersection of Powder Mill Road/B-W Parkway

Northbound Ramps will continue to exceed the MNCPPC standards during the AM and PM peak hours. The intersection of Soil Conservation Road/Powder Mill Road will continue to operate at LOS "B" during the AM peak hour and LOS "F" during PM peak hour. The existing site access will be closed and re-aligned with Springfield Road. The southbound site access will be widened to provide two outbound lanes and one inbound lane. The outbound lanes will include a shared thru-left and an exclusive right turn lane. With the relocated entrance, the intersection of Powder Mill Road/Springfield Road/Site access will operate with a delay that will exceed MNCPPC Standards during AM and PM peak hours. Without the RTC expansion, the site access would not be relocated. The intersection of Powder Mill Road/Laurel-Bowie Road will continue to operate at LOS "F" during the both the AM and PM peak hours.

Table 4
2012 RTC Master Plan
Intersection Level of Service Summary

Intersection	Operating Condition	Approach/ Movement	Existing AM	Existing PM	Background AM	Background PM	Total AM	Total PM
1: BW Parkway SB Off-Ramp/Powder Mill Road	Unsignalized	WBL	A [8.8]	A [9.7]	A [9.4]	B [10.8]	A [9.6]	B [11.6]
		SB	F [250.0]	F [195.1]	F [693.4]	F [555.8]	F [886.3]	F [925.5]
Improvements - Addition of EBR Lane							A [8.7]	B [10.9]
							F [832.9]	F [879.7]
With Improvement (Signalization and addition of EBR Lane)	Signalized	Overall					A (991)	D (1399)
2: BW Parkway NB On-Ramp/Powder Mill Road	Unsignalized	EBL	B [10.8]	D [31.8]	B [12.8]	F [151.6]	B [12.9]	F [213.3]
		NB	F [103.2]	F [*]	F [439.9]	F [*]	F [366.3]	F [*]
Improvements - Addition of WBR Lane							B [9.8]	B [11.3]
							F [306.2]	F [*]
3: Powder Mill Road/Soil Conservation Road	Signalized	Overall	A (836)	D (1397)	B (1029)	F (1713)	B (1065)	F (1724)
Improvement - Second NB left and a second receving lane on							A (879)	C (1209)
4: Powder Mill Road/Site Driveway[1]	Unsignalized	EBL	B [10.2]	A [7.6]	B [11.2]	A[7.7]		
		SB	B [14.2]	B [11.6]	C [16.8]	B [12.7]		
5: Powder Mill Road/Springfield Road[2]	Unsignalized	WBL	A [7.5]	A [8.6]	A [7.5]	A [9.0]	A [7.5]	A [8.9]
		NB	C [22.0]	B [14.6]	E [38.8]	C [18.5]	F [812.4]	E [35.2]
		EB					B [12.4]	A [7.6]
		SB					C [19.6]	B [12.8]
Improvement - Signalization							C (1284)	A (935)
6: Powder Mill Road/Laurel-Bowie Road[3]	Signalized	Overall	F (2119)[4]	D (1370)	F (2573)	F (1667)	F (2663)	F (1668)

Notes : 1. The site access will be closed and re-aligned with Springfield Road for total conditions.
2. Under total future conditions, Powder Mill Road/Spring Field Road is analyzed as a four-legged intersection due to site access relocation.
A shared thru-left lane and an exclusive right turn lane are proposed on the Site Access (SB approach)
3. Not a critical study intersection. 20% or less of site traffic will affect this intersection.
4. Critical lane volume does not reflect field conditions. High CLV due to required PCE factor
Numbers in parentheses ( ) represent critical lane volume in vehicles for signalized intersections, numbers in square brackets [ ] represent delay at unsignalized intersections in seconds per vehicle, * - indicates that the calculated delay exceeds 999.9 seconds

Wells + Associates, Inc.
Annapolis, Maryland

Roadway Improvements

As indicated by the results of the intersection analysis, the intersections of Powder Mill Road and the B-W Parkway SB and NB Ramps, Soil Conservation Road and Laurel-Bowie Road will all operate at unsatisfactory levels of service under existing, and background conditions. The 2012 RTC Master Plan will not materially impact any of the study intersections. However, for planning proposes the following improvements should be considered in the MNCPPC planning process for this area of Prince George's County to improve the overall conditions at these study intersections:

- At the intersection of Powder Mill Road/B-W Parkway SB Ramps, install a traffic signal. In addition, add an exclusive right turn lane on the EB approach of the intersection. With these improvements, this intersection will operate at LOS "A" during the AM peak hour and LOS "D" during the PM peak hour.

- At the intersection of Powder Mill Road/B-W Parkway NB Ramps, add an exclusive right turn lane on the west bound approach of the intersection. With this improvement, the intersection will operate at a better LOS than background conditions during both AM and PM peak hours.

- At the intersection of Powder Mill Road/Soil Conservation Road, add a second northbound left turn lane and a second receiving lane on the western leg of the intersection. With this improvement, the intersection will operate at LOS "A" during the AM peak hour and LOS "C" during the PM peak hour. It should be noted that the additional receiving lane recommended on the western leg of Powder Mill Road/Soil Conservation Road intersection will be transitioned into an exclusive right turn lane at a distance of 250' from the intersection Powder Mill Road/B-W Parkway NB Ramps.

- The intersection of Powder Mill Road/Laurel-Bowie Road is not a critical intersection; less than 20% of the site traffic will affect it.

- At the intersection of Powder Mill Road/Springfield Road/Site access, the site access will be designed to provide two outbound lanes and one inbound lane. The outbound lanes should include a shared thru-left and an exclusive right turn lane. In addition, the site access would likely require signalization to meet the MNCPPC Prince George's County standards; further such signalization would be coordinated with the appropriate government agencies. At a minimum, a Signal Warrant Analysis would be required for the planning and design of the site access relocation.

The improvements recommended above will improve area roadways but several intersections will continue to not meet the MNCPPC Prince George's County standards based on the analysis conducted for this Master Plan update. Additional studies should be conducted prior to construction to determine the impact and any improvements needed to offset the expansion of RTC. Any additional studies and improvements should be coordinated with the appropriate agencies, including DPW&T, SHA, the FHWA,and the National Park Service. The analysis including possible improvements is contained in Appendix F and summarized in Table 4. The suggested improvements are illustrated in Figure 10.

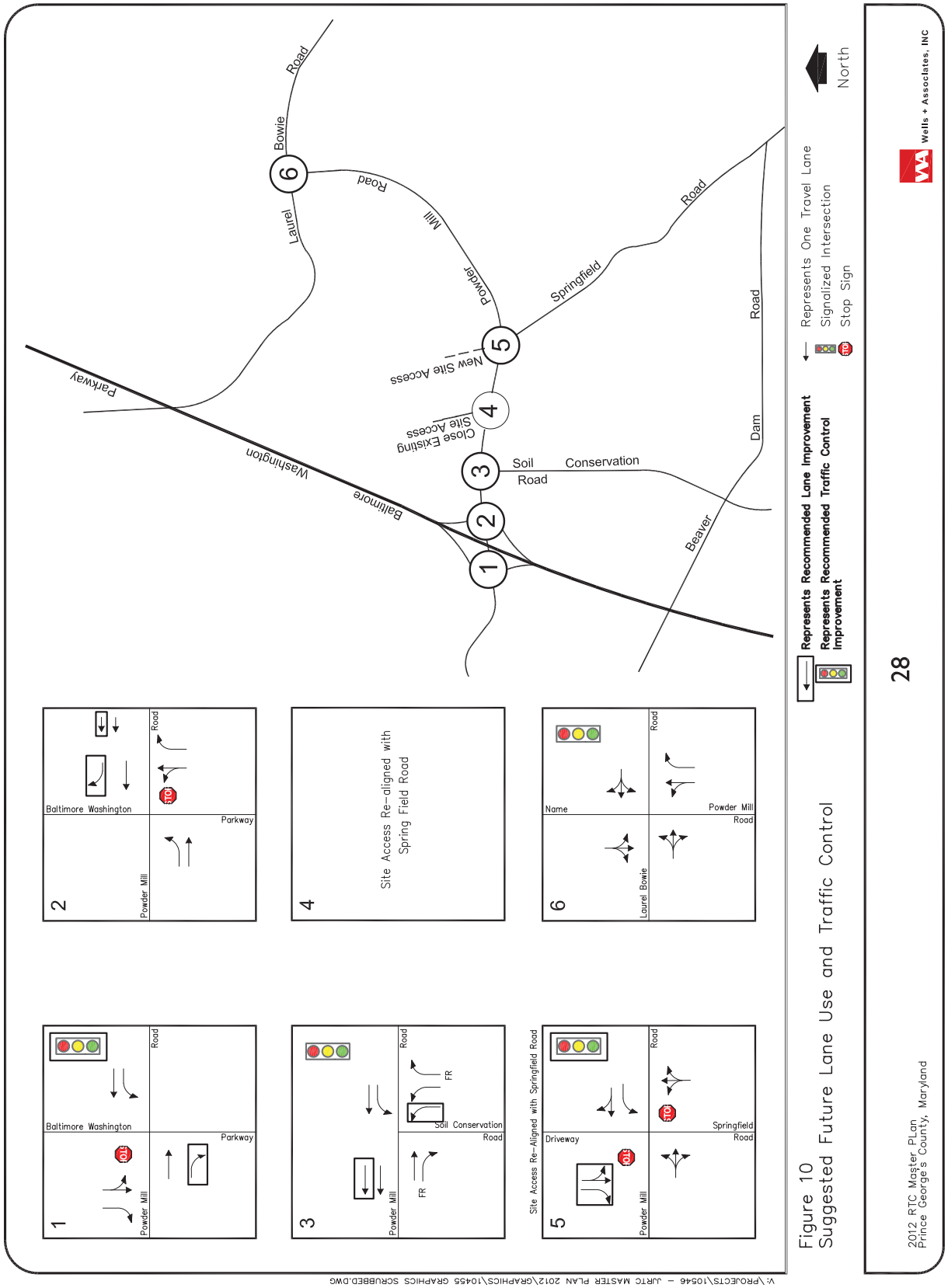


Figure 10
Suggested Future Lane Use and Traffic Control

V:\PROJECTS\10546 – JJRTC MASTER PLAN 2012\GRAPHICS\10455 GRAPHICS SCRUBBED.DWG

CONCLUSIONS

The major findings and conclusions of this traffic impact study are as follows:

1. Under existing conditions, the intersections of Powder Mill Road/B-W Parkway SB Ramp, Powder Mill Road/B-W Parkway NB Ramp and Powder Mill Road/Laurel-Bowie Road are all operating at unacceptable levels of service or with delays in excess of 50.0 seconds. All other study intersections are operating at acceptable levels of service or with acceptable delays.

2. Regional growth attributable to development outside the study area has been taken into account through the build-out year of 2021 based on historical volume data obtained from SHA.

3. The MNCPPC provided in 2009 showed that there were four approved background developments that will add another 112 AM peak hour and 134 PM peak hour trips to the public street system once built.

4. Under background conditions, the intersections of Powder Mill Road/Site Driveway and Powder Mill Road/Springfield Road continue to operate with acceptable delays. All other study intersections will operate at unacceptable levels of service or delays in excess of 50.0 seconds during at least one peak hour.

5. The RTC Expansion will add an additional 194 new AM peak hour and 148 new PM to peak hour trips to the public street system upon project completion.

6. All of the study intersections will continue to operate with unacceptable delays or LOS during at least one peak hour under total future conditions. The intersection of the relocated site access/Powder Mill Road/Springfield Road will operate with a delay that exceeds the MNCPPC standard.

7. The RTC Master Plan will be implemented in phases over a 10-15 year period. The Transportation Study will be updated at key phases. At a minimum, a Signal Warrant Analysis would be required for the planning and design of the site access relocation.

TRANSPORTATION MANAGEMENT GUIDELINES

INTRODUCTION

Overview

This report presents a Transportation Management Guidelines (TMG) for the James J. Rowley Training Center (RTC), as requested by the United States Secret Service (USSS).

This TMG was prepared in accordance with the "Federal Agency Transportation Management Program Handbook" dated May 2008 and provides guidelines to be followed as applicable. This TMG generally follows the four (4) steps in preparing a TMG, including: (1) initiating the TMG, (2) selecting the TMG strategies, (3) implementing the TMG strategies, and (4) monitoring and evaluation.

The following sections address the first three of these areas and their relationship to RTC employees. This TMG evaluates TMG goals and objectives, and strategies for implementing this TMG.

Mission Statement

The goal of this RTC TMG is to reduce single occupancy vehicle (SOV) trips and increase carpools and public transit trips during peak hours in order to support community and national efforts to reduce traffic congestion and vehicle emissions, and to comply with NCPC and federal mandates.

RTC Development Program

As previously stated, the maximum daily population is expected to double by the year 2021. It is expected that the number of peak hour trips will double accordingly.

EXISTING WORKSITE ANALYSIS

Public Transportation Availability

Public transportation is sparse in the RTC site vicinity. Only three (3) Metrobus lines, Lines 87, 88 and B30, service the site vicinity. Lines 87 and 88 provide express service between Laurel and the Greenbelt and New Carrollton Metrorail stations via the BW Parkway. Line B30 provides express service from the Greenbelt Station to the BWI airport. None of these three lines have bus stops within convenient walking distance of the RTC. The Greenbelt Metro station is approximately 3.9 miles from the site. The New Carrollton Metrorail station is approximately six (6) miles from the site. The Muirkirk MARC station is approximately 3.2 miles northwest of the site. The Bowie State MARC station is approximately 4.5 miles east of the site.

TMG STRATEGIES

Overview

The RTC TDM program is designed to attain the TMG goals and objectives identified above. The plan elements are listed below and discussed in detail in the following sections.

1. Continuation of existing shuttle to /from area hotel with possible expansion to include a stop at the Greenbelt Metro Station.

2. Encourage parking management in order to promote shuttle, carpools, and vanpools to discourage single-occupant auto use.

3. Encourage those who use automobiles to carpool.

4. Encourage the RTC to expand the existing telecommute program and consider implementation of alternative work schedules, such as flextime, compressed workweek, and/or staggered work hours.

Public Transportation

The RTC should encourage the use of public transportation through the following actions:

1. Encourage users to participate in a transit benefit program. This program allows agencies to give their employees subsidies, tax-free, in benefits to commute to work by transit or eligible vanpools. Participate in federal programs, as available for employees, which subsidize fares on any type of public transportation serving the national capital region.

2. Continue to provide shuttle service to the nearby hotels, and consider expanding the service to nearby Metrorail and MARC stations.

Parking Management

The USSS should promote the use of public transportation and group riding through the following suggestions:

1. Provide marked visitor parking spaces.

2. Provide preferential spaces for small vehicles, motorcycles, and/or high occupancy vehicles.

3. Provide preferential parking spaces designated for employee carpools. These spaces would be placed in a location that is most convenient to the entrance to the building.

Carpool Program

The USSS should initiate a carpool ridesharing program among employees. Commuter Connections is a regional computerized matching service that links potential carpoolers together by their home and work site and core hours of work. Ride matching services could be coordinated through the Commuter Center, and the Metropolitan Washington Council of Governments (COG).

Alternative Work Schedules

If possible the USSS should encourage employees to schedule work hours outside the typical 9:00 AM to 5:00 PM pattern or telecommute, which will reduce the number of site-generated trips during peak commuting hours.

The most popular strategies are:

1. Flextime: Employees can select their arrival and departure times and length of their lunch period. They would have to work their eight hours and be in the office during a core period.

2. Compressed Work Week: Employees can complete the number of weekly hours in fewer than five days per week.

3. Staggered Work Hours: The employer staggers the arrival and departure time of groups of employees, so that the employees do not arrive and leave work at the same time.

4. Telecomute Programs: Employees that meet the qualification can work from home one or more days a week. This program is currently an option for some employees at RTC.

SUMMARY

The RTC Transportation Management Guidelines (TMG) could consist of a number of elements that would reduce peak hour single occupancy vehicle (SOV) trips and increase carpools and transit trips, to support community and national efforts to reduce traffic congestion and emissions:

1. Continue to provide shuttle from the local hotels to the site, and consider the expansion of the shuttle to include stops at the nearby Metrorail and/or Marc stations.

2. Encourage parking management in order to promote transit use and discourage auto use.

3. Encourage those who use automobiles to carpool.

4. Encourage the implementation of alternative work schedules, such as flextime, compressed workweek, and/or staggered work hours.

5. Continue the use of Telecommuting as an option for those employees that qualify.

Appendix A

Scoping Letter and Correspondence

WELLS + ASSOCIATES

April 23, 2009

VIA EMAIL

Mr. Tom Masog
MNCPPC Transportation Planning Section
14741 Governor Oden Bowie Drive
Upper Marlboro, Maryland 20772

Subject: Scoping Agreement for JJRTC
Prince George's County, Maryland

Mr. Masog:

This letter is to confirm the scope for the JJRTC Expansion Traffic Impact Study. JJRTC is a federal development located north of Powder Mill Road (MD 212) and east of the Baltimore-Washington Parkway (MD 295), in Beltsville, Prince George's County. The United States Secret Service (USSS) is proposing to expand the existing training Center. In September 1995, Wells & Associates prepared a Transportation Management Plan (TMP) in support of the Master Plan, as well as a Traffic Impact analysis in 2003 and again in 2006, and we are updating those documents to support the application for the expansion of the JJRTC.

Based on the SHA traffic volume maps and previously submitted reports, an annual growth rate 2.0% will be applied to the through traffic along Powder Mill Road and MD 295 to account for regional growth. Trip generation rates will be in general accordance with the MNCPPC and NCPPC Guidelines.

We proposed that the study area include the following intersections (these intersections were previously approved for the Traffic Impact analysis performed in 2003 and 2006):

1. Powder Mill Road/Southbound Baltimore-Washington Parkway ramps.
2. Powder Mill Road/Northbound Baltimore-Washington Parkway ramps.
3. Powder Mill Road/Soil Conservation Road.
4. Powder Mill Road/Springfield Road.
5. Powder Mill Road/MD Route 197 (Laurel Bowie Road).

170 Jennifer Road, Suite 260 • Annapolis, Maryland 21401 • 410 /266-5723 • Fax: 410 /266-9189

The site trips will be distributed to the study intersections following the distributions used in the previous study:

- 10% to/from the east via Laurel-Bowie Road,
- 5% to/from the southeast via Springfield Road,
- 5% to/from the south via Soil Conservation Road,
- 50% to/from the south via the Baltimore-Washington Parkway,
- 20% to/from the north via the Baltimore-Washington Parkway, and
- 10% to/from the west via Powder Mill Road.

Please confirm that the intersections and site distribution listed above are still satisfactory and provide to us a list of the local background developments that should be included in this analysis along with any approved background distributions. If the above information meets with your approval, please sign this letter below, as well as the attached Scoping Agreement, and return one copy of each to our office via mail or facsimile (410-266-9189). Should you have any comments or questions, please contact me at (410) 266-5723.

Sincerely,

Barbara Blackmore

Barbara Blackmore
Associate

Approved By: _____ Date: _____
Tom Masog

2

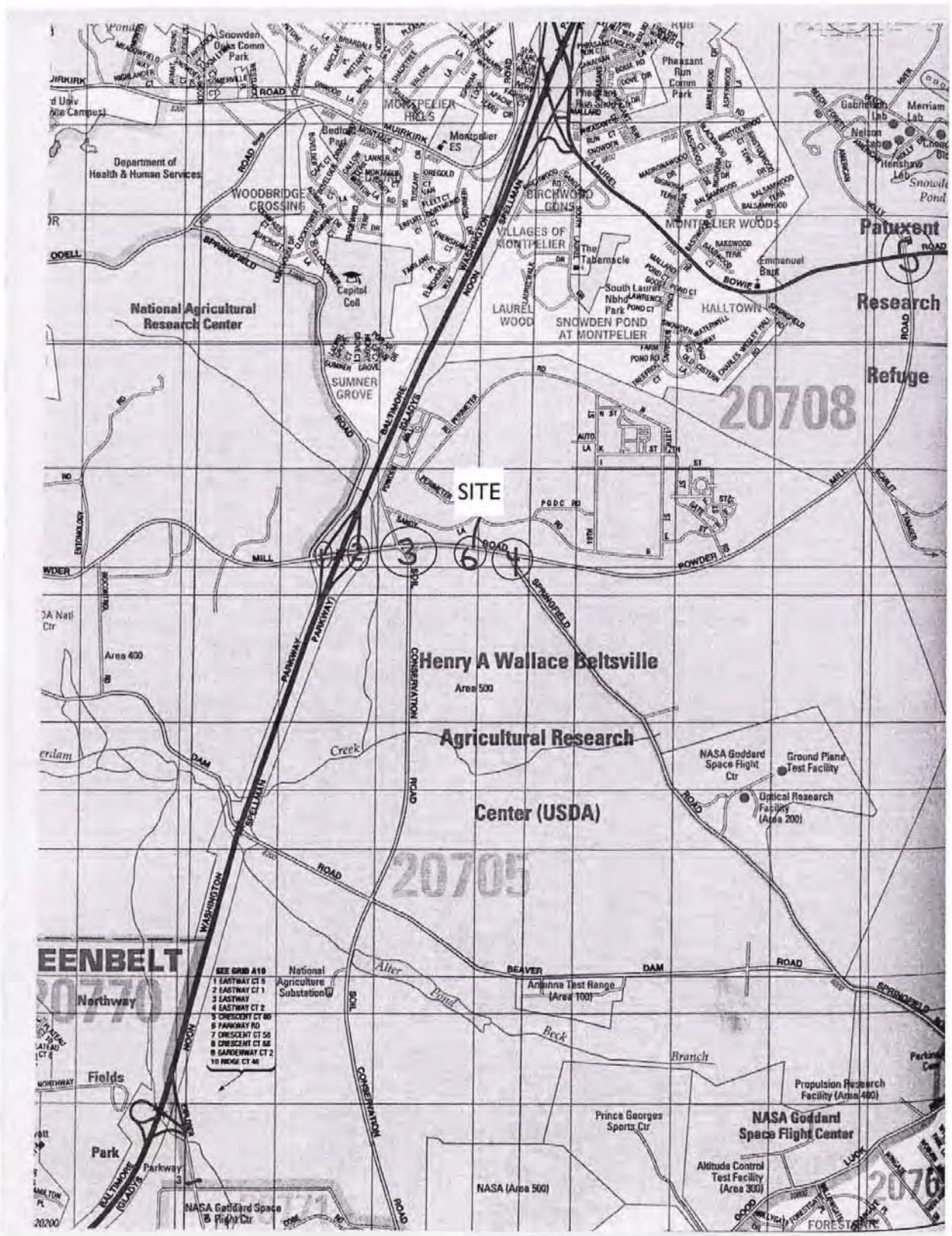

SITE
Henry A Wallace Beltsville
Agricultural Research
Center (USDA)
National Agricultural
Research Center
Patuxent
Research
Refuge
20708
20705
Department of
Health & Human Services
WOODBRIDGE
CROSSING
VILLAGES OF
MONTPELIER
MONTPELIER WOODS
HALLTOWN
SNOWDEN POND
AT MONTPELIER
LAUREL
WOOD
SUMNER
GROVE
Area 400
Area 500
NASA Goddard
Space Flight
Center
NASA (Area 500)
Northway
Fields
Park
Parkway
National
Agriculture
Substation
Antenna Test Range
(Area 100)
Prince Georges
Sports Ctr
Propulsion Research
Facility (Area 400)
Altitude Control
Test Facility
(Area 300)
Ground Plane
Test Facility
Optical Research
Facility
(Area 200)
NASA Goddard
Space Flight
Ctr
Pheasant
Run
Comm
Park
Snowden
Oaks Comm
Park
Bedford
Park
Montpelier
ES
Capitol
Coll
The
Tabernacle
Emmanuel
Bapt
South Laurel
Nbhd
Park
Gabrielson
Lab
Nelson
Lab
Henshaw
Lab
Merriam
Lab
Snowden
Pond
SEE GRID A19
1 EASTWAY CT 5
2 EASTWAY CT 1
3 EASTWAY
4 EASTWAY CT 2
5 CRESCENT CT 80
6 PARKWAY RD
7 CRESCENT CT 58
8 CRESCENT CT 56
9 GARDENWAY CT 2
10 RIDGE CT 46

Figure 1

The Maryland-National Capital Park and Planning Commission
Prince George's County Planning Department
Transportation Planning Section, Countywide Planning Division

TRAFFIC IMPACT STUDY SCOPING AGREEMENT

This form must be completed prior to commencing a Traffic Impact Study. The completed Scoping Agreement should be submitted to the Transportation Planning Section (TPS) by the traffic consultant for concurrence and signature. TPS will return a signed copy, with any comments, to the traffic consultant for inclusion in the Traffic Impact Study. Failure to conduct the study in accordance with the guidelines and the signed Scoping Agreement may be grounds for rejection of the study, thereby necessitating an addendum or a new study prior to the start of the staff review.

1. Date: 4/23/2009 2. Consultant: Wells +Associates
3. Project Name: JJRTC Expansion
4. Type of Application (see Figure 2 of Guidelines): Master Plan & Expansion
5. Location (please attach map showing site location and boundaries)
   Policy Tier Developing Center _____ Corridor _____
6. Municipality _____
7. Use (check one): Residential _____ Commercial _____ Other X
   If Residential, number and type of units proposed: _____
   If Commercial, amount and type of space proposed: _____
   If Other, describe: Expansion of Federal Facility - Training Center
8. SHA/DPW&T improvements assumed: None
9. Other improvements assumed: None
10. Will study assume trip reduction? (check one) Yes X No
    Describe the source: TDM Program
11. Is Mitigation (Section 11 in Guidelines) proffered? (check one) Yes _____ No _____
12. Will SCRP (Section 12 in Guidelines) be used? (check one) Yes _____ No _____
13. Will summer counts be used? (check one) Yes _____ No _____
14. Do you want staff to provide you with a list of background development? (check one) Yes X No _____

Please attach a map (or maps) showing Study Area network with included intersections and links, estimated site trip distribution, and growth factors for through traffic. Please note any other assumptions and/or comments on a separate sheet with initials.

SIGNED: Barbara Blackmore 4/23/2009
Consultant **Date**

APPROVED: _____ _____
TPS Coordinator (or Supervisor) **Date**

8 Guidelines for the Analysis of the Traffic Impact of Development Proposals

Barbara J. Blackmore

From: Masog, Tom [Tom.Masog@ppd.mncppc.org]
Sent: Tuesday, June 09, 2009 12:42 PM
To: Barbara J. Blackmore
Subject: RE: Scope/Background - JJRTC

Barbara

ON JJRTC, our records suggest that Emmanual is under construction. If your field work indicates that the building is complete and in use, that is fine. Additional development would include:
4-06150, Sylla Business Park, south side of MD 197 between South Laurel Drive and Basswood Drive, for 16,000 square feet office and 72 room hotel.

King to follow...

From: Barbara J. Blackmore [mailto:bjblackmore@mjwells.com]
Sent: Friday, June 05, 2009 1:09 PM
To: Masog, Tom
Subject: Scope/Background - JJRTC & the King Property

Tom,
I know you are swamped, so I've done some preliminary research on the background developments for these two projects. Hopefully this is helpful to you.

JJRTC
When we last scoped this project in 2006, there were three background developments.
- Rosso Property, 31 Single family du (approved 2006)
- Glenn Dale North, 31 Single family DU (approved 2005)
- Emmannuel Baptist Church, 18,600 SF

Based on their website, I believe construction is complete at the church; however, as it appears that the Rosso and Glenn Dale properties are still pending. I searched the DAMS site for additional development, but I did not find any new developments approved since 2006 which would impact our study intersections.

King Property
The Woodmore Town Center TIS, which we are using as reference lists 19 background developments. Based on the size and age of some of the developments, as well as field research, I have determined that 5 of them are likely built out. Additional projects may be partially constructed, but I was unable to determine their status. I've listed the remaining developments below:

1. Acton Park – 60 SF DU, 20 TH DU
2. Tartan South – 181 SF DU (at least partially built out.)
3. Villages at Collington – 80 Senior Adult Attached DU
4. Bellehaven Estates LAC – 5,000 SF day care, 21,270 SF shopping center
5. La Dove Heights – 25 SF DU
6. Campus Way Property – 276,424 SF General Office
7. Largo Park – 192,065 SF Med/Pro Office, 258,890 Gen Office
8. Captial Commerce Park – 190,655 SF Office
9. Largo Center West – 14,000 SF Restaurant, 239,000 SF gen Office, 153,800 R&D
10. Largo Town Center – 1,151,500 SF office
11. Inglewood Restaurant Park – 3,750 SF Fast Food, 6,750 SF Restaurant, 12 Pump Service Station
12. Inglewood Business Park – 735,015 SF R&D, 89 Room Hotel, 204,235 SF Office
13. Balk Hill Village – 283 SF DU, 60 TH DU, 50 Apt DU, 20,000 SF specialty retail, 328,480 SF shopping center

8/28/2009

14. Woodmore Town Center – 360 Room Hotel, 191 SF DU, 731 TH DU, 701,300 SF retail, 1,000,000 SF Office

You have indicated in the past that the website may not be up to date, so please advise for both of these projects if there are developments which I missed or which are not shown in the system, or if any of these projects have been partially or totally constructed.
Thank you.

Barbara Mosier (formerly Blackmore)
Wells + Associates, Inc.
170 Jennifer Road, Suite 260
Annapolis, MD 21401
p: 410.266.5723
f: 410.266.9189
bjblackmore@mjwells.com

8/28/2009

Appendix B

Existing Peak Hour Traffic Counts

Wells + Associates, Inc

McLean, Virginia

Existing Traffic Count

PROJECT: JJRTC
W & A JOB NO.: 10455
INTERSECTION: Powder Mill Rd.& SB BW Pkwy.ramp
LOCATION: Prince Georges County,MD

DATE: 4/28/2009
DAY: Tuesday
WEATHER: clear
COUNTED BY: Gina & Roy
INPUTED BY: agan

SOUTHBOUND ROAD: Exit from B. Washington Parkway
NORTHBOUND ROAD: Exit to B. Washington Parkway
WESTBOUND ROAD: Powder Mill Road
EASTBOUND ROAD: Powder Mill Road

Time Period	Turning Movements																		Total	PHF	Time Period
	Southbound Exit from B. Washington Parkway				Westbound Powder Mill Road				Northbound Exit to B. Washington Parkway				Eastbound Powder Mill Road				North & South	East & West			
	1 Right	2 Thru	3 Left	Total	4 Right	5 Thru	6 Left	Total	7 Right	8 Thru	9 Left	Total	10 Right	11 Thru	12 Left	Total					
AM																					
6:00-6:15	72	0	64	136	81	17	0	98	0	0	0	0	17	36	0	53	136	151	287		6:00-6:15
6:15-6:30	75	0	69	144	104	20	0	124	0	0	0	0	30	51	0	81	144	205	349		6:15-6:30
6:30-6:45	47	0	71	118	85	27	0	112	0	0	0	0	31	61	0	92	118	204	322		6:30-6:45
6:45-7:00	53	0	61	114	91	37	0	128	0	0	0	0	31	52	0	83	114	211	325		6:45-7:00
7:00-7:15	53	0	73	126	118	57	0	175	0	0	0	0	41	61	0	102	126	277	403		7:00-7:15
7:15-7:30	47	2	75	124	101	52	0	153	0	0	0	0	49	64	0	113	124	266	390		7:15-7:30
7:30-7:45	50	0	69	119	129	40	0	169	0	0	0	0	44	66	0	110	119	279	398		7:30-7:45
7:45-8:00	34	0	67	101	111	26	0	137	0	0	0	0	28	61	0	89	101	226	327		7:45-8:00
8:00-8:15	37	0	82	119	63	19	0	82	0	0	0	0	26	54	0	80	119	162	281		8:00-8:15
8:15-8:30	34	0	88	122	79	25	0	104	0	0	0	0	26	54	0	80	122	184	306		8:15-8:30
8:30-8:45	42	1	80	123	48	12	0	60	0	0	0	0	32	56	0	88	123	148	271		8:30-8:45
8:45-9:00	41	1	78	120	59	13	0	72	0	0	0	0	21	54	0	75	120	147	267		8:45-9:00
3 Hour Totals	585	4	877	1,466	1,069	345	0	1,414	0	0	0	0	376	670	0	1,046	1,466	2,460	3,926		
1 Hour Totals																					
6:00-7:00	247	0	265	512	361	101	0	462	0	0	0	0	109	200	0	309	512	771	1,283	0.92	6:00-7:00
6:15-7:15	228	0	274	502	398	141	0	539	0	0	0	0	133	225	0	358	502	897	1,399	0.87	6:15-7:15
6:30-7:30	200	2	280	482	395	173	0	568	0	0	0	0	152	238	0	390	482	958	1,440	0.89	6:30-7:30
6:45-7:45	203	2	278	483	439	186	0	625	0	0	0	0	165	243	0	408	483	1,033	1,516	0.94	6:45-7:45
7:00-8:00	184	2	284	470	459	175	0	634	0	0	0	0	162	252	0	414	470	1,048	1,518	0.94	7:00-8:00
7:15-8:15	168	2	293	463	404	137	0	541	0	0	0	0	147	245	0	392	463	933	1,396	0.88	7:15-8:15
7:30-8:30	155	0	306	461	382	110	0	492	0	0	0	0	124	235	0	359	461	851	1,312	0.82	7:30-8:30
7:45-8:45	147	1	317	465	301	82	0	383	0	0	0	0	112	225	0	337	465	720	1,185	0.91	7:45-8:45
8:00-9:00	154	2	328	484	249	69	0	318	0	0	0	0	105	218	0	323	484	641	1,125	0.92	8:00-9:00
AM Peak 7:00-8:00	**184**	**2**	**284**	**470**	**459**	**175**	**0**	**634**	**0**	**0**	**0**	**0**	**162**	**252**	**0**	**414**	**470**	**1,048**	**1,518**	**0.94**	**AM Peak 7:00-8:00**
PM																					
3:00-3:15	95	2	61	158	47	25	0	72	0	0	0	0	16	119	0	135	158	207	365		3:00-3:15
3:15-3:30	62	2	69	133	52	34	0	86	0	0	0	0	22	123	0	145	133	231	364		3:15-3:30
3:30-3:45	46	4	74	124	70	38	0	108	0	0	0	0	25	146	0	171	124	279	403		3:30-3:45
3:45-4:00	45	1	72	118	50	21	0	71	0	0	0	0	25	144	0	169	118	240	358		3:45-4:00
4:00-4:15	40	8	59	107	60	13	0	73	0	0	0	0	31	128	0	159	107	232	339		4:00-4:15
4:15-4:30	60	14	63	137	69	29	0	98	0	0	0	0	22	170	0	192	137	290	427		4:15-4:30
4:30-4:45	49	13	80	142	58	29	0	87	0	0	0	0	17	151	0	168	142	255	397		4:30-4:45
4:45-5:00	40	2	69	111	64	19	0	83	0	0	0	0	16	169	0	185	111	268	379		4:45-5:00
5:00-5:15	54	1	77	132	66	10	0	76	0	0	0	0	25	153	0	178	132	254	386		5:00-5:15
5:15-5:30	47	1	53	101	82	9	0	91	0	0	0	0	19	171	0	190	101	281	382		5:15-5:30
5:30-5:45	39	5	75	119	65	6	0	71	0	0	0	0	20	171	0	191	119	262	381		5:30-5:45
5:45-6:00	47	2	88	137	65	11	0	76	0	0	0	0	22	142	0	164	137	240	377		5:45-6:00
6:00-6:15	28	0	65	93	48	11	0	59	0	0	1	1	14	130	0	144	94	203	297		6:00-6:15
6:15-6:30	19	2	63	84	61	4	0	65	0	0	0	0	22	120	0	142	84	207	291		6:15-6:30
6:30-6:45	17	0	54	71	48	7	0	55	0	0	0	0	12	105	0	117	71	172	243		6:30-6:45
6:45-7:00	31	0	64	95	75	5	0	80	0	0	0	0	13	88	0	101	95	181	276		6:45-7:00
3 Hour Totals	471	48	810	1,329	761	153	0	914	0	0	1	1	233	1,698	0	1,931	1,330	2,845	4,175		
1 Hour Totals																					
3:00-4:00	248	9	276	533	219	118	0	337	0	0	0	0	88	532	0	620	533	957	1,490	0.92	3:00-4:00
3:15-4:15	193	15	274	482	232	106	0	338	0	0	0	0	103	541	0	644	482	982	1,464	0.91	3:15-4:15
3:30-4:30	191	27	268	486	249	101	0	350	0	0	0	0	103	588	0	691	486	1,041	1,527	0.89	3:30-4:30
3:45-4:45	194	36	274	504	237	92	0	329	0	0	0	0	95	593	0	688	504	1,017	1,521	0.89	3:45-4:45
4:00-5:00	189	37	271	497	251	90	0	341	0	0	0	0	86	618	0	704	497	1,045	1,542	0.90	4:00-5:00
4:15-5:15	203	30	289	522	257	87	0	344	0	0	0	0	80	643	0	723	522	1,067	1,589	0.93	4:15-5:15
4:30-5:30	190	17	279	486	270	67	0	337	0	0	0	0	77	644	0	721	486	1,058	1,544	0.97	4:30-5:30
4:45-5:45	180	9	274	463	277	44	0	321	0	0	0	0	80	664	0	744	463	1,065	1,528	0.99	4:45-5:45
5:00-6:00	187	9	293	489	278	36	0	314	0	0	0	0	86	637	0	723	489	1,037	1,526	0.99	5:00-6:00
5:15-6:15	161	8	281	450	260	37	0	297	0	0	1	1	75	614	0	689	451	986	1,437	0.94	5:15-6:15
5:30-6:30	133	9	291	433	239	32	0	271	0	0	1	1	78	563	0	641	434	912	1,346	0.88	5:30-6:30
5:45-6:45	111	4	270	385	222	33	0	255	0	0	1	1	70	497	0	567	386	822	1,208	0.80	5:45-6:45
6:00-7:00	95	2	246	343	232	27	0	259	0	0	1	1	61	443	0	504	344	763	1,107	0.93	6:00-7:00
PM Peak 4:15-5:15	**203**	**30**	**289**	**522**	**257**	**87**	**0**	**344**	**0**	**0**	**0**	**0**	**80**	**643**	**0**	**723**	**522**	**1,067**	**1,589**	**0.93**	**PM Peak 4:15-5:15**

B-1

Wells + Associates, Inc

McLean, Virginia

Existing Traffic Count

PROJECT:	JJRTC	DATE:	4/28/2009	SOUTHBOUND ROAD:	Exit to B. Washington Parkway
W & A JOB NO.:	10455	DAY:	Tuesday	NORTHBOUND ROAD:	Exit from B. Washington Parkway
INTERSECTION:	Powder Mill Rd.& NB BW Pkwy.ramp	WEATHER:	clear	WESTBOUND ROAD:	Powder Mill Road
LOCATION:	Prince Georges County,MD	COUNTED BY:	Jasenia & Eduvina	EASTBOUND ROAD:	Powder Mill Road
		INPUTED BY:	agan		

Time Period	Turning Movements																				
	Southbound Exit to B. Washington Parkway				Westbound Powder Mill Road				Northbound Exit from B. Washington Parkway				Eastbound Powder Mill Road				North & South	East & West	Total	PHF	Time Period
	1 Right	2 Thru	3 Left	Total	4 Right	5 Thru	6 Left	Total	7 Right	8 Thru	9 Left	Total	10 Right	11 Thru	12 Left	Total					
AM																					
6:00-6:15	0	0	0	0	54	72	0	126	13	1	19	33	0	85	18	103	33	229	262		6:00-6:15
6:15-6:30	0	0	0	0	68	92	0	160	18	2	23	43	0	91	37	128	43	288	331		6:15-6:30
6:30-6:45	0	0	0	0	71	87	0	158	24	0	14	38	0	99	23	122	38	280	318		6:30-6:45
6:45-7:00	0	0	0	0	83	112	0	195	22	0	19	41	0	104	16	120	41	315	356		6:45-7:00
7:00-7:15	0	0	0	0	86	134	0	220	14	0	34	48	0	109	46	155	48	375	423		7:00-7:15
7:15-7:30	0	0	0	0	91	124	0	215	17	0	27	44	0	121	51	172	44	387	431		7:15-7:30
7:30-7:45	0	0	0	0	75	143	0	218	12	0	24	36	0	139	24	163	36	381	417		7:30-7:45
7:45-8:00	0	0	0	0	66	110	0	176	6	0	12	18	0	101	40	141	18	317	335		7:45-8:00
8:00-8:15	0	0	0	0	72	57	0	129	9	0	11	20	0	113	26	139	20	268	288		8:00-8:15
8:15-8:30	0	0	0	0	63	80	0	143	13	1	19	33	0	111	14	125	33	268	301		8:15-8:30
8:30-8:45	0	0	0	0	54	43	0	97	13	1	8	22	0	106	20	126	22	223	245		8:30-8:45
8:45-9:00	0	0	0	0	59	66	0	125	5	0	21	26	0	111	24	135	26	260	286		8:45-9:00
3 Hour Totals	0	0	0	0	842	1,120	0	1,962	166	5	231	402	0	1,290	339	1,629	402	3,591	3,993		
1 Hour Totals																					
6:00-7:00	0	0	0	0	276	363	0	639	77	3	75	155	0	379	94	473	155	1,112	1,267	0.89	6:00-7:00
6:15-7:15	0	0	0	0	308	425	0	733	78	2	90	170	0	403	122	525	170	1,258	1,428	0.84	6:15-7:15
6:30-7:30	0	0	0	0	331	457	0	788	77	0	94	171	0	433	136	569	171	1,357	1,528	0.89	6:30-7:30
6:45-7:45	0	0	0	0	335	513	0	848	65	0	104	169	0	473	137	610	169	1,458	1,627	0.94	6:45-7:45
7:00-8:00	0	0	0	0	318	511	0	829	49	0	97	146	0	470	161	631	146	1,460	1,606	0.93	7:00-8:00
7:15-8:15	0	0	0	0	304	434	0	738	44	0	74	118	0	474	141	615	118	1,353	1,471	0.85	7:15-8:15
7:30-8:30	0	0	0	0	276	390	0	666	40	1	66	107	0	464	104	568	107	1,234	1,341	0.80	7:30-8:30
7:45-8:45	0	0	0	0	255	290	0	545	41	2	50	93	0	431	100	531	93	1,076	1,169	0.87	7:45-8:45
8:00-9:00	0	0	0	0	248	246	0	494	40	2	59	101	0	441	84	525	101	1,019	1,120	0.93	8:00-9:00
AM Peak 6:45-7:45	0	0	0	0	335	513	0	848	65	0	104	169	0	473	137	610	169	1,458	1,627	0.94	**AM Peak 6:45-7:45**
PM																					
3:00-3:15	0	0	0	0	121	61	0	182	0	1	8	9	0	131	52	183	9	365	374		3:00-3:15
3:15-3:30	0	0	0	0	147	89	0	236	0	0	10	10	0	113	82	195	10	431	441		3:15-3:30
3:30-3:45	0	0	0	0	197	93	0	290	0	0	20	20	0	129	137	266	20	556	576		3:30-3:45
3:45-4:00	0	0	0	0	154	62	0	216	0	0	15	15	0	165	117	282	15	498	513		3:45-4:00
4:00-4:15	0	0	0	0	182	60	0	242	6	0	8	14	0	119	97	216	14	458	472		4:00-4:15
4:15-4:30	0	0	0	0	216	65	0	281	3	0	25	28	0	160	106	266	28	547	575		4:15-4:30
4:30-4:45	0	0	0	0	212	73	0	285	3	0	12	15	0	158	125	283	15	568	583		4:30-4:45
4:45-5:00	0	0	0	0	204	73	0	277	6	1	7	14	0	128	99	227	14	504	518		4:45-5:00
5:00-5:15	0	0	0	0	193	67	0	260	10	1	7	18	0	169	78	247	18	507	525		5:00-5:15
5:15-5:30	0	0	0	0	246	53	0	299	3	1	8	12	0	189	113	302	12	601	613		5:15-5:30
5:30-5:45	0	0	0	0	210	58	0	268	8	1	6	15	0	171	127	298	15	566	581		5:30-5:45
5:45-6:00	0	0	0	0	221	68	0	289	12	1	2	15	0	194	140	334	15	623	638		5:45-6:00
6:00-6:15	0	0	0	0	180	54	0	234	4	1	6	11	0	131	60	191	11	425	436		6:00-6:15
6:15-6:30	0	0	0	0	148	61	0	209	10	2	6	18	0	131	90	221	18	430	448		6:15-6:30
6:30-6:45	0	0	0	0	139	43	0	182	10	1	13	24	0	106	77	183	24	365	389		6:30-6:45
6:45-7:00	0	0	0	0	111	59	0	170	12	2	26	40	0	111	48	159	40	329	369		6:45-7:00
3 Hour Totals	0	0	0	0	2,262	734	0	2,996	87	11	126	224	0	1,767	1,160	2,927	224	5,923	6,147		
1 Hour Totals																					
3:00-4:00	0	0	0	0	619	305	0	924	0	1	53	54	0	538	388	926	54	1,850	1,904	0.83	3:00-4:00
3:15-4:15	0	0	0	0	680	304	0	984	6	0	53	59	0	526	433	959	59	1,943	2,002	0.87	3:15-4:15
3:30-4:30	0	0	0	0	749	280	0	1,029	9	0	68	77	0	573	457	1,030	77	2,059	2,136	0.93	3:30-4:30
3:45-4:45	0	0	0	0	764	260	0	1,024	12	0	60	72	0	602	445	1,047	72	2,071	2,143	0.92	3:45-4:45
4:00-5:00	0	0	0	0	814	271	0	1,085	18	1	52	71	0	565	427	992	71	2,077	2,148	0.92	4:00-5:00
4:15-5:15	0	0	0	0	825	278	0	1,103	22	2	51	75	0	615	408	1,023	75	2,126	2,201	0.94	4:15-5:15
4:30-5:30	0	0	0	0	855	266	0	1,121	22	3	34	59	0	644	415	1,059	59	2,180	2,239	0.91	4:30-5:30
4:45-5:45	0	0	0	0	853	251	0	1,104	27	4	28	59	0	657	417	1,074	59	2,178	2,237	0.91	4:45-5:45
5:00-6:00	0	0	0	0	870	246	0	1,116	33	4	23	60	0	723	458	1,181	60	2,297	2,357	0.92	5:00-6:00
5:15-6:15	0	0	0	0	857	233	0	1,090	27	4	22	53	0	685	440	1,125	53	2,215	2,268	0.89	5:15-6:15
5:30-6:30	0	0	0	0	759	241	0	1,000	34	5	20	59	0	627	417	1,044	59	2,044	2,103	0.82	5:30-6:30
5:45-6:45	0	0	0	0	688	226	0	914	36	5	27	68	0	562	367	929	68	1,843	1,911	0.75	5:45-6:45
6:00-7:00	0	0	0	0	578	217	0	795	36	6	51	93	0	479	275	754	93	1,549	1,642	0.92	6:00-7:00
PM Peak 5:00-6:00	0	0	0	0	870	246	0	1,116	33	4	23	60	0	723	458	1,181	60	2,297	2,357	0.92	**PM Peak 5:00-6:00**

B-2

Wells + Associates, Inc

McLean, Virginia

Existing Traffic Count

PROJECT:	JJRTC	DATE:	4/28/2009	SOUTHBOUND ROAD:	Driveway
W & A JOB NO.:	10455	DAY:	Tuesday	NORTHBOUND ROAD:	Soil Conservation Road
INTERSECTION:	Powder Mill Rd.& Soil Conservation Rd.	WEATHER:	clear	WESTBOUND ROAD:	Powder Mill Road
LOCATION:	Prince Georges County,MD	COUNTED BY:	Matt & Maria	EASTBOUND ROAD:	Powder Mill Road
		INPUTED BY:	agan		

Time Period	Turning Movements																		Total	PHF	Time Period
	Southbound Driveway				Westbound Powder Mill Road				Northbound Soil Conservation Road				Eastbound Powder Mill Road				North & South	East & West			
	1 Right	2 Thru	3 Left	Total	4 Right	5 Thru	6 Left	Total	7 Right	8 Thru	9 Left	Total	10 Right	11 Thru	12 Left	Total					
AM																					
6:00-6:15	0	0	0	0	0	68	9	77	0	0	56	56	69	29	0	98	56	175	231		6:00-6:15
6:15-6:30	0	0	0	0	0	84	24	108	0	0	79	79	76	31	0	107	79	215	294		6:15-6:30
6:30-6:45	0	0	0	0	0	86	29	115	0	0	37	37	45	33	0	78	37	193	230		6:30-6:45
6:45-7:00	0	0	0	0	0	117	57	174	0	0	89	89	80	36	0	116	89	290	379		6:45-7:00
7:00-7:15	0	0	0	0	0	127	49	176	0	0	84	84	96	41	0	137	84	313	397		7:00-7:15
7:15-7:30	0	0	0	0	0	138	80	218	2	0	69	71	102	45	0	147	71	365	436		7:15-7:30
7:30-7:45	0	0	0	0	0	115	61	176	18	0	97	115	94	46	0	140	115	316	431		7:30-7:45
7:45-8:00	0	0	0	0	0	111	60	171	0	0	67	67	70	35	1	106	67	277	344		7:45-8:00
8:00-8:15	0	0	0	0	0	68	33	101	4	0	81	85	62	28	3	93	85	194	279		8:00-8:15
8:15-8:30	0	0	0	0	0	50	37	87	1	0	75	76	116	31	0	147	76	234	310		8:15-8:30
8:30-8:45	0	0	0	0	0	49	23	72	0	0	52	52	98	27	0	125	52	197	249		8:30-8:45
8:45-9:00	0	0	0	0	0	52	20	72	7	0	70	77	92	29	0	121	77	193	270		8:45-9:00
3 Hour Totals	0	0	0	0	0	1,065	482	1,547	32	0	856	888	1,000	411	4	1,415	888	2,962	3,850		
1 Hour Totals																					
6:00-7:00	0	0	0	0	0	355	119	474	0	0	261	261	270	129	0	399	261	873	1,134	0.75	6:00-7:00
6:15-7:15	0	0	0	0	0	414	159	573	0	0	289	289	297	141	0	438	289	1,011	1,300	0.82	6:15-7:15
6:30-7:30	0	0	0	0	0	468	215	683	2	0	279	281	323	155	0	478	281	1,161	1,442	0.83	6:30-7:30
6:45-7:45	0	0	0	0	0	497	247	744	20	0	339	359	372	168	0	540	359	1,284	1,643	0.94	6:45-7:45
7:00-8:00	0	0	0	0	0	491	250	741	20	0	317	337	362	167	1	530	337	1,271	1,608	0.92	7:00-8:00
7:15-8:15	0	0	0	0	0	432	234	666	24	0	314	338	328	154	4	486	338	1,152	1,490	0.85	7:15-8:15
7:30-8:30	0	0	0	0	0	344	191	535	23	0	320	343	342	140	4	486	343	1,021	1,364	0.79	7:30-8:30
7:45-8:45	0	0	0	0	0	278	153	431	5	0	275	280	346	121	4	471	280	902	1,182	0.86	7:45-8:45
8:00-9:00	0	0	0	0	0	219	113	332	12	0	278	290	368	115	3	486	290	818	1,108	0.89	8:00-9:00
AM Peak 6:45-7:45	0	0	0	0	0	497	247	744	20	0	339	359	372	168	0	540	359	1,284	1,643	0.94	**AM Peak 6:45-7:45**
PM																					
3:00-3:15	0	0	0	0	0	52	12	64	6	0	134	140	87	54	0	141	140	205	345		3:00-3:15
3:15-3:30	0	0	0	0	0	83	25	108	19	0	204	223	71	52	2	125	223	233	456		3:15-3:30
3:30-3:45	0	0	0	0	0	99	27	126	25	0	209	234	70	65	0	135	234	261	495		3:30-3:45
3:45-4:00	0	0	0	0	0	49	7	56	10	0	216	226	55	27	2	84	226	140	366		3:45-4:00
4:00-4:15	0	0	0	0	0	45	5	50	24	0	207	231	91	77	0	168	231	218	449		4:00-4:15
4:15-4:30	0	0	0	0	0	72	8	80	28	0	246	274	75	108	0	183	274	263	537		4:15-4:30
4:30-4:45	0	0	0	0	0	63	7	70	48	0	236	284	108	85	0	193	284	263	547		4:30-4:45
4:45-5:00	0	0	0	0	0	54	9	63	24	0	220	244	104	106	0	210	244	273	517		4:45-5:00
5:00-5:15	0	0	0	0	0	57	9	66	32	0	223	255	101	110	0	211	255	277	532		5:00-5:15
5:15-5:30	0	0	0	0	0	54	8	62	34	0	260	294	73	124	0	197	294	259	553		5:15-5:30
5:30-5:45	0	0	0	0	0	45	5	50	32	0	244	276	88	93	0	181	276	231	507		5:30-5:45
5:45-6:00	0	0	0	0	0	37	8	45	27	0	218	245	126	104	0	230	245	275	520		5:45-6:00
6:00-6:15	0	0	0	0	0	48	8	56	28	0	148	176	96	71	0	167	176	223	399		6:00-6:15
6:15-6:30	0	0	0	0	0	36	7	43	26	0	164	190	72	69	0	141	190	184	374		6:15-6:30
6:30-6:45	0	0	0	0	0	35	4	39	21	0	160	181	66	70	1	137	181	176	357		6:30-6:45
6:45-7:00	0	0	0	0	0	26	2	28	17	0	109	126	73	65	0	138	126	166	292		6:45-7:00
3 Hour Totals	0	0	0	0	0	572	80	652	341	0	2,435	2,776	1,073	1,082	1	2,156	2,776	2,808	5,584		
1 Hour Totals																					
3:00-4:00	0	0	0	0	0	283	71	354	60	0	763	823	283	198	4	485	823	839	1,662	0.84	3:00-4:00
3:15-4:15	0	0	0	0	0	276	64	340	78	0	836	914	287	221	4	512	914	852	1,766	0.89	3:15-4:15
3:30-4:30	0	0	0	0	0	265	47	312	87	0	878	965	291	277	2	570	965	882	1,847	0.86	3:30-4:30
3:45-4:45	0	0	0	0	0	229	27	256	110	0	905	1,015	329	297	2	628	1,015	884	1,899	0.87	3:45-4:45
4:00-5:00	0	0	0	0	0	234	29	263	124	0	909	1,033	378	376	0	754	1,033	1,017	2,050	0.94	4:00-5:00
4:15-5:15	0	0	0	0	0	246	33	279	132	0	925	1,057	388	409	0	797	1,057	1,076	2,133	0.97	4:15-5:15
4:30-5:30	0	0	0	0	0	228	33	261	138	0	939	1,077	386	425	0	811	1,077	1,072	2,149	0.97	4:30-5:30
4:45-5:45	0	0	0	0	0	210	31	241	122	0	947	1,069	366	433	0	799	1,069	1,040	2,109	0.95	4:45-5:45
5:00-6:00	0	0	0	0	0	193	30	223	125	0	945	1,070	388	431	0	819	1,070	1,042	2,112	0.95	5:00-6:00
5:15-6:15	0	0	0	0	0	184	29	213	121	0	870	991	383	392	0	775	991	988	1,979	0.89	5:15-6:15
5:30-6:30	0	0	0	0	0	166	28	194	113	0	774	887	382	337	0	719	887	913	1,800	0.87	5:30-6:30
5:45-6:45	0	0	0	0	0	156	27	183	102	0	690	792	360	314	1	675	792	858	1,650	0.79	5:45-6:45
6:00-7:00	0	0	0	0	0	145	21	166	92	0	581	673	307	275	1	583	673	749	1,422	0.89	6:00-7:00
PM Peak 4:30-5:30	0	0	0	0	0	228	33	261	138	0	939	1,077	386	425	0	811	1,077	1,072	2,149	0.97	**PM Peak 4:30-5:30**

B-3

Wells + Associates, Inc.

McLean, Virginia

Existing Traffic Count

PROJECT: JJRTC
W & A JOB NO.: 33605
INTERSECTION: Powder Mill Rd & Main Entr
LOCATION: Prince Georges County, MD

DATE: 4/26/2006
DAY: Tuesday
WEATHER: clear
COUNTED BY: Luz & Dr
INPUTED BY: dgn

SOUTHBOUND ROAD: Main Entrance
NORTHBOUND ROAD: 0
WESTBOUND ROAD: Powder Mill Road
EASTBOUND ROAD: Powder Mill Road

Time Period	Turning Movements: Southbound Main Entrance 1 Right	2 Thru	3 Left	Total	Westbound Powder Mill Road 4 Right	5 Thru	6 Left	Total	Northbound 0 7 Right	8 Thru	9 Left	Total	Eastbound Powder Mill Road 10 Right	11 Thru	12 Left	Total	North & South	East & West	Total	PHF	Time Period
6:00-6:15	1	0	0	1	7	38	0	45	0	0	0	0	8	14	6	32	1	67	68		6:00-6:15
6:15-6:30	0	0	1	1	5	50	0	55	0	0	0	0	6	12	15	25	1	80	81		6:15-6:30
6:30-6:45	0	0	0	0	3	76	0	79	0	0	0	0	0	15	18	33	0	112	112		6:30-6:45
6:45-7:00	0	0	0	0	7	108	0	115	0	0	0	0	9	19	10	37	0	152	152		6:45-7:00
7:00-7:15	2	0	0	2	10	115	0	125	0	0	0	0	0	32	30	62	2	187	189		7:00-7:15
7:15-7:30	2	0	0	2	21	174	0	195	0	0	0	0	0	20	24	44	2	239	241		7:15-7:30
7:30-7:45	0	0	0	0	28	173	0	201	0	0	0	0	0	25	24	49	0	250	250		7:30-7:45
7:45-8:00	7	0	0	7	17	205	0	222	0	0	0	0	0	25	22	47	7	269	276		7:45-8:00
8:00-8:15	7	0	0	7	18	169	0	187	0	0	0	0	0	28	24	52	7	237	244		8:00-8:15
8:15-8:30	3	0	0	3	4	168	0	172	0	0	0	0	0	37	14	51	3	215	218		8:15-8:30
8:30-8:45	3	0	0	3	4	93	0	97	0	0	0	0	0	37	10	47	3	144	147		8:30-8:45
8:45-9:00	4	0	1	5	3	86	0	89	0	0	0	0	0	28	7	35	5	124	129		8:45-9:00
9:00-9:15	8	0	1	9	2	68	0	70	0	0	0	0	0	28	6	34	9	104	113		9:00-9:15
9:15-9:30	6	0	0	6	1	69	0	70	0	0	0	0	0	31	8	39	6	109	115		9:15-9:30
9:30-9:45	1	0	0	1	5	38	0	43	0	0	0	0	0	27	4	31	1	74	75		9:30-9:45
9:45-10:00	4	0	0	4	2	38	0	40	0	0	0	0	0	43	7	50	4	90	94		9:45-10:00
10:00-10:15	0	0	0	0	0	27	0	27	0	0	0	0	0	34	3	37	0	63	63		10:00-10:15
10:15-10:30	4	0	0	4	0	30	0	30	0	0	0	0	0	29	4	33	4	59	64		10:15-10:30
10:30-10:45	3	0	0	3	0	31	0	31	0	0	0	0	0	30	5	35	3	56	59		10:30-10:45
10:45-11:00	7	0	0	7	0	33	0	33	0	0	0	0	0	24	5	29	7	62	69		10:45-11:00
11:00-11:15	6	0	0	6	1	37	0	38	0	0	0	0	0	27	4	31	6	69	75		11:00-11:15
11:15-11:30	10	0	0	10	0	25	0	25	0	0	0	0	0	22	3	25	10	50	60		11:15-11:30
11:30-11:45	11	0	0	11	0	23	0	23	0	0	0	0	0	33	5	37	11	60	71		11:30-11:45
11:45-12:00	3	0	3	6	0	32	0	32	0	0	0	0	0	41	13	54	6	88	94		11:45-12:00
12:00-12:15	12	0	0	12	0	27	0	27	0	0	0	0	0	24	7	31	12	58	70		12:00-12:15
12:15-12:30	10	0	0	10	0	23	0	23	0	0	0	0	0	27	6	33	10	56	66		12:15-12:30
12:30-12:45	13	0	1	13	0	25	0	25	0	0	0	0	0	28	6	35	13	61	74		12:30-12:45
12:45-1:00	7	0	1	8	1	32	0	33	0	0	0	0	0	26	7	33	8	58	66		12:45-1:00
1:00-1:15	11	0	1	12	1	39	0	40	0	0	0	0	0	41	18	59	12	99	111		1:00-1:15
1:15-1:30	10	0	2	12	0	33	0	33	0	0	0	0	0	36	8	44	12	77	89		1:15-1:30
1:30-1:45	7	0	2	9	4	32	0	36	0	0	0	0	0	22	10	32	9	68	77		1:30-1:45
1:45-2:00	7	0	0	7	1	30	0	31	0	0	0	0	0	28	9	37	7	68	75		1:45-2:00
2:00-2:15	13	0	4	17	2	38	0	40	0	0	0	0	0	33	11	44	17	84	98		2:00-2:15
2:15-2:30	20	0	5	25	2	29	0	31	0	0	0	0	0	34	10	44	25	75	100		2:15-2:30
2:30-2:45	15	0	1	16	1	46	0	47	0	0	0	0	0	53	1	54	16	101	117		2:30-2:45
2:45-3:00	7	0	1	8	2	28	0	30	0	0	0	0	0	46	1	48	8	79	87		2:45-3:00
3:00-3:15	22	0	5	27	0	46	0	46	0	0	0	0	0	73	5	78	27	124	151		3:00-3:15
3:15-3:30	34	0	7	41	0	78	0	78	0	0	0	0	0	82	2	84	41	162	203		3:15-3:30
3:30-3:45	44	0	7	51	0	79	0	79	0	0	0	0	0	82	7	89	51	161	210		3:30-3:45
3:45-4:00	12	0	5	17	0	42	0	42	0	0	0	0	0	98	3	101	17	143	160		3:45-4:00
4:00-4:15	16	0	5	23	1	31	0	32	0	0	0	0	0	83	0	83	23	115	138		4:00-4:15
4:15-4:30	45	0	7	53	2	36	0	38	0	0	0	0	0	127	1	128	54	166	219		4:15-4:30
4:30-4:45	35	0	10	51	2	42	0	44	0	0	0	0	0	128	1	129	51	173	224		4:30-4:45
4:45-5:00	15	0	3	18	0	48	0	48	0	0	0	0	0	115	0	115	18	164	182		4:45-5:00
5:00-5:15	11	0	6	18	0	53	0	53	0	0	0	0	0	116	1	117	18	170	188		5:00-5:15
5:15-5:30	10	0	3	13	0	50	0	50	0	0	0	0	0	128	0	128	13	184	197		5:15-5:30
5:30-5:45	3	0	1	6	0	41	0	41	0	0	0	0	0	128	0	128	6	169	175		5:30-5:45
5:45-6:00	6	0	0	6	0	44	0	44	0	0	0	0	0	101	1	102	6	146	152		5:45-6:00
6:00-6:15	5	0	1	6	0	51	0	51	0	0	0	0	0	97	0	97	6	148	154		6:00-6:15
6:15-6:30	0	0	1	1	0	43	0	43	0	0	0	0	0	92	0	92	1	135	136		6:15-6:30
6:30-6:45	3	0	1	4	0	31	0	31	0	0	0	0	0	93	1	96	4	117	121		6:30-6:45
6:45-7:00	3	0	2	5	1	27	0	28	0	0	0	0	0	76	1	79	5	107	112		6:45-7:00
13 Hour Totals	492	0	91	583	158	3,037	0	3,195	0	0	0	0	0	2,535	401	2,936	583	6,231	6,814		
1 Hour Table																					
6:00-7:00	1	0	1	2	22	342	0	364	0	0	0	0	0	58	58	117	2	421	423	0.70	6:00-7:00
6:15-7:15	2	0	1	3	25	359	0	384	0	0	0	0	0	77	80	157	3	541	544	0.72	6:15-7:15
6:30-7:30	4	0	0	4	41	473	0	514	0	0	0	0	0	85	91	176	4	690	694	0.72	6:30-7:30
6:45-7:45	4	0	0	4	56	570	0	626	0	0	0	0	0	95	97	192	4	828	832	0.83	6:45-7:45
7:00-8:00	11	0	0	11	76	667	0	743	0	0	0	0	0	102	100	202	11	945	956	0.87	7:00-8:00
7:15-8:15	16	0	0	16	84	721	0	805	0	0	0	0	0	99	94	193	16	985	1,011	0.92	7:15-8:15
7:30-8:30	17	0	0	17	72	710	0	782	0	0	0	0	0	103	84	187	17	969	986	0.89	7:30-8:30
7:45-8:45	20	0	0	20	45	633	0	678	0	0	0	0	0	113	70	183	20	863	883	0.80	7:45-8:45
8:00-9:00	17	0	1	18	31	514	0	545	0	0	0	0	0	118	55	173	18	718	736	0.75	8:00-9:00
8:15-9:15	18	0	2	20	13	413	0	426	0	0	0	0	0	120	37	157	20	585	605	0.76	8:15-9:15
8:30-9:30	21	0	3	24	7	319	0	326	0	0	0	0	0	124	31	155	24	481	504	0.86	8:30-9:30
8:45-9:45	18	0	2	21	11	261	0	272	0	0	0	0	0	114	25	139	21	411	432	0.86	8:45-9:45
9:00-10:00	19	0	1	20	10	213	0	223	0	0	0	0	0	129	25	154	20	377	397	0.86	9:00-10:00
9:15-10:15	11	0	0	11	6	172	0	180	0	0	0	0	0	135	21	156	11	336	347	0.75	9:15-10:15
9:30-10:30	9	0	0	9	7	133	0	140	0	0	0	0	0	130	17	147	9	287	296	0.79	9:30-10:30
9:45-10:45	11	0	0	11	2	126	0	128	0	0	0	0	0	133	18	151	11	279	290	0.77	9:45-10:45
10:00-11:00	14	0	0	14	0	121	0	121	0	0	0	0	0	116	16	132	14	251	265	0.96	10:00-11:00
10:15-11:15	20	0	0	20	1	131	0	132	0	0	0	0	0	107	18	125	20	257	277	0.92	10:15-11:15
10:30-11:30	26	0	0	26	1	126	0	127	0	0	0	0	0	103	17	120	26	247	273	0.91	10:30-11:30
10:45-11:45	34	0	0	34	1	118	0	119	0	0	0	0	0	105	17	122	34	241	275	0.82	10:45-11:45
11:00-12:00	39	0	3	33	1	117	0	118	0	0	0	0	0	122	27	149	33	267	300	0.80	11:00-12:00
11:15-12:15	36	0	3	39	0	107	0	107	0	0	0	0	0	119	30	149	39	256	295	0.78	11:15-12:15
11:30-12:30	36	0	3	39	0	105	0	105	0	0	0	0	0	124	33	157	39	262	301	0.83	11:30-12:30
11:45-12:45	37	0	4	41	0	107	0	107	0	0	0	0	0	120	36	156	41	253	294	0.81	11:45-12:45
12:00-1:00	41	0	2	43	1	87	0	88	0	0	0	0	0	107	28	135	43	233	276	0.93	12:00-1:00
12:15-1:15	40	0	3	43	2	109	0	111	0	0	0	0	0	124	39	163	43	274	317	0.71	12:15-1:15
12:30-1:30	40	0	5	45	2	119	0	121	0	0	0	0	0	132	42	174	45	295	340	0.77	12:30-1:30
12:45-1:45	35	0	6	41	5	128	0	133	0	0	0	0	0	128	44	172	41	302	343	0.77	12:45-1:45
1:00-2:00	35	0	5	40	6	134	0	140	0	0	0	0	0	128	46	174	40	312	352	0.78	1:00-2:00
1:15-2:15	37	0	8	45	7	133	0	140	0	0	0	0	0	115	39	154	45	294	339	0.86	1:15-2:15
1:30-2:30	47	0	11	58	6	139	0	145	0	0	0	0	0	114	40	154	58	292	350	0.88	1:30-2:30
1:45-2:45	55	0	10	65	6	143	0	149	0	0	0	0	0	145	31	176	65	325	390	0.83	1:45-2:45
2:00-3:00	55	0	11	66	7	141	0	148	0	0	0	0	0	165	23	188	66	336	402	0.86	2:00-3:00
2:15-3:15	64	0	12	76	5	149	0	154	0	0	0	0	0	208	17	225	76	379	455	0.75	2:15-3:15
2:30-3:30	73	0	14	82	3	198	0	201	0	0	0	0	0	256	9	245	82	445	538	0.73	2:30-3:30
2:45-3:45	107	0	20	127	2	231	0	233	0	0	0	0	0	286	15	289	127	513	640	0.73	2:45-3:45
3:00-4:00	112	0	24	136	0	245	0	245	0	0	0	0	0	315	17	332	136	577	713	0.81	3:00-4:00
3:15-4:15	108	0	24	132	1	230	0	231	0	0	0	0	0	325	12	337	132	568	700	0.80	3:15-4:15
3:30-4:30	120	0	24	144	1	190	0	191	0	0	0	0	0	390	11	401	144	592	736	0.84	3:30-4:30
3:45-4:45	111	0	33	144	3	153	0	156	0	0	0	0	0	435	5	441	144	597	741	0.83	3:45-4:45
4:00-5:00	114	0	29	143	3	160	0	163	0	0	0	0	0	453	2	455	143	618	761	0.85	4:00-5:00
4:15-5:15	107	0	29	136	2	182	0	184	0	0	0	0	0	486	3	489	136	573	709	0.96	4:15-5:15
4:30-5:30	71	0	25	96	2	200	0	202	0	0	0	0	0	487	2	489	96	691	787	0.94	4:30-5:30
4:45-5:45	41	0	10	51	0	199	0	199	0	0	0	0	0	487	1	488	51	687	738	0.94	4:45-5:45
5:00-6:00	32	0	9	41	0	194	0	194	0	0	0	0	0	473	2	475	41	669	710	0.90	5:00-6:00
5:15-6:15	28	0	3	31	0	192	0	192	0	0	0	0	0	454	1	455	31	647	678	0.88	5:15-6:15
5:30-6:30	18	0	3	18	0	178	0	178	0	0	0	0	0	416	1	416	18	596	614	0.88	5:30-6:30
5:45-6:45	14	0	3	17	0	169	0	169	0	0	0	0	0	375	2	377	17	545	562	0.81	5:45-6:45
6:00-7:00	11	0	5	16	1	152	0	153	0	0	0	0	0	332	2	334	16	507	523	0.85	6:00-7:00
AM Peak 7:15-8:15	18	0	0	18	84	721	0	805	0	0	0	0	0	99	94	193	18	985	1,011	0.92	AM Peak 7:15-8:15
Mid-Day Peak 3:00-4:00	112	0	24	136	0	245	0	245	0	0	0	0	0	315	17	332	136	577	713	0.81	Mid-Day Peak 3:00-4:00
PM Peak 4:15-5:15	107	0	29	136	2	182	0	184	0	0	0	0	0	485	3	488	136	573	709	0.96	PM Peak 4:15-5:15

B-4

Wells + Associates, Inc

McLean, Virginia

Existing Traffic Count

PROJECT:	JJRTC	DATE:	4/28/2009	SOUTHBOUND ROAD:	
W & A JOB NO.:	10455	DAY:	Tuesday	NORTHBOUND ROAD:	Springfield Road
INTERSECTION:	Powder Mill Rd.& Springfield Rd.	WEATHER:	clear	WESTBOUND ROAD:	Powder Mill Road
LOCATION:	Prince Georges County,MD	COUNTED BY:	Majda & Alba	EASTBOUND ROAD:	Powder Mill Road
		INPUTED BY:	agan		

Time Period	Turning Movements																				Time Period
	Southbound 0				Westbound Powder Mill Road				Northbound Springfield Road				Eastbound Powder Mill Road				North & South	East & West	Total	PHF	
	1 Right	2 Thru	3 Left	Total	4 Right	5 Thru	6 Left	Total	7 Right	8 Thru	9 Left	Total	10 Right	11 Thru	12 Left	Total					
AM																					
6:00-6:15	0	0	0	0	0	61	4	65	0	0	12	12	4	13	0	17	12	82	94		6:00-6:15
6:15-6:30	0	0	0	0	0	95	7	102	0	0	17	17	9	9	0	18	17	120	137		6:15-6:30
6:30-6:45	0	0	0	0	0	115	3	118	2	0	14	16	7	16	0	23	16	141	157		6:30-6:45
6:45-7:00	0	0	0	0	0	170	4	174	3	0	16	19	7	11	0	18	19	192	211		6:45-7:00
7:00-7:15	0	0	0	0	0	173	6	179	1	0	27	28	4	10	0	14	28	193	221		7:00-7:15
7:15-7:30	0	0	0	0	0	204	18	222	3	0	23	26	7	13	0	20	26	242	268		7:15-7:30
7:30-7:45	0	0	0	0	0	167	14	181	1	0	24	25	5	23	0	28	25	209	234		7:30-7:45
7:45-8:00	0	0	0	0	0	139	11	150	3	0	26	29	6	18	0	24	29	174	203		7:45-8:00
8:00-8:15	0	0	0	0	0	76	5	81	3	0	18	21	8	29	0	37	21	118	139		8:00-8:15
8:15-8:30	0	0	0	0	0	80	3	83	1	0	13	14	8	21	0	29	14	112	126		8:15-8:30
8:30-8:45	0	0	0	0	0	49	7	56	0	0	15	15	5	20	0	25	15	81	96		8:30-8:45
8:45-9:00	0	0	0	0	0	57	7	64	1	0	5	6	4	27	0	31	6	95	101		8:45-9:00
3 Hour Totals	0	0	0	0	0	1,386	89	1,475	18	0	210	228	74	210	0	284	228	1,759	1,987		
1 Hour Totals																					
6:00-7:00	0	0	0	0	0	441	18	459	5	0	59	64	27	49	0	76	64	535	599	0.71	6:00-7:00
6:15-7:15	0	0	0	0	0	553	20	573	6	0	74	80	27	46	0	73	80	646	726	0.82	6:15-7:15
6:30-7:30	0	0	0	0	0	662	31	693	9	0	80	89	25	50	0	75	89	768	857	0.80	6:30-7:30
6:45-7:45	0	0	0	0	0	714	42	756	8	0	90	98	23	57	0	80	98	836	934	0.87	6:45-7:45
7:00-8:00	0	0	0	0	0	683	49	732	8	0	100	108	22	64	0	86	108	818	926	0.86	7:00-8:00
7:15-8:15	0	0	0	0	0	586	48	634	10	0	91	101	26	83	0	109	101	743	844	0.79	7:15-8:15
7:30-8:30	0	0	0	0	0	462	33	495	8	0	81	89	27	91	0	118	89	613	702	0.75	7:30-8:30
7:45-8:45	0	0	0	0	0	344	26	370	7	0	72	79	27	88	0	115	79	485	564	0.69	7:45-8:45
8:00-9:00	0	0	0	0	0	262	22	284	5	0	51	56	25	97	0	122	56	406	462	0.83	8:00-9:00
AM Peak 6:45-7:45	0	0	0	0	0	714	42	756	8	0	90	98	23	57	0	80	98	836	934	0.87	**AM Peak 6:45-7:45**
PM																					
3:00-3:15	0	0	0	0	0	35	5	40	4	0	11	15	16	60	0	76	15	116	131		3:00-3:15
3:15-3:30	0	0	0	0	0	54	3	57	4	0	17	21	10	61	0	71	21	128	149		3:15-3:30
3:30-3:45	0	0	0	0	0	53	9	62	2	0	20	22	13	61	0	74	22	136	158		3:30-3:45
3:45-4:00	0	0	0	0	0	28	3	31	2	0	12	14	18	82	0	100	14	131	145		3:45-4:00
4:00-4:15	0	0	0	0	0	22	2	24	5	0	10	15	15	81	0	96	15	120	135		4:00-4:15
4:15-4:30	0	0	0	0	0	17	3	20	2	0	13	15	13	104	0	117	15	137	152		4:15-4:30
4:30-4:45	0	0	0	0	0	30	5	35	13	0	9	22	24	103	0	127	22	162	184		4:30-4:45
4:45-5:00	0	0	0	0	0	33	5	38	6	0	10	16	15	99	0	114	16	152	168		4:45-5:00
5:00-5:15	0	0	0	0	0	32	3	35	6	0	14	20	24	95	0	119	20	154	174		5:00-5:15
5:15-5:30	0	0	0	0	0	27	2	29	18	0	19	37	20	114	0	134	37	163	200		5:15-5:30
5:30-5:45	0	0	0	0	0	25	4	29	12	0	14	26	27	92	0	119	26	148	174		5:30-5:45
5:45-6:00	0	0	0	0	0	30	0	30	13	0	18	31	17	86	0	103	31	133	164		5:45-6:00
6:00-6:15	0	0	0	0	0	33	1	34	6	0	14	20	12	70	0	82	20	116	136		6:00-6:15
6:15-6:30	0	0	0	0	0	24	4	28	6	0	16	22	16	70	0	86	22	114	136		6:15-6:30
6:30-6:45	0	0	0	0	0	20	2	22	4	0	7	11	18	65	0	83	11	105	116		6:30-6:45
6:45-7:00	0	0	0	0	0	17	0	17	4	0	12	16	19	56	0	75	16	92	108		6:45-7:00
3 Hour Totals	0	0	0	0	0	310	31	341	95	0	156	251	220	1,035	0	1,255	251	1,596	1,847		
1 Hour Totals																					
3:00-4:00	0	0	0	0	0	170	20	190	12	0	60	72	57	264	0	321	72	511	583	0.92	3:00-4:00
3:15-4:15	0	0	0	0	0	157	17	174	13	0	59	72	56	285	0	341	72	515	587	0.93	3:15-4:15
3:30-4:30	0	0	0	0	0	120	17	137	11	0	55	66	59	328	0	387	66	524	590	0.93	3:30-4:30
3:45-4:45	0	0	0	0	0	97	13	110	22	0	44	66	70	370	0	440	66	550	616	0.84	3:45-4:45
4:00-5:00	0	0	0	0	0	102	15	117	26	0	42	68	67	387	0	454	68	571	639	0.87	4:00-5:00
4:15-5:15	0	0	0	0	0	112	16	128	27	0	46	73	76	401	0	477	73	605	678	0.92	4:15-5:15
4:30-5:30	0	0	0	0	0	122	15	137	43	0	52	95	83	411	0	494	95	631	726	0.91	4:30-5:30
4:45-5:45	0	0	0	0	0	117	14	131	42	0	57	99	86	400	0	486	99	617	716	0.90	4:45-5:45
5:00-6:00	0	0	0	0	0	114	9	123	49	0	65	114	88	387	0	475	114	598	712	0.89	5:00-6:00
5:15-6:15	0	0	0	0	0	115	7	122	49	0	65	114	76	362	0	438	114	560	674	0.84	5:15-6:15
5:30-6:30	0	0	0	0	0	112	9	121	37	0	62	99	72	318	0	390	99	511	610	0.88	5:30-6:30
5:45-6:45	0	0	0	0	0	107	7	114	29	0	55	84	63	291	0	354	84	468	552	0.84	5:45-6:45
6:00-7:00	0	0	0	0	0	94	7	101	20	0	49	69	65	261	0	326	69	427	496	0.91	6:00-7:00
PM Peak 4:30-5:30	0	0	0	0	0	122	15	137	43	0	52	95	83	411	0	494	95	631	726	0.91	**PM Peak 4:30-5:30**

B-5

Wells + Associates, Inc

McLean, Virginia

Existing Traffic Count

PROJECT: JJRTC
W & A JOB NO.: 10455
INTERSECTION: MD Route 197 & Powder Mill Rd.
LOCATION: Prince Georges County,MD

DATE: 4/28/2009
DAY: Tuesday
WEATHER: clear
COUNTED BY: Hilda,Carlos & Oscar
INPUTED BY: agan

SOUTHBOUND ROAD: American Holly Drive
NORTHBOUND ROAD: Powder Mill Road
WESTBOUND ROAD: Laurel Bouwie Road
EASTBOUND ROAD: Laurel Bouwie Road

Time Period	Turning Movements																		Total	PHF	Time Period
	Southbound American Holly Drive				Westbound Laurel Bouwie Road				Northbound Powder Mill Road				Eastbound Laurel Bouwie Road				North & South	East & West			
	1 Right	2 Thru	3 Left	Total	4 Right	5 Thru	6 Left	Total	7 Right	8 Thru	9 Left	Total	10 Right	11 Thru	12 Left	Total					
AM																					
6:00-6:15	0	0	0	0	2	141	41	184	9	0	1	10	34	103	4	141	10	325	335		6:00-6:15
6:15-6:30	0	0	0	0	5	154	43	202	8	0	0	8	54	94	1	149	8	351	359		6:15-6:30
6:30-6:45	1	0	0	1	3	209	50	262	10	3	5	18	68	106	2	176	19	438	457		6:30-6:45
6:45-7:00	1	0	0	1	1	240	45	286	17	4	2	23	118	159	3	280	24	566	590		6:45-7:00
7:00-7:15	0	0	0	0	2	204	62	268	13	3	0	16	142	147	5	294	16	562	578		7:00-7:15
7:15-7:30	0	1	0	1	1	216	69	286	14	1	5	20	150	160	4	314	21	600	621		7:15-7:30
7:30-7:45	1	2	0	3	1	215	58	274	15	0	3	18	122	155	3	280	21	554	575		7:30-7:45
7:45-8:00	0	0	0	0	2	214	45	261	13	3	5	21	89	147	3	239	21	500	521		7:45-8:00
8:00-8:15	0	0	0	0	0	180	27	207	10	3	5	18	63	160	5	228	18	435	453		8:00-8:15
8:15-8:30	3	2	0	5	3	199	25	227	17	3	4	24	48	125	8	181	29	408	437		8:15-8:30
8:30-8:45	0	0	0	0	2	129	10	141	15	0	2	17	42	100	3	145	17	286	303		8:30-8:45
8:45-9:00	1	2	1	4	3	133	23	159	22	2	5	29	34	125	5	164	33	323	356		8:45-9:00
3 Hour Totals	7	7	1	15	25	2,234	498	2,757	163	22	37	222	964	1,581	46	2,591	237	5,348	5,585		
1 Hour Totals																					
6:00-7:00	2	0	0	2	11	744	179	934	44	7	8	59	274	462	10	746	61	1,680	1,741	0.74	6:00-7:00
6:15-7:15	2	0	0	2	11	807	200	1,018	48	10	7	65	382	506	11	899	67	1,917	1,984	0.84	6:15-7:15
6:30-7:30	2	1	0	3	7	869	226	1,102	54	11	12	77	478	572	14	1,064	80	2,166	2,246	0.90	6:30-7:30
6:45-7:45	2	3	0	5	5	875	234	1,114	59	8	10	77	532	621	15	1,168	82	2,282	2,364	0.95	6:45-7:45
7:00-8:00	1	3	0	4	6	849	234	1,089	55	7	13	75	503	609	15	1,127	79	2,216	2,295	0.92	7:00-8:00
7:15-8:15	1	3	0	4	4	825	199	1,028	52	7	18	77	424	622	15	1,061	81	2,089	2,170	0.87	7:15-8:15
7:30-8:30	4	4	0	8	6	808	155	969	55	9	17	81	322	587	19	928	89	1,897	1,986	0.86	7:30-8:30
7:45-8:45	3	2	0	5	7	722	107	836	55	9	16	80	242	532	19	793	85	1,629	1,714	0.82	7:45-8:45
8:00-9:00	4	4	1	9	8	641	85	734	64	8	16	88	187	510	21	718	97	1,452	1,549	0.85	8:00-9:00
AM Peak 6:45-7:45	2	3	0	5	5	875	234	1,114	59	8	10	77	532	621	15	1,168	82	2,282	2,364	0.95	**AM Peak 6:45-7:45**
PM																					
3:00-3:15	4	0	1	5	1	133	14	148	48	2	12	62	28	152	0	180	67	328	395		3:00-3:15
3:15-3:30	4	0	4	8	4	118	25	147	47	1	23	71	34	190	0	224	79	371	450		3:15-3:30
3:30-3:45	2	5	1	8	0	146	19	165	46	1	30	77	34	170	0	204	85	369	454		3:30-3:45
3:45-4:00	3	1	5	9	2	147	13	162	58	1	37	96	8	193	1	202	105	364	469		3:45-4:00
4:00-4:15	4	2	1	7	0	130	8	138	44	0	49	93	10	162	0	172	100	310	410		4:00-4:15
4:15-4:30	1	2	1	4	1	141	13	155	73	0	41	114	7	253	0	260	118	415	533		4:15-4:30
4:30-4:45	9	3	4	16	0	130	10	140	63	4	61	128	11	233	1	245	144	385	529		4:30-4:45
4:45-5:00	3	5	0	8	0	177	17	194	75	1	61	137	17	249	0	266	145	460	605		4:45-5:00
5:00-5:15	4	2	1	7	0	183	14	197	52	0	60	112	13	248	0	261	119	458	577		5:00-5:15
5:15-5:30	3	3	1	7	0	197	22	219	69	0	57	126	9	249	0	258	133	477	610		5:15-5:30
5:30-5:45	4	1	4	9	0	213	12	225	71	0	58	129	7	240	0	247	138	472	610		5:30-5:45
5:45-6:00	5	1	3	9	1	167	25	193	50	0	61	111	6	234	0	240	120	433	553		5:45-6:00
6:00-6:15	1	1	1	3	1	158	17	176	42	0	60	102	11	183	0	194	105	370	475		6:00-6:15
6:15-6:30	2	2	0	4	0	134	15	149	33	0	44	77	10	188	0	198	81	347	428		6:15-6:30
6:30-6:45	0	0	1	1	0	149	16	165	27	0	45	72	8	151	0	159	73	324	397		6:30-6:45
6:45-7:00	0	1	0	1	0	124	18	142	41	0	37	78	4	131	1	136	79	278	357		6:45-7:00
3 Hour Totals	36	23	17	76	3	1,903	187	2,093	640	5	634	1,279	113	2,521	2	2,636	1,355	4,729	6,084		
1 Hour Totals																					
3:00-4:00	13	6	11	30	7	544	71	622	199	5	102	306	104	705	1	810	336	1,432	1,768	0.94	3:00-4:00
3:15-4:15	13	8	11	32	6	541	65	612	195	3	139	337	86	715	1	802	369	1,414	1,783	0.95	3:15-4:15
3:30-4:30	10	10	8	28	3	564	53	620	221	2	157	380	59	778	1	838	408	1,458	1,866	0.88	3:30-4:30
3:45-4:45	17	8	11	36	3	548	44	595	238	5	188	431	36	841	2	879	467	1,474	1,941	0.91	3:45-4:45
4:00-5:00	17	12	6	35	1	578	48	627	255	5	212	472	45	897	1	943	507	1,570	2,077	0.86	4:00-5:00
4:15-5:15	17	12	6	35	1	631	54	686	263	5	223	491	48	983	1	1,032	526	1,718	2,244	0.93	4:15-5:15
4:30-5:30	19	13	6	38	0	687	63	750	259	5	239	503	50	979	1	1,030	541	1,780	2,321	0.95	4:30-5:30
4:45-5:45	14	11	6	31	0	770	65	835	267	1	236	504	46	986	0	1,032	535	1,867	2,402	0.98	4:45-5:45
5:00-6:00	16	7	9	32	1	760	73	834	242	0	236	478	35	971	0	1,006	510	1,840	2,350	0.96	5:00-6:00
5:15-6:15	13	6	9	28	2	735	76	813	232	0	236	468	33	906	0	939	496	1,752	2,248	0.92	5:15-6:15
5:30-6:30	12	5	8	25	2	672	69	743	196	0	223	419	34	845	0	879	444	1,622	2,066	0.85	5:30-6:30
5:45-6:45	8	4	5	17	2	608	73	683	152	0	210	362	35	756	0	791	379	1,474	1,853	0.84	5:45-6:45
6:00-7:00	3	4	2	9	1	565	66	632	143	0	186	329	33	653	1	687	338	1,319	1,657	0.87	6:00-7:00
PM Peak 4:45-5:45	14	11	6	31	0	770	65	835	267	1	236	504	46	986	0	1,032	535	1,867	2,402	0.98	**PM Peak 4:45-5:45**

B-6

Appendix C

Existing Intersection Levels of Service Analysis

Two-Way Stop Control Page 1 of 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SK	Intersection	BW Parkway SB/Powder Mill Rd
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed		Analysis Year	Existing
Analysis Time Period	AM Peak		

Project Description 2012 RTC Master Plan	
East/West Street: Powder Mill Road	North/South Street: BW Parkway Southbound Ramp
Intersection Orientation: East-West	Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		252	162	175	459	
Peak-Hour Factor, PHF	1.00	0.95	0.95	0.95	0.95	1.00
Hourly Flow Rate, HFR (veh/h)	0	265	170	184	483	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration			TR	L	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				284	2	184
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	0	0	0	298	2	193
Percent Heavy Vehicles	0	0	0	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	1	1	0
Configuration				L		TR

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L				L		TR
v (veh/h)		184				298		195
C (m) (veh/h)		1125				171		565
v/c		0.16				1.74		0.35
95% queue length		0.58				21.16		1.53
Control Delay (s/veh)		8.8				404.0		14.7
LOS		A				F		B
Approach Delay (s/veh)	--	--				250.0		
Approach LOS	--	--				F		

Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 3/30/2012 4:53 PM

file:///C:/Users/skondagari/AppData/Local/Temp/u2kA84E.tmp 3/30/2012

Two-Way Stop Control Page 1 of 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SK	Intersection	BW Parkway SB/Powder Mill Rd
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed		Analysis Year	Existing
Analysis Time Period	PM Peak		

Project Description 2012 RTC Master Plan	
East/West Street: Powder Mill Road	North/South Street: BW Parkway Southbound Ramp
Intersection Orientation: East-West	Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		643	80	87	257	
Peak-Hour Factor, PHF	1.00	0.95	0.95	0.95	0.95	1.00
Hourly Flow Rate, HFR (veh/h)	0	676	84	91	270	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration			TR	L	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				289	30	203
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	0	0	0	304	31	213
Percent Heavy Vehicles	0	0	0	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	1	1	0
Configuration				L		TR

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L				L		TR
v (veh/h)		91				304		244
C (m) (veh/h)		852				190		522
v/c		0.11				1.60		0.47
95% queue length		0.36				19.96		2.46
Control Delay (s/veh)		9.7				337.5		17.8
LOS		A				F		C
Approach Delay (s/veh)	--	--				195.1		
Approach LOS	--	--				F		

Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 3/30/2012 4:54 PM

file:///C:/Users/skondagari/AppData/Local/Temp/u2k2412.tmp 3/30/2012

Two-Way Stop Control Page 1 of 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SK	Intersection	BW Parkway NB/Powder Mill Rd
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed		Analysis Year	Existing
Analysis Time Period	AM Peak		

Project Description: 2012 RTC Master Plan

East/West Street: Powder Mill Road | North/South Street: BW Parkway Northbound Ramp

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	137	473			513	335
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	144	497	0	0	540	352
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	0	1	0
Configuration	L	T				TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	104	0	65			
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	109	0	68	0	0	0
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	1	1	0	0	0	0
Configuration	L		TR			

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L		L		TR			
v (veh/h)	144		109		68			
C (m) (veh/h)	760		109		573			
v/c	0.19		1.00		0.12			
95% queue length	0.70		6.39		0.40			
Control Delay (s/veh)	10.8		159.9		12.1			
LOS	B		F		B			
Approach Delay (s/veh)	--	--	103.2					
Approach LOS	--	--	F					

Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 3/30/2012 4:54 PM

file:///C:/Users/skondagari/AppData/Local/Temp/u2k6536.tmp 3/30/2012

Two-Way Stop Control Page 1 of 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SK	Intersection	BW Parkway NB/Powder Mill Rd
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed		Analysis Year	Existing
Analysis Time Period	PM Peak		

Project Description 2012 RTC Master Plan	
East/West Street: Powder Mill Road	North/South Street: BW Parkway Northbound Ramp
Intersection Orientation: East-West	Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	458	723			246	870
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	482	761	0	0	258	915
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	0	1	0
Configuration	L	T				TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	60	4	33			
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	63	4	34	0	0	0
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	1	1	0	0	0	0
Configuration	L		TR			

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L		L		TR			
v (veh/h)	482		63		38			
C (m) (veh/h)	595		7		27			
v/c	0.81		9.00		1.41			
95% queue length	8.12		9.49		4.52			
Control Delay (s/veh)	31.8		4626		534.7			
LOS	D		F		F			
Approach Delay (s/veh)	--	--	3087					
Approach LOS	--	--	F					

Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 3/30/2012 4:55 PM

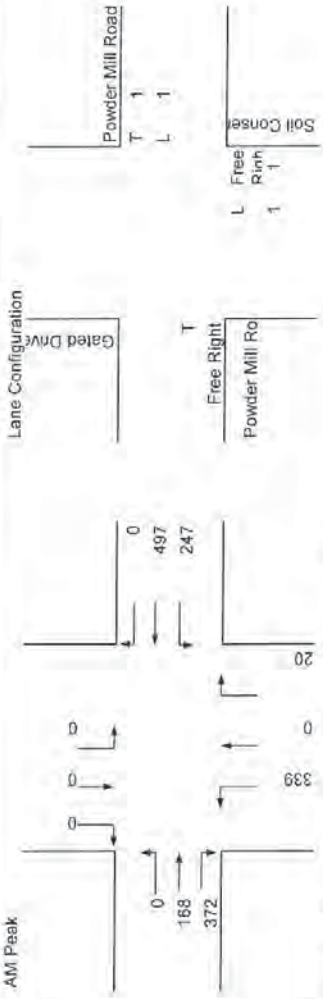
file:///C:/Users/skondagari/AppData/Local/Temp/u2kD90E.tmp 3/30/2012

2012 RTC Master Plan
Critical Lane Volue
Level of Service Calculations

Intersection: 3: Powder Mill Road/Soil Conservation Road
Jurisdiction: Prince George's County
Scenario/Design Year: Existing
Computed by: BJB

WELLS + ASSOCIATES
TRANSPORTATION, TRAFFIC, AND PARKING CONSULTANTS
1770 Underwood Street, Annapolis, Maryland 21401
Phone (410)268-5123 Facsimile (410)268-5189

AM Peak



Intersection Control: Signal: X Split: ____
Stop: ____ Ways: ____

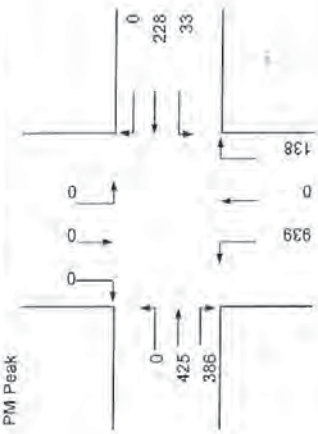
RTOR/Overlap (AM): NB 0 SB 0 EB 0 WB 0
RTOR/Overlap (PM): NB 0 SB 0 EB 0 WB 0

Shared Left PCE (AM): NB 1 SB 1 EB 1 WB 1
Shared Left PCE (PM): NB 1 SB 1 EB 1 WB 1

Phase	Movement	Volume	Lane Use Factor	Lane Volume	Opposing Lefts	Lane Use Factor	Opposing Volume	Critical Lane Volume	*
EB	T	168	1.00	168	247	1.00	247	415	
WB	T	497	1.00	497	0	1.00	0	497	*
NB	L	339	1.00	339	0	1.00	0	339	*
SB	0	0	1.00	0	0	1.00	0	0	

Note: SUM 836 A

PM Peak



Phase	Movement	Volume	Lane Use Factor	Lane Volume	Opposing Lefts	Lane Use Factor	Opposing Volume	Critical Lane Volume	*
EB	T	425	1.00	425	33	1.00	33	458	*
WB	T	228	1.00	228	0	1.00	0	228	
NB	L	939	1.00	939	0	1.00	0	939	*
SB	0	0	1.00	0	0	1.00	0	0	

Note: SUM 1397 D

Opposing Volume	PCE	Number of Lanes	Lane Use Factor	Critical Lane Volume
<199	1.10	1	1.00	A 1,000
200-599	2.00	2	0.55	B 1,150
600-799	3.00	3	0.37	C 1,300
800-999	4.00	4	0.29	D 1,450
>999	5.00	5	0.25	E 1,600
				F 1,600

Two-Way Stop Control Page 1 of 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SK	Intersection	Powder Mill Rd/Site Access
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed		Analysis Year	Existing
Analysis Time Period	AM Peak		

Project Description	2012 RTC Master Plan
East/West Street: Powder Mill Road	North/South Street: Site Access
Intersection Orientation: East-West	Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	94	96			721	84
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	98	101	0	0	758	88
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	0	1	1
Configuration	L	T			T	R
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				0		16
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	16
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L						LR	
v (veh/h)	98						16	
C (m) (veh/h)	791						407	
v/c	0.12						0.04	
95% queue length	0.42						0.12	
Control Delay (s/veh)	10.2						14.2	
LOS	B						B	
Approach Delay (s/veh)	--	--				14.2		
Approach LOS	--	--				B		

Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 3/30/2012 4:57 PM

file:///C:/Users/skondagari/AppData/Local/Temp/u2k9CE9.tmp 3/30/2012

Two-Way Stop Control Page 1 of 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SK	Intersection	Powder Mill Rd/Site Access
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed		Analysis Year	Existing
Analysis Time Period	PM Peak		

Project Description 2012 RTC Master Plan	
East/West Street: Powder Mill Road	North/South Street: Site Access
Intersection Orientation: East-West	Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	3	486			182	2
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	3	511	0	0	191	2
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	0	1	1
Configuration	L	T			T	R
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				29		107
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	0	0	0	30	0	112
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L						LR	
v (veh/h)	3						142	
C (m) (veh/h)	1380						687	
v/c	0.00						0.21	
95% queue length	0.01						0.77	
Control Delay (s/veh)	7.6						11.6	
LOS	A						B	
Approach Delay (s/veh)	--	--				11.6		
Approach LOS	--	--				B		

Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 3/30/2012 4:57 PM

file:///C:/Users/skondagari/AppData/Local/Temp/u2kF3FD.tmp 3/30/2012

Two-Way Stop Control Page 1 of 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SK	Intersection	Powder Mill Rd/Springfield Rd
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed		Analysis Year	Existing
Analysis Time Period			

Project Description 2012 RTC Master Plan

East/West Street: Powder Mill Road | North/South Street: Springfield Road

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		57	23	42	714	
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	0	60	24	44	751	0
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration			TR	L	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	90		8			
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	94	0	8	0	0	0
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L		LR				
v (veh/h)		44		102				
C (m) (veh/h)		1513		312				
v/c		0.03		0.33				
95% queue length		0.09		1.38				
Control Delay (s/veh)		7.5		22.0				
LOS		A		C				
Approach Delay (s/veh)	--	--	22.0					
Approach LOS	--	--	C					

Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 3/30/2012 4:57 PM

file:///C:/Users/skondagari/AppData/Local/Temp/u2k44AC.tmp 3/30/2012

Two-Way Stop Control Page 1 of 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SK	Intersection	Powder Mill Rd/Springfield Rd
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed		Analysis Year	Existing
Analysis Time Period	PM Peak		

Project Description: 2012 RTC Master Plan

East/West Street: Powder Mill Road | North/South Street: Springfield Road

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		441	83	15	122	
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	0	464	87	15	128	0
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration			TR	L	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	52		43			
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	54	0	45	0	0	0
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L		LR				
v (veh/h)		15		99				
C (m) (veh/h)		1019		475				
v/c		0.01		0.21				
95% queue length		0.04		0.78				
Control Delay (s/veh)		8.6		14.6				
LOS		A		B				
Approach Delay (s/veh)	--	--	14.6					
Approach LOS	--	--	B					

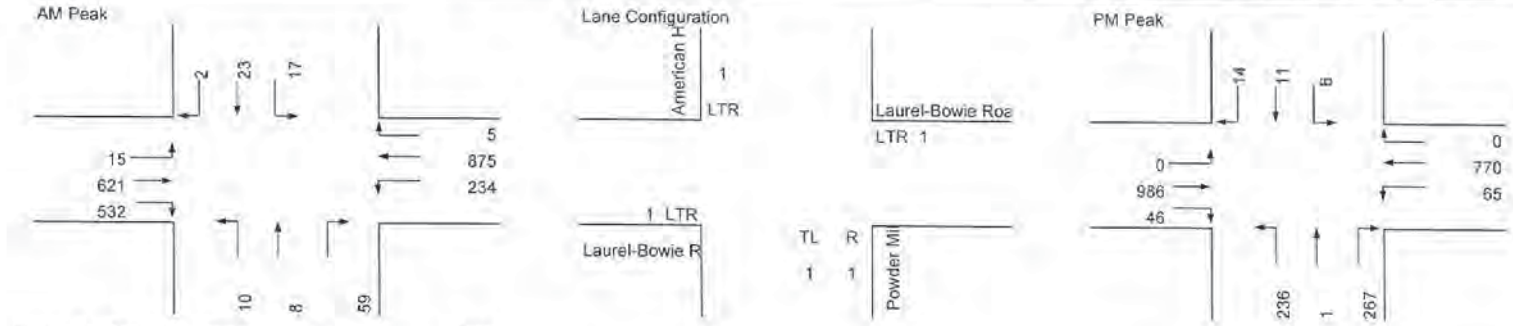
Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 3/30/2012 4:58 PM

file:///C:/Users/skondagari/AppData/Local/Temp/u2kE8F6.tmp 3/30/2012

2012 RTC Master Plan
Critical Lane Volue
Level of Service Calculations

Intersection: 6: Powder Mill Road/Laurel-Bowie Road
Jurisdiction: Prince George's County
Scenario/Design Year: Existing
Computed by: BJB

WELLS + ASSOCIATES
TRANSPORTATION, TRAFFIC, AND PARKING CONSULTANTS
170 Jennifer Road, Annapolis, Maryland 20401
Phone (410)266-5723 Facsimile (410)266-9189



Intersection Control: Signal: X Split: Stop: Ways:

RTOR/Overlap (AM):	NB	59	SB	0	EB	0	WB 0
RTOR/Overlap (PM):	NB	65	SB	0	EB	0	WB 0
Shared Left PCE (AM):	NB	1.1	SB	1.1	EB	4	WB 5
Shared Left PCE (PM):	NB	1.1	SB	2	EB	3	WB 5

Opposing Volume	PCE	Number of Lanes	Lane Use Factor	Critical Lane Volume		
<199	1.10	1	1.00	A	≤	1,000
200-599	2.00	2	0.55	B	≤	1,150
600-799	3.00	3	0.37	C	≤	1,300
800-999	4.00	4	0.29	D	≤	1,450
>999	5.00	5	0.25	E	≤	1,600
				F	>	1,600

Phase	Movement	Volume	Lane Use Factor	Lane Volume	Opposing Lefts	Lane Use Factor	Opposing Volume	Critical Lane Volume	*
EB	LTR	1213	1.00	1213	234	1.00	234	1447	
WB	LTR	2050	1.00	2050	15	1.00	15	2065	*
NB	TL	19	1.00	19	17	1.00	17	36	
SB	LTR	43.7	1.00	44	10	1.00	10	54	*
Note:							SUM	2119	
								F	

Phase	Movement	Volume	Lane Use Factor	Lane Volume	Opposing Lefts	Lane Use Factor	Opposing Volume	Critical Lane Volume	*
EB	LTR	1032	1.00	1032	65	1.00	65	1097	*
WB	LTR	1095	1.00	1095	0	1.00	0	1095	
NB	TL	260.6	1.00	261	6	1.00	6	267	
SB	LTR	37	1.00	37	236	1.00	236	273	*
Note:							SUM	1370	
								D	

Appendix D

Traffic Forecasting Worksheets
And Background Development Distributions

1: BW Parkway SB Off-Ramp/Powder Mill Road
AM Peak Hour

2019

	Traffic Component			Southbound BW Parkway SB Off-Ramp Right	Southbound Through	Southbound Left	Westbound Powder Mill Road Right	Westbound Through	Westbound Left	Northbound BW Parkway SB On-Ramp Right	Northbound Through	Northbound Left	Eastbound Powder Mill Road Right	Eastbound Through	Eastbound Left
	Existing Traffic Volume			184	2	284	-	459	175	-	-	-	162	252	-
	Growth			40	-	62	-	101	38	-	-	-	35	55	-
	Pipeline Developments	IN	OUT												
1	Rosso Property	5	19	-	-	1	-	3	-	-	-	-	-	1	-
2	Glen Dale North	5	19	-	-	1	-	3	-	-	-	-	-	1	-
3	Sylla Business Park Office	29	3	-	-	-	-	-	-	-	-	-	-	1	-
-	Sylla Business Park Hotel	16	11	-	-	-	-	-	-	-	-	-	-	-	-
4	Emmanuel Baptist Church	3	2	-	-	-	-	-	-	-	-	-	-	-	-
	Subtotal	58	54	-	-	2	-	6	-	-	-	-	-	3	-
	Background			224	2	348	-	566	213	-	-	-	197	310	-
	Site	178	16	-	-	35	-	2	8	-	-	-	-	18	-
	Total Future			**224**	**2**	**383**	**-**	**568**	**221**	**-**	**-**	**-**	**197**	**328**	**-**

1: BW Parkway SB Off-Ramp/Powder Mill Road
PM Peak Hour

	Traffic Component			Southbound None Right	Southbound Through	Southbound Left	Westbound Powder Mill Road Right	Westbound Through	Westbound Left	Northbound BW Parkway SB On-Ramp Right	Northbound Through	Northbound Left	Eastbound Powder Mill Road Right	Eastbound Through	Eastbound Left
	Existing Traffic Volume			203	30	289	-	257	87	-	-	-	80	643	-
	Growth			44	7	63	-	56	19	-	-	-	18	141	-
	Pipeline Developments	IN	OUT												
1	Rosso Property	18	10	-	-	2	-	1	-	-	-	-	-	3	-
2	Glen Dale North	18	10	-	-	2	-	1	-	-	-	-	-	3	-
3	Sylla Business Park Office	6	24	-	-	-	-	1	-	-	-	-	-	-	-
	Sylla Business Park Hotel	22	20	-	-	-	-	-	-	-	-	-	-	-	-
4	Emmanuel Baptist Church	3	3	-	-	-	-	-	-	-	-	-	-	-	-
	Subtotal	67	67	-	-	4	-	3	-	-	-	-	-	6	-
	Background			247	37	356	-	316	106	-	-	-	98	790	-
	Site	5	143	-	-	1	-	14	72	-	-	-	-	1	-
	Total Future			**247**	**37**	**357**	**-**	**330**	**178**	**-**	**-**	**-**	**98**	**791**	**-**

Wells + Associates, Inc
Annapolis, Maryland

2

2: BW Parkway NB On-Ramp/Powder Mill Road
AM Peak Hour

2019

Traffic Component			Southbound BW Parkway NB On-Ramp Right	Southbound Through	Southbound Left	Westbound Powder Mill Road Right	Westbound Through	Westbound Left	Northbound BW Parkway NB Off-Ramp Right	Northbound Through	Northbound Left	Eastbound Powder Mill Road Right	Eastbound Through	Eastbound Left
Existing Traffic Volume			-	-	-	335	513	-	65	-	104	-	473	137
Growth			-	-	-	73	112	-	14	-	23	-	104	30
Pipeline Developments	IN	OUT												
1 Rosso Property	5	19	-	-	-	2	3	-	-	-	-	-	1	-
2 Glen Dale North	5	19	-	-	-	2	3	-	-	-	-	-	1	-
3 Sylla Business Park Office	29	3	-	-	-	-	-	-	-	-	-	-	1	-
- Sylla Business Park Hotel	16	11	-	-	-	-	-	-	-	-	-	-	-	-
4 Emmanuel Baptist Church	3	2	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	58	54	-	-	-	4	6	-	-	-	-	-	3	-
Background			-	-	-	412	631	-	79	-	127	-	580	167
Site	178	16	-	-	-	3	10	-	89	-	-	-	53	-
Total Future			-	-	-	415	641	-	168	-	127	-	633	167

2

2: BW Parkway NB On-Ramp/Powder Mill Road
PM Peak Hour

Traffic Component			Southbound BW Parkway NB On-Ramp Right	Southbound Through	Southbound Left	Westbound Powder Mill Road Right	Westbound Through	Westbound Left	Northbound BW Parkway NB Off-Ramp Right	Northbound Through	Northbound Left	Eastbound Powder Mill Road Right	Eastbound Through	Eastbound Left
Existing Traffic Volume			-	-	-	870	246	-	33	4	60	-	723	458
Growth			-	-	-	191	54	-	7	1	13	-	158	100
Pipeline Developments	IN	OUT												
1 Rosso Property	18	10	-	-	-	1	1	-	-	-	-	-	5	-
2 Glen Dale North	18	10	-	-	-	1	1	-	-	-	-	-	5	-
3 Sylla Business Park Office	6	24	-	-	-	-	1	-	-	-	-	-	-	-
- Sylla Business Park Hotel	22	20	-	-	-	-	-	-	-	-	-	-	-	-
4 Emmanuel Baptist Church	3	3	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	67	67	-	-	-	2	3	-	-	-	-	-	10	-
Background			-	-	-	1,063	303	-	40	5	73	-	891	558
Site	5	143	-	-	-	29	86	-	2	-	-	-	2	-
Total Future			-	-	-	1,092	389	-	42	5	73	-	893	558

Wells + Associates, Inc.
Annapolis, Maryland

3

3: Powder Mill Road/Soil Conservation Road
AM Peak Hour

2019

	Traffic Component			Southbound Gated Driveway			Westbound Powder Mill Road			Northbound Soil Conservation Road			Eastbound Powder Mill Road		
				Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
	Existing Traffic Volume			-	-	-	-	497	247	20	-	339	372	168	-
	Growth			-	-	-	-	109	54	4	-	74	81	37	-
	Pipeline Developments	IN	OUT												
1	Rosso Property	5	19	-	-	-	-	5	-	-	-	-	-	1	-
2	Glen Dale North	5	19	-	-	-	-	5	-	-	-	-	-	1	-
3	Sylla Business Park Office	29	3	-	-	-	-	-	-	-	-	-	-	1	-
-	Sylla Business Park Hotel	16	11	-	-	-	-	-	-	-	-	-	-	-	-
4	Emmanuel Baptist Church	3	2	-	-	-	-	-	-	-	-	-	-	-	-
	Subtotal	58	54	-	-	-	-	10	-	-	-	-	-	3	-
	Background			-	-	-	-	616	301	24	-	413	453	208	-
	Site	178	16	-	-	-	-	13	1	9	-	-	-	142	-
	Total Future			-	-	-	-	629	302	33	-	413	453	350	-

3

3: Powder Mill Road/Soil Conservation Road
PM Peak Hour

	Traffic Component			Southbound Gated Driveway			Westbound Powder Mill Road			Northbound Soil Conservation Road			Eastbound Powder Mill Road		
				Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left
	Existing Traffic Volume			-	-	-	-	228	33	138	-	939	386	425	-
	Growth			-	-	-	-	50	7	30	-	206	85	93	-
	Pipeline Developments	IN	OUT												
1	Rosso Property	18	10	-	-	-	-	2	-	-	-	-	-	5	-
2	Glen Dale North	18	10	-	-	-	-	2	-	-	-	-	-	5	-
3	Sylla Business Park Office	6	24	-	-	-	-	1	-	-	-	-	-	-	-
-	Sylla Business Park Hotel	22	20	-	-	-	-	-	-	-	-	-	-	-	-
4	Emmanuel Baptist Church	3	3	-	-	-	-	-	-	-	-	-	-	-	-
	Subtotal	67	67	-	-	-	-	5	-	-	-	-	-	10	-
	Background			-	-	-	-	283	40	168	-	1,145	471	528	-
	Site	5	143	-	-	-	-	115	7	-	-	-	-	4	-
	Total Future			-	-	-	-	398	47	168	-	1,145	471	532	-

Wells + Associates, Inc
Annapolis, Maryland

4

4: Powder Mill Road/Site Driveway
AM Peak Hour

2019

Traffic Component			Southbound Site Driveway Right	Southbound Site Driveway Through	Southbound Site Driveway Left	Westbound Powder Mill Road Right	Westbound Powder Mill Road Through	Westbound Powder Mill Road Left	Northbound None Right	Northbound None Through	Northbound None Left	Eastbound Powder Mill Road Right	Eastbound Powder Mill Road Through	Eastbound Powder Mill Road Left
Existing Traffic Volume			16	-	-	84	721	-	-	-	-	-	96	94
Growth							158						21	
Pipeline Developments	IN	OUT												
1 Rosso Property	5	19	-	-	-	-	5	-	-	-	-	-	1	-
2 Glen Dale North	5	19	-	-	-	-	5	-	-	-	-	-	1	-
3 Sylla Business Park Office	29	3	-	-	-	-	-	-	-	-	-	-	1	-
- Sylla Business Park Hotel	16	11	-	-	-	-	-	-	-	-	-	-	-	-
4 Emmanuel Baptist Church	3	2	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	58	54	-	-	-	-	10	-	-	-	-	-	3	-
Background			16	-	-	84	889	-	-	-	-	-	120	94
Site	178	16	14	-	2	27	-	-	-	-	-	-	-	151
Total Future			30	-	2	111	889	-	-	-	-	-	120	245

4

4: Powder Mill Road/Site Driveway
PM Peak Hour

Traffic Component			Southbound Site Driveway Right	Southbound Site Driveway Through	Southbound Site Driveway Left	Westbound Powder Mill Road Right	Westbound Powder Mill Road Through	Westbound Powder Mill Road Left	Northbound None Right	Northbound None Through	Northbound None Left	Eastbound Powder Mill Road Right	Eastbound Powder Mill Road Through	Eastbound Powder Mill Road Left
Existing Traffic Volume			107	-	29	2	182	-	-	-	-	-	486	3
Growth							40						106	
Pipeline Developments	IN	OUT												
1 Rosso Property	18	10	-	-	-	-	2	-	-	-	-	-	5	-
2 Glen Dale North	18	10	-	-	-	-	2	-	-	-	-	-	5	-
3 Sylla Business Park Office	6	24	-	-	-	-	1	-	-	-	-	-	-	-
- Sylla Business Park Hotel	22	20	-	-	-	-	-	-	-	-	-	-	-	-
4 Emmanuel Baptist Church	3	3	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	67	67	-	-	-	-	5	-	-	-	-	-	10	-
Background			107	-	29	2	227	-	-	-	-	-	602	3
Site	5	143	122	-	21	1	-	-	-	-	-	-	-	4
Total Future			229	-	50	3	227	-	-	-	-	-	602	7

Wells + Associates, Inc
Annapolis, Maryland

5

5: Powder Mill Road/Springfield Road
AM Peak Hour

2019

Traffic Component			Southbound None Right	Southbound None Through	Southbound None Left	Westbound Powder Mill Road Right	Westbound Powder Mill Road Through	Westbound Powder Mill Road Left	Northbound Springfield Road Right	Northbound Springfield Road Through	Northbound Springfield Road Left	Eastbound Powder Mill Road Right	Eastbound Powder Mill Road Through	Eastbound Powder Mill Road Left
Existing Traffic Volume			-	-	-	-	714	42	8	-	90	23	57	-
Growth			-	-	-	-	156	9	2	-	20	5	12	-
Pipeline Developments	IN	OUT												
1 Rosso Property	5	19	-	-	-	-	-	-	-	-	5	1	-	-
2 Glen Dale North	5	19	-	-	-	-	-	-	-	-	5	1	-	-
3 Sylla Business Park Office	29	3	-	-	-	-	-	-	-	-	-	-	1	-
- Sylla Business Park Hotel	16	11	-	-	-	-	-	-	-	-	-	-	-	-
4 Emmanuel Baptist Church	3	2	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	58	54	-	-	-	-	-	-	-	-	10	2	1	-
Background			-	-	-	-	870	51	10	-	120	30	70	-
Site	178	16	-	-	-	-	18	-	-	-	9	-	2	-
Total Future			-	-	-	-	888	51	10	-	129	30	72	-

5

5: Powder Mill Road/Springfield Road
PM Peak Hour

Traffic Component			Southbound None Right	Southbound None Through	Southbound None Left	Westbound Powder Mill Road Right	Westbound Powder Mill Road Through	Westbound Powder Mill Road Left	Northbound Springfield Road Right	Northbound Springfield Road Through	Northbound Springfield Road Left	Eastbound Powder Mill Road Right	Eastbound Powder Mill Road Through	Eastbound Powder Mill Road Left
Existing Traffic Volume			-	-	-	-	122	15	43	-	52	83	441	-
Growth			-	-	-	-	27	3	9	-	11	18	97	-
Pipeline Developments	IN	OUT												
1 Rosso Property	18	10	-	-	-	-	-	-	-	-	2	5	-	-
2 Glen Dale North	18	10	-	-	-	-	-	-	-	-	2	5	-	-
3 Sylla Business Park Office	6	24	-	-	-	-	1	-	-	-	-	-	-	-
- Sylla Business Park Hotel	22	20	-	-	-	-	-	-	-	-	-	-	-	-
4 Emmanuel Baptist Church	3	3	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	67	67	-	-	-	-	1	-	-	-	4	10	-	-
Background			-	-	-	-	150	18	52	-	67	111	538	-
Site	5	143	-	-	-	-	1	-	-	-	-	7	14	-
Total Future			-	-	-	-	151	18	52	-	67	118	552	-

Wells + Associates, Inc
Annapolis, Maryland

6

6: Powder Mill Road/Laurel-Bowie Road
AM Peak Hour

2019

Traffic Component			Southbound American Holly Drive Right	Southbound Through	Southbound Left	Westbound Laurel-Bowie Road Right	Westbound Through	Westbound Left	Northbound Powder Mill Road Right	Northbound Through	Northbound Left	Eastbound Laurel-Bowie Road Right	Eastbound Through	Eastbound Left
Existing Traffic Volume			2	23	17	5	875	234	59	8	10	532	621	15
Growth							192	51	13		2	117	136	
Pipeline Developments	IN	OUT												
1 Rosso Property	5	19	-	-	-	-	-	-	-	-	-	-	-	-
2 Glen Dale North	5	19	-	-	-	-	-	-	-	-	-	-	-	-
3 Sylla Business Park Office	29	3	-	-	-	-	1	-	-	-	1	-	-	-
- Sylla Business Park Hotel	16	11	-	-	-	-	1	-	-	-	-	-	1	-
4 Emmanuel Baptist Church	3	2	-	-	-	-	2	-	-	-	-	-	1	-
Subtotal	58	54	-	-	-	-	4	-	-	-	1	-	2	-
Background			2	23	17	5	1,071	285	72	8	13	649	759	15
Site	178	16	-	-	-	-	-	18	2	-	-	-	-	-
Total Future			**2**	**23**	**17**	**5**	**1,071**	**303**	**74**	**8**	**13**	**649**	**759**	**15**

6

6: Powder Mill Road/Laurel-Bowie Road
PM Peak Hour

Traffic Component			Southbound American Holly Drive Right	Southbound Through	Southbound Left	Westbound Laurel-Bowie Road Right	Westbound Through	Westbound Left	Northbound Powder Mill Road Right	Northbound Through	Northbound Left	Eastbound Laurel-Bowie Road Right	Eastbound Through	Eastbound Left
Existing Traffic Volume			14	11	6	-	770	65	267	1	236	46	986	-
Growth							169	14	58		52	10	216	
Pipeline Developments	IN	OUT												
1 Rosso Property	18	10	-	-	-	-	-	-	-	-	-	-	-	-
2 Glen Dale North	18	10	-	-	-	-	-	-	-	-	-	-	-	-
3 Sylla Business Park Office	6	24	-	-	-	-	-	-	-	-	-	1	1	-
- Sylla Business Park Hotel	22	20	-	-	-	-	1	-	-	-	-	-	1	-
4 Emmanuel Baptist Church	3	3	-	-	-	-	2	-	-	-	-	-	2	-
Subtotal	67	67	-	-	-	-	3	-	-	-	-	1	4	-
Background			14	11	6	-	942	79	325	1	288	57	1,206	-
Site	5	143	-	-	-	-	-	1	14	-	-	-	-	-
Total Future			**14**	**11**	**6**	**-**	**942**	**80**	**339**	**1**	**288**	**57**	**1,206**	**-**

Wells + Associates, Inc
Annapolis, Maryland

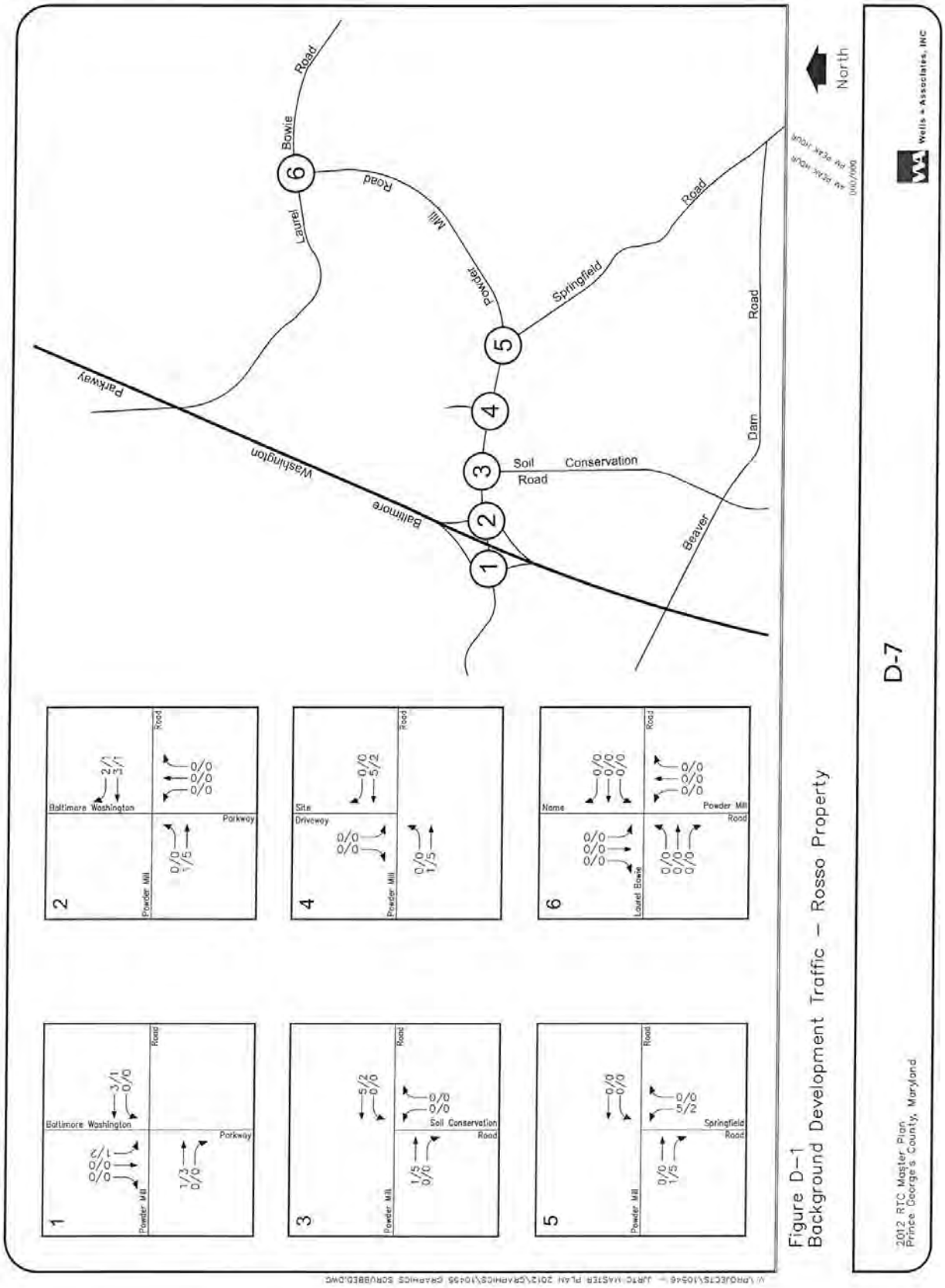


Figure D–1
Background Development Traffic – Rosso Property

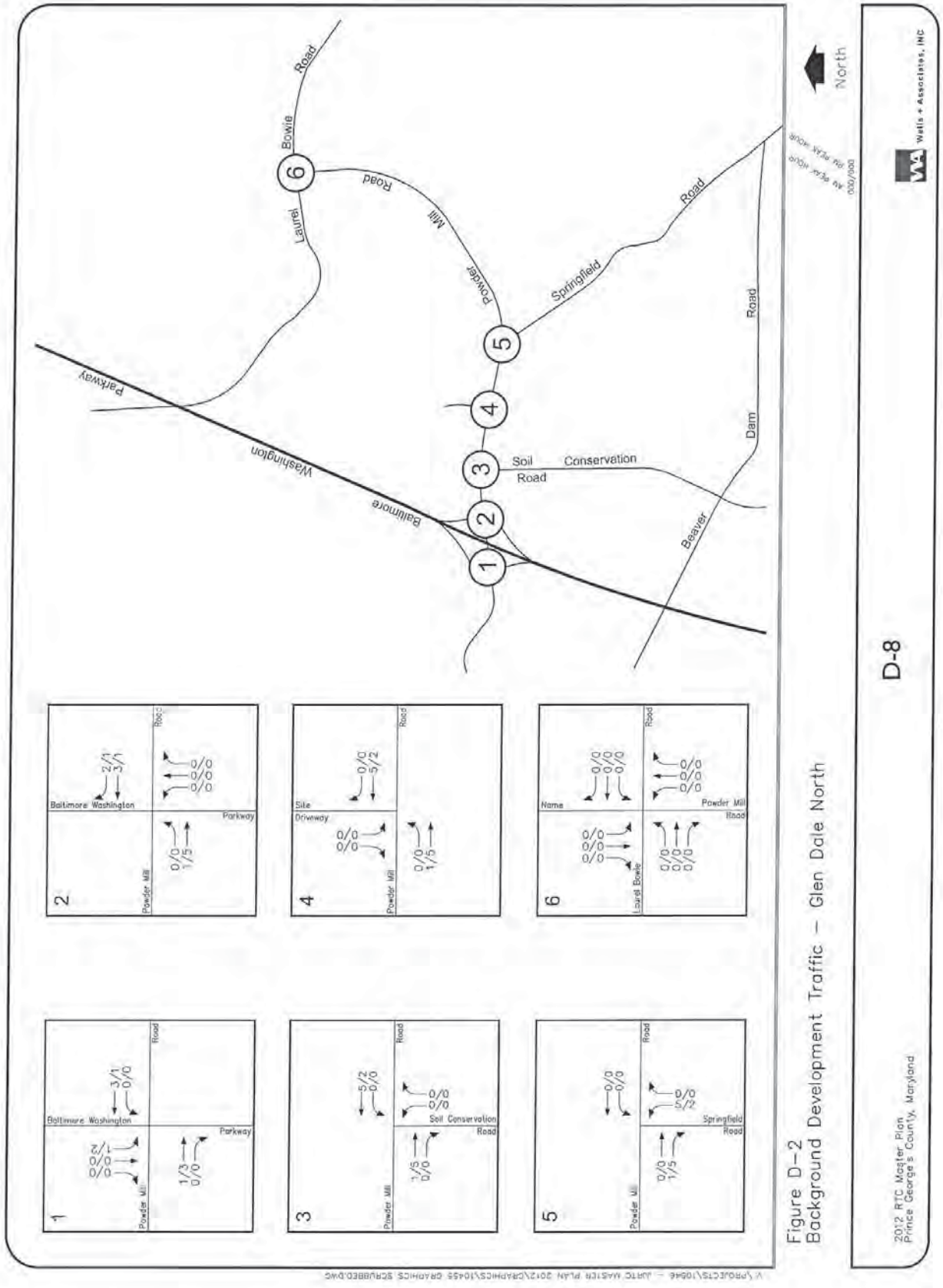


Figure D-2
Background Development Traffic – Glen Dale North

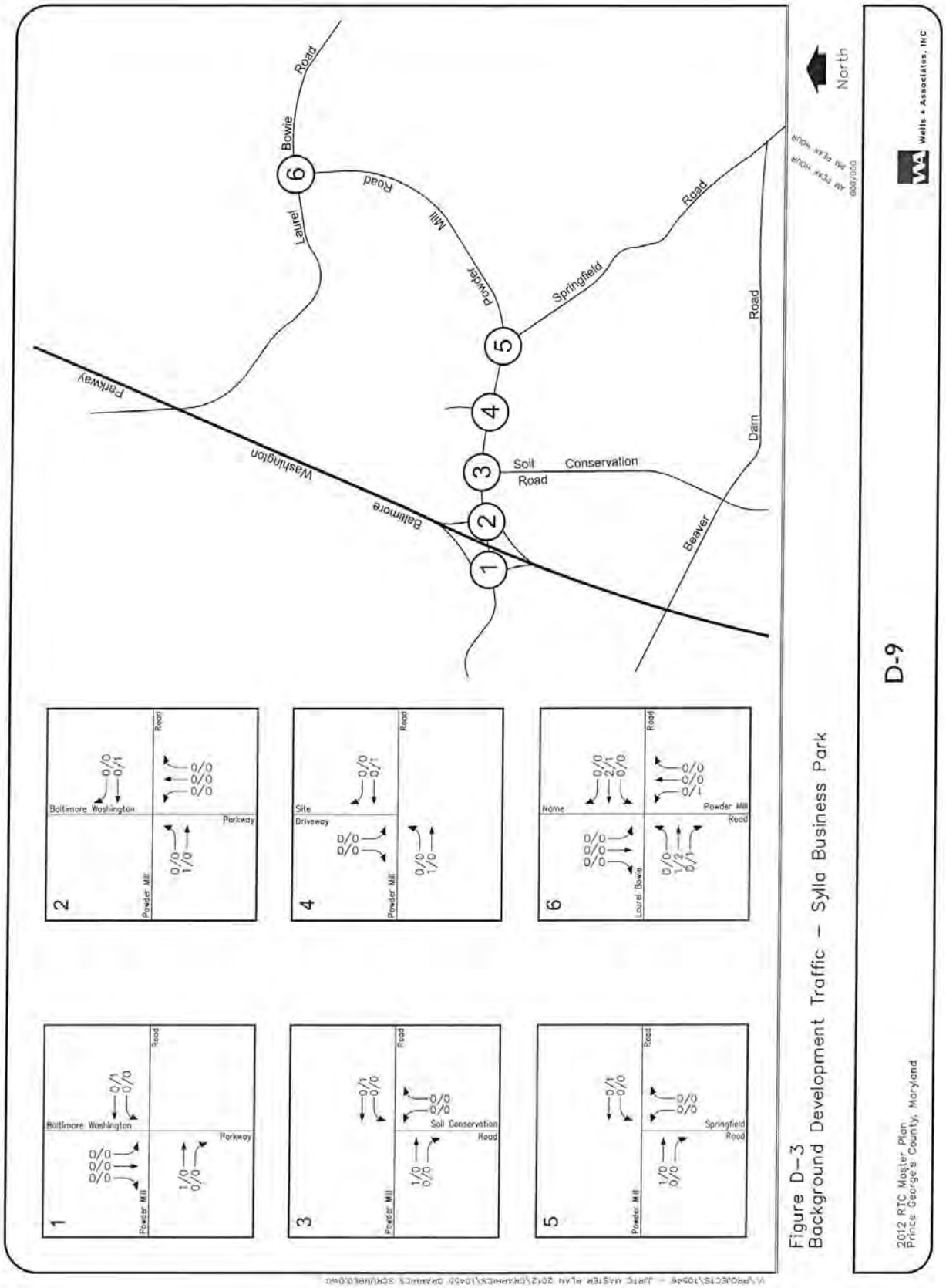


Figure D–3
Background Development Traffic – Sylla Business Park

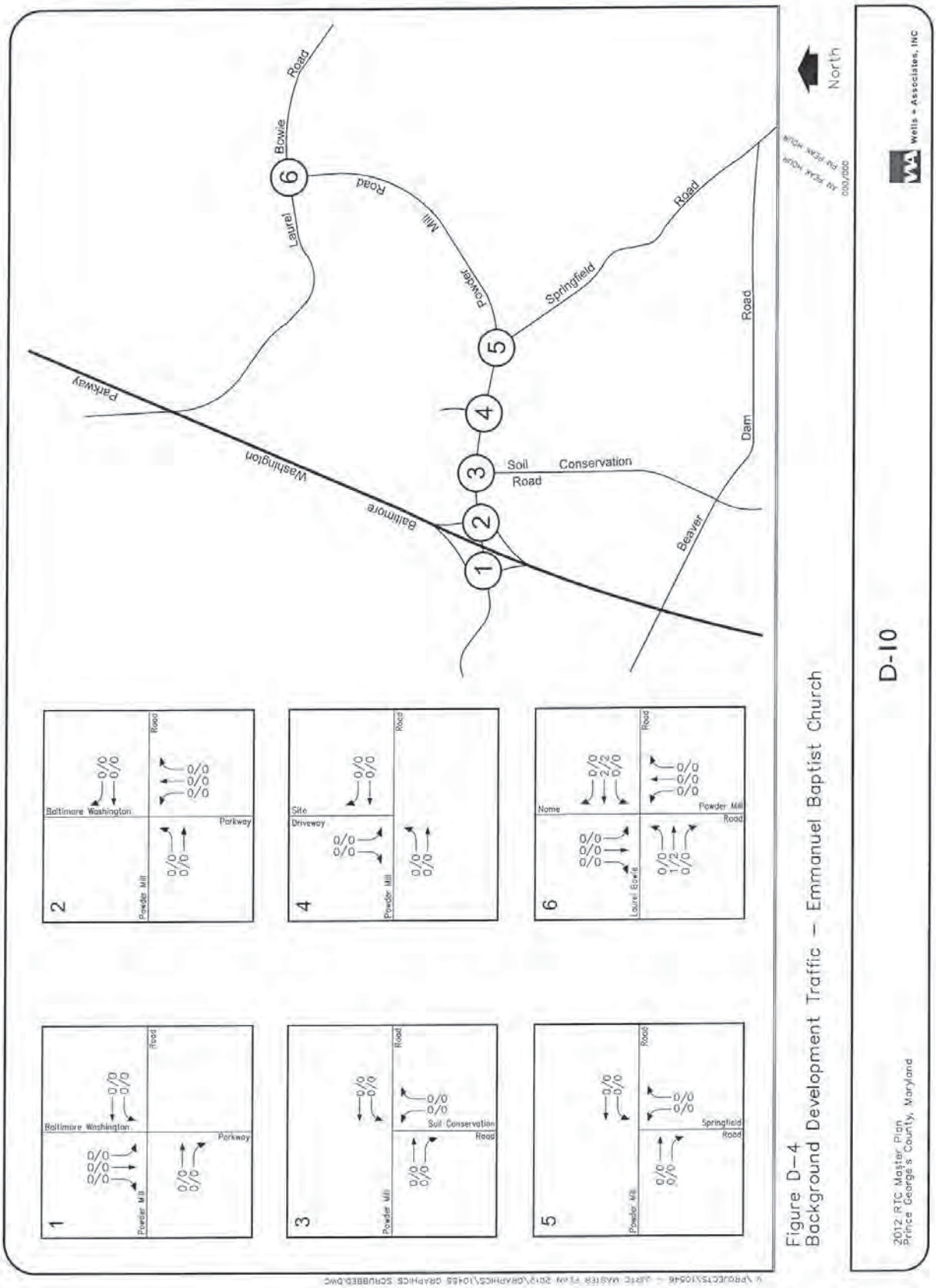


Figure D-4
Background Development Traffic – Emmanuel Baptist Church

D-10

2012 RTC Master Plan
Prince George's County, Maryland

Appendix E

Background Future Intersection Levels of Service Analysis

Two-Way Stop Control Page 1 of 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	sk	Intersection	BW Parkway SB/Powder Mill Rd
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed		Analysis Year	Background
Analysis Time Period	AM Peak		

Project Description: 2012 RTC Master Plan

East/West Street: Powder Mill Road | North/South Street: BW Parkway Southbound Ramp

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		310	197	213	566	
Peak-Hour Factor, PHF	1.00	0.95	0.95	0.95	0.95	1.00
Hourly Flow Rate, HFR (veh/h)	0	326	207	224	595	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration			TR	L	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				348	2	224
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	0	0	0	366	2	235
Percent Heavy Vehicles	0	0	0	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	1	1	0
Configuration				L		TR

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L				L		TR
v (veh/h)		224				366		237
C (m) (veh/h)		1035				110		484
v/c		0.22				3.33		0.49
95% queue length		0.82				35.83		2.65
Control Delay (s/veh)		9.4				1130		19.4
LOS		A				F		C
Approach Delay (s/veh)	--	--				693.4		
Approach LOS	--	--				F		

Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 3/30/2012 5:01 PM

file:///C:/Users/skondagari/AppData/Local/Temp/u2k4DDF.tmp 3/30/2012

Two-Way Stop Control Page 1 of 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SK	Intersection	BW Parkway SB/Powder Mill Rd
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed		Analysis Year	Background
Analysis Time Period	PM Peak		

Project Description 2012 RTC Master Plan

East/West Street: Powder Mill Road | North/South Street: BW Parkway Southbound Ramp

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		790	98	106	316	
Peak-Hour Factor, PHF	1.00	0.95	0.95	0.95	0.95	1.00
Hourly Flow Rate, HFR (veh/h)	0	831	103	111	332	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration			TR	L	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				356	37	247
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	0	0	0	374	38	260
Percent Heavy Vehicles	0	0	0	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	1	1	0
Configuration				L		TR

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L				L		TR
v (veh/h)		111				374		298
C (m) (veh/h)		733				125		409
v/c		0.15				2.99		0.73
95% queue length		0.53				35.12		5.71
Control Delay (s/veh)		10.8				971.6		34.1
LOS		B				F		D
Approach Delay (s/veh)	--	--				555.8		
Approach LOS	--	--				F		

Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 3/30/2012 5:01 PM

file:///C:/Users/skondagari/AppData/Local/Temp/u2kA458.tmp 3/30/2012

Two-Way Stop Control Page 1 of 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SK	Intersection	BW Parkway NB/Powder Mill Rd
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed		Analysis Year	Background
Analysis Time Period	AM Peak		

Project Description 2012 RTC Master Plan

East/West Street: Powder Mill Road | North/South Street: BW Parkway Northbound Ramp

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	167	580			631	412
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	175	610	0	0	664	433
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	0	1	0
Configuration	L	T				TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	127	0	79			
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	133	0	83	0	0	0
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	1	1	0	0	0	0
Configuration	L		TR			

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L		L		TR			
v (veh/h)	175		133		83			
C (m) (veh/h)	636		60		494			
v/c	0.28		2.22		0.17			
95% queue length	1.12		12.97		0.60			
Control Delay (s/veh)	12.8		705.9		13.8			
LOS	B		F		B			
Approach Delay (s/veh)	--	--	439.9					
Approach LOS	--	--	F					

Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 3/30/2012 5:01 PM

file:///C:/Users/skondagari/AppData/Local/Temp/u2kFDBD.tmp 3/30/2012

Two-Way Stop Control Page 1 of 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SK	Intersection	BW Parkway NB/Powder Mill Rd
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed		Analysis Year	Background
Analysis Time Period	PM Peak		

Project Description 2012 RTC Master Plan

East/West Street: Powder Mill Road | North/South Street: BW Parkway Northbound Ramp

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	558	891			303	1063
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	587	937	0	0	318	1118
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	0	1	0
Configuration	L	T				TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	73	5	40			
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	76	5	42	0	0	0
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	1	1	0	0	0	0
Configuration	L		TR			

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L		L		TR			
v (veh/h)	587		76		47			
C (m) (veh/h)	473		0		0			
v/c	1.24							
95% queue length	23.58							
Control Delay (s/veh)	151.6							
LOS	F		F		F			
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

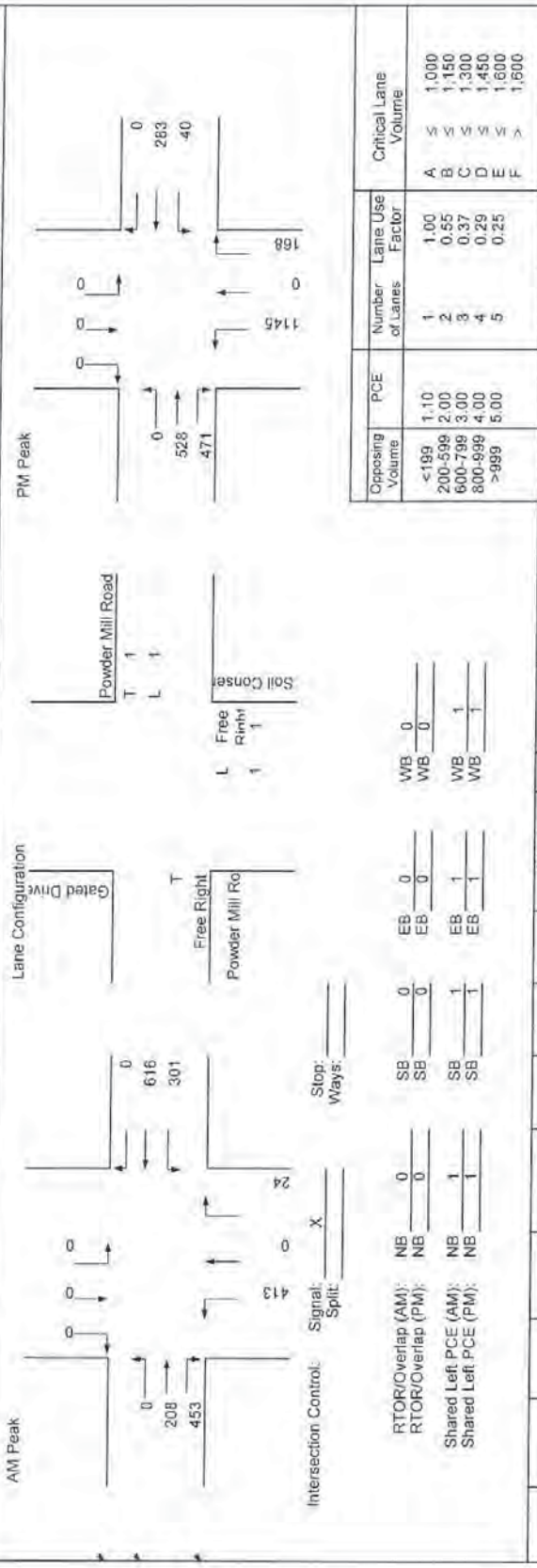
Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 3/30/2012 5:02 PM

file:///C:/Users/skondagari/AppData/Local/Temp/u2k3F5F.tmp 3/30/2012

2012 RTC Master Plan
Critical Lane Volue
Level of Service Calculations

Intersection: 3: Powder Mill Road/Soil Conservation Road
Jurisdiction: Prince George's County
Scenario/Design Year: Background
Computed by: BJB

WELLS + ASSOCIATES
TRANSPORTATION, TRAFFIC, AND PARKING CONSULTANTS
170 Jennifer Road, Annapolis, Maryland 21401
Phone: (410) 266-9122 Fax: (410) 266-9189



Phase	Movement	Volume	Lane Use Factor	Lane Volume	Opposing Lefts	Lane Use Factor	Opposing Volume	Critical Lane Volume	*
EB	T	208	1.00	208	301	1.00	301	509	
WB	T	616	1.00	616	0	1.00	0	616	*
NB	L	413	1.00	413	0	1.00	0	413	*
SB	0	0	1.00	0	0	1.00	0	0	
						SUM	1029	B	

Note:

Phase	Movement	Volume	Lane Use Factor	Lane Volume	Opposing Lefts	Lane Use Factor	Opposing Volume	Critical Lane Volume	*
EB	T	528	1.00	528	40	1.00	40	568	*
WB	T	283	1.00	283	0	1.00	0	283	
NB	L	1145	1.00	1145	0	1.00	0	1145	*
SB	0	0	1.00	0	0	1.00	0	0	
						SUM	1713	F	

Note:

Opposing Volume	PCE	Number of Lanes	Lane Use Factor	Critical Lane Volume
<199	1.10	1	1.00	A <= 1,000
200-599	2.00	2	0.55	B <= 1,150
600-799	3.00	3	0.37	C <= 1,300
800-999	4.00	4	0.29	D <= 1,450
>999	5.00	5	0.25	E <= 1,600
				F > 1,600

Two-Way Stop Control Page 1 of 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SK	Intersection	Powder Mill Rd/Site Access
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed		Analysis Year	Background
Analysis Time Period	AM Peak		

Project Description 2012 RTC Master Plan

East/West Street: Powder Mill Road | North/South Street: Site Access

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	94	120			889	84
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	98	126	0	0	935	88
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	0	1	1
Configuration	L	T			T	R
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				0		16
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	16
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L						LR	
v (veh/h)	98						16	
C (m) (veh/h)	679						322	
v/c	0.14						0.05	
95% queue length	0.50						0.16	
Control Delay (s/veh)	11.2						16.8	
LOS	B						C	
Approach Delay (s/veh)	--	--				16.8		
Approach LOS	--	--				C		

Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 3/30/2012 5:03 PM

file:///C:/Users/skondagari/AppData/Local/Temp/u2kC80E.tmp 3/30/2012

Two-Way Stop Control Page 1 of 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SK	Intersection	Powder Mill Rd/Site Access
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed		Analysis Year	Background
Analysis Time Period	PM Peak		

Project Description 2012 RTC Master Plan

East/West Street: Powder Mill Road | North/South Street: Site Access

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	3	602			227	2
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	3	633	0	0	238	2
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	0	1	1
Configuration	L	T			T	R
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				29		107
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	0	0	0	30	0	112
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L						LR	
v (veh/h)	3						142	
C (m) (veh/h)	1327						606	
v/c	0.00						0.23	
95% queue length	0.01						0.90	
Control Delay (s/veh)	7.7						12.7	
LOS	A						B	
Approach Delay (s/veh)	--	--				12.7		
Approach LOS	--	--				B		

Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 3/30/2012 5:04 PM

file:///C:/Users/skondagari/AppData/Local/Temp/u2kAB8.tmp 3/30/2012

Two-Way Stop Control Page 1 of 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SK	Intersection	Powder Mill Rd/Springfield Rd
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed		Analysis Year	Background
Analysis Time Period	AM Peak		

Project Description: 2012 RTC Master Plan

East/West Street: Powder Mill Road	North/South Street: Springfield Road
Intersection Orientation: East-West	Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		70	30	51	870	
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	0	73	31	53	915	0
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration			TR	L	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	120		10			
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	126	0	10	0	0	0
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L		LR				
v (veh/h)		53		136				
C (m) (veh/h)		1488		237				
v/c		0.04		0.57				
95% queue length		0.11		3.22				
Control Delay (s/veh)		7.5		38.8				
LOS		A		E				
Approach Delay (s/veh)	--	--	38.8					
Approach LOS	--	--	E					

Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 3/30/2012 5:04 PM

file:///C:/Users/skondagari/AppData/Local/Temp/u2k55EB.tmp 3/30/2012

Two-Way Stop Control Page 1 of 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SK	Intersection	Powder Mill Rd/Springfield Rd
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed		Analysis Year	Background
Analysis Time Period	PM Peak		

Project Description: 2012 RTC Master Plan

East/West Street: Powder Mill Road | North/South Street: Springfield Road

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		538	111	18	150	
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	0	566	116	18	157	0
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration			TR	L	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	67		52			
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	70	0	54	0	0	0
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L		LR				
v (veh/h)		18		124				
C (m) (veh/h)		911		390				
v/c		0.02		0.32				
95% queue length		0.06		1.34				
Control Delay (s/veh)		9.0		18.5				
LOS		A		C				
Approach Delay (s/veh)	--	--	18.5					
Approach LOS	--	--	C					

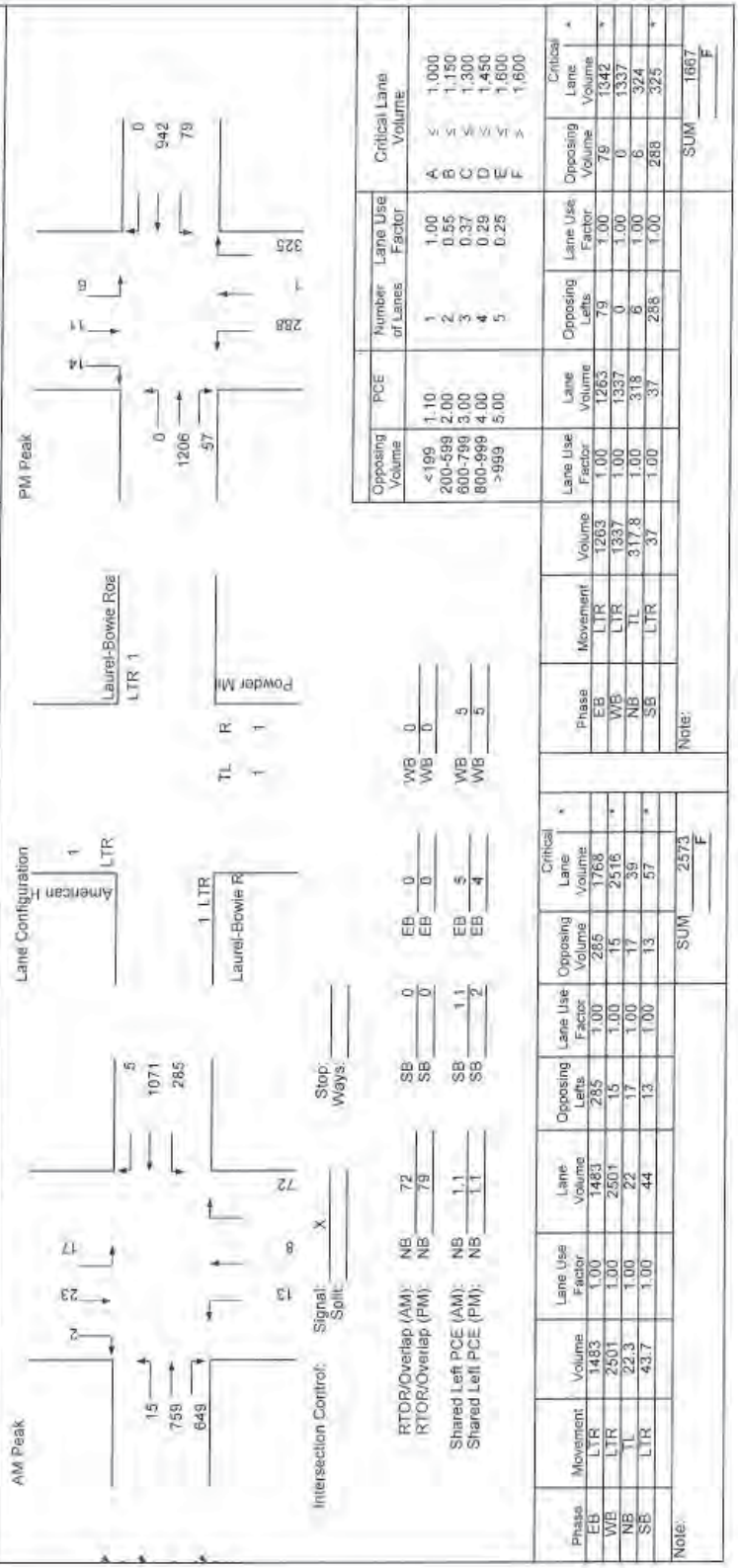
Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 3/30/2012 5:04 PM

file:///C:/Users/skondagari/AppData/Local/Temp/u2kC244.tmp 3/30/2012

2012 RTC Master Plan
Critical Lane Value
Level of Service Calculations

Intersection: 6: Powder Mill Road/Laurel-Bowie Road
Jurisdiction: Prince George's County
Scenario/Design Year: Background
Computed by: BJB

WELLS + ASSOCIATES
TRANSPORTATION, TRAFFIC, AND PARKING CONSULTANTS
170 Jennifer Road, Annapolis, Maryland 21401
Phone: (410)266-5723 Facsimile: (410)266-0183



Phase	Movement	Volume	Lane Use Factor	Lane Volume	Opposing Lefts	Lane Use Factor	Opposing Volume	Critical Lane Volume	*
EB	LTR	1483	1.00	1483	285	1.00	285	1768	
WB	LTR	2501	1.00	2501	15	1.00	15	2516	*
NB	TL	22.3	1.00	22	17	1.00	17	39	
SB	LTR	43.7	1.00	44	13	1.00	13	57	*

Phase	Movement	Volume	Lane Use Factor	Lane Volume	Opposing Lefts	Lane Use Factor	Opposing Volume	Critical Lane Volume	*
EB	LTR	1263	1.00	1263	79	1.00	79	1342	*
WB	LTR	1337	1.00	1337	0	1.00	0	1337	
NB	TL	317.8	1.00	318	6	1.00	6	324	
SB	LTR	37	1.00	37	288	1.00	288	325	*

Opposing Volume	PCE	Number of Lanes	Lane Use Factor	Critical Lane Volume
<199	1.10	1	1.00	A ≤ 1,000
200-599	2.00	2	0.55	B ≤ 1,150
600-799	3.00	3	0.37	C ≤ 1,300
800-999	4.00	4	0.29	D ≤ 1,450
>999	5.00	5	0.25	E ≤ 1,600
				F > 1,600

Appendix F

Total Future Intersection Levels of Service Analysis

Two-Way Stop Control Page 1 of 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SK	Intersection	BW Parkway SB/Powder Mill Rd
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed		Analysis Year	Total Future
Analysis Time Period	AM Peak		

Project Description: 2012 RTC Master Plan

East/West Street: Powder Mill Road | North/South Street: BW Parkway Southbound Ramp

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		328	197	221	568	
Peak-Hour Factor, PHF	1.00	0.95	0.95	0.95	0.95	1.00
Hourly Flow Rate, HFR (veh/h)	0	345	207	232	597	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration			TR	L	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				383	2	224
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	0	0	0	403	2	235
Percent Heavy Vehicles	0	0	0	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	1	1	0
Configuration				L		TR

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L				L		TR
v (veh/h)		232				403		237
C (m) (veh/h)		1018				103		482
v/c		0.23				3.91		0.49
95% queue length		0.88				41.17		2.67
Control Delay (s/veh)		9.6				1396		19.5
LOS		A				F		C
Approach Delay (s/veh)	--	--				886.3		
Approach LOS	--	--				F		

Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 3/30/2012 5:38 PM

file:///C:/Users/skondagari/AppData/Local/Temp/u2k6E9B.tmp 3/30/2012

Two-Way Stop Control Page 1 of 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SK	Intersection	BW Parkway SB/Powder Mill Rd
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed		Analysis Year	Total Future
Analysis Time Period	PM Peak		

Project Description: 2012 RTC Master Plan

East/West Street: Powder Mill Road	North/South Street: BW Parkway Southbound Ramp
Intersection Orientation: East-West	Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		791	98	178	330	
Peak-Hour Factor, PHF	1.00	0.95	0.95	0.95	0.95	1.00
Hourly Flow Rate, HFR (veh/h)	0	832	103	187	347	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration			TR	L	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				357	37	247
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	0	0	0	375	38	260
Percent Heavy Vehicles	0	0	0	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	1	1	0
Configuration				L		TR

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L				L		TR
v (veh/h)		187				375		298
C (m) (veh/h)		732				86		333
v/c		0.26				4.36		0.89
95% queue length		1.01				39.67		8.61
Control Delay (s/veh)		11.6				1612		62.3
LOS		B				F		F
Approach Delay (s/veh)	--	--				925.5		
Approach LOS	--	--				F		

Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 3/30/2012 5:39 PM

file:///C:/Users/skondagari/AppData/Local/Temp/u2k9F0D.tmp 3/30/2012

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SK	Intersection	BW Parkway SB/Powder Mill Rd
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed		Analysis Year	Total Future with Improvements
Analysis Time Period	AM Peak		

Project Description: 2012 RTC Master Plan

East/West Street: Powder Mill Road	North/South Street: BW Parkway Southbound Ramp
Intersection Orientation: East-West	Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		328	197	221	568	
Peak-Hour Factor, PHF	1.00	0.95	0.95	0.95	0.95	1.00
Hourly Flow Rate, HFR (veh/h)	0	345	207	232	597	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	Undivided					
RT Channelized			1			0
Lanes	0	1	1	1	1	0
Configuration		T	R	L	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				383	2	224
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	0	0	0	403	2	235
Percent Heavy Vehicles	0	0	0	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	1	1	0
Configuration				L		TR

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L				L		TR
v (veh/h)		232				403		237
C (m) (veh/h)		1214				108		489
v/c		0.19				3.73		0.48
95% queue length		0.70				40.60		2.61
Control Delay (s/veh)		8.7				1311		19.1
LOS		A				F		C
Approach Delay (s/veh)	--	--	832.9					
Approach LOS	--	--	F					

Copyright © 2006 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 6/5/2012 11:29 AM

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SK	Intersection	BW Parkway SB/Powder Mill Rd
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed		Analysis Year	Total Future with improvements
Analysis Time Period	PM Peak		

Project Description: 2012 RTC Master Plan

East/West Street: Powder Mill Road | North/South Street: BW Parkway Southbound Ramp

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		791	98	178	330	
Peak-Hour Factor, PHF	1.00	0.95	0.95	0.95	0.95	1.00
Hourly Flow Rate, HFR (veh/h)	0	832	103	187	347	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	Undivided					
RT Channelized			1			0
Lanes	0	1	1	1	1	0
Configuration		T	R	L	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				357	37	247
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	0	0	0	375	38	260
Percent Heavy Vehicles	0	0	0	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	1	1	0
Configuration				L		TR

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L				L		TR
v (veh/h)		187				375		298
C (m) (veh/h)		801				89		368
v/c		0.23				4.21		0.81
95% queue length		0.90				39.33		7.07
Control Delay (s/veh)		10.9				1543		45.4
LOS		B				F		E
Approach Delay (s/veh)	--	--				879.7		
Approach LOS	--	--				F		

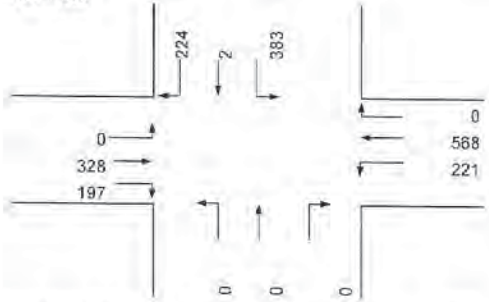
Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 6/5/2012 11:30 AM

JJRTC
Critical Lane Volume
Level of Service Calculations

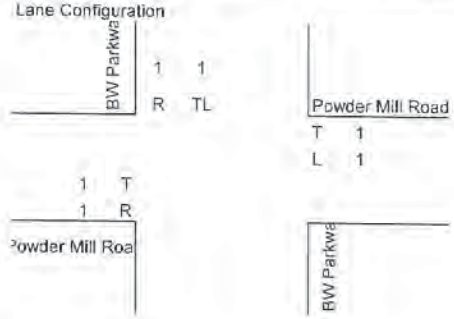
Intersection: 1: BW Parkway SB Off-Ramp/Powder Mill Road
Jurisdiction: Prince George's County
Scenario/Design Year: Total Future Improved
Computed by: BJB

WELLS + ASSOCIATES
TRANSPORTATION, TRAFFIC, AND PARKING CONSULTANTS
170 Jennifer Road, Annapolis, Maryland 20401
Phone: (410)266-5723 Facsimile: (410)266-9183

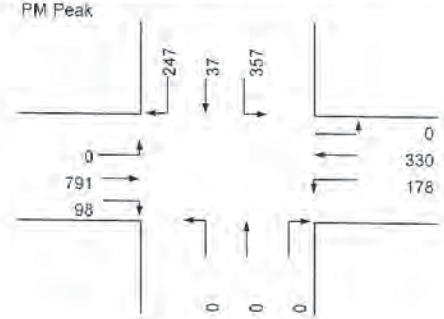
AM Peak



Lane Configuration



PM Peak



Intersection Control: Signal: X Split: Stop: Ways:

RTOR/Overlap (AM):	NB 0	SB 0	EB 0	WB 0
RTOR/Overlap (PM):	NB 0	SB 0	EB 0	WB 0
Shared Left PCE (AM):	NB 1	SB 1.1	EB 1	WB 1
Shared Left PCE (PM):	NB 1	SB 1.1	EB 1	WB 1

Opposing Volume	PCE	Number of Lanes	Lane Use Factor	Critical Lane Volume		
<199	1.10	1	1.00	A	≤	1,000
200-599	2.00	2	0.55	B	≤	1,150
600-799	3.00	3	0.37	C	≤	1,300
800-999	4.00	4	0.29	D	≤	1,450
>999	5.00	5	0.25	E	≤	1,600
				F	>	1,600

Phase	Movement	Volume	Lane Use Factor	Lane Volume	Opposing Lefts	Lane Use Factor	Opposing Volume	Critical Lane Volume	*
EB	T	328	1.00	328	221	1.00	221	549	
WB	T	568	1.00	568	0	1.00	0	568	*
NB	TL	0	0.00	0	0	1.00	0	0	
SB	TL	423	1.00	423	0	1.00	0	423	*

Note:

SUM 991
A

Phase	Movement	Volume	Lane Use Factor	Lane Volume	Opposing Lefts	Lane Use Factor	Opposing Volume	Critical Lane Volume	*
EB	T	791	1.00	791	178	1.00	178	969	*
WB	T	330	1.00	330	0	1.00	0	330	
NB	TL	0	0.00	0	0	1.00	0	0	
SB	TL	430	1.00	430	0	1.00	0	430	*

Note:

SUM 1399
D

Date Printed: 6/5/2012

Two-Way Stop Control Page 1 of 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SK	Intersection	BW Parkway NB/Powder Mill Rd
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed		Analysis Year	Total Future
Analysis Time Period	AM Peak		

Project Description 2012 RTC Master Plan

East/West Street: Powder Mill Road | North/South Street: BW Parkway Northbound Ramp

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	167	633			641	415
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	175	666	0	0	674	436
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	0	1	0
Configuration	L	T				TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	127	0	168			
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	133	0	176	0	0	0
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	1	1	0	0	0	0
Configuration	L		TR			

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L		L		TR			
v (veh/h)	175		133		176			
C (m) (veh/h)	629		54		459			
v/c	0.28		2.46		0.38			
95% queue length	1.13		13.55		1.78			
Control Delay (s/veh)	12.9		827.7		17.6			
LOS	B		F		C			
Approach Delay (s/veh)	--	--	366.3					
Approach LOS	--	--	F					

Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 3/30/2012 5:39 PM

file:///C:/Users/skondagari/AppData/Local/Temp/u2kDD16.tmp 3/30/2012

Two-Way Stop Control Page 1 of 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SK	Intersection	BW Parkway NB/Powder Mill Rd
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed		Analysis Year	Total Future
Analysis Time Period	PM Peak		

Project Description: 2012 RTC Master Plan

East/West Street: Powder Mill Road | North/South Street: BW Parkway Northbound Ramp

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	558	893			389	1092
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	587	940	0	0	409	1149
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	0	1	0
Configuration	L	T				TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	73	5	42			
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	76	5	44	0	0	0
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	1	1	0	0	0	0
Configuration	L		TR			

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L		L		TR			
v (veh/h)	587		76		49			
C (m) (veh/h)	424		0		0			
v/c	1.38							
95% queue length	28.19							
Control Delay (s/veh)	213.0							
LOS	F		F		F			
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 3/30/2012 5:39 PM

file:///C:/Users/skondagari/AppData/Local/Temp/u2k4154.tmp 3/30/2012

Two-Way Stop Control Page 1 of 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SK	Intersection	BW Parkway NB/Powder Mill Rd
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed		Analysis Year	Total Future with Improvements
Analysis Time Period	AM Peak		

Project Description 2012 RTC Master Plan

East/West Street: Powder Mill Road | North/South Street: BW Parkway Northbound Ramp

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	167	633			641	415
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	175	666	0	0	674	436
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			1
Lanes	1	1	0	0	1	1
Configuration	L	T			T	R
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	127	0	168			
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	133	0	176	0	0	0
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	1	1	0	0	0	0
Configuration	L		TR			

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L		L		TR			
v (veh/h)	175		133		176			
C (m) (veh/h)	917		61		459			
v/c	0.19		2.18		0.38			
95% queue length	0.70		12.87		1.78			
Control Delay (s/veh)	9.8		688.0		17.6			
LOS	A		F		C			
Approach Delay (s/veh)	--	--	306.2					
Approach LOS	--	--	F					

Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 6/5/2012 11:31 AM

file:///C:/Users/skondagari/AppData/Local/Temp/u2k86EA.tmp 6/5/2012

Two-Way Stop Control Page 1 of 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SK	Intersection	BW Parkway NB/Powder Mill Rd
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed		Analysis Year	Total Future with improvements
Analysis Time Period	PM Peak		

Project Description: 2012 RTC Master Plan

East/West Street: Powder Mill Road | North/South Street: BW Parkway Northbound Ramp

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	558	893			389	1092
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	587	940	0	0	409	1149
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			1
Lanes	1	1	0	0	1	1
Configuration	L	T			T	R
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	73	5	42			
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	76	5	44	0	0	0
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	1	1	0	0	0	0
Configuration	L		TR			

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L		L		TR			
v (veh/h)	587		76		49			
C (m) (veh/h)	1150		6		99			
v/c	0.51		12.67		0.49			
95% queue length	3.00		11.28		2.18			
Control Delay (s/veh)	11.3		6441		72.7			
LOS	B		F		F			
Approach Delay (s/veh)	--	--	3945					
Approach LOS	--	--	F					

Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 6/5/2012 11:32 AM

file:///C:/Users/skondagari/AppData/Local/Temp/u2k1CC2.tmp 6/5/2012

2012 RTC Master Plan
Critical Lane Volue
Level of Service Calculations

Intersection: 3: Powder Mill Road/Soil Conservation Road
Jurisdiction: Prince George's County
Scenario/Design Year: Total Future
Computed by: BJB

WELLS + ASSOCIATES
TRANSPORTATION, TRAFFIC, AND PARKING CONSULTANTS
170 Jennifer Road, Annapolis, Maryland 20401
Phone: (410)266-5723 Facsimile: (410)266-8169

AM Peak

Intersection Control: Signal: X Split: ____ Stop: ____ Ways: ____

RTOR/Overlap (AM): NB 0 SB 0 EB 0 WB 0
RTOR/Overlap (PM): NB 0 SB 0 EB 0 WB 0

Shared Left PCE (AM): NB 1 SB 1 EB 1 WB 1
Shared Left PCE (PM): NB 1 SB 1 EB 1 WB 1

Phase	Movement	Volume	Lane Use Factor	Lane Volume	Opposing Lefts	Lane Use Factor	Opposing Volume	Critical Lane Volume	*
EB	T	350	1.00	350	302	1.00	302	652	*
WB	T	629	1.00	629	0	1.00	0	629	
NB	L	413	1.00	413	0	1.00	0	413	*
SB	0	0	1.00	0	0	1.00	0	0	
Note:							SUM	1065	
								B	

PM Peak

Phase	Movement	Volume	Lane Use Factor	Lane Volume	Opposing Lefts	Lane Use Factor	Opposing Volume	Critical Lane Volume	*
EB	T	532	1.00	532	47	1.00	47	579	*
WB	T	398	1.00	398	0	1.00	0	398	
NB	L	1145	1.00	1145	0	1.00	0	1145	*
SB	0	0	1.00	0	0	1.00	0	0	
Note:							SUM	1724	
								F	

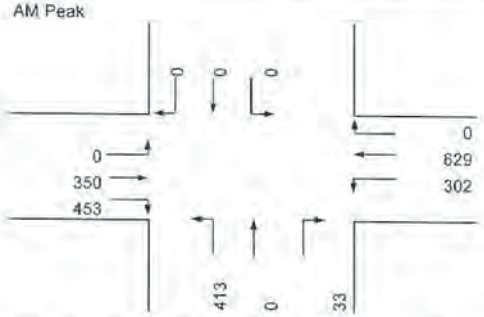
Opposing Volume	PCE	Number of Lanes	Lane Use Factor	Critical Lane Volume
<199	1.10	1	1.00	A ≤ 1,000
200-599	2.00	2	0.55	B ≤ 1,150
600-799	3.00	3	0.37	C ≤ 1,300
800-999	4.00	4	0.29	D ≤ 1,450
>999	5.00	5	0.25	E ≤ 1,600
				F > 1,600

2012 RTC Master Plan
Critical Lane Volue
Level of Service Calculations

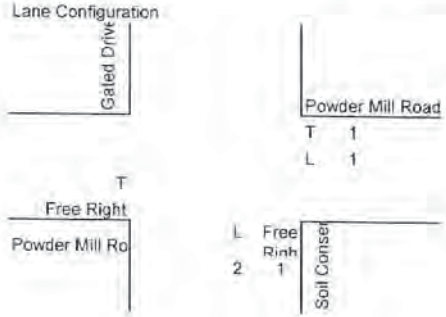
Intersection: 3: Powder Mill Road/Soil Conservation Road
Jurisdiction: Prince George's County
Scenario/Design Year: Total Future Improved
Computed by: BJB

WELLS + ASSOCIATES
TRANSPORTATION, TRAFFIC, AND PARKING CONSULTANTS
170 Jennifer Road, Annapolis, Maryland 20401
Phone: (410)266-5723 Facsimile: (410)266-5185

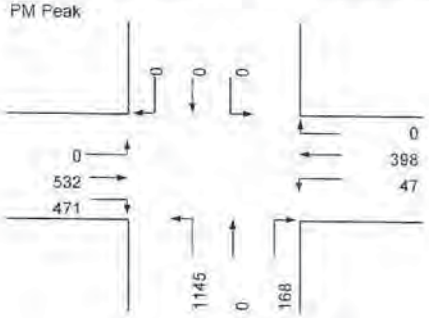
AM Peak



Lane Configuration



PM Peak



Intersection Control: Signal: X Split: Stop: Ways:

RTOR/Overlap (AM):	NB	0	SB	0	EB	0	WB 0
RTOR/Overlap (PM):	NB	0	SB	0	EB	0	WB 0
Shared Left PCE (AM):	NB	1	SB	1	EB	1	WB 1
Shared Left PCE (PM):	NB	1	SB	1	EB	1	WB 1

Opposing Volume	PCE	Number of Lanes	Lane Use Factor	Critical Lane Volume		
<199	1.10	1	1.00	A	≤	1,000
200-599	2.00	2	0.55	B	≤	1,150
600-799	3.00	3	0.37	C	≤	1,300
800-999	4.00	4	0.29	D	≤	1,450
>999	5.00	5	0.25	E	≤	1,600
				F	>	1,600

Phase	Movement	Volume	Lane Use Factor	Lane Volume	Opposing Lefts	Lane Use Factor	Opposing Volume	Critical Lane Volume	*
EB	T	350	1.00	350	302	1.00	302	652	*
WB	T	629	1.00	629	0	1.00	0	629	
NB	L	413	0.55	227	0	1.00	0	227	*
SB	0	0	1.00	0	0	1.00	0	0	

Note:

SUM 879
A

Phase	Movement	Volume	Lane Use Factor	Lane Volume	Opposing Lefts	Lane Use Factor	Opposing Volume	Critical Lane Volume	*
EB	T	532	1.00	532	47	1.00	47	579	*
WB	T	398	1.00	398	0	1.00	0	398	
NB	L	1145	0.55	630	0	1.00	0	630	*
SB	0	0	1.00	0	0	1.00	0	0	

Note:

SUM 1209
C

Two-Way Stop Control Page 1 of 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*SK*	Intersection	*Powder Mill Rd/Site Access*
Agency/Co.	*Wells + Associates*	Jurisdiction	*Prince George's County*
Date Performed	*5/11/2009*	Analysis Year	*Total Future*
Analysis Time Period	*AM Peak*		

Project Description *JJRTC*

East/West Street: *Powder Mill Road*	North/South Street: *Site Access/Spring Field Road*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	245	70	30	51	769	102
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	257	73	31	53	809	107
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration	LTR			L		TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	120	9	10	2	0	30
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	126	9	10	2	0	31
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	1
Configuration		LTR		LT		R

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LTR	L		LTR		LT		R
v (veh/h)	257	53		145		2		31
C (m) (veh/h)	745	1488		59		54		355
v/c	0.34	0.04		2.46		0.04		0.09
95% queue length	1.54	0.11		14.50		0.11		0.29
Control Delay (s/veh)	12.4	7.5		812.4		74.2		16.1
LOS	B	A		F		F		C
Approach Delay (s/veh)	--	--	812.4			19.6		
Approach LOS	--	--	F			C		

Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 6/5/2012 7:00 PM

file:///C:/Users/skondagari/AppData/Local/Temp/u2k50F4.tmp 6/5/2012

Two-Way Stop Control Page 1 of 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SK	Intersection	Powder Mill Rd/Site Access
Agency/Co.	Wells + Associates	Jurisdiction	Prince George's County
Date Performed	5/11/2009	Analysis Year	Total Future
Analysis Time Period	PM Peak		

Project Description JJRTC

East/West Street: Powder Mill Road | North/South Street: Site Access/Spring Field Road

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	7	509	111	18	160	3
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	7	535	116	18	168	3
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration	LTR			L		TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	67	0	52	43	7	229
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	70	0	54	45	7	241
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	1
Configuration		LTR		LT		R

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LTR	L		LTR		LT		R
v (veh/h)	7	18		124		52		241
C (m) (veh/h)	1406	935		239		253		874
v/c	0.00	0.02		0.52		0.21		0.28
95% queue length	0.02	0.06		2.72		0.75		1.13
Control Delay (s/veh)	7.6	8.9		35.2		22.9		10.7
LOS	A	A		E		C		B
Approach Delay (s/veh)	--	--	35.2			12.8		
Approach LOS	--	--	E			B		

Copyright © 2008 University of Florida, All Rights Reserved HCS+™ Version 5.4 Generated: 6/5/2012 7:01 PM

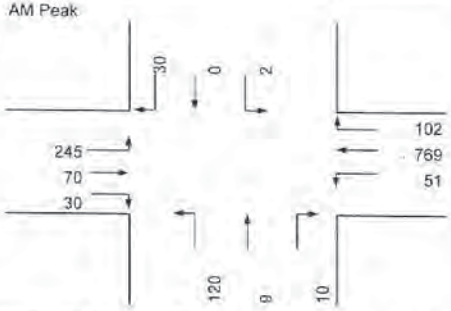
file:///C:/Users/skondagari/AppData/Local/Temp/u2k33B4.tmp 6/5/2012

JJRTC
Critical Lane Volue
Level of Service Calculations

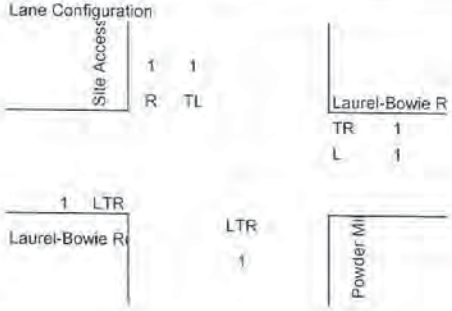
Intersection: 5. Powder Mill Road/Spring Field Road/Site access
Jurisdiction: Prince George's County
Scenario/Design Year: Total Future Improved (Recommended)
Computed by: BJB

WELLS + ASSOCIATES
TRANSPORTATION, TRAFFIC, AND PARKING CONSULTANTS
170 Jennifer Road, Annapolis, Maryland 20401
Phone: (410)266-5723 Facsimile: (410)266-9189

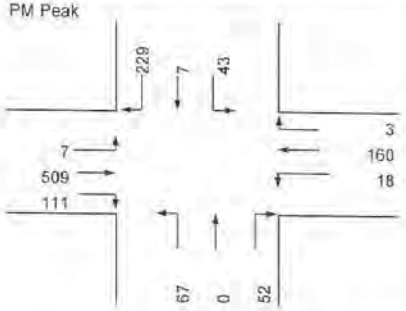
AM Peak



Lane Configuration



PM Peak



Intersection Control: Signal: X Split: Stop: Ways:

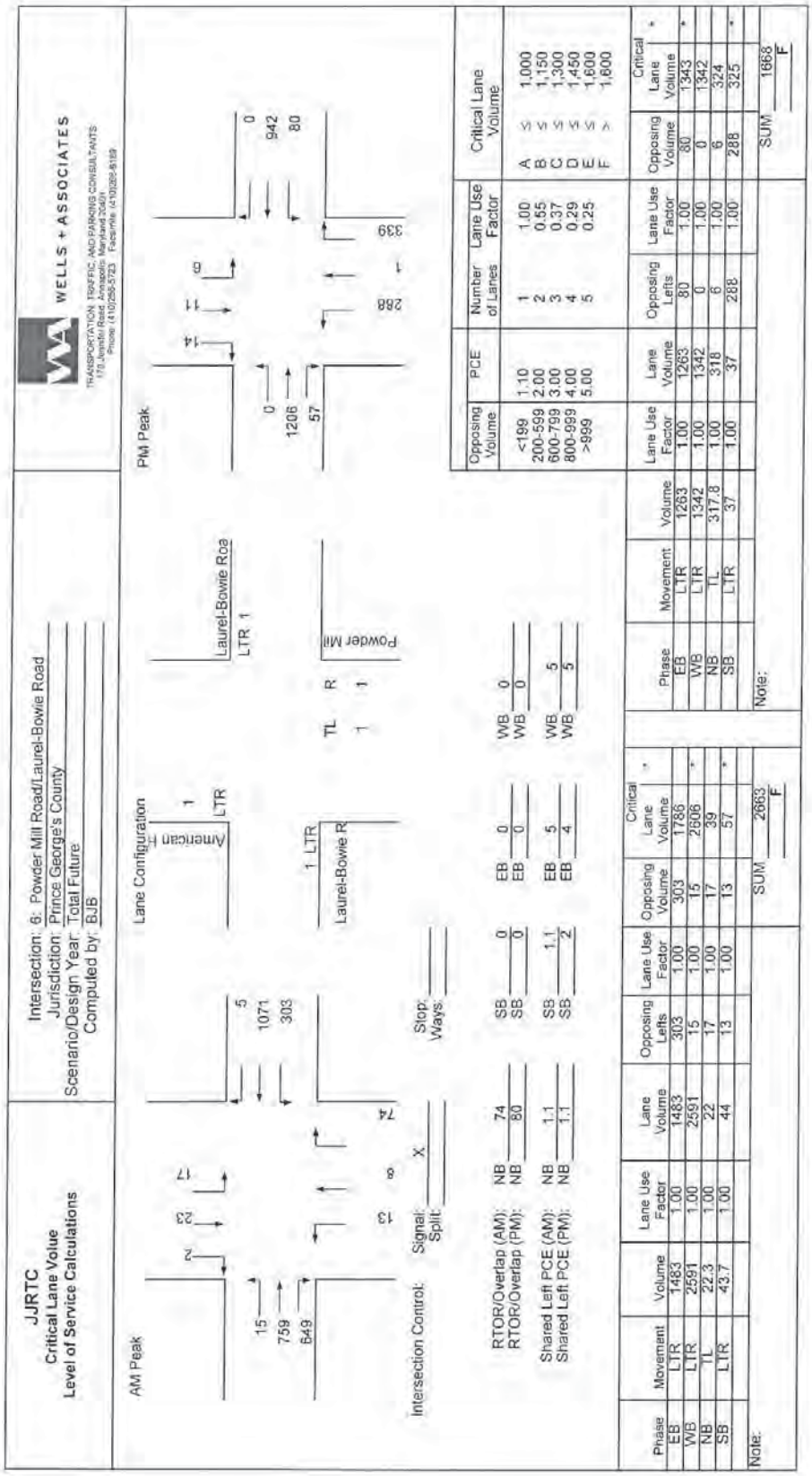
RTOR/Overlap (AM):	NB	0	SB	30	EB	0	WB 0
RTOR/Overlap (PM):	NB	0	SB	7	EB	0	WB 0
Shared Left PCE (AM):	NB	1.1	SB	1.1	EB	4	WB 1
Shared Left PCE (PM):	NB	2	SB	1.1	EB	1.1	WB 1

Opposing Volume	PCE	Number of Lanes	Lane Use Factor	Critical Lane Volume		
<199	1.10	1	1.00	A	≤	1,000
200-599	2.00	2	0.55	B	≤	1,150
600-799	3.00	3	0.37	C	≤	1,300
800-999	4.00	4	0.29	D	≤	1,450
>999	5.00	5	0.25	E	≤	1,600
				F	>	1,600

Phase	Movement	Volume	Lane Use Factor	Lane Volume	Opposing Lefts	Lane Use Factor	Opposing Volume	Critical Lane Volume	*
EB	LTR	1080	1.00	1080	51	1.00	51	1131	*
WB	TR	871	1.00	871	245	1.00	245	1116	
NB	LTR	151	1.00	151	2	1.00	2	153	*
SB	TL	33	1.00	33	120	1.00	120	153	
Note:							SUM	1284	
								C	

Phase	Movement	Volume	Lane Use Factor	Lane Volume	Opposing Lefts	Lane Use Factor	Opposing Volume	Critical Lane Volume	*
EB	LTR	628	1.00	628	18	1.00	18	646	*
WB	TR	163	1.00	163	7	1.00	7	170	
NB	LTR	186	1.00	186	43	1.00	43	229	
SB	R	222	1.00	222	67	1.00	67	289	*
Note:							SUM	935	
								A	

Date Printed: 6/5/2012


WELLS + ASSOCIATES
TRANSPORTATION, TRAFFIC, AND PARKING CONSULTANTS
1110 Jennifer Road, Annapolis, Maryland 21401
Phone (410)266-5723 Facsimile (410)266-8169
JJRTC
Critical Lane Volue
Level of Service Calculations
Intersection: 6: Powder Mill Road/Laurel-Bowie Road
Jurisdiction: Prince George's County
Scenario/Design Year: Total Future
Computed by: BJB
AM Peak
PM Peak
Lane Configuration
American
Laurel-Bowie Roa
Powder Mil
Laurel-Bowie R
Intersection Control:
Signal:
Split:
Stop:
Ways:
RTOR/Overlap (AM): NB 74 SB 0 EB 0 WB 0
RTOR/Overlap (PM): NB 80 SB 0 EB 0 WB 0
Shared Left PCE (AM): NB 1.1 SB 1.1 EB 5 WB 5
Shared Left PCE (PM): NB 1.1 SB 2 EB 4 WB 5
Critical Lane Volume
Note:
SUM 2663 F
SUM 1668 F
Date Printed: 3/30/2012

This page intentionally left blank.

6.5 Environmental Assessment (Under Separate Cover)

This page intentionally left blank.

6.6 Stormwater Management Plan

COMPLETE JAMES J. ROWLEY TRAINING CENTER MASTER PLAN AND ENVIRONMENTAL ASSESSMENT

GS-11P-12-MKC-0012

Stormwater Management Plan
Final Submission, 22 May 2012

Prepared by:

VIKA
20251 Century Boulard
Suite 400
Germantown, MD 20874

301.916.4100
301.916.2262 fax

www.vika.com

WBA, an HGA Company
44 Canal Center Plaza
Suite 100
Alexandria, VA 22314

703.836.7766
703.836.3042 fax

www.hga.com

Prepared For:

United States Secret Services
James J. Rowley Training Center
9200 Powder Mill Road
Laurel, Maryland 20708

Stormwater Management Plan

1. Purpose

The purpose of this document is to provide the Stormwater Management Plan (SMP) portion of the James J Rowley Training Center Master Plan, 2012 Update (2012 RTC Master Plan). This SMP provides a campus-wide strategy to control and treat stormwater runoff from the post developed site (as envisioned in the 2012 RTC Master Plan), such that the requirements of the local governing authority and the requirements of Section 438 of the Energy Independence and Security Act of 2007 (EISA) are satisfied. Furthermore, this SMP will identify existing areas on the campus that appear to have been adversely impacted by stormwater runoff and provide general recommendations to remediate these existing issues.

2. Existing Site

The subject site is approximately 493 acres. The site serves as a training center for the United States Secret Service (USSS), and is therefore currently developed with specific areas and structures targeted at effectively training USSS staff. The 2012 RTC Master Plan proposes to modify the ultimate build-out development plan on-site to meet current and anticipated future needs for USSS purposes.

The site is currently developed with a campus-like layout, in which common development on the site is grouped together, but there is often significant separation between development clusters. Because of this, there are significant portions of the site that remain wooded today, and are intended to be kept in a wooded condition following the buildout of the 2012 RTC Master Plan (*See Exhibits 4 and 6*).

Furthermore, two (2) ponds exist on the subject property today – however it is unclear based on coordination with USSS staff as to whether or not these facilities were designed to provide any kind of stormwater management. Furthermore, the requirements of EISA and the local governing authority (discussed in detail below) allow the use of structural ponds for stormwater management as last resort alternatives only. Because of these reasons, the aforementioned ponds will not be considered in the SMP.

Significant portions of the site are also designated as wetlands. *Exhibit 3, Wetland Delineation*, depicts the wetlands on the site, which were mapped by others.

There are areas on the site which currently have poor drainage characteristics and exhibit signs of standing water. Certain areas of the site are also steeply sloped. There are certain areas where existing roadside ditches are in poor condition. All of these areas are indicated on *Exhibit 1, Existing Features*, attached to this SMP.

The 2012 RTC Master Plan proposes development near the area of poor drainage and standing water – it is recommended that upon development in this area, grading to alleviate the poor

drainage and standing water occur. Several of the roadside ditches in poor condition are proposed to be converted into bio-swales per the SMP. The conversion to bio-swales will alleviate much of the damage that is currently exhibited in these ditches. For roadside ditches that do not propose conversion to bio-swales, the installation of turf reinforcing mats would alleviate much of the damage to these areas.

Calculations included later in this report show that the subject property is less than 40% impervious in its existing condition (please see *Exhibit 2, Existing Impervious Area*). This fact, coupled with the proposed development in the 2012 RTC Master Plan which increases the post-developed impervious area, prevent the subject site from qualifying as redevelopment per the local governing authority's regulations. As such, the work proposed in the 2012 RTC Master Plan will be considered new development in the SMP.

3. Requirements of Local Governing Authority and EISA

The subject campus is located in Beltsville, Maryland at the intersection of the Baltimore Washington Parkway and Powder Mill Road. The campus is located on Federal property. Being located in the state of Maryland on Federal property, the local governing authority for the campus in terms of stormwater management is the Maryland Department of the Environment (MDE). The Maryland Stormwater Management Guidelines for State and Federal Projects, published April 15, 2010, provides clarification as to the review and approval process for State and Federal projects within Maryland, and indicates that MDE is the governing authority for such projects.

The design guidelines for addressing MDE criteria and requirements are found in the 2000 Maryland Stormwater Design Manual Volumes I and II (Manual). Changes to the Manual have occurred from its initial publication to the current version of the manual. The most recent changes have their beginnings in April of 2007 with the signing of the "Stormwater Management Act of 2007" (the "Act") by the governor of Maryland. The Act is centered on the implementation of Environmental Site Design (ESD). ESD is defined in the Manual as "a comprehensive design strategy for maintaining predevelopment runoff characteristics and protecting natural resources…"

Prior to the Act, ESD had been encouraged through a series of credits spelled out in the Manual for various design techniques. Following the implementation of the Act however, ESD is required to be implemented to the maximum extent practicable. This results in more stringent design criteria that promotes low impact development and only allows previously common structural SWM facilities (such as ponds and underground vaults / filters) as a last alternative. Instead of using these structural facilities (which often collect and treat stormwater runoff at central locations), designers are now required to use techniques which more effectively treat stormwater runoff at its source.

Following the signing of the Act, MDE was tasked with implementing the goals set out within the Act. To this end, MDE began the process of revising the Manual, as well as producing additional supplemental publications to complete its charge.

- In April of 2009, MDE adopted changes to the Manual which were designed to implement the directives of the Act – these changes constitute the "as amended" portion of the Manual
- In April of 2010, MDE updated the "Maryland Guidelines for State and Federal Projects" (the "State/Federal Guidelines")
- In July of 2010, MDE published a document titled "Environmental Site Design (ESD) Process and Computations" (the "ESD Guidelines")
- In October of 2010, MDE published guidance on technical procedures and calculations for redevelopment (the "Redevelopment Guidelines")

The result of the above referenced actions by MDE is that the Act has been implemented, and all new projects that are proposed after May of 2010 are required to utilize ESD to the maximum extent practicable.

As noted above, the RTC campus is a Federal facility, and as such is subject to the requirements set forth in EISA. These requirements are that "the sponsor of any development or redevelopment project involving a Federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, and duration of flow."

Further details about the requirements of EISA, and guidelines for design and implementation of development in order to comply with EISA can be found in the Environmental Protection Agency (EPA) publication titled "Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects Under Section 438 of the Energy Independence and Security Act" (EISA Design Guidance).

The goals of ESD required by MDE and the regulations set forth in EISA are similar. Each requires that development of a site occur such that the post-developed runoff characteristics of the site will mimic the pre-development runoff characteristics of the same site. This similarity leads to significant overlap between MDE-compliant design and EISA-compliant design for a development plan. However, there are differences in the methodologies used by each regulation to achieve the stated goals. Given that the subject campus is to be permitted through MDE, and is subject to EISA, an analysis of the requirements of each is necessary, with the more stringent requirement dictating design.

4. MDE and EISA Requirements Comparison

MDE requirements can be broken into two (2) categories – quality and quantity. Quality controls are regulated by MDE through the items in the Manual identified as Water Quality Volume (WQv) and Recharge Volume (Rev). Quantity control is regulated by MDE through the item defined in the Manual as Channel Protection Volume (Cpv).

WQv is defined as "the storage needed to capture and treat the runoff from 90% of the average annual rainfall." Rev is a "criteria for maintaining recharge" and is "based on the average annual recharge rate of the hydrologic soil group(s) (HSG) present at a site as determined from USDA, NRCS Soil Surveys or from detailed site investigations." Rev is part of the WQv, and therefore unless treated separately (thereby reducing the WQv) no additional volume is required to address Rev requirements. ESD requirements must at a minimum treat the runoff from 1 inch of rainfall, which per the State/Federal Guidelines addresses WQv and Rev requirements.

Cpv is accomplished through 24 hour extended detention of the 1-year, 24 hour storm event. Per the State/Federal Guidelines, if ESD is implemented for not just the minimum of runoff from 1 inch of rainfall, but rather for the runoff from the entire target rainfall (described below), then Cpv is also satisfied in the ESD practices.

Each of these MDE requirements then can be translated into a volume of runoff that must be treated or detained. When computing the ESD volume (described below) for the entire target rainfall all three of the above criteria are accounted for. Thus the MDE requirements can be summarized simplistically, from a planning standpoint, into a single volume.

EISA offers two (2) options to meet the requirements of the relevant legislation. The first option is to "design, construct, and maintain stormwater management practices that manage rainfall onsite, and prevent the off-site discharge of the precipitation from all rainfall events less than or equal to the 95th percentile rainfall event to the maximum extent technically feasible." The second option is to "design, construct, and maintain stormwater management practices that preserve pre-development runoff conditions following construction."

The requirements of EISA are not broken down into separate quality and quantity requirements as MDE requirements are. However, since EISA is more in line with the ESD elements of MDE requirements, and ESD has combined MDE quality and quantity requirements, the lack of a differentiation in EISA is not unexpected.

Of the two (2) EISA options, each has a volumetric component. Option 2 however also includes a rate, duration, and temperature requirement – while Option 1 is strictly volumetric.

In order to provide a the most direct comparison of MDE versus EISA requirements, Option 1 for EISA compliance and ESD for the runoff from the entire target rainfall for MDE compliance has been considered in this SMP.

5. MDE and EISA Computations

It should be noted that significant portions of this site will remain forested per the 2012 RTC Master Plan. Because the runoff characteristics of these areas of the site will remain unchanged in the post-developed condition relative to their pre-development condition, these forested areas are excluded from the computations performed to establish stormwater volumes for both MDE and EISA compliance.

MDE

For MDE compliance computations, the first step is to assess the existing site conditions. This includes establishing the total drainage area, and the hydrologic soil groups for all of the soil types identified on the site. In the case of the subject campus, this also includes establishing the area of existing forest that is to remain undisturbed on the site. Next, the post-developed condition is analyzed to establish a percent impervious cover on the site in the post-developed condition. For the subject property this results in the following:

Existing Conditions

Approximate Total Drainage Area:	20,969,993 sf
Approximate Forest Area to Remain:	10,455,431 sf
Soil Types Excluding Forest to Remain:	29.5% HSG ‘A’ (3,084,616 sf)
	0.6% HSG ‘B’ (59,833 sf)
	62.5% HSG ‘C’ (6,532,190 sf)
	Includes 50% split of Elkton Silt Loam (Eka)
	4.1% HSG ‘D’ (428,360 sf)
	Includes 50% split of Elkton Silt Loam (Eka)
	3.3% Water (350,381 sf)
Area Subject to ESD Practices:	20,969,993 – 10,455,431 = 10,514,562 sf
Approximate Road/Sidewalk Area:	2,067,637 sf
Approximate Building Area:	235,839 sf
Approximate Total Impervious Area:	2,303,476 sf
Approximate Percent Impervious:	22% (use 25%) – for area subject to ESD
	11% (use 15%) – for site

Note that the soils types were taken from NRCS Web Soils Survey, National Cooperative Soil Survey of subject area in Prince George’s County, Maryland. A composite of this data from this web based application and a base prepared by VIKA is attached to this SMP as *Figure 5, Soils*.

Using a runoff curve number (RCN) of 38, 55, 70, 77, and 98 for HSG ‘A’, ‘B’, ‘C’, ‘D’, and water respectively for woods in good condition, a weighted RCN is determined by:

RCNsoil = [(.295 x 38) + (.006 x 55) + (.625 x 70) + (.041 x 77) + (.033 x 98)] = 61.68 (Use 62)

Proposed Conditions

Approximate Road/Sidewalk Area:	2,820,438 sf
Approximate Building Area:	1,176,270 sf
Approximate Total Impervious Area:	3,996,708
Approximate Percent Impervious:	38% (use 40%) – for area subject to ESD
	19% (use 20%) – for site

Using the weighted RCN for area which will not remain wooded calculated above and a value of 98 for areas which are impervious (sidewalk, rooftop, and roadway), the weighted RCN for the post-developed site can be computed as:

RCN = [(3,996,708 x 98) + (6,517,854 x 62)] / 10,514,562 = 75.68 (Use 76)

Having the percent impervious, the dimensionless volumetric runoff coefficient (Rv) can be computed as:

Rv = 0.05 + 0.009 x Percent Impervious = 0.05 + 0.009 x 40 = 0.41

Using Table 5.3 of the ESD Guidelines, the rainfall depth target used to determine ESD goals and the size of practices (Pe) can be determined for each HSG with 20% imperviousness. These values are 1.2 inches, 1.2 inches, 1.0 inches and 1.0 inches for HSG types ‘A’, ‘B’, ‘C’, and ‘D’ respectively. Becase water is not included in any of these HSG’s, the area of water has been evenly distributed to the four (4) HSG’s. Taking these values and the areas of each soil type a weighted average to determine the Pe for the site is computed as follows:

Pe = [(1.2 x .303) + (1.2 x .014) + (1.0 x .633) + (1.0 x .049)] = 1.06 inches

Having the Pe, area subject to ESD, and Rv values, the volume of runoff to be infiltrated, reused, evaporated, or otherwise treated in a manner compliant with ESD for the site (ESDv) can be computed as:

ESDv = Pe x Rv x A / 12 = 1.06 x 0.41 x 10,514,562 / 12 = 380,802. 39 cf

This represents the target that will be used in laying out stormwater controls in the SMP in order to meet MDE design criteria.

EISA

For EISA compliance computations, the first step is to determine the rainfall depth for the 95th percentile storm. The EISA Design Guidance requires a minimum of 10 years of daily rainfall data to determine the rainfall depth for the 95th percentile storm. *Exhibit 10* in this SMP includes rainfall data collected for a 15-year period from the National Climatic Data Center website from the Beltsville station.

In analyzing the rainfall data that was collected, the 95th percentile rainfall depth for this area was determined to be:

1.53 inches

Given the 95% percentile rainfall depth described above, the RCN for the post-developed condition computed above, and the time of concentration computed based on TR-55 methodology, the runoff depth was computed using the graphical peak discharge method in TR-55. *Exhibit 8* of this SMP includes the relevant TR-55 data. The runoff depth was calculated to be:

0.20 inches

Taking the runoff depth and the Area Subject to ESD Practices (which as noted above is the same area subject to EISA requirements), the volume required to be infiltrated, reused, evaporated, or otherwise controlled in a method compliant with EISA requirements (EISAv) for this site can be computed as:

EISAv = 0.20 / 12 x 10,514,562 = 175,242.70 cf

This represents the target that will be used in laying out stormwater controls in the SMP in order to meet EISA design criteria.

Based on these computations, the requirements of MDE require a greater volume to be infiltrated, reused, evaporated, or otherwise treated in an ESD/EISA complaint manner than the requirements of EISA. Therefore, by complying with the requirements of MDE, the requirements of EISA will necessarily be met.

6. Typical ESD and EISA Design Facilities or Methods

MDE

The Manual breaks down the types of facilities and methods for achieving ESD into three (3) basic categories. These categories are:

- Alternative Surfaces
- Nonstructural Practices
- Micro-Scale Practices

Each of these categories has several alternatives within them for achieving ESD. Each alternative has a unique set of design criteria and considerations – which are extensively detailed in Chapter 5 of the Manual (*excerpts are included in Exhibit 11*). Use of an alternative for any of the categories above will not be universally applicable. Instead, in keeping with the concept of ESD, the alternative chosen shall take into account the specific site location and constraints of said location. In so doing, the alternative that will result in the least disruption to, or alternately most closely mimic, the predevelopment runoff characteristics can be chosen. Discussion in this SMP will be limited to ESD practices considered for use on the campus, although the list will be comprehensive relative to what is listed in the Manual.

Alternative Surfaces

The alternative surfaces identified in the Manual are aimed at reducing the amount of impervious areas on a site. Three (3) methods are listed as options in the Manual.

- Green Roof
- **Permeable Pavements – Considered for use on the campus**
- Reinforced Turf

Permeable Pavements

The use of permeable pavements, which generally consist of a permeable surface course over top of an open graded stone base/sub-base, rely on infiltration of stormwater runoff from the pavement base/sub-base into the underlying in-situ soils. Therefore, the use of these types of pavements is best suited for areas with soils that will allow for the above referenced infiltration, and where the water table is not high. For the purposes of this SMP, the use of permeable pavement has been limited to areas of new construction. The areas proposed include parking bays of new surface parking areas and in the middle of roadways. On the roadways it is envisioned that a minimum 10 foot wide travel way will be maintained for each lane as standard asphalt. The permeable pavement would be in areas between these travel ways. As existing pavement in existing parking bays or other paved areas reaches the end of its life cycle and needs to be replaced, permeable pavement may be considered for such replacement. This would potentially reduce the need for other planned facilities in the SMP.

Nonstructural Practices

The nonstructural practices alternatives in the Manual are aimed at directing non-concentrated flow, or sheet flow, towards vegetated areas as opposed to directing stormwater runoff to conventional conveyance systems. As runoff flows over these vegetated areas, it is able to soak into and / or filter through the vegetation. The three (3) methods listed as options in the design manual are:

- **Disconnection of Rooftop Runoff – Considered for use on the campus**
- **Disconnection of Non-Rooftop Runoff – Considered for use on the campus**
- Sheet Flow to Conservation Areas

Disconnection of Rooftop Runoff

Because all of the buildings proposed with the 2012 RTC Master Plan will be new, the potential to design their roof drainage system to daylight at grade, in location suitable for disconnection exists. The most ideal place then to make use of such an alternative would be new buildings located adjacent to areas which are currently vegetated, and are to remain vegetated with the 2012 RTC Master Plan.

Disconnection of Non-Rooftop Runoff
The grading and edge treatment design of paved areas on the site would need to account for the use of this alternative. Areas of existing mild slopes, and adjacent to areas of existing vegetation to remain would be suitable disconnection locations.

Micro Scale Practices

Micro scale practices more closely resemble the traditional structural alternatives or facilities used to meet SWM requirements. These micro scale practices are generally small facilities or alternatives that capture and treat stormwater runoff from specific drainage areas. Many of these alternatives rely on the use of overland drainage systems, vegetation, and infiltration to achieve ESD. While these alternatives are intended to treat stormwater runoff at or near its contributing drainage area, they are often times interconnected to create a system with a more natural pattern of drainage. The nine (9) alternatives spelled out in the Manual under this category are:

- **Rainwater Harvesting – Considered for use on the campus**
- Submerged Gravel Wetlands
- **Landscape Infiltration – Considered for use on the campus**
- Infiltration Berms
- Dry Wells
- **Micro-Bioretention – Considered for use on the campus**
- **Rain Gardens – Considered for use on the campus**
- **Swales – Considered for use on the campus**
- **Enhanced Filters – Considered for use on the campus**

Rainwater Harvesting
Rainwater harvesting is an alternative that is useful in applications where a significant need for non-potable water exists for proposed development. Uses such as irrigation, cooling tower make-up, car washing, and grey-water substitution are common applications for harvested rainfall.

Landscape Infiltration
Landscape infiltration is best suited for areas where sufficient space is available to provide pretreatment to the facility, as well as necessary facility footprint size for proper infiltration of stormwater being treated. The underlying in-situ soils are a critical component of this alternative, as good infiltration is critical to the success of this alternative. Additionally, a high water table will render this practice unfeasible if it is present. Review of the aforementioned soils map indicates there are several areas on the Site in which the soil types are sandy loam or loamy sand – such soils are likely to provide infiltration rates that are conducive to the use of this alternative.

Micro-Bioretention
Micro-bioretention is a highly adaptable alternative that relies on an engineered soil media to treat stormwater runoff. This particular alternative is adaptable to most soil conditions, as it allows for infiltration into the underlying in-situ soils or for the filtered runoff to be entered into the stormwater conveyance system of the site. Given the numerous variations of this alternative, and its high degree of adaptability, it can generally be located in any area in which there is landscaping. From residential development, to roadways, to highly urbanized areas, to commercial and industrial uses, this alternative is almost universally applicable. Given the availability of space on the Site, it is likely that some form of Micro-Bioretention could be used at most all of the proposed development sites in the 2012 RTC Master Plan.

Rain Gardens
Rain gardens are small depressed areas that are excavated landscape features. An absorbant soil bed mulch layer, and plantings (shrubs / grasses / flowers) are typical features of a rain garden. Runoff captured and conveyed to rain gardens will temporarialy pond and slowly filter out over the course of 24 to 48 hours. The facilities can be made to blend into the surrounding landscape and are ideal for smaller drainage areas.

Swales
Swales serve not only as a means of meeting SWM requirements, but also as a form of conveyance for stormwater runoff. Swales are generally employed for linear projects such as roadway designs. As such, the most appropriate use of this alternative for development of the site under the 2012 RTC Master Plan would be alongside new roadways proposed to connect the various sub-areas of the Site. The stretches of roadway between sub-areas where no development is proposed would be ideal locations for this alternative. There are various types of swales presented in the Manual, with each having specific scenarios that are more appropriate for its use – in the case of this SMP bio-swales have been planned for.

Enhanced Filters
An enhanced filter is a modification to a standard filtering device, in which a stone reservoir is placed under the filtering alternative. This type of facility provides for a greater degree of infiltration into the underlying in-situ soil by providing a reservoir to temporarily hold the runoff until it can be infiltrated. The design constraints for such a facility are the same as for the filtering device to which the modification is being made, and thus the locations at which this alternative would be appropriate would be consistent with whichever filtering practice described above that the stone reservoir were to be added to.

EISA

As noted in the EISA Design Guidance, specific practices to achieve the stated goals were not mandated in section 438. The EISA Design Guidance references the use of Green Infrastructure / Low Impact Development Tools (GI/LID) in order to achieve the mandated goals. More specifically, the EISA Design Guidance references the following systems under a heading of GI/LID approaches include but are not limited to:

- Rain gardens, bioretention, and infiltration planters
- Porous pavements
- Vegetated swales and bioswales

- Green roofs
- Trees and tree boxes
- Pocket wetlands
- Reforestation/revegetation using native plants
- Protection and enhancement of riparian buffers and floodplains
- Rainwater harvesting for use (e.g. irrigation, HVAC make-up, non-potable indoor uses)

This list from EISA provides alternatives that are consistent with those selected above from the ESD section of the Manual. Because the EISA Design Guidance is more general with respect to specific requirements for each design alternative, and because permitting for work on the campus will be through MDE, the design criteria for sizing and taking credit for each practice will be taken from the Manual – specifically Chapter 5.

7. SMP Compliance with ESD/EISA Requirements

Based on the above sections of this report, it has been determined that stormwater management controls for the campus must infiltrate, reuse, evaporate, or otherwise treat (in an ESD/EISA complaint manner) a volume of 380,802.39 cf of runoff. In order to provide this volume in acceptable practices, a preliminary layout of stormwater controls has been provided as an attachment to this SMP (*see Exhibit 9*). Included as part of *Exhibit 9* are preliminary computations that show the volume of runoff accounted for and/or credited for in each of the controls proposed. A tabulation on this attachment demonstrates the total volume of runoff accounted for in the SMP is 381,648.64 cf, which is sufficient to satisfy the ESD/EISA requirements.

General details of each of the ESD practices considered for the campus have been provided as attachments to this SMP. Although final design of each of these stormwater controls will be required at the construction document level, the initial details and computations in this SMP are intended to serve as a planning tool which will provide guidance in completing future construction level design plans and documents. Part of this future final design may include additional soils testing to determine final suitability of the underlying soils, and design parameters for the final details of stormwater management practices.

This SMP and attachments provide information that is needed for submission to MDE for review of the Concept Plan. As further detailed design progresses for development on the campus, any comments from MDE on the Concept Plan will need to be addressed, with further detail provided in subsequent submissions to MDE in the Site Development Plan phase and Final Plan Design Phase.

8. General Conclusions

The information presented in this SMP indicates that the development on the subject site, with respect to stormwater management, will be governed by MDE. A development compliant with MDE regulations, as described in this SMP, will provide stormwater controls beyond those required by EISA as established in this SMP. The stormwater controls proposed in this SMP indicate at a preliminary design stage, that sufficient controls can be provided to comply fully with the requirements of ESD as spelled out by MDE.

The number of stormwater controls and footprint of said controls necessary to comply with MDE requirements are significant. The design of all development from a planning level through construction level documents will have to consider stormwater management from the very initial stages. This includes not only site design, but building design as well – as several of the proposed stormwater controls will require building design to be cognizant of the methods in which stormwater controls are being provided.

This SMP is intended to serve as a guide for stormwater controls as development of the site progresses. As further phasing and construction plans become available, the computations in the SMP may be refined and detailed in order to more fully vet stormwater controls for the subject site.

Exhibits

Exhibit 1	Existing Features	Page 13
Exhibit 2	Existing Impervious Areas	Page 14
Exhibit 3	Wetlands Delineation	Page 15
Exhibit 4	Forest Stand Delineation	Page 16
Exhibit 5	Soils	Page 17
Exhibit 6	Tree Cover to Remain	Page 18
Exhibit 7	Proposed Impervious Areas	Page 19
Exhibit 8	TR-55 Flow Path and Calculations	Page 20
Exhibit 9	SWM Master Plan	Page 23
Exhibit 10	Rainfall Data	Page 30
Exhibit 11	MDE Chapter 5	Page 56

EXHIBIT 1 Existing Features

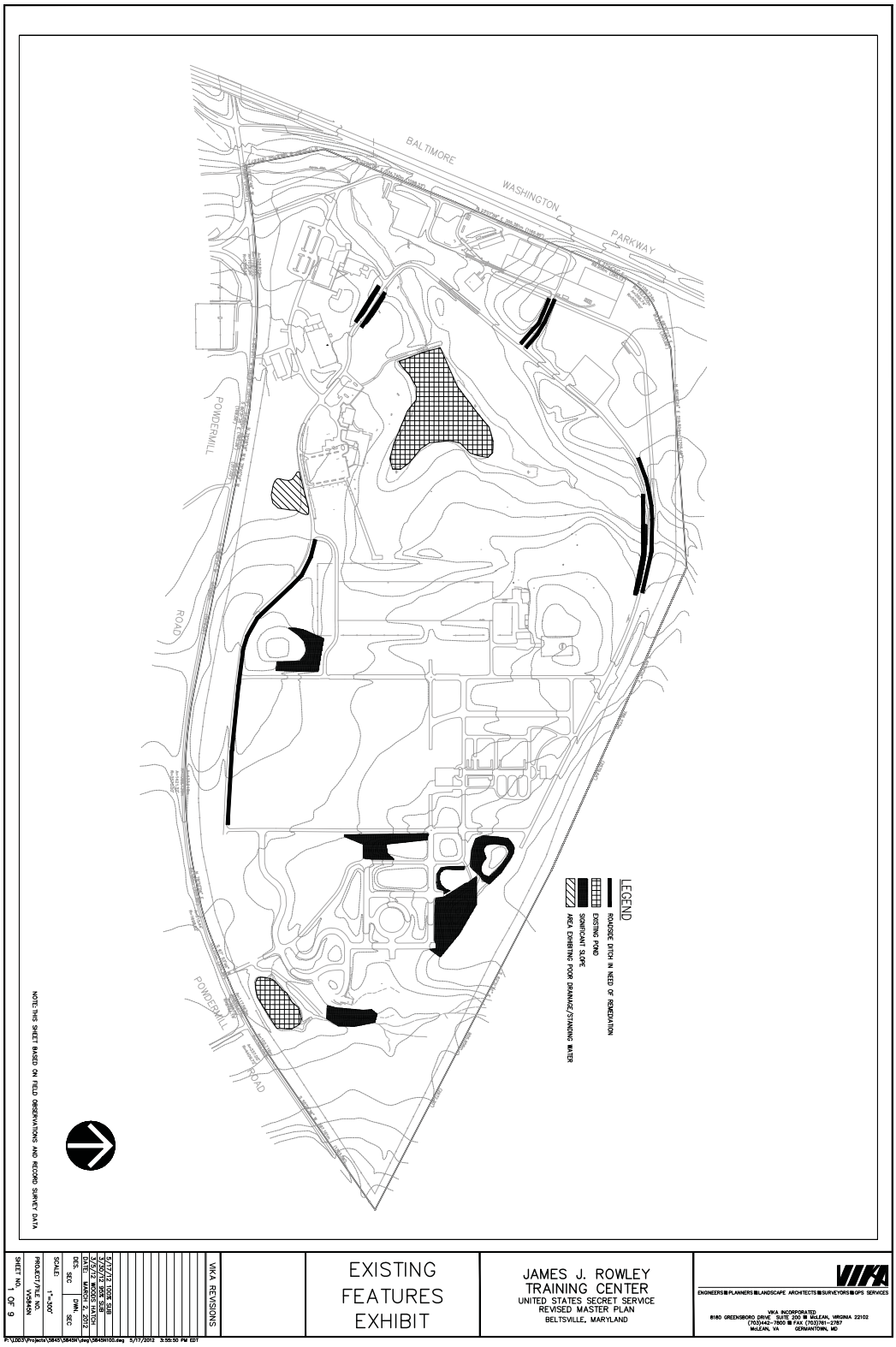
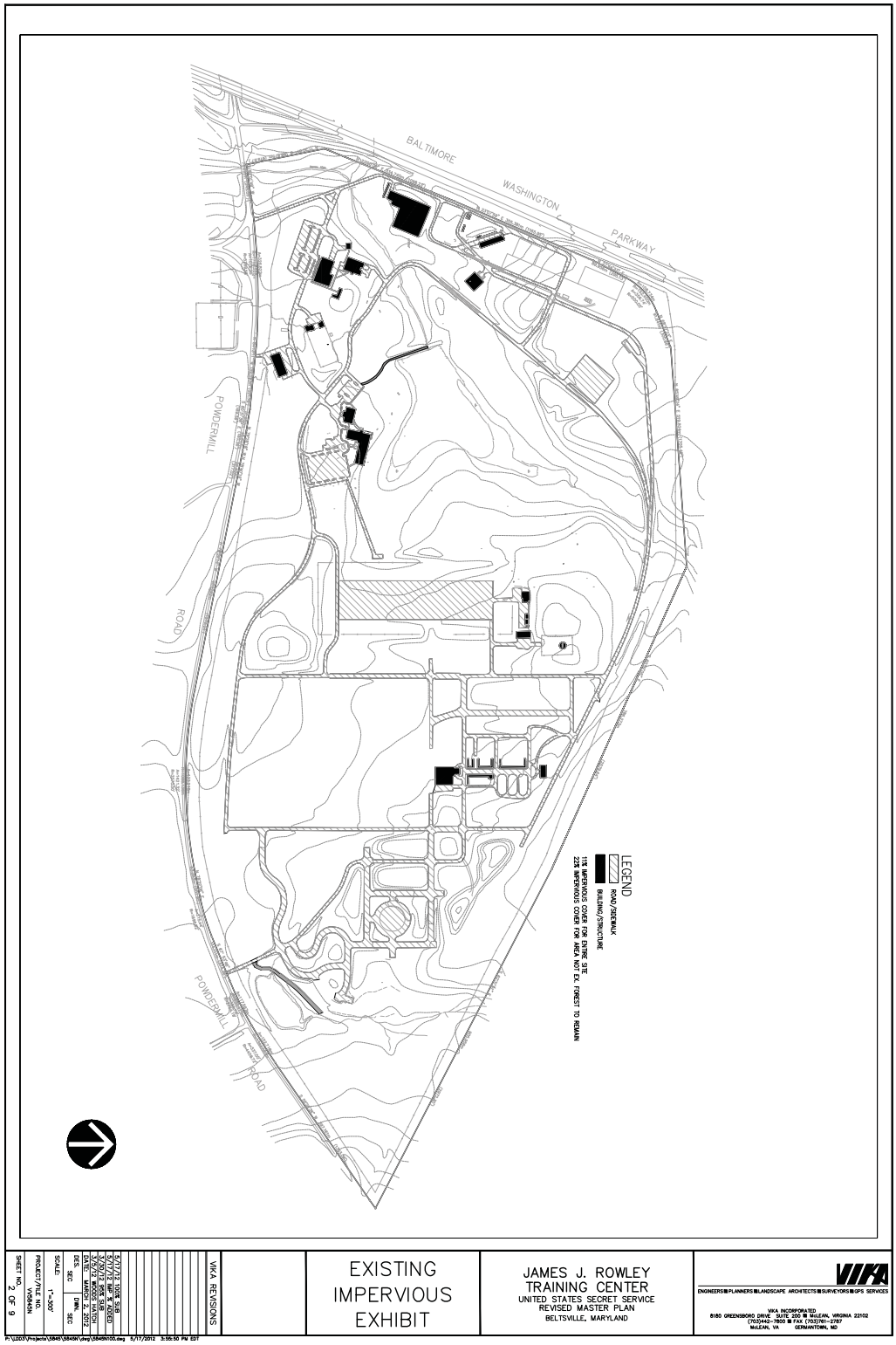


EXHIBIT 2 **Existing Impervious Areas**



14

EXHIBIT 3 Wetlands Delineation

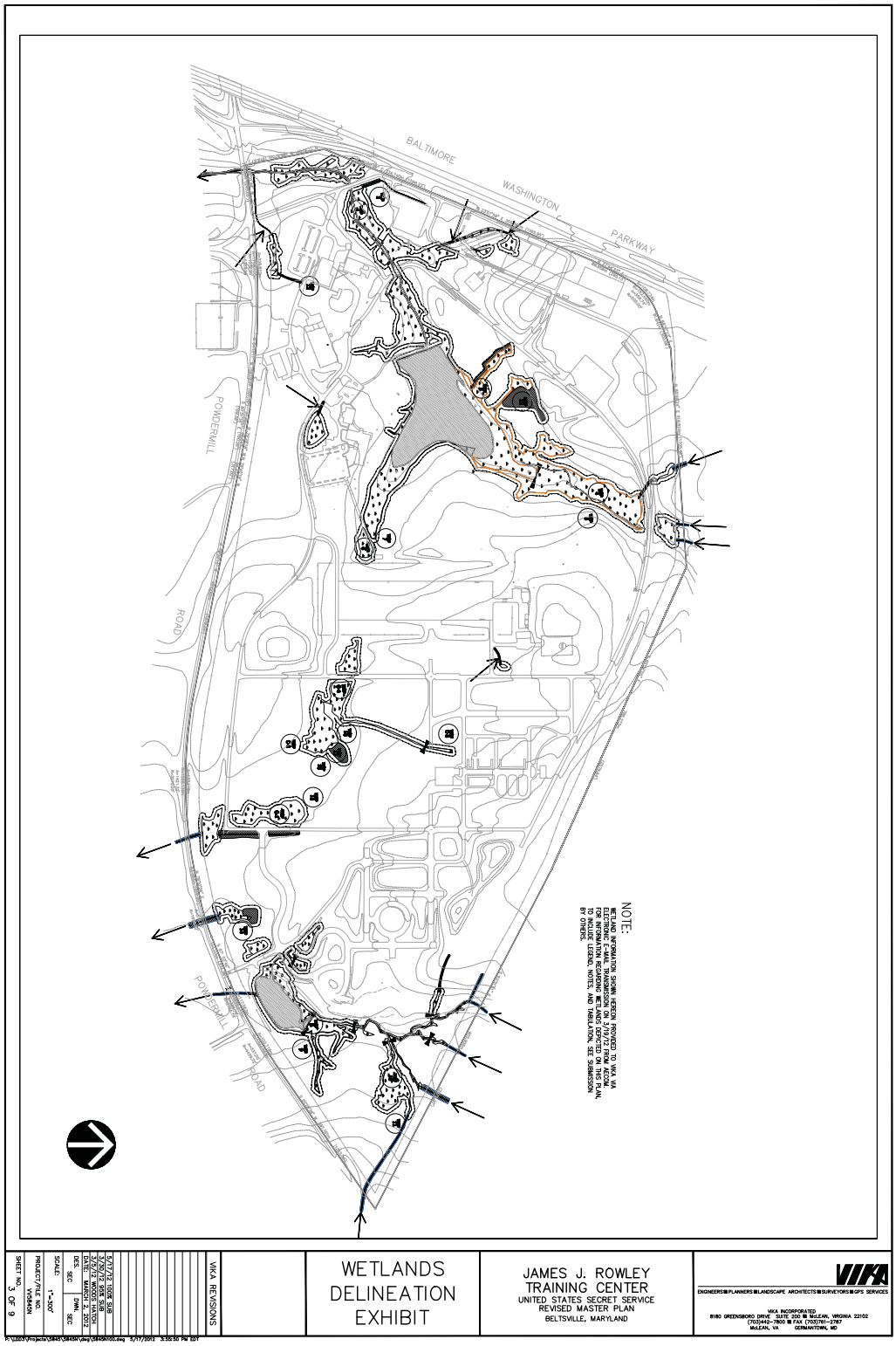
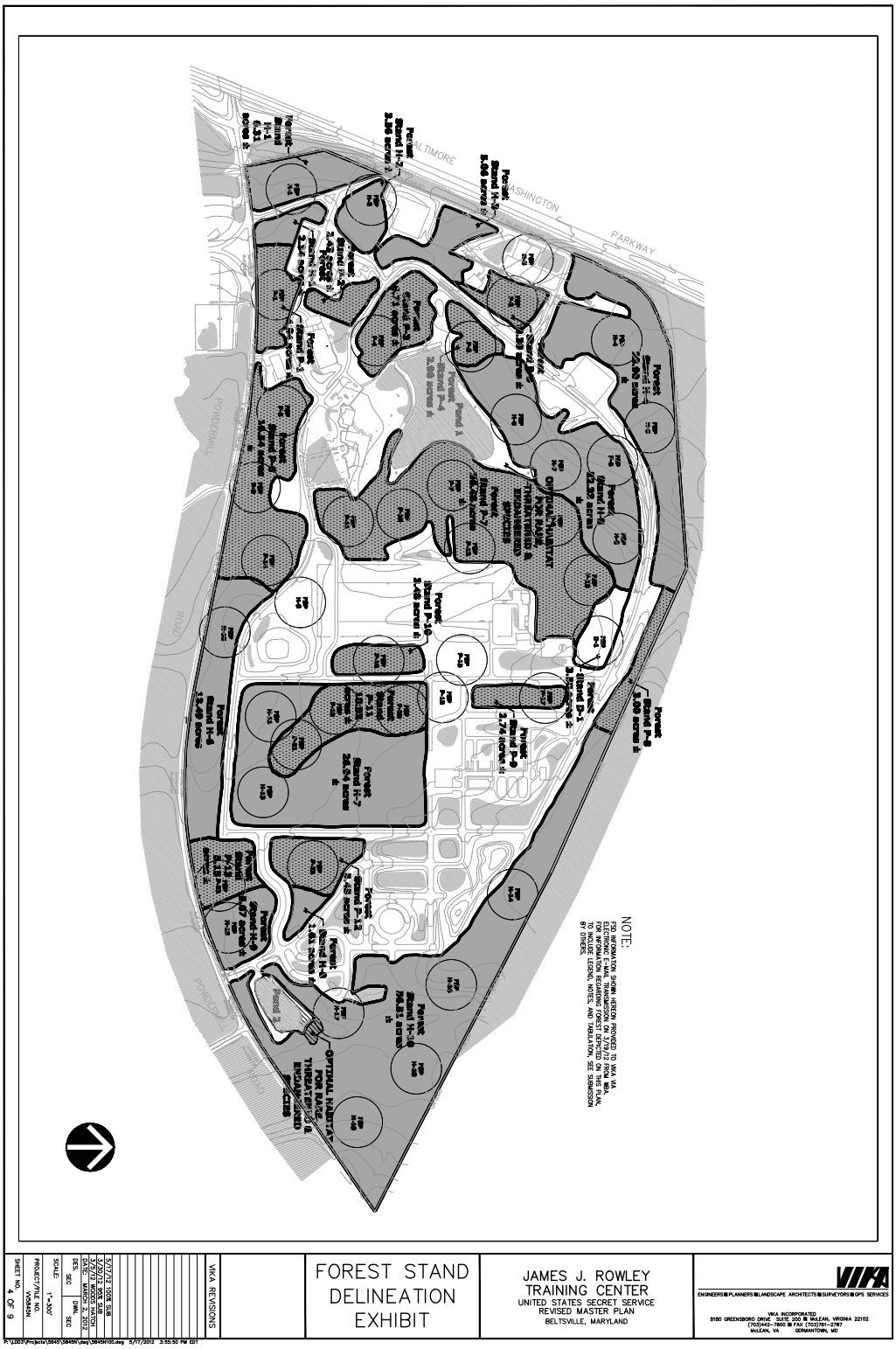


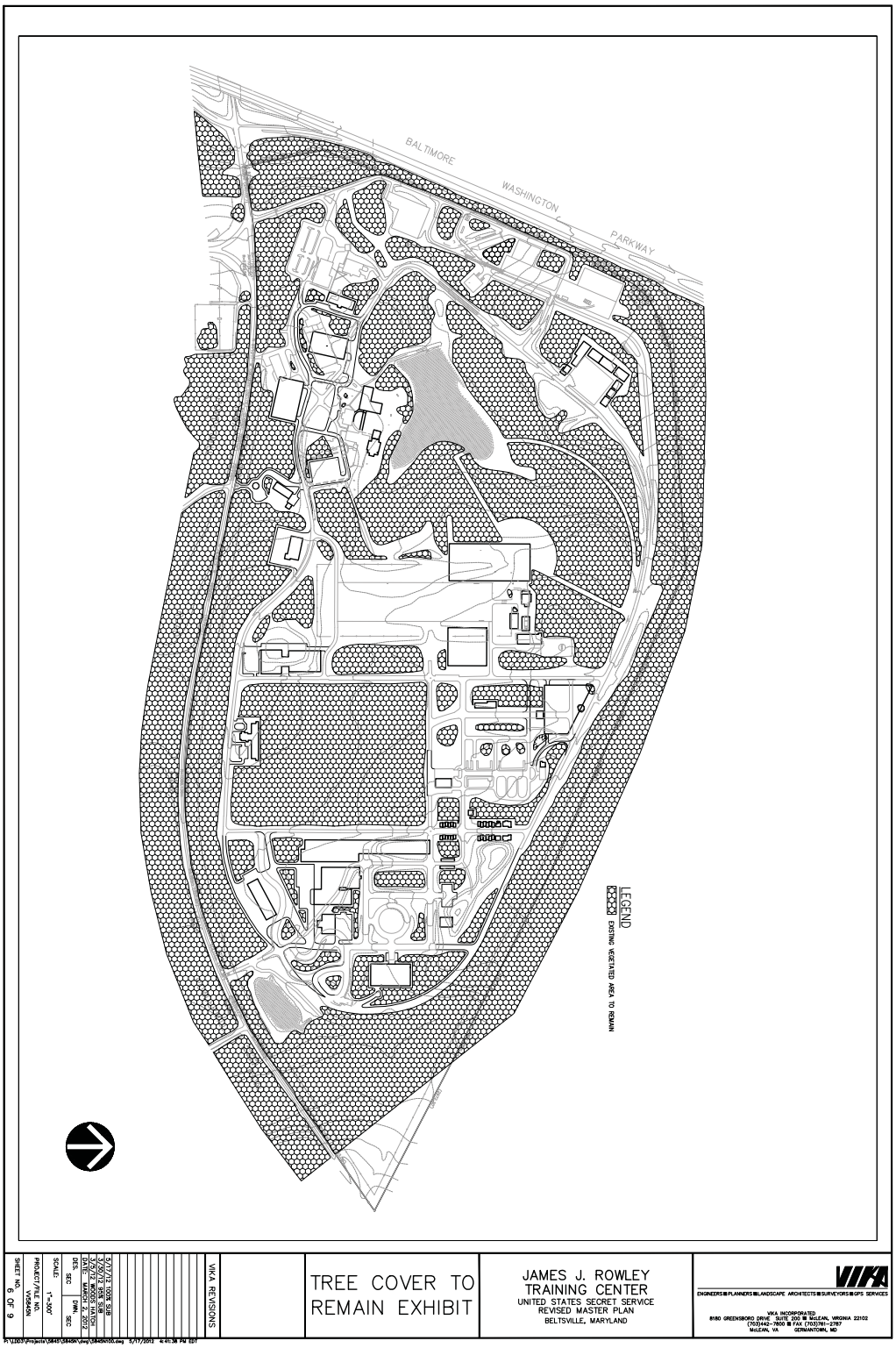
EXHIBIT 4 **Forest Stand Delineation**



16

EXHIBIT 5 **Soils**

EXHIBIT 6 Tree Cover to Remain



18

EXHIBIT 7 Proposed Impervious Areas

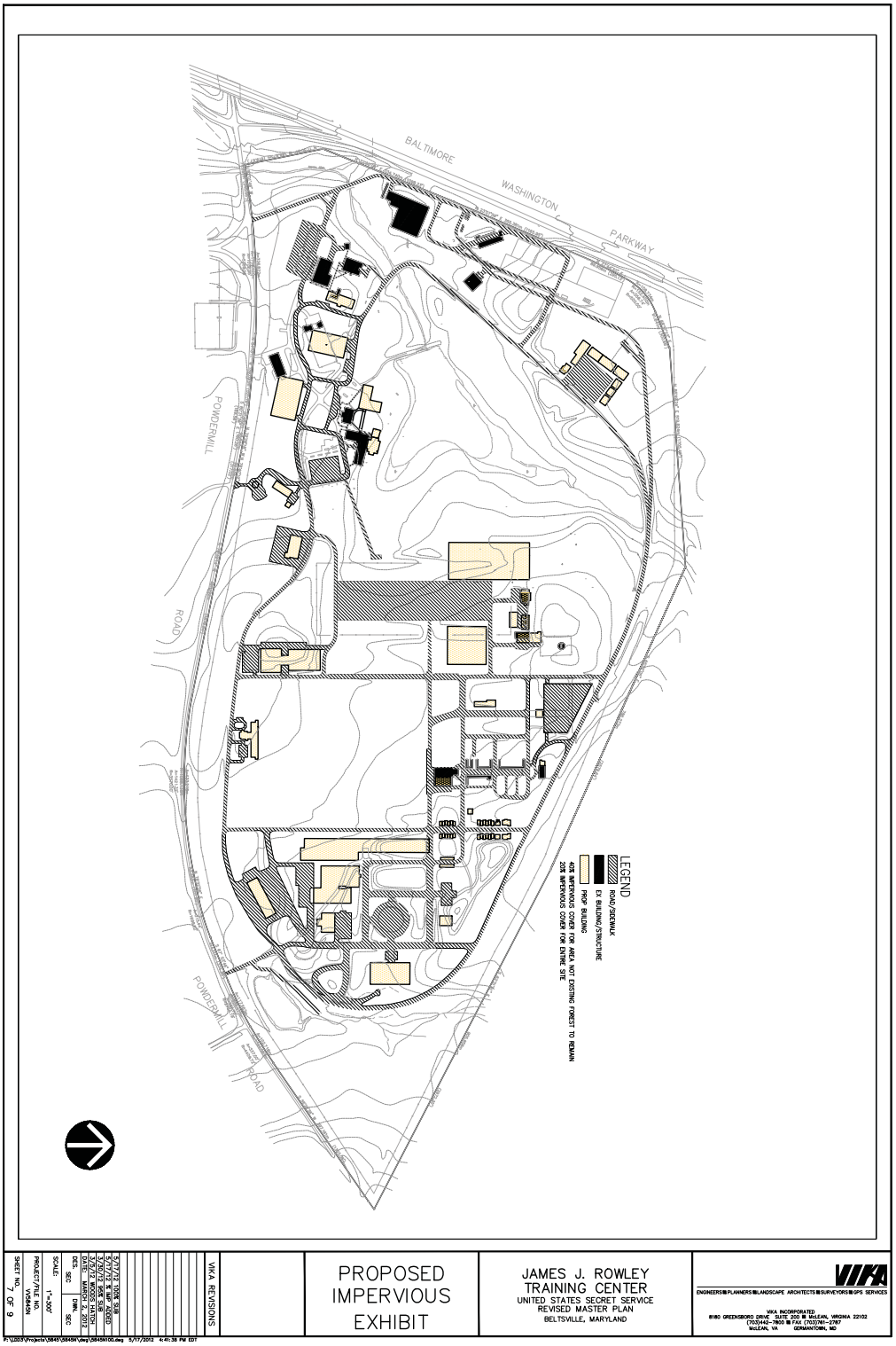
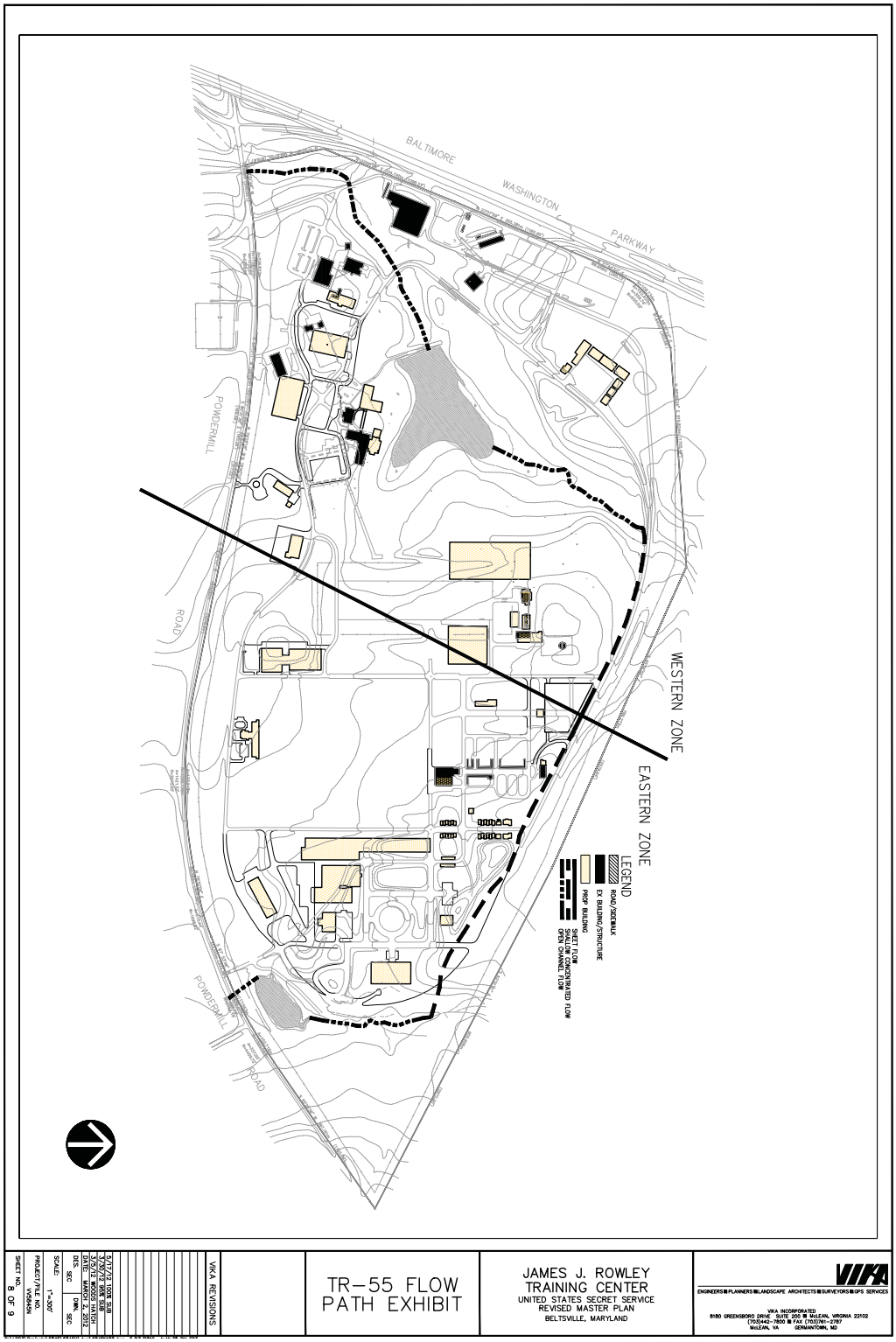


EXHIBIT 8 **TR-55 Flow Path and Calculations**



20

EXHIBIT 8 **TR-55 Flow Path and Calculations**

```
                                    JJEAST.PRN
                     TIME OF CONCENTRATION AND TRAVEL TIME        Version 2.10
 Project : JAMES J ROWLEY SMP                     User: SEC      Date: 05-17-2012
County  : PRINCE GEORGE'S      State: MD      Checked: ____     Date: ________
Subtitle: POST DEVELOPED FOR EISA COMPLIANCE

-------------------------------------------------------------------------------
Flow Type   2 year   Length   Slope  Surface   n   Area     Wp   Velocity  Time
             rain     (ft)   (ft/ft)   code       (sq/ft)  (ft)  (ft/sec)  (hr)
-------------------------------------------------------------------------------
Sheet        3.3      100      .05      E                                   0.111
Shallow Concent'd     2538     .0204    U                                   0.306
Open Channel          986                                            4      0.068
Open Channel          183                                            4      0.013
                                                   Time of Concentration = 0.50*
                                                                           =====

        --- Sheet Flow Surface Codes ---
    A Smooth Surface           F Grass, Dense     --- Shallow Concentrated ---
    B Fallow (No Res.)         G Grass, Burmuda   ---     Surface Codes    ---
    C Cultivated < 20 % Res.   H Woods, Light               P Paved
    D Cultivated > 20 % Res.   I Woods, Dense               U Unpaved
    E Grass-Range, Short       J Range, Natural


* - Generated for use by GRAPHIC method
♀                        GRAPHICAL PEAK DISCHARGE METHOD            Version 2.10
 Project : JAMES J ROWLEY SMP                     User: SEC      Date: 03-30-2012
County  : PRINCE GEORGE'S      State: MD      Checked: ____     Date: ________
Subtitle: POST DEVELOPED FOR EISA COMPLIANCE

  Data: Drainage Area        :  241   Acres
        Runoff Curve Number  :  76
        Time of Concentration:  0.50 * Hours
        Rainfall Type        :  II
        Pond and Swamp Area  :  NONE

=======================================
| Storm Number          |   1   |   2   |
|-----------------------|-------|-------|
| Frequency  (yrs)      |   1   |  1.5  |
|                       |       |       |
| 24-Hr Rainfall (in)   |  2.7  | 1.53  |
|                       |       |       |
| Ia/P Ratio            | 0.23  | 0.41  |
|                       |       |       |
| Runoff (in)           | 0.82  | 0.20  |
|                       |       |       |
| Unit Peak Discharge   |0.732  |0.518  |
|    (cfs/acre/in)      |       |       |
|                       |       |       |
| Pond and Swamp Factor| 1.00  | 1.00  |
|    0.0% Ponds Used    |       |       |
|-----------------------|-------|-------|
| Peak Discharge (cfs)  |  144  |   25  |
=======================================

* - Value(s) provided from TR-55 system routines
♀
```

21

EXHIBIT 8 TR-55 Flow Path and Calculations

```
                                    JJWEST.PRN
                    TIME OF CONCENTRATION AND TRAVEL TIME        Version 2.10
 Project : JAMES J ROWLEY SMP                    User: SEC      Date: 05-17-2012
County  : PRINCE GEORGE'S      State: MD      Checked: ____     Date: ________
Subtitle: POST DEVELOPED FOR EISA COMPLIANCE

-------------------------------------------------------------------------------
Flow Type   2 year   Length   Slope  Surface   n   Area     Wp   Velocity  Time
             rain     (ft)   (ft/ft)   code       (sq/ft)  (ft)  (ft/sec)  (hr)
-------------------------------------------------------------------------------
Sheet        3.3      100      .03      E                                  0.137
Shallow Concent'd     1443     .03      U                                  0.143
Open Channel          1401                                          4      0.097
Open Channel          2313                                          4      0.161
                                                   Time of Concentration = 0.54*
                                                                           =====

        --- Sheet Flow Surface Codes ---
    A Smooth Surface           F Grass, Dense     --- Shallow Concentrated ---
    B Fallow (No Res.)         G Grass, Burmuda   ---     Surface Codes    ---
    C Cultivated < 20 % Res.   H Woods, Light               P Paved
    D Cultivated > 20 % Res.   I Woods, Dense               U Unpaved
    E Grass-Range, Short       J Range, Natural


* - Generated for use by GRAPHIC method
♀                       GRAPHICAL PEAK DISCHARGE METHOD            Version 2.10
 Project : JAMES J ROWLEY SMP                    User: SEC      Date: 03-30-2012
County  : PRINCE GEORGE'S      State: MD      Checked: ____     Date: ________
Subtitle: POST DEVELOPED FOR EISA COMPLIANCE

  Data: Drainage Area        :  241   Acres
        Runoff Curve Number  :  76
        Time of Concentration:  0.54 * Hours
        Rainfall Type        :  II
        Pond and Swamp Area  :  NONE

=====================================
| Storm Number          |   1   |   2  |
|-----------------------|-------|------|
| Frequency  (yrs)      |   1   |  1.5 |
|                       |       |      |
| 24-Hr Rainfall (in)   |  2.7  | 1.53 |
|                       |       |      |
| Ia/P Ratio            | 0.23  | 0.41 |
|                       |       |      |
| Runoff (in)           | 0.82  | 0.20 |
|                       |       |      |
| Unit Peak Discharge   |0.702  |0.496 |
|    (cfs/acre/in)      |       |      |
|                       |       |      |
| Pond and Swamp Factor| 1.00  | 1.00 |
|    0.0% Ponds Used    |       |      |
|-----------------------|-------|------|
| Peak Discharge (cfs)  |  139  |   24 |
=====================================

* - Value(s) provided from TR-55 system routines
♀
```

22

EXHIBIT 9 **SWM Master Plan**

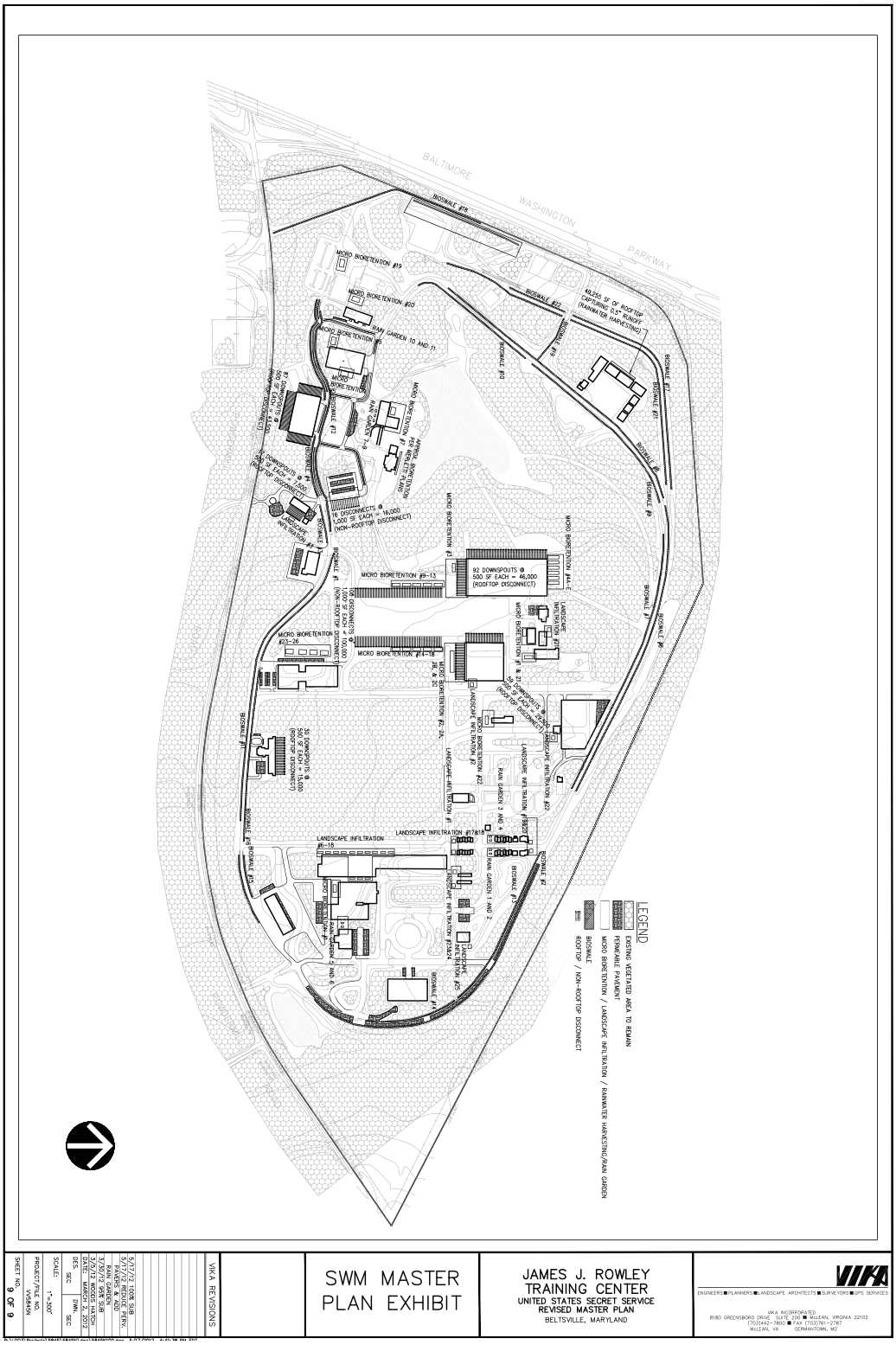


EXHIBIT 9 SWM Master Plan

ESD PRACTICES SUMMARY SHEET

OVERALL TARGET (CF) 380,802.39

TOTAL PROVIDED (CF) 381,648.64

ESD MET (Y/N) YES

PERMEABLE PAVEMENT WITH 12" SUBBASE

HSG	ESDV / SF	% OF HSG
A	0.206	32.50%
B	0.196	22.10%
C	0.160	35.90%

WEIGHTED ESDV / SF
0.168

SQUARE FEET OF PERMEABLE PAVEMENT	133,178
TOTAL PERMEABLE PAVEMENT CREDIT	22,334.75

ROOFTOP DISCONNECT WITH FLOW PATH >=75'

DEPTH TREATED (IN)	Rv	AREA (SF)	TOTAL ROOFTOP DISCONNECT CREDIT
1	0.95	142,500	11281.25 CF

NON-ROOFTOP DISCONNECT WITH FLOW PATH >=75'

DEPTH TREATED (IN)	Rv	AREA (SF)	TOTAL NON-ROOFTOP DISCONNECT CREDIT
1	0.95	118,000	9341.67 CF

RAINWATER HARVESTING CAPTURING 0.5" OF RUNOFF

DEPTH TREATED (IN)	Rv	AREA (SF)	TOTAL RAINWATER HARVESTING CREDIT
0.5	0.95	49,255	1949.68 CF

LANDSCAPE INFILTRATION 1

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
10,000.00	1,000.00	2.00	0.95	1,583.33

LANDSCAPE INFILTRATION 2

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
10,000.00	1,000.00	2.00	0.95	1,583.33

MICRO BIORETENTION 1

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
14,500.00	1,450.00	1.50	0.95	1,721.88

MICRO BIORETENTION 7

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

MICRO BIORETENTION 2

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
14,500.00	1,400.00	1.45	0.95	1,662.50

MICRO BIORETENTION 2A

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
14,500.00	1,400.00	1.45	0.95	1,662.50

MICRO BIORETENTION 3

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
14,500.00	1,450.00	1.50	0.95	1,721.88

MICRO BIORETENTION 2B

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
14,500.00	1,400.00	1.45	0.95	1,662.50

MICRO BIORETENTION 4

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

MICRO BIORETENTION 2C

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
14,500.00	1,400.00	1.45	0.95	1,662.50

24

EXHIBIT 9 SWM Master Plan

MICRO BIORETENTION 4A

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

MICRO BIORETENTION 4B

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

MICRO BIORETENTION 4C

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

MICRO BIORETENTION 4D

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

MICRO BIORETENTION 4E

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

BIO-SWALE 1

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
39,341.00	8,225.00	3.14	0.5	5,140.63

BIO-SWALE 2

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
87,787.00	19,950.00	3.41	0.5	12,468.75

MICRO BIORETENTION 5

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

MICRO BIORETENTION 6

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

BIO-SWALE 3

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
10,750.00	2,350.00	3.28	0.5	1,468.75

BIO-SWALE 4

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
14,628.00	3,829.00	3.93	0.5	2,393.13

BIO-SWALE 5

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
50,614.00	6,523.00	1.93	0.5	4,076.88

LANDSCAPE INFILTRATION 3

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
9,000.00	900.00	2.00	0.95	1,425.00

LANDSCAPE INFILTRATION 4

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
10,000.00	1,000.00	2.00	0.95	1,583.33

LANDSCAPE INFILTRATION 5

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
10,000.00	1,000.00	2.00	0.95	1,583.33

MICRO BIORETENTION 8

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

LANDSCAPE INFILTRATION 6

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
10,000.00	1,000.00	2.00	0.95	1,583.33

LANDSCAPE INFILTRATION 7

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
10,000.00	1,000.00	2.00	0.95	1,583.33

LANDSCAPE INFILTRATION 8

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
10,000.00	1,000.00	2.00	0.95	1,583.33

LANDSCAPE INFILTRATION 9

AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
10,000.00	1,000.00	2.00	0.95	1,583.33

EXHIBIT 9 SWM Master Plan

LANDSCAPE INFILTRATION 10				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
10,000.00	1,000.00	2.00	0.95	1,583.33

LANDSCAPE INFILTRATION 11				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
10,000.00	1,000.00	2.00	0.95	1,583.33

LANDSCAPE INFILTRATION 12				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
10,000.00	1,000.00	2.00	0.95	1,583.33

LANDSCAPE INFILTRATION 13				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
10,000.00	1,000.00	2.00	0.95	1,583.33

LANDSCAPE INFILTRATION 14				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
10,000.00	1,000.00	2.00	0.95	1,583.33

LANDSCAPE INFILTRATION 15				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
10,000.00	1,000.00	2.00	0.95	1,583.33

LANDSCAPE INFILTRATION 16				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
10,000.00	1,000.00	2.00	0.95	1,583.33

LANDSCAPE INFILTRATION 17				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
10,000.00	1,000.00	2.00	0.95	1,583.33

LANDSCAPE INFILTRATION 18				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
10,000.00	1,000.00	2.00	0.95	1,583.33

BIO-SWALE 6				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
516,830.00	16,989.00	0.49	0.8	16,989.00

BIO-SWALE 7				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
209,937.00	18,930.00	1.35	0.8	18,930.00

MICRO BIORETENTION 9				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

MICRO BIORETENTION 10				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

MICRO BIORETENTION 11				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

MICRO BIORETENTION 12				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

MICRO BIORETENTION 13				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

MICRO BIORETENTION 14				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

MICRO BIORETENTION 15				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

MICRO BIORETENTION 16				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

MICRO BIORETENTION 17				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

26

EXHIBIT 9 SWM Master Plan

MICRO BIORETENTION 18				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

MICRO BIORETENTION 19				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.87	2,175.00

MICRO BIORETENTION 20				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.87	2,175.00

BIO-SWALE 8				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
508,072.00	18,950.00	0.56	0.8	18,950.00

BIO-SWALE 9				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
193,159.00	11,932.00	0.93	0.8	11,932.00

MICRO BIORETENTION 21				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

MICRO BIORETENTION 22				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

BIO-SWALE 10				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
79,543.00	8,365.00	1.58	0.8	8,365.00

BIO-SWALE 11				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
156,499.00	15,755.00	1.51	0.8	15,755.00

BIO-SWALE 12				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
92,993.00	14,270.00	2.30	0.8	14,270.00

MICRO BIORETENTION 23				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

MICRO BIORETENTION 24				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

MICRO BIORETENTION 25				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

MICRO BIORETENTION 26				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
20,000.00	2,000.00	1.50	0.95	2,375.00

BIO-SWALE 13				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
243,029.00	10,491.00	0.65	0.8	10,491.00

BIO-SWALE 14				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
353,833.00	4,864.00	0.21	0.8	4,864.00

BIO-SWALE 15				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
68,445.00	2,649.00	0.58	0.8	2,649.00

BIO-SWALE 16				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
563,812.00	10,681.00	0.28	0.8	10,681.00

BIO-SWALE 17				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
195,359.00	14,138.00	1.09	0.8	14,138.00

BIO-SWALE 18				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
200,901.00	13,745.00	1.03	0.8	13,745.00

EXHIBIT 9 SWM Master Plan

LANDSCAPE INFILTRATION 19				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
10,000.00	1,000.00	2.00	0.95	1,583.33

LANDSCAPE INFILTRATION 20				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
10,000.00	1,000.00	2.00	0.95	1,583.33

LANDSCAPE INFILTRATION 21				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
6,525.00	650.00	1.99	0.95	1,029.17

LANDSCAPE INFILTRATION 22				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
3,250.00	325.00	2.00	0.95	514.58

LANDSCAPE INFILTRATION 23				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
5,000.00	500.00	2.00	0.95	791.67

LANDSCAPE INFILTRATION 24				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
5,000.00	500.00	2.00	0.95	791.67

Rain Garden 1				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
2,000.00	200.00	1.00	0.95	158.33

Rain Garden 2				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
2,000.00	200.00	1.00	0.95	158.33

Rain Garden 3				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
2,000.00	200.00	1.00	0.95	158.33

Rain Garden 4				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
2,000.00	200.00	1.00	0.95	158.33

Rain Garden 5				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
2,000.00	200.00	1.00	0.95	158.33

Rain Garden 6				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
2,000.00	200.00	1.00	0.95	158.33

BIO-SWALE 19				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
34,656.00	3,000.00	1.30	0.8	3,000.00

BIO-SWALE 20				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
117,766.00	7,925.00	1.01	0.8	7,925.00

BIO-SWALE 21				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
250,000.00	13,505.00	0.81	0.8	13,505.00

BIO-SWALE 22				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
100,000.00	3,750.00	0.56	0.8	3,750.00

BIO-SWALE 23				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
118,000.00	7,100.00	0.90	0.8	7,100.00

Rain Garden 7				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
2,000.00	200.00	1.00	0.95	158.33

Rain Garden 8				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
2,000.00	200.00	1.00	0.95	158.33

Rain Garden 9				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
2,000.00	200.00	1.00	0.95	158.33

EXHIBIT 9 SWM Master Plan

Rain Garden 10				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
2,000.00	200.00	1.00	0.95	158.33

LANDSCAPE INFILTRATION 25				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
10,000.00	1,000.00	2.00	0.95	1,583.33

Rain Garden 11				
AREA TREATED (SF)	SURFACE AREA (SF)	Pe (IN)	Rv	CREDIT (CF)
2,000.00	200.00	1.00	0.95	158.33

29

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
January 2, 1996	0.3
January 3, 1996	0.75
January 7, 1996	0.25
January 8, 1996	0.8
January 10, 1996	0.2
January 12, 1996	0.2
January 13, 1996	0.25
January 19, 1996	0.1
January 20, 1996	1.1
January 25, 1996	0.35
January 27, 1996	0.3
January 28, 1996	0.25
February 2, 1996	0.2
February 3, 1996	0.25
February 8, 1996	0.15
February 9, 1996	0.15
February 16, 1996	0.1
February 17, 1996	0.2
February 21, 1996	0.7
February 23, 1996	0.15
February 28, 1996	0.1
March 4, 1996	0.15
March 8, 1996	0.2
March 9, 1996	0.1
March 10, 1996	0.45
March 17, 1996	0.25
March 22, 1996	1.1
March 30, 1996	0.15
March 31, 1996	1.15
April 4, 1996	0.85
April 9, 1996	0.15
April 12, 1996	0.45
April 26, 1996	0.16
May 4, 1996	0.68
May 6, 1996	0.11
May 8, 1996	0.55
May 9, 1996	0.6
May 11, 1996	0.51
May 12, 1996	0.31
May 16, 1996	0.58
May 19, 1996	0.49
May 25, 1996	0.55
May 30, 1996	0.12
May 31, 1996	0.45
June 2, 1996	0.47

95th Percentile Storm
1.53 in

30

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
June 8, 1996	0.11
June 13, 1996	0.24
June 21, 1996	2.71
June 22, 1996	0.42
June 23, 1996	1.51
June 28, 1996	0.98
July 3, 1996	0.62
August 5, 1996	0.15
August 14, 1996	0.25
August 17, 1996	2.17
August 23, 1996	0.14
September 1, 1996	0.36
September 8, 1996	0.11
September 9, 1996	0.64
September 11, 1996	2.38
September 15, 1996	1.25
September 16, 1996	0.54
September 17, 1996	0.3
September 21, 1996	1.35
September 27, 1996	0.53
October 4, 1996	0.66
October 7, 1996	0.27
October 13, 1996	0.13
October 14, 1996	1.12
October 15, 1996	0.21
October 25, 1996	2.7
November 13, 1996	3.06
November 29, 1996	0.83
December 2, 1996	1.82
December 6, 1996	1.02
December 8, 1996	0.47
December 12, 1996	0.15
December 13, 1996	0.5
December 14, 1996	1.53
December 19, 1996	0.25
December 25, 1996	0.25
February 5, 1997	0.7
February 9, 1997	0.3
February 14, 1997	0.45
February 27, 1997	0.13
March 2, 1997	1.22
March 4, 1997	1.3
March 10, 1997	0.2
March 14, 1997	0.26
March 15, 1997	0.37

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
March 19, 1997	0.7
March 26, 1997	0.49
March 31, 1997	0.47
April 7, 1997	0.15
April 14, 1997	0.46
April 18, 1997	0.15
April 22, 1997	0.21
April 28, 1997	1.23
May 5, 1997	0.27
May 12, 1997	0.21
May 26, 1997	1.68
May 30, 1997	0.11
June 2, 1997	0.96
June 3, 1997	0.96
June 15, 1997	0.66
June 19, 1997	0.93
June 27, 1997	0.52
July 2, 1997	0.19
July 3, 1997	0.23
July 24, 1997	0.55
July 29, 1997	0.2
August 6, 1997	0.13
August 18, 1997	0.21
August 20, 1997	1.04
August 21, 1997	1.22
September 3, 1997	0.14
September 11, 1997	0.58
September 18, 1997	0.14
September 29, 1997	0.59
October 15, 1997	0.3
October 18, 1997	1.41
October 25, 1997	1.04
October 27, 1997	0.73
November 1, 1997	0.46
November 2, 1997	0.25
November 3, 1997	0.17
November 7, 1997	0.55
November 8, 1997	2.1
November 9, 1997	0.45
November 14, 1997	0.54
November 15, 1997	0.18
November 22, 1997	0.7
December 4, 1997	0.14
December 10, 1997	0.1
December 11, 1997	0.2

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
December 23, 1997	0.34
December 25, 1997	0.58
December 28, 1997	0.28
January 8, 1998	0.2
January 9, 1998	0.13
January 16, 1998	0.65
January 23, 1998	0.54
January 24, 1998	1.1
January 25, 1998	0.17
January 28, 1998	0.8
January 29, 1998	1.2
February 4, 1998	0.42
February 5, 1998	1.37
February 12, 1998	0.46
February 18, 1998	1.03
February 19, 1998	0.14
February 24, 1998	0.84
March 3, 1998	0.64
March 8, 1998	0.14
March 9, 1998	2.23
March 18, 1998	0.6
March 19, 1998	0.99
March 21, 1998	1.47
April 2, 1998	0.85
April 4, 1998	0.24
April 5, 1998	0.14
April 9, 1998	0.14
April 10, 1998	0.92
April 17, 1998	0.25
April 18, 1998	0.3
April 20, 1998	0.65
April 27, 1998	0.15
May 3, 1998	1.36
May 4, 1998	0.57
May 6, 1998	1.48
May 8, 1998	0.65
May 11, 1998	0.32
May 12, 1998	0.45
May 13, 1998	0.39
May 26, 1998	0.16
June 10, 1998	0.28
June 11, 1998	0.14
June 12, 1998	0.45
June 14, 1998	0.82
June 15, 1998	0.1

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
June 16, 1998	0.13
June 20, 1998	0.69
June 24, 1998	1.09
June 29, 1998	0.11
July 8, 1998	0.71
July 9, 1998	0.25
July 22, 1998	0.26
July 31, 1998	0.69
August 11, 1998	0.26
August 17, 1998	0.11
August 18, 1998	0.15
September 8, 1998	0.38
September 18, 1998	0.49
September 22, 1998	1.21
September 23, 1998	0.2
October 8, 1998	0.1
October 9, 1998	0.68
November 11, 1998	0.51
November 21, 1998	0.1
November 26, 1998	0.55
December 9, 1998	0.49
December 13, 1998	0.32
December 14, 1998	0.12
December 24, 1998	0.22
January 3, 1999	1.12
January 4, 1999	0.19
January 9, 1999	0.1
January 10, 1999	0.48
January 15, 1999	0.49
January 16, 1999	0.35
January 18, 1999	0.52
January 19, 1999	0.24
January 24, 1999	0.84
January 25, 1999	0.71
February 2, 1999	0.55
February 5, 1999	0.1
February 13, 1999	0.25
February 18, 1999	0.68
February 19, 1999	0.12
February 28, 1999	0.28
March 1, 1999	0.41
March 4, 1999	0.28
March 7, 1999	0.28
March 10, 1999	0.55
March 15, 1999	1.15

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
March 22, 1999	1.1
April 2, 1999	0.24
April 5, 1999	0.56
April 10, 1999	0.36
April 12, 1999	0.43
April 16, 1999	0.21
April 22, 1999	0.15
April 24, 1999	0.21
May 8, 1999	0.16
May 23, 1999	0.73
May 25, 1999	0.78
June 15, 1999	0.47
June 18, 1999	0.36
June 20, 1999	0.14
June 21, 1999	0.62
June 30, 1999	0.44
July 2, 1999	0.38
July 3, 1999	0.11
July 13, 1999	0.26
July 29, 1999	0.11
July 31, 1999	0.17
August 9, 1999	0.12
August 15, 1999	0.59
August 20, 1999	0.69
August 21, 1999	0.15
August 24, 1999	0.47
August 26, 1999	1.44
August 27, 1999	0.67
September 5, 1999	1.15
September 6, 1999	1.57
September 7, 1999	0.77
September 10, 1999	0.85
September 16, 1999	2.85
September 17, 1999	2.06
September 21, 1999	0.38
September 22, 1999	1.01
September 29, 1999	0.15
September 30, 1999	1.29
October 4, 1999	0.31
October 5, 1999	0.63
October 10, 1999	0.51
October 11, 1999	0.41
October 18, 1999	0.26
October 20, 1999	0.24
October 21, 1999	0.26

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
October 23, 1999	0.11
November 3, 1999	0.33
November 27, 1999	1.53
December 11, 1999	0.49
December 14, 1999	0.32
December 15, 1999	0.12
December 22, 1999	0.22
January 5, 2000	1.22
January 11, 2000	0.75
January 20, 2000	0.18
January 21, 2000	0.12
January 24, 2000	0.3
January 25, 2000	0.53
January 31, 2000	0.77
February 5, 2000	0.1
February 18, 2000	0.27
February 19, 2000	0.93
February 28, 2000	0.76
March 12, 2000	0.36
March 17, 2000	0.35
March 21, 2000	0.27
March 22, 2000	1.65
March 26, 2000	0.17
March 28, 2000	0.89
March 29, 2000	0.17
April 4, 2000	0.34
April 9, 2000	0.98
April 16, 2000	0.13
April 17, 2000	0.38
April 18, 2000	0.63
April 19, 2000	0.31
April 22, 2000	0.34
April 26, 2000	0.55
May 11, 2000	0.31
May 20, 2000	0.23
May 21, 2000	0.18
May 22, 2000	0.13
May 23, 2000	0.52
May 24, 2000	0.13
May 25, 2000	0.29
May 28, 2000	0.27
May 29, 2000	0.24
June 6, 2000	0.5
June 16, 2000	0.57
June 18, 2000	0.34

36

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
June 19, 2000	0.6
June 22, 2000	0.96
June 26, 2000	0.92
June 28, 2000	0.74
June 30, 2000	0.21
July 4, 2000	0.33
July 11, 2000	0.22
July 15, 2000	1.15
July 17, 2000	1.25
July 19, 2000	0.11
July 20, 2000	0.58
July 25, 2000	0.22
July 26, 2000	0.77
July 27, 2000	0.38
July 29, 2000	1.03
August 2, 2000	0.44
August 4, 2000	0.29
August 7, 2000	0.52
August 8, 2000	0.13
August 18, 2000	0.11
August 28, 2000	1.71
August 29, 2000	0.18
August 30, 2000	0.23
September 1, 2000	0.68
September 3, 2000	1.07
September 4, 2000	0.21
September 5, 2000	0.34
September 20, 2000	1.03
September 25, 2000	0.48
September 26, 2000	1.92
September 27, 2000	0.15
October 10, 2000	0.14
November 10, 2000	0.3
November 14, 2000	0.18
November 26, 2000	0.68
November 30, 2000	0.1
January 9, 2001	0.2
January 19, 2001	0.44
January 20, 2001	0.77
January 21, 2001	0.11
January 30, 2001	0.44
January 31, 2001	0.11
February 5, 2001	0.4
February 6, 2001	0.15
February 16, 2001	0.11

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
February 17, 2001	0.72
February 23, 2001	0.31
March 5, 2001	0.39
March 13, 2001	0.32
March 16, 2001	0.24
March 21, 2001	0.65
March 22, 2001	0.41
March 30, 2001	1.44
April 10, 2001	0.14
April 11, 2001	0.17
April 12, 2001	0.83
April 16, 2001	0.31
April 17, 2001	0.17
May 19, 2001	0.23
May 21, 2001	0.67
May 22, 2001	0.39
May 23, 2001	1.16
May 26, 2001	1.49
May 27, 2001	0.34
May 28, 2001	0.8
June 2, 2001	0.66
June 3, 2001	0.29
June 5, 2001	0.16
June 7, 2001	1.49
June 8, 2001	0.1
June 16, 2001	0.19
June 17, 2001	0.97
June 22, 2001	0.4
June 23, 2001	1.03
July 2, 2001	0.71
July 4, 2001	1.05
July 5, 2001	1.91
July 6, 2001	1.74
July 8, 2001	0.25
July 9, 2001	0.4
July 27, 2001	0.12
July 29, 2001	0.3
July 30, 2001	0.57
August 11, 2001	0.25
August 12, 2001	0.81
August 13, 2001	0.18
August 14, 2001	0.2
August 20, 2001	0.86
August 24, 2001	1.14
August 30, 2001	0.58

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
September 1, 2001	0.37
September 11, 2001	0.21
September 15, 2001	0.1
September 20, 2001	0.29
September 21, 2001	1.24
September 25, 2001	1.16
October 1, 2001	0.19
October 15, 2001	0.49
October 17, 2001	0.23
November 26, 2001	0.52
December 9, 2001	0.53
December 11, 2001	0.38
December 18, 2001	0.14
December 24, 2001	0.28
January 7, 2002	0.46
January 11, 2002	0.2
January 21, 2002	0.37
February 7, 2002	0.17
March 3, 2002	0.78
March 10, 2002	0.15
March 13, 2002	0.33
March 18, 2002	0.35
March 20, 2002	0.47
March 21, 2002	0.2
March 27, 2002	0.37
April 1, 2002	0.28
April 10, 2002	0.56
April 22, 2002	0.66
April 28, 2002	1.13
April 29, 2002	0.65
May 2, 2002	0.7
May 3, 2002	0.15
May 5, 2002	0.11
May 13, 2002	0.53
May 18, 2002	0.72
May 27, 2002	0.27
May 28, 2002	0.11
June 7, 2002	0.36
June 14, 2002	0.5
June 15, 2002	0.33
June 19, 2002	0.56
June 28, 2002	0.24
July 10, 2002	0.11
July 14, 2002	0.79
July 15, 2002	0.38

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
July 24, 2002	0.29
July 27, 2002	0.45
August 4, 2002	0.16
August 6, 2002	0.29
August 28, 2002	0.17
August 29, 2002	2.05
September 1, 2002	1.33
September 2, 2002	0.58
September 16, 2002	0.28
September 27, 2002	1.38
September 28, 2002	0.3
October 10, 2002	0.19
October 11, 2002	1.14
October 12, 2002	0.53
October 16, 2002	0.91
October 17, 2002	0.75
October 26, 2002	1.13
October 30, 2002	0.79
October 31, 2002	0.28
November 6, 2002	0.86
November 11, 2002	0.27
November 12, 2002	0.28
November 13, 2002	0.43
November 16, 2002	0.48
November 17, 2002	1.08
November 18, 2002	0.32
December 6, 2002	0.75
December 12, 2002	1.66
December 14, 2002	0.58
December 20, 2002	0.2
December 25, 2002	0.22
December 26, 2002	1.35
January 1, 2003	0.48
January 2, 2003	0.9
January 3, 2003	0.32
January 4, 2003	0.26
January 6, 2003	0.25
February 1, 2003	0.18
February 4, 2003	0.11
February 5, 2003	0.16
February 7, 2003	0.65
February 16, 2003	0.42
February 17, 2003	1.32
February 22, 2003	0.77
February 23, 2003	2.11

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
February 24, 2003	0.11
February 27, 2003	0.15
February 28, 2003	0.16
March 1, 2003	0.21
March 2, 2003	0.38
March 6, 2003	0.18
March 7, 2003	0.12
March 14, 2003	0.11
March 20, 2003	0.11
March 21, 2003	1.66
March 27, 2003	0.34
March 30, 2003	0.22
March 31, 2003	0.49
April 7, 2003	0.21
April 8, 2003	0.55
April 9, 2003	0.27
April 10, 2003	0.21
April 11, 2003	0.35
April 26, 2003	0.59
April 27, 2003	0.21
May 1, 2003	0.13
May 6, 2003	0.21
May 8, 2003	0.29
May 9, 2003	0.1
May 10, 2003	0.31
May 11, 2003	0.49
May 16, 2003	1.37
May 17, 2003	0.39
May 18, 2003	0.36
May 22, 2003	0.87
May 24, 2003	0.24
May 25, 2003	0.32
May 26, 2003	1.39
May 29, 2003	0.31
June 1, 2003	0.19
June 4, 2003	0.53
June 5, 2003	0.13
June 7, 2003	0.27
June 8, 2003	1.45
June 9, 2003	0.12
June 12, 2003	0.73
June 13, 2003	0.43
June 14, 2003	0.21
June 15, 2003	0.33
June 18, 2003	0.76

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
June 19, 2003	0.43
June 20, 2003	0.92
June 21, 2003	0.75
July 1, 2003	0.26
July 3, 2003	0.84
July 4, 2003	0.11
July 8, 2003	0.6
July 10, 2003	0.64
July 11, 2003	0.69
July 13, 2003	0.87
July 23, 2003	2.12
July 29, 2003	0.83
August 4, 2003	0.16
August 6, 2003	0.33
August 9, 2003	0.12
August 10, 2003	0.18
August 12, 2003	0.95
August 17, 2003	0.35
August 27, 2003	0.59
August 28, 2003	0.44
August 31, 2003	0.75
September 1, 2003	0.75
September 2, 2003	0.4
September 3, 2003	0.16
September 4, 2003	0.29
September 5, 2003	0.1
September 13, 2003	1.32
September 14, 2003	0.15
September 16, 2003	0.28
September 19, 2003	2.2
September 23, 2003	2.61
September 28, 2003	0.1
October 15, 2003	1.7
October 27, 2003	2.2
October 28, 2003	0.78
October 29, 2003	1.17
November 6, 2003	0.96
November 7, 2003	0.47
November 12, 2003	0.26
November 13, 2003	0.21
November 20, 2003	1.29
November 25, 2003	0.18
November 29, 2003	0.51
December 5, 2003	0.1
December 6, 2003	0.78

42

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
December 7, 2003	0.11
December 11, 2003	1.18
December 15, 2003	0.81
December 17, 2003	0.36
December 18, 2003	0.18
December 24, 2003	0.24
December 25, 2003	0.23
January 2, 2004	0.14
January 6, 2004	0.31
January 19, 2004	0.34
January 26, 2004	0.56
January 28, 2004	0.19
February 4, 2004	0.65
February 6, 2004	0.39
February 7, 2004	1.14
March 2, 2004	0.16
March 6, 2004	0.78
March 8, 2004	0.14
March 16, 2004	0.13
March 17, 2004	0.22
March 28, 2004	0.11
April 1, 2004	0.41
April 2, 2004	0.39
April 3, 2004	0.88
April 13, 2004	0.97
April 14, 2004	0.27
April 15, 2004	0.26
April 23, 2004	0.66
April 26, 2004	0.8
May 2, 2004	0.1
May 3, 2004	0.71
May 4, 2004	0.23
May 8, 2004	0.24
May 10, 2004	0.25
May 16, 2004	0.24
May 19, 2004	0.68
May 22, 2004	0.14
May 26, 2004	0.19
May 28, 2004	0.3
June 1, 2004	0.18
June 5, 2004	0.66
June 6, 2004	0.32
June 12, 2004	0.68
June 18, 2004	0.46
June 19, 2004	0.73

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
June 26, 2004	1.2
July 2, 2004	1.04
July 5, 2004	4.09
July 6, 2004	0.31
July 8, 2004	0.12
July 14, 2004	0.16
July 18, 2004	0.45
July 23, 2004	0.75
July 24, 2004	0.91
July 27, 2004	0.9
July 28, 2004	3.44
July 29, 2004	0.61
August 2, 2004	0.26
August 5, 2004	0.83
August 12, 2004	0.36
August 13, 2004	1.12
August 14, 2004	0.11
August 15, 2004	0.36
August 22, 2004	0.1
September 9, 2004	0.51
September 15, 2004	0.19
September 18, 2004	1.12
September 19, 2004	0.18
September 29, 2004	2.23
October 2, 2004	0.28
October 14, 2004	0.1
October 17, 2004	0.14
October 20, 2004	0.2
October 21, 2004	0.31
November 5, 2004	1.43
November 12, 2004	0.54
November 13, 2004	1.36
November 20, 2004	0.11
November 25, 2004	0.15
November 28, 2004	0.18
December 1, 2004	0.38
December 7, 2004	0.28
December 8, 2004	0.2
December 10, 2004	0.63
December 11, 2004	0.2
December 20, 2004	0.14
December 23, 2004	0.12
December 24, 2004	0.96
January 5, 2005	0.4
January 8, 2005	0.24

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
January 14, 2005	1.91
January 15, 2005	0.19
January 23, 2005	0.36
January 30, 2005	0.43
February 14, 2005	0.17
February 15, 2005	0.38
February 25, 2005	0.32
March 1, 2005	0.4
March 8, 2005	0.36
March 9, 2005	0.15
March 23, 2005	1.59
March 24, 2005	0.62
March 28, 2005	0.41
March 29, 2005	1
April 2, 2005	0.7
April 3, 2005	1.44
April 8, 2005	0.14
April 22, 2005	0.28
April 23, 2005	0.13
April 24, 2005	0.22
April 30, 2005	0.5
May 1, 2005	1.01
May 15, 2005	0.15
May 20, 2005	1.04
May 21, 2005	1.16
May 24, 2005	0.15
May 25, 2005	0.45
May 31, 2005	0.11
June 3, 2005	0.56
June 4, 2005	0.12
June 7, 2005	1.08
June 10, 2005	0.22
June 30, 2005	0.99
July 2, 2005	0.23
July 8, 2005	2.1
July 14, 2005	0.12
July 15, 2005	0.83
July 16, 2005	0.8
July 17, 2005	0.27
July 25, 2005	0.19
July 28, 2005	0.52
July 30, 2005	0.22
August 8, 2005	0.12
August 9, 2005	1.28
August 10, 2005	0.3

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
August 17, 2005	0.83
August 20, 2005	0.52
August 28, 2005	0.5
September 27, 2005	0.19
October 7, 2005	0.11
October 8, 2005	5.54
October 9, 2005	2.04
October 13, 2005	0.16
October 22, 2005	0.89
October 23, 2005	0.13
October 25, 2005	0.68
October 26, 2005	0.29
November 17, 2005	0.57
November 22, 2005	0.69
November 30, 2005	0.51
December 4, 2005	0.23
December 6, 2005	0.25
December 9, 2005	0.59
December 26, 2005	0.67
December 30, 2005	0.14
January 3, 2006	0.35
January 12, 2006	0.21
January 14, 2006	0.45
January 18, 2006	0.31
January 19, 2006	0.28
January 23, 2006	0.86
January 31, 2006	0.25
February 3, 2006	0.53
February 5, 2006	0.71
February 12, 2006	0.39
February 23, 2006	0.11
April 4, 2006	0.57
April 8, 2006	0.36
April 9, 2006	0.59
April 18, 2006	0.15
April 22, 2006	0.43
April 23, 2006	1.5
May 8, 2006	0.13
May 12, 2006	1.43
May 13, 2006	0.14
May 15, 2006	0.15
May 19, 2006	0.1
June 12, 2006	0.28
June 13, 2006	0.11
June 15, 2006	0.17

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
June 20, 2006	0.48
June 23, 2006	0.1
June 24, 2006	0.27
June 25, 2006	0.15
June 26, 2006	4.75
June 27, 2006	1.02
June 28, 2006	0.58
July 3, 2006	0.22
July 5, 2006	0.29
July 6, 2006	1.96
July 13, 2006	0.1
July 23, 2006	0.92
August 7, 2006	0.45
September 2, 2006	2.45
September 3, 2006	0.16
September 5, 2006	0.73
September 6, 2006	0.96
September 14, 2006	0.48
September 15, 2006	0.22
September 29, 2006	1.01
October 1, 2006	0.15
October 6, 2006	1.08
October 7, 2006	0.55
October 18, 2006	0.79
October 20, 2006	0.67
October 28, 2006	1.86
November 2, 2006	0.25
November 8, 2006	1.44
November 9, 2006	0.26
November 12, 2006	0.33
November 13, 2006	0.38
November 17, 2006	0.69
November 23, 2006	0.82
December 23, 2006	1.08
December 26, 2006	0.47
January 1, 2007	0.93
January 2, 2007	0.14
January 6, 2007	0.26
January 8, 2007	0.54
January 22, 2007	0.24
February 14, 2007	1.26
February 21, 2007	0.26
February 23, 2007	0.1
February 26, 2007	0.66
March 2, 2007	0.9

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
March 11, 2007	0.16
March 16, 2007	0.99
March 17, 2007	0.98
April 4, 2007	0.33
April 12, 2007	0.91
April 15, 2007	1.33
April 16, 2007	1.23
April 27, 2007	0.39
May 13, 2007	0.48
May 17, 2007	0.31
May 28, 2007	0.11
June 4, 2007	0.65
June 5, 2007	0.44
June 9, 2007	0.24
June 13, 2007	0.33
June 14, 2007	0.14
June 20, 2007	0.12
June 29, 2007	0.22
July 5, 2007	0.23
July 28, 2007	0.28
July 30, 2007	0.21
August 6, 2007	0.12
August 10, 2007	0.15
August 20, 2007	1.05
August 21, 2007	0.86
August 26, 2007	0.15
September 11, 2007	0.94
September 12, 2007	0.1
September 28, 2007	0.28
October 11, 2007	0.12
October 20, 2007	0.52
October 24, 2007	0.14
October 25, 2007	1.6
October 26, 2007	0.12
October 27, 2007	3.3
November 6, 2007	0.15
November 12, 2007	0.28
November 14, 2007	0.11
November 15, 2007	0.35
November 16, 2007	0.33
November 27, 2007	0.11
December 3, 2007	0.3
December 6, 2007	0.3
December 8, 2007	0.23
December 16, 2007	0.72

48

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
December 17, 2007	0.13
December 24, 2007	0.15
December 27, 2007	0.31
December 29, 2007	0.51
December 31, 2007	0.26
January 6, 2008	0.12
January 11, 2008	0.11
January 12, 2008	0.1
January 18, 2008	0.78
February 1, 2008	0.46
February 2, 2008	1.7
February 21, 2008	0.22
March 5, 2008	0.64
March 8, 2008	0.55
March 9, 2008	0.16
March 16, 2008	0.34
March 20, 2008	0.46
April 1, 2008	0.1
April 2, 2008	0.1
April 4, 2008	0.72
April 6, 2008	0.23
April 7, 2008	0.11
April 12, 2008	0.12
April 20, 2008	0.22
April 21, 2008	2.2
April 22, 2008	0.36
April 27, 2008	0.51
April 29, 2008	0.76
May 9, 2008	1.62
May 10, 2008	0.51
May 12, 2008	2.99
May 13, 2008	0.36
May 16, 2008	0.86
May 19, 2008	0.15
May 20, 2008	0.58
May 21, 2008	0.1
June 1, 2008	0.67
June 2, 2008	0.21
June 4, 2008	0.47
June 5, 2008	1.04
June 17, 2008	0.54
June 19, 2008	0.1
June 24, 2008	0.31
June 28, 2008	1.05
July 2, 2008	0.1

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
July 5, 2008	0.24
July 7, 2008	0.12
July 10, 2008	0.26
July 14, 2008	1.15
July 24, 2008	1.39
July 28, 2008	0.8
August 2, 2008	0.16
August 28, 2008	0.1
August 29, 2008	0.41
August 30, 2008	0.25
September 6, 2008	0.24
September 7, 2008	2.13
September 10, 2008	0.13
September 26, 2008	0.29
September 27, 2008	1.04
September 28, 2008	0.27
October 1, 2008	0.23
October 2, 2008	0.16
October 25, 2008	0.11
October 26, 2008	0.87
October 28, 2008	0.34
November 14, 2008	0.54
November 15, 2008	0.33
November 16, 2008	0.17
November 30, 2008	0.13
December 1, 2008	0.63
December 11, 2008	0.22
December 12, 2008	1.62
December 17, 2008	0.75
December 20, 2008	0.32
January 7, 2009	1.35
January 8, 2009	0.65
January 11, 2009	0.23
January 28, 2009	0.61
January 29, 2009	0.11
February 19, 2009	0.14
March 2, 2009	0.3
March 16, 2009	0.21
March 27, 2009	0.36
March 28, 2009	0.97
May 4, 2009	0.87
May 5, 2009	0.35
May 6, 2009	0.31
May 7, 2009	0.97
May 8, 2009	0.28

50

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
May 12, 2009	0.35
May 17, 2009	0.51
May 26, 2009	4.27
May 29, 2009	0.28
May 30, 2009	0.19
May 31, 2009	0.21
June 3, 2009	0.15
June 4, 2009	1.46
June 5, 2009	0.64
June 6, 2009	0.35
June 9, 2009	0.29
June 10, 2009	0.2
June 11, 2009	2.13
June 14, 2009	0.17
June 18, 2009	1.27
June 19, 2009	0.31
June 21, 2009	0.38
July 1, 2009	0.63
July 24, 2009	0.49
July 26, 2009	0.56
August 1, 2009	0.35
August 2, 2009	0.45
August 3, 2009	0.35
August 11, 2009	0.25
August 19, 2009	0.13
August 22, 2009	1.35
August 23, 2009	0.45
August 28, 2009	0.91
August 30, 2009	0.3
September 7, 2009	0.4
September 8, 2009	0.11
September 11, 2009	0.54
September 12, 2009	0.19
September 16, 2009	0.27
September 27, 2009	1.36
September 28, 2009	0.11
October 15, 2009	0.25
October 16, 2009	0.57
October 17, 2009	0.7
October 18, 2009	1.28
October 25, 2009	0.66
October 27, 2009	0.67
October 28, 2009	1.16
November 1, 2009	0.45
November 2, 2009	0.18

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
November 11, 2009	0.15
November 12, 2009	1.07
November 13, 2009	0.22
November 14, 2009	0.29
November 20, 2009	0.97
November 24, 2009	0.98
November 25, 2009	0.13
November 26, 2009	0.1
November 27, 2009	0.3
December 1, 2009	0.26
December 3, 2009	0.71
December 6, 2009	0.65
December 9, 2009	1.38
December 14, 2009	0.58
December 19, 2009	0.4
December 20, 2009	0.48
December 26, 2009	1.32
December 31, 2009	0.1
January 18, 2010	0.58
January 25, 2010	0.43
January 31, 2010	0.21
February 3, 2010	0.31
February 6, 2010	1.61
February 7, 2010	0.21
February 10, 2010	0.62
February 23, 2010	0.16
March 3, 2010	0.11
March 12, 2010	0.64
March 13, 2010	0.59
March 14, 2010	1.15
March 23, 2010	0.26
March 26, 2010	0.2
March 29, 2010	0.81
April 9, 2010	0.71
April 14, 2010	0.16
April 22, 2010	0.31
April 25, 2010	0.16
April 26, 2010	0.38
May 3, 2010	0.45
May 12, 2010	0.14
May 13, 2010	0.56
May 15, 2010	0.12
May 18, 2010	0.36
May 23, 2010	1.07
May 24, 2010	0.1

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
June 7, 2010	0.47
June 16, 2010	0.1
June 17, 2010	0.75
June 23, 2010	0.25
June 29, 2010	0.75
July 10, 2010	0.32
July 11, 2010	0.18
July 13, 2010	0.78
July 14, 2010	1.44
July 15, 2010	0.11
July 17, 2010	0.17
July 19, 2010	0.23
July 26, 2010	0.68
July 30, 2010	0.17
August 4, 2010	0.34
August 12, 2010	1.59
August 13, 2010	0.65
August 16, 2010	0.33
August 18, 2010	2.31
August 19, 2010	1.15
September 12, 2010	0.65
September 13, 2010	0.17
September 17, 2010	0.11
September 23, 2010	0.49
September 27, 2010	0.3
September 28, 2010	0.51
September 30, 2010	1.86
October 1, 2010	2.23
October 4, 2010	0.6
October 5, 2010	0.13
October 15, 2010	1.02
October 27, 2010	0.46
October 28, 2010	0.44
November 4, 2010	0.64
November 5, 2010	0.63
November 14, 2010	0.23
November 15, 2010	0.23
November 16, 2010	0.48
November 24, 2010	0.11
December 1, 2010	0.27
December 2, 2010	0.36
December 12, 2010	0.36
December 13, 2010	0.38
December 17, 2010	0.11
January 12, 2011	0.14

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
January 18, 2011	0.47
January 26, 2011	0.26
January 27, 2011	1.09
February 2, 2011	0.81
February 6, 2011	0.13
February 22, 2011	0.3
February 25, 2011	0.25
February 28, 2011	0.22
March 1, 2011	0.42
March 7, 2011	1.32
March 10, 2011	0.57
March 11, 2011	1.13
March 16, 2011	0.55
March 21, 2011	0.28
March 24, 2011	0.19
March 31, 2011	0.18
April 1, 2011	0.18
April 3, 2011	0.14
April 5, 2011	0.19
April 9, 2011	0.31
April 13, 2011	0.59
April 17, 2011	0.85
April 23, 2011	0.45
April 25, 2011	0.52
May 4, 2011	0.37
May 5, 2011	0.13
May 7, 2011	0.1
May 15, 2011	0.31
May 16, 2011	0.36
May 17, 2011	0.5
May 18, 2011	0.11
May 19, 2011	0.36
May 20, 2011	0.16
June 11, 2011	0.15
June 17, 2011	1.05
June 18, 2011	0.29
June 20, 2011	0.23
June 29, 2011	0.95
July 3, 2011	0.47
July 4, 2011	0.47
July 9, 2011	1.18
July 12, 2011	0.24
July 14, 2011	0.19
July 26, 2011	0.23
August 2, 2011	0.67

EXHIBIT 10 Rainfall Data

Date	Daily Rainfall (in)
August 7, 2011	0.88
August 8, 2011	0.17
August 14, 2011	0.51
August 15, 2011	2.91
August 19, 2011	0.39
August 22, 2011	1.78
August 26, 2011	0.53
August 28, 2011	4.47

EXHIBIT 11 MDE Chapter 5

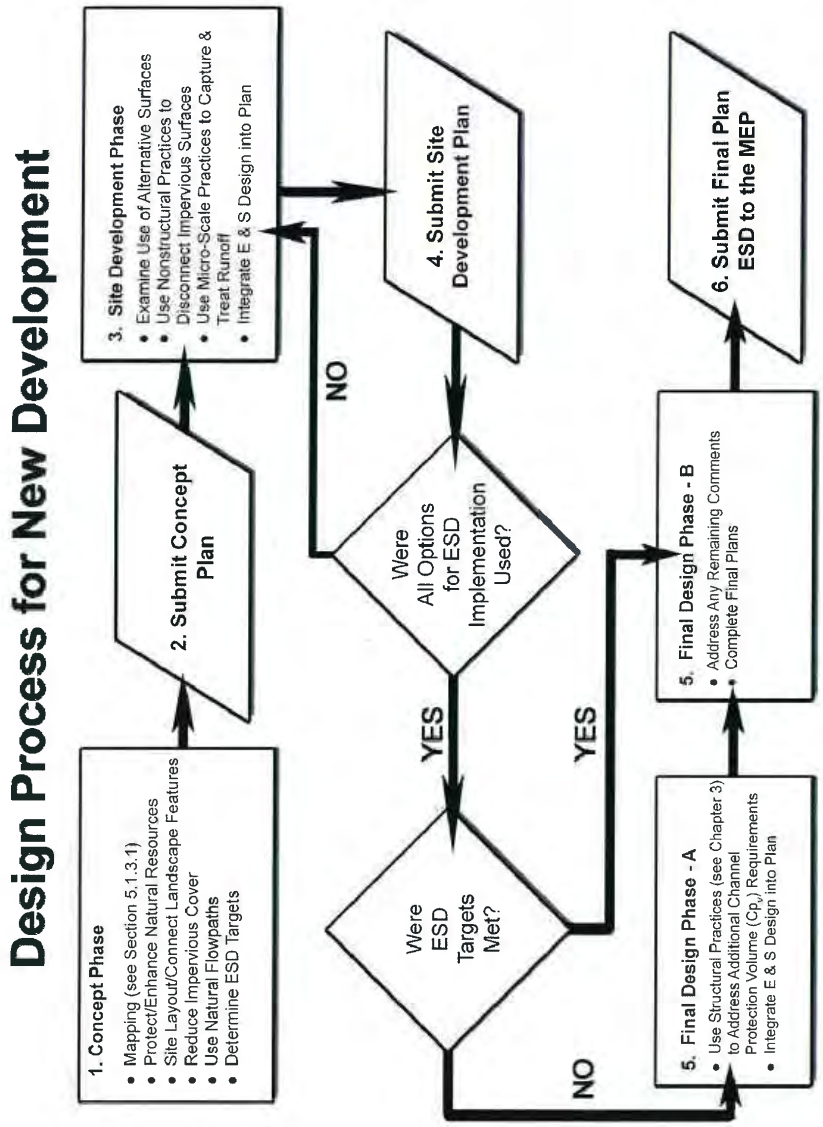
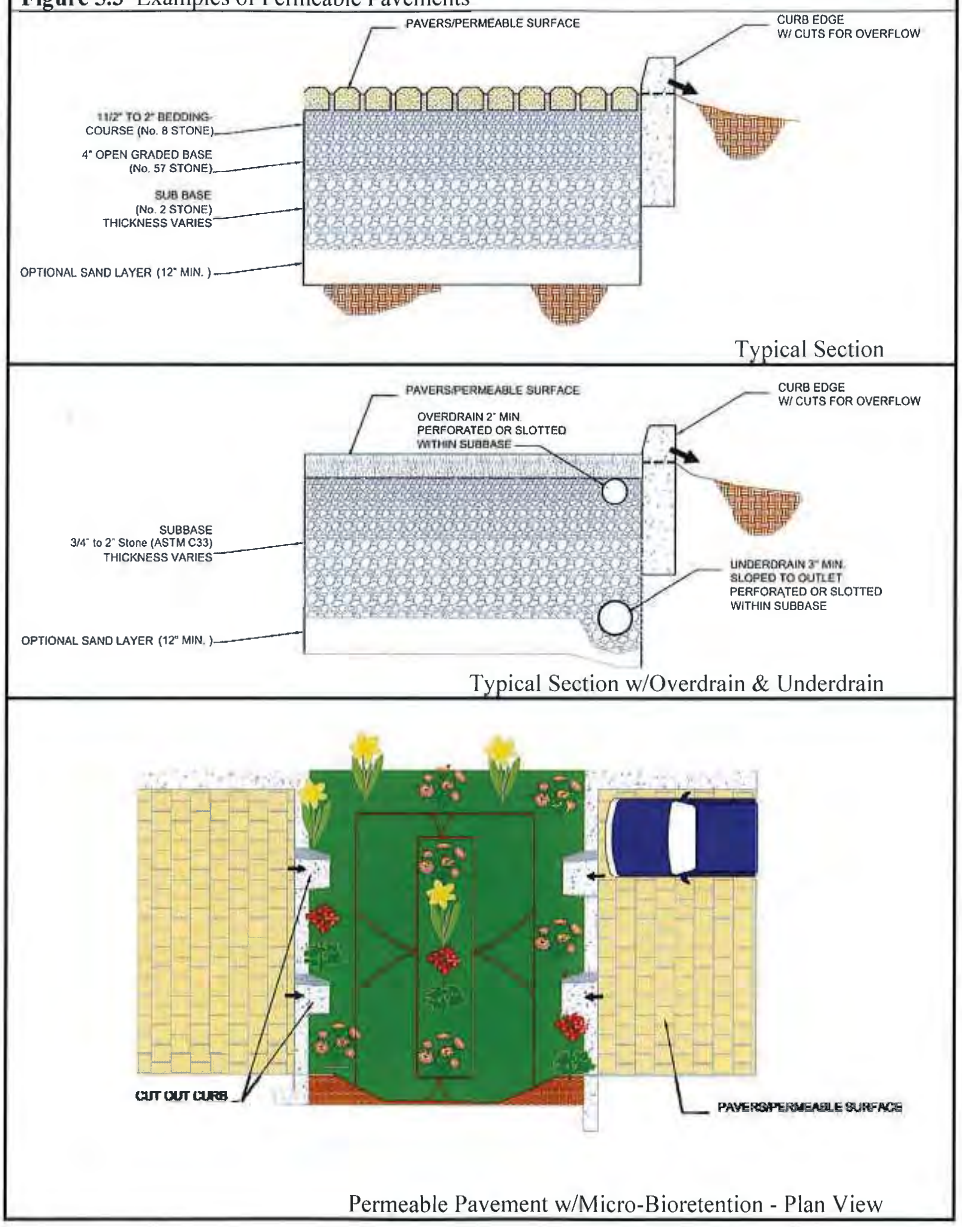


Figure 5.1 Design Process for New Development

EXHIBIT 11 **MDE Chapter 5**

Chapter 5. Environmental Site Design.....Alternative Surfaces

Figure 5.3 Examples of Permeable Pavements



5.49 Supp.1

57

EXHIBIT 11 MDE Chapter 5

Figure 5.4 Disconnection of Rooftop Runoff

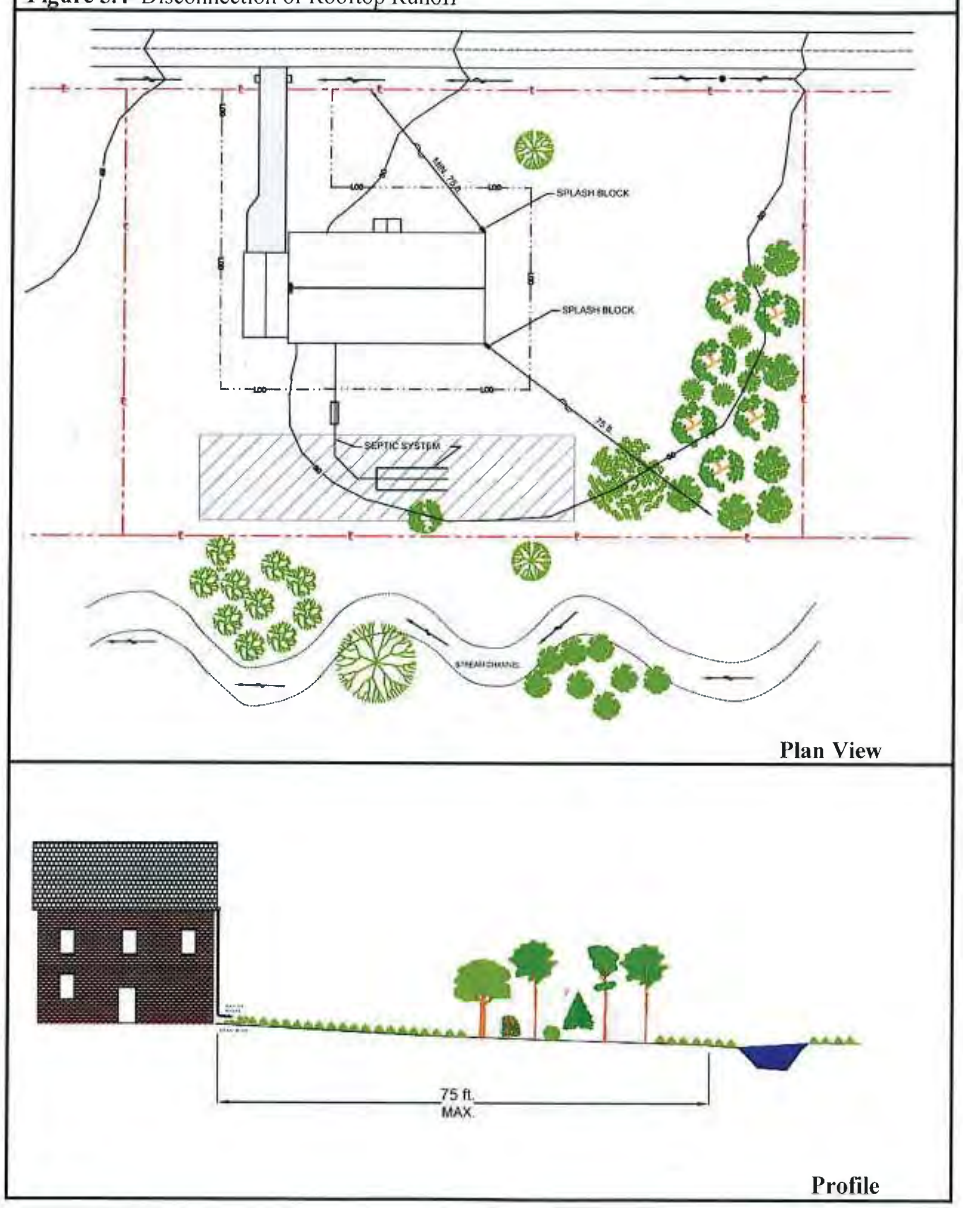


EXHIBIT 11 MDE Chapter 5

Figure 5.6 Non-Rooftop Disconnection

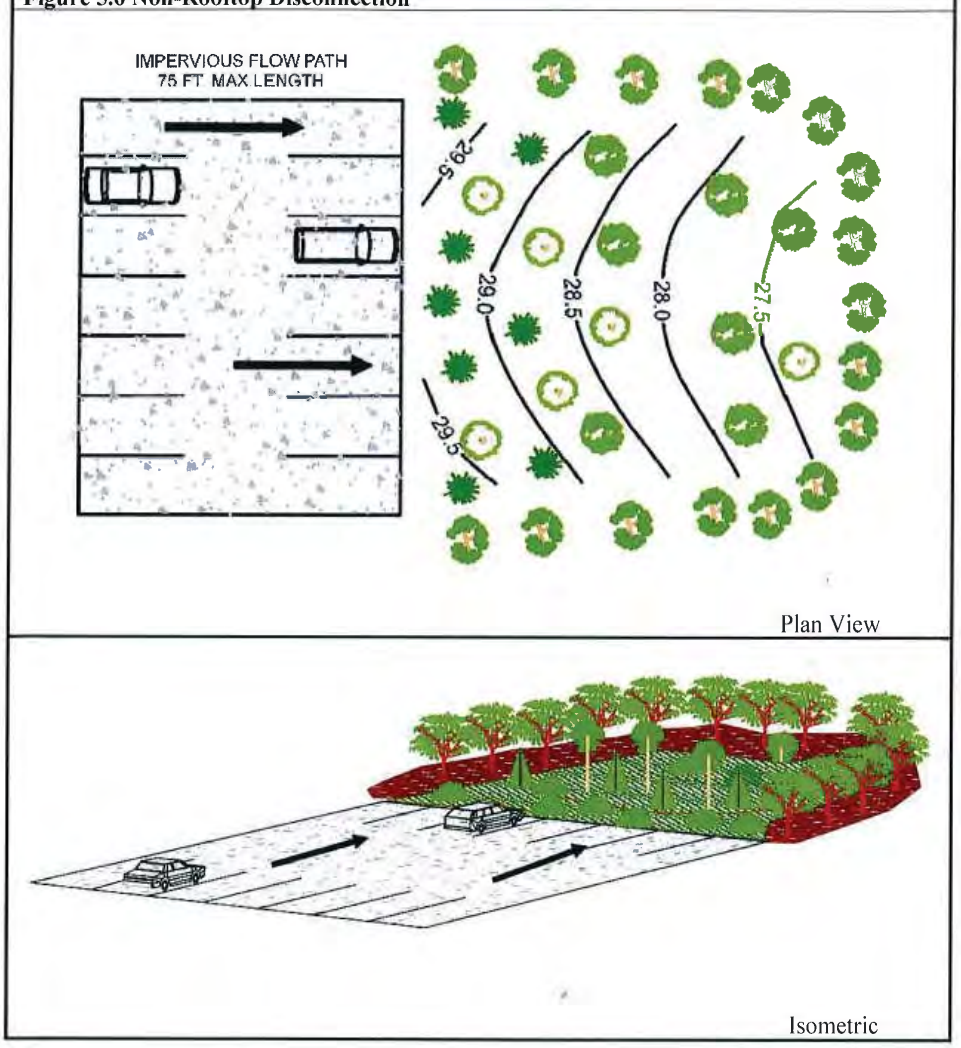
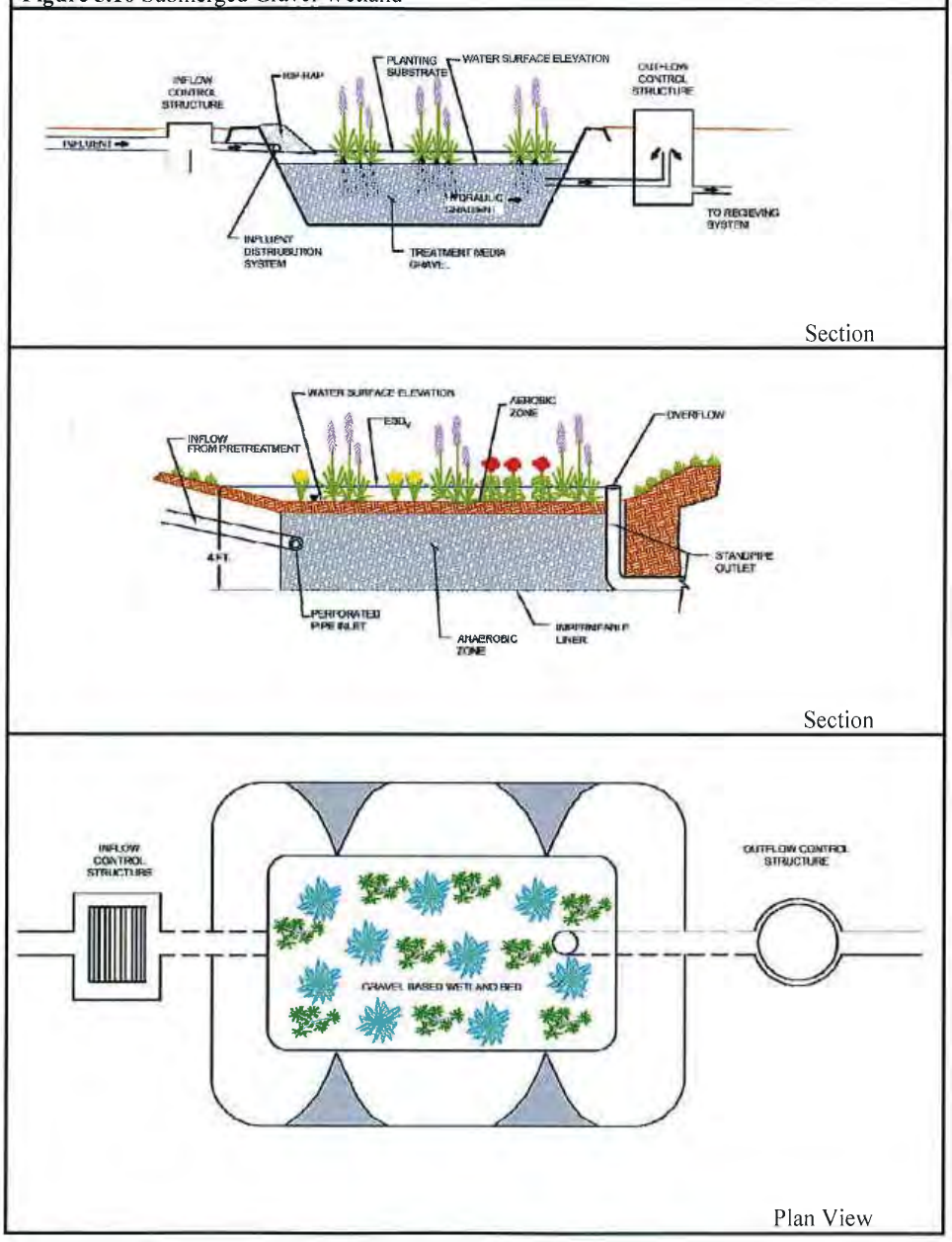


EXHIBIT 11 MDE Chapter 5

Chapter 5. Environmental Site Design.....Nonstructural and Micro-Scale Practices

Figure 5.10 Submerged Gravel Wetland

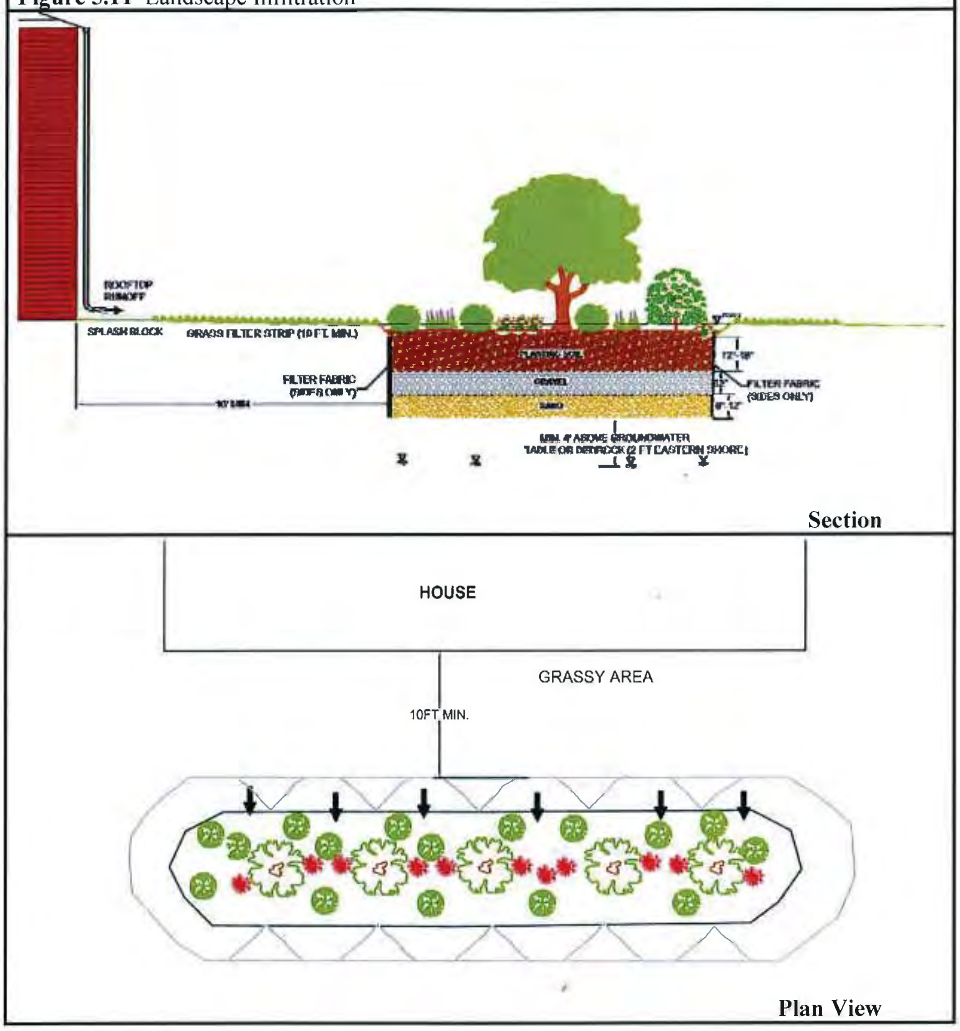


5.79 Supp.1

60

EXHIBIT 11 **MDE Chapter 5**

Figure 5.11 Landscape Infiltration

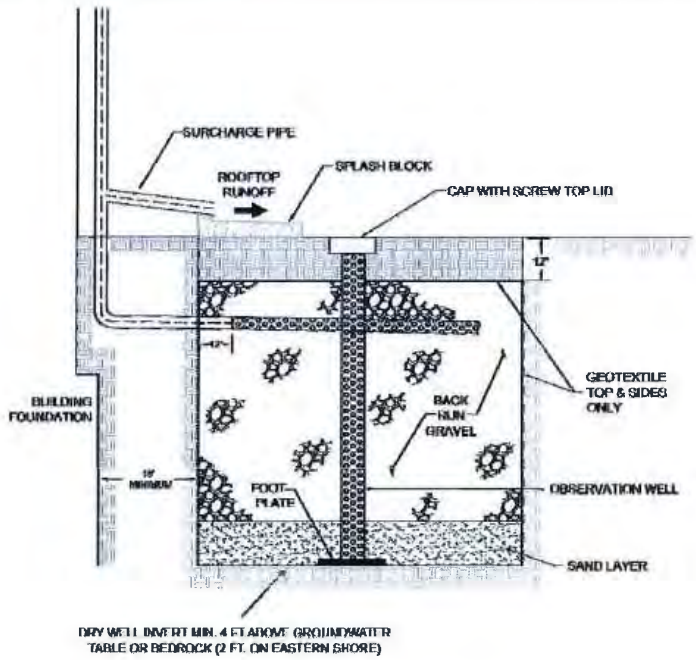


➢ **Filter Cloth:** *Filter cloth shall not be installed on the bottom of any landscape infiltration practice.*

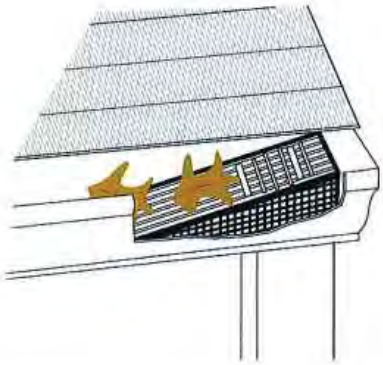
Landscape infiltration may be constructed as an excavated trench in natural ground and backfilled with sand, gravel, and planting soil. These applications should use non-woven filter cloth to line the sides of the facility to prevent clogging.

EXHIBIT 11 MDE Chapter 5

Figure 5.13 Dry Well



Section

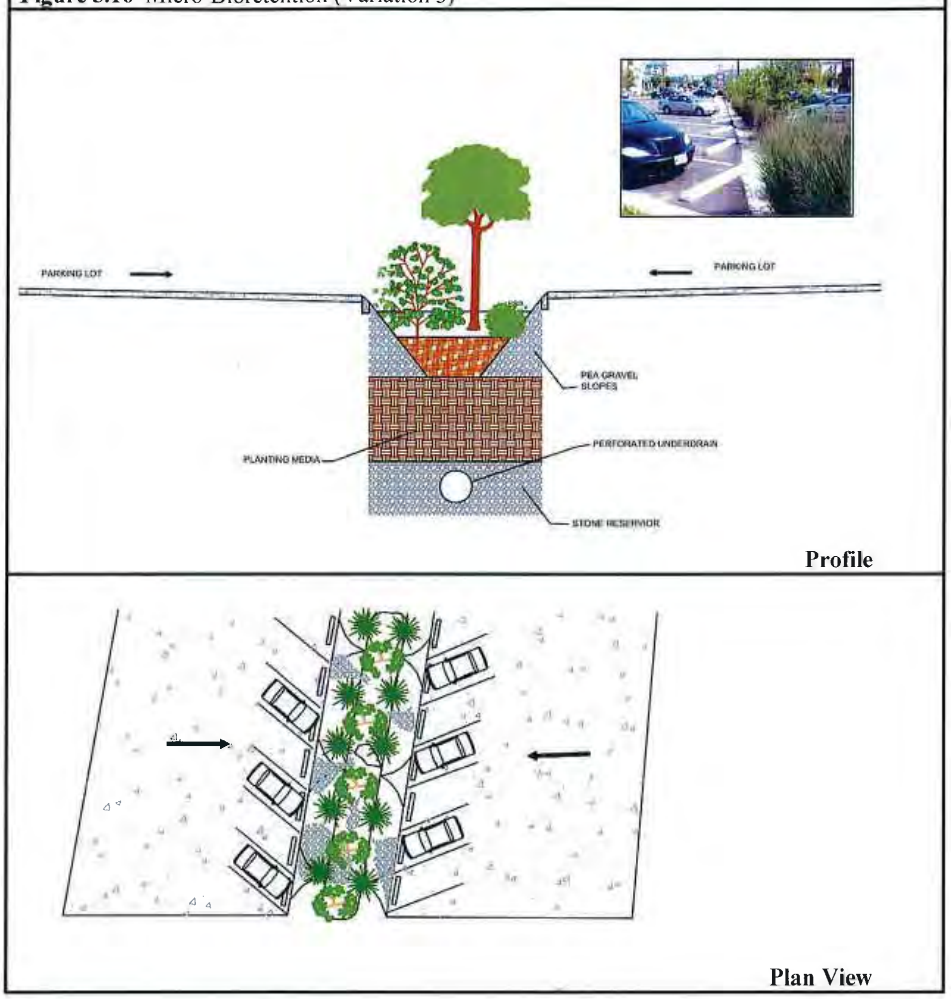


Gutter Drain Filter (Typical)

62

EXHIBIT 11 MDE Chapter 5

Figure 5.16 Micro-Bioretention (Variation 3)



Construction Criteria:

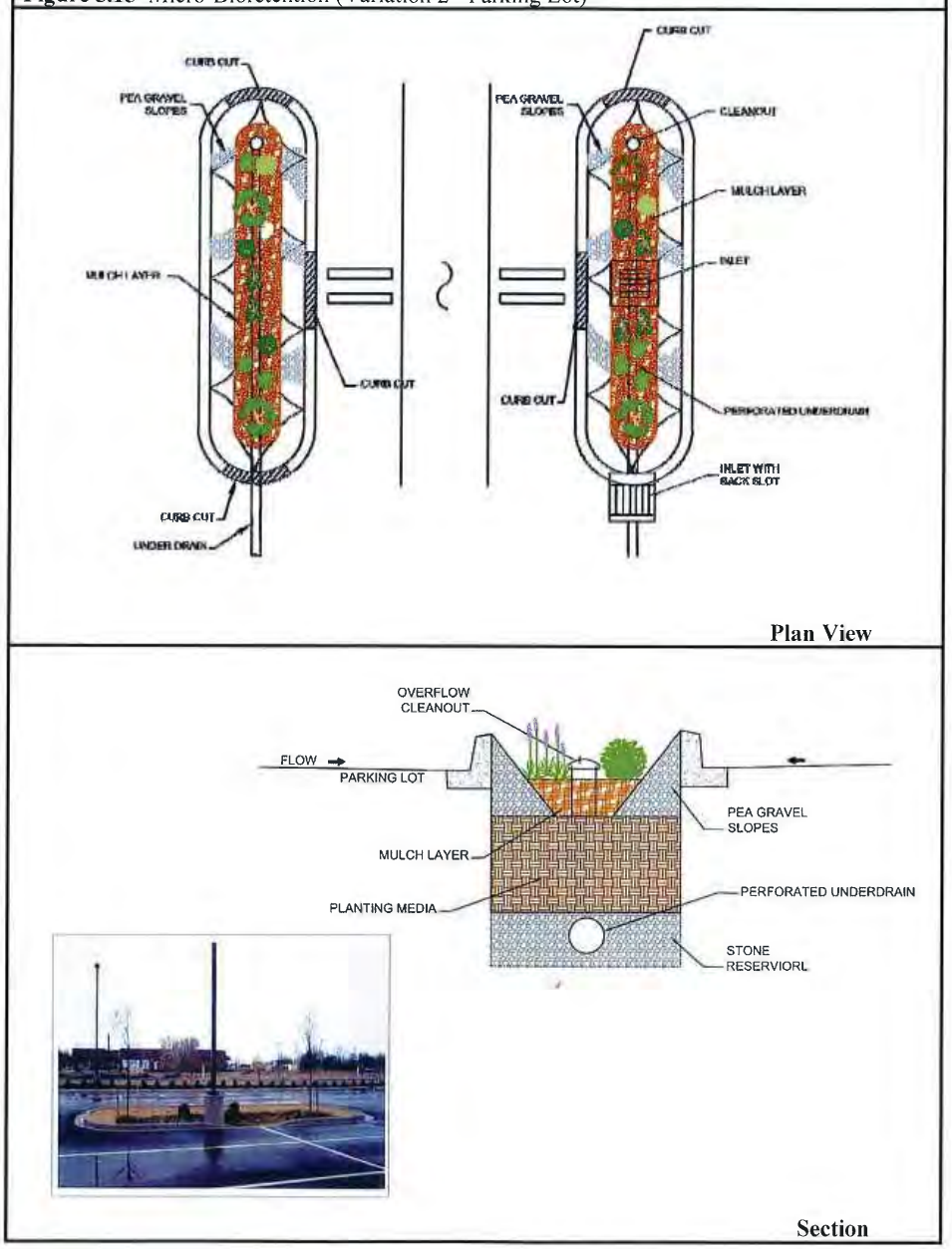
The following items should be addressed during construction of projects with micro-bioretention:

- **Erosion and Sediment Control:** Micro-bioretention practices should not be constructed until the contributing drainage area is stabilized. *If this is impractical, runoff from disturbed*

EXHIBIT 11 MDE Chapter 5

Chapter 5. Environmental Site Design.....Nonstructural and Micro-Scale Practices

Figure 5.15 Micro-Bioretention (Variation 2 - Parking Lot)



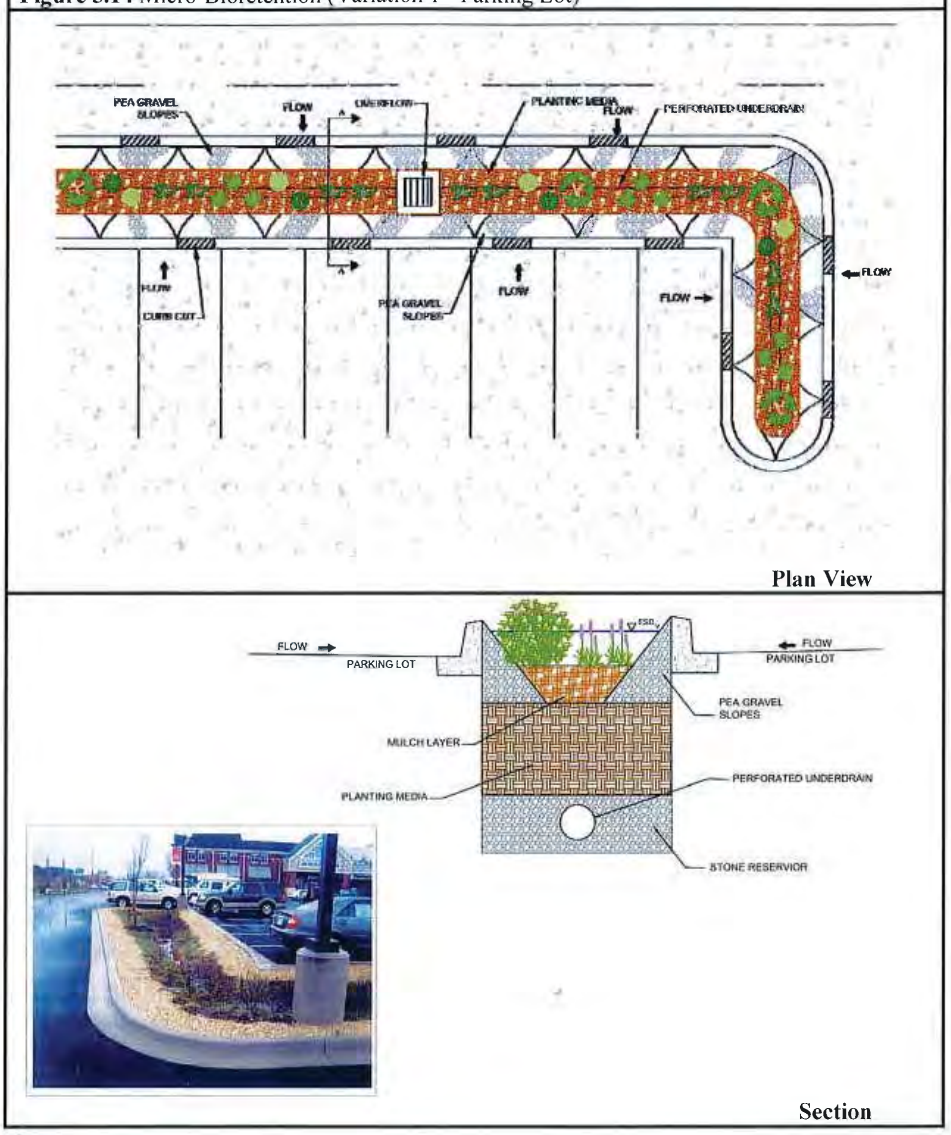
Supp. 1 5.100

64

EXHIBIT 11 **MDE Chapter 5**

Chapter 5. Environmental Site Design.....Nonstructural and Micro-Scale Practices

Figure 5.14 Micro-Bioretention (Variation 1 - Parking Lot)



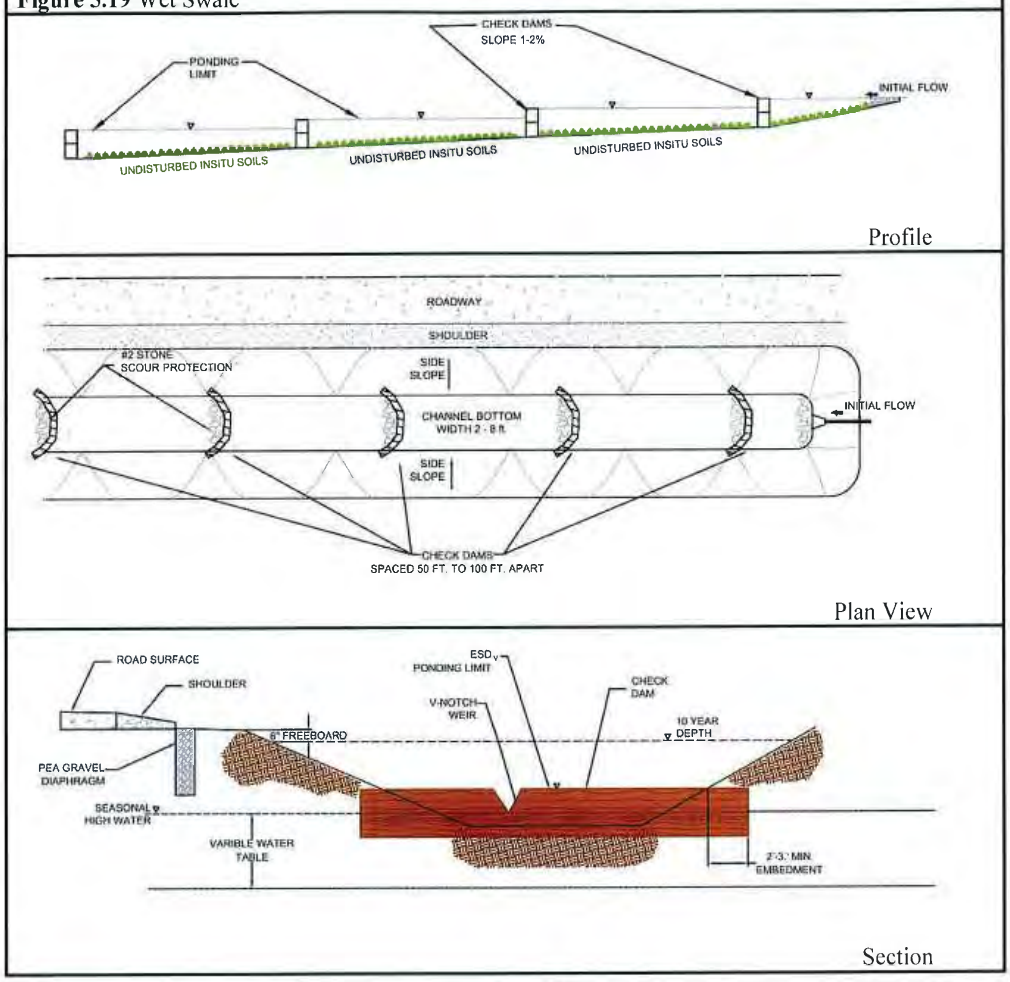
5.99 Supp.1

65

EXHIBIT 11 MDE Chapter 5

Chapter 5. Environmental Site Design.....Nonstructural and Micro-Scale Practices

Figure 5.19 Wet Swale

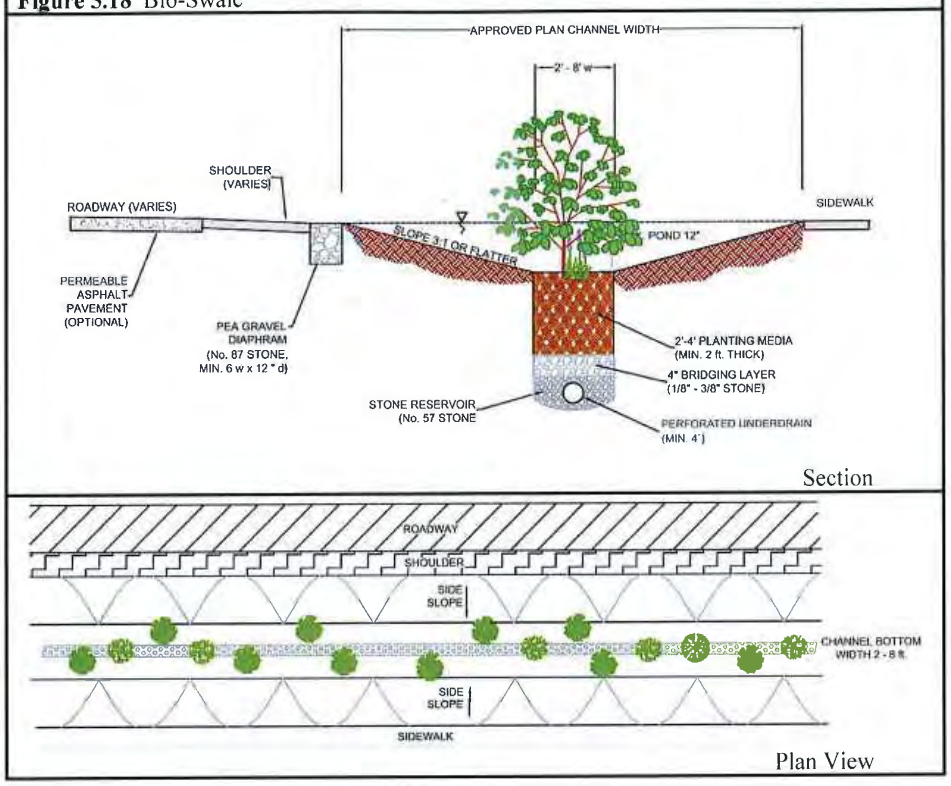


Supp. 1 5.112

66

EXHIBIT 11 **MDE Chapter 5**

Figure 5.18 Bio-Swale



Maintenance Criteria:

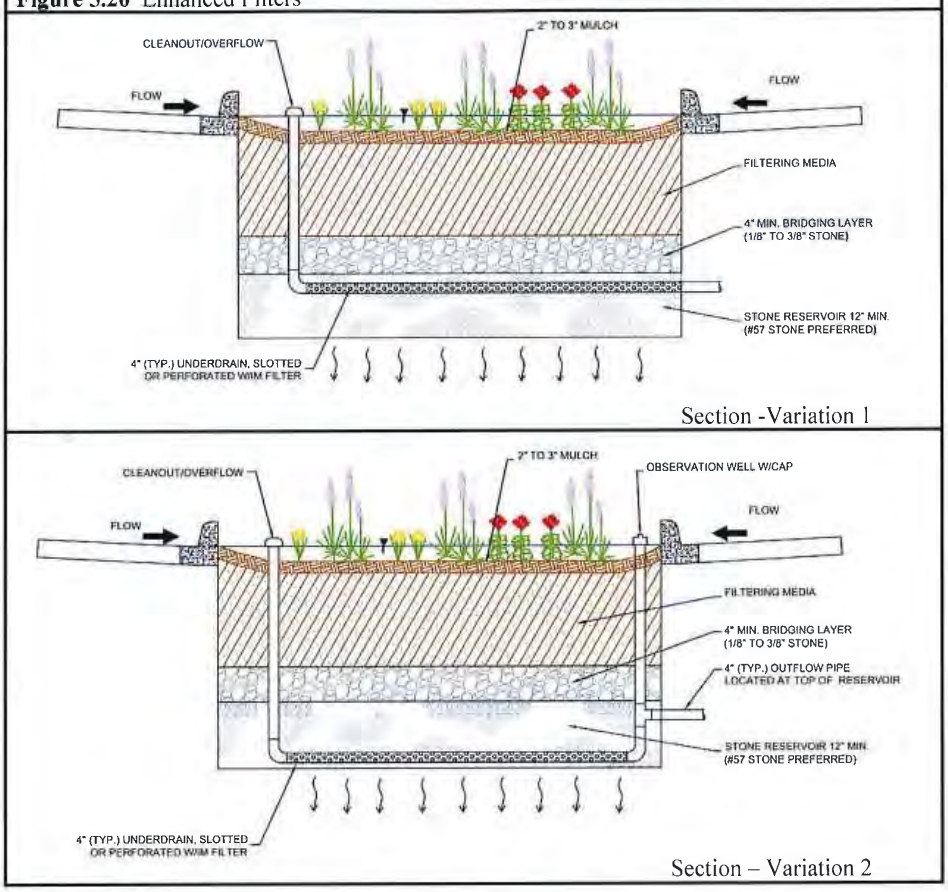
The following items should be addressed to ensure proper maintenance and long-term performance of swales:

- For grassed swales, regular mowing (at least bi-annually) is critical in order to reduce competition from weeds and irrigation may be needed during dry weather to establish vegetation. Sparsely vegetated areas need to be re-seeded to maintain dense coverage.
- If water does not drain within 48 hours, the bottom soil should be tilled and revegetated.
- Inspections should be performed once a year to assess slope integrity, vegetative health, soil stability, compaction, erosion, ponding, and sedimentation. Periodic removal of sediment, litter, or obstructions should be done as needed. Eroded side slopes and the swale bottom should be repaired and stabilized where needed.

EXHIBIT 11 MDE Chapter 5

Chapter 5. Environmental Site Design.....Nonstructural and Micro-Scale Practices

Figure 5.20 Enhanced Filters



Supp. 1 5.116

68