

New Troop Village Area Development Plan

January 2008

Final



New Troop Village

Area Development Plan

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1 Introduction

Purpose

Area Development Plans (ADPs), by definition, address the site planning of a specific area of an installation – unified by function, identity, location or architectural style. The focus of this ADP is the relocation and rebuilding of the 1400 Area as the new Troop Village.

Since this project is one that may not take place in the near-term it is something that can be used by Ft. Belvoir as a future planning tool. When the new Troop Area is funded and approved the pre-planning information needed to complete the project will be available here.

In addition to analysis, drawings, and plans, the ADP will also include details or sketches that illustrate important features of the plan - such as architectural character, recommended solutions to circulation problems, etc.

Process

Developing an ADP is an inherently flexible process. While each ADP has its own unique focus, there are eight key steps that are general to creating an ADP. The intent is to use these steps in coordination with the Leadership in Energy and Environmental



New Troop Village

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Design (LEED) for Neighborhood Development (ND) Rating System administered by the US Green Building Council (USGBC). At the time of publication LEED ND was in pilot form. The use of this program within the ADP will encourage and raise awareness of best practices in sustainable design.

- STEP 1: Set goals.
- STEP 2: Define area boundary.
- STEP 3: Define program requirements.
- STEP 4: Collect and analyze data.
- STEP 5: Develop alternative plans.
- STEP 6: Evaluate alternative plans.
- STEP 7: Develop final plan.
- STEP 8: Develop implementation plan.

Vision

The development of a new Troop Housing area on Belvoir will accomplish several goals that benefit both the installation community and the troops themselves. Moving the troops from the Lower North Post area will help bring the troops back toward the Town Center and allow them to be closer to where the main activity centers are. The move will also give the troops an entirely new village of housing with larger, more modern accommodations, and the location of the new village will reutilize some older industrial buildings that might otherwise need to be torn down.

- Establish a new troop housing area that emphasizes a sense of community
- Rebuild the area north of Jackson Loop Road with new barracks that open to the natural landscape to the west
- Explore opportunities to adaptively reuse some of the older warehouse and industrial buildings. This may include indoor training, recreational, or other amenities that would otherwise require new construction
- Develop necessary athletic/outdoor recreation areas along the southern edge of the area in coordination with the MWR Framework plan.

Figure 1-1 The Setting: New Troop Village

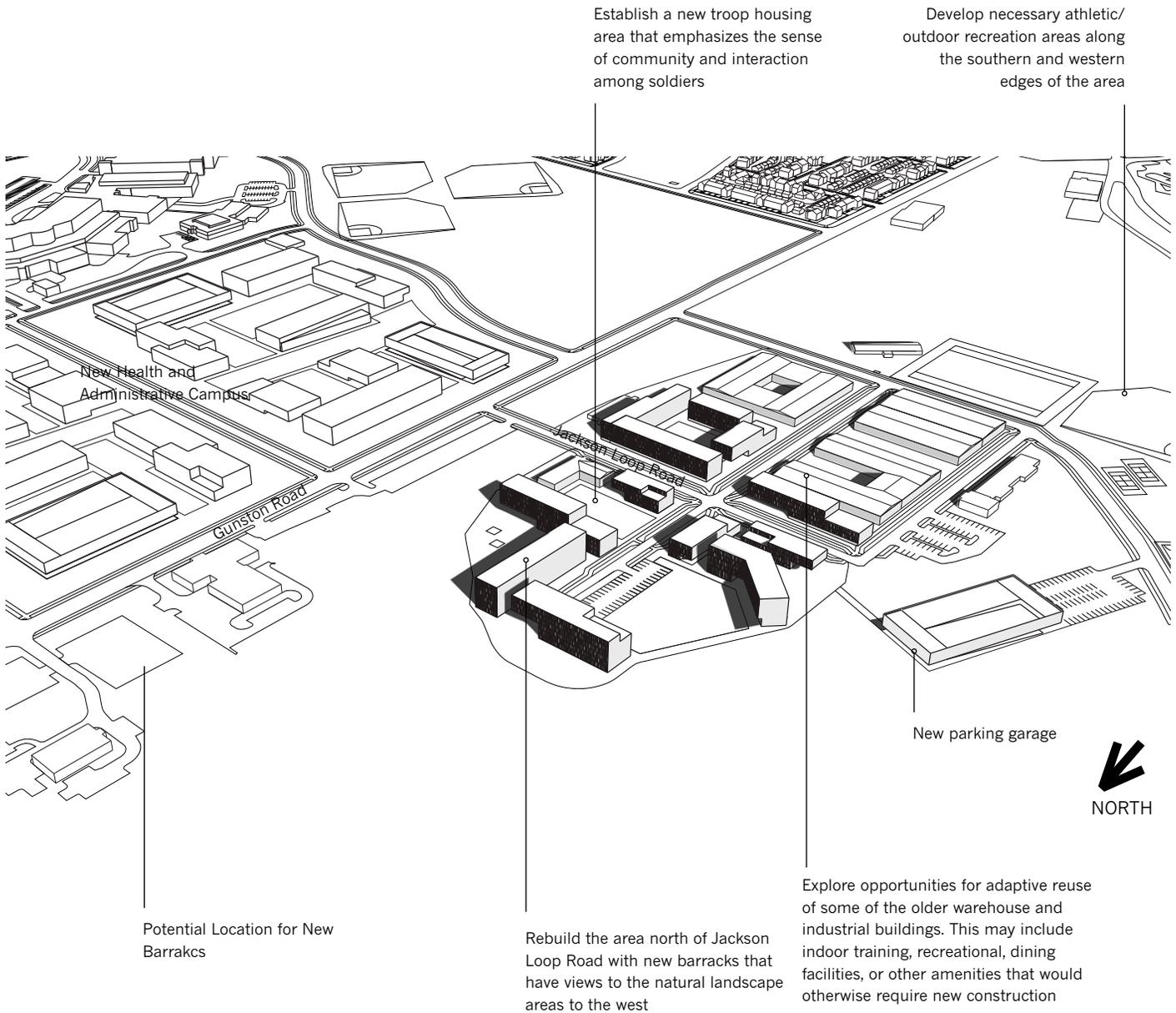
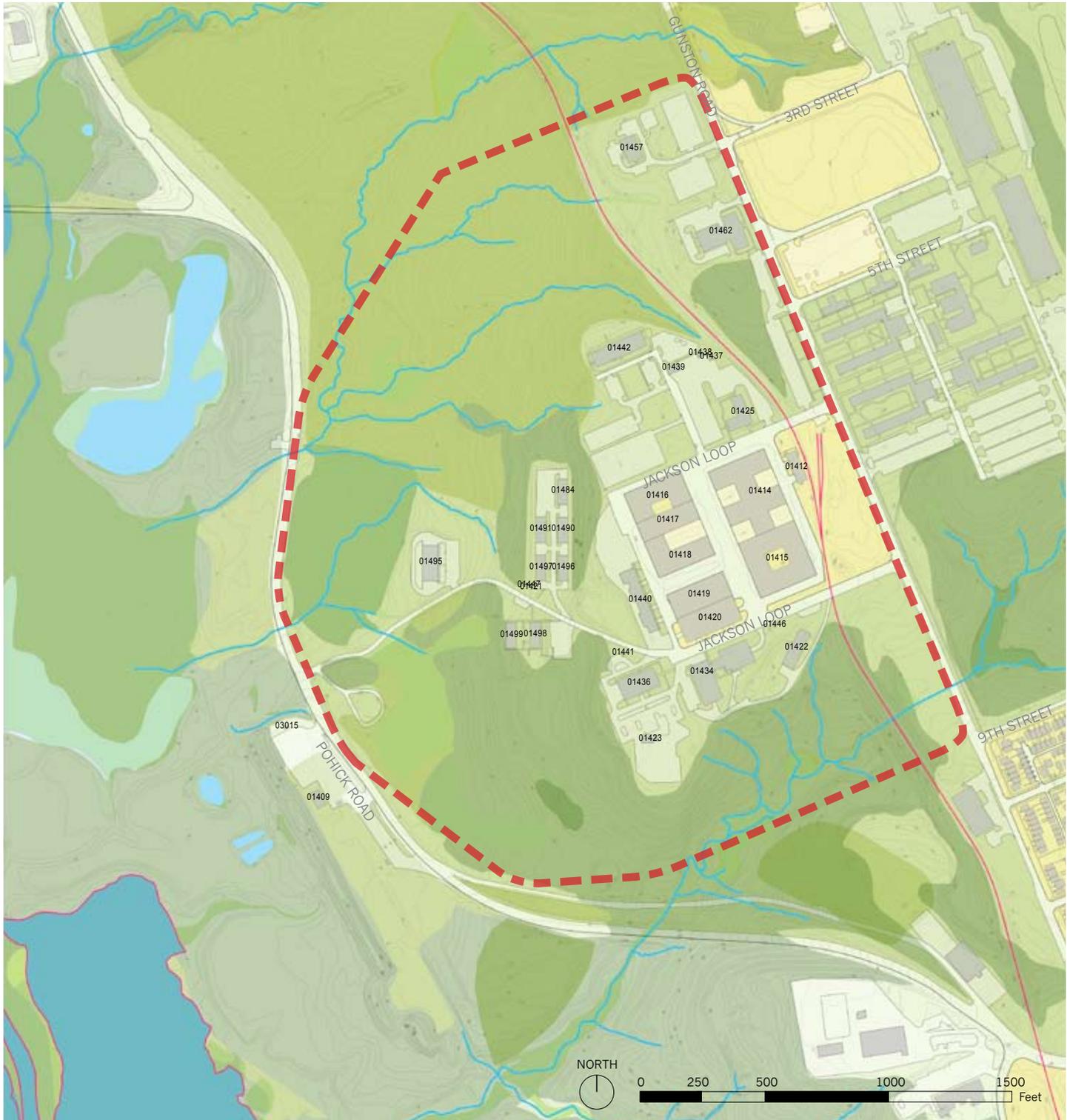


Figure 1-2 Existing New Troop Village

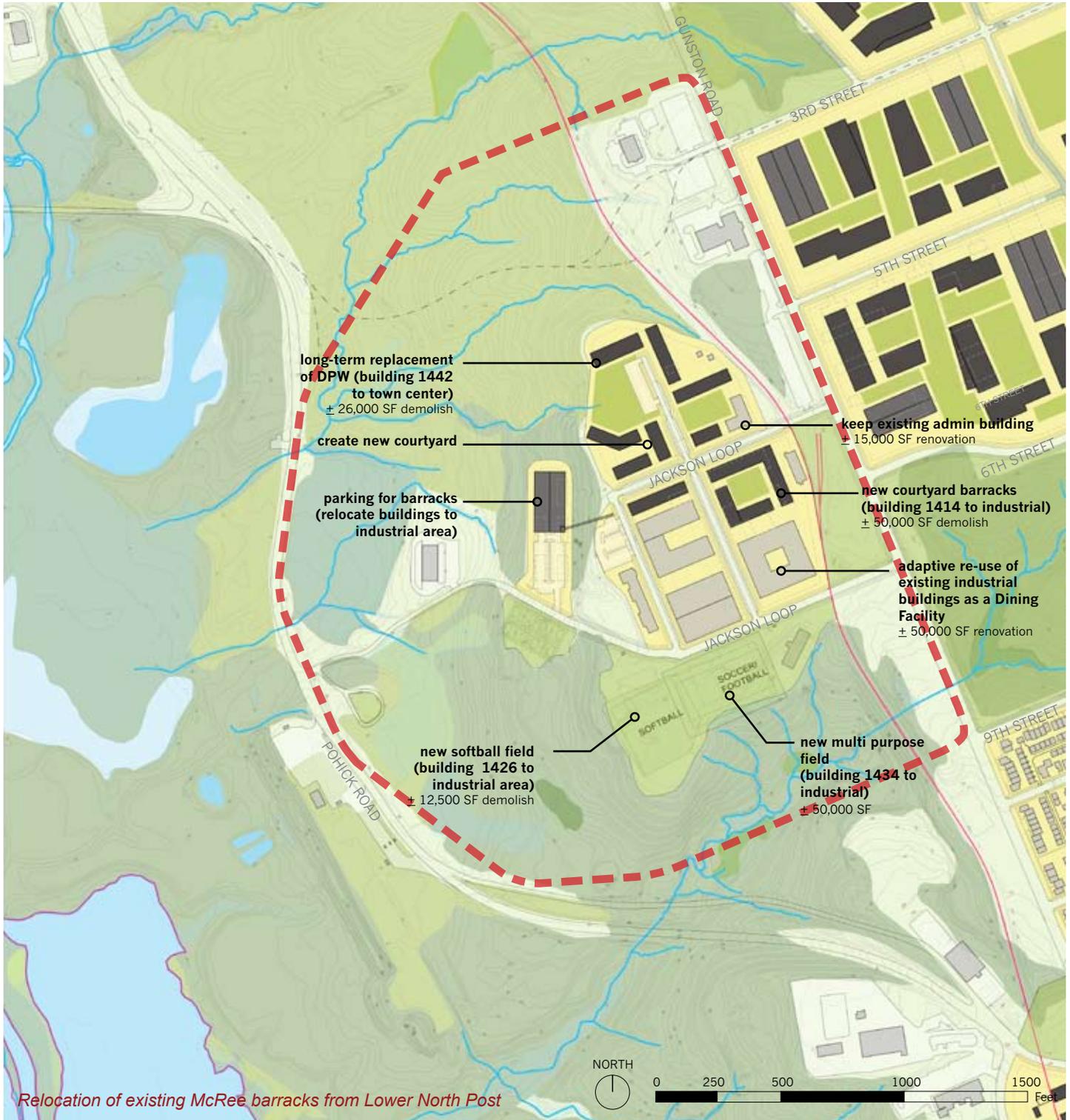


1412 INDUSTRIAL / WAREHOUSE
 1414 INDUSTRIAL / WAREHOUSE
 1415 INDUSTRIAL / WAREHOUSE
 1416 INDUSTRIAL / WAREHOUSE
 1417 INDUSTRIAL / WAREHOUSE
 1418 INDUSTRIAL / WAREHOUSE
 1419 INDUSTRIAL / WAREHOUSE
 1420 INDUSTRIAL / WAREHOUSE
 1421 SEWAGE PUMPING STATION
 1422 HEAT PLANT
 1423 STOREHOUSE, GEN PURP

1425 ADMIN. GENERAL PURPOSE
 1434 GEN INSTR BLDG
 1436 APPLIED INSTR BLDG
 1437 STOREHOUSE, FLAMMABLE MTRL
 1438 STOREHOUSE, FLAMMABLE MTRL
 1439 ADMIN, GEN PURP
 1440 GENERAL INSTRUCTION
 1441 STOREHOUSE, FLAMMABLE MTRL
 1442 ADMIN, GEN PURP
 1484 APPLIED INSTR BLDG
 1490 STOREHOUSE, GEN PURP

1491 PRINT PLANT
 1495 APPLIED INSTR, POWER TNG STA
 1496 STOREHOUSE, GEN PURP
 1497 STOREHOUSE, GEN PURP
 1498 ADMIN, GEN PURP
 1499 ADMIN, GEN PURP
 1446 TRANSFORMERS
 1447 STANDBY GENERATOR W/TANK
 1457 CIDC FIELD OFFICE
 1462 SKILL DEVL CTR, CRAFT SHOP

Figure 1-3 Long Term Proposal for the New Troop Village



- | | | |
|--|--|---|
|  Existing Buildings |  Area Development Plan Boundary |  Engineered Open Space |
|  Proposed Buildings |  Proposed Block Framework |  Previously Developed Land |
|  Future Expansion |  Streams |  Recreational Fields |
|  Proposed Parking Garage |  Forest | |
| |  Grasslands | |

2 The Setting

Location of ADP Study Limits

The boundaries of the Troop Area are Route 1 Richmond Highway to the north, Gunston Road on the east, and Pohick Road on the west and south.

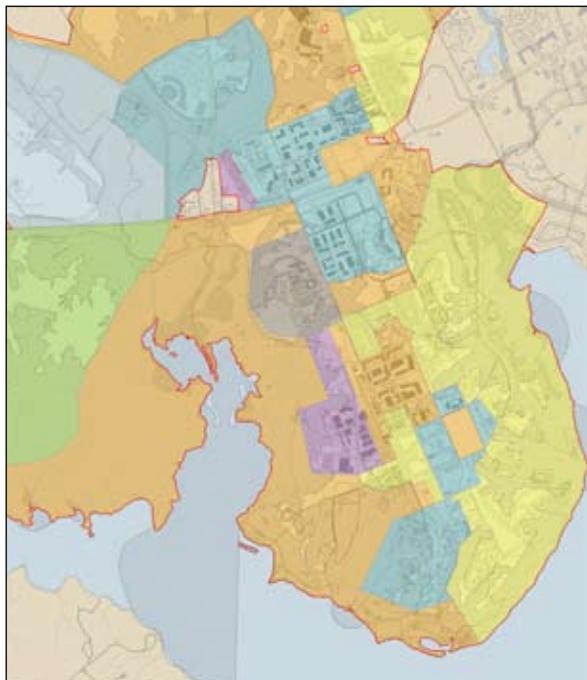
Character of ADP Study Limits

The Troop housing area features buildings for administration and warehousing at the present time. It is also surrounded by natural features especially in the underdeveloped area of the southwest portion of the area. These areas also contain some streams that lead to the Accotink Creek and need to remain undeveloped. There is however, large swaths of flat land than can be either developed or redeveloped for the new troop housing.

LRC Land Use Designation

The entire area is presently designated as Industrial Use according to the Land Use Designation in the Long Range Component (LRC) Plan for Fort Belvoir. For both 2015 and 2030 the area is labeled as Troop Use.

This land use is designated for operational facilities for TOE units, Basic Combat Training (BCT) and One Station Unit Training (OSUT) complexes and for selected Initial Entry Training (IET) complexes. The goal is to provide contiguous facilities to related organizations in order to facilitate operational readiness, to support operations security for deployable units, and to improve circulation and movement of trainees between sleeping, eating and training facilities.

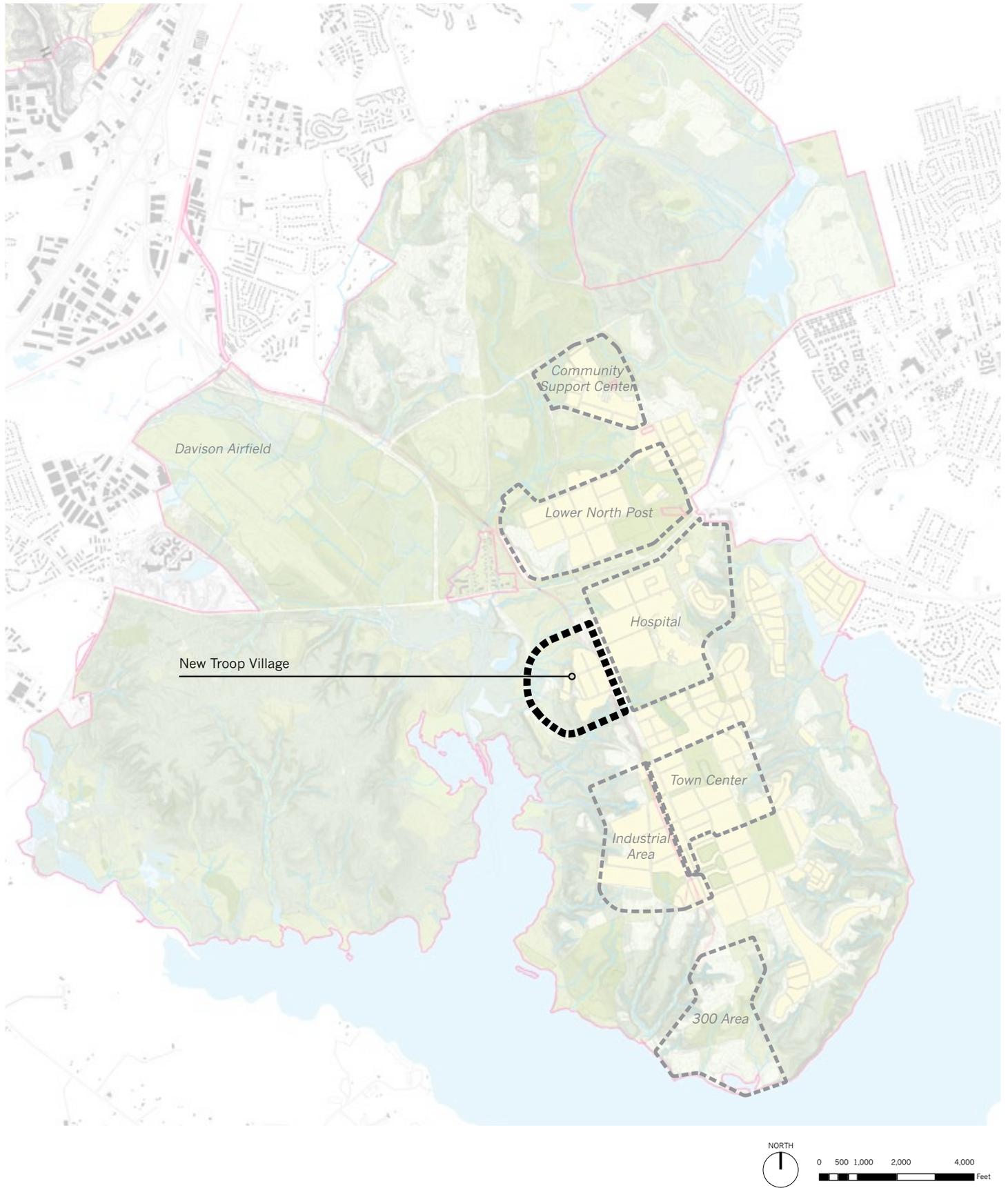


Land Use Legend

- Constrained Areas Overlay
- Main Post Installation Boundary
- Airfields (AIR)
- Community (CMY)
- Industrial (IND)
- Professional Institutional (PRO)
- Residential (RES)
- Ranges and Training (TNG)
- Troop (TRP)

Land Use Map 2030

Figure 2-1 Main Post Neighborhoods



3 Existing Site Character

Overview

This section describes the existing character of the site by analyzing its existing natural constraints, buildable areas, structures, and circulation patterns.

Fort Belvoir is a significant part of the local and regional ecosystem. All decisions affecting Fort Belvoir's wealth of natural resources have a critical impact on the surrounding environment. It is important for the New Troop Village Area Development Plan to uphold the land-use planning goals as established by the post.

The way in which Fort Belvoir manages its ecosystem requires all proposed development to understand the delicate interrelationships that exist within and outside the installation boundaries.

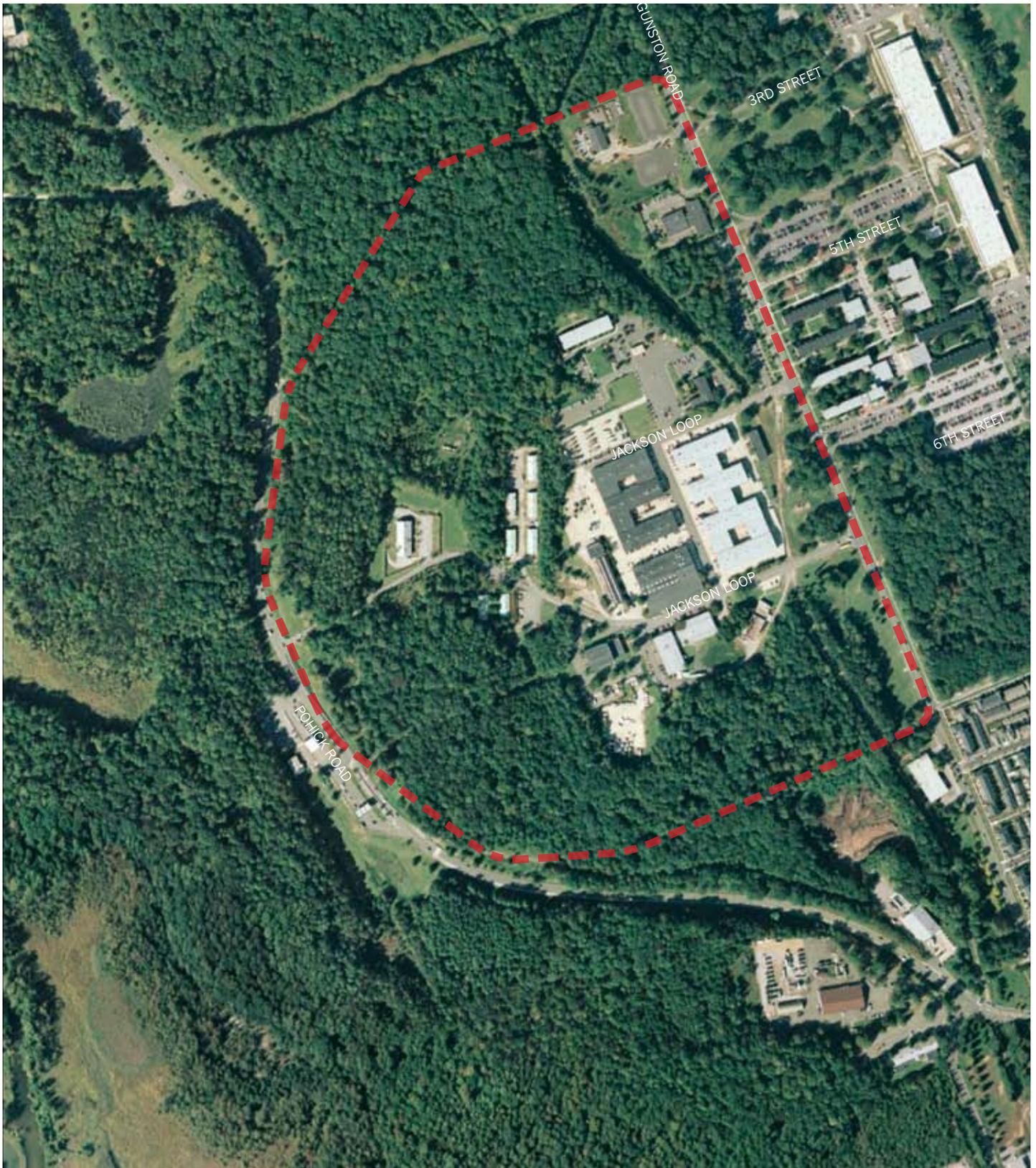


Existing Warehouses



Existing Warehouses

Figure 3-1 Aerial Today (2007)



Source- Fort Belvoir DPW GIS Department



3 Existing Site Character

Development Constraints

Discussed here are the natural, cultural, and operational constraints of the ADP study area.

From an environmental perspective, much of the plateau areas on the Troop Village Development Plan (TVDP) parcel are developable as these areas have been disturbed by prior development. However, there are natural, cultural, historical, and operational environmental constraints within the TVDP parcel. The location of TVDP parcel is illustrated on Figure 1-1. The methodology used to evaluate the environmental constraints on the TVDP parcel was to populate a constraints matrix using a GIS-based tool that calculates the acreage or number of each environmental constraint within the footprint of the TVDP parcel.

Using this methodology identified the following environmental constraints that could be affected by the developing within the TVDP parcel:

- 100 Year Floodplain Zone
- Resource Protection Areas (RPAs)
- Wetlands
- Riparian Buffers
- Special Species Area
- Grassland Management Areas
- Partners In Flight (PIF)
- Conservation Areas
- Wildlife Management Areas
- Steep Slopes
- Airfield Building Height Restrictions
- Former Training Range
- Solid Waste Management Units
- Petroleum Storage Areas
- Petroleum Release Sites
- Air Quality Permits
- Construction Permits

The constraint and the extent of these impacts are summarized in Table 3-1.

Table 3-1 Development Constraints Located in the Study Area

Resource	Size or Number	Units	Comment/Description
<i>Natural Resource Constraints</i>			
100 Year Floodplain	0.1	Acres	Avoid where possible. Construction of habitable structures is not permitted in these areas.
Resource Protection Areas (RPAs)	22.1	Acres	Avoid where possible. Coordinate with Fort Belvoir ENRD to be in compliance with Chesapeake Bay Program.
Wetlands	15.9	Acres	Avoid where possible. Permit may be required if impacting wetlands. Costs for wetland banking. Jurisdictional review by the USACE and VDEQ.
Riparian Buffers	25.2	Acres	Implement Low Impact Development (LID) in these areas if avoiding completely is not possible.
Special Species Area	0.7	Acres	Avoid developmental impact on the area to help ensure the survival of the rare plant species communities.
Grassland Management Area	3.3	Acres	Negligible impact on this resource would be expected, however, ideally, no net impact would be expected if similar habitat elsewhere on Fort Belvoir were to be set aside for preservation.
Partners In Flight	32.2	Acres	Negligible impact on this resource would be expected, however, ideally, no net impact would be expected if similar habitat elsewhere on Fort Belvoir were to be set aside for preservation.
Conservation Areas	64.6	Acres	Negligible impact on this resource is expected, however, ideally, no net impact would be expected if similar habitat elsewhere on Fort Belvoir were to be designated for preservation.
Wildlife Management Areas	0.1	Acres	Avoid. Development cannot occur in the Accotink Bay Wildlife Refuge.
Steep Slopes	2.3	Acres	Engineering practices may allow for construction on steep slopes should unconstrained land nearby not be available.
<i>Operational Resource Constraints</i>			
Airfield Restrictions	approx. 96-190	Feet	See Appendix for Airfield discussion. Further site studies should be done once the site is selected.
Former Training Range	62.6	Acres	62.6 acres of active and deactivated military ranges in the southern and western portions of within the TVDP parcel. The 2 former training ranges are known as the Operational Training Area and the Gunston Road 1000 inch Rifle Range. The ranges do not contain UXOs. Elevated lead levels were identified in soil during the site investigation. Additional investigations are required to delineate the impacts.
Petroleum Storage Areas (PSAs)	52	Each	There are 22 active and 30 inactive PSAs in the TVDP parcel. These could be aggressively addressed as part of the site preparations. A closure process involving administrative and decontamination process will be required. Confirmation samples collected beneath USTs and potentially some ASTs will likely be required to demonstrate no release has occurred. It can be expected that some USTs will have a release previously undiscovered. Mitigation measures could be integrated into the construction phase of the project in concert with the site preparation and earthwork features for minimal impact to the overall construction schedule.
Petroleum Release Sites (PRSs)	15	Each	Petroleum releases were discovered at these locations, pollutant complaint numbers (PC #s) were assigned by the VDEQ, and various corrective actions/remediation occurred at the sites. Any disturbance to the subsurface soil at these sites may require environmental remediation actions. Intrusive activities at the sites would require a Health and Safety Plan be prepared specifying construction workers protection and monitoring requirements at the site(s). PRSs located within a proposed building envelope could be aggressively addressed as part of the site preparations. Mitigation measures could be integrated into the construction phase of the project in concert with the site preparation and earthwork features for minimal impact to the overall construction schedule. Excavation and sampling of petroleum impacted soils areas will likely be the most effective manner to address these PRSs within an aggressive time frame.
<i>Other Environmental Regulatory Considerations</i>			
Air Quality	N/A	Not Applicable	Air quality permitting requirements will require all development be involved in calculating pollution loads and determining most prudent air permitting course of action. The threshold value of 100 tons of NOx per year would trigger additional permitting requirements for large Fort Belvoir development projects.
Construction Permits	TBD	Not Applicable	Disturbance of wetlands; would require permit. Sediment and Erosion Plan and Registration Statement also required for development projects.

Natural Constraints

Fort Belvoir's natural environment is a complex area where several ecological sub-regions converge, resulting in a diversity of environmental conditions, habitats, and climate. See Figures 3-3 and 3-4.

100 Year Floodplain. The TVDP parcel includes 0.1 acres of floodplains (Figure 3-2). There should be little or no impact to floodplains on this area, which is located along Pohick Rd, the western boundary line of the TVDP land parcel. Building in this area should be avoided.

Resource Protection Areas (RPAs). The TVDP parcel includes 22.1 acres of Resource Protection Areas (RPAs), which are shown on Figure 3-3. The RPAs are located along perennial and intermittent streams in the southeastern corner and along the western boundary of the TVDP parcel. Habitable development in these areas should be avoided. Any proposed road and bridge corridor crossing that would go through the RPAs are permitted but should be minimized.

Wetlands. The TVDP parcel includes 15.9 acres of wetlands (Figure 3-3). The majority of wetland areas are located along Pohick Rd, which is also the western boundary of the TVDP parcel. The other wetland areas can be found in the southern part of the TVDP parcel along a small network of intermittent and perennial streams.

The wetlands on Figure 3-3 are used for planning purposes only and have not been jurisdictionally delineated. Construction in jurisdictional wetlands is possible but requires obtaining a Section 404 permit from the Corps, and mitigation such as wetland creation or banking.

Riparian Buffer Areas. The TVDP parcel includes 25.2 acres of riparian areas (Figure 3-3), which generally overlap the RPAs along perennial drainages.

Because of the importance of riparian areas as buffers for runoff filtration for water quality and habitat, these areas should be avoided. If development in riparian areas is unavoidable, low impact development (LID) practices should be incorporated into design.

Special Species Areas. The TVDP parcel includes 0.7 acres of sensitive fauna habitat (Figure 3-4). The sensitive flora habitat is a coastal plain piedmont acidic seepage swamp, located by the southern boundary of the TVDP area. A negligible impact on this resource would be expected.

Grassland Management Areas. The TVDP parcel includes 3.3 acres of grassland management areas which are divided into 3 separate areas; the largest grassland area is northwest of Jackson Loop, while the two smaller areas are located along Sharon Lane Rd and by Pohick Rd, the southern boundary of the TVDP parcel (Figure 3-4).

This area is included within the boundaries of partners in flight buffers and established riparian buffer zones. A negligible impact on this resource would be expected, however, ideally, no net impact would be expected if similar habitat elsewhere on Fort Belvoir were to be designated for preservation.

Partners In Flight Areas. The TVDP parcel includes about 32.2 acres of PIF avian habitats (Figure 3-4) in the north half of the proposed development area. No net impact would be expected if potential PIF habitat elsewhere on Fort Belvoir were to be set aside for preservation.

Conservation Area. The TVDP parcel includes 64.6 acres of conservation areas in the northern, western, and southeastern portions of the proposed development area (Figure 3-4). Almost 50 percent of the TVDP parcel is designated as Accotink/Pohick Wetland Conservation Area. A negligible impact on this resource would be expected, however, no net impact would be expected if similar habitat elsewhere on Fort Belvoir were to be designated for preservation.

3 Existing Site Character

Wildlife Management Area. The TVDP parcel includes about 0.1 acres of wildlife management areas (Figure 3–4) in the western portion of the proposed development area along Pohick Rd. The Accotink Bay Wildlife Refuge (ABWR) was established in 1979 and covers 1,360 acres of freshwater tidal marsh and climax hardwood forest adjacent to Accotink Bay. The ABWR areas are habitat for several rare animals, plants, plant communities, and habitats, including the bald eagle, peregrine falcon, and wood turtle. The refuge also overlaps with other natural constraints such as some PIF priority bird species buffers and RPAs. These areas should be avoided.

Steep Slopes. The TVDP parcel includes 2.3 acres of steep slopes, which are mostly located along unnamed tributaries of Accotink Creek in the southern portion of the TVDP parcel and along Pohick Rd, as well as along the northern boundary inside the PIF area. Steep slopes should be avoided, however engineering practices that allow for construction on steep slopes may be permitted should unconstrained land nearby not be available.

Operational Constraints

Airfield Restriction 150 ft and 500 ft Building Height Restrictions. The entire development area of the TVDP parcel (130.4 acres) is situated within the building height restrictions zone for Davison Army Airfield (DAAF). 77.8 acres restricts building heights to no greater than 150 ft above the runway and 52.6 acres restrict building heights to no higher than 500 ft above DAAF ground surface level. The restrictions are relative to the airfield runway elevation of 73 feet above mean sea level (Figure 3–5). Designs in the TVDP parcel should reflect the site-specific building height restrictions.

If buildings taller than six stories are considered, airfield operations should be consulted.

Former Training Ranges. The TVDP parcel includes approximately 62.6 acres of former training range (Figure 3–5). There are two separate ranges within the TVDP parcel. The first is the Gunston Rd 1000 Inch Rifle Range. The range is approximately 4 acres in size and was used primarily for rifle practice for firearms that used rounds as large as .50 caliber. The range was in use from 1940 to 1946 and was decommissioned around the early 1950s. Based on the use of the range as a rifle range and military operations range, costly UXO removal is not warranted. Depending on the time frame of development for this area, this range may be addressed under the Military Munitions Response Program (MMRP) prior to development. The remaining range area is part of the active Operational Range Area (Figure 8). The active operational range area status would have to be changed to inactive prior to any development.

Solid Waste Management Units (SWMUs). The TVDP parcel includes 16 SWMUs which are scattered throughout the development area (Figure 3–5). Table 3–2 summarizes the SWMUs. Mitigation for these SWMUs range from administrative closure to site investigation including soil and groundwater sample collection and analysis. The cost estimates for the investigation of these SWMUs is about \$250,000 and if fully funded would take about a year to complete. However, for those sites requiring confirmation sampling or site investigation, subsequent cleanup requirements can only be determined following analysis of the samples to determine if additional corrective action is required.

3 Existing Site Character

Table 3–2 SWMUs on Troop Village Development Parcel

SWMU_ID	SWMU Description
N-24	Former oil/water separator located on a concrete pad next to Building 1422
N-08	Inactive storage unit located within Building 1434 SE corner of the building
E-06	Former site consisted of five 55-gal drums stored on a metal rack.
B-09	Former Storage area used to store electrical transformers that contained PCBs
B-16	Building 1490 is used as a hazardous materials (pesticides) storage facility.
L-43	Outdoor/underground unit consists of a series of manholes, ditches, storm water management ponds, and underground piping
L-42	80 miles of underground gravity flow pipe network
N-10	Two 1,000-gallon single-walled steel underground storage tanks used to store waste oil
G-13	Consists of a series of trench drains in Building 1462
N-13	Building 1490 is currently used as a hazardous waste storage facility, had waste containment cells
L-32	Active indoor/outdoor dust collector is on the north side of Building 1462.
G-07	1,000-gallon single-walled steel waste oil underground storage tank located approximately 8 feet southwest of Building 1462
N-19	The oil/water separator is enclosed on concrete pad in north parking lot of Building 1462.
L-25	Building 1462 and consists of a series of trench drains
L-38	475 to 525 steel dumpsters 2 to 33 yds^3 that are located throughout the facility.
E-03	Active site is used as a recycling dump point for used oil and used antifreeze and storage of three (3) metal carts.

Petroleum Storage Areas (PSAs). 52 PSAs have been identified on the TVDP parcel (Figure 3–5). Table 3–3 identifies all the active tanks and Table 3–4 identifies the inactive tanks on the LNPDP parcel. Mitigating these PSA constraints is a straightforward decommissioning process. Many of the open PSAs are unregulated, so a costly formal closure process can be avoided. On average, 1 in 3 USTs at Fort Belvoir have had a release so it can be expected that some USTs will have a release previously undiscovered. This mitigation measure could be integrated into the construction phase of the project in concert with the site preparation and earthwork features for minimal impact to the overall construction schedule.

Table 3–3 Active Petroleum Storage Areas in Troop Village ADP

ACTIVE			
TANK_ID	TANK_ID	TANK_ID	TANK_ID
01462C	01422Q	01495G	01420C
01417A	01422R	01416A	01412A
01421B	01422T	01420A	01412B
01422P	01436C	01420B	01416B
01420G	01420F	01420E	01420D
01436D	01422S		

Table 3–4 Inactive Petroleum Storage Areas in Troop Village ADP

INACTIVE			
TANK_ID	TANK_ID	TANK_ID	TANK_ID
01462A	01422K	01491A	01427A
01453A	01422L	01418A	01434A
01439A	01422M	01422G	01434B
01442A	01422N	01422H	01440B
01422J	01422O	01422I	01453B
01453C	01462B	01495D	01436A
01436B	01460C	01421A	01460A
01460B	01495E		

Petroleum Release Sites (PRs).

15 PRS have been identified in the TVDP parcel. Figure 3–5 illustrates their locations. Petroleum releases were discovered at these locations, pollutant complaint numbers (PC #s) were assigned by the VDEQ, and various corrective actions/remediation occurred at the sites. Any disturbance to the subsurface soil at these sites may require environmental remediation actions. Intrusive activities at the sites would require a Health and Safety Plan be prepared specifying construction workers protection and monitoring requirements at the site(s).

PRs located within a proposed building envelope could be aggressively addressed as part of the site preparations. Mitigation measures if required could be integrated into the construction phase of the project in concert with the site preparation and earthwork features for minimal impact to the overall construction schedule. Excavation and sampling of petroleum impacted soils areas will likely be the most effective manner to address any residual contamination associated with these PRs within an aggressive time frame.

This constraint can be mitigated by employing a Health and Safety Program including qualified industrial hygienists and a HSP. Most large construction firms are experienced in this area. The cost estimates for a Health and Safety Program to adequately address this issue are not considered significant as the specifications of the construction project itself will likely require a HSP. This requirement can be incorporated into the construction program without adding significant costs.

Other Environmental Constraints

Air Quality. If the pollution loads of a single proposed development in the TVDP exceed the threshold standard of 100 tons of NOx per year, a Nonattainment New Source Review (NNSR) would be required. The reviews typically take 18-24 months to complete. If engineering controls such as

selective catalytic recovery can be specified in the design of the backup power generator the pollution load can be lowered. The issue is installation-wide so Fort Belvoir should work with future tenants to address this critical path issue.

Fort Belvoir is currently near the threshold of their current Title V permit. Disaggregating emissions sources and permitting processes is a novel approach that requires support from VDEQ. However, disaggregation should be examined further for this program as a possible form of mitigation.

Construction Permits. Construction activities that disturb wetlands and stream crossing would require a wetland permit. Fort Belvoir’s development contractor would also need to prepare and submit a sediment and erosion control plan to Fort Belvoir DPW-ENRD for approval as Fort Belvoir holds an MS4 Permit and self-regulates in this arena.

3 Existing Site Character

TVDP Parcel Conclusions

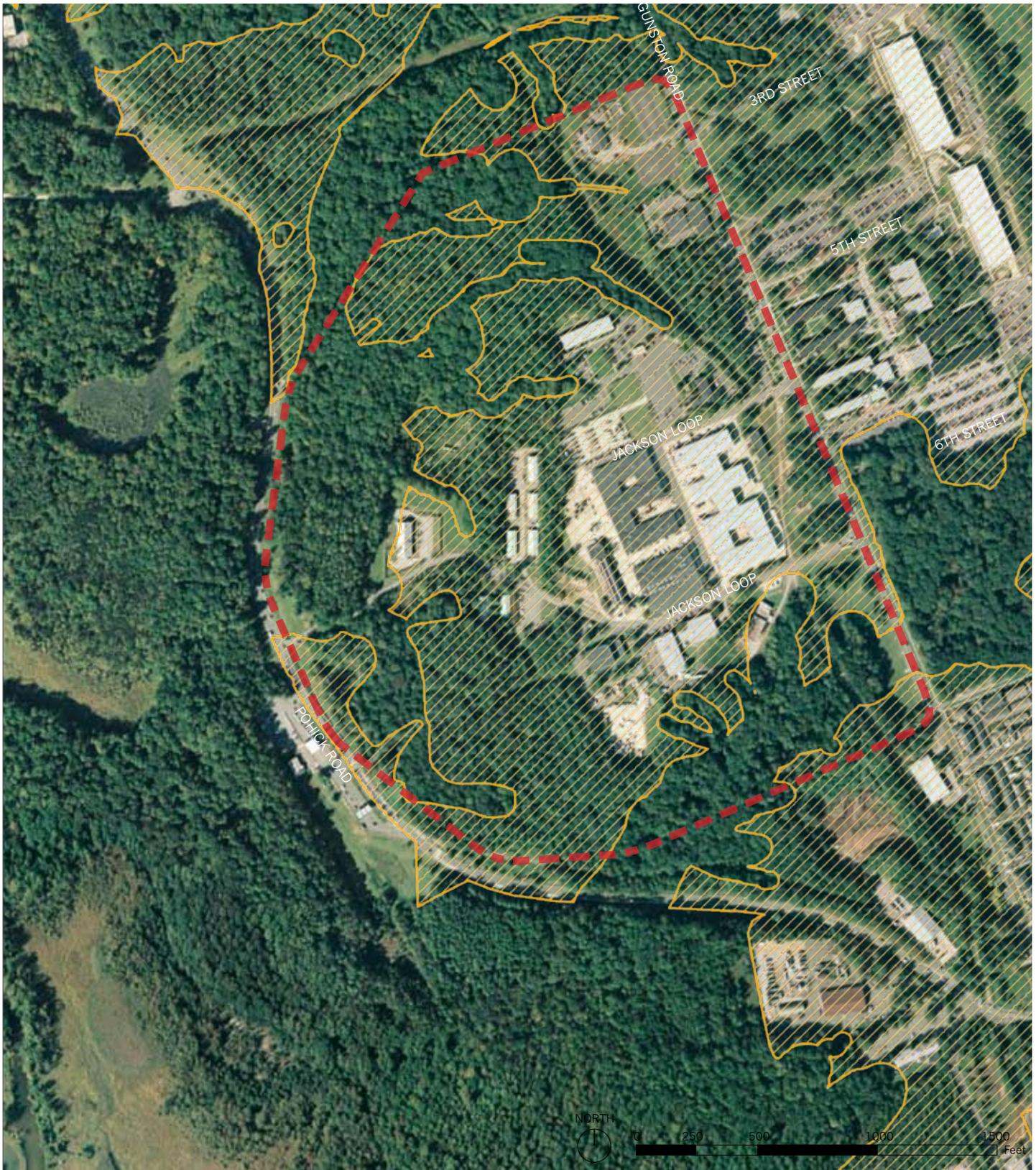
In light of the numerous environmental constraints at Fort Belvoir these areas are relatively small when compared to Fort Belvoir as a whole with many environmental constrained areas avoided completely. The resources identified in Figure 3-2 should be avoided where possible development of the TVDP parcel may occur. If they cannot be avoided, mitigation measures for each of the constraints identified in the text above would likely be required to be implemented.

Buildable Areas

Buildable areas within the study area are shown in Figure 3-6. Except for building height restrictions due to the airfield, buildable areas are not limited by the previously described development constraints. Because these areas are the most cost-effective and readily available, development plans will aim to completely utilize buildable areas before venturing on to constrained land.

The Buildable Areas Overlay is generated by subtracting the constraints overlay area from the installation area. The constraints overlay utilizes all GIS constraint layers – natural, cultural and operational.

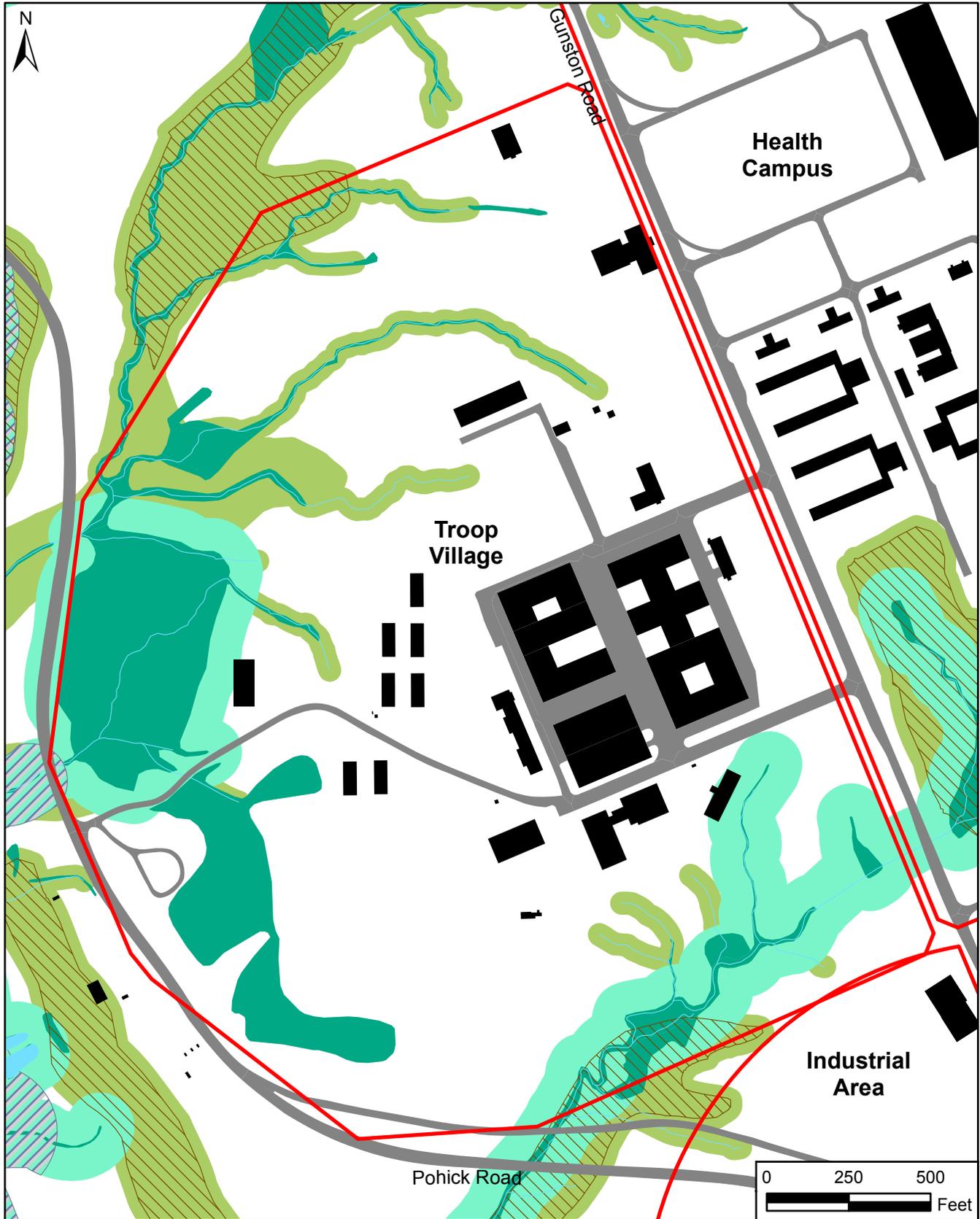
Figure 3-2 Buildable Areas Overlay Map



Legend
Developable Areas Overlay

Source- Fort Belvoir DPW GIS Department

Figure 3-3 Water Resources



LEGEND

- ADP Boundary
- Wetland
- 100-Year Floodplain
- Steep Slopes
- RPA
- Riparian Area

**Troop Village
Water Resources**

Sources: Fort Belvoir GIS, 2006; Fairfax County GIS, 2006.

Figure 10-1

Figure 3-4 Sensitive Habitat

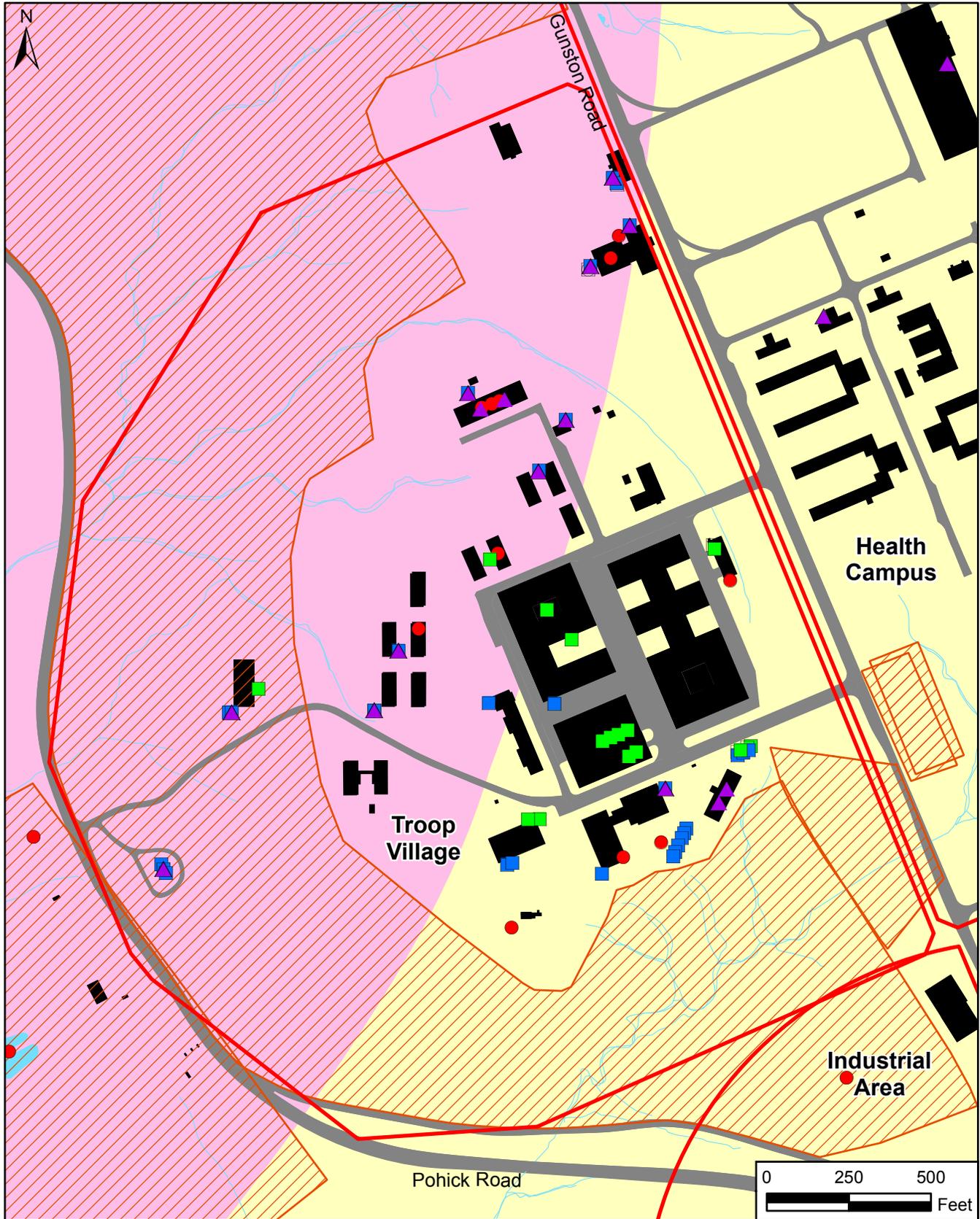


LEGEND

- | | | |
|----------------------------|--------------------------|-------------------|
| ADP Boundary | Wildlife Management Area | PIF Priority Area |
| Fauna Special Species Area | Grassland Mangement Area | |
| Flora Special Species Area | Conservation Area | |

**Troop Village
Sensitive Habitat**

Figure 3-5 Operational Constraints



LEGEND

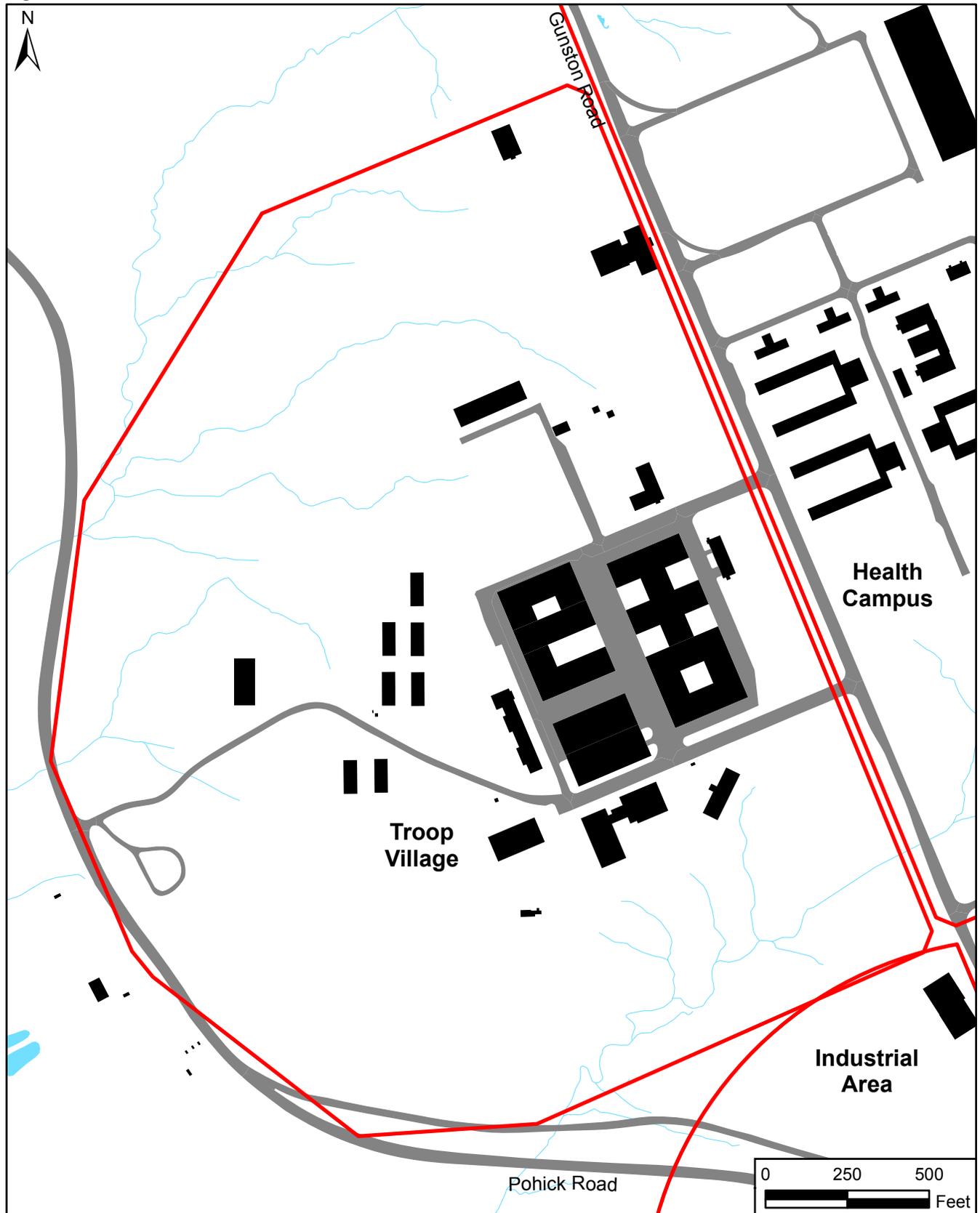
- ADP Boundary
- Petroleum Storage Area - Active
- Petroleum Storage Area - Inactive
- 150-ft Air Restriction Zone
- Former Range
- 500-ft Air Restriction Zone
- Solid Waste Management Unit
- Petroleum Release Site

Sources: Fort Belvoir GIS, 2006; Fairfax County GIS, 2006.

**Troop Village
Operational Constraints**

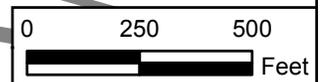
Figure 10-3

Figure 3-6 Cultural Resources



LEGEND

-  Historic Building
-  Cemetery
-  Historic District
-  Historic Overlay Buffer



**Troop Village
Cultural Resources**

Sources: Fort Belvoir GIS, 2006; Fairfax County GIS, 2006.

Figure 10-4

Facilities and Operations

Each item of real property is defined as a facility. The Army uses four facility types for analysis purposes:

Land (L) - Land (in acres) comprises whole, or part, of a military installation owned in fee by the Federal Government and/or under custody and accountability of the Army.

Building (B) - Buildings (in square feet) are constructed on a space of land that is completely enclosed by a roof, walls, and usually flooring. It normally serves the purpose of occupancy.

Utility (U) - A utility (in capacity) is a distribution system, commodity source, or commodity collection point that provides a service or commodity to more than one building or structure.

Structure (S) - A structure is any real property facility that is not classified as a building, utility system, or land by the previous definitions. Typical examples are airfield pavements, roads, firing ranges, and athletic fields.

Source:
1. Department of the Army, Pamphlet 415-28: Guide to Army Real Property Category Codes, 11 April 2006

Building Quantity

The study area contains about 30 buildings, totaling approximately 400,000 GSF. Figure 3-6 shows the existing building status and Appendix A-1 lists each existing building, its tenants, and functional use from the Real Property Inventory (RPI). Uses are classified by the current use category code (CUCC).

Building Quality

Installation buildings are always under consideration for maintenance and repair. In order to determine the current quality of a building, it is assigned a Quality or Q-Rating. These ratings are based on a ratio of restoration cost estimates (“cost to fix”) to facility plant replacement value (PRV). Restoration cost is based on facility condition assessments conducted by facility occupants. These Q-Ratings are used to derive an installation-wide Quality Rating at the Facility Class level. All military services report Q-ratings using the same DoD methodology. The four Q-Ratings are defined below.

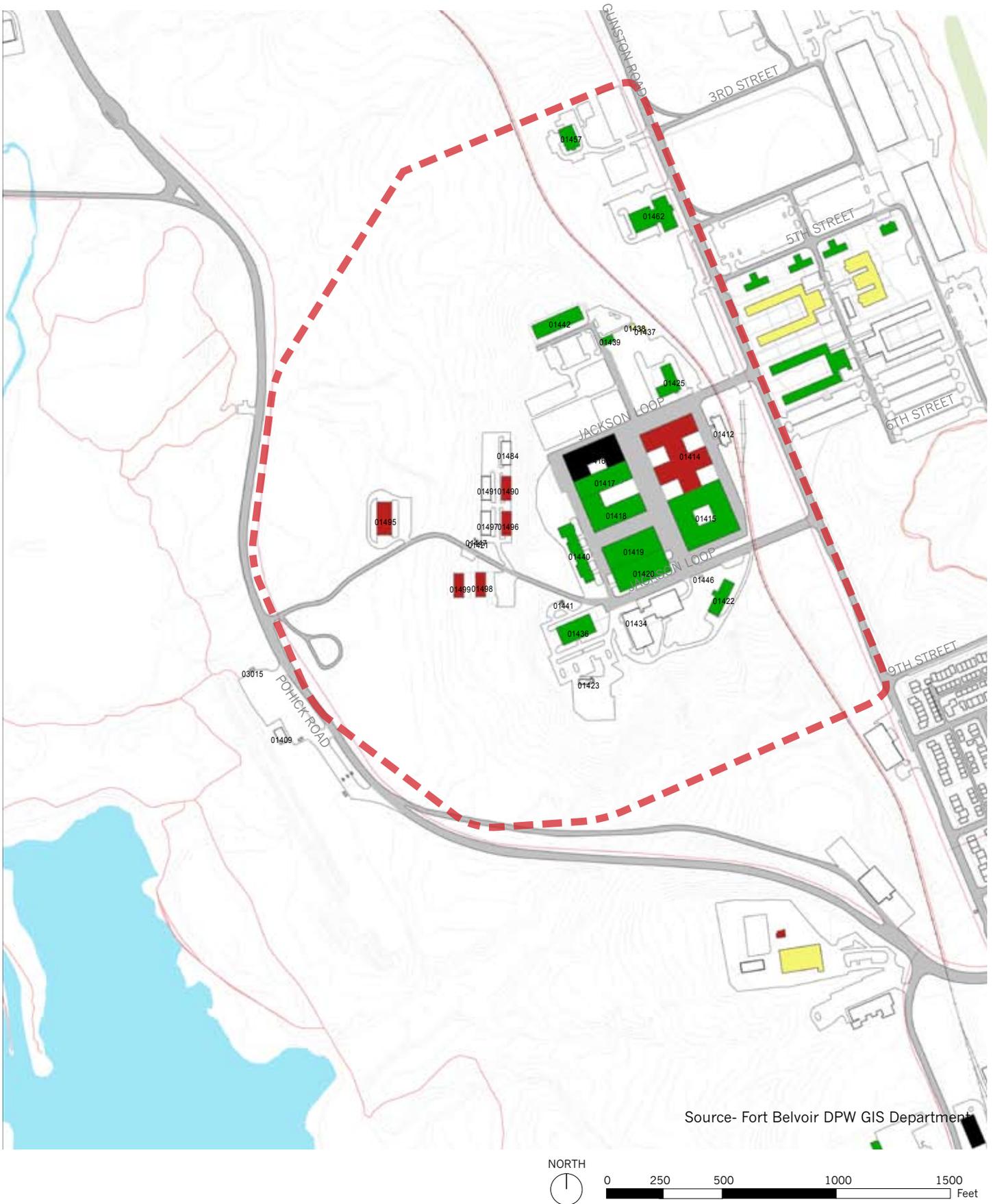
Q-ratings for facilities can be found in the Installation Status Report (ISR). Appendix A-1 lists buildings within the ADP study area. Q-rating colors are applied to the installation’s GIS data to create a graphic overlay that clearly shows ratings in the study area.

Table 3-5 ISR Rating Definitions

Rating	Definition
Q-1 (Green)	Minor facility condition deficiencies and no significant facility configuration deficiencies, with negligible impact on the capability to support the tenant organizations’ required missions.
Q-2 (Yellow)	Some facility condition deficiencies and/or configuration deficiencies that have limited impact on the capability to support the tenant organizations’ required missions.
Q-3 (Red)	Significant facility condition deficiencies and/or configuration deficiencies that impair the capability to support some of the tenant organizations required missions.
Q-4 (Black)	Major facility condition deficiencies and/or configuration deficiencies that present significant obstacles to the tenant organizations accomplishment of required missions.

Table Sources:
1. Military Planning Technical Manual
2. U.S. Army Installation Management Agency, Public Works Digest Vol. XVIII No.1, Jan/Feb 2006, downloaded from http://www.ima.army.mil/sites/pw/digest/pwd_janfeb06.pdf

Figure 3-5 Building Installation Status



Source- Fort Belvoir DPW GIS Department

3 Existing Site Character

Circulation Patterns

Circulation in the study area is categorized into primary roadways, secondary roadways, and alleys. These designations are defined by roadway characteristics and frequency of use.

Primary roads provide main access into the Post and internal circulation between North and South Post, and are heavily traveled. Primary roadways serving the proposed Troop Village include:

- Pohick Road, which is the main access point from Route 1 into South Post via Tulley Gate. Pohick Road is currently one lane in each direction.
- Gunston Road, currently one lane in each direction with left turn bays, provides connection between Lower North Post and South Post, including the Troop Village.

Within the Troop Village, there are two secondary roads that provide internal circulation, they are:

- Jackson Loop is a crescent, or a loop, that provides two access points to Gunston Road and provides circulation within the area.

- Sharon Lane Road provides a link from Pohick Road, near Tulley Gate, into the existing industrial area in Troop Village. Access is currently closed from Pohick Road.

Currently, there are not any signalized intersections along Gunston Road in the vicinity of Troop Village. This causes access difficulties for vehicles exiting the area. Gunston Road is a major internal arterial for traffic circulation on Main Post.



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4 Program Requirements

Overview

The following is a summary of the near term requirements and long term program capacity.

The remainder of the warehouses to the south of the site could be reused for recreation, dining and other facilities to support the barracks.

Existing Tenants and Functions

The present 1400 Area is a mix of office, light industrial and warehouse uses. A detail of all the present uses can be found in Appendix A-1. The buildings that will no longer be used, or will be demolished in this move are noted in Figure 7-1 “Long Term Proposal for the New Troop Village”. This shows a notional plan of how the area could be laid out and what could fit. Since the new Troop Area will not be moved before 2015, this will remain notional. In the meantime, as opportunity arises, tenants can move into new facilities. It is suggested in this plan that buildings 1414, 1426 & 1434 can move to the new, more dense industrial area near the Town Center. Building 1442, Directorate of Public Works, is suggested to move to the Town Center to make room for the barracks. This could take place in phases as the projects are ready.

Proposed Projects

The barracks will be moved from their location in the Lower North Post to the 1400 Area. This move will also include moving the support facilities and replacing them in the 1400 area as well. These projects would include dining, theater, fitness center(s), basketball court(s), and outdoor recreation (including softball field(s), and tennis court(s)). At the present time the only project that has been approved is the renovation of the existing barracks that were built in the mid-1970’s. That update will modernize the existing barracks until the new barracks are built after 2015.

Table 4-1 Near Term Projects

Project Number	Project Name	PROJECT DESCRIPTION/ (COMMENTS)	FUNDING SOURCE	SIZE (GSF/PN)	CWE	1391 PROGRAM YEAR (FY)
57498	Replace 1400/1900 Warehouses	Replace existing warehouses with modern, more efficient facilities in Industrial Area.	MCA - Validated	83,000 SF	\$8.1 M	2012
51326	Multipurpose Fields	Construct two softball fields, two pavilions, concession/restroom building.	MCA - Validated		\$1.65 M	2012
65745	Warrior in Transition (WT) Complex	Construct Warrior in Transition Complex. Primary Facilities include WT Barracks, Soldier and Family Assistance Center (SFAC) and a WT Administration and Operations facility		150,000 SF	\$47 M	2009
70936	Trainee Barracks			220,000 SF		

Table 4-2 Long Term Projects

62892 (EIS #21)	Barracks	Replace existing McRee Barracks facilities.	MCA - Validated	171,000 SF	\$26.2 M	2011
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New Construction

Although the size and number of barracks is not known at this time, the area for the new barracks could hold up to 800 Troops. The layout of the barracks will mostly likely follow the new barracks design from Ft. Bliss, TX (Figure 3-1) but will follow whatever standard design is at the time of construction. This design calls for each room to house two soldiers; each soldier has their own bedroom and they share a bathroom and a small kitchen. (Figure 7-2) The design also calls for a structure with space for courtyards and it should be about 4 stories high. The plan for the potential new barracks will also be configured to face the area of the site that is wooded to create a more park-like setting for the barracks. This would be a change from the location in the Lower North Post area that does not have many trees or open spaces. The site would also be configured so each soldier can have one parking space; and that there are amenities within walking distance. These amenities might include recreation spaces; both indoor and outdoor, a dining facility and maybe a theater. The location will also allow the soldiers to be closer to the

South Post recreational facilities and the Town Center.

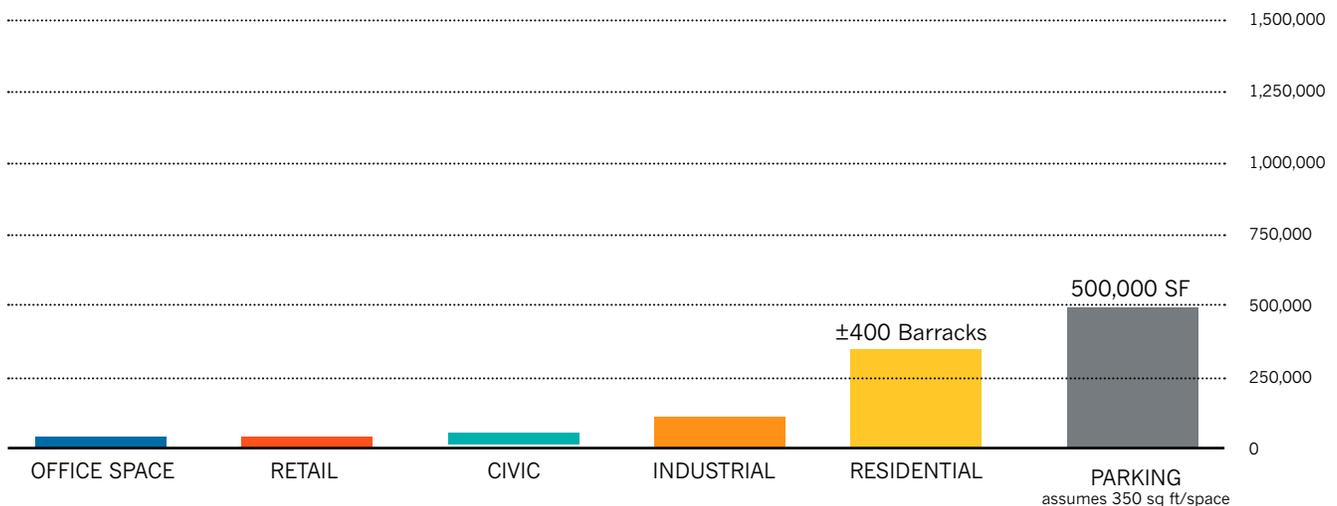
Figure 8-2 “Long-Term Development Strategy 2030” gives more details on the sizes of building footprints for the area. The map entitled “7-1 Long Term Proposal for the New Troop Village” has the corresponding blocks for those square footage estimates.

Long-Term Program Strategy

As determined by the preferred framework a long-term strategy of the New Troop Village. The New Troop Village is reserved for WIT, Trainee and regular barracks

Figure 4-1 Long Term Program Capacity

As determined by preferred framework plan developed in Planning Framework, Chapter 6



5 Planning Principles



Figure 5-1 New Troop Area: Restoring Ecological Integrity

Overview

The Belvoir New Vision master plan embraces many principles from connected street grids, accessible open space and appropriate and compact development.

The recently established LEED for Neighborhood Development (ND) pilot program is aligned with these principles and provides an open forum to further organize and raise awareness of these complex and comprehensive issues. The LEED ND system emphasis is to:

- Revitalize existing urban areas
- Reduce land consumption
- Reduce automobile dependence
- Promote pedestrian activity
- Improve air quality
- Decrease polluted stormwater runoff
- Build more livable communities for people of all income levels

LEED for Neighborhood Development

Implementing best practices in sustainable design is key for the post to maintain its long standing commitment to conserve the natural beauty of the land and preserve their standing as one of America's enduring installations. The purpose of the LEED ND pilot program is to provide an accessible and comprehensive framework to make environmentally sensitive and livable places. The framework incorporates the principles of smart growth, new urbanism and green building technologies. Participation in the program would be a first for the US Military and will help provide an example for other installations and for Fort Belvoir to continue as a model world-class installation.

What is a "Neighborhood Development"? The LEED ND rating system is designed to certify exemplary development projects that perform well in terms of smart growth, new urbanism, and green building.

The LEED ND rating system is organized into three sections: smart location and linkage, neighborhood patterns and design, and green construction and technology.

Smart Location and Linkage

The goals and intent the smart location and linkage principles are largely addressed within Chapter 3 (Existing Site Character) in the mapping of natural constraints and defining where to build and where not to build.

Neighborhood Design and Pattern

Chapter 6 (Planning Framework) addresses many of the credits in the Neighborhood Design and Pattern section regarding compact development, walkable neighborhoods and diversity of uses.

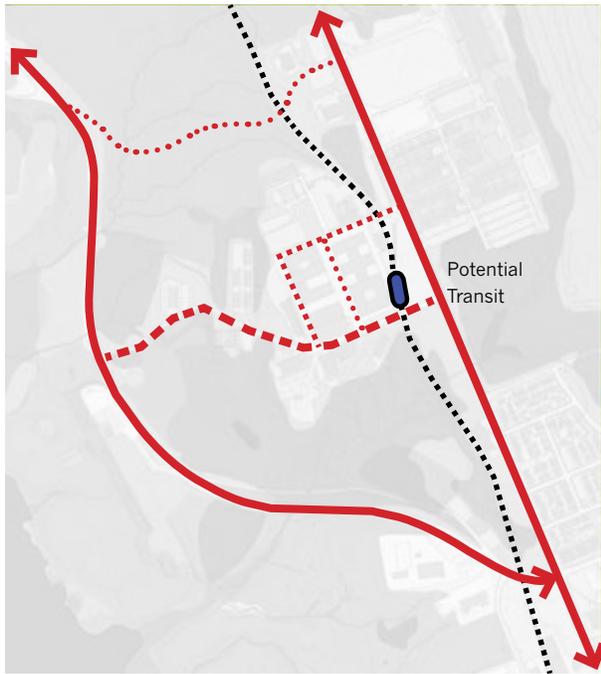
Green Technologies and Construction

Strategies to address the green technologies and construction are contained within Chapters 7 (Planning Recommendations) as well as Chapter 8 (Implementation) to ensure that the future projects within the ADP will maintain the highest standards of construction. This is in conjunction with meeting the current Federal Mandates in both water and energy consumption and achieving individual building certification under the LEED for New Construction where required.

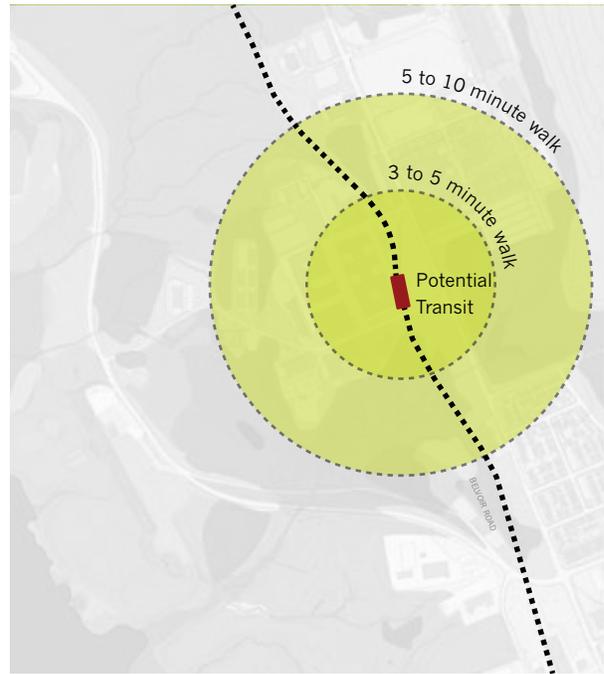
General Planning Principles

- **Buildings should reinforce the common campus edges.** This includes the central open space. Buildings should be in conversation with one another. An attention to the compatibility of uses and building typology is critical along any common campus areas.
- **Locate parking at the perimeter of each campus** area along the major access routes. This will reinforce standoff requirements and provide optimal development area for programs.
- **Connect buildings and places** with pedestrian paths and a series of “campus gardens“.
- **Maintain and preserve views** and sight lines to important open spaces from each campus area.
- **Develop a hierarchy of streets** and points of access that are coordinated with the larger transportation strategy.
- **Reinforce a comprehensive strategy for security** and AT/FP requirements that is integrated with building siting, access and overall development concept.
- **Initiate collective approaches** for stormwater management, ancillary uses, and remote truck inspection areas that share resources to optimize site development and program integration.
- **Promote sustainable strategies** that minimize development impact and embrace forward thinking and best practices in site planning, open space design, and architecture.
- **Develop a feasible and constructible strategy** that is sensitive to schedule and costs.

Figure 5-2 Troop Area Planning Principles



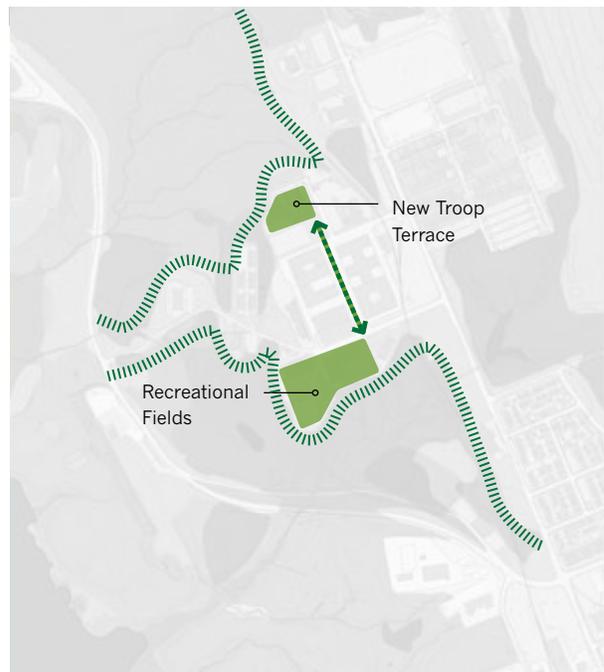
Streets



Transit



Blocks



Open Space



Troop Area Analogies



Figure 3-1 Ft. Bliss Barracks

Source- http://www.theaustin.com/html/up-u_s__army_barracks.html

Ft. Bliss Barracks

- The housing facilities consist of one 110,000 square-foot barracks to accommodate 288 soldiers and two 83 000 square-foot barracks, each able to house 192 military personnel
- Courtyard orientation
- Variety of uses including fitness center, furniture store and multiplex

Troop Area Analogies



Tulane University, Willow Street Housing, Mack Scogin Architects



Bowdoin University Dormitories, Kyu Sung Woo Architects



Tulane University, Willow Street Housing, Mack Scogin Architects

6 Planning Framework

Overview

The goal of a planning framework is to establish a street framework and block pattern that can allow for a variety of scenarios of intensity or diversity of use. The planning principles endorsed with LEED ND are to encourage compact growth, promote pedestrian activity, improve air quality. Working together to create a living framework that can be adjusted without sacrificing the quality of place in response to future needs of tenants as the neighborhood continues to grow and develop.

Required NEPA Documentation

The building of a large project such as a new barracks will require an Environmental Assessment. The Assessment will cover both the demolition and/or redevelopment of existing buildings and it will cover any new uses of open space. In some cases the plan calls for tearing down buildings and using the area for recreational activities. The siting plans do show that the plans for the barracks would fit without encroaching on the wetland and/or Resource Protection Areas.

Framework Plan Alternatives

Before arriving at the preferred plan, several alternatives were explored in order to ensure all implications of a siting decision are understood and to illustrate different means of achieving the common planning principals. Each alternate scheme generates varying amounts of new building construction based on the amount of space designated for outdoor motor pools and storage. New building efficiencies are also affected by the building size and the amount of existing buildings that may be preserved.

Alternative A: The first alternative was that the Troops would remain in the Lower North Post in the existing McRee barracks that were built in the mid-1970's. However, the barracks have been renovated and still do not suit the needs of the modern soldier. There is a plan in place to give the barracks a face lift

in 2008. This will keep the barracks up and running for a few more years; however it is unrealistic to think that new barracks will not be needed in the future.

Alternative B: The second alternative was to eventually build new barracks in the Lower North Post near their same location; this would call for a tight phasing plan in order to accomplish that. Part of that plan would also mean keeping the existing support facilities and perhaps either rebuilding or renovating these building that are also old and in need of repair.

Alternative C: The final alternative is to completely replace the barracks in a different location. The 1400 Area is well located on post; it is also an area with older warehouse buildings that might be better served being located in the industrial area near the other warehouses on post. In addition, the existing administrative buildings in the area need to be replaced and can be relocated to areas that are generally office spaces. The location also gives Ft. Belvoir the opportunity to move the Troops to be more part of installation life being near the Town Center, recreational facilities and the housing areas.

Preferred Framework

The preferred framework or alternative C is illustrated in figure 6-1.

The framework encourages compact development with a recommended density for non-residential of 1.0 Floor Area Ratio (FAR) and build any residential components of the project at an average density of seven or more dwelling units per acre of buildable land available for residential uses. If achieved, the New Troop Village could accommodate at least 500,000 square feet of space.

Figure 6-1 Framework Plan

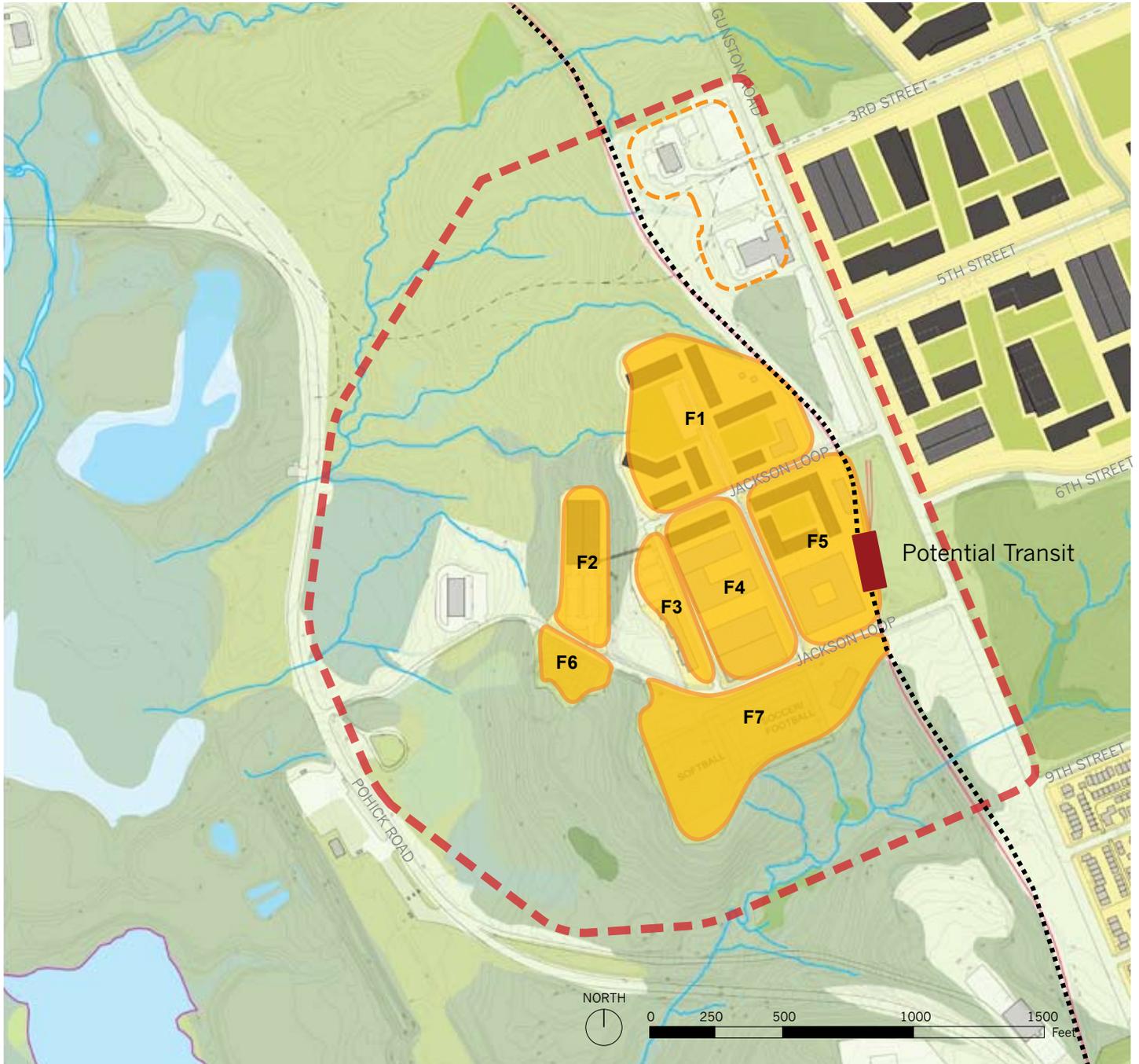


Table 6-1 Block Framework

Block No	Land Use	Area-SF (Measured)	Area-SF (Rounded)	Area (Acres)
F1	Troop Housing	319,233	320,000	7.4
F2	Troop Housing/ Parking	105,794	106,000	2.5
F3	Troop Housing	97,642	98,000	2.3
F4	Troop Housing	204,172	205,000	4.8
F5	Troop Housing	247,587	248,000	5.7
F6	Optional Fields	51,751	52,000	1.2
F7	Recreational Fields	318,455	319,000	7.4
TOTAL		1,344,634	1,348,000	31

7 Planning Recommendations

Development Strategy

The strategy for the New Troop Village is to:

- Reuse existing buildings when feasible
- Build new barracks on site south of the DPW
- Emphasize connectivity between the barracks and the landscape
- Emphasize walking and recreational playfields
- Proximate and convenient parking
- Minimize impact on natural resources
- Enable incremental development and redevelopment
- Maintain connectivity with master plan
- Integrate barrack prototypes
- Investigate sustainable opportunities
- Create a “place” and “tie it together”

Long Range plan for transportation includes:

- Extension of Metro’s Blue line from the Franconia-Springfield Station south to Prince William County.
- Development of the abandoned rail line into Bus Rapid Transit (BRT) or a light rail spur from Main Post to the Franconia-Springfield Metrorail Station to connect to Metrorail, Virginia Railway Express (VRE) and bus services.
- Development of transit connection (likely buses) from EPG to Metro and VRE.
- HOV lanes on the Fairfax County Parkway between Main Post and I-95 (either of 6 or 8 lanes – TBD)
- Extension of Fairfax County Parkway onto South Post.

Relationship to Long Range Development Plan

Development of the new Troop Village will also adhere to these important guiding principles, specifically:

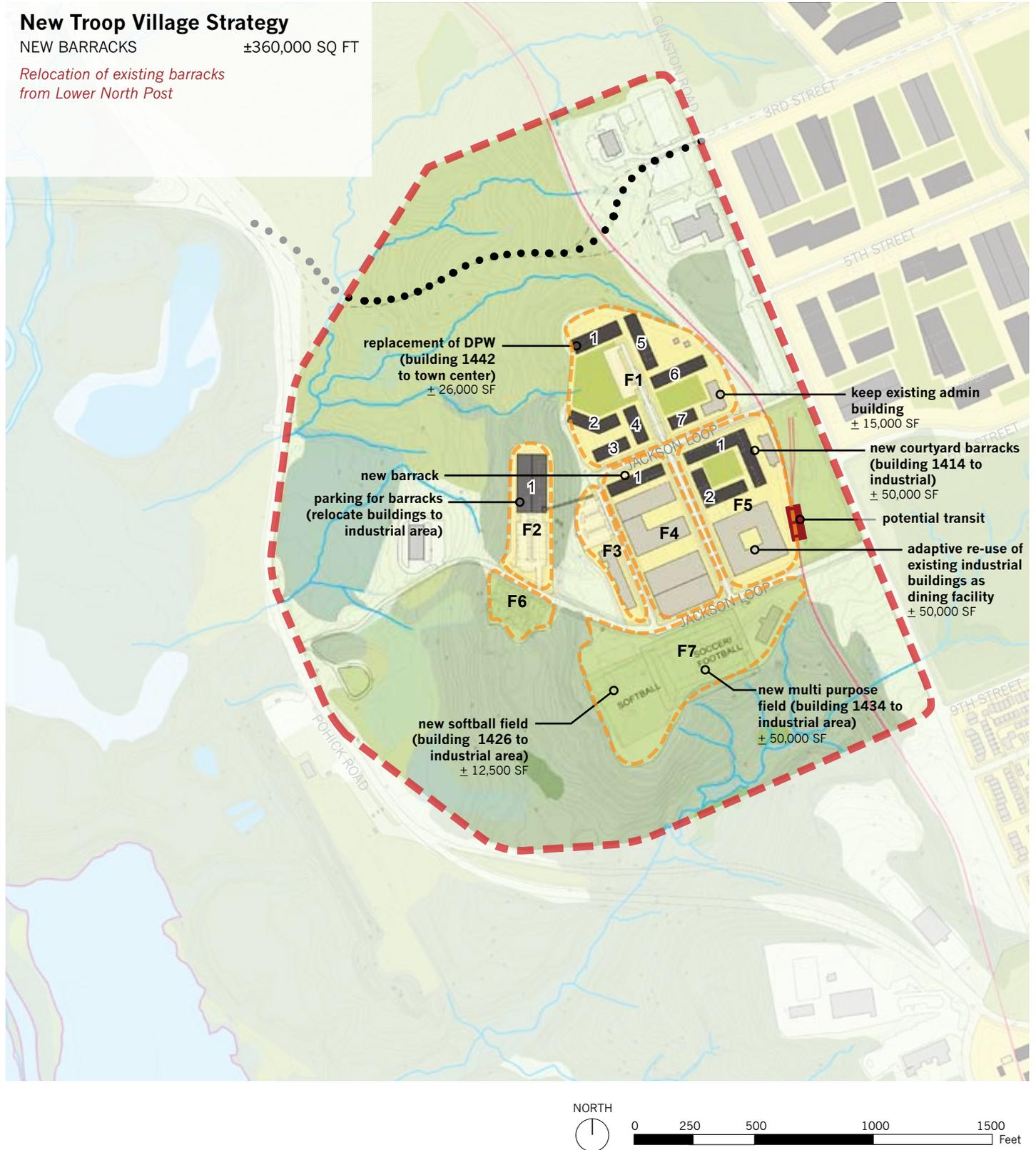
- Increase density of current facilities
- Optimize use of existing roads, parking, outdoor loading areas, and other paved areas
- Increase diversity of campus functions – to allow locating noisy/unsightly facilities with bigger footprints behind buffers comprised of smaller, community-oriented facilities
- Increase diversity of functions within each cluster – to allow for a gradual transition between land use clusters and create better functioning, more visually appealing environments

Table 7–1 Proposed Troop Village *
Building Development Summary

Block	Building No.	Primary Use	Building Footprint-SF (Rounded)	No. Floors	Total GSF	Parking Garage 350 sf/car
F1	1	New Barracks	13,000	4	52,000	
	2	New Barracks	11,000	4	44,000	
	3	New Barracks	8,000	4	32,000	
	4	New Barracks	8,000	4	32,000	
	5	New Barracks	12,000	4	48,000	
	6	New Barracks	12,000	4	48,000	
	7	New Barracks	6,000	4	24,000	
subtotal					160,000	
F2	1	Parking Garage	30,000	5		430
F3		Surface Parking				
F4	1	New Barracks	12,000	4	48,000	
F5	1	New Barracks	23,000	4	92,000	
	2	New Barracks	15,000	4	60,000	
subtotal					152,000	
F6		Open Space				
F7		Open Space				
TOTAL NEW (ROUNDED)					360,000	430

* The Proposed Troop Village is reserved for WIT, Trainee and regular barracks

Figure 7-1 Development Strategy for the New Troop Village



Building Siting

The plan for development for this sub-area of Ft. Belvoir is the creation of a new troop housing area. The existing buildings and functions will be moved to other areas of the post, and most of the buildings will be demolished to make room for the new development. However, because there are several large warehouse buildings in the area, these could be reused as part of the troop area. These buildings are double-height, single story buildings that could serve as a dining hall, a recreation center, or even an indoor basketball court.

There are few constraints on the land since it is largely developed and will have the existing buildings demolished. However, along the southwest portion of the property there are several steep slopes and streams that lead to the Accotink Creek, an important environmental component of the installation, in this same area there are also large stands of mature trees that would serve as a great feature of the new village.

The new Troop Area will have all the facilities and operations that are available at the lower north post troop area; but they will be updated, improved and will be closer to the hospital and town center. These specific facilities are the actual barracks that are configured in a manner that is consistent with the present Army standards. Figure 7-2 shows a floor plan of the standard floor plan. Each room will have two soldiers per unit and they would share common facilities such as showers and a small kitchen. The area will also have a dining facility, a fitness facility, parking and a variety of recreation programs. The Troop Area will also feature recreational facilities that are easily accessible, i.e. within a very short walk, they will be located so that the Troops won't even have to cross a major street to get to many recreational fields/courts. The new Troop Area will also have a dining facility that is closer than the present one.

With the Troops located in the South Post area they will be more a part of the Town

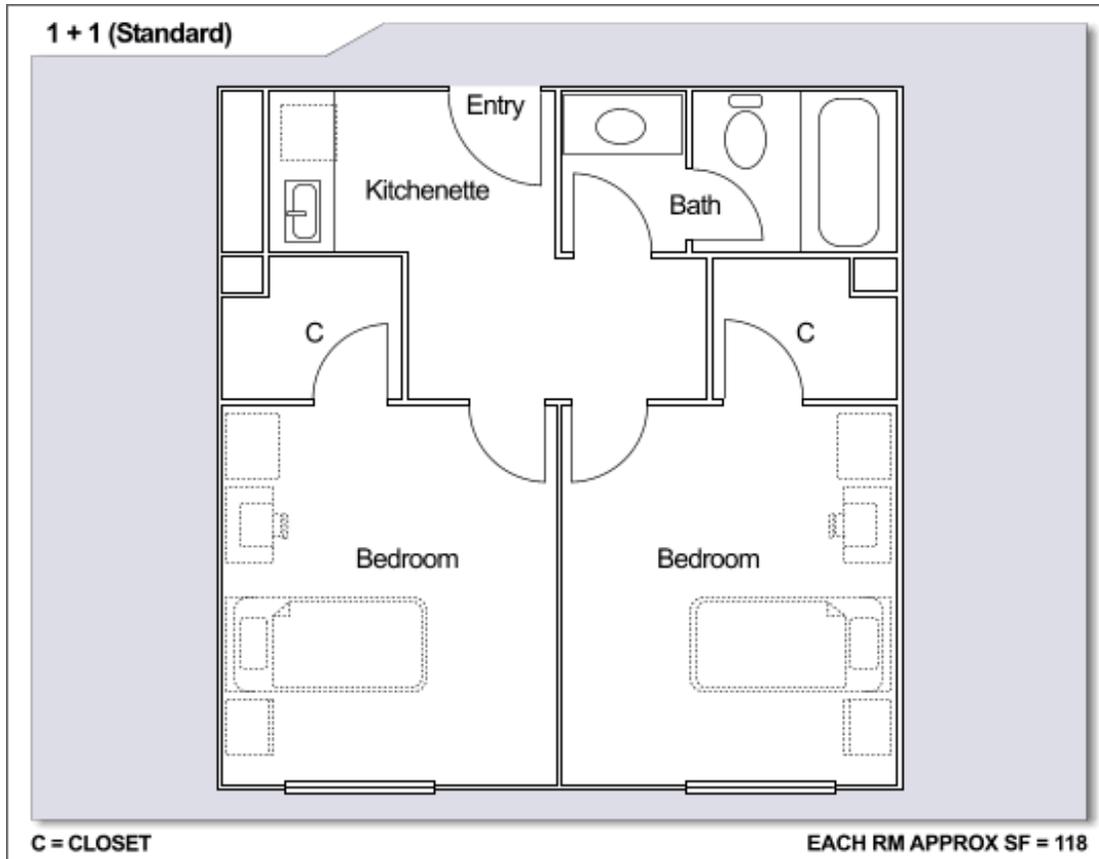
Center, hospital, recreation and housing areas making them more a part of the post community. Where they are presently located they are very separated and isolated from the rest of the post and the community at large, this movement will not only give them more modern facilities; but it will create more of a sense of community for the troops.

The area presently is a combination of warehouse and administrative buildings along with some open space and forested areas. The planning principles behind moving the Troops to South Post are several. The Troops move to an area of the installation that is more populated; being located on North Post they were very isolated from a majority of the post population and activity. The new South Post location would offer proximity to the Town Center, recreation amenities, and the hospital. Although each soldier will have a parking space for a car, they will be able to walk to a great deal of support facilities, recreational facilities, dining facilities, and for those who work at the hospital and other office buildings nearby could even walk to work.

The plan for the area will also include open space, and the siting of the barracks will allow the troops a more "green" view out their windows. The Lower North Post location is sparsely forested and there is not much passive open space. The new, more modern barracks will increase the quality of life for the soldiers and will enable the post to redevelop an older industrial area of the installation that will also assist in the consolidation of warehouse activities in the lower South Post area.

Figure 7-2 Building Organization

DoD 1+1 Standard



Department of Defense 1+1 Standard
-Each Room Approximate SF = 118

7 Planning Recommendations

LEED Standards

The following are LEED standards relating to the New Troop Village and should be considered during the implementation phase:

- Evaluate existing facilities for continued use and reuse

Encourage site planning strategies that:

- Reduce environmental impacts through site selection
- Provide alternative transportation
- Protect open space and reduce site disturbance by reducing development footprint
- Implement stormwater management to control flow-rate and treatment
- Landscaping to reduce heat impacts
- Create water-efficient landscaping
- Reduce water use
- Use renewable energy

Sources:

1. www.usgbc.org downloaded on May 17, 2007
2. The U.S. Green Building Council, LEED-NC Application Guide for Multiple Buildings and On-Campus Building Projects, October 2005
3. The U.S. Green Building Council, Green Building Rating System for New Construction and Major Renovations (LEED-NC), Version 2.1, March 2003
4. The U.S. Green Building Council, Green Building Rating System for Existing Buildings, Upgrades, Operations and Maintenance, Version 2, July 2005



Figure 7-3 Environmental Strategies

Buildings - Green Roofs

Environmental Benefits

- Water Conservation/ Reduced Stormwater Runoff
- Fire Prevention
- Habitat Recreation
- Noise Reduction

Financial Benefits

- Conservation of Water Management Systems
- Extension of Roof Life
- Energy Conservation
- LEED Certification Points
- Aesthetic Value



LiveRoof System - www.LiveRoof.net

- Easily handled and transported
- Implement on both new and existing structures.
- Reduce Costs - Cultivate native plant life from seeds.
- Plantings can grow offsite during construction or retrofit or within vacant paved areas as temporary greenhouses.

Surface Parking

Reduce heat islands to minimize impact on microclimate and human and wildlife habitat.

Provide the following strategies for the non-roof impervious site landscape (including roads, sidewalks, courtyards, parking lots, and driveways):

- Shade (within five years of occupancy)
- Paving materials with a Solar Reflectance Index (SRI) of at least 29
- Open grid pavement system
- Place off-street parking spaces under cover

Porous Concrete

A specific mix of concrete creates stable air pockets to be encased within it, allowing water to drain uniformly through the material into the ground below.



Infrastructure Strategy

Long term planning and construction phasing

The Area Development Plan for the New Troop Village reconfigures the existing road networks. New building locations as proposed in the ADP will conflict with many of the existing utilities. Since much of the existing water, sanitary sewer, and storm drainage systems are over 50 years old and nearing the end of their useful life, we recommend that the vision plan provide for replacement of most of the existing systems in each area. This may also provide an opportunity to construct more efficient utility networks with potential operational savings; for example, some existing pump stations which will require replacement or expansion can be combined.

We have developed potential water distribution, storm drainage, and sanitary collection systems for each of the Area Development Plans to serve as guidance for replacing and relocating these systems as new development is funded. These are described below. Overall conceptual sanitary, water and storm layouts are shown in Figures 7-4 to 7-6.

We also developed preliminary calculations to determine the quantity control volumes needed with the anticipated growth. Approximate facility sizes are shown assuming a five-foot depth of storage. Quality control will also need to be provided; it could be provided within the quantity volumes shown or be provided separately. Facility locations were determined based on space and the topography of the area.

Ultimate development to the densities shown in 7-1 "Long Term Proposal for the New Troop Village" will require a combination of surface treatment for quality control, with above ground basins or below ground storage to provide the required quantity control. The conceptual storm plan can be used to guide location and design of drainage systems as future projects are authorized.

Design of all new facilities which require

relocation or replacement of existing utilities should consider the ultimate anticipated development in the surrounding area, including the entire upstream sanitary or storm drainage-shed. New infrastructure should be designed to serve the new building; the existing adjacent facilities to remain; and, to the extent possible, the ultimate development in the adjacent area. For example, if a new building requires relocation of an existing 8-inch water main, and ultimate development requires the main to be increased to 12-inches; the portion of the main being relocated should be constructed to the ultimate 12-inch size. Similarly, new storm water conveyance facilities and new sanitary sewers should be designed and constructed for the ultimate anticipated flow from the upstream area. New storm water management facilities should be designed with adequate area to allow for expansion to serve future development in the drainage area.

Assuming that quality control is provided by rain gardens or similar LID facilities near each new building; additional quantity control is provided by a storage facility located to serve several blocks of the area. When the initial building is constructed, possibly with temporary surface parking, an LID facility is built adjacent to it, and the first portion of the quantity control facility is built. As additional buildings are constructed, surface parking is replaced with structured parking, additional LID facilities are built, and the quantity control facility is enlarged. Eventually, at full development, the quantity control facility may be replaced by an underground structure to provide quantity storage.

Conceptual Utility Plans

Sanitary

New sewer lines will need to be provided for the proposed buildings in the Troop Village Area. It is recommended that the existing pipe in the corridor in between all the buildings, running parallel to Gunston Road, be replaced. All the service lines from the new buildings could tie into this new trunk line; turn east, crossing under Gunston Road; and end up in the same collection line as the New Fort Belvoir Hospital (Figure 7-4).

As discussed in the New Fort Belvoir Hospital summary, the system collecting sewage from both the Troop Village Area and the Hospital Area could drain into a new pump station which will then connect to the Fairfax County gravity line.

Storm water Management

The Troop Village Area sits on a high spot, adjacent to streams that drain west to Accotink Bay. Several SWM facilities are proposed on the west side of the area that will discharge to the adjacent streams. Refer to Figure 7-5 for the Troop Village Area SWM plan.

Water

New water lines will be provided to serve the new buildings. Interconnections could be made to the water line on the southern limits of the area and to the proposed water line along Gunston Road. Refer to Figure 7-6 for the proposed water system layout.

Power

The Main Post of Fort Belvoir is supplied power by Dominion Virginia Power under

the rate schedule MS – Federal Government Installations.

In the New Troop Village, the current distribution system is adequate for existing functions. If additional supply is needed in the future, Dominion Virginia Power should be able to provide the New Troop Village with additional capacity.

Natural Gas

Washington Gas supplies natural gas to Fort Belvoir and the surrounding community. The gas company has a robust distribution system in the area that appears capable of providing adequate natural gas.

In the New Troop Village, the current distribution system is adequate for existing functions. If additional supply is needed in the future, Washington Gas should be able to provide the New Troop Village with additional capacity.

Steam and Chilled Water

Existing System

The existing New Troop Village Area Development does not contain any Central Energy Plant or piping distribution to multiple buildings.

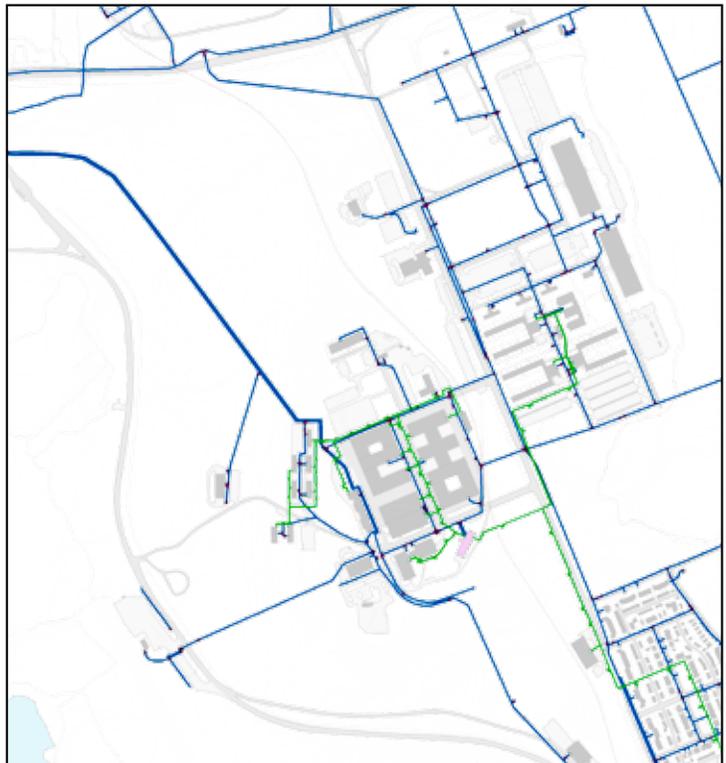
Proposed New System

In the New Troop Village Area, it is recommended that Energy Systems (heating and chilled water) be provided on an individual building basis in lieu of centralized utilities.

Providing heating and cooling for these buildings on an individual building basis will allow each building to provide a unique solution to heating and cooling based upon building type while accomplishing the sustainability goals including energy reduction and water reduction. This will also allow buildings to be built based upon individual construction budgets and not have each tenant rely upon a central energy plant that would need to be constructed prior to any other development. The concept of individual energy sources for each building allows for maximum metering flexibility of the individual tenants and allows the phasing to be accomplished without reliance on outside energy resources. The individual buildings can then consider renewable alternatives such as solar photovoltaics and even solar hot water heating.

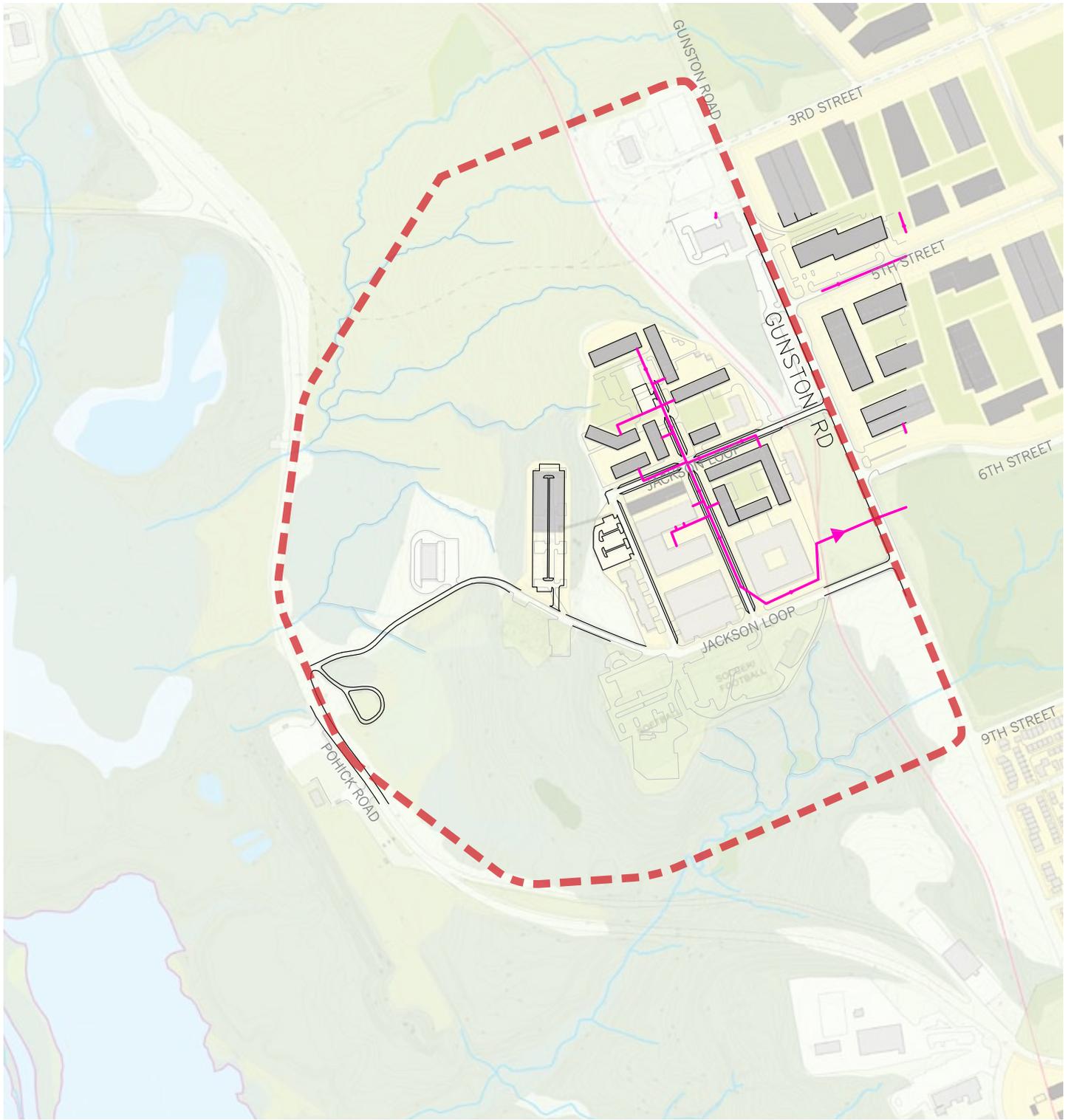


Existing Stormwater Management



Existing Main Water Lines

Figure 7-4 Infrastructure Strategies

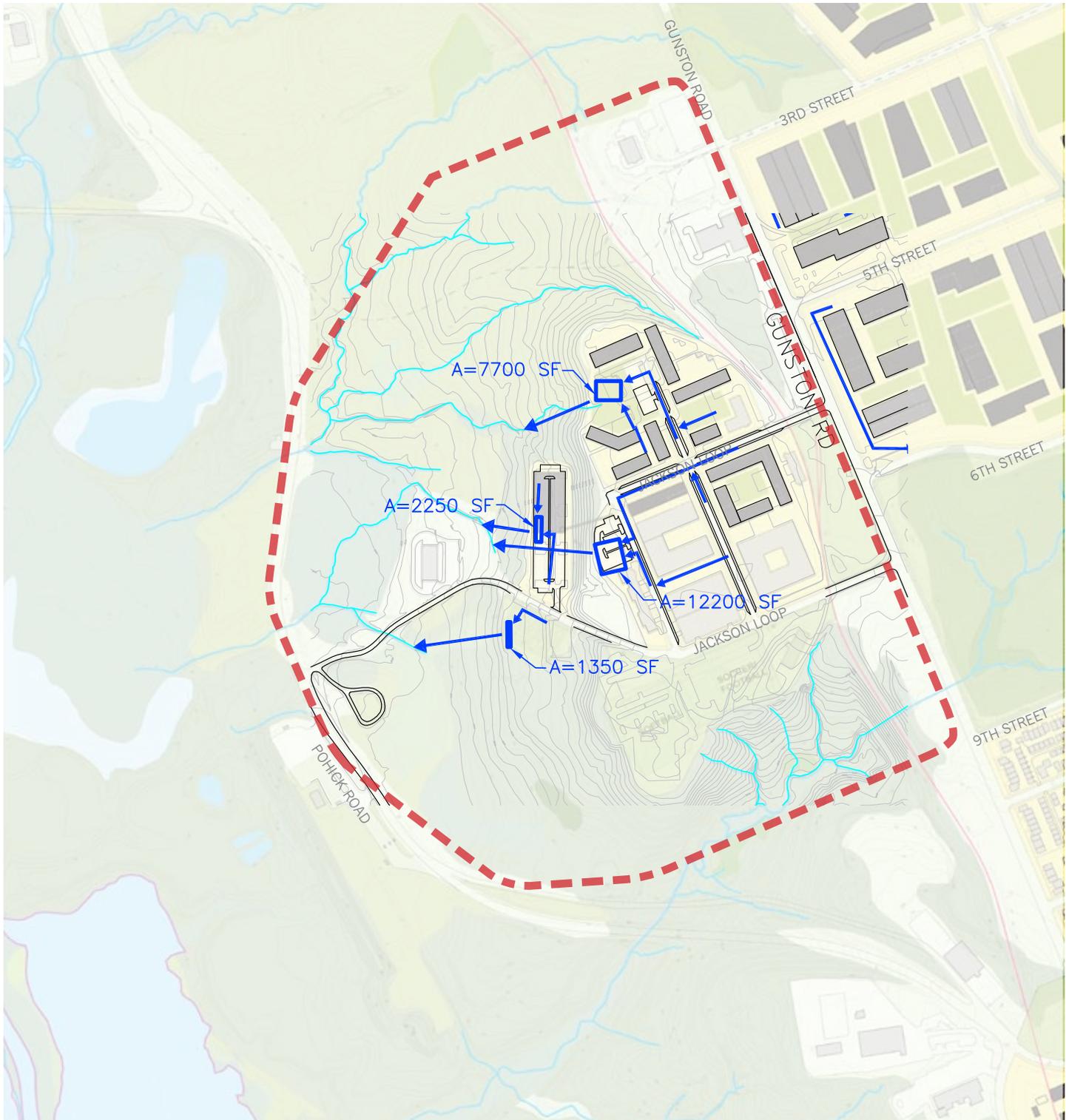


Fort Belvoir Utilities: Proposed Sanitary Sewer System

—▶— Proposed Sanitary Sewer Line



Figure 7-5 Infrastructure Strategies

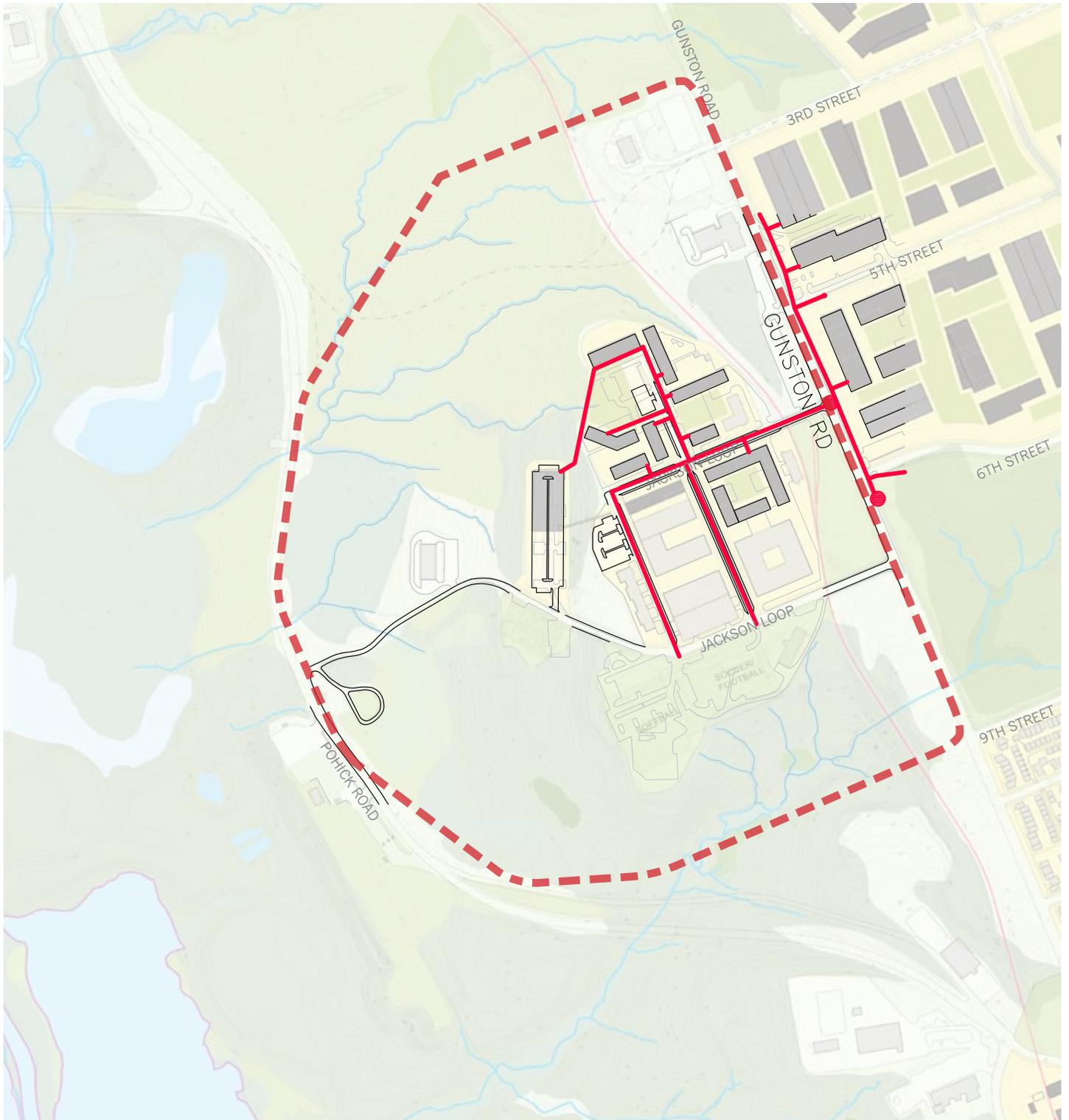


Fort Belvoir Utilities: Proposed Storm Sewer System

-  Possible Storm Water Management Area (Assumed Typical 5ft Depth)
-  Possible Future Drainage System (Swale, Channel, or Pipe)



Figure 7-6 Infrastructure Strategies



Fort Belvoir Utilities: Proposed Water System

- Proposed Water System Lines
- Connection Point



Circulation Patterns/ Transportation Management

The Master Plan lays out the long term vision for Fort Belvoir. It includes roadway improvements such as widening, intersection signalization and inclusion of pedestrian/ bicyclist circulation. In the vicinity of the Troop Village, the proposed roadway projects include:

- Widening of:
 - o Pohick Road to four lanes from U.S. Route 1 to Theote Road
 - o Gunston Road to four lanes from Kingman Road to 12th Street
 - o Extension of Third Street as a four lane roadway from Gunston Road to Pohick Road
- Signalization of major intersections along Gunston Road
- Inclusion of pedestrian and bicycle facilities as part of roadway improvements, so to provide internal circulation paths for pedestrian and cyclists, and to link the Troop Village to the adjacent land uses.

These roadway projects and intersection improvements would improve the traffic circulation, and provide the opportunity for walking and cycling as an alternative to the automobile for short trips on Main Post.

A comprehensive Transportation Management Plan (TMP) has been developed for Fort Belvoir. The TMP outlines various strategies that the Fort Belvoir Employee Transportation Coordinator can use to reduce the rate of single occupancy vehicle trips by encouraging, but not limited to, carpooling/ridesharing, vanpool programs, transit services, and bicycling/walking. Parking strategies, and parking enforcement, can reduce the ratio of number of spaces to employee to help promote other modes. A transitway to the Franconia-Springfield Metrorail station would link Fort Belvoir to the regional transit system, potentially reducing SOV trips. The short-term goal of the TMP is to reduce daily SOV trips to Fort Belvoir by

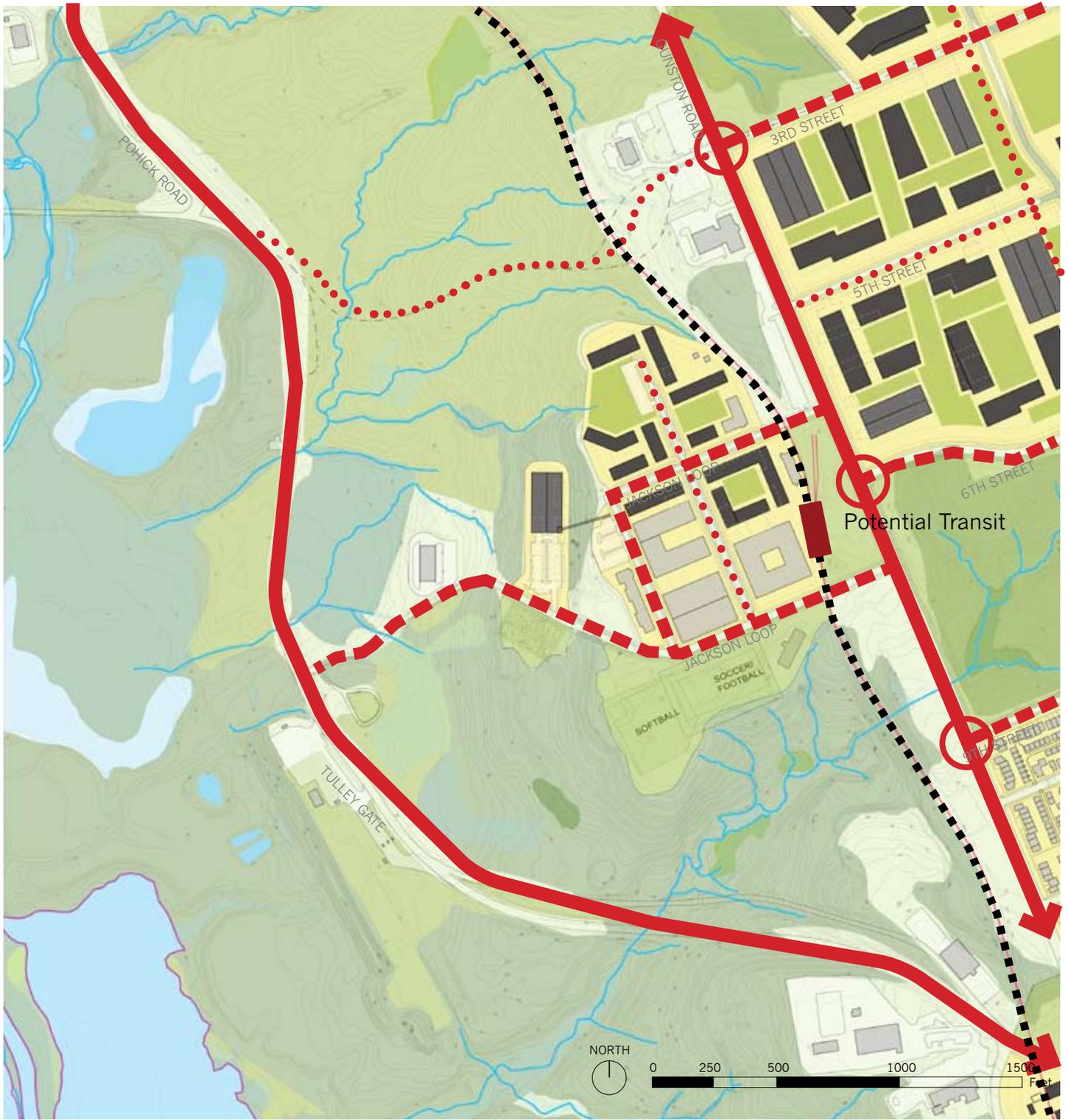


On-Post Transportation Improvements 2030

10 percent. In developing site-specific TMP programs, the nature of the land use of the Troop Village should be considered.

Once fully developed, the Troop Village would be a mixed-use area. There will be barracks, office space, industrial and a mix of recreational fields. The first two land-uses lend themselves very well to supporting a TMP. Circulator buses (or shuttle buses) would provide for a post-wide access, as well as connect to the transit center to provide connections to points off-post. On-post residents could use transit options, or carpool, to travel to duty stations off-post. By promoting various strategies, workers coming to the Post could shift their commuting pattern from the SOV to carpool or transit. The employees of the industrial area would also benefit from a TMP; however, deliveries would still be made in the same fashion.

Figure 7-7 Circulation Strategy



All Transportation Improvements 2030

-  Roadway Widening/Extension with 4 lanes
-  Secondary Roadway
-  Local Road / Alleyway
-  Potential Transit Corridor
-  New Traffic Signal needed

Security Strategy

Fort Belvoir refocused the posture of its security and force protection efforts in response to the terrorist attacks on September 11, 2001. The result of this effort is the current Anti-Terrorism/Force Protection (AT/FP) Plan being used to guide the installation's preparedness posture. Concurrently, Fort Belvoir is being reconfigured to accommodate specific recommendations outlined first by the Base Realignment and Closure Commission Report in 2005, then enacted into public law and implemented through Army direction.

In order to ensure future building and infrastructure projects at Fort Belvoir are planned with appropriate consideration of AT/FP measures, the Long Range Component

plan offer planners and decision makers an awareness of how the AT/FP Plan and Fort Belvoir's Real Property Master Plan complement and interrelate with each other.

AT/FP Planning

Because threats change over the life of a facility, building owners and facility managers should be aware that security elements can be more economically integrated within structures during the early planning and design phases of new construction projects than during subsequent additions or renovations.

Renovations to existing buildings can be challenging because the existing building systems must be able to accommodate increased security requirements and may not have the additional space or upgrade capacity. Therefore, it is imperative that AT/FP planning begin at the earliest opportunity.



The key to a successful security master plan begins at the initial conception of both new construction and renovation projects and not at the end of the design process. Coordination and effective communication are essential in this process and should start prior to a Planning Charrette. The tenant or user should assemble a Planning Team which may include representative staff from Garrison Directorates: Logistics, Intelligence, Security, Operations, and Public Works. The team then begins the AT/FP planning:

Step 1: Identify and categorize assets

Step 2: Assess asset value

Step 3: Identify aggressors and assess likelihoods

Step 4: Identify tactics and severity

Step 5: Consolidate into design basis threat

Step 6: Determine levels of protection

Step 7: Identify design constraints

8 Implementation

Phasing and Funding

At the present time this is a long-term plan for the area, it may occur anytime after 2015. At that time the funding documents would be created. However, the phasing for the plan could be completed ahead of that. As warehousing tenants have the opportunity to move to the Industrial Area that warehousing can be demolished if the funding is available, or those can be held in reserve for when the Troop housing is built.

Updating the Plan

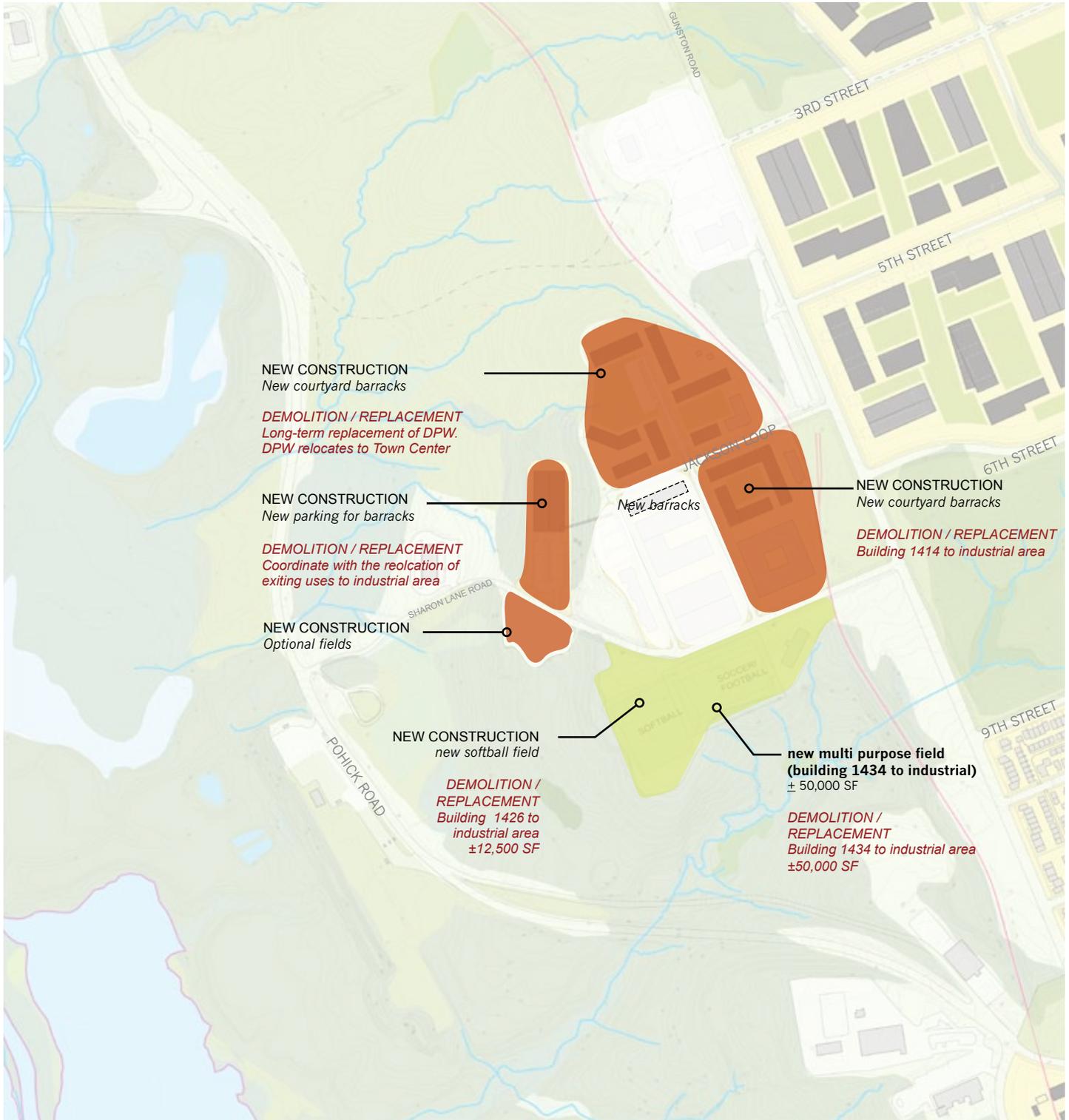
As tenants move out of the 1400 Area the plan can be updated by eliminating a tenant from the list of tenants and if buildings are demolished they can also be eliminated. If there are any changes to the plans or floor plans for standard barracks design these can be added to the appendices. When Gunston Road is widened it will encroach slightly into the eastern portion of the site and that will need to be updated as well.

As stated in Chapter 5 (Planning Principles) it is the intent of the master plan and ADPs to implement best practices in sustainable design by encouraging the principles of the LEED ND pilot program. It is also the intent of the ADP to require each project and capital investment greater than 20 acres within the installation to meet the requirements of LEED ND certification. The full masterplan of Belvoir New Vision is participating in the LEED ND pilot program, and all future projects are expected to participate in the full program, which should launch in early 2009. A LEED ND checklist has been included in appendix A-10 and more information can also be accessed from the U.S. Green Building Council. The numerical rating presented in the checklist is based on the entire installation as one project the actual ratings based on individual projects will vary based on size and use.



Figure 8-1 Troop Village Terrace

Figure 8-2 Long-Term Development Strategy



Appendices

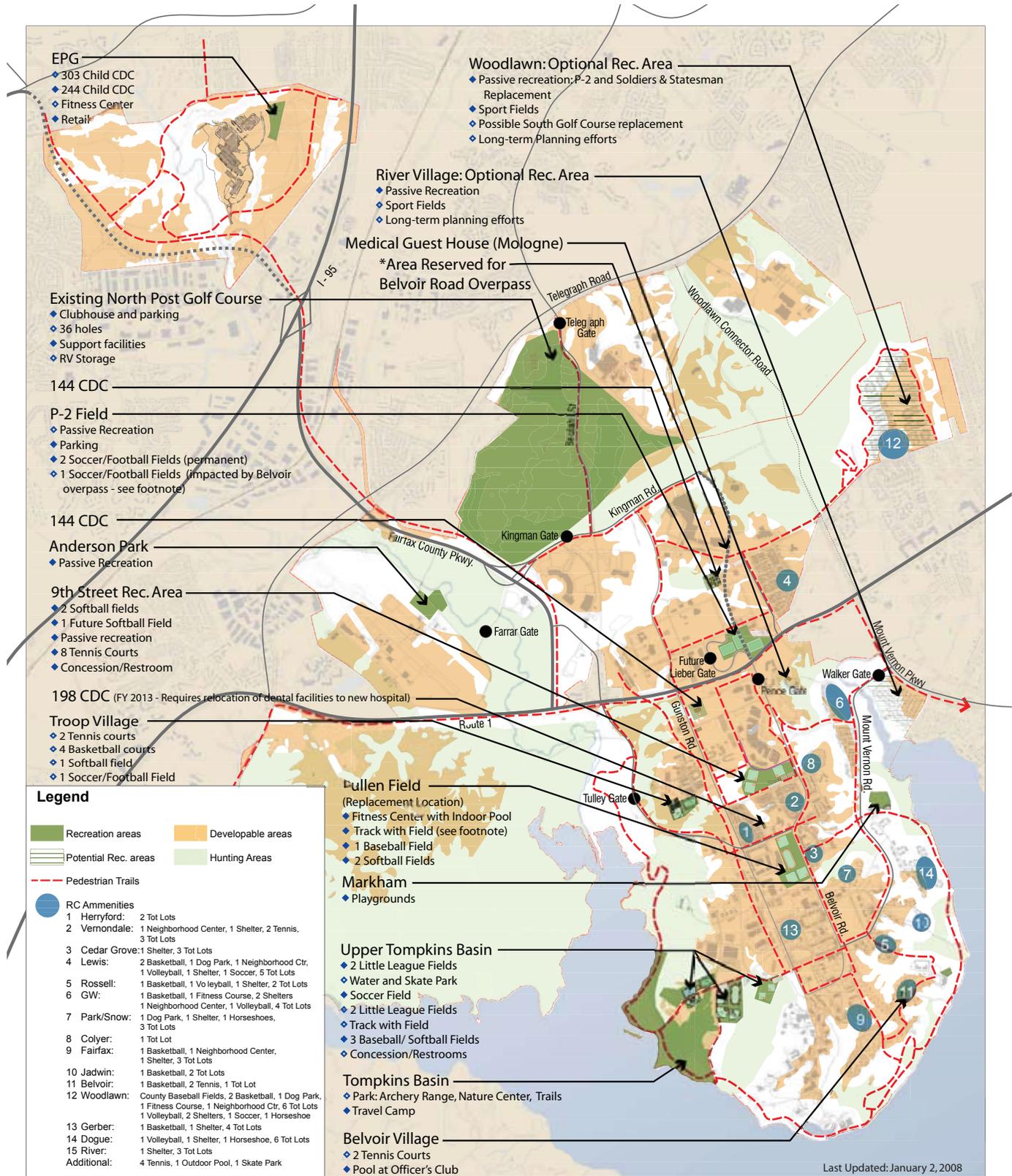
Strategy for Existing Buildings



New Troop Village Existing Buildings

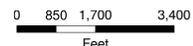
ID	STRUCTURE NAME	GROUND AREA	HEIGHT	LEVELS	BUILT	ISR_RATING	USE	GSF	ACTIONS	ACTIONS NOTES
1412	GEN INSTR BLDG	5,438 SQFT	17 FT	1	1952		OFFICE	5,438	Remain	
1414	GEN INSTR BLDG	50,985 SQFT	32 FT	1	1945	Q-3	OFFICE	50,985	Demolish-Near Term	New courtyard barracks
1415	GEN INSTR BLDG	51,004 SQFT	32 FT	1	1945	Q-1	OFFICE	51,004	Remain	
1416	GEN INSTR BLDG	27,028 SQFT	32 FT	1	1953	Q 4	OFFICE	27,028	Renovation	
1417	GEN INSTR BLDG	19,540 SQFT	32 FT	1	1945	Q-1	OFFICE	19,540	Remain	
1418	GEN INSTR BLDG	25,537 SQFT	32 FT	1	1945	Q-1	OFFICE	25,537	Remain	
1419	GEN INSTR BLDG	25,082 SQFT	32 FT	1	1945	Q-1	OFFICE	25,082	Renovation	Renovate and create new courtyard
1420	APPLIED INSTR BLDG	25,082 SQFT	26.5 FT	1	1953	Q-1	OFFICE	25,082	Renovation	
1421	SEWAGE PUMPING STATION	95 SQFT	10 FT	1	1966		UTILITY	95	Remain	
1422	HEAT PLANT	7,992 SQFT	36 FT	1	1945	Q-1	UTILITY	7,992	Renovation	
1423	STOREHOUSE, GEN PURP	1,171 SQFT	10 FT	1	1959		INDUSTRIAL	1,171	Demolish-Near Term	
1425	ADMIN, GENERAL PURPOSE	8,039 SQFT	27 FT	2	1960	Q-1	OFFICE	16,078	Renovation	
1434	GEN INSTR BLDG	26,841 SQFT	22 FT	1	1963		OFFICE	26,841	Demolish-Near Term	?? Relocate to Industrial Area for recreational fields
1436	APPLIED INSTR BLDG	12,473 SQFT	32 FT	1	1970	Q-1	OFFICE	12,473	Demolish-Near Term	?? Relocate to Industrial Area for recreational fields
1437	STOREHOUSE, FLAMMABLE MTRL	417 SQFT	13 FT	1	1958	Q-2	INDUSTRIAL	417	Remain	
1438	STOREHOUSE, FLAMMABLE MTRL	400 SQFT	13 FT	1	1958	Q-2	INDUSTRIAL	400	Remain	
1439	ADMIN, GEN PURP	1,530 SQFT	16 FT	1	1958	Q-1	OFFICE	1,530	Remain	
1440	GENERAL INSTRUCTION	12,968 SQFT	29.5 FT	2	1971	Q-1	OFFICE	25,936	Renovation	
1441	STOREHOUSE, FLAMMABLE MTRL	135 SQFT	9 FT	1	1959	Q-1	INDUSTRIAL	135	Remain	
1442	ADMIN, GEN PURP	13,329 SQFT	27 FT	2	1967	Q-1	OFFICE	26,657	Demolish-Long Term	Relocate DPW to Town Center
1446	TRANSFORMERS	111 SQFT	9 FT	1	1945	Q-2	UTILITY	111	Remain	
1447	STANDBY GENERATOR W/TANK	36 SQFT	6 FT	1	1945	Q-1	UTILITY	36	Remain	
1457	CIDC FIELD OFFICE	5,997 SQFT	26 FT	1	1995	Q-1	OFFICE	5,997	Remain	
1462	SKILL DEVL CTR, CRAFT SHOP	18,503 SQFT	18.5 FT	1	1973	Q-1	CIVIC	18,503	Remain	
1484	APPLIED INSTR BLDG	4,178 SQFT	20 FT	1	1966		OFFICE	4,178	Demolish-Near Term	
1490	STOREHOUSE, GEN PURP	4,187 SQFT	20 FT	1	1966	Q-3	INDUSTRIAL	4,187	Demolish-Near Term	Relocate to Industrial Area
1491	PRINT PLANT	4,134 SQFT	20 FT	1	1966		INDUSTRIAL	4,134	Demolish-Near Term	Relocate to Industrial Area
1495	APPLIED INSTR, POWER TNG STA	8,855 SQFT	20 FT	1	1970	Q-3	OFFICE	8,855	Demolish-Near Term	Relocate to Industrial Area
1496	STOREHOUSE, GEN PURP	4,170 SQFT	20 FT	1	1966	Q-3	INDUSTRIAL	4,170	Demolish-Near Term	Relocate to Industrial Area
1497	STOREHOUSE, GEN PURP	4,181 SQFT	20 FT	1	1966		INDUSTRIAL	4,181	Demolish-Near Term	Relocate to Industrial Area
1498	ADMIN, GEN PURP	4,205 SQFT	20 FT	1	1966	Q-3	OFFICE	4,205	Demolish-Near Term	Relocate to Industrial Area
1499	ADMIN, GEN PURP	4,250 SQFT	20 FT	1	1966	Q-3	OFFICE	4,250	Demolish-Near Term	Relocate to Industrial Area
TOTALS		377,892 SQFT						412,227		
NEAR TERM DEMOLITION								129,629	SQFT	
LONG TERM DEMOLITION								26,657	SQFT	
RENOVATION								127,198	SQFT	
REMAIN								255,941	SQFT	
EXISTING USES										
OFFICE								366,696	SQFT	
RETAIL								0	SQFT	
CIVIC								18,503	SQFT	
UTILITY								8,234	SQFT	
INDUSTRIAL								18,795	SQFT	

Appendices MWR Framework Plan (2030)



MWR Framework Plan (2030)

Fort Belvoir / EPG
Fort Belvoir, Virginia



Meeting Minutes

July 11, 2007

Meeting with the Troops at Fort Belvoir

The Meeting opened with Sgt. Major Anbiya explaining to the Troops that the purpose of this meeting was to gather ideas about the new barracks that will be built at Fort Belvoir. While most of the troops at the meeting would no longer be at Fort Belvoir by the time the barracks are completed; the ideas presented today will help the troops that will come later.

A majority of the comments that were received were based on the fact that the present barracks are over 30 years old and have had several renovations that did not improve the barracks. Therefore, simply building new “dorm style” barracks that are the new Army standard would address most issues.

This group of soldiers did not think that a dinning hall was necessary since a majority of them are on “separate rations”; in other words they do not eat at the dinning hall, mostly because the dinning hall is not open 24 hours a day and their work schedules do not fall within dinning hall hours.

The soldiers would like more space. The new Army standard design calls for a space with two bedrooms, a shared bathroom and a shared kitchenette. This would provide for more space than the present rooms have.

As far as technology is concerned access to digital cable, more computer rooms (one per floor; rather than one per building). Better control of heating/cooling, better ventilation system, humidity control, separate circuits per room (to prevents roommates from shorting the other room). Better access control through technology; examples from other bases, CAC card access, dog tag access, key fob access. Any of these methods would also identify “who” is entering a building or room. This is especially true for “day rooms” and other common areas that have been vandalized. Better technology to prevent theft and vandalism.

Lockers and/or storage rooms to storage things that either don't fit or are unneeded. The ability to take the standard furniture out of the room and place each soldiers own

furniture. Better mattresses are a universal comment. Combination shower and bathtub rather than just the shower is preferred. Local phone service and/or an emergency phone (one per floor) in case of an emergency since not all soldiers have cell phones.

One comment that may be hindered by Anti-Terrorism/Force Protection (AT/FP) standards is the fact that most soldiers think that parking is too far away from the building. The barracks have just purchased carts to ease that problem. Even with the new Army standard design AT/FP does not allow for vehicles to get too close to any building, especially where soldiers are living. There is also a need for secured, motorcycle parking that is made of concrete, not asphalt, these should also feature a method to lock the motorcycles. The new standard does call for a courtyard format which could cause the parking to move a little closer than the present design. Presently there is a place to wash cars; it is requested that this feature be kept.

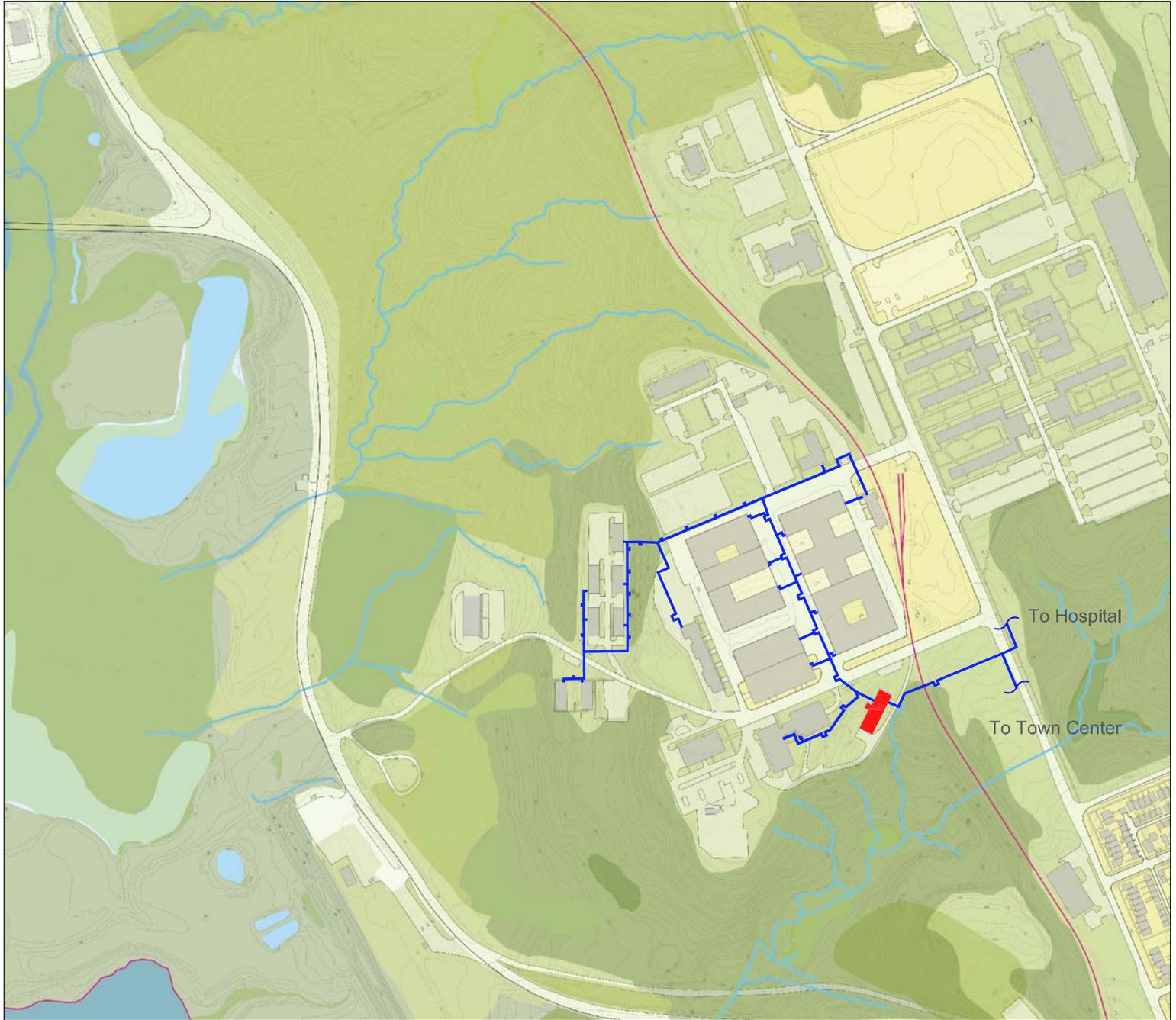
Either smoking and non-smoking rooms/floors or better ventilation system that would help prevent the smells from crossing over into other rooms.

More laundry rooms with more washers and dryers are needed. Presently there are not as many washers because of the piping system that is in the existing buildings are not adequate for more washers. The post is getting upgrades on almost all its utility systems; this may solve that washer/dryer issue.

The common areas on the new barracks might have snack machines, or even a full kitchen for each building to share. The concern of the post is that any common area needs to be protected from theft and vandalism; the early discussion about access and technology could solve this.

Presently each soldier's mail needs to be picked up at the post office on post; a request is that the new barracks have an individual mail box for each soldier that is located at the barracks.

Central Plant Study



Existing

Troop Housing

Existing System

The existing central energy plant, Building 1422, contains three (3) Cleaver Brooks steam boilers with an input capacity of 600 BHP each. This steam is distributed to eighteen (18) buildings within the Troop Area ADP. 1422 also serves Hospital and Town Center.

The heat loss of steam distribution system is 52% of the total annual steam production per steam plant analysis by Fort Belvoir. The annual cost of heat loss is \$724,251 based on \$12.91/MBTU.

See Table 7 and 8 for the detail information

NORTH



NTS



Steam/Hot Water Line



Utility Plant

Table 7. Existing Troop Area

Central Energy Plant	Type	Capacity	Quantity	Equipment	Owner	Year	SF Served
1422	Steam	600 BHP	3	Cleaver Brooks steam	Pepco Government Services in 2000 as part of NCR ESPC - ECM 12	2000	331,670

* 1422 serves 3 Area Developments :
 Hospital 202,947 SF
 Town Center 255,406 SF
 Troop Area 331,670 SF

Table 8 Central Energy Plant for Individual Building of Troop Area ADP

Troop Area	Total Gross Square Footage	Building ID	Use	Gross Square Footage	Action
Central Energy Plant (CEP) Steam (1422)	331,670	1412	OFFICE	5,438	Remain
		1414	OFFICE	50,985	Demolish-Near Term
		1415	OFFICE	51,004	Remain
		1416	OFFICE	27,028	<i>Renovation</i>
		1417	OFFICE	19,540	Remain
		1418	OFFICE	25,537	Remain
		1419	OFFICE	25,082	<i>Renovation</i>
		1420	OFFICE	25,082	<i>Renovation</i>
		1422	UTILITY	7,992	<i>Renovation</i>
		1425	OFFICE	16,078	<i>Renovation</i>
		1434	OFFICE	26,841	Demolish-Near Term
		1440	OFFICE	25,936	<i>Renovation</i>
		1490	INDUSTRIAL	4,187	Demolish-Near Term
		1491	INDUSTRIAL	4,134	Demolish-Near Term
		1496	INDUSTRIAL	4,170	Demolish-Near Term
		1497	INDUSTRIAL	4,181	Demolish-Near Term
		1498	OFFICE	4,205	Demolish-Near Term
1499	OFFICE	4,250	Demolish-Near Term		
Independent Building	80,558	1421	UTILITY	95	Remain
		1423	INDUSTRIAL	1,171	Demolish-Near Term
		1436	OFFICE	12,473	Demolish-Near Term
		1437	INDUSTRIAL	417	Remain
		1438	INDUSTRIAL	400	Remain
		1439	OFFICE	1,530	Remain
		1441	INDUSTRIAL	135	Remain
		1442	OFFICE	26,657	Demolish-Long Term
		1446	UTILITY	111	Remain
		1447	UTILITY	36	Remain
		1457	OFFICE	5,997	Remain
		1462	CIVIC	18,503	Remain
		1484	OFFICE	4,178	Demolish-Near Term
1495	OFFICE	8,855	Demolish-Near Term		

Potential Troop Housing



Potential Troop Housing

Potential Troop Housing

Long Range System
 Provide the new steam and condensate piping distribution to the existing buildings
 Provide the new heat exchanger, hot water and return piping to the new buildings

NORTH



NTS



Steam/Hot Water Line



Utility Plant

Appendices

LEED ND Checklist



LEED for Neighborhood Development Pilot Project Checklist

Project Name:

Primary Contact:

Instructions: In the Points Earned column, enter "Yes," "No," or "Maybe" for prerequisites and the expected number of points earned for credits. For prerequisites with more than one compliance path, enter the compliance path option # in column E, in the row under the prerequisite's name.

Points Earned				30 Points Possible
15	Smart Location & Linkage			
Yes	Prereq 1	Smart Location		Required
1		Option #:		
Yes	Prereq 2	Proximity to Water and Wastewater Infrastructure		Required
1		Option #:		
Yes	Prereq 3	Imperiled Species and Ecological Communities		Required
2		Option #:		
Yes	Prereq 4	Wetland and Water Body Conservation		Required
3		Option #:		
Yes	Prereq 5	Farmland Conservation		Required
2		Option #:		
Yes	Prereq 6	Floodplain Avoidance		Required
2		Option #:		
2	Credit 1	Brownfield Redevelopment		2
1	Credit 2	High Priority Brownfields Redevelopment		1
6	Credit 3	Preferred Location		10
1	Credit 4	Reduced Automobile Dependence		8
1	Credit 5	Bicycle Network		1
	Credit 6	Housing and Jobs Proximity		3
	Credit 7	School Proximity		1
1	Credit 8	Steep Slope Protection		1
1	Credit 9	Site Design for Habitat or Wetlands Conservation		1
1	Credit 10	Restoration of Habitat or Wetlands		1
1	Credit 11	Conservation Management of Habitat or Wetlands		1
18	Neighborhood Pattern & Design			39 Points Possible
Maybe	Prereq 1	Open Community		Required
Yes	Prereq 2	Compact Development		Required
2	Credit 1	Compact Development		7
2	Credit 2	Diversity of Uses		4
3	Credit 3	Diversity of Housing Types		3
2	Credit 4	Affordable Rental Housing		2
	Credit 5	Affordable For-Sale Housing		2
1	Credit 6	Reduced Parking Footprint		2
4	Credit 7	Walkable Streets		8
	Credit 8	Street Network		2
	Credit 9	Transit Facilities		1
	Credit 10	Transportation Demand Management		2
1	Credit 11	Access to Surrounding Vicinity		1
1	Credit 12	Access to Public Spaces		1
	Credit 13	Access to Active Public Spaces		1
1	Credit 14	Universal Accessibility		1
1	Credit 15	Community Outreach and Involvement		1
	Credit 16	Local Food Production		1

Appendices

22		Green Construction & Technology	31 Points Possible
Yes	Prereq 1	Construction Activity Pollution Prevention	Required
2	Credit 1	LEED Certified Green Buildings	3
1	Credit 2	Energy Efficiency in Buildings	3
3	Credit 3	Reduced Water Use	3
1	Credit 4	Building Reuse and Adaptive Reuse	2
1	Credit 5	Reuse of Historic Buildings	1
1	Credit 6	Minimize Site Disturbance through Site Design	1
1	Credit 7	Minimize Site Disturbance during Construction	1
1	Credit 8	Contaminant Reduction in Brownfields Remediation	1
5	Credit 9	Stormwater Management	5
	Credit 10	Heat Island Reduction	1
	Credit 11	Solar Orientation	1
	Credit 12	On-Site Energy Generation	1
1	Credit 13	On-Site Renewable Energy Sources	1
	Credit 14	District Heating & Cooling	1
	Credit 15	Infrastructure Energy Efficiency	1
1	Credit 16	Wastewater Management	1
1	Credit 17	Recycled Content for Infrastructure	1
1	Credit 18	Construction Waste Management	1
1	Credit 19	Comprehensive Waste Management	1
1	Credit 20	Light Pollution Reduction	1
1		Innovation & Design Process	6 Points
	Credit 1.1	Innovation in Design: Provide Specific Title	1
	Credit 1.2	Innovation in Design: Provide Specific Title	1
	Credit 1.3	Innovation in Design: Provide Specific Title	1
	Credit 1.4	Innovation in Design: Provide Specific Title	1
	Credit 1.5	Innovation in Design: Provide Specific Title	1
1	Credit 2	LEED® Accredited Professional	1
56		Project Totals (pre-certification estimates)	106 Points
Certified: 40-49 points, Silver: 50-59 points, Gold: 60-79 points, Platinum: 80-106 points			

Appendices

Sources

Council on Environmental Quality (CEQ). 1997. *Environmental Justice Guidance Under the National Environmental Policy Act*. Council on Environmental Quality, Executive Office of the President, Washington, D.C.

Dewberry & Davis (Dewberry), 1993. Engineer Proving Ground, Solid Waste Management Units. Action Plans. US Army Garrison, Fort Belvoir, Virginia.

Dewberry & Davis (Dewberry), 2001. Environmental Study – Proposed Fairfax County Parkway Construction at Engineer Proving Ground. Department of the Army. US Army Garrison, Fort Belvoir, Virginia.

Dewberry & Davis (Dewberry), 2002a. Closure Plan Site M-27 Waste Ordnance Pits at Range 1. Department of the Army. US Army Garrison, Fort Belvoir, Virginia.

Dewberry & Davis (Dewberry), 2002b. Environmental Study II – Engineer Proving Ground. Department of the Army. US Army Garrison, Fort Belvoir, Virginia.

Dewberry, 2005a. Groundwater Investigation Summary Report Site M-27 Waste Ordnance Pits at Range 1. Department of the Army. US Army Garrison, Fort Belvoir, Virginia.

Dewberry, 2005b. Groundwater Investigation Summary Report Site M-27 Waste Ordnance Pits at Range 1. Department of the Army. US Army Garrison, Fort Belvoir, Virginia.

Dewberry, 2005c. Phase III Groundwater Investigation Summary Report Site M-26 Hydrocarbon Spill Area. Department of the Army. US Army Garrison, Fort Belvoir, Virginia.

Fairfax County, 1982. General Ratings for Urban Development for Fairfax County. Fairfax County, Soil Science Office, Fairfax, Virginia.

Fairfax County Comprehensive Plan, 2003 Edition; Environment, Amended through 11-152004; Chesapeake Bay Supplement, Adopted 11-15-2004

Fort Belvoir. 2001. Integrated Natural

Resources Management Plan (INRMP). Fort Belvoir Directorate of Public Works-Environmental and Natural Resources Division.

Fort Belvoir. 2002. DeWitt Hospital Environmental Assessment (North Post site).

Fort Belvoir GIS Department. 2006. GIS Data for Fort Belvoir, Virginia. Fort Belvoir Directorate of Public Works.

International Technology Corporation (IT Corp), 1990a. Environmental Baseline Study for the Engineer Proving Ground, Fort Belvoir, Virginia. Phase I, Scope Definition, and Phase II, Environmental Survey, Volume 1. US Army Toxic and Hazardous Materials Agency (USATHAMA), Aberdeen Proving Ground, Maryland.

International Technology Corporation (IT Corp), 2005b. Environmental Baseline Study for the Engineer Proving Ground, Fort Belvoir, Virginia. Phase III, Environmental Baseline Survey, Volume 2. US Army Toxic and Hazardous Materials Agency (USATHAMA), Aberdeen Proving Ground, Maryland.

PBS&J. 2005. 95% Draft Fort Belvoir Master Plan Long Range Component. Prepared for Fort Belvoir Directorate of Public Works. January.

Malcolm Pirnie, Inc. 2006. Historical Records Review, Fort Belvoir, Fairfax County, Virginia. Prepared for the U.S. Army Corps of Engineers Baltimore District and Fort Belvoir. March.

State Water Control Board/Groundwater Quality Standards 9 VAC 25-280-10 et seq Groundwater Standards Statutory Authority: 62.1-44.15(3a) of the Code of Virginia. Effective February 12, 2004.

Tetra Tech, Inc. 2005a. Visual Site Investigation Report, Fort Belvoir Main Post SWMU Program. Prepared for Fort Belvoir Directorate of Public Works-Environmental and Natural Resources Division. October.

Tetra Tech, Inc. 2005b. Visual Site Investigation Report, Task I—RCRA RFI Description of Current Conditions-Engineer Proving Ground.

Prepared for Fort Belvoir Directorate of Public Works-Environmental and Natural Resources Division. October.

Tetra Tech, Inc. 2006. Phase III Groundwater Investigation M27 Prepared for Fort Belvoir Directorate of Public Works-Environmental and Natural Resources Division. March.

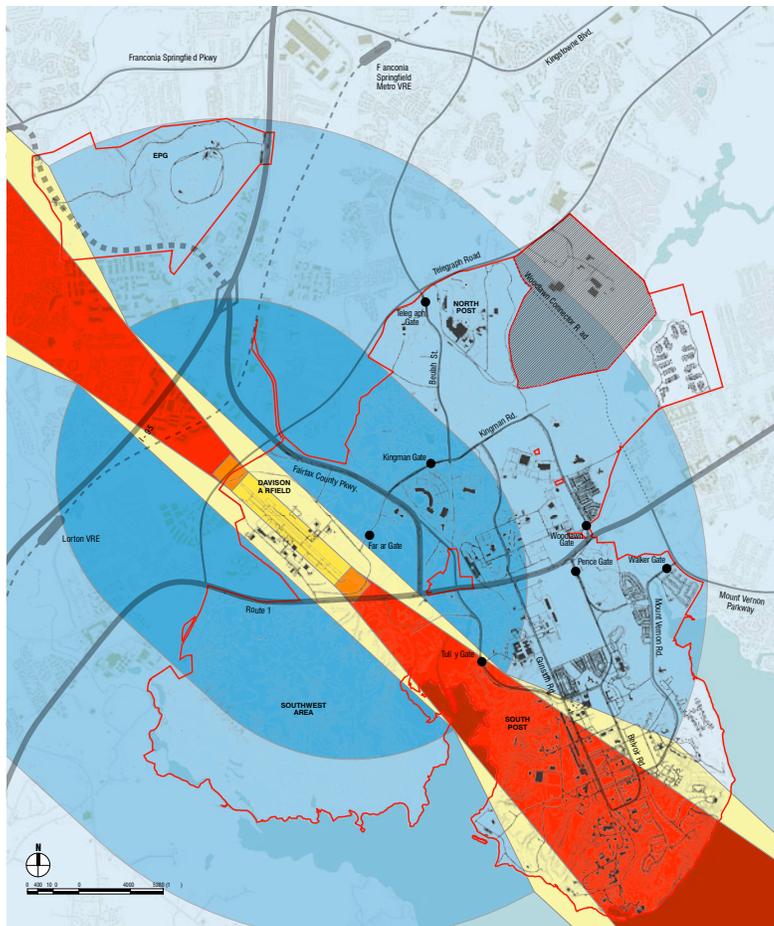
United States Department of Transportation (DOT), Federal Highway Administration (FHA) and Virginia Department of Transportation (VDOT) 2003. *Fairfax County Parkway Environmental Assessment*.

United States Geological Survey. Annandale Quadrangle, Virginia. 7.5 Minute Series (Topographic). 1965, photorevised 1983, 1994.

United States Geological Survey Fort Belvoir Quadrangle, Virginia – Maryland. 7.5 Minute Series (Topographic). 1965, photorevised 1980.

Virginia Department of Environmental Quality, 2001. Guidance for Closure Plans and Post-Closure Plans for Hazardous Waste Management Facilities. Office of Waste Permitting, Division of Waste Program Coordination, Richmond, Virginia.

Figure 2.43- Airfield Constraints Map



Airfield Facilities

Davison Army Airfield

Davison Army Airfield (DAA) is an operational and training facility. DAA accommodates five operational flying units within the Washington/National Capital Region Military District and a training unit of the District of Columbia Air National Guard. The five operational flying units are:

- 12th Aviation Battalion - Rotary
- Operational Support Airlift Agency (OSAA/OSACOM) - Fixed wing
- DC Air National Guard - Rotary
- Aviation Night Vision Lab - Rotary/ Fixed wing
- Civil Air Patrol - Fixed wing

The operational units are primarily responsible for supporting Post-related missions and operations. Currently DAA supports training and operations by both helicopter and fixed wing aircraft. DAA Air Traffic Services Staff's monthly activity records show that there were a total of 50,181 fixed wing and helicopter operations from April 2005 to April 2006. Helicopter operations account for approximately 60 percent of the total annual flight operations.

DAA is required to comply with guidelines and regulations to meet a Class A airfield as outlined in the Unified Facilities Criteria (UFC) 203-260-01, Airfield and Heliport Planning and Design. The maximum aircraft size which can be safely accommodated at DAA is UC-35 (Citation 560). Operations at the DAA accommodate a helicopter fleet ranging from small OH-6s to large UH-60 Blackhawks and CH-53 Stallions, while fixed wing aircraft operations range from small Cessna 182s to large C-130 Hercules aircraft. Although C-130 operations exceed the design weights and pavement geometry parameters of this Class A regulated airfield, they have occurred frequently and resulted in the rapid deterioration of the airfield pavements. Additionally, the existing facility layout often results in the interaction of helicopter and fixed wing aircraft operations, which reduces the operational safety and capacity of the airfield.

Figure 2.43 maps the imaginary surfaces associated with the runway at DAA. No manmade structures or natural features are allowed on the primary surface and clear zones. Height restrictions are imposed on the development and landscape below the rest of the surfaces. The DAA runway elevation is +74 ft MSL. The associated imaginary surfaces are calculated based on this level.

Maximum allowed height for development on any given parcel is determined by the topography and the imaginary surface the parcel falls under. Figure 2.44 depicts the maximum allowed height for development surrounding the airfield.

Figure 2.44- Maximum Building Heights based on Airfield Imaginary Surfaces Restrictions

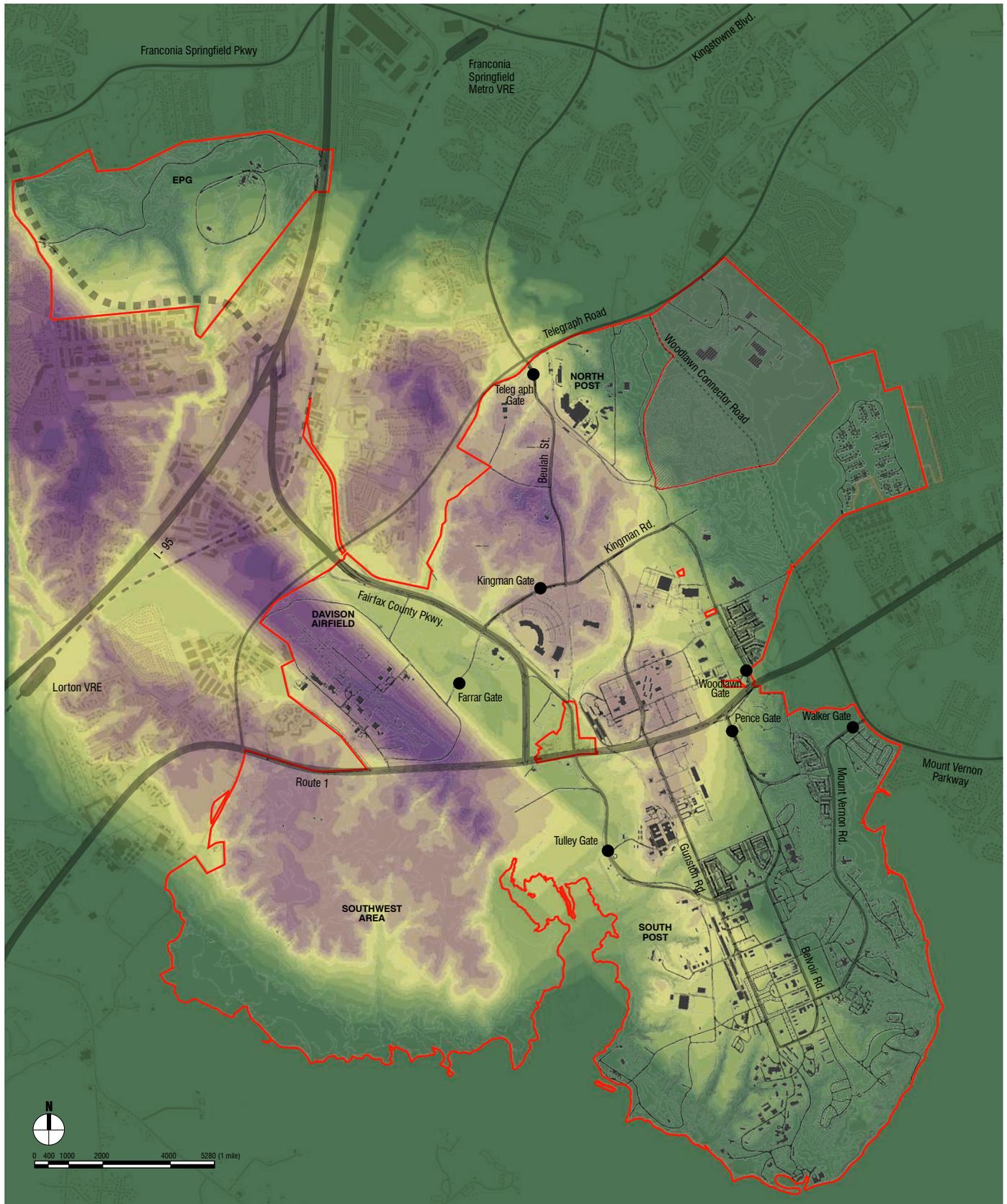


Table 2.21 - DAA Imaginary Surfaces, Existing On-Post Obstructions and Impacts on Development

Imaginary Surface	Definition	Development Impacts and Existing Obstructions*
Primary Surface	A surface longitudinally centered on the runway and extending 200 feet beyond each runway end. The width of the primary surfaces varies depending on the class of runway and coincides with the lateral clearance distance.	No manmade or natural features are allowed. Obstructions include building nos. 3136, 3137, 3138, 3140, 3141, 3230, 3231, 3233, 3234, 3237, and 3239.
Clear Zone (graded area only)	A surface located on the ground at the runway end and symmetrical about the runway centerline extended.	No manmade or natural features are allowed. No obstructions identified.
Approach-Departure Surface	An inclined plane arranged symmetrically about the extended runway centerline. The beginning of the inclined plane starts at the end of the primary surface and the elevation of the centerline at the runway end. The surface flares outward and upward from these points at a uniform slope.	No structure must puncture this surface. No obstructions identified.
Inner Horizontal Surface	An imaginary plane that is oval in shape and is located at a height of 150 feet above the established airfield elevation.	No structure must puncture this surface. Obstructions include building no. 2462.
Conical Surface	An imaginary surface that extends from the periphery of the inner horizontal surface outward and upward at a slope of 20 to 1 for a horizontal distance of 7,000 feet and a height of 500 feet above the established airfield elevation.	No structure must puncture this surface. Obstructions include building nos. 2901, 2902, 2903, 2905, and 2907.
Outer Horizontal Surface	An imaginary plane located at a height of 500 feet above the established airfield elevation, extending outward from the edge of the conical surface a horizontal distance of 30,000 feet.	No structure must puncture this surface. No obstructions identified.
Transitional Surface	An imaginary surface that extends outward and upward at right angles to the runway centerline at a slope of 7 to 1 and connects the primary and approach departure surfaces to the inner horizontal, conical and outer horizontal surfaces.	No structure must puncture this surface. No obstructions identified.

Note: * Existing Obstructions were calculated based on Fort Belvoir GIS data provided. Field investigations are required to verify these conclusions.

Planning Considerations

Current and future facilities should not penetrate the imaginary surfaces which are detailed in Figure 2.43, so that DAA may operate at its full capacity. Table 2.21 lists the existing facilities which conflict with the imaginary surfaces. While height restrictions apply to the entire Post and EPG, restrictions of 100 ft or lower only apply to parts of the North Post and Southwest area (Figure 2.44). Severe restrictions of 40 ft or lower apply to small areas within the North Post Golf Course and the eastern portion of the Southwest area. It is extremely important that existing obstructions are removed and potential future obstructions are prohibited. This will help DAA regain lost operational capacity and protect against further loss of overall airfield functionality.

DAA plays a key role in the National Emergency Response plan. In the event of a National Emergency, Andrews Air Force Base (AFB) will be used to launch fighter aircraft and the Presidential Command Control Berth. Andrews AFB will be locked down to all other operations. DAA will provide for simultaneous operations, such as evacuation of the Secretary of Defense and other key personnel. DAA's assets will be used primarily within the DC area Beltway. During a National Emergency, DAA will be in "lockdown", restricting personnel from leaving or accessing the airfield until the Emergency has passed. These National Emergency Response plans must be considered during land-use development planning.



Airfield Facilities

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