AIR COMBAT COMMAND

A7PS

Installation Development and Design (ID2)

Seymour Johnson Air Force Base, North Carolina

ID2

March 2011

This page intentionally left blank.

Page

Page

Page

List of Figures

Page

1 Introduction

This document addresses planning, design and construction criteria guidance for Seymour Johnson Air Force Base (SJAFB) so that implementing Sustainable Development and High Performance Green Building Design (SD&HPGBD) objectives become primary considerations along with building site, context, program needs, and function

Located in Goldsboro, North Carolina (Figure 1-1), the host unit at SJAFB is the 4th Fighter Wing (FW) which currently flies F-15E Strike Eagle aircraft. A primary tenant at SJAFB is the 916th Air Refueling Wing (ARW), Air Force Reserve, which operates KC-135 aircraft.

- The mission of the 4 FW "*…is to put airpower on-target, on-time for America.*
- The strategic vision for the installation is to "*Provide infrastructure and facilities at SJAFB to allow the 4 FW and 916 ARW to support the long-term strategies of Global Strike, Global Response, Global Mobility, and Homeland Security."*

1.1 Document Scope, Applicability, and Audience

Current guidance removes design process short-circuits by realigning constraints, changing mandates into a performance framework and limiting prescriptive requirements to those critical in meeting Command and Installation functional requirements. Prior editions of design guidance, both at the Command level and the Installation level, relied heavily on mandates and prescriptive formula relating to the building form, aesthetics and materials, and this often narrowed design phase investigations into plan arrangement exercises.

Installation-level development and design guidance focuses on the identification of regional and local design characteristics, common building methods and preferences, architectural context, landscape standards, infill and building density opportunities, future vision and the establishment of installation centric preferences and strategies. Building aesthetics and character cannot be fully established prior to conducting the concept charrette, as aesthetics develop and evolve in response to multiple drivers. Designing and then evaluating aesthetics and architectural character is highly subjective and has to be approached on a project-by-project basis.

Companion information to this document is provided in the form of an Installation 3D mass model, photographic log database and the Installation Sustainability Assessment (ISA). The Installation 3D mass model is dimensionally accurate and reflects overall building massing, height and form. The photographic log database includes all structures on the installation, with the exception of family housing units and utility sheds. The ISA serves to provide a current-state snapshot of the Installation's "green posture" and will serve as a way to measure changes over time; indicators should change for the better over time as more green design strategies and processes are put into place.

1.1.1 Applicability

Publication of this document serves to supersede previous installation-level design guidance. All external references to installation-level guidance documents now refer to the Installation Development and Design Handbook (ID2). The ID2 serves to inform Future Year Development Plan (FYDP) site selections, Area Development Plan (ADP) designs, Requirements Document (RD) investigations, and Concept Charrette Document (CCD) packages. The ID2 will be summarized in the installation Electronic General Plan (eGP).

Architect-Engineer (A-E) Scope of Work descriptions, Request for Proposal (RFP) solicitation and, Design-Bid-Build (D-B-B) and Design-Build (D-B) contracts shall explicitly identify HQ ACC/A7P sustainable development and high performance green building design requirements and objectives as functional requirements.

The ID2 shall not be referenced in Design and/or Construction solicitations as establishing mandates relative to facility aesthetics, character, or form. All Design and/or Construction solicitation packages shall include contract provisions citing the ID2 as containing broad considerations and shall require government review of design proposals in the source selection trade off and evaluation process. Contractor's responsiveness to ID2 considerations shall carry weight as a significant evaluation factor in determining the overall acceptability and value of the proposal to the government.

1.1.2 Audience

This document provides criteria and considerations used in the planning, development and design of projects and are in addition to technical criteria readily available to professional architects, planners, engineers, and interior designers. This document and companion information sources shall be used as primary reference in all planning/siting considerations, building renovation projects and new construction projects.

SEYMOUR JOHNSON AIR FORCE BASE

Vicinity Map

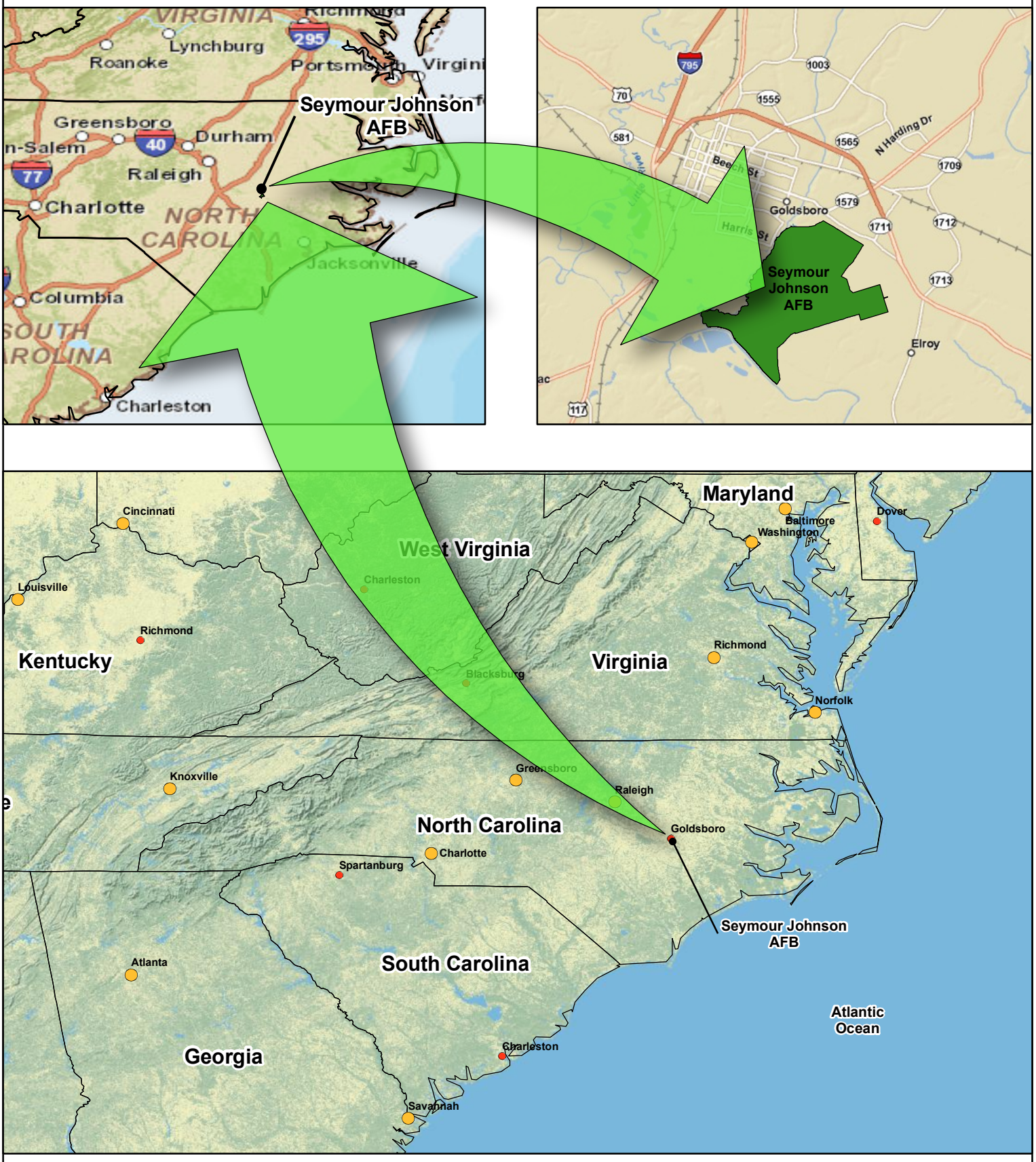


Figure 1-1

1.2 Development and Design—A Holistic Approach

1.2.1 HQ ACC/A7P

The Command's vision is to lead by example and serve as a role model for sustainable development and high performance green building design in the Air Force, DoD, and the federal government. When "Green Design" is infused into every facet and decision, immediate and long-range benefits including healthier working environments, reduction of the installation's carbon footprint and enhancing the enduring quality of facilities while lowering the total cost of facility ownership will be realized. To this end, development and design strategies must consider a myriad of factors and influences and ensure solutions are appropriate to the site, sensitive to the built and natural context, reflective of functional needs, responsive to aesthetic considerations and that they embody green building design.

Green design is not optional. Implementing green building design (functional constraints) objectives is required to produce a complete and usable facility or a complete and usable improvement to an existing facility. A green building design approach forms the functional and technical foundation for all performance requirements, development consideration, and design constraints made, referenced, or otherwise used in this document.

"Green Design" is synonymous with "Quality Design." Quality design strategies produce results that conserve energy; make efficient use of resources; produce visually appealing structures; reduce environmental degradation; create built environments that are livable, comfortable, safe, enduring, and productive; and shrink the environmental impact of our operations.

1.3 Development and Design—Requirements and Evaluation Metrics

1.3.1 HQ ACC/A7P Requirements

Command-level requirements are described in ACC Instruction, Installation Development, and Design (publication forthcoming). This document establishes sustainable development and high performance green building design objectives as primary functional constraints, prescribes HQ ACC/A7P review and oversight processes, identifies architectural and engineering design considerations, and promulgates performance and prescriptive constraints.

1.3.2 Installation Requirements

The ID2 aligns with Command-level guidance and is intended to be a vital component in developing strategies appropriate to smart growth development and the building site, sensitive to the built context, reflective of building program and scale and responsive to object/background importance. It should also fully implement sustainable development and high performance green design objectives. The ID2 describes constraints and identifies objectives necessary to accomplish quality design. Topics and focus areas include installation context, architectural context, an Illustrative Plan, overarching development and design guidelines, site selection and development considerations, landscape design issues, architectural design objectives and technical constraints.

Technical constraints can be generally categorized either as "Non-negotiable," such as compatibility with existing fire-alarm communication or keying systems, or "Negotiable," such as a brick blend generally used throughout the installation. "Non-Negotiable" constraints should not directly or indirectly predetermine building aesthetics, character, or form or limit/restrict investigation of high performance green building design strategies.

1.3.3 HQ ACC Development and Design Review Board (D2 Board) Evaluation Metrics

Projects meeting threshold levels established in the *ACC Instruction* (publication forthcoming) will be evaluated by the HQ ACC Development and Design Review Board (D2 Board). D2 Board evaluations seek to validate conformance with requirements established by Command-level guidance and in this document and seek to validate adherence to principles of quality design, such as optimizing benefits from site selection and energy use, protecting and conserving water resources, utilizing environmentally preferable products, enhancing indoor environmental quality and optimizing operational and maintenance practices. All development and design solutions must embody an *"appropriate response"* and reflect a responsible use of public funds.

Evaluations of aesthetics and architectural design are inherently subjective, and the D2 Board reserves latitude in evaluating design strategies on a project-by-project basis. Design aesthetics, architectural character, and appropriate building form cannot be prescriptively determined in advance of conducting a concept development charrette, as these characteristics arise only *after* consideration and synthesis of all design drivers. Setting aesthetic preconditions short-circuits design development and will be avoided.

1.3.4 HQ ACC D2 Board Evaluations

D2 Board evaluations may produce recommendations (non-mandatory), directives (mandatory), or a combination of both. In extreme cases, D2 Board directives may include project stoppage in order to address continued or critical failure in meeting functional constraints.

Directives must be implemented, unless in very rare and extenuating circumstances a waiver is first endorsed by the D2 Board and then approved by HQ ACC/A7. Waiver requests must be submitted by the BCE Squadron Commander and must clearly document the basis for non-compliance and describe actions that will be taken to offset the deviation. Issuance of a waiver does not establish precedent or a basis for justifying other projects' non-compliance.

1.3.5 Installation Evaluation Metrics and Evaluations

Installation metrics are those used by the D2 Board with additional interest in evaluating the implementation of installation-centric technical requirements. Installation evaluations may result in recommendations (non-mandatory), directives (mandatory), or a combination of both.

1.4 Organization of this Document

This ID2 Handbook is organized into five main chapters:

- **Chapter 1, Introduction—**Familiarizes the reader with the need, scope and applicability, requirements and organization of the document.
- **Chapter 2, Installation Image—**Provides insight into the existing conditions found on base, specifically in areas where new development can be accommodated.
- **Chapter 3, Development Considerations—**Provides information regarding opportunities and constraints found within the development areas.
- **Chapter 4, Illustrative Plan—**Provides a view of potential development opportunities in the next 10 - 20 years
- **Chapter 5, Development and Design Guidelines—** Highlights approaches to areas of SD&HPGBD, site development and architectural design.
- **Appendices—**Identify specific technical considerations and constraints and other supporting materials.

2 Installation Image

This section presents a discussion of the installation context, which identifies the natural and man-made conditions/resources present at the installation. It is within these conditions that planning, design and construction decision are made. The context discussion is followed by a discussion of design goals that help define the future "image of the base." Also evaluated are the physical elements of the installation that make up the current "image" of the base. These elements include paths, edges, nodes, landmarks, and districts. This report uses the element framework established in Kevin Lynch's *The Image of the City*, which was first published in 1960 by the M.I.T. Press.

The physical elements that make up an image of a community or military installation form an impression of the installation for military and civilian personnel, families, and visitors. The sense of place that is established through the combination of paths, edges, nodes, and landmarks adds to the quality of life for installation residents and workers. The way these elements are treated can add to the knowledge or perception of the important locations on the installation and provide visual directions for traversing the installation.

- A well-established hierarchy of roads (or paths) provides a driver with strong clues as to whether they are in the right location. An important element of road hierarchy is how the streetscape is treated. Roads should be limited, serve a defined purpose and, in most instances, the streetscape should be shared with pedestrians.

  The hierarchy of paths also extends to the pedestrian environment. Paths should provide a pleasant way to walk, bike or jog throughout the installation and should be designed appropriately for their task, which ranges from simple access to a building to an installation-wide bike trail or pedestrian plazas and walkways in high-density nodes.

- Edges can physically separate areas and function but can also form screens to reduce or eliminate views of certain areas. Edges can also be used to frame a visitor's perspective of an installation, frame nodes, and highlight landmarks.

- Nodes are associated with multiple image elements, such as locations where decisions are made or locations that draw higher densities of people. A node is, in many cases, distinctly different from many other locations on an installation because that area is a relatively constant center of gravity for social or work-related gatherings. Nodes can be highlighted and identified through the establishment of a landmark.

- Although signage is necessary to assist people in wayfinding, landmarks are an important way to direct people from one place to another. Landmarks serve many purposes, from inspirational to simple, functional structures. Height, scale, and site are typical elements of a landmark; however, they are not always used to the maximum extent.

Pedestrian pathway with crosswalk.

The static displays at Heritage Park are prominent landmarks at the installation.

2.1 Installation Context

Planning, design and construction decisions need to be based on the fundamental tenets of sustainable design[1] and require an understanding of natural resource conditions from the region to the site, the needs of

[1]Sustainability is generally considered to be the integration of ecology, sociology, and economics in addressing master planning and building design; however, master planning and design for military installations requires additional considerations. Sustainable planning and design solutions for military installations such as SJAFB are directly linked to mission sustainment, quality of life for personnel and families, conservation of natural resources and economic realities.

personnel to effectively complete their tasks, the needs of families for a safe and healthy community and the fiscal constraints that all federal agencies must adhere to. In addition to guidance provided in this report, master planners and designers need to be familiar with all other relevant reports such as the SJAFB General Plan (GP), Integrated Natural Resources Management Plan (INRMP), Integrated Cultural Resources Management Plan (ICRMP), and many others. The SJAFB GP will direct the reader to all relevant documents. The following is a brief overview of SJAFB, which is culled from relevant SJAFB documents.

- SJAFB occupies 3,233 acres (5 square miles) of land within the city limits of Goldsboro, North Carolina (Figure 1-1). It is approximately 50 miles southeast of Raleigh, on the Neuse River. Highway 70 runs north of the base and Highway 117 lies to the west of the base.

- According to the most recent census information, the current population of Goldsboro is about 38,000, and the population of surrounding Wayne County is approximately 114,000. Residential, agricultural, commercial, and industrial land uses occur adjacent to the installation.

- SJAFB is located on relatively flat land at the center of the coastal plain of eastern North Carolina, approximately 65 miles from the Atlantic Ocean. The topography includes the floodplain of the Neuse River, a higher terrace of the river, and a still higher terrace that may also be of riverine origin.

- As in most Coastal Plain river valleys, the Neuse River valley is not symmetrical. The river flows along the south side of the watershed, with the southern drainage divide located about four miles to the southwest. The Neuse River at the western boundary of the base and Stoney Creek along the northern boundary of the base are Clean Water Act Section 303(d) listed impaired water bodies. The northern portion of the base discharges directly to Stoney Creek which is a tributary to the Neuse River and most of the southern portion of the base discharges directly to the Neuse River. A Total Maximum Daily Load (TMDL) for nitrogen has been established for the Neuse River Basin as well as a program for nitrogen control.

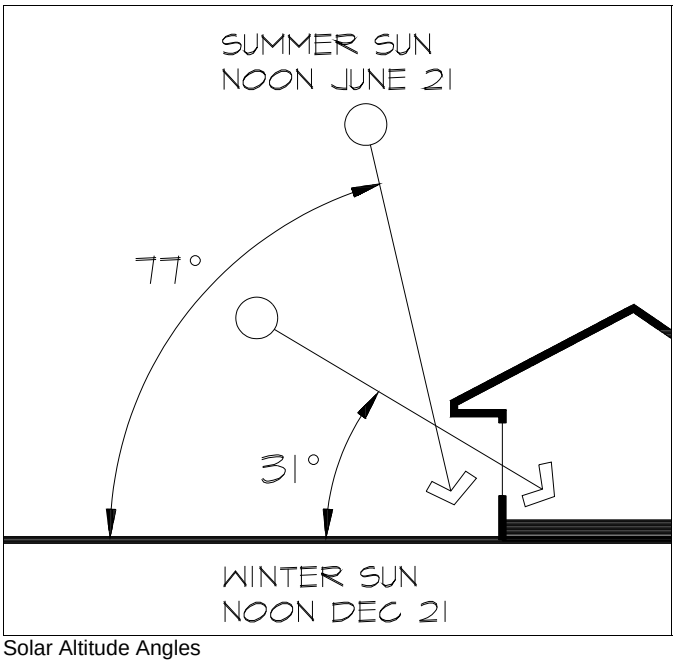
- The vegetative habitat on SJAFB is small and fragmented; there are no known federally listed threatened and endangered species on the base.

- Elevations on the base vary from approximately 45 to 110 feet, gradually sloping downward from the northeast to the southwest. The greatest relief is along Stoney Creek, where it flows through the higher terrace. (Refer to the General Plan for flood zone information.)

- A soil survey of Wayne County indicates the presence of fifteen different soil series on base, reflecting the differing ages of the landscape and the variety of soil drainage created by the topography.

- Eastern North Carolina has a temperate climate with long, humid summers and short, mild winters with frontal storm systems and cold spells. Precipitation averages 50 inches annually, with the greatest monthly rainfall occurring in the spring. Snow is infrequent.

- Seymour Johnson's location, near the Atlantic Coast, creates the potential for serious damage due to hurricanes and tropical storms. Hurricane season runs from June to November.



Solar Altitude Angles

- The following is location information for SJAFB:
  - Latitude = 35°20' North
  - Longitude = 77°50' West
  - Altitude Above Sea Level = 100 feet
  - Winter Outdoor Design Temperature = 22° F
  - Heating Degree Days = 2,771 (based on 65° F)
  - Cooling Degree Days = 1,922 (based on 65° F)
  - Sun Altitude Angles: Noon on 21 December = 31°
    Noon on 21 June = 77°
  - USDA Plant Hardiness = Zone 8
  - Annual Precipitation = 50 inches
  - Wind Power Classification = 1 (weakest winds)
  - Annual Clear Days = 111
  - Annual Cloudy Day = 149

2.2 Installation Design Goals

The 4 FW established four architectural and planning goals that provide the overall guidance for land development, including land use, facility sitings, and infrastructure development. The design guidelines in this document have been developed in response to those goals as well as the Command's goal for a holistic approach to sustainable design and development:

- Create buildings that project a corporate image for the Air Force.
- Develop a campus atmosphere at Seymour Johnson.
- Establish a style which responds to the architectural context of the region.
- Create architectural standards that are compatible with the existing built and natural environment.

Create a Corporate Image

"Corporate image" can be interpreted in a variety of ways. The SJAFB Installation Design and Development guidelines have been formulated to express an installation character that projects an image of efficiency and permanence. Common building forms and materials will allow individual buildings to appear as part of a larger whole. Logical vehicular circulation and an emphasis on creating highly visible building entrances will help develop the image of buildings within a corporate office park.

"Corporate image" also includes worker satisfaction as a priority. The design guidelines contain provisions for operable windows in all offices and living areas. The addition of site lighting, site furnishings, and outdoor break areas will also benefit building occupants.

Base main entrance sign.

As well, "corporate image" includes the landscaping of a site. The design guidelines consider carefully designed landscaping as one of the most effective means of achieving visual harmony on a base-wide scale. A base street tree program can mitigate the negative impact of older, incompatible buildings. Landscape guidelines that encourage use of a limited number of regionally suitable species will help unify the entire base.

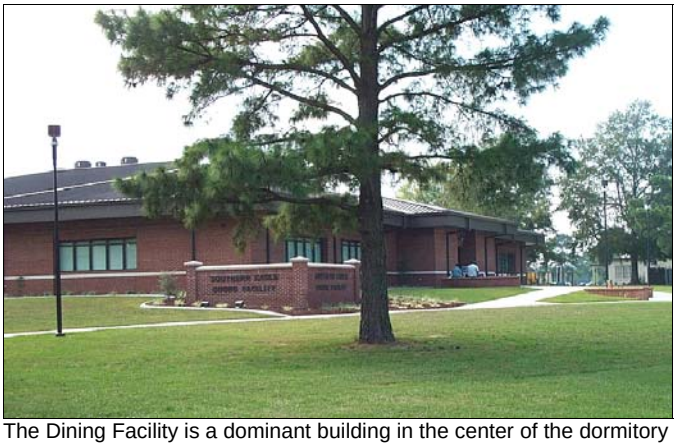
Develop a Campus Atmosphere

As part of developing a campus atmosphere, the design guidelines suggest that a focus on the pedestrian is critical to the creation of a campus environment. The guidelines propose methods for mitigating the negative impact of the automobile by separating parking from building entrances and linking buildings with shaded pedestrian paths. A carefully designed network of paths connecting living, working, shopping, and recreational facilities will increase pedestrian activity and help to overcome the perception that "it's too far to walk."

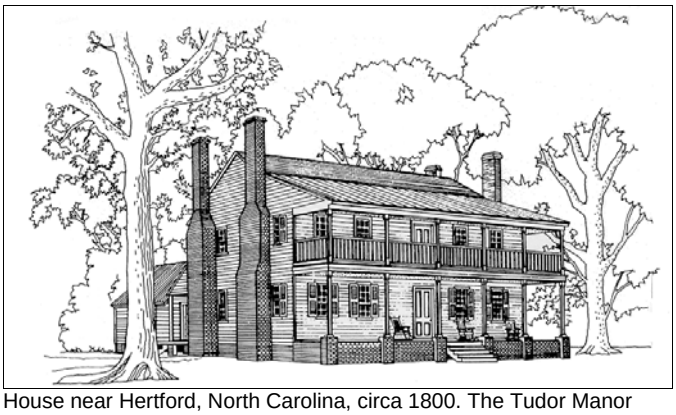
The design guidelines also encourage clearly defined entrances and gathering places for recreation and socializing for successful campus buildings. The recommended building materials and fenestration patterns are designed to provide human scale on all buildings, another feature common to successful campus architecture.

Respond to Regional Architecture

Since the 18th century, settlers in eastern North Carolina have adapted buildings to the local climate of hot, humid summers and temperate winters by incorporating moderately pitched roofs and large, deep porches to provide protection from the summer sun. Buildings were constructed of locally harvested woods and brick made from local clays. As in the other original colonies, early roofing materials were wood shingles. As technology developed, many structures incorporated metal roofing.


The Dining Facility is a dominant building in the center of the dormitory campus.

Many of the design concepts of colonial architecture are still important today. Thick masonry walls help keep dwellings cool in the summer by slowing heat transfer, and operable windows can be used to provide natural ventilation. One- and two-story buildings with sloping metal roofs, entrance porches, and walls of locally manufactured masonry continue the tradition of an architectural style that developed in response to the local environment.



House near Hertford, North Carolina, circa 1800. The Tudor Manor House of New England is adapted to the southern climate through use of a shallow-pitched roof and a two-story, metal-roofed porch.

Create Architectural Standards that are Compatible with Existing Built and Natural Conditions

The *Seymour Johnson ID2* has been developed with the consideration that most facilities on base will remain in use for many years. A major objective of the document is to identify positive architectural features that should be replicated in future development to promote visually compatible within districts.

In the past, base leadership has followed a plan to use red brick and dark bronze metal roofs on dormitories, community buildings, and other facilities in the central part of the base. This document supports this vision, but allows for flexibility in design to achieve SD&HPGBD objectives.

Renovated dormitories and many other facilities in the Community Area make use of red brick walls and dark bronze metal roofing.

Constructed of beige split-face concrete masonry with dark bronze metal roof, the 916th Wing Headquarters is an example of compatible development in the Mission/Industrial area.

This ID2 also seeks to promote infill development that, in turn, provides greater opportunities for the application of natural and man-made green infrastructure systems.

2.3 Image Elements

Installation image elements include paths, edges, nodes, landmarks, and districts. They form the basic pattern of the installation form and the way personnel and visitors perceive and relate to the installation. Figure 2-1 illustrates the overall pattern of elements at SJAFB.

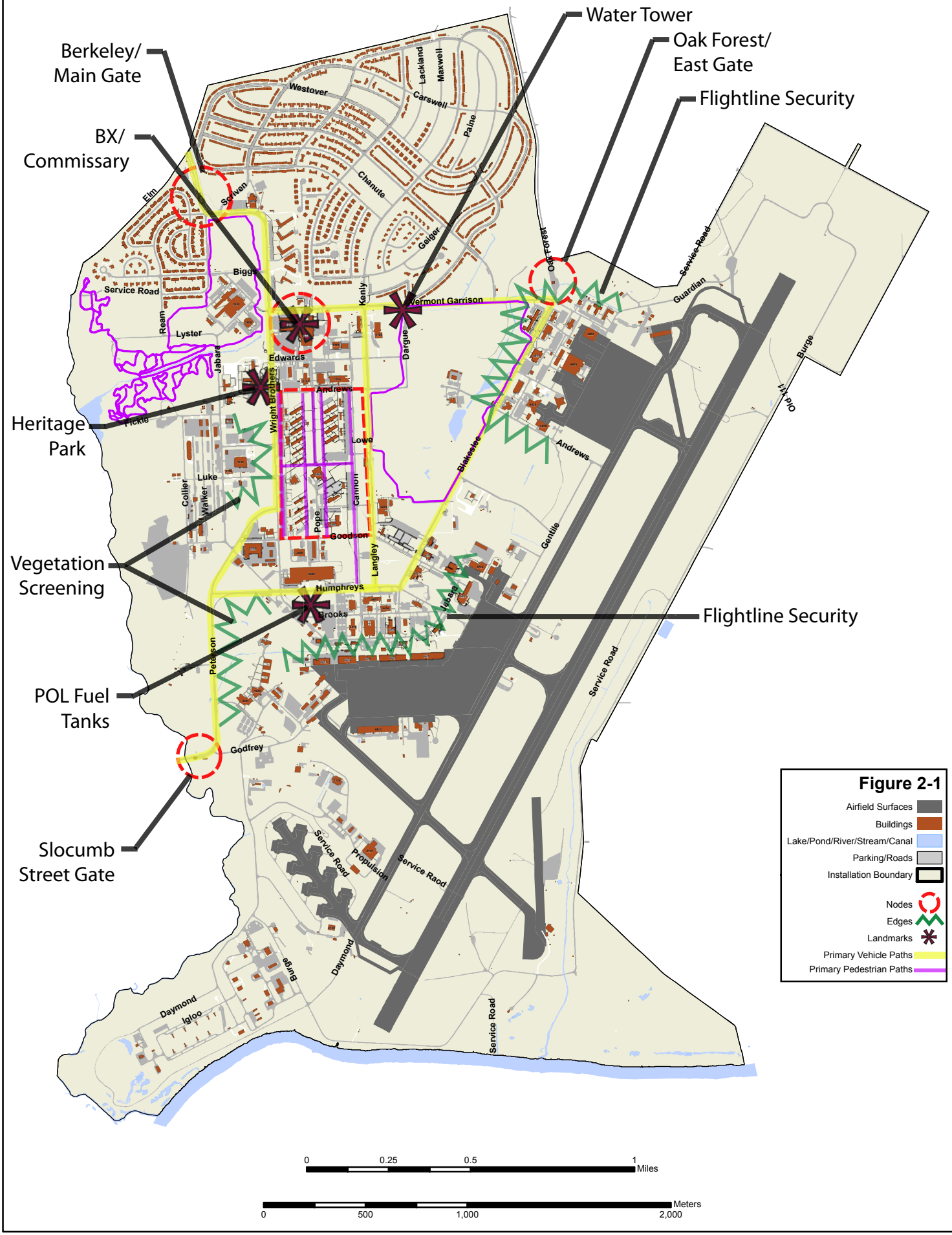
2.3.1 Paths

Paths can be essentially defined as movement corridors. On SJAFB, paths include roads, sidewalks and walk/bike trails. They function as basic orientation to the installation by providing the means to access most areas on base. Beyond their basic utility as a conveyor of people, paths provide the traveler with visual experiences with the other elements that comprise the installation image.

The primary paths at SJAFB are the arterial roads, which are Wright Brothers Avenue, Blakeslee Avenue, Vermont Garrison Street, Humphreys Street, and Peterson Avenue. These paths direct the highest volume of travelers to their desired destinations on the installation or to the gates to exit the installation. Langley Avenue parallels Wright Brothers Avenue and also serves as a high volume path. Other roads (paths) radiate from the arterials.

Sidewalks and walking/bike paths provide opportunities for installation personnel to experience elements at a different pace; they also provide a different experience in the form of exercise.

SEYMOUR JOHNSON AIR FORCE BASE
Installation Image Elements

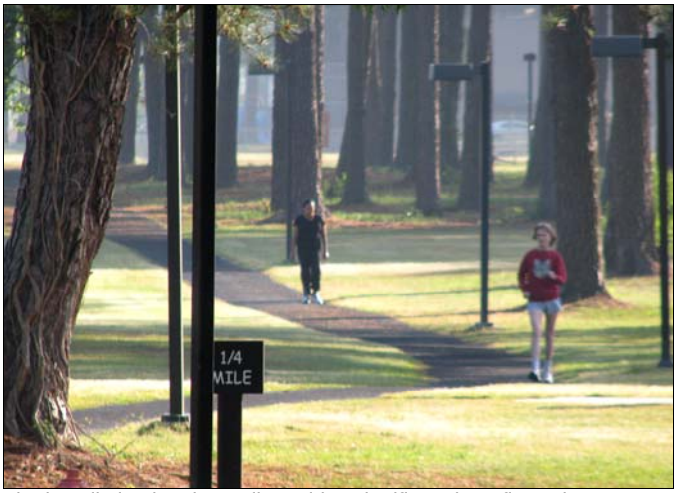



The dormitory area is bisected by a strong, linear pedestrian path.

The installation has an adequate pedestrian circulation system. Sidewalks link buildings throughout the dormitory, administrative and community center areas. The dormitories area includes a central corridor that links all dormitories with the dining hall and up to the community center area.

Informal, yet very important, pedestrian circulation is provided by a jogging trail that extends through the outdoor recreation area and around the golf course. Another jogging trail connects the Medical Center with family housing and parks. These trails provide great health benefits to the installation population; however, the trail around the golf course does not provide direct access between facilities and cannot be considered an alternate mode of travel.

- The trail around the Medical Center does provide direct access to numerous facilities; however, widening the trail to allow bicycle use would enhance this trail as an alternative mode of travel to outdoor recreation, administrative facilities, and the community center.



The installation jogging trail provides significant benefit to Airmen, families, and civilian workers.

2.3.2 Edges

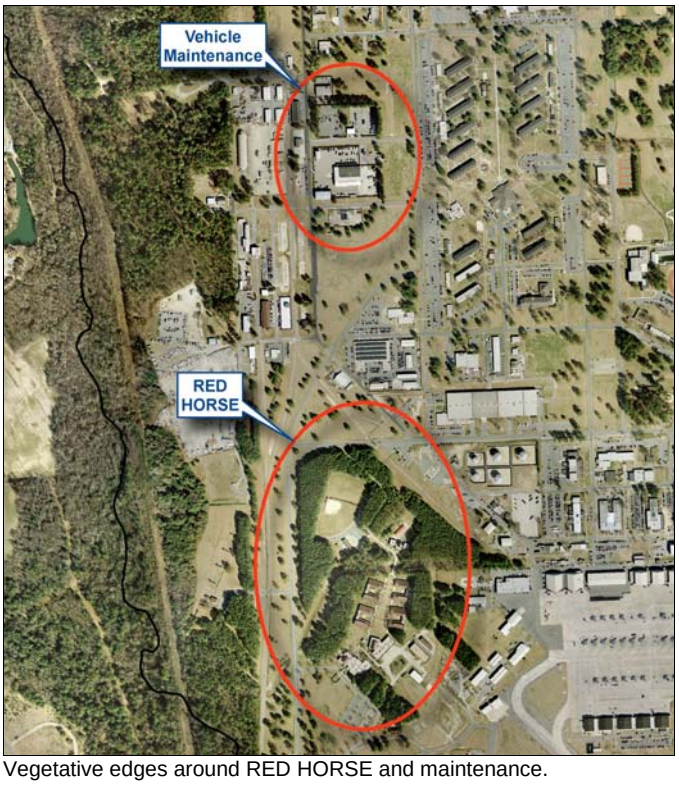
Edges are defined by Lynch as "*linear elements that are not used or considered as paths…*" These elements are primarily boundaries between areas. They may function as visual or physical barriers and can be simple walls, fences, vegetation, infrastructure, or structures. Typically, these features are not as dominant in a person's mind as primary paths, such as arterial roads, but they can be significant organizing features for land form. Edges can also be an important element of green infrastructure.

Although there are countless trees throughout the installation, there are few areas where natural features could be defined as edges. The only place where tree stands are a dominant part of the landscape and form a strong visible edge is the area surrounding the RED HORSE compound. This wooded area eliminates views into this portion of the installation from Peterson Avenue and Humphreys Street. The wooded area just inside the main gate could be considered a "filtered" edge, which is noticeable, but not a prominent feature.

A good use of a vegetation edge occurs along Wright Brothers Avenue. In this case, the edge is used to screen views of the vehicle maintenance area from the road.

The security fences along the flightline are less visually prominent than the wooded area surrounding RED HORSE, but are equally strong edges. The chain link and ornamental iron fencing does not affect viewsheds, but is a strong barrier between the flightline and the balance of the installation. Edges are also illustrated in Figure 2-1.


Fencing along the flightline does not hinder views, but is a strong edge.



Vegetative edges around RED HORSE and maintenance.

2.3.3 Nodes

Nodes are typically destination areas, but can be considered decision points (or reference points) at breaks in paths and strategic locations such as the gates where people enter and exit the installation. The Berkeley/Main Gate and the Oak Forest/East Gate are the only locations where people have to make decisions as they enter the installation. Decision points such as these need simple, clear directions to minimize confusion for motorists. The intersections at Wright Brothers Avenue/Vermont Garrison Street and Blakeslee Avenue and Vermont Garrison Street also require simple, clear wayfinding signage.


The Oak Forest/East Gate is an initial decision-point node.

There are also destination or activity concentration nodes at the base. The BX/Commissary complex is an example of this type of node; this is a place where people concentrate, particularly during lunch and on Saturdays.


The BX and Commissary in the community center is a major social/destination node.

The destination nodes at SJAFB are primarily a result of facility size and resulting activity levels rather than unique design, decision-making or building density. There is only one area on base that may be considered a density node. The anchor of this node is the unaccompanied dormitory area, which includes the dining hall and education center.

A typical node in local communities is the downtown area. This node is characterized by a high density of buildings and diverse activities in a compact development pattern. Nodes that are based on a high density of buildings, particularly in a downtown setting, provide many opportunities for personnel to live, work, and play. A high density of buildings, in conjunction with a strong pedestrian realm, will encourage walking between facilities. Such a setting will encourage longer stays within an area and provide opportunities for social contact and gatherings.

Although SJAFB does have some elements of those downtown characteristics, the density of buildings and pedestrian realm can be enhanced and expanded to form a compact node of diverse activities—similar to a small town center—which would increase the reasons for personnel and families to extend their stay in the area. A compact node of buildings should be complemented with outdoor gathering areas that further enhance the public realm and quality of life. This type of node, with well-thought-out pedestrian circulation amenities, should reduce the reliance on automobiles. Although automobiles cannot be ignored, they should be subordinate to the pedestrian realm within a compact node of diverse activities.

The SJAFB Community Center has many diverse activities within a relatively compact area; however, the pedestrian connections are not strong. The core of the Community Center has very limited sidewalks or other paths to allow for safe pedestrian travel. A strong trail and sidewalk system leads to the area, but is not continued throughout the Community Center. Primary nodes are illustrated in Figure 2-1.

2.3.4 Landmarks

Although nodes can be considered reference points, landmarks are probably the most common reference point for people. In some cases, they are simple objects, such as a sign or tree, or they can be more complicated, such as some type of structure. They can also be symbolic, such as the flagpole in the traffic circle or static aircraft displays. Although landmarks can be simple objects, they can be important to wayfinding for personnel and visitors because they can be seen from a distance. The water tower is an example of a simple object that is a likely landmark. Although the water tower is a simple design, the prominence in the landscape makes this type of structure one of the most recognizable landmarks throughout the country. Landmarks are also illustrated in Figure 2-1.

Dominant buildings in a landscape are often very important landmark elements. Civic buildings, such as the Wing Headquarters and the chapel, should be strong landmarks; however, the Wing Headquarters is a visible, but not dominant, building in the streetscape of Wright Brothers Avenue. The chapel has been surrounded by the BX and Commissary and has very limited visibility.

The bulk fuel storage facilities can be seen from a moderate distance, but the scale of the structures certainly identifies its location along the flightline.

The BX and Commissary are likely considered by many personnel as landmarks due to their mass and prominent location at the highest volume intersection on the installation. These facilities provide motorists entering SJAFB their first clue that they are nearing the community center.

Landmarks should be significant elements of the overall character of a district. Dominant buildings and facilities important to daily living and installation operations should be evaluated during the programming and design process as to whether they would function as landmarks. The early determination of a buildings “status” will affect site orientation.

Landmarks should be strategically located at the terminus of prominent paths, whether they are vehicular or pedestrian. If buildings are sited at road termini, the site design will require extensive AT/FP measures to ensure the safety of building inhabitants. Memorials, extensive landscaping, and directional landmarks are more appropriate types of landmarks for road termini.

The installation water tower is an example of a landmark due to its prominence in the landscape, rather than its architectural design.

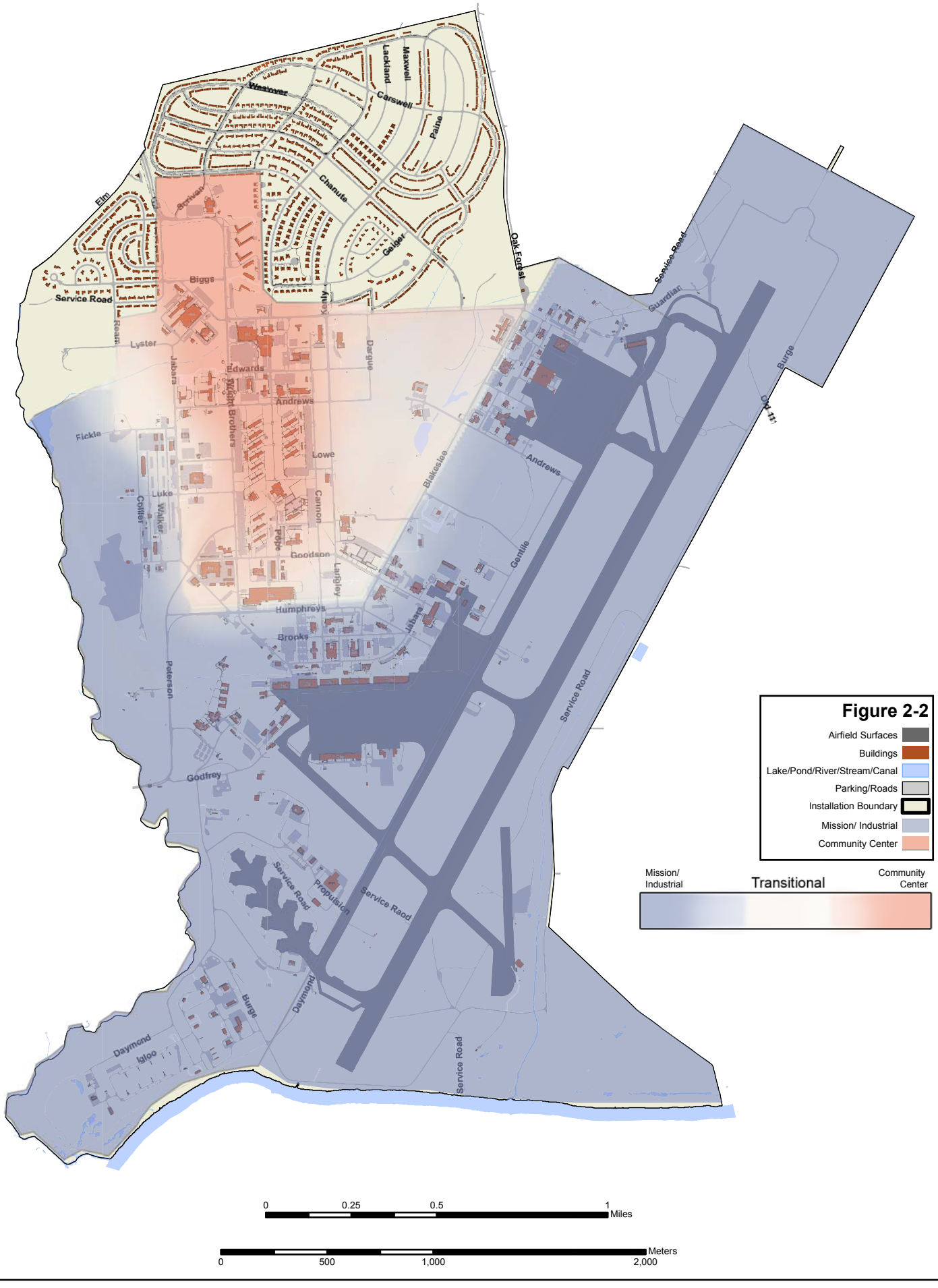
2.3.5 Districts

Districts are small to large areas within the installation that have a common identifiable character. The common characteristics signify a place. Because of their scale, districts will incorporate some or all other image elements. Lynch states, “*physical characteristics that determine districts are thematic continuities which may consist of an endless variety of components: texture, space, form, detail, symbol, building type, use, activity, inhabitants…*”

Districts are characterized by certain functions, materials, and scale. To ensure future design appropriate to location, certain areas at the installation that are currently not developed are included within the district boundaries. Districts[2] are illustrated in Figure 2-2.

[2]SJAFB family housing areas are not included in the districts because housing is being privatized. Design elements for housing are determined through collaboration between the Air Force and the developer.

SEYMOUR JOHNSON AIR FORCE BASE
Design Districts



2.3.6 Mission/Industrial District

The Mission/Industrial District is characterized by the industrial and aircraft operations functions of the installation. These areas include flightline facilities, support facilities, munitions storage, warehouses, and training. This district comprises the largest land area on the installation and surrounds the Community Center District. Most of the functions in this district are industrial, which in many cases requires larger structures, but with a relatively low density of personnel. Other factors in this district that contribute to a low density of people are safety and security requirements and the overall incompatibility of industrial functions with housing and community support activities. The low density of people, compact development pattern, and the requirement for extensive pavement make it unlikely that a strong circulation system dedicated to pedestrians can be established or warranted.

There are administrative facilities within the district supporting industrial and flightline activities, which provide a higher working-population density. These facilities also function as transitional land use activities between districts of different function and scale.

Many different materials were used to construct the existing facilities in the Mission/Industrial District. Metal wall and roof panels in beige and brown tones are the predominant materials for large warehouses and hangar buildings. Materials for other buildings include beige, textured concrete masonry, and exposed aggregate precast concrete panels. Existing roofs include flat roofs and sloped, dark bronze metal roofs, some with large, turned-down fascias. Visual unity can be enhanced by standardizing the palette of materials and colors.

The veterinary clinic is a good example of integrating a textured concrete masonry unit to a utilitarian structure.

The flightline facilities are oriented to support the flying mission, which is the primary “sustainability” issue at SJAFB. Therefore, optimal building orientation is for the mission, with all other orientation issues secondary. When possible, building orientation that reduces energy loads should be implemented.


Fluted masonry units were a common exterior material used in the past in the Mission/Industrial District; however, future construction will be based on textured concrete masonry units.


The new primary design material for the flightline is textured concrete masonry units.

2.3.7 Community Center District

The Community Center District is the area along Wright Brothers Avenue from the main gate to Goodson Street, extending south to Blakeslee Avenue and east to Vermont Garrison Street. It contains the dormitories, community center, shopping, recreation, medical and worship facilities. For most visitors, it is the first impression they receive of the base.

Most of the buildings in this area are one- or two-story masonry in various shades of red and brown brick. Some of the newer buildings have dark bronze, sloped metal roofs; many of the older buildings have flat roofs with dark bronze trim. Recent renovations and new construction in the Community Center District have used materials that reinforce the theme of red brick and sloped, dark bronze metal roofs.

The Education Center is a great example of the design that characterizes the Community Center District.

The image for this area should be one of quality and permanence and should emphasize the importance of the pedestrian. It should take on the characteristics of a campus environment through use of similar materials and well-maintained grounds, walkways and outdoor spaces. It is important to site buildings with the front facade to the main street.

The dormitories utilize typical exterior materials for the Community Center District and reflects regional context with construction of multi-level “porches.”

Many of the facilities in this district function as gathering places for living, working, shopping and recreating, and as a result, support higher densities of people than in the Mission/Industrial District. The types of facilities and land use activities within this district are similar to those found in a small downtown, and there is a relatively dense development pattern. However, there are opportunities for infill to increase development density. When taken in this context, a development pattern for the Community Center can be visualized. A typical downtown has a higher density of buildings, many that are multi-story structures. The higher density of buildings is supported by a strong and safe pedestrian circulation system that encourages walking or riding bikes to a variety of uses within that district. The vehicle circulation system is downplayed, and vehicle parking is subordinate to buildings and the landscape.

Current vehicle parking is not a subordinate site feature in the Community Center District.

Other typical features of a dense development district are parks and formal outdoor spaces. Significant outdoor recreation and open space is immediately adjacent to the community center. These areas are an immense benefit to the quality of life for Airmen, employees and families at SJAFB.

Debden Park is one part of an extensive outdoor recreation and open-space system in the Community Center District.

The use of electronic signs is an ongoing issue on many installations, and the viability of a constantly changing sign on a high-volume street might be considered a distraction to drivers. However, a high volume of information can be presented with an electronic sign and they are used to reduce the number of temporary signs requested by installation tenants. The Community Center District is the more appropriate location for this type of signage.

2.3.8 Transition Areas Between Districts

To provide flexibility in facility design, some portions of districts will no longer have a distinct edge that separates one district from another. A transition area between districts will allow designers to utilize design elements and building forms from each of the bordering districts for a new facility. The transition areas are shown as the lighter shaded area between districts in Figure 2-2. The ability to integrate design elements from neighboring districts increases as the shading gets lighter, which is in the middle of the transition zone.

3 Development Considerations

Installation development and sustainability can work hand in hand and, to a degree, has over the decades. The installation has been reusing buildings for many years and continues to do so in limited situations; however, the age of many structures and the requirement to reduce the amount of square feet of facilities is making building reuse less viable. The installation is implementing an aggressive program of consolidation. Consolidation of functions will be accommodated through new facility construction and reuse of existing facilities on infill sites.

Infill development allows the development of modern facilities that more effectively meet the needs of the Air Force to maintain their mission capabilities, reduce energy consumption, and enhance the working conditions of personnel and the overall quality of life for families. Infill development should be prioritized to fill in vacant parcels and previously developed sites to create a dense, compact development pattern.

3.1 Reuse Opportunities

Many of the buildings at SJAFB were designed for different functions than their current ones. It is intended for some of these older, single-function buildings to be demolished and replaced with larger buildings (some multi-story) that consolidate functions into a higher-density working population at appropriate locations on the installation.

In addition to functional considerations, many older structures will be demolished to meet the Air Force requirement to reduce the installation's building footprint by 20 percent by the year 2020. Some buildings will be backfilled and used as swing-space as the installation redevelops based on the General Plan and associated Area Development Plan recommendations.

Building consolidations will be implemented throughout the installation. Examples include Building 3611, which is in the dormitory area, and Building 4517, which is in the 4 FW flightline. Building 3611 will continue to house the Airmen Leadership School and other ongoing functions, plus the building will be used for swing space for administrative functions awaiting construction of new facilities.

Building 3611 is one of many structures to be used during installation-wide consolidation of functions.

Building 4517 will continue to house 4 TS and others throughout the planning period. The building will receive an addition to allow relocation of the 4 OG SPT for the short term. This group will then relocate when the consolidated OG HQ is constructed. Building 4517 will then be backfilled with other units as well as provide additional space for future tenants.

Although most reuse opportunities are predicated on reducing installation footprints and consolidation of functions, there is one significant reuse opportunity that is currently being implemented at SJAFB. The former federal prison facility is being reused as a RED HORSE compound.

Building 2402 is one of many facilities in the former federal prison that is being reused for the RED HORSE compound.

3.2 Infill Opportunities

The installation has prepared ADPs for infill development along the flightline for both the 4 FW and the 916 ARW. The ADPs identify infill development on previously developed sites and some development of the few vacant parcels still remaining in these areas (see Figures 3-1 and 3-2).

SJAFB is a relatively compact installation, and there are not many acres of undeveloped land. In addition to the flightline ADPs, the ADP for the community center identifies consolidation and redevelopment of vacant and previously developed sites to reduce building footprints and enhance the work environment of personnel. The ADP addresses known issues for the installation and allows for future development on parcels where facilities will be demolished and parcels that are currently vacant. Continued increases in development density of the community center area would greatly enhance this portion of the installation as a place to work, live, and play.

The location of representative infill sites are illustrated in Figure 3-1. Infill sites range in size and most of the acreage is previously developed sites. Infill site design will enhance the pedestrian environment through landscaping and pedestrian amenities such as benches and safe street crossings and centralized shared-use parking lots. Development density in the community center and dormitory areas will focus on multi-story construction and consolidation of functions. Mixed-use (consolidation of functions) opportunities in the multi-story buildings reduce the distance personnel will need to walk, create less reliance on vehicle use and take up less land area for impervious surfaces (buildings).

The entry plaza to the Education Center is a good example of smaller, social-gathering “urban parks” that should be common throughout the installation.

Increased development density should be enhanced with increased linkages in the pedestrian circulation system, shared-use parking lots, and additional opportunities for open spaces (urban parks) that are smaller and focus more on social gathering than active sports.

Ideally, the denser development pattern within a half-mile radius of the community center area will result in a much larger work-day population as well as encourage personnel and families to spend additional time beyond the work day in this area.

Infill development along the flightline is based on orientation to the runway and the aircraft parking apron. Although orientation to the flightline is important, there are opportunities to site facilities to maximize orientation to solar angles.

In addition to the land use planning and social beneficial impacts of denser development, there are also opportunities for:

- Reducing storm water runoff through a reduction in impervious surface.
- Minimizing the heat island effect.
- Evaluating alternative heating and cooing systems that can be used to reduce the base’s carbon footprint through less energy consumption and save water. Lower maintenance cost and staffing requirements can also be realized.

More detailed illustrations of the infill sites discussed below are shown in Figure 3-2.

3.2.1 Infill Site #1

The redevelopment of this site is predicated on the demolition of Building 3728, which occurred in 2010. The site is in the heart of the retail portion of the Community Center District and at the northern terminus of the central pedestrian spine of the dormitory area. The site is adjacent to the Bowling Center, the Base Theater and bank.

AT/FP setbacks make redevelopment of this infill site as an inhabited or primary gathering facility problematic. A central park would be a good reuse opportunity for this site. A small “urban” park at this location would provide additional green space that could include a gazebo, landscaping, small playground, benches and chairs and a memorial. The park would have direct access to a new pedestrian walkway, which would replace the existing alley. The new park and pedestrian walkway would accommodate an addition to the bowling center.

SEYMOUR JOHNSON AIR FORCE BASE

Infill Sites

SEYMOUR JOHNSON AIR FORCE BASE

Infill Sites

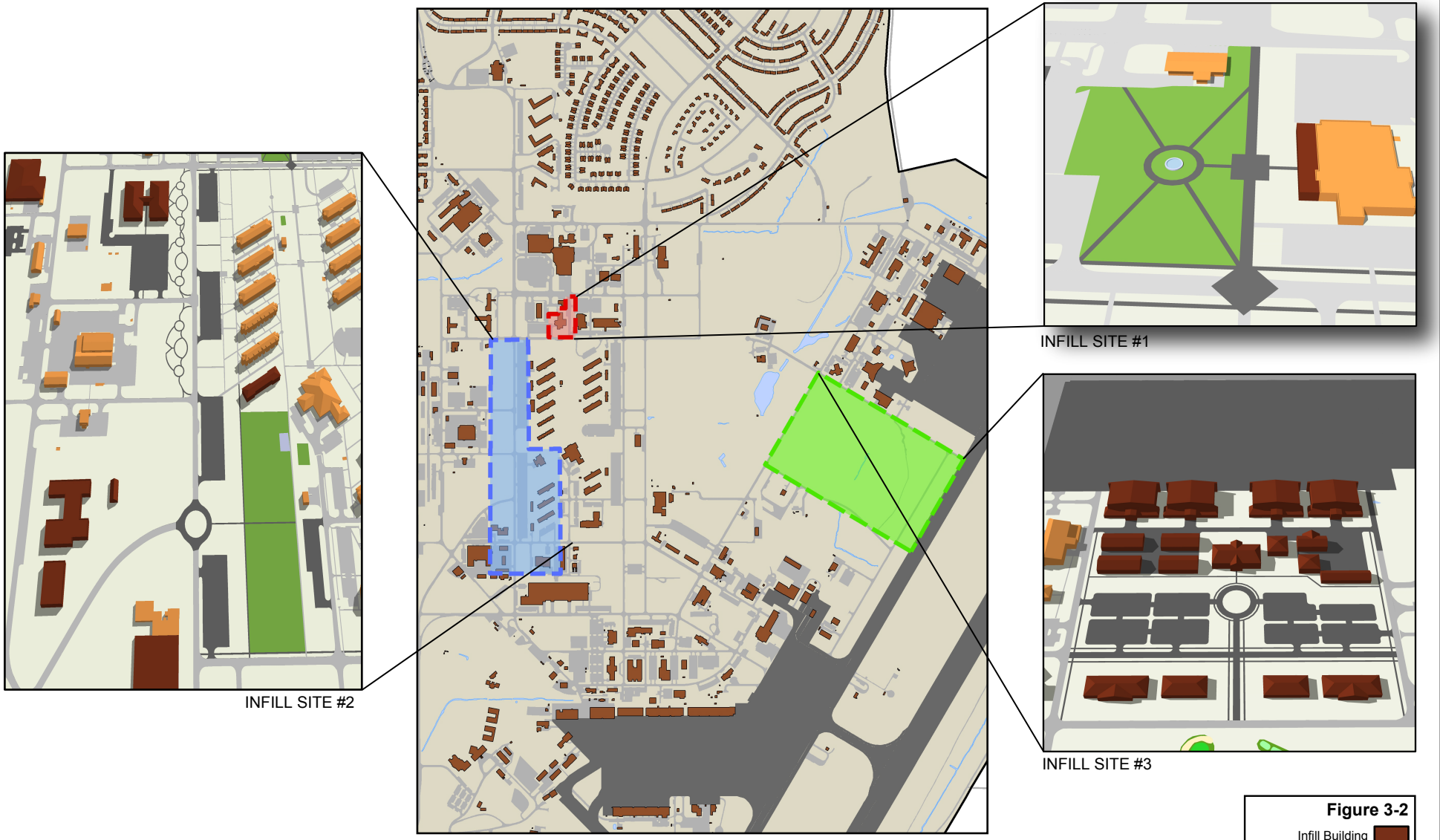


Figure 3-2

- Infill Building
- Existing Buildings
- New Paved Areas
- Existing Paved Areas

The alley between this building and the bowling center could be rebuilt as an extension of the central pedestrian spine from the dormitory area. The pedestrian walkway will connect the dormitories to the heart of the retail area, Heritage Park, and administrative buildings to the west and the outdoor recreation areas to the east. The existing parking spaces along this alley would be demolished.


An example of an "urban park" that provides a desirable social setting.

3.2.2 Infill Site #2

Infill Site #2 is located along Wright Brothers Avenue in the dormitory area and community center areas. This site is within the Community Center District and the current context for building orientation could influence new construction in this area. If the new buildings reflect the dormitories, then a stronger solar orientation can be accomplished. Appropriate uses in this area would be—depending on housing demand—additional education and training facilities, additional housing and/or services for Airmen. The streetscape along Wright Brothers Avenue should be enhanced with street trees, shrubs and other perennial plantings to mitigate the view of the extensive POV parking lots associated with the dormitories. There is an opportunity to provide needed green space south of the dormitory area to support the open space needs of Airmen.

Enhancement of the streetscape—in conjunction with streetscape improvements to the north side of Wright Brothers Avenue—could include improvements to vehicle circulation and construction of a strong landmark. A round-a-bout could replace the intersection of Wright Brothers Avenue and Peterson Avenue. The interior space of the round-a-bout would include a strong physical element that would be visible along the entire length of Wright Brothers Avenue. The round-a-bout could be "framed" by clusters of trees.


Older, less functional buildings at Infill Site #2 are scheduled for demolition.

The portion of this infill site on the north side of Wright Brothers Avenue offers opportunities for future development within comfortable walking distance of the community center. Establishing as strong visual relationship between development on the north and south sides of the street could be used to enhance the physical and visual transition from the dormitory and community center to the industrial area to the north.

3.2.3 Infill Site #3

The opportunity for additional flightline and industrial development would be provided through the relocation of four holes of the installation golf course. The site is immediately west of the 916th ARW and will require site fill and construction of drainage features to replace the natural drainage in the site. Because the flightline is generally east-west, facility development at this infill site can be oriented to take advantage of solar orientation. Established setbacks from Blakeslee Avenue would be referenced for industrial facility construction. The basic philosophy of consolidation and multi-story buildings should be followed, when possible. However, there are limited opportunities along the flightline for multistory buildings. An example would be a consolidated squadron operations facility. Most other buildings are primarily aircraft maintenance and would be one story, although they would be high-bay back shops or aircraft maintenance hangars.

Excellent examples of appropriate building materials for new construction in this portion of the installation are the newer buildings of the 916th ARW campus. Andrews Road and McColpin Road can be utilized for site ingress and egress to minimize curb cuts along Blakeslee Avenue. Security features would be incorporated into the site to prevent unauthorized access to the flightline.

Larger shared-use parking lots and strong pedestrian connections should be incorporated. Pedestrian connections should extend to the walking/jogging trail across Blakeslee Avenue.

3.3 Circulation

3.3.1 Vehicle Circulation

The primary circulation corridors originate at the three entry gates. These primary roads include Wright Brothers Avenue, Blakeslee Avenue, and Peterson Avenue (see Figure 3-3) and account for a large volume of traffic. All secondary and tertiary roads serve the balance of the installation. The SJAFB General Plan has detail on existing and future transportation needs.

Roads within the installation are generally bare of pedestrian amenities and there is no apparent distinction (other than the number of lanes) between major roads such as Vermont Garrison Avenue and secondary roads like Kenly Street.

Although the function of roads is to allow efficient movement of vehicles throughout the installation, there may actually be too much pavement at SJAFB dedicated to this function. The installation intends to eliminate Cannon Avenue as a through road. Elimination of this road will put an emphasis on the pedestrian within the dormitory area. Other streets that might be converted to pedestrian orientation include the alley between the bowling center and Building 3728.

3.3.2 Pedestrian Circulation

Pedestrian circulation is primarily focused in the “living” portions of the installation such as family housing and the dormitory area. There are few, if any, sidewalks along streets, and connectivity between different areas of the installation is mostly vehicle oriented. It appears that some sidewalks were constructed with the intent to link to a broader network of sidewalks; however, integration of sidewalks in some locations is incomplete.

Running/walking trails are located near the hospital and the golf course, and a bike trail is located near the FAMCAMP. These trails provide a great opportunity to get exercise and experience some natural areas on the installation; however, not all running/walking trails have adequate width to be considered multi-use trails for pedestrians on foot and those on bicycles. Aside from the designated bike paths near the FAMCAMP, bike traffic is limited to installation streets.

The sidewalk from the south entrance of the Education Center ends at Goodson Street; however, there is no drop-off area or connection to any sidewalk.

The jogging/walking paths are limited to two areas on base. Although much of the trails are within a wonderful landscape, the width of the pavement does not permit their use as multi-use trails.

- The two jogging/walking paths should have direct and safe connection along Vermont Garrison Street and Edwards Street. Making connection along both streets will provide additional “loops” in the system as well as provide an enhanced physical fitness opportunity for families and Airmen.

SEYMOUR JOHNSON AIR FORCE BASE

Circulation

Figure 3-3

- Airfield Surfaces
- Buildings
- Lake/Pond/River/Stream/Canal
- Parking/Roads
- Installation Boundary
- Primary Road
- Secondary Road
- Tertiary Road

0 0.25 0.5 1 Miles

0 500 1,000 2,000 Meters

3.4 Utilities

Seymour Johnson AFB is well served with all required utilities. Established utility corridors (a high density of utility systems) follow arterial streets. As an example, Blakeslee Avenue could be considered a primary utility corridor because this alignment accommodates all utilities including a fuel distribution line. The right-of-way dimensions along most arterials allow relatively easy development of utility corridors. The right-of-way dimension is enhanced with the application of required AT/FP setbacks for buildings. Utility figures are provided in Appendix A, Figures A-1 through A-4. The following are the utility service providers for SJAFB:

- **Potable Water—**City of Goldsboro
- **Sanitary Sewer—**City of Goldsboro
- **Electricity—**Progress Energy
- **Natural Gas—**Piedmont Natural Gas

3.5 Land Use

The existing land use layout of SJAFB has been logical and has followed basic Air Force planning guidance design to support the base's mission. Future land use locations identified in the eGP are similar to the existing land use found on the base; very little change is proposed.

- The future land use map should be revised to reflect, or provide, some guidance on future land use decisions related to Districts and the development opportunities areas shown in the eGP. Although changes to land use are relatively minor, the concept of increasing density and a diversity of uses appropriate for a typical downtown is reflected by the land use pattern of administration, commercial, outdoor recreation and housing. An example of an appropriate change to the Future Land Use is in the eastern portion of the Community Center District, which is shown as Open Space in the Future Land Use Map. This area should be considered for administration or some function (housing, education, outdoor recreation) that is essentially higher density development.

3.6 Sustainability Initiatives

Over the years, Seymour Johnson AFB has undertaken a number of initiatives to reduce their consumption of natural resources and their impact on the environment. Future actions planned for the base should enhance and improve upon past actions.

3.6.1 Natural Area Preservation

SJAFB has protected communities of mature pine trees in the administrative and community center areas of the base. In these developed area, the trees help to reduce the heat island effect on the base, provide energy savings through shading, provide habitat and maintain water quality. They are a valued, visible natural asset to the base community.

3.6.2 Energy Conservation Initiatives

SJAFB has taken a number of steps to reduce energy consumption and control costs of energy from their provider.

3.6.2.1 Energy Studies

- A renewable energy study was completed in 2006 to identify the most cost-effective sources for the base. The findings in the study determined thermal solar projects to be the most cost effective; wind and photovoltaic were determined to be the least cost-effective. The energy study is going to be updated in the near future; as a result, renewable recommendations should be updated as appropriate.

  No renewable energy sources are currently being used on base except for a few small solar panels for restoration sites to run pumps.

- The base energy manager has begun a program of Level 1 and Level 2 energy audits. Level 3 audits for all facilities will be performed (FY11) under a contract managed by the Air Force Civil Engineering Support Agency. Audits are used to determine the best candidates for additional metering and energy efficiency projects.

3.6.2.2 Reduction in Energy Consumption

- The base is currently at 27 percent reduction in energy consumption with respect to a 2003 baseline. The reduction in energy is the result of two main projects:

  - Heat plant decommissioning (2003-2004), which consisted of removing the old coal fired steam plant and steam heating systems and replacing the central system with a decentralized system of individual boilers (over 100 boilers) at buildings for heating. Steam lines were abandoned in place.

  - Light ballast replacement project (2005), which was an Energy Savings Performance Contract executed to replace fluorescent T-12 lighting with T-8 lighting in many locations on the base.

  - Lighting project to replace high-intensity discharge lighting with T5 High Output fixtures with sensors is on going on several buildings on base.

- The base has been operating an Energy Monitoring Control Systems (EMCS) using Barber-Coleman Direct Digital Control (DDC) to control HVAC equipment throughout the base as well as hot water heaters in the housing area of the base. The controls have been used to reduce anticipated peaks by cycling the equipment during periods of high load. Efforts are ongoing to meter and automate systems for facilities throughout the base.

- The base is planning to install occupancy sensors to help achieve a 30 percent energy consumption reduction goal.

  - Occupancy sensors are being coordinated with appropriate program start ballasts. The base has determined that occupancy sensors with instant start ballasts wear down lamps too quickly.

- Variable Frequency Drives are being installed on HVAC fans to minimize the fan power used depending on the type of HVAC system the fan is serving and, based on the controls, how much the drives can actually decrease the fans speed.

3.6.2.3 Submetering

- Standard analog meters exist on approximately 100 facilities on base.

- The advanced metering program includes 38 facilities.

  - It includes all occupied buildings greater than 21,000 SF. Originally, advanced electrical metering was going to be for facilities of 35,000 square feet or greater per ACC programming. However, the base was able to demonstrate the required payback for buildings as small as 21,000 SF based on the Air Force Civilian Engineering Support Agency's 2 percent payback rule.

  - The base plans to add advanced metering to more buildings after completion of the current program. Reimbursing facilities will be a priority.

  - The advanced electrical metering program finishes the energy management loop started with DDC controls on facilities. The base is now able to control and monitor energy use and develop building-by-building energy management strategies based on use trends and 15 minute energy rates received 24 hours in advance. The base is looking into its ability to pre-cool or adjust building use schedules for energy savings and cost.

  - Advanced metering natural gas program implemented with the installation of 18 gas meters on high gas consuming facilities. The system is operating and linked to the existing electric metering.

  - Reporting to the central data collector is through wireless radio mesh.

3.6.3 Water Conservation Initiatives

- The base has undertaken a significant leak detection and pipe replacement program. All but about 12 miles of the base's 60 miles of piping has been replaced in the last 10-15 years. These efforts have led to a significant reduction in water consumption. Potable water reduction strategies have been limited to education, low-flow fixtures in new construction and maintenance activities, leak repairs, and replacement of leaky water mains. However, there has not yet been a base-wide program of retrofitting fixtures with low-flow fixtures.

- All sewer main pipes were relined about five years ago in an attempt to eliminate infiltration and inflow (I&I) problems identified in a Sewer System Evaluation Survey. The reduction of I/I reduces the amount of sanitary water pumped by on-base pump stations and treated off base by the local utility.

- All of the pumps at the sewage lift stations have been replaced with new pumps that reduce maintenance requirements and operate more efficiently than the old pumps. Future projects that add flow to the pump stations should review the selected pumps to verify the station is operating efficiently after the added flow.

3.6.4 Waste Reduction Initiatives

- The base operates a recycling program that meets the minimum requirements of state laws requiring recycling of cardboard, plastic bottles and wooden pallets. The base used to operate a more comprehensive recycling program when the prison camp was on base and could provide inmate support. Yard waste from the housing area is separated and hauled off base. According to base staff, the separated yard waste is composted.

- The base recycling program includes a lot of education of base staff and family housing area.

- The base recovers or recycles as much hazardous material as possible. The hazardous material recycling program includes antifreeze, waste oil, jet fuel and continued use solvent; lead acid batteries, oil and fuel absorbents, and dental amalgam; mixed scrap metal from the range; and returning empty 55 gallon drums.

3.7 Constraints

Constraints to development include natural resources, operations, safety/security, and utility infrastructure. Figure 3-4 illustrates composite constraints at SJAFB. There are significant constraints that will affect development at SJAFB.

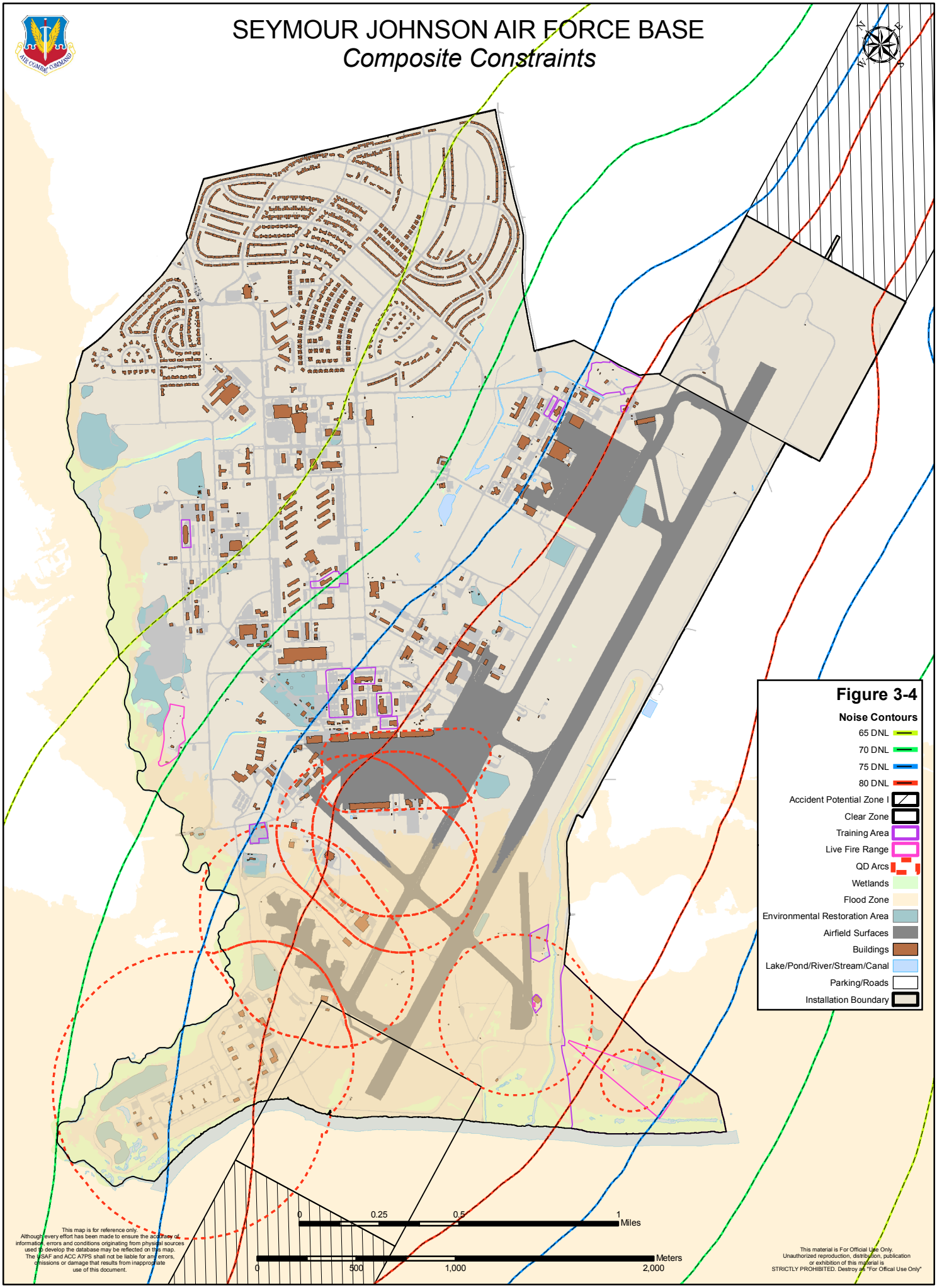
Floodplains and wetlands associated with the Neuse River and Stoney Creek impact the southwest and northwest installation boundaries respectively. In addition, noise contours associated with aircraft operation affect a large portion of the installation. The ESQD Arcs in the southwest corner of the installation extend far enough to the northeast to impact the fighter apron. The eastern boundaries of the Mission/Industrial District are delineated by the 100-year floodplain. Another constraint to development is the noise contours associated with aircraft operations. Noise is a quality of life issue and can directly affect human health if not attenuated through appropriate construction.

Overall, natural infrastructure at SJAFB is experiencing little encroachment from federal and civilian sources. Most measures received the best score ratings of N-0 or N-1. The water supply quality measure and the stormwater/wastewater receiving body quality measure were the only exceptions, and rated N-2. The N-2 rating means the resource is capable of supporting the current mission of assigned units, organizations, and tenants with minimal workarounds.

There are also no identify capacity/constraint issues associated with the man-made infrastructure necessary to support mission and non-mission related activities.

SEYMOUR JOHNSON AIR FORCE BASE

Composite Constraints



This page intentionally left blank.

4 Illustrative Plan

The purpose of the illustrative plan shown in Figure 4-1 is to graphically illustrate the desired, future state of SJAFB by:

- Incorporating the sustainable recommendations found in this document.
- Using the infill opportunity areas that were discussed in Section 3 and shown on Figure 4-2.
- Integrating current SJAFB ADPs and demolition plans.

Implementation of the plan will result in development density increases to enhance the base as a place to work, live, and play, while at the same time providing development opportunities for the mission. Increasing the compact nature of the base will help reduce the reliance on automobiles and encourage pedestrian circulation throughout the area. Increased development density will be enhanced with significant improvements to the pedestrian circulation system, shared-use parking lots, and additional opportunities for outdoor recreation. The redevelopment of the area provides opportunities for low- or no-cost sustainable building design solutions, as well as opportunities for sustainable utility and infrastructure design. Figures 4-3, 4-4, and 4-5 depict selected subareas of the illustrative plan.

On Figure 4-1 the design concepts and components embodying improvements for the base are labeled as:

1. The small “urban” park envisioned for this location provides additional green space. Visitors can access the park via a new pedestrian walkway created using the existing alley. The walkway will connect the dormitories to the heart of the retail area, Heritage Park, administrative buildings to the west and outdoor recreation areas to the east.

2. The design of this area is to provide green space in a core area of the installation and support the open space needs of Airmen.

3. The streetscape along Wright Brothers Avenue is enhanced with street trees, shrubs and other perennial plantings, and a reduced parking area to mitigate the view of the extensive parking lots associated with the dormitories.

4. A round-a-bout replaces the intersection of Wright Brothers Avenue and Peterson Avenue, with strong physical elements visible along the entire length of Wright Brothers Avenue.

5. Relocation of four holes of the installation golf course provides opportunities for additional flightline and industrial development. Flightline orientation is favorable for infill development to take advantage of solar orientation. Functional relationship consolidation using multi-story buildings is envisioned. A pedestrian connection to the walking/jogging trail across Blakeslee Avenue provides for shared-use parking lots and strong pedestrian connections.

Overall, development infill occurs in redevelopment areas where existing buildings are scheduled for demolition and in areas where there is available vacant land and it makes sense to increase the density of development.

As infill development occurs it is important to try to achieve good solar orientation for the new buildings. This can result in an overall reduction in energy consumption.

- Although it is best to face structures directly into the sun, it can be oriented up to 30 degrees away from due south and lose only 5 percent of the potential savings.

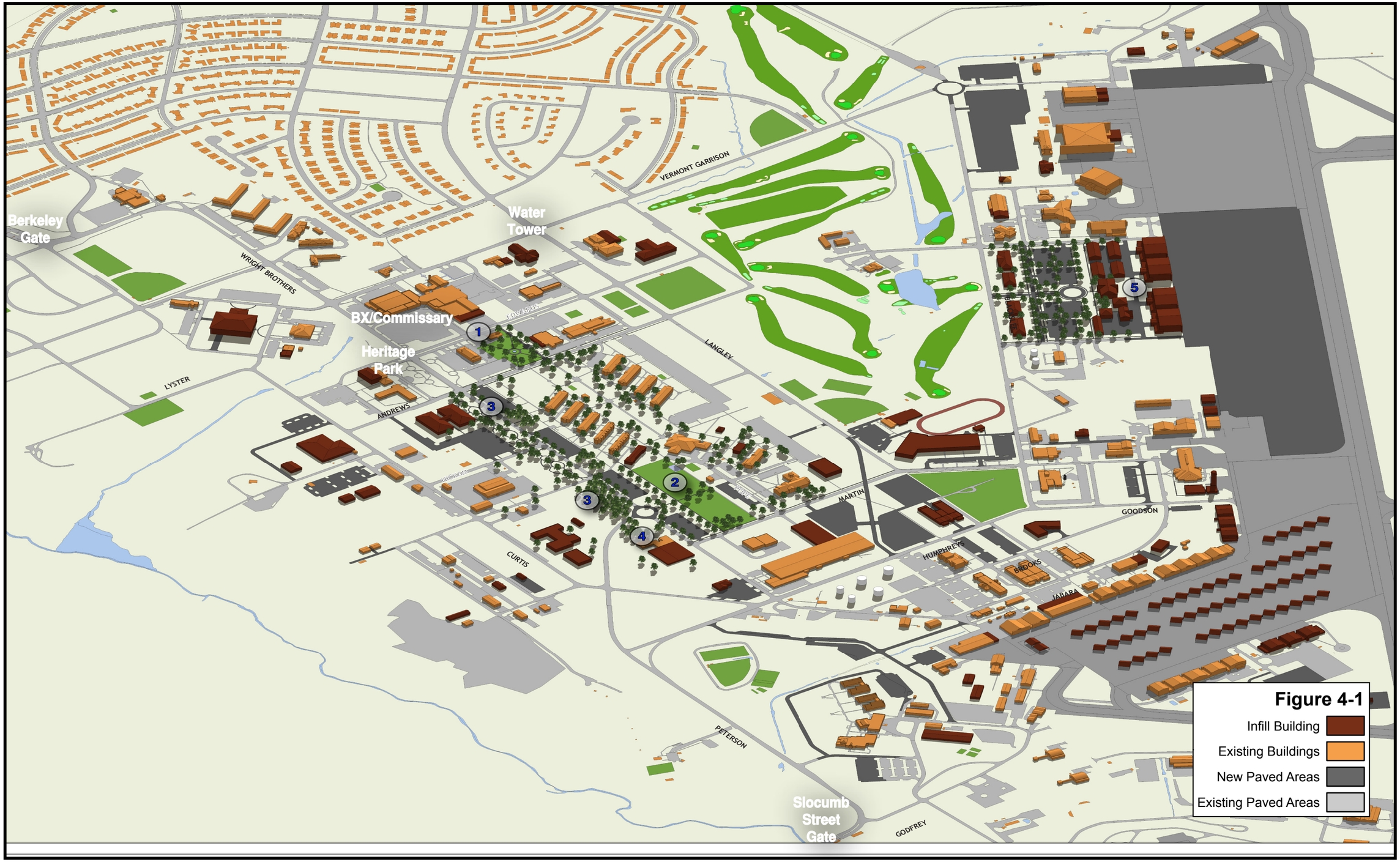
Although it is important to try to achieve good solar orientation, it is also important to maintain established setbacks and building orientation in certain areas. An example is the setback and street orientation established by Wing Headquarters along the west side of Wright Brothers Avenue. No matter which building orientation is utilized, the siting of new facilities should result in a compact parking and building relationship that reduces development and infrastructure costs.

Infill Site #3 maintains the existing building orientation and setbacks that are established by the 916th ARW campus. This site provides good solar orientation and respects the orientation to the street, within a compact development pattern.

This page intentionally left blank.

SEYMOUR JOHNSON AIR FORCE BASE

Illustrative Site Plan



This page intentionally left blank.

SEYMOUR JOHNSON AIR FORCE BASE

Infill Development Area View

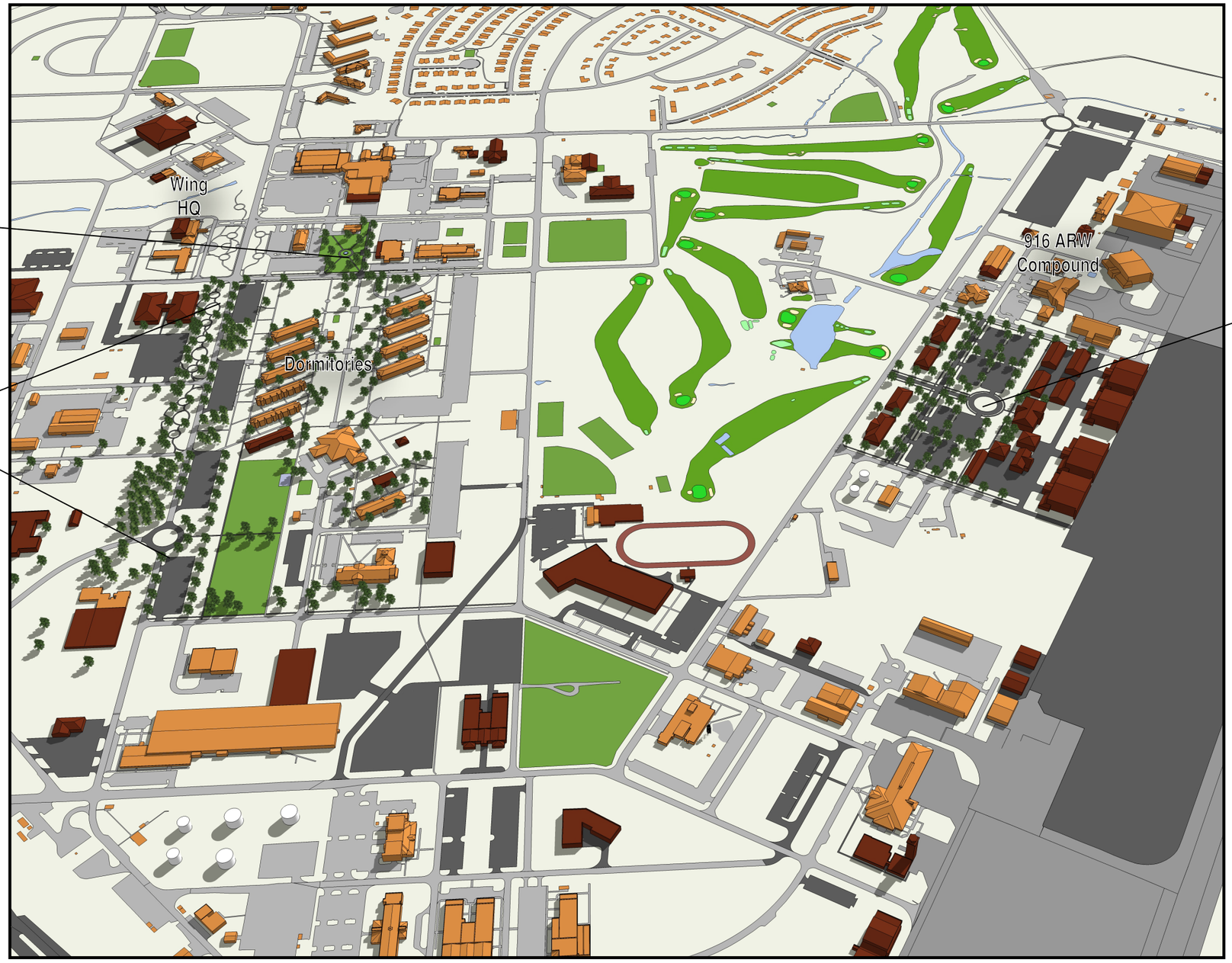


Figure 4-2

- Infill Building
- Existing Buildings
- New Paved Areas
- Existing Paved Areas

This page intentionally left blank.

SEYMOUR JOHNSON AIR FORCE BASE

Illustrative Plan Subarea #1

Figure 4-3

- Infill Building
- Existing Buildings
- New Paved Areas
- Existing Paved Areas
- Parks

This page intentionally left blank.

SEYMOUR JOHNSON AIR FORCE BASE

Illustrative Plan Subarea #2

Figure 4-4

- Infill Building
- Existing Buildings
- New Paved Areas
- Existing Paved Areas
- Parks

This page intentionally left blank.

SEYMOUR JOHNSON AIR FORCE BASE

Illustrative Plan Subarea #3

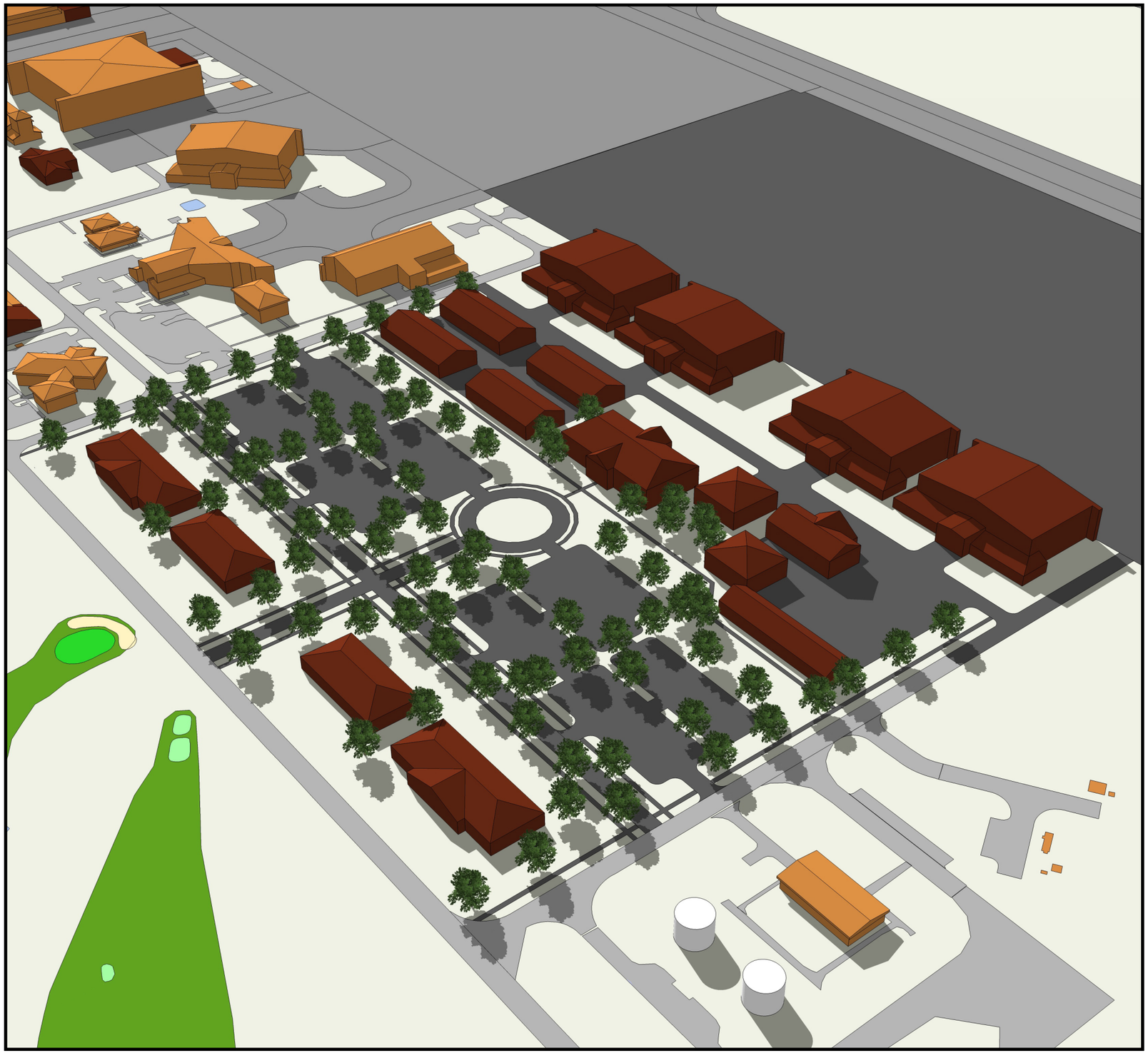


Figure 4-5

- Infill Building
- Existing Buildings
- New Paved Areas
- Existing Paved Areas
- Recreation Areas

This page intentionally left blank.

5 Development and Design Guidelines

5.1 Sustainable Development and High-Performance Green Building Design (SD&HPGBD)

Air Combat Command (ACC) has re-aligned planning, design and construction practices so implementing SD&HPGBD objectives become primary considerations. These changes will allow SD&HPGBD strategy opportunities to influence the building form.

SJAFB is also committed to SD&HPGBD to improve the quality of the installation and reduce resource consumption. Initiatives currently in place include purchase of “green power” and focused efforts to reduce energy and water consumption.

SJAFB uses *the ACC SD&HPGBD Scorecard (Scorecard)* as its green building self-assessment metric. The scorecard assembles and consolidates Executive Orders, Public Laws and Federal Agency rulemaking on SD&HPGBD requirements with the LEED Rating System. Using the scorecard is a way to achieve the desired LEED rating and meet critical statutory minimum requirements.

When applied in context, the scorecard can illuminate opportunities for sustainable design, often with low- or no-cost choices. Some choices carry an upfront cost but provide long-term operational cost savings and are value-added building features. Scorecard requirements can guide and inform building projects towards lower lifecycle costs and enhanced sustainability.

This section provides guidelines related to site development and infrastructure systems as well as architectural order and elements necessary for achieving SD&HPGBD.

5.2 Site Development

Site development guidelines focus on building siting and orientation, open space, access, parking and landscape. Each section includes a brief description of existing conditions with illustrations included to support the description. The intent of these guidelines is to provide the designer with general background information for the installation and to provide recommendations for site development. The recommendations identified will help foster the base’s green infrastructure.

5.2.1 Solar Orientation and Building Siting

5.2.1.1 Solar Orientation

As shown on Figure 5-1 existing buildings at SJAFB are mostly oriented parallel to the roadway network, which does not provide for optimal solar orientation. The main exceptions are the Dormitory Area between Cannon and Wright Brothers Avenues and the buildings south of Blakeslee Avenue. The dorm buildings in this area are optimally oriented with their long axis in an east-west direction.

Design and planning teams should maximize the future solar orientation of buildings through land development planning. All future area development plans (ADP) in areas without an established road system must be laid out and new buildings oriented such that solar heat gains/losses are optimized. This orientation is generally with the long axis of buildings east-west and solar exposures to the north and south. The layout of new streets in an ADP often dictates the future orientation of buildings toward the street, and as such, aligning the street grid according to the sun is critical. Aligning streets and buildings on an east-west axis will serve the dual purpose of also optimizing those buildings to host rooftop solar panels, should the opportunity arise. The planners or designers of any ADP or building not designed to optimize passive solar gains need to give justifications for these omissions during concept design and design development reviews.

When siting a building and developing early schematic design, the designer shall maximize the shape and orientation of the building with respect to the sun for passive solar heating, cooling, and daylighting. This will help maximize energy performance.

- Passive solar design of buildings can reduce a building’s energy demand by as much as 30 percent, at essentially no cost. SJAFB cannot afford to develop new buildings without maximizing solar orientation for energy savings.

5.2.1.2 Building Siting

Numerous factors need to be considered when siting new facilities. Some of these factors include the following:

- Existing and future land use
- Functional relationships between activities
- AT/FP
- Building function and size
- Parcel shape and size
- Operational and natural constraints
- Infill opportunity location

SEYMOUR JOHNSON AIR FORCE BASE

Building Orientation

0 0.15 0.3 0.6 Miles

0 260 520 1,040 Meters

- Vehicular and pedestrian access
- Proximity to utility corridors

Some of the above factors provide low–to-no-cost development opportunities.

5.2.2 Open Space

The open space discussion focuses on the spaces between buildings and the connections between them. The Administrative, Community, and Housing areas include open spaces that have large groupings of hardwood and pine trees. Pedestrian walkways constructed of concrete or asphalt connect these areas. This vegetation and the existing outdoor recreation areas comprise the majority of open space at SJAFB.

Some of the developed, open space areas are located adjacent to the dormitory buildings between Wright Brothers Avenue and Cannon Avenue. These spaces include several nodes of picnic tables, benches, barbecue grills and some shade structures. Opportunities for additional shade, using vegetation or shade structures, should be pursued for those areas lacking in sufficient shade to make these spaces more comfortable in the summer months.

Open space areas at Seymour Johnson include nice stands of pine and hardwood trees.

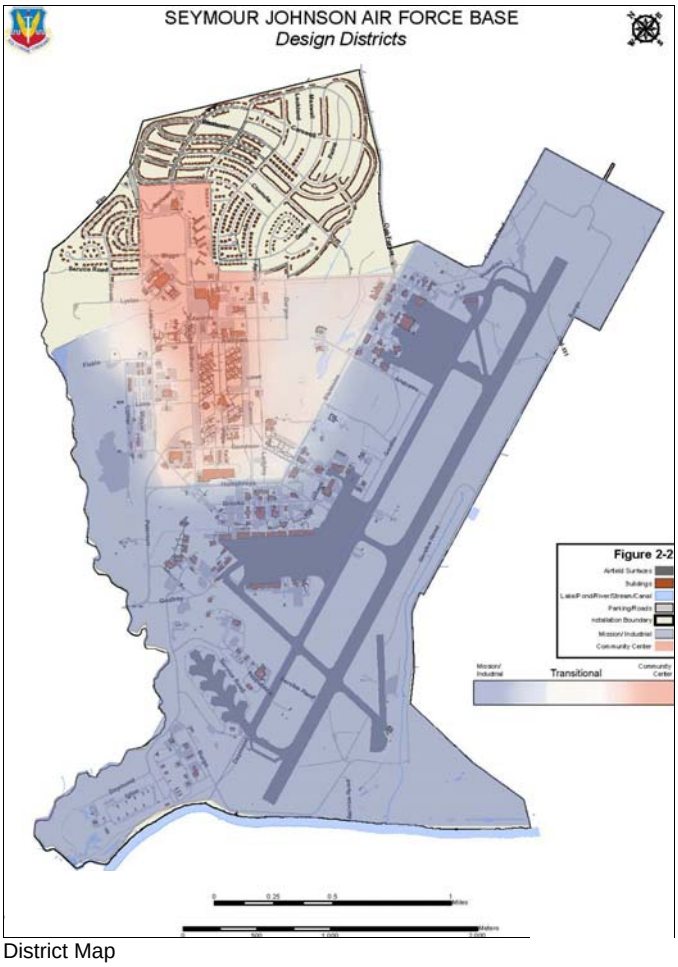
The recommended level and frequency of future open space development should vary depending on the district where it is located. However, for new construction in all districts, consideration should be given for the integration of low-impact development design solutions with open space areas.

In the Mission/Industrial Area shown in blue on the District Map, open space development for new buildings should include:

- Outdoor break areas with picnic tables and/or benches that include recycled plastic lumber.

View of open space development in the Dormitory area.

- Provisions for shade and shelter from the sun and rain. Shade can be achieved through planting of landscape material or the use of shade structures that are compatible in color, form, and materials with the adjacent buildings.



District Map

The Community Center District shown in red on the District Map includes the community, administrative and recreation areas at SJAFB. Open space development includes small gathering nodes equipped with picnic tables, walkways and barbecue grills. It is recommended that:

- Amenities of the existing gathering nodes be replicated when constructing new nodes.
- Provisions for shade though plant material or structures be included in those areas where it is lacking—shade structures should be compatible in color, form, and materials with the adjacent buildings.

Other large, open space areas should be preserved to function as gathering/multi-use spaces especially in the administration and troop housing areas. Area development plans as well as site specific developments need to considered open space/green infrastructure linkage between the area/site and the rest of the base.

5.2.3 Access

As discussed in Section 3.3, roads within the installation are generally bare of pedestrian amenities and there are no apparent distinctions (other than the number of lanes) between major roads. Pedestrian circulation is primarily focused in the "living" portions of the installation such as family housing and the dormitory area, and there are few, if any, sidewalks along streets and little connectivity between different areas of the installation.

Although there are elements of the "Complete Streets" concept at locations throughout the base, the concept could be more fully embraced.

Lynch describes complete streets as ones "…*designed and operated to enable safe access for all users. Pedestrians, bicyclists and motorists of all ages and abilities must be able to safely move along and across a safe street*." Complete streets could include bike lanes, sidewalks on both sides of the street, frequent street crossings and median islands. The streetscape should include pedestrian amenities, such as benches and landscaping. The complete street concept can be further enhanced with the application of sustainable design features such as permeable pavement or gutters and curb cuts to rain gardens within the landscaped areas to reduce storm water runoff and pollution.

The application of streetscape (or the complete street concept) improvements is seen as one of the ways to enhance pedestrian connectivity. As a result, it is recommended that:

- Streetscape features in the Community Center District should be pedestrian oriented and patterned on the "Complete Streets" concept.
- Streetscape improvements in the Mission/Industrial District should not require the same level of care as "complete streets," but appropriate pedestrian circulation paths are necessary to minimize pedestrian and vehicle conflicts.

It is also recommended that the design team look beyond the development site for pedestrian improvement opportunities that connect new development sites with adjacent services and amenities, which will provide an alternate to short-trip driving, ideally embodying the LEED concept of "Community Connectivity."

Appendix B and Command-level (forthcoming) requirements provide additional measures for pedestrian trails and sidewalks as well as planting along roadways and sidewalks.

Well-developed Pedestrian path includes lighting and signage.


Typical crosswalk development.

Langley Avenue is within the Community Center District but does not currently exhibit many elements of a complete street.

Langley Avenue with the complete street concept.

5.2.4 Parking

The amount of parking at the base seems to be more than adequate to meet the need. Newer facilities have parking lots that were developed at the appropriate distance from the building to meet AT/FP standards. Most lots have limited or no shade provided (as shown on the following page) or stormwater management systems designed to benefit the site as a whole. The lack of shade intensifies the heat island effect making the area less comfortable for people.

- Include sustainable, green infrastructure design features, such as low-impact development (LID) design solutions for stormwater management that are appropriate to the local climate in new parking lot development.

- Design parking lots to have islands within the parking lot, where trees can be planted. When selecting trees for parking lots, use rounded, high-branched, dense, and relatively fast-growing trees. Additionally, select trees that can withstand harsher conditions such as sun, glare, heat, and reduced water supply. Avoid trees with low-growing branches. Choose trees and shrubs that require minimum maintenance and will not litter the parking area with branches, fruit, or nuts.

- Set aside 5 percent of parking for car/vanpools and 5 percent for low-emitting vehicles in preferred locations near building entrances, embodying the LEED concept of limiting environmental impacts from automobile use and encouraging alternative transportation.

Appendix B and Command-level (forthcoming) requirements provide additional guidance for parking lots.

5.2.5 Landscape

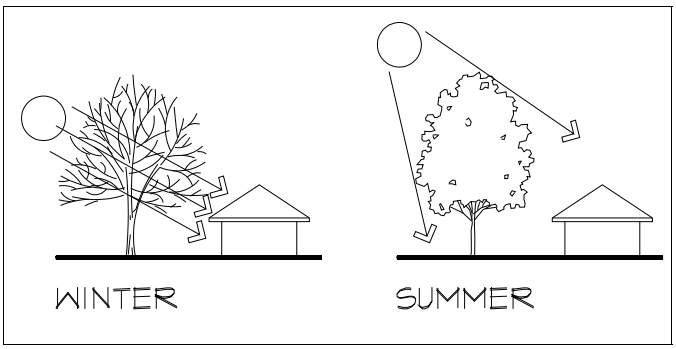
Landscape development at SJAFB exhibits a good variety of plant material appropriate for its location. Hardy plant materials have been incorporated into the landscape design, and the installation has established a list of plant species. Currently, most landscape irrigation is limited to high visibility areas in Administration and Community areas, potable water is used for irrigation.

- All future landscape should be designed to avoid the need for long-term irrigation. For selected, high visibility areas where irrigation is essential, only drip irrigation should be used, unless a more efficient/ sustainable solution, such as non-potable water use, can be provided. When temporary irrigation systems are necessary for establishing landscape, the design of the system should be linked with water main flushing locations whenever possible.

- Strategically placed landscaping should be provided for all new facilities, in order to provide necessary shading for the facilities' solar orientation. This should include the use of deciduous trees on the south, east, and west sides to shade buildings during the summer but allow sun in the winter months.

Appendix B and Command-level (forthcoming) requirements provide additional landscaping guidance.

Appropriate landscape development.



Placement of trees for shading and sun.

Attractive azaleas at the golf course.

Parking area lacking shade.

Parking area with shade.


Appropriate landscape development at the Wing Headquarters Building.

5.3 Energy and Utilities

SJAFB has undertaken a number of energy and water efficiency projects to meet higher level policy goals and directives. Further reduction of the base's resource consumption is a complex problem that will only be solved by approaching energy and water utilities in a holistic way.

Energy saving recommendations presented in this section are taken from the SJAFB Installation Sustainability Assessment, 2010. The recommendations build upon sustainability initiatives already in place and are specific to the local conditions and previous, successfully implemented practices. Recommendations should be reviewed by planning and design teams for consideration in ADPs and capital improvement projects as well as site specific projects.

5.3.1 Heating and Cooling

Air conditioning is the primary thermal load at SJAFB. Air conditioning during spring, summer, and fall seasons provides relief from both the heat and humidity. Efforts to reduce cooling load at the base have been primarily focused on shaving electrical peak loads by cycling cooling equipment on/off through the use of a DDC system, although recently the base has begun developing programs to retrofit existing units with Variable Frequency Drive (VFD) blowers to reduce electrical consumption.

- In all cases, distributed water heating and cooling systems should be considered for new construction. Such systems will allow for greater flexibility in the future to connect to centralized cooling systems or solar thermal heating systems.
- Combining increased density through infill development, with corresponding centralized utility plant and distribution systems serving multiple buildings within a campus, offers a possible order of magnitude improvement in energy savings compared to current development practices. It can also provide an opportunity to utilize renewable energy sources as a fuel at the central plants to provide heating, cooling, and electrical power through co-generation for the campus that is served.
- Consider construction of central plants to create a district cooling system. Larger cooling districts attached to a single central plant provide more benefits because the distribution system acts as a thermal reservoir (a "flywheel" effect) and the aggregation of equipment is often more efficient and easier to maintain than individual units at each building. Ice storage plants developed as part of such a system should provide for additional cost savings by developing cooling load during off-peak hours.
- SJAFB is located in a relatively humid climate that produces a significant amount of air conditioning condensate from air-handling units. The condensate is generally good quality water and could be used without treatment for non-potable water uses such as makeup water for water-cooled air conditioning systems, site irrigation, and toilet flushing.
- The base has been using economizers to use free-cooling when outside air temperatures are low and cooling is required. Some buildings with energy management systems are also using CO2 monitors to perform demand-controlled ventilation (DCV) when spaces are lightly staffed. Continue this practice on new construction and major renovations.
- Water-cooled air conditioning systems can develop chilled water for air conditioning more efficiently than air cooled systems. Future development and projects, including replacement of existing chilled-water systems, should consider using only water-cooled systems.

Heating systems on the base consist mostly of efficient gas-fired boilers installed as part of the project to remove the coal fired central heating plant.

- Any modification to the type of heating used should favor non-electrical power sources to reduce the Source 2 greenhouse gas emissions caused by the local energy provider's use of coal or gas to generate electricity.

- Consider a high-temperature hot water system that distributes hot water under pressure to minimize construction and maintenance costs of the distribution network when compared to individual units.

- As the existing boilers (and hot water heaters) require replacement, upgrade to 94 percent or higher condensing-type boilers in the event that district heating or other more sustainable systems cannot be used.

- Within individual buildings, consider using variable refrigerant flow systems to capitalize on internal heat gains to minimize heating required for the exterior envelope of buildings as an alternative to water source heat pump systems.

5.3.2 Metering and Controls

The base has installed a radio frequency based load shed system produced by Comverge Technologies in 144 buildings. The system disengages HVAC equipment for 15 minutes out of every hour when the electrical demand for the base reaches 7.5 megawatts. The base has also installed a Barber Coleman Network 8000 Direct Digital Control (DDC) system in 104 buildings to remotely control HVAC equipment.

The base is implementing a program of installing advanced metering in all buildings larger than 21,000 SF, which improved upon the ACC standard of buildings larger than 35,000 SF by demonstration of payback for buildings as small as 21,000 SF. There are also plans to install advanced metering for all reimbursable tenants. However, the base's new metering strategy will require compliance with the new Air Force Facility Metering Policy, Memorandum, 10 July 2009, which provides specifications for use of advanced metering and water metering.

- Ensure advanced metering and control systems are compatible with existing systems to enable the Base Energy Manager to control the energy load.

- Continue the existing building DDC and advanced metering system programs and expand them when practical.

- Consider including real-time energy use displays in each facility, so users can be made aware of energy consumption. This practice often results in significant savings since building occupants take charge of their own energy habits.

- Phase out the use of load shed devices in buildings with both DDC systems and advanced metering systems and develop a demand-based building operation schedule for those buildings. Load shed devices reduce electric load, but often at the cost of additional wear and tear on the HVAC equipment because they typically do not consider what stage of operation the equipment is in when it is shut down. Load shed devices also increase the number of start and stop cycles the equipment runs through.

- At a minimum, use occupancy sensors in assembly areas. Currently, there are plans for installing occupancy sensors to help achieve a 30% energy consumption reduction goal. The base is evaluating what type of start-up ballast should be used.

5.3.3 Water Utilities

The SJAFB team has made their most significant achievements in water use reduction through a program of eliminating water systems leaks. The base has significant opportunities remaining for reducing water use in existing facilities.

- The base should implement a retrofit program of high-efficiency water fixtures with automatic fixture sensors, flow restrictors, and flow aerators.

- Low-consumption toilets and urinals should be standard for each new project. All building alterations and modifications should promote this program.

- The base flushes water from the potable water distribution system to maintain required chlorine levels. New development and redevelopment should consider the practicality of integrating the storage of hydrant flushing water into the project for non-potable water uses, including toilet flushing, irrigation, and makeup water for water-cooled air conditioning systems. ADPs should consider how non-potable water from flushing locations can be repurposed and utilized, particularly as makeup water if incorporating a central cooling plant.

- The base is expanding the metering of water systems to more closely identify high-intensity water users. Metering that provides real-time data to the base energy manager for assessing periods of high use and should be standard for all projects.

- Water harvesting should be considered a possible source of water for both potable and non-potable uses for remote facilities that would otherwise require significant extension or upgrades to potable water infrastructure. Currently, the low cost of potable water makes most water harvesting projects not cost effective.

5.3.4 Renewable Energy Infrastructure

According to a renewable energy study conducted in 2006, thermal solar projects are the most cost-effective renewable energy source; wind and photovoltaic were determined to be the least cost effective. The energy study will be updated in the near future; as a result, renewable recommendations should be updated, as appropriate.

5.3.4.1 Solar Energy

The base has been considering programs for solar thermal pre-heating of water for some facilities.

- Thermal panels using evacuated tube technology for heating water should be considered since damaged tubes do not create water leaks and can be easily replaced without taking panels out of service.

In any event, all new construction on the base should consider the potential for adding solar energy systems and should design the buildings and the mechanical systems in a manner that makes the facility as "solar ready" as possible.

- Orient the building with a south-facing roof that is un-shaded from 9 AM to 3 PM with a large rectangular area free from vent pipes, skylights and other penetrations. Roofs do not need to be exactly south facing, but should be within a southeast to southwest orientation. The roof should have adequate uninterrupted square footage for a useful system of panels. At a minimum, at least 200 square feet is required for any solar array. This provides sufficient room for the array, maintenance access, and to comply with most fire codes. Ultimately, the size of a solar thermal system should be determined by estimating the buildings' hot water demands. Sizing of a photovoltaic array is usually constrained by available space and budget, as excess electricity can be returned to the grid

- Include wire and piping in new construction or renovation so that at a later date the building can be easily augmented with solar PV (electric) and/or solar hot water systems.

- Ensure structural capacity to carry future panels and equipment related to solar energy capture, including wind load considerations.

- Provide roof access for installation and maintenance.

Solar-ready construction allows the SJAFB energy manager to procure solar hot water systems (or PV if determined feasible) as funding becomes available and/or through power purchaser agreements with the local utility without costly and disruptive renovations.

5.3.4.2 Ground Source Heat Pumps

Local conditions at SJAFB are suitable for ground source heat pump systems. Consider ground source geothermal heat pump systems for heating and cooling.

5.3.4.3 Biomass Energy

Future development plans should consider a dense enough development pattern to support a combined heat and power plant (co-gen), burning biomass if possible (and natural gas if not) to provide renewable electric and thermal energy. District heating enables the use of co-generation plants to heat and power multiple buildings independently of local utilities, subsequently increasing installation operability in extreme circumstances.

Note: Municipal solid waste or biomass incinerators have been considered for use at the base in the past. However, Title V permitting implications, and the associated costs and new requirements, have been considered hurdles to overcome. These concerns should not rule out the potential use of these renewable energy resources.

5.3.5 Storm Water

SJAFB currently operates a storm water system that primarily focuses on collection and conveyance of storm water away from facilities on base. Improvements for storm water quantity and quality controls have previously been limited to those required for permit and regulatory approvals.

Between FY2011 and the implementation of the 2007 Energy and Independence Security Act (EISA) which requires restoration of pre-development hydrology for new and redeveloped facilities, SJAFB has restored over 50 acres of impervious area to pervious area to provide credit for creation of impervious area for future development at the base.

SJAFB is currently managing development and stormwater to meet or exceed Neuse River Nutrient Sensitive Water regulations.

Non-permit and regulatory conditions and measures for stormwater management that should be considered in the design process include:

- Infiltration methods for storm water management because SJAFB has areas of highly permeable surface soils.

- In nearly all cases, the upstream (source) management of stormwater is preferred over the

downstream (e.g., retention facilities) management of storm water.

5.4 Architectural Design

Buildings at SJAFB consist of a variety of types and designs that convey a fairly unified aesthetic throughout the installation. This aesthetic is mainly due to a common palette of exterior materials and colors. One main goal of this section is to identify and encourage architectural elements that should be maintained in order to preserve this installation's unique image.

Although the buildings at SJAFB convey some general uniformity, visual cues are also used to indicate various zones, or "districts," throughout the installation. These districts are defined in "Section 2 Installation Image." Each district, while containing various elements and materials from the other district, has a few components that separate it visually.

The purpose of this section of the document is to provide architectural guidance that will result in providing the installation with a degree of visual order, while allowing designers to seek creative solutions that respond to the unique challenges associated with the contextual setting of the base as well as each individual site and building. It will also serve to guide the designer in maintaining positive elements of each district and upholding some of the existing overall architectural consistency, without inhibiting the flexibility to provide imaginative design solutions.

5.4.1 Architectural Order

Architectural design for new construction at SJAFB should not only address the functional needs dictated by the facility's program, but should be sympathetic to the specific opportunities presented by each individual project's site while considering the overarching goal of delivering the 'greenest' facility possible.

5.4.1.1 Plan Complexity and Geometry

A significant portion of the existing buildings' plans tend to be simple due to the straightforward function of the building. Examples of this simplicity would be hangers, maintenance or storage buildings, which are more predominant in the industrial areas and flightline areas (Mission/Industrial District). In other areas of the installation (Community Center District), simple rectangular plans also are prevalent in buildings such as the Commissary, BX, barracks, and administration buildings.

For future development, plan complexity and geometry should be derived primarily from the building's type or function. Less complex programs will still likely result in straightforward plan geometries. However, more complex programs and uses should be seen as an opportunity to provide more interesting buildings that can better respond to site constraints or better support sustainable design goals, such as providing better views and enhanced daylighting.

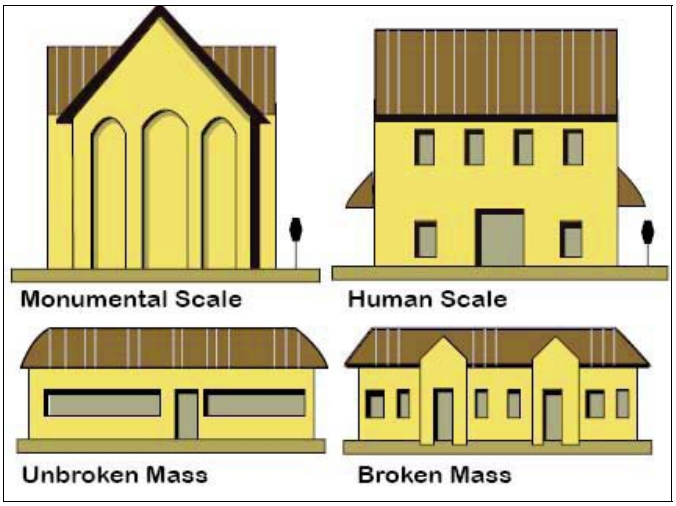
The existing 916th Refueling Wing HQ building is a good example of how use of complex plan geometry can be a benefit. The cross shaped footprint gives more offices access to natural daylighting and views than would be found in a rectangular plan. The shape also provides more visual interest and opportunities for positive outdoor spaces.

Complex Plan Geometry at HQ 916th Refueling Wing (Building 4814).

5.4.1.2 Building Scale and Proportion

Scale refers to the size of building elements in relation to people and surrounding buildings. Buildings of monumental scale feature predominantly vertical facades that dwarf a person and surrounding buildings. Buildings of human scale have more horizontal facades designed to relate to the size of a person. Additionally, the sizes of roof forms, windows, ornament, and landscaping affect a building's scale. In general, larger windows, plants, and taller roofs relate less to the human scale than do smaller elements. The scale of most buildings on SJAFB is human rather than monumental scale. Obvious exceptions to this would be hangers and other large flightline or industrial facilities.

Monumental architectural design should be reserved for more ceremonial buildings, such as worship centers and headquarters complexes. These buildings often make use of large, glazed areas at entrances and oversized fenestration elements to draw users to the building entry and to create a scale appropriate to the building's use.



Scale and mass diagrams.

The existing library building is a good example of an appropriate use of a monumental scale. The north entrance and circulation element is enclosed in a two story glass curtain wall, clearly defining its importance.


Monumental scale entrance element at Education Center (Building 3660).

For new developments, building scale and proportion should vary by building type, which in turn will usually vary by District. In general, buildings should be of a scale appropriate for their use or importance. If a building has functions which require large-scale building masses, but is not of particular importance or a ceremonial use, effort should be taken to humanize the building scale. One way to achieve this is to surround large-scale functions with smaller-scale functions (the use of additive forms) thus providing a more human scale at the points where people see or approach the facility. Good examples of the positive use of additive forms are seen in the existing F-15E Mission Training Center and the additions to the Refueling Wing Hangar pictured.


Humanizing building scale at F-15E Training Center (Building 4400).


Additive forms at Refueling Squadron hangar (Building 4828).

Another good practice for buildings with large uninterrupted masses is to use horizontal banding to minimize the impact of these forms by giving them some visual interest. Banding can be in the form of a contrasting material or recesses in the main building veneer. In the case of concrete masonry unit (CMU) exterior walls, variation in color and texture can create banding, such as on the existing F-15E Mission Training Center shown below. When brick is used, changes in pattern and plane should be used, such as the projected brick soldier courses banding, as shown on the Library below.


CMU banding at F-15E Training Center (Building 4400).


Face brick banding at Library (Building 3660).

Water tables, or wainscot, may be used to create more of a human-scale for buildings. Water tables should be made of a durable material such as face brick or CMU. At buildings that have only one veneer material, the appearance of a water table can be created using banding or varying wall projections and colors. At pedestrian-accessed buildings, the height of the water table should be about one-third the height of the total wall, such as on the existing Dining Hall, Building 3650. At larger structures, such as hangars, the proportion should be closer to one-fifth. A good example of a water table on a larger building is seen on the recently constructed Refueling Wing hangar.


Face brick water table at Dining Hall (Building 3650).

Efforts should be made to modulate vertical elements of the façade, as well. Windows along long stretches of walls could be arranged into groups of two or three and patterned along the wall. Long, straight walls can also receive vertical treatment to break up monotonous horizontal planes. This can be achieved by the use of pilasters and downspouts or varying the protrusion of the wall itself as seen on Dormitory, Building 3652.


CMU water table at Refueling Wing hangar.


Facade modulation and window grouping at Dormitory (Building 3652).

5.4.1.3 Symmetry/Hierarchy of Elevations

Major building elements should be sectioned into order of importance. Entrances, walkways, and non-accessible building faces should all have distinct characteristics that give occupants visual signals as to how the building may be accessed.

Main entrances should be covered for shade and weather and have a vertical appearance that provides a strong indication of pedestrian access. Main entrances should also face the road and be clear of visual obstructions that would block the view of the entrance from the street. A good example of how the main building entrance can be made a positive visual experience is at the Headquarters Building.

Secondary entrances should have a low roof covering. The appearance of secondary entrances should be minimal in scale and should not compete with the main building entrances.


Main entrance to Headquarters Building (Building 2902).

Walkways along the face of a building might have a roof canopy, or could become a colonnade. In these instances, the roof should be lower than the roof over the main entrance, in order to provide a visual indication of a secondary hierarchy that leads into the larger, main hierarchy.

Major building facades that do not relate to entering the building should be relatively simple and clear of architectural elements that would deter from the building's entrances. Roofs at these areas should have continuous, straight eaves and ridge lines.

5.4.1.4 Building Open Spaces

Open spaces relating to the interior of the building deal mostly with public buildings, such as recreation and dining facilities along with some barracks areas. Efforts should be made to create a strong connection between large interior spaces and outdoor spaces. Entries and vestibules should have a strong visual connection to outdoor spaces. These areas also provide a transition between indoor and outdoor environments. Any space inside a building that has access to a courtyard, main entrance or other pedestrian-friendly area should have as much glazing as is possible and practical.


Outdoor courtyard at main Education Center entrance (Building 3600).

The key to making such outdoor spaces most useable is to provide shade. An example of a positive existing outdoor space which could be even more successful with added shading is the outdoor entrance courtyard at the Library.

Daylighting and views to the outside are significant building elements which support sustainable design goals and must be incorporated whenever possible. Additional vertical height typically seen in large open spaces, such as vehicle maintenance bays or dining halls, should be leveraged to provide as much natural daylighting as possible. Translucent panels, in the form of skylights, clerestories or wall panels should be used to furnish additional daylighting. Some appropriate means of adding daylighting found on existing SJAFB buildings are shown in the images below.


High windows provide indirect daylight at Youth Center (Building 4103).


Clerestory windows provide daylight in RED HORSE area (Building 2406).


High bay translucent panels provide indirect daylight (Building 4902).

5.4.2 Architectural Elements

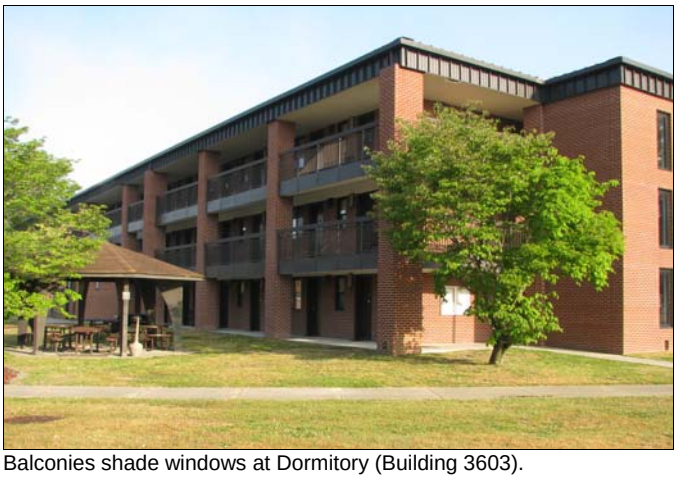
Along with the items that define architectural order, there are also various architectural elements that define the overall look of SJAFB. These elements include fenestration, roof elements, and exterior building materials.

5.4.2.1 Fenestration

Windows on existing SJAFB buildings vary a great deal in form and scale. Some windows are punched openings, which is a good window form to minimize the impact of the summer sun. Large areas of glazing are sometimes used on more prominent buildings or to highlight building entrances. Window types often vary within the same building, but can still be appropriate, as seen on the Air Refueling Squadron building shown below.


Various window types on Refueling Squadron building (Building 4902).

Translucent wall panels can be an attractive way to provide natural light for large interior spaces when views are not possible, i.e. at clerestories or skylights. All new or replacement glazing must be insulated, tinted and have a Low E coating to achieve a high level of energy efficiency. Large areas of glazing should not be used anywhere on a building unless it is north facing or can be properly screened from direct summer solar gain. The use of curtain walls or storefronts can be an appropriate feature of main building entrances, if north facing or properly shaded. Good examples of building elements providing shade at windows can be seen on many of the typical dormitory buildings, such as Building 3603 pictured below.


Balconies shade windows at Dormitory (Building 3603).

5.4.2.2 Roof Features and Form

The hip roof form is predominant on steep sloped roofs in the Community Center district. A gabled form can be found on a very small number of buildings in this district, such as the Chapel and Library. Often, these hip roofs have a short fascia with deep (+/- 2 feet) overhang. A typical roof slope for steep-sloped roofs in this area is about 3:12. This should be the minimum slope for steep slope roofs in new construction. The Dining Hall is a fairly typical example of this existing roof form, but with a tall fascia. Most steep sloping roofs in this district have prefinished standing seam metal roof panels and matching fascia, soffits, gutters and downspouts.


Community Center District hip roof forms at Dining Hall (Building 3650).

The gabled roof form is predominant on steep sloped roofs in the Mission/Industrial District. A hipped form can be found on a small number of buildings in this district, such as the Fire Station. Often these gabled roofs have a short fascia with no overhang, but this varies. A roof slope of 3:12 should be the minimum slope for steep slope roofs in new construction, but many roofs in this area are steeper. A slope of 4:12 to 6:12 is not uncommon. Building 2115 is a fairly typical example of the existing predominant roof form. Most steep sloping roofs in this district have prefinished, standing-seam metal roof panels and matching fascia, soffits, gutters and downspouts.


Mission/Industrial District gabled roof forms (Building 2115).

For both districts, large buildings, such as hangars, can have a more minimal slope of 1:12 if an appropriate structural type standing-seam metal roof is provided. Steep-sloped roofs are generally desired, however "low-slope" roofs (1/4:12) can be a good solution for larger building masses and are used often throughout SJAFB. If low-slope roofs are used, a white membrane roof with high solar reflectivity should be used in order to help reduce the heat island effect and utility usage. Roofs at major building elements can have a steeper slope in order to create visual interest. Slopes should not exceed 8:12 at these areas.

5.4.2.3 Other Building Features

Decorative lighting may be used for visual interest at major architectural elements. Light fixtures should have a simple profile and be a "cut-off" type that will not contribute to light trespass.

Cast stone caps and banding have historically been used sparingly, but are acceptable. For example, brick piers at an entrance canopy may be capped with a stone cap, or stone banding may be used to top a brick water table. Cast stone can be seen in this use on the existing Dining Hall (see photo under "Building Scale and Proportion" above).

Accessory buildings (e.g., sheds) should be compatible in color, form, and materials with the adjacent buildings.

5.4.2.4 Materials—Mission/Industrial District

The Mission/Industrial District includes industrial and flightline areas consisting mainly of pre-engineered metal buildings. Pre-engineered type buildings typically have metal wall panels and dark bronze, sloping, standing-seam metal roofs. It is appropriate for these types of buildings to have a split-faced CMU wainscot as discussed in Section 5.3.1 under "Building Scale and Proportion." An example of appropriate design and use of materials for this type of building is the new Refueling Wing hangar shown below.


Appropriate design in Mission/Industrial District: Refueling Wing hangar.

Also seen in the Mission/Industrial District are some buildings of traditional construction, which most often have split-faced CMU walls with sloping, standing-seam metal roofs. An example of appropriate design and use of materials for this type of building is the new Air Refueling Squadron shown below.


Appropriate design in Mission/Industrial District: refueling squadron building (Building 4902).

One use of materials in this district that should be avoided in new construction is ribbed CMU as the main building wall material. It can be appropriate for accents, but should not be the main "field" material, as seen on this 336th Fighter Squadron building.

Inappropriate use of ribbed CMU: Mission/Industrial District (Building 4421).

Another material historically used in this district which should be avoided completely in new construction is exposed aggregate concrete panel walls. It can be seen in use on Building 4904 below.

Inappropriate use of exposed aggregate concrete walls in Mission/ Industrial District (Building 4904).

5.4.2.5 Materials— Community Center District

The Community Center District includes a wide variety of building types mainly of traditional construction. The predominant building material palette is red face brick walls with dark-bronze, sloping, standing-seam metal roofs, or "flat" roofs. Examples of appropriate design and use of materials for these types of buildings in the Community Center Area are shown below.

Appropriate design of typical Dormitory (Building 3652) in the Community Center District.

Appropriate design of housing office (Building 3801) in the Community Center District.

The Community Center District also contains more "transitional" building material palettes, which use a combination of materials from both districts. See the additional discussion of Transition Areas between Districts in "Section 2, Installation Image." A good example of a transitional building in the Community Center District is the Fitness Center. The building has similar roof materials, and forms, typically found in the District, but with light-colored concrete walls.

Appropriate transitional design of Fitness Center (Building 4210) in the Community Center District.

There are some building materials found in the Community Center District which should generally be avoided. An example of their use can be found around the Community Center facility itself, the pool buildings and screen walls. They have a dissimilar colored face brick from anything else found in the area, and they have asphalt shingle roofing. Use of shingled roofs on new construction should be avoided. In this case, the use of these materials was to provide a color contrast for the former officer club and to match the shingle type of the adjacent military family housing.

Inappropriate use of materials at Community Center/Pool (Building 1600) in the Community Center District.

5.4.3 Additional Architectural and Design Direction

Appendix B provides additional architectural and design direction that is preferred by the base.

Appendix B includes:

- B.1 Background
- B.2 Design Elements
- B.3 Site Design
- B.4 Landscape
- B.5 Signage
- B.6 Self-Help

6 List of Acronyms

A-E	Architecture/Engineering
ACC	Air Combat Command
ADP	Area Development Plan
AFB	Air Force Base
ARW	Air Refueling Wing
AT/FP	Anti-terrorism/Force Protection
BX	Base Exchange
CCD	Concept Charrette Document
CMU	Concrete Masonry Unit
D2	Development and Design Board
D-B	Design-Build
D-B-B	Design-Bid-Build
DCV	Demand-Controlled Ventilation
DDC	Direct Digital Control
DOD/AF	Department of Defense/Air Force
eGP	Electronic General Plan
EISA	Energy and Independence Security Act
EO	Executive Orders
ESQD	Explosive Safety Quantity Distance
FAMCAMP	Family Camp
FW	Fighter Wing
FY	Fiscal Year
FYDP	Future Year Development Plans
GP	General Plan
HQ	Headquarters
HVAC	Heating, Ventilation and Cooling
ICRMP	Integrated Cultural Resources Management Plan
ID2	Installation Development and Design Handbook
I&I	Inflow and Infiltration
INRMP	Integrated Natural Resources Management Plan
LEED	Leadership in Energy and Environmental Design
LID	Low-impact Development
MILCON	Military Construction
mph	miles per hour
MSL	Mean Sea Level
NOAA	National Oceanic and Atmospheric Administration
OG	Operations Group
RD	Requirements Document
RFP	Request for Proposal
RED HORSE	Rapid Engineer Deployable Heavy Operational Repair Squadron Engineers
SD&HPGBD	Sustainable Development & High Performance Green Building Design
SJAFB	Seymour Johnson Air Force Base
TS	Training Squadron
USAFCENT	United States Air Force Central
USDA	United States Department of Agriculture
VFD	Variable Frequency Drive
w/m^2	watts per square meter

This page intentionally left blank.

A Figures

FIGURES

This page intentionally left blank.

SEYMOUR JOHNSON AIR FORCE BASE
Water Distribution

Figure A-1

- Fire Hydrant
- Water Valve
- Abandoned Water Main
- Fire Main
- Water Main
- Water Service Main
- Airfield Surfaces
- Buildings
- Lake/Pond/River/Stream/Canal
- Parking/Roads
- Installation Boundary

0 0.25 0.5 1 Miles

0 500 1,000 2,000 Meters

SEYMOUR JOHNSON AIR FORCE BASE
Sanitary Sewer Distribution

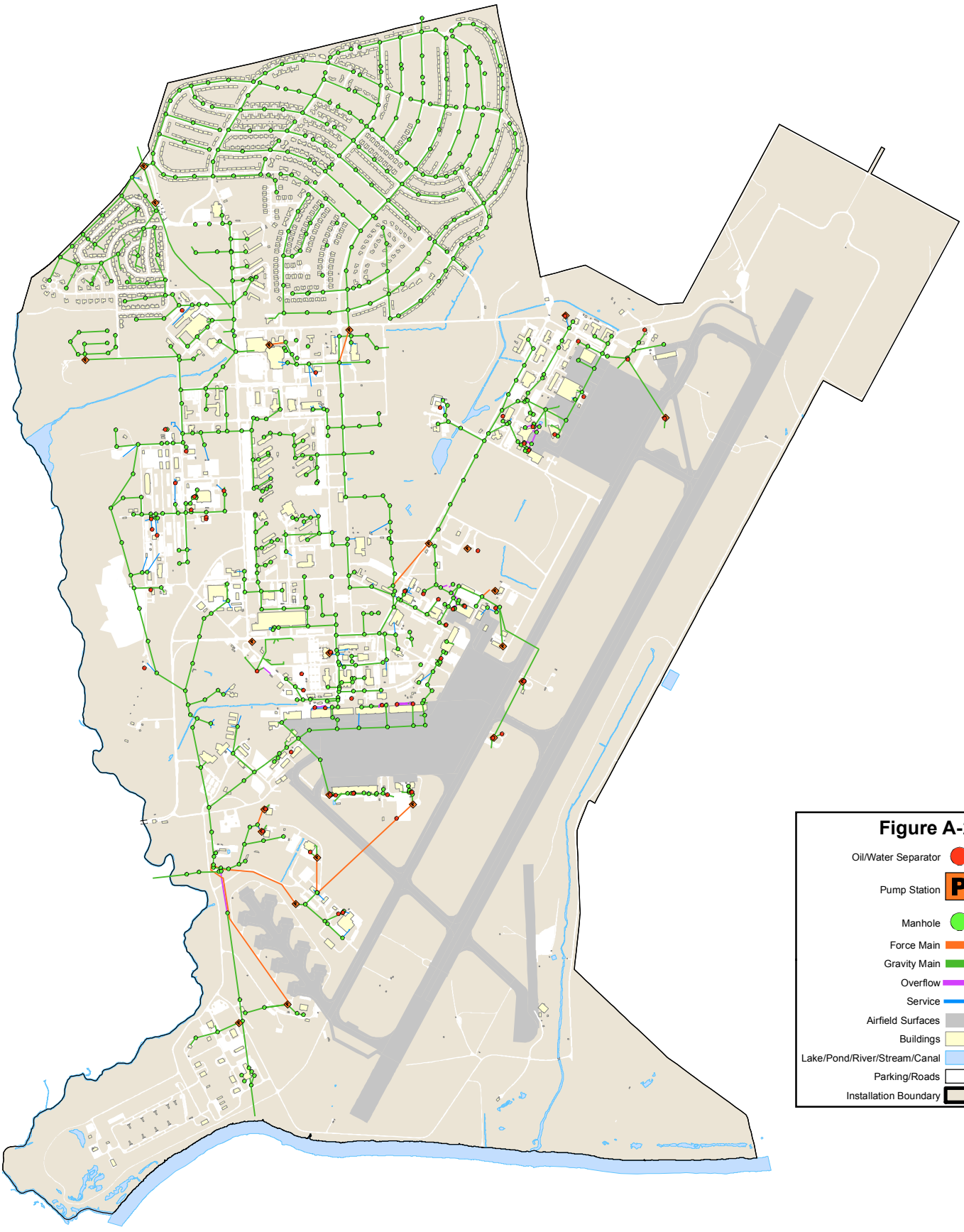


Figure A-2

- Oil/Water Separator
- Pump Station (P)
- Manhole
- Force Main
- Gravity Main
- Overflow
- Service
- Airfield Surfaces
- Buildings
- Lake/Pond/River/Stream/Canal
- Parking/Roads
- Installation Boundary

0 0.25 0.5 1 Miles

0 500 1,000 2,000 Meters

SEYMOUR JOHNSON AIR FORCE BASE

Electric Distribution

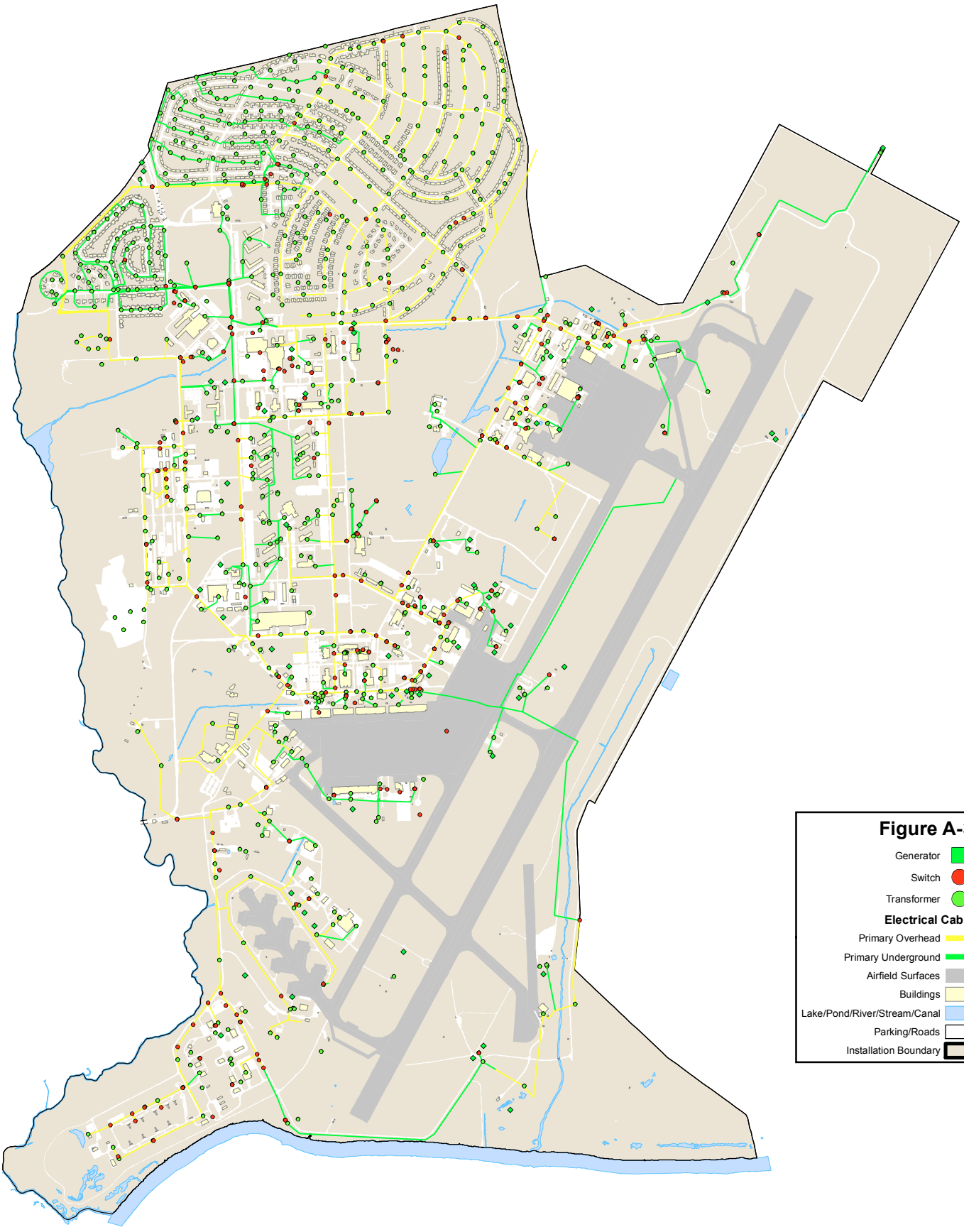


Figure A-3

- Generator
- Switch
- Transformer

Electrical Cable

- Primary Overhead
- Primary Underground
- Airfield Surfaces
- Buildings
- Lake/Pond/River/Stream/Canal
- Parking/Roads
- Installation Boundary

0 0.25 0.5 1 Miles

0 500 1,000 2,000 Meters

SEYMOUR JOHNSON AIR FORCE BASE
Natural Gas Distribution

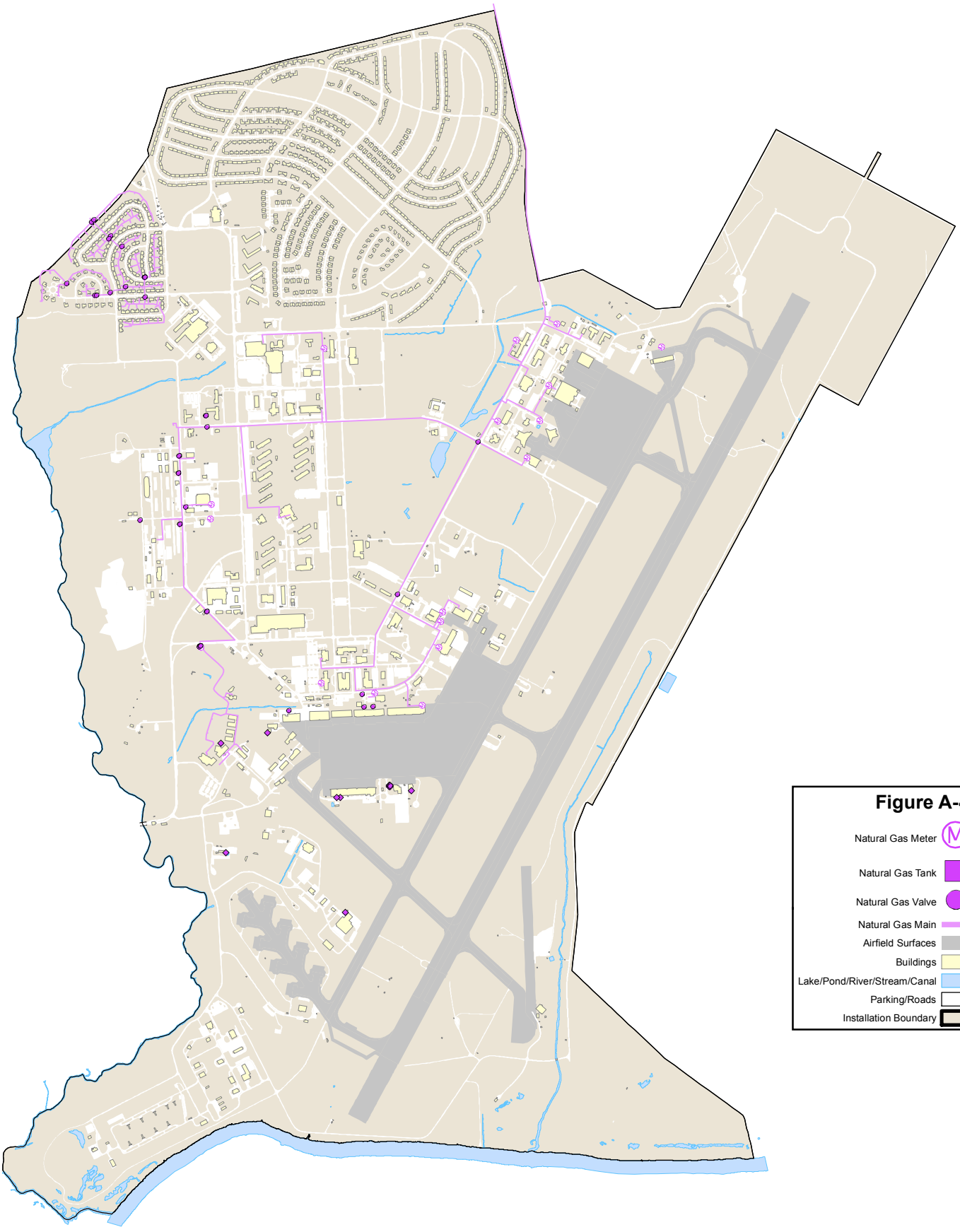


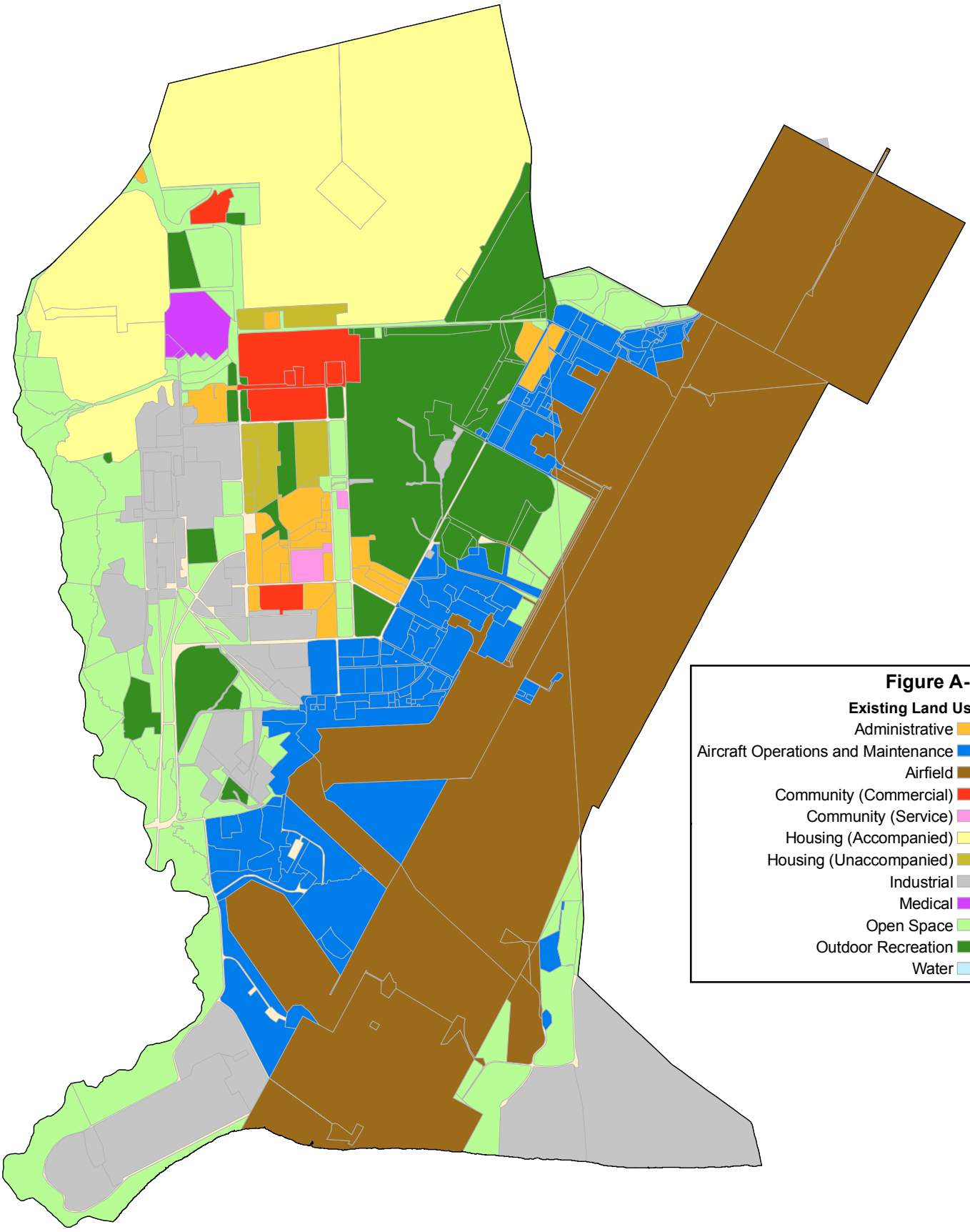
Figure A-4

- Natural Gas Meter
- Natural Gas Tank
- Natural Gas Valve
- Natural Gas Main
- Airfield Surfaces
- Buildings
- Lake/Pond/River/Stream/Canal
- Parking/Roads
- Installation Boundary

0 0.25 0.5 1 Miles

0 500 1,000 2,000 Meters

SEYMOUR JOHNSON AIR FORCE BASE
Existing Land Use



0 0.25 0.5 1 Miles

0 500 1,000 2,000 Meters

This page intentionally left blank.

B Site and Facility Guidelines

B.1 Installation Functional/ Technical Constraints and Considerations

B.1.1 General

This section provides installation-centric background information and identification of functional-technical considerations necessary for a fully successful design. It identifies preferred systems and technical components and is intended to describe best practices related to planning, architecture, engineering, and interior design. It identifies materials, furnishing, systems, practices, approaches, and finishes historically used and having proven success over time. It is not intended to serve as a comprehensive list of all applicable building codes, regulations, directives, references, or to identify facility centric or unique user requirements. Functional-Technical Constraints and Considerations need to be specifically addressed in the Basis of Design analysis written during the concept development phase and the design development phase. Understanding the driving forces behind these constraints and considerations will greatly contribute to a successful project outcome.

B.1.2 Brand Name References

References to equipment, materials, articles, or patented process by trade name, make, or catalog number, shall be regarded as establishing a standard of quality and not construed as limiting competition.

B.1.3 Design Criteria

- When additions are less than 25 percent of the existing building's floor area, it is usually more appropriate to design additions to match the original construction. However, opportunities to meet the current standards of the ID2 should be investigated.
- Where a high maintenance existing finish such as paint occurs, provide a low maintenance, integrally colored material.
- When additions exceed 25 percent of the original building area, investigate upgrading the existing facility to comply with current standards of the ID2.
- Whether large or small, additions should not appear as obvious add-ons. Match form, massing, and scale to make the addition and the original structures appear as parts of a new, unified whole.

B.1.4 Site Planning

B.1.4.2 Site Development Pattern

- Arrange buildings in tight groupings, which share parking and encourage people to walk between buildings (Figure B-1).

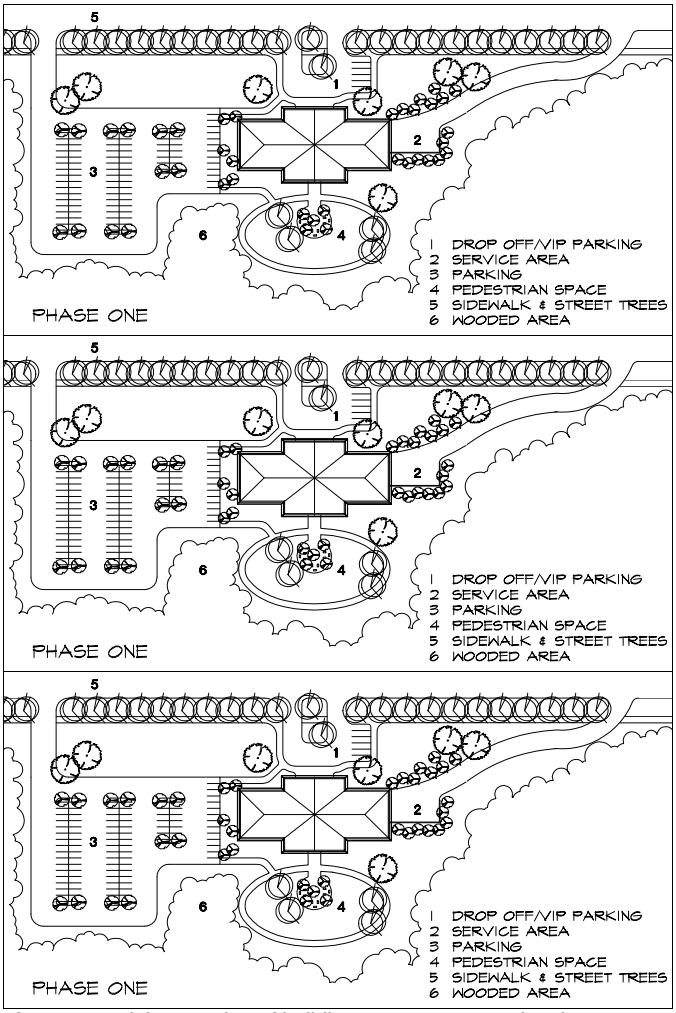


Figure B-1 *Tight grouping of buildings encourages pedestrian circulation.*

- Where possible, integrate new buildings into existing groupings. Areas between buildings should be designed as exterior pedestrian spaces.
- Use building forms, landscaping, and existing topography to enclose outdoor spaces.
- Configure site to separate service zones from parking and pedestrian spaces. Screen service areas from major streets.

B.1.4.3 Environmental Stewardship

- Site planning must minimize the negative impact on the natural environment.

- Design facilities to work within the existing topography; preserve as many desirable trees as possible.

B.1.4.4 Future Development

- Where the possibility of facility expansion exists, the building site plan should show the proposed method of expansion (addition or separate building).
- Consider locations of underground utilities, parking, and service areas to minimize impact on future growth.

B.1.4.5 Location of Visually Objectionable Items

- Aboveground utility equipment, transformers, meters, connections, trash receptacles, etc. should be discreetly located at the rear of the site and should be screened with walls and landscaping.

B.1.5 Roofs and Gutters/Downspouts

B.1.5.1 Roofs Material

- Existing standing seam metal roofs match Petersen Aluminum Corporation (PAC-CLAD) “Dark bronze.”

B.1.5.3 Rooftop Equipment

- SJAFB prefers that all vent piping, flues, exhaust fans, etc., penetrating roofs not be visible from the view of the building front/main entrance. These penetrations are considered trim material and should be painted/ manufactured for consistency/compatibility with the facility.
- SJAFB prefers minimizing the number of roof penetrations with penetrations on the least visually objectionable side of the roof.

B.1.5.4 Gutters and Downspouts

- Gutters may be exposed or integrated into the fascia design.
- Exposed downspouts should be factory finished to match adjacent wall or metal roof and trim color.
- Rain diverters or gutters and downspouts must be provided over building entrances.
- The building location should always be considered when designing roof drainage.
- If no other low impact development stormwater solution exists, downspouts can be inserted into cast iron boots and routed into the underground storm drainage system. A simple alternative is to provide concrete splashblocks at grade. Locate splashblocks to avoid conflict with pedestrian walks.

B.1.6 Entrances

- At least one building entrance should be clearly visible from the main viewing street and the parking area. Each building entrance must be readily identifiable.
- Facility design should address the entire entry sequence beginning with vehicular/pedestrian circulation routes and terminating in the building lobby.

B.1.7 Exterior Walls

B.1.7.1 Materials

- Commonly used throughout the Community Center District for wall material is modular red brick with off-white mortar. (Figure B-2). This brick is Pine Hall Old Colony/Light Range modular face brick.

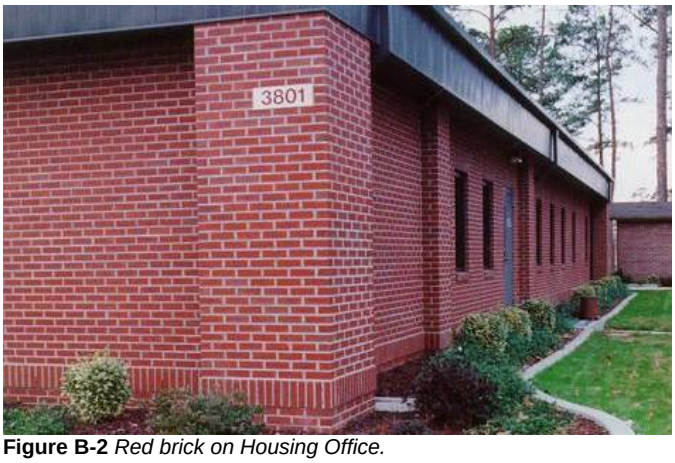


Figure B-2 *Red brick on Housing Office.*

- In the Mission/Industrial District the primary wall material is integrally colored and textured concrete masonry units. A common color of masonry units and mortar that has been used is Adams A815W, “Ivory,” as used on the F-15E Simulator building and Fighter Squadron Operations building (Figure B-3). The primary CMU texture is split-face with other textures used as accents.

Figure B-3 *Integrally colored and textured concrete masonry units on Fighter Squadron Operations building.*

- When using metal wall panels the panels should be factory finished and have 20-year full replacement warranty. A common colored used at the base Fed. Std. 595b #23617.

B.1.7.2 Wall Construction

- **Wall Louvers—**When using exterior metal louvers they must be stormproof and able to withstand wind-driven rain without infiltration. Minimum design wind speed is 90 mph. Louvers shall have fluoropolymer (*i.e.,* Kynar 500) coating.

B.1.8 Windows and Doors

B.1.8.1 Design

- Design building fenestration for user comfort and energy efficiency. Reduction of cooling loads is critical during Seymour Johnson's hot summer months.
- Operable windows are encouraged.
- Provide screens where windows are operable.
- Orient windows to take advantage of cross ventilation.
- Encouraged is the use of overhangs, porches, colonnades, and other strategies to block direct summer solar gain (Figure B-4).
- Use north facing clerestory windows and other natural lighting methods to reduce lighting demand and associated cooling loads.

B.1.8.2 Materials

- Windows should have aluminum, thermal-break frames. Commonly used finishes throughout are dark bronze anodized or fluoropolymer coating (*i.e.,* Kynar 500) in color to match Petersen Aluminum Corporation (PAC-CLAD) "Dark bronze."
- Glass must be insulated, tinted, with minimum reflectance. Energy efficient glazing is mandatory.
- **Primary Entrances—**Aluminum storefront are commonly used for primary entrances. The main color used is dark bronze anodized or fluoropolymer finish (*i.e.,* Kynar 500) matching Petersen Aluminum Corporation (PAC-CLAD) "Dark bronze."
- **Secondary Exterior Doors and Frames—**SJAFB prefers doors and frames. Hollow metal doors and frames should be galvanized and field painted color.

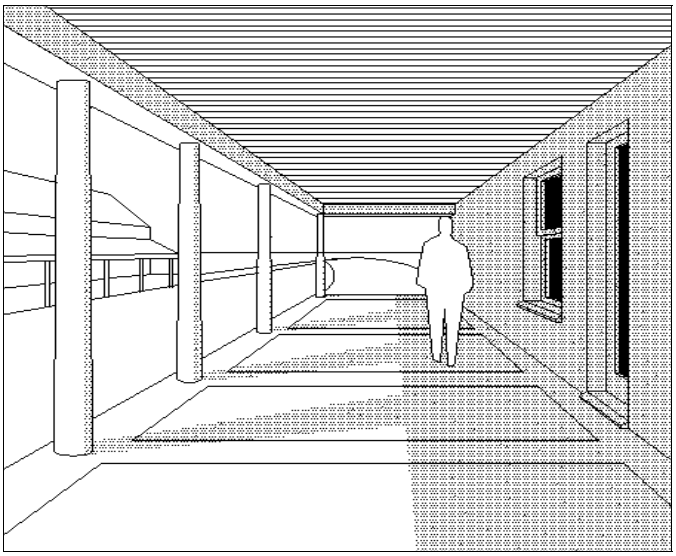


Figure B-4 *Colonnades and overhangs shade building exterior and reduce cooling loads.*

- **Maximum Sensible Heat Gain Coefficient** - The assembly maximum Sensible Heat Gain Coefficient for Seymour Johnson AFB can be found in the ASHRAE 90.1 table for Climate Zone 3 (Wayne County, NC is classified as being a Zone 3A location). The actual maximum allowed for the fenestrations in any particular building is dependent on the overall building design and the comparison of the building in question with a model building using ASHRAE 90.1 guidelines and the requirements of EISA to design a facility that exceeds the requirements of ASHRAE 90.1 by 30%.

B.1.9 Finish Hardware

- Locks shall be compatible with the base standard interchangeable core system manufactured by Best Lock Co.
- Call for a three-year warranty on parts and labor for all locks.
- Prior to the Final Design Phase, project designers shall discuss keying requirements with building users.

B.2 Site Design

B.2.1 Vehicular Circulation

- Provide maintenance vehicle access to building mechanical rooms where feasible. Pavement or reinforced sidewalks are acceptable for vehicle access.

B.2.2 Parking

B.2.2.1 Siting

- Maximize the use of existing parking and opportunities for shared parking must be considered.
- Do not locate parking between a building and the main viewing street (Figure B-5).

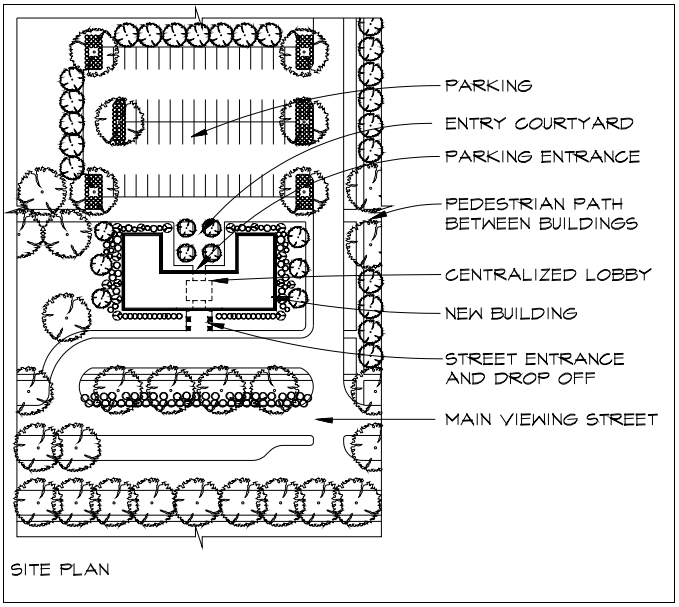


Figure B-5 *Example of good site planning.*

- Do not let parking occupy pedestrian spaces between buildings in a group.

B.2.2.2 Screening

- Use buildings, natural topography, and landscaping to screen parking from the primary street (Figures B-5 and B-6).

Figure B-6 *Landscape screening between street and parking area.*

- Subdivide large parking areas into lots of 50 cars or less, where feasible. Small parking areas reduce the negative visual impact and allow opportunity for additional landscaping.
- When developing parking areas, save as many desirable existing trees and shrubs as possible. Justification must be provided in the Basis for Design analysis for the removal of trees deemed desirable.

B.2.2.3 Pedestrian Paths

- Provide safe pedestrian paths from parking to building entrances.

B.2.2.4 Services

- Separate service/dumpster locations from pedestrian circulation. Ensure turnaround space for fire trucks and service vehicles.

B.2.3 Pedestrian Circulation

B.2.3.1 Paths

- Provide safe, convenient paths to encourage bicycle and pedestrian circulation (Figure B-7).
- Design continuous paths linking buildings, courtyards, parks, and other activity nodes.
- Provide bike paths with the roadway or create separate bike path/jogging trails.
- Separate vehicular and pedestrian circulation (Figure B-8).

Figure B-7 *Well-lit paths encourage pedestrian circulation.*

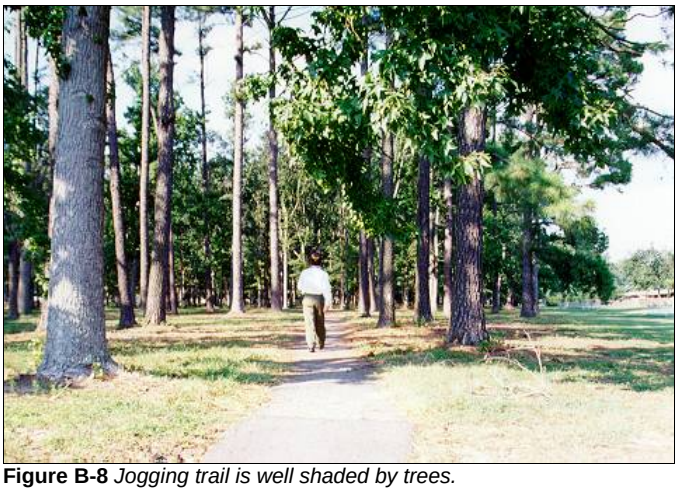


Figure B-8 *Jogging trail is well shaded by trees.*

B.2.3.2 Sidewalks

- Add sidewalks to existing roadways where possible. New roads in developed areas should have sidewalks on both sides of the road.
- Set sidewalks back an appropriate distance from the curb edge to allow for landscaping and maintenance.

B.2.3.3 Landscaping

- **Promote Security—**Configure paths and design landscaping to permit surveillance of pedestrian circulation routes (Figure B-9).
- Provide shade trees along paths.
- Provide low-maintenance, vandal resistant seating, and water fountains at intervals along paths.

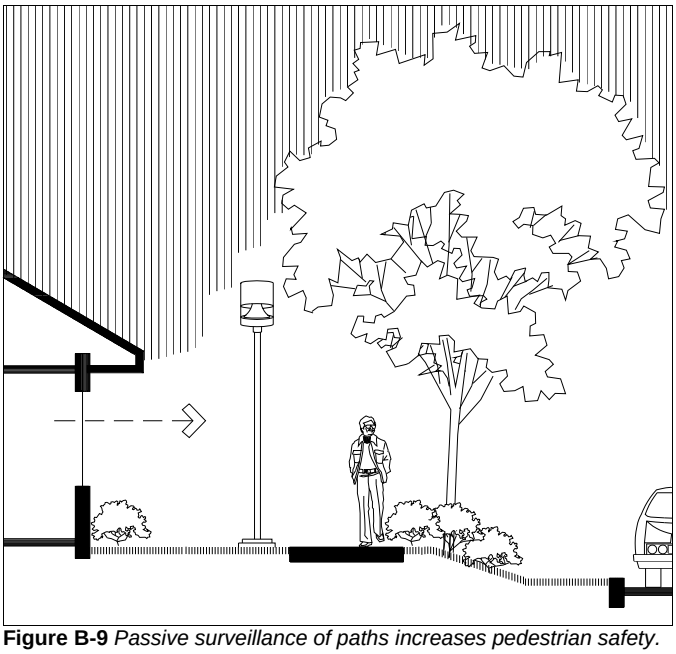


Figure B-9 *Passive surveillance of paths increases pedestrian safety.*

B.2.4 Site Lighting

B.2.4.1 Design

- Create a unified appearance on base by selecting light fixtures of a consistent design and lamp type.
- Fixtures shall be low maintenance and vandal resistant.
- Parking lot and area lighting should be high pressure sodium, rectangular cut-off (shoebox fixtures).
- Poles in use are square, straight aluminum shaft with a dark bronze anodized finish (Figure B-10
- Street lights should be high pressure sodium cobrahead fixtures mounted on 25' tall poles with a single 8' long arm (Figure B-11). Cobrahead style lighting chosen must be a style with the least amount of light trespass as available on the market while still meeting the need for safety and security. Poles in use clear anodized, round tapered seamless aluminum.

Figure B-10 *Fixture for parking lot and area lighting.*

Figure B-11 *Cobrahead street lights.*

Note: For street and parking lot lighting, high pressure sodium lamps should be continued to be used until more energy efficient lamps are identified and approved for use. A possible interim solution could be induction lighting. Induction lamps have up to a 100,000 hour lifespan as compared to 24,000 hour lifespan for high pressure sodium lamps. Induction and high-intensity discharge ballasts have a lifespan of approximately 60,000 hours. (Ballasts for replacement Induction lamps are integral to the lamp). Induction lamps are instant on and have minimal Lumen depreciation during the life of the lamp. With minor modifications, an existing shoe box or cobra head style fixture can be relamped with an induction lamp. The energy usage per watt for an induction lamp is similar to the energy used by a high pressure sodium lamp.

- All exterior lighting shall meet the efficiency levels established in *Command-level requirements described in ACC Instruction ID2 (publication forthcoming); in the interim use ACC Energy and Facility Management Policy)* as well as the specifications found in:
  - Engineering Technical Letter (ETL) 10-18: Light-Emitting Diode (LED) Fixture Design and Installation Criteria for Interior and Exterior Lighting Applications, 13 December 2010, (latest version) and
  - UFC 3-530-01, Design: Interior, Exterior Lighting and Controls, Chapter 8, 10 December 2010, (latest version)
- Fixtures for pedestrian circulation and area lighting should be mounted on 12' to 15' high posts. Color in use is dark bronze anodized.
- Lighting must be designed to withstand minimum 100 mph wind speed (if code requirements differ, the more stringent requirement shall apply).
- The use of architectural lighting of landmark buildings to aid way-finding and accentuate important structures must be specifically approved.

B.2.5 Fences and Screens

B.2.5.1 Screening

- Use screening around mechanical equipment, storage areas, trash dumpsters and other visually objectionable items.
- Mechanical equipment should be screened with landscape materials, metal screen enclosure, metal panel privacy fence, or masonry screen walls. The color of metal screens and metal panel privacy fencing currently used is dark bronze. Finish shall have 20-year warranty. Design screening/enclosing walls similar to the building wall material. (Figure B-12).
- Equipment screens must allow required clearance for equipment maintenance, removal, and airflow. Provide vehicle access to mechanical equipment areas where necessary. Pavement or reinforced sidewalks are acceptable for vehicle access.
- Dumpsters are typically screened with three-sided masonry enclosures (Figure B-13); Design screening/enclosing walls should be similar to the building wall material. Minimum height of walls shall be 6" greater than dumpster height. Provide concrete slab and 6" diameter concrete filled pipe bollards to prevent damage to walls.

Figure B-12 *Masonry screen wall matches adjacent building in dormitory area.*

Figure B-13 *Dumpster enclosure matches concrete masonry units of adjacent 916th Headquarters building.*

B.2.5.2 Fences

- Masonry walls or metal panel privacy fences are currently used to screen storage areas (Figure B-14). Metal fence shall have factory finish with 20-year warranty. The commonly used color on base is dark bronze.

Figure B-14 *Metal panel privacy fence screens storage areas and mechanical equipment.*

- Use of chainlink fencing should be limited to high security functions. Prior approval is required. Fabric or privacy slats may be used.

B.2.5.3 Storage Buildings

- Accessory buildings, such as shed and storage buildings, should be similar with the materials and design of the primary building and must be approved prior to erection by the Base Civil Engineer (BCE).

B.2.6 Site Furnishings

- Site furnishing must be made from sustainable products or recycled materials.
- Develop a coordinated approach to site furnishings. This includes trash receptacles, ash urns, benches, tables, mailboxes, drinking fountains, telephone booths, bus shelters, kiosks, flagpoles, bike racks, and picnic shelters.
- Furniture must be comfortable, durable, vandal resistant, and easily maintained.
- Site furnishings must be accessible to the physically handicapped.

B.2.6.1 Materials and Colors

- Furniture colors and materials should complement the surrounding architecture.
- The commonly used color tables and benches have brown tones (Figure B-15) unless it would be in contrast with surrounding amenities/facilities.

Figure B-15 *Brown bench made from recycled material.*

- Preferred trash can/ash receptacles are pre-cast exposed aggregate concrete with dark brown plastic lids. The commonly used concrete color has beige and brown tones (Figure B-16), unless it would be in contrast with surrounding amenities/facilities.

Figure B-16 *Trash can/ash receptacle of pre-cast exposed aggregate concrete.*

B.2.6.2 Location

- Locate tables and benches where they will receive shade in summer months. This is especially important when using metal or concrete furnishings.
- Create small pedestrian pockets along paths by grouping together picnic tables, benches, trash receptacles, and paving. Develop the surrounding landscape to define the space and provide shade (Figure B-17).

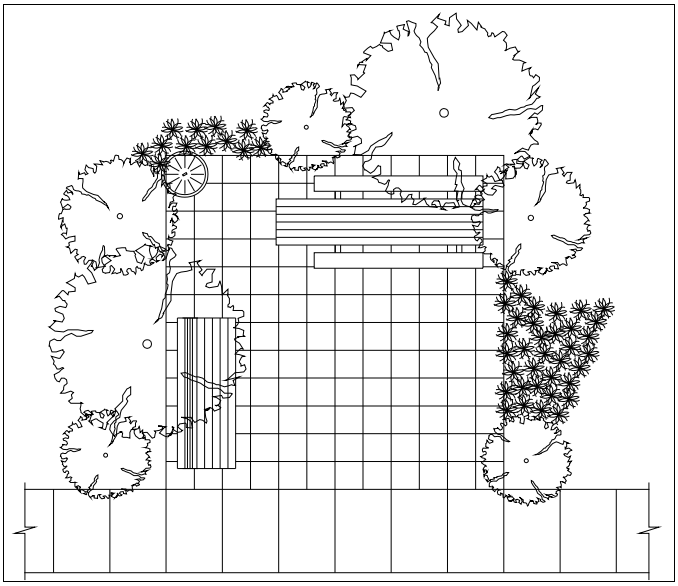


Figure B-17 *Pedestrian pockets provide areas for socializing along paths.*

B.2.6.3 Recommended Furnishings

Tables

- **Manufacturer—**Du Mor, Inc., Columbia Cascade
- **Style—**Pedestal Table 76, Timber-Form Greenway Series

- **Manufacturer—**Du Mor, Inc., Columbia Cascade
- **Style—**Picnic Table 100,Timber-Form Greenway Series

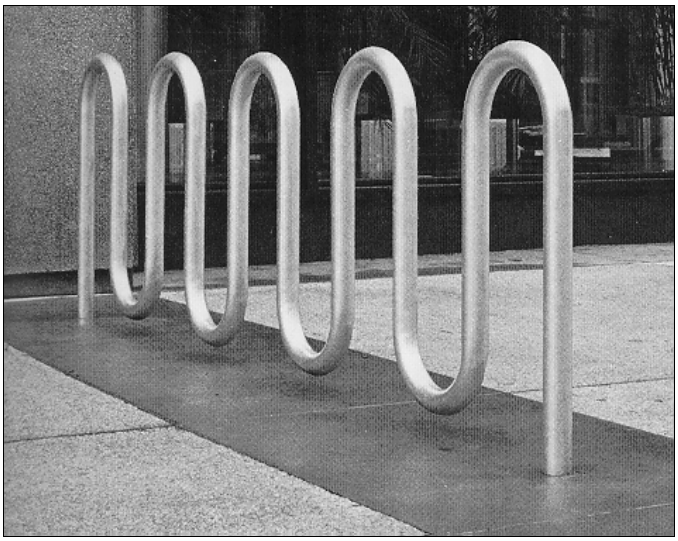
Benches

- **Manufacturer—**Du Mor, Inc., Cambridge Designs, Columbia Cascade
- **Style—**Bench 88, Seating Model CD468, Timber-Form Greenway Series 2140-6

B.2.6.4 Recommended Furnishings

Bike Racks

- **Manufacturer—**Brandir International Madrax, Columbia Cascade
- **Style—**Ribbon Rack, Heavy Duty Winder, Original CycLoops



Ash Urns/Trash Receptacles

- **Manufacturer—**Architectural Precast, Ultrum, DuMor, Inc.
- **Style—**Ash/Trash Combo, Model 4301 or 4101, Side Opening Round Receptacle, UL-1233, Receptacle 44

B.3 Landscape

B.3.1 Existing Conditions

- Seymour Johnson is located in USDA Plant Hardiness Zone 8.

B.3.2 Landscape Materials

- Use native plants. Where this is not feasible, use only fully naturalized plant species.
- Limit turf to areas used for active or passive recreation where possible. Consider use of groundcovers in lieu of turf.
- Select landscape materials with low maintenance requirements.
- Reduce the need for pruning by planting the right size plant for a space.
- Use regional natives to reduce the need for fertilizer and pesticides.
- Test soils prior to designing the planting plan. Identify deficient soils, areas of over compaction, and soil pH. Modify or replace poor soil prior to planting.
- Follow the *USAF Xeriscape Design Guide,* group plants according to water requirements and use mulch to conserve water.

B.3.3 Irrigation System

- All future landscape should be designed to avoid the need for long-term irrigation. For selected, high visibility areas where irrigation is essential, only drip irrigation should be used, unless a more efficient/ sustainable solution, such as non-potable water use, can be provided. When temporary irrigation systems are necessary for establishing landscape, the design of the system should be linked with water main flushing locations whenever possible.

B.3.4 Energy Conservation

- Use deciduous trees on the south, east, and west sides to shade buildings and circulation routes during the summer but allow sun in the winter months. When planting to the south care should be taken because deciduous tree can block as much as 60 percent of winter sunlight.
- Since substantially more energy enters through windows than through insulated walls, give priority to shading windows over shading walls. Also, give priority to shading the west over shading the east, because heat from afternoon sunlight comes when the house has had an opportunity to build up heat all day, outdoor temperatures are at their highest, and the house is most likely to be occupied.
- Consider planting shade areas to the north of the building. Even though trees to the north can't shade the facility directly, they reduce the air and ground temperatures surrounding the house and reduce the light reflected into it.
- **Incorporate Foundation Plantings—**Low evergreen plants on north facing walls reduce winter heat loss.

B.3.5 Street Trees

- Plant street trees to delineate roadways, reduce pavement temperature, and provide shade on sidewalks.
- Basewide, a variety of tree species should be used to avoid monoculture. A predominance of one tree type is more susceptible to pest and disease damage.
- Coordinate tree species selection with utility lines, signage, visual clearance requirements, and other man-made constraints.
- Provide a mulched area between tree trunks and adjacent grass to prevent damage from mowers and string trimmers.

B.3.6 Planting Design

- Formal street tree planting design should use trees of the same species spaced at regular intervals (Figure B-18).

Figure B-18 *Street trees provide shade on sidewalks and help delineate roadways.*

- Plant complementary trees of a different species at regular intervals within the grouping to break monotony.
- Provide adequate planting areas. Planting strips shall be a minimum of 10 feet wide for trees. The trunk should be no closer than 5 feet to the sidewalk.
- Maintain clear sight lines at intersections, crosswalks, parking lots, and driveways (Figure B-19).

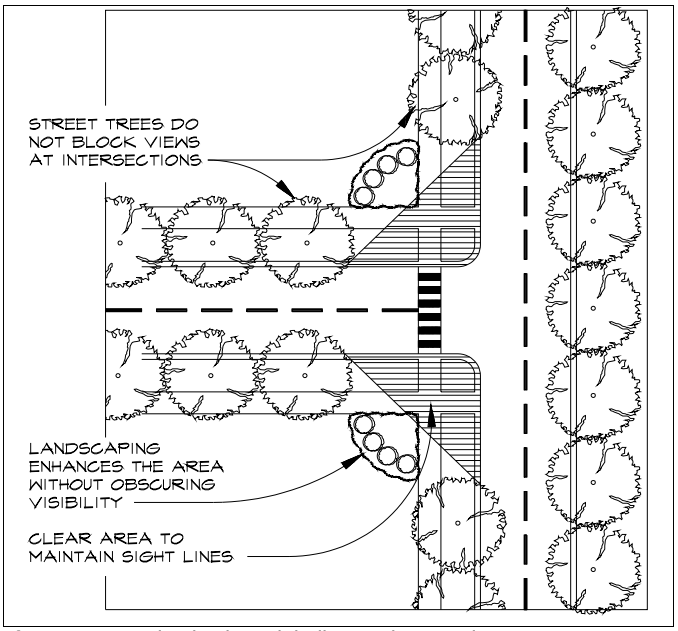


Figure B-19 *Maintain clear sight lines at intersections.*

B.3.7 Parking Lot Landscaping

- Landscape at least 10 percent of the parking area.
- Screen parking areas from view of major streets through the use of natural topography, earth berms, and vegetation (Figure B-20).
- Use a combination of trees and shrubs to provide both a visual screen and shade (Figure B-21).
- Parking areas should be set back from streets. Setbacks a minimum of 20 feet wide will allow adequate space to incorporate planting for effective screening.
- Provide landscaped islands in parking areas to add shade, articulate vehicular circulation, and visually break up large expanses of paving.
- Plantings must be low maintenance and suitable for harsh conditions present in parking areas.

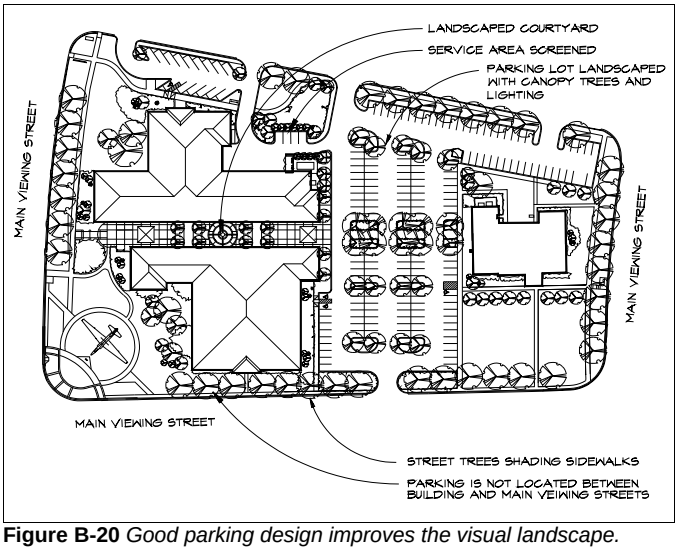


Figure B-20 *Good parking design improves the visual landscape.*

Figure B-21 *Use of both trees and shrubs provides shade and screens parking from the street.*

- At parking lot entrances and intersections, design landscaping to provide clear sight lines when plants reach mature sizes.

B.3.8 Visual Screening

- Use landscape materials to visually soften long fence lines (Figure B-22).

Figure B-22 *Landscaping improves the appearance of metal fencing.*

- Screen family housing from adjacent primary or secondary roadways with planting and/or earth berms.

- Retain existing natural habitat as a buffer between housing and commercial or industrial uses.

B.3.9 Equipment Screening

- Use material similar to the building for enclosures. When this is not possible metal fencing and planting may be used.

- Maintain required airflow and maintenance clearances between plant materials and screened equipment.

- Plantings around masonry enclosures or metal screens will help integrate these elements with the surrounding site.

B.3.10 Foundation Planting

- Use foundation plantings to visually integrate the building with the site (Figure B-23).

- Landscape around the building perimeter to help direct pedestrian movement.

- To achieve a natural appearance and layer planting designs, place groundcovers in front, followed by small shrubs, with tall shrubs or small trees planted at the rear of the planting bed (Figure B-7).

Figure B-23 *Section showing layering of foundation plantings.*

B.3.11 Maintenance

- Reduce maintenance requirements by using plant materials that maintain the desired height at maturity.

- Due to high maintenance requirements, sheared hedges and annual/perennial flowerbeds should be limited in size and quantities.

B.3.12 Courtyards and Entrances

- Use landscaping to enhance the entry sequence from the street or parking area to the building's main entrances.

- Use mass plantings to define outdoor spaces (Figure B-24).

- Create landscape patterns that accentuate building entrances (Figure B-25).

- Design courtyard landscaping to give building users relief from summer heat.

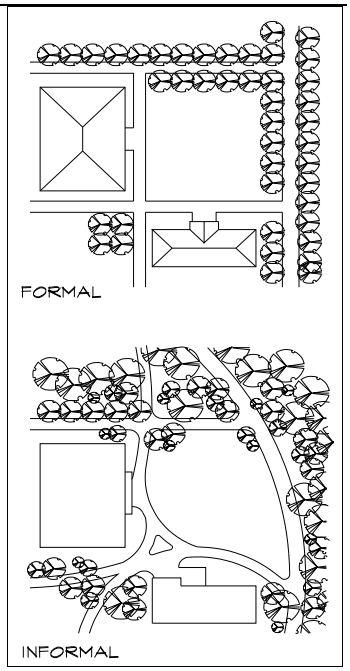


Figure B-24 *Use plant materials to enclose outdoor spaces.*

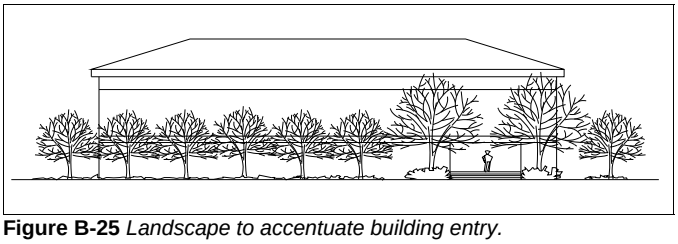


Figure B-25 *Landscape to accentuate building entry.*

B.3.13 Landscape Materials

- Avoid the use of planters. Where large planting boxes are used at courtyards, incorporate seating into the design.

B.3.14 Planting Beds

- Provide protective mowing strips of concrete or metal edging around all planting beds (Figure B-26).

Figure B-26 *Use of concrete edging around planting bed at the Housing Office.*

- Use mulching fabric, covered by thick mulch, to reduce weeds in planting beds.

- **Mulch—**The use of lava rock mulch or pine straw mulch is preferred. Hardwood mulch may be used with prior approval.

B.3.15 Plant Materials

- **Turf—**Use turf only at recreation areas, courtyards or other places where it provides a benefit to personnel. Use groundcovers to reduce maintenance, water, and chemical requirements.

- **Grass Species/Seeding Requirements—**Standard grass species at Seymour Johnson is Bermuda or centipede. High visibility areas should receive centipede sod. Seed and sprig other areas. Consult the BCE for which types of grass species to plant for specific locations.

- Avoid use of many different plant species on a single project. Successful planting designs can be accomplished by using repetition with occasional contrast.

- Recommended plant species are included on the following pages.

B.4 Signage

B.4.1 Exterior Signs

B.4.1.1 General

- Location and content of all exterior signs must be approved by the Wing Commander via the base sign master plan. The number of signs will be held to a minimum.

Street Signs

- Lettering shall be Helvetica Medium type style, except Helvetica Regular type style shall be used for subordinate information on building and organization identification signs. Organization names should normally be shortened to the minimum required to describe the function (*i.e.,* "Strike Eagle Hardware," not "Civil Engineering Squadron Strike Eagle Hardware" or "Seymour-Johnson AFB Self-Help Store").

- Signage for facilities that house the command section of an organization should include the number of the squadron preceding the organization (*i.e.,* Component Repair Squadron). Only commonly understood abbreviations will be used.

B.4.1.2 Building and Organization Identification Signs

- Building numbers must be used to identify all facilities.

- For facilities that do not have entry doors visible from the street, the location of address numbers will be determined by the BCE. The preferred option is to mount individual dimensional numbers on an alternate location on the building, visible from the street. The numbers shall be non-ferrous material, dark bronze in color. Height of numbers shall be selected based on viewing distance and building size.

- If a freestanding sign is used, it shall be in accordance with UFC 3-120-01, Type B3 with the following modifications:

  - Use white letters on brown background.

  - Signs shall be aluminum post and panel design with 3-inch square posts.

Trees

Common Name	Botanical Name	Regional Native	Evergreen/Deciduous	Mature Height (In Feet)	Mature Width (In Feet)	Exposure (F=Full Sun PS=Partial Shade S=Shade)	Water Requirements	Street Tree	Foundation Planting	Screen	Accent	Parking Areas	Naturalized Areas	Shade Tree
Birch, River	*Betula nigra*	X	D	30-40	25-30	F/PS	MED				X		X	X
Blackgum	*Nyssa sylvatica*	X	D	60	30-40	F/PS	MED	X			X	X	X	X
Bradford Pear	*Pyrus calleryana*		D	30-40	20-30	F	LOW				X	X		X
Cedar, Eastern Red	*Juniperus virginiana*	X	E	30-40	15-18	F	LOW			X	X		X	
Crabapple, Flowering	*Malus spp.*		D	15-20	20-25	F/PS	LOW		X		X		X	
Crape Myrtle	*Lagerstroemia indica*		D	20-25	12-15	F/PS	LOW	X	X		X	X		X
Cypress, Bald	*Taxodium distichum*	X	D	50-60	25-30	F/PS	LOW	X			X		X	X
Dogwood, Flowering	*Cornus florida*	X	D	20-25	15-20	PS/S	MED		X		X		X	X
Dogwood, Kousa	*Cornus kousa*		D	15-18	10-12	F/PS	MED		X		X			
Holly, American	*Ilex opaca*	X	E	20-35	15-20	F/PS	LOW		X	X	X		X	
Ligustrum, Tree	*Ligustrum lucidum*		E	15-20	8-12	F/PS	LOW			X	X	X		
London Planetree	*Platanus acerifolia*		D	70	50	F/PS	MED	X			X	X		X
Maidenhair Tree	*Gingko biloba*		D	50	30	F	LOW	X			X	X		
Maple, Japanese	*Acer palmatum*		D	15-20	10-15	PS	MED		X		X			X
Maple, Red	*Acer rubrum*	X	D	40-50	25-35	F/PS	MED	X			X		X	X
Oak, Darlington	*Quercus laurifolia*	X	E	60-80	40-80	F/PS	LOW	X		X	X		X	X
Oak, Scarlet	*Quercus coccinea*	X	D	60-80	50-60	F/PS	LOW	X			X		X	X
Oak, Shumard	*Quercus shumardii*		D	60	40-50	F/PS	LOW	X			X		X	X
Oak, Southern Live	*Quercus virginiana*	X	E	40-50	55-65	F/PS	LOW	X		X	X		X	X
Oak, Water	*Quercus nigra*	X	D	60-70	35-45	F/PS	LOW	X			X		X	X
Oak, Willow	*Quercus phellos*	X	D	60-70	35-45	F/PS	LOW	X			X		X	X
Pecan	*Carya illinoensis*		D	50-60	50-60	F	MED				X		X	X
Pine, Loblolly	*Pinus taeda*	X	E	60	30	F	LOW			X	X		X	
Pine, Longleaf	*Pinus palustris*	X	E	60	30	F	LOW			X	X		X	
Redbud, Eastern	*Cercis canadensis*	X	D	12-20	12-20	F/PS	LOW		X		X		X	X
Sourwood	*Oxydendron arboreum*	X	D	30-40	12-15	F/PS	LOW		X		X		X	X
Wax Myrtle, Southern	*Myrica cerifera*	X	E	10-20	8-15	F/PS	LOW		X	X	X	X	X	
Zelkova, Japanese	*Zelkova serrata*		D	50-60	30-40	F/PS	MED	X			X	X		X

Shrubs

Common Name	Botanical Name	Regional Native	Evergreen/Deciduous	Mature Height (In Feet)	Mature Width (In Feet)	Exposure (F=Full Sun PS=Partial Shade S=Shade)	Water Requirements	Foundation Planting	Screen	Accent	Parking Areas	Naturalized Areas
Abelia, Glossy	*Abelia grandiflora*		E	2-6	2-6	F/PS	MED	X	X	X		
Arborvitae	*Thuja*	X	E	12-15	3-4	S	MED	X	X			
Aucuba, Japanese	*Aucuba japonica*		E	4-6	3-4	PS/S	MED	X	X	X		
Azalea, Kurume	*Asalea kurume*		E	3-4	3-4	PS/S	MED	X	X	X		
Bamboo, Heavenly	*Nandina domestica*		E	4-8	4-8	F/PS	MED	X	X	X		
Bamboo,Dwarf Heavenly	*Nandina domestica 'woods dwarf'*		E	3-4	3-4	F/PS	MED	X	X	X	X	
Camellia, Common	*Camellia japonica*		E	8-10	6-10	PS/S	MED	X	X	X		X
Cleyera, Japanese	*Cleyera japonica*		E	8-15	6-10	F/S	MED	X	X	X		X
Conradina	*Conradina canescens*	X	E	1-3	2-4	F	LOW	X				X
Cotoneaster	*Cotoneaster spp.*		E	2-8	2-8	F/PS	LOW	X	X		X	X
Gardenia	*Gardenia jasminoides*		E	4-6	4-5	PS/S	MED	X	X	X		X
Grape Holly, California	*Mahonia pinnata*		E	4-5	3	F/PS	MED	X	X	X	X	
Hawthorn, Indian	*Raphiolepis indica*		E	3-4	4	F	LOW	X	X	X	X	
Holly, Dwarf Japanese	*Ilex crenata 'compacta'*		E	3-4	4	F/PS	MED	X	X			

Common Name	Botanical Name	Regional Native	Evergreen/Deciduous	Mature Height (In Feet)	Mature Width (In Feet)	Exposure (F=Full Sun PS=Partial Shade S=Shade)	Water Requirements	Foundation Planting	Screen	Accent	Parking Areas	Naturalized Areas
Holly, Dwarf Yaupon	*Ilex vomitoria 'nana'*		E	2-4	3-4	F/PS	LOW	X	X		X	
Holly, Japanese	*Ilex crenata 'helleri'*		E	1	2	F/PS	MED	X	X			
Hydrangea, Oakleaf	*Hydrangea quercifolia*	X	D	6-8	3-8	F/PS	MED	X	X	X		X
Laurelcherry, Carolina	*Prunus caroliniana*	X	E	20-25	10-15	F/PS	LOW	X	X			X
Photinia, Redtip	*Photinia fraseri*		E	10-15	6-8	F/PS	LOW	X	X			
Privet, Wax-Leaf	*Ligustrum japonicum*		E	6-10	6-10	F/PS	MED	X	X	X		
Rose, Ramanas Shrub	*Rosa rugosa*		D	4-6	2-6	F/PS	LOW	X		X		X
Rosemary	*Rosmarinus officinalis*		E	2-5	2-6	F	LOW	X	X		X	X
St. Johnswort	*Hypericum patulum*		E	2-3	2-3	F/PS	LOW	X	X		X	X
Wax Myrtle, Southern	*Myrica cerifera*	X	E	10-12	8-10	F/PS	LOW	X	X	X		X

Ground Covers

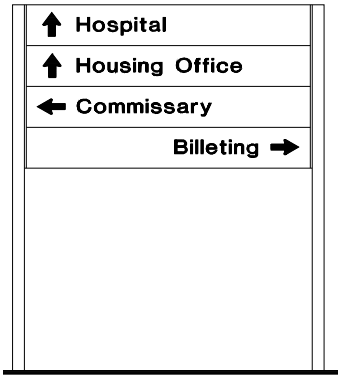
Common Name	Botanical Name	Regional Native	Evergreen/Deciduous	Mature Height (In Feet)	Mature Width (In Feet)	Exposure (F=Full Sun PS=Partial Shade S=Shade)	Water Requirements	Foundation Planting	Screen	Accent	Parking Areas	Naturalized Areas
Aaron's Beard	*Hypericum calycinum*		E	1	1-2	F/PS	LOW	X			X	X
Blueberry, Evergreen	*Vaccinium myrsinites*	X	E	1/2-2	1-2	F/PS	LOW	X				X
Cotoneaster, Bearberry	*Cotoneaster dammeri*		E	1-1.5	3	F	LOW	X			X	
Daylily	*Hemerocallis spp.*		D	1-3	1-2	F/PS	LOW	X		X		X
Ivy, English	*Hedera helix*		E	1/2-1	30-40	PS/S	MED	X	X		X	X
Juniper, Creeping	*Juniperus horizontalis*		E	1/2-2	4-5	F	LOW	X	X		X	
Juniper, Shore	*Juniperus conferta*		E	1-1.5	4-5	F	LOW	X	X		X	
Liriope	*Liriope muscari*		E	1	1	F/S	LOW	X			X	
Mondo Grass	*Ophiopogon japonicus*		E	1/2-1	1	F/PS	LOW	X			X	
Pussytoes	*Antennaria plantaginifolia*	X	E	1/4	1-2	PS	LOW	X				X
Santolina, Gray	*Santolina chamaecyparissus*		E	1-1.5	1-3	F	LOW	X			X	
Wintercreeper, Purple Leaf	*Euonymous fortunei 'colorata'*		E	1/2-1	5-15	F/S	LOW	X			X	

- Finish shall be fluoropolymer (Kynar 500) coating, or equal.
- Locate organization identification in upper left corner.

- When the building address is posted in an alternate location, the organization name should still be displayed on the main entry door to indicate the public entrance to the building.
- Additional identification signage may be required on important buildings, such as headquarters, or on facilities with significant visitor use (Commissary, Billeting, Officers' Club, etc.). Base Civil Engineering will evaluate each facility individually. These signs shall use individual dimensional letters mounted on the building. The letters shall be fabricated from dark bronze non-ferrous material, using uppercase Helvetica Medium type style. Height of the letters shall be selected based on building size and viewing distance.

B.4.1.3 Directional Signs

Vehicular directional signs shall be in accordance with *UFC 3-120-01, Type D2* with the following modifications:



Type 2 Direction Sign

- Use white reflective letters on brown background.
- Type D2 signs shall be aluminum post and panel design with 3-inch square posts. Finish is to match building identification signage.

B.4.1.4 Regulatory Signs

- Traffic regulation signs shall be designed in accordance with the *Manual of Uniform Traffic Control Devices (MUTCD)* published by the Federal Highway Administration.
- Base warning signs shall comply with *UFC 3-120-01.*
- Parking regulation signage shall comply with *UFC 3-120-01.* Avoid curb markings. Where post-mounted signs are used, posts shall be located to avoid vehicle damage. Handicapped accessible parking spaces shall be identified with a post mounted international symbol of accessibility in compliance with ADA.
- Work area and personnel safety regulation signs shall comply with OSHA requirements and applicable Air Force regulations.

B.4.1.5 Information and Motivational Signs

Placement and content of these signs shall be reviewed on an individual basis by the BCE, with an emphasis on maintaining a unified image for the base.

B.4.2 Interior Signs

B.4.2.1 General

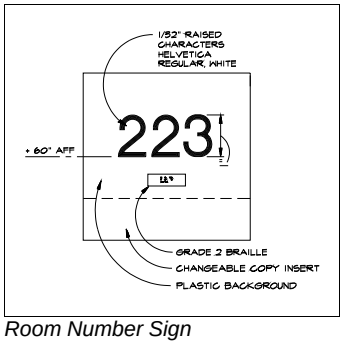
- Signage should be designed as an integral component of the building interior design. Sign content, colors, and locations should be consistent throughout a facility. To avoid a cluttered appearance, the number of signs should be reduced to the minimum required to guide visitors through the building. All new interior signage must be approved by the BCE.
- A modular mounting rail system with changeable copy inserts is recommended for interior signage.

B.4.2.2 Information Signs

- Use a building directory with changeable letter board in the entry lobby of large buildings and buildings frequently used by visitors.
- Mount bulletin boards in office common areas and break rooms. Posting of notices and temporary information signs should be limited to bulletin boards.

B.4.2.3 Identification Signs

- Signs for identification of rooms and permanent spaces should use plastic inserts with white lettering in Helvetica Regular type style. Frame finish and background color of inserts shall be coordinated with the interior design. Signs shall be mounted on the wall adjacent to the latch side of the door. Where this is not possible, as at pairs of doors, sign shall be mounted on the nearest adjacent wall, outside the door swing area. Sign centerline shall be 60 inches above the floor.
- Permanent room number signs shall have one-inch high numbers raised 1/32 inch and Grade 2 Braille to comply with ADA requirements.



Room Number Sign

- Identification of signs for permanent public spaces such as restrooms and stairs shall have one-inch high uppercase letters raised 1/32 inch and Grade 2 Braille to comply with ADA requirements. The international symbol of accessibility shall appear on signs that identify accessible facilities.

- Signage identifying office name or occupant title should be limited to those areas frequently used by visitors. These signs should be integrated with the room number into one larger sign where possible. Lettering should be upper and lower case Helvetica Regular type style.

- Desk signs and signs identifying occupants in open office areas should be compatible with room number signage in color and type style. Signs should be designed to be adaptable to personnel changes by using changeable inserts for name/job title.

B.4.2.4 Directional Signs

- Signs used to direct visitors to important areas may be ceiling hung or wall mounted. Wall mounted signs shall have frames and inserts to match room number signs, and shall be mounted with centerline 60 inches above the floor. Ceiling hung signs shall have 3-inch minimum height lettering. Text and arrows pointing up or left shall be left justified. Text and arrows pointing right shall be right justified. Directional signs should usually indicate room numbers, except for high use destinations such as “Finance” or “Pass Office.”

B.5 Self-Help

B.5.1 General

- Self-help projects are projects initiated, designed, and constructed (with certain exceptions) by building users. Self-help projects must comply with applicable codes and regulations, and they must adhere to requirements of the Seymour Johnson *ID2.*

- The self-help method may be used only for projects of limited scope. Approval of the BCE is required for all proposed projects.

B.5.2 The Self-Help Process

- Building users should begin the project by making a list of programmatic requirements (*i.e.,* replace vinyl wall covering in conference room; add wood chair rail; add mini-blinds on windows).

- Meet with the building manager and discuss proposed ideas. If applicable, draw scale diagrams to illustrate the ideas and determine material quantities.

- Visit the Base Self-Help Center to select materials for the project. Standard building materials are available at the center. Available finish materials are arranged on sample boards showing acceptable color schemes.

- Fill out Self-Help Work Order. Approved and funded work orders (Form AF332) shall be reviewed by BCE.

- Arrange a meeting with BCE to discuss the project and obtain approval before any materials are ordered.