

# Architectural Compatibility Study



Luke Air Force Base  
28 September, 2001

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## EXECUTIVE SUMMARY

### PURPOSE

Quality of life initiatives enhance morale and therefore improve successful mission accomplishment. Architectural compatibility is not merely an aesthetic upgrade to a base but also encompasses safety, security, maintenance, energy efficiency and elements which enhance day to day living. Adoption of these guidelines by base leadership will ensure compliance and result in a homogenous community fabric improving overall installation appearance and mission effectiveness.

### GOAL

The goal of this study is to provide an Architectural Design Compatibility package for the exterior architecture of Luke Air Force Base. This will help guide A-E firms and design professionals in providing cohesive architecture compatible with -- but not identical to -- the surrounding indigenous architectural character. This study will also endorse the design and construction practices currently found on Luke Air Force Base.

### OBJECTIVES

Specific study objectives include:

- Better utilization of space through design standardization
- Clarify the urban design character of the base
- Develop distinctive community characteristics
- Discuss architectural themes for various sections of the base
- Identify recommended architectural elements and painting schemes
- View the base in terms of Visual Districts
- Define Visual District edges that require screening
- Identify all Destination Buildings on the base

### PRODUCT

This study is intended to be a "living document". It is provided in electronic format to facilitate ease of revision as well as addition of new information. It is the intent of this guide to

## FINDINGS

promote continuous updating. The flexibility of this guide will serve to record and maintain an accurate account of the growth and development of Luke Air Force Base. This guide should have the endorsement of key personnel. The intended audience of this study are users of new and existing facilities slated for construction or renovation as well as programmers, designers, A-E firms and construction contractors. It is essential that this guide be reviewed and updated on a regular and continuous basis.

After carefully examining the Five-Year MILCON for Luke Air Force Base there appear to be only four future projects that have the potential to become Destination Buildings. These projects were identified as future destination buildings due to their function, potential location within certain visual districts, a relationship with existing Destination Buildings. The future destination buildings include the following buildings which will complement the existing Destination Buildings identified on the map.

- Contracting Center
- CE Administration Building
- Library/Education Center
- Administration Facility

The following represents the top five recommendations which incorporate the team's findings and will have the most immediate impact toward achieving architectural compatibility at Luke Air Force Base:

- Develop the Luke Mall
- Bury overhead communication lines
- Identify all destination buildings
- Implement a strong design review program
- Develop Military Family Housing Area with a consistent architectural style

## SECTION 1 INTRODUCTION

### PURPOSE

This report presents the findings and recommendations developed by an Architectural Assistance Team which conducted an evaluation and validation process on-site at Luke Air Force Base. The goal of the study was to produce a professional, objective, and applicable set of recommendations and observations to benefit Luke Air Force Base. The process involved researching existing design documents, touring facilities, and interviewing appropriate base personnel. After gathering information, the team organized the data into observations, and suggested recommendations. The team focused mainly on architectural compatibility issues, but also addressed comprehensive planning and specific area development needs.

### SCOPE AND USE

The team focused its efforts on the entire base, with specific attention given to the Community Center, North Cantonment Area, and the Central Mall. This document is to be used by Headquarters Air Education and Training Command and local base leaders as a guideline for the continued development of Luke Air Force Base. While it is, by no means, comprehensive, it offers comments and suggestions in support of the Luke Air Force Comprehensive Plan.

### HISTORY AND MISSION

In 1940, a United States Army representative was sent to Arizona to find a site for an Army Air Corps training field for advanced training in conventional fighter aircraft. The City of Phoenix and the federal government entered into an agreement in March 1941 to lease 1,440 acres of land for \$1 per year. The training center was named Luke Field. The first class of fighter aircraft training students arrived in June 1941.



During World War II, Luke Field was the largest fighter training base in the Army Air Corps, graduating more than 17,000 fighter pilots and earning the nickname “Home of the Fighter Pilot.” The base was deactivated in 1946. In 1951, soon after combat developed in Korea, Luke Field was reactivated as Luke Air Force Base, part of Air Training Command under the reorganized United States Air Force (USAF).

Students progressed from flying the P-51 Mustang to the F-84 Thunderstreak jet. The Thunderbirds, the official Air Force aerial demonstration team, was formed at Luke Air Force Base in 1953. Luke Air Force Base began training German fighter pilots in the F-84 in 1957. In July 1958, the Base was transferred from Air Training Command to Tactical Air Command. In 1969, the 58th Fighter Wing (FW) was activated at Luke Air Force Base. In 1971, tactical air training resumed with pilots using the F-4C Phantom II, F-100, A-7, F-4, and F-104. In 1974, the F-15 Eagle arrived to serve as the training vehicle. By 1982, the F-16 Fighting Falcon was being flown at Luke Air Force Base. In 1994, the 58th FW was replaced with the 56th FW as part of the Air Force Heritage Program. The 56th FW is one of the most highly decorated units in USAF history.

Today, Luke Air Force Base is the most diversified training center in Air Education and Training Command. Luke Air Force Base provides technical, medical, field, and flight training utilizing over 200 F-16 aircraft. Annual sorties flown reach approximately 40,000.

## SECTION 2 BASE INFORMATION

### INSTALLATION PROFILE

Luke Air Force Base is a fighter training base in a Southwestern desert climate. Luke Air Force Base is known for its primary mission, which is to train fighter pilots. While supporting its mission is its primary focus, quality-of-life initiatives serve to improve overall morale, increasing capability and effectiveness.

Past mission requirements has left Luke Air Force Base with a mixture of temporary, semi-permanent, and permanent facilities. Luke Air Force Base does not currently have formal architectural compatibility standards in place to guide designers in providing quality exterior designs for new construction and renovation of existing structures. Base structures of the post World War II era sit side-by-side more recently constructed buildings of varied architectural styles. Some existing structures are sited with poor vehicular and pedestrian circulation.

Strong measures should be taken to assure that future structures conform to established standards of architectural compatibility, and whenever possible, existing structures should be brought into compliance with these standards to foster architectural unity.

This Architectural Compatibility Study supports and builds on the guidance given in the Luke Air Force Base General Plan.

### VICINITY

Luke Air Force Base is on the western edge of Phoenix, Arizona's capital and largest city

### CHARACTER

The base is comprised largely of single story and low-rise facilities. A few larger structures accommodate the Hospital, Base Exchange, Commissary, flight simulators, and aircraft hangars. Some buildings have sloped roofs while many roofs are flat. Exterior materials range from split-face CMU to metal and plaster. Most buildings are tan or brown in color, and there is no predominant architectural theme which carries across the majority of the facilities.

REGIONAL  
CHARACTER



Arizona is rich in design heritage. Area influences include Native American and Spanish Colonial references. While the city of Phoenix is represented by a myriad of architectural styles, many small structures and residential neighborhoods employ stucco, adobe, or CMU exteriors. Roofs are typically of sloped design with clay tile or metal roofing.

GENERAL DESIGN  
GUIDELINES

General design guidelines are dependent upon a wide variety of influences. A compatible and coherent design character at Luke Air Force Base will promote a positive visual image and continue to foster pride in the Air Force. This overall design character should be expressed as a consistent base-wide design theme.

COMPATIBILITY  
GUIDELINES

The compatibility guidelines presented here establish the framework to support new construction, renovation of existing structures, painting and site development. This provides a way of informing architects and designers of certain standards of construction materials and architectural styles that have been adopted by Luke Air Force Base, and must be adhered to when developing projects.

DESIGN THEME:

The design theme, therefore, is a set of specific standards that meet the mission requirements, address the context in which the project is set and relate to both local cultural influences and address the familiar environments of the base's inhabitants.

## VISUAL DISTRICTS

Visual districts are areas where design components create or should create a consistent character. The districts are further defined in terms of land use and functions which share common characteristics.

Architectural elements which establish the physical appearance and character of visual districts and individual buildings include:

- Commonality of facility form indicating function
- Type and application of materials
- Use of color and texture
- Relationships of project siting to adjacent facilities
- Established formal facility entrances
- Appropriate screening of mechanical equipment and dumpsters
- Form, scale and massing



## SECTION 3 DESIGN GUIDELINES

### GENERAL DESIGN GUIDELINES

The compatibility guidelines presented here establish the framework to support new construction, renovation of existing structures, material selection and color selection. They provide a way of informing architects and designers of certain standards of construction materials and architectural styles that have been adopted by Luke Air Force Base, and must be adhered to when developing projects on the base.

The general design concepts shown here should be used for all construction and upgrade work at Luke Air Force Base.

### ARCHITECTURAL ELEMENTS

The following is a list of general architectural elements which establish the physical appearance and visual character of buildings base-wide. Refer to these general aesthetic requirements in conjunction with the guidelines for the individual visual districts in the following sections.



CONTEXT

The relationship of an individual building to its function and its surroundings creates its context. The primary consideration for the visual environment is whether a building has a “foreground” context or “background” context. **Destination buildings** refer to those such as the Hospital or the Wing Headquarters Building whose function or location makes it visually prominent. **Background buildings** (such as warehouses or industrial buildings) are those which do not require a prominent visual image or location.

MASS/SCALE

The mass of a building refers to the volume which a building encloses. Scale compares the elements of the building (doorways, windows, and details) to the human body. Use simple building shapes and massing with facade proportions that are integrated with adjacent like facilities. Where possible, break up large volumes such as gymnasiums by clustering with other smaller volume elements, or integrating with smaller scale porches or entranceways. Avoid long unmodulated wall areas. Break up walls with porches, modulated set-backs, attached pergolas, or other ancillary or support structures. Generally, set taller structures back on the site, stepping down to the pedestrian ways with buildings of either a smaller scale or buildings with attached transition elements.

- A proposed building should be scaled to be compatible with the overall mass and individual parts of buildings in its visual district.
- New construction on the base should avoid designs using a single rectangular mass and include massing appropriate to that particular visual district.
- Major administrative buildings will have a more formal massing than any other building type, signifying their relative importance. This can be achieved through a more balanced, symmetrical design with less articulation.
- Avoid vast blank building walls facing streets.
- Except for major buildings, the scale for all buildings should be human, not monumental. This human scale is achieved by using small (normal sized) windows, doors, and details. It is also conveyed by using normal floor to floor heights and floor to eave heights. For large buildings, human scale is improved by the extent to which the mass is broken into smaller elements.



#### FORM/ PROPORTION

The form and proportion of a building are basic elements which relate a building to its setting.

- Use building shapes and roof forms similar to appropriate adjacent buildings. There should be no use of flat roofs except where fiscally imperative and on a facility located in a low-profile area, such as an industrial functional area, or where building size makes a sloped roof impracticable.
- Stress horizontal proportions in the design of the facade. Design windows, entrances and detailing to complement those horizontal proportions.
- Emphasize the parts of all buildings to clearly show a division of roof, walls, and base. Utilize color, materials, and/or details to express these divisions.
- Use roof overhangs, floor overhangs, porches, trellises, exterior louvers and other similar elements to shade exterior walls and glazing.

#### FENESTRATION/ OPENINGS

Fenestration is the design and rhythm of window and door openings within the building envelope. Window and doorframes should have a complementary accent color; usually tan, gray or a lighter shade of the wall color. Window frames should be of dark brown anodized aluminum. Exterior doors can be either aluminum or steel. Aluminum storefront doors should match the windows. Steel doors should blend with the surrounding wall color.

- Design openings to form a unified composition in proportion to the building elevation.
- Window placement should relate to internal areas. Mullion

spacing should provide a good module for internal layout of office space, entrances, common use areas, etc.

- Locate windows to overlook exterior pedestrian areas or landscaped grounds.
- Glazing should be designed to be shaded from the summer sun on the south, east and west sides of each building.
- With the exception of major buildings, oversized fenestration elements which create monumental scale should be avoided.
- Consider the use of building forms or shading devices where significant energy savings can be achieved
- Use predominant and secondary facade materials consistently and uniformly on all sides of the building.
- Graphics/Stripes - Graphics and stripes should not be used.
- Building materials that are not considered appropriate as facade materials are:
  - wood
  - glazed porcelain panes
  - reflective glass curtain walls
  - materials that are applied to imitate other materials except for exterior insulation and finish systems (EIFS) to simulate stucco
  - aluminum siding
  - corrugated fiberglass
- Use anodized aluminum of a complementary color for windows, doors, handrails, etc.
- Locate all above-grade utility connections, vents, and other projections through the building away from high visibility areas. Do not locate any utility projections, such as air conditioning units, on the street side of the building.
- For freestanding walls, use materials and colors similar to those on appropriate buildings.



## ENTRANCES

The scale and detailing of an entrance give the pedestrian a sense of the function and importance of a building. Pronounced entries and porticoes should be used wherever space and function permit. Along with providing a visual break in building facades, they provide a readily identifiable point of building entry, and refuge from inclement weather. Entries should have roofs of similar slopes as the major building elements, and have the same material, trim and eave detail

## ROOFS

Use hipped or gable end roofs with a slope range of 4 in 12 or greater. Shed roofs (single slopes) are acceptable where hipped or gable roofs cannot be used. Slope may be varied for retro-fitting large buildings. Vary roof eave elevations within building groupings to create rhythm. Avoid flat roofs for both appearance and maintainability considerations.

## MATERIALS

- Roofs. Roofs should be of clay tile, or standing seam metal, depending on the visual district, scale of the building and adjacent building materials. Once the standard is selected, all buildings on the site should conform to the selected material.
- Walls. Walls should have split-faced CMU, adobe brick or stucco surfaces except for selected industrial facilities that would incorporate metal siding.
- Trim. Trim should be metal and should be finished to blend with adjacent materials. Aluminum is currently being used effectively on many facilities and is appropriate for new construction.

Exterior materials give color, texture and scale to a building's

## COLORS

appearance. Architectural details such as cornices, reveals, or masonry patterns create interest and scale.

Color unifies or emphasizes elements of a building. Related colors are a means to harmonize different elements while maintaining visual interest. Building colors should be in the local vernacular. These include light earth colors such as light brown, beige and sepia, along with terra cotta and light gray. Make every effort to minimize exposed mechanical appurtenances, but where necessary they should be the same color as the surrounding wall, or roof material.

Not all buildings, or parts of buildings, need to be painted the same color scheme, but should blend well to create a consistent image in each visual district.

## MECHANICAL, ELECTRICAL, AND UTILITY CONSIDERATIONS

- Mechanical intake and exhaust devices should not be allowed on wall surfaces. Flush wall louvers are permitted, but they should be painted the same color as the surrounding wall, and should not be located on entry or principal wall elevations.
- Mechanical intake and exhaust devices mounted on roofs should be of the same color (preferably factory finished) as the surrounding roof. Natural aluminum or unpainted galvanized steel should be avoided.
- Mechanical air handlers should be mounted in yards with screen walls as space allows and should not conflict with adjacent activities. If such devices must be located on roofs, then they should be screened.
- Solar hot water collectors, where visible, should be integrated with the roof design.
- Buried electrical lines are strongly recommended.
- Coordinate with Base Communications so that telephone, LAN and other communications cabling is installed during construction within wall ducts; not surface mounted after construction is complete.
- Screen utility yards, air handling equipment, propane tanks, transformers and other outside mounted mechanical equipment with a screen wall. Use the same design screen wall throughout the site.
- Eliminate unnecessary signs and street markings.
- Standardize signage.
- Do not allow exterior storage sheds, trailers or temporary structures.

- Eliminate as much exterior wall and roof appurtenances as possible. Where not possible, finish the same color as the surrounding surface. Fire devices such as bells and horns should be painted the same color as the surrounding wall, however, fire alarm pull stations should be painted red.
- Set standards for site furniture and exterior lighting. Avoid a conglomeration of different styles, materials and finishes of site furniture.



#### SITE LOCATION ANALYSIS

Site planning is one of the more important elements of any project design and can “make or break” the overall success of the project. The art of site planning requires an interdisciplinary involvement of the community planner, landscape architect, architect, interior designer, and civil, mechanical and electrical engineers. The landscape architect should lead and be responsible for the development of the site plan, coordinating with the other disciplines.

#### SITING REQUIREMENTS

To achieve the optimum site plan, each design discipline must work in concert with one another. The following siting requirements must be evaluated and analyzed to ensure the optimal solution is selected:

##### **Location**

New facilities should be sited in accordance with the Luke Air Force Base General Plan, which is currently under development

##### **Site Organization**

Pay special attention to building orientation, mass and scale in developing the site plan. Develop a sense of order, arrival, orientation and community in planning the site. Insofar as possible, facilities must not be overwhelming in apparent size. Site facilities in relationship to one another to create outdoor

spaces. Achieve spatial balance and scale through thoughtful placement and arrangement of structures, landscaping and landforms.

If the potential for adding to a project is identified during the initial programming stage, allow space in the site development plan for additional structures and size site utilities accordingly.

### **Orientation**

Site buildings to take advantage of the positive features of the site. Provide protection from undesirable winds and glare, shading from excessive sun, and orient windows to take advantage of summer breezes. Solar gain and prevailing winds can enhance energy conservation and affect a significant cost savings. Building placement and design should also take advantage of views that are scenic, pleasant, or interesting. Designers must be sensitive to the approaches to the facility and strive to create a clear sense of arrival for newcomers.

Refer to Building Design Considerations section below for more information concerning building orientation.

### **View of the Site**

All design disciplines involved in the site planning process must evaluate and re-evaluate their design concepts to ensure the project presents a professional image of the Air Force, and encourages "pride of ownership". Consider the initial view presented to visitors and the more personal view or impressions of the user.



## BUILDING DESIGN CONSIDERATIONS

Many design techniques can be utilized to improve the quality-of-life for a building's occupants, reduce energy consumption, reduce maintenance requirements, and enhance the aesthetics of the built environment. Luke Air Force Base has a hot, arid climate for a good portion of the year. Buildings should be designed using applicable passive cooling principles. The following items should be considered for any new facility:

- Design roof overhangs to work with sun angles to provide solar shading.
- Achieve mutual shading and funneling of breezes by sensitively arranging adjacent structures.
- Design for maximum cross-ventilation where feasible.
- Where possible, orient buildings with the long axis running east-west to reduce summer heat gain and maximize winter heat gain.
- Increase the length of the north and south walls and reduce the size of east west walls
- Minimize widows on east and west walls. East and west windows should be designed to minimize summer heat gain by adding in architectural shading devices, movable shades, reflective film on glass, or other methods.

- Minimize use of reflective surfaces around buildings such as parking lots and abutting sidewalks to reduce glare and heat gain.
- Provide vestibules and deep-set front porches that protect entries from temperature extremes. Very few buildings at Luke Air Force Base provide an acceptable transition zone with filtered shade between the unprotected environment of a parking lot, and the interior environment. Covered entries and vestibules effectively provide this transition, and these types of entry transitions are indigenous to this region of the country.
- Create building designs that contain self-shading elements such as courtyards, deep overhangs, wingwalls, and trellises.
- Consider berming to reduce exterior walls exposed to air temperature.
- Place outside stairwells and other non-conditioned space on east and west walls to help shade the building
- All exterior walls should be thermally insulated. Exterior insulation and finish systems (EIFS) should be considered for renovations as well as new construction. While these systems provide excellent thermal and moisture retarding characteristics, care must be taken to specify heavy duty systems where EIFS is subject to impact damage. Also, such systems require a high level of skill by the applicator.



- All windows should have thermal pane glass and high quality metal or plastic frames. Metal frames should have integral thermal breaks.
- Windows should be operable so that they may be opened during mild weather.
- South windows should incorporate overhangs or other shading methods to reduce summer heat gain without blocking winter sun. North windows do not require overhangs.
- Install appropriate ceiling or roof thermal insulation
- Install pitched roofs with adequate ventilation. Gable vents relying on natural air movement are insufficient. Soffit vents and ridge vents are generally required
- Employ natural day-lighting features whenever possible, particularly in warehouse spaces. High windows can fill large open spaces with light, but it is important to provide shading so that direct sunlight does not fall on glass except in winter.
- Do not use incandescent lamps in light fixtures except in spaces where the fixture is rarely used. Use T-8 triphosphorus fluorescent lamps for maximum efficiency.
- Install timed switches, photo sensors, motion sensors and other devices to keep lights off in unoccupied spaces.
- Use photo sensors to switch off or dim artificial lighting where natural daylighting has been incorporated into the design.
- Specify high-efficiency heating and cooling equipment.
- Specify programmable thermostats
- Maximize design features to reduce the size and cost of mechanical equipment.
- Specify solar hot water systems on residential facilities, hospital, dorms, fitness centers and other facilities that have large and constant hot water demands. This

technology is readily available and widely used in this area of the country. Where possible, solar collectors should be integrated into the roof design. Contrary to popular belief, it is unnecessary to tilt solar panels at an exact angle to achieve maximum performance. Solar panels can follow the roof slope provided that face of the roof is oriented generally to the south.

- Explore options of capturing waste heat from the cooling system to heat hot water
- Locate hot water tanks as close as possible to the end use area. Small, under-counter on-demand water heaters are very efficient for locations where large capacity is unnecessary.
- Insulate all hot water pipes. Insulated exterior pipe shall be covered with sheet metal or other weather proof material.
- Use low-maintenance materials such as concrete and tile, and avoid high-maintenance materials such as wood and painted metal.
- Allow materials with inherent finishes to remain unpainted. Concrete should not be painted.



## SECTION 4 SECURITY DESIGN

### FOCUS

The focus of this chapter is the architectural application of security design to guard against moving and stationary vehicle bomb attacks. This guidance is not all inclusive nor is it an assessment of the current state of readiness at Luke Air Force Base. The topics below should be used as guidance to determine appropriate security design on new projects and existing facilities.



### GENERAL DESIGN CRITERIA

#### **Sitework Elements**

- Eliminate potential hiding places near the facilities
- Provide an unobstructed view around the facilities
- Locate assets stored on site, but outside of the facility within view of occupied rooms in the facility
- Minimize exterior signage indicating location of assets
- Provide a 150' minimum facility separation from installation boundaries
- Eliminate lines of approach perpendicular to the facility
- Do not design parking beneath facilities
- Secure access to power/heat plants, gas mains, water supplies and electrical service
- Locate public parking within view of occupied rooms
- Locate trash receptacles at least 30' away
- Locate parking at least 30' from facilities
- All standoff distances should be validated against the latest Air Force criteria

### **Building Elements**

- Locate critical assets on the interior of facilities
- Minimize window area
- Back up glass doors in foyers with solid doors or walls
- Layout buildings to eliminate hiding places
- Design circulation to provide unobstructed views of people/vehicles approaching controlled areas
- Locate assets in or adjacent to spaces occupied 24 hours a day
- Locate activities attracting large visitor populations remote from assets where possible
- Place mailrooms/orderly rooms on facility perimeters
- Design narrow and recessed windows and openings
- Minimize the number and size of doors and windows
- Avoid indented corners & large recesses in building design
- Locate mechanical rooms on the facility exterior with an exterior entrance only

### FRONT GATE

Particular attention must be given to the streets and pavement at the installation entry gates to assure adequate security, safety and control of visitors.

The main gate should have a minimum of dual traffic lanes in each direction to facilitate high traffic volumes during peak periods. Lane width or spacing should permit safety for security personnel standing between lanes.

The guard house should be located on a traffic island located between the entry and departure traffic lanes. Curving the entrance drive will reduce the approach speed of potential aggressor vehicles.

Pull-offs should be provided for vehicles requiring clearance to avoid blocking traffic lanes.

Vehicle lanes should be provided in front of and behind the guard house to allow vehicles to make a U-turn or to cross over from one traffic lane to another under the positive control of the gate guard



#### GATES

Each gate at Luke Air Force Base must have a positive means of securing the installation perimeter. Gate mechanisms should be discreetly concealed from all directions using decorative walls or landscaping. This concealment feature should be incorporated into the design of the new gate facilities. Control of an automated gate should be designed for quick activation during increased Threat Conditions.

#### BARRICADES

Barricades must be provided around the guard house to prevent errant vehicles from crashing into the guardhouse. Barricades should be integrated into the facility design disguised as planters or decorative walls with Luke Air Force Base identification signage.

#### PASSIVE BARRIERS

Passive barriers rely on bulk or mass (without moving parts) to impede vehicular attack. Passive barriers include Jersey barriers, earthwork or berms, steel posts, large concrete planters, guardrails, and reinforced fences with aircraft barriers.

#### SECURITY LIGHTING

Lighting in and of itself does not provide security, but it helps to assess aggressor activity and enhance physical safety. Security lighting is also a psychological deterrent to potential aggression.

Aggressors can use lighting to their advantage. Coordinate lighting design with Security Forces to determine potential liability. Lighting falls into the following categories:

- boundary and entry control point lighting (ECP)
- area lighting

### **Boundary and ECP**

Lighting should be focused on the perimeter of the bordering area, with light directed outward (with minimal light cast toward security). The perimeter should be illuminated on both the exterior and interior of the perimeter barriers. Install lighting at each ECP to facilitate identification of personnel or vehicles accessing the base.

### **Area Lighting**

The objective of area security lighting is to illuminate the area under protection. Uniform lighting should be augmented by "fill-in" lighting at locations where structures, utilities, or vegetation create shadows or reduced lighting levels.

## VEGETATION AND PLANT SELECTION

Vegetation can be used to define property and standoff zone boundaries as well as obscure lines of sight.

Plant selection requires definite determination as to which plant materials will fulfill the protective measures needed. Consider the following items when specifying plants:

- size
- shapes
- density
- thorn/spike bearing plants
- growth characteristics
- layout pattern
- attraction to wildlife

## STANDOFF ZONES

Standoff distances are determined by building construction, threat severity levels and availability of land.

## LANDFORMS

Landforms inherently have positive and negative effects upon protective measures. Landforms should:

- define boundaries of property
- provide a barricade/obstacle to moving vehicles
- hinder aggressor movement on foot
- obscure sightlines advantageous to aggressors (constructed high enough to achieve the desired effect, or combined with vegetation/construction elements)
- landforms should be located at appropriate standoff distances from assets where practical

Landforms used for security applications include:

- slopes and berms

- ditches, swales and depressions

### **Slopes and Berms**

Slopes should be designed that are at a slope of 1:1 or steeper with a minimum rise of 3 feet to deter vehicle movement. Slopes must be stabilized. Recommend rolling terrain and include irregularities to provide obstacles and drop-offs to deter vehicular movement.

### **Ditches, Swales and Depressions**

Ditches should be constructed at a slope of 1:5 for rock lined slopes or 1:2.5 for non-rock lined slopes. Integrate slopes and berms with ditches for greater effect.

## FENCING

Enhanced fencing can facilitate limited sight lines and stop moving vehicles. Additional screening material can assist in obscuring sight lines in conjunction with the protective features of the fencing.

Standard security fencing is 6' high. Where specified to protect high priority Air Force assets the fence must be 7' high with 15 inch long outriggers each with 3 strands of barbed wire, for a total height of 8'.

Reinforced fences integrated into chain-link fencing require two 3/4 aircraft cables (general purpose galvanized, class 2, 6 by 19). Placement of cables should be at a height of 30-35 inches above finished grade. These cables should be secured to the line posts with connections of equal or greater strength than the shear strength of the cable.

## BUILDING SYSTEMS

Preferred materials for security design

- reinforced concrete or CMU
- double wythe masonry

Issues related to specific visual districts are noted below:

## HOUSING

Perimeter fencing is an issue in the Housing District, with rear yards of some units adjoining off base neighborhoods. A combination of landscape and screen fencing, to reduce clear sight lines is recommended.

## DORMITORY

Lighting is limited to the porch lighting in the dormitory area. Consideration should be given to the resident comfort with respect to increased area lighting, however exterior gathering

spaces and perimeter lighting should be illuminated.

COMMUNITY

Certain facilities such as the BX, Commissary, CDC, Bowling Alley, and Movie Theater should address limited protected entries, and orientation due to the potential of high concentrations of patrons.

FLIGHTLINE

The flightline appears relatively secure, screening sightlines to assets and establishing formal entry control points for both pedestrian and vehicular access during times of increased Threat Conditions.

INDUSTRIAL FACILITIES

Screening assets from view will deter aggressors from acquiring targets while driving through the industrial district.



## SECTION 5 ARCHITECTURAL DESIGN GUIDELINES

### INTRODUCTION

An Architectural Compatibility Study for any base usually begins with the definition of the Visual Districts found on the base. These Visual Districts often follow the proposed land use functions on the base but usually tend to cross proposed land use boundary lines. This is the situation at Luke Air Force Base. At Luke Air Force Base there are ten distinct Visual Districts that include: the Flightline, Administrative Areas, Industrial Areas, the North Cantonment Area, the Community Center, Military Family Housing, Dormitory Areas, Services Area, the Mall Area, and Outdoor Open Space. A detailed description of each Visual District including location, assets, liabilities and general architectural design guidelines can be found on the following pages.



## SECTION 5A FLIGHTLINE DISTRICT

### LOCATION

This district comprises most of the installation property West of Jerstad Lane and North of Super Sabre Street. The district includes the flightline, taxiways, aircraft storage, maintenance facilities and flightline administrative facilities.

### CHARACTER

The character of the district is utilitarian with a mixture of large and small scale facilities concentrated along Jerstad Lane, Fighter Country Avenue and Super Sabre Street. Supporting facilities are grouped on all three streets. Significant noise levels occur within this district. Vehicular and pedestrian circulation is concentrated along Jerstad Lane and Fighter Country Avenue.



### ASSETS

#### **Buildings**

- Most of the aircraft hangars are of a consistent design and are sited along the flight line.
- The flightline district is separated from the rest of the base to minimize the impact of flightline operations
- Building 968 is of a quality to serve as the standard for

LIABILITIES

future high-bay facilities within this district

- Smaller scale buildings are closer to the street rather than the high-bay facilities so as not to be overly imposing on the streetscape

**Site Elements**

Several low screen walls are well integrated with their adjacent facility

A few of the covered break areas are well sited and constructed at a human scale

**Buildings**

- Inconsistent roof forms and color schemes occur on most buildings
- Paint schemes on some of the small buildings are too busy and needs to be simplified
- An abundance of materials contributes to the visual chaos

**Site Elements**

- Inconsistent fencing materials used along Fighter Country Avenue
- There are no consistent shaded outdoor spaces appropriate for personnel break areas
- Several outdoor storage yards face directly onto Fighter Country Avenue

OBJECTIVES

- Update existing facilities along Fighter Country Avenue so they better relate to each other and convey a common visual theme
- Ensure all future facility designs continue to strengthen the architectural theme
- Create common outdoor activity areas to be shared among grouped buildings
- Establish consistent visual screening methods for outdoor storage yards and exposed utilities
- Consolidate outdoor storage areas wherever practicable
- Use future buildings to screen elements along Fighter Country Avenue



## DESIGN CHARACTER

Facilities along and around the flightline are so driven by their function and ability to support the flying mission that aesthetics rightfully take a back seat. This results in a very utilitarian background building character. Even the inconsistent building forms found in this area can be enhanced greatly through consistent exterior treatments.

## BUILDING FORMS

- Design and visual continuity should be extended to new structures or additions through the use of previously used common forms
- Building plans and elevations should be based on right angle geometry
- Provide roof systems with pitch angle to match existing sloped roofs
- Parapet walls should not to be used
- The use of roof-mounted equipment should be avoided and limited to vents and similar appurtenances.
- Building entrances should be obvious to the pedestrian. It is easy for the entry to get lost on a large-scale building. It may be recessed in the face of the building, project from the face of the building, or be identified with distinctive landscaping. A combination of these elements is also appropriate.
- The normal standards for having adjacent buildings relate to each other is not always practical due to the type and differences of functions found along the flightline. Therefore, single-story facilities may be next to large aircraft hangars. But it is not acceptable to construct single-story additions to multi-story or high-bay facilities that are grossly out of scale. When this is impractical, match height to an adjacent facility.

## EXTERIOR ELEVATIONS

- Facilities should be rectilinear and usually emphasize the horizontal in overall proportion. This is especially important for large structures in order to reduce the apparent height.
- Roofs should be sloped to match existing roof slopes
- Minimize penetrations through the roof plane and exterior walls to reduce visual clutter and potential maintenance requirements

## MATERIALS

- The prevailing materials should represent the nature of a military flightline and its mission. Primarily, materials will be the result of functional requirements and relate to adjacent facilities.
- Exterior walls for smaller facilities should consist of materials matching large facilities.
- Exterior walls for large facilities should match those of the existing large structures in the district.
- A standing-seam metal roof is the standard for all new facilities in this district



## COLORS

- The intent in the Flightline District is to allow the facilities to fade into the background so as to minimize visual clutter or confusion. The use of bright colors or non-existing contrasting colors is strongly discouraged.
- Large new structures should follow Building 968 as the standard for exterior materials and colors (brown split faced block or brick walls with a light tan metal roof)
- Recommend that all the smaller metal buildings be painted tan to eliminate the contrasting horizontal bands and visual clutter.

DETAILING

- Exterior personnel doors should be pre-finished or painted to blend with the surrounding wall color.
- The key issue for detailing on facilities in this district is maintaining the same framing, infill and trim colors throughout
- All other details are secondary, but should still be addressed. As future construction occurs, give careful consideration to details at the roof fascia, downspouts, roof penetrations, signage, landscaping where appropriate, building siting and orientation, and roof configuration.
- Even though the high level of attention often afforded to administrative or community facilities is not required in this visual district, all details should mirror the professional and quality performance expected of flightline operations.
- Equipment exposed to the exterior should be factory finished, if possible, to match adjacent structures or concealed by screening
- Stainless steel should not be painted
- Exposed concrete items should not be painted. They should remain their natural color so as not to create new maintenance requirements.
- Glass should be tinted to minimize solar heat gain
- Any existing roof mounted equipment should be finished to match the existing roof material



SELECTED

- Standardize screen fencing or screen walls along Jerstad

PROJECTS

Lane and Fighter Country Avenue. The length of the fence or wall should be visually broken up by periodic landscaped areas.

- Create outdoor activity/recreation/break areas where concentrations of personnel warrant
- Provide screening to match new screen fencing or screen walls for all dumpsters

## SECTION 5B ADMINISTRATIVE DISTRICT

### LOCATION

The Administrative Facilities visual district is primarily located north of Thunderbird Road and just east of Litchfield Road in the east area of the base. The district adjoins the ball fields and the housing area to the east. A separate site on the west side of the base southeast of the intersection of Fighter Country Avenue and Eagle Street is the location of the Wing Headquarters building, another administrative function.

### CHARACTER

This district has the potential to have a strong tie to the Community Center district. It currently contains an assortment of poorly sited and somewhat unrelated smaller facilities dominated by the large hospital and the Support Group Facility, Building 1150.



### ASSETS

#### **Buildings**

- Building 1130, the Hospital, has a pleasant appearance suitable to its function.
- The Youth Center serves as a good example of appropriate materials and form for new buildings in this district.

LIABILITIES

**Landscape**

- There are a few good examples of indigenous landscape plantings in this district.

**Buildings**

- Building 1150 is somewhat controversial in appearance, due to its large mass and lack of fenestration. It is also considered a Cold War asset, and as such, presents difficulties in obtaining approval for demolition. Demolition costs would be excessive due to its very heavy reinforced concrete construction.
- Building siting for smaller structures is seemingly very arbitrary with little continuity in form or orientation

**Vehicular Circulation**

- Vehicular circulation is very poor to the east of the hospital and Building 1150

OBJECTIVES

- Develop the Administrative District to relate more favorably to the Community Center District.
- Develop a consistent palette of colors, building massing, and materials for this district.

DESIGN CHARACTER

- Use of materials and massing reflects the character of both the Administrative District and Community Center District which also contains several large structures. Since these two districts are bisected by Thunderbird Road, it is important that design features in both districts be coordinated and compatible.



BUILDING FORMS

- The Administrative District is a compilation of smaller one story buildings and two large two story structures. Most have flat roofs. There is a wide variety of scale and form in the district's buildings. The apparent mass and scale of new structures should be compatible with the hospital and Building 1150.

EXTERIOR  
ELEVATIONS

- The facilities in the Administrative District have varying degrees of external detail. The exterior elevations of both the hospital and Building are somewhat out of date.
- Building 1150 is a windowless building with bland facades. A new exterior treatment emphasizing the horizontal dimension is recommended.
- Emphasize the entrances by providing substantial entry canopy additions to existing facilities to act as transitional zones between the exterior and conditioned interior spaces.

MATERIALS

- New facilities should adapt the materials used for the Youth Center.

COLORS

- New facilities should adapt the colors used for the Youth Center.

DETAILING

- The key issue for detailing on facilities in this district is maintaining the same colors and materials throughout. This will be difficult to accomplish for the hospital and Building 1150, which currently are very different from other base facilities as well as from each other.
- All other details are secondary, but should still be addressed. As future construction occurs, give careful consideration to details including signage, landscaping where appropriate, building siting and orientation, and roof color
- Any new equipment exposed to the exterior should be factory finished, if possible, to match adjacent materials or concealed by appropriate screening
- Exposed concrete items should not be painted. They should remain their natural color so as not to create new maintenance requirements

SELECTED  
PROJECTS

- The main project that would greatly enhance the Administrative District



## SECTION 5C INDUSTRIAL DISTRICT

LOCATION	<p>The Industrial District is located to the north of the main cantonment area on the west side of Litchfield Road and north of Lightning Street. It is bordered on the west by the northern end of the Flightline District.</p>
CHARACTER	<p>The character of the Industrial District is very utilitarian in nature and does not have any dominant or distinctive structures.</p>
ASSETS	<p>Buildings</p> <ul style="list-style-type: none"><li>• There are no significant conflicts with non-compatible uses within the district.</li><li>• Overall, there is a consistent use of building forms and roof slopes.</li></ul> <p>Landscape</p> <ul style="list-style-type: none"><li>• A few desert landscape planting areas occur in this district, but none are prominent or distinctive.</li></ul> <p>Site Elements</p> <ul style="list-style-type: none"><li>• Site elements in this district are mostly limited to fencing and screenwalls.</li></ul>
LIABILITIES	<p>Buildings</p> <ul style="list-style-type: none"><li>• Low quality somewhat temporary construction (many metal buildings)</li><li>• Entries are not consistently well-defined</li></ul> <p>Landscaping</p> <ul style="list-style-type: none"><li>• Landscaping is minimal in this visual district</li></ul> <p>Site Elements</p> <ul style="list-style-type: none"><li>• Few outdoor seating areas</li><li>• There are few existing shaded outdoor spaces appropriate for personnel break areas</li></ul>

## OBJECTIVES

- Unify all the industrial buildings with common colors, form and materials
- Ensure all future facility designs continue to strengthen a common architectural theme
- Create common outdoor activity areas to be shared among grouped buildings
- Establish consistent visual screening methods for outdoor storage yards and exposed utilities
- Consolidate outdoor storage areas wherever practical
- Provide visual or physical barriers between non-compatible uses along the district edges
- Improve parking



## DESIGN CHARACTER

Since there is a wide variety of buildings in this district, character is created not so much by individual buildings but by all the buildings as a whole or groupings.

## BUILDING FORMS

- Design and visual continuity are to be extended to new structures or additions through the use of previously used common forms
- Building plans and elevations should be based on right angle geometry
- Provide roof systems with pitch angles to match existing sloped roofs
- Parapet walls should not be used, and roof-mounted equipment should be avoided and limited to vents and

EXTERIOR  
ELEVATIONS

- similar appurtenances.
- Building entrances should be obvious to the pedestrian. It is easy for the entry to get lost on a large-scale building. It may be recessed in the face of the building, project from the face of the building, or be identified with distinctive landscaping or an entrance canopy. A sensitive combination of these elements is also appropriate.
  - New structures should attempt to match or complement the scale and mass of adjacent buildings when feasible.
  - Facilities should be rectilinear and usually emphasize the horizontal dimension in overall proportion
  - Roofs should be sloped to match existing roof slopes
  - Minimize penetrations through the roof plane and exterior walls to reduce visual clutter and potential maintenance requirements
  - Generally, buildings in this district will not have a large number of windows (except at administrative functions) but windows should be grouped or located to present a balanced appearance on all elevations
  - Overhead doors or other large openings in the elevations should be located to meet functional requirements, but also to enhance the building's appearance through the use of repetition and scale.



MATERIALS

- Exterior walls for shop/warehouse facilities should consist of metal siding with ribs running vertically
- Exterior walls for administrative facilities in this district should continue with masonry.
- Standing-seam metal roofing should be the standard for all new facilities in this district.
- All metal siding and metal roof corrugation styles should match within the district
- Whenever possible, use factory coated/painted materials to minimize maintenance

COLORS

- The intent in the Industrial District is for the facility color scheme to be relatively muted so as to minimize the visual impact on the neighboring districts. Usage of bright colors or non-existing colors is strongly discouraged.
- Exterior personnel doors should be pre-finished or painted to blend with the surrounding wall color.

DETAILING

- The key issue for detailing on facilities in this district is maintaining a consistent color scheme throughout
- All other details are secondary, but should still be addressed. As future construction occurs, give careful consideration to details at the roof fascia, downspouts, roof penetrations, signage, landscaping where appropriate, building siting and orientation, and roof configuration.
- Equipment exposed to the exterior should be factory painted, if possible, to match adjacent structures or concealed by screening
- Stainless and galvanized steel should not be painted
- Exposed concrete items should be painted and should remain their natural color so as not to create new maintenance requirements.
- Where used, glass should be tinted to minimize solar heat gain
- Solar shading devices should be considered for all windows
- Any existing roof mounted equipment should be painted to match the existing roof material
- Install exterior lighting on facilities to provide safe and secure access and to illuminate outdoor storage areas
- Unify the district with a common screen fence style

SELECTED

- A new CE operations facility is planned to replace the

## PROJECTS

administrative functions currently housed in Building 343. Its proposed location is to the southeast of 140<sup>th</sup> Avenue and Lightning Street. This new facility should complement other primarily administrative buildings on the base.

- This new facility should have split-face block as the exterior wall material and a light-colored metal roofing system similar to that of the Dining Hall and dormitories between Falcon Street and Mustang Street.
- If possible, site the new CE operations building at the north end of Bong Lane and treat it as a destination building. Doing this will incur some phasing challenges with the current CE complex.



## SECTION 5D NORTH CANTONMENT DISTRICT

### LOCATION

The North Cantonment District is located to the south of the Industrial District and east of the Flightline District west of Litchfield Road. It is bordered on the south by the West Mall area.

### CHARACTER

The character of the North Cantonment area is somewhat arbitrary and non-unified due to the wide variety of functions that occur therein. The district contains a mixture of land uses including Administrative, Community Commercial, Dormitory, and Aircraft Operations and Maintenance.



ASSETS

Buildings

- A few large permanent structures such as Buildings 219, 122 and 297 occur in the district which are coupled with large open spaces suitable for future development.
- The NCO Club can serve as an appropriate model for new facilities within this Visual District.
- Overall, there is a fairly consistent use of building forms and roof slopes.

Landscape

- Some good quality plantings occur around the NCO Club

LIABILITIES

Buildings

- Inconsistent mass and scale of facilities
- Entries to administrative functions are not consistently well-defined

Landscaping

- Landscaping is somewhat limited in this district

Site Elements

- There are few shaded outdoor spaces appropriate for personnel break areas
- Parking areas are expansive and lack visual screening

OBJECTIVES

- Unify all the buildings in this district with common colors, form and materials
- Ensure all future facility designs continue to strengthen a common architectural theme
- Create common outdoor activity areas to be shared among grouped buildings
- Establish consistent visual screening methods for outdoor storage yards and exposed utilities
- Consolidate outdoor storage areas wherever practical
- Plan new development in this zone to develop common land use characteristics
- Improve parking area design



## DESIGN CHARACTER

The wide variety of buildings in this district creates a character produced not so much by individual buildings but by all the buildings as a whole or groupings. It is difficult to assign a single distinctive character to this assortment of buildings with varying architectural styles, diverse functions, and differing materials.

## BUILDING FORMS

- New structures planned for this zone should be consistent in their general form and should capture the form of the NCO Club.
- Building plans and elevations will be based on right angle geometry
- Provide roof systems with pitch angle to match existing sloped roofs
- Parapet walls should not be used; consequently, the use of roof-mounted equipment should be avoided and limited to vents and similar appurtenances.
- Building entrances should be obvious to the pedestrian. It is easy for the entry to get lost on a large-scale building. It may be recessed in the face of the building, project from the face of the building, or be identified with distinctive landscaping. A combination of these elements is also appropriate.
- The normal standards for having adjacent buildings relate to each other is not practical due to the variety of functions occurring in this district. Designs for new structures in this zone should set consistent standards for building forms

EXTERIOR  
ELEVATIONS

- Facilities should be rectilinear or nearly square
- Roofs should be sloped to match existing roof slopes of the NCO Club
- Minimize penetrations through the roof plane and exterior walls to reduce visual clutter and potential maintenance requirements
- Windows should be grouped or located to present a balanced appearance on all elevations

MATERIALS

- Exterior walls for new structures should match those of the NCO Club
- Clay tile roofs to match that of the NCO Club should be the standard for all new facilities in this district.
- Whenever possible, use factory finished materials, or materials that can remain unfinished to minimize maintenance

COLORS

- The facility color scheme in this district should be relatively muted so as to minimize the visual impact on the neighboring districts. Usage of bright colors or non-existing colors is strongly discouraged.
- New facilities should use colors matching the NCO Club
- Exterior personnel doors should be pre-finished or painted to blend with the surrounding wall color.

DETAILING

- The key issue for detailing on facilities in this district is maintaining a consistent color scheme throughout
- All other details are secondary, but should still be addressed. As future construction occurs, give careful consideration to details at the roof fascia, downspouts, roof penetrations, signage, landscaping where appropriate, building siting and orientation, and roof configuration.
- Equipment exposed to the exterior should be factory finished to match adjacent structures or concealed by screening
- Stainless and galvanized steel is not to be painted
- Exposed concrete items should not be painted. They should remain their natural color so as not to create new maintenance requirements.
- Glass should be tinted to minimize solar heat gain
- Any existing roof mounted equipment should be finished to match the existing roof material
- Install exterior lighting on facilities to provide safe and secure access and to illuminate outdoor storage areas
- Unify the district with a common screen fence style

SELECTED  
PROJECTS

- Several large new facilities are currently proposed for this district under the updated General Plan. The design of these facilities should capture the general features of the NCO Club in order to develop a consistent pattern of form, style, and materials throughout this visual district.



## SECTION 5E COMMUNITY DISTRICT

### LOCATION

The Community District is located on the eastern portion of the base across from the Main Gate. This area is most easily accessed from Litchfield Road, then east on Thunderbird Road, the main thoroughfare for this area. Significant facilities include the Base Exchange, Commissary, Theater, Bowling Alley, Credit Union West, Armed Forces Bank, Military Clothing Sales, Dry Cleaners, AAFES Administration, Burger King and other miscellaneous eateries. The Shoppette, Pharmacy and Gas Station will relocate to a new multipurpose facility. Airman's Attic and the Thrift Shop will collocate to Building 1535 and Credit Union West will move into a new facility yet to be determined. The Bowling Alley will be renovated to meet Luke AFB architectural compatibility standards and streets, parking lots, and landscaping will be redesigned.



## CHARACTER

A wide variety of building styles and sizes exists in the Community District. The buildings to the west of 137<sup>th</sup> Ave. were all constructed at different times reflecting an inconsistent use of color, detailing, and materials. The Commissary, BX complex and Parking Garage maintain consistent color themes, building heights, and construction materials creating a common visual link with one another. This area around the BX and Commissary is a good example of harmonious architectural character on Luke AFB.

## ASSETS

### **Buildings**

- The Community District buildings represent some of the better designed facilities on the base. This will be further enhanced as new facilities come on line, renovations continue, and buildings relocate to their appropriate functional areas.

### **Landscape**

- A variety of indigenous landscape plantings and design elements occur in these areas.



### **Site Elements**

- A variety of site elements such as trash receptacles, benches, light fixtures, merchant booths, etc. occur in the area.

## LIABILITIES

### **Buildings**

- Although the Pharmacy, Building 1514 is an incompatible function for its location in the Community District, this building is frequented on a regular basis and should continue to be located within this District. However, because of its proximity to a blind corner and the large number of visitors, this creates major safety problems and interrupts traffic flow along 137<sup>th</sup> Ave.
- The Bowling Alley, Building 1525 is a metal clad structure that doesn't relate well with the surrounding buildings. Mechanical equipment is located just off the front entrance and screened inappropriately, lighting along the sides of the building is unsightly, and it lacks any hint of architectural detailing.
- A few of the buildings have minimal roof overhangs, providing little shade for pedestrians walking next to the building.
- The roof mounted mechanical equipment on the Commissary is visible at a distance and is in need of screening.
- The proximity of many of the Community District buildings to the base perimeter fence raises security and anti-terrorism concerns.

### **Landscape**

- Lack of shade
- Lack of planting islands in parking lots and along pedestrian corridors

### **Site Elements**

- The wide variety or absence of site elements presents a non-unified environment.
- Although benches and trash receptacles are spread throughout the site, they are visually incompatible with one another.
- Although light fixtures and poles are consistent, they are old and unsightly.
- Some signage does not conform to AETC standards, creating an inconsistent, cluttered look.
- The wide expanse of paving in front of the BX and Commissary creates a very non-friendly environment for

OBJECTIVES

pedestrians.

- The Community District should stand alone as a readily identifiable zone located for convenient access by base personnel. This is where basic services are obtained, and often several of these services are accessed each time a customer visits the area.
- The design of facilities should promote ease of access through close proximity and by arranging parking to minimize the need to drive between activities.
- This area can often be very congested at certain times of the day, and a careful analysis of vehicular and pedestrian traffic patterns and requirements is imperative.
- The services provided in the Community District are some of the most important ways to impart a sense of familiarity to those who are stationed at Luke AFB. For that reason, special attention should be given to increase the design standards and continuity of the good design elements in this area.

GUIDELINES

- The facilities in this area should be constructed with the same materials, structural systems, roof types, etc., and should share common details and colors.

DESIGN  
CHARACTER

- Although no particular design theme currently exists in this area, the BX complex incorporates an excellent mix of construction materials and has many exceptional architectural details. These materials and details should be continued for all other Community District facilities.

BUILDING FORMS

- Many different shapes and sizes of buildings occur in this area, and no single building form approach is used consistently

EXTERIOR  
ELEVATIONS

- Again, a wide variety of facades occur in this area. It is important that the scale of the buildings in this area relates well to human scale and have sufficient detail to add interest.



#### MATERIALS

- Although many different systems are used for these buildings, the predominant construction scheme uses split-faced block. This should be the standard used for new facilities.

#### COLORS

- Exterior colors for the Community District facilities vary widely and are, for the most part, unacceptable.
- Most of the buildings have exposed tan colored split-face or slump block exteriors and a large white band on the upper portion of the facade carrying a green accent line through the middle.
- Most of the buildings utilize flat built up roofing systems.

#### DETAILING

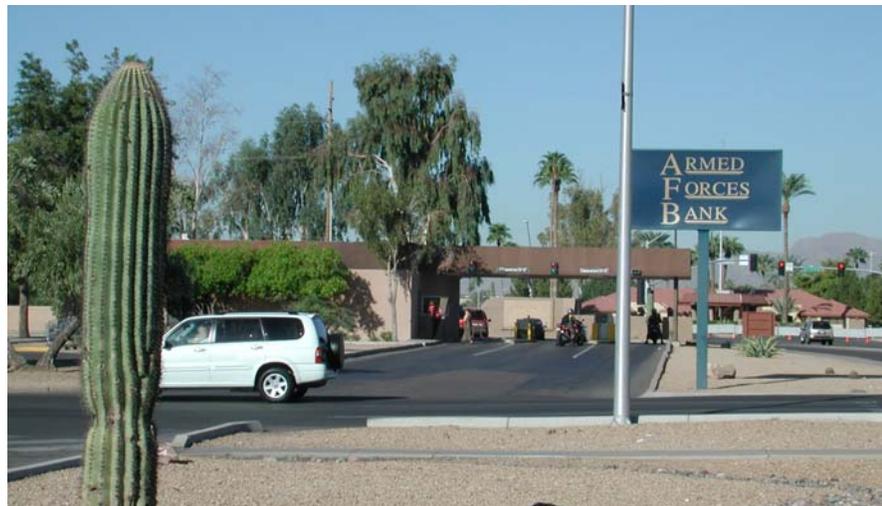
- Although colors and materials are similar, there is a wide variety of architectural detailing due to the varying age and design of the Community District buildings.
- Every attempt should be made to standardize architectural details that can be adapted for use in any new building that is added to the area or to any major renovation project.
- Good examples include a standard roof slope, standard door and window designs, overhangs, etc.

#### SELECTED PROJECTS

- As new Community District projects are built, these projects should be expanded to include additional site amenities such as fixed seating, landscaping, sidewalks, light fixtures, bicycle racks and trash receptacles.
- Bicycle racks should match the design found in front of the BX complex.
- The base should establish a set standard for bench and

trash receptacle design that applies not only to these items occurring in the Community area, but throughout the entire base.

- Special attention should be given to the design of the new Shoppette, Gas Station and Pharmacy complex. This new facility will have a major visual impact on the Commissary/BX area.
- The Bowling Alley should be renovated to compliment the BX and other nearby facilities. A scheme that matches the same exposed split-faced block, flat roof and architectural details is recommended.
- Since Thunderbird Road is the main street through the Community District, special design considerations should be given to this area. An improvement project introducing compatible design elements and landscaping along this corridor will create a visual link with the areas west of Litchfield Road and to the East Mall area to the east of the district.
- There is very little space dedicated to pedestrian and vehicular circulation to the south of the BX complex and parking garage. An improvement project is needed to better define crosswalks and visually unify this area.



## Section 5F HOUSING DISTRICT

### LOCATION

The Military Family Housing (MMFH) District is located to the East of the Main Base across Litchfield Road in two distinct areas, one located to the north of Glendale Ave and the other to the south of Glendale Ave. The MMFH area located to the north of Glendale has Thunderbird Road as the main access corridor and contains approximately 80% of the MMFH District with the balance of MMFH District to the south of Glendale Ave.

The northern section of the MMFH District is bordered by the Community Area on the West. This study is based on site observations in the housing areas and a review of the April 2001 Luke Air Force Base General Plan.

### CHARACTER

Each of the housing areas share similar characteristics: single story duplex (with a few single family units), masonry facades, low sloped pitched roofs, xeriscape front lawns and a beige paint scheme. The Capehart Housing (Saguaro Manor) roofs are red clay tile and the Wherry Housing (Ocotillo Manor) MMFH roofs are brown composition shingles. The Capehart Housing District includes not only the MMFH units but also a tree lined access route (Thunderbird Road) many site amenities and landscape elements such as benches, sidewalks, curbing, bus shelters, lighting standards, open/play space, landscaping, trails, signage and utilities.



## ASSETS

### **Buildings**

- Existing housing designs have a modified southwestern architectural theme. Future MFH construction proposed for the Wherry Housing should establish a stronger architectural character in building forms and neighborhood planning concepts.
- Continued use of existing color themes in MFH is encouraged in concert with other Southwestern colors and accents. Varied use of color shades through MFH housing is recommended to break up the monotony of the one existing color theme in MFH.
- Utility appurtenances such as fire hydrants are well graded.

### **Landscape**

- Landscaping in the Capehart MFH area are appropriate xeriscaped in most front lawns and public areas with grassed areas in most backyards.

### **Site Elements**

- Street lighting is well organized and consistent
- There are some good examples of screening currently used in MFH. These examples emulate the infill screens typically used around utility equipment.

LIABILITIES

**Buildings**

- Units reflect the AF “Capehart” cookie cutter design.

**Landscape**

- The Wherry MFH area needs landscaping upgrades to bring it to the standard of the Capehart area.

**Site Elements**

- Chain link fencing is used extensively in the backyards of many housing units
- Many air handling units need screening.
- Exposed utilities such as transformers should be screened.

OBJECTIVES

- Capitalize on unifying elements already in place such as clay tile roofing, uniform stucco and color, screening elements, developed landscaping,
- Establish a sense of community for the Wherry housing areas, establishing entrances and unifying site elements.
- Further develop the existing color themes in MFH. Lighter colors of linen, beige and light tan are desirable color themes. Darker colors such as brown are discouraged. Subtle variety in color themes through MFH housing is recommended to break up the monotony of color themes in MMFH.
- Incorporate energy conserving building elements. Such as roof overhangs, shutters and insulation on new construction.
- Provide additional MMFH bus shelters, where required, reflecting the character of the neighborhood.
- Standardize and reduce the amount of privacy fencing.

BUILDING FORMS

- MMFH units are one story masonry structures with sloped clay tile roofs in Saguaro Manor and composition shingle roofs in Ocotillo Manor.
- Established building forms are developed and consistent.
- Future MFH projects should avoid symmetrical, flat linear facades.
- Future MFH projects should include one and two story units



#### EXTERIOR ELEVATIONS

- Building forms are based on right angle geometry with wall planes offset on the front and rear elevations.
- Roofs are sloped.
- Windows are operable units set into walls as relatively small "punched openings".
- Garages and carports are open to the street
- Screen walls are open decorative CMU.

#### MATERIALS

- Exteriors walls consist of masonry and stucco.
- Saguaro Manor roofs are clay tiles and Ocotillo Manor roofs are composition shingles.
- Windows are punched openings with minimal solar shading as is frequently employed in the region.

#### COLORS

- Stucco and CMU walls are painted beige Continued use of these color is encouraged with minor variations.
- Red clay tile is used exclusively in MFH (except for Wherry Housing). Future MFH should use red clay tile material.

#### DETAILING

- Architectural themes and detailing of the units is very important. While very simple, it is imperative that detailing match within the housing areas and preferably throughout the Housing District. Color palettes, gutters/downspouts, tile products, window types and flashings all require consistency.

## NEW PROJECTS

- Provide window shading devices or large overhangs for all MMFH units. Optimize use of building insulation.
- Provide screen walls and or planting around trash containers and A/C condensing units.
- Focal points are needed at the MMFH main entry points. Entrances should include informational signage and appropriate landscaping. Sign base construction needs to draw from the material pallet established for the Housing District.
- Provide additional landscape screening and/or fenced screening at locations of undesirable adjacency. At streetscapes bordering other districts maintain the masonry screen walls.
- Existing playground structures should be reused and augmented with new equipment. Standardize construction elements in the play areas.
- Underground irrigation systems are recommended for all dedicated sports fields.

## SECTION 5G DORMITORY DISTRICT

### LOCATION

Unaccompanied housing at Luke Air Force Base is located in a single campus area. The Dormitory District bordered by Falcon Street to the north, Homer Drive to the west, Phantom Street to the south and 139 Drive to the east with Mustang Street dividing the campus north and south

### CHARACTER

The buildings are all 3-story rectilinear structures with both interior and exterior balconies. The newer facilities have hip standing seam metal roofs and the older dorms are flat roofs. Solar collection systems are sited on several of the flat roof dormitories.

### ASSETS

#### **Buildings**

- Several new dormitories now anchor the campus area and consist of:
  - Standing seam metal roof
  - Split faced CMU exterior walls
  - Exterior balconies/corridors



	<p><b>Landscape</b></p> <ul style="list-style-type: none"><li>• Several of the new dormitory areas have appropriate xeriscape landscaping with indigenous planting. Some of the dormitories have acceptable deciduous trees planted parallel to the long side of the building to enhance solar shading.</li></ul> <p><b>Site Elements</b></p> <ul style="list-style-type: none"><li>• Site elements in the dormitory areas are limited to a few covered picnic pavilions and benches adjacent to the dining facility, a basketball court and a volleyball court.</li></ul>
LIABILITIES	<p><b>Buildings</b></p> <ul style="list-style-type: none"><li>• Several dormitories have flat roofs.</li><li>• Rooftop mounted solar collector panels have been installed on top of the flat roofs, presenting a “tacked-on” appearance.</li><li>• Several dormitories have exterior exposed stairs.</li></ul> <p><b>Landscape</b></p> <ul style="list-style-type: none"><li>• Grass lawns and deciduous are not irrigated.</li></ul> <p><b>Site Elements</b></p> <ul style="list-style-type: none"><li>• Bicycle racks are insufficient in quantity.</li></ul>
OBJECTIVES	<ul style="list-style-type: none"><li>• Dormitories should provide, to the greatest extent practical, the same level of amenity as afforded accompanied personnel residing in military family housing.</li><li>• While additional dormitories are being planned for Luke AFB, the balance of the dormitories should be upgraded to comply with the current 1+1 standard. (Some conversion is currently underway.)</li><li>• The new “1+1” Air Force standard allows private rooms and shared kitchens.</li></ul>
GUIDELINES	<ul style="list-style-type: none"><li>• Specific design criteria for dormitories are found in the <i>Department of the Air Force Facility Design Guide for Enlisted Dormitories</i>, latest edition.</li><li>• Some basic design parameters are highlighted below.</li></ul>
DESIGN CHARACTER	<ul style="list-style-type: none"><li>• While perhaps not as accommodating as a detached single family dwelling, a dormitory truly functions as the occupants home and therefore must project a home-like residential image.</li><li>• Dormitories must avoid a rigid, institutional appearance.</li></ul>

- These buildings are very repetitious by their very nature; therefore the design should strive to encompass a reasonable level of variety. This can be accomplished by shifting blocks of rooms to modulate the footprint and avoid a boring “box-like” appearance



#### BUILDING FORMS

- Due to the inherent linear nature of dormitory buildings, it is imperative to limit the length of the structure.
- The width of a dormitory is a direct function of the proportions of the 1+1 modules.
- Modules should be as deep and as narrow as possible to maximize building depth and minimize building length when stacked back-to-back and side-by-side.
- This must be done while still complying with the minimum and maximum space requirements set forth in the Design Guide. Exterior access to the rooms from exterior balconies is appropriate in this arid climate, however, corridor access dormitories are more energy efficient and promote greater social interaction.

#### EXTERIOR ELEVATIONS

- Again, due to the horizontal form of dormitories, the designer should strive to introduce a good balance of vertical elements as an offsetting factor.

#### MATERIALS

- The wall material on the new dormitories is brown split faced CMU and should be continued on future dormitories.
- The roof system on the new dormitories is light beige standing seam metal hip roofs and should be continued on future new and renovated dormitories.

COLORS

- The exterior balconies should use beige painted steel pipe hand and guard rails that match the roof color.
- Exterior colors for the dormitories are a mixture of brown, reddish brown and beige tones. An attempt should be made to incorporate the new dormitory standard palette of colors and materials for all new and renovated dormitories. Buildings 528 and 530 serve as excellent examples for exterior color applications for all dormitories.

DETAILING

- There is some noticeable inconsistency in detailing among the dormitories, some of which is the variety in balcony rail, stair designs, roof types and rail colors.

SELECTED PROJECTS

- As the dormitories are upgraded to the new 1+1 standard, projects should be expanded to include addition site amenities such as picnic pavilions, patios, fixed seating, landscaping, sidewalks, bicycle racks and trash receptacles.
- Picnic pavilions should be adequately sized and should use the same palette of materials as adjacent buildings.
- The base should establish a set standard for bench and trash receptacle design that applies not only to these items occurring in the dormitory area, but also throughout the entire base.



## SECTION 5H SERVICES DISTRICT

### LOCATION

The Services Visual District is a small area of the installation bounded by Phantom Street on the North, 139<sup>th</sup> Drive on the East, Shooting Star Street on the South, and fighter Country Avenue on the West. The district includes the Community Center Building, the Officer's Club, the Temporary lodging Facilities, the Distinguished Visitor Facilities, and the main Base Chapel.

### CHARACTER

The character of the district is a mixture of large and small scale facilities with no overall apparent character.



### ASSETS

#### **Buildings**

- The main base chapel is a destination facility of human scale and appropriate siting
- The Community Center Building and the Officers Club are similar in scale and overall exterior appearance and currently serve as good background buildings
- Smaller scale buildings are closer to the street

LIABILITIES	<p><b>Site Elements</b></p> <ul style="list-style-type: none"><li>• Several low screen walls are well integrated with their adjacent facility</li><li>• A few of the covered break areas are well sited and constructed at a human scale</li></ul> <p><b>Buildings</b></p> <ul style="list-style-type: none"><li>• Inconsistent roof forms and color schemes on most buildings</li><li>• Color and texture schemes on some of the small buildings are too pronounced</li><li>• An abundance of materials, shapes and scales contributes to the visual chaos</li></ul>
OBJECTIVES	<p><b>Site Elements</b></p> <ul style="list-style-type: none"><li>• Inconsistent fencing materials are used around the Community Center Building and the Officers Club</li></ul> <ul style="list-style-type: none"><li>• Update existing facilities along Fighter Country Avenue so they better relate to each other and convey a common visual theme</li><li>• Ensure all future facility designs continue to strengthen the architectural theme</li><li>• Create common outdoor activity areas to be shared among grouped buildings</li><li>• Establish consistent visual screening methods for outdoor storage yards and exposed utilities</li><li>• Consolidate outdoor storage areas wherever practicable</li></ul>
DESIGN CHARACTER	<p>With the exception of the main base chapel, facilities in this Visual District should remain background buildings. Even the inconsistent building forms found in this area can be enhanced greatly through consistent exterior treatments.</p>
BUILDING FORMS	<ul style="list-style-type: none"><li>• Design and visual continuity are to be extended to new structures or additions through the use of previously used common forms</li><li>• Building plans and elevations will be based on right angle geometry</li><li>• Provide roof systems with slight pitch angle to match existing sloped roofs on the Community Center Building and the Officer's Club</li><li>• Parapet walls should not to be used. The use of roof-</li></ul>

## EXTERIOR ELEVATIONS

- mounted equipment should be avoided and limited to vents and similar appurtenances.
- The normal standards for having adjacent buildings relate to each other is not always practical due to the type and differences of functions found in the Services Visual District
- Single-story facilities may be next to large buildings. It is not acceptable to construct single-story additions to multi-story or high-bay facilities that are grossly out of scale. When this is impractical, match height to an adjacent facility.
- Facilities should be rectilinear and usually emphasize the horizontal dimension in overall proportion
- Roofs should be sloped slightly to match existing roof slopes of nearby buildings.
- Minimize penetrations through the roof plane and exterior walls to reduce visual clutter and potential maintenance



## MATERIALS

- The prevailing materials should represent the nature of a human scaled services area. Primarily, materials will be the result of functional requirements and relate to adjacent facilities.
- Exterior walls for large facilities should match the Community Center building and the Officer's Club.

## COLORS

- The intent in the Services District is to allow the facilities to fade into the background so as to minimize visual clutter or confusion. The use of bright colors or non-existing contrasting colors is strongly discouraged.
- Large new structures should follow the Community Center Building and the Officer's Club as the standard for exterior materials and colors.
- Recommend that all the smaller buildings have a tan finish to eliminate visual clutter.
- Exterior personnel doors should be pre-finished or painted to blend with the surrounding wall color.

## DETAILING

- The key issue for detailing on facilities in this district is maintaining the same framing, infill and trim colors throughout
- All other details are secondary, but should still be addressed. As future construction occurs, give careful consideration to details at the roof fascia, downspouts, roof penetrations, signage, landscaping where appropriate, building siting and orientation, and roof configuration.
- The high level of attention often afforded to administrative or community facilities is required in this visual district, all details should communicate the relative importance of the building.
- Equipment exposed to the exterior should be factory finished, if possible, to match adjacent structures or concealed by screening
- Stainless steel should not be painted
- Exposed concrete items should not be painted. They should remain their natural color so as not to create new maintenance requirements.
- Glass should be tinted to minimize solar heat gain
- Any existing roof mounted equipment should be finished to match the existing roof material



SELECTED  
PROJECTS

- The proposed site for the new Visiting Officers Quarters is in the southern portion of this Visual District and should be designed as a background building.
- Create outdoor activity/recreation/break areas where concentrations of personnel warrant
- Provide screening to match new screen fencing for all dumpsters basewide.

## SECTION 5I THE MALL DISTRICT

### LOCATION

The Mall Visual District at Luke Air Force Base consists of the land along an east-west spine from the Base Fire Station, Building 450, east to Lachina Street. The Mall District currently has three distinct parts. The West Mall area is located west of Litchfield Road to Building 450. The Central Mall area is located on both sides of Thunderbird Road east of Litchfield Road to 137th Avenue. The East Mall area is located on both sides of Thunderbird Road east of 137<sup>th</sup> Avenue to Lachina Street. There are only three facilities in the Mall Visual District, Buildings 1, 25, and 26 and all three are located in the West Mall.

### CHARACTER

The Mall Visual District currently has three distinct characters. The West Mall contains the three buildings, static aircraft displays, site elements and landscaping. The Central Mall is basically Thunderbird Road with minimal landscaping and an abundance of vehicular parking. The East Mall is the beautiful open space along Thunderbird Road that leads into the Military Family Housing area.

### ASSETS

#### **Buildings**

- The Base Chapel, Building 25, is a small structure sited in the middle of the west mall.



### **Landscape**

- The East Mall is the best of the three parts with palm trees and well designed landscaped areas on both sides of Thunderbird Road. The West Mall is adequate with the landscape development occurring between Eagle Street and Falcon Street.

### **Site Elements**

- Site elements include static displays, streetlights, benches, and some covered rest areas.

## LIABILITIES

### **Buildings**

- The former Wing Headquarters, Building 1 should be demolished, as should the substandard Building 26.



### **Landscape**

- Although there are some Palm trees and a few deciduous trees adjacent to some of the static displays in the West Mall it doesn't portray a well thought out landscape solution
- The Central Mall has very little landscaping and needs a lot of work.

### **Site Elements**

- The small covered pavilions that exist in the West Mall are undersized and poorly located. The benches beneath the covered pavilions appear to be rarely used.



## **OBJECTIVES**

- Landscaped open space should be preserved and enhanced to the greatest extent practical in this visual district.
- Maintain the excellent character found in the East Mall visual district.
- Improve slightly the character found in the West Mall visual district with the addition of street lights, landscaping and the demolition of Buildings 1 and 26
- Greatly improve the character of the Central Mall visual district with the addition of significant landscape elements, benches and street lighting. This can be achieved by extending the general theme of the East Mall into this area.

GUIDELINES

- Specific design criteria for open space planning are found in the United States Air Force Landscape Design Guide.
- Every effort should be made to expand the amount of open space in the Mall, particularly in the West and Central Malls.
- Some basic design parameters are highlighted below:

DESIGN  
CHARACTER

- If properly designed the Mall has the potential to serve as a unifying visual element for Luke Air Force Base
- There also is an opportunity to redesign the Main Gate west of Litchfield Road as part of this initiative
- Some of the amenities found in the East and West Mall should be added to the Central Mall in an effort to tie all three parts into a cohesive whole.

BUILDING FORMS

- With the exception of the old Base Chapel, Building 25, building forms should be non-existent in this visual district.
- The original character of the Base Chapel should be maintained and enhanced to elevate it to destination building status.

EXTERIOR  
ELEVATIONS

- Due to the historic nature of the chapel, future work should strive to maintain the original design.
- The basic color scheme of white with light gray roof color should be maintained.

MATERIALS

- The chapel has a pitched composition shingle roof
- The structural system for this building is standard wood frame construction

COLORS

- Exterior colors in the Mall Visual District are primarily earth tones; tan, brown, warm gray, and green
- The walkways are exposed gray concrete and decomposed granite. Screen walls and pedestals are buff colored plaster or concrete



#### DETAILING

- There is some noticeable inconsistency in detailing among the three parts of the Mall Visual District.

#### SELECTED PROJECTS

- The biggest improvement project in the Mall would be to demolish buildings 1 and 26.
- Picnic pavilions should be adequately sized and should use the same palette of materials as adjacent buildings.
- High maintenance trees should be replaced with other more suitable deciduous trees.
- Sidewalks should follow established pedestrian routes and the bicycle racks should match the design found in front of the Base Exchange Building 1552.
- The base should establish a set standard for bench and trash receptacle design that applies not only to the items occurring in the Mall area, but throughout the entire base.

## SECTION 5J OPEN SPACES

The open spaces addressed in this chapter include the Open Space/Recreation area Areas 1, 2, 3, and 4. A detailed description of each Open Space Area is contained on the following pages.

LOCATION	<b>Open Space Area 1</b> Open Space Area 1 is located at the corner of Litchfield Road and Super Saber Street.
CHARACTER	Open Space Area 1 is comprised of softball fields, concession facility, dugouts, tennis courts, volleyball court and a picnic pavilion. The area is xeriscaped.
ASSETS	<b>Buildings</b> <ul style="list-style-type: none"><li>• The fitness center, softball field concession facility, picnic pavilion and dugouts are comprised of beige split faced CMU and a variety of roof styles with brown/beige composition shingles.</li></ul> <b>Landscape</b> <ul style="list-style-type: none"><li>• The area is xeriscaped with minimal use indigenous plants.</li></ul> <b>Site Elements</b> <ul style="list-style-type: none"><li>• The area has a jogging trail, tennis courts, volleyball court, lighted softball fields, trail lights and several small berms located throughout that provide interest.</li></ul>
LIABILITIES	<b>Buildings</b> <ul style="list-style-type: none"><li>• The Fitness Center incorporates the beige theme although its solar panels are prominently located on the south facade on an exposed structural system.</li></ul> <b>Landscape</b>

- The area lacks a drip irrigation system.
- The area adjacent to the pavilion and volleyball court is a large open area that does not provide enough indigenous plant life.

**Site Element**

- The Volleyball court is in disrepair
- Benches and trash receptacles are minimally provided.
- Wood light poles on the softball fields



**OBJECTIVE**

- Open Space areas should provide the Luke community with amenities that provides enjoyable outdoor recreation.
- The area should provide additional:
  - Indigenous shade trees
  - Trail lighting
  - Drip irrigation
  - Pavilion
- Replace wood light poles with steel or concrete poles for the softball fields

**DESIGN CHARACTER**

The area has an established landscape character that should be maintained. Adding additional trees, shrubs, compatible trail lighting, pavilion and a drip irrigation system will dramatically enhance the existing site.

**Open Space Area**

**LOCATION** Open Space Area 2 runs north and south and is bordered along the east side by Litchfield Road and on the west side by 139th Drive. Its southern end meets Shooting Star North and the northern end terminates at Mitchell Street.

**CHARACTER** The area is xeriscaped and is fairly narrow with a few boulders and indigenous trees. A masonry screen wall on the east side of the area runs parallel with Litchfield Road side. The west side the area is bordered by parking lots and 139 Drive.

**ASSETS**

**Buildings**

- No building exist is this area

**Landscape**

- Small indigenous trees, several boulders and small berms.

**Site Elements**

- Some indigenous trees and shrubs

**LIABILITIES**

**Buildings**  
No building exist is this area

**Landscape**

- Minimal plant life
- Lacks drip irrigation
- No points of interest

**Site Elements**

- Site elements are nonexistent



OBJECTIVE

- Extend this area through what is currently the vehicle maintenance facility which will tie the north and south end of the Base together.  
Eventually relocate four facilities within the Vehicle Maintenance area  
Provide visual screening between the Vehicle Maintenance area and Open Space 2
- Provide a jogging path through this open space to encourage use.
- Install site amenities such as benches, trail lighting and drinking fountains.
- Tie this area together visually with Area 3 which will run along Lightning Street into the Open Area (Area 4, the recreation area behind the youth center) with a cross walk across Litchfield Road.

LOCATION

**Open Space Area 3**

Open Space Area 3 incorporates the space along Lightning Street from Litchfield Road on the west to the recreation area adjacent to the Youth Center

CHARACTER

This area has little in the way of character. A vision wall screens the retention pond and the field to the north. It contains gravel and minimal plant life

ASSETS

**Buildings**

- No buildings exist in this area

**Landscape**

- No assets

**Site Elements**

- No site elements provided in this area

LIABILITIES

**Buildings**

- No buildings exist in this area

**Landscape**

- Area lacks plant life
- Area consists of only gravel

OBJECTIVES

**Site Elements**

- Area lacks site amenities such as benches, lighting, and jogging trails.
- This area should tie the proposed extension of Area 2 which traverses north and south on the west side of Litchfield Road with the recreation area adjacent to the youth center (Area 4)
- Provide a jogging trail, benches, trail lighting and exercise stations along the trail
- Plant Indigenous trees and shrubs
- Provide drip irrigation system



LOCATION

Open Space Area 4 is located adjacent to the Youth Center in the northwest corner of the Capehart housing area

CHARACTER

This area is a recreational softball playing field with field lighting and grass fields

ASSESTS

**Buildings**

- No building exist in this area

**Landscape**

- Grass

**Site Elements**

- Softball fields

LIABILITIES

- Ball field lighting
  - Parking
  -
- Buildings**
- No buildings exist in this area

**Landscape**

- No perceived liabilities

**Site Elements**

- Wood light poles

OBJECTIVES

- No recommendations



## SECTION 6 SITE ELEMENTS

### SITE DEVELOPMENT

Site development needs should be thoroughly evaluated with the highest value placed on pedestrian circulation, orientation, safety, and accessibility requirements.

Site design should provide developed outdoor spaces for passive and active needs. Pedestrians should be provided with outdoor areas where they can meet during lunch, and after work periods.

### CIRCULATION

#### **Vehicular Access**

Provide access to facilities from secondary (collector) streets to reduce congestion associated with main arterial streets. Where possible, divide main entrances with landscaped traffic medians between entry and exit lanes. Because of the high volume of traffic using the entrances, the width of non-divided entrances should be a minimum of 24 feet.

#### **Fire Protection and Force Protection Setbacks**

Site all buildings no less than the prescribed distance required by fire protection or force protection guidance, whichever is greatest, from the closest adjacent building. Provide access to fire protection vehicles from three sides. Obtain width, weight, and turning radii of fire fighting vehicles from the base fire department.

#### **Service Vehicles**

Design access streets and parking areas to accommodate service vehicles and fire protection equipment. Where interior court areas are proposed between adjoining buildings, consider designing the main pedestrian walks to accommodate service and fire protection vehicles. As an example, the minimum width of such walkways should be 8' wide and should be constructed using reinforced concrete to accommodate medium weight vehicles. Consider treating the walkways with interlocking pavers to minimize the negative impact of the wider access route.

### **Pedestrian Circulation Systems**

Sidewalks, plazas, and covered walkways should be an important element of any new project. Due to the emphasis on vehicular circulation, Luke does not present itself as a "pedestrian friendly" base. Sidewalks should be separated from vehicular traffic wherever possible. Walkways to building entrances should be 8' wide. All other sidewalks are typically 6' wide. Design and grade sidewalks to provide barrier free access to the first floor of all buildings and to any associated outdoor use areas. Provide corridor connections to other functional areas of the base with pedestrian circulation systems. Consider developing jogging/biking trails as part of the site development.

### **Passive Outdoor Areas**

Plan all facility developments to provide outdoor passive and/or active use areas. Design pavilions as an integral part of the complex. The pavilions should compliment the architectural style and materials of the adjacent buildings. Compliment these areas with additional amenities such as barbecue grills, tables, benches, lighting and landscape plant materials.

### **Service Entrances**

Separate service entrances associated with mechanical rooms or mechanical enclosures from parking areas.

### **Bicycle Paths**

Bicycles comprise an alternate form of transportation at Luke Air Force Base, but must compete with motorized vehicles and pedestrians for roadway space. Bicycle paths are needed to allow safe movement by bicycle to all major areas of the base. This path system should be isolated from motorized vehicles wherever possible. Where space does not allow a separate route, existing roadways should be widened and striped to designate a dedicated bike route. In some areas, bike paths can be successfully combined with jogging paths. When this is done, a 6 foot wide asphalt bike path is routed along side a finely crushed gravel jogging path of equal width. Careful attention should be paid to curb cuts where bike paths intersect with walks or roadways.

## PARKING LOTS

### Guidelines

Vehicle parking areas consume more site space and impact more on the physical environment than any other site feature. Paving increases storm water runoff, results in increased reflected and absorbed radiation, and raises the ambient air temperature of the surrounding area. Parking areas also result in reflected sun glare off vehicles, increased air pollution, and concentrated contamination of runoff from leaking oil and antifreeze. Much of the parking at Luke Air Force Base consists of a combination of perpendicular and angled on-street parking. These parking configurations present a direct conflict with pedestrian traffic in the many areas where no sidewalk is present. Wherever possible, this type of parking should be discouraged in favor of dedicated, "pedestrian friendly" parking lots. Parking lots should clearly remove vehicles from the street, are well lit, and include convenient walkways from the parking spaces up to the main entry of the building.



Grading can potentially create a transition zone within parking areas, between parking and buildings, and between multiple groups of facilities.

Many of the negative impacts of parking areas can be mitigated or lessened by improved design techniques. Tree planting in islands between rows of parking intercept reflected radiation, visually breaks up the mass of paved surface, and

provides shade for vehicles. Properly located, the traffic islands also can provide safer pedestrian circulation.

### **Parking for Persons with Disabilities**

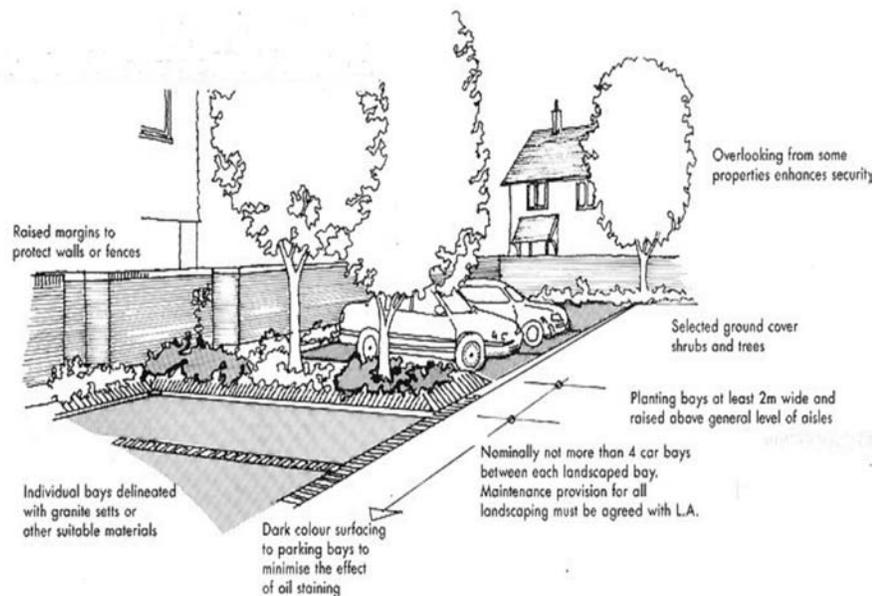
Provide handicap parking spaces in accordance with the Uniform Federal Accessibility Standards and the Americans with Disabilities Act Accessibility Guidelines. Locate these parking spaces to provide the most convenient access to the building entry.

### **Motorcycle Parking**

Construct areas designated for motorcycle parking of reinforced concrete to prevent motorcycle stands from sinking into asphalt concrete parking areas.

### **Bicycle Parking**

Many different designs of bicycle racks are found around the base, widely varying in design, utility, and quality. Provide lockable bicycle racks for all facilities where personnel have bicycles. Provide all bicycle parking on concrete surfaces adjacent to sidewalks. Consider enclosed bicycle lockers, which maximize security and minimize visual clutter. Such lockers can be purchased with equipment funds.



*Typical Communal Parking Area*

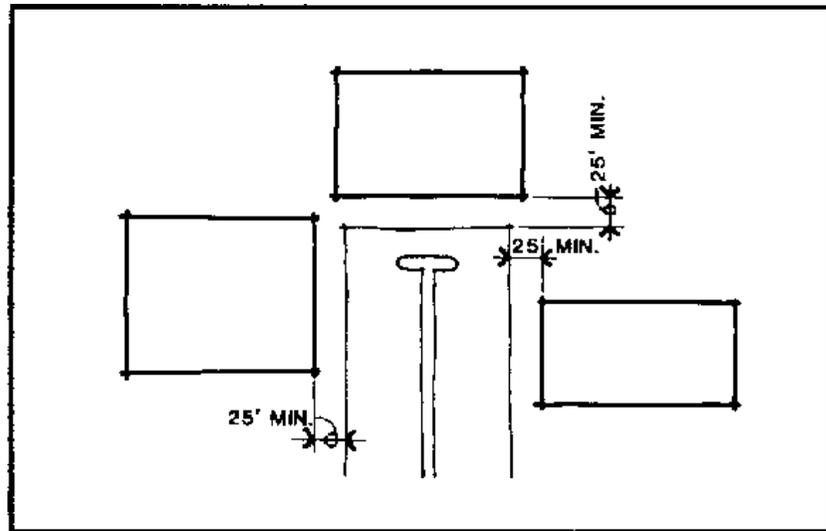
Automobile parking is a dominant visual element in many parts of Luke Air Force Base. Parking areas have often been handled in an incomplete manner, with poor relationships to streets or building entries, lacking landscaping and other improvements.

Having an adequate number of parking spaces in a convenient location is obviously a concern at Luke Air Force Base. A base-wide parking needs assessment study should be initiated.

### **General Design Criteria**

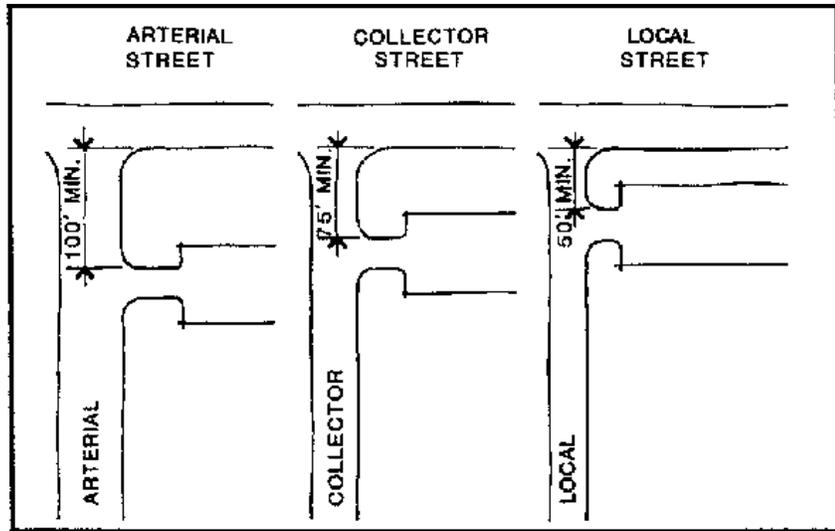
Parking lots should be placed on the site in a location that allows for sufficient quantity of spaces and potential future expansion. The quantity of vehicles accommodated should be in response to the facility size and intensity of people using the facility. Parking lots should be designed based on the following criteria:

- Typical parking stall 9'x19'. Compact parking 7.5'x15'
- 90-degree spaces and two-way traffic aisles are encouraged.
- Provide handicapped parking as close to the accessible entry as possible. One handicap stall for each 25 spaces up to 100, 1 per 50 up to 200, and 1 per 100 up to 500. One in every 8 handicap stalls should have an 8-ft side aisle for van parking. All other handicap spaces should have 5-ft side aisle.
- Loading dock parking: 10'x 35'x14' high;
- One-way drives with no adjacent parking: 12' wide.



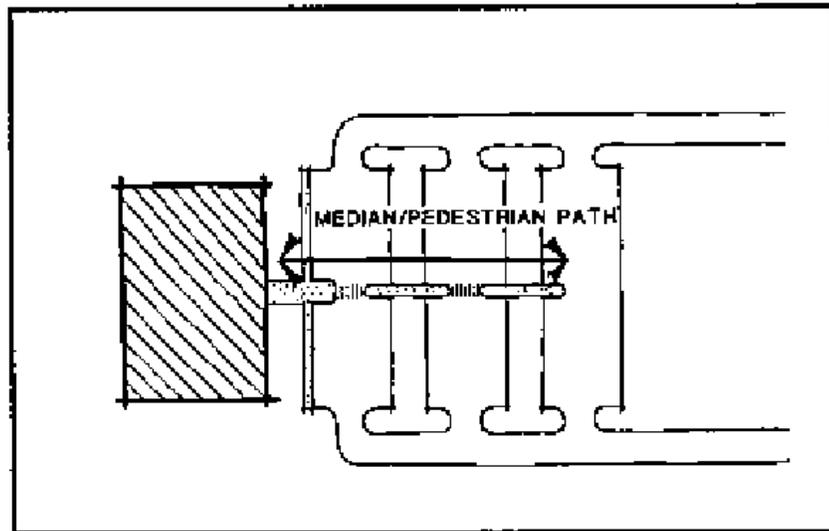
*Parking Lot/Building Separation*

- Two-way drive with no adjacent parking: 18' to 24' wide.
- Recommended pavement slope: 1 to 5%.
- Primary walks: 6' to 10' wide.
- Secondary walks: 3' to 6' wide.
- Walks adjacent to parking areas with overhanging car bumpers: 6' minimum.
- For initial planning purposes, a planning factor of 400 gross square feet per authorized space should be used. This gross area factor includes parking spaces, drives and walks.
- Parking lots should be located to maximize sharing with other related facilities.
- Whenever possible, parking lots should be designed as a series of smaller lots rather than as large unbroken areas.
- Parking lot layouts that promote cross-traffic between parallel streets should be avoided for safety reasons.
- Parking lots should be separated by at least 25' from all adjacent buildings by a buffer area to provide space for safe pedestrian access and landscaping.



*Access Drive Separation*

- The lot design should emphasize building entries by the alignment of landscape median/pedestrian paths leading to each main building entry.



*Pedestrian Circulation at Parking Lots*

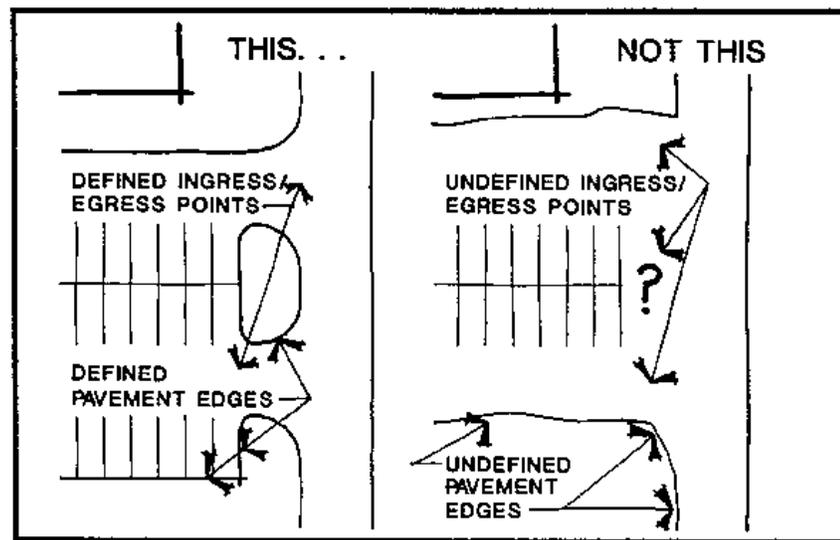
- On-street, head-in parking that would require backing of a vehicle onto any street should not be permitted. The design and construction of on-street parallel parking should be limited to family housing areas.

### **Parking Lot Definition**

A common problem observed in many hard-surfaced areas is the lack of edge definition. Undefined traffic flow patterns are a significant visual liability and safety hazard. Parking lot

design should include the following:

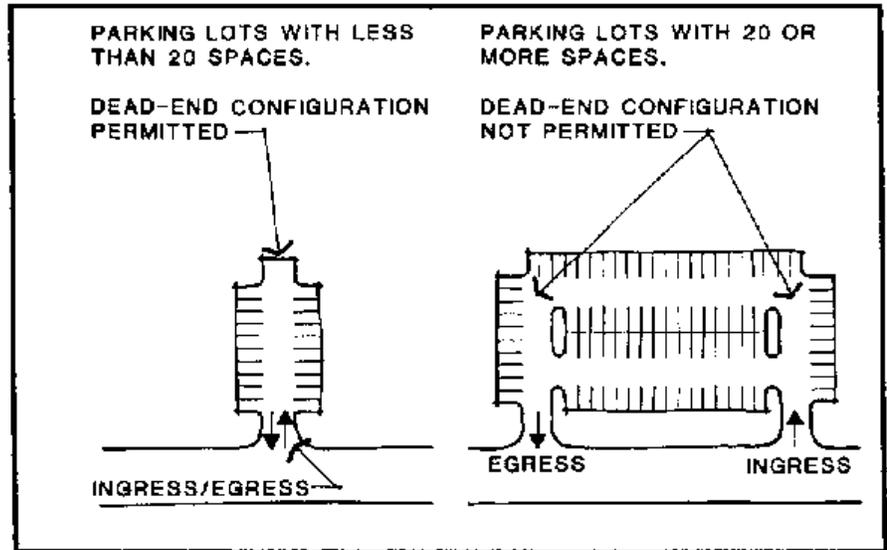
- Clear visual communication of vehicular functional separations.
- Points of ingress and egress that are adequately defined.
- Visually reinforced edges that present a clean, orderly appearance, eliminating significant safety hazards, with transitional landscaped areas between parking lots and adjacent buildings.



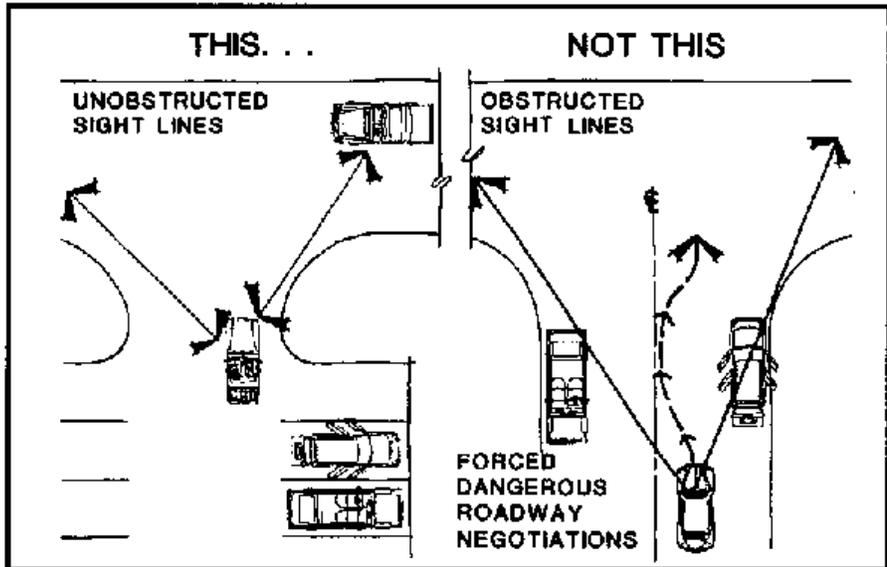
*Edge Definition*

Two principal parking arrangements are permitted on the base. The preferred arrangement is off-street lots containing no more than seventy-five (75) to one hundred (100) spaces comprised of a series of smaller lots connected by an external perimeter access drive.

- If required by site limitations or high rate of turnover, 60-degree spaces may be used with one-way traffic aisles. Use only one orientation within a single parking lot to avoid potential confusion and conflicts.
- Dead-end parking lots should be avoided for lots exceeding twenty (20) spaces. If additional access (ingress/egress) drives cannot be provided for larger lots, convenient interior circulation should allow for easy maneuvering of vehicles. Typically, two access drives should be provided for lots exceeding twenty (20) spaces.



*Dead End Parking Lots*



*Avoid On-Street Parking*

- The perimeter edges of all parking lots, access drives, and interior "islands" and "peninsulas" should be physically separated from adjacent surfaces by a continuous concrete curb with integral gutter. The curb should have a vertical face (barrier) configuration with a minimum height of six inches (6'). The use of "rolled" or similar type curbs should not be used as they permit uncontrolled vehicular access to adjacent landscaped areas.

## GRADING

All parking spaces and pedestrian cross-walks should be marked with white stripes of paint or applied vinyl coatings. Red or yellow markings should be used for safety purposes only and should be kept to a minimum. All lines should be four inches (4') wide.

Grade the site to achieve an orderly transition from the point where personnel enter the site by automobile or on foot to the point where they are at the first floor elevation. Site grading should consider the impacts of the parking area, the building, bus-stop shelters, sidewalks, outdoor passive use areas, mechanical equipment and trash dumpsters. Where appropriate, use grading to control the negative impacts these man-made facilities have on the visual environment, such as shielding trash dumpsters, etc. See the discussion of landforms below.

### **Establishing the Finished Floor Elevation (FFE)**

Establishing the finished floor elevation of buildings is one of the more important aspects of site planning. The FFE affects grading, cut and fill, visual impact of the facility and interior-exterior transitions. In addition, the FFE has a significant impact on the landscape architect's ability to effectively introduce plant materials into the new environment. When the approach is to "level the site" without sensitivity to other demands, the results often are catastrophic, resulting in barren sites lacking visual interest. The landscape architect, architect and civil engineer should work closely together to achieve the most optimal design results. Even though Luke Air Force Base is essentially flat, there are still many opportunities to incorporating creative grading techniques.

### **Storm Drainage**

The successes and failures of site planning rely heavily on the designer's ability to facilitate drainage. Depending on the geographic location and the availability of nearby subsurface storm drains, provide underground storm drainage for each complex. All site water should either be intercepted in drop inlet structures or be designed to drop directly into a subsurface system. If subsurface storm drains are not available at the proposed site, then program them as part of the building project. Provide for retention and erosion prevention. Do not discharge water from downspouts onto splash blocks. Provide for drop inlets as necessary to intercept surface runoff and prevent walkways from being

flooded.

### **Landforms**

The landscape architect and the civil engineer should work together to use landforms to soften the impact of parking on the landscape. Use landforms such as mounds and swales in conjunction with landscape plant materials to soften or obscure parking areas and utilities, provide spatial articulation, and enhance drainage structures or surface water retention areas. Use landforms to add interest and diversity to the project. In particular, landforms can perform an important function around outdoor activity areas by screening undesirable views.

## SIGNAGE



### **Guidelines**

Signs are most effective when they are part of a total orientation system that includes base maps, street signs, building signs, and guidance from gate personnel. An effective orientation system is logical, easy to follow, and leads the visitor from the point of entry to the desired destination with no confusion.

In order to design an effective orientation system, the following points should be considered. Identify each decision point with a sign that clearly indicates the options. Keep names of destinations consistent throughout the system,

including the names on maps and the names used by security forces when they are directing visitors to points on base. Do not provide more than four destinations per sign.

Do not omit a destination from a series of direction signs until that destination is reached. A sign series leading a visitor to a particular building should culminate in the building identification sign.

It is important to minimize the number of signs on base. A primary objective of a sign system is to reduce the number of signs and eliminate the visual clutter that results from over-signage. Locate signs only where they are absolutely needed to provide orientation. As a general rule, provide one sign for each building. The number of directional signs can be minimized if the streets are properly identified in accordance with the Federal Highway Administration's Manual on Uniform Traffic Control Devices, and if good base maps are made available at entry points.

Signs are an important part of the impression made by a base. Use signs of high quality design and construction in order to present a professional image for both the Air Force and Luke Air Force Base.

Air Force Pamphlet 32-1097, *Sign Standards* sets standards for identification, direction, regulation, morale, and information signs, street address signs, base destination signs, parking regulation signs, and interior signs.

The Americans with Disabilities Act and the Federal Highway Administration's Manual on Uniform Traffic Control Devices are national standards for sign design and traffic control device placement.

### **Sign Control Group**

The base should establish a sign control group to review and approve sign needs, design, and placement. The group should include representatives from the civil engineer squadron and security forces.

### **Master Sign Plan**

The first step in implementing an effective sign system on base is the development of a Master Sign Plan that shows the location and content of every proposed exterior sign. It is the key to an efficient, attractive, and cost effective sign system. The plan should be developed before any new signs are procured, since it will enable construction and placement of new signs to be prioritized, coordinated, and streamlined.

The Master Sign Plan has two components: a sign site plan and a sign schedule. The engineer preparing the plan should become familiar with all the Air Force sign types and their functions. A Master Sign Plan should not be prepared without touring the base, since a location which looks clear on a base plan may actually be hidden by vegetation or other obstacles. The sign schedule will show the sign number, sign, type, exact message, and will reference the appropriate structural details.

As the signs are manufactured and installed, the information in the Master Sign Plan should be transferred to base sign inventory sheets in accordance with the two manuals Highways for National Defense and Development and Maintenance of Traffic Control Device Inventories for DoD Installations. This information will be used as the basis for maintaining and updating signs in the future.

### **Observations**

- Direction signs for vehicular traffic and information signs for pedestrians are needed to help with orientation in moving about the base.
- Most identification signs for buildings are uniform in design, but are not located at all buildings and are inconsistently located relative to the street and the facility.
- A simple, coordinated, and well-designed sign system can be one of the most effective elements in unifying the visual appearance of the entire base.

## LIGHTING

### Site Lighting

Site lighting is an integral part of any building project to ensure occupants have a means of safely moving between outdoor spaces. Several types of street lighting exist at Luke AFB, ranging from modern aluminum pole fixtures with multiple lamps near the flightline to decorative traditional single lamp street light fixtures along Thunderbird Road in the housing area. Security lighting should be mounted on buildings wherever possible to reduce the number of poles. Energy-efficient, high-pressure sodium lamps with color correction ensure optimum visual acuity and are recommended for energy-conscious site lighting.

Provide adequate site lighting at any point where there is a change in grade requiring steps, near handicapped and motorcycle parking areas, and near main entrances to buildings. A lighted sign may be appropriate for night visitors. Use the recommendations of the IES Lighting Handbook to establish illumination levels.

Streetscape lighting should be standardized throughout the base to one or two types and styles. Consider both compatibility and durability.



In general, use overhead lighting in lieu of low level lighting, as it more efficient and economical. Wide spread down lights are the recommended at standard height of 2 to 4 meters above grade for walkways. Fixtures should provide an overlapping illumination pattern of approximately 2 meters. Streetscape lighting should be mounted on individual standards, and not on the exterior or of facilities.

Sight hazards such as steps, ramps and steep embankments should be illuminated with a combination of low level and high level lighting.

Set parking area lighting at a standard height of 9 to 15 meters above grade.

Trees and landscaping should be considered in lighting distribution, as they can negate lighting levels.

## UTILITIES

The site planner should develop underground utility corridors in coordination with the base community planner, electrical, mechanical, and civil engineers. Size corridors to accommodate future expansion. Locate utility corridors away from mature trees no closer than one and one-half times the crown width of the trees in question or 10.7 m (35 feet), whichever is greater. Locate utility corridors to allow for future street tree plantings. Consider using pipe tunnels and trenches. Some of the electrical distribution system at Luke Air Force Base is located overhead. Reliability, serviceability, and aesthetics can be enhanced by placing utilities underground. To economize the expense of excavation, placement of utilities underground should be included with any drainage projects or building renovations.

Utilities should be located away from the primary elevations of buildings. In all cases utilities such as propane tanks, fuel oil tanks, lift stations, electrical transformers, garbage receptacles, etc., should be screened from public view. Screen with masonry walls of the same color and materials as surrounding buildings. Top masonry walls with a pre-cast concrete cap. Provide an additional screen of vegetation around the masonry wall where possible.

Electrical substations should not be located at prominent positions on the site, such as at or near the primary building elevations, near entranceways or other areas of public view.

Construct screening of the same materials and colors as surrounding buildings, and provide plant screening.

Access to services and utilities should be at the site perimeter. If site entry is required, it should be scheduled on an irregular basis and accessible through the pedestrian pathways. All heavy vehicle access such as dining facility service by semi-trailer trucks should be at the perimeter of the site.

This guideline provides the overall approach for a comprehensive utilities system of exterior spaces at Luke Air Force Base. The concepts below are presented to help correct deficiencies noted during that phase.

### **Utility Structures**

Similar to site lighting systems, utilities are by nature a linear site system. Since they service virtually every building within the installation, there is the potential for major positive visual impact. The above ground telephone and power supply utilities have a negative impact on the visual environment.

Utility “point location” items add visual clutter to the overall environment. Structures in this category include, but are not limited to, the following:

- Electrical substations
- Sewage lift stations
- Water well pumps, storage tanks and/or related structures
- Building-related mechanical/electrical equipment
- Gas piping, meters and similar incidental items
- Above ground fuel storage tanks
- Any ground-mounted free-standing utility item exposed to view and not located within a building

The visual impact of these items should be diminished through a combination of careful placement, screen walls, landscaping and painting. Larger structures such as electrical substations, sewage lift stations, fuel storage tanks and mechanical/electrical equipment should be screened from view, using materials, forms, and colors in the screen walls which match those respective design elements present at adjacent buildings. Smaller items such as incidental above-ground piping, should be painted warm gray , with a matte (low-luster) finish, to reduce their visual impact. These facilities cannot always be hidden; however, a common color

palette will help to reinforce an overall continuity and integrated visual image.

### **Service Lines**

Overhead telephone and electric service lines are generally a prominent visual liability on military installations. Luke Air Force Base has avoided this problem by burying the majority of these lines. This is a definite visual asset which should be recognized and commended.

Items in this category include, but should not be limited to, the following exposed lines:

- Electrical power grid and service lines
- Telephone lines
- Cable TV lines
- Communications lines
- Exterior lighting service lines
- Any similar system of above ground lines serving Luke Air Force Base

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The visual impact of these items should be eliminated by installing them underground. The lines may be direct-buried or may be consolidated and enclosed in underground utility corridors.

### **SITE FURNISHINGS**

The selection of site furniture and signage is similar to putting "icing on the cake". Along with the landscape development, it gives the project a finished appearance. Site furniture and signage that is in harmony with the architectural style of the facilities compliments the base, makes the outdoor spaces more usable, and appear more organized. Poorly selected or poorly placed site furniture and signage can result in major disharmony, drawing attention away from otherwise superbly designed site and building features. The landscape architect should coordinate the selections with the architect and interior designer to ensure smooth transitions are made in the procession from within the building to the outdoors and vice versa. Effective transitions are achieved when building materials, colors, and design details from the building are incorporated into paving materials, signage and site furnishings. Luke Air Force Base should standardize such items as benches, trash receptacles, etc., and not allow the uncontrolled placement of unrelated site items.

Site furniture consisting of bollards, landscape lighting, outdoor seating, trash receptacles, tree grates, bicycle racks, and water fountains play an important function in unifying the features of a project. These features, properly coordinated and integrated with architectural styles, colors, and materials provide the basis for a fully integrated design. Site furniture selections should be composed of unifying elements, which relate well with each other.

The appropriate selection of site furniture can encourage use of an open space. Off-the-shelf commercial site furniture should be used where appropriate when the product fulfills compatibility requirements and meets base-wide standards for site furniture.



In cases where trees are proposed in outdoor paved areas, tree grates should be used to provide a maintenance free planting environment and protection of new trees. Selection of tree grate style, design, and color should be coordinated with other site furniture needs. Likewise, tree grates provide a continuum of the ground plane without an uneven surface hazard. Trees planted in these environments also require special subsurface anchoring requirements since they provide no above ground obstacles for site users.

TRASH  
DUMPSTERS

While trash dumpsters should have convenient access by the users and by large trash handling trucks, they should be located in areas away from main entrances. Screen trash dumpster locations with any combination of hard wall materials, earth forms and landscaping to reduce their impact. Where hard wall materials are used, the materials should compliment the materials used in adjacent buildings and other outdoor facilities.

MECHANICAL  
ENCLOSURES

Screen mechanical equipment such as chillers, evaporating condensers, switchgear, and electrical transformers. Architectural screening materials should compliment the architectural style and the materials used to construct the building. Use landforms and/or landscape plantings to screen objects in the landscape that do not require enclosures. They should be screened with landscape plantings rather than with a screenwall.

PAVING

Site paving consist of a variety of needs ranging from automobile circulation requirements to pedestrian traffic ways. Distinct paving materials should be used to accentuate pedestrian traffic patterns to warn drivers of vehicles of potential pedestrian use. Use of modular pavers provide an economy in making below grade repairs at a later date.

Selection of site pavers should accent main entry areas, direct the eye to focal points, compliment architectural colors and materials, and carry pedestrians from one point to another. In addition, modular pavers should be used as base-wide elements to replace marked crosswalk areas.

COLOR

Some site items such as fire hydrants, curbs, manhole covers, valves, headwalls, etc. are often painted bright colors such as reflective white, red and yellow for ready identification. While this is usually based on tradition rather than necessity, it usually is not required on an Air Force installation where maintenance, security forces, and fire department personnel are intimately familiar with the location of these items. Many items such as concrete curbs and headwalls, or manhole covers should not be painted at all. Items such as these that do require painting should be painted a warm gray color so that these items recede into the landscape and are less obtrusive and noticeable. (See Utility section above)

FOCAL POINT  
FEATURES

Where appropriate, provide a limited number of focal point features on the Base. Examples include a monument,

fountain, clock tower, or a piazza with a sculpted symbol. A focal point feature could be provided for the community center, child development center, or wing headquarters.

#### FENCING, WALLS, AND SCREENING

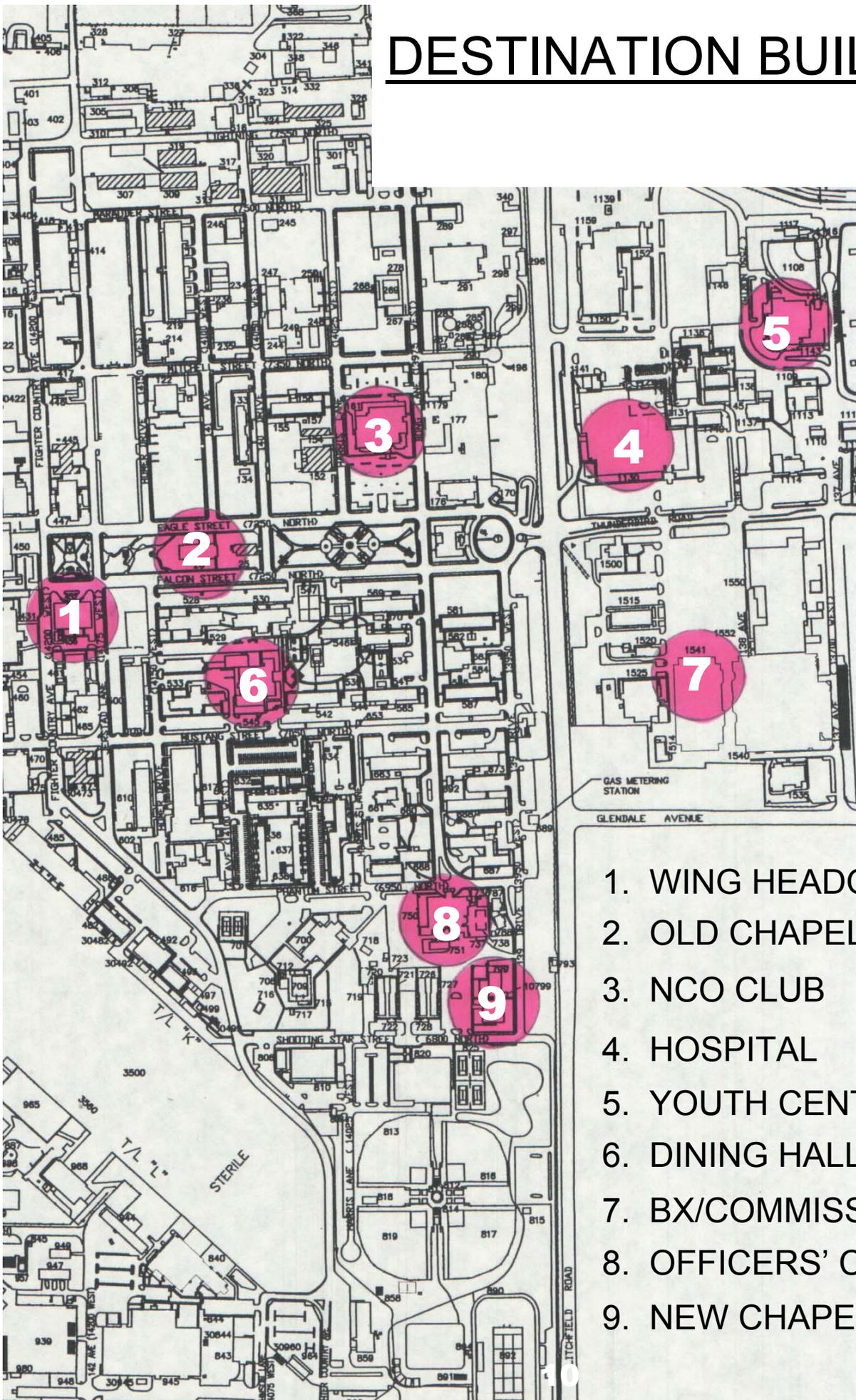
Different types of fencing are found at Luke Air Force Base in a variety of designs and constructed from a variety of materials. This should be reduced to only a few base standard fences. Separate but similar fence standards should be set for general purpose containment fencing, screenwall fencing in the housing area, base perimeter security fencing, ball field and playground fencing, and fencing used in areas other than housing where objectionable views require screening.

#### FABRIC STRUCTURES

Luke Air Force Base has a need for additional shade. An excellent way of achieving this is with high quality tent structures. Not only are these structures great shading devices, they can also introduce color to plaza areas. This practice must be carefully controlled, and must conform to a uniform standard. Individual organizations should be prohibited from purchasing such structures with their own funds without approval from those charged with enforcing the installation's architectural compatibility standards.



# DESTINATION BUILDINGS



1. WING HEADQUARTERS
2. OLD CHAPEL
3. NCO CLUB
4. HOSPITAL
5. YOUTH CENTER
6. DINING HALL
7. BX/COMMISSARY
8. OFFICERS' CLUB
9. NEW CHAPEL

# VISUAL DISTRICTS

