AIR COMBAT COMMAND

U.S. AIR FORCE

Installation Development and Design (ID2)

[Offutt Air Force Base, Nebraska]

Air Force Weather Agency, Offutt AFB

ID2

26 July 2011

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[1.1] Document Scope - Applicability and Audience

HQ ACC/A7P

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

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

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

Applicability

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

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

The ID2 shall be referenced in all Design and/or Construction solicitations to inform Contractors of its existence, and to ensure that the goals underlying the ID2 are incorporated into all new projects. This reference should inform Contractors that the ID2 document does not mandate facility aesthetics, character, or form, but rather that it contains broad design considerations relative to the Installation's built environment. The reference should include a statement that the Contractor's responsiveness to these considerations is an important evaluation factor when reviewing proposals, as well as subsequent design submittals.

Audience

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

[1.2] Development and Design - A Holistic Approach

HQ ACC/A7P

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

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

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

Installation History

Offutt AFB's storied history begins with the construction of Fort Crook between 1894 and 1896, some 10 miles south of Omaha and two miles west of the Missouri River. The new post's namesake was Maj. Gen. George Crook, a renowned Indian fighter and Civil War hero who commanded the forces to which Apache War Chief Geronimo surrendered in

1896. Many of the original structures built on the post before 1900, including the guardhouse and various enlisted and officers' quarters, are still in use today.

The 61st Balloon Company became the first air unit to command the post on September 10, 1918. In the spring of 1921, the plowing, leveling and seeding of 260 acres of land at Fort Crook created a field suitable for frequent takeoffs and landings, and a refueling point for military and government aircraft on cross-country flights. The flying field was designated Offutt Field on May 10, 1924 in honor of 1st Lt. Jarvis J. Offutt. Lieutenant Offutt was killed while flying with the Royal Air Force in France and was Omaha's first World War I air casualty.

In late 1940, the Army Air Corps chose Fort Crook as the site for a new bomber plant. The plant's construction included two 2-mile long concrete runways, six large hangars, and a huge 1.2 million square foot aircraft assembly building. Production operations began under the Glenn L. Martin Company in January 1942, with the plant reaching full-scale production on June 8, 1942. A total of 531 B-29 Super fortresses and 1,585 B-26 Marauders were built at the Martin-Nebraska bomber plant before the end of World War II. These aircraft include the Enola Gay and Bock's Car, the two B-29's that dropped the atomic bombs at Hiroshima and Nagasaki, Japan. Production ended on September 18, 1945, when the last B-29 rolled out of the assembly building.

In June 1946, the Army Air Force redesignated Fort Crook and the Martin-Nebraska facilities as Offutt Field. Just 18 months later, on January 13, 1948, Offutt Field was transferred to the new Department of the Air Force and became Offutt Air Force Base.

At one minute past midnight on November 9, 1948, Offutt gained international prominence when it became the host base for Headquarters, Strategic Air Command (SAC). Air Force Secretary Stuart Symington chose to base the Air Force's crucial long range atomic strike force at Offutt primarily because the base was centrally located on the North American continent, placing it well beyond the existing range of potentially hostile bombers or missiles.

The old frontier post underwent startling changes in the Cold War years that followed World War II. Operations at Offutt AFB included the basing of alert bombers and tankers in the late 1950's and 1960's; support for intercontinental ballistic missile sites in Nebraska and Iowa in the 1960's; and worldwide reconnaissance from the mid-1960's to the present.

The establishment of the Joint Strategic Target Planning Staff in 1960, the Looking Glass airborne command post in 1961, the activation of the Air Force Global Weather Center in 1969, and the arrival of the National Emergency Airborne Command Post mission in 1977 further enhanced Offutt AFB's military significance.

Offutt AFB's population and facilities have grown dramatically to keep pace with increased operational demands. Several new dormitories and over 2,000 family housing units, built in the late 1950's and 1960's under incremental Wherry and Capehart projects, replaced the early quarters of Fort Crook.

Headquarters SAC moved from the Martin-Nebraska bomber plant to Building 500 in 1957. New base facilities in the 1960's and 1970's included a hospital, main exchange, commissary and library.

The 3902nd Air Base Wing was inactivated March 1, 1986, and the 55th Strategic Reconnaissance Wing assumed host unit responsibilities.

Increased defense spending in the 1980's brought additional operational improvements including the wing's special operations building, the Bennie L. Davis Aircraft Maintenance Complex, and a new underground command center for Headquarters SAC.

Offutt AFB again faced monumental changes in 1992 when the easing of world tensions allowed the United States to reorganize its Air Force. The Strategic Air Command was disestablished here June 1, 1992, and the new, unified command, U.S. Strategic Command, was activated.

With this historic change, the operational control of Offutt AFB became the responsibility of Air Combat Command, another of the Air Force's new commands. The former Army outpost, once hard pressed to support a few hundred soldiers, marked the turn of the century with the resources and facilities to accommodate a combined military and civilian work force of approximately 12,000, while supporting nearly 20,000 family members.

Installation Development and Design

This Installation Development and Design (ID2) guide is intended to provide overall direction regarding future development and definition of the base areas and buildings at Offutt AFB. Included are principles of design that will give order and functionality to the built environment. Sustainable design principles are foremost in the list of criteria that are being emphasized in this guide, and these principles will strongly influence building design and aesthetics.

Offutt AFB has several unique characteristics which define both its future limitations and potential at the same time. The Base is an outgrowth of an old US Army post from the 19th century, Fort Crook, which later incorporated an airstrip, a number of hangars, and a large bomber manufacturing plant for the Martin Company, all built before or during World War II. The original Fort Crook area of the Base consists of historic buildings surrounding an expansive parade ground *(see Figure 1.1)*, with the entire area on the National Register of Historic Places. This historic district is therefore protected and must be maintained in its current state *(see Figure 1.2)*.

The main portion of the Base houses the mission-related facilities. This part of the Base is rather small compared to most Air Force bases, and space is at a premium. There is a state highway on one side, a residential neighborhood on another side, and two railroads bordering the other boundaries of the Base. There is a potential expansion area located on the south end of the Base; however, this land is less than ideal due to the potential for flooding (it could serve as parking or recreation fields in its current state, but building use would require raising the finished grade). All of these factors place a high priority on wise utilization of the Base's current land.

Figure 1.1
Parade Ground

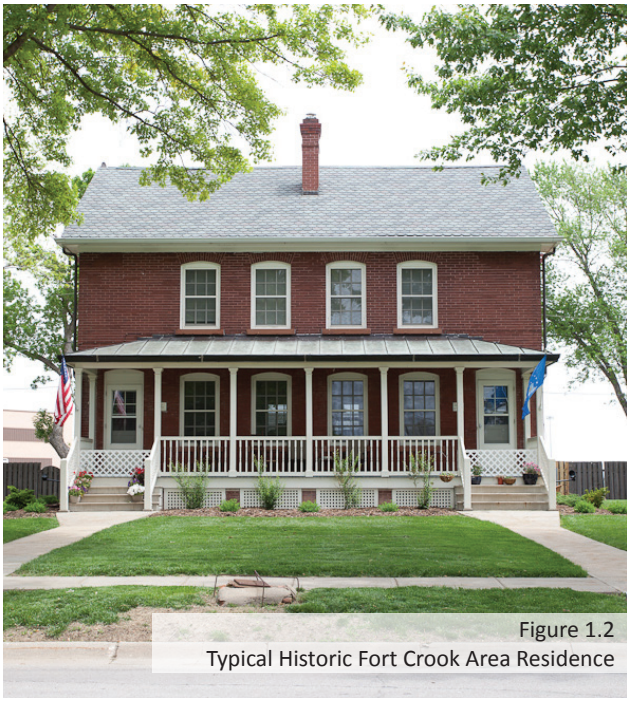


Figure 1.2
Typical Historic Fort Crook Area Residence

A major physical expansion of Offutt AFB is unlikely due to adjacent urban areas and natural resource constraints east of the Base.

There is a distinct separation of family living areas relative to the mission area. The housing is located in the Rising View Community Housing in the Capehart area, which is about a mile away from the main base. The majority of the family housing, the medical clinic, temporary lodging facilities, a convenience store, one of the two chapels, the 18-hole golf course, the youth center, one of the child development centers, the theater, and the two elementary schools all are part of this separate family housing area. This part of the Base will be gaining some open land area in the near future. The housing privatization which is underway will consolidate family housing, leaving two large tracts of vacant land available once the demolition of existing housing is complete. There are many possibilities for the development of these land areas. One of the main areas of focus is to work toward moving all remaining community service-type functions to this area of the Base to free-up land for expansion of mission-related facilities on the main base. Candidates for relocation would be the religious center, library, education center, bowling center, and consolidated club.

The main base is bisected by the runway, with two distinct mission areas located on either side. While on base, there is only one pathway to use to travel between the north and south sides of the runway.

This path is well-traveled and becomes a real lifeline between the two halves of the Base *(see Figure 1.3)*. Ensuring that this critical roadway can adequately handle on-base traffic is important. Upgrading this roadway to a 3- or 4-lane section should be a priority to ensure it can support Offutt AFB's internal circulation needs.

This Base is located at a communications crossroads in the center of the country. The original Strategic Air Command played a significant role in bringing abundant communications infrastructure to Offutt AFB. Partly because of this ability to receive large encrypted intelligence feeds, there developed on this Base an expertise in CISR, or Communications, Intelligence, Surveillance, and Reconnaissance. The main mission of the 55th Wing, the host group at Offutt AFB, is surveillance and reconnaissance. U.S. Strategic Command Headquarters, or USSTRATCOM *(see Figure 1.4)*, is the major tenant at the Base, along with the Air Force Weather Agency (AFWA) Headquarters. Both host and major tenants are heavily involved in information/data transport and processing. Because of the existing emphasis on CISR, along with the Air Force's goal of replacing personnel on planes with personnel on the ground connected to the planes, the Base foresees its future as catering to the training and operations of the intelligence community. There is an area of the Base on the south side of the runway that is ideal for a "campus" style grouping of similar CISR facilities that could be attracted to Offutt AFB in the future. Also there is another prime area just south of the historic core of the Base that would be a good location for another MAJCOM or major tenant.

Offutt AFB is located in a populated area of Sarpy County, the fastest growing county in the State of Nebraska, and is tasked with keeping a vigilant outlook to protect its airspace. Maintaining the required flight paths and still allowing development

Figure 1.4
U.S. Strategic Command Headquarters

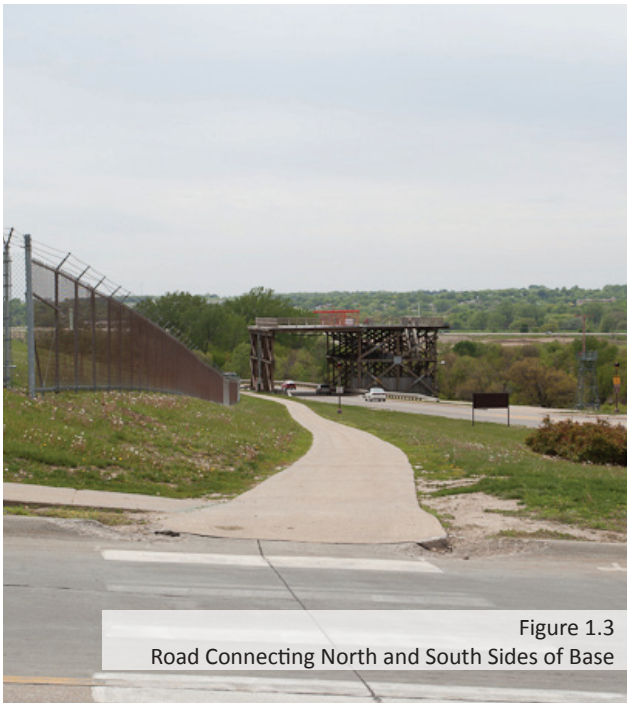


Figure 1.3
Road Connecting North and South Sides of Base

growth in the area is a challenge that will be facing the Base in future years, and may best be addressed at the state, rather than local, level. A state committee, similar to committees at other Air Force Bases, could weigh the needs for continued private development and increased tax base with the requirements of an active flight line, and could render decisions free from local politics. Despite this, there is a synergy between the Base and the community that makes the presence of the Base a win for the community and vise versa. The Bellevue gate is the visible and actual connection to the Bellevue community, and this conveys a valuable image to the public.

There is a new highway bridge under construction over the Missouri River a few miles south of the Base. There are a number of Iowans who work at Offutt AFB, and this will provide another route for them to access the Base. Harlan Lewis Road, which runs along the eastern edge of the Base, will be improved as part of the new highway bridge project. This may provide an impetus to consider an additional gate on the east side of the Base to relieve traffic and congestion at the other gates, especially the STRATCOM Gate.

The Base has a lake on its eastern side, which collects runoff from the eastern portion of the Base. This runoff normally flows into the lake, which then discharges any overflow into the Missouri River, about a half-mile away. In recent years the lake has experienced an infestation of zebra mussels, which has prevented any discharge of overflow into the river,

Figure 1.5
Building 44 - Heritage of Masonry Buildings

resulting in localized standing water in low areas of the Base. However, even after the zebra mussel issue is resolved, a more robust storm drainage system is required for the eastern portion of the Base. This could take the form of improvements to the existing ditch on the west side of Harlan Lewis Road which connects to an existing drainage ditch that flows to the Missouri River, or possibly the installation of a lift station to pump water to the drainage ditch. The entire system needs to be studied in-depth to determined how best to correct the situation. This is an important improvement to the Base that is necessary to assure that the Base and airfield can fully operate without being hampered by drainage issues.

There is a heritage of masonry structures here, primarily face brick and concrete masonry *(see Figure 1.5)*. Many innovative project designs have been accomplished using these materials. The preference is for designs that are highly responsive to functional and contextual conditions, which allows building solutions to be uniquely well-suited to their purpose. Designers will find guidance on site development and facility design in this ID2 that will allow flexibility to create one-of-a-kind solutions that are both practical and inspirational, while enhancing a positive relationship with the built environment.

Opportunities for mission expansion, as well as bedding-down new missions, exist at Offutt AFB through the demolition of obsolete facilities, redevelopment of under-utilized areas, and reuse of existing buildings, including Buildings 500 and 515 once the new USSTRATCOM facility is constructed. Additional opportunities for internal growth exist by relocating certain community facilities away from the main base to the Rising View Community Housing in the Capehart area. As new projects are proposed for infill or redevelopment sites, Base leadership will need to balance the desirability of meeting this current need with its potential impact on attracting new missions to Offutt AFB in the future.

Offutt AFB is located in the Missouri River region, a locale with a broad range of temperatures and changing weather conditions. During the year, temperatures can vary from extreme cold to excessive heat with humidity. Days of sunshine regularly give way to periods of wet weather lasting several days. The built environment of Offutt AFB needs to address these weather conditions by providing exterior courtyards and plazas sheltered from the prevailing winter winds along with areas to appreciate the warming sun during the winter months, while at the same time screening solar heat gain in warmer weather and providing overhead protection during wet weather. Furthermore, by encouraging more development density on Base, a more pedestrian-friendly environment can be created regardless of the weather. Creating a system of continuous sidewalks as well as bike/pedestrian trails along all major Base roads would further enhance non-motorized transportation options and promote an active lifestyle *(see Figure 1.6)*. Finally, buildings at Offutt AFB need to be responsive to their setting, bringing sunlight into interior environments as natural lighting, while mitigating the undesirable effects of glare and heat gain.

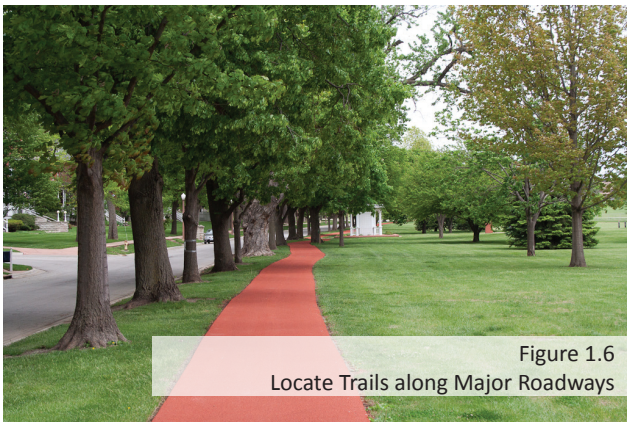


Figure 1.6
Locate Trails along Major Roadways

Offutt AFB has a policy of not including irrigation systems on new facilities and provides supplemental watering only during the initial establishment of plantings. This policy supports several Sustainable Design & High Performance Green Building principles. It can be taken a step further on Base by fully instituting a landscape plantings policy to use only native and well-adapted species on Base. These hardy trees, shrubs, and other plantings would not require supplemental irrigation after establishment, yet would improve the microclimate of the Base

and the exterior environment around facilities. Landscaping can play an important role in creating pleasant exterior "rooms", which allow outdoor activities to take place on many more days of the year.

Installation Goals

Incorporate sustainable development and green design principles into every facility and site design project at Offutt AFB.
Use the Sustainable Design Scorecard and Air Combat Command design guidance to create solutions that meet federal requirements for conserving water and energy, and for sustaining the environment. Innovations that go beyond these requirements are encouraged.

Make the places where people work and play at Offutt AFB functional and pleasant places to be.
Embrace the principles of good architectural and site design to create highly functional and inspirational solutions. Interiors should be full of natural light, and have thoughtful material and color selections. Building layouts should meet the functional requirements as efficiently as possible, and that functionality should be inherent in the building's shape and form. Building layouts should encourage narrow footprints to allow for maximum natural light to penetrate all spaces within. Site development around buildings should tie buildings to their surroundings, allowing the buildings to fully function as part of the Base community.

Locate mission-related facilities on main Base and community facilities at Rising View Community Housing area.
Decrease Base traffic congestion and parking demand by locating only mission-related facilities on Base. Make community facilities easier to access and closer to Air Force family homes by relocating most community facilities to the family housing area.

Retain options for attracting new missions when siting facilities today.
Leverage Offutt AFB's ability to attract new missions by preserving key infill sites for future new development. When evaluating how to meet current needs, consider if this decision will eliminate future mission bed-down options.

Make re-use of infill sites a priority in locating new buildings.
Leverage existing roadways, parking areas, and Base utilities by locating new facilities on currently vacant infill sites. Where appropriate, consider removing infrequently used roadways to create large infill areas where functionally feasible. Cluster parking for adjacent facilities to minimize area lost to standoff distances.

Create a sense of pride in the community at Offutt AFB.
Every project should be considered relative to its visual affect on the community-at-large. Include individuals who will be affected and seek the opinions of users in all design projects. Strive to thoughtfully design every project to blend with and complement the neighboring facilities.

Foster a quality of life that encourages healthful outdoor activities.
Make outdoor activities a priority. Relocate existing recreational ballfields from the main Base to Rising View Community Housing in the Capehart area, to place them closer to the majority of families on-base *(see Figure 1.7)*. Encourage on-base bike use by enhancing the current Base trail system to incorporate bike use, and better connect the system to the Rising View Community Housing area, as well as the Omaha metropolitan trail system. Link all buildings and work areas to a base-wide system of walkways to encourage more pedestrian use. Extend outdoor use by having courtyards and plazas that invite indoor activities outside.

Figure 1.7
Relocate Existing Ballfields on Main Base to Capehart Area

[1.3] Development and Design - Requirements and Evaluation Metrics

HQ ACC/A7P Requirements

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

Installation Requirements

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

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

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

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

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

HQ ACC D2 Board Evaluations

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

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

Installation Metrics and Evaluations

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

[1.4] Organization of the Document

The Installation Development and Design Handbook (ID2) is organized into five main chapters:

Chapter 1 Introduction
Familiarizes the reader to the need, scope, applicability, requirements, and organization of the document.

Chapter 2 Installation Image
Provides insight into the existing conditions found on Base, specifically in areas where new development can be accommodated.

Chapter 3 Development Considerations
Provides information regarding opportunities and constraints found within the development areas.

Chapter 4 Illustrative Plan
Provides a view of potential development opportunities in the next 10 - 20 years.

Chapter 5 Development and Design Guidelines
Highlights approaches to SD&HPGB, Site Development, and Architectural Design.

Appendices
Identifies specific technical considerations, constraints, and other supporting materials.

[2.1] Installation Image

The mental image that people form of a town or military installation provides the information they use to navigate its streets and comprehend its physical layout. This information also serves as the basis upon which they develop either a positive or negative impression of its visual appearance. Study of an installation's image refers to an assessment of how "legible" a place is to residents and visitors. Can a person easily go from place to place based upon their understanding of its street patterns, notable landmarks, and other visual cues? Do an adequate number of landmarks exist to help a person organize their mental map? Does the visual character of this place cause a person to like or dislike it?

Answering these questions provides insight into how to make installations better places to work, live and recreate. It benefits visitors as well, by making wayfinding easier. It provides guidance into how an installation's appearance can be improved by changes to its public spaces (shopping, community services, and parks), by adding landmarks, and by improving the visual character of its primary and secondary streets. Every community improvement project - for example a street reconstruction, new building, or park rehabilitation - can contribute to creating a more mentally coherent and attractive community. In most cases, projects undertaken to provide safer roads or construct a new, more efficient facility can also contribute to an improved community image. This image analysis, along with the other guidance included in this ID2, when aggregated are intended to assist Installation leadership and project designers in improving the visual image of Offutt AFB. Examining the design of all new facilities in the larger context of the Base's image will assist designers in creating new buildings which complement existing forms and urban patterns.

Installation Image Analysis

Offutt AFB consists of two separate areas: the Main Base and the Capehart Area, which includes the Rising View Community Housing. The airfield and aircraft operations occupy the central portion of the Main Base, dividing the remaining land into two zones, one north and one south of the runway. A variety of land uses occur in each of these areas. The north zone includes Airmen's and family housing, a mixture of administrative uses, the former Martin Bomber Building, and a static display of aircraft *(see Figure 2.1)*. The southern zone includes the historic army post, a cluster of community facilities, the Base Operations building, and a number of administrative uses, including the 55th Wing Headquarters, Buildings 500 and 515, and the site of the proposed USSTRATCOM facility.

People develop their mental images of communities, including military installations, based upon their movement through them, most often as passengers inside vehicles. Road systems therefore play an important role in helping people learn to navigate a community. The occurrence of landmarks along that roadway system further assists people in creating a coherent mental image of a community. Offutt AFB has an interesting variety of landmarks, such as individual buildings like the Martin Bomber Building, and small districts, like the historic post and parade

Figure 2.1
Static Aircraft Display at Kenney Gate

Installation Image

ground. A review of Offutt AFB's primary road system will provide insight into the Base's image.

Offutt AFB lacks the simple grid road system associated with many air force bases that were developed as a result of World War II. Due to the Base's varied history, the road system has been adapted more to current needs rather than planned comprehensively as a single system.

Relatively few major roads serve the Base, due to its small size and configuration. SAC Boulevard is the sole major north-south road, connecting the cantonment areas north and south of the airfield. North of the airfield, Nelson Drive connects the Bellevue and Kenney Gates. Near the Kenney Gate, it intersects with the northern terminus of SAC Boulevard. Minor streets radiate off of Nelson Drive, providing access to various administrative and operations buildings, as well as a family housing area and the Airmen's dormitories. This area is relatively easy to navigate since access to major destinations, including Coffman Heights Family Housing, Airmen's dormitories, Air Force Weather Agency (AFWA) Headquarters, Child Development Center (CDC), and Martin Bomber Building occur at major intersections along Nelson Drive, and are visible from the street. Most of the development flanking Nelson Drive is low density and includes landscaped open space. East of the Martin Bomber Building, land use is different in nature and more industrial in character. This area includes an AAFES gas station, auto self-help shop, recreational vehicle storage lots, and other residual industrial/support uses. These features are mostly visually unremarkable and likely unmemorable. Nelson Drive makes a 90-degree turn just north of this area which is easily accomplished and again, not likely memorable.

For someone wishing to travel inside the Base from its north to south side, SAC Boulevard is the only option.

Figure 2.2
Martin Bomber Building

The intersection of Nelson Drive to SAC Boulevard occurs immediately east of the Kenney Gate. This intersection is well marked with directional signage and has a traffic signal. The Martin Bomber Building looms over the intersection to the east *(see Figure 2.2)*. While these cues infer an importance to the intersection, no visual cue, other than the signage, indicates that visitors should proceed south on SAC Boulevard to reach the remainder of the Base. It may be appropriate to add a landmark at this location, such as a civic-scaled sculpture, to help identify the intersection as the connection to south Base. This sculpture might commemorate the contribution of the Martin Bomber workers to the war effort, or another appropriate theme.

Figure 2.3
Historic District Parade Ground

SAC Boulevard extends south around the west end of the runway, and then runs along the northern edge of the Base's historic area, before taking a north-south alignment. The boulevard then meanders somewhat in its alignment, in response to historic and non-historic buildings and the pre-existing landform. The boulevard continues to near the Base's southern perimeter, where it ends at an intersection with Butler Boulevard. Several locations along SAC Boulevard act as landmarks, helping individuals identify their location. The first locale is the aircraft blast protection structure that spans over SAC Boulevard at the west end of the airfield runway. The scale of this structure and its utilitarian nature make it a landmark along the road. The second memorable landmark is the historic district that contains the former army post quarters, barracks and parade ground *(see Figure 2.3)*. Sweeping views of these pleasant buildings and well-kept green space create a memorable impression.

After passing by the parade ground, SAC Boulevard bends 90-degrees and runs behind some of the barracks and quarters. The boulevard suddenly jogs

around the Base Operations building, and several old hangar structures are visible to the east. Upon passing the last historic quarters, the Commissary and Exchange buildings become visible. These land uses seems somewhat at odds with the historic post immediately to the north. Continuing south, the boulevard makes a broad sweep. The O'Malley Inn is on the road's west side, and the AAFES Mini-Mart/Food Court is on its east. The hotel serves as a landmark because it is several stories high and is memorable in form. Continuing south, the large green lawn in front of Building 500 comes into view, reflecting the importance of the activities that occur in the building *(see Figure 2.4)*. The ceremonial drive to the building's front door, and the static display of missiles in the front yard, reinforce this impression, making the building and the missile display landmarks along the route. SAC Boulevard ends at its intersection with Butler Boulevard. A static display of a B-17 Bomber serves as a landmark at this intersection.

Figure 2.4
Building 500 - U.S. Strategic Command

Butler Boulevard is one of two major cross streets in the Base's southern area. Butler Boulevard begins at the STRATCOM Gate, near the Base's southwest corner. It runs east, generally paralleling the Base's southern boundary to Recon Road, where its alignment turns to join Recon Road.

The southern area's other major cross street is Looking Glass Avenue. Looking Glass Avenue generally parallels the southern edge of the airfield, serving the flight line and adjacent operations buildings. The western end of Looking Glass Avenue was recently reconstructed to intersect with SAC Boulevard, near the Exchange and Commissary. From there, Looking Glass runs east to Recon Road, where it turns to join Recon Road to form a continuous four-lane loop road around Buildings 500, 515, and adjacent DRMO/POL facilities. Eastern segments of Butler Boulevard and Looking Glass Avenue branch off the east side of Recon Road, at right angle intersections. At these intersections, the roads take on the character of local, two-lane streets. The two streets serve the operations, intelligence, and security facilities located south of the flight line. The eastern end of Butler Boulevard provides access to the E-4 Maintenance Hangar and connects to the Base's former east gate, which is no longer in operation. The close alignment of these two parallel streets has a large impact on area land use.

Several local roads extend off of SAC and Butler Boulevards, as well as Looking Glass Avenue. Most of these roads lead directly to one or two buildings, or directly to parking associated with major buildings. Comsat Drive provides a north-south connection between Butler and Looking Glass, east of Buildings 500 and 515. Within the area containing the Commissary, Exchange and historic district, there is a network of streets. Due to the area's small size, it is relatively easy to navigate. The streets in the historic district are broad, tree-lined streets with a distinct character, which contrasts with the remainder of the Base, making them memorable.

Offutt AFB has several easily identifiable landmarks which vary greatly in character. Like many bases, it has heritage static displays of aircraft and, in this case, missiles. The Base's historic district is an extensive landmark, which includes both buildings and defined green space. The Martin Bomber Building is a landmark visible from many areas on Base, as well as the adjacent freeway to the west. Other large structures like the Offutt Field House, O'Malley Inn and Building 500 are landmarks due to their large mass and locations on Base. The proposed USSTRATCOM replacement facility will most likely become a landmark, due to its proposed size. AFWA Headquarters is the Base's newest landmark, and is very visually prominent due to its location in an area of the Base with few large buildings *(see Figure 2.5)*. Less prominent landmarks occur within the Base's

Figure 2.5
Air Force Weather Agency (AFWA) Headquarters

family housing areas including schools, chapels, and parks. These landmarks provide orientation to residents of these areas.

Offutt AFB's landmarks are dispersed across the Base and serve as identifiable locales along its street system. The value of landmarks is to help individuals learn a community and later navigate through it. Reconstruction of the STRATCOM Gate will move traffic directly onto SAC Boulevard, reinforcing its role as a primary route. Careful consideration should be given during the future redesign of the Kenney and Bellevue Gates. Potential changes in traffic flow should be analyzed to determine if the resulting traffic pattern will improve the legibility of Offutt AFB's image.

One portion of the Base that presents an inconsistent image is the district east of Recon Road that includes the eastern segments of Looking Glass Avenue and Butler Boulevard. This district is long and relatively narrow, and contains the greatest variety of building types. They range from very functional, industrial structures, to older single-story administrative buildings, to the more recent Security Forces Operations and 97th Intelligence Squadron buildings. Most of these buildings closely front local streets. A nearly continuous parking lot occurs behind the buildings between Recon Road and Nightwatch Avenue. Streets and parking lots predominant the local landscape. This area has potential to accommodate additional buildings to house new units with similar missions. Consideration should be given to studying how land use could be changed to improve functional use, consolidate parking, and create a more cohesive visual image. Land use changes would need to provide the parking needed, meet AT/FP requirements, and create locations for new buildings.

As areas of Offutt AFB are redeveloped to accommodate growth in existing missions or to bed-down new Air Force missions, the issue of image should be considered. Several prominent redevelopment sites exist in the "Mike North" redevelopment area, which is north of the runway and includes a portion of a former, unused runway. This district could provide missions new to Offutt AFB with a prominent location adjacent to the well-designed AFWA Headquarters building. Similarly, the site of the former Airmen's dormitories area that is immediately north of the Commissary/Exchange complex provides an excellent location for a new landmark building, which could be designed to provide a transition from the commercial area on its south to the historic district to the north. This site should be reserved for a significant new mission or expansion of mission for one of Offutt AFB's existing units.

- *Consider providing a landmark at the intersection of SAC Boulevard and Nelson Drive to demarcate this important intersection*
- *Protect the unique visual character of the Base's historic district (see Figure 2.6)*
- *On the redevelopment site that contains the former Airmen's dormitories, carefully consider visual character and massing of new development since it will be adjacent to historic district*
- *Reserve prime redevelopment sites for new facilities that will bolster Base image and accommodate bed-down of new missions to improve Base sustainability*
- *Study eastern Looking Glass Avenue/Butler Boulevard area to determine how to improve land use and visual character to make it more attractive to expanded and new missions*

Figure 2.6
Preserve the Visual Character of the Historic District

[3.1] Reuse Opportunities

Reusing structurally-sound existing buildings that are adaptable to current needs conserves natural resources, reduces the volume of demolition debris sent to landfills, and decreases the extent of land needed for development on an installation. Using existing buildings for new purposes also reuses the existing infrastructure serving these sites. In-place roadways and utility services can continue to be used to support the new uses.

Reuse of existing parking lots and service drives associated with these buildings provides the additional benefit of avoiding the need to increase the amount of impervious cover on Base. Avoiding additional pavement will prevent additional heat island effects and stormwater generation, and preserve existing greenspace.

Facility reuse is the "greenest" approach to construction of facilities and one that fully accounts for the "real" cost that construction places on the natural environment. Often facility reuse is the most cost effective method of providing new space on Base, if the proposed use can be accommodated in the existing structure. Matching a new use to available building stock may require re-thinking how the space needs are accommodated. Likely it would be different than how space would be laid-out in a new building. Good design can build on these differences to create new space that incorporates the heritage of the building's past use with the space needs of today.

Offutt AFB has a history of reusing existing buildings by re-purposing structures often built for other uses. The two most visible examples of this are the Martin Bomber Building and the Offutt Field House. Reuse of each of these structures has extended its service life beyond the original purpose and, in the case of the field house, preserved an important redevelopment site. While both buildings are reaching functional obsolescence and will be demolished, they serve as a model for successful reuse at Offutt AFB.

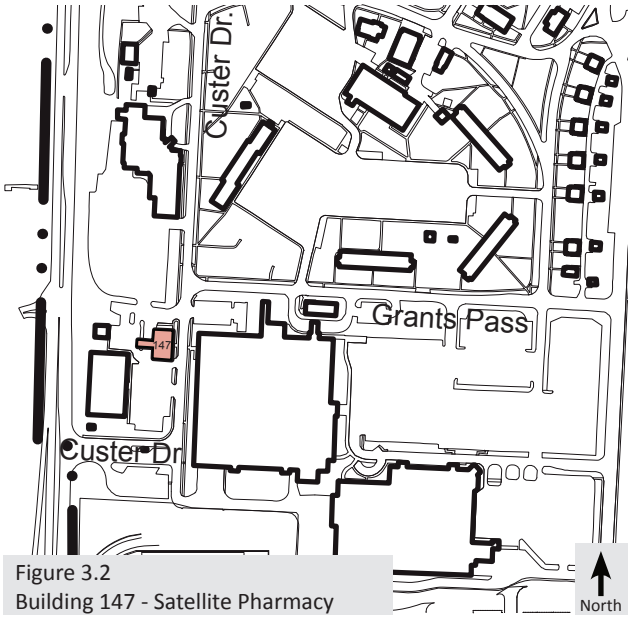


Figure 3.2
Building 147 - Satellite Pharmacy

Other recent examples of building reuse at Offutt AFB include:

- **B40:** Renovated to serve as offices for Base Contracting and other functions *(see Figure 3.1)*
- **B147:** Recently remodeled to serve as Satellite Pharmacy *(see Figure 3.2)*
- **B311:** Remodeled to serve as the Airmen's Leadership School *(see Figure 3.3)*

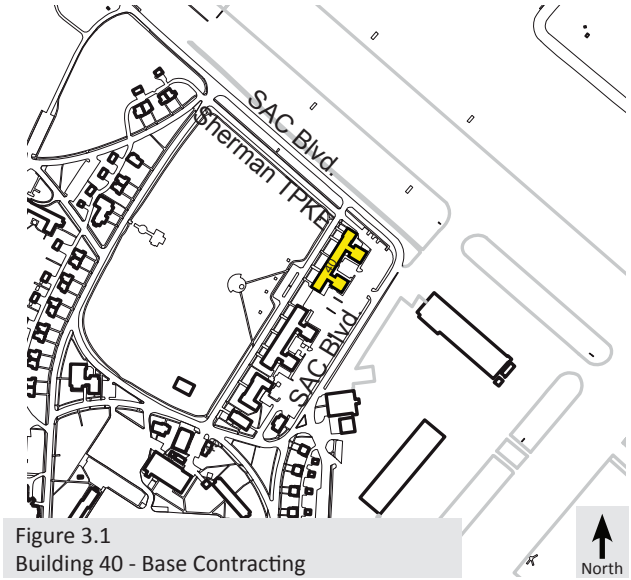


Figure 3.1
Building 40 - Base Contracting

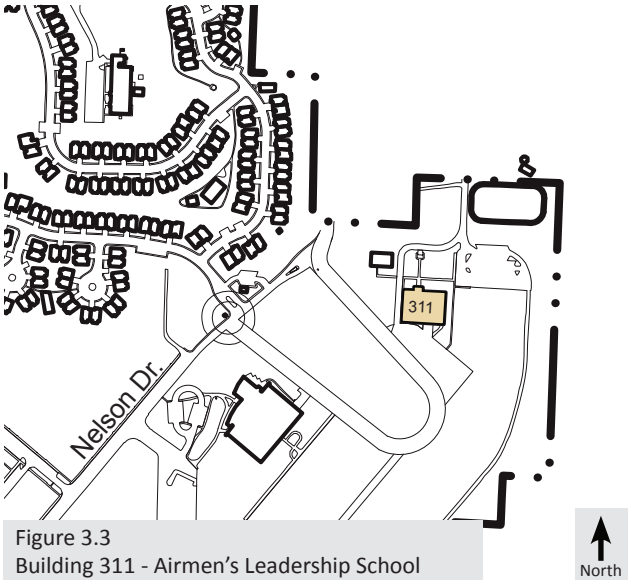


Figure 3.3
Building 311 - Airmen's Leadership School

Planned Reuse Projects

Building 500 – This building will be repurposed after the new USSTRATCOM facility is constructed and occupied. The 55th Wing Headquarters, 55th MSG, and other administrative uses will relocate to the building. A formal study to identify future space uses for the building, including a renovation phasing plan, has not been completed. A study of this type would benefit the 55th Wing in managing the future uses in this 1,000,000 SF structure *(see Figure 3.4)*.

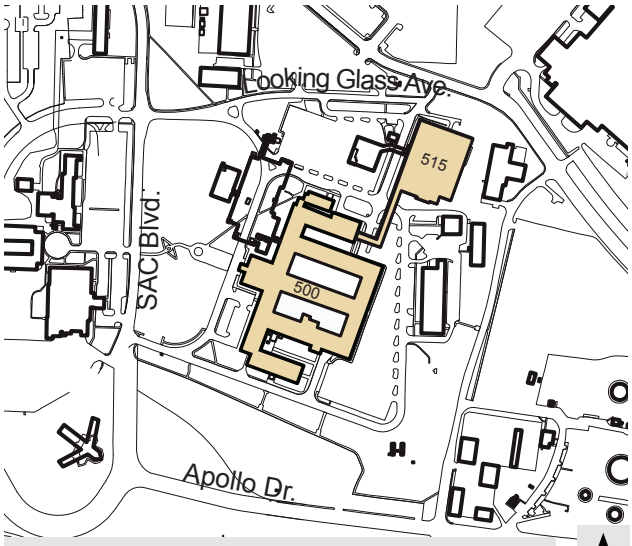


Figure 3.4
Buildings 500 and 515 - USSTRATCOM Facilities

Building 515 – The intelligence unit located in Building 578 will be moved to this facility after its current occupants move to the new USSTRATCOM facility *(see Figure 3.4)*.

Offutt Field House – One option under consideration would preserve the southern portion of this building for reuse as part of a new mobility facility. Further investigation into the existing building's structural systems is needed to determine the feasibility of this reuse *(see Figures 3.5 and 3.6)*.

Figure 3.6
Offutt Field House

Building 49 – Base CE administrative functions will move from the Martin Bomber Building to this historic barracks building once it has been renovated. Corps of Engineers field staff assigned to Offutt AFB will also be relocated to this building *(see Figure 3.7)*.

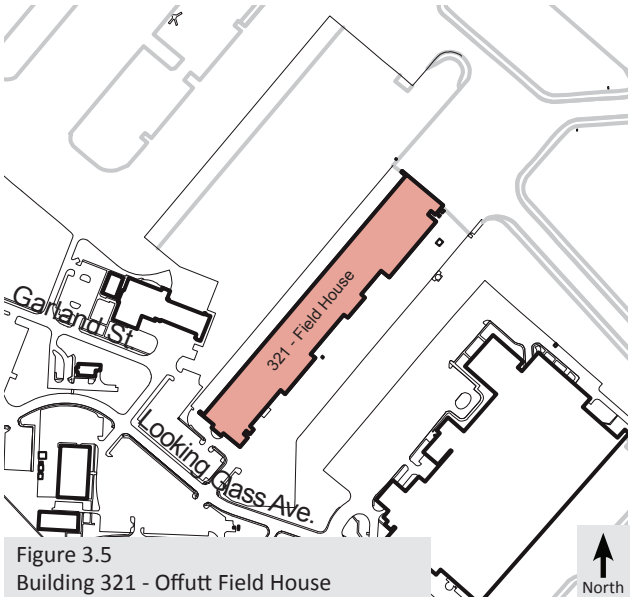


Figure 3.5
Building 321 - Offutt Field House

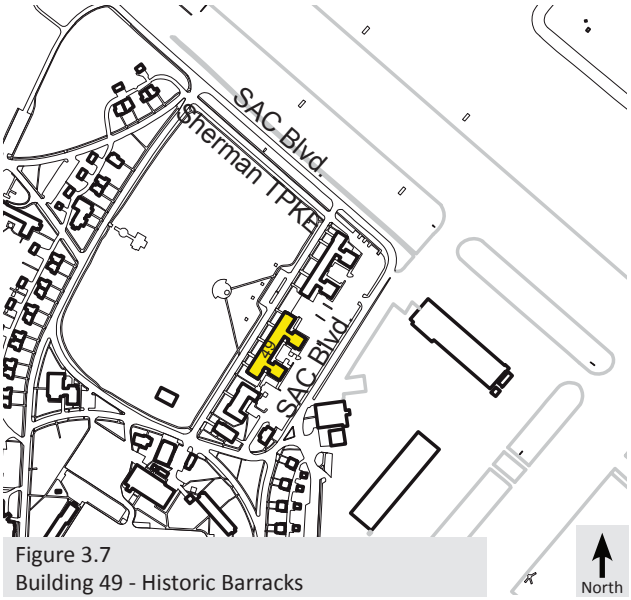


Figure 3.7
Building 49 - Historic Barracks

Buildings Not Considered for Reuse

Not every building is a candidate for reuse. Building condition, size, configuration and location may make reuse impractical or at odds with installation-wide planning goals. Examples of this situation exist at Offutt AFB.

The Martin Bomber Building is reaching its functional obsolescence and will be demolished to remove a significant airfield lateral clear zone obstruction *(see Figure 3.8)*.

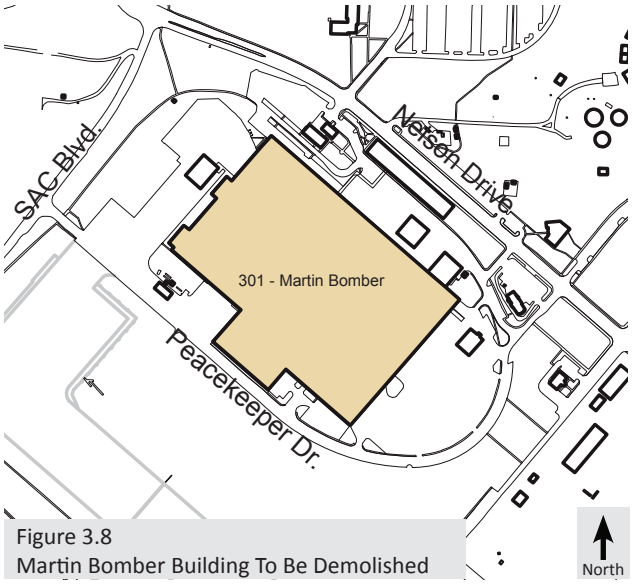


Figure 3.8
Martin Bomber Building To Be Demolished

Building 306, a hangar near the existing Base Operations building, will be demolished for the same reason, once its current occupants have been relocated elsewhere on Base *(see Figure 3.9)*.

Fairchild Hall (Building 527) is functionally obsolete and will be demolished after the new Flight Medicine facility is constructed *(see Figures 3.10 and 3.11)*.

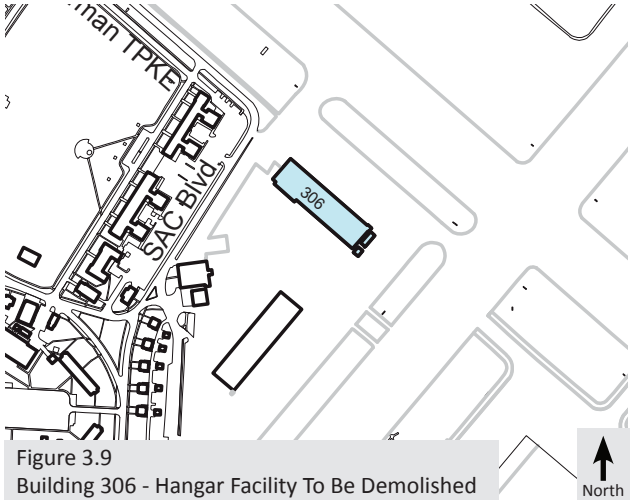


Figure 3.9
Building 306 - Hangar Facility To Be Demolished

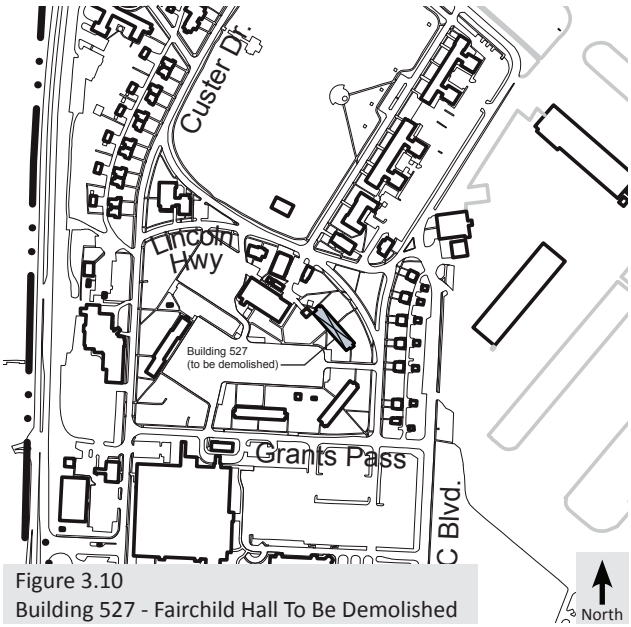


Figure 3.10
Building 527 - Fairchild Hall To Be Demolished

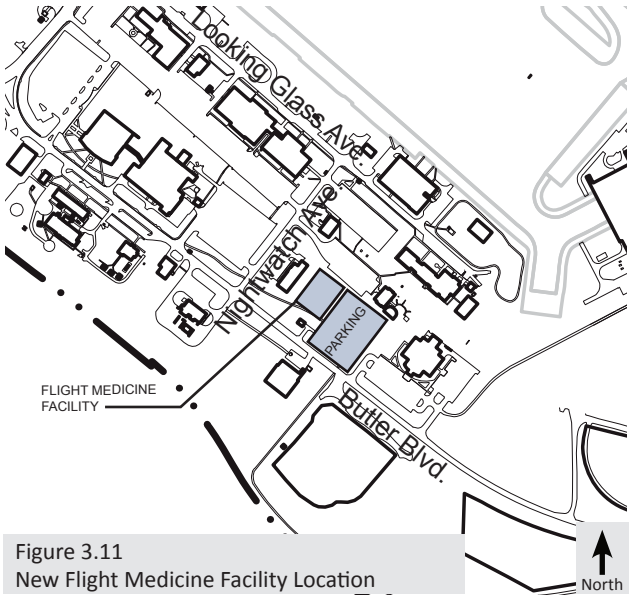


Figure 3.11
New Flight Medicine Facility Location

Other buildings on Base that reach functional obsolescence and are not candidates for reuse will be demolished. In some cases these demolitions will resolve issues with the airfield's lateral clear distance, and in other cases will provide infill sites for new facilities.

[3.2] Infill Opportunities

Several newer buildings completed at Offutt AFB demonstrate an understanding of the value of infill projects. The Air Force Weather Agency Headquarters in the North Mike area is located next to a former runway, using part of that runway for its parking lot. The 97th Intelligence Squadron's new building is located on a former recreational ballfield, adjacent to an existing intelligence facility. The proposed USSTRATCOM facility will be located on the former Warrior 9-hole golf course, increasing the density of development in the Base's core administrative area.

Additional opportunities exist at Offutt AFB to locate new, small and large facilities on infill sites. Base leadership needs to be strategic in approving how these infill sites will be re-used, since this has large implications for the Base's sustainability and long-term viability for mission expansion.

Proposed Mission-Related Infill Projects

The following mission-related infill projects were identified as part of the Infill Design Charrette, conducted with Base CE staff. As infill sites are selected for new uses, consideration should be given to Offutt's unique opportunity to become the premier Base to locate other Communications, Intelligence, Surveillance and Reconnaissance (CISR) units. Offutt AFB's existing concentration of CISR units provides the opportunity to create a "Silicon Valley" type location for Air Force CISR operations. This concentration of units could result in elevating the effectiveness and professionalism of these mission-critical units by creating a synergy of training and career opportunities for service and civilian personnel.

The following discussion of infill sites refers to the four general geographic areas at Offutt AFB where infill opportunities exist *(see Figure 3.12)*. In some cases, the land is vacant or under-utilized; in others existing buildings are nearing obsolescence or have reached functional obsolescence.

North District

This area includes the entire Base north of the active runway, except the Airmen's dormitories. An inactive runway occupies a large portion of this district. The Martin Bomber Building and its associated buildings are located on the western edge of this area. The Child Development Center (CDC) and the Navy Operational Support Center (NOSC) are located near its center, on infill sites which were once part of the former Wherry Housing area. AFWA Headquarters is located adjacent to the inactive runway, and uses a portion of the runway for its parking lot.

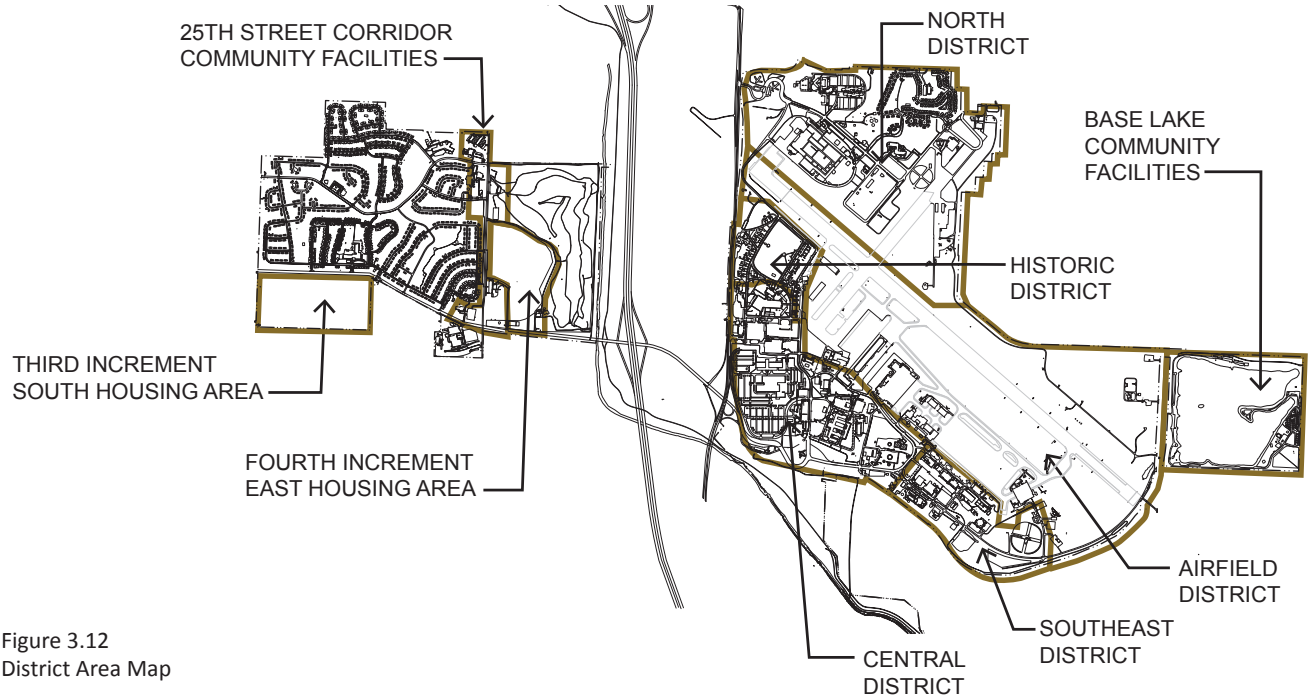


Figure 3.12
District Area Map

Infill Area Map

The southern edge of this area abuts the active runway. Most of the Martin Bomber Building is located in either the runway's lateral clear zone, or its 7:1 transitional surface. The Base's hot cargo pad is located on a portion of the inactive runway, north of the active runway. The associated QD arc creates a development constraint on potential infill building opportunities near the hot cargo pad's location.

Infill Site "A"
Removing the Martin Bomber Building and associated Buildings 303, 304, 313 and 323 will create a long, narrow 15.3 acre site bordered by Nelson Drive on its north, by the Law Center / U.S. Court Room and JAG office (Buildings 298 and 302) on its west edge, and the SAC Federal Credit Union on its east edge. This infill site is probably best suited for several medium-sized buildings that could be sited to have shared parking lots between them *(see Figure 3.13)*.

Infill Site "B"
A vacant 3.9 acre parcel exists that is bounded by Berquist Drive on its east, Nelson Drive on its south, and Travis Drive on its west. The west end of the CDC forms its northern edge. This could serve as a site for a smaller building similar to the NOSC to its west *(see Figure 3.13)*.

Infill Site "C"
South of the CDC is an open area of land that once had ballfields on it. This 4.0 acre rectangular site is bounded by Nelson Drive on two sides and Berquist Drive on the other two sides. Any infill uses proposed for this parcel would need to be compatible with the CDC *(see Figure 3.13)*.

Infill Site "D"
Immediately south of AFWA is an 19.8 acre infill site. Like AFWA, this site backs to the inactive runway, allowing portions of it to be used for parking or roads, similar to the AFWA building. This site could be used to bed down a new administrative mission on Base *(see Figure 3.13)*.

Infill Site "E"
An infill area exists along the eastern edge of the inactive runway which has been proposed to serve as the replacement site for Base Civil Engineering functions currently housed in the Martin Bomber Building. This site is about 300 feet wide and 1,300 feet long comprising approximately 13.9 acres. An industrial use is appropriate on this location, as long as it is buffered from the residential neighborhood to the east and maintains proper standoff requirements to the Base perimeter fence. One sustainability issue that warrants further study is the travel time from the proposed maintenance shops at this location to the bulk of the Base's buildings, which are on the other side of the airfield. The road distance from this proposed location to the southern portions of the Base is 3,500 to 5,000 feet further than the distance from the existing shops. If the new CE shops and warehouses are constructed here, consideration should be given to moving the Base DRMO facility to be nearer to them. This would open up the existing DRMO site to other uses and co-locate DRMO with its major supplier of items for disposition *(see Figure 3.13)*.

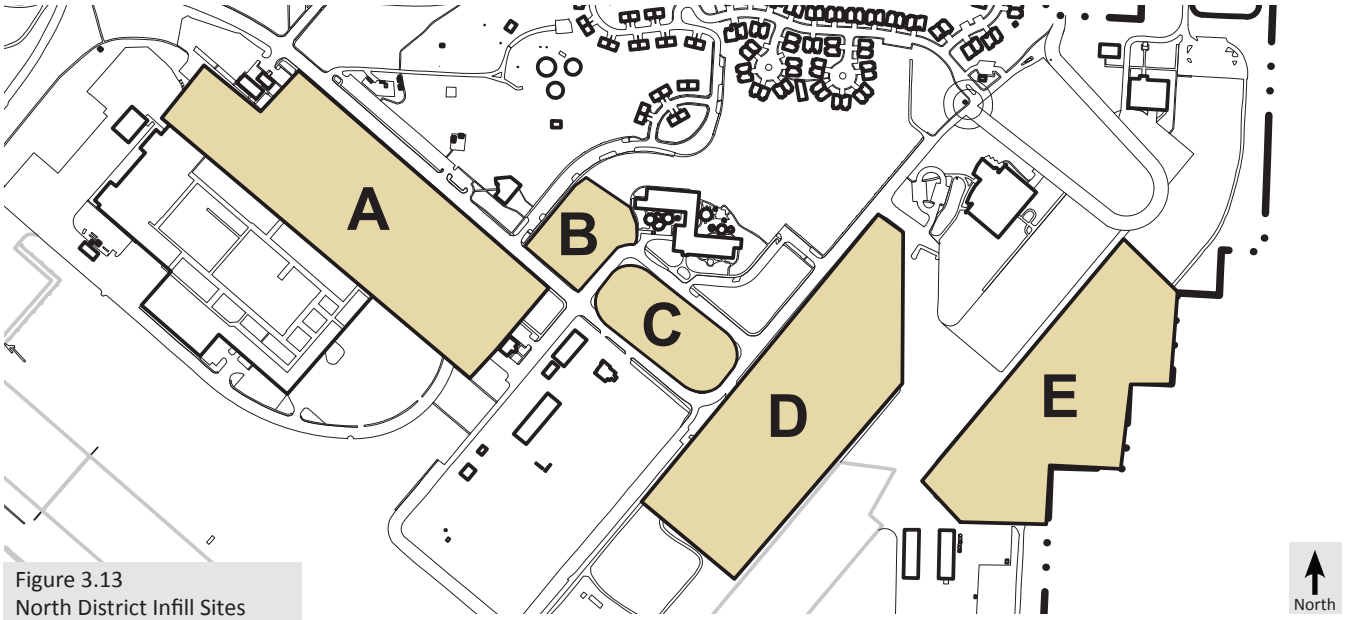


Figure 3.13
North District Infill Sites

Figure 3.14
Offutt Field House

Airfield District

The Airfield District includes the runway and associated flight line facilities. Infill sites in this district are related to existing obsolete structures or under-used areas of inactive runways. The Offutt Field House is an example of an obsolete structure, along with the current Base Operations buildings *(see Figure 3.14)*. An inactive former crosswind runway occupies a large area on the south side of the active runway. This area provides an opportunity to serve as infill sites for needed new flight line facilities, including a replacement Base Operations facility *(see Figure 3.15)* and LRS/Mobility facility *(see Figure 3.16)*. Areas along the flight line near the east end of the active runway provide opportunities to infill available sites with squadron operations and other flight support facilities. An E-4 Fuel Cell Maintenance facility will be added to this area, at the pavement terminus between Buildings 565 and 160 *(see Figure 3.17)*.

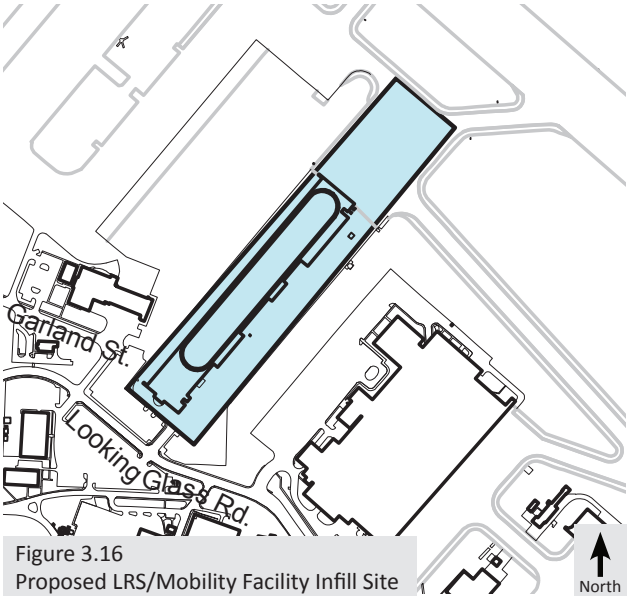


Figure 3.16
Proposed LRS/Mobility Facility Infill Site

Currently Offutt AFB is studying reducing the width of the active runway from 300 feet to 150 feet. This would reduce long-term maintenance costs, improving the sustainability of the airfield. Two other airfield improvements which should be studied relative to sustainability are relocation of the hot cargo pad and extending the existing east taxiway on the south side of the runway. Relocation of the hot cargo pad potentially would increase the amount of land available for redevelopment that occurs north of the runway. The taxiway extension would improve aircraft safety and increase the efficiency of airfield operations. Drainage improvements associated with this extension could assist in alleviating drainage issues in this portion of the Base, which are discussed elsewhere in this ID2.

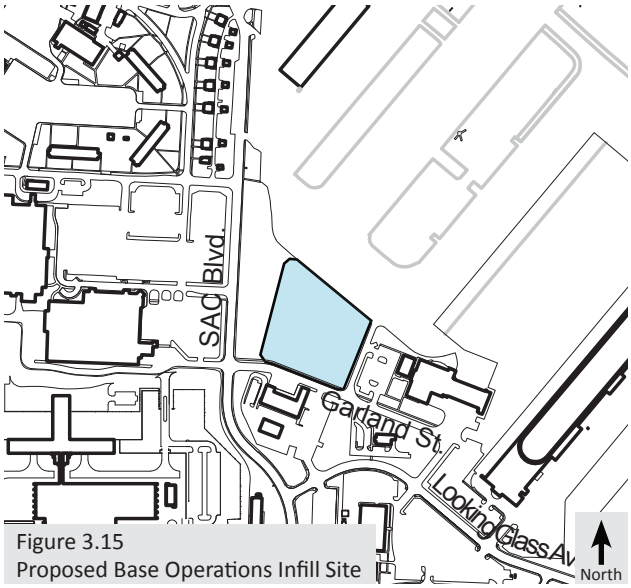


Figure 3.15
Proposed Base Operations Infill Site

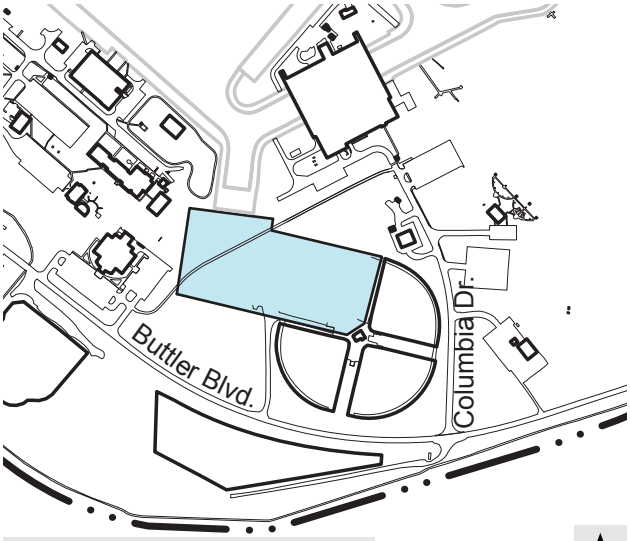


Figure 3.17
Proposed Base Operations Infill Site

Central District

This area south of the airfield includes Buildings 500 and 515, the proposed USSTRATCOM facility, Exchange/Commissary complex, and other community facilities, such as the temporary lodging facilities and the Patriot Club *(see Figure 3.18)*. Redevelopment of the former south Airmen's dormitory area adjacent to the Exchange/ Commissary complex presents an opportunity to attract a major administrative mission to Offutt AFB. The site's proximity to the proposed USSTRATCOM facility and the re-purposed Buildings 500 and 515 creates a potential for operational synergies to build upon the extensive expertise in CISR that currently exists at Offutt AFB.

Figure 3.18
Malmstrom Inn - Temporary Lodging Facility

Two significant infill sites exist in this district. The first is the front lawn of Building 500 *(see Figure 3.19)*. This infill site would increase the density of buildings in this area. The other site is the former south Airmen's dormitories complex *(see Figure 3.20)*.

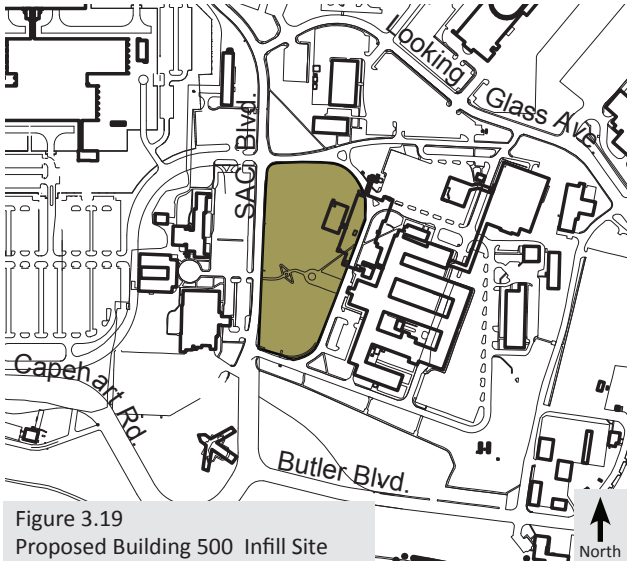


Figure 3.19
Proposed Building 500 Infill Site

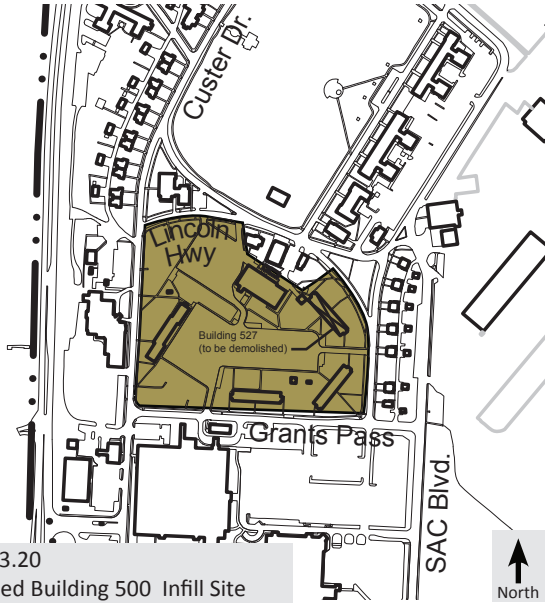


Figure 3.20
Proposed Building 500 Infill Site

Buildings 402, 404, 525, 526 and 527 comprise this former unaccompanied personnel housing complex. The buildings are all functionally obsolete and merit demolition instead of reuse. The site where they are located is likely the most desirable infill site at Offutt AFB. This site is located between the Exchange/ Commissary complex to the south and the historic district to the north. Whatever development goes on this site should be scaled to blend with the historic district's character. Parking for the redeveloped site could be located on the west side of Custer Drive, which forms its western border. A number of older community facilities are located here that are within the 45-meter standoff required along a Base's perimeter. Demolishing these buildings and utilizing the land for parking would eliminate this AT/FP issue.

Southeast District

This district includes the area east of Recon Road that is between the flight line and the Base's southern boundary. This district includes the sections of Looking Glass Avenue and Butler Boulevard located east of Recon Road. Several CISR units are located in this district *(see Figure 3.21)*. Relocating the 55th Wing Headquarters and other units from this district to Buildings 500 and 515 will provide additional opportunities to redevelop parts of the district to have a more efficient land use and a higher density of buildings.

One key consideration in the redevelopment of this area will be to redesign it to meet current AT/FP standards. Much of the existing parking and some

Figure 3.21
97th IS - CISR Campus

streets violate the 25 meter standoff requirement. Creative redesign of area streets and parking areas is needed to develop a solution that resolves current AT/FP issues and allows for increased density of development. Consolidating existing, scattered parking areas into larger combined lots would reduce the extent of land devoted to standoffs associated with parking lots. Consideration is being given to closing and demolishing a portion of Looking Glass Avenue to increase the amount of buildable land in this area. Buildings 497 and 578 could be demolished after they have been vacated, providing additional options on how best to configure existing streets and parking in these locations.

A location for a new Flight Medicine building has been selected within this area. The siting and design of this new facility should be viewed as an opportunity of how best to increase building density in the area. A comprehensive examination of the entire area should be made to determine how to leverage changes in land use to increase density and create infill building sites in this district *(see Figure 3.11)*.

Stormwater surface drainage is another issue that could impact future development in this district, since it sits on the Missouri River floodplain. The area's flat topography creates challenges in conveying stormwater off Base. While earth fill can be brought in to elevate the ground surface where new buildings would be sited, a long-term solution is needed to convey storm drainage to the NRD ditch that runs along the Base's north boundary. Correcting this problem will also benefit the airfield by making it less attractive to birds.

Current Base facilities that are planned to be located in this district as funding becomes available include the NC2 Alert Facility/38th RS, SERE Warehouse and Life Support Training, Consolidated Training complex, Simulator Training complex, and Combat Arms.

Proposed Base Fitness Center

Several locations north and south of the airfield have been considered for the new Base Fitness Center. Advantages of locating it north of the runway include siting it close to the Airmen's dormitories and the only family housing area on the main Base. The disadvantage of a north side location is that it is somewhat distant from the largest number of the Base's units, which are located south of the airfield and will use the facility for PT *(see Figure 3.22)*. Locating the Fitness Center south of the airfield will require that Offutt AFB use a prime infill site, the former south Airmen's dormitory complex site. This site is adjacent to the Exchange/Commissary complex, the proposed USSSTRATCOM facility, and Buildings 500 and 515, placing it near a high density of potential users. The use of the former dormitory site for this use comes with a high opportunity cost, that of eliminating a site which could be reserved for attracting a new mission to Offutt AFB, which would contribute to the Base's long-term sustainability.


Figure 3.22
Existing Base Fitness Center - Offutt Field House

Proposed Community-Related Infill Projects

Community-related infill projects were identified as part of the Infill Design Charrette conducted with Base CE staff. One concept that emerged during the Charrette was that community facilities that primarily serve families should be located near or within family housing areas. Clustering many of these relocated facilities along 25th Street will also reinforce a sense of community, creating a synergy with the community facilities that are currently located there *(see Figure 3.12)*.

Implementing this concept would reduce travel times for military families using these facilities, and open-up prime sites on the main Base for infill. Moving these community uses off main Base will also lower on-Base traffic counts and may allow families to walk or bike from their homes to these facilities. Creating walkable neighborhoods encourages healthy and active lifestyles.

Two existing family housing areas will be returned to the government by the housing privatization contractor in the near future. One is the housing area east of 25th Street and north of Capehart Road, which abuts the Willow Lakes Golf Course. This area is referred to as the "Fourth Increment East Housing Area." The second is the housing area on the south side of Capehart Road, which extends from 29th Street to 36th Street. This area is referred to as the "Third Increment Housing Area". The houses on both areas will be removed, providing vacant land for new community uses.

25th Street Corridor Community Facilities

The 25th Street corridor that runs through the Capehart Area has a number of existing community facilities located along it. The corridor offers a logical place for relocating additional community facilities off the main Base. Rising View Community Housing is adjacent to 25th Street, placing these facilities closer to the majority of facility visitors. Some of the facilities that could successfully be relocated to 25th Street include the education center, religious education center, library, arts and crafts center, outdoor recreation, Peacekeeper Lanes bowling alley, temporary lodging facility, community center, and Patriot Club. The housing privatization contractor recently constructed a community center in the Rising View Community Housing in the Capehart area, so the need for a second near-by community center should be evaluated further. Relocating the combined club off-Base will create the need for a smaller, satellite dining facility on main Base, to provide near-by food service for guests at the Offutt, Malstrom, and O'Malley Inns *(see Figure 3.23)*.

Fourth Increment East Housing Area/ Replacement 9-Hole Golf Course

The Warrior 9-Hole Golf Course will be eliminated with the construction of the new USSTRATCOM facility. If it is determined that a new 9-hole course is needed for the Base, it most likely will be constructed on the family housing area east of 25th Street. The existing housing units in the Fourth Increment East Housing Area will be demolished and the site will be turned back to the government by the housing privatization contractor.

Third Increment South Housing Area

This parcel includes approximately 75 acres of land that can be redeveloped for community needs or used as a location for an enhanced lease with private industry. A pipeline easement bisects the site, running slightly west of north from the south property boundary to Capehart Road between 33rd and 34th

Figure 3.23
O'Malley Inn

Streets. Development within the pipeline easement is limited to open space uses. The parcel, due to its size and location adjacent to the Base's largest family housing area, provides an attractive location for community facilities and outdoor recreational fields which require large land areas.

Locations for new recreational sports fields are needed if existing fields on main Base are used for mission-related infill or parking areas. The Third Increment South Housing Area could accommodate several "wheels" of sports fields. Youth fields could be separated from, yet be located near, adult fields to facilitate family play. The parcel is large enough to serve as an alternate location to 25th Street for a new community center, library or education center. The RV storage lot located on main Base could be relocated to this property, if a mission-related infill opportunity creates the need to relocate the existing 7-acre storage yard north of the airfield.

An alternate use for this site would be for the government to enter into an "enhanced use" lease with a private company to lease the property for a use which may or may not be related to the Base's mission or community facilities. This site is within the rapidly growing area of Sarpy County, which may make it attractive to a private developer.

Base Lake Community Facilities

Camping cabins will be constructed along the north shore of Base Lake on the location of the former horse stables *(see Figure 3.24)*. The rental cabins will provide military families, who do not own a recreational vehicle, with the opportunity to vacation at the lake.

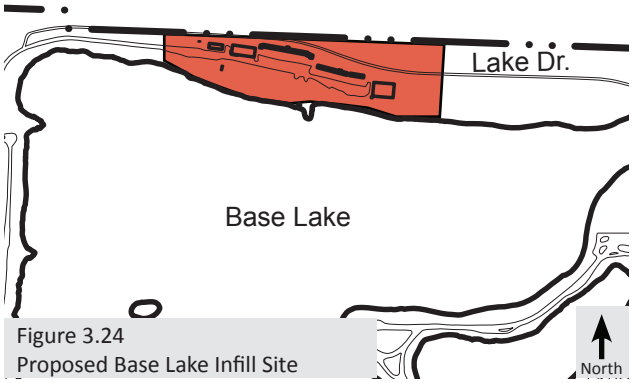


Figure 3.24
Proposed Base Lake Infill Site

[3.3] Circulation

Vehicular Circulation

Major transportation routes at Offutt AFB are constrained due to the central location of the airfield on what is a small-sized base, relative to other Air Force Bases in the western United States. As discussed in the Installation Image Section, Offutt AFB's vehicular circulation system is the result of the Base's history and changing missions.

SAC Boulevard

SAC Boulevard is the major north-south road on Base, and connects the areas north and south of the airfield. Improvements associated with reconstruction of the STRATCOM Gate will lead traffic directly onto SAC Boulevard, improving traffic flow. Street improvements associated with the proposed USSTRATCOM facility will widen the southern section of SAC Boulevard from two to four lanes, with dual left-turn lanes. When the former Airmen's dormitory site that is north of the Exchange/Commissary complex is redeveloped, it is likely that the four lane portion of SAC Boulevard will be extended north to its intersection with Grant's Pass.

Several key intersections occur along this section of SAC Boulevard. The first is the intersection from where the new access road runs west to the proposed USSTRATCOM facility. The former western terminus of Looking Glass Avenue extends east from this intersection. A traffic signal will be added to this intersection to better manage traffic flow. Access to the former section of Looking Glass Avenue from the parking lots north of Building 500 has been eliminated, so the street carries only traffic from the building's ceremonial drive.

In 2010, the western terminus of Looking Glass Avenue was relocated about 500 feet to the north, to ease traffic congestion at its former terminus. A traffic signal was added at SAC Boulevard to improve traffic flow at the new intersection. The realignment of Looking Glass Avenue improves the function of the eastern loop road formed by Looking Glass Avenue, Recon Road and Butler Boulevard around Buildings 500 and 515.

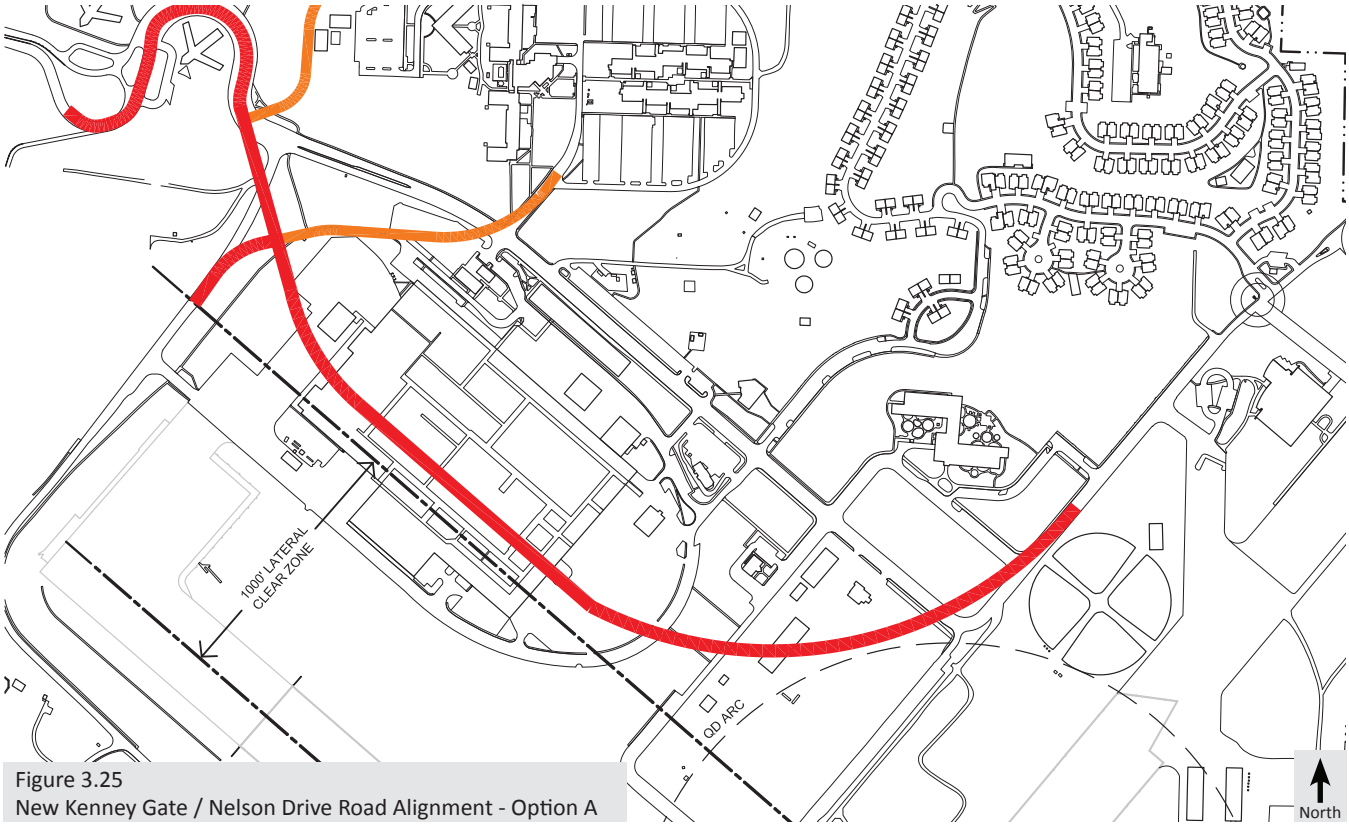


Figure 3.25
New Kenney Gate / Nelson Drive Road Alignment - Option A

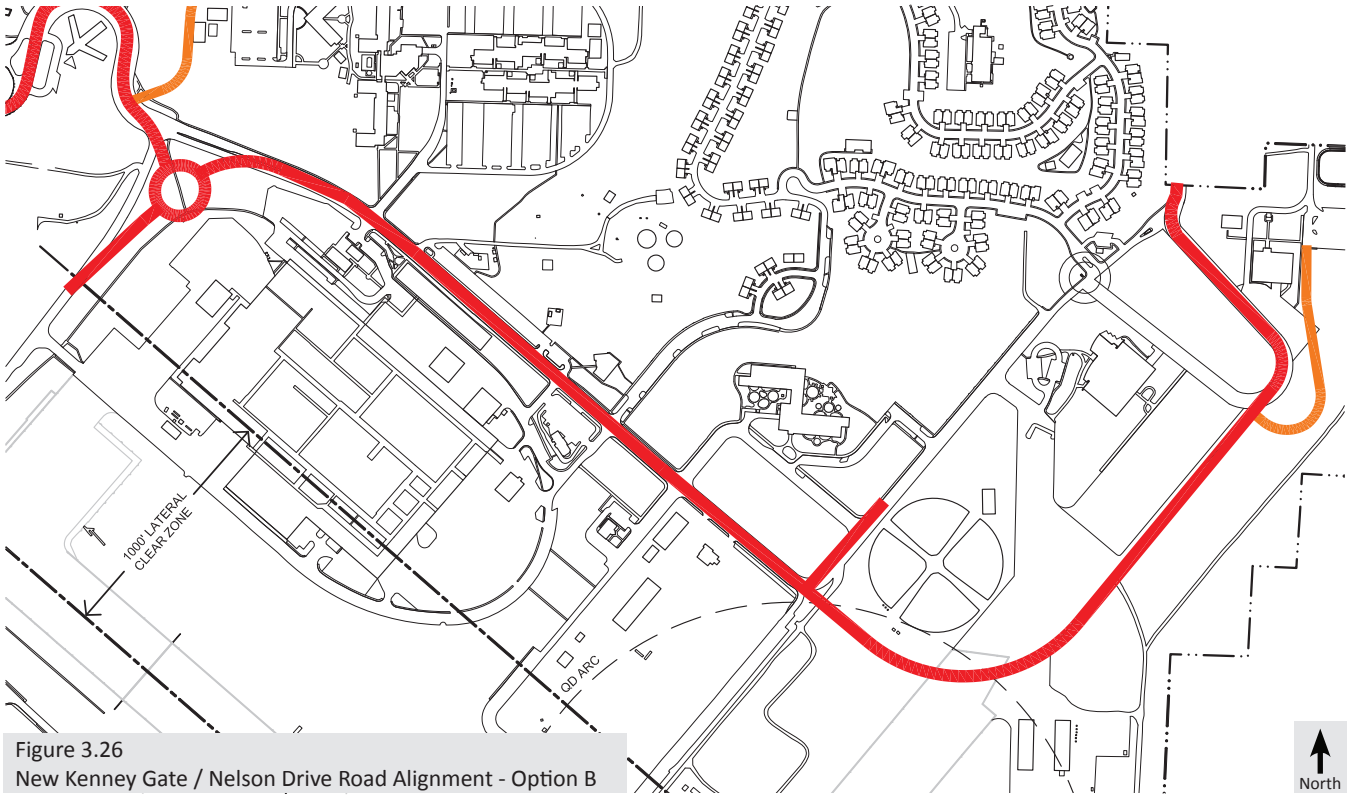


Figure 3.26
New Kenney Gate / Nelson Drive Road Alignment - Option B

Improvements are underway within the Exchange/ Commissary parking lots to improve internal traffic flow. A new north-south road, aligning with Lincoln Highway, will extend south through the parking lots to Garland Street. This will direct traffic to intersections with existing or planned traffic signals.

Building a new Base Operations facility near the Fire Station will allow Building 29, the current Base Operations building, to be demolished. This removal will permit the adjacent section of SAC Boulevard to be straightened and moved to the east. Moving the road east will provide more space for parking east of Buildings 40 and 49, along with sufficient distance to meet AT/FP standoffs. The road's more eastern alignment will also allow the radius of the 90-degree curve in SAC Boulevard to be increased to improve traffic flow and safety. If Building 306 is removed prior to the reconstruction of SAC Boulevard, the radii for this curve will be able to be increased. This three-lane configuration should be continued north to the intersection with Nelson Drive, to provide unhindered emergency services access on the north segment of SAC Boulevard. Where feasible, this road section should be designed to allow for a future expansion to four lanes. Design of this improved street will need to take airfield and historic district restrictions into account.

Nelson Drive

A new gate design is programmed for both the Kenney and Bellevue Gates to improve force protection and provide adequate stacking space outside of the gates. Demolition of the Martin Bomber Building and its associated buildings will provide space to realign area streets as needed to facilitate area redevelopment *(see Figures 3.25 & 3.26)*. The existing 90-degree curve where Nelson Drive transitions from an east-west to a north-south alignment should be changed to a sweep curve to improve traffic flow to the redesigned Bellevue Gate.

Historic District Roads

Roads in the historic district reflect the design of early suburban subdivisions, with sweeping curves and triangular intersections. The street pattern contributes to the character of the District and any changes made to the pattern must be carefully evaluated. Custer Drive extends from SAC Boulevard on the District's northwest corner, south to the corner of the Exchange/Commissary complex. This makes using Custer Drive as a short-cut attractive to many motorists. It may be possible to close a short section of Custer Drive near the SAC Chapel to discourage this traffic. This concept should be studied further to confirm potential benefits and determine its impact on area traffic flow.

Existing Vehicular Circulation Map

Looking Glass Avenue, Recon Road and Butler Boulevard Loop Road

With the recent reconstruction of the west end of Looking Glass Avenue, a continuous loop road has been created, the majority of which is four-lane. Reconstruction of the STRATCOM Gate will alter the west end of Butler Boulevard, requiring motorists to make a right turn onto the beginning of Butler Boulevard from SAC Boulevard. Currently, a round-about is proposed to provide better traffic control at the intersection of Butler Boulevard and Recon Road. Further study should be given to this concept, due to the significant amount of large truck traffic that occurs through this intersection. An insufficiently-sized round-about will have a negative impact on traffic flow and safety, often resulting in damage to area pavements. Often, other traffic control methods are more effective and cost efficient than a round-about.

East Segments of Looking Glass Avenue and Butler Boulevard

As described earlier in the Installation Image Section, these two streets closely parallel each other, serving a long narrow area adjacent to the flight line. Base CE has considered closing portions of east Looking Glass Avenue to facilitate redevelopment of the area. This action, along with consolidation of parking to address AT/FP standoff requirements, would reduce the amount of pavement in this district and increase the amount of redevelopment land.

East Gate

A new bridge will be constructed across the Missouri River north of the Platte River, which will connect to US 75 south of Offutt AFB. Base personnel who live in Iowa south of Council Bluffs will use the new bridge when coming to work at Offutt AFB. After crossing the Missouri, the new road will intersect Harlan Lewis Road, which runs on the east side of the main Base and separates it from the Base Lake. If the number of workers is substantial, it may warrant consideration as to whether a new East Gate should be constructed to provide some relief for traffic, which will otherwise end up at the heavily-used STRATCOM Gate. A study examining workers' points of origin and on-Base destinations would provide insight on use levels if a new East Gate was constructed.

Figure 3.27
Typical Off-Street Parking

Parking

Most parking on Base occurs in off-street parking lots *(see Figure 3.27)*. On-street parking occurs along some sections of Nelson Drive and some minor streets. Certain parking lots, specifically those near Buildings 500, 515, and the Offutt Field House are intensively used. Changes in the use of these buildings may decrease the demand in these areas. As funding has allowed, Base CE has relocated existing parking to meet current AT/FP standards.

Ensuring that an adequate but not excessive amount of parking exists on Base is challenging, as mission and building use changes. New parking lot construction should be limited to meet requirements, and no more. Preferred parking near building entrances for car/vanpools and low-emitting vehicles should be included in all new construction projects. This strategy could also be applied to existing lots when they are re-striped. It is typical to set aside five percent of total stalls for each of these user groups. This follows the intent of LEED. One additional strategy to consider is installing bicycle racks at all facilities, to encourage biking to work and community facilities and for recreation. This simple improvement would improve the Base's sustainability, lower its carbon footprint, and help decrease both stormwater runoff and heat island effect.

- *Realigning SAC Boulevard when Building 29 is demolished and change to three lane street section – Grant's Pass to Nelson Drive. Design to be expanded to four-lane section where feasible*
- *Consider realigning Nelson Drive after the Martin Bomber Building is demolished to increase the size of resulting infill site areas and address AT/FP for buildings to remain*
- *Study options to eliminate cut-through traffic on Custer Drive*
- *Evaluate additional traffic control options at Recon Road and Butler Boulevard intersections*

- *Study benefits of removing a portion of Looking Glass Avenue east of Recon Road*
- *Study if new East Gate would help decrease traffic congestion at the STRATCOM Gate*
- *Annually review minor low-use streets for possible removal*
- *Remove underutilized minor streets to create larger infill sites and/or to lower maintenance costs*
- *Continue to relocate parking which does not meet AT/FP standards as funds permit*
- *Remove excess and underutilized parking as funds permit*
- *Set aside 5% of parking for car/vanpools and 5% of parking for low-emitting vehicles in new and re-striped lots*
- *Provide bicycle racks at all facilities*

Pedestrian Circulation

Walkways occur inconsistently across the Base. Areas well-served by a system of sidewalks suddenly transition to areas with inconsistent sidewalk coverage. In the flight line and industrial areas, walkways appear to connect to certain destinations, like the ballfield on the east side of Combat Arms, rather than provide for an alternate mode of transportation between facilities. In many areas of the Base, the primary purpose of walks is to connect parking lots to building entries. The lack of walks connecting to either the Mini-Mall or the Post Office provides insight into how much vehicle travel dominates circulation on Offutt AFB.

Sidewalks paralleling one or both sides of streets provide an alternate transportation mode, as well as encourage recreational use by residents and those who work in an area *(see Figure 3.28)*. Making walking and bicycling on Base attractive and efficient reduces the need for expensive and expansive vehicle transportation improvements. It also encourages active and healthier lifestyles. Due to seasonal weather conditions, all walkways won't be used every day of the year, but when they are used, they contribute to a more sustainable and greener installation.

The concept of creating multi-modal streets that accommodate pedestrians, cyclists and motorists is termed "Complete Streets". A national non-profit organization exists to assist communities and military installations to implement this concept. The organization is called the National Complete Streets Coalition. The Coalition website address is www.completestreets.org. The website provides information on complete street fundamentals, best management practices, and training opportunities for professional staff and citizen advocates.

Figure 3.28
Pedestrian Circulation along Generals Row

Adding regularly-spaced street trees or clusters of shade trees periodically along streets will provide shade for pedestrians and increase use. Street trees are most appropriate in areas away from the airfield and flight line, to minimize the potential for BASH incidents. Placement of benches at key locations along the walk system again provides an amenity, and contributes to an improved walking experience, which in turn encourages greater use.

In many cases at Offutt AFB, walks along streets are set back from the curb *(see Figure 3.29)*. This provides a safer and more pleasant experience for the pedestrian. Where space allows, varying the distance from the walk edge to the street curb can improve the visual character of the walk and make walking more interesting, by creating a walk with long, sweeping curves.

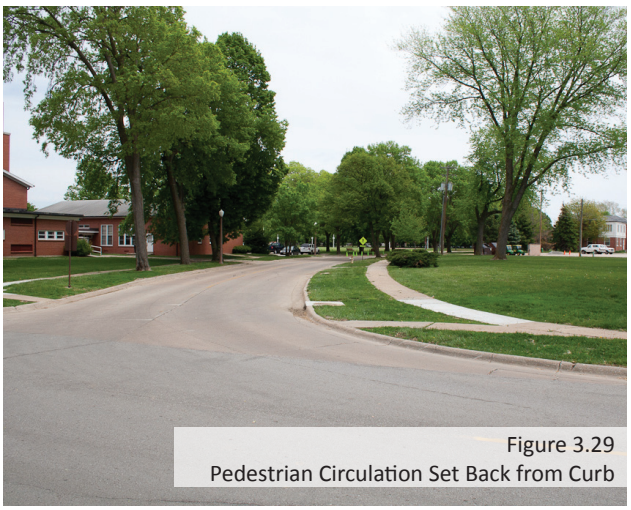


Figure 3.29
Pedestrian Circulation Set Back from Curb

North

EXISTING RUNNING PATHS

Existing Running Paths

Walkways in the areas surrounding the Exchange/ Commissary complex provide pedestrian access to the edge of the parking areas, but the complex lacks a walk system that brings people to the store entryways. Pedestrians are forced to weave through parking stalls to get to the buildings. This condition is especially dangerous for persons with disabilities who use wheelchair or other mobility devices, because they are less visible among cars in the lot.

In family housing areas, walkways appear to provide connections within the neighborhoods and to local parks. Connections for community members to nearby community facilities are inconsistent. Marginal walk connections exist from the family housing areas to community facilities, like the Capehart Child Care Center, Offutt Theater and Youth Center. Yet no walks connect the Rising View Community Housing area to the Willow Lakes Golf Course, or the Coffman Estates housing area to the adjacent Child Development Center. Adding walk connections to these community facilities will create a more sustainable Base.

- *Adopt and apply a "Complete Streets" philosophy to all Base streets*
- *Provide five-foot wide walks on each side of street along most streets, with at least a walk on one side along industrial or very low-use streets*
- *Perform a "gap analysis" on all Base streets to create an inventory of locations where walks are missing*
- *Add walks to existing areas where they are lacking, to connect areas well-served by walks*
- *Require all new construction projects to include walks throughout project site, as needed*
- *Provide shade along walkways with trees and provide benches for resting*
- *Move walks away from road edges where space exists, to improve the walking experience*
- *Ensure that a complete walkway system exists within the Base, allowing residents and workers to walk to work, take a stroll during a lunch hour, or go to the store*

Base Trail System

Offutt AFB lacks a comprehensive trail system that could provide an alternate means of transportation for Base residents and create an on-Base recreational amenity. This trail system would be comprised of "shared-use paths" which allow use by pedestrians, runners, bicyclists, in-line skaters, and persons using mobility devices. This system should follow major streets where feasible, and would be placed along Nelson Drive, SAC Boulevard, and the loop road formed by Butler Boulevard, Recon Road and Looking Glass Drive. The on-Base trail system should extend to each Base gate so it could be connected to the Omaha metropolitan trail system, as well as local off-Base streets. A high-priority need at Offutt AFB is to provide a trail connecting the Base's north and south sides. This trail should be included in the design of a widened SAC Boulevard and Nelson Drive, if it is relocated.

In some cases, existing running paths could be incorporated into this new trail system. Most similar trails of this type in the Omaha metropolitan area have a 10-foot paved width and require a corridor of about 20-feet in width. In some locations, the new 10-foot wide trail would replace a 5-foot wide walk along one side of major streets. The new trails should be setback from the curb and separated from the existing roads by green space.

An existing running path extends through much of the South Operations Area. It starts near the Bennie L. Davis Maintenance Facility and runs through the operations area, ending near the ballfield by Combat Arms. This path could be replaced with a full-width trail that has spur trails to additional facilities in the area, and would include an extension to the west of Bennie Davis to the Offutt Field House. This conversion would give workers in the South Operations area an alternate mode to travel to the field house for PT or recreational use. It would encourage healthier lifestyles and a more sustainable Base.

Several opportunities exist to provide a connection from Offutt AFB to Omaha's regional trail system. The Bellevue Loop Trail runs south along the east side of the Papillion Creek, and then north along the west bank of the Missouri River. At Capehart Road, a connection exists from the Bellevue Loop Trail to the wide sidewalk that runs west along the north side of Capehart Road, to the Rising View Community Housing located in the Capehart Area. This walkway provides direct access to 23rd and 25th Streets, as well as Dow Drive. A pedestrian crossing exists at the 25th Street and Capehart Road intersection. Sidewalks extend into the Rising View Community neighborhoods from the three aforementioned streets. Bicyclists traveling beyond these points would need to use neighborhood streets, which can easily be designated as "Share the Road" lanes.

Proposed Base Trail System

The Bellevue Loop Trail continues south and east of Capehart Road to a point within 350 feet of the STRATCOM Gate. A spur trail could easily be extended from the Bellevue Loop Trail north to a point outside of the gate. Bicyclists or pedestrians could then pass through gate security to enter the Base. If the recommendation to provide a trail along every major street is implemented, bicyclists or pedestrians could use these transportation facilities to complete their trip on Base. Bicycle racks should be installed at Base destinations, so bicyclists will have a place to secure their bikes.

At the Base Lake, an opportunity exists to create a connection to the eastern leg of the Bellevue Loop Trail, by extending a new paved trail from the parking area north of the Family Camp to the maintenance road that runs along the south side of the NRD ditch. The section of the road east to the Bellevue Loop Trail could be paved as a 6-inch thick, 10-foot wide trail to allow continued maintenance vehicle access and provide a safe riding and walking surface for trail visitors.

Tree clusters should be added along the trails, or shade structures should be provided, to create areas for trail visitors to get out of the sun. When considering adding plantings along trails, review locations in light of BASH issues, to avoid creating aircraft operation hazards. Signage should show the layout of the trail system and include information on trail grades and lengths. With this information, visitors can select an appropriate trail to enjoy during their first visit. As their familiarity with the area increases during repeat visits, they can explore more of the trail system.

Alignments for the proposed trails are shown on the Proposed Base Trail System Map.

- *Create a spine trail system along major Base streets that extends to Base gates and connects to metro trail system and adjacent communities*
- *Incorporate a "shared use path" trail along one side of all major streets in all future design projects*
- *Include a trail in the redesign of SAC Boulevard and Nelson Drive, as well as the new Base gate designs*
- *Pick "low hanging fruit" by incorporating existing running paths into a Base trail system*
- *Provide connections to the Bellevue Loop Trail at STRATCOM Gate and Base Lake*
- *Provide connections to the other community trails and adjacent neighborhoods at all Base gates*
- *Consider signing key routes in the Rising View Community Housing in the Capehart Area as "Share the Road" lanes to encourage bicycle use*
- *Provide tree clusters or shade structures along trails. Consider BASH issues in all planting designs*
- *Provide trail parking areas and information signs on trail grades and lengths*
- *Install secure bicycle racks at Base destination points*

On-Street Bike Trails

The creation of on-street bike trails should be explored at Offutt AFB *(see Figure 3.30)*. Implementing a "share the road" system could increase bicycle commuting and decrease the number of intra-Base vehicle trips. While the perception is that existing roads are too narrow to accommodate both bicycle and vehicle traffic, a planning process that includes interested bicyclists could identify potential bike routes and set the stage for a mind change on this topic. If installations without daily public transportation are to be sustainable, new approaches to intra-Base transportation have to be explored.

- *Develop a "share the road" on-street bike trail system*
- *Create Commander's Bike-Pedestrian Committee to foster off- and on-street trail development*

Figure 3.30
Develop On-Street Bike Trails / Lanes

[3.4] Utilities

Power, communications, natural gas, potable water, and sanitary sewer services are available throughout the Installation's developed areas. Utilities on Base generally parallel roadways. There are no identified constraints regarding the availability of utilities relative to current use levels or planned future expansion.

Electric power for the Base is supplied by Omaha Public Power District (OPPD), using federal hydro-power purchased from the Western Area Power Administration (WAPA). The Base has two substations and three feeder lines which are maintained by OPPD. Distribution of power occurs through a collection of overhead and underground electrical distribution lines. Power lines have been buried on most areas of the Base, with the exception of some industrial areas and some locations along the flight line.

Natural gas is provided to Offutt AFB by Black Hills Energy via three commercial gas mains. Most individual buildings, as well as the three central plants on Base, utilize natural gas for heating purposes. The three central plants provide heating and cooling to a limited number of adjacent buildings. The Base's low density of buildings decreases the feasibility of creating a single central heating and cooling plant. Potential to utilize ground-source heat pumps exists on the Base. Ground-source heat pumps are routinely used in the Bellevue area at other public facilities, like the Fontenelle Forest Nature Center.

Potable water is provided to Offutt AFB by the Metropolitan Utilities District. The District has several well fields near the Platte River, and also obtains water directly from the Missouri River at the Florence Treatment Plant in North Omaha. The Base has a contract to purchase up to 4 million gallons per day. Water is supplied to the Base through connections to several different mains. No potable water is used on Base for landscape irrigation. All water consumed is for domestic and industrial uses.

Wastewater treatment services are purchased from the City of Omaha at the Omaha Metropolitan Wastewater Treatment Plant, which is located a few miles southeast of the Base. This treatment plant is designed to handle all wastewater generated in the Sarpy and Douglas County areas. The Base is connected to a 120-inch city outfall main that runs along the east side of Papillion Creek

The Installation's stormwater drainage system is discussed in Section 5.1 SUSTAINABLE DEVELOPMENT & HIGH PERFORMANCE GREEN BUILDINGS.

[3.5] Land Use

Land uses intermingle throughout the Base, creating a mosaic of mixed uses. In most cases where an incompatibility exists, it will be removed as Offutt AFB's Area Development Plans are implemented. Offutt AFB's pattern of varying lands uses is the result of several factors. The first is the Base's development history, with its changing missions. The second factor is that some facilities, like sports fields, tend to be located on available vacant land. Similarly, available large buildings, like the Offutt Field House, are often adapted to other uses that benefit from their large footprint, even though the new use is unrelated to the facility's location on Base. In this case, the Field House is located on a prime site on the flight line. This conversion of use often serves as a de facto method to reserve an available site or building for a different use in the future.

A third factor that becomes apparent after examining Offutt AFB's land use pattern is the Base's past tendency to locate new facilities on sites that were expedient to develop, rather than taking a more strategic viewpoint when making land use decisions. This approach goes beyond simply reviewing whether a proposed use is compatible with adjoining uses. It examines the long-term opportunity costs of dedicating a site to a particular land use. In determining the opportunity costs, issues such as ability to accommodate growth for existing missions, ability to attract new missions, and appropriateness of mixing mission and community land uses on the main Base should be analyzed.

North District

Recent projects in the North District have established a consistent land use pattern that complements the adjacent family housing and Airmen's dormitories. Demolition of the Martin Bomber Building and its associated structures will remove a major land use which may not be fully incompatible with some adjacent uses, but influences future land uses on adjacent tracts. The removal of the outdated Wherry housing units and replacement of all family housing units in Coffman Heights, along with the construction of AFWA, the CDC, and the NOSC, has created a coherent land use pattern in this Area *(see Figure 3.31)*. Adding future community facilities in the North District, which benefit by being on-Base or complement the community uses located there, is appropriate. Expanding the Administrative /


North
KENNEY GATE
BELLEVUE GATE
WILLOW LAKES GOLF COURSE
QD ARC
QD ARC
STRATCOM GATE
FLIGHTLINE
INDUSTRIAL
ADMINISTRATIVE / EDUCATION / COMMUNICATIONS
COMMUNITY COMMERCIAL & SERVICES
MEDICAL
FAMILY HOUSING
AIRMEN'S HOUSING
OUTDOOR RECREATION AREAS
DESIGNATED OPEN SPACE & HERITAGE AREAS
FUTURE DEVELOPMENT

Land Use Map

Figure 3.31
Child Development Center

Communications / Education land uses south across Nelson Drive, outside of the airfield lateral clear zone, would strengthen existing land use patterns. Attracting a second, stand-alone mission similar to AFWA, to locate on the vacant site south of AFWA, will enhance this part of the Base and reinforce the new land use pattern.

Locating the CE Shops and Warehouses along the eastern edge of the inactive runway in the Northeast District is probably compatible with AFWA and any potential development on the site to its south. The options to screen this complex from those two sites will be limited. Careful siting of new buildings, parking, and storage yards will be important. Providing screening to the non-Base residential area to the east must also be addressed.

The remaining industrial uses on the block bounded by Nelson Drive and Union Lane will require improved screening if they are to remain. Removal of the Arts and Crafts building, along with improved screening around the industrial and community uses that remain, would decrease the visibility of these uses. If the RV storage lot moves to the Third Increment Housing Area in the Rising View Community at the Capehart Area, this will significantly decrease the footprint of these uses.

Central District

The Central District has a mixture of land uses which for the most part are compatible. Community uses including visitor lodging, the Mini-Mall, Post Office, and Exchange/Commissary complex, are located along major streets, intermixed with administrative and communications facilities. The new USSTRATCOM facility will replace a large outdoor recreation area with a large administrative facility. The historic district is located on the northern edge of the Area, with a distinct land use pattern.

Land use changes in the Central Operations Area Development Plan will resolve many of the incompatibilities that exist. Demolition of the Communications Squadron Facility (Building 41) and conversion of its site to open space will resolve an uncomfortable adjacency between the historic quarters and a large administrative building, and the conversion of the Offutt Field House site to the LRS / Mobility facility will remove a community use from the flight line.

The Central District's largest and most attractive infill site is the former south Airmen's dormitory complex *(see Figure 3.32)*. The future use on this parcel could have major implications on the ability of Offutt AFB to attract major new missions. Currently, this is the preferred site for the future Fitness Center, to replace the current Field House. Its central location on-Base makes it an attractive site for units using the facility for PT. Its adjacency to Building 500 and the proposed USSTRATCOM facility make it attractive to persons who work or will work in the facilities in the future. The need to relocate and remove the community facilities to the west of Custer Drive, due

Figure 3.32
McCoy Hall - South Airmen's Dormitory Complex

to Base perimeter standoff requirements, could open up space for parking or outdoor fields. Use of the site for a Fitness Center would be compatible with the Exchange/Commissary complex to the south. Without a detailed site plan and building elevations, it is impossible at this point to determine if this proposed use will be compatible with the historic district to the north. The Nebraska State Historic Preservation Office (SHPO) will need to address that question at a later date.

An alternate land use for this parcel would be to remove existing buildings as funds become available, and reserve this location for the site of a future mission which might complement either USSTRATCOM or the 55th Wing. Any development that occurs on this site should consider its context next to the historic district, should not have a high density use, and should not involve a "big box" type structure. Sensitive redevelopment of this site should reflect the scale and character of the historic district to the north, and integrate screened parking areas into its design. Locating parking west of Custer Drive would allow for a redeveloped site, with possibly more total square footage and increased green space between buildings.

Southeast District

The Southeast District includes flight line, operations, CISR, POL storage, and other support uses *(see figure 3.33)*. Several new facilities that support the flight line and will enhance the Base's image as a center for CISR are planned in this district. A goal of CE staff is to promote this district on the Base as a potential location for new CISR missions that build on the existing CISR expertise at Offutt AFB. As discussed in Section 3.3 CIRCULATION, improving parking lot efficiency to decrease the amount of land devoted to AT/FP standoffs is critical in this area's future development. Open space exists on the eastern end of the Southeast District that could accommodate its expansion to the east. Some of this open space will be used for the E-4 Fuel Cell facility, so growth needs to be coordinated with that project. Existing sports fields may be able to be relocated to the Third Increment South Housing Area in the Rising View Community at the Capehart Area.

Figure 3.33
Southeast District Area

A 10-acre parcel south of the Base perimeter has been purchased by the Greater Omaha Chamber of Commerce, with the intent to convey this parcel to the government to address perimeter security and standoff issues with the adjacent communications facilities. This area might be available for parking or limited sports field development. Further study is needed to determine land use in this 10-acre parcel.

Community Facilities in Rising View Community Housing in the Capehart Area

Several community facilities are proposed to be relocated from the main Base to the Capehart Area. These facilities would be clustered along 25th Street or located in the Third Increment South Housing Area. These community uses are compatible with the adjacent Rising View Community Housing Area as well as other existing community facilities along 25th Street. Careful site planning will still be required for these new or renovated facilities, to adequately separate community and residential lands uses, and provide needed screening.

- *Infill uses proposed in this ID2 reinforce or enhance existing land use patterns*
- *Continue trend in North District to create a land use pattern that can accommodate new missions*
- *In the Central District, further examine the opportunity costs of alternate future uses for the former south Airmen's dormitories site. Determine if highest and best use is for bed-down of a new mission or for a community facility*
- *Define possible uses within 10-acre acquisition area on Base's southern perimeter and develop plan showing uses*
- *Carefully site and plan all new community land uses in the Rising View Community at the Capehart Area*

[3.6] Constraints

Cultural Constraints

Offutt AFB's greatest constraint is the Base's small footprint, or land area, and the extent to which this land has already been developed for facilities that serve the Base. The community of Bellevue surrounds the Base, and most land on the Base's north and west sides is urbanized. This creates a cultural constraint due to the disruption that would be caused by the need to relocate adjacent residents and businesses in order to physically expand the Base's land area.

The Bellevue and Greater Omaha Communities work cooperatively with Offutt AFB to protect the interests and viability of Offutt AFB's flight missions. The economic development organization of the Greater Omaha Chamber of Commerce recently acquired and is holding title to a 10-acre parcel of land needed by the Base. Undeveloped agricultural land exists adjacent to the Base's south boundary and along part of its eastern boundary. Public roads, two mainline railroads, residential neighborhoods and the Papillion Creek provide challenges to expanding the Base's footprint significantly. These cultural constraints are the basis for proposing to relocate community facilities off of the main Base, to the Rising View Community Housing in the Capehart Area, to free up parcels on-Base.

Strategies to minimize the impact of these cultural resource-related constraints include:

- *Consider opportunity costs of all main Base infill development to ensure new uses are the "highest and best use" for each site*
- *Continue to work with local private and community leaders to protect Offutt AFB's right to operate and grow as needed to accomplish the missions stationed there*

Natural Resource Constraints

Natural resource constraints on Base appear to be relatively few, and those that exist are related to the management of stormwater. The Base's flat topography creates challenges to providing adequate drainage in the eastern portion of the Base. Stormwater issues will become increasingly important at Offutt AFB as new federal regulations regarding stormwater quality and quantity are implemented. Due to these new regulations, the volume of stormwater that is generated by new development on Base must be fully mitigated on site.

Standing water in the Base's southeast corner is the result of run-off from higher elevation areas of the Base and the flat floodplain topography along the Base's eastern boundary *(see Figure 3.34)*. The lack of surface drainage must be addressed to decrease the presence of waterfowl and the corresponding potential for BASH incidents, and to allow future development in the Base's southeast corner. Further study will be needed to determine whether the excess water can flow north in an existing public road ditch to the Natural Resources District (NRD) drainage ditch that borders the Base, or if the excess stormwater will need to be pumped north in a force main to that ditch. Reducing impervious surfaces in the watershed draining to this area, along with the installation of stormwater Best Management Practices (BMP's) in new or retrofit construction projects, like bio-retention gardens, pervious pavements, or rapid infiltration trenches, will help to reduce the severity of this problem.

Figure 3.34
Standing Water at Southeast Edge of Base

Meeting Section 438 of the Energy Independence and Security Act of 2007 (EISA) on new construction projects could potentially result in stormwater management becoming a major constraint to further development on infill sites. The challenge of conforming to Section 438 requirements has been tested during the design of the proposed USSTRATCOM facility. The need to detain all additional stormwater generated by new development is challenging and requires creative solutions, which come at a higher cost for construction, on-going maintenance, and additional land area to accommodate them. Programming documents (1391's) developed for future projects on Base must include these costs in project budgets.

The availability of potable water at offutt AFB is not currently a constraint. None the less, this resource is so valuable that it must be considered in this evaluation of natural resource constraints. Several years ago, Base leadership wisely eliminated the use of potable water for landscape irrigation. This eliminated an expensive and often wasteful practice of water use. What irrigation that exists on base utilizes non-potable well water. For all new landscape plantings, the use of native and well-adapted plant species, as defined in the Base's landscape development guidance documents, will help ensure long-term survival and success. Temporary irrigation during plant establishment should be viewed as an investment in minimizing plant loss and improving long-term success.

Strategies to minimize the impact of these natural resource-related constraints include:

- *Stormwater should be viewed as a resource, not a nuisance*
- *Determine most feasible method to convey excess stormwater to NRD Ditch – gravity flow or pumping via a force main*
- *Appropriately-sized infiltration BMP's (rain gardens, bioretention cells, infiltration trenches) should be included in all new project designs and retrofitted into areas where drainage problems exist (see Figure 3.35)*
- *Conduct all Base and mission operations in a manner to protect local ground water sources*
- *Irrigate landscape areas with well-water as long as it can be sustainably harvested*
- *If well water becomes unavailable, consider rainwater harvest systems or use of greywater for irrigation of key installation landscape areas, like the Parade Ground or other people-intensive outdoor spaces*
- *Continue to use potable water efficiently*

Figure 3.35
Infiltration Trench Drainage

[3.7] Green Infrastructure

Green infrastructure enhances the quality of life for people while mitigating negative impacts associated with land development and operations. It has been calculated that a single mature shade tree provides "services" to its surroundings that have an annual economic value of approximately $360.00. These services include reducing energy consumption for heating and cooling of adjacent structures, providing stormwater management/erosion control, improving wildlife habitat, cleaning the air, and providing carbon sequestration.

Existing parks, open space, undisturbed vacant land, natural drainage ways and the Installation's landscape plantings comprise Offutt AFB's green infrastructure. The Installation is located in the Missouri River valley, on the eastern edge of the Great Plains. Temperature extremes and precipitation vary greatly year to year. Multi-year periods of drought or excessive precipitation occur periodically, requiring the plantings to be resilient and adaptive. Use of native and well-adapted non-native plant species at Offutt AFB will improve success of green infrastructure at the Base. Supplemental moisture is needed to improve the survival rate of plantings during establishment, and may be needed during extended times of drought to protect the investment in the Installation's green infrastructure.

- *Use of native plant species, and non-invasive well-adapted introduced plant species, will provide the greatest return on investment relative to green infrastructure*
- *Limit landscape irrigation to key civic green spaces that receive active use like the Parade Ground*

Significant Green Resources

Certain green infrastructure resources extend beyond a single park or building site. These resources provide benefits that extend throughout an installation. The proper approach to managing these green resources is to make decisions on a community- or area-wide basis, rather than at the site level.

Offutt AFB Urban Forest

Tree planting should be an annual occurrence at Offutt AFB, to create a forest that has a diverse number of tree and shrub species of various ages. Creating an urban forest consisting of a diversity of species is critical to long-term success. The latest threats to the health of Offutt AFB's urban forests include Emerald Ash Borer, Pine Wilt, and Thousand Canker Black Walnut Disease. These, along with the earlier threat of Dutch Elm Disease, demonstrates why an urban forest that includes a mix of tree species will be the most resilient *(see Figure 3.36)*.

Figure 3.36
Mix of Tree Species for Urban Forest

- Actively manage Offutt AFB's urban forest to protect the health of its trees
- Increase the diversity of species through new tree plantings
- Creating a forest of trees of all ages by annual tree planting should be a priority
- Expand Offutt AFB's urban forest where possible to produce multiple benefits of providing shade, reducing glare, cleansing the air, and decreasing stormwater runoff

Offutt AFB Street Trees

Trees planted along streets would enhance the aesthetic character of the entire Base and provide important services, like reducing the amount of rainfall reaching the ground to decrease stormwater runoff, shading pavement and walks to reduce the heat island effect, and lowering glare from vehicles and lights. Systematic plantings of street trees should be implemented across Offutt AFB in areas where it is appropriate. A Street Tree Master Plan should be developed to guide this effort and provide a mechanism to ensure a diverse street tree collection.

The Base's street tree collection should extend into all POV parking areas. Tree islands in parking lots can dramatically improve local microclimates and assist in achieving the stormwater management requirements of Section 438 of the Energy Independence and Security Act. Section 5.2 SITE DEVELOPMENT has additional information and recommendations on

how best to include tree islands and other green infrastructure in parking lots.

- *Implement a Base-wide street tree system that incorporates the goals of an urban forest*
- *Create a Base Street Tree Master Plan*
- *Extend the street tree collection into parking lots*

Preserve Mature Trees in Family Housing Areas to be returned to Government

Two current family housing areas will be returned to the government in the future, the Third Increment South and Fourth Increment East Housing areas. The urban forests within these areas should be preserved when the existing houses and streets are demolished.

- *Protect the mature trees in the family housing areas that are returned to the government*
- *Incorporate mature trees into design of new uses for these sites*

Building Courtyards and Outdoor Spaces

These areas demonstrate the value of building forms which create and shelter outdoor spaces *(see Figure 3.37)*. The less windy, partially shaded courtyards promote plant growth and increase human comfort while using these spaces.

- *New building projects should consider how building form and footprint could create viable outdoor spaces, integrating these spaces into the building design rather than simply attaching an outdoor space near an entry or at one end*

Figure 3.37
Outdoor Space / Courtyard

Scattered Landscape Areas within the Flight line and Industrial Areas

Scattered mature trees and landscape plantings occur near facilities along the flight line and within the industrial areas. These plantings are associated with existing buildings or occur on former building sites. These plantings soften the urban nature of these areas. New construction adjacent to the flight line should include plantings, to extend the benefit of green infrastructure to those portions of the project not fronting the airfield. Similar plantings should occur with industrial projects where possible.

- *Green spaces visually stand out within these highly developed areas*
- *Plantings around existing buildings should be managed to extend their effective life*
- *Plantings that occurred near buildings that have been demolished should be preserved, if possible, when new uses are located on those sites*
- *New plantings should be included as part of new construction and major renovation projects within these areas, to extend the benefits of green infrastructure throughout the Installation*
- *All plantings along the flight line and in industrial areas should be reviewed relative to BASH concerns*

Figure 3.38
AFWA - Native Landscape Plantings

Recently Completed MILCON and Renovation Projects with Landscape Plantings

Green infrastructure is needed on new construction projects, to comply with several Executive Orders regarding sustainable design and to attain LEED credits *(see Figure 3.38)*. Stormwater quality and quantity issues can be cost-effectively addressed using bioretention and bio-infiltration plantings.

- *All Installation building and infrastructure construction projects which are located outside of the operational side of the flight line should incorporate green infrastructure*

Undeveloped Land Surrounding the Installation's Developed Area

The natural areas surrounding the built-up portion of the Installation should be viewed as providing green ecologic services to the Installation. These plantings hold soil in place, reduce the erosive power of stormwater, provide wildlife habitat and food, sequester carbon, and release oxygen.

- *Degraded areas of native vegetation should be restored to maximize the value of services these areas provide to the residents and employees at the Base*

Airfield Open Space

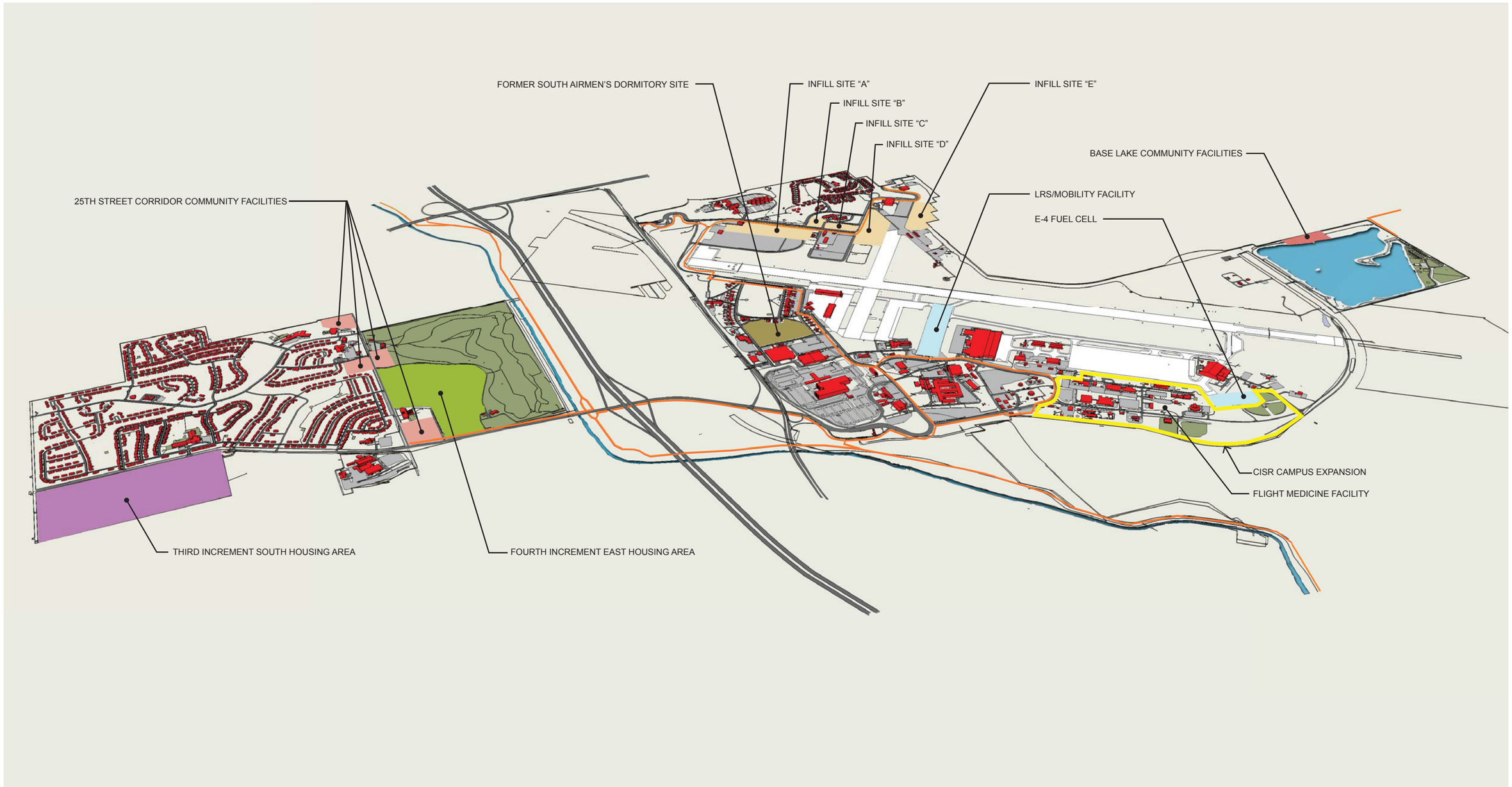
The acres of mowed grass within the airfield may be able to be converted to shorter native grass species, which will require less mowing and have fewer pest problems than most turfgrass species *(see Figure 3.39)*. These native grasses may work best in "rough" areas of the airfield that are not immediately adjacent to the runway and can be allowed to be mowed at a higher height. Grass species that might be considered for this use include Blue Gramma and Sideoats Gramma.

- *Study the feasibility of converting rough turfgrass areas on airfield to shorter native grasses*

Figure 3.39
Plant Native Grasses in Airfield Open Space

[4.1] Illustrative Plan

The purpose of this section is to graphically illustrate the desired future state of the Installation at both a macro and micro scale. The key element of this section is the Illustrative Plan showing the desired changes in the Installation image elements, and the resultant urban form achieved following the ID2 guidelines. Building footprints, roadways, parking areas, and pathways are illustrated. The following illustrative plan(s) highlights the establishment of nodes, landmarks and links that create the future vision of the Main Base and Flight Line areas. Future development has been depicted in symbolic or notational form to guide implementation of new Base needs.



Illustrative Plan

[5.1] Sustainable Development & High Performance Green Buildings

Offutt AFB uses the ACC SD&HPGB Scorecard as its green building self-assessment metric. The Scorecard assembles and consolidates Executive Orders, Public Laws, and Federal Agency rulemaking on Sustainable Development & High Performance Green Buildings (SD&HPGB) design requirements with the LEED Rating System. Using the Scorecard is a way to achieve the desired LEED rating and meet critical statutory minimum requirements.

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

To be successful, sustainable development needs to fit within the parameters of the natural environment in which it is located. Similarly, successful high performance green buildings need to be designed and sited with regional location, local climate, orientation, and surrounding land uses in mind. Existing development at Offutt AFB will influence the degree to which new facilities can be placed to meet optimal building siting criteria, specifically in regard to solar orientation. Designers of new facilities should accept these limitations as challenges to be dealt with creatively during the design process.

Offutt AFB is located in a region with a broad range of temperatures and changing weather conditions. During the year, temperatures can vary from extreme cold to excessive heat with humidity. Days of sunshine regularly give way to periods of wet weather lasting several days. The built environment of Offutt AFB needs to address these weather conditions by providing exterior courtyards and plazas sheltered from the prevailing winds to appreciate the warming sun during winter months, while screening solar heat gain in warmer weather and providing overhead protection during wet weather.

Energy-efficient buildings can be achieved by proper building orientation, utilizing thermally-enhanced wall and roof construction, and carefully selecting HVAC systems that incorporate the use of energy recovery and free cooling. Every facility design should include an analysis of life cycle costs of various optional HVAC systems. Geothermal systems should be considered on every project as a primary option.

Building orientation should take into account the prevailing winds and sun angles, and building fenestration (openings in the building envelope, such as windows, doors, and skylights) should take advantage of these natural resources *(see Figure 5.1)*. Operable windows could be utilized during the spring and fall, depending on the humidity and wind. And every building should be designed with the idea that daylight and views should be available to all the occupants, as much as functionally possible. Transfer of daylight internally via clerestory windows, transoms, and glass lites is encouraged. Appropriate sun control measure should be incorporated into designs to limit heat gain and glare within the facility *(see Figure 5.2)*.

Figure 5.1
AFWA - Building Orientation with Atrium to Southwest

Figure 5.2
Exterior Sun-Shading Devices

Buildings should be designed to eliminate the proliferation of refrigerators, microwaves, copiers, and high-volume printers that populate most office and workstation environments. Instead, work toward solutions that economize by designing a few common work areas that incorporate these items to serve multiple users. Energy use is reduced, fumes can be removed properly, and these work areas can also serve as appropriate places to locate the necessary recycling centers *(see Figure 5.3)*.

Water saving features should be incorporated into facility designs as much as possible. Use of waterless urinals, low flow fixtures, and HVAC systems that minimize water use are all strategies to consider for decreasing interior water use *(see Figure 5.4)*.

Offutt AFB's policy of irrigating only a handful of highly visible open spaces using well water demonstrates an understanding of how to implement SD&HPGB concepts. On the irrigation systems that exist, system controllers that track plant evapotranspiration and precipitation should be installed. These controllers use National Weather Service data to calculate soil moisture needs and shut-down the irrigation system during periods of adequate rainfall. Additionally, soil moisture monitors can be installed and connected to the controllers to further improve their performance.

A variety of innovative site development and landscape solutions could be used to achieve interesting, varied landscapes that further respond to sustainable site design principles. Two key principles underlie sustainable site design concepts. The first is to minimize the extent of impervious surface in order to minimize the volume of stormwater created as a result of these surfaces's inability to absorb precipitation. The second principle is to use native and well-adapted plants that are accustomed to regional climatic conditions and local soils. Together, these set the basis for successful and sustainable sites.

Figure 5.3
Common Work Area

Figure 5.4
Waterless Urinal

Since not all impervious surfaces can be eliminated from a new project, new methods of stormwater management must be incorporated into the design of sustainable sites. One is the concept of infiltrating stormwater into the ground, as close as possible to the location where it is created. This concept is now required on all federal projects that have a footprint that exceeds 5,000 square feet, by EISA Section 438. Section 438 requires projects "to maintain or restore, to the maximum extent technically feasible, the pre-development hydrology of the property with regard to the temperature, rate, volume and duration of flow". The soils at Offutt AFB have the ability to hold water, although the rate of water uptake, or permeability, in most areas is likely to be slow. Creative use of a combination of methods, including limiting the extent of impervious surfaces, green roofs, bioretention/rain gardens, rapid infiltration trenches, underground infiltration chambers, and other innovative stormwater BMP's will need to be incorporated into all construction projects. Bioretention gardens make excellent places to plant species that require more water. Water infiltrated into these areas will also benefit local groundwater conditions, potentially providing water to deeply-rooted trees that are nearby.

- *Minimize the extent of impervious areas in new construction projects*
- *Remove unused or excessive areas of pavement to reduce heat island effects and to decrease the total volume of stormwater created on Base*
- *In redevelopment areas, identify locations for BMP's that can serve several projects, to lower overall construction costs and facilitate future maintenance*
- *Promote the use of deep-rooted native prairie plants to improve infiltration in BMP's*

Perhaps the most sustainable activity that could be undertaken at Offutt AFB is the demolition of some of the existing out-dated building stock. No facility is more appropriate for removal than the Martin Bomber Building *(see Figure 5.5)*. This facility is a notorious energy hog, and any Base-wide reduction in energy usage is difficult to achieve with this building remaining on-line.

Sustainability Recommendations

The recommendations described below are derived from the specific information obtained from the Offutt AFB Installation Sustainability Assessment (ISA). They are intended for further definition, and to assist in the development of projects that would have a direct and viable impact on the sustainability of the Installation.

- *Develop strategies to decrease the commuting carbon footprint by encouraging carpooling, public transportation, and high efficiency/non carbon-based fuel vehicles.*

- *Continue to improve on energy efficiency by using fuels such as natural gas to reduce total carbon-based fuel consumed. This can be accomplished by assessing existing building systems via the retro-commissioning process and by improving existing systems.*

- *Complete sub-metering in order to capture and analyze the data to facilitate focused direction on future projects that will impact energy usage, carbon footprint, water conservation, etc.*

- *Continue to reduce small appliance duplication, replace low efficiency motors, and change light fixture types at buildings. These efforts should be analyzed on a building by building basis to establish the return on investment.*

Figure 5.5
Martin Bomber Building

- *Continue to implement the required 2% reduction per year of water consumption based on the Executive Order through the following:*
    - *Implement the next generation of low flush toilets and urinals, and introduce automatic faucets on hand wash sinks.*
    - *Reduce the amount of water used for irrigation on Base by using more native plant species that are able to survive with little to no irrigation.*
- *Incorporate composting practices with a garbage hauler in lieu of sending waste to the landfill.*
- *Remove or schedule for reuse all unused or undesirable buildings to bring the square feet per FTE closer to the benchmark average.*
- *Future development of the Installation should consider improving the overall density of the Base, and providing proximity to supporting services.*
- *Conduct a study to determine existing internal traffic counts and internal commuting to examine the impact of the proximity of services on energy usage and carbon footprint.*
- *Remove unused or excessive areas of pavement to reduce heat island effects and to decrease the total volume of stormwater created on Base.*
- *Incorporate pervious concrete pavements in parking areas and sidewalks, and add green space islands within parking lots at Offutt AFB.*
- *Reduce site lighting and air field lighting to minimum requirements.*
    - *Based on observations while on site, the exterior lighting appears to be above recommended standards at parking areas. A complete study should be executed to look at implementing higher efficiency fixtures or lowering light level and controls.*
    - *Based on the limited data collected, the range of light on the airfield was between 3-15 foot-candles. This level is greatly higher than the recommended level of 0.2 foot-candles per the Air Force Installation Security Program. As a result, a complete airfield study should be executed to determine improvements to be made to the current lighting design or security technology, such as low light video.*

[5.2] Site Development

Site development at Offutt AFB should incorporate both traditional standards of good site planning and emerging technologies of sustainable design. These design philosophies have much in common – a high level of functionality, thoughtful use of land, and careful use of natural resources. Adding "green design" to good site design will only improve how well a site functions.

One important factor in green design is that stormwater is viewed as a resource to be utilized rather than a nuisance to be quickly conveyed and disposed off elsewhere. This change in viewpoint has vast implications on site design and development. These are discussed in this section and the preceding section.

Parking

Avoid Over-Development

When constructing new facilities or renovating existing facilities, a review of existing available parking near the project site should be conducted to determine if some or all of the required new parking can be provided by using existing parking lots *(see Figure 5.6)*. Shared parking between two or more facilities might be possible at some locations. This option is very desirable because it consumes less land for AT/FP standoffs than having separate lots for each facility, and helps decrease runoff from impervious areas.

The most sustainable parking stall is one that is used on a daily basis. When determining the number of parking stalls for projects, follow the guidance in Air Force Handbook (AFH) 32-1084. Avoid over-sizing parking lots. Seldom-used parking stalls consume land, require expensive periodic maintenance, contribute to the heat island effect, and generate stormwater runoff. Include compact-size vehicle stalls in all new parking lot designs and when re-striping existing parking areas.

Figure 5.6
Abandoned Runway used for Parking

- *Analyze parking needs thoroughly for new and existing facilities*
- *Consider feasibility of shared-use parking lots*
- *Establish number of parking lot stalls for projects using AFH 32-1084*
- *Avoid constructing seldom-used parking stalls*
- *Include compact-size vehicle stalls in all parking lots*
- *Allocate 5% of stalls for car/vanpools*
- *Allocate 5% of stalls for low-emitting vehicles*

Green vs. Piped Drainage Systems

Keeping stormwater on the surface until it can be routed to infiltration areas, or allowed to percolate into permeable or porous pavements, is more sustainable than traditional piped storm sewer systems. Green solutions, such as the use of rain gardens or bioretention cells, address stormwater quality and quantity issues. Research has shown that green solutions can provide cost savings over piped solutions. Regulatory testing of water cleansed using green solutions is often less rigorous or not required when compared to piped systems.

Figure 5.7
Implement Plantings within Parking Lots

Including bioretention features within parking lots provides several benefits. Stormwater is intercepted and cleansed near to where it falls. Plantings in these gardens break-up the massive expanse of larger parking lots, and mitigate the heat island effect created by pavement, providing shade for vehicles and pedestrians walking to their cars (see Figure 5.7).

- *Infiltrate stormwater into the ground near where it's created*
- *Use stormwater as a resource instead of viewing it as an expensive nuisance*
- *Avoid piped solutions except in intensely developed areas*
- *Incorporate green solutions (bioretention gardens, bioswales, rain gardens, etc.) in parking lot designs, to provide multiple benefits*
- *Monitor projects on Base to determine which types of features perform best at Offutt AFB*

Permeable and Porous Pavements

Innovative pavement systems, which allow stormwater to drain through them, are becoming more common. Testing in New Hampshire has demonstrated that snow on permeable asphalt melts faster, with no ice accumulation, compared to traditional paving materials. Porous concrete infiltrates snow melt water without damage.

A key factor of success in using these materials is rapidly draining the soils under them. Soils at Offutt AFB have slow permeability. Due to this characteristic, infiltrating water directly into the subgrade below pavement is not desirable from an engineering standpoint. The use of permeable and porous pavements at Offutt AFB could be used at locations where it is desirable to temporarily detain water in the rock sub-base below the pavement *(see Figure 5.8)*. A waterproof liner would be needed to isolate the rock sub-base and any stormwater from the subgrade below it. The water would slowly be released through a series of pipes within the aggregate sub-base after a storm.

The delayed release could be used to lower the peak rate of water leaving a site, or to provide water to a rain garden or bioretention cell whose plants could use it for evapotranspiration. Use of permeable and porous pavements should be considered when site size constraints prevent using green infrastructure to accomplish the same goals. Porous concrete is not appropriate for areas used by heavy vehicles or in truck loading areas, where trucks turn on a continuous basis. It is appropriate for most POV or small vehicle parking areas, which constitute a large portion of pavement on most bases.

Figure 5.8
Example of Permeable Paving

In every situation, site designers should design pavement areas to meet functional needs, with the minimum amount of pavement necessary. This lowers construction costs, lowers long-term maintenance expenses, and decreases the amount of storm water generated, thereby creating a triple bottom-line benefit for the Base.

- *Limit the extent of pavement to the least amount required to meet functional needs*
- *Consider use of permeable or porous pavements where traffic loads permit*
- *Benefits from using permeable or porous pavements at Offutt AFB would primarily be to lower storm flow peaks*
- *Monitor the performance of pervious and permeable pavements installed at Offutt AFB to determine their performance and develop a "lessons learned" document to guide future design of similar pavements*

Green Infrastructure in Parking Lots

New and reconstructed existing parking lots should incorporate green infrastructure concepts. Bioretention gardens planted with native plants should be used to capture, cleanse and infiltrate runoff. Shade trees could be planted within the bioswales to shade vehicles and pavement. A continuous bioswale, approximately twenty feet wide, should be placed every two bays of parking in large lots. Pavement should be sloped to drain to the bioswales. Along the pavement edge, a flush band of crushed rock should be placed to collect debris and petroleum in the first flush of run-off. Vehicle wheel barriers would be placed along the pavement edge to allow unconcentrated sheet flow into the bioswales.

In parking lots less than two parking bays wide, or where a continuous bioswale island is not possible, bio-swale openings can be designed into the pavement areas. These non-paved areas should be the same size as four standard parking stalls, to provide adequate area for shade tree root development. Pavement surfaces would slope to

these openings, demarcated with vehicle wheel stops. Native grasses, shrubs and well-adapted shade trees could be planted in the openings to cleanse runoff.

In the Airmen's dormitory area, the current number of parking stalls appears to greatly exceed parking demand *(see Figure 5.9)*. Large areas of parking could be removed to bring the parking supply back into balance with the parking demand. Green infrastructure solutions should be designed into these parking lot reconstruction projects. The elimination of excess pavement will lower the volume of run-off from the lots and allow some of the stormwater to be cleansed and infiltrated on-site.

Figure 5.9
Dormitory Parking Area

Soils in the rain gardens, bioretention cells, and bioswales should be amended to be equal portions by volume of sand and compost. This soil mixture will allow rapid infiltration of stormwater, while retaining moisture to support plant growth during dry periods. Deep-rooted plants increase the infiltration rate of these bioswales, gardens, and cells over time, improving their performance. The organic matter in the compost will serve as a filter and remove or retain certain contaminates. Research in Minnesota has proven that bioswales, gardens and cells function year-round, providing stormwater management benefits in all seasons.

In some locations the use of green infrastructure may not be possible due to space constraints. In those cases, structural, non-biologic Best Management Practices (BMP's) should be incorporated into the design. Structural BMP's include hydrodynamic separators which remove debris and sediment from stormwater, and underground storage systems to detain stormwater for later release. While these structures provide similar benefits to green infrastructure, they have a higher initial construction cost and may require frequent maintenance.

Green infrastructure and structural BMP's that will mitigate and cleanse stormwater were incorporated into the design of the proposed USSTRATCOM facility. Once these features are installed and become established, Base CE staff should informally monitor their performance to create a lessons learned document that can be incorporated into future updates of the Offutt AFB ID2.

- *Manage stormwater within the footprint of parking lots where possible*
- *Properly prepare soils in bioswales and retention gardens to ensure long term success*
- *Use deeply-rooted native plant species to improve infiltration over time*
- *Include green solutions in parking lot reconstructions as well as new construction*
- *Incorporate structural BMP's into projects when space constraints prevent the use of green infrastructure*
- *Create a lessons learned document of green infrastructure/ structural BMP's for Offutt AFB*

Rainwater Harvest Systems

Collection of rain and snow-melt water from building roofs for use as gray water within buildings or as purple water for supplemental irrigation on high-visibility landscape areas should be considered in future construction projects. These systems require careful design and adherence to current building codes. Their primary benefit is that they make water which could be viewed as a liability into a useable asset *(see Figure 5.10)*.

Figure 5.10
Rainwater could be Harvested from Expansive Roofs on Base

Access and Accessibility
Vehicle access to a new or redevelopment site should use best practices relative to traffic flow and distance of site entry and exit points to existing road intersections. At most areas of Offutt AFB, site accessibility requirements can be easily met.

Accessible parking stalls should be placed near building entrances while meeting AT/FP standoffs to provide safe travel routes for persons with disabilities *(see Figure 5.11)*. When a POV parking lot with accessible parking stalls is separated from the facility it serves by a street, a clearly-marked pedestrian crossing should be established to provide a reasonably direct travel route for persons using the lot.

- *Locate POV parking near new facilities when possible while meeting AT/FP standoffs*
- *Provide clearly-marked pedestrian crossings when remote parking is required*
- *Conform to applicable federal guidelines to ensure that all individuals have full use of the Base*

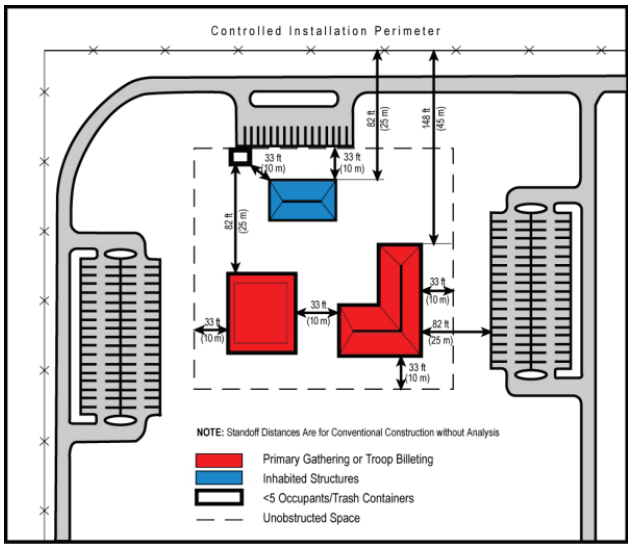


Figure 5.11
Anti-Terrorism/Force Protection Standoffs

Open Space and Recreation

An overriding consideration in the development of new open spaces or the renovation of existing open spaces should be to focus on a level of quality that can be sustained at Offutt AFB. Wind, sun and temperature extremes during the year provide clues on what features are needed for successful site development at the Base. Wind protection in the form of plantings and structures can provide relief from hot summer winds, as well as the chill of bitter winter winds. Shade structures and overhead canopies of trees provide shelter from hot and intense sunlight. To improve environmental conditions near the various sport fields, shade trees should be added to provide shade for spectators and participants, shade parking areas, and help define spaces surrounding the fields. Creating an urban forest on Offutt AFB will provide green infrastructure benefits of reduced heat island effect, reduced stormwater runoff volume, and improved microclimate, which encourages active lifestyles. Certain areas of the Base are not good candidates for development of an urban forest, including the airfield and portions of the Base's industrial areas. All plantings on Base should be reviewed relative to BASH concerns.

All structures, including break or picnic shelters, gazebos, outdoor break areas, smoking facilities, or other constructed features, must be approved by Base CE prior to construction. The Base CE standard for these structures is to install pre-engineered, tubular steel structures that come with factory-applied finishes. Stick-built shelters, structures, and decks are not allowed at Offutt AFB.

- *Create sustainable outdoor areas at Offutt AFB that include features that buffer wind and provide shade*
- *Provide shade by creating an urban forest on Base to increase use of sidewalks, trails, and outdoor recreation areas*
- *Provide shade trees at all sports fields to shade spectators and buffer wind*

Landscape Plantings

To survive at Offutt AFB, landscape plant selections for community open spaces should be native or well-adapted plant species. Clustering plantings in close association will be more successful in this setting than attempting to create a landscape consisting of separate, specimen plants.

Long-term success for landscape plantings is directly tied to proper site preparation. Inadequate site preparation will result in landscape plantings that will never reach their potential, and in many cases do not reach maturity. Depending upon soil conditions, this may vary from little more than correctly digging the planting hole and carefully backfilling soil around the plant roots. In other cases, it may require a complete

removal and replacement of existing site soils with prepared soils, to improve drainage or provide a more conducive environment for plant roots. Correcting compacted soil conditions is necessary on most construction sites.

A chronic problem occurring with landscape planting at most Air Force Bases is improper pruning as part of on-going maintenance. Plant spacing in projects should be based on the plant's ultimate size and the designer's intent. Shrubs trimmed into geometric shapes greatly reduce a plant's ability to thrive. Shrubs should be pruned in a manner to enhance their natural form or to elevate the height of lower branches on young trees. To alleviate the issue of improper planting, the landscape architect on each project should be required to provide a sketch showing the mature plant size and form relative to the building façade. This drawing would help Base CE confirm that the size of mature plantings match the architecture and fit within the available space. While this drawing will not prevent bad pruning, it would convey design intent and set a standard to be followed relative to pruning. This would also lower landscape maintenance costs over the long-term, improving the financial sustainability of maintaining an attractive and healthy Base landscape.

- *Use native or well-adapted plant species (see Figure 5.12)*
- *Cluster plantings to create naturalistic communities of plants (see Figure 5.13)*
- *Prepare sites correctly prior to planting*
- *Match planting spacing to mature plant size*
- *Require landscape architects to provide elevations showing desired mature plant sizes and forms to guide landscape management efforts*

Figure 5.13
Cluster Plantings to Create Natural Look

Figure 5.12
Use Native or Well-Adapted Plant Species

[5.3] Architectural Design

Offutt AFB is located in the Missouri River Valley 10-miles south of downtown Omaha, Nebraska. It occupies approximately 3,200 acres of land just south of Bellevue, Nebraska. Offutt AFB consists of two large distinct areas, the base proper, and the Rising View Community family housing in the Capehart area, which is located approximately one-mile west of the main base.

Neither the City of Omaha nor Offutt AFB has a distinct local design character, but what architectural character there is tends to parallel between the City and Base. Each has their historic districts of red or brown brick buildings; their mid-century modern buildings of buff brick and ribbon windows; and their more recent eclectic styles of architecture. The City and Base also share a more conservative approach to design, with few projects coming across as trendy or dated.

Offutt AFB has seen sporadic building campaigns over several decades since its inception as Fort Crook in the late 1800's. This has led to a mix of architectural styles and materials in use on Base, which is fairly cohesive within individual Zones, but may not create a strong architectural identity for the entire Base. In an attempt to create a unified Base identity, the following recommendations should be considered for all new construction and renovation work at the Base. These recommendations incorporate the good design practices already in use on the Base, while at the same time affording the designer the latitude to explore new and unique solutions to the specific design issues at hand. At all times, sustainable design and high-performance green building principles should inform the design decisions regarding a specific project.

Figure 5.14
Bennie L. Davis Maintenance Facility - Operational / Mission

Goals

The following goals should guide all levels of design at Offutt AFB:

- *Low Maintenance: Use permanent low maintenance exterior materials that are complementary to the natural and man-made environment of Offutt AFB.*
- *Environmental: Design facilities in ways to enhance environmental quality and minimize consumption of natural resources.*
- *Layouts: Provide functional layouts that satisfy user needs.*
- *Cost: Reduce life cycle costs.*
- *Labor: Reduce labor-intensive maintenance procedures.*

Zoning

Offutt AFB is currently segregated into eight (8) major zones. Many aesthetic treatments have been successfully established across all zones. Amplification of these positive trends in future design work will further reinforce the image of the Base as a cohesive whole. Functional requirements may produce conflicting conditions within zones. This conflict is inevitable in an environment as diverse as Offutt AFB; however, recognizing these differences and grouping facilities with similar missions together may realize some functional and aesthetic coherence within this diversity. Building form, massing, scale, and siting will vary from zone to zone, while still maintaining an overall sense of cohesiveness throughout the Base by the use of similar materials and detailing. Both base-wide and zone-specific standards are outlined in this document.

Zone 1, Operational / Mission

The Operational / Mission Zone includes areas that are directly related to the daily operation and functions of the 55th Wing. This area includes, but is not limited to, runways, aircraft hangars, maintenance and storage facilities, and some office functions *(see Figure 5.14)*. This zone is primarily comprised of large-scale, utilitarian buildings, which are surrounded by pavement and parking areas. There is typically little attention to landscaping and other site amenities. Noise is a major concern due to the inclusion of the aircraft functions. This zone, the

ZONING MAP KEY

Zone 1 - Operational / Mission
Zone 2 - Administrative / U.S. Strategic Command
Zone 3 - Historic District / Fort Crook
Zone 4 - Community Facility
Zone 5 - Coffman Heights Housing
Zone 6 - Administrative Operational
Zone 7 - Capehart Housing
Zone 8 - Unaccompanied Housing

Offutt AFB District Building Zones

largest single portion of the Base, occupies the entire southeastern section of the Base. The Operational/ Mission Zone is separated from the rest of Offutt AFB by SAC Boulevard on the west, and by Peacekeeper Drive and Union Lane on the north.

Zone 2, Administrative / U.S. Strategic Command
The Administrative / U.S. Strategic Command Zone contains primarily administrative spaces and support facilities *(see Figure 5.15)*. Although by function this zone is similar to Zone 4, Community Facility, this area is unique at Offutt AFB due to its campus-like identity, which is coherent and consistent. The setting features relatively large lawns with few buildings, and consistent building materials and landscaping. This zone occupies the southwest corner of the Base, and is bordered to the north by Looking Glass Avenue, and to the east by Comsat Drive.

Currently, a new facility for the U.S. Strategic Command (USSTRATCOM) is under design, to occupy the existing nine-hole golf course within Zone 2. This facility is taking design cues from both Zones 2 and 3, but because of the shear mass of the development, it will occupy a distinct position within the Base.

Zone 3, Historic District / Fort Crook
The Historic District / Fort Crook Zone at Offutt AFB includes many of the original buildings and fabric of Fort Crook *(see Figure 5.16)*. This zone is oriented to a central parade ground, and encompasses a wide variety of functions, including housing. The buildings in this zone are typically set back from the street, with lawns and sidewalks. Large shade trees are plentiful, and create a sense of neighborhood. Because this area is listed on the National Register of Historic Places, careful consideration and planning must be taken prior to attempting alterations to structures in this area. This zone occurs on the western edge of Base, and is bordered to the north and east by SAC Boulevard.

Figure 5.16
Generals Row - Historic District / Fort Crook

Figure 5.15
USSTRATCOM - Administrative / U.S. Strategic Command

Zone 4, Community Facility
The Community Facility Zone includes public service facilities as well as commercial buildings. This zone consists of three areas of the Base: one zone on the western edge of the base proper; one zone on the eastern edge of the Rising View Community in the Capehart area; and the 183-acre recreational zone to the east of the base proper around Lake Offutt.

The base proper area of this zone is fairly densely-built, with buildings typically set back from the street. This area closely relates to a typical town in function, including a grocery, post office, retail stores, and a library *(see Figure 5.17)*. This portion of the zone is bordered to the north by Lincoln Highway, and to the south by Meyer Avenue.

The area of this zone to the east of the Rising View Community in the Capehart area is more suburban in character, and complements and supports the adjacent housing area. Facilities included in this area are the chapel, theater, youth center, medical clinics, the 18-hole golf course, and several temporary lodging facilities, which provide public services to the Base housing.

Density is not a characteristic of the recreational area and buildings surrounding Lake Offutt. In addition to the lake, this area's facilities include a large pavilion for parties, covered picnic areas, softball fields, campsites, and boat rental.

Figure 5.17
Thomas S. Power Library - Community Facility

Zone 5, Coffman Heights Housing
The Coffman Heights Housing Zone includes areas of multifamily and duplex style housing that resembles a typical suburban setting, located in the northeast corner of the Base. Since family housing on Base is privatized, it is excluded from consideration in this Installation Development and Design guide.

Zone 6, Administrative Operational
The Administrative Operational Zone includes areas that are directly related to the daily operations and functions of the 55th Wing. It also includes administrative spaces, public service facilities, and commercial buildings.

Currently, this zone is dominated by the Martin Bomber Building (MBB) *(see Figure 5.18)*. This facility, along with adjacent facilities, is slated for demolition, with the functions housed in these buildings moving to the other side of the Base to Building 500. As such, the architectural character of this zone will change dramatically in the future. Newer facilities in this zone, including the Air Force Weather Agency Headquarters and the Child Development Center, may more appropriately set architectural context for future building projects in this zone.

Zone 7, Capehart Housing
The Rising View Community family housing in the Capehart area includes primarily single family and duplex style housing, with some multiplex housing, that resembles a typical suburb in many ways. This Zone is located to the west of base proper. Since family housing on Base is privatized, it is excluded from consideration in this Installation Development and Design guide.

Figure 5.19
Tuskegee Hall Dormitory - Unaccompanied Housing

Zone 8, Unaccompanied Housing
The Unaccompanied Housing Zone includes areas designated primarily for dormitory style housing *(see Figure 5.19)*. Although functionally similar to the family housing areas, building massing and site relationships are very different. The dormitory style housing occurs in the northwest corner of the Base, to the north of Zone 6.

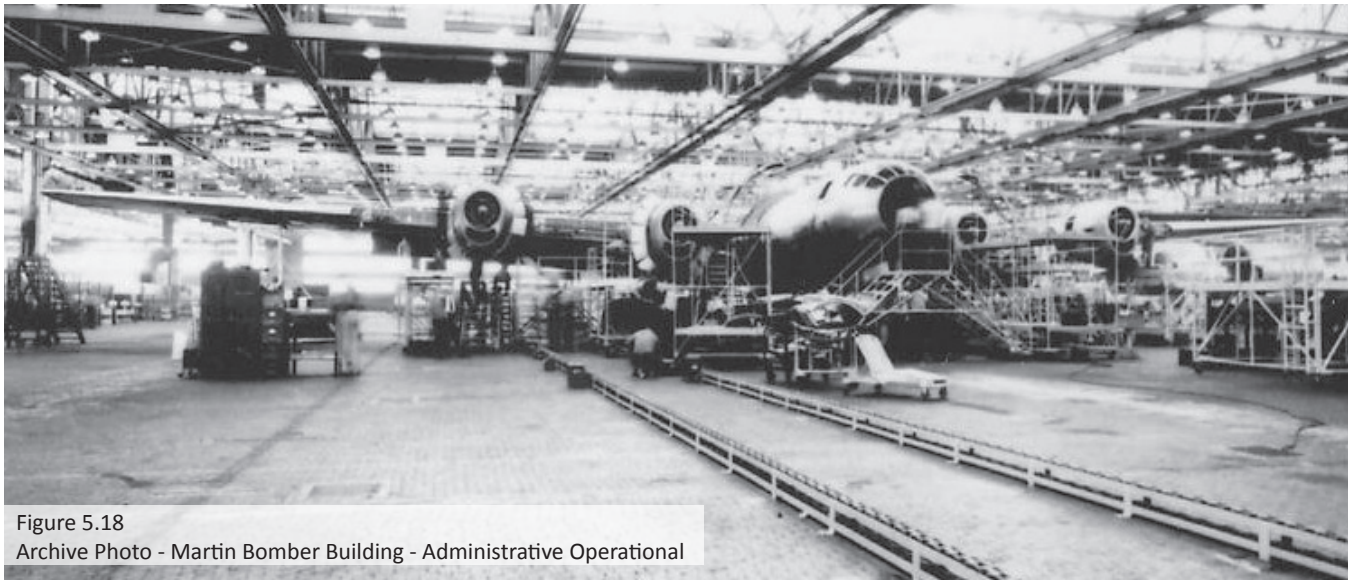


Figure 5.18
Archive Photo - Martin Bomber Building - Administrative Operational

Architectural Order

Plan Complexity and Geometry
Typically, the existing facilities at Offutt AFB are fairly simple in plan and geometry. This is a function of the utilitarian uses of most of the buildings, such as the hangars. Furthermore, facilities tend to be fairly square or rectangular in plan, with the interior functions not really informing the exterior massing. However, there are notable exceptions to these statements, such as the facilities in the Historic District *(see Figure 5.20)*, the recently completed Child Development Center *(see Figure 5.21)*, and Building 500.


Figure 5.20
Generals Row in the Historic District

Future construction projects should attempt to articulate more the building footprint, which could serve a number of functions: to allow more daylight and views into the occupied portions of the building; to create sheltered exterior plazas and courtyards; and to create plans more functionally responsive to the programmatic requirements of the facility. Whereas each of the aforementioned concepts might be achieved with a square plan, a square or rectilinear plan should not be the default design solution.


Figure 5.21
Child Development Center

When designing a new facility, consideration should also be given to future additions to the facility. Oftentimes, a more complex plan geometry lends itself better to future additions than a more formal geometry.

- *Incorporate daylight into facility interiors*
- *Use floor plan articulation to create exterior courtyards and plazas*
- *Consider future additions*

Building Scale and Proportion
Building function, evolving construction technology, and changing aesthetics have resulted in a wide variety of building forms and sizes at Offutt AFB. The various Zones are characterized as follows:

Zone 1, Operational/Mission: Large buildings with simple massing, as characterized by the hangars. This zone also contains smaller scale structures of varying function and character *(see Figure 5.22)*.

Figure 5.22
Operational/Mission Zone - Hangar Facility

Zone 2, Administrative/U.S. Strategic Command: One- to four-story structures in a campus-like setting. Consistent street setbacks and generous lawn areas combine with consistent materials to create the most cohesive architectural effect among recently constructed facilities *(see Figure 5.23)*.

Figure 5.23
Administrative/U.S. Strategic Command Zone - USSTRATCOM

Zone 3, Historic District/Fort Crook: One- and two-story structures, many of which are residential in character and scale *(see Figure 5.24)*. These buildings include many of the original Fort Crook structures. Consistent street setbacks and site orientations around the parade ground combine with careful massing and materials to create the most architecturally cohesive and visually pleasing zone on Base.

Figure 5.24
Historic District/Fort Crook

Zone 4, Community Facility: Structures are generally one- and two-stories in height, with a few three-story buildings scattered throughout. Some consistency in setback, relationship to the street, and entry definition is apparent in this area.

Zone 6, Administrative Operational: One- to three-story buildings serving industrial, administrative, commercial, and public service functions *(see Figure 5.25)*.

Zone 8, Unaccompanied Housing: Three-story dormitory buildings. These facilities have good scale and siting relationships to each other, and create a pleasant courtyard environment. Landscaping and other site amenities are generally well done.

The scale of the existing facilities at Offutt AFB mostly conforms to the programmatic requirements of the facility. For example, a hangar is sized to accommodate the aircraft to be housed there. This concept of scaling facilities to meet their programmatic requirements should be continued in future building projects.

Future facilities should carefully consider multi-story solutions. A multi-story solution may more appropriately address the programmatic requirements of the facility over a single-story solution, as well as present more opportunities for daylight and views. Furthermore, facilities located near the flight line may benefit from the larger massing of a multi-story solution in relationship to the large adjacent hangars. Of course, costs must be weighed in any design solution, but the additional cost of stairs and elevators in a multi-story facility may be offset by the reduced amount of exterior skin. Finally, multi-story solutions require less land, and can address the steep grades found in certain areas of the Base.

- *Consider multi-story solutions to address programmatic requirements with small site impact*
- *Scale new facilities to relate to adjacent context*

Figure 5.25
Administrative Operational Zone - AFWA

Figure 5.26
Bennie L. Davis Maintenance Facility (B457)

Massing and Typical Bay Spacing

Because of the varying age of facilities on Base, combined with the myriad of functional requirements, building massing is very disparate across the Zones. The hangars in Zone 1 are the largest structures on Base, especially Building 457, but Building 500 in Zone 2 is a massive structure occupying a lot of real estate *(see Figure 5.26)*. And the 800-lb gorilla on Base is the Martin Bomber Building, which is scheduled for demolition *(see Figure 5.27)*.

Care should be taken to assure the appropriate roof type is chosen for the facility, as this will impact the building's massing more than any other single element. Very large facilities, such as hangars, the Exchange, and commissary, should utilize low-slope roofs. Smaller facilities, especially those more rectilinear in plan, could utilize a standing seam metal roof to complement other such roofs on Base. The desired roof type for the building must be considered when designing a facility, and should be reflected in the solution's plan, both from a scale and constructability standpoint. A very geometrically complicated plan is difficult to cap with a sloped roof. Ultimately, the roofing solution will be an outcome of the development process, and should not be determined beforehand. A standing seam metal roof may be an appropriate solution for some facilities, as long as its use does not preclude achieving other sustainable design and high performance green building requirements.

Figure 5.27
Martin Bomber Building

Examples of buildings which use sloped standing seam metal roofing are plentiful on this Base. A notable building that has used this roofing technique most successfully is the Child Development Center, which allows the interior spaces to contain elevated ceiling heights as well as utilizing daylighting techniques that are designed into the roofing shapes *(see Figure 5.28)*.

Figure 5.28
Child Development Center - Standing Seam Metal Roof

Because most facilities on Base are designed to house the specific functions of the facility, bay spacing is not an apparent design issue. Whereas the Base has many hangar facilities, these are typically the only replicated facility, and other buildings are designed for their own specific use. This concept should be continued in future building projects, in that the buildings should reflect their individual programmatic requirements, and not some arbitrarily selected bay spacing or massing. However, both

massing and bay spacing of a new facility should take into account adjacent facilities, in order to create a complementary design.

- *Select roofing design and materials to complement facility size and type (see Figure 5.29)*
- *Use building massing and bay spacing to address programmatic requirements and surrounding context*

Figure 5.29
Fire/Crash/Rescue Station - Standing Seam Metal Roof

Siting and Orientation

The typical facility located in Zones 1 and 6 of Offutt AFB is aligned with the runway, which is set approximately 45-degrees from north. The facilities in the other zones either align with the streets, the parade ground, or the ordinal directions. Whereas orientation to the runway is important for the large hangars supporting the runway, for other facilities an orientation closer to the ordinal directions may be more beneficial from a solar perspective.

Figure 5.30
AFWA - Introduction of Daylight into Atrium

When siting future facilities to be built on Base, sustainable design and high-performance green building principles need to be taken into consideration. HQ ACC has emphasized the importance of daylight and views within their facilities, as well as the performance of the exterior building envelope in regard to energy use reduction *(see Figure 5.30)*. Careful analysis of each facility needs to be conducted during the concept development process to verify the most beneficial orientation of the building, regardless of alignment with the existing street grid and adjacent facilities. Furthermore, sun control devices shall be incorporated into the design as appropriate, and as required to mitigate solar heat gain for those facilities which cannot be optimally oriented.

Efficient land use is another factor to consider when siting buildings, along with the requisite guidance relative to Anti-Terrorism and Force Protection. On this Base, the limited land mass and infill opportunities makes the efficient use of land more important than at a more typical base. It will be important to keep in mind that future buildings may share the standoff distances created between buildings, which will allow better utilization of the land and infrastructure of the Base.

- *Orient facilities to take advantage of sun angles and prevailing winds*
- *Incorporate sun control devices to address glare and solar heat gain (see Figure 5.31)*
- *Site facilities to maximize land use, while still complying with AT/FP requirements*

Figure 5.31
AFWA - Sun Control Devices Mitigate Heat Gain and Glare

Symmetry and Hierarchy of Elevations

The different Zones at Offutt AFB incorporate symmetry into building design to varying degrees. The Historic District has the most symmetrical buildings, even if the symmetry is more implied than actual. The hangars in Zone 1 are for the most part symmetrical, owing to their functional requirements. And the Administrative Zone also incorporates symmetry through the overwhelming presence of the U.S. Strategic Command Headquarters.

Figure 5.32
Fire/Crash/Rescue Station - Articulation of all Facades

In the other Zones on Base, building design has tended to reflect the prevailing trends when the facilities were constructed, with symmetry being a minor consideration. A more prevalent design concept is the modern credo of "Form Follows Function", with the building massing and fenestration reflecting the interior uses.

Existing facilities on Base tend to emphasize the main elevation, with less attention paid to the remaining facades. Often times, this is a function of the facility's use, with the main elevation serving as access for Base personnel, and the remaining elevations accessing more industrial areas. A prime example of this are the hangars, with their large doors facing the runway, and little if any articulation of the remaining sides of the building. But even if all elevations are articulated, other site and building requirements may render certain views of the building less attractive, as with the incorporation of antennae and disks on building walls and roofs.

More recent projects on Base have attempted to articulate all facades that are visible from the street system and public parking areas. These buildings create a more human scale on those sides accessible to personnel. A good example of this is the Fire\ Crash Rescue Station *(see Figure 5.32)*.

Future construction and renovation efforts on Base should continue this trend of articulating the building facades that are accessible or visible to Base personnel. At all times, the main entry to the facility needs to be maintained as the primary focus of the exterior elevations, in order to enhance way-finding on the Base. There are many good examples of architectural solutions on this Base that enhance building entrance identification, such as the 97th Intelligence Squadron, the Alert Facility, and Tuskegee Hall *(see Figure 5.33)*. Also, placement of antennae, disks, outdoor storage and maintenance spaces, and exterior shelters needs to be carefully considered with the facility design.

- *Articulate all building facades visible to Base personnel*
- *Emphasize building entry*
- *Incorporate antennae and exterior structures into facility design*

Open Spaces

Offutt AFB is a fairly compact base, and does not have a surplus of open space. What open space there is may not be accessible to Base personnel, such as that adjoining the runway, or may be disjointed

Figure 5.33
Tuskegee Hall - Emphasis of Building Entry

and unusable. A notable exception to this is the parade ground located in the middle of the Historic District, which is an open space on the Base that sees continual use *(see Figure 5.34)*.

Figure 5.34
Parade Ground

Since land is at a premium, particular attention needs to be paid to the spaces between buildings to assure that these areas are not filled with concrete. New buildings should be sited in relationship to the surrounding facilities, in order to create opportunities for usable exterior spaces. Parking should be shared between facilities, and should be subservient to the pedestrian entry procession into a building.

Protected outdoor employee break areas, picnic shelters, and playground and park shelters should be included in new projects when justified by building occupancy. These shelters should complement the architectural style of the facility, while at the same time fitting into the context of the Base zone *(see Figure 5.35)*.

Figure 5.35
Fire/Crash/Rescue Station - Open Plaza Space

Another concept of open space is the courtyard, usually created by the siting of more than one building. A courtyard creates a sheltered space, and allows landscaping to be concentrated in one area, where it is easier to maintain and enjoy by Base personnel. Landscaping in courtyards requires less water, and the concentration of development becomes a focal point for the surrounding buildings, both visually and functionally. A current example of a successful courtyard is located between two dormitories, and includes passive recreational activities for the airmen *(see Figure 5.36)*.

Figure 5.36
AFWA - Exterior Rooftop Area

Future construction and renovation efforts on Base should focus on the exterior spaces around the buildings, as well as the spaces between buildings. There is opportunity to create a sense of community by siting adjacent buildings to take advantage of the exterior space between them, as well as to create areas to concentrate landscaping. By concentrating landscaping in certain areas on Base that relate to the buildings, pleasant exterior environments can be created for the enjoyment of Base personnel, and the landscaping is easier to maintain.

- *Create exterior environments, such as courtyards or plazas (see Figure 5.37)*
- *Concentrate landscape in specific areas most accessible to Base personnel*

Figure 5.37
Dormitory Courtyard Area

Architectural Elements

Materials
Exterior building materials should be chosen for their durability, color and appearance retention, and ease of maintenance. Furthermore, materials should be chosen to support the sustainable design principles of regional materials and recycled content.

The predominant exterior building materials for the different zones on Base are as follows:

Figure 5.38
Naval Operations Support Center - Admin. Operational

Zone 1, Operational/Mission: Brown or tan face brick, medium tan concrete masonry units, prefinished metal wall panels in neutral tan colors, sloped standing seam roofs in neutral tan or dark bronze colors *(see Figure 5.40)*.

Figure 5.39
Historic District/Fort Crook

Zone 2, Administrative/U.S. Strategic Command: Tan face brick and medium tan concrete masonry units.

Zone 3, Historic District/Fort Crook: Red brick, sandstone sills, gray asphalt shingles, white window frames *(see Figure 5.39)*.

Zone 4, Community Facility: Brown, tan, or red face brick, medium tan concrete masonry units, sloped standing seam roofs in dark bronze.

Zone 6, Administrative Operational: Brown or tan face brick, medium tan concrete masonry units, prefinished metal wall panels in neutral tan colors, sloped standing seam roofs in dark bronze *(see Figure 5.38)*.

Zone 8, Unaccompanied Housing: Brown or tan face brick, medium tan concrete masonry units, red tile roofs.

Figure 5.40
97th IS - Operational/Mission

Figure 5.41
Bennie L. Davis Maint. Facility - Prefinished Metal Wall Panels

Prefinished metal wall panels are utilized on larger facilities, such as the hangars *(see Figures 5.41 and 5.42)*. Standing seam metal roofs in a neutral tan or dark bronze color are utilized on a number of facilities, and will be addressed later in this section.

Figure 5.42
Typical Hangar Facility at Offutt AFB

Exterior materials for new facilities should be selected to complement the overall aesthetic of the Base. Masonry in brown or tan colors, incorporating details and banding in complementary materials, is recommended. Metal wall panels may be used as appropriate for the facility's function and scale, but should be protected from abuse at the building base and openings by incorporating a masonry wainscot. Other exterior materials, such as composite metal wall panels, may be considered. Exterior insulation finish systems (E.I.F.S.), due to their poor performance history and lack of comprehensive manufacturer's warranty, are prohibited by HQ ACC, and may not be used at Offutt AFB.

- *Use masonry colors that complement other architecture on Base*
- *Incorporate masonry detailing, banding, and accents to provide a human scale*

Fenestration

Building fenestration, or the openings in the building envelope such as windows, doors, and skylights, should be designed to enhance the exterior image of facilities, as well as to incorporate daylight and views into the building interior *(see Figure 5.43)*. Primary concerns regarding building fenestration are its effect on the building envelope performance, as well as its compliance with Anti-Terrorism/Force Protection (AT/FP) requirements.

Figure 5.43
Building 40 - Fenestration of Historic Structure

In the design of new facilities, prominence of the building's main entrance must be achieved. The main entrance must be welcoming, sheltered, and visible to the building's occupants to enhance security. Glazed aluminum swinging doors are the standard on Base, oftentimes with surrounding sidelites and transoms. This type of entrance should be continued with future building projects. All building entrances must be handicap accessible.

The majority of buildings on Base utilize thermally-broken aluminum frame windows, with high-performance glazing *(see Figure 5.44)*. Examples of fixed windows, and operable sliding, casement, and awning windows, are evident on Base. The type of window selected should serve the user's

Figure 5.44
AFWA - Aluminum Frame Windows

Figure 5.45
Tuskegee Hall Dormitory - Operable Windows

requirements. Operable windows are encouraged where appropriate, to enhance the indoor air quality of a facility, and to give the building's occupants greater personal control over their thermal environment *(see Figure 5.45)*.

The type of glazing selected for exterior windows and doors should be carefully analyzed in regard to thermal performance and its effect on the overall building envelope. Whereas tinted glazing is predominant on Base, clear glazing may be considered where appropriate for the individual project. Additional glazing coatings, beyond the standard Lo-E coating, should be considered to improve glazing performance, as well as the inclusion of various gases in the interstitial space in insulating glass units. Triple glazing, for sound control, should be considered for use along the flight line and in Air Installation Compatible Use Zones (AICUZ). Finally, all exterior glazing must comply with AT/FP requirements.

Aluminum finishes are dependent on the zones in which the facilities are located. Some zones see a predominance of dark bronze anodized finish, whereas as other zones utilize white painted finishes. Continued use of dark bronze anodized frames is discouraged, because research has shown

Figure 5.46
Fairchild Hall - Aluminum Frame Windows

that dark window frames increase interior glare. Other aluminum finishes should be considered as appropriate to the overall aesthetic of a new facility *(see Figures 5.46 and 5.47)*.

Great care must be taken for window replacement projects within the Historic District. New windows should be selected following careful consideration of aesthetic and functional/ programmatic issues, and the condition of existing windows. Consultation with and approval of the Nebraska State Historic Preservation Office (SHPO), as well as the Base Architect, is required.

Due to the severe nature of the winters, special consideration should be taken to avoid placement of entries and excessive fenestration on the north side of buildings. Main entries should not face the Base perimeter, per AT/FP requirements.

Daylight and views must be analyzed when designing the fenestration of a new facility. Meeting HQ ACC's requirements for daylight and views may require a much greater amount of glazing than is found in the typical building on Base, and these recommendations may inform the design of the building footprint as well. Long, linear buildings, as well as multi-story

Figure 5.47
Satellite Pharmacy - Aluminum Frame Storefront

Figure 5.48
AFWA - Sun Control Devices for Exterior Glazing

facilities, have greater opportunities for introducing daylight and views into the building interior, and these concepts should be considered in the initial concept development phase of a project.

Sun control at exterior windows may be required for enhancing the interior environment of a facility *(see Figure 5.48)*. Glare at work surface level should be avoided, which may require the inclusion of exterior sun shading devices at the windows, as well as sun control films incorporated into the insulating glass units. Light shelves installed on the interior of clerestory glazing can bring sunlight further into the interior of the building, and should be considered *(see Figure 5.49)*. In all, a combination of vision glazing and clerestory glazing can be used to maximize daylight and views within the facility, while at the same time controlling unwanted glare and heat gain.

Another option for introducing daylight into a facility is the use of insulating translucent panels, which may be used both for vertical applications or skylights. These panels have been successfully used at many existing facilities on Base, such as the recently completed Child Development Center *(see Figure 5.50)*. The benefit of this type of product is that the thermal performance is greater than a typical insulating glass unit. Furthermore, these units provide opportunities for natural daylighting

Figure 5.49
Light Shelves Increase Sunlight within Building

within facilities, but because they are not glass, they do not present hazards to occupants in the case of an explosive event. Unlike traditional glazed assemblies, translucent panels have been approved for use by the US Army Corps of Engineers Protective Design Center, and no further design analysis is required. Pre-manufactured translucent skylight assemblies are encouraged; however, translucent panels shall not be used as part of a roof assembly without prior coordination and concurrence of HQ ACC/A7PS. Wherever skylights are utilized on a facility, careful detailing must be included to prevent water leakage, unacceptable snow build-up, etc. Insulating glass unit skylights should be avoided because of their tendency for water spotting and dirt build-up.

- *Use thermally-enhanced glazing products*
- *Incorporate daylight and views into building interiors*
- *Provide sun control devices to avoid glare*
- *Consider use of insulating translucent panels in both vertical and sloped applications to provide interior daylight*

Figure 5.50
Insulated Translucent Panels

Roof Features and Forms

Building roofs should be designed to achieve the following: to maintain a weather-tight barrier; to facilitate ease of maintenance; to maintain color and appearance retention for those roofs exposed to view; and to provide a long life-span. On-going roofing maintenance is a major concern to the Base, and alleviating these maintenance issues should be the primary function of roof design.

Figure 5.51
Bennie L. Davis Maint. Facility - Membrane Roof

The type of roof system selected for a project should be a direct reflection of the building form. Buildings with large floor plates should consider a low-slope membrane roofing in a light color, complying with reflectivity requirements of sustainable design and high-performance green building principles *(see Figure 5.51)*. As an option, a sloped standing seam metal roof may be used, such as those currently installed on many of the hangars. Because of the shear mass of these hangar facilities, the additional height of a sloped roof does not dwarf the building below. For smaller facilities, a sloped standing seam metal roof may be used, provided the geometries of the building floor plate do not create an overly complicated roof form, which would be prone to water infiltration. For these types of facilities, a low-slope membrane roofing may be more appropriate in providing a long life-span and low maintenance roof. Standing seam metal roofs on existing facilities, except for the hangars, are typically a dark bronze color, which could be used on new building projects. As an option, the designer may consider a lighter roof color to comply with reflectivity requirements of sustainable design and high-performance green building principles. Ultimately, the exposed roof color should complement the overall aesthetic of the building *(see Figure 5.52)*.

Figure 5.52
Naval Operations Support Center - Membrane Roof

The roofing solution will be an outcome of the development process, and should not be determined beforehand. A standing seam metal roof may be an appropriate solution for some facilities, as long as its use does not preclude achieving other sustainable design and high performance green building requirements.

Fascia design becomes especially critical if broad overhangs are used. If pronounced fascias are used on metal roofs, the fascia material should match that of the roof. Seam treatment between fascias and roofs may vary, but the color and material should match. A metal fascia should never extend above the edge of a sloped roof. In no case should a metal fascia be used on a flat-roofed building. All fascia, gutter, and roof trim material should be made of prefinished metal, and should be designed to prevent deformation (oil canning) due to expansion and contraction.

Figure 5.53
Roof Feature at Building Entry

Avoid locating equipment on the roof that would be exposed to view. Roof-mounted equipment should be screened to avoid visibility from the ground. Avoid mounting vents and equipment on standing seam metal roofs to the greatest extent possible. If unavoidable, insure proper detailing of curbs and flashing to create a weather-tight enclosure.

Facilities on Base have utilized roof features over the main entrance, often times to great success. These roof features both announce the location of the main entrance as well as provide protection from the elements. This design feature should be encouraged in future projects. Care should be taken to insure any exposed structure is not conducive to roosting birds *(see Figure 5.53)*.

Figure 5.54
USSTRATCOM Green Roof

- *Select roof system to accommodate building form and massing*
- *Utilize roofing systems that are low-maintenance and provide a long life-span (see Figure 5.54)*
- *Incorporate roof elements at building entries*

Other Building Features

Other building features which must be considered in the design of new facilities are as follows: gutters and downspouts, porticos, canopies, overhead sectional doors, and louvers. These building elements must be integrated into the overall design of any new facility. Of special concern are downspouts, which often times become much more of a design element in the finished product than the designer intended. Downspouts should be incorporated into the overall aesthetic of a facility in such a way that they do not cause maintenance concerns in the future, such as by building them into the exterior envelope.

Figure 5.56
Golf Course Maintenance Facility
Air Intake Louver Elevated above the Ground Level

The design of porticos and canopies should complement the facility architecture, as well as provide opportunities to create pleasant exterior spaces adjacent to the facility *(see Figure 5.55)*. Porticos and canopies should provide protection from the elements, as appropriate, and should provide a sense of enclosure and space. These exterior "rooms" enhance the quality of life for Base personnel, and oftentimes create a more human scale for a facility.

Overhead sectional doors and louvers need to be considered in the design of any facility. Their location is obviously dependent on the functional requirements of the building design, but care should be exercised not to locate these elements adjacent to the main facility entrance or on the main façade. Air intake louvers must comply with Anti-Terrorism/ Force Protection requirements *(see Figure 5.56)*. If these items must be located on highly-visible facades, they should be integrated into the overall aesthetic of the facility.

Figure 5.55
97th IS - Canopy and Portico at Building Entry

Fabric-covered canopies or awnings will be addressed on a case-by-case basis. Use of such design elements will be limited to highlighting primary facility entry points. Fabric colors should complement exterior wall material palette colors. Printed graphics will be limited to building addresses only, and require approval by the Base Architect.

- *Integrate downspouts into the facility design*
- *Incorporate porticoes and canopies to create outdoor rooms*
- *Coordinate fabric awnings with Base Architect*

Other Site Features

Sheds, picnic and smoking shelters, and screen fencing shall be permanent construction. "Self-help" projects will not be allowed *(see Figures 5.57, 5.58, and 5.59)*. All sheds, picnic and smoking shelters, and screen fencing shall complement the facility design, and shall be integrated into the overall site design of the project.

Poles for exterior speakers, discs, and antennae shall match the poles used for exterior lighting on a project, or the poles used for adjacent street lighting. Wood poles will not be allowed. Speakers and spotlights should attempt to utilize existing poles serving site lighting.

Permanent site-constructed barbecues will not be allowed.

All structures, including break or picnic shelters, gazebos, outdoor break areas, smoking facilities, or other constructed features, must be approved by Base CE prior to construction. The Base CE standard for these structures is to install pre-engineered, tubular steel structures that come with factory-applied finishes. The approved manufacturer for these structures is Poligon.

Figure 5.57
Permanent Construction Picnic Shelter

Figure 5.58
Permanent Construction Picnic Shelter

Figure 5.59
Permanent Construction Picnic Shelter

[6.1] Acronyms and Abbreviations

AAFES	Army and Air Force Exchange Service
AB	Air Base
ABA	Architectural Barriers Act - Guidelines for Accessibility
ABB	A Manufacturer of Power Products or Systems
ABS	Acrylonitrile Butadiene Styrene
ACC	Air Combat Command
ACGIH	American Conference of Government Industrial Hygienists
ADA	Americans with Disabilities Act
ADAAG	Americans with Disabilities Act Architectural Guidelines
AFB	Air Force Base
AFCEE	Air Force Center for Environmental Excellence
AFCESA	Air Force Civil Engineer Support Agency
AFFF	Aqueous Film Forming Foam
AFH	Air Force Handbook
AFI	Air Force Instruction
AFMAN	Air Force Manual
AFOSH	Air Force Occupational Safety and Health
AFPM	Air Force Pamphlet Manual
AFR	Air Force Requirement
AHJ	Authority Having Jurisdiction
AIC	Alternate Intensity Current
AICUZ	Air Installation Compatible Use Zone
AMDS	Aerospace Medicine Squadron
ANSI	American National Standards Institute
ARPA	Archaeological Resources Protection Act
ARR	Appearance Retention Rating
ASCA	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASSE	American Society of Sanitary Engineering
ASTM	American Society for Testing and Materials
ATFP	Anti-Terrorism Force Protection
AWWA	American Water Works Association
BCE	Base Civil Engineer (Commander)
BX	Base Exchange
BTU	British Thermal Unit
CADD	Computer Aided Design Drafting
CATV	Community Area Television
CBC	California Building Code
CCB	Construction Criteria Base
CE	Civil Engineer
CEF	Base Fire Chief
CEP	Programs Flight
CER	Communications Equipment Room

CFM	Cubic Feet per Minute
CEO	Operations Flight
CES	Civil Engineer Squadron
CEV	Environmental Flight
CMU	Concrete Masonry Units
COE	Corps of Engineers
COMM	Communications
CPSC	Consumer Product Safety Commission
CPT	Cone Penetration Test
CRC	Criteria Review Conference
CS	Communications Squadron
CSC	Consolidated Support Center
CSP	Corrugated Steel Pipe
dBA	Decibels (acoustic)
DCG	Design Compatibility Guide
DDC	Direct Digital Control
DGS	Deployable Ground Station
DOC	Department of Commerce
DoD	Department of Defense
DODDS	Department of Defense Dependents Schools
DOE	Department of Energy
DX	Direct Expansion
ECP	Entry Control Point
EIA	Electronic Industries Association
EIAP	Environmental Impact Analysis Process
EIFS	Exterior Insulation Finish System
EMCS E	Energy Monitoring Control System
EO	Executive Order
EPA	Environmental Protection Agency
ERP	Environmental Restoration Program
ETL	Engineering Technical Letter
FF	Federal Flammability
FFA	Federal Flammability Agency
FFE	Finished Floor Elevation
FGS	Final Governing Standards
FM	Factory Mutual Global
FOC	Fiber Optic Cable
FOD	Foreign Object Damage
FR	Flame Retardant
FS	Federal Standard
FSP	Final Sketch Plan
GFI	Ground Fault Interrupter
GIS	Geographical Information System
GPG	Grains per gallon
GPS	Global Positioning System
HDPE	High Density Polyethylene
Hi-X	High-Expansion
HM/HW	Hazardous Materials/Hazardous Waste

HQ	Headquarters
HVAC	Heating, Ventilating and Air Conditioning
IAPMO	International Association of Plumbing and Mechanical Officials
IAW	in accordance with
IBC I	International Building Code
IDS	Intruder Detection System
IEEE	Institute of Electrical and Electronics Engineers, Inc.
IEQ	Indoor Environmental Quality
IESNA	Illuminating Engineering Society of North America
IP	International Protection
IPC	International Plumbing Code
IR	Infrared
ISO	International Organization for Standardization
IWW	Industrial Waste Water
LAN	Local Area Network
LED	Light Emitting Diode
LEED	Leadership in Energy and Environmental Design
LPS	Lightning Protection System
LSC	Life Safety Code
LV	Low Voltage
MCP	Military Construction Program
MDOS	Medical Operations Squadron
MUTCD	Manual on Uniform Traffic Control Devices
MV	Medium Voltage
MWR	Morale, Welfare, and Recreation
NAGPRA	Native American Graves Protection and Repatriation Act
NEC	National Electrical Code
NEMA	National Electrometric Manufacturers Association
NESC	National Electric Safety Code
NFC	National Fire Code
SD&HPGB	Sustainable Design & High Performance Green Buildings

[6.2] Installation Functional Constraints and Considerations

6.2.1 General

The following section 7.3 provides installation-centric background information and identification of functional-technical considerations necessary for a fully successful design. It identifies preferred systems and technical components and is intended to describe best practices related to planning, architecture, engineering and interior design. It identifies materials, furnishing, systems, practices, approaches, and finishes historically used and having proven success over time. It is not intended to serve as a comprehensive list of all applicable building codes, regulations, directives, references or to identify facility centric or unique user requirements. Functional-Technical Constraints and Considerations need to be specifically addressed in the Basis of Design analysis written during the concept development phase and the design development phase. Understanding the driving forces behind these constraints and considerations will greatly contribute to a successful project outcome.

6.2.2 Brand Name References

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

[6.3] Offutt AFB Design Compatibility Guidelines

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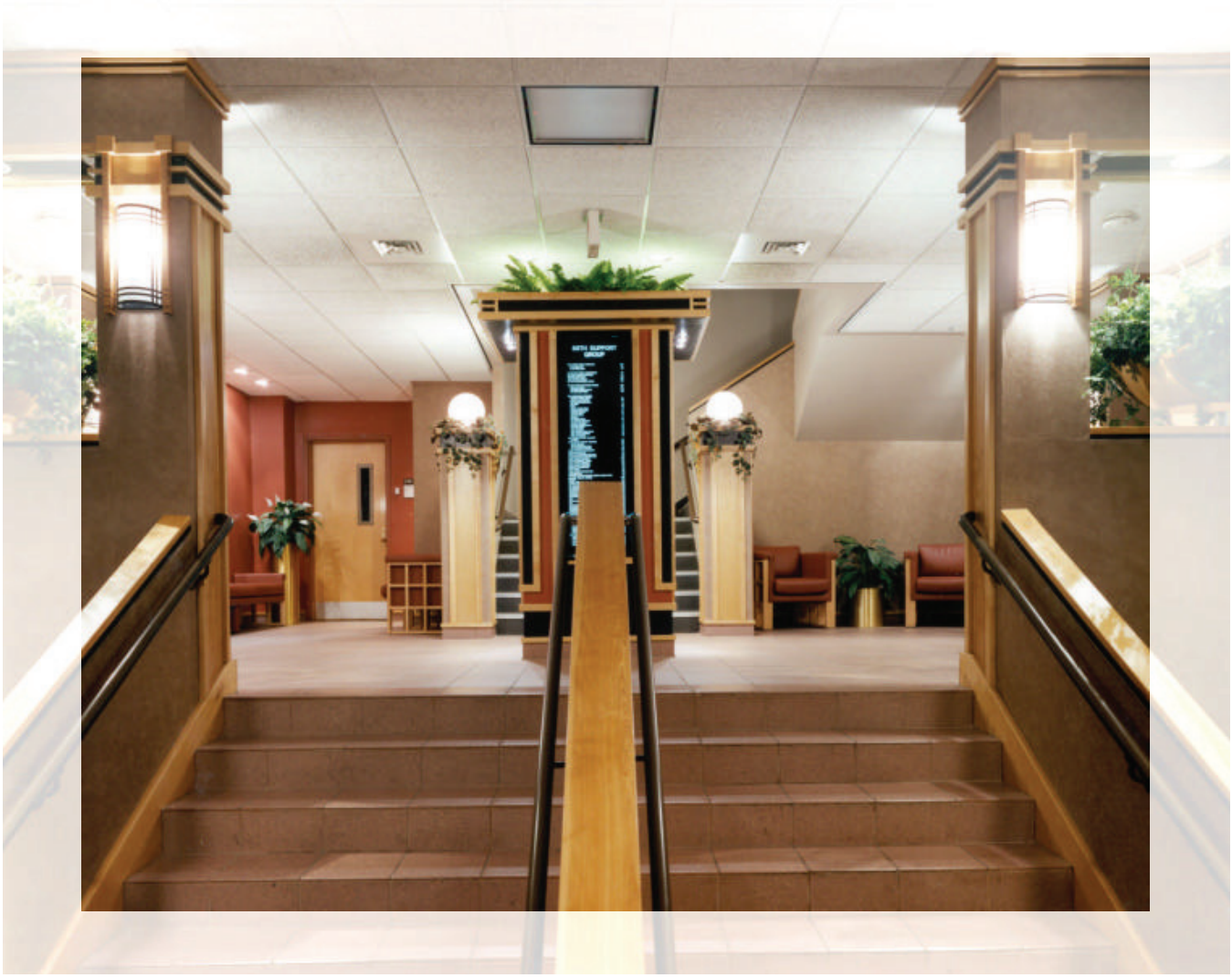
AUGUST 2006

AIR COMBAT COMMAND
UNITED STATES AIR FORCE



[Section 1] Executive Summary

1.1 Scope of the Document

These Design Compatibility Guidelines (DCG) are intended to provide a reference for anyone involved in base design, construction and planning. By using this document, architects, engineers, and planners will be able to maintain a consistent level of quality, style, and character appropriate for all facilities at Offutt Air Force Base.

The DCG identifies design and planning compatibility standards for eight established "zones": Operational/ Mission, Administrative (U.S. Strategic Command), Historic District, Community Facility, Coffman Heights Housing, Administrative/Operational, Capehart Housing, and Unaccompanied Housing. These standards take into account the primary function of each zone, but also identify base-wide design standards to help the creation of a consistent image for the base as a whole. While these zones reflect various functions and character present at Offutt, there exists significant "overlap" in several areas of the base. Care should be taken when using these guide lines to identify unique situations and to assure visual compatibility between these buildings and their neighboring structures.

Offutt AFB has initiated efforts aimed at the comprehensive planning of future base facilities and needs. For example, the Offutt General Plan deals with broad-scope planning issues, while the Community Forestry Master Plan presents more specific goals and recommendations and the Offutt Base Sign and Parking Standards outline specific regulations now in effect for base-wide development. All Air Force facilities are now required to meet DOD Minimum Antiterrorism Standards for Buildings (UFC 4-010-01). In addition, all designs must meet the requirements of: the International Building Code (IBC); the Americans with Disabilities Act Accessibility Guidelines ADAAG), Uniform Federal Accessibility Standards (UFAS), and Air Combat Command (ACC) Architectural and Interior Design Standards, and all applicable UFCs and ETLs. The DCG should be used in conjunction with, and complement the intent of, these and other existing active planning documents.

1.1A Omaha skyline

1.1B Childcare facility

1.1C U.S. Stragetic Command monument

The DCG must be used by all individuals involved in base planning, design, and construction. The success of any design standard is dependent upon implementation and enforcement. It is the responsibility of each design professional working at Offutt AFB to adhere to the design framework presented. Perhaps more importantly, it is the responsibility of the reviewing agencies, particularly at the base level, to enforce the guidelines. Without a collective commitment to understand and enforce the guidelines, achievement of the aesthetic goals desired at ACC facilities is unlikely.

All tenant units at Offutt Air Force Base are required to comply with the architectural, landscape, exterior signage and engineering sections of this document.

Any deviations from the standards listed in this document must be approved by the Base Architect, ACC Command Architect noted in each section. Waivers to these standards may be requested through the Base Civil Engineer.

1.1D Crash Rescue Facility

1.1E Dormitory housing

1.1F Fort Crook Parade ground

1.2 Base Mission

1.2.1 Base Components

The 55th Wing Commander oversees the wing special staff and the five functional groups, which comprise the wing. The special staff totals several hundred people in specialty areas such as finance, legal, public affairs, inspections, history, safety, manpower, quality improvement, protocol and administration.

Each organization has its own responsibilities to aid the overall mission. The 55th Wing's five functional groups include: Operations Group, Maintenance Group, Mission Support Group, Communications Group, and Medical Group.

Of the more than 35 associate units included in the 55th Wing, the three major associate units include: U.S. Strategic Command, Air Force Weather Agency, and the Defense Finance and Accounting Service Omaha Operating Location.

1.2.2 Mission Summary

The above five (5) functional groups at Offutt AFB provide vital support to the primary base functions: Air Force Weather Agency, National Emergency Airborne Command Post, and U.S. Strategic Command.

1.3 Regional Setting

1.3.1 Geography

Offutt Air Force Base is located in the Missouri River Valley 10 miles south of downtown Omaha. It occupies approximately 3,200 acres of land just south of Bellevue, Nebraska. Two interstate highways lead to the Omaha-Offutt area. Interstate 80 provides access from the east and west, while Interstate 29 provides access from the north and south.

Offutt AFB consists of two large distinct areas: the base proper, and the Offutt Family Housing Annex (also known as the Capehart Housing Area) which is approximately one mile west of the main base and includes the Hospital, Chapel, Community Center, Schools, Temporary Lodging Facilities, and a Golf Course.

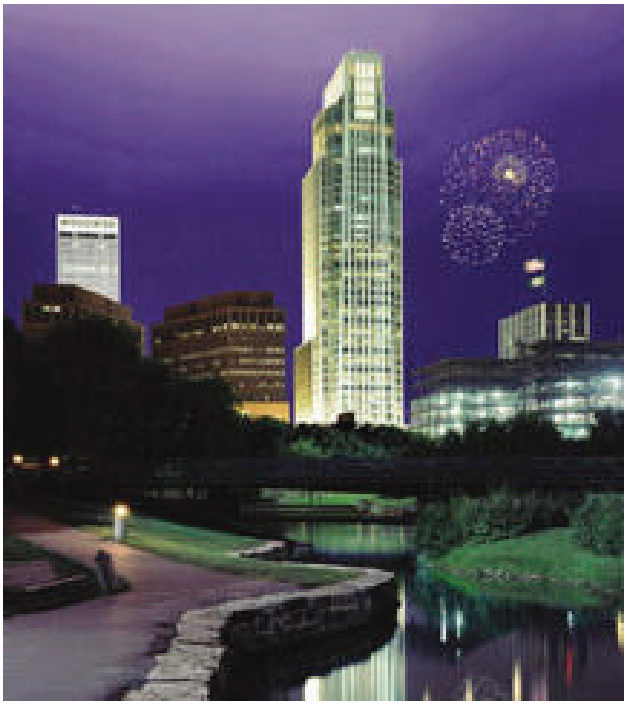
1.3.2 Climate

Omaha is located 982-feet above sea level and has a continental climate - relatively warm summers and cold dry winters. Most of the precipitation in Omaha occurs from April through September in the form of showers or thunderstorms in the evening hours. Average annual rainfall is 30-inches. An average of 145 days per year are clear, 107 partly cloudy, and 145 cloudy. Wind speeds average 10.9 mph from the south to southeast.

While spring and fall temperatures are mild, averaging mean temperatures of 62.1°F and 40.2°F respectively; summer temperatures are much warmer with mean averages of 72.8°F and high temperatures averaging 87.6°F. The Omaha area is subject to severe winters with mean average temperatures around 28 degrees and lows averaging 12°F in January. Annual snowfall averages 32-inches, while the 0°F days and freezing days number 13 and 138 respectively.

Regional Summary

Located 10 miles south of downtown Omaha, Nebraska, the base occupies 3,200-acres of land.



1.3A Omaha Skyline

1.3B Downtown Historic District—Omaha

1.4 General Requirements

Construction projects that occur within Offutt AFB need to observe the following general requirements:

1. New and major renovation projects must include a "Force Protection Analysis" and follow the UFC 4-010-01 DOD Minimum Antiterrorism Standards for Buildings.

2. New and major renovation projects must conform to the Uniform Federal Accessibility Standards (UFAS) and the Americans With Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG).

3. Renovation projects should, in most cases, match the existing colors and finishes; however major renovations and new work should follow the guidelines outlined in this document.

4. Any deviation from the Architectural Compatibility Guidelines must be approved by the Base Civil Engineer Squadron.

5. All signage, both exterior and interior, must comply with requirements of Offutt's Base Sign and Parking Standards (Offutt AFBI 32-200) and (UFC 3-120-1) Air Force Sign Standards.

6. Development of all on-base parking shall comply with standards set forth in Offutt's Base Sign and Parking Standards.

7. New and major renovation projects must include implementation of LEED guidelines.

Summary

Construction projects located at Offutt AFB shall comply with Force Protection, Accessibility and LEED guidelines currently adopted by the US Air Force. Deviations from these guidelines must be approved by Base Civil Engineer Squadron.

Offutt Air Force Base Vicinity Map

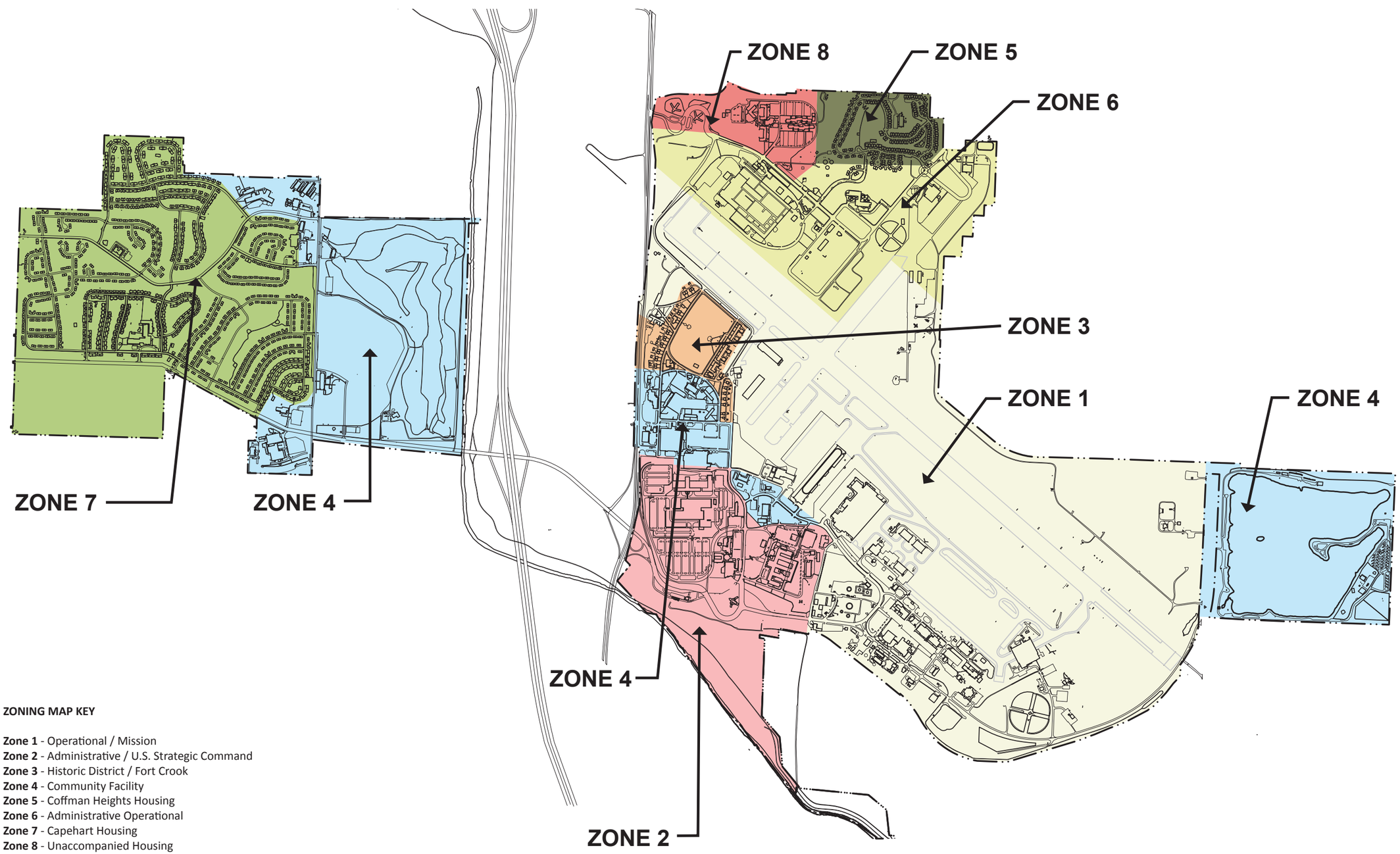
[Section 2] Architectural Standards

2.1 Zoning

Offutt AFB is currently segregated into eight major zones. Administrative support structures and community buildings are located in the Operational/Mission Zone. Dormitories are located in the Unaccompanied Housing and Community Facility Zones. Care should be taken to assure visual compatibility between these buildings and neighboring structures.

Many aesthetic treatments have been successfully established across all zones. Amplification of these positive trends in future design work will further reinforces the image of the base as a cohesive whole. Functional requirements may produce conflicting conditions within zones. This conflict is inevitable in an environment as diverse as Offutt AFB; however recognizing these differences and grouping facilities with similar missions and functions together may realize some functional and aesthetic coherence realized within the diversity. Both base-wide and zone-specific standards are outlined in this document. See chart, Section 7.13.

Although significant overlap occurs in some of the areas, the “zones” may be described as follows:
(see page A-18 for map of zones)



ZONING MAP KEY

Zone 1 - Operational / Mission
Zone 2 - Administrative / U.S. Strategic Command
Zone 3 - Historic District / Fort Crook
Zone 4 - Community Facility
Zone 5 - Coffman Heights Housing
Zone 6 - Administrative Operational
Zone 7 - Capehart Housing
Zone 8 - Unaccompanied Housing

Offutt AFB District Building Zones

Zone 1-Operational/Mission

The Operational/Mission Zone includes areas that are directly related to the daily operation and functions of the 55th Wing. This area includes, but is not limited to, runways, aircraft hangars, maintenance & storage facilities, and some office functions. This zone is primarily comprised of large scale, utilitarian buildings which are surrounded by pavement and parking areas. There is typically little attention to landscaping and other site amenities. Noise is a major concern due to its inclusion of the aircraft functions. This zone, the largest single portion of the base, occupies the entire southeastern section of the base. The Operational/Mission Zone is separated from the rest of Offutt AFB by SAC Boulevard on the west side and by Peacekeeper Drive and Union Lane to the north.

2.1A Building 565 is typical of massing of Zone 1

Zone 2-Administrative/ U.S. STRATEGIC COMMAND

The Administrative/U.S. STRATEGIC COMMAND Zone contains primarily administrative spaces and support facilities. Although by function this zone is similar to Zone 4-Community Facility, this area is unique at Offutt AFB due to its campus-like identity, which is coherent and very consistent. The setting features relatively large lawns with few buildings and consistent building materials and landscaping. This zone occupies the southwest corner of the base and is bordered to the north by Looking Glass Avenue and to the east by Comsat Drive.

2.1B U.S. Strategic Command Headquarters—Zone 2

Zone 3-Historic District/ Fort Crook

The Historic District/ Fort Crook Zone at Offutt AFB includes many of the original buildings and fabric of Fort Crook. The zone is oriented to a central parade ground and encompasses a wide variety of functions including housing. The buildings in this zone are typically set back from the street, with lawns and sidewalks. Large shade trees are plentiful and create a sense of neighborhood. Because this area is listed on the National Register of Historic Places, careful consideration and planning must be taken prior to attempting alterations to structures in this area. This zone occurs on the Western edge of the base and is bordered to the north and east by SAC Boulevard.

2.1C Parade Ground—Fort Crook Zone 3

Zone 4 - Community Facility

The Community Facility Zone includes public service facilities as well as commercial buildings. This zone consists of three areas of the base - two small zones on the western edge and the 183-acre recreational zone to the east of the base proper around Lake Offutt. The "base proper" portion of this zone closely relates to a typical town in function, including a grocery, post office, retail stores, and a library. Also included in this zone is some dormitory-type housing.

The "base proper" area is fairly densely built, with buildings typically set back from the street. The larger of the two small zones contains the BX and Commissary and is bordered to the north by Lincoln Highway and to the south by Meyer Avenue. The smaller zone occurs roughly to the west of the Historic zone and is bordered to the north by SAC Boulevard and to the south by Sherman Turnpike. There is a component of the Capehart Housing area consisting of the Hospital, Chapel, Theatre, Gold Course, Youth Center and several TLFs providing public service to the base housing.

Density is not a characteristic of the recreational area and buildings surrounding Lake Offutt. In addition to the lake, this area's facilities include a large pavilion for parties, covered picnic areas, softball fields, campsites, and boat rental.

Zone 5 - Coffman Heights Housing

The Coffman Heights Housing Zone includes areas of multifamily and duplex style housing that resemble typical suburbs in many ways. Wherry Housing is programmed for demolition and replacement. Coffman Heights is the first two phases of replacement units. These areas often have their own public services, recreational areas, and parks. Family Housing occurs in three distinct areas of Offutt - one to the west of the base proper (Capehart Housing), one which occupies the northeast corner of the base, roughly bordered to the south by Nelson Drive and to the west by Airman Drive (Coffman Heights) and one in the Historic District (Zone 3).

2.1D Commissary in Zone 4

2.1E Coffman Heights Housing—Zone 5

2.1F Operational Center—Zone 6

Zone 6 - Administrative Operational

The Administrative Operational Zone includes areas that are directly related to the daily operations and functions of the 55th Wing. It also includes administrative spaces, public service facilities, and commercial buildings.

Zone 7 - Capehart Housing

The Capehart Housing Zone includes areas of primarily single family and duplex style housing with some multiplex units that resemble typical suburbs in many ways. Also included in this zone are the Hospital, Chapel, Theater, Golf Course, Youth Center, and several TLF units. These areas often have their own public services, recreational areas, and parks. Family Housing occurs in three distinct areas of Offutt - one to the west of the base proper (Capehart Housing), one which occupies the northeast corner of the base, roughly bordered to the south by Nelson Drive and to the west by Airman Drive (Coffman Heights) and one in the Historic District (Zone 3).

Zone 8 - Unaccompanied Housing

The Unaccompanied Housing Zone includes areas designated primarily for dormitory style housing. Although functionally similar to the Family Housing areas, building massing and site relationships are very different. Most of the dormitory style housing occurs in the northwest corner of the base, although there are dormitory facilities in the Community Facility Zones as well.

Summary

Offutt AFB is currently segregated into eight major zones. Refer to Architectural Design Elements Matrix shown in Section 2.9 of this document for palette of approved materials and suggested sources.

2.1G Coffman Heights Housing – Zone 5

2.1H Dormitory Housing—Zone 8

2.2 ACC Architectural Standards Synopsis

2.2.1 Goals

The following goals have guided the ACC policy and should also guide all levels of design at Offutt AFB:

Site Conditions-Provide site conditions and building forms appropriate to any new, future or existing buildings.

Low Maintenance-Use permanent low maintenance exteriors that are compatible with ACC bases and their natural and man-made environments.

Environmental-Design facilities in ways to enhance environmental quality and minimize consumption of natural resources.

Layouts-Provide functional layouts that completely satisfy user needs.

2.2A Visiting Officer's Quarters

2.2B Good site integration

Cost - Reduce lifecycle costs.

Labor-Reduce labor-intensive maintenance procedures.

Sustainable Architecture-Design in accordance with LEED principles to the maximum extent practical or as directed by 55th CES.

Approval-Obtain user approval of design concept in order to prevent costly changes during final design, contracting and construction. This is normally done through a Customer Concept Document (CCD). The CCD is performed following the initial programming to further define the scope of word. CCDs are part of all MILCON projects. The recommendations presented in the following pages are specific to Offutt AFB, but are based on the overall ACC design philosophy.

2.2C Interesting combination of roof elements and building materials

2.3 BUILDING MASSING

2.3.1 Current Conditions

Building function, evolving construction technology and changing aesthetic tastes, over time, have resulted in a wide variety of building forms and sizes at Offutt AFB.

Zone 1- Operational/Mission: these buildings are large with simple massing. One large building in this zone, Building 457, provides an excellent example of massing transition. The "rear" of the building along the flight line, is strictly aircraft oriented and several stories high. The building then steps down to an administrative section approximately one story high. Although Zone 1 is a mission-based zone, it does contain smaller scale structures of varying function and character.

In addition to their size, structures in Zone 1 typically differ in site orientation from buildings in other zones. Many Zone 1 buildings are oriented to the runway and flight line not to base streets. Zone 1 show and will continue to show the fewest consistencies in height, scale and massing due to the function driven design of its structures.

Zone 2- Administrative/ U.S. STRATEGIC COMMAND consists of one- to four-story structures, which are campus like in setting and scale. Consistent street setbacks and generous lawn areas combine with consistent materials to create the most cohesive architectural effect among recently constructed facilities.

Zone 3- Historic District/Fort Crook consists primarily of one- and two-story structures, many of which are residential in character and scale. These buildings include many of the original Fort Crook structures. Consistent street setbacks and site orientations (around the parade ground) combine with the careful massing and materials to create the most architecturally cohesive and visually pleasing zone on base.

Zone 4- Community Facility structures are generally one- or two stories in height, with a few three-story buildings scattered about. Some consistency in setback, relationship to the street and entry definition is apparent in this area.

2.3A Flight line side of hangar—Zone 1

2.3B U.S. Strategic Command Facility—Zone 2

2.3C Parade ground—Zone 3

Zone 5- Coffman Heights Housing consists of one and two-story duplex and multiplex units, residential in both character and scale. Street setbacks are typically consistent and massing is appropriate for this type of use. Coffman Heights consists of 2 and 3 bedroom duplexes, which are the first two phases of Wherry replacement and should be used as the model for future replacement units. All housing on base, with the exception of Historic Housing, has been privatized.

Zone 6- Administrative Operational consists of facilities that directly relate to the daily operations and functions of the 55th Wing. This zone has many buildings built during WWII like the Martin Bomber Building. Buildings in this zone range from one to three stories and include industrial facilities, administrative spaces, commercial buildings, and public service buildings.

Zone 7- Capehart Housing consists of one and two story duplex and multiplex units, residential in both character and scale. Street setbacks are typically consistent and massing is appropriate for this type of use.

Zone 8- Unaccompanied Housing typically consists of three-story dormitory style units. The most successful examples are Buildings 364 and 365, located near the Coffman Heights Housing area and Building 367, located west of the Dining Hall. These units have good scale and siting relationships and create a pleasant cluster/courtyard environment. Landscaping and other site amenities are generally well done. All housing on base, with the exception of Historic Housing, has been privatized.

2.3 D Commissary—Zone 4

2.3 E Duplex Housing—Zone 5/7

2.3F Dormitory Housing—Zone 8

2.3.2 General Recommendations

If functionally and programmatically appropriate, consider interior courtyards and the clustering of buildings to soften the harsh climate and create naturally protected exterior courtyard spaces.

Site buildings supporting common functions (such as dormitories) in close proximity to each other. In addition to sharing common infrastructure, the massing, scale, materials, and details can be used to link the buildings aesthetically.

A building's entrance shall be defined in a fashion appropriate to its function.

Unconditioned and unoccupied structures primarily used as ancillary storage facilities shall comply with the base architectural guidelines for exterior appearance.

2.3G Good example of shared common plazas at Housing Area

2.3.3 Variations

As noted, due to the utilitarian nature of many buildings, primarily those within Zone 1 and Zone 6, compatibility in building height and scale is often problematic. Structures of conflicting scale should be connected by design elements such as masonry base treatments, banding or coloration. The Family Visitation Facility and the Alert Facility represent successful examples of buildings that, despite scale differences, are architecturally compatible.

2.3H Well-articulated entrance illustration

2.4 ROOFS

2.4.1 Current Conditions

Roof forms and materials at Offutt AFB vary considerably. As with the base architecture as a whole, roof configurations reflect changing technology over time and varied building functions. Flat roofs, both built-up and membrane types, occur base-wide. Curved and low slope metal roofs of various ages and types have been used on hangar and service buildings. Higher sloped standing seam metal roofs occur on many medium and small-scale structures. Family Housing roofs in zones 3, 5, and 7 are typically fiberglass and asphalt shingles; cedar shake roofs occur on only a few base shelters.

2.4A Alert Facility indicates appropriate use of sloped roof accent in flat-roofed building

2.4.2 General Recommendations

Where products involve roof replacement, replace existing built-up roofs with a fully adhered single -ply membrane that satisfy LEED requirements. Roof products shall meet EPA Energy Star Roofing Guidelines in effect.

Building scale, function, and economy may dictate the use of long span metal roofs or “low sloped” roofs. If used, long span metal roofs should have a minimum slope of 1.5:12. “Low sloped” roofs, if used, should be single -ply membrane with a minimum slope of 1/2-inch per foot. Designers are encouraged to use strategically placed sloped roof elements to punctuate key building points (entrances for example) and to screen portions of the low-sloped roof where possible. The Alert Facility successfully uses a sloped metal roof to punctuate the entry on a primarily low-sloped roofed structure. The Base Architect and ACC Command Architect must approve all low slope or flat roofs.

2.4 B Residential scale style roofing utilized for support facilities

Skylights and clerestories may be used if strong economic and functional criteria dictate. If such elements are proposed full economic justification including life cycle cost shall be submitted to the project manager.

Fascia design becomes especially critical if broad overhangs are used. If pronounced fascias are used on metal roofs, the fascia material should exactly match that of the roof.

Seam treatment may vary, however color and material should match. A metal fascia should never extend above the edge of a sloped roof. In no case should a metal fascia be used on a flat-roofed building.

Gutters are recommended, but not mandatory, on all sloped roof buildings. Installation of gutters shall be in accordance with recommendation indicated for “snow zones” as shown on page 460 of the tenth edition of Architectural Graphic Standards. Downspout placement should be carefully considered and well integrated into the overall building design. In high profile buildings, conceal downspouts in exterior columns or pilasters. The new fire station represents good integration of downspouts with structural elements. Interior rain leaders should not be used. Overflow scuppers, when used, should be integrated into the building design and carefully placed on the elevations.

All fascia, gutter, and roof trim material shall be made of prefinished metal and be designed to prevent deformation (‘oil canning’) due to expansion and contraction.

Vents, piping and equipment, which must penetrate the roof, should be treated as trim material and finished to match the roof.

Combine roof penetrations if at all possible. Locate these elements on the rear slope of roofs, out of view if possible. Strategic location of these elements may be used to create a pattern, enhancing the aesthetic appearance of the roof.

2.4C Example of integrated metal fascia and sloped roof system

Equipment should never be located on sloped roofs. If rooftop equipment is used on low-sloped roofs, it must be approved by the Base Architect and ACC Command Architect and should be located to the rear or areas out of view. Access to equipment for maintenance, repair, and replacement shall be considered on all facilities.

2.5 EXTERIOR WALLS

2.5.1 Current Conditions

Exterior wall materials and finishes vary widely at Offutt AFB. A full range of masonry treatments can be seen, including ribbed and split-face concrete - masonry units (CMU), painted CMU, brick, aggregate panels and limited applications of precast concrete. Many buildings are finished with metal wall systems or Exterior Insulation and Finish System (EIFS). In the Housing Zones, exterior walls of brick and steel siding can be seen. The most consistent architectural treatment of modern times can be seen in Zone 2 Administrative/U.S. Strategic Command with its widespread use of yellow/buff brick. The Historic District (Zone 3) provides the most cohesive and consistent exterior wall finishes on the base with its red brick walls and stone foundations. Color palettes in zones 1 and 4 vary greatly and range from white and light tan through medium and dark browns. See Architectural Design Elements Matrix in 2.9 for colors and materials acceptable in each zone.

2.5A Building B457 represents good use of varied exterior wall materials

While the Administrative/U. S. Strategic Command and Historic areas are nice examples of cohesive planning and use of materials, the most positive recent trend is the use of brown brick with white precast concrete accents as in the Family Visitation Facility, the Alert Facility, and the Security Police Operations Facility. Used in various mixes, these materials allow pattern, texture, color flexibility, and variety from two very durable materials. The Bennie Davis Maintenance Facility and Hangar, Building 457, on the other hand represents a fairly successful union of two exterior wall finish types. The large metal section of the building is grounded by a brick foundation.

2.5.2 General Recommendations

In Zone 1, solid colored brown brick should be used as the primary exterior wall finish on the smaller structures. If, in large-scale structures such as hangars or warehouses, function and budget dictate the use of a pre-engineered metal building system, masonry “base” should be used. This base should protect the portions of the building subject to impact damage and help to blend the structure with the base-wide aesthetic. The masonry base should match the color, texture and height of any adjacent administrative or

support buildings. Building 457 represents a nice use of a masonry base on a metal-sided structure.

In general, a single color brick with one metal color will produce the best result. Wall color variations within a single building should be limited to brick of one type, with accent areas or bands of another brick color. Differentiation and architectural featuring does not need to occur through the use of color, but may occur through architectural detailing such as reveals, indentations or soldier courses. In addition to adding visual interest to the wall, in appropriate applications masonry articulation can aid in identifying building entries and features. Metal wall panels shall be factory-finished aluminum or galvanized steel with at least a 20-year guarantee against fading. Use of metal siding requires approval of the Base Architect and ACC Command Architect.

When upgrading existing CMU and frame structures, precast concrete and limited exposed aggregate panels are acceptable. These materials are limited primarily to renovation applications and require approval from the Base Architect and ACC Command Architect.

Painting should not emphasize extraneous wall attachments such as downspouts, conduit, switches, bells, hollow metal frames, etc. Such elements should be factory finished when possible or painted in a color to match adjacent pre-finished exterior metals or the adjacent wall color. Care should be taken when locating these elements to provide a clean, pleasing facade. Use one trim color to the greatest extent possible.

Structures in zones 2, 3, 5, 7, and 8 should continue to use materials which have already been established and successfully used in these areas. The U. S. Strategic Command area and base entrances should continue to use the “buff” brick, the Historic Zone, red brick; and the housing areas brick, vinyl, wood, steel or aluminum siding.

Split-face CMU use will be permitted in areas where material has already been utilized. Generally use shall be limited to Zones 1 and 6. See the Architectural Design Elements Matrix in Section 2.9.

2.5B Building represents good use of single brick & roof material colors

2.5.3 Unacceptable Applications

New buildings should not require exterior painting. Standard CMU, brick, metal wall panels, stucco or other exterior materials that are normally restored by painting should not be used. Avoid the use of brick which is inconsistent in color and texture. Use of this type of brick often results in a building which looks “peppered” in color and is generally not desirable.

2.6 CANOPIES AND AWNINGS

In general, fabric -covered canopies or awnings will be addressed on a case-by-case basis. Use of such design elements will be limited to highlighting primary facility entry points. Fabric colors shall complement exterior wall material palette colors. Printed graphics shall be limited to building addresses only and require approval by Base Civil Engineer Squadron.

2.6A Shade structure awning color complements play structure

2.6B Visual interest of exterior wall with 2 masonry colors and use of complimentary metal roof color at entrances

2.7 WINDOWS

2.7.1 Current Conditions

Window types at Offutt AFB vary from building to building based on age and function. Most recently constructed buildings have used double glazed insulated units set in thermally broken aluminum frames—often bronze in color. Many of the newer buildings, especially in zone 1, have been constructed with white aluminum frames. These white frames coordinate well with the white window frames used in the historic and housing areas. Frame color will be evaluated on a case-by-case basis.

2.7.2 General Recommendations

New windows at Offutt AFB shall have double-glazing set in thermally broken anodized aluminum frames. Triple glazing, for sound control, should be used in windows along the flight line and in Air Installation Compatible Use Zones (AICUZ). Bathroom windows should be frosted glass. Refer to the General Plan for AICUZ limits.

In general, all windows must meet the criteria as outlined in UFC-4-010-01, DOD minimum Antiterrorism Standards for Buildings.

Great care must be taken for window replacement projects within the Historic Zone. New windows should be selected following careful consideration of aesthetic and functional/programmatic issues, and the condition of existing windows. Consultation with and approval of the State Historic Preservation Officer (SHPO), and with the Base and ACC Command Architects is required.

Glazing in punched masonry openings is recommended. If appropriate, limited window groupings, glazed entry doors with sidelights and other variations are acceptable. The extensive use of curtain wall is not encouraged.

Operable windows are allowed. Operable windows are mandatory in all temporary and permanent quarters in all zones.

2.7A Punched masonry opening

2.7B Housing Office represents use of residential scale & color for support facilities function

2.7C Punch openings in precast panels

Skylights and clerestories are permitted if strong economic and functional criteria dictate. Clerestory windows should be designed to minimize solar heat gain through orientation or shading.

Replacement windows should match the size of the window being replaced unless code dictates change. Unless otherwise justified, replacement windows should adhere to the guidelines for new windows. Any variation shall require review and approval by the Base Architect.

Main entry doors in Zones 1, 2 and 3 should be glazed storefront in approved colors. Secondary entry and exit doors and frames shall be painted metal. Exterior doors on houses in Zone 5 and 7 shall be painted insulated metal.

2.7.3 Unacceptable Applications

Window design and selection should consider function and maintenance. Window materials that require painting or other frequent maintenance are not acceptable, with a possible exception for the Historic Zone structures.

2.7D Limited curtain wall use as represented at Security Police Operations Facility

2.7E Good entrance use of storefront entrance system is presented here

2.8 SITE WALLS AND FENCES

2.8.1 Current Conditions

Serving as property and security boundaries, visual screens and windbreaks, a variety of site walls and fences appear at Offutt AFB. Occurring in all zones the primary materials are chain link and wood, although split face CMU walls have been used in limited applications.

The use of split face and CMU for the landscape walls and fences is clearly the most positive trend visually. As with exterior walls the use of this type of CMU allows design flexibility within the context of a single inexpensive, durable material. The color and texture of the block and the horizontal emphasis of the walls blend well with the character of the base and reflect the material palette of much of the recent architecture. This adds to the visual harmony of the base sought in the overall ACC design policy.

2.8A Scalloped block retaining walls and site steps

2.8.2 Site Walls and Fences

Whenever possible site walls should be of split-face block, in a maximum of two colors with a solid top course. When used in conjunction with a new building the material and design should match the block on the new building.

Mechanically stabilized earth retaining walls and freestanding masonry walls are used throughout the base. As with site furnishings, the context of the application needs to be considered when specifying a wall system or design. In close proximity to a masonry building, site walls should complement the structure and repeat the same or complementary colors and finishes, such as at the new fire station. For general use, site walls should be a split face or tumbled block type system with a flat face rather than a scalloped block, as manufactured by Versalok, or equal, with a solid top course or precast cap.

2.8B Scalloped block retaining walls

Versa-lok can be used for retaining and freestanding applications. For extensive site walls within the historic core, red brick faced walls should be considered.

Any decoration on site walls and fences should be achieved through variations in the wall plane and the use of perforated block or open voids in the block coursing at selected locations. Variation in height and surface plane may be considered where appropriate for stability and aesthetics. The horizontal character should however remain the prominent image.

The existing buff masonry and steel picket fence system should be continued at the public interface between the base and the surrounding community and at formal boundary areas. There are many manufacturers of black powder coated steel and aluminum fence systems that can be utilized, such as Master Halco, La Habra, CA; Ameristar, Tulsa, OK; and Specrail, Hamden CT.

In Family Housing areas, primarily Zones 5 and 7 fences separating individual yards should be base standard PVC whenever possible, however wood privacy fences may be used between duplex/ multiplex units and chain link fences may be used between yards in the housing area.

For screening mechanical systems and utility areas within the base interior a semi-private screen fence should be utilized. The “Imperial” design illustrated can be manufactured in PVC or wood and blends with a wide range of architectural styles. Screen fences should be white or brown/bronze, depending upon the context. Masonry columns may be used to integrate with surrounding structures.

Pre-engineered buildings- Use metal buildings where they are compatible with adjacent structures. Do not use metal buildings in highly visible locations, unless other metal buildings surround them. Metal buildings used in highly visible locations should be well screened with walls or vegetation. When designing a new metal building, consider using a textured, integrally colored masonry base for durability.

Finish- Use factory-applied finishes with more than 15-year warranties.

Submit site justification- At the programming stage, submit siting criteria. Indicate adjacent building construction. If the building is isolated, describe how visible it is from major, minor, or service roads. State reason for selection of metal over masonry in addition to cost consideration.

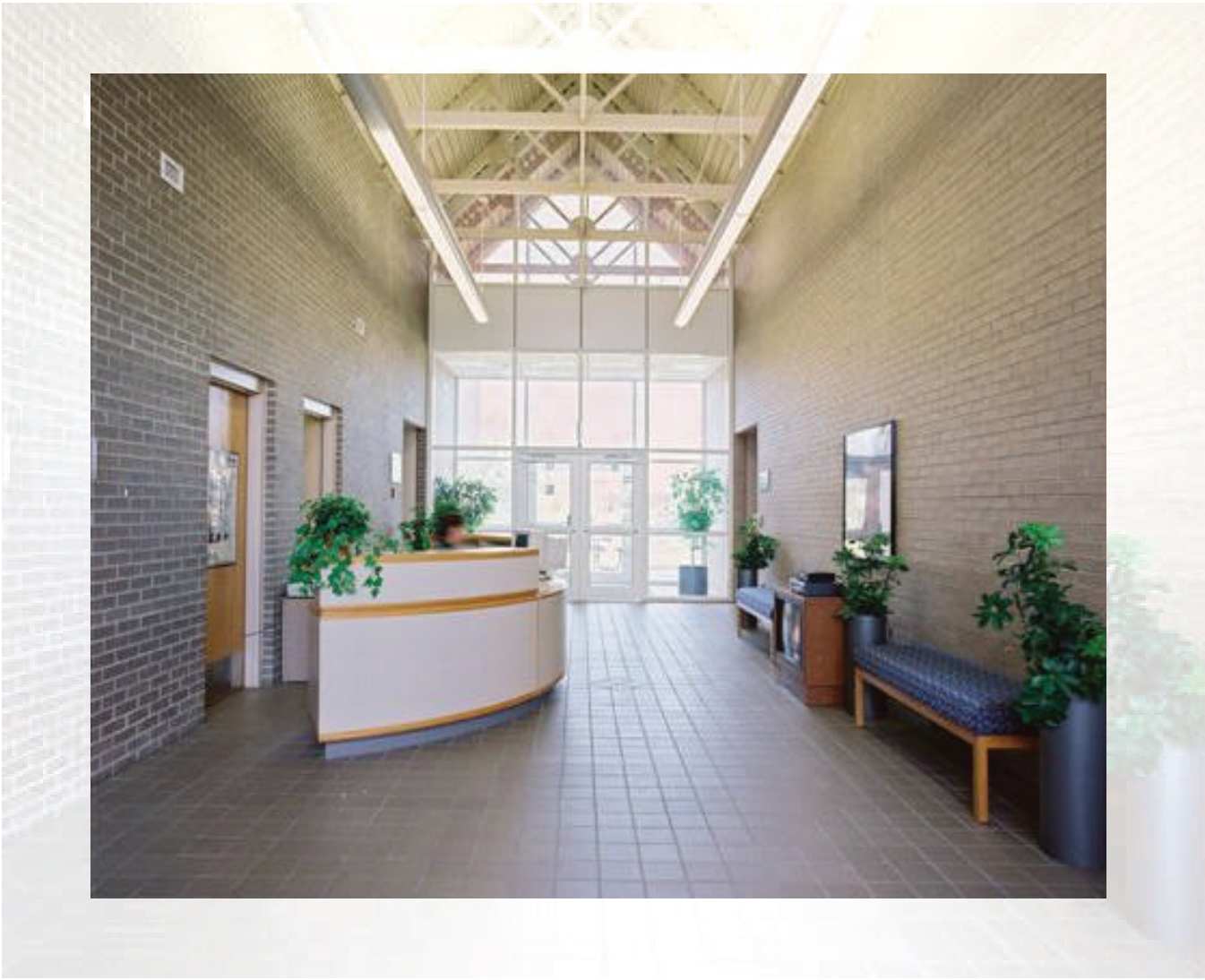
Protective masonry- Provide protection on the exterior of buildings where impact to metal panels is probable. For example, integrally colored and textured masonry should be used at entrances, at corners, exterior wainscot to four feet high where vehicles are parked next to buildings, around forklift operations, and at loading docks.

2.8C Residential yard separation fencing

2.9 ARCHITECTURAL DESIGN ELEMENTS MATRIX

		Operational Mission ZONE 1	Administrative USSTRACTCOM ZONE 2	Historic District Fort Crook ZONE 3	Community Facility ZONE 4	Coffman Heights Housing ZONE 5	Administrative Operations ZONE 6	Capehart Housing ZONE 7	Unaccompanied Housing ZONE 8
ROOF:									
1	SLOPE			MATCH HISTORIC		>3/12		>3/12	
2	MATERIAL			ASPHALT SHINGLES & COPPER STANDING SEAM		ASPHALT SHINGLES		ASPHALT SHINGLES	
3	COLOR			MATCH HISTORIC		NEUTRALS		NEUTRALS	
WINDOWS:									
4	TYPE	OPERABLE	OPERABLE	DOUBLE HUNG	OPERABLE	OPERABLE	OPERABLE	OPERABLE	OPERABLE
5	MATERIAL	ALUMINUM	ALUMINUM	*WOOD	ALUMINUM	CLAD	ALUMINUM	CLAD	CLAD
6	COLOR			*WHITE		*WHITE		*WHITE	*WHITE
MASONRY:									
7	BRICK 1	BROWN	BUFF	*HISTORIC RED	BUFF	RESIDENTIAL	BUFF	RESIDENTIAL	BUFF
8	BRICK 2	BUFF	N/A	N/A	BROWN	RESIDENTIAL	N/A	RESIDENTIAL	BROWN
9	BRICK MORTAR	STANDARD	STANDARD	*HISTORIC RED	STANDARD	STANDARD	STANDARD	STANDARD	OYSTER/BROWN
10	EXPOSED CMU/STONE	LIMESTONE	LIMESTONE	LIMESTONE	LIMESTONE	N/A	LIMESTONE	N/A	LIMESTONE
11	CMU MORTAR	OYSTER	OYSTER	HISTORIC MATCH	OYSTER	N/A	OYSTER	N/A	OYSTER
12	STONE/PRECAST	N/A	LIMESTONE	*RED SANDSTONE SILLS	N/A	N/A	LIMESTONE	N/A	LIMESTONE
EXTERIOR FINISHES:									
13	COLOR 1			WHITE TRIM		WHITE TRIM		WHITE TRIM	
14	COLOR 2	N/A	N/A	LIGHT BLUE CLG	N/A	NEUTURALS	N/A	NEUTRALS	NEUTRALS
15	SIDING	NEUTRALS	N/A	WHITE	N/A	PREFINISHED	NEUTRALS	PREFINISHED	N/A
PAVING:									
16	SIDEWALKS	CONCRETE	CONCRETE	*RED SANDSTONE STAMPED CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
INTERIOR FINISHES:									
17	**WALLS**	NEUTRALS	NEUTRALS	NEUTRALS	NEUTRALS	NEUTRALS	NEUTRALS	NEUTRALS	NEUTRALS
	CEILINGS								
18	ACT	OFF-WHITE/WHITE	OFF-WHITE/WHITE	OFF-WHITE/WHITE	OFF-WHITE/WHITE	OFF-WHITE/WHITE	OFF-WHITE/WHITE	OFF-WHITE/WHITE	OFF-WHITE/WHITE
19	GYP BO	OFF-WHITE/WHITE	OFF-WHITE/WHITE	OFF-WHITE/WHITE	OFF-WHITE/WHITE	OFF-WHITE/WHITE	OFF-WHITE/WHITE	OFF-WHITE/WHITE	OFF-WHITE/WHITE
	FLOORS								
20	VCT	NEUTRALS	NEUTRALS	NEUTRALS	NEUTRALS	NEUTRALS	NEUTRALS	NEUTRALS	NEUTRALS
21	CT	NEUTRALS	NEUTRALS	NEUTRALS	NEUTRALS	NEUTRALS	NEUTRALS	NEUTRALS	NEUTRALS
	NON-PERMANENT								
22	CARPET	PATTERN NEUTRALS	PATTERN NEUTRALS	PATTERN NEUTRALS	PATTERN NEUTRALS	PATTERN NEUTRALS	PATTERN NEUTRALS	PATTERN NEUTRALS	PATTERN NEUTRALS
23	ACCENTS	NON-NEUTRAL ALLOWED	NON-NEUTRAL ALLOWED	NON-NEUTRAL ALLOWED	NON-NEUTRAL ALLOWED	NON-NEUTRAL ALLOWED	NON-NEUTRAL ALLOWED	NON-NEUTRAL ALLOWED	NON-NEUTRAL ALLOWED
24 SIGNAGE		UFC-3-120-01	UFC-3-120-01	UFC-3-120-01	UFC-3-120-01	UFC-3-120-01	UFC-3-120-01	UFC-3-120-01	UFC-3-120-01
		BRONZE	BRONZE	*HISTORIC	BRONZE	BRONZE	BRONZE	BRONZE	BRONZE
25 SITE LIGHTING		"SHOEBOX" STYLE	"SHOEBOX" STYLE	MATCH	"SHOEBOX" STYLE	"SHOEBOX" STYLE	"SHOEBOX" STYLE	"SHOEBOX" STYLE	"SHOEBOX" STYLE

**Items requiring waiver from ACC standard*



[Section 3] Interior Design Standards

3.1 INTERIOR DESIGN STANDARDS

3.1.1 Offutt Air Force Base Interior Design Policy

Offutt's interior design standards are based on an understanding of the elements and principles of design and of how the industry works, not on personal likes and dislikes. Comply with LEED standards on all interior finishes to the maximum extent possible. Compliance with LEED 2.2 (Leadership in Energy and Environmental Design – latest version), Indoor Environmental Quality Credits for Low-Emitting Materials is mandatory.

3.1A Permanent finish porcelain tile floors

3.1.2 Interior Design Standards

ACC standards differentiate between permanent and nonpermanent finishes. The differentiation is necessary due to color palette changes each year.

Permanent Finishes

Permanent finishes are generally the hard surface structural interior design (SID) finishes that will last 15 to 20 years and whose removal and reinstallation is a major disruption to the facility. Items such as vinyl composition tile (VCT), ceramic and other surface tile, plastic laminates, toilet partitions, lockers, window blinds, all modular or systems furniture panels, work surfaces, and flipper doors are considered permanent finishes. In general, these finishes need to be in colors that will not become dated in a few years. Command standards require that all permanent finishes be either brown tone or gray-toned neutrals. These neutral shades can vary from very light (such as an off-white relating to the particular color tone) to a mid-range neutral of this same shade.

3.1B Demountable displays

Non-Permanent Finishes

Carpet, paint, vinyl wall covering, upholstery, artwork, etc. are considered nonpermanent finishes. Nonpermanent finishes will last from five to seven years under most conditions. Command standards allow nonpermanent finishes to be any coloration appropriate to the facility. Most often these finishes will be in mid-range colorations. In very seldom instances is there a use for pastel or very bright colors in facilities. However, primary colors of red, yellow, blue and green may be used in youth centers, child care centers and bowling centers.

While nonpermanent finishes are allowed in various colors, in office and other work areas it is highly recommended that the vinyl wall covering or other painted wall surfaces be kept in neutral coloration. In other words, develop a neutral shell for the interior space with only the carpet, upholstery and artwork providing the color accent.

General Recommendations for Finishes and Treatments

Mottos, murals, or shields associated with building occupant will be allowed in the building interior. Such signs shall be constructed in a demountable nature to facilitate building reuse by others.

Vinyl Wall covering-Should be type II in most applications. Type I has limited use in most ACC facilities. A vertical texture will help hide seaming.

Paint-Use a low sheen latex for all painted surfaces except doors, door and window trim, where a semigloss should be used.

Laminates-Laminate surfaces are much more maintainable if the laminate has a flecked, speckled, mottled or granite look. Soiling or water spotting is not nearly so visible on these surfaces.

Ceiling-In almost all facilities ceilings (whether painted gypsum board or acoustical ceiling tile) are to be white to coordinate with the color tone of the walls. Textured ceiling tiles in a two-foot square with a tegular edge are recommended.

Wainscot and Chair Rail- Wainscot is not recommended in most areas. Paneled wainscot has the effect of visually reducing the size of small office spaces. In long hallways wood panel wainscot has a railroading effect. A type II heavy-duty vinyl wall covering will have a better effect. If paneling is specifically requested, cover one accent wall floor to ceiling. A chair rail protects wall surfaces from being marred by chair backs. Therefore, the chair back height must be considered to properly locate the chair rail. It may be stained or painted to coordinate with other woodwork or doors. Wainscot and chair rail should be no more than 42-inches high in corridors. Heavy vinyl bumper guards may also be used to protect walls in corridors where needed. They, too, should be in coordinating neutrals.

3.1C Demountable displays

3.1D Weather Command murals

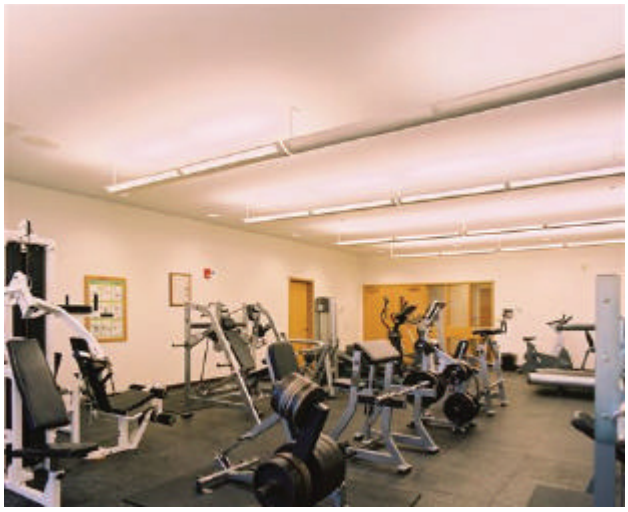
3.1 E Tegular ceilings

Vinyl/Rubber Base and Carpet Base- Use vinyl/rubber base in floor areas where the floor surface is vinyl composition tile (VCT) or rubber tile. Base is to be in a coordinating neutral to the floor surface, as near the same shade as possible. Do not use a dark color or accent color for the base. Use a 4-inch carpet base capped with a dark neutral vinyl/rubber carpet cap in carpeted areas. Use the same carpet for the base as meets the wall in the case of borders. When carpet tile is used it will be necessary to use a vinyl/rubber base. Choose a neutral that will most closely relate to the carpet coloration or wall coloration. With carpet tile, a straight base must be used (one without a cove foot) and installed first with the carpet tile butted up to it. In ceramic tile areas, if a base is used it will be a coordinating ceramic tile base.

Ceramic Tile- Use a mottled, flecked, or speckled floor tile if at all possible. Also be sure to use a dark tone grout, which coordinates with the floor tile to avoid a stained or soiled appearance. Tile banding accents or patterns are approved for walls and floors provided the accent is another neutral shade, which coordinates with the dominant tile color.

Doors and Door Frames- Depending on veneer quality; wood doors may either be stained or painted. If painted, they may be painted either a color related to the wall color or an accent color of mid-range hue. Hollow metal door frames are best painted a color close to the wall color or a shade or two darker.

Window Blinds- Metal or vinyl blinds may be horizontal or vertical and are best in off-white or light neutrals. In no case should blinds be of a reflective metallic finish. Dust is not as visible on the light colors as on the dark colors, and vertical blinds collect less dust than horizontal ones. All blinds on a given building shall have the same finish color exposed to the exterior. Dark blinds that match the anodized finish of the window frames are acceptable, provided the windows are of reflective glass. If the windows are not of reflective glass, dark blinds will radiate a great deal of heat into the building rather than reflecting it as light or off-white blinds will do. Windows shall also have blackout panels. Panels shall be rod operated from one side only.



3.1F Functional ceiling lighting

3.1 G Permanent floor tile finishes

3.1H Floor tile accents

Carpet- (See ETL 03-3: Air Force Carpet Standard and revised ACC Carpet Guidance). In general, use mainly bold tweed, nylon, level-loop commercial grade carpet of at least 24 oz. face weight. Bold tweed means yarn of several different colors, not various shades of the same color. Level loop is the most hardwearing type of carpet, and bold tweed allows for several upholstery color combinations in a facility using only one carpet color-way. Again, use a 4-inch carpet base capped with a vinyl/rubber, dark neutral carpet cap. Carpet systems must meet or exceed the Carpet and Rug Institute green label indoor air-quality test program requirements.

Dormitory Carpet- Carpet dormitories by using one carpet pattern per building with a different colorway per floor. Take care to insure that carpet used in living areas is not the same carpet used in the work areas on the base. Do not use dull, drab colors in living areas. Bedspreads and chair upholstery can be coordinated per floor to the carpet color-way. Draperies in these small living areas are best kept in neutral colorations to blend with the walls. This provides a neutral background for personal items of the occupants.

Carpet Borders- Carpet borders may be solid in color. They may be used with either carpet tiles or roll goods. Be careful not to overdo borders. In corridors a border of about nine inches is about right. Install field carpet in rectangular shapes and allow border to fill in indentation such as doorways, drinking fountains, etc. Do not use borders in rooms where the furniture will cover the borders.

Systems/Prewired Workstations/ Modular Furniture- All panel fabrics shall be either browntone or grey-tone neutrals. Work surfaces and flipper doors shall complement brown and grey fabric panels. Only one type of systems furniture should be used per building. This will allow greater flexibility in reconfiguration as occupants, needs and requirements change and will provide continuity throughout the space. Systems furniture should be installed over carpet tiles. Removal and installation of new carpet in 12-foot widths becomes a major undertaking. A professional team must be hired to dismantle, store, and then reinstall the systems furniture. This is not efficient or cost effective. Carpet tile will allow for self-help replacement and ease of maneuvering under the systems furniture.

3.1I Wood door & sidelights

3.1J Pattern carpet—dining facility

3.1K Coordinated dorm room

Carpet tile will also accommodate flat wiring for electrical and communications under the carpet.

Door Hardware

Door Hinges-Exterior door hinges shall be stainless steel, heavy weight ball bearing. Interior hinges shall be stainless steel, ball bearing or plain bearing. All hinges shall be satin chrome finish.

Door Closers-Door closers shall be Grade 1, surface mounted, regular or parallel arm mount. Finish shall be BMHA689, sprayed aluminum.

Exit Devices-Doors shall have Type 1, rim exit device (no vertical rod type). Push bars shall be rail style as opposed to open bar type. Finish of all exit devices shall be satin chrome.

Locksets-Interior and exterior shall be BMHA Series 4000, Grade 1, knob trim, interchangeable core function as required (see BMHA ANSI function F75. F93). Lever handles shall be provided at all locations. Finish of levers, knobs and all miscellaneous visible parts shall be Satin Chrome finish.

Miscellaneous Hardware-Stops, flush bolts, and other miscellaneous hardware shall be satin chrome finish. Hardware on bronze-anodized aluminum storefront entrances may match the doorframe finish.

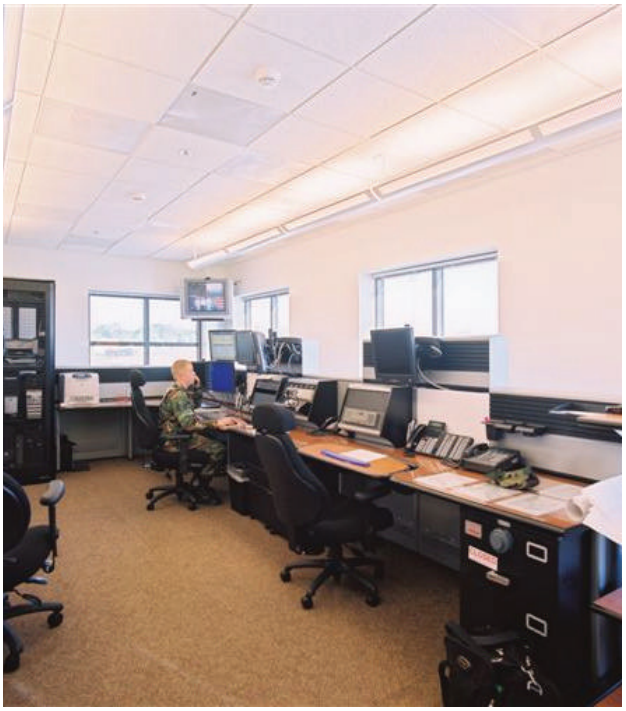
Armor, kick and mop plates-shall be stainless steel, 0.050-inch (U.S. 18 Gage).

Thresholds-shall be extruded aluminum and meet ADA requirements.

Exposed rubber parts-on holders, stops and bumpers shall be grey.

Keying-Mechanical and electrical rooms shall be keyed to the base standard for all mechanical and electrical rooms on base. Users shall define the key standard for the user spaces, but there should be one master key for the user area in the building. If the facility is not manned 24 hours/day, a “Knox Box” shall be placed next to the main entry that contains the master key for the building.

3.1L System furniture



3.1M Workstation integration

Door hardware should be selected and sized on a case-by-case basis for its specific function. Acceptable manufacturers are Schlage, Corbin Ruswin, or Best. These recommendations shall apply to hardware items not specifically listed, so that the quality level and appearance of hardware will be unified base wide. The Base Architect shall approve all hardware design.

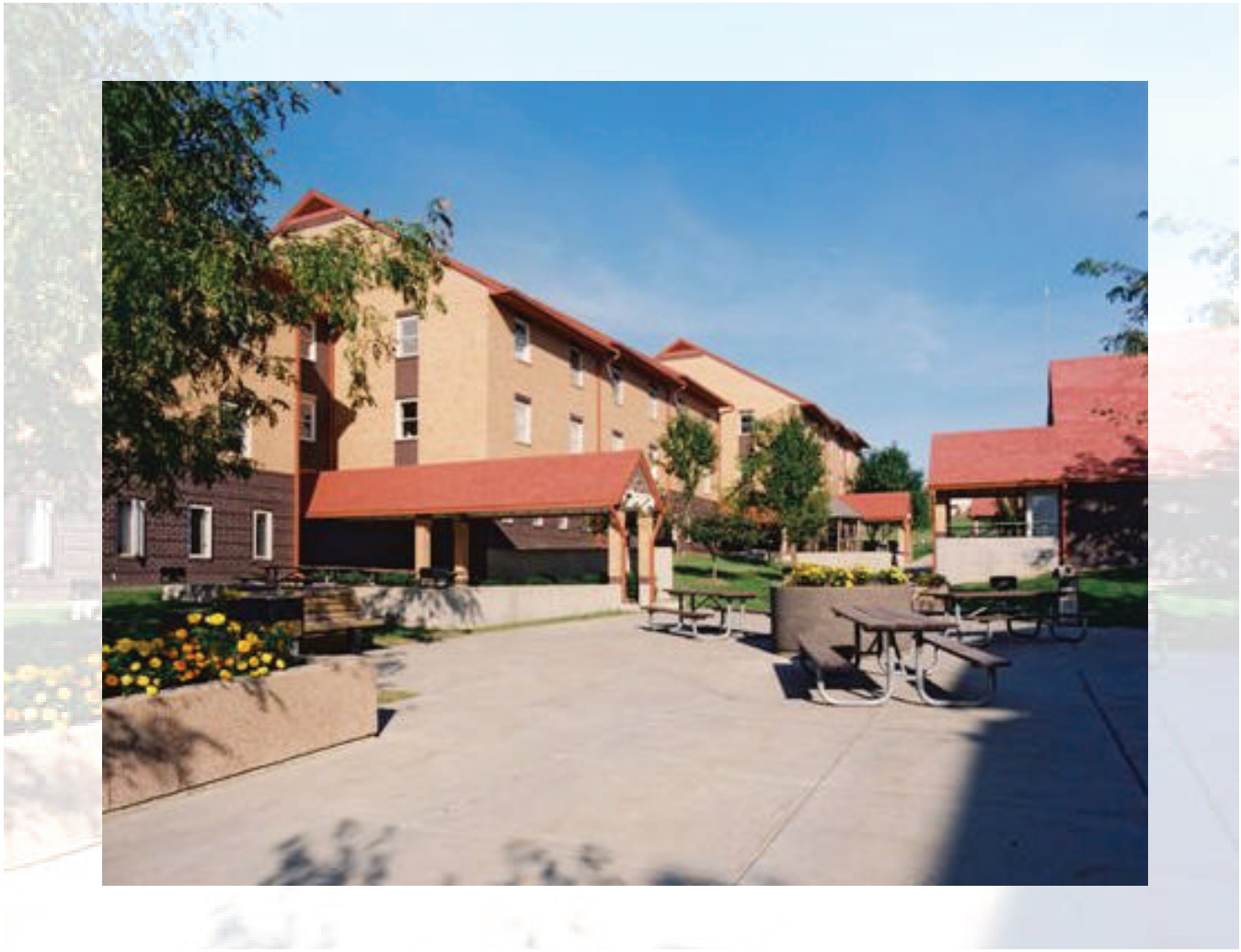
Summary

Color palettes for interior finishes are available from the Base Architect. Designers are encouraged to coordinate new work with established color palettes.

3.1O Coordinated interior furnishings

3.1P Interior furnishings complement building wall colors

3.1N Snack Bar furnishings accent building color schedule



[Section 4] Landscape Standards

4.1 INTRODUCTION

Offutt AFB's location in eastern Nebraska, outside the city of Omaha, presents a host of landscape design opportunities along with numerous challenges and constraints. The climate and soils of the base pose few limitations on the establishment and management of trees and shrubs. The limitations that do exist can be overcome with proper species selection and cultural practices such as watering and weed control.

The Landscape Design Compatibility Standard is offered not only as an approved framework for developing the planned landscape but also as a guide in identifying the right materials for your particular site's microclimate.

Landscape design shall include efforts to reduce site disturbance and heat islands to reduce impact on microclimate and human and wildlife habitat. Design shall comply with guidelines established to implement LEED practices.

Since Offutt AFB is a unique place the landscape should reflect the character, climate and culture of the location and serve as a monument to the continuing evolution of the managed landscape in eastern Nebraska.

As stated in the November 1987 Community Forestry Master Plan prepared by the Nebraska Forest Service, Department of Forestry, Fisheries, and Wildlife, University of Nebraska-Lincoln: *"Landscape planning creates an attractive environment that promotes the well being of the people who live and work within it. The landscape design provides both a practical solution and an aesthetic statement. As a practical solution, the design supports the functions of the installation and improves environmental quality; it designates areas for different uses, provides privacy, screens unsightly areas, reduces wind velocities, provides shade, assists in dust and erosion control, aids in noise abatement, directs pedestrian and vehicular movement, and reduces maintenance requirements. As an aesthetic statement, the design also helps to preserve and enhance the quality of base life and the existing landscape resources; it includes elements of human scale, adds color and texture, provides a balance between vertical and horizontal lines, and improves visual quality."*

4.1A Gazebos located adjacent to parade ground encourage pedestrian use of area

4.2 ACC LANDSCAPE DESIGN POLICY

4.2.1 General Recommendations

In the spirit of overall visual harmony, simplicity and minimal maintenance by design, ACC policy suggests the following as general landscape guidelines applicable to all ACC bases.

"All landscaping should comply with the base land management plan. Develop functional rather than purely visual landscapes and pre-plan to reduce maintenance. Provide a landscaped space uncluttered by vehicles in front, at the entrance, and between the viewing street and the entrance. "

Mowing Strips-Provide planting beds with wide mowing strips such as 4-inch thick by 12-inch wide concrete. Mowing strips should eliminate hand trimming and edging caused by turf creeping into bedding plants.

Plant Material-Use indigenous, low maintenance, adapted trees and shrubs recommended for urban street use that can survive without irrigation after the first season (one year) warranty maintenance period. Do not use plant material that drops large amounts of fruit or seedpods. Select deciduous trees that drop their leaves early in the fall season rather than those that retain brown leaves most of the winter and continue to be a maintenance problem for many months. Some trees to minimize are sycamore, beech and some oaks.

Surface Runoff-Use trees, shrubs, grass and landscaping to reduce storm water runoff.

Terrace steep slopes. Use berms to screen and restrict views. Limit berm slopes to 1-foot in 5-feet. Do not use earth berms against building walls. Consider force protection guidelines when designing berms and plantings. Used properly, berms may limit access and form a barrier; however, they can also block site visibility. Plant materials should be zoned on site according to height. In general, groundcover and canopy trees should be used close to buildings.

4.2A Example of retaining walls integrated into the landscape

Function-Use landscape to reduce energy costs; shade to prevent heat and glare, wind breaks to lessen air infiltration. Use landscape to screen unsightly views, control pedestrian circulation and define entries.

Landscape design on ACC Bases should reinforce the same base wide harmony that is described in the architectural design policy statement.

Landscape guidelines specific to Offutt AFB are outlined on the following pages.

4.2.2 Protection and Accessibility Requirements

All Site Design (vehicular and pedestrian circulation, parking, site features, landscaping, etc.) must be in compliance with UFC 4-010-01 DOD Minimum Antiterrorism Standards for Buildings, and the American with Disabilities Act (ADA). The most stringent shall govern.

4.3 CLIMATE AND LANDSCAPE PLANTING

4.3.1 Current Conditions

The climate in and around Offutt Air Force Base is classified as moist and sub-humid. It is characterized by warm summers and cold, dry winters. Characteristic features of the area are abundant sunshine, moderate rainfall, high evaporation rates, moderate to high wind movement, variable humidity, and a wide daily range of temperatures.

Record high and low temperature range from a high of 110°F, to a low of -20°F. Average summertime temperature is 88°F and average wintertime temperature is 29°F. The base receives an average of 30-inches of rain each year.

The above shall serve as guidance to aid landscape architects, landscape designers, grounds maintenance personnel, and others, in their continued efforts to develop a sustainable landscape environment which complements base buildings, streets, artifacts, recreation areas, etc.; while providing environmental support to humans, animals, and the earth.

4.3A Canopy trees, groundcover, and low level lighting define an entryway

4.3.2 General Recommendations

Landscape planning should be based on development of a range of plant species, which are proven to thrive on the base. (See “Community Forestry Master Plan, Offutt AFB, Recommended List of Woody Plants for Offutt AFB”) for approved recommendations. It is the designer’s responsibility to select specific plant species from identified plant list sources with the appropriate zone, character, height, texture, etc., for the specific function and aesthetic outcome desired. Indigenous plant species can be utilized as long as intensive maintenance or extensive water requirements are not an issue.

4.4 PLANTING

4.4.1 Current Conditions

The perception of the quality of life as experienced from a United State Air Force Base is often measured via a base's physical aesthetics. ACC prides itself in developing attractively designed and well-maintained bases by recognizing and responding to the geographical, cultural and climatic conditions at each specific Base.

4.4A Courtyards, canopies, site furnishings, and ornamental planting enhance this housing area

4.4.2 General Recommendations

Continue to maximize the variety of plant material selections. Whenever possible, utilize low water plant material at Offutt AFB. See the plant materials list source for recommended plant species and recommended plant installation methods.

Landscaping should define street edges and punctuate main intersections. Use plant species, which will not obstruct sight distances as they mature. Use landscaping to punctuate parking lot entrances and to visually screen parking lots from public view.

Base wide, landscaping should be used in conjunction with site walls, for visual screening of mechanical equipment, dumpsters, loading docks, and parking. Locate equipment, dumpsters, loading docks, etc. away from building fronts and other high visibility areas.

Use of canopy trees to provide shade, and evergreens to screen some views is highly recommended. Playgrounds, picnic areas, gazebos and community open spaces should use trees in conjunction with the man made overhead structures where possible to provide shade and shelter.

Administration Facilities, mission support facilities and facilities having prominent facades should follow a layout of plant material whereby evergreen plant material is used as a structural framework, deciduous plant material and groundcover plants are used in a layering style of design. Shrubs and dense evergreen trees that create concealment areas should not be used in close proximity to buildings, in accordance with current force protection guidelines.

Landscape planning for mission specific facilities such as hangars and maintenance/storage buildings shall be purely functionally driven. This could, in some cases, result in no landscaping at specific buildings, however, even a minor amount of landscaping at main entrance doors can add appeal and offer human scale to facilities otherwise lacking in these qualities. Additionally, landscape areas can provide adequate location and access for underground utilities and can serve to soften the hard lines of architectural elements.

Major, high visibility buildings and major activity areas should be punctuated by defined entry or gathering plazas. Accent pavement design, hardscape materials and site furnishings should be incorporated as appropriate to reinforce the prominence of the building. Establish logistically accessible courtyards, paths, seating plazas, break areas, etc. close to building entrance/exits, which encourage their usage and extend living and workspaces outdoors in "outdoor rooms."

Historic areas should maintain a formal landscape appearance indicative of the originating era. Formal, symmetrical layouts of evergreen and blooming ornamental plant materials, punctuated with seasonal perennial and annual flowers will serve to set the idealistic images historic structures often bring to mind.

Housing areas can receive a similar landscape design philosophy as the historic areas with the added option of more curvilinear planting arrangements. Landscaping around housing units can offer the greatest flexibility and often the greatest ability to demonstrate the unusual or exotic species available to the region's climatic constraints. Seasonal change, seasonal color, and variety of plant material textures and heights are all basic parameters in establishing the residential landscape. The use of blooming plant materials, rock gardens, arbors, trellises, and gazebos with swings add greatly to our feelings of tranquility and peace in the place we like to call home.

4.4B Large areas of hardscape adjacent to facility magnify artificial temperature rise of microclimate

4.4C Structures encourage pedestrian use of parade ground

In perimeter areas, open space and runway and taxiway areas that are difficult to maintain, there are options for native plantings to be effectively utilized. For instance buffalo grass is a low growing, drought tolerant turf that can be seeded, sodded or over seeded in existing turf. Other native grasses and shrubs can also be used effectively to re-vegetate areas and need only occasional maintenance. The Nebraska Department of Roads has extensive experience in developing native seed mixtures and planting techniques and has been nationally recognized for their efforts. The website for the Nebraska wildflower guide is:
www.nebraskatransportation.org/docs/flowers.

The Midwest grass and wildflower online guide is :
www.lib.ksu.edu/wildflower/index.html.

One challenge with using native plant materials is changing the perception of them as unkempt or not in keeping with a campus composed of clipped lawns. Similarly trees and shrubs that are natural, open, loose, or have irregular form are over-pruned and unnecessarily trimmed onto geometric shapes. In many cases this is not the best management practice and can lead to plant decline and lends a formal appearance that is out of character with a naturalized landscape. Ongoing landscape maintenance contracts should specify that the onsite foreman is a certified arborist and that detailed work plans are submitted and approved prior to any on site operations are authorized.

4.4D Mulched beds provide visual variety and reduce mowing demands

4.5 IRRIGATION AND WATER USE

4.5.1 Current Conditions

Irrigation is not widely used at Offutt AFB. Only highly visible lawns such as USSTRATCOM, Wing HQ, and the Parade Ground are irrigated.

4.5.1 General Recommendations

Temporary irrigation shall be used to establish native or naturalized landscape installations. Permanent irrigation shall be limited to major landscape applications at focus areas or in special situations such as at entrances to major facilities. Base Civil Engineer Squadron must approve all irrigation installations.

Due to mineral buildup in drip irrigation systems, limit their use. Bubbler heads are a good alternative. Use spray heads for lawn areas only. Use minimum 1½-inch diameter PVC pipe. Reduce supplemental irrigation requirements by taking advantage of runoff from paved areas, roof drains and slightly bermed areas - which can help direct runoff to where it's needed. To minimize the need for irrigation, limit turf to high visibility areas and recreation areas such as those near a sun shelter or tot-lot. The use of high efficiency irrigation technology or use of captured rain or recycled site water to reduce potable water consumption is encouraged. Adhere to guidelines established and provided by LEED.

4.5.3 Approved Products/Treatments

Refer to Base Civil Engineer Squadron for current approved irrigation practices and products. Comply with most current LEED Version Water Efficiency Credits WE 1.1 and WE 1.2 to the maximum extent possible.

4.5.4 Landscape Maintenance

Refer to November 1987 Community Forestry Master Plan for Offutt AFB, Nebraska.

4.5A limited turf and utilization of drought tolerant plant material minimize the need to extensive irrigation systems

4.6 APPROVED PLANT LIST

Following is a recommended plant list from which to choose appropriate plant material. For additional acceptable and approved plant materials species, please see the "November 1987 Community Forestry Master Plan for Offutt AFB, Nebraska" list of approved woody plant material.

4.6.1 Large Deciduous Trees (over 35 feet at maturity)

Common Name	Botanical Name
Emerald Luster Maple	Acer platanoides 'Emerald luster'
Emerald Queen Norway Maple	Acer platanoides 'Emerald Queen'
Columnar Norway Maple	Acer platanoides 'Erectum'
Armstrong Maple	Acer rubrum 'Armstrong'
October Glory Maple	Acer rubrum 'October Glory'
Red Sunset Maple	Acer rubrum 'Red Sunset'
Green Mountain Maple	Acer saccharum 'Green Mountain'
Common Alder	Alnus glutinosa
River Birch	Betula nigra
Pignut Hickory	Carya glabra
Shagbark Hickory	Carya ovata
Northern Catalpa	Catalpa speciosa
Common Hackberry	Celtis occidentalis
Common Persimmon	Diospyros virginiana
Autumn Purple Ash	Fraxinus americana 'Autumn Purple' Fraxinus
Green Ash	pennsylvanica
Maidenhair Tree	Ginkgo biloba
Century Maidenhair tree	Ginkgo biloba 'Century'
Imperial Honeylocust	Gleditsia triacanthos inermis 'Imperial'
Shademaster Honeylocust	Gleditsia triacanthos inermis 'Shademaster'
Skyline Honeylocust	Gleditsia triacanthos inermis 'Skyline'
Kentucky Coffeetree	Gymnocladus dioica
Black Walnut	Juglans nigra
Common Larch	larix decidua
Tuliptree	liriodendron tulipifera
Osage Orange	Maclura pomifera
Cucumbertree Magnolia	Magnolia acuminata
London Planetree	Platanus x acerifolia
American Sycamore	Platanus occidentalis
Eastern Cottonwood	Populus deltoides
Sawtooth Oak	Quercus acutissima
White Oak	Quercus alba
Swamp White Oak	Quercus bicolor
Scarlet Oak	Quercus coccinia
Shingle Oak	Quercus imbricaria
Bur Oak	Quercus macrocarpa
Chinkapin Oak	Quercus muehlenbergii
Chestnut Oak	Quercus prinus
English Oak	Quercus robur
Upright English Oak	Quercus robur 'Fastigiata'
Red Oak	Quercus rubra
Tristis Willow	Salix alba 'Tristis'
Common Sassafras	Sassafras albidum
Baldscypress	Taxodium distichum
American Linden	Tilia americana
Littleleaf Linden	Tilia cordata
Greenspire Linden	Tilia cordata 'Greenspire'
Redmond Linden	Tilia x euchlora 'Redmond'
Silver Linden	Tilia tomentosa

4.6.2 Small Deciduous Trees (less than 35 feet at maturity)

Common Name	Botanical Name
Hedge Maple	Acer campestre
Flame Amur Maple	Acer ginnala 'Flame'
Japanese Maple	Acer palmatum
Ohio Buckeye	Aesculus glabra
Horsechestnut	Aesculus hippocastanum
Eastern Redbud	Cercis canadensis
American Yellowood	Cladrastis lutea
Thornless Cockspur Hawthorn	Crataegus crusgalli inermis\
English Hawthorn	Crataegus laevigata (oxyacantha)
Lavallei Hawthorn	Crataegus x lavallei
Toba Hawthorn	Crataegus x mordenensis 'Toba'
Washington Hawthorn	Crataegus viridis 'Winterking'
Russian Olive	Eleagnus angustifolia
Golden Raintree	Koelreuteria paniculata
Saucer Magnolia	Magnolia soulangeana
Star Magnolia	Magnolia stellata
Adams Flowering Crabapple	Malus x 'Adams'
Indian Magic Flowering Crabapple	Malus x 'Indian Magic'
Liset Flowering Crabapple	Malus x 'Liset'
Mary Potter Flowering Crabapple	Malus x 'Mary Potter'
Midwest Flowering Crabapple	Malus x 'Midwest'
Pinkspires Flowering Crabapple	Malus x 'Pinkspires'
Red Jade Flowering Crabapple	Malus x 'Red Jade'
Royalty Flowering Crabapple	Malus x 'Royalty'
Sargent Flowering Crabapple	Malus x sargentii
Selkirk Flowering Crabapple	Malus x 'Selkirk'
Snowdrift Flowering Crabapple	Malus x 'Snowdrift'
Spring Snow Flowering Crabapple	Malus x 'Sugartyme'
Tina Flowering Crabapple	Malus x 'Tina'
Velvet Pillar Flowering Crabapple	Malus x 'Velvet Pillar'
White Candle Flowering Crabapple	Malus x 'White Candle'
Zumi Flowering Crabapple	Malus x zumi calocarpa
Dawn Redwood	Metasequoia glyptostroboides
Hophornbeam	Ostrya virgin1 a.a
Sand Cherry	Prunus besseyi
European Birdcherry	Prunus padus
Canada Red Cherry	Prunus x 'Shubert'
Chokecherry	Prunus virginiana
Wafer-ash	Ptelea trifoliata
Aristocrat Pear	Pyrus calleryana 'Aristocrat'
Chanticleer Pear	Pyrus calleryana 'Chanticleer'
Bradford Pear	Pyrus calleryana 'Bradford'
Redspire Callery Pear	Pyrus calleryana 'Redspire'
Japanese Pagodatree	Sophora japonica
European Mountain Ash	Sorbus aucuparia
Japanese Tree Lilac	Syringa reticulata

4.6.3 Larger Evergreen Trees

Common Name	Botanical Name
Balsam Fir	Abies balsa mea
Concolor Fir	Abies concolor
Keteleer Juniper	Juniperus chinensis 'Keteleerii'
Cologreen Juniper	Juniperus scopulorum 'Cologreen'
Eastern Redcedar	Juniperus virginiana
Canaert Juniper	Juniperus virginiana 'Canaertii'
Norway Spruce	Picea abies
White Spruce	Picea glauca
Colorado Spruce	Picea pungens
Bristlecone Pine	Pinus aristata
Jack Pine	Pinus banksiana
Lacebark Pine	Pinus bungeana
Limber Pine	Pinus flexilis
Austrian Pine	Pinus nigra
Ponderosa Pine	Pinus ponderosa
Red Pine	Pinus resinosa
White Pine	Pinus strobus
Scotch Pine	Pinus syvestris
Douglas Fir	Pseudotsuga menziesii
Upright Japanese Yew	Taxus cuspidata capistata
Hicks Anglojap Yew	Taxus x media 'Hicksii'
Mission Arborvitae	Thuja occidentalis 'Mission Hills'

4.6.4 Deciduous Shrubs

Common Name	Botanical Name
Fiveleaf Aralia	Acanthopanax siboldianus
Bailey's Compact Amur Maple	Acer ginnala 'Bailey's Compact'
Shadblow Serviceberry	Amelanchier canadensis
Brilliant Red Chokeberry	Aronia arbutifolia 'Brilliantissima'
Black Chockberry	Aronia melanocarpa
Mentor Barberry	Berberis x mentorensis
Japanese Barberry	Berberis thunbergii
Crimson Pygmy Barberry	Berberis thunbergii atropurpurea
Siberian Peashrub	Caragana arborescens
Flowering Quince	Chaenomeles speciosa
Gray Dogwood	Cornus racemosa
Isantii Dogwood	Cornus sericea 'Isantii'
Kelsey Dogwood	Cornus sericea 'Kelseyii'
American Hazelnut	Corylus americana
Cranberry Cotoneaster	Cotoneaster apiculatus
Spreading Cotoneaster	Cotoneaster divaricatus
Hedge Cotoneaster	Cotoneaster lucidus
Winged Euonymus	Euonymus alatus
Dwarf Winged Euonymus	Euonymus alatus 'nana'
Eastern Wahoo	Euonymus atropurpureus
Showy Border Forsythia	Forsythia x intermedia
Bronx Forsythia	Forsythia viridissima 'Bronxensis'
Shrubby St. Johnswort	Hypericum prolificum
Winter Red Winterberry	Ilex verticillata 'Winter Red'
Miniature Snowflake Mockorange	Philadelphus coronarious
Dwarf Ninebark	Physacarpus opulifoliusnanum
Katherine Dykes Potentilla	Poltentilla fruticosa 'Katherine Dykes'
Tallheldge Buckthorn	Rhamnus frangula 'columnaris'
Smooth Sumac	Rhus glabra
Staghorn Sumac	Rhus typhina
Alpine Current	Ribes alpinum
Russet Buffaloberry	Shepherdia argentea
Garland Spirea	Spirea arguta
Froebel Spirea	Spirea x bumulda 'Froebelii'
Little Princess Spirea	Spirea japonica alpina 'Little Princess'
Snowmound Spirea	Spirea nipponica 'Snowmound'
Vanhoutte Spirea	Spirea x vanhouttei
Snowberry	Symphoricarpos albus
Hancock Coralberry	Symphoricarpos x chenaultii 'Hancockii'
Coralberry	Symphoricarpos orbiculatus
Littleleaf Lilac	Syringa microphylla
Dwarf Korean Lilac	Syringa palibiniana
Persian Lilac	Syringa persica
Late Lilac	Syringa villosa
Common Lilac	Syringa vulgaris
Burkwood Viburnum	Viburnum x burkwoodii
Koreanspice Viburnum	Viburnum carlesii
Arrowhead Viburnum	Viburnum dentatum
Wayfaringtree	Viburnum lantana
Nannyberry	Viburnum lentago
Doublefile Viburnum	Viburnum placatum tomentosum
Blackhaw Viburnum	Viburnum prunifolium
Siebold Viburnum	Viburnum sieboldii
Alfredo Viburnum	Viburnum trilobum 'alfredo'
Dwarf American Cranberrybush	Viburnum trilobum compactum

4.6.5 Ornamental Grasses

Common Name	Botanical Name
Fountain Grass	Alopecuroides 'Hamlin'
Maiden Grass	Miscanthus sinensis 'Gracillimus'
Pampas Grass	Cortaderia selloana
Feather Reed Grass	Calamagrostis acutiflora 'Feather Reed'

4.6.6 Lawn Grasses (Seed at a rate of 8 lbs per 1,000 sf)

Common Name	Botanical Name
Turf Type Tall Fescue, Rebel Olympic, Apache	Festuca arundinacea
Creeping Red Fescue	Festuca rubra
Kentucky Bluegrass/ Adelphi, Briston and Mystic	Poa pratensis
Perennial Ryegrass/Manhattan II Palmer & Prelude	Lolium perenne
Bentgrass/Penncross	Agrostis species

4.6.7 Hardy Perennials

Common Name	Botanical Name
Yarrow	Achillea 'Yarrow'
Astilbe	Astilbe species
Purple Coneflower	Echinacea purpurea
Lady Fern	Fern Species
Hosta	Hosta Species
Black Eyed Susan	Rudbeckia fulgida 'Goldstrum'
Sedum	Sedum species
Salvia	Salvia species
Verbena 'Homestead Purple'	Homestead purple verbena

4.7 STREETSCAPE

4.7.1 Current Conditions

Upon arrival at Offutt, the visitor is greeted with rolling green lawns, which distinguish Offutt AFB from other USAF facilities.

Roadways are currently well maintained, almost all with curb and gutter and most with concrete sidewalks.

4.7A Mature trees and grass buffer strips between roadway & sidewalk contribute to a comfortable & attractive streetscape

4.7.2 General Recommendations

General streetscape improvements should be considered an integral part of any street improvement or building construction project. The introduction of plantings along existing sidewalks set back from street edges, along with hardscape improvements such as new concrete sidewalks, site furnishings and light standards will improve the overall aesthetics of Offutt AFB.

Equally a spaced or random, staggered, or alternating grouping of sidewalk/street-edged landscaping is strongly encouraged on all primary and secondary roadways. Although larger approved specimen trees may be used at strategic locations the use of younger material, which might better, become acclimated to the site are recommended.

Major intersections and parking lot entrances should be punctuated by landscape. Limit landscaping, masonry walls and fences within 50-feet of intersections and entrances to a maximum of three feet in height, to ensure minimum 100-foot unobstructed site lines of traffic. No walls, shrubs or trees that may obstruct views should occur within 20-feet of any road intersection. Refer to Department of Defense standards for unobstructed view requirements. Maintain good visibility and sight distance when planning for plantings along roadways. Consider mature plant heights, placing taller shrubs and trees away from curbs and sidewalks. Tree-lined streets work well within Offutt and are encouraged.

4.7.3 Approved Products/Treatment

Refer to Architectural Standards Section 2.8 for approved site wall materials and treatments. See Landscape Standards Section 4.6 for approved plant materials and applications.

4.8 SITE ENCLOSURES AND AMENITIES

4.8.1 Current Conditions

Ranging from dumpster enclosures, mechanical courtyards, bus stops, utility buildings and picnic areas, there are many different types of site amenities at Offutt AFB. Unfortunately, many of these structures, particularly in picnic areas, are "self help" projects that were constructed by individuals without regard to base standards. This has resulted in a mixed bag of structures, which greatly detracts from the base aesthetic.

A need exists at Offutt AFB for more exterior courtyard and shelter spaces for staff break areas, picnic shelters, and shaded playground observation.

New shelters and gazebos should incorporate ample outdoor, cooking facilities, seating, shading, and open grass lawns.

4-9A Existing self-help project

4.8.2 General Recommendations

Protected outdoor employee break areas, picnic shelters, playground and park shelters should be included when justified by building occupancy in new construction, improvement, and renovation projects. Overhead shelters, referred to in the region as gazebos or overhead trellises, should be included in all new playground and park designs.

There is a diversity of architectural styles, periods and materials at Offutt AFB. Site furnishings should reflect the surrounding character zone or related buildings. For example a gazebo design that is appropriate within the historic core may not be appropriate within zones with more contemporary structures. There is however site furnishing systems that allow for consistency in color, materials, or rooflines while providing options for railings, trim or shape to best fit the project context.

The Polygon park architecture line from the Porter Corp, Holland, Michigan offers a system of shelters that can be integrated throughout Offutt AFB. Built upon a standard line of powder coated steel structures, the design of each structure can be customized with railings, trims, roofing materials and shapes. The steel construction provides a durable low maintenance alternative to wood shelters.

4.9B Landscape screening

4.9C Site furnishing—picnic shelter

Metal standing seam roofs should be used for most applications on the base, and shingles should be used within the historic core. Masonry column bases or full columns can be used on shelters developed as an integral part of the site plan for masonry buildings. Bronze trim and metal roofs are used throughout much of the base and should be adapted as the standard for most shelters. There are recent projects with red or other color roofs, and shelters associated with those buildings should incorporate matching roofs.

Polygon shelters are available in hexagonal and octagonal shapes with multi-tier roofs, which are appropriate for gazebos within the historic zone. For bus, bicycle and park shelters in newer areas on the base, rectangular structures may be more appropriate. Partially enclosed shelters provide protection from the harsh winter weather. Examples of custom applications follow.

Orient shelters and courtyards to take advantage of climate conditions, such as seasonal sun, shade, and breezes.

Provide site furnishings, lighting, and landscaping to both support the function and create an inviting gathering zone. Landscaping should consist of soft textured, finer material deemed relaxing and inviting to touch and smell. Avoid rigid, sharp, and prickly plant materials. Appropriately small, natural grass lawns can be used to encourage family interaction. Consider incorporating sand volleyball courts in family areas. Three-sided enclosures of concrete or masonry should be provided for all dumpsters. Masonry enclosures should follow the guidelines for masonry site walls.

In parking lots, locate dumpster enclosures to the side or rear of facilities and in such a manner as to minimize traffic conflicts. Orient the open end, when possible, away from building entrances and primary views. Include a concrete apron and steel gate. In the Housing Zones, dumpsters should be located away from front yards.

4.9D Site furnishing—existing picnic benches

4.9E Site furnishing—exterior break area

4.9F Site furnishing—bus shelter

4.8.3 Approved Products/Treatments

Masonry site walls (see Architectural Standards, Section 2.8) should extend along well-defined boundary lines and streets as visual buffers between conflicting land uses or to control views.

Site walls should be incorporated along street edges at neighborhood boundaries and at boundaries between Mission Zones and other base zones.

Screen walls constructed of the same material as the supporting structure, or "Offutt Fence" shall be constructed around all dumpster surrounds or mechanical courtyards in a manner that complies with force protection requirements. "Offutt Fence" is the only approved fencing material approved for this application. Information and details on this fence can be obtained at:
www.bellprivacyfence.com.

Masonry BBQs/cooking facilities are not allowed without approval by Base Civil Engineer and the Installation Commander.

4.9G Site furnishing—gazebo

4.9H Existing mechanical enclosure

4.9 SITE FURNISHINGS

4.9.1 Current Conditions

While site furnishings and other pedestrian amenities are present at Offutt AFB, they are largely facility specific rather than conforming to a base wide standard. A wide variety of bench, shelter and trash receptacle styles are found.

4.9.2 General Recommendations

Site furnishing should be considered in all new construction, renovation and street improvement projects. When site furnishings are warranted the furnishing selections should conform to base wide standards to reinforce the overall visual harmony.

Consider climate conditions in selection and placement of all site furnishings. Solar factors such as direct heat gain on metal components (especially play equipment); ultraviolet degradation of plastics and shade for users should be addressed. Consider the need for wind protection, especially during times of strong prevailing winds. When possible take advantage of shelters, gazebos, landscaping and building mass for solar and wind protection.

Playgrounds should be designed to meet or exceed the standards outlined in the Consumer Product Safety Commission *Handbook for Public Playground Safety*, latest edition. These standards address not only the design and construction of play structures and equipment, but also the layout of the play areas, accessibility, and safety surfacing. A number of manufacturers provide equipment that meets these standards.

When designing and specifying a play area on base, the designer should consider the primary age group(s) that will be using the space and select equipment accordingly. If there are other play areas nearby observe what types of activities are being offered and which are underutilized or lacking. Playgrounds that serve a broad age range should provide separate areas or clusters for different age groups. Design for low maintenance with metals and composite materials suitable to the climate. Consider the long term cost benefit of materials such as resilient paving that has a higher initial cost, but longer life span than wood fibers.

4.10A A “polygon” staffed bench incorporated into a shelter

4.10B Separation of activity areas & resilient play surfacing around play equipment will create safer playgrounds

4.9.3 Approved Products/Treatments

The following products are a starting point for standardizing future selections. Actual project needs, facility types, and color selections should be resolved before specifying these amenities.

Benches: Victor Stanley Inc., Classic Series Model No. CR-138 for use within historic Fort Crook. Polygon steel slotted bench—four styles, depending upon mounting requirements.

Trash Receptacles: Victor Stanley Inc., Model S-35 3/8-inch solid steel bars for use anywhere on base.

4.10C Good site integration

4.10 MULTI-USE PATHS

4.10.1 Current Conditions

Currently bicycle lanes do not exist, however future development of such is planned for the housing areas.

4.11A Individual bike racks

4.10.2 General Recommendations

Often viewed as recreational, bicycle trails can decrease vehicular traffic congestion, improve air quality and add to the overall quality of life for daily two wheel commuters. For added safety, bicycle lanes should be separate from vehicular travel lanes. A Class 1 bicycle lane is one in which the paved lane is separated from the vehicular roadway via landscaped areas, medians, or other physical separator. Some effort needs to be coordinated to develop a minimum 6-feet wide, concrete or asphalt paved bicycle trail system, which connects major points of activity throughout the base.

One opportunity for increasing the opportunity for cycling on base is to expand existing sidewalks along primary streets to multi-use paths that can accommodate pedestrians, joggers and cyclists. The AASHTO Guide for Development of Bicycle Facilities, current version, contains guidelines for off-road multi-use paths that should guide the development of the multi-use path network. A standard width of ten feet is recommended wherever possible. In planning the network, a route that links the primary destinations that residents use should be the first priority.

Summary

Landscape design shall be encouraged to minimize site disturbances and reduce heat island impacts to existing microclimates and surrounding habitats. Designs are encouraged to comply with adopted LEED guidelines.

[Section 5] Civil Engineering Standards

5.1 STREETS/PAVING

5.1.1 Current Conditions

Four main arterial routes serve Offutt AFB. SAC Boulevard is the base's main artery, running roughly from the Kenney Gate in the northwest corner of the base to the STRATCOM Gate in the southwest corner. Looking Glass Avenue parallels most of the flight line, and Butler Boulevard runs along the southern border of the base. Nelson Drive on the north side of the base connects the Kenney and Bellevue Gates.

Street edge treatment at Offutt AFB varies greatly. Some areas are nicely landscaped, while others are barren and harsh. Consistent treatment of street edges can be identified at several locations base wide. Along the Parade Ground on Custer Road and Washington Square, the red sandstone sidewalks, set back from the street by a landscape strip, create a beautiful street edge.

5.1A Good sidewalk for separation from roadway

5.1.2 General Recommendations

All street edge improvements should conform to guidelines outlined in the Landscape standards of this document. See Section 4.7.

Intersections of roads or streets shall be no closer than 150-feet to adjacent intersections.

All new street and road intersections should have new survey monuments installed per Base Standard details, see Standard Details Section 8.

To ensure drainage, minimum pavement slope shall be 0.60% for asphaltic concrete and 0.40% for portland cement concrete.

All new portland cement concrete (PCC) joints shall be sealed using preformed neoprene compression seals installed per manufacturer's instructions. All existing PCC joints shall be sealed using pourable joint sealant. See Standard Details Section 8.

5.2 PARKING

5.2.1 Current Conditions

Surface parking lots at Offutt AFB are treated in a variety of fashions, with mixed results. The commissary, BX, and mini mall areas have some of the highest parking demands on base. Rather than being pulled to the rear or side of the buildings, parking stretches across the buildings' fronts with little or no barrier or transition present. This situation represents a serious pedestrian hazard, and the parking completely blocks the building entries visually and functionally. Additionally, the buildings may be subject to impact damage by vehicles. By re-orienting the bulk of the parking to the space between buildings and by using landscape screening along road edges and parking lots, the situation could be altered so that parking would not dominate the complex. The 55th Wing buildings around Looking Glass Avenue generally do a good job of orienting parking away from building fronts and providing appropriate buffer zones. See Section 4.2.1, Protection and Accessibility Requirements for additional design guidance.

5.2A Commissary parking


5.2B Parking directly in front of facility, Building 68E

5.2.2 General Recommendations

Do not locate parking directly in front of a building or entrance. Do not locate parking between a main viewing street and a building. If possible, parking should be located behind the building it serves. In no case should parking be designed "on-street."

Along major street edges parking should be screened from public rights of way and adjacent buildings by approved landscaping, berms or masonry site walls.

Design sites to limit walking distance to 200-feet. For transient and bachelor housing, limit luggage carrying and walking distance to 100-feet.

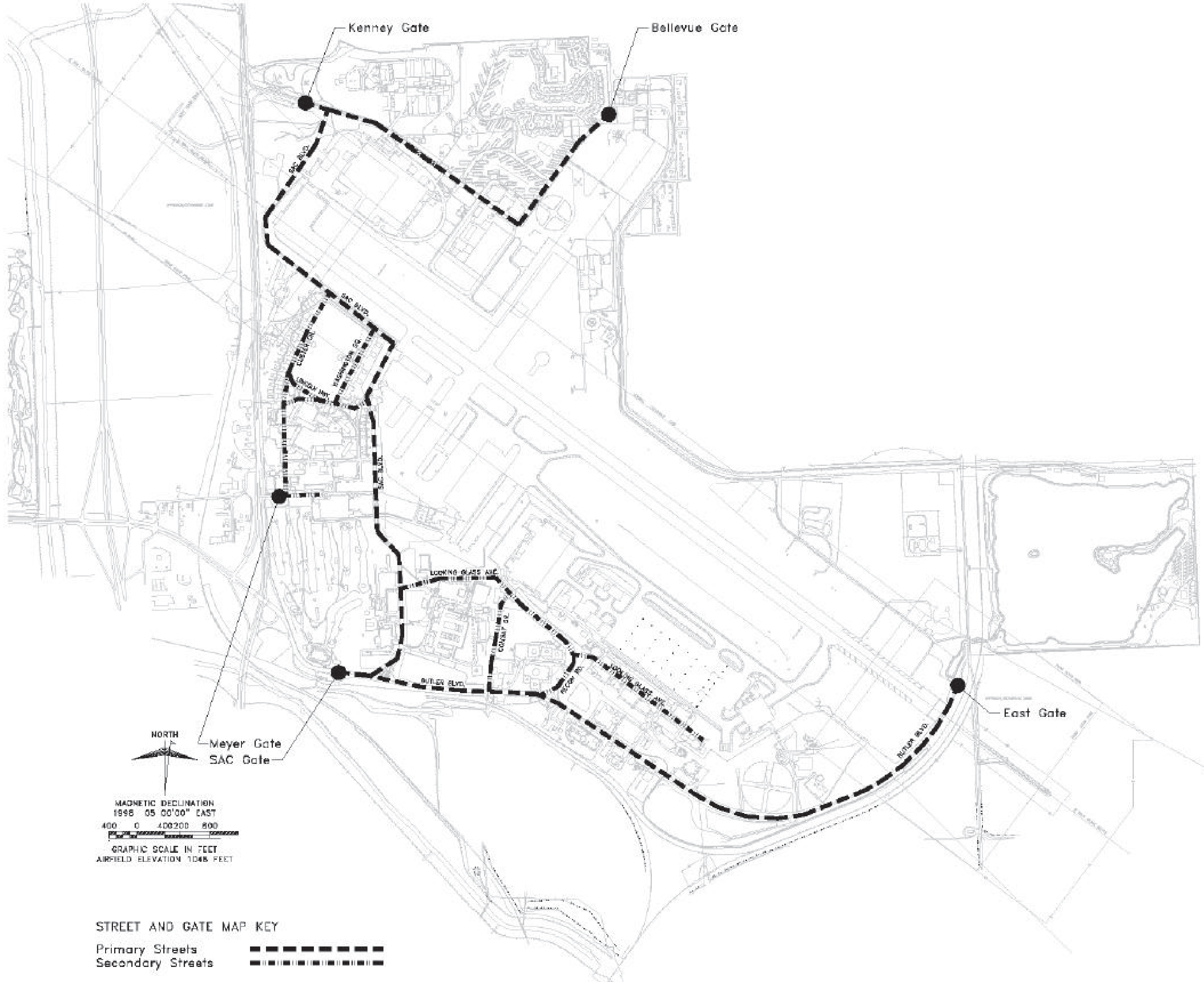
Use separate parking lots accommodating 50 or fewer cars rather than single lots with 200 cars or more where possible. Where large parking lots exist or are required by functional layout, landscape approximately 10% of the lot. Screen lots and break up large expanses of pavement with planting islands and buffer strips.

Parking areas should contain both standard and handicap stalls with 24 foot driving lanes. Standard stall size shall be 20-feet by 10-feet. Minimum size shall be 19-feet by nine-feet. Handicap stalls shall be standard stalls with a 5-foot common area between stalls, or an expanded stall, minimum size 12-feet x 18-feet. Handicap access ramps shall be constructed into concrete curb and sidewalk.

All parking lots shall be striped and signed in accordance with Offutt AFB's *Base Sign and Parking Standards*.

Housing parking should allow for an average of 1.5 spaces of off-street parking per unit. Additional parking should be accommodated through the use of strategically placed banks of parking perpendicular to the street. On-street parking is not included in required parking counts.

5.2C Parking separation by grade change


Kenney Gate
Bellevue Gate
SAC BLVD.
LOOKING GLASS AVE.
BUTLER BLVD.
East Gate
Meyer Gate
SAC Gate
NORTH
MAGNETIC DECLINATION
1998 05 00'00" EAST
400 0 400200 800
GRAPHIC SCALE IN FEET
AIRFIELD ELEVATION 1048 FEET
STREET AND GATE MAP KEY
Primary Streets
Secondary Streets

5.3 SIDEWALKS/CURB AND GUTTER

5.3.1 Current Conditions

Sidewalks, where present, and curb and gutter installation at Offutt AFB appear to be in fairly good condition base wide. The continued use of sidewalks and curb and gutter at appropriate locations at Offutt AFB should be considered mandatory. Most of the sidewalks are constructed of "typical" grey concrete with the exception of red sandstone sidewalks in parts of the Historic Zone.

5.3.2 General Recommendations

Within pedestrian use areas, sidewalks shall be used along all parking lots and along at least one side of the street. Sidewalks shall be a minimum of 4-feet wide. A minimum 5-foot wide landscaping strip shall be incorporated between edge of curb and an edge of sidewalk when used along primary roads. Sidewalks along secondary roads do not require landscaping strips. In the Family Housing Zones, sidewalks should occur on both sides of the street.

Portland cement concrete (PCC) curb and gutter shall be used on all paving except in the Historic Zone, where red sandstone sidewalks are recommended. Colored concrete is permitted in replacement projects for street sidewalks. Walks from the street up to housing shall utilize salvaged sandstone. Curbs shall be a minimum of 6-inches high. Gutters shall be a minimum of 21-inches wide. Drainage should be along the curb. PCC curb without gutter is acceptable where drainage does not flow at perimeter.

Parking lot drainage shall be designed to flow along perimeter curb and gutter. Where runoff is required to flow to the center of a lot a PCC gutter shall be used. Base Civil Engineer Squadron shall approve design.

Storm water is currently managed on site primarily in storm sewer systems feeding into Offutt Lake in the southeast corner of the base, and into underground cisterns. The difficulty in piping under thick airfield paving in some sectors of the base limit the ability to tap into or increase the size of existing storm sewers. Stormceptors and other alternative storm water management systems may need to be utilized for new development.

5.3A Exterior pedestrian walkway, articulated building entrances

5.3B Dormitory site circulation

The use of grassed swales and bioretention features can also be effective means to divert and slow peak storm water volumes. Curbless parking islands can create bioretention areas and allow for snow storage in winter. These are effective only with proper soil conditions to allow infiltration. If conditions are suitable, these facilities must drain within hours of the storm event so as not to become wetland habitats, which support water, fowl, which can interfere with flight operations. These types of facilities supplement, but do not replace the need for traditional storm water management systems.

5.4 SITE LIGHTING

5.4.1 Current Conditions

Site lighting at Offutt AFB appears to have been approached on a facility or project specific basis rather than as a base wide issue. Recent new construction such as the Alert Facility and Family Visitation Center however, incorporate similar lighting palettes. This palette begins to blend with the architectural character sought at Offutt AFB.

See Standard Details Section 8 for listing of acceptable fixtures.

5.4.2 General Recommendations

Exterior building lights shall be incandescent or High Intensity Discharge (HID) fixtures. All street, site, and plaza lighting shall be high-pressure sodium.

Typically, all streetlights shall be bronze "shoebox" style on square aluminum poles. For mounting heights over 35-feet, a square steel pole, tapered toward the top, shall be used. Shoebox luminaires and poles shall be anodized or duranodic bronze aluminum or matching color bronze painted steel finish with appropriate National Electrical Manufacturers Association (NEMA) distribution for its intended function. All luminaires shall be rectilinear. Roadway luminaires shall be arm mounted.

Lighting in the Historic Zone should match the poles and 'acorn' fixtures found in this district.

Site lighting should be mounted on poles. Mounting on buildings should be avoided. If required, use directional type wall-mounted fixtures. If building mounting is necessary, care should be taken to ensure light placement is sensitive to the building's design.

Mounting heights shall be as follows:
Sidewalk and plaza lighting-12-feet to 50-feet
Special purpose lighting-20-feet to 30-feet
Parking and roadway lighting-30-feet to 50-feet

Lighting levels and installations should vary with the volume and type of traffic and the visual character desired.

5.4A Example of recommended bronze-anodized shoebox lighting

5.4B "Acorn" luminaires to be used in the historic area

5.3C Bollards define building entrance

Coordinate street lighting and sidewalk lighting locations with site amenities such as landscaping, benches, signs, etc.

5.5 FLAGPOLES

5.5.1 Current Conditions

Inclusion of flagpole(s) will be addressed on a case by- case basis. Approval must be obtained from Base Civil Engineering staff prior to facility programming and design.

SUMMARY

Base circulation consists of primary and seconding streets, parking at facilities shall be carefully sited away from building fronts and provide required stand-off distances for force protection requirements.

Pedestrian circulation is encouraged on the base with sidewalks and bike paths carefully integrated with roadways. Site development shall accommodate storm water best management practices.

[Section 6] Signage Standards

6.1 EXTERIOR SIGNS

6.1.1 Current Conditions

For the most part, exterior signage at Offutt AFB is in conformance with ACC Standards. Where special signs (freestanding or marquee signs) are used, they are generally appropriate in size, location and design.

Monuments or memorials will be on a case-by-case basis. Approval must be obtained from Base Civil Engineer Squadron.

6.1A Wall-mounted building signage

6.1.2 Signs (General)

The number of signs should be held to the minimum required for identification and customer service. Individual lettering attached to buildings, structures, monuments or entryway glass must be white, beige or bronze. Color policy for other types of exterior signs is white letters on brown background and brown posts with the exception of signs relating to safety and governed by National Standards applicable to the USAF.

All interior and exterior signage shall be in accordance with Offutt AFB's Base Sign and Parking Standards (Offutt AFBI 32-200) and the Air Force Sign Standards (UFC 3-120-01).

Traffic control signs (e.g. speed limit, stop, yield, hazard, danger, directional signs, etc.) shall be in accordance with the Manual of Uniform Traffic Control Devices (MUTCD); OSHA, Signs, Signal and Barricades; and ACCI 32-1054, Exterior Signs. Color shape and design shall comply with these standards. Other exterior signs (not related to traffic control or governed by the above references) shall have white lettering on brown backgrounds with brown posts.

As traffic signs are replaced due to age or damage, painting of sign backs and mounting posts will not be required.

6.1.3 Current Conditions

All buildings at Offutt AFB shall have a B4 Building sign affixed near the main entrance and a B5 building number sign affixed to one corner. See Standard Details Section 8 for specifications and mounting placement.

If a building identification name sign is necessary, it will require Base Architect approval. Building identification name signs shall be individual aluminum or bronze letters, all capitals, mounted directly to the building fascia or exterior wall adjacent to the facility's main entrance. If a building monument sign is necessary, it will require the Base Architect's approval and shall comply with UFC 3-120-01.

Addresses on residential units shall be white pressure sensitive letters on a dark bronze metal panel mounted adjacent to the unit's front door, visible from the street.

Care should be taken to ensure the building's size does not cause the signage to be lost. In certain situations, multiple signs and nonstandard sign schemes may be appropriate.

6.1.4 AAFES/DECA/Commercial Signs

Logo and lettering supplied by AAFES/DECA or the parent organization are required to be light bronze or dark bronze. All signage shall conform to Offutt's *Base Sign and Parking Standards*.

Format shall be AAFES logo followed by facility name, i.e. AAFES BASE EXCHANGE. This format shall be used for all AAFES facilities including shopettes, laundry and dry cleaners, military clothing sales, class six stores.

Logo and facility name shall be the same height and positioned on one continuous horizontal line if possible.

Facility name shall be spelled out completely with individual letters.

Logo and letters shall be mounted directly to the building fascia or exterior wall adjacent to the facility's main entrance, visible from the street.

6.1B Logo integrated into c anopy

Logo and letters shall be light or dark bronze anodized aluminum or plastic in a light or dark bronze color. Select finish color for maximum contrast and readability.

Logo and letters shall be available in even height increments from 2-inches to 16-inches. Choose the appropriate size and color for each facility and location.

The ratio of height to depth of logo and letters shall be approximately 8 to 1.

6.1.5 Historic Signs
Structures within the Historic Zone at Offutt AFB shall be marked with signs like those currently in place around the parade ground. Base Architect must approve use of alternate signs in this zone.

6.1.6 Other Signs
Marquee signs are defined as those constructed of masonry, illuminated or non-illuminated, with removable/ replaceable lettering for updates. Authorized marquee locations are limited to the primary base entry gates. Any requests for new Marquees, including replacement of existing Marquee signs, must receive ACC/CE and ACC/ SVS approval prior to purchase or installation. Site approval is required by Base Civil Engineer and Installation Commander.

Scrolling/letter board-type signs will be permitted at entrances to a limited number of service-type facilities. These signs shall be window-mounted type. Final approval for each sign shall be obtained from the Base Architect.

Revolving or moving signs shall not be used.

Internally lighted signs shall not be used. When night visibility is functionally required, use external flood or spot lights that illuminate both the adjacent landscape and building.

Sortie boards and use of the Air Force symbol shall be in accordance with Offutt's *Base Sign and Parking Standards*.

6.1.7 Lettering Size
For signs other than those covered by ACCI 32-0154, size lettering according to the functional viewing distance. Keep sign size to a minimum. The rule to follow for readability is one inch of letter height for each 25-feet of view distance. Example: If a sign is intended to be read from a passing car using a road 100-feet away, the largest sign lettering would be 4-inches (100 divided by 25 equals 4). Do not oversize. Lettering on all Base signs shall be of the same style. All base signs shall have the standard lettering, upper and lower case Helvetica Medium type.

6.1C Historic signage in Fort Crook – Zone 3

6.1.8 Approved Products/Treatments
Exterior Wall-Mounted Dimensional Letters.
Individual characters shall be cast aluminum or other noncorrosive material with light or dark bronze finish or to match Base standard. Characters shall be flush-mounted against a light-colored wall surface using masonry anchors or threaded screws. On buildings with only dark exterior materials (red or dark brown brick, for instance), cast aluminum letters with a white baked enamel finish are acceptable.

Pressure Sensitive Lettering. Vinyl sheeting for die - cut graphics shall have a .003 to .006 film thickness and conform to Military Specification M 43719A. Color shall be white. The sheeting shall have a recoated pressure sensitive adhesive backing (Class) or positionable pressure sensitive backing (Class 3).

6.2 INTERIOR SIGNS

6.2.1 Current Conditions

The graphics and interior signage shall be provided as a total system and shall be furnished and installed in accordance with AFPAM 32-1097. Again, All signage shall be in accordance with Offutt AFB's *Base Signage and Parking Standards*.

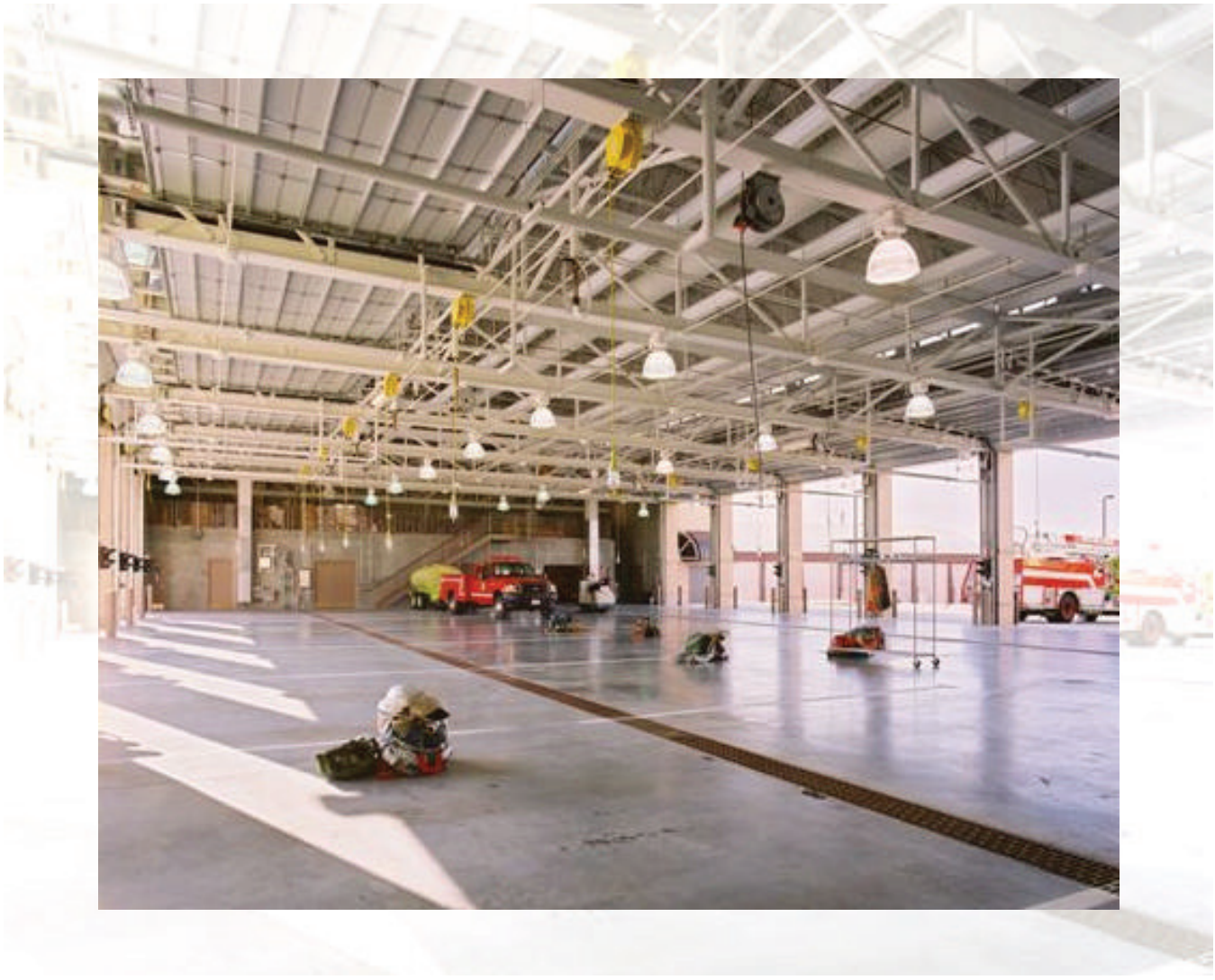
Signs shall be clear matte acrylic plastic with subsurface printed background color. Office identification signs shall have a clear sleeve to accept paper or plastic insert identifying tenant or tenants. With more than one door to a space, door numbers shall be alphanumeric, i.e., 11 OA, 11 OB, 11 OC. Restroom door signs shall be MEN and WOMEN graphic symbols, centered and mounted on the door with the top edge at five feet six inches above finished floor.

Height and location of signs shall be in accordance with AFPAM 32-1097 unless otherwise specified. Signs shall be mounted using either vinyl tape or adhesive as recommended by the manufacturer for the specific application. Adhesive shall cover the entire back surface of the sign panel. Signs shall be mounted in place after all other interior work in the immediate vicinity has been completed.

6.2.1 Approved Sign Types

Refer to Department of the Air Force Sign Standards, Document # AFPAM 32-1097, for a full description and specifications of interior sign types.

Applicable Standards: Offutt Base Signage and Parking Standards (Offutt AFBI 32-200); Air Force Sign Standard (UFC 3-120-01)



[Section 7] Engineering Standards

7.1 UNDERGROUND PLUMBING

7.1.1 Current Conditions

The soil at Offutt AFB is underlain with well drained soils of sand and silty clay from the surface down to 10-feet below grade, and will vary depending on season.

7.1.2 General Recommendations

Water piping shall be designed for a maximum velocity of 3 fps, or manufacturer's recommendation, whichever is less. Plastic piping shall be pressure pipe capable of withstanding 165 psi. Trenching, backfilling (in lifts), and pipe installation shall be done according to manufacturer's recommendations. Underground pipes shall be installed such that the depth, at finished grade level, is at a minimum of 5-feet.

Fire hydrants shall be painted tan with color-coded caps in accordance with industry standards to delineate high and low pressures. All hydrants shall have a number affixed per base standard. Coordinate the number for new hydrants with the base civil engineer. One system that complies with the base standard can be found at:
www.gradelok.com/hydratags/html.

No pressure piping shall be allowed under slabs unless it is in a crawl space or pipe chase except for the service entrance. The service entrance shall be perpendicular to the slab edge and not extend more than 5-feet under the slab.

Sewer lines shall be installed according to manufacturer's recommendations with not less than a 2.5 fps hydraulic velocity flow. Sewer mains from buildings shall have a minimum diameter of 4- inches.

Sewer manholes shall be precast reinforced concrete manhole sections with two exterior coats of heavyduty bitumen. Manholes shall conform to ASTM C4 78- 72. Position manholes at all changes in direction greater then 45 degrees and a maximum of 00-feet apart.

Provide reduced pressure backflow preventers at the service entrance. The mechanical make-up water system shall have a separate air gap type (10-gallon tank and float with pressure actuated gear driven pumps) backflow prevention device.

Gas lines shall have a maximum working pressure of 60 PSIG.

7.1.3 Approved Materials/Treatments

Supply Piping shall be copper or nonmetallic such as Polybutylene (PB), Chlorinated Polyvinyl Chloride (CPVC), or Polyvinyl Chloride (PVC).

Waste, vent, and drainage piping shall be cast iron or nonmetallic, such as Acrylonitrile -Butadiene- Styrene (ABS), Polyvinyl Chloride (PVC), Polypropylene (PP), or Filament-wound Reinforced Thermo-setting Resin (RTRP).

Gas piping shall be coated steel pipe with appropriate cathodic protection sized for the pipe and soil conditions in the area, or nonmetallic, such as Polyethylene.

7.2 ABOVEGROUND PLUMBING

7.2.1 Current Conditions

Conditions within buildings generally conform to industry standards, with piping run at right angles to the structure and insulated. Waste piping under slabs exits buildings by the most direct route.

7.2.2 General Recommendations

In buildings normally occupied by more than 15 persons, provide separate toilet rooms for each sex; position them together and use a common wall for a plumbing chase. In buildings normally occupied by 1 to 15 employees, a single toilet to serve both sexes may be provided. In Zones 1, 4, and 6, furnish one water closet, one lavatory, and a room door that can be locked from inside.

Water, electric, and gas meters are required in all new construction or major facility renovations that require utility upgrades. Only one set of meters is required per facility regardless of the different users, unless specified by the Base Civil Engineer Squadron office.

7.2.3 Approved Materials/Treatments

Supply piping shall be as follows:

Water supply piping shall be copper, PVC or CPVC suitable for water above 180 degrees F.

Compressed Air piping shall be black steel with malleable iron fittings.

Waste, vent, and drainage piping shall be cast iron, PVC or CPVC.

7.3 PLUMBING FIXTURES

7.3.1 Current Conditions

The plumbing fixtures presently installed at Offutt AFB have been selected based on Federal Specification WW-P-541.

7.3.2 General Recommendations

Energy conservation washer-less fixtures shall consist of all metal construction, with no chromeplated plastic. Water-conserving techniques which shall be considered include: 1 gpm flow restrictors for faucets, ½ gallon per flush or waterless urinals, 3 gpm low-flow shower heads, single control mixing type faucets, low-volume (3 gallons or less) flush water closets, and self-closing faucet valves. Showers shall have valves with a pressure balance feature. Use freezeless wall hydrants. Provide interior wall access (self draining) with hose attached. Wall mounted drinking fountains are preferred.

The Offutt AFB public health offices prior to design completion must approve plumbing layouts and fixtures for food service facilities. Coordinate this effort through the civil engineering project manager for each project.

All applications of plumbing fixtures shall incorporate features for handicapped use as directed by Air Force Guidelines.

Flush valves on water closets and urinals shall be automatic flush with hardwired power rather than battery wherever practical.

Engineering Standards SECTION 7.0

The following table suggests plumbing fixture types for the eight zones. See the Architectural Standards for zone definitions and the notes below the table for fixture types.

FIXTURE	Zones 1 & 6	Zones 2, 3 &4	Zones 6, 7 & 8
Water Closets	(1), (2)	(1), (2)	(3)
Lavatories	(4)	(4)	(5)
Urinals	(7)	(7)	
Sinks (Kitchen)		(8)	(8)
Sinks (Service)	(9)	(9)	
Sinks (Food Service)	(10)	(10)	
Sinks (Accessible)	(6)	(6)	(6)
Water Coolers	(11)	(11)	
Showers	(12)	(12)	(12)
Bath Tubs		(13)	(13)

Notes:

(1) Water closets shall be Flushometer valve, siphon-jet type, with elongated bowl, top supply stub, floor or wall mounted. Seats shall be plastic, elongated, open front.

(2) Handicapped accessible water closets shall have the top rim of bowl 18-inches above the floor. They shall be Flushometer valve, siphon-jet type, with elongated bowl, top supply stub, floor or wall mounted. Seats shall be plastic, elongated, open front.

(3) Water closets for residential use shall be the siphon-jet type with elongated bowls, flush tank, floor mounted. Seat shall be plastic, elongated, open front with seat cover.

(4) Lavatories shall be enameled cast iron or vitreous china. Faucets as required.

(5) Lavatories for residential use shall be enameled cast iron or vitreous china counter top. Faucets as required.

(6) Wheelchair-accessible sinks shall be vitreous china, 20- inches by 27- inches deep.

(7) Urinals shall be wall hung, siphon-jet, or washout type with flushometer valve. Waterless urinals can be used if approved by base architect.

(8) Kitchen sinks shall be single or double bowl, ledge back with holes for faucet and spout. Enameled cast iron, porcelain enameled steel or stainless steel. Faucets as required.

(9) Service sinks shall be enameled cast iron. Trap standard, wall mounted or floor mounted. Faucets as required.

(10) Food service sinks shall be stainless steel with drain board. Faucets as required.

(11) Water coolers shall be self-contained. Exposed surfaces shall be stainless steel. Acceptable types include: wall mounted surface, wall mounted semi-recessed, wall mounted recessed, handicapped-accessible and freestanding.

(12) Showers shall be wall mounted for stall or bathtub. Valves as required.

(13) Bathtubs shall be straight front recessed. Acceptable types include: enameled cast iron or porcelain enameled, formed steel, plastic without wall, and plastic with high wall.

7.4 HEATING

7.4.1 Current Conditions

Currently, heating on the base is accomplished with gas fired furnaces, gas fired boilers, electric heat pump systems, and geothermal heat pump systems, both gas and electric. The transfer medium is either hot air or hot water. There is equipment outside or on some buildings, which does not enhance the appearance of the structure. Roof top equipment is strongly discouraged and placement requires the approval of both the Base Civil Engineer and Architect.

7.4.2 General Recommendations

The use of cast iron boilers is discouraged. Provide boiler water testing sample points and chemical feeding systems on all hot water heating systems. Provide automatic pilot less ignition systems on all gas-fired equipment. Install thermostats on heating supply and return lines. Install pressure gauges with valves on suction and discharge lines to all pumps. Install gas pressure gauges with valves on all gas trains on boilers. Individual metering is desired for monitoring energy consumption.

Controls shall be Staefa, Barber Coleman or Honeywell. New facilities and modifications to existing facilities shall be compatible with the existing EMCS system. Temperature controls will be used to the fullest extent consistent with economy of operation, and shall be protected against unauthorized adjustment or tampering (i.e. with locking covers). Heating systems shall be provided with a control for positive cutoff above 65°F outside temperature.

The single most important consideration in designing new systems is access to equipment for service. Consider the removal or servicing of oils, filters, valves, pumps and tubes when designing mechanical systems.

VAV Systems shall be considered when the project warrants.

Sloped roofs shall not have any equipment located on them. All equipment located closer than ten feet from the edge of a flat roof shall have a safety railing. Access for maintenance, repair, and replacement shall be provided for all equipment mounted on roof. Equipment shall be screened from view. Equipment located on the ground shall be screened from view.

Where humidification is required (except in housing), steam humidifiers shall be used.

Solar heating systems shall be considered when the base has indicated that budget conditions are favorable to solar design.

Design conditions are as follows:

Latitude:	41° 07’
Longitude:	95° 55’
Elevation:	1048-feet
Winter Design @ 97.5%:	
-3°F outside	70°F inside
Heating Degree Days:	6213

Fuels available for use include gas for furnaces and boilers, electric for heat pumps, and solar if the scope will allow.

7.4.3 Equipment

Equipment selection should provide the most energy efficient combination.

The following equipment types may be used in the following zones:
Type 1 : Steel water tube or fire tube boilers.
Type 2: Shell and tube type or plate type heat exchangers.
Type 3: Air-to-air, water-to-air or geothermal closed loop heat pumps.
Type 4: Centrifugal base mounted inline horizontal or vertical circulating pumps.
Type 5: Horizontal or vertical unit heaters.
Type 6: Blow-through or draw-through packaged type air handling units.
Type 7: Horizontal, vertical or through wall fan coil units.

Type 8: Gas-fired radiant heaters.

Applicable zones:
Zone 1 & 6: Equipment types 1, 2, 4, 5, 6 and 8 may be used.
Zones 2, 3, & 4: Equipment types 1, 2, 3, 4, 6 and 7 may be used.
Zones 5, 7, & 8: Equipment types 1, 3, 4, 7 and 9 may be used.

7.5 AIR CONDITIONING

7.5.1 Current Conditions

Mechanical refrigeration is used for living quarters, office buildings, dining halls and clubs, hospitals and clinics, and shop areas where equipment requires a controlled environment. There is no central district heating or cooling system on base; however, there are a few isolated central systems.

7.5.2 General Recommendations

The use of cooling towers should be avoided. Evaporative coolers shall be installed two to three feet above grade, but not on roofs. All condensing units shall be air-cooled. Select air-cooled condensers based on 95°F ambient. Central mechanical systems shall be provided unless an engineering cost analysis indicates sub-systems to be more economical. Ground mounted mechanical equipment shall be screened from public view. All ground-mounted equipment shall be painted in conformance with base standards. Do not locate outdoor equipment near main building entrances.

Controls shall be Staefa or Barber Coleman or Honeywell. New facilities and modifications to existing facilities shall be compatible with the existing EMCS system. Temperature controls will be used to fullest extent consistent with economy of operation.

Consider the removal or servicing of oils, filters, valves, pumps and tubes when designing mechanical systems.

See previous section for prohibitions for mounting equipment on the roof.

Design conditions are as follows:

Latitude:	41° 07’
Longitude:	95° 55’
Elevation:	1048-feet

Summer Design:
91°F DB 77°F WB Outside 78°F DB,
50% RH Inside
Mean Daily Range 22°F.

Mechanical refrigeration shall be fueled by electricity.

7.5A Integrated service courtyard—with screen wall—remotely located to occupied portion of facility

7.5.3 Equipment

The following equipment types shall be allowed in the following zones. Regardless of zone, equipment used shall be suitable for the application.

Type 1: Packaged air-cooled type chillers (for use on small systems only).
Type 2: Air-to-air, water-to-air or geothermal closed loop heat pumps.
Type 3: Centrifugal base mounted inline horizontal or vertical circulating pumps.
Type 4: Blow-through or draw-through packaged type air handling units.
Type 5: Horizontal, vertical or through wall type fan coil units.
Applicable Equipment Types
Zone 1 & 6: Equipment types 1, 3, 4 and 5 are acceptable.
Zones 2, 3, & 4: Equipment types 1, 3, 4 and 5 are acceptable.
Zones 5, 7, & 8: Equipment type 2 is acceptable.

7.5.4 Energy

Insulate all fluid conveying piping. Insulate all ductwork carrying conditioned air through unconditioned spaces. Recover heat from exhaust air if cost efficient.
Minimum SEER = 13.0, minimum COP - 2.5.

7.6 FIRE PROTECTION

7.6.1 Current Conditions

Most buildings on base have some type of fire protection or detection system, depending on the level of protection or detection needed and the environment in which the system operates.

7.6.2 Design Conditions

Design Conditions - All fire protection design shall be per NFPA 13, NFPA 13R, Life Safety Code and UFC 3-600-01, Fire Protection Engineering for Facilities.

7.6.3 General Recommendations

All buildings shall be equipped with an antenna to provide interface with the base fire alarm system MONACO BT23. If antenna is pole mounted, poles shall be either aluminum or concrete. All cabling shall be in conduit, whether exposed or concealed.

Facilities shall be pre-wired for communications using the latest TIA/EIA communication standards. All applicable ETLs shall be followed.

Distribution - The underground piping systems shall be PVC. Above ground piping systems shall be Schedule 40 steel threaded or welded.

Alarm Systems - All buildings shall be monitored for fire signals back to the base fire stations. All buildings shall have a graphic annunciator at the main entrance.

For dormitories all areas must be sprinkled and the sprinkler system must be connected with the existing base alarm system. Dormitories shall have dual heat/ smoke detection systems in sleeping rooms, with a local room alert.

7.7 UNDERGROUND ELECTRICAL

7.7.1 Current Conditions

There are two primary substations with a total of 70 MVA nominal with 87.5 MVA FA primary voltage 13.8/7970 kV. Secondary is 480/277V or 208/120V, three phase.

Offutt's Electrical Utility has been privatized. Primary power is the responsibility of Omaha Public Power District (OPPD), the privatization contractor. Secondary electrical and building electrical systems remain the responsibility of the Base Civil Engineer Squadron.

7.7.2 General Recommendations

Underground electrical distribution shall be appropriately sized PVC duct encased in concrete. Provide one spare conduit. Use compression connectors to connect service feeders to overhead conductors. Use pad mounted disconnect switches for isolation and primary fuse protection. Indoor 15 kV shall be installed in rigid steel or threaded IMC. Conduit shall be identified with 13,800-volt insignia.

Design Conditions - The design of underground distribution systems shall be based on the calculated demand, with sufficient electrical capacity for expansion if allowed or if within the budget.

For plastic conduit encased in concrete, allowable plastic conduits include PVC, fiberglass or similar nonmetallic electrical duct.

Primary Substation - Transformers shall be rated with 13.8 kV mid-tap with taps 2 to 2-1/2% above and below rated voltage. Main Base transformers shall have automatic load tap hangers. Primary switchgear shall have vacuum breakers stacked to minimize space. Outdoor gear shall be enclosed in a weather-tight building. Relays shall be electronic and control breakers using 125 VDC trip. Metering shall be electronic and read remotely.

All facilities shall be individually metered for electrical consumption when upgrading service. Metering shall be able to be read remotely.

7.8 ABOVEGROUND ELECTRICAL

7.8.1 General Recommendations

All motors of 5 HP or larger shall have single phasing protection of the type that trips when the phase angle between the three phases is not 120°F or on an under voltage condition. All motors of 50 HP or larger shall utilize soft start type.

Site lighting - Site lighting shall continue to exhibit continuity throughout the Base.

All poles used to facilitate base wide distribution shall be either aluminum or concrete.

7.8.2 Grounding

Provide separate grounding conductors and rods for surge (lightning) arrestors and service neutrals. Provide insulated grounding conductors to all grounding type outlets.

Metallic conduit shall not constitute a safety ground. Include the following requirements in specifications: Use three-point ground test and instrumentation. Perform test in presence of the government inspector. Submit results and indicate type of test performed.

7.8.3 Transformers

Provide service transformers with delta primary and wire secondary connections for three phase services. All service transformers shall have two 2½-inch taps above and below rated voltage. Provide low impedance transformers where short circuit currents permit. Screen all exterior transformers from major circulation routes or common areas.

7.8.4 Panel Boards

Provide typed panel schedules. Provide manual bypass for all auto transfer generator panels. Provide DOC monitoring of generators critical points.

7.9 INTERIOR LIGHTING

7.9.1 General Recommendations

Provide wire guards for all open fluorescent lamps. Use energy saver 32-watt T-8 fluorescent lamps and electronic ballasts in office areas. Use high-pressure sodium lights in bay areas where color rendition is not vital. Provide seismic zone 2 protection for all fixtures, especially ceiling grid mounted fluorescent fixtures. Provide Certified Ballast Manufacturer (CBM) listed ballasts. All ballasts shall have 0.90 power factor or greater. Exit lights shall be LED.

7.9.2 Approved Products/Materials

Provide new devices and plates whenever an area is renovated. All devices shall be recessed except in mechanical rooms and utility areas. Provide devices rated at 20 amps. All wiring shall be copper. No aluminum allowed.

Automatic Controllers- Provide battery backup for lawn sprinkler system controllers and automatic setback thermostats.

Over current Protective Devices- The minimum sized over current device for branch circuits is 20 amps. Ensure proper coordination and withstand ratings for all over current protection devices. Demonstrate coordination with first upstream existing protective device. Replace old circuit breakers with new when remodeling facilities. If replacement breakers are unavailable, consider replacement of entire panel board. Main fusing is acceptable for limiting short circuit currents; however, place a box with one full set of spare fuses adjacent to main panel.

Electrical Identification- Provide plastic panel board and disconnect labels. Labels shall be laminated (black with white core) engraved with ¼-inch high letters. Attach to front exterior of enclosures. Labels shall match plan designations. Provide nonferrous phase and circuit identification labels in all enclosures for feeder circuit conductors. Provide underground marker tapes for all underground conductors. If underground conductors are not in metallic conduit, provide marker tape with foiled backing to facilitate detection.

Power Factor Correction- Add power factor (pJ.) capacitors to induction motors (10 HP or larger) to correct pJ. to 0.90 (+.05, -.00). Switch pJ. capacitors in with the motor. Size capacitor IAW IEEE 141, NEMA MG2 and motor manufacturer recommendations.

Power Service- Power requirements for buildings shall be 208/120 except 480/277 based on building function as an exception.

Electrical Related Work- Balance loads on phases within 10% at all panel boards. Conduit fault calculations to ensure proper withstand ratings for all protective devices. Ensure coordination for all protection devices, conductors, enclosures and equipment.

Raceways- Conduit run in concrete shall be PVC unless otherwise approved. Underground primary voltage feeders shall be in concrete encased conduit. All penetrations of fire resistance rated walls shall be fire stopped IAW NEC Article 300-21. Highlight compliance with NEC Articles 300-5(g) and 300-7(1) regarding moisture seals. Large harmonic generators (i.e. computers, VFD's and electronic ballasts) shall be filtered and have harmonic traps installed and use K rated transformers.

Conductors- Aluminum conductors smaller than No. 4 AWG may not be used. In mission critical facilities, housing, dormitories, and transient quarters, aluminum conductors may only be used for service entrances. The smallest branch circuit conductors acceptable are No. 12 AWG. Conductors No. 6 AWG and larger shall have heat resistant insulation.

Conduits- All new utility lines shall be run in underground conduit. Provide spare conduits from transformer to building.

Meters- Meters shall be located at the rear of buildings or near service entrances.

Lighting Protection- All new buildings shall be designed with lightning protection. Surge suppression for service entrance shall be installed on all upgraded services.

7.10 SECURITY SYSTEMS

7.10.1 General Recommendations

Provide wire guards for all open fluorescent lamps. Use energy saver 32-watt T-8 fluorescent lamps and electronic ballasts in office areas. Use high-pressure sodium lights in bay areas where color rendition is not vital. Provide seismic zone 2 protection for all fixtures, especially ceiling grid mounted fluorescent fixtures. Provide Certified Ballast Manufacturer (CBM) listed ballasts. All ballasts shall have 0.90 power factor or greater. Exit lights shall be LED.

7.10.2 Approved Products/Materials

Provide new devices and plates whenever an area is renovated. All devices shall be recessed except in mechanical rooms and utility areas. Provide devices rated at 20 amps. All wiring shall be copper. No aluminum allowed.

Automatic Controllers- Provide battery backup for lawn sprinkler system controllers and automatic setback thermostats.

Over current Protective Devices- The minimum sized over current device for branch circuits is 20 amps. Ensure proper coordination and withstand ratings for all over current protection devices. Demonstrate coordination with first upstream existing protective device. Replace old circuit breakers with new when remodeling facilities. If replacement breakers are unavailable, consider replacement of entire panel board. Main fusing is acceptable for limiting short circuit currents; however, place a box with one full set of spare fuses adjacent to main panel.

Electrical Identification- Provide plastic panel board and disconnect labels. Labels shall be laminated (black with white core) engraved with ¼-inch high letters. Attach to front exterior of enclosures. Labels shall match plan designations. Provide nonferrous phase and circuit identification labels in all enclosures for feeder circuit conductors. Provide underground marker tapes for all underground conductors. If underground conductors are not in metallic conduit, provide marker tape with foiled backing to facilitate detection. Power Factor Correction—Add power factor (pJ.) capacitors to induction motors (10 HP or larger) to correct pJ. to 0.90 (+.05, -.00). Switch pJ. capacitors in with the motor. Size capacitor IAW IEEE 141, NEMA MG2 and motor manufacturer recommendations.

Power Service- Power requirements for buildings shall be 208/120 except 480/277 based on building function as an exception.

Electrical Related Work- Balance loads on phases within 10% at all panel boards. Conduit fault calculations to ensure proper withstand ratings for all protective devices. Ensure coordination for all protection devices, conductors, enclosures and equipment.

Raceways- Conduit run in concrete shall be PVC unless otherwise approved. Underground primary voltage feeders shall be in concrete encased conduit. All penetrations of fire resistance rated walls shall be fire stopped IAW NEC Article 300.21.

Highlight compliance with NEC Articles 300-5(g) and 300-7(1) regarding moisture seals. Large harmonic generators (i.e. computers, VFD's and electronic ballasts) shall be filtered and have harmonic traps installed and use K rated transformers.

Conductors- Aluminum conductors smaller than No. 4 AWG may not be used. In mission critical facilities, housing, dormitories, and transient quarters, aluminum conductors may only be used for service entrances. The smallest branch circuit conductors acceptable are No. 12 AWG. Conductors No. 6 AWG and larger shall have heat resistant insulation.

Conduits- All new utility lines shall be run in underground conduit. Provide spare conduits from transformer to building.

Meters- Meters shall be located at the rear of buildings or near service entrances.

Lighting Protection- All new buildings shall be designed with lightning protection. Surge suppression for service entrance shall be installed on all upgraded services.

7.11 TELECOMMUNICATIONS

7.11.1 General Recommendations

This section describes telephone, pre-wiring, computer support, and other communication requirements which must be addressed in the project design.

New construction and remodeling projects should make provisions for conduit, outlets, lockable enclosures, power and building entrance. Locate telecommunication rooms near electrical equipment rooms.

Telephone Systems—Provide a ¾-inch by 4-foot by 8-foot plywood backboard in the mechanical room. Provide a 120V duplex receptacle adjacent to the board, with a #6 AWG bare copper wire from the backboard to the grounding bar in panel board. Provide conduit to exterior for telephone service drop - prefer below ground access.

Pay Phones—Ensure that electrical power is provided next to all pay phones.

Wiring and Conduit (General)—All cable and phone lines shall be pre-wired back to a central communication room within the building. Provide appropriately sized PE 39 (gel filled) 24 AWG to manholes for exterior service to the building. Service entrances for communications shall utilize two 4-inch conduits (one for communications, one for future LAN).

Pre-wired outlets shall use dual 8-pin jack served with 2-4 pair 24 AWG cable. Cable shall have a Category 5 rating. Modular jacks shall use RS 45 for data and RJ 11 for voice. Outlets shall be spaced 6-feet on center on the wall for administration spaces.

7.12 GENERATOR SITES

7.12.1 General Recommendations

General Information: This section provides guidance for facilities requiring emergency power.

These systems shall only be used as specifically required and justified by AF Regulation or Uniform Facilitie s Criteria (UFC) standards for the current building occupant or use.

New construction shall incorporate adequate space to house the generator set. If space cannot be provided, provisions for an addition on optional weatherproof enclosure shall be provided with screen wall.

Fuel system shall have 72-hour capability. The system shall use a double wall tank with sensors between to alarm if leaking. The outside tank should be an above ground concrete vault with transfer pumps and overfill protection. An alarm with light shall indicate 90% fill. It shall meet environmental requirements.

Generator set shall be sized such that minimum of 50% loading on the unit is maintained. The generator ATS shall be an isolation bypass type. The facility shall be equipped with a cannon plug connection for a portable generator of equivalent size. Generator should have sub-base tank for use as a day tank.

Monitoring of generator shall be accomplished using the existing EMCS system. Design can incorporate DDC technology. Some vendors use a FT10 communication module, which can be connected to the EMCS through a zone manager panel. Points of importance are ATS position, generator on/off, low oil pressure, high temperature, current, KWH, KW, frequency, common alarm, and fuel tank level.

[Section 8] References / Links

8.1 REFERENCES

This section contains a list of recommended references. Contractors shall refer to, but not limit their references to, the latest edition of the listed publications.

- ADAAG, Americans with Disabilities Act Architectural Guidelines
- Air Force Regulation 91-38
- AFH 32-1084 Facility Requirements Handbook
- AFI 31-101, Volume I, Air Force Physical Security Program
- AFI 31-209 USAF Resources Protection Program
- AFI 31-210 Air Force Antiterrorism Program
- AFI 32-1010, Land Use Planning, 1 November 1998
- AFI 32-7062, Air Force Comprehensive Planning, 1 October 1997
- AFMAN 32-1071, Vol. 1 force protection requirements for glazing
- AFPM 32-1097, Sign Standards Pamphlet, 1 November 1997
- AFOSH 9166, General Industrial Operations
- Americans with Disabilities Act (ADA)
- Americans with Disabilities Act Accessibility Guidelines (ADAAG)
- ANSI/TIA/EIA-568-B and All Addenda, Commercial Building Telecommunications Cabling Standard, 2001 (includes System Testing Requirements)
- ANSI/TIA/EIA-569-A, Commercial Building Standard for Telecommunications Pathways and Spaces
- ANSI/TIA/EIA-598-A, Optical Fiber Cable Color Coding
- ANSI/TIA/EIA-606, Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
- ANSI/TIA/EIA-607, Commercial Building Grounding and Bonding Requirements for Telecommunications
- ASTM—American Society for Testing and Materials—E648—Naval Publications and Forms Center, 5801 Tabor Ave, Philadelphia, PA 19120
- DoE 435 (Energy conservation performance standard)
- ETL 93-1, Construction Signs, 11 March 1993
- ETL 94-3, Air Force Carpet Standards
- ETL 86-8, 86-9, 90-6, 90-9, 91-1, 91-4, 91-5, 93-4, 96-1, 99-12, 00-7, and 01-2
- Emerald Book for Equipment Grounding, NFPA-70/NEC, National Electric Code
- HQ AFCEE Carpet Selection Handbook
- Manual on Uniform Traffic Control Devices (MUTCD by Federal Highway Administration)
- MIL-HDBK-1008B Fire Protection for Facilities, Engineering, Design, and Construction
- Military Traffic Management Command, Traffic Engineering 7 Highway Safety Bulletin, Traffic Engineering for Better Gates; August 2001
- NFPA 13 Sprinkler Systems
- NFPA 17A Standard for Wet Chemical Extinguishing Systems
- NFPA 70 National Electrical Code
- NFPA 72 Standard for Fire Protection Signaling Systems
- NFPA 72E Automatic Fire Detectors
- NFPA 80 Fire Doors and Windows
- NFPA 96 Standard for Installation of Equipment for the Removal of Smoke and Grease Laden Vapors
- NFPA 101 The Life Safety Code
- NFPA 403 Standard for Aircraft Rescue and Fire Fighting Services at Airports
- NFPA 1500 Standard for Fire Department Occupational Safety and Health Program
- NFPA 409 Aircraft Hangars
- NFPA 410 Aircraft Maintenance
- Plant Installation Safety Guide, NESC (ANSI/IEEEC-2), National Electric Safety Code
- International Organization for Standardization (ISO)
- International Conference of Building Officials
- National Standard Plumbing Code, latest edition
- UFC 3-120-01 Air Force Sign Standard, 6 February 2003
- UFC (Unified Facilities criteria) 4-010-01, DoD Minimum Antiterrorism Standards for Buildings, latest edition
- UFC 4-010-02, DoD Minimum Antiterrorism Standoff Distances for Buildings, 08 October 2003
- A Manual of Recommended Practice, latest edition, American Conference of Governmental industrial Hygienists
- Department of Energy Standards Part 435, Energy Conservation Voluntary Performance Standards for New Buildings
- Development and Maintenance of Traffic Control Device Inventories for DOD Installations

8.2 RECOMMENDED WEB SITES

Factory Mutual Global (FM)
(http://www.fmglobal.com)

International Conference of Building Officials, publishers of the Uniform Building Code (UBC)
(http//:www.icbo.org)

National Fire Protection Association (NFPA)
(http://www.nfpa.org)

National Institute of Building Sciences (NIBS), producers of the "Construction Criteria Base" (CCB)
(http://www.nibs.org):
(http://www.ccb.org/html/home.html)

Occupational Safety & Health Administration
(OSHA) (http://www.osha.gov/comp-links.hlml)

Society of Fire Protection Engineers, Inc. (SFPE)
(http://www.sfpe.org)

Underwriters Laboratories, Inc. (UL)
(http://www.ul.com/welcome.html)

Unified Facilities Criteria (UFC) and Unified Criteria Guide Specifications (UFGS)
(http://www.dsp.dla.mil)

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