Marine Corps Base Guam

Installation Appearance Plan

April 2011

Slingstones

The image on the internal pages of this document is of the slingstone used in combat by ancient Chamorro warriors. The stones were fashioned from limestone, basalt, or fire-hardened clay and were slung from slings of made of pandanus or coconut fiber. Today, the slingstone shape is part of the design of the official Guam flag and is a cultural icon widely used in tattoo and clothing designs.

Source: guampedia.com

Marine Corps Base Guam

Installation Appearance Plan

April 2011

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LIST OF ACRONYMS

A	Accent
ADA	Americans with Disabilities Act
ABA	Architectural Barriers Act
AFB	Air Force Base
ASCE	American Society of Civil Engineers
A/T	Administrative/Training
AT/FP	Anti-Terrorism/Force Protection
B	Body
BEQ	Bachelor Enlisted Quarters
BIPV	Building Integrated Photovoltaics
BMPs	Best Management Practices
BOQ	Bachelor Officer Quarters
BQ	Bachelor Quarters
CMU	Concrete Masonry Unit
COTR	Contracting Officer's Technical Representative
CS	Community Support
DoD	Department of Defense
DRB	Design Review Board
ECF	Entry Control Facilities
EIFS	Exterior Insulated Finish System
EFS	Exterior Finish Systems
FACD	Functional Analysis Concept Development
FHWA	Federal Highway Administration
FT	Feet
GFRC	Glass Fiber Reinforced Concrete
GOV.	Government
HQ	Headquarters
HVAC	Heating, Ventilation, and Air Conditioning
IAP	Installation Appearance Plan
IBC	International Building Code
IDE	Intrusion Detection Equipment
IND	Industrial
K	Base or Kicker
LED	Light Emitting Diode
LEED	Leadership in Energy and Environmental Design
LID	Low Impact Development
M	Meter
MCAS	Marine Corps Air Station
MCO	Military Corps Order
MEF	Marine Expeditionary Force
MIL-HDBK	Military Handbook
MIN.	Minimum
MM	Millimeter
MPH	Miles Per Hour
MPI	Master Painter's Institute
MUTCD	Manual on Uniform Traffic Control Devices
MWR	Morale, Welfare & Recreation
NAVFAC	Naval Facilities Engineering Command
NCO	Non-Commissioned Officer
NCTS	Naval Computer and Telecommunications Station
NEPA	National Environmental Policy Act
PIER	Pacific Island Ecosystems at Risk
POV	Privately Owned Vehicle
PPV	Public Private Venture
PV	Photovoltaics
QOL	Quality of Life
R	Roof
SF	Square Feet
SHSM	Standard Highway Signs and Markings
SRI	Solar Reflectance Index
T	Trim
T/A	Trim/Accent
UFC	Unified Facility Criteria
USMC	United States Marine Corps
UV	Ultraviolet

Executive Summary

Installation appearance is an important element in providing the highest quality working and living environment for Marine Corps Base Guam personnel. Quality base appearance sends a strong positive message and demonstrates pride and professionalism to all personnel residing at or visiting the installation.

This Marine Corps Base Guam Installation Appearance Plan (IAP) provides guidance tailored to the installation. The IAP is comprised of an introductory discussion of IAP format, highlighted themes, study area, IAP Functional Districts, and IAP goals. The introduction is followed by two main sections, the Design Guides and Implementation.

DESIGN GUIDES

Design Guides provide recommendations for new projects, renovations, and maintenance to ensure a cohesive look throughout the installation, and are required to be used by personnel and contractors.

Design Guides establish standards through the following chapters:

- Chapter 2 Site Design
- Chapter 3 Architecture
- Chapter 4 Building Color
- Chapter 5 Landscape Architecture
- Chapter 6 Signage

IMPLEMENTATION

Chapter 7 Implementation presents guidelines for implementation. As all projects are subject to applicable Design Guides, a structured review process with a qualified IAP Design Review Board is recommended. This process is important to improving and maintaining installation appearance and quality.

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The Purpose of Installation Appearance Plans *(Navy Installation Appearance Guideline, 2006):*

...to provide aesthetic and functional direction for new development and renovation efforts & to help to protect & preserve the Installation's natural & historic resources

Well-designed and attractive facilities, timely and economical construction, and clean and organized installations all contribute to military pride and excellence. This is the aim of coordinated efforts to provide high quality working and living environments to meet military mission and goals.

The Marine Corps Base Guam Installation Appearance Plan (IAP) guides the ongoing efforts to improve the appearance and function of the installation through good planning and design practices. These guidelines provide clear direction with flexibility to allow for creativity and innovation.

This chapter discusses the following:

- Goal of the IAP
- IAP Format
- Key Considerations
- Study Area and IAP Functional Districts
- Wayfinding

GOAL OF THE IAP

The overall goal of the IAP is to guide the development of Marine Corps Base Guam into an attractive and cohesive installation with distinct functional districts.

Development of the IAP is guided by the following objectives:

- Define the overall character of Marine Corps Base Guam
- Create an identity that expresses Marine Corps values and local culture
- Implement sustainability measures and best management practices
- Highlight the characteristics of the different functional districts

U.S. Marine Corps Captains Paul O'Neal and Milton Thompson plant the American flag during the liberation of Guam from Japanese occupation in July of 1944

IAP FORMAT

The Marine Corps Base Guam IAP consists of two distinct sections: Design Guides and Implementation.

Design Guides

Design Guides provide overarching guidance for the following elements:

- Chapter 2 Site Design
- Chapter 3 Architecture
- Chapter 4 Exterior Building Color
- Chapter 5 Landscape Architecture
- Chapter 6 Signage

The Design Guides shall be utilized by all personnel involved in the development and execution of projects for Marine Corps Base Guam, including government personnel, design professionals, and construction administrators. Dissemination of the IAP to these and other entities shall occur at regular intervals and at the start of each project.

For ease of reference, resources for each of the above design topics are listed near the start of each chapter. All references to design criteria, military handbooks, standards, codes, guidelines, etc. shall be the latest edition unless indicated otherwise.

Implementation

The Implementation section (Chapter 7) outlines the considerations for the development of a design review process including the establishment of the Design Review Board (DRB). The purpose of the DRB is to review all projects at Marine Corps Base Guam to ensure that they meet the intent of the IAP.

The DRB will provide continuity and vision in implementing the installation appearance standards. The DRB members should include architects, landscape architects, planners, color experts, and construction administrators. The establishment of a coordinated review process is key in achieving the goals of the IAP.

The Implementation section also provides two design concepts that illustrate the application of the design guidelines to typical areas of the installation. These projects are provided to graphically illustrate for designers how different elements and principles of the guidelines may be applied to achieve the intended results of the IAP.

KEY CONSIDERATIONS

In each of the design guide chapters, key considerations for sustainability, security and force protection, and best management practices (BMPs) have been included where applicable to supplement the guidelines. These considerations have been highlighted in call out boxes for easy reference.

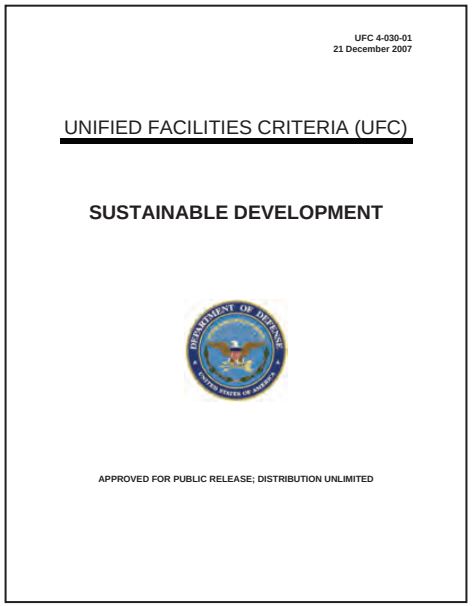
The following describes these key considerations:

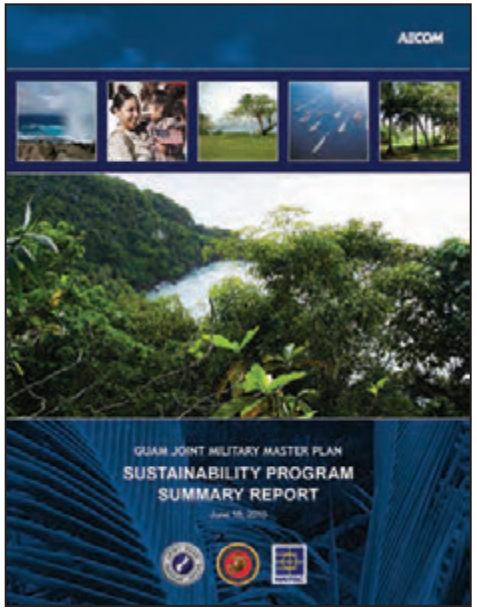
Sustainability

From a military perspective, "sustainability" is the capacity to continue the mission without compromise. It is the ability to operate into the future without decline – either in the mission or the natural and man-made systems that support it. Department of Defense (DoD) Sustainable Development Unified Facilities Criteria (UFC) 4-030-01 references a number of sustainability requirements for new facility projects.

In general, sustainable design measures should be implemented where applicable to help protect the environment, reduce facility life cycle costs, and improve quality of living and working conditions. As new technologies are developed, they should be implemented in accordance with the intent of the IAP guidance for the sustainable strategy considered.

The Guam Joint Military Plan Sustainability Program Option E (June 2010) addresses multiple elements of sustainability specific to Marine Corps Base Guam including water, energy, green building, transportation and ecosystem services. Relevant concepts have been integrated into the IAP. The sustainability program may be modified over time and designers must check to make sure they also meet its requirements.





Security/Anti-Terrorism/Force Protection

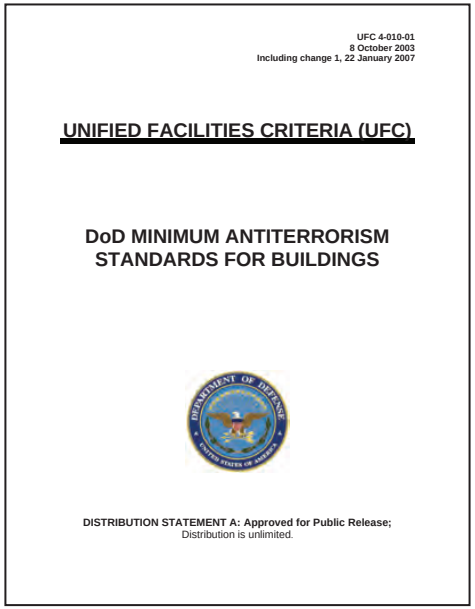
The IAP guidelines have been developed in context of meeting operational, security, and Anti-Terrorism/Force Protection (AT/FP) requirements.

Specific standards are outlined in DoD Minimum Antiterrorism Standards for Buildings (UFC-4-010-01), DoD Minimum Antiterrorism Standoff Distances for Buildings (UFC-4-010-02), and Military Handbook Design Guidelines for Security Fencing, Gates, Barriers, and Guard Facilities (MIL-HDBK-1013/10). Also, the Comprehensive Study to Reduce Stand-Off Distances for New Facilities in Guam and Commonwealth of the Northern Mariana Islands will address specific building conditions and related setbacks.

AT/FP requirements, as defined in these documents themselves provide opportunities for installation appearance improvements. For example, building setbacks provide areas for adding appropriate features that meet AT/FP requirements and installation appearance goals.

Best Management Practices

BMPs highlight noteworthy and proven design industry standards and construction practices that relate to the design guidelines. These include routine performance and maintenance standards, code and technical information, and design and construction methods that minimize lifecycle costs and ensure compliance with standard practices while achieving installation appearance and sustainability goals.



UFC 4-010-01
8 October 2003
Including change 1, 22 January 2007

UNIFIED FACILITIES CRITERIA (UFC)

DoD MINIMUM ANTITERRORISM STANDARDS FOR BUILDINGS

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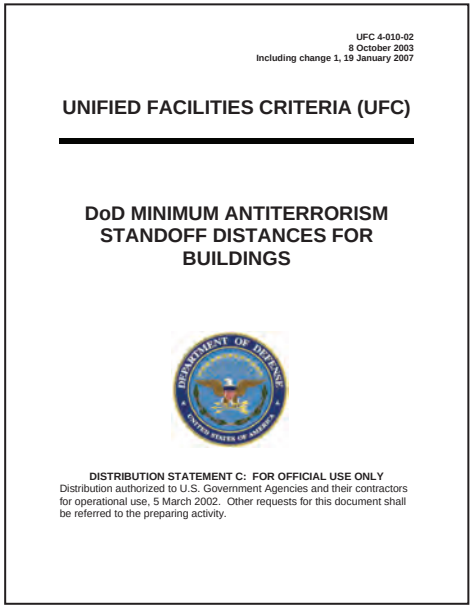

UFC 4-010-02
8 October 2003
Including change 1, 19 January 2007

UNIFIED FACILITIES CRITERIA (UFC)

DoD MINIMUM ANTITERRORISM STANDOFF DISTANCES FOR BUILDINGS

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STUDY AREA AND IAP FUNCTIONAL DISTRICTS

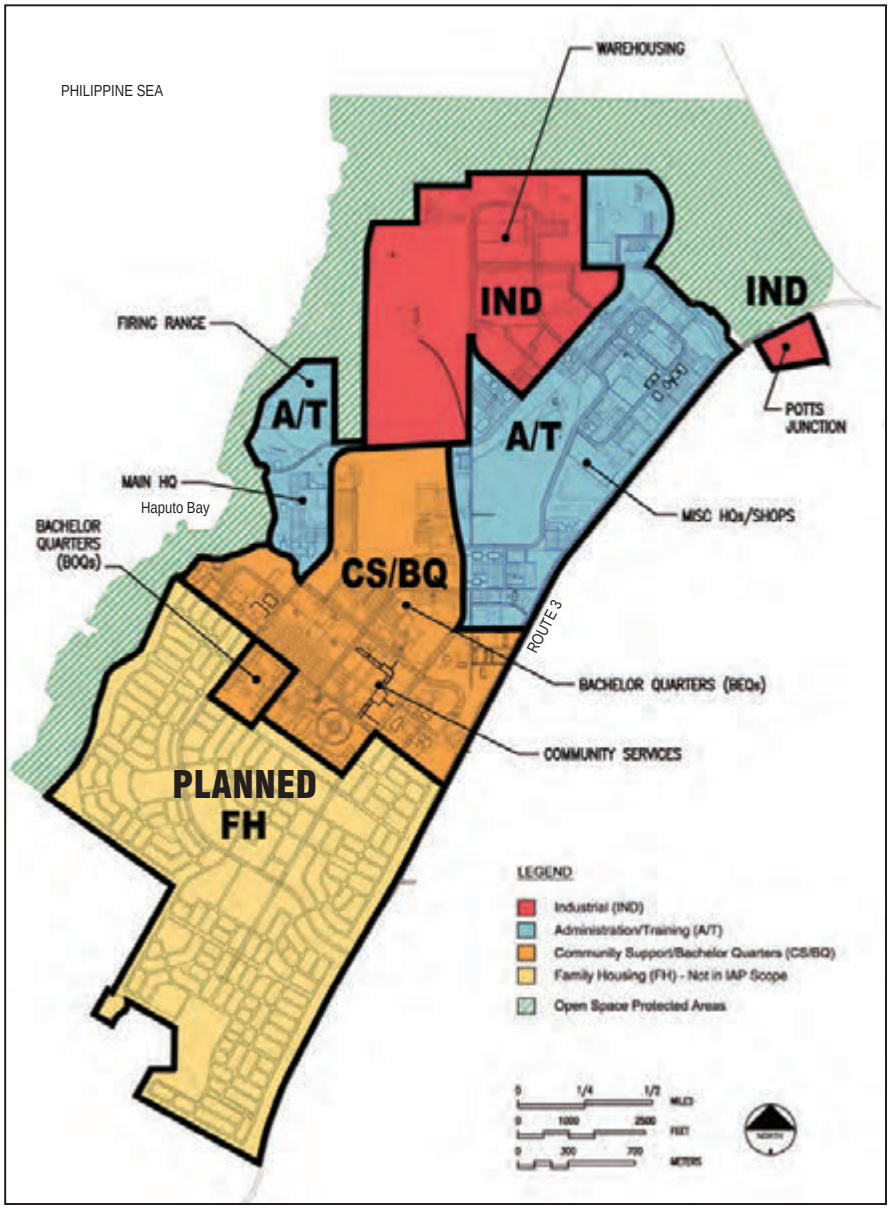
The IAP applies to all areas of Marine Corps Base Guam with the exception of family housing areas, which will be covered under subsequent guidance for the Public Private Venture (PPV) responsible for the development and operation of family housing.

IAP Functional Districts characterize areas of the installation by their primary use. Where there are multiple functions in an area, the dominant function is used to assign the Functional District.

IAP Functional Districts at Marine Corps Base Guam are:

- Community Support (includes Bachelor Housing)
- Administrative/Training
- Industrial

The boundaries for each of these districts are shown on the map to the right. Each of the districts are discussed in the following sections.



Source: Guam Joint Military Master Plan NEPA Alternative 2, 09/08/2009

Community Support Functional District

The Community Support district consists of facilities that provide support services for Marines and their family members. This district is a focal point for support activities and includes residential units, temporary living facilities, health centers, schools, religious centers, fire and law enforcement, food and exchange services, and recreation facilities.

At Marine Corps Base Guam these facilities are centrally located and easily accessible from the Main Gate. Because of the mix of services, this functional district will tend to attract the greatest portion of the base population on a daily basis. It is important, therefore, that this district express a level of appearance that conveys a high "quality of life" for residents and visitors alike.

The Community Support District should:

- Be pedestrian friendly
- Be well-landscaped
- Be easily accessible to visitors
- Have parking close to facilities
- Incorporate buildings with varied architectural styles
- Have a "private commercial" rather than military appearance
- Have buildings with clear entries to facilitate wayfinding
- Be easy to find and navigate

Administrative/Training Functional District

The Administrative/Training district consists of facilities that support the organizational, managerial, executive, secretarial, clerical, and military skills improvement and educational functions of the installation. Considered the operational center of the base, this district consists primarily of office, education, and training facilities.

There are two separate Administrative/Training Functional Districts at Marine Corps Base Guam. The main headquarters area with the Base, Division, and III Marine Expeditionary Force (MEF) Headquarters is located on the west side of the base above Haputo Bay with a combat training area just north of the headquarters. A larger Administrative/Training area is located on the northeast side of the base and includes areas with combined headquarters and shops for the various activities as well as some Naval Computer and Telecommunications Station (NCTS) functions.

The Administrative/Training Districts should:

- Convey a campus feel that is compact and pedestrian oriented
- Distinguish headquarters buildings through landscaping
- Include green space and park areas, especially around the most important headquarters buildings
- Have prominent, detailed buildings that express authority and influence
- Have landscaped parking lots
- Encourage separation of pedestrians and vehicles
- Contain signage to allow personnel to easily find specific administrative or training facilities

Industrial Functional District

The Industrial District consists of facilities that support the industrialized functions of the installation, including manufacturing, storage, engineering, maintenance, repair, packing, shipping, and receiving. Facilities include warehouses, shops, and operational and commercial support facilities.

The Marine Corps Base Guam industrial area on the north end of the installation is the primary area for warehouses, shops, as well as the brig and kennel. It also includes an NCTS operational area.

The Industrial District should:

- Implement landscaping along primary roadways to visually screen open maintenance yards
- Implement landscaping along Route 3 to screen the off base community from noise emanating from the maintenance areas
- Undergo periodic maintenance and cleanup to present a neat and orderly appearance and positive image
- Include clean and presentable facilities that incorporate aesthetic features to enhance and improve the general look of the district instead of it appearing too sterile, hard and gray

Warehouse at Andersen AFB

WAYFINDING

Visitors and newcomers to Marine Corps Base Guam should be able to easily navigate the base and find their destination. A good system of wayfinding involves much more than accurate and clear signage; it also involves the application of site design features and elements that work together to orient people in the landscape and allow them to intuitively navigate the base.

Key features that support intuitive wayfinding on the installation include:

- **Organized land use and site layout that distinguishes live, work, & play areas**

  Users should be able to easily orient themselves on the installation by observing the unique characteristics of their surroundings. Organization of the base into physically distinct live, work, and play areas should allow users to orient themselves within and between different areas.

  The functional districts discussed earlier in this chapter represent the live, work, and play areas of the installation. Varying the facility types, building colors, and landscaping of these areas will enhance the differences in physical appearances of the districts and facilitate wayfinding between them.

  Development of the above physical elements should be consistent with the attributes associated with each of the districts as discussed earlier in this chapter and in Chapter 3 Architecture. Building colors and landscaping are discussed in Chapter 4 and Chapter 5 respectively.

- **Lines of sight, especially to landmarks**

  Lines of sight are important to help viewers orient themselves in the landscape. By providing, and maintaining, clear and direct views to interest areas, landmarks, and important facilities, users can easily orient themselves in the installation in reference to what they see. When screening parking lots in the Community Support and Administration Districts, some visual permeability should be provided to give viewers lines of sight to their destinations.

  Water towers, by virtue of their height, are visual landmarks. To the extent feasible, lines of sight to these landmarks should be maintained. However, bright colors should not be used on the towers. Instead, neutral body colors (Chapter 4 Building Color) should be used. Marine Corps base identification may also be added to the towers to aid in off-base wayfinding as appropriate.

- **Landmarks for key locations using vertical features**

  Landmarks such as static displays, memorials, plazas, and landscaped and natural features should be utilized whenever possible to orient viewers and aid wayfinding.

  Natural topography should be considered when orienting landmarks. Looking up at landmarks placed at higher elevations tends to emphasize and heighten the importance of the landmark. Looking down at landmarks from higher elevations gives viewers greater reference on the relationship of surrounding areas to the landmarks.

  Chapter 5 Landscape Architecture provides guidelines on image planting and focal point displays to help highlight or serve as landmarks. For guidance on designing activity nodes, courtyards, and plazas, see Chapter 2 Site Design and Chapter 3 Architecture.

- **Clear hierarchy of roadways and paths**

  The relative types and treatments of roadways and paths are important navigational cues that orient drivers and pedestrians to their surroundings. Landscaping treatment, including street trees and other vegetation, should be implemented to reinforce the roadway hierarchy of the installation. Similarly, important promenades and pathways connecting multiple destinations should be reinforced with landscaping, site amenities, and architectural features, such as covered walkways.

  Guidance on Roadways and Streetscapes is provided in Chapter 2 Site Design, and Chapter 5 Landscape Architecture provide guidance on street trees and planting.

- **Clear visual clues at decision points (intersections)**

  Intersections represent the typical navigation points where drivers make directional decisions. Along wide multiple lane roadways, these decisions need to occur before the intersection. Therefore, directional signage should be located adequately before the intersection to allow drivers to take in information and make lane changes if necessary.

  Gateways to districts represent another type of visual clue that allows the traveller to understand, identify, and interpret the area they are entering. Gateways, therefore, should be distinguishable in the environment. The use of image planting can help highlight gateways.

  For guidance on Image Plantings see Chapter 5 Landscape Architecture.

- **Clear entrances and gateways**

  Building entrances and gateways between districts provide visual clues for wayfinding at the building and district levels.

  Chapter 2 Site Design provides guidance on district separation, and Chapter 3 Architecture provides guidance on building entrances.

- **Wayfinding elements (e.g. information kiosks, directional signs, identification signs, etc.)**

  Military installations should not rely too heavily on directional signage for wayfinding. Directional signage should be limited to areas in advance of key intersections. Directional text should start with general locations such as family housing, base headquarters, bachelor officers' quarters (BOQ), and bachelor enlisted quarters (BEQ). Detailed information such as facility names may be included on later directional signs.

  Directional signage can be supplemented with maps provided at the main gate to orient newcomers to the base. A turn-off area after the gate can also provide an informational kiosk with an installation map to help orient first time users to the base.

  See Chapter 6 Signage for guidelines on directional signs.

The objective of site design is to relate facilities in a positive way to their site and establish clear connections between places in the installation. It involves thinking beyond individual construction projects toward a holistic design of the installation environment. Through holistic design, a positive, attractive, and sustainable installation may be developed over time.

These site design guidelines provide general parameters along with specific requirements for the design and planning of site elements in Marine Corps Base Guam. Guidelines are presented here in a hierarchy of their potential to visually impact the environment, starting with installation perimeter and entry elements, then site circulation systems, and culminating with building facilities and site appurtenances.

Site design guidance found in this chapter covers the following:

- Application of the Guidelines
- References
- Site Anti-Terrorism / Force Protection (AT/FP) and Security Considerations
- Installation Boundaries
  - Route 3 Installation Boundary
  - North and South Installation Boundaries
  - Cliff Boundary
- Gates and Entrances
- Road Circulation and Hierarchy
- Streetscapes
  - Arterial Roads
  - Collector Streets
  - Local Streets
  - Perimeter Roads
  - Roundabouts
- Pathways
  - Promenades
  - Walkways
  - Bikeways
- Activity Nodes
- Building Siting
- District Boundaries
- Plazas and Courtyards
- Parking
- Service Elements
- Utilities

APPLICATION OF THE GUIDELINES

The site design guidelines shall apply to all site design elements in Marine Corps Base Guam except for family housing. Since site design relates to other topics in this Installation Appearance Plan (IAP), designers shall coordinate the guidance of this chapter with other chapters as required to ensure an organized development of the installation.

The site design chapter provides guidance for required and desired site elements that are typically found in military installations. Designers shall consult the installation development plan to coordinate elements of these guidelines with the overall master plan. Where these guidelines provide options, designers may select the best elements allowed by these guidelines that fit the specific requirements of the project.

Where the guidelines say "may", the written instruction is permissive. Where the guidelines say "must", "shall", or "will", the written instructions are mandatory. Written approval for deviations from the guidelines must be obtained from the Installation Design Review Board (DRB). All site design elements must be approved by the DRB.

The graphic presentations in these guidelines are meant to illustrate the concepts presented and to provide suggestions for the designer's consideration. The intent of providing these suggestions is to increase communication between designers and the DRB.

Designers shall coordinate early with the DRB on site design projects to ensure consistency with the overall installation development master plan. The DRB will have the final decision on all site design and development proposals.

REFERENCES

PUBLICATIONS

- UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings
- The Comprehensive Study to Reduce Stand-Off Distances for New Facilities in Guam and Commonwealth of the Northern Mariana Islands
- UFC 4-022-01 Security Engineering: Entry Control Facilities/Access Control Points
- UFC 4-030-01 Sustainable Development
- UFC 3-210-10 and UFC 3-210-10N, DoD Low Impact Development
- UFC 3-210 01A Area Planning, Site Planning, and Design
- UFC 3-210-06A Site Planning and Design
- Comprehensive Drainage and Low Impact Development Implementation Study, Finegayan Main Cantonment Area, Guam, April 2010
- MIL-HDBK-1013/10 Military Handbook, Design Guidelines for Security Fencing, Gates, Barriers, and Guard Facilities
- Americans with Disabilities Act and Architectural Barriers Act Accessibility Guidelines
- GJMMP Sustainability Program Summary Report and Technical Appendix Program E

WEBSITES

- Whole Building Design Guide, http://www.wbdg.org/
- United States Green Building Council, http://www.usgbc.org/

SITE ANTI-TERRORISM AND FORCE PROTECTION AND SECURITY CONSIDERATIONS

Buildings and sites must meet Anti-Terrorism / Force Protection (AT/FP) and security requirements. The intent of AT/FP requirements is to minimize the likelihood of mass casualties from terrorist attacks against Department of Defense (DoD) personnel in the buildings and areas in which they live and work. Security guidelines focus on the design of physical barriers around installation perimeters and restricted areas. Site design contributes enormously to maximizing the effectiveness of AT/FP and security measures.

The primary requirements for site AT/FP and security are specified in Unified Facility Criteria (UFC) 4-010-01 and MIL-HDBK-1013/10 respectively. These IAP guidelines are not intended to be a comprehensive guide to meeting AT/FP and security requirements. Designers must consult the appropriate references when dealing with any aspect of AT/FP and security in their projects.

The following are key applications regarding AT/FP and security that apply to site design:

- Minimum standoff distances from inhabited buildings to installation perimeters, roads, parking lots, and service equipment enclosures
- Unobstructed spaces around buildings that are inhabited
- Placement of service equipment and appurtenances
- Access roads to inhabited buildings
- Parking beneath and above inhabited buildings, such as parking garages
- Unobstructed security clear zones along security fences
- Observation clearances for security surveillance along perimeter patrol roads
- Design of security fences, gates, and turnstiles
- Protection of drainage culverts and utility openings

Designers shall refer to UFC 4-010-01, MIL-HDBK-1013/10, and The Comprehensive Study to Reduce Stand-Off Distances for New Facilities in Guam and Commonwealth of the Northern Mariana Islands to provide the minimum requirements for these and other applications not specifically cited here but which are required by AT/FP and security best management practices.

INSTALLATION BOUNDARIES

Installation boundaries, including perimeter fences and entrance gates, provide the first line of defense from intrusion and help establish the initial character of the installation. Perimeter fences and entry gates provide enormous opportunities to provide a strong first impression for both the passing public and visitors. Gate areas for Marine Corps Base Guam should be given special design attention due to their high visibility as first points of entry into the installation.

The various installation boundaries are discussed in the following sections. They include Route 3 along the east, the south boundary along the family housing area, and the cliff boundary to the west *(Figure 2.1)*. It is anticipated that the north boundary will not be protected with a perimeter fence due to the large expanse of thick vegetation within the preserve area that naturally protects the boundary.

Guidance for gates and entrances include treatment recommendations for both the main gate and the commercial gate. The IAP does not specifically address the planned housing entrance gate, but the general guidelines discussed in this section may still apply to housing gates barring specific requirements for residential entrances. Designers shall coordinate with the installation planners when applying these guidelines to housing gates.

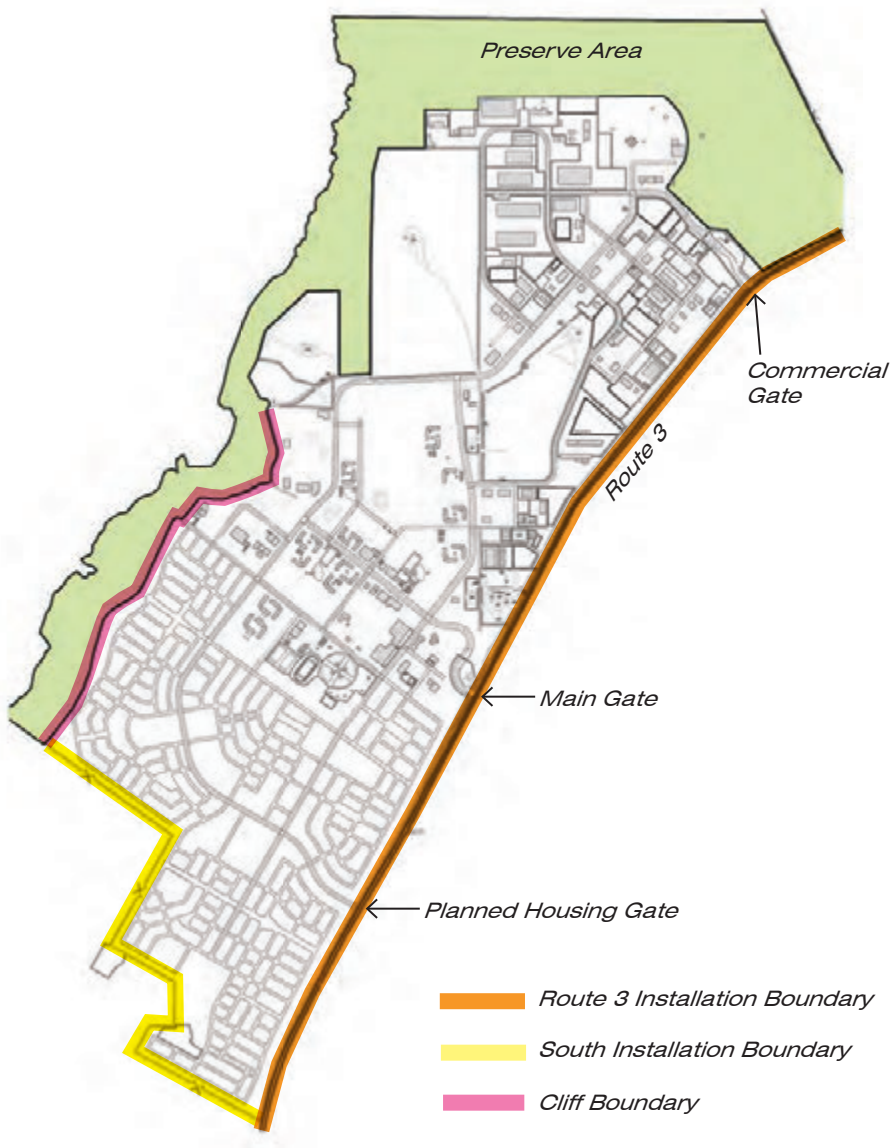


Figure 2.1 Installation Boundaries

ROUTE 3 INSTALLATION BOUNDARY

The Route 3 installation perimeter is the main physical boundary for Marine Corps Base Guam, extending approximately four miles north-south along the west side of Route 3.

Because this boundary presents the primary barrier between the installation and outside community, the visual elements of the perimeter boundary shall portray a secure and aesthetically pleasing edge.

Figure 2.2 illustrates the typical boundary section along Route 3, including setback requirements, security clear zones, and desired amenities. These basic elements shall be maintained throughout the extent of the boundary. Additional elements that improve security and landscaping, such as berms, swales, and Low Impact Development (LID) measures, may be installed where possible to enhance the overall look of the boundary.

SUSTAINABILITY/LOW IMPACT DEVELOPMENT

- Provide vegetated swales or other LID measures along the installation side of the perimeter fencing where possible to capture and control runoff

AT/FP AND SECURITY REQUIREMENTS

- Meet the clearance requirements of MIL-HDBK-1013/10
- Provide fencing that meets the requirements of MIL-HDBK-1013/10
- Provide the required standoff distance per UFC 4-101-01 from the controlled perimeter (fence) to inhabited buildings in the installation

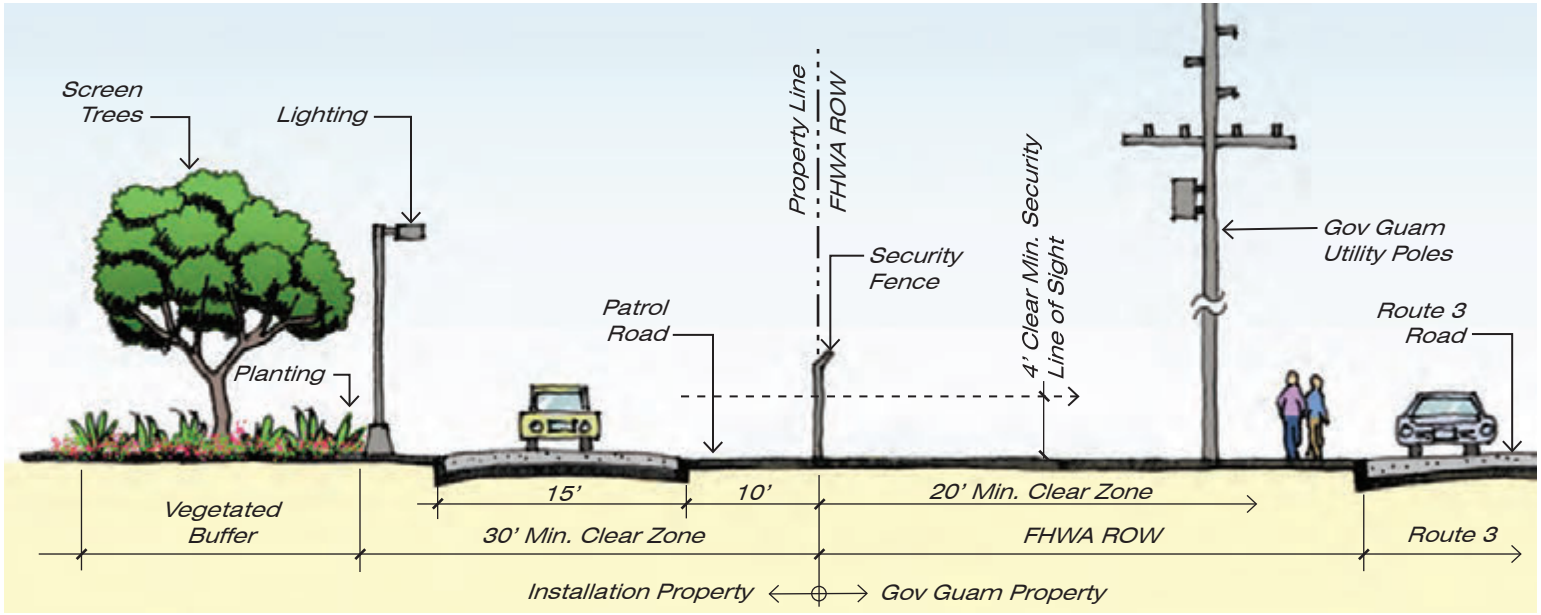


Figure 2.2 Route 3 Installation Boundary

SOUTH INSTALLATION BOUNDARY

The south installation boundary extends east-west along the south areas of the installation. The area immediately outside the south boundary consists primarily of undeveloped vegetation.

Figure 2.3 illustrates the typical south boundary section, including setback requirements, security clear zones, and desired amenities. These basic elements shall be maintained throughout the extent of the boundary. Additional elements that improve security and landscaping, such as berms, swales, and LID measures, may be installed where possible to enhance the overall look of the boundary.

SUSTAINABILITY/LOW IMPACT DEVELOPMENT

- Provide vegetated swales or other LID measures along the perimeter fencing where possible to capture and control runoff

AT/FP AND SECURITY CONSIDERATIONS

- Meet the clearance requirements of MIL-HDBK-1013/10 and UFC 4-010-01
- Provide fencing that meets the requirements of MIL-HDBK-1013/10
- Provide the required standoff distance per UFC 4-101-01 from the controlled perimeter (fence) to inhabited buildings in the installation

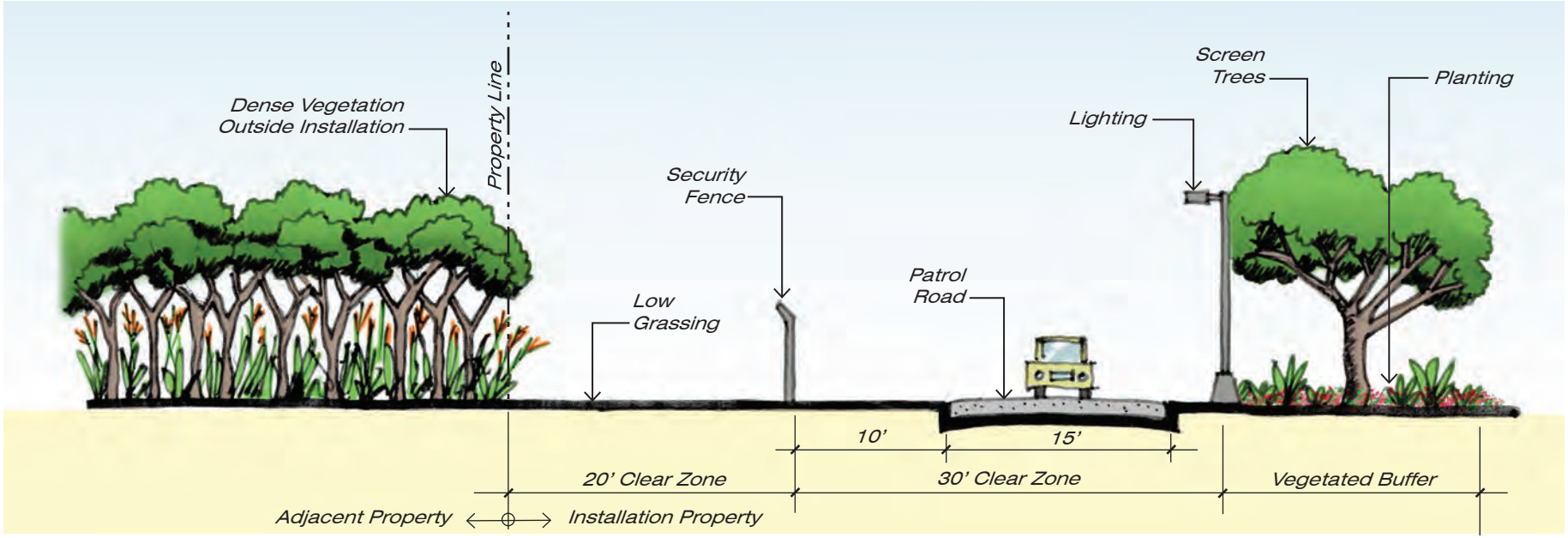


Figure 2.3 North and South Installation Boundary

CLIFF BOUNDARY

The cliff boundary is set back from the cliff line and runs approximately north-south along the west side of the installation, extending from the housing area to the training area on the north side of the command area.

Areas immediately outside the cliff boundary consist primarily of undeveloped vegetation within the open space preserve area before falling off steeply at the cliff edge.

Figure 2.4 illustrates the typical treatment along the planned Haputo and bluff edge trail roads, including clear zones and desired amenities. These basic elements shall be maintained throughout the extent of the trail roads. Additional elements that may improve the cliff edge, such as berms, swales, and LID measures, may be installed where possible to enhance the overall boundary.

SUSTAINABILITY/LOW IMPACT DEVELOPMENT

- Provide vegetated swales or other LID measures along the trail roads wherever possible to help capture and control runoff

AT/FP AND SECURITY CONSIDERATIONS

- Meet the clearance requirements of MIL-HDBK-1013/10 and UFC 4-010-01 where applicable
- Provide security fencing that meets the requirements of MIL-HDBK-1013/10 where required
- Provide decorative fencing along the highly visible portions of the boundary along the command and quality of life campus areas (see Chapter 5 Landscape Architecture, Site Amenities for general fencing requirements)

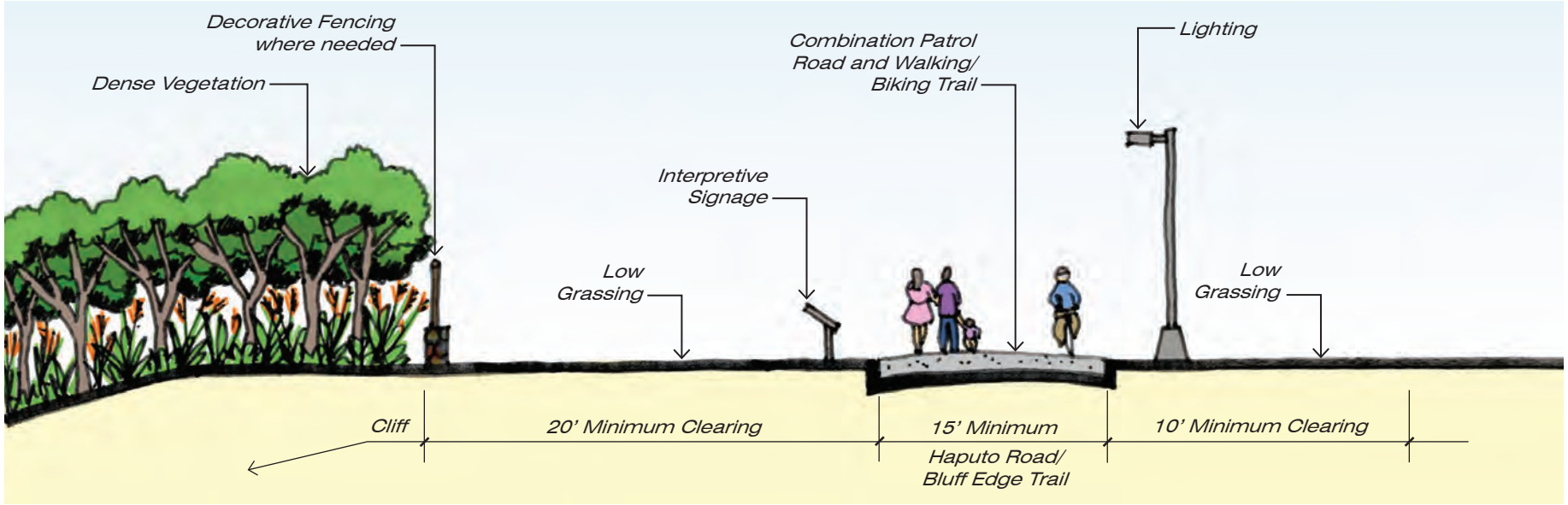


Figure 2.4 Cliff Boundary

GATES AND ENTRANCES

Gates and entrances, also known as entry control facilities (ECF) provide the proper level of access control for DoD personnel, visitors, and commercial traffic into the installation. The objective of ECFs is to guard against unauthorized access, intercept contraband, maximize traffic flow, and provide for a functional and attractive point of entry for authorized users and visitors.

Design considerations for ECFs should include security, safety, capacity, and image of the entry control elements, including overhead canopies and guard houses.

Guidelines

- Design gatehouses, sentry/guard booths, overwatch position shelters, overhead canopies, and gates to complement each other in accordance with the architectural design guidelines in Chapter 3
- Design gatehouses to be integrated with the overhead canopy architecture and locate the gatehouse on an island between traffic lanes
- Provide overhead canopies that extend the entire width of the ECF traffic lanes to provide shade and shelter for gate personnel
- Provide the base-required minimum overhead clear height at overhead canopies; clear height should not be less than 17'
- Provide static displays at appropriate locations along the ECF to showcase Marine Corps pride (see Landscape Architecture chapter)

Naval Station entrance gate example

Andersen AFB entrance gate example

SUSTAINABILITY/LOW IMPACT DEVELOPMENT

- LID strategies, such as vegetated swales at grassed areas along ECFs to capture and control runoff and provide visual relief
- Follow the sustainability guidelines in the Architecture Chapter as they apply to the design of gate houses and overhead canopies

AT/FP AND SECURITY CONSIDERATIONS

- Design approach, access control, and response and safety zones in accordance with UFC 4-022-01
- Utilize traffic calming measures, geometric road layouts, signage, and other traffic control devices to control vehicular speeds and traffic flow through the ECF
- Use a combination of passive and active vehicular barriers to channel and direct traffic flow

ROAD CIRCULATION AND HIERARCHY

Roads typically form the organizational framework for the layout of military installations. *Figure 2.5* shows the network of roads for Marine Corps Base Guam based on the primary road classifications: arterial roads, collector streets, local streets, and perimeter (security patrol) roads. These guidelines focus on non-residential roads for the installation. Throughout this IAP, the term "road" and "street" may be used synonymously to denote a thoroughfare for automobiles and other vehicles but not including residential lanes or alleys.

The following provides guidance on maintaining a coherent road circulation and hierarchy in the installation:

- Maintain the hierarchy of road types, including road widths and appurtenances, such as medians, bikeways, and sidewalks, for each street that is developed over time in accordance with the installation master development plan and transportation study for the installation
- Maintain the hierarchy of street trees and other planting materials and landscaping in accordance with the following streetscape sections and recommendations from the Landscape Architecture chapter
- Maintain the hierarchy of street elements, including lighting, signage, and street furnishings, in accordance with the following streetscape sections and approved site amenities in the Landscape Architecture chapter

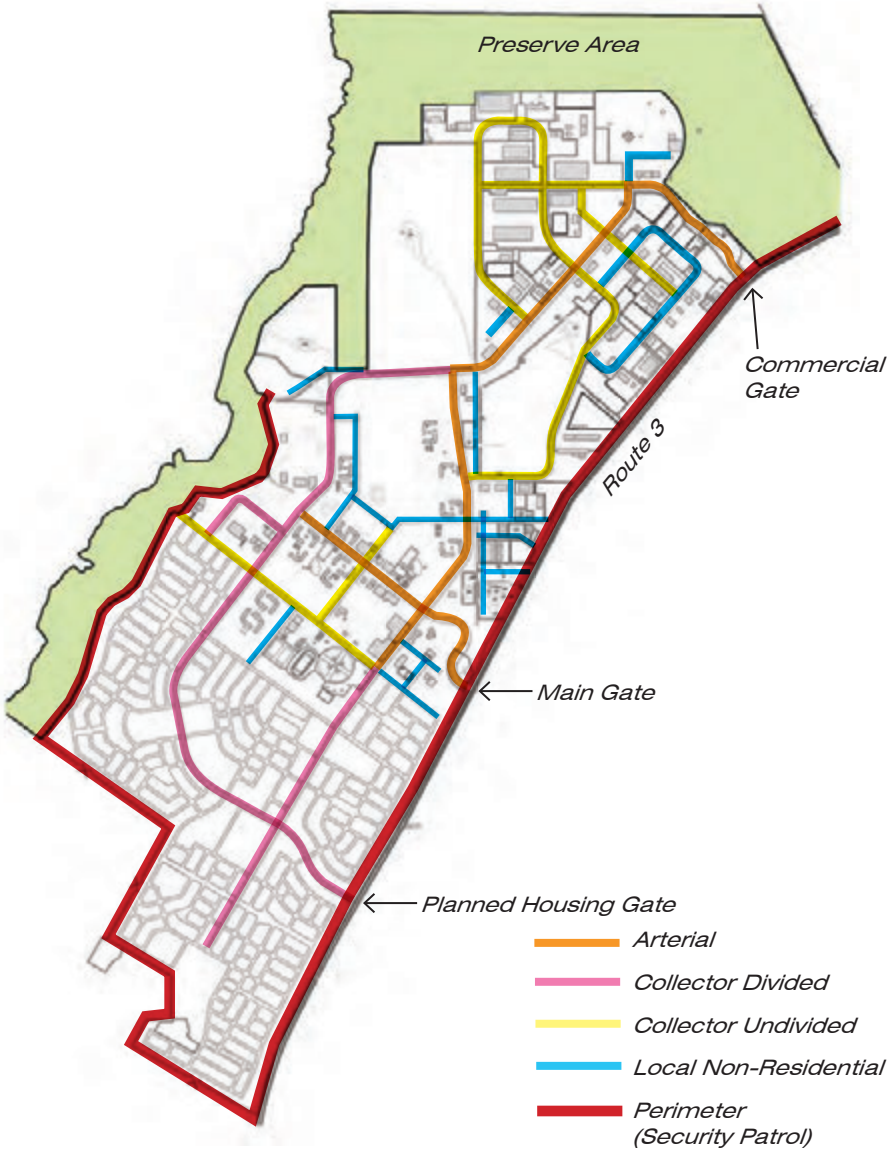


Figure 2.5 Road Circulation and Hierarchy

NOTE: Due to the ongoing development of the installation, the reader shall refer to the latest transportation plan for updates and revisions to the road circulation plan.

STREETSCAPES

A streetscape is the appearance of a street, including all the design elements that make up the street section. Streetscapes are important in that they are the most visible elements in the installation, establishing the perspective through which other site elements and facilities are viewed.

To maintain a hierarchy of roads in the installation and facilitate wayfinding, the appearance of streets should vary from one street type to the other. This generally involves varying the street elements, including road widths, sidewalks, bike lanes, street trees, planting, landscaping, median strips, light fixtures, and street furnishings. The changes could be subtle, but they should enhance the area served by the street.

The following sections discuss the streetscape elements for each of the primary road classifications in the installation. Road widths and dimensions for sidewalks, bike lanes, medians, parkways, and bus pullover areas are based on the roadway sections developed for the Marine Corps Base Guam master development plan.

Example Urban Arterial Streetscape

Example Streetscape

ARTERIAL ROADS

Arterial roads are primary or major streets designed for the highest traffic volumes in the installation. Design speed limits are 30 miles per hour (mph) and above. Arterials can have four to six lanes of traffic.

Figure 2.6 illustrates the typical arterial road streetscape for Marine Corps Base Guam, including typical dimensions, desired landscaping elements, trees placement, lighting, and street amenities. These basic elements shall be maintained along all arterial streets. Where possible, LID strategies may be incorporated into the basic street elements to enhance the overall design of the streetscape.

SUSTAINABILITY/LOW IMPACT DEVELOPMENT

- Utilize native planting for roadway landscaping
- Provide regularly spaced canopy trees for shading along sidewalks
- Utilize bioretention areas at median strips to capture and control runoff and pollution
- Utilize energy efficient light emitting diode (LED), induction, and photovoltaic street lights where possible

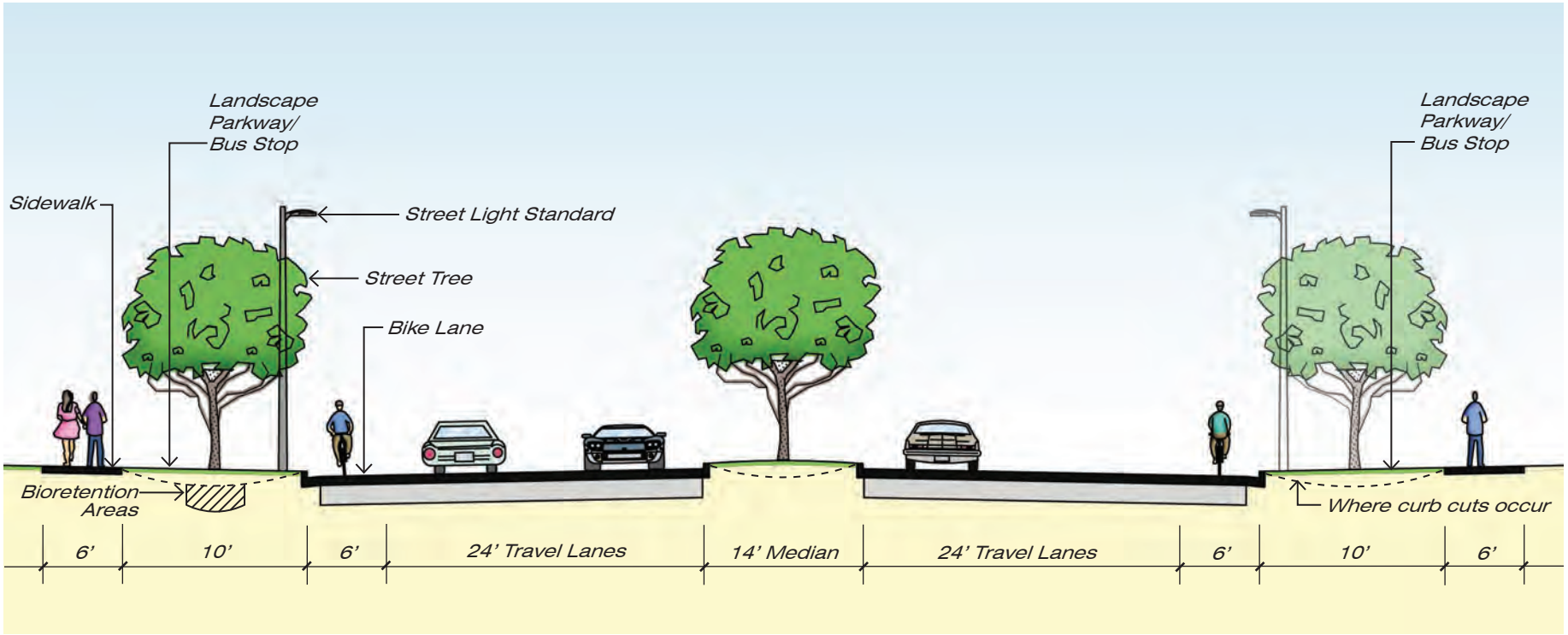


Figure 2.6 Arterial Road Streetscape

COLLECTOR STREETS – UNDIVIDED

Collector streets are secondary streets designed for moderate traffic volumes in the installation. They receive traffic from local streets and distribute them to arterial roads. Design speed limits are 25 to 40 mph. Collectors have one traffic lane for each direction of traffic.

Figure 2.7 illustrates the typical undivided collector streetscape for Marine Corps Base Guam, including typical dimensions, desired landscaping elements, trees placement, lighting, and street amenities. These basic elements shall be maintained along all undivided collector streets. Where possible, LID strategies may be incorporated into the basic street elements to enhance the overall design of the streetscape.

SUSTAINABILITY/LOW IMPACT DEVELOPMENT

- Utilize native planting for roadway landscaping
- Provide regularly spaced canopy trees for shading along sidewalks
- Utilize bioretention areas where possible to capture and control runoff and pollution
- Utilize energy efficient LED, induction, and photovoltaic street lights where possible

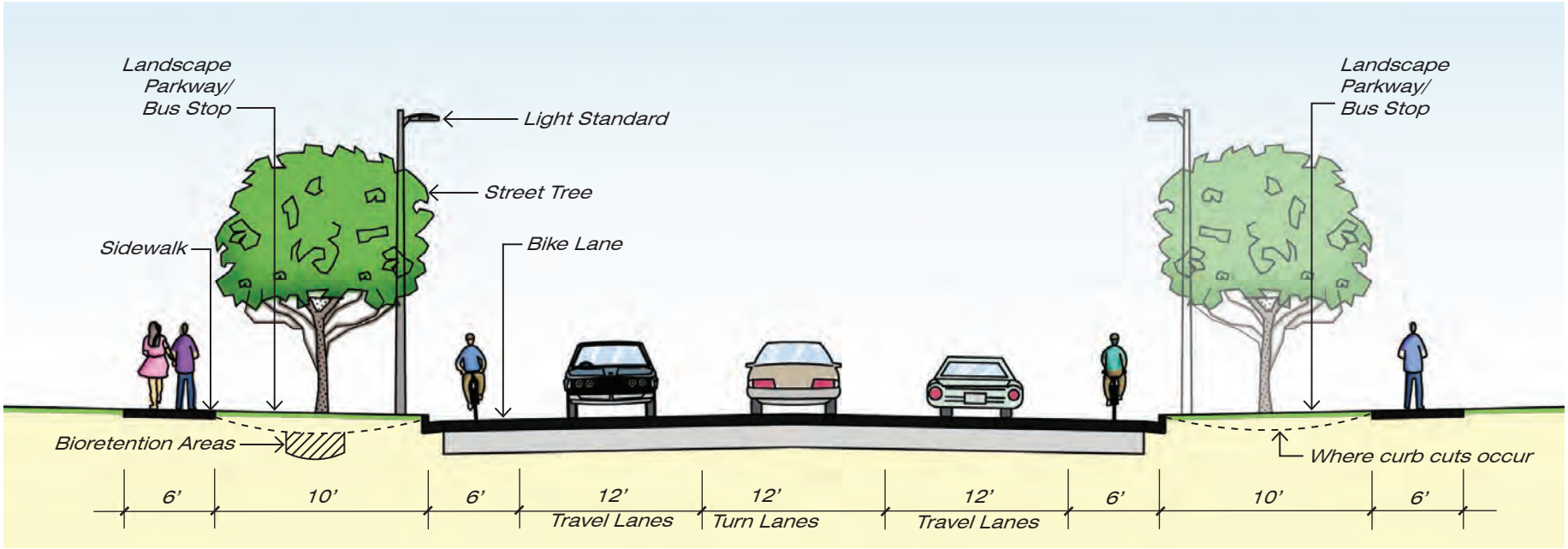


Figure 2.7 Undivided Collector Street Streetscape

COLLECTOR STREETS – DIVIDED

Divided collector streets exhibit the same general qualities as undivided collector streets, except these types of streets do not contain left-turn lanes.

Figure 2.8 illustrates the typical divided collector streetscape for Marine Corps Base Guam, including typical dimensions, desired landscaping elements, trees placement, lighting, and street amenities. These basic elements shall be maintained along all divided collector streets. Where possible, LID strategies may be incorporated into the basic street elements to enhance the overall design of the streetscape.

SUSTAINABILITY/LOW IMPACT DEVELOPMENT

- Utilize native planting for roadway landscaping
- Provide regularly spaced canopy trees for shading along sidewalks
- Utilize bioretention areas at median strips to capture and control runoff and pollution
- Utilize energy efficient LED, induction, and photovoltaic street lights where possible

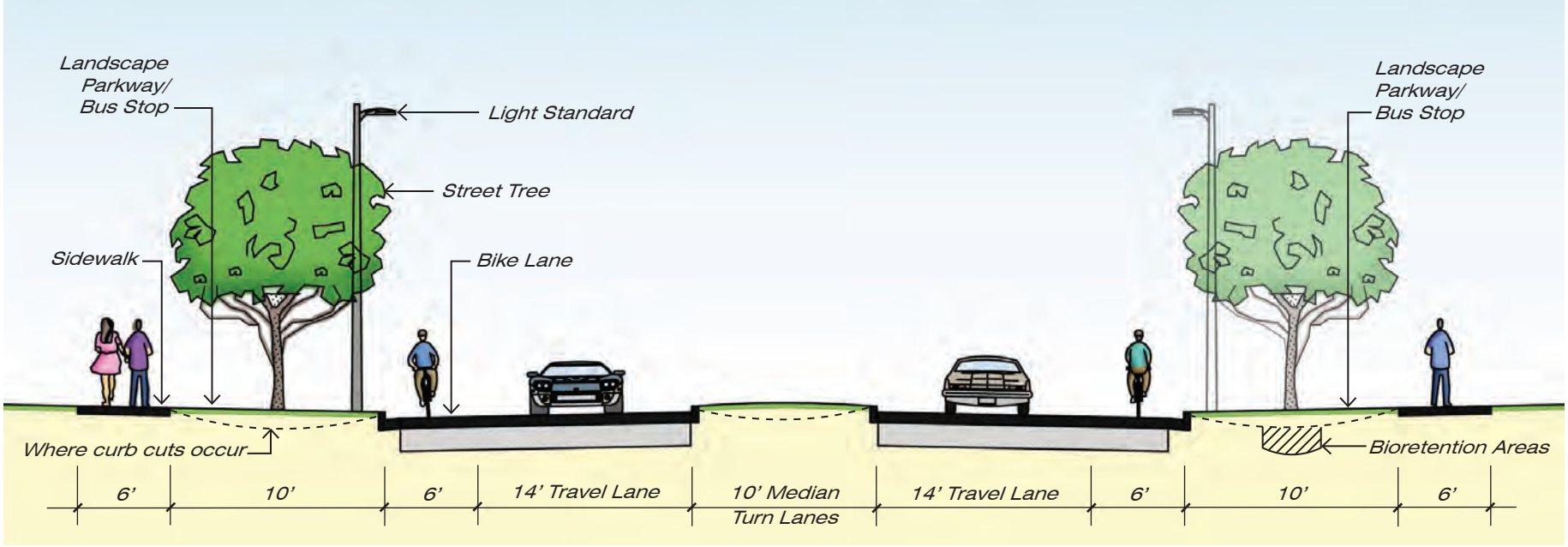


Figure 2.8 Divided Collector Street Streetscape

LOCAL STREETS – NON-RESIDENTIAL

Local non-residential streets are tertiary streets designed for the lowest traffic volumes in the installation. They receive traffic from collector streets and distribute them typically to parking lots and driveways. Posted speed limit is 25 mph. Local streets have one traffic lane for each direction of traffic.

Figure 2.9 illustrates the typical non-residential local streetscape for Marine Corps Base Guam, including typical dimensions, desired landscaping elements, trees placement, lighting, and street amenities. These basic elements shall be maintained along all non-residential local streets. Where possible, LID strategies may be incorporated into the basic street elements to enhance the overall design of the streetscape.

SUSTAINABILITY/LOW IMPACT DEVELOPMENT

- Utilize native planting for roadway landscaping
- Provide regularly spaced canopy trees for shading along sidewalks
- Utilize bioretention areas where possible to capture and control runoff and pollution
- Utilize energy efficient LED, induction, and photovoltaic street lights where possible

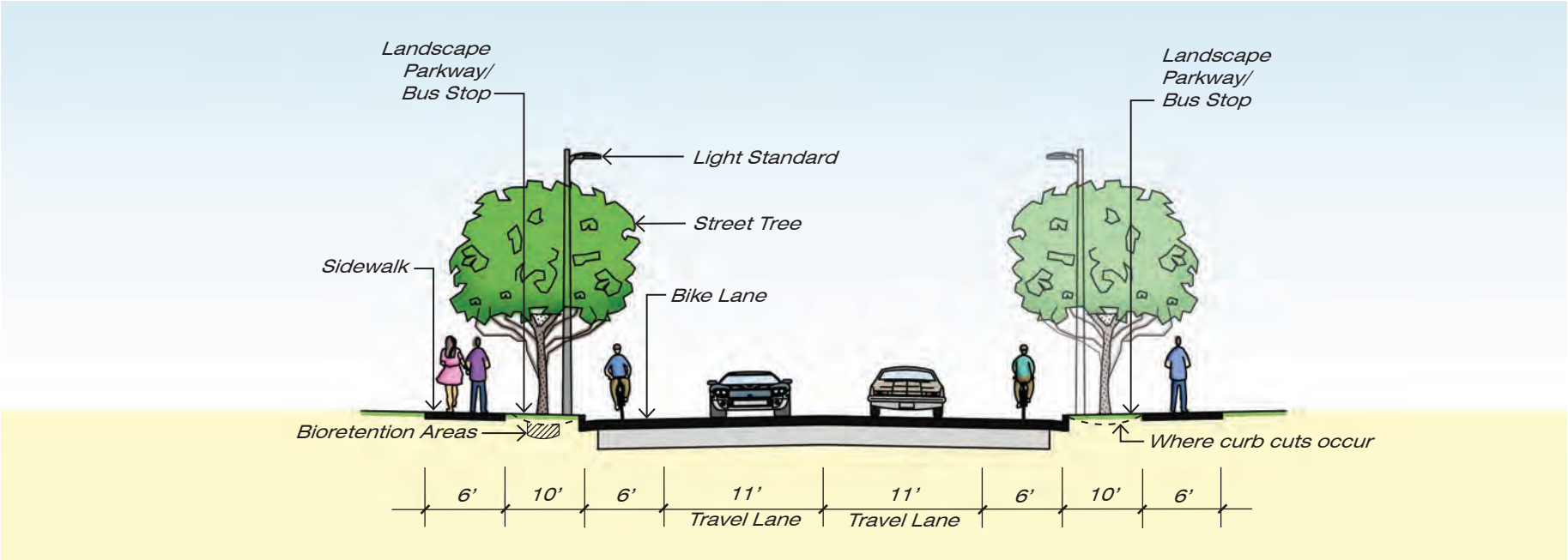


Figure 2.9 Non-Residential Local Street Streetscape

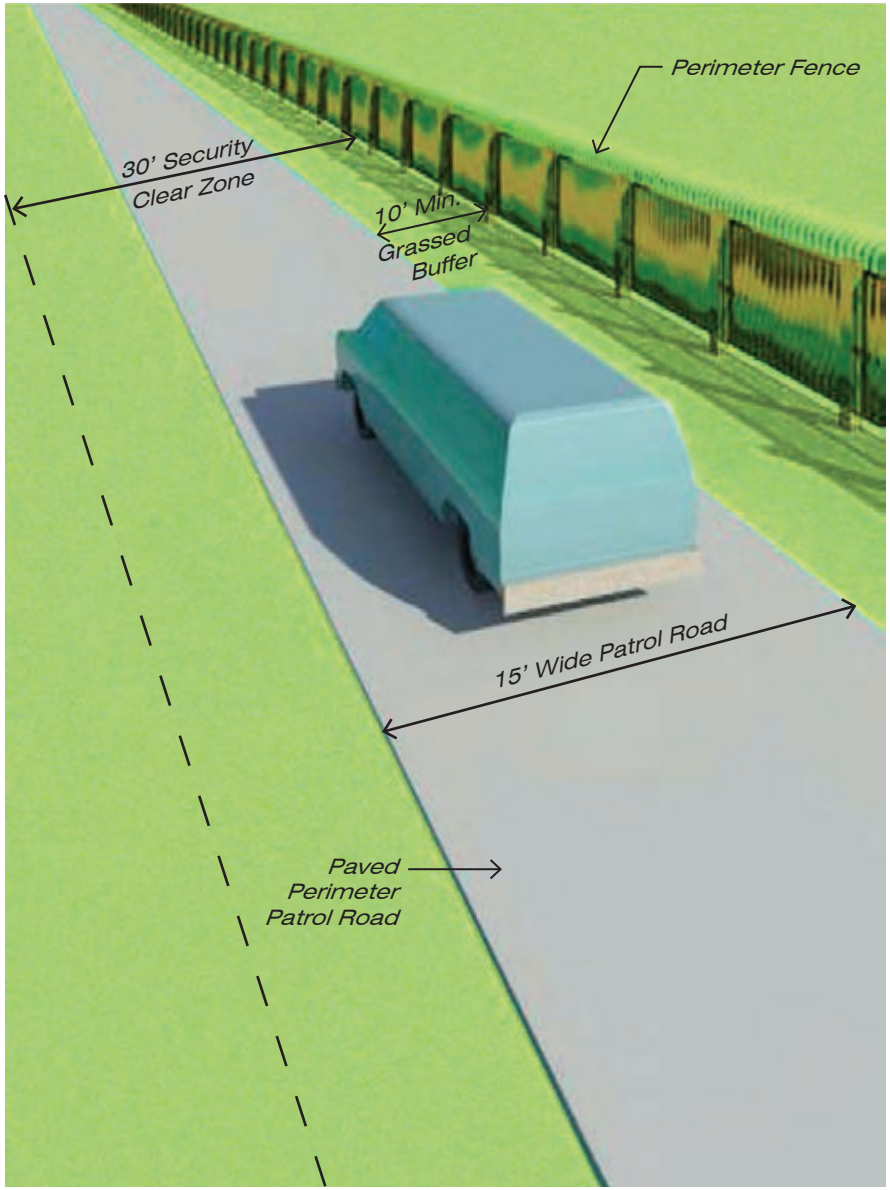
PERIMETER PATROL ROADS

Perimeter patrol roads or security roads are non-public streets utilized by security personnel to conduct surveillance of installation perimeters and boundaries. These roads are single lane roads that typically run parallel with the installation perimeter fencing or boundary. Security roads often may also be used as pedestrian walkways or jogging paths.

Refer to the section on installation boundaries earlier in this chapter for graphic sections showing the perimeter patrol roads in context with the various installation boundaries. The following are general guidelines for perimeter patrol roads.

Guidelines

- Provide interior perimeter patrol roads at all areas along the perimeter fencing that are not affected by impassable terrain features
- Whenever possible, locate the patrol road within the required security clear zone
- Design patrol roads to preclude concealment by intruders
- Secure the openings of drainage culverts that pass under patrol roads
- Design drainage ditches running alongside patrol roads to be shallow or with low angle slopes to allow observation from a 4-foot line of sight above the patrol road
- Provide a 10-foot minimum grassed buffer between the patrol road and perimeter fence
- Design patrol roads to be 15-feet wide minimum



Perimeter Patrol Road

ROUNDABOUTS

Roundabouts are traffic control devices consisting of circular road layouts that encircle an island placed at the center of intersections of major roadways. Traffic travels in a counterclockwise direction around roundabouts, and vehicles entering the roundabout must yield to other vehicles, bicyclists, and pedestrians.

Roundabouts provide numerous advantages. They reduce traffic, increase safety, increase the efficiency of traffic flow, and reduce operating costs (no traffic signals to install or maintain). The central islands of roundabouts also provide opportune areas to install landscaping or set up static displays.

Because of its benefits, roundabouts should be installed in the installation where possible. *Figure 2.10* illustrates the recommended streetscape elements for roundabouts.

SUSTAINABILITY

- Utilize native planting for roadway landscaping
- Provide canopy trees to provide shading along sidewalks where appropriate
- Utilize bioretention areas within the roundabout central island to capture and control runoff and pollution
- Utilize energy efficient LED, induction, and photovoltaic street lights where possible
- Utilize pervious pavers at sidewalks and crosswalks

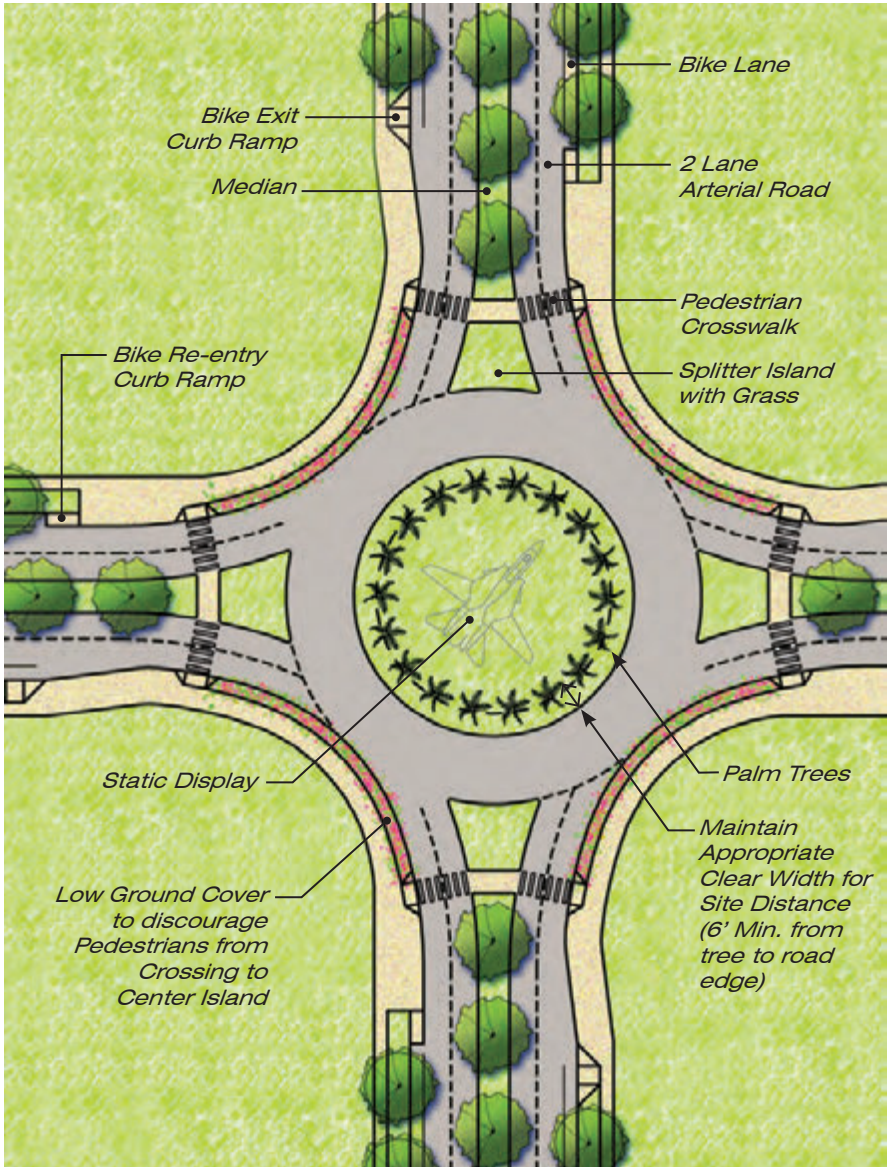


Figure 2.10 Typical Urban Double Lane Roundabout

PATHWAYS

Pathways as defined in this section are paths for pedestrians and bikers that are separated, though not necessarily disconnected, from street sidewalks and on-street bike lanes. Pathways include promenades, pedestrian walkways, and bikeways. Each of the pathways may be individual elements or they may also be combined as multi-pathways (e.g., bike and walking paths).

The installation master development plan provides notional layouts of promenades (also called pedestrian malls) and internal pedestrian walkways. Internal bike paths are not illustrated in the development plan, but they may be considered as the installation develops over time.

The following sections provide guidance on the design and treatment of promenades, walkways, and bike paths. The primary goal for Marine Corps Base Guam is to develop an integrated and comfortable system of pathways that connect roads, sites, and facilities to encourage walking and biking and reduce automobile trips in the installation.

Pedestrian Pathway

Road Separated Bikeway

PROMENADES

Promenades, or pedestrian malls, are wide, high capacity pedestrian paths used for leisurely strolling and socializing. Promenades contain landscaping, seating, and street furnishings, and they typically connect or run alongside public facilities and activity nodes.

Guidelines

- Design promenades to be wide pedestrian malls, 20 to 40 feet wide
- Connect promenades with other pedestrian pathways, arcades, and covered walkways to capture and attract as much pedestrian traffic in the installation as possible
- Connect promenade with plazas, courtyards, public areas, shops, eating places, and other activity nodes
- Utilize pavers or a combination of pavers and textured concrete throughout the promenade to give it visual texture and interest
- Provide canopy trees in tree wells to provide shading for pedestrians
- Provide shaded sitting areas and lighting for safety

SUSTAINABILITY/LOW IMPACT DEVELOPMENT

- Locate bioretention areas and landscape filter strips along promenades to capture and control runoff and recharge the groundwater
- Utilize energy efficient lighting and solar powered fixtures that allow lights to go on automatically during the evening
- Use tree box filters to promote stormwater infiltration

BEST MANAGEMENT PRACTICES

- Install street furnishings such as benches, trash bins, recycling bins, and water fountains; anchor furnishings to the ground whenever possible to prevent uplift during typhoons
- Design promenade surfaces to be compatible with Federal accessibility requirements

Example of paved and landscaped promenade

Example of paved and landscaped promenade

WALKWAYS

Walkways are utilitarian pedestrian paths that connect various destinations, facilities, and use areas. They are generally intended to allow people to walk from one place to another and may be lineal or curvilinear in geometry.

Guidelines

- Design walkways to have a minimum width of 6 feet to comfortably allow two persons to walk abreast
- Provide as direct a path as possible from parking lots to building entries, especially if the walkway is an accessible route
- Use a combination of linear and meandering geometries to provide interest along walkways where direct paths are not as important
- Utilize pavers where possible to highlight stretches of walkways along places of interest or as a transition to entry areas with similar materials
- Provide shaded sitting areas and lighting for safety
- Provide benches along long stretches of walkways to provide pedestrians the opportunity to rest
- Exterior walkways shall either be of reinforced concrete or of concrete pavers with reinforced concrete edger. Concrete walkways shall have a textured finish to provide appropriate slip resistance.

SUSTAINABILITY/LOW IMPACT DEVELOPMENT

- Utilize energy efficient lighting and solar powered low-level fixtures to light pedestrian paths where required; see Chapter 5 Landscape Architecture, Site Lighting for information on area and walkway lighting

BEST MANAGEMENT PRACTICES

- Limit walkway slopes to less than 1:20 and cross slopes to less than 1:50 for accessibility
- Provide railings and landing areas that comply with federal accessibility requirements along walkway slopes that exceed 1:20
- Connect walkways with arcades and covered walkways whenever possible to provide shading and shelter for pedestrians

Example of meandering walkway with low-level lighting

Example of paved walkway

BIKEWAYS

Bikeways for the purpose of this section are defined as off-street bicycle paths that are used primarily by leisure bicyclists. Bikeways may also sometimes be combined with walkways as long as the bike lane is clearly marked and demarcated from the walking path.

Bikeways in the installation may be exclusive or shared depending on space availability and costs. For safety reasons, however, exclusive bicycle paths are preferred.

Guidelines

- For exclusive bikeways, provide a minimum width of eight feet (8') for a two lane bike path; provide 18 inch clearances on both sides of the bike path, and mark the bike lane with painted white bicycling symbols every 50 feet along the bike path *(Figure 2.11)*
- For bike and pedestrian pathways, provide a minimum bikeway width of six feet-six inches (6'-6") and walkway width of four feet (4'); provide 18 inch clearances on both sides of the pathway; provide a 4 inch wide painted white lane marker between the bike lane and walking path, and mark the bike lane with painted white bicycling symbols every 50 feet along the bike lane *(Figure 2.12)*
- For shared bike and pedestrian paths, pave the walkway with pavers to clearly designate the walking path
- Limit the slopes of shared bike and pedestrian paths to less than 1:20 for accessibility
- Refer to the previous walkways section for similar information on sustainability and best management practices

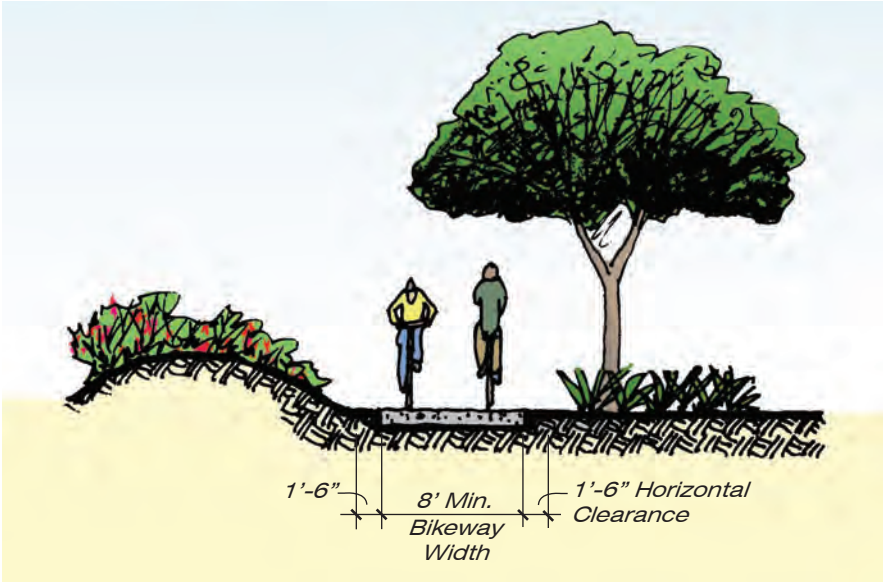


Figure 2.11 Bike Only Bikeway

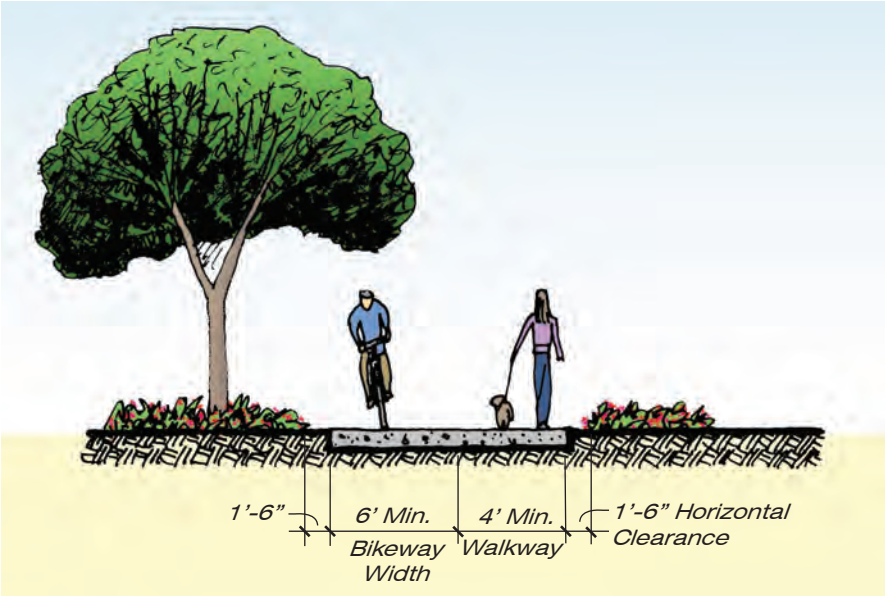


Figure 2.12 Shared Bike and Pedestrian Bikeway

ACTIVITY NODES

Activity nodes are definable areas that support high concentrations of activity and people. They generally coincide with major facility landmarks or buildings that house important and highly populated functions such as headquarters and recreation and commercial facilities. Nodes can also occur outside facilities in public spaces such as plazas, courtyards, entrances, or other exterior spaces such as play courts and playing fields. In addition to facilities, activity nodes also occur in areas where a high level of vehicular or pedestrian traffic converges and interacts within spaces between facilities.

Designers shall consider the following guidelines when designing or renovating activity nodes:

Guidelines

- Orient the installation's system of pathways, such as promenades, walkways, and bikeways to connect to and provide direct access to activity nodes
- Scale elements for pedestrian use and design them in character with the surrounding architecture and landscaping
- Ensure that the facilities surrounding open space activity nodes are compatible with each other and that they support, not detract from, the activity node
- For plazas and courtyards, provide signature features such as monuments, static displays, memorials, landscaping, and water features for interest
- Provide support features and amenities whenever possible, including covered walkways, landscaping, trees for shading, site lighting benches, water fountains, and other appropriate site furnishings

SUSTAINABILITY/LOW IMPACT DEVELOPMENT

- Utilize permeable paving or pavers at paved plaza-like areas rather than asphalt or concrete whenever possible
- Minimize or remove impermeable surfaces whenever possible to reduce solar heat gain and glare

AT/FP AND SECURITY CONSIDERATIONS

- Utilize bollards to control and/or prohibit vehicular entry into large gathering spaces; refer to the bollards section in Chapter 5 Landscape Architecture

Example of activity node for outdoor performances

BUILDING SITING

Placing and orienting buildings in the installation requires designers to consider the needs of the individual project as well as the overall development master plan for Marine Corps Base Guam.

Designers shall coordinate with the installation planners early in the project to determine the limits and allowances for the siting of individual buildings. In general, designers shall consider the following guidelines when siting and laying out buildings in the installation.

Guidelines

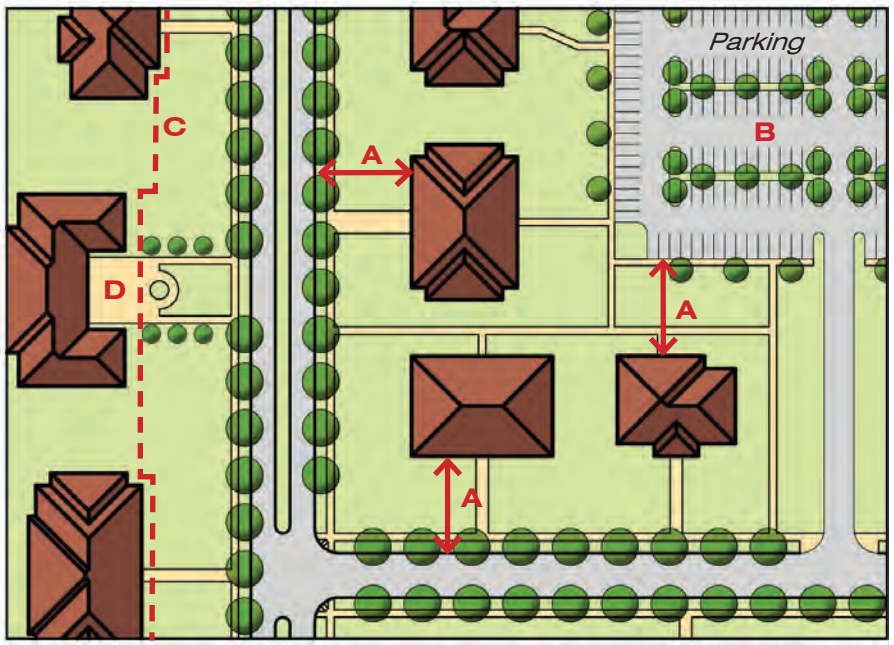
- Orient the main entrances of buildings toward the primary avenues of approach so that the entries are clearly visible
- Along long lineal stretches of streets, vary the alignment of building planes to promote a non-rigid street frontage
- Create entry plazas where possible to enhance the street frontage and vary the setback pattern
- Whenever possible, place associated parking lots and service yards behind buildings to screen them from street views and avenues of approach
- Site buildings to maintain the natural terrain and to reduce cut and fill during development
- Lay out and configure groups of buildings on the site whenever possible and appropriate to form courtyards (see section on Plazas and Courtyards in this chapter and the Architecture chapter)

SUSTAINABILITY/LOW IMPACT DEVELOPMENT

- Place and orient building to take advantage of the cooling effect of breezes and to ensure maximum daylighting to building interiors
- Orient buildings to reduce direct solar heat gain to building interiors throughout the day
- Orient buildings to preserve desirable view planes and to enhance interior views to the outdoor
- Place buildings to preserve natural drainage patterns and encourage the absorption of runoff within the site

AT/FP AND SECURITY CONSIDERATIONS

- Provide the required force protection setbacks from buildings to parking lots, streets, and perimeter fences



A = Provide required AT/FP setbacks
B = Tuck parking behind buildings
C = Vary the alignment of building planes
D = Create entry plazas where possible

DISTRICT BOUNDARIES

District boundaries delineate the edges of districts or functional areas and help reinforce the operations, subcultures, and lifestyles within the zones. District boundaries also protect districts from encroachment and create space for their growth and development. District boundaries should be well defined physically and, over time, psychologically in the minds of occupants or visitors.

Refer to Chapter 1 IAP Functional Districts for the delineation of the various districts within Marine Corps Base Guam. Designers shall consider the following to encourage the development and maintenance of identifiable district boundaries.

Guidelines

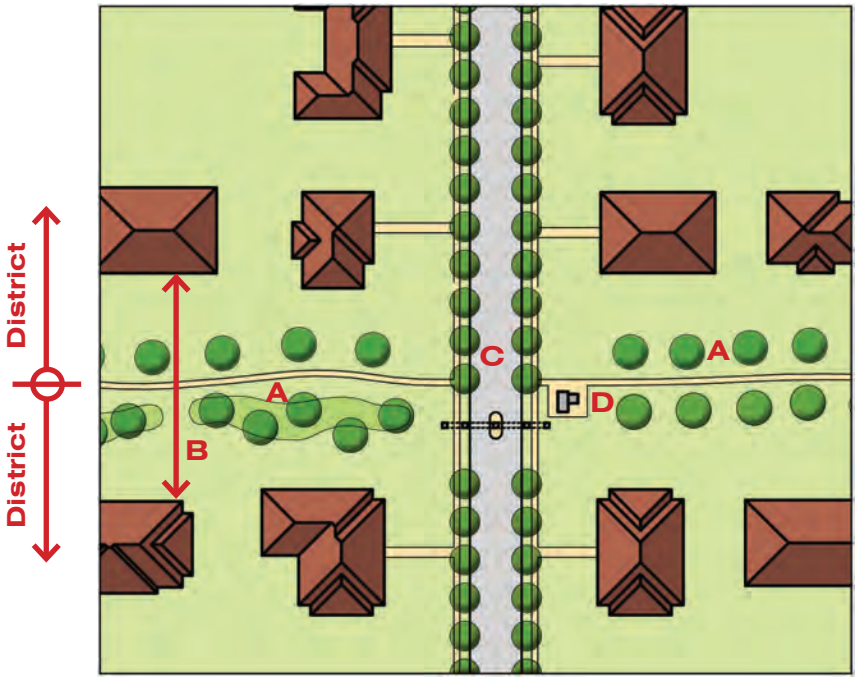
- Maintain and encourage natural elements such as open space, rows of trees, land forms, and landscaping whenever possible at district edges
- Where possible, maintain deep boundary zones to reinforce the feeling of separation and transition between adjacent districts
- Utilize landscaping and planting to screen security fences if fencing is required for security purposes; utilize decorative fencing if security requirements allow
- Accentuate street entry points into distinct districts with entrance features such as static displays, gateways, monuments, or signage to give identity to the operations or occupants within the district
- Between industrial districts and administrative and community support zones, utilize a combination of berming and closely spaced, dense canopy trees and planting to help screen noise that emanate from industrial facilities

SUSTAINABILITY/LOW IMPACT DEVELOPMENT

- Look for opportunities to implement LID strategies, such as bioretention features, vegetated swales, and filter strips along landscaped boundaries

AT/FP AND SECURITY CONSIDERATIONS

- Provide the required clear zones and force protection setbacks along the interior and exterior sides of security fences



A = Landscaping, rows of trees, and landforms to distinguish boundary

B = Deep boundary zone where possible

C = Street entry feature to accentuate entry into district

D = Static display to give identity to district

PLAZAS AND COURTYARDS

Plazas and courtyards as discussed in this section are public open spaces or squares that serve as activity nodes and space organizing elements. Plazas are typically larger, more open, and less confined, while courtyards tend to be more intimate and partly or wholly surrounded by building walls. A more detailed discussion of building courtyards can be found in the Architecture chapter.

Designers shall consider the following when designing plazas and courtyards for the installation.

Guidelines

- Locate plazas and courtyards where high pedestrian traffic is expected such as at community and commercial facilities and recreation and entertainment centers
- Size plazas and courtyards appropriately so that they are not too large and desolate looking; study the surrounding activities and operations, to anticipate how many people may reasonably use the plaza or courtyard
- Whether laid out in an informal or formal manner, design plazas and courtyards to be compatible with the architecture and layout of surrounding facilities
- Provide enough enclosure by buildings, streets, and site elements to define the plaza or courtyard without jeopardizing openness
- Create multiple entry points into plazas and courtyards; provide connections from inside activity areas, and allow pedestrian pathways to cut through the open space
- Allow views into plazas and courtyards from all avenues of approach and from walkways and streets to allow activities in the open space to be seen by passers-by
- Include amenities for human comfort such as landscaping, trees for shading, sitting areas, water features, and site furnishings

SUSTAINABILITY/LOW IMPACT DEVELOPMENT

- Utilize pervious paving and/or pavers instead of concrete or asphalt whenever possible to reduce solar heat gain and glare
- Use tree box filters to promote stormwater infiltration

AT/FP AND SECURITY CONSIDERATIONS

- Utilize trees, boulders, berms, and/or bollards to control vehicular entry into plazas

Example courtyard with landscaping, trees for shading, sitting areas, and pavers

Example of large plaza that becomes desolate looking when not utilized by large gatherings

PARKING LOTS

Although public transportation, walking, and biking are encouraged modes of transportation within the installation, automobile use is still a necessity. This section offers guidance on improving the appearance of parking lots, while limiting the ecological impacts to the installation. Designers should provide the minimum number of parking stalls and parking and vehicular circulation clearances required by the relevant UFCs and master development plan.

Guidelines

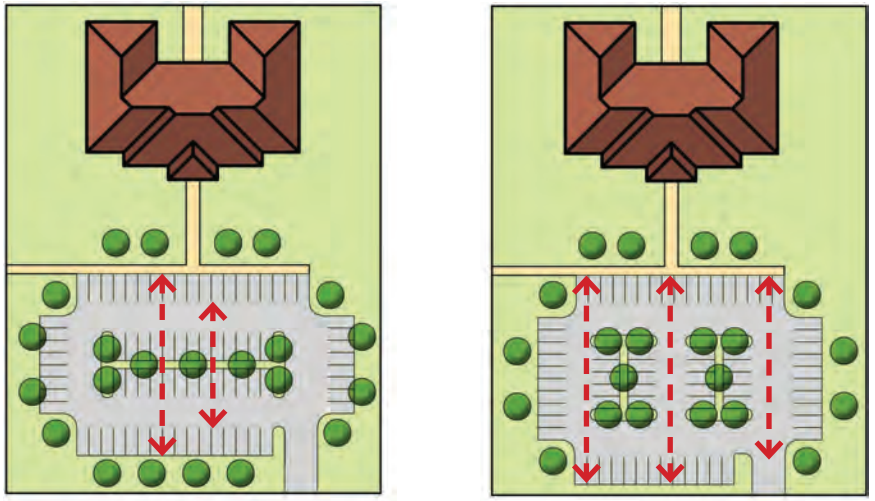
- Locate parking lots behind and between buildings to reduce their visual impact from streets
- Where possible, provide landscaped areas equal to or greater than 10% of the total paved area of the parking lot; where possible, provide the required landscaping within islands and within 10 feet of the perimeter of the paved area
- Provide landscaped islands between rows of parking and at the ends of parking rows where possible. For 5 foot islands, plant with grass, ground covers, or shrubs. For 8 foot islands, include light standards, trees, and shrubs. Provide one shade tree for every eight parking stalls in the between-row islands and at least two trees in each of the end-row islands
- Provide additional planting such as hedging and berms at the edges of parking lots to screen parked vehicles from adjoining roadways
- Orient the parking rows so that people circulate along the parking aisles to get to buildings, rather than between parked cars *(Figure 2.13)*
- Provide clearly marked accessible routes from accessible parking stalls to building entrances; keep accessible routes separated from vehicular circulation aisles

SUSTAINABILITY/LOW IMPACT DEVELOPMENT

- Forego the use of curbing to allow runoff to flow into parking islands and the surrounding landscaping; utilize recycled wheel stops instead with undercutting to allow runoff to flow beneath the wheel stops
- Provide vegetated strips at the edges of parking lots to capture and control runoff and pollution
- Utilize pervious paving, pervious pavers, and grassed paving to capture and control runoff and reduce the heat island effect and glare from parking lots

AT/FP AND SECURITY CONSIDERATIONS

- Utilize trees, boulders, berming, and/or bollards between parking lots and buildings to delineate the required force protection setbacks



Parking layout encourages pedestrian circulation through parking stalls - avoid

Parking layout encourages pedestrian circulation along aisles - preferred

Figure 2.13 Layout of Parking Rows

SERVICE ELEMENTS

Service elements facilitate the servicing of buildings and sites by service personnel and equipment. They include service yards, loading docks, trash bins, and recycling containers. While critical to the functioning of many facilities, they are often unattractive and treated as afterthoughts. Special care must be taken to screen these elements from public view.

Designers shall consider the following guidelines in the design and treatment of service elements.

Guidelines

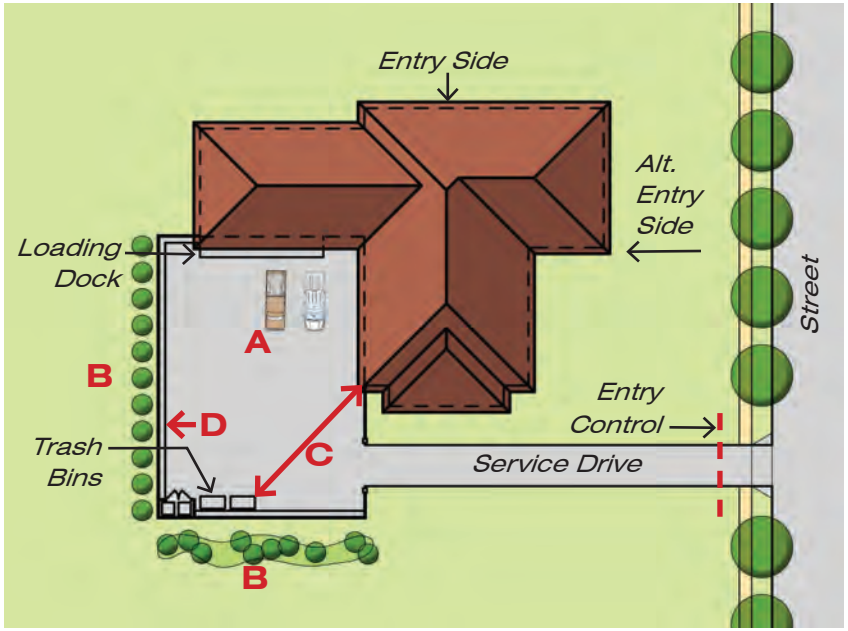
- Locate service elements on non-prominent sides of buildings, away from public thoroughfares and gathering places
- Utilize a combination of decorative screen walls and landscaping to screen service yards and loading docks from public view; refer to Chapter 5 Landscape Architecture for design guidance on screen walls
- If the use of decorative walls is not possible, utilize a combination of land forms such as berms, banks, and grade separations and planting such as hedges and rows of trees to screen service yards and loading docks from public view
- Whenever possible, locate trash bins and recycling containers within enclosed service yards or enclose them within enclosure walls; refer to Chapter 3 Architecture, Service Equipment Enclosures for guidelines on enclosure walls for service equipment
- Where possible, consolidate the service areas of multiple facilities into one central service yard to cut down on multiple service entry roads and enclosure walls

SUSTAINABILITY/LOW IMPACT DEVELOPMENT

- Utilize landscaped filter strips along the inside perimeter of enclosure walls to capture and control runoff and pollution

AT/FP AND SECURITY CONSIDERATIONS

- Provide the required standoff distance from trash bins to the inhabited portions of the building per UFC 4-101-01 and The Comprehensive Study to Reduce Stand-Off Distances for New Facilities in Guam and Commonwealth of the Northern Mariana Islands



A = Service yard located on non-prominent side of building

B = Combinations of decorative walls, rows of trees, and land forms to screen service yard

C = Provide AT/FP setbacks from trash bins to building

D = Landscape filter strips along interior side of fence

UTILITIES

While utilities provide basic infrastructure requirements necessary for the operation of the installation, the visual and environmental impacts of these facilities must be minimized and mitigated. The planning and design of power, communications, water, and sewer services should consider not only functional and structural priorities, such as typhoon and earthquake resistance, but aesthetic factors as well.

Designers shall consider the following general recommendations in the design of utility services for the installation.

Guidelines

- Utility service lines and piping should be placed (or relocated) underground; avoid above ground utility lines whenever possible
- Group and run combinations of wet and dry service lines within concrete utility corridors whenever possible to facilitate maintenance and promote efficiency of land use
- Enclose site appurtenances such as transformers, backflow preventers, switchgears, and substations within enclosure walls or utility sheds to protect them from airborne debris during typhoons; refer to Chapter 3 Architecture, Service Equipment Enclosures for guidelines on service equipment enclosure walls
- Whenever possible, locate site appurtenances within walled service yards; refer to the section on Service Elements in this chapter for guidelines
- Where placing service lines underground is not possible, mitigate the adverse visual impacts of above ground utility lines through the following:
  - Align overhead utility lines along edges of land use areas to avoid dividing and disrupting contiguous land uses
  - Avoid alignments that disrupt scenic view planes
  - Avoid alignments along hill crests and steep grades
  - Place alignments along collector and local roads rather than along arterial roads
  - Utilize dark colors at support elements such as utility poles to help them visually recede in the environment
- Design drainage systems to be compatible with LID elements; keep drainage infrastructure above ground to the greatest degree possible in grassed or lined channels

Utility poles create an eyesore in the landscape. Locate utilities underground whenever possible.

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The architecture for military bases should be functional, economical, visually appealing, and professional looking. In Marine Corps Base Guam, building designs should enhance the mission, function, and quality of life (QOL) of Marine Corps personnel and their families.

These architectural guidelines provide general design parameters along with specific requirements when designing buildings for the Marine Corps Base Guam. This enables flexibility in design while ensuring a certain level of consistency in the installation.

Architectural guidance found in this chapter covers the following:

- Application of the Guidelines
- References
- Architectural Character
- Presenting the USMC Image
- Balance of Variety and Consistency
- Wind and Seismic Criteria
- Guam Tropical Architecture
- Chamorro Cultural Symbols
- Latte Stone Use in Architecture
- Building Accessibility Considerations
- Building Antiterrorism & Force Protection Considerations
- General Building Design
  - Scale
  - Massing
  - Proportion
  - Rhythm
  - Texture
- Architectural Features
  - Roof Forms
  - Roofing
  - Roof-mounted Photovoltaics and Solar Hot Water Panels
  - Exterior Walls
  - Fenestration
  - Covered Entries
  - Arcades and Covered Walkways
  - Courtyards
  - Arches
  - Shading Elements
  - Gutters and Downspouts
  - Typhoon Shutters
  - Trims and Surface Articulation
  - Decorative Panels and Grilles
  - Service Equipment Enclosures

The General Building Design and Architectural Features sections represent the basic elements covered by these guidelines. Building elements not discussed in these guidelines may be considered, but they should complement, not clash with, the guidance and should be approved by the Design Review Board (DRB).

APPLICATION OF THE GUIDELINES

The architectural guidelines shall apply to all buildings in the installation except for family housing. Each building may incorporate the general building elements in any combination, but designers may also vary the features from building to building to avoid a monotonous look.

Where guidelines say "may", the written instruction is permissive. Where the guidelines say "must", "shall", or "will", the written instructions are mandatory. Written approval for deviations from the guidelines must be obtained from the Installation DRB. All architectural designs must be approved by the DRB.

Where the guidelines provide options, designers may select the best elements to fit the building type they are designing. Where necessary, the guidelines will identify cases where specific elements may not be appropriate for use on certain buildings types.

Some of the graphic presentations in these guidelines are suggestions or concepts offered for the designer's consideration. The intent of providing these suggestions is to increase communication between designers and the DRB.

Designers are encouraged to discuss innovative concepts and ideas with the DRB early in the design process. The DRB will consider original and innovative concepts that do not conflict with the intended architectural character for the installation.

Designers shall apply thoughtful use of the guidelines in congruence with the unique requirements of the project to achieve designs that complement the desired installation character. The DRB will have final decision on whether a design meets the architectural character objectives and the Installation Appearance Plan (IAP).

REFERENCES

PUBLICATIONS

- International Building Code (IBC)
- American Society of Civil Engineers Minimum Design Loads for Buildings and Other Structures
- UFC 1-200-01 General Building Requirements
- UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings
- The Comprehensive Study to Reduce Stand-Off Distances for New Facilities in Guam and Commonwealth of the Northern Mariana Islands
- UFC 3-300-10N General Structural Requirements
- UFC 3-310-01 Structural Load Data
- UFC 3-440-05N Tropical Engineering
- UFC 3-440-06N Cooling Buildings by Natural Ventilation
- UFC 4-030-01 Sustainable Development
- Americans with Disabilities Act and Architectural Barriers Act Accessibility Guidelines
- Leadership in Energy and Environmental Design (LEED) Reference Guide
- Buildings Guide to Hot-Humid Climates by Dr. Joseph Lstiburek, 2005, Building Science Press
- Typhoon Readiness Assessment Commander, U.S. Naval Forces Marianas, August 2003
- Marianas Navy & Marine Corps Design & Construction Standard
- Guam Technical Guide Addendum for DBB UFGS
- Guam Technical Guide Addendum for DB RFP Part 3-Project Program

WEBSITES

- Whole Building Design Guide, http://www.wbdg.org/
- United States Green Building Council, http://www.usgbc.org/
- Guampedia, http://guampedia.com/

ARCHITECTURAL CHARACTER

Architectural character is the thread that ties the entire installation to create an overarching sense of place. It conveys unity while expressing variation in building designs to avoid a dull and monotonous appearance.

The architectural character for Marine Corps Base Guam is intended to present a United States Marine Corps (USMC) image, be consistent across the installation, express variation in building designs to avoid monotony, and reflect the local vernacular of Guam (i.e., be within the context of architecture as seen on Guam).

To achieve the intended character, buildings in the installation shall reflect a Guam tropical architecture that blends local cultural and historical influences in a design expression that meets the standards, ideals, and functions of the USMC.

In general, buildings shall:

- Reflect a dignified and timeless quality, rather than being faddish or trendy
- Utilize clean, simple lines in the delineation of building forms and architectural elements
- Be of sturdy and durable construction to endure typhoons, wind-driven flying debris, seismic forces, and the corrosive environment
- Express structural honesty, where structures are straight forward and not complicated
- Incorporate architectural elements and design features that respond to the unique tropical conditions of Guam
- Commemorate the culture and history of Guam through the integration of locally inspired forms, materials, motifs, and patterns

These ideas present the characteristics of an architecture that respects the USMC standards while cultivating an identify that is unique to Guam.

PRESENTING THE USMC IMAGE

The USMC values of “honor, courage, and commitment” are the standards by which all Marines conduct their daily lives. These values are inherent in the USMC motto of Semper Fidelis, or “always faithful”.

The architecture of Marine Corps Base Guam should reflect the USMC image in all aspects of design and construction. The following summarizes the ideas inherent in the USMC values and motto:

Honor = *integrity, honesty*
Courage = *honor in action, strength*
Commitment = *dedication, selfless, excellence*

Semper Fidelis (always faithful) = *loyal, steadfast, firm*

These ideas speak to an enduring type of architecture that are characterized in the preceding Architectural character section.

These basic characteristics shall infuse all aspects of the architectural recommendations presented in these IAP guidelines.

BALANCE OF VARIETY AND CONSISTENCY

Building designs should express variety and interest in the installation while characterizing the different functional districts of the base. This is achieved through architecture that helps define the districts without conveying monotony within the districts themselves. Through this balance, a "sense of order and place" in the installation is achieved.

The IAP is not intended to direct the "look" of buildings in the installation. The popular adages of "form follows function", "variety is the spice of life", and "sense of belonging" should guide building designs.

All buildings should be attractive and appear to belong within their functional district. To help designers visualize the functional districts characteristics, the following concepts are provided. These concepts shall be reinforced in building designs that convey beauty and variety within the individual districts (see Chapter 1).

Administrative/Training (A/T)

- Office, managerial, and administrative
- Formal, official, and ceremonial
- Seat of command, authority, and control
- Respect, reverence, and admiration

Community Support/Bachelor Quarters (CS/BQ)

- Commercial, recreational, and communal
- Informal, public, and family
- Welcoming, warm, secure, and relaxing
- Entertaining, attractive, and engaging

Industrial (IND)

- Warehousing, maintenance, and support
- Efficient, orderly and straightforward
- Safety, security, and restricted

WIND AND SEISMIC CRITERIA

Due to the regular occurrence of typhoons and seismic activity in the Marianas, buildings in Guam are required to meet a higher level of wind and seismic design criteria than most installations. The stringent design controls have allowed buildings in Guam to perform well during typhoon conditions and earthquakes.

Designers shall meet the minimum design criteria for Guam to guard against airborne debris during storms and structural failure due to earth quakes. Designers shall refer to the IBC, American Society of Civil Engineers (ASCE) code publications, Unified Facility Criteria (UFC) 3-300-10N, UFC 1-200-01, UFC 3-301-01, and UFC 3-310-04 for specific design criteria.

GUAM TROPICAL ARCHITECTURE

Building designs in the tropics generally focus on design strategies to deal with heat, humidity, and rain. Tropical buildings employ various passive elements to respond to these conditions including deep overhangs for shading, operable windows for cross ventilation, and high pitched roofs for reducing heat gain and shedding water.

In Guam, the high heat and humidity precludes some of the typical tropical design solutions that are used in milder tropical climates. For instance, smaller windows and air conditioning are preferred over large operable windows and natural ventilation. In addition, typhoons and the high-salt air content create additional challenges for building design and construction that are unique to the island.

A Guam tropical architecture blends time-tested design strategies and elements that respond to Guam's unique climate. These strategies are typically inherent in the architectural vernacular of Guam and are characterized in the following design principles and building characteristics.

General Design Principles

- Orient buildings to minimize direct solar exposure to interior spaces
- Utilize sturdy building materials that withstand typhoons
- Reduce solar heat gain with shading, building color, and glazing selection
- Drain rain water quickly from buildings to minimize moisture/ mold growth
- Create open spaces around buildings to maximize the cooling effects of breezes
- Minimize unnecessary paved areas to reduce heat gain and glare
- Protect building elements from corrosion

Building Characteristics

- Pitched roofs that minimize heat gain on roof surfaces but allow for rooftop rain water collection
- Roof overhangs that shade exterior walls and window openings
- Thermal mass walls of concrete construction that act as heat sinks to absorb heat during the day and radiate it back to the atmosphere at night
- Light colored, plaster-like exterior walls that reflect solar radiation
- Exterior building materials that resist corrosion and mold growth
- Small windows with high performance glazing to reduce solar heat gain to building interiors but allow for maximizing daylighting
- Efficient air conditioning to allow long periods of interior cooling during the day
- Operable windows along with moisture control measures to enable cross ventilation when required during power outages or emergencies
- Covered main building entrances that provide shade and shelter from the elements
- Arcades and covered walkways that provide shade and shelter from the elements and to shade exterior walls
- Courtyards that capture breezes and help cool exterior walls
- Projected elements such as shelves, wall fins, and awnings that shade window openings
- Typhoon shutters that protect windows and doors from airborne debris during storms (Note: Applies to windows required by code or specific project RFP requirements to meet protection of openings requirement)

CHAMORRO CULTURAL SYMBOLS

In developing building designs for Marine Corps Base Guam, designers are encouraged to incorporate forms, patterns, and motifs that symbolize the local Chamorro culture of Guam. There are numerous symbols that characterize the Chamorro culture, but few are more iconic than the following:

Latte stone *(refer to Latte Stone use in architecture)*
Stone pillars of ancient Chamorro houses. Comprised of a hemispherical cap stone (tasa) and column (haligi). Found nowhere else in the world, the Latte stone has come to symbolize Guam and the Marianas and is a source of pride for the Chamorro people.

Latte house
A-framed wood and thatched structure that was supported on double rows of Latte stones. Generally housed the ruling class (Matua) but were also used as boat houses.

Sling stone
Football shaped stone (acho' atupat) used as a projectile propelled from woven slings. Stones were typically carved from limestone or basalt. The sling stone is also symbolized in the Guam seal.

Flying Proa
Ancient sailing vessel of the Chamorro people consisting of a canoe with outriggers and a triangular shaped sail.

Spondylus (spiny oyster shell) disks
O-shaped disks cut from Spondylus shells. Disks were commonly strung on coconut fiber sennit (coir) and worn as adornment.

Basket weave
Criss-cross or checker board pattern made by the weaving of coconut fronds into usable items, such as baskets, mats, hats, and roof thatching.

These symbols may be used as inspiration to generate forms or as the basis for developing patterns and motifs for decorative panels and grilles. In general, abstract representation is preferred over literal translation. Designers shall use sensitivity when interpreting and transforming the symbols to architectural forms.


Latte Stone


Latte House


Sling Stone


Basket Weave


Spondylus Disks


Flying Proa

LATTE STONE USE IN ARCHITECTURE

The Latte stone form can be seen readily in the built environment of Guam. Sometimes subtle, often literal, the Latte stone has been incorporated into diverse structures as buildings, pavilions, bus shelters, signage, entry gates, and fences.

The goal for the installation is to utilize the Latte stone sparingly and wisely. Because of the significance of the Latte stone in the hierarchical structure of the Chamorro culture, its integration shall be limited to significant buildings and structures. These buildings and structures shall include *entry gates, command headquarters, operations facilities, and institutional buildings.*

Incorporation of the Latte stone symbol into building architecture should be sensitive and appropriate. Designers shall avoid inappropriate uses of the Latte stone by adhering to the following guidelines:

- Strive for subtlety and abstraction when translating the Latte stone symbol into architectural forms
- When utilizing Latte stones as structural elements to support roof structures, use them in pairs or double rows to be consistent with their original use
- Avoid designing Latte stones as large, literal freestanding structures that overwhelm the primary building architecture
- Avoid treating the Latte stone symbol as applique or stuck-on silhouette elements on building surfaces

The following illustrations exemplify various uses of the Latte stone in Guam architecture. The illustrations are examples only of successful and less desirable applications, and designers are encouraged to utilize creativity in developing different expressions for the Latte stone in the installation architecture.

Literal and abstract use of Latte stone at entry gate

Good example of abstracted Latte form integrated with architecture

Double rows of Latte stones supporting roof structure

Latte stone pair supporting roof dormer

Avoid large free-standing Latte stone structures

Avoid Latte stone as applique or stuck-on forms

BUILDING ACCESSIBILITY CONSIDERATIONS

On military installations, any building that is used by the general public or civilians must comply with the Department of Defense (DoD) Standards, Americans with Disabilities Act and Architectural Barriers Act Accessibility Guidelines. The general idea behind DoD Standards is to provide access to all areas and spaces within buildings and sites that allow public access. New work and renovations must never decrease accessibility to facilities.

These guidelines are not intended to be a comprehensive or complete guide to meeting the DoD Standards as they apply to buildings. Designers must consult the DoD Standards when dealing with any aspect of accessibility in their projects.

Although the DoD Standards primarily focuses on accessibility for interior building components, there are several items relating to exterior building design in which all buildings in Marine Corps Base Guam must meet:

- At least one accessible route shall connect accessible parking spaces and passenger loading zones to an accessible building entrance
- Exterior stairs and ramps along the accessible route to building entrances must comply with the requirements of DoD Standards
- Entry doors at each accessible entrance to buildings shall comply with the requirements of DoD Standards for door hardware, swing operation, and clearances
- At least 50% of all public entrances shall be accessible and at least one must be a ground floor entrance
- The number of accessible entrances must equal at least the number of exits required by the applicable building/ fire exit codes

Although the DoD Standards allows the use of platform lifts (wheelchair lifts) to provide accessibility at building entrances, the use of lifts shall be avoided for Marine Corps Base Guam.

Where exterior stairs and ramps will be used to provide accessibility to buildings, designers shall blend the design of these elements with the overall building design to achieve a coordinated look. Exterior stairs and ramps shall also be located such that they are clearly visible to building users from accessible routes but not obtrusive to the building design.

BUILDING ANTI-TERRORISM AND FORCE PROTECTION CONSIDERATIONS

On military installations, any building that is inhabited must meet Anti-Terrorism and Force Protection (AT/FP) requirements. The general idea behind AT/FP is to minimize the likelihood of mass casualties from terrorist attacks against DoD personnel in the buildings in which they live and work.

The primary requirements for AT/FP are specified in UFC 4-010-01 with the Comprehensive Study to Reduce Stand-Off Distances for New Facilities in Guam and Commonwealth of the Northern Mariana Islands. These guidelines are not intended to be a comprehensive or complete guide to meeting AT/FP requirements as they apply to buildings. Designers must consult UFC 4-010-01 when dealing with any aspect of AT/FP in their projects.

Although UFC 4-010-01 focuses on protecting the entire installation, there are several key applications that apply to architectural design:

- All new construction must meet the requirements of UFC 4-010-01 regardless of funding source; exemptions are made for certain facilities, but, in general, it is recommended that all facilities meet the UFC requirements
- Minimum standoff distances shall be provided for all inhabited buildings
- Buildings shall be engineered to prevent progressive building collapse
- Building windows shall be engineered to minimize the damage due to flying debris from explosive events
- Building layouts and orientations shall be effectively designed to reduce opportunities for terrorists to target building occupants or injure large numbers of people
- Heating, ventilation, and air conditioning (HVAC) systems shall be designed to reduce the potential for chemical, biological, and radiological agents being distributed throughout the buildings
- Mass notification systems shall be designed to notify building occupants in a timely manner of threats and what should be done in response to the threats

Designers shall refer to UFC 4-010-01 to provide the minimum requirements for these and other applications not specifically cited here but which are required by AT/FP best management practices.

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General Building Design

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BUILDING FORM

Building form refers to the shape or configuration of buildings. It gives scale to architectural structures and helps define the envelope for interior spaces. When looking at a building, its form helps viewers process the character and style of the building and gives clues to its function and purpose.

Aspects that influence building form include shape, scale, massing, proportion, rhythm, and texture. These qualities constitute the primary elements of architecture.

Because building shapes are largely defined by a building's overall roof form and exterior configuration, shape as an aspect of building form will not be discussed. Roof forms are discussed in upcoming sections.

The following sections discuss scale, massing, proportion, rhythm, and texture as they relate to the visual perception of building forms.

SCALE

Scale refers to the size of building façades in relation to humans. Buildings with predominantly vertical façades that dwarf the individual are defined as monumental in scale. Buildings with predominantly horizontal façades relate more to the size of human figures and present a more human scale.

Buildings in the installation shall be human scale rather than monumental. Exceptions include installation headquarters and warehouses, which may benefit from having monumental scales.

Guidelines

- Where possible, design buildings to be no more than four stories tall (buildings such as Bachelor Quarters (BQ) and Command Headquarters (HQ) may be exempt from this requirement)
- Design building façades to have greater width than height
- Where buildings are required to be more than three stories tall, utilize horizontal design elements, such as spandrel beams, to visually break up the height of buildings
- Articulate blank walls to break down the scale of buildings (see section on trims and surface articulation)
- Utilize texture to help reduce the visual scale of large buildings (see section on texture)
- Incorporate design features such as arcades and covered walkways at the ground floor levels of monumental buildings to add human scale elements (see section on arcades and covered walkways)
- Avoid blank, unarticulated walls that extend more than two stories
- Avoid monumental building entrances, unless they are functionally required

Ground level arcade adds human scale to the entrance of an otherwise large building (Note: Lack of landscaping at parking lot is undesirable; see Site Design Chapter)

Monumental building entrance, out of scale with building façade

MASSING

Massing refers to the overall physical bulk or volume of a building. It is understood as the actual size of a building in relation to its context. Massing combined with scale affects one's perception of the size of a building.

Buildings shall be sized and shaped so that they are not visually overwhelming in the installation.

Guidelines

- Strive for the design of personable buildings that are human scale rather than monolithic
- Translate the building program into a building form that constitutes a cohesive set of moderately sized volumes rather than one single large volume
- For large building programs with numerous space requirements, consider breaking the building into separate structures connected with covered walkways rather than creating a single large building
- Design buildings to be compatible with the size of nearby groups of buildings to provide visual consistency in the installation
- Utilize the visual effect of pushing and pulling of building planes where possible to break up the visual mass of large buildings
- Articulate large wall surfaces to break down the visual mass of buildings (see section on trims and surface articulation)
- Utilize building colors and texture to help soften the visual mass of large buildings (see building color chapter and section on texture)
- Avoid placing single volume sloped roofs on large squarish or rectangular buildings as they tend to increase the visual bulk of buildings

Push and pull of planes and texture of fenestrations break up the building mass

Large building surface articulated with architectural elements to break down the building mass

PROPORTION

Proportion refers to the harmonious relationship of buildings parts to each other and to the whole building. It takes into consideration the relationship between length, width, and height; between length and area; between area and volume; and between volume and other volumes. Proportion also considers the regularity and shape of a set of forms to other sets of forms.

Parts of buildings shall visually balance each other and the building as a whole to create a sense of coherence and order in the overall design.

Guidelines

- Utilize symmetry where appropriate to balance similar building forms and design elements in relation to a centralized or main form
- Utilize asymmetry appropriately to visually balance different sets of forms through the proper placement of the forms in relation to each other
- Size fenestrations to be proportional to each other and to the building façade on which they are located
- Design pitched roofs to fit the height, size, and volume of forms by utilizing slope ratios that provide the best roof proportions
- Apply proportioning measures when applying trims and surface articulation to wall surfaces to avoid chaotic patterns that detract from the overall design
- Design buildings to be proportional in size and massing to groups of nearby buildings to create consistency in the installation
- Avoid the use of large unusual shapes and forms that stand out and detract from other building parts and to the building as a whole

Balancing of forms and elements symmetrically on a central form

Asymmetric balancing of different building forms and elements of varying sizes

RHYTHM

Rhythm refers to the repetition of architectural elements, shapes, structural bays, and fenestrations. Doors, windows, bays, and surface articulation all help to establish a rhythm to the building exterior. A balanced and regular rhythm is more comfortable to the user's eye than a chaotic and irregular rhythm.

Building façades shall be designed to have a regular and balanced rhythm rather than a complex or chaotic rhythm.

Guidelines

- Coordinate the placement of windows to work with both the interior spaces and exterior façade while achieving a regular rhythm
- Design structural bays to be regular rather than irregular to help provide proportion and order to building façades
- Express vertical structural elements to help establish the rhythmic framework for the building façade
- Maintain horizontal and vertical alignment of fenestration, structural elements, and trims and surface articulation to provide a sense of rhythmic order
- Match the rhythmic order of design elements on adjacent buildings to create unity and consistency in the landscape
- Place buildings on a site in proportion to adjacent individual buildings to help create a larger street wall rhythm along street fronts
- Avoid the random placement of windows on building façades

Rhythm expressed through regular bays, aligned openings, fenestration, and expressed structural columns

Rhythm of windows and arched entry openings provide balance to the building façade

TEXTURE

Texture refers to the visual tactile effect produced by the combination of materials, architectural features, and color. Texture can provide visual interest to building façades and help affect the appearance of scale and massing of buildings.

Buildings shall have a textural quality that is comfortable and pleasing to the eye and not be overly tactile, uneven, or irregular.

Guidelines

- Consider utilizing architectural features such as projections and recesses that create shadow and patterns as an alternative way to produce tactile effect
- Utilize texture to help soften and reduce the size and visual weight of large buildings
- Utilize trim and surface articulation to create texture on otherwise blank exterior walls (see section on trims and surface articulation)
- Utilize trim colors as appropriate to highlight structural or architectural elements that project from building façades.
- Utilize clay tile roofing or battens on appropriate buildings to create visual interest and texture on sloped roofs (see section on roofing)
- Utilize decorative panels to give interest and texture to building façades (see section on decorative panels)
- Avoid overly tactile or chaotic façades that unnecessarily mix multiple materials and design features without reason

Textural quality provided by play of textured tile roof and articulated exterior walls

Textural quality provided by combination of projected fins, motif detailing, and smooth and ribbed walls (Note: photo used to illustrate textural quality only; use of mansard roof is undesirable for use on Marine Corps Base Guam)

Architectural Features

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ROOF FORMS

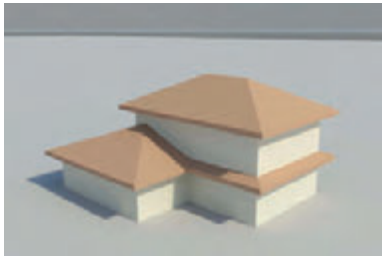
Roofs have a strong visual impact on a building's appearance. Roof forms shall perform well in the tropical environment, allow easy maintenance, and reflect the architectural vernacular of Guam.

Buildings in Marine Corps Base Guam shall utilize concrete reinforced hip roofs (First Choice) and gable roofs (Second Choice). Shed and low slope roofs are acceptable but not preferred. Limit low slope roofs to where they are required for functional reasons.

Illustrations show the various roof types that are acceptable in the installation. These roof types may be utilized alone or in combination to generate roof designs.

Guidelines

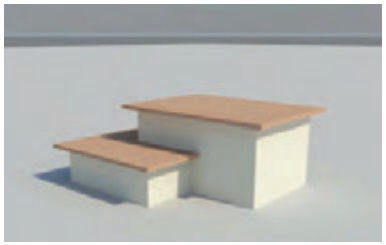
- Design steep sloped roofs to have a 4:12 slope ratio preferably; 3:12 is the minimum
- Provide overhangs at all pitched roof eaves
- Extend low slope roof edges beyond the exterior wall line as required to fit roof drains, gutters and downspouts and include a concrete fascia or curb to give the edge a more substantial look
- Utilize batten-formed concrete roofs where applicable (see section on roofing materials for applicable uses of batten-formed roofs)
- Avoid secondary roof elements such as dormers and gablets unless required to emphasize entrances or to bring natural light into building interior spaces



Hip Roof Form - First Choice

Gable Roof Form - Second Choice

Shed Roof Form



Low Slope Roof Form

SUSTAINABILITY

- Provide overhangs to shade exterior walls and windows
- Incorporate roof rain water catchment systems where practical and appropriate
- Due to regular typhoons in Guam, avoid installing vegetated roofs

BEST MANAGEMENT PRACTICES

- Provide integrated concrete gutters at all pitched roof eaves
- Do not place mechanical equipment on roof tops
- Except for plumbing vents, avoid roof penetrations such as roof access hatches and skylights
- Do not use parapet walls at low slope roofs
- Provide overhang depths that have been structurally engineered to meet the wind design pressures for Guam

ROOFING

Roofing treatments form a protective barrier and aesthetic cover on roofs. Roofing treatments shall be durable, allow easy maintenance, and be appropriate for Guam.

Roofing treatments for buildings in Marine Corps Base Guam shall include roof tiles, concrete-formed simulated tile roofs, concrete battens, and fluid applied roof coatings.

Guidelines

- Utilize roof tiles or concrete-formed simulated tile roofs with fluid applied roof coating at pitched roofs for prominent buildings, including high-level headquarters and command facilities
- Utilize fluid applied roof coating over batten-formed concrete pitched roofs for operational buildings, bachelor housing, and institutional and commercial buildings
- Utilize fluid applied roof coating over pitched roofs for industrial buildings, warehouses, and other common facilities
- Utilize fluid applied roof coating for all low slope roof applications
- For roof tiles, specify S-type, low profile Spanish tiles, fired clay with a factory-applied sealer
- Apply roof tiles over a full mortar bed and individually attach the tiles directly to the concrete roof slab with stainless steel fasteners. Utilize concrete bonding agent in mortar
- See chapter on building colors for allowable colors for roofing materials

Spanish S-Tile; see Building Color chapter for acceptable roof tile colors

Concrete-formed simulated tile roofing

Concrete batten roof

Fluid applied roof coating on hip roof; see Building Color chapter for acceptable roof colors

SUSTAINABILITY

- Utilize roofing materials containing reflective pigments that help reduce solar heat gain on roofs
- Utilize roofing materials with minimum solar reflectance index (SRI) values of 78 for low sloped roofs (≤2:12 slope) or 29 for steep-sloped roofs (>2:12 slope)
- Utilize building integrated photovoltaic (BIPV) technology where appropriate and applicable (see section on use of BIPV on roofs)
- Utilize roofing materials containing recycled content if available

BEST MANAGEMENT PRACTICES

- Utilize self-cleaning roof coating materials containing mildewcide to help combat mold and mildew
- Utilize roofing installation methods that withstand design wind pressures for Guam

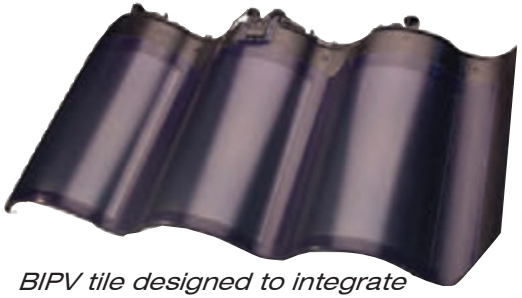
USE OF BUILDING INTEGRATED PHOTOVOLTAICS ON ROOFS

Photovoltaics (PV) are solar arrays that convert solar radiation into usable electrical energy. BIPV are photovoltaic materials that are integrated into the building roofing or façade in place of traditional materials to supply the building with primary or supplemental electrical energy.

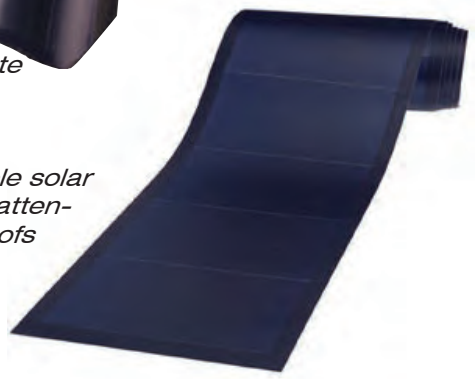
Buildings in Marine Corps Base Guam shall incorporate rooftop BIPV where applicable and appropriate to meet the installation's sustainability goals. BIPV technologies shall be compatible with the roof forms and materials discussed in these guidelines. Installation of BIPV shall be considered early in the design process so that the solar arrays blend seamlessly with the overall building design.

Guidelines

- For tile roof applications, utilize BIPV tiles that integrate seamlessly with the tile roof
- For batten-formed concrete roof applications, utilize thin film BIPV flexible solar panels or shingles that fit and adhere seamlessly between the batten profiles
- For low slope roof applications, utilize low profile, BIPV solar modules for low slope roofs that adhere directly onto the roof deck
- Utilize BIPV roofing products that are able to withstand Guam's design wind pressure
- Ensure that BIPV products meet the required fire rating for roofs and that they are Ultraviolet (UV) stabilized and low maintenance
- Utilize BIPV products that implement the most efficient solar cell technology; ensure that all wiring and electrical components are concealed
- Due to normal occurrence of typhoons, do not utilize rackmounted PV panels on roofs; PV panels shall typically be mounted within ground-level protected structures (refer to the installation's design and construction standards)



BIPV tile designed to integrate seamlessly with clay tiles



Thin film BIPV flexible solar panel; utilize with batten-formed concrete roofs

Low profile, BIPV solar modules for low slope roof applications

EXTERIOR WALLS

Exterior walls keep out the elements and help define the overall structure of buildings.

Exterior walls for buildings in Marine Corps Base Guam shall be of solid reinforced cementitious construction as allowed by the installation construction standards. Wall finishes shall be slightly textured or smooth.

Guidelines

- Apply simulated plaster coating over all exterior wall surfaces
- For simulated plaster, specify silicone or silicone-enhanced acrylic exterior finish systems (EFS) with integral colors and mildewcide to help fight mold and mildew
- For wall finishes, specify smooth or slightly textured coat applications (e.g., stucco, lace, or orange peel)
- Avoid very rough textures with deep crevices and pits that tend to hold dirt easily and require periodic washing to keep walls looking clean
- Do not use exterior "insulated" finish systems (EIFS)

Stucco Texture

Lace Texture

Orange Peel Texture

SUSTAINABILITY

- Utilize materials that have zero or low volatile organic compound (VOC) content
- Utilize materials containing recycled content if available
- Utilize Guam local materials whenever possible

BEST MANAGEMENT PRACTICES

- Utilize materials that hold up well to prolonged UV exposure, wind-driven rain, and the corrosive salt air environment
- Utilize architectural elements, such as roof overhangs, to reduce prolonged rain water runoff on exterior walls
- Design exterior walls to withstand design wind pressures for Guam

FENESTRATION

Fenestration refers to the arrangement, proportioning, and design of windows and doors in a building. Aside from keeping out the elements, fenestrations add character, texture, and rhythm to buildings.

Fenestrations in Marine Corps Base Guam shall be simple, functional, and proportioned to balance the building façade.

Guidelines

- Utilize rectangular fixed, operable (sliding, casement, double-hung, awning), or combination window units; avoid ribbon and hopper windows unless they are functionally required
- Specify windows to be anodized aluminum with dark bronze finishes
- Utilize window sashes with simple divisions; avoid multi-divided lights with multiple muntins that have a residential look
- Align windows on the façade; place them to achieve a regular and balanced rhythm
- For exterior doors, utilize flush, louver, or sash panels as required; specify anodized aluminum doors and frames with dark bronze finishes unless otherwise required by the building design
- Utilize heavy duty stainless steel hardware at doors
- Limit the use of storefront windows to covered (protected) ground floor levels
- Utilize glass block where appropriate; avoid the use of translucent composite panels that may discolor or promote mold growth over time

Rectangular windows with simple divisions

Avoid multiple muntin and hopper type windows

Example of rhythm, balance, and alignment

SUSTAINABILITY

- Utilize high efficiency glazing to reduce solar heat gain through windows
- Arrange windows to maximize daylighting and views

BEST MANAGEMENT PRACTICES

- Maximize windows at north exposures; provide shade for east, west, and south facing windows
- Provide typhoon shutters at all exposed windows required by code to meet protection of openings requirements
- Design fenestrations to meet wind pressures for Guam and meet code requirements for impact resistance
- Utilize operable windows above the first floor to allow access to typhoon shutters from the inside
- Design glazings, frames, connections, and structural components as integrated systems
- For tinted glazing, utilize tint colors that complement the color scheme for the building

COVERED ENTRIES

Covered entries provide shelter from the elements and help define the main entry points to buildings. Covered entries also provide character and interest to a building's main façade.

The primary entrances for all significant buildings in the installation shall be covered.

Guidelines

- Design entryways as porticos, recessed entries, or architectural features that are part of covered walkways or arcades.
- Place main entries where they can be seen immediately from the primary avenues of approach
- Provide a minimum depth of seven feet for all covered entries
- Give entrances a bold, visible shape, which stands out in front of the building
- Size and proportion covered entries appropriately to complement the main building
- Where several entries are required, treat each entryway similarly or emphasize the main entry from the subordinate entries
- Design covered entries to complement and blend with the building's architecture; avoid covered entries appearing as out of place appendages
- Design portico roofs to be similar to the primary roof structures of the buildings to which they are attached

Intimate portico with hip roof

Portico entry connected to an arcade

Covered recessed entry

SUSTAINABILITY

- Design covered entries to completely shade entry doors throughout the day

BEST MANAGEMENT PRACTICES

- Provide gutters and downspouts to control roof runoff at entrances and prevent runoff from spilling onto entry approach walkways
- Provide entry lobbies immediately after entry doors to provide a transition space from the covered entry to the building interior
- Connect covered entries with arcades and covered walkways of nearby buildings where possible to create an interconnected system of shaded walking paths
- Design covered entries to protect against wind-driven rain by properly placing and orienting the entry and utilizing design features such as screen walls and louvers

ARCADES AND COVERED WALKWAYS

Arcades are covered walkways attached to building façades. Covered walkways are freestanding roofed structures that connect buildings and arcades. Both provide shelter from the elements and offer users space to circulate, gather and socialize.

Where possible, buildings in the installation shall incorporate arcades and covered walkways to enhance the character of buildings and provide shading.

Guidelines

- Locate arcades along fenestrated exterior walls to create connections between the arcade spaces and building interior spaces
- Provide a minimum depth of seven feet clear at arcades and minimum width of six feet clear at covered walkways
- Design arcades and covered walkways to be no taller than one story
- Design the roofs of arcades and covered walks to complement the building architecture
- Design support elements, such as columns, arches, or pillars to complement the building architecture
- Look for opportunities to connect arcades and covered walks with breezeways and courtyards

Arcade interior

Arcade structure compatible with building architecture

Covered walkway connecting buildings

SUSTAINABILITY

- Utilize arcades to shelter fenestration and control glare and heat gain at exterior windows
- Look for opportunities to connect arcades and covered walkways with those of adjacent buildings to create a network of shaded walking paths to promote walking and help reduce vehicle trips

BEST MANAGEMENT PRACTICES

- Utilize arcades to create possible covered spaces for troop formations
- Utilize gutters and downspouts at arcade and covered walkway roofs to capture and control runoff and prevent it from spilling onto walkways
- Provide benches along arcades to provide sitting areas for resting, socializing, or waiting out the weather

COURTYARDS

Courtyards are open areas, wholly or partly surrounded by building walls. They serve as spaces for gathering, socializing, and circulating between building interior spaces.

Where possible, courtyards may be incorporated as part of building layouts to enhance the design and character of buildings and to act as organizing elements for two or more adjacent buildings.

Guidelines

- Incorporate arcades around the perimeter of courtyards to act as transition spaces between the indoors and outdoors; avoid unsheltered doors and entries that lead directly into courtyards, as such transitions are too abrupt
- Design courtyards to have at least two or three openings into it, and locate openings on opposite ends of the courtyard so that the pathways connecting the openings cut across the courtyard
- Include sitting areas and planting where possible for shading within the courtyard space
- Utilize pavers whenever possible to articulate the courtyard space
- Avoid designing courtyards that are too large for practical use; design courtyards to be more intimate in size rather than grand
- Where possible, design courtyards to be partially open to the exterior to facilitate breezes through the courtyard

Paved and landscaped courtyard

Intimate landscaped courtyard

Wholly enclosed building courtyard (not recommended or limited use because of reduced ability to capture tropical, cooling breezes)

SUSTAINABILITY

- Design and orient courtyards to facilitate wind movement through the courtyard space to help cool exterior walls and fenestrations and enhance user comfort
- Implement appropriate Low Impact Development (LID) strategies, such as pervious pavers and pervious ground cover and planting to capture and control runoff

BEST MANAGEMENT PRACTICES

- Arrange interior spaces to provide positive spatial relationships between the courtyard and the building interior

AT/FP CONSIDERATIONS

- Orient sensitive interior spaces that house critical assets toward courtyards to shield them from the more vulnerable exterior perimeter

ARCHES

Arches are curved structural elements that span and support openings. Prevalent in the Guam architectural vernacular, arches can help provide a local character for buildings.

Arches may be utilized where appropriate to enhance the design and character of buildings.

Guidelines

- Design arches to be Roman (rounded) or segmental
- Utilize arches to span openings, such as the structural bays of arcades and covered walkways or entries and other building openings
- Dimension and proportion “Roman” arches to be visually taller rather than squat, and use them to span narrow openings; use “segmental” arches to span wider openings
- Design with sensitivity and balance in mind; although arches may be used to create visual consistency, avoid overusing arches to the point where they become the predominant architectural feature
- Do not allow arches to dominate the building façade such that the overall composition appears too repetitive and overwhelming

Roman arches

Segmental arches

Repetitive arches dominating the building façade

SHADING ELEMENTS

Shading elements include architectural projections used to provide shading and daylighting control at windows and protection from rain. When used repeatedly, shading elements provide texture and surface articulation at building façades.

Shading elements are recommended for Guam's environmental conditions and shall be incorporated in building designs whenever possible.

Guidelines

- In general, utilize shelf-fin assemblies, flat awnings, or louvered sun shades
- Integrate shading elements with the building architecture and construction to avoid a stuck on look
- If pre-manufactured aluminum louvered sun shades are used, ensure that they are designed to withstand Guam's typhoon conditions and shall have anodized finish
- For effectiveness, project shelves a minimum of 18" from the exterior wall; project fins a minimum of 12"
- Slope the tops of concrete awnings a minimum of 1/4" per foot to allow water to run off
- Design shading elements to be passive, permanent fixtures; avoid mechanical shading elements that rotate with the sun's position

SUSTAINABILITY

- Use a combination of exterior and interior shelves to help reflect natural light deeper into interior spaces
- Install light shelves in combination with clerestory windows near ceiling levels to increase daylighting into interior spaces
- Where possible, consider integrating BIPV on shelves and awnings

BEST MANAGEMENT PRACTICES

- Vertical fins are most effective on near-east, near-west, and north exposures
- Slanted vertical fins are most effective on east and west exposures; slant fins toward the north
- Deep shelves are most effective on southern exposures
- Design shading elements to withstand design wind pressures for Guam
- Design shading elements to allow safe and easy operation and maintenance of windows

Shelf and fin assembly

Concrete flat awning

Pre-manufactured louver sun shade; must meet the design wind pressures for Guam

GUTTERS, DRAINS, AND DOWNSPOUTS

Gutters, drains, and downspouts capture and transfer rain water from roofs to storm water drainage systems or rain water collection containers.

All buildings in the installation, except for minor utility structures, shall incorporate gutters, drains, and downspouts as part of the roof drainage system.

Guidelines

- Provide gutters at all pitched roofs; do not allow rain water to spill off of roofs
- Design gutters as boxed sections, formed as an integral part of the concrete roof structure; form gutter fascias with simple profiles to add visual interest to roof eaves
- Specify downspouts to be stainless steel or epoxy-painted cast iron; utilize round or rectangular cross sections
- Specify roof drains to be stainless steel or cast iron with an epoxy coat finish, with flashing clamps, and cast iron or cast aluminum domes
- Provide elongated concrete splash blocks at downspouts that discharge directly onto unpaved surfaces
- Utilize leader (conductor) heads in combination with downspouts as character defining elements

Concrete integrated gutter with simple fascia profile

Various leader head profiles

Elongated concrete splash block where downspout discharges onto unpaved areas

SUSTAINABILITY

- Connect gutters and downspouts to rain water harvesting systems where appropriate
- Where applicable, ensure that rain water runoff is discharged to LID systems
- Discharge water directly onto vegetated areas rather than paved areas

BEST MANAGEMENT PRACTICES

- Do not locate drain pipes within interior spaces; place roof drains at the edges of low slope roofs
- Do not allow downspouts to discharge onto walkway surfaces; route downspouts near building entrances through planter boxes or lateral downspout runs rather than underground piping
- Avoid encasing downspouts in concrete columns
- Size downspouts appropriately *(general rule of thumb: 1 square inch of downspout cross section to100 SF of roof drained)*
- Design gutters, drains and downspouts to withstand design wind pressures for Guam

TYPHOON SHUTTERS

Typhoon shutters are operable, shield-like covers that protect fenestration during storms. Due to the frequency of typhoons in the Marianas, typhoon shutters have become necessary design elements in the Guam architectural vernacular.

All buildings in the installation shall incorporate typhoon shutters to protect exposed windows and doors as required by code for protection of openings.

Guidelines

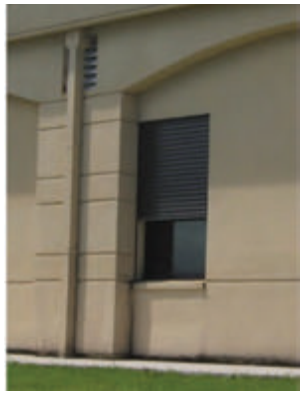
- Utilize overhead, rolling (coiling) type shutters, accordion shutters, or Colonial style (hinged) shutters with polycarbonate protective covers
- Specify shutters, housing, and components to be anodized aluminum with stainless steel fasteners; select finishes compatible with the color scheme for the building and IAP district
- Specify shutter operation to be manual; avoid electrically-operated shutters unless they are functionally necessary
- Incorporate shutter assembly with the building construction and/or fenestration opening so that the shutter assembly appears integrated with the window design rather than attached
- Whenever possible, inset the shutter housing for overhead coiling shutters into the interior; avoid surface attaching housings to exterior wall surfaces

SUSTAINABILITY

- Specify and utilize shutters containing recycled content if available
- Specify and utilize shutters that are locally available

BEST MANAGEMENT PRACTICES

- Specify and utilize shutters that will withstand the design wind pressures for Guam
- Specify and utilize shutters that will meet the code required impact resistance standards for Guam
- Coordinate shutter sizes with window sizes and vice versa; ensure that shutters are not designed excessively large such that binding due to wind pressures would restrain shutter operation



Overhead rolling shutter integrated seamlessly with building construction

Accordion shutters integrated with the window opening and design (does not appear attached)

Colonial style (hinged) shutters with integrated polycarbonate protective covers on back side of shutter panels

TRIMS AND SURFACE ARTICULATION

Trims and surface articulation are architectural elements that add visual interest and texture to otherwise plain building surfaces.

Trims and surface articulation may be utilized as appropriate to enhance the exterior appearance of buildings and moderate the visual massing and scale of facilities in the installation.

Guidelines

- Utilize simple profiles for trims and cornices; use "V" or similar profiles at score lines to help shed rain water
- Utilize base trims at the level of ground floor window sills to emphasize a building base
- Utilize cornices with simple profiles at low slope roof fascias to give interest to roof edges
- Utilize score lines to subdivide wall surfaces with patterns to break up the scale of large walls
- Utilize expressed structural elements to enhance the rhythm of building bays and provide interest to exterior walls
- Design trims and surface articulation as integral parts of the exterior wall; as much as possible, avoid attaching or adhering trims to exterior walls

Example of corniced roof edges and score lines

Example of expressed structural elements and score lines

Example of base trim and profiled recesses

SUSTAINABILITY

- Where available, utilize hardened trim materials that contain recycled content

BEST MANAGEMENT PRACTICES

- Do not use EIFS at exterior walls to build up trims, banding, or cornices
- If trims must be attached, utilize hardened materials such as glass fiber reinforced concrete (GFRC) for trims and utilize attachment methods to meet Guam's wind speed criteria
- Design trims and cornices to withstand design wind pressures for Guam

DECORATIVE PANELS AND GRILLES

Decorative panels and grilles are bas relief or punched panels embedded into building exterior wall surfaces. Primarily a decorative element, panels and grilles help to articulate and enhance building façades.

Decorative panels and grilles shall be utilized where appropriate on buildings in the installation to enhance their appearance and to give them a more tropical look.

Guidelines

- Utilize decorative elements in the form of panels, grilles, spandrels, banding, and railings
- Utilize Chamorro symbols to develop the decorative patterns and motifs for panels and grilles (see section on Chamorro symbols)
- Design patterns and motifs to be abstract rather than literal
- Place panels and grilles on the parts of buildings that will have high visibility, such as at entrances and street-facing façades
- Size panels in proportion to building façades; avoid overly large panels that could overwhelm the building design
- Utilize cementitious materials such as GFRC to construct the panels and grilles
- Do not utilize EIFS in the construction of panels or grilles

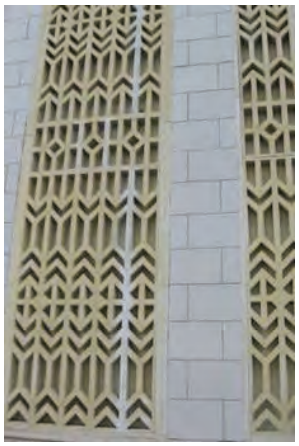
SUSTAINABILITY

- Whenever possible, utilize materials that contain recycled content or locally available in Guam

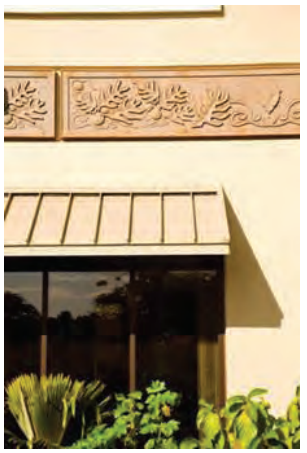
BEST MANAGEMENT PRACTICES

- Utilize local artists to design patterns and motifs for use on panels and grilles
- In addition to the symbols illustrated in this manual, designers are encouraged to explore the Chamorro cultural history for additional icons and themes that may be appropriate for use in this application
- Design panels and grilles to withstand design wind pressures for Guam

Example of decorative panel



Example of patterned decorative grille



Example of decorative banding

Note: Examples shown for illustrative purposes only. Utilize Chamorro symbols to develop patterns for panels, grills and banding.

SERVICE EQUIPMENT ENCLOSURES

Service equipment enclosures screen unsightly mechanical and electrical equipment, trash containers, recycling bins, and other appurtenances and protect them from typhoons and vandalism.

Service equipment and appurtenances shall be located within buildings whenever possible. Service equipment that is placed outdoors shall be screened and protected within walled enclosures.

Guidelines

- Locate service equipment enclosures on the less visible side of buildings; utilize landscaping to soften the walls
- Utilize solid concrete or concrete masonry unit (CMU) construction for enclosure walls; Refer to Chapter 5 Landscape Architecture for design guidance for screen walls
- Design enclosure walls to meet required equipment ventilation clearances between the equipment and walls; decorative CMU blocks are acceptable only at situations where they are required by code or equipment installation standards to meet ventilation requirements
- Design heights of enclosure walls to comfortably screen the entire equipment
- Where possible, integrate enclosure walls with the building architecture to achieve an integrated design
- Provide landscaping around enclosures in accordance with Chapter 5

Solid enclosure wall - preferred

Punched CMU blocks to be used only if required for ventilation

Chainlink enclosure at top of enclosure wall to meet AT/FP requirements

SUSTAINABILITY

- CMU punched blocks, if used, must withstand design wind pressures for Guam and meet code requirements for impact resistance
- Provide solid operable covers at Ground PV enclosures to protect PV panels during typhoons

AT/FP CONSIDERATIONS

- Locate electrical and mechanical equipment outside the unobstructed space for buildings; closer placement is possible if equipment provides no opportunity to conceal explosive devices
- Place trash enclosures the correct distances from inhabited buildings per UFC requirements
- Close off and secure all sides and tops of enclosures placed within the unobstructed space; limit openings and gaps to 6 inches or less
- Utilize chain link to close off tops of walled enclosures if the top enclosure is necessary

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Exterior building color is one of the most visible elements of installation design. The appropriate color selection can unify and enhance installation appearance.

The primary objectives of the Building Color Design Guide are to:

- Establish a basic and unified exterior color palette for buildings in Marine Corps Base Guam
- Provide guidance for color selection and application of paint finishes
- Outline an approval process for proposed color schemes for new and renovation projects

Guidelines in this chapter include the following:

- Application of The Guidelines
- References
- Color Selection
- Color Assignments to Building Components
- Technical Application
- Approval Process

APPLICATION OF THE GUIDELINES

These guidelines shall apply to all buildings, new and renovated, at Marine Corps Base Guam.

As the base is developed, clues shall be taken from existing buildings for elements of consistency. However, designers are encouraged to creatively use the Color Palettes to avoid monotony. The different color palettes for the Installation Appearance Plan (IAP) Functional Districts will help distinguish the different general use areas on base. In particular, the downtown Personnel Support Functional District should have a range of color applications.

The Design Review Board (DRB) shall review color proposals during the development of building designs. Mock-ups of building colors are essential for evaluating proposed color schemes and should be included in design contracts.

REFERENCES

- Unified Facility Guide Specifications (UFGS) Division 09 Finishes Section 09 90 00 Paints and Coatings (http://www.wbdg.org)
- Master Painter's Institute (MPI) Green Performance™ Standard GPS-1-08 & GPS-2-08 (http://www.paintinfo.com/)
- MPI Architectural Painting Specifications Manual
- MPI Maintenance Repainting Manual Guide Specification Revision
- Paint Manufacturer's Technical Data

COLOR SELECTION

Carefully selected colors enhance the appearance of buildings, contribute to the overall image of the installation, and achieve cost savings through the use of appropriate colors and materials that reduce maintenance.

Color Selections were based on the following considerations:

- Island architecture (for local compatibility)
- Neighboring Air Force and Navy installations colors (to distinguish among the installation appearances)
- Pre-selected building elements (dark bronze anodized)
- Military uniform colors (to ensure building colors complement and contrast with the uniform colors)
- Environmental conditions including:
  - Ultraviolet (UV) light
  - Glare
  - Red dirt, mold, and other building contaminants
- IAP Functional Districts (to provide visual clues to differentiate between work vs. living areas)

  The IAP Functional Districts at Marine Corps Base Guam are:
  - Industrial
  - Administrative/Training
  - Personnel Support (Bachelor Quarters (BQ) and other personnel support)

Color recommendations for family housing are not included in this IAP.

Color Palettes

Industrial Color Palette (Figure 4.1)

The palette for the Industrial Functional District is a simple scheme that includes two medium body colors for use on larger buildings to avoid glare and a light body color for smaller buildings. There is one base color and one accent color.

The industrial Functional District accent color is gray.

In general, the colors in this palette are in the cool range.

Administrative/Training Color Palette (Figure 4.2)

Color selections of the Administrative/ Training Color Palette are interchangeable. The light and dark body colors from Schemes 1 and 2 can be used interchangeably, and the two accent colors can be used with any of the four possible body color combinations.

The Administrative / Training Functional District accent color is green.

Per Chapter 3 Architecture, tile roofs are recommended for prominent buildings such as headquarters buildings. Tile roof color shall be selected using the following section on tile roofs.

Personnel Support Color Palettes

The Personnel Support Functional District serves as the heart of the installation and downtown. It is highly visible after entering through the main gate. Four color palettes are provided to create variety and interest in this area.

The Personnel Support Color Palette is divided into two categories:

Bachelor Housing *(Figure 4.3)*

Other Personnel Support *(Figure 4.4)*

Each category includes two color schemes, one cool and one warm. For continuity and unity, this district has one base color and one Functional District Accent color for all four palettes.

The Personnel Support Functional District accent color is ochre.

The components of these schemes are not interchangeable and roof colors should be used as assigned. Thoughtful application of the four color schemes will provide sufficient variety and interest to create a true town center.

Color Systems

The color palettes in *Figures 4.1 to 4.4* reference the following industry color systems for color matching:

- Benjamin Moore paint color system for the building colors (Accent, Trim, Body and Base). It is an example of a quality paint system with low/no VOC options and readily available color chips
- Topcoat Roof membrane colors for membrane type roofs (Roof)

Tile Roofs

For tile roofs, on selected high profile buildings, the standard to match is the Santafé Roofing blend of 10% Red (TSNT), 20% Peach (TSGP), 20% Galeras (TSGRG), 25% Avocado (TSGVG) and 25% Amazon (TSEVA). The tile roof color blend was inspired by the roofs of the Spanish period in Guam and influenced by the aged patina of weathered roofs of historic buildings of Guam.

The use of a multi-colored tile roof material for all tile roofs on base is part of a long-term maintenance strategy. It can be used with all of the building color palettes in *Figures 4.1 to 4.4* and the required backup tile supply for maintenance can be limited to one material. Individual replacement tiles when needed would be barely perceptible among the mix of colors in a multi-colored tile roof.

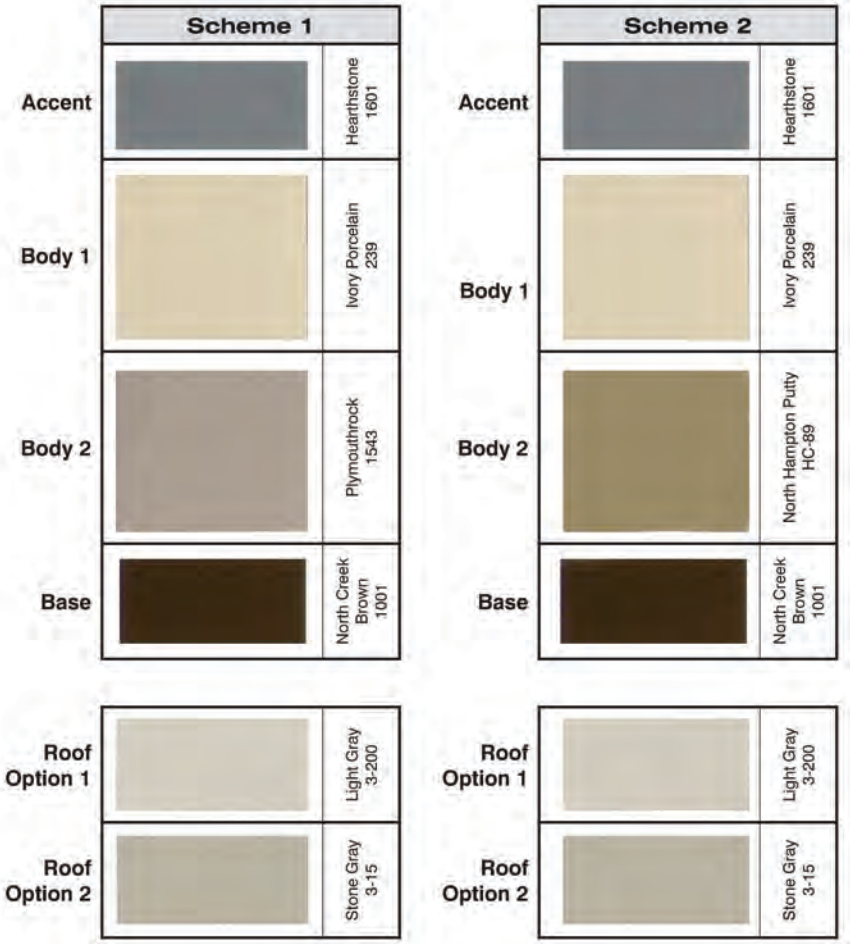
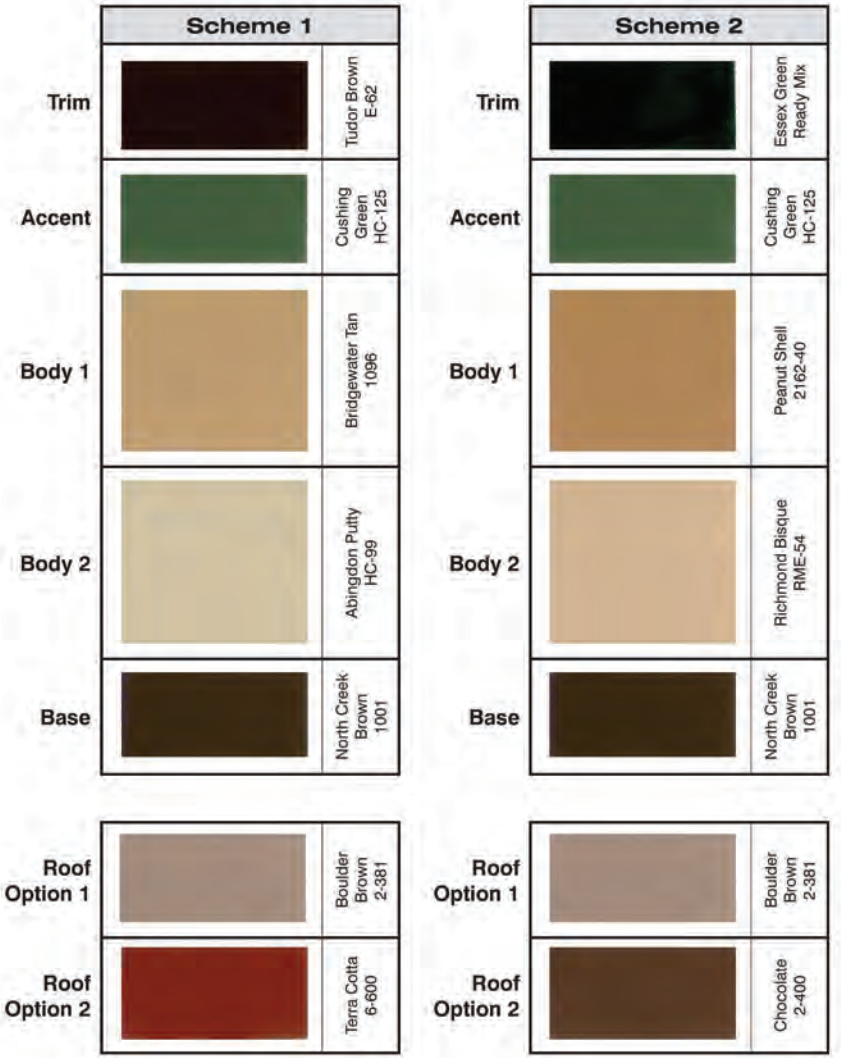


Figure 4.1 Industrial Functional District Color Palette

Accent, Body, Base, Trim = Benjamin Moore Paint System
Roof = Topcoat Roof Colors



Tile roofs are recommended for the prominent buildings such as headquarters

Figure 4.2 Administrative/Training Functional District Color Palette

Note: Printed colors are only a general indication of the colors to be used. Do not match colors shown on this page. Match only to Benjamin Moore and Topcoat Roof color samples.

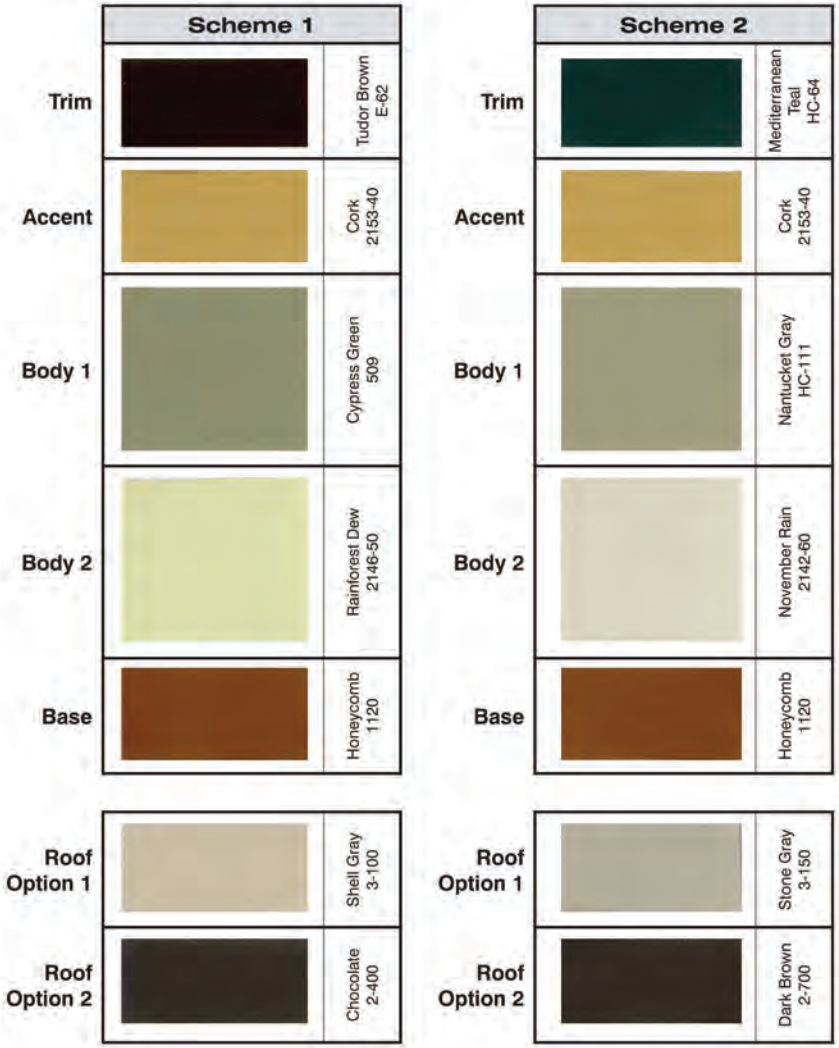


Figure 4.3 Personnel Support Functional District: Bachelor Housing

Accent, Body, Base, Trim = Benjamin Moore Paint System
Roof = Topcoat Roof Colors

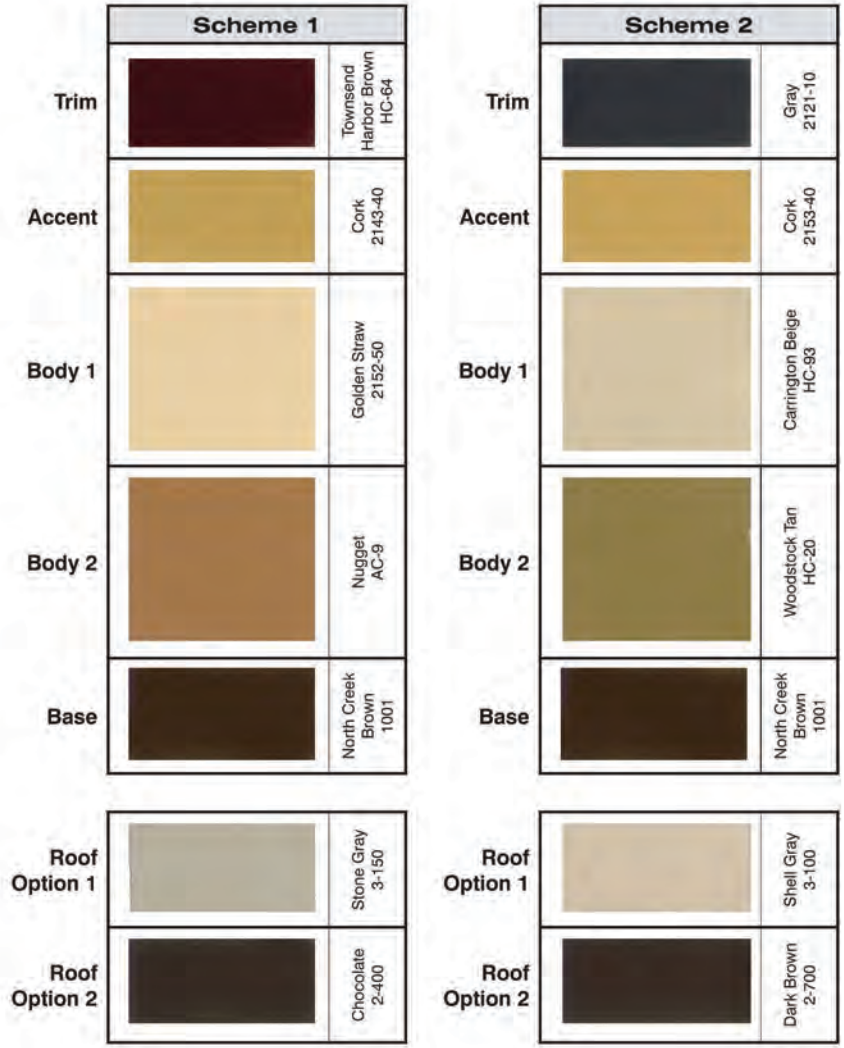


Figure 4.4 Personnel Support Functional District: Non-Bachelor Housing

Accent, Body, Base, Trim = Benjamin Moore Paint System
Roof = Topcoat Roof Colors

Note: Printed colors are only a general indication of the colors to be used. Do not match colors shown on this page. Match only to Benjamin Moore and Topcoat color samples.

COLOR ASSIGNMENT TO BUILDING COMPONENTS

The color palettes list building colors based on the architectural components to which the colors are applied; they are shown in *Figure 4.5* and described below. Not all building colors need to be used on each building; they should be used as appropriate to highlight architectural features, aide in building maintenance, and provide variety within the functional district. Color assignments for architectural components not shown are left to the designer's discretion.

Body (B)

The dominant surface mass of a structure is the body.

The Body 1 color with the accent color exemplifies the district. However, not all buildings are suited for either a very light or medium/dark body color. Therefore, a second body color (Body 2) is provided to used where architecturally appropriate and to provide variety within the functional district. Protruding elements such as pilasters and spandrel beams, can be highlighted using the lighter body color while utilizing the darker body color on the flat planes. This can serve to enhance building texture and avoid a flat appearance.

Trim / Accent (T/A)

Typical trim elements include doors, window sashes, sills, railings, fascias, and canopies. Typical accents include flashings and fascias and can also include such items as doors, handrails, shutters, and signage.

These colors can be used for the above elements as well as other similar architectural components such as awnings and wall fins. For pre-finished aluminum doors, windows, and accessories, refer to Chapter 3 Architecture for finishes.

Base or Kicker (K)

Base or kicker refers to the bottom area of a wall subject to dirt accumulation. Kicker or base colors are used for planter walls, kicker (exterior 'wainscot'), and finishes. In general, the base should be proportioned to the size of the building but should not be less than 18 inches in height.

Base or Kicker (K) Base bottom areas are dark colors to help hide dirt staining and other discolorations that are prevalent with this area of the elevations. The dark colors help keep the building appearance and helps with maintenance.

Roof Colors (Painted Roofs)

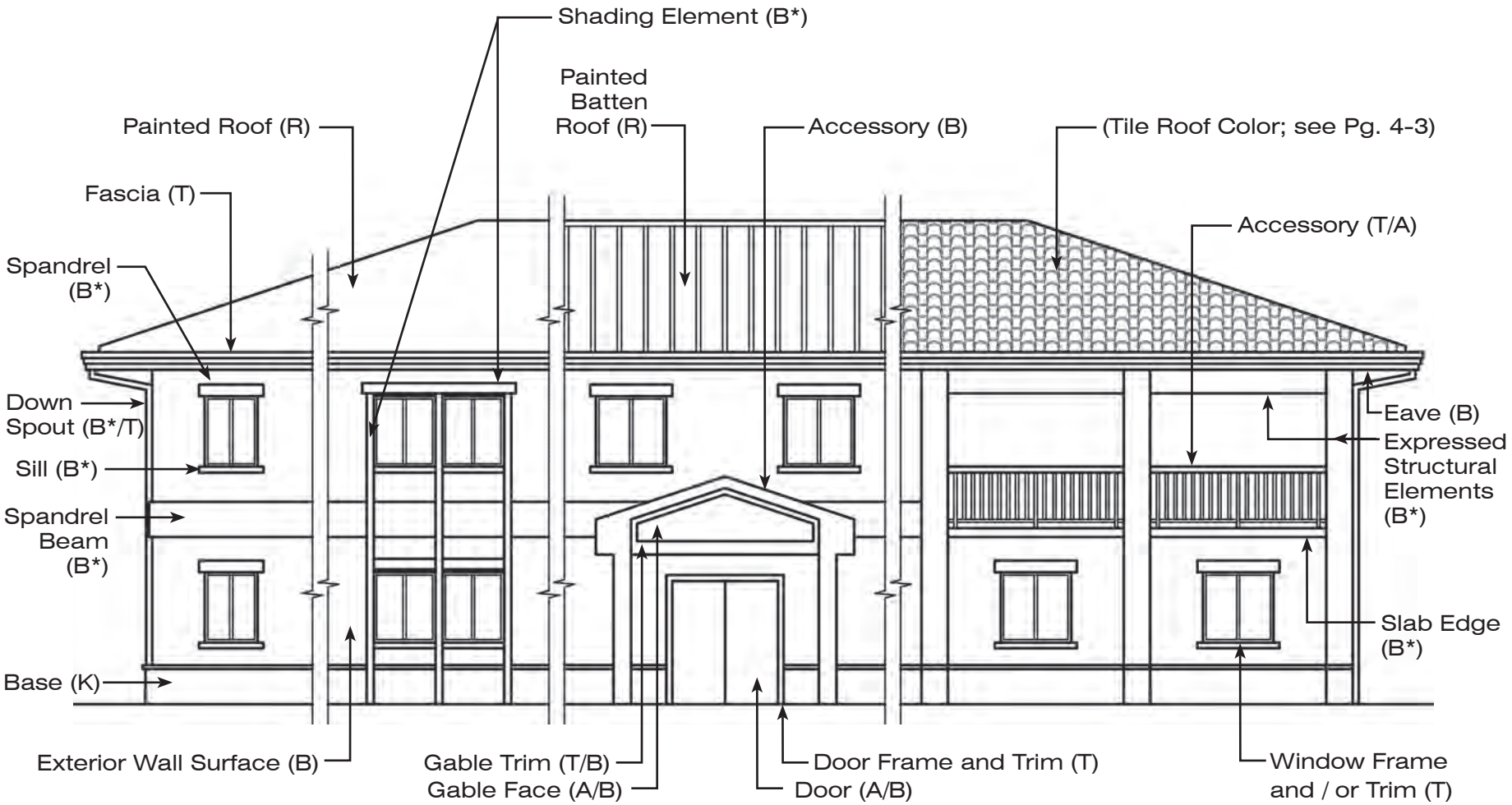
Initial selection of sloped roof colors should be made using the provided color palette for roof colors. The colors presented are for painted roofs only. See earlier section on Tile Roofs for color selection for tile roofs.

Designers then should match the selected color, as best they can, to available roofing colors for the roofing material selected. For the sake of variety, two roof options are provided for each color palette. The first option should be used for large roof areas, and the other options can be used for smaller buildings. For every palette a light-colored roof option is provided to help meet solar refection requirements for cool roofs.

Dark-colored cool roofing materials, which utilize infrared reflective pigments to reflect solar heat, are available and help to meet sustainability goals in addition to aesthetic goals.

Low slope roofs should utilize light reflective colors whenever possible to reduce solar heat gain, which tends to be greater on horizontal surfaces.

Where a two story or greater building has occupants looking down on a building roof, consider using a sloped roof with a roof color to minimize glare for those viewing it from above.



B* - These elements may be painted in the contrasting body color.

Note: Utilities should be painted a neutral or receding color in order to blend into the landscape.

B = Body Color
T = Trim Color
A = Accent Color
K = Base/Kicker Color
R = Roof

Figure 4.5 Building Components and Trim Elements

TECHNICAL APPLICATION

This section contains standard material application procedures to achieve a well-prepared and finished surface. The Master Painter's Institute and Unified Facility Guide Specifications provide industry standards that must be followed for the proper application of finish materials.

Color Samples

The review of color samples is an important step in ensuring that the selected colors are the intended colors. See Color Approval Processes in the following section for more details.

Paint System

Existing surface conditions must be considered when selecting specific paints. The type of paint or product ultimately used will vary with the type of substrate. Anodized aluminum and stainless steel should not be painted.

A semi-gloss paint is recommended for most applications. Flat paint should not be used except for soffits.

Due to the effects of dirt, heat and moisture on surface adhesion, substrates should be cleaned and filled prior to primer and/or finish applications.

Primers must be compatible with existing or new materials. Finish coatings should be selected to withstand fading, salt, soiling, mold, and mildew.

Application

Color changes should occur at architectural feature changes e.g. from horizontal to vertical, surface mounted trims, grooves in the surfaces and at corners. Color changes shall not be a painted line dividing a surface or plain.

Proper techniques and tools should be specified to meet manufacturers' conditional warranties and general requirements for achieving the best possible finishes.

Methods of application will vary depending on the type of material - e.g. stucco, concrete, metal (sheet or corrugated). Types of applicators used such as spray (airless or compressor), roll, or brush, will also vary according to the job location and area coverage required.

Spray applications are not generally recommended as paint spray can stray onto nearby trees, facilities, and vehicles. If proposed, written request to apply paint by spray application should be submitted to the Contracting Officer for approval prior to beginning work.

During all phases of preparation and finish application, the weather and surface conditions should be monitored to ensure that paint products will adhere properly. Manufacturers' recommendations concerning acceptable weather and surface conditions must be followed.

References

Please see the References box on page 4-2 for the standards in paint selection and application, and surface preparation.

COLOR APPROVAL PROCESSES

The color approval process assures that quality materials are utilized and applied correctly.

The two approval processes to be followed for all painting projects (new and existing facilities) are:

- Color Assignment Approval
- Application Process Approval

Both approval processes should be facilitated by the DRB.

The DRB shall assure the continuity of color selection, product quality, appropriate historic treatment, and correct architectural component designations for Station facilities. The DRB should review projects to ensure a variety of color schemes and roof colors among projects proceeding concurrently or consecutively. Details of the DRB Review Process and Team are provided in Chapter 7.

Color Assignment Approval

For approval of color assignments for all buildings, designers shall be required to submit **front, back, and side elevations** illustrating the proposed paint schemes, complete with corresponding paint chips.

For more complex buildings a complete and detailed color mock-up shall be required to illustrate the intended visual outcome *(Figure 4.6)*. Colors may be applied using a computer generated program and color chips attached to show actual colors. Note: The use of paint chips at this step in the approval process does not preclude the requirement for submittal of brush outs.

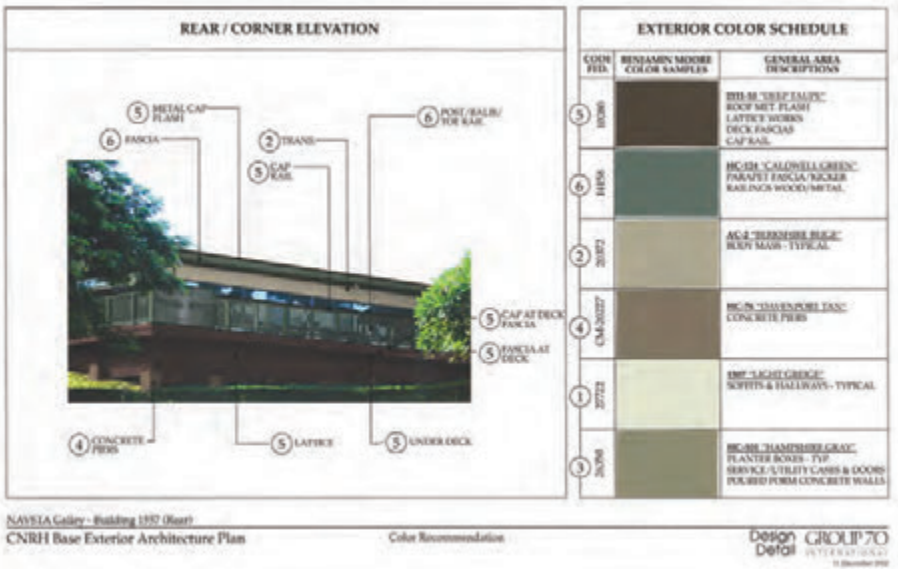


Figure 4.6 Example Color Mock-up

Color Selection | Color Assignment to Building Components | Technical Application | **Approval Process** | Paint

Application Process Approval

A description of the technical surface preparation, paint application and materials list must be provided and approved prior to the start of each project. Designers shall adhere to the applicable specifications listed in the resources box on the first page of this chapter.

Sample brush outs for each project shall be required. Brush outs are coats of paint brushed onto stiff paper (minimum size 8.5 x 11 inches) to show the proposed paint colors and sheens. Because paint formulations vary by manufacturer, these brush outs should be checked to ensure color consistency across the installation. Review of brushouts under daylight is encouraged to observe truer color renditions than would be observed under artificial lighting. This review process should take no longer than two weeks.

Also, 3 foot by 3 foot samples of physical **building brush outs** of body color and 3 foot sections of trim color adjacent to the body color shall be provided and approved in writing by the Contracting Officer's Technical Representative (COTR) before the painting contractor is allowed to proceed. This review process should take no longer than one week.

The COTR shall be responsible for checking the work of the contractor prior to and during the painting process.

Landscape architecture is an essential component of urban design that together with architectural design, roadway and pedestrian circulation, and public outdoor spaces, creates a complete built environment

Through the arrangement of planting, landforms, and site amenities, landscape architecture helps create environments that are useful, aesthetically pleasing, safe, and enjoyable.

Although landscape architecture provides tangible benefits for the environment, it is often deleted from the final project scope due to cost constraints, resulting in barren, harsh, and unattractive sites and facilities. In Guam, regularly occurring typhoons provide another constraint that may preclude the installation of landscaping on projects.

It is the goal of Marine Corps Base Guam to implement appropriate and responsible landscape architecture throughout the installation, in line with budget allowances and considerations for the unique tropical conditions of Guam.

In general, landscape architecture should be provided to:

- Enhance and organize the installation environment
- Visually organize buildings or a complex of buildings
- Enhance the installation architecture
- Link facilities with pedestrian connections
- Facilitate sustainability
- Encourage the use of outdoor facilities

Whenever possible, projects should allocate the industry standard of 3-4% of new construction costs for landscape architecture. These costs should be moderated with the unique requirements of the project and the master development plan for the installation to ensure that the appropriate, rather than minimum, amount of landscape architecture is installed.

This chapter provides guidance for landscape architecture in two sections: landscaping and site amenities. The landscaping section focuses on the planned arrangement of planting and natural landforms. The site amenities section focuses on the integration of built forms and furnishings that provide for the comfort, convenience, or enjoyment of a site. Both landscaping and site amenities contribute to the overall makeup of landscape architecture.

APPLICATION OF THE GUIDELINES

The landscape architecture guidelines shall apply to all landscaping and site amenities in Marine Corps Base Guam except for family housing. Family housing guidance to be provided by the Public Private Venture (PPV) and subject to review by the Natural Resources Project Manager. Since landscaping affects other topics in these guidelines, designers shall coordinate the guidance of this chapter with other chapters to minimize possible conflicts.

The landscape architecture chapter provides guidance for required and desired landscaping and site amenities for the installation. Designers shall consult the master development plan to coordinate landscape architecture elements with the overall installation site layout. Where these guidelines provide options, designers may select from the elements presented to accommodate the specific requirements of the project.

Some of the graphic presentations in this chapter are meant to illustrate the concepts presented and to provide visual reference for preferred elements. The intent of providing these suggestions is to increase communication between designers and the installation Design Review Board (DRB) on achieving the desired character for the installation.

Designers shall coordinate early with the DRB to ensure that they are meeting the landscaping goals for the installation. The DRB will have final decision on development proposals for landscaping and site amenities.

REFERENCES

PUBLICATIONS

- UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings
- UFC 3-210-10 and UFC 3-210-10N DoD Low Impact Development
- UFC 4-030-01 DoD Sustainable Development
- NAVFAC Comprehensive Drainage and Low Impact Development Implementation Study, April 2010
- MIL-HDBK-1013/10 Military Handbook, Design Guidelines for Security Fencing, Gates, Barriers, and Guard Facilities
- UFC 3-210-02 POV Site Circulation and Parking
- Guam Landscaping Guideline's Approved Native and Non-Native Plant Lists

WEBSITES

- Whole Building Design Guide, Landscape Architecture *http://www.wbdg.org/design/dd_landscapearch.php*
- Whole Building Design Guide, Low Impact Development Technologies *http://www.wbdg.org/resources/lidtech.php*
- Whole Building Design Guide, Landscape Architecture and the Site Security Design Process *http://www.wbdg.org/resources/landscape_sitesecurity.php*
- United States Green Building Council *http://www.usgbc.org/*

Landscaping

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LANDSCAPING

The overall objective of the landscaping at the Marine Corps Base Guam is to enhance the visual character and environmental quality of the installation and thereby improve the physical and psychological well being of the people who live and work there. This can be achieved by using plant material to:

- Blend the built environment with the natural environment
- Provide scale and comfort to pedestrian environments
- Reinforce the hierarchy of the circulation systems and assist in intuitive wayfinding
- Screen unsightly views or elements
- Buffer different land uses
- Reduce heat in parking lots and other large paved areas
- Accent key places or elements
- Be appropriate with the culture and environment by using plants native to the region

The landscaping design guide is intended to provide a comprehensive program to incorporate landscaping into the installation's physical setting. In this section are subsections on:

- Landscape Character
  - Presenting the United States Marine Corps (USMC) Image
  - Balance of Variety and Consistency
  - Guam Tropical Landscape Design
  - Chamorro Culture
- Landscape Planning
  - Landscaping Benefits
  - Plant Protection and Preservation
  - Designing for Minimal Maintenance
  - Minimizing Wind Damage
- Landscape Design Guidelines
- Street Trees
- Parking Lot Planting
- Facility Planting
- Open Space Planting
- Image Planting
- Screening and Buffering
- Plant Material
  - Approved Native and Non-Native Plant Lists
  - Native Plants
  - Invasive Species
  - Restricted Species
  - Size of Plant Material

Landscape elements not covered in these guidelines may be utilized, but they should complement, not clash with, the Installation Appearance Plan (IAP) guidance. Species not identified on the approved plant lists would need to be approved by the Natural Resources Program Manager.

LANDSCAPE CHARACTER

The landscape character for Marine Corps Base Guam is intended to present a USMC image, be consistent across the installation, express variation to avoid monotony, and reflect the local cultural sense of place.

To achieve the intended character, the landscape shall reflect a tropical design that blends native and adaptive plants in a design expression that meets the standards, ideals, and functions of the USMC.

In general, the landscape shall:

- Incorporate durable plant material and landscape features
- Incorporate native and approved non-native plants that are appropriate to the climate, especially the ability to survive typhoons
- Commemorate the culture of Guam through the use of native plants and design motifs

Presenting the USMC Image

Landscaping at the Marine Corps Base Guam should reflect the USMC values of "honor, courage, and commitment" through landscape designs that are timeless, durable and honest. To achieve this, landscape designs shall:

- Be clean and simple
- Express a timeless quality through designs that are enduring and not faddish or trendy
- Be durable and withstand the environmental conditions

Balance of Variety and Consistency

The landscape design of Marine Corps Base Guam can provide a unifying element by blending, screening and softening the variety of architectural forms and expressions, as well as provide buffers or transitional areas between different land uses.

While landscape design should be coordinated to provide a consistent landscape character, effort should also be made to provide variety and interest. The key is to find a balance between consistency and variety.

Guam Tropical Landscape Design

Landscape designs in the tropics generally focus on design strategies to deal with heat, humidity and rain.

Landscaping on Guam presents some challenges unique to tropical climates. The ease of establishing ornamental plants can result in poor species choices, poor placement, and overplanting. In addition, regularly occurring typhoons create additional challenges, as much of the damage is to vegetation. The selection of plant materials that are wind resistant and have been sufficiently tested in ornamental landscapes is critical.

The Guam Landscaping Guideline's Approved Native and Non-Native Plant Lists identify a variety of plant materials that are appropriate for Marine Corps Base Guam and compatible with existing plant materials.

Chamorro Culture

In support of Executive Order 13148, Beneficial Landscaping, it is Navy policy to "use regionally native plants for landscaping". Native plants are not only beautiful and practical, but beneficial to the environment. They have adapted to survive in climatic conditions that exist in the area and often require less water, care and maintenance. Native plants also furnish shelter and food for native wildlife.

Native plants are also an important part of a region's cultural heritage. These plants were intertwined with the daily lives of Chamorros as they served as sources of medicine, fiber, fuel, food and wood.

In addition to these native plants, the Chamorros introduced useful plants like breadfruit, lime and banana to Guam. Plants such as these can be incorporated in community gardens in the family housing area.

The planting of native trees will serve as a means through which people might learn about the Chamorro culture. For example, the planting of Pahong (Pandanus tectorius) can provide materials for the traditional art of weaving, while the seeds of the Fish-Kill Tree or Puteng (Barringtonia asiatica) was used for the floats of fishing nets.

Leaves of Pandanus are used for weaving

Seeds of Fish-Kill Tree or Puteng (Barringtonia Asiatica) were used for floats

LANDSCAPE PLANNING

Good landscape planning can positively affect the visual environment of the installation and reduce maintenance costs. Choosing appropriate plant material for a given location and properly locating the plants are key in creating excellent landscaping.

Landscape planning elements discussed in this section include:

- Landscaping Benefits
- Plant Protection and Preservation
- Design for Minimal Maintenance
- Minimizing Wind Damage

All landscape plans shall be prepared and stamped by a licensed and/or Navy landscape architect and shall be approved by the Natural Resources Program Manager.

General Design Principles

- Provide canopy trees to shade pedestrian environments, wall faces, parking lots and other large paved areas
- Minimize unnecessary paved areas to reduce solar heat gain and glare
- Provide maintenance strips around buildings to promote increased air circulation and reduce the occurrence of mold and rot
- Provide only a temporary irrigation system during the plant establishment period due to the annual rainfall
- Use plants with higher wind tolerance
- Group or clump several plant species together to increase survivorship and recovery after typhoons
- Minimize the use of formal tree/palm plantings which can have a “missing tooth” appearance if trees/palms are lost
- Use plants with higher salt tolerance

Tree Heliotrope or Hunik (Tournefortia argentea); native tree that has high wind, drought and salt tolerance, and is low maintenance

Planting trees in clusters or groupings of at least five trees increases survivorship during typhoons

Landscaping Benefits

The benefits of integrating landscaping, especially trees, into project designs go far beyond aesthetics. While it is true that plant materials can be used to provide accent and color, screen and enhance views, soften building facades, blend incompatible architectural styles, and establish visual corridors for circulation systems, they also provide less tangible benefits such as social, economic, health and environmental benefits.

The increased attention being paid to global warming causes and impacts has also provided increased awareness of the valuable services that trees provide: they reduce energy consumption, trap and filter stormwater, clean the air by intercepting air pollutants, and sequester carbon dioxide.

In general, plant trees instead of shrubs whenever possible to maximize the benefits to the environment. Select the largest trees possible to achieve maximum effect.

Temperature modification; reinforced grass paving at fire lane reduces ambient air temperature and decreases amount of impervious surface, while landscaped earth berm used for AT/FP

SUSTAINABILITY

- Energy Conservation - The placement of plant materials can significantly increase energy efficiency by shading buildings
- Wildlife Conservation - Plant materials support native wildlife habitats by furnishing shelter and food
- Temperature Modification - Plant materials reduce the ambient air temperature and stabilize temperatures, decreasing extremes
- Reduce Stormwater Runoff and Improve Hydrology – Plant materials intercept and store rainfall, delaying the onset of peak flows
- Erosion and Dust Control - Plant material reduces splash and runoff or sheet flow erosion and controls dust by stabilizing the soil
- Offsetting Greenhouse Gas Emissions – The use of plant materials with high carbon sequestration values is one of the most cost-effective ways in helping offset greenhouse gas emissions; refer to the GJMMP Sustainability Program Summary Report (April 2010 draft) for the five primary landscape prototypes and the recommended carbon sequestration strategies. Use only plants that are also listed in the Guam Landscaping Guidelines.
- Ozone Reduction – The use of canopy trees to shade parked cars reduces the production of ozone
- Improve Air Quality – Plant materials absorb gaseous pollutants through leaf surfaces, intercept particulate matter and release oxygen through photosynthesis

Plant Protection and Preservation

An important element of landscape planning is protecting and preserving appropriate existing plant resources. The following guidance should be applied where possible:

- Preserve existing trees that are in good health
- Wherever possible, plan construction to preserve significant trees, and protect trees from damage during clearing and construction
- Consider composting the vegetation not suitable for transplanting

Significant trees are determined on a case-by-case basis. Typically, a significant tree is a tree, or grove of trees, with historic or cultural value, or which by reasons of age, rarity, location, size, aesthetic quality or endemic status are worthy of preservation.

In areas where only some of the plant resources can be saved, the following guidance should be applied to maintain the existing landscaping design:

- Replace diseased, deteriorating, or dying mature trees with the same species, as appropriate
- Replace vegetation with mature stock whenever feasible to maintain uniformity with neighboring trees and shrubs

The services of a licensed landscape architect, a certified arborist and/or the Navy Landscape Architect and Navy Biological Monitor shall be utilized to determine which plants should be protected and preserved.

One native tree that is particularly important to Chamorro culture is the Nunu or strangling fig (Ficus prolixa). It is believed that the taotaomo'na or ancestral spirits live in the Nunu. The belief in the taotaomo'na continues today and reflects the Chamorro respect for their ancestors. For this reason, Nunu are rarely removed.

Chamorros believe that taotaomo'na or ancestral spirits reside in Nunu (Ficus prolixa)

Preserve significant trees, where feasible at Finegayan

Designing for Minimal Maintenance

All landscapes require some degree of maintenance. However, maintenance can be reduced through the selection of appropriate landscaping material, careful siting, and proper installation. The landscape planning phase is the ideal time to make decisions that can greatly reduce ongoing maintenance costs.

Appendix A provides a comprehensive list of guidelines that should be applied to ensure that landscape projects are designed for minimal maintenance.

General Design Principles

- Install high quality plant material of the appropriate size
- Use plants that are native, drought-resistant, low maintenance and pest-resistant wherever possible; often the best plants are native plants that occur naturally in the area and are capable of surviving on natural rainfall; refer to the Guam Landscaping Plan's Approved Native and Non-native Plant Lists for appropriate plant materials
- Provide a minimum 600mm (2ft) wide concrete maintenance strip around the perimeter of buildings; this maintenance strip may double as a walkway if the width is increased to 900mm (3ft); this treatment:
  - Allows room for building painting, window washing, and other regularly scheduled maintenance procedures
  - Provides increased air circulation around the building, which will reduce the occurrence of mold and rot
  - Keeps plants away from the buildings, thereby reducing easy access for termites, cockroaches and other insects
  - Allows for visual inspection for the entry points of insects and pests into the buildings
- Avoid the use of inorganic mulch (e.g., gravel or coral) maintenance strips as the mulch can become projectiles during typhoons

Neisosperma or Fagot (Neisosperma oppositifolia); native tree that has high wind, drought and salt tolerance, and is low maintenance

Pandanus or Kafu (Pandanus tectorius); native tree that has high wind, salt and drought tolerance, and grows well in a variety of soils.

Minimizing Wind Damage

Guam is located in one of the most typhoon prone corridors in the world. During typhoons, wind speeds may reach as high as 190 miles per hour (mph). Because trees typically are adapted to the average wind climate, damages due to storm winds are inevitable.

The goal for Marine Corps Base Guam is to minimize wind damage to landscaping due to typhoons. As tree species vary in their ability to withstand typhoons, refer to the Guam Landscaping Plan's Approved Native and Non-native Plant Lists for appropriate plant material.

In order to **minimize** storm damage:

- Plant trees in clusters or groupings of three to five trees, rather than as single trees; clumping allows for mutual support during high winds, and trees in the inside of groupings are more sheltered than those at the perimeter
- Plant trees where their roots will have room to spread; Trees planted in small spaces, too close to structures, and in shallow or compacted soils tend to fall over more easily
- Plant trees where branches will not overhang or touch overhead utility lines and structures

A healthy and more wind resistant urban forest also depends on managing existing trees and the proper establishment of new trees. Detailed guidance on both pre-storm and post-storm tree care is provided in Appendix B.

Alexandrian Laurel or Daok (Calophyllum inophyllum); native tree that is highly resistant to typhoons

Neisosperma or Fagot (Neisosperma oppositifolia); native tree that has high wind tolerance

LANDSCAPE DESIGN GUIDELINES

Design guidelines are provided to define appropriate uses for plant material. Landscape design solutions for individual projects shall not be considered as isolated entities, but as a component of the surrounding environment.

For all projects at the Marine Corps Base Guam the goal is to use a minimum 50% native trees and shrubs. The other 50% may be native or approved non-invasive, non-native (introduced) plants.

Use plants with the following characteristics, where feasible:

- lower maintenance requirements
- higher wind tolerance
- higher drought tolerance
- higher carbon sequestration values

Selection of appropriate plant species shall be based on the Guam Landscaping Plan's Approved Native and Non-Native Plant Lists.

The following sections discuss guidelines for street trees, parking lot planting, facility planting, open space planting, image planting, and screening and buffering.

Tree Heliotrope or Hunik (Tournefortia argentea); native tree that has high wind, drought and salt tolerance, and is low maintenance

Half-Flower or Nanaso (Scaevola sericea); native shrub that is hardy, fast growing and has high drought and salt tolerance

STREET TREES

The use of landscape, especially street trees, is one of the simplest and most effective ways to enhance the visual quality of the streetscape. Street trees provide an important unifying element to site design by reinforcing the vehicular circulation patterns and are the primary component of urban greening, along with parks and open space.

While the main function of streets is as transportation and utility corridors, and street trees are a secondary use, trees should be considered as part of the roadway infrastructure and included in the planning process.

Function

The function of street trees can be classified into 4 general categories:

- Architectural: continuity, spatial definition, unity, character, screening, buffering
- Engineering: traffic calming, advanced indication of circulation pattern and land use, pedestrian safety, noise abatement, air pollution control, glare and reflection control, water quality improvement
- Aesthetic: general beauty, soften/blend architecture
- Climatic: temperature modification, wind control

The roadway system is the major vantage point from which the installation is viewed; an attractive streetscape enhances the visual image of the installation

Alexandrian Laurel or Daok (Calophyllum inophyllum) at Naval Hospital on Nimitz Hill

Street trees provide unity and aesthetics

Guidelines

- Use regular spacings and uniformly sized trees and palms to provide a formal, regimented appearance
- Use landscaping to highlight intersections and pedestrian crossings for increased safety
- Use special plantings to identify key intersections or districts
- Use tree species to reflect the name of a street or neighborhood
- Provide a landscape buffer between the vehicular and pedestrian ways
- Use planting to screen undesirable views
- Use planting to frame views and vistas
- Use planting to soften the visual expanse of paving and buildings
- Use planting to reduce headlight and other glare
- Consider the location of other streetscape elements in the placement of street trees
- Provide accent and screening planting where necessary
- Locate utilities in corridors to allow room for continuous street tree planting; installing underground utilities within the roadways is the best way to avoid tree root conflicts

SUSTAINABILITY

- Utilize native trees whenever possible
- Utilize trees with higher carbon sequestration values, where feasible
- Locate trees to shade the paving and walkways to reduce the heat island effect and improve walkability
- Locate trees to shade parked cars to reduce ozone emissions
- Utilize medians and parkways for stormwater management and to reduce runoff

BEST MANAGEMENT PRACTICES/CODE DATA

- Planting along streets with parallel parking shall not interfere with easy car door opening
- Avoid narrow planting areas that do not support trees; plant trees only where there is adequate soil and space
- Do not plant trees, except soft-wood species such as Plumeria, closer than 6.1m (20ft) from new or existing utility lines
- Do not plant soft-wood species trees such as Plumeria and palms closer than 1.8m (6ft) from new or existing utility lines
- Provide 4.2m (14ft) clear height of trees over streets
- Provide 2.1m (7ft) clear height of trees over sidewalks
- Provide 2.4m (8ft) wide minimum landscape parkway along arterial and collector roads
- Use tree box filters to promote stormwater infiltration

Diversity

The use of too few street tree species increases the vulnerability of the street tree population to devastation from pest or disease, while the use of too many species diminishes the continuity of the design.

It is common planning practice to note that no one species should be planted such that it causes the total population of that species to exceed 5 to 10 percent of the total street tree population. However, this standard does not often take into account the reality of existing site conditions and the proven adaptability and suitability of available tree species.

While monocultures are discouraged and effort should be made to prevent an overdependence on a few species, species diversity will be ultimately based on:

- proven adaptability and suitability of tree species
- availability
- fulfillment of desired functions
- existing character of the streetscape

Fish-kill Tree or Puteng (Barringtonia asiatica)

Alexandrian Laurel or Daok (Calophyllum inophyllum)

Cordia or Niyoron (Cordia subcordata)

Composition/Arrangement

In general, the goal of street tree plantings is to provide a sense of three-dimensional unity. Unity is achieved when the planting is perceived as a continuous row, rather than as individual trees.

The relevant principles of landscape design include:

- repetition – repeated use of an element
- sequence – interchanging of elements or groupings of elements achieved through repetition (continuation), gradation or alteration
- balance – equal distribution or symmetrical placement of elements
- scale – complementary relationship between elements or its surroundings

Streets may be divided into segments due to significant changes of any of the following factors for a significant distance: street width, land use, sidewalks on one or both sides of the street, overhead utilities and soil conditions.

Species Selection

Select tree species from the list of approved native and non-native plants in the Guam Landscaping Guidelines based on the plants characteristics – size, form, foliage, density, texture and color – and ability to perform the desired functions.

Provide a consistent plant selection of street trees for roadway types based on species, size and form to provide visual hierarchy and assist in intuitive wayfinding.

Repetition; continuous row of trees provides unity

Sequence; repetition of a single species on one side of street and another species on the opposite side

Balance; symmetrical placement of landscape elements

Planting Placement and Positioning

Placement refers to the location of a row planting in relation to the street, curb and sidewalk, while positioning refers to the location of individual trees to meet recommended setbacks and to avoid conflicts with other streetscape elements.

Placement and positioning are functions of available space and reinforces the need for considering street trees an integral part of the street infrastructure during the planning process.

In general, street trees shall be planted within the parkways in an opposite configuration and with a uniform spacing that is related to the mature canopy spread such that the crowns of adjacent or opposite trees will not, or at the most, barely touch when they reach maturity.

Streetscape elements may disrupt the desired uniform spacing causing the standardized distance to have to be subtly increased or decreased between some trees. In some instances, individual trees may need to be deleted to maintain the overall unity of the row planting.

Where trees cannot be planted in the parkways, they can be planted outside of the street right of way and still function as street trees.

Traffic safety shall be a major consideration in the design of the streetscape. Clear sight lines are critical at intersections, driveways and pedestrian crossings.

Preferred location of street trees within parkways – between the sidewalk and the road

Trees planted outside the street right of way can still function as street trees

Roadway Types

There are seven roadway types identified in the Guam Joint Military Master Plan. The selection of tree species and spacing is related to the class of roadway. Specific guidance is provided for the following roadway types:

- Arterial – Primary: Use large canopy trees and palms spaced 15.2m (50ft) to 18.3m (60ft) on center in the median and in the landscape parkway along both sides of the street; the plant types may differ between the median and the parkways, but the placement should be uniform on each side, wherever possible

  Use triangular (staggered) spacing if three rows of canopy trees are planted: two rows in the parkway and one row in the median

  Use low growing groundcovers or shrubs to discourage foot traffic through medians, except where crossings are provided

- Collector – Undivided: Use medium canopy trees and palms spaced 9.1m (30ft) to 12.2m (40ft) on center in the landscape parkway along both sides of the street; placement should be uniform on each side, wherever possible
- Collector – Divided: Use medium canopy trees and palms spaced 9.1m (30ft) to 12.2m (40ft) on center in the median and in the landscape parkway along both sides of the street; the plant types may differ between the median and the parkways, but the placement should be uniform on each side, wherever possible

  Use triangular (staggered) spacing if three rows of canopy trees are planted: two rows in the parkway and one row in the median

  Use low growing groundcovers to discourage foot traffic through medians, except where crossings are provided

Large canopy tree – Alexandrian Laurel or Daok (Calophyllum inophyllum)

Large canopy tree – Fish-kill Tree or Puteng (Barringtonia asiatica)

Half-Flower or Nanaso (Scaevola sericea) discourages foot traffic across median

Medium canopy tree – Hong Kong Orchid (Bauhinia blakeana)

Medium canopy tree – Cordia or Niyoron (Cordia subcordata)

Medium palm – Fiji Fan Palm (Pritchardia pacifica)

- Local Non-Residential: Use medium and small canopy trees and palms spaced no less than 9.1m (30ft) on center; Placement may be uniform or in groupings; the distance between groupings shall be no more than 30.5m (100ft) on center; successful street tree plantings are perceived as a continuous row, rather than as individual trees
- Perimeter Patrol Road: Use native trees in natural groupings. Due to the continuous length of the road, a variety of tree sizes and types is desired; consideration must be given to Anti-Terrorism/Force Protection (AT/FP) and security requirements, especially at the perimeter adjacent to Route 3

  The naturally established tree masses of the preserve areas and along the cliff boundary do not warrant the planting of street trees along adjacent roadways; street tree plantings would contradict the naturalness of such areas; the existing grass shoulders and low fern plantings serve as transition areas to the tree masses and should be maintained
- Roundabouts: Use landscaping to make the central island more conspicuous, contrast with the canopy form street trees, and allow for installation of a static display; use grass at the perimeter of the central island and the splitter islands for visibility

  Use low groundcover at the corner radii to discourage pedestrians from crossing to the central island, while maintaining required sight distances

Medium canopy tree – Cordia or Niyoron (Cordia subcordata)

Small canopy tree – Tree Heliotrope or Hunik (Tournefortia argentea)

Medium canopy tree for Perimeter Patrol Road - Rosewood or Binalo (Thespesia populnea)

Medium canopy tree for Perimeter Patrol Road – Neisosperma or Fagot (Neisosperma oppositifolia)

Existing streetscape adjacent to preserve areas

Many native trees can be found in the preserve areas including Kafu or Screw Pine (Pandanus tectorius) and Neisosperma or Fagot (Neisosperma oppositifolia)

PARKING LOT PLANTING

Parking lots are often un-landscaped and visually unattractive. Parking areas shall be landscaped to provide a pleasing visual impact and a comfortable physical experience for the user.

Trees are the most effective means of improving the aesthetics of parking lots. Canopy trees also soften the expanse of paving, reduce the urban heat island effect, reduce ozone emissions by shading cars, reduce glare, and increase the longevity of asphalt paving.

Guidelines

- Provide planting areas at the ends of all rows of parking spaces with at least two trees per island
- Provide landscaped medians between rows of parking spaces, where feasible
- Provide one canopy tree for every 12 parking stalls; one tree for every 8-10 parking stalls is preferred to meet aesthetic and sustainability goals
- Locate canopy trees evenly spaced throughout the parking lot
- Use canopy trees that tolerate urban conditions, especially drought and heat
- Where islands are used in lieu of landscaped medians, the minimum size of the islands to be 2.2 square m (24 sf)
- Screen parking lots containing more than 12 stalls from adjoining roadways with a hedge, landscape strip or berms

Provide planting areas at the ends of all rows of parking spaces

Locate trees evenly spaced throughout the parking lot to reduce the heat island effect

Screen parking lots

SUSTAINABILITY

- Utilize native plants whenever possible
- Utilize trees with higher carbon sequestration values, where feasible
- Locate trees to shade the paving and walkways to reduce the heat island effect
- Locate trees to shade parked cars to reduce ozone emissions
- Utilize planting areas for stormwater management and to reduce runoff
- Use reinforced grass paving for overflow parking lots

BEST MANAGEMENT PRACTICES

- Use root control barriers at all islands and medians
- Avoid the use of turfgrass in islands due to the higher maintenance requirement
- Avoid plantings which drop fruit or flowers that are corrosive to, or stain the paint of automobiles
- Provide 4.2m (14ft) clear height over streets and aisle
- Provide 2.1m (7ft) clear height over sidewalks

FACILITY PLANTING

Facility planting refers to the planting around buildings. The landscape provides scale and character to the building and visually relates the building to the ground plane and to its surroundings, including adjacent buildings. Plantings also provide interest, shade and visual screening.

Guidelines

- Design the landscaping to complement the architecture and function of the building
- Design landscaping to emphasize building entries to help create interest for pedestrians, enhance the sense of arrival, and facilitate intuitive wayfinding
- Use landscaping to create human scale environments
- Use landscaping to break up the massiveness along long expanses of fencing, walls and building facades
- Minimize the use of plantings in rows, except for formal areas where special maintenance efforts are justified and the effect of formal or ceremonial use of plant material is desired
- Provide trees or palms for shade at courtyards to ensure outdoor areas are usable and enjoyable throughout the day
- Provide continuity in landscape design with adjacent landscapes
- Avoid small planting areas with higher maintenance requirements, as compared to massed plantings

Landscaping assists in intuitive wayfinding and creates sense of arrival

Landscaping provides human scale at entry

Trees provide shade at seating areas in courtyard

SUSTAINABILITY

- Utilize native trees whenever possible
- Plant trees to protect west and south-facing building exposures
- Identify pedestrian connections to adjacent buildings and land uses; provide canopy trees for shade along pathways to encourage walking and reduce automobile use
- Use reinforced grass paving for fire lanes

BEST MANAGEMENT PRACTICES

- Locate trees so branches do not touch buildings, causing mechanical damage, noise, and easy access for brown tree snakes, rats and insects
- Locate trees to minimize leaf litter on roofs
- Allow space for mature growth of plants, including root systems

AT/FP CONSIDERATIONS

- Landscaping to conform to Unified Facility Criteria (UFC) requirements

OPEN SPACE PLANTING

Open space planting refers to the often overlooked areas between buildings and land uses. Oftentimes, the landscaping of buildings is done separately, without regard for the adjacent buildings or the overall landscape.

The landscape scope of work for projects should not just include the relatively narrow area around the perimeter of buildings, but take into consideration the entire area including adjacent buildings and roadways to provide continuity between spaces and improve the overall attractiveness and function as a whole.

This network of greenspace creates an interconnected park system that adds to the borrowed landscape and provides area for active and passive recreation.

Guidelines

- Provide plants compatible with adjacent plantings
- Use planting to accent views and points of interest
- Use buffer planting to visually separate non-compatible land uses
- Provide canopy trees for shade to ensure outdoor areas are usable and enjoyable throughout the day
- Plant trees in clusters or groupings rather than as single trees; clumping allows for mutual support during high winds, and trees in the inside of groupings are more sheltered than those at the perimeter

Provide shade at walkways

Simple planting provides human scale, color and accent

Accent planting highlights points of interest

SUSTAINABILITY

- Utilize native plants whenever possible
- Utilize native plants to support wildlife habitats
- Utilize trees with higher carbon sequestration values, where feasible
- Use open/green spaces to create gathering spaces for both active and passive activities and connectivity between adjacent areas
- Set aside needed land for stormwater management
- Use drainage overflow areas for recreation and open space
- Protect existing trees to maintain a mature tree canopy
- Preserve significant views to retain the sense of place

BEST MANAGEMENT PRACTICES

- Allow for visual surveillance of open space
- Fenced detention basins shall be screened with landscaping to provide both a visual and physical barrier

IMAGE PLANTING

The image of an installation is formed by a composite of individual visual impressions. Locations that contribute to impressionable images include the main gate, primary circulation routes, and activity nodes.

Features such as signs and focal point devices – flag poles, memorials and static displays – can be improved and highlighted by the strategic placement of appropriate trees, shrubs, and groundcover around the features.

Guidelines

- Use plants to complement the focal point devices, and not compete with them
- Avoid landscape backgrounds that will make focal points visually "disappear"
- Select and locate plants to avoid visual conflicts with signs and frequent trimming

SUSTAINABILITY

- Utilize native plants whenever possible
- Utilize native plants and design elements to emphasize the native culture and create an appropriate sense of place

BEST MANAGEMENT PRACTICES

- Limit the use of annuals which need to be replanted every year

Well designed and maintained landscaping provides image of quality and professionalism.

Landscaping used to define space, but does not compete with focal point device

SCREENING AND BUFFERING

Plant material is very effective in screening unwanted views or to visually separate areas. Berms and architectural screens may also be used to enhance the vegetative screen or buffer.

Guidelines

- Use landscaping to soften the walls of service equipment enclosures
- Maximize the screening effect by planting a layered combination of trees, shrubs, and groundcover
- Use plants that do not require hedging, where possible
- Use evergreen plants for year-round screening

Layered planting softens the equipment enclosure

Hedges screen unwanted views of service areas

Shrubs and groundcovers screen a trash enclosure

Tall, dense planting serves as a buffer between different land uses

SUSTAINABILITY

- Utilize native plants whenever possible
- Utilize plants with higher carbon sequestration values, where feasible

AT/FP CONSIDERATIONS

- Install landscaping elements to conform with and enhance AT/FP strategies in compliance with UFC 4-010-01

Areca Palms (Chrysalidocarpus lutescens) provide a low maintenance screen

Trees and shrubs screen unwanted views and also serve as a wind break

PLANT MATERIAL

Approved Native and Non-Native Plant Lists

The Guam Landscaping Plan's Approved Native and Non-Native Plant Lists identify a variety of plant materials that are appropriate for Marine Corps Base Guam and compatible with existing plant materials.

The Approved Native and Non-Native Plant Lists are divided into the following categories:

- Trees
- Palms
- Shrubs
- Groundcovers
- Grasses

Refer to the "Guam Landscaping Plan" and the most recent "Tropical Landscaping and Plant Selection Guide for Hawaii, Guam and the Pacific Islands" for detailed descriptions and photographs of the plant materials.

Care must be taken to select the appropriate plant for the function, condition and location. Some plants are more suited for use as specimens or accent rather than mass plantings.

The Approved Native and Non-Native Plant Lists have been established to assist the landscape architect in selecting plants appropriate to the installation. The landscape architect must use professional judgment in selecting the appropriate materials for each specific situation.

Plants that are desired, but are not on the recommended plant lists, must be approved by the Natural Resources Program Manager.

Native Plants

Native plants are those that arrived to a location on their own, typically by 'wind, water or wing.' Native plants that evolved into species unique to a single location are considered endemic. Indigenous plants are those found naturally in multiple locations.

The emphasis for planting in Marine Corps Base Guam is to use native plants; native plants can help to reduce costs as they have adapted to survive in climatic conditions that exist in the area and often require less water, fertilizer, pesticides, and maintenance. Many native plants also withstand typhoons better than introduced plants.

The use of native plants in ornamental landscapes encourages cultivation, which in turn helps prevent extinction of species.

The recommended plant list includes natives that are readily used and available, as well as those that have strong potential for ornamental use, but are not yet commercially propagated in significant numbers. The guidelines are not intended to suggest plants that are unavailable, but rather to promote the use of suitable native plants, and encourage a collaborative effort among the Navy, the University of Guam, the Guam Department of Agriculture and the private landscape industry to propagate and incorporate native species into the landscape.

To ensure that plants in their wild habitat are protected and perpetuated, not injured or depleted, native plants should be acquired from nurseries and landscape contractors that are familiar with the laws and ethics associated with the cultivation of native plants.

Invasive Species

Alien plants seriously threaten Guam's unique native flora and ecosystem. Over time, disturbances from fire, agriculture and urbanization have created ideal conditions for the establishment of alien plants within native communities. Once there, these plants smother native vegetation, displacing native species or preventing their reestablishment.

Executive Order 13112, Invasive Species (3 February 1999) seeks to prevent the introduction of invasive species and provides for their control to minimize the economic, ecological and human health impacts caused by invasive species. Federal agencies are required, to the extent practicable and permitted by law, to control their populations, to restore native species and habitat in ecosystems that have been invaded, and to promote public education on invasive species.

Through responsible planning, the Navy can help prevent further introductions of pests into ornamental landscapes. Prioritizing the use of native plants that are locally available will minimize the shipping of plants from overseas, reduce the risk of introducing pathogens that have devastated native flora and fauna in the past, and reduce the risk of propagating invasive plants.

The Western Micronesia Regional Invasive Species Council, the Hawaii-Pacific Weed Risk Assessment, and the U.S. Forest Service's Institute of Pacific Island Forestry - Pacific Island Ecosystems at Risk project (PIER) should be consulted when selecting plant material for a project. Plants with a PIER rating of 6 or above are not permitted unless approved by the Natural Resources Program Manager.

Restricted Species

Plants identified as 'Restricted Use' are prohibited, unless otherwise approved by the Natural Resources Program Manager. Examples of such plants are large fruiting trees that cause maintenance problems due to excessive debris and by becoming an 'attractive nuisance' as people attempt to pick the fruit. Other plants are labeled 'restricted' due to growth habits, such as aggressive root systems, that generally make them difficult to maintain. Restricted Use plants should not be used in 'improved' areas unless there is a compelling reason.

Size of Plant Material

Plant material needs to be of sufficient size for impact and high survival rates.

The use of larger plants that are spaced further apart rather than smaller plants located closely together is preferred.

Plant material recommended sizes at time of installation:

- Trees: 2.5m (8ft) high, 1.5m (5ft) spread, 50mm (2ft) caliper
- Single Trunk Palm: 1.8m (6ft) brown trunk height
- Multi-trunk Palm: 1.5m (5ft) tall, 5 cane/trunk
- Shrubs: 600mm (2ft) high

Begin as soon as possible identifying and establishing partnerships to ensure that mature plant stock is available in the massive quantities needed for base landscaping.

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Site Amenities

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SITE AMENITIES

Site amenities are outdoor elements that contribute to the comfort, convenience, or enjoyment of the site and environment. They include such items as fencing, lighting, paving, displays, shelters and pavilions, and site furniture.

Site amenities should be part of an established, coordinated system throughout Marine Corps Base Guam. As such, the design and location of site amenities should express an image, character, and scale appropriate to the installation.

In general, site amenities in Marine Corps Base Guam shall be minimized and provided at strategic locations to avoid visual clutter. Provision and placement of major structures such as pavilions, bus shelters, fences and walls, and static displays should be coordinated with the installation master development plan to reduce conflicts with planned buildings and other site elements. Provision and placement of minor site amenities should be coordinated as part of individual projects.

The subsequent sections provide guidance for the following site amenities:

- Fences and Walls
- Security Fences
- General Fences
- Screen Walls
- Pavers and Paving
- Pavilions
- Bus Shelters
- Site Lighting
- Street Lighting
- Parking and Area Lighting
- Low Level Lighting
- Flagpoles, Memorials, and Static displays
- Bollards
- Picnic Tables
- Benches
- Trash Receptacles
- Cigarette Receptacles
- Bicycle Racks
- Drinking Fountains
- Barbecue Grills

FENCES AND WALLS

Fences and walls define boundaries, provide physical barriers around the installation and restricted areas, and screen unattractive site elements. Fences and walls also provide perimeter security and serve as defensive barriers along required AT/FP setbacks.

This section covers freestanding fences and walls that are typically found on sites and do not include retaining walls or slope stabilization walls, such as rip rap and embankment walls. These types of earth retaining walls, if required, shall be designed in accordance with specific project requirements.

In general, fences and walls should:

- Be carefully selected and/or designed or engineered to meet their intended functions
- Be compatible with adjacent architecture and landscape design features
- Be unobtrusive and transparent (except for screen walls) wherever possible when there is a vista beyond the fence or wall
- Be able to withstand the design wind speed and seismic design criteria for Guam
- Incorporate gates where required that are visually and functionally compatible with the design of the fences and walls to which they are attached

The primary types of fences and walls in the installation include:

- Security fences
- General fences
- Screen walls

The following sections provide general design guidance for each of these fence and wall types.

Fencing and Wall Examples

SECURITY FENCES

Security fences provide a physical barrier at installation boundaries and restricted areas. Their primary purpose is to impede and delay breaching attempts by intruders and vehicles to allow security personnel time to respond to the threat.

Design requirements for security fencing are specified in MIL-HDBK-1013/10 and the Marine Corps Physical Security Program Manual (MCO 5530.14A). Chain link fencing is the most common type of barrier used to enclose restricted areas. This is because chain link is relatively maintenance free and provides little concealment for intruders. Ornamental fencing presents an option to chainlink, but its maintenance costs prohibits its exclusive use throughout the installation.

For Marine Corps Base Guam, a combination of chain link and ornamental fence types shall be installed. Designers shall meet with security and AT/FP officers to ensure that the design of security fences meet all mandated security and force protection requirements for the installation.

The following provides guidance for locating ornamental and chainlink security fences in the installation:

- Utilize ornamental fencing:
  - at entrance gates and along portions of the Route 3 perimeter leading up to the entrance gates
  - along the portions of Route 3 that enclose the family housing areas
  - at restricted areas along high visibility routes within the installation and where the restricted areas face command, community, and housing areas
  - at the cliff boundary edges adjacent to the command and quality of life campus area
- Utilize chain link fencing:
  - at the cliff boundary edges adjacent to the family housing areas
  - for the portions of perimeter fencing along Route 3 enclosing the industrial areas
  - for the north and south installation boundaries and at restricted areas within industrial districts

The following are general considerations for the design of both chain link and ornamental type security fences:

Chain Link Fences

- Adhere to the requirements for chain link fences in MIL-HDBK-1013/10
- Meet with AT/FP and security officers to discuss options to soften the utilitarian look of the chain link fencing along Route 3 through the integration of ornamental elements or landscaping while meeting the intent of MIL-HDBK-1013/10

Ornamental Fences

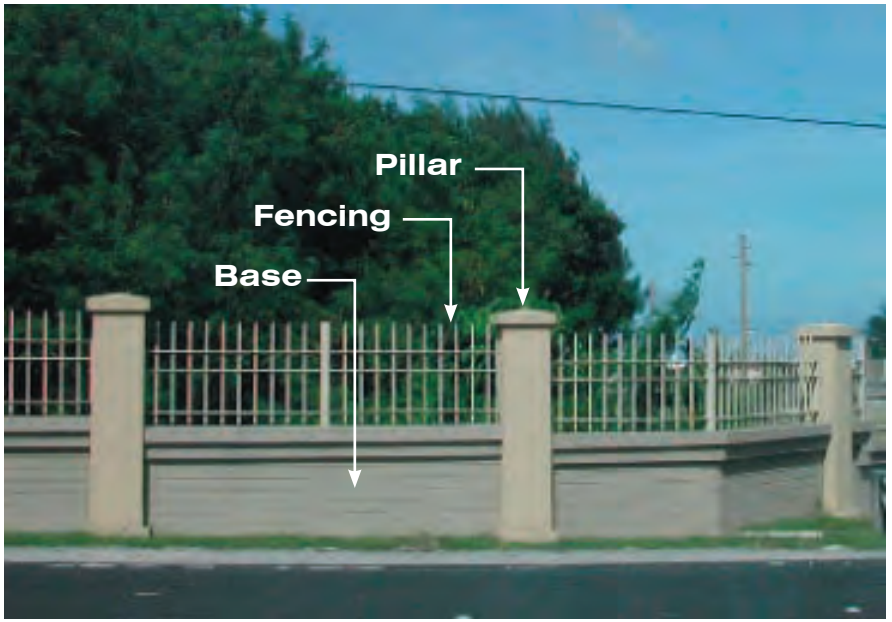
- Utilize concrete, concrete masonry unit (CMU), decorative metal, or a combination thereof as the primary elements for ornamental fencing
- Utilize corrosion resistant, treated or protected metal elements; do not use cast iron or unprotected steel
- Utilize outward curving lance pickets with corrugated spear points in lieu of barbed or concertina wiring
- Utilize anti-ram vehicular cabling where possible to enhance the effectiveness of ornamental fencing
- Meet with AT/FP and security officers to discuss the design of ornamental fences to ensure that the fences will meet the intent of MIL-HDBK-1013/10, as well as any special security requirements for Marine Corps Base Guam

GENERAL FENCES

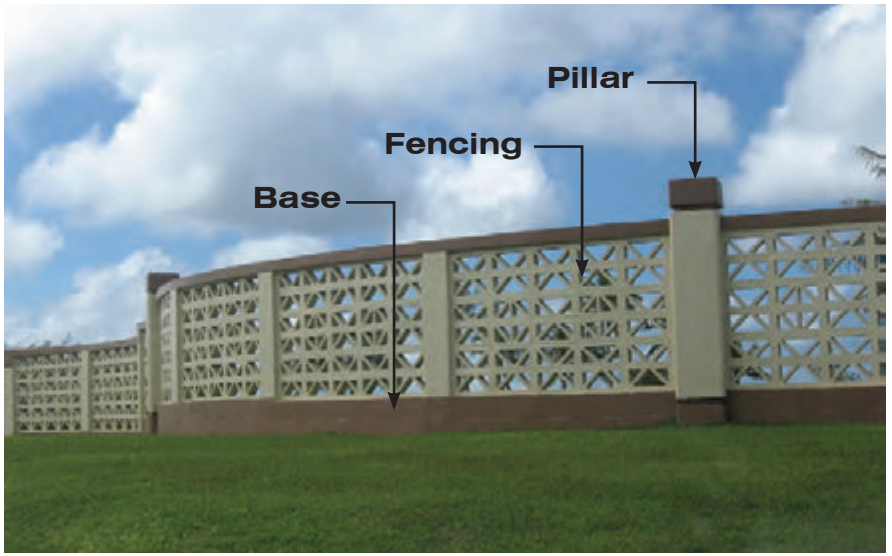
General fences define boundaries of non-restricted areas in the installation where fencing is required or desired. They are primarily decorative in nature and may vary in design details from one area of the installation to the other, but the basic visual elements of these fences should remain consistent.

Guidelines

- Develop fence designs that consist of the following visual elements: 1) regularly spaced pillars; 2) fencing infill; and 3) base
- Utilize concrete or CMU as the primary construction materials
- For fencing infill, utilize decorative corrosion resistant treated metal fencing or decorative CMU blocks
- Incorporate concrete or CMU pillar caps; slope the tops of the pillar caps to shed water
- Incorporate continuous concrete or CMU walls caps at base; slope the tops of the wall caps to shed water
- Select neutral colors that complement the color assignments for the district in which the fences are located; see Chapter 4 Building Color
- Utilize corrosion resistant, treated or protected metal; do not use cast iron or unprotected steel
- Match the design elements of adjacent buildings that the fencing may be part of to create visual consistency in the environment



Example fencing with concrete pillars, non-corrosive metal pickets, and base wall



Example fencing with pillars, decorative CMU blocks, and curb wall

SCREEN WALLS

Screen walls block views to unattractive elements on the site, such as service yards, trash bins, and utility equipment and appurtenances. Because the primary function of screen walls is to block views, they should not be used as security fencing, which requires transparency for surveillance purposes.

Guidelines

- Utilize solid reinforced concrete or CMU construction for the full height of screen walls
- Incorporate continuous sloped concrete or CMU wall caps, or slope the tops of the screen walls to shed water
- Where screen walls are used as enclosures to protect utility equipment and appurtenances, design the walls to be impact-resistant to typhoon-generated airborne debris
- Articulate the surfaces of screen walls with texture, scoring, or trims for visual interest
- Utilize landscape planting to soften the surfaces of screen walls
- Select neutral colors that complement the color assignments for the district in which the screen walls are located; see Chapter 4 Building Color
- When attached to buildings, design screen walls to blend with the architecture style of the building

Example solid fencing with surface articulation enclosing a service yard

Screen wall enclosure that blends with the adjacent building architecture

PAVERS AND PAVING

Pavers and paving refer to the hard and durable surfaces placed directly atop the ground and consist of individual units (pavers) or monolithic surfaces (paving). Pavers and paving may also consist of varying materials, and depending on how they are treated can affect the overall appearance of an area.

Guidelines

- Utilize concrete and asphalt paving for general utilitarian surfaces such as driveways, walkways, and parking
- Utilize pavers or a combination of pavers and paving at high visibility areas such as plazas, courtyards, promenades, and malls
- Utilize pavers at road crosswalks located along community support areas
- Utilize pavers at approach walkways and entry porticos to emphasize entry approaches to significant facilities
- Utilize brick, concrete, or stone pavers; limit paver shapes to rectangular, square, or hexagonal shapes
- For paver patterns, utilize running bond, herringbone, stack, basket weave (Parquet), hexagon, or Roman Cobble
- Utilize interlocking pavers or a herringbone pattern at areas subject to vehicular loads
- As an option to pavers, utilize stamped concrete with regular patterns to simulate pavers
- Do not utilize mortar-set ceramic tiles for outdoor paving material

SUSTAINABILITY/LOW IMPACT DEVELOPMENT

- Utilize locally available pavers and paving materials to facilitate maintenance
- Utilize pavers and paving products that utilize recycled content where available

Running bond

Herringbone

Stack

Basket weave (Parquet)

Hexagon

Roman Cobble

PAVILIONS

Pavilions are roofed outdoor structures used for entertaining and social gatherings. Pavilions are typically provided at barbecue and picnic areas to shelter users from the elements.

The goal for Marine Corps Base Guam is to install pavilions with consistent designs throughout the installation to help create visual consistency in the environment.

Guidelines

- In general, provide pavilion designs of the type shown at right, which consists of a gable roof with integrated gutters, regularly spaced square columns with trim reveals, and shallow arched gable ends
- Utilize solid reinforced cementitious construction as allowed by the installation construction standards, and provide a smooth to slightly textured finish; see Chapter 3 Architecture, Exterior Walls for guidelines on surface treatment
- For typical pavilions, provide concrete batten roofs with a fluid-applied roof coating
- For pavilions located within the Headquarters and community service districts, provide clay tile roofing; refer to Chapter 3 Architecture, Roofing Materials, for guidelines on tile roofs
- Vary the colors of the pavilions per the district in which they are located; refer to Chapter 4 Building Color for district color assignments
- Utilize cast iron downspouts with an epoxy-coated finish; provide splash blocks where downspouts discharge onto unpaved ground surfaces

SUSTAINABILITY

- Utilize locally available materials whenever possible

BEST MANAGEMENT PRACTICES

- Strategically locate and size pavilions for shared use to discourage a proliferation of pavilions scattered throughout the installation
- Place pavilions in areas with scenic vistas or near outdoor gathering areas, and integrate or connect pavilions with paved walkways and access routes
- Place utilities (sinks, wash areas, etc.) on the implied back side of the pavilion, away from primary views
- At barbecue and picnic areas, provide site furnishings such as picnic tables, benches, barbecue grills, wash sinks, and water fountains where appropriate; refer to the sections on recommended site furnishings in this chapter for additional recommendations

Typical Pavilion

BUS SHELTERS

Bus shelters provide comfort and protection from the weather at bus stops.

The goal for Marine Corps Base Guam is to install similarly designed bus shelters throughout the installation to help create visual consistency in the environment.

Guidelines

- In general, provide bus shelter designs of the type shown at right, which consists of a gable roof, back and side enclosure walls, vertical slit openings with projected sills, and a continuous and integrated bench slab seat
- Utilize solid reinforced cementitious construction as allowed by the installation construction standards, and provide a smooth to slightly textured finish; see Chapter 3 Architecture, Exterior Walls, for guidelines on surface treatment
- For typical bus shelters, provide concrete batten roofs with a fluid-applied roof coating
- For bus shelters located within the Headquarters and community service districts, provide clay tile roofing; refer to Chapter 3 Architecture, Roofing Materials for guidelines on tile roofs
- Vary the colors of the bus shelters per the district in which they are located; refer to Chapter 4 Building Color for district color assignments

SUSTAINABILITY

- Utilize locally available materials whenever possible

BEST MANAGEMENT PRACTICES

- Locate bus shelters where warranted by the anticipated degree of use and need for weather protection
- Locate bus shelters adjacent to paved sidewalks and walkways
- Locate bus shelters so that users waiting in the shelters will have clear sight lines to approaching buses

Typical Bus Shelter
Note: tile roofing example shown should be provided on bus shelters located within headquarters and community service districts only

SITE LIGHTING

Site lighting fixtures provide safety and functional lighting at roads, walkways, open areas, and parking lots. The goal for Marine Corps Base Guam is to provide consistent light fixtures for each of the above use areas to help create visual consistency in the environment.

The primary site lighting types discussed in these IAP guidelines include:

- Street lighting
- Parking and area lighting
- Low level lighting

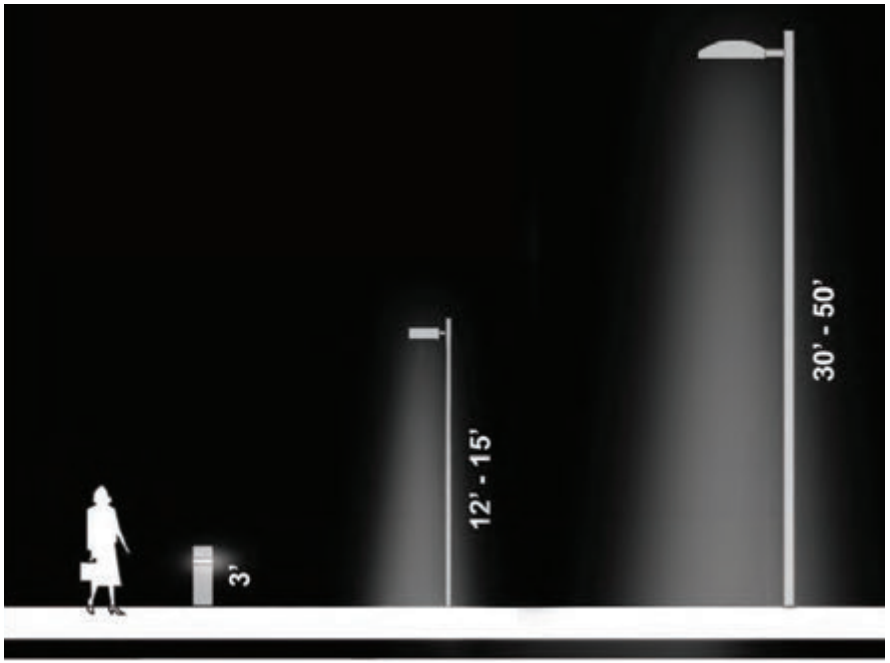
Specific guidance and fixture selections for these site lighting types will be provided in the upcoming sections.

General Guidelines

- Design and/or select site lighting fixtures to withstand the design wind speed and seismic criteria for construction in Guam
- Provide underground power supply to site lighting fixtures to reduce the visual clutter of overhead wires and utility poles
- Scale site lighting fixtures to their intended uses; the figure at right illustrates typical fixture heights for each of the primary site lighting types listed above
- Select matte finishes for fixture housings and poles that are compatible with the color selections of Chapter 4 Building Color
- Avoid decorative, ornate, or period style fixtures that detract from the intended installation character
- Avoid mounting light fixtures on out-of-scale, bulky, and massive concrete utility poles

SUSTAINABILITY

- Select shielded light fixtures whenever possible to help reduce the overall light pollution and light trespass levels in the installation
- Utilize energy efficient light emitting diode (LED) or induction type lighting whenever possible to help reduce maintenance and life cycle costs for site lighting
- Utilize solar powered photovoltaic (PV) technology where possible and appropriate to provide supplemental and/or permanent power to site lighting fixtures



Site Lighting Scale Reference

STREET LIGHTING

Street lighting provides functional and safety lighting along roadways in the installation.

The goal for Marine Corps Base Guam is to utilize consistent light fixture standards for various streets to help create visual consistency in the environment.

General Design Criteria

- Luminaire
  - Provide aluminum, full cut-off luminaires with LED lamps, one-piece metal housings, and impact resistant clear tempered glass lens
  - Provide dark bronze, thermoset polyester powder coat finishes
  - Provide double luminaires at roadway median strips where required by lighting analyses
- Pole
  - Provide prestressed, reinforced, round concrete poles with finishes to match luminaires
  - Provide pole diameter and dimensions as required by engineering analysis to meet Guam's wind speed design criteria
- PV Integration
  - Consider PV technology that integrates seamlessly with the specified fixture or light pole
  - Ensure that installation of PV panels meet Guam's wind speed criteria
  - Select PV panels that are visually unobtrusive and sized in proportion to the selected luminaire

Street Lighting Luminaire with LED Lamp and Dark Bronze Finish

Double Luminaire Fixture for Use on Median Strips

PARKING AND AREA LIGHTING

Parking and area lighting provides functional and safety lighting at parking lots and other open areas such as plazas, promenades, and malls. This type of lighting can also be used along pedestrian walkways.

The intent for Marine Corps Base Guam is to generally utilize consistent light fixture standards throughout parking lots and open areas to help create visual consistency in the environment. At public spaces, the use of custom fixtures may be considered by the DRB if the fixtures enhance and strengthen the design scheme of surrounding facilities.

General Design Criteria

- Luminaire Arm-Mount (parking and walkway lighting)
  - Provide aluminum, full cut-off luminaires with LED lamps, shoebox type housings arm-mounted to poles, dark bronze corrosion resistant powder coat finishes, and impact resistant clear tempered glass lens
- Luminaire Top-Mount (area lighting)
  - Provide aluminum, full cut-off luminaires with LED lamps, shoebox type housings top-mounted to poles, dark bronze corrosion resistant powder coat finishes, and impact resistant clear tempered glass lens
- Pole
  - Provide extruded, non-tapered aluminum poles with dark bronze corrosion resistant powder coat finishes
  - Utilize 4”, 6”, or 8” square poles as required by engineering analysis to meet Guam’s wind speed design criteria
- PV Integration
  - Consider PV technology that integrate with the specified fixture or light pole
  - Ensure that installation of PV panels meet Guam’s wind speed criteria
  - Select PV panels that are visually unobtrusive and sized in proportion to the selected luminaire

Parking and Area Lighting Standard

Parking and Walkway Lighting Luminaire

Area Lighting Luminaire

LOW LEVEL LIGHTING

Low level lighting provides functional and safety lighting at pedestrian walkways, ramps, stairs, and secondary paths. They are typically mounted at heights below eye level.

The goal for Marine Corps Base Guam is to utilize a consistent set of low level light fixture standards throughout the installation to help create visual consistency in the environment.

Low level lighting shall consist of bollard lighting and rail fixtures. Utilize bollard lighting along walkways and walking areas. Mount rail fixtures on stair, ramp, and walkway rail walls.

General Design Criteria

- Aluminum Bollard Lighting
  - Provide 4-inch or 6-inch round, heavy duty, cast aluminum posts with dark bronze corrosion resistant powder coat finishes, aluminum reflectors, and single piece clear acrylic shields
- Concrete Bollard Lighting
  - Provide 4-inch or 6-inch round, prestressed concrete posts with slightly blasted terrazzo aggregate finishes, clear coat sealer, and die cast aluminum louver fixtures
- Rail Fixtures
  - Provide cast brass or aluminum dome, hood, or rail housings with dark bronze corrosion resistant powder coat finishes, stainless steel fasteners, and clear or frosted acrylic shields
- PV Integration
  - Consider PV technology that integrates seamlessly with the specified fixtures in lieu of detached or protruding PV panels

Aluminum Bollard Lighting

Concrete Bollard Lighting

Dome Rail Fixture

Hood Rail Fixture

Louver Rail Fixture

FLAG POLES, MEMORIALS, AND STATIC DISPLAYS

Flag poles, memorials, and static displays are focal point devices that commemorate, educate, and add visual interest to the environment. They convey history, honor, and pride, and celebrate past events and achievements.

Guidelines

Flag Poles

- Provide aluminum tapered flag poles with dark bronze, corrosion resistant powder coat finishes, ball ornaments, revolving trucks, cleats, and base plates
- Limit the installation of flag poles to gate entrances, headquarters, and other important facilities; locate flag poles appropriately with the site layout and integrate them with landscaping
- Group flagpoles where possible to display the American flag flanked by the Guam flag and Marine Corps flag

Memorials and Static Displays

- Carefully design memorials and static displays for the purposes for which they are intended; utilize artwork, memorial plaques, and military pride objects
- Place the displays in prominent locations in the installation where they will be seen by large numbers of personnel or visitors
- Consolidate memorials and static displays in one location where possible and appropriate to create a central museum or exhibition facility
- Place displays on an elevated base whenever possible, and include informational plaques or signage to narrate the message of the display where appropriate
- Utilize neutral colors to provide contrast between the display and the environment

Flagpole Display
Andersen AFB, Guam

Flagpole Grouping
Naval Station, Guam

Iwo Jima Memorial,
MCAS Kaneohe, Hawaii

War Dogs of the Pacific Memorial,
Naval Station, Guam

Static Displays, Pacific Missile
Range Facility, Hawaii

Entry Static Display,
MCAS Iwakuni, Japan

BOLLARDS

Bollards are short rigid posts used to delimit an area, exclude vehicles, control or direct traffic, and protect building features such as doorways and corners.

The goal for Marine Corps Base Guam is to utilize consistent bollard standards throughout the installation to help create visual consistency in the environment.

Guidelines

- Utilize heavy duty reinforced concrete cylindrical bollards with single reveals of the type shown in the top left photo at primary entry points or boundaries to facilities and sites to provide permanent vehicular barriers or to delineate required force protection setbacks
- At high profile areas such as headquarters and community support areas, utilize sculpted Latte stone-inspired reinforced concrete bollards of the type shown in the top right photo in lieu of the round concrete bollards above
- Utilize fixed or retractable stainless steel bollards of the type shown the middle left photo at secondary entry points to facilities and sites to provide permanent vehicular barriers or controlled vehicular access
- Utilize fixed or retractable non-corrosive metal bollards with integrated reflectors of the type shown in middle right photo to control and direct vehicular traffic along roads, entry gates, and access drives
- Utilize “swing back” moulded plastic traffic bollards with reflective sleeves of the type shown in bottom left photo to direct vehicular traffic along roads, entry gates, and access drives where fixed bollards may present a safety hazard
- Utilize brightly colored, traffic yellow, non-corrosive safety bollards of the type shown in the bottom right photo to protect building features, utilities, and equipment

Round Concrete Bollard

Latte Stone Sculpted Bollard

Stainless Steel Bollard

Stainless Steel Bollard

Traffic Bollards

Safety Bollards

PICNIC TABLES

Picnic tables provide sitting and eating spaces at pavilions, community service facilities, and other activity nodes.

The goal for Marine Corps Base Guam is to utilize a consistent set of picnic table standards throughout the installation to help create visual consistency in the environment.

Guidelines

- Provide picnic tables with integrated tables, seats, and framing
- In general, provide reinforced concrete picnic tables of the types shown in the top and middle images with smooth table tops and seat tops and support frames with sandblast finishes; apply a clear coat sealer to all surfaces
- As an option at covered areas, such as pavilions and roofed recreation facilities, utilize recycled plastic picnic tables of the type shown in the bottom photo
- To provide for accessibility, provide accessible rectangular picnic tables with overhanging table ends for wheelchair access
- Utilize stainless steel fasteners to attach table tops and seats to the support framework
- Secure picnic tables to the ground or floor slab as required to protect them from shifting during typhoons
- Select neutral colors that complement the color assignments for the district in which the tables will be located; see Chapter 4 Building Color

Concrete Rectangular Picnic Table

Concrete Circular Picnic Table

Recycled Plastic Lumber Picnic Table

BENCHES

Benches provide seating at pavilions, community service and recreation facilities, covered walkways, arcades, walkways, and other activity nodes.

The goal for Marine Corps Base Guam is to utilize a consistent set of bench standards throughout the installation to help create visual consistency in the environment.

Guidelines

- Provide reinforced concrete backless benches of the type shown in the top photo with smooth seat tops and supports with sandblast finishes; apply a clear coat sealer to all surfaces
- Provide reinforced concrete benches with backrests of the type shown on in the middle photo with smooth seat tops and backrests and supports with sandblast finishes; apply a clear coat sealer to all surfaces
- As an option at covered areas, such as in pavilions and roofed recreation facilities, utilize recycled plastic benches of the type shown in the bottom photo with seats and backrests of recycled plastic lumber planks; bench pictured is intended to complement the recycled plastic picnic table shown on the previous Picnic Tables section
- Utilize stainless steel fasteners to attach seats and backrests to the supports
- Secure benches to the ground or floor slab as required to protect them from shifting during typhoons
- Select neutral colors that complement the color assignments for the district in which the benches will be located; see Chapter 4 Building Color

Concrete Flat Bench

Concrete Bench with Backrest

Recycled Plastic Bench with Backrest

TRASH RECEPTACLES

Trash receptacles include trash bins and hot coals disposal bins.

The goal for Marine Corps Base Guam is to utilize a consistent set of standards for trash receptacles throughout the installation to help create visual consistency in the environment.

Guidelines

- At exposed, non-covered areas, provide reinforced square concrete trash bins of the type shown in top left image with rigid plastic hoods and spring loaded refuse doors
- At covered areas, provide heavy duty , non-corrosive trash bins of the type shown on top right photo with open hoods and aggregate stone panels
- At barbecue areas, provide reinforced concrete hot coals disposal bins of the type shown on bottom left with exposed aggregate finishes, non-corrosive metal grated tops, ash removal doors, and “Hot Ash Only” signs
- Secure trash receptacles to the ground or floor slab as required to protect them from shifting during typhoons
- Select neutral colors that complement the color assignments for the district in which the trash receptacles will be located; see Chapter 4 Building Color
- Limit trash receptacles to the types shown in this section only; avoid the use of trash receptacles with open tops that tend to collect water during heavy rain

Concrete Trash Receptacle with Enclosed Hood

Concrete Trash Receptacle with Open Hood

Concrete Hot Coals Disposal Bin

Trash Receptacle with Open Top - Avoid

CIGARETTE RECEPTACLES

Cigarette receptacles provide a clean and safe container for the disposal of used cigarettes.

The goal for Marine Corps Base Guam is to utilize a consistent set of standards for cigarette receptacles throughout the installation to help create visual consistency in the environment.

Guidelines

- At exposed, non-covered smoking areas, provide non-corrosive metal cigarette outposts of the type shown in top photo at right with dark bronze finishes
- At covered smoking areas, provide sand-filled, reinforced concrete cylindrical urns with exposed aggregate finish of the type shown in the bottom photo at right
- Select neutral colors that complement the color assignments for the district in which the cigarette receptacles are located; see Chapter 4 Building Color

Notes on Smoking Areas

Cigarette receptacles shall be installed at designated smoking areas within the installation. The following are general guidelines for smoking areas:

- Locate smoking areas 25ft minimum away from building entrances
- Locate smoking areas away from and downwind of building mechanical fresh air intake vents
- Do not utilize makeshift site furniture for smoking areas; utilize recommended site furnishings from this site amenities section

All Metal Cigarette Receptacle Outpost

Concrete Cigarette Receptacle Urn

BICYCLE RACKS

Bicycle racks provide for the temporary parking and holding of bicycles in the installation.

The goal for Marine Corps Base Guam is to utilize consistent standards for bicycle racks throughout the installation to help create visual consistency in the environment.

Guidelines

- Install bicycle racks at all facilities where possible to encourage bicycling in the installation
- In general, provide stainless steel serpentine bike racks with embedded posts of the type shown in the above right photo.
- Mount and secure bike racks directly into the ground or paving where they are located
- Whenever possible, locate bicycle racks within 200ft of building entrances for convenience and ease of use
- Whenever possible, place bike racks under cover within the building served or, if not cost prohibitive, within separate stand-alone shelters; designs for stand-alone shelters shall be consistent with the design of the building served and construction of the shelter shall be concrete or CMU

Stainless Steel Serpentine Bicycle Rack

DRINKING FOUNTAINS

Drinking fountains and water coolers provide drinking water at outdoor recreation and community service areas in the installation.

The goal for Marine Corps Base Guam is to utilize consistent standards for outdoor drinking fountains throughout the installation to help create visual consistency in the environment.

Guidelines

- Provide drinking fountains at outdoor recreation areas such as play fields and play courts, barbecue areas, pavilions, and other community service areas, as well as along pedestrian pathways and bicycle routes.
- In general, provide reinforced concrete, single height or dual-height, accessible pedestal type drinking fountains of the types shown at right with sandblast or aggregate finish
- Provide stainless steel bowls, bubblers, push buttons, and maintenance access panels with vandal resistant screws
- Provide hood protection for bubblers to protect the spouts from vandalism
- Locate drinking fountains along accessible routes to provide accessibility for wheelchair-bound users
- Select neutral colors that complement the color assignments for the district in which the drinking fountains will be located; see Chapter 4 Building Color

Concrete Pedestal Dual-Height Drinking Fountain

Concrete Pedestal Drinking Fountain

BARBECUE GRILLS

Barbecue grills provide cooking surfaces for use at recreation facilities in the installation.

The goal for Marine Corps Base Guam is to utilize consistent standards for barbecue grills throughout the installation to help create visual consistency in the environment.

Guidelines

- Provide barbecue grills at recreation facilities such as pavilions, picnic areas, and other activity nodes
- Barbecue areas should also have a wash sink and a drinking fountain
- Utilize single or large group type, non-corrosive metal barbecue grills of the types shown in photos at right with high temperature, non-toxic and non-corrosive black enamel paint finishes
- Utilize double reinforced and all welded fireboxes to dissipate heat and resist warpage
- Provide coil-handled, structurally reinforced and adjustable cooking grates of 5/8” diameter perimeter bars and 1/2” center bars that can be swiveled 360-degrees to allow for fire building and cleaning
- Provide base posts of similar construction and finish and secure barbecue grills into the ground using an embedded post installation
- Provide hot coals disposal bins in close proximity to barbecue grills to allow for the disposal of used coals; see earlier section on Trash Receptacles

Single Barbecue Grill

Large Group Barbecue Grill

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The purpose of signage is to guide personnel and visitors around the base, enhance traffic safety, and provide a unifying visual element for the installation. Signs in Marine Corps Base Guam should be well conceived and designed to make the installation more attractive, inviting, and easy to navigate.

These signage guidelines provide general design parameters and specific requirements for a coordinated family of signs for the installation. The guidelines are based on the Unified Facility Criteria (UFC) 3-120-01, Air Force Sign Standard, but have been tailored for Marine Corps Base Guam. The recommendations apply only to exterior signs.

Each of the sign types in the family of signs is intended to complement one another to provide consistency throughout the installation. Written approval for deviations from the sign types must be obtained from the Installation Design Review Board (DRB).

Signage guidance found in this chapter covers the following:

- Application of the Guidelines
- References
- General Sign Design
  - General Guidelines for Signs
  - Typography
  - Graphics
  - Sign Colors
  - Sign Placement
  - Accessibility Considerations
- Sign Types
  - Exterior Identification Signs
    - Military Identification Signs
    - Centralized Facility Sign
    - Community Facilities Signs
    - Community Building Entry Sign
    - Recreation Facility Sign
    - Bus Route Sign
  - Direction Signs
    - Directional Signs
    - Street Name Sign
  - Regulatory Signs
    - Traffic Control Signs
    - Installation Warning Signs
    - Parking Regulation Signs
  - Motivation Signs
  - Informational Signs
  - Wall Mounted Signs

APPLICATION OF THE GUIDELINES

The signage guidelines shall apply to all site and building signs in Marine Corps Base Guam except for family housing signs.

Each project shall incorporate the applicable sign types in accordance with the project requirements and the master installation sign plan. Where options for the sign classifications are available in these guidelines, designers may select the best sign type to fit the needs of the project.

Several standards and references are relevant to sign design and placement. These include the Americans with Disabilities Act - Architectural Barriers Act Accessibility Guidelines, the National Fire Protection Association Life Safety Code, the Federal Highway Administration's Manual on Uniform Traffic Control Devices Handbook, and the U.S. Department of Transportation's Standard Highway Signs publication and Traffic Control Devices Handbook. The Installation Appearance Plan (IAP) guidelines are intended to supplement these documents, which continue to be the authority for the issues to which they apply.

The intent of these guidelines is to develop visual consistency for signs in the installation. In situations where custom signs are necessary to meet special projects, designers must coordinate with the Installation Design Review Board (DRB) to determine solutions that will complement the IAP sign types. The DRB will have final decision on whether a custom sign complies with the IAP.

Signs for commercial activities, such as Exchanges and Commissaries, which are based on standards with specific images and symbols, may deviate from these guidelines as long as they are set in a framework that is consistent with these guidelines.

REFERENCES

PUBLICATIONS

- UFC 3-120-01 Air Force Sign Standard, February 6, 2003
- Americans with Disabilities Act and Architectural Barriers Act (ADA-ABA) Accessible Guidelines
- National Fire Protection Association Life Safety Code
- Federal Highway Administration, Manual on Uniform Traffic Control Devices (MUTCD)
- U.S. Department of Transportation Standard Highway Signs and Markings (SHSM)
- Signage and Wayfinding Design, A Complete Guide to Creating Environmental Graphic Design Systems, by Chris Calori, 2007 John Wiley & Sons
- The Wayfinding Handbook, Information Design for Public Places, by David Gibson, 2009 Princeton Architectural Press
- Marianas Navy & Marine Corps Design & Construction Standard
- Guam Technical Guide Addendum for DBB UFGS
- Guam Technical Guide Addendum for DB RFP Part 3-Project Program

General Sign Design

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GENERAL GUIDELINES FOR SIGNS

Signs in Marine Corps Base Guam should function as a coordinated orientation system that includes base maps, street signs, direction signs, building signs, and guidance from gate personnel. The system should be logical and easy to follow so that users are able to find their destinations in the installation without confusion.

Designers shall adhere to the following general guidelines when developing signs for the installation:

- Coordinate development of signs with the installation command to ensure that sign designs and placements adhere with the installation sign master plan
- Identify decision making points with signs that clearly indicate the options
- Minimize the number of signs on the installation to reduce visible clutter; locate signs only where they are absolutely necessary to provide orientation
- Ensure that the names of destinations on signs are consistent throughout the orientation system, including the names on maps that are used by police or gate attendants to direct users around the installation
- Ensure that destination names are included on a series of direction signs until the destination is reached
- As a general rule, provide one building identification sign per significant building, in addition to the building number sign
- Reduce directional signs where possible by clearly identifying street names
- Use signs of high quality materials and construction to present a professional image for Marine Corps Base Guam and to provide good first impressions to visitors
- Keep the number of building mounted regulatory signs denoting hazardous materials, paint lockers, and similar facilities to the minimum required to meet safety regulations
- Place building and site identification signs appropriately to be visible from all avenues of approach; adhere to the recommended sign placement guidelines in this chapter
- Convey the necessary information on signs with a minimal amount of reading time
- Where two-sided signs (signs readable from both sides) are required, ensure that the message on both sides of the sign are the same
- Spell out names in full whenever possible; if abbreviations are required, they should be consistent for all signs in the installation (note: while abbreviations may be clear to some, avoid their use where signs may be viewed from off the installation or by visitors who may not be familiar with the abbreviation)
- Spell out numbers under ten (10) and treat numbers over ten as numerals
- Construct and install signs to meet Guam's wind speed design criteria
- Utilize non-corrosive sign materials and fasteners for all signs
- Slope the tops of concrete sign foundations and footings to drain water away from sign posts
- Cap the tops of solid surface sign posts to prevent water intrusion

TYPOGRAPHY

Typography refers to the style, size, and spacing of letters. Different letter styles are described as fonts or letterforms. Each font comes in a variety of sizes.

Style

Helvetica Medium and Helvetica Regular are the principle approved fonts for Marine Corps Base Guam, due to their high legibility, simplicity, and availability *(Figures 6.1 and 6.2)*. Helvetica Medium shall be used for the primary information on most signs. Helvetica Regular shall be used for secondary information on identification signs and for certain regulatory signs.

Size

Standard letter heights are based on the capital letter height of the alphabet. Letter heights have been specified for each sign type discussed in these guidelines. Refer to UFC 3-120-01, Figure 2.8 Standard Letter Heights for examples of typical letter heights used for signs in the installation.

Spacing

Proper letter spacing on signs is based on a tile system. Tile systems consist of proportionately sized paperboard cutouts of letters with notches used to align and layout the letters on the signboard. Letter manufacturers will typically supply their own tiles. In the case where tiles are not available, use the letter spacing specifications described in UFC 3-120-01, Chapter 2, Section 2.6 Letter Spacing Standards.

ABCDEFGHIJKLMNOPQRSTUVWXYZ&
Abcdefghijklmnopqrstuvwxyz
1234567890

Figure 6.1 Helvetica Medium Letterform

ABCDEFGHIJKLMNOPQRSTUVWXYZ&
Abcdefghijklmnopqrstuvwxyz
1234567890

Figure 6.2 Helvetica Regular Letterform

SIGN LAYOUT FOR TENANT IDENTIFICATION SIGNS

The proper selection of elements and their arrangement on a sign face are crucial for effective communication. Information should be conveyed with clarity and require minimal reading time.

Sign layouts for exterior identification signs (identifying tenant organization and facilities) should follow the following formats:

- Building signs - building signs generally carry only one unit name.

  Example: 1st Marine Air Wing

- Secondary information - add secondary information below the unit name.

  Example: 1st Marine Air Wing
  Headquarters

- Major tenant - if a building houses more than one organization, the identification sign usually indicates only the major tenant.

  Example: Deputy Commander
  for Resource
  Management

- High priority component units - if major tenant includes high priority component units (the destinations most often sought by people who are new to the installation), those names should also be shown on the sign. Title of major tenant is shortened to accommodate component unit.

  Example: DCR
  Installation Finance

- Coequal units - in cases where there is no clear major tenant, two or three coequal units may be shown on the sign.

  Example: Library
  Education Center
  Family Services
  Red Cross
  Thrift Shop

- Military and community tenants - if a building houses both a military and a community facility, place the major tenant first on the sign face, and use the design rules that apply to the major tenant's sign type.

  Example: Post Office
  Area Defense
  Council

GRAPHICS

Different graphics may be used on signs for Marine Corps Base Guam, including limited use of the United States Marine Corps (USMC) symbol, organizational emblems, and internationally recognized graphic symbols. The following are general guidelines for the use of the different graphics:

- Use the USMC symbol only on base identification signs and the main installation headquarters identification sign; do not use the USMC symbol on any other sign type
- Use the authorized organization emblem of lower echelon flag bearing units and tenant units on military identification signs
- Use organizational emblems only where they apply directly to unit identification; avoid overuse of emblems as overuse dilutes the impact of the emblem and gives the impression of sameness and repetition rather than distinction
- Avoid the use of multiple unit emblems on signs – a unit has only one authorized emblem
- Use internationally recognized service, concession, and regulation symbols shown in *Figures 6.3, 6.4 and 6.5* whenever possible in lieu of word messages, as the symbols are easier to understand and follow than words
- Use sports and recreation symbols shown in *Figure 6.6* whenever possible to identify recreational facilities; use National Park Service recreation symbols for those activities not shown
- Use international symbols for accessibility on accessible signs (see section on accessibility considerations)

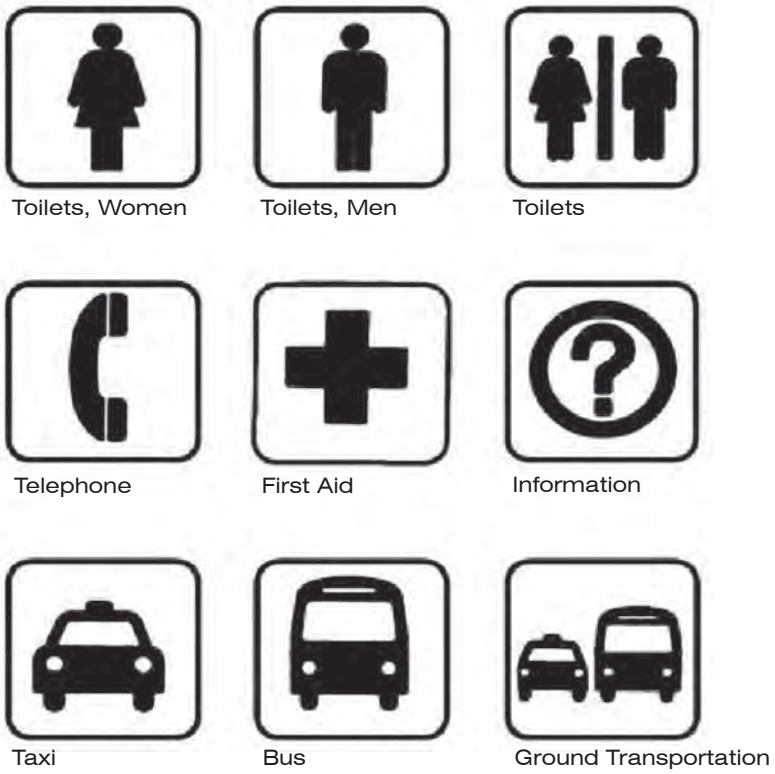

Figure 6.3 Service Symbols

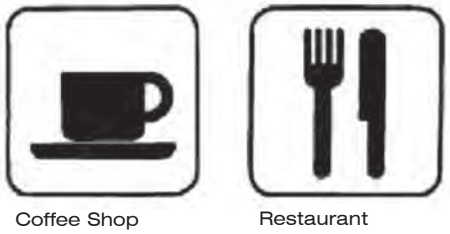

Figure 6.4 Concession Symbols

Figure 6.5 Regulation Symbols

Figure 6.6 Recreation Symbols

SIGN COLORS

Sign colors apply to sign letters, signboards, framing, and monument signs. General colors and finishes are indicated on the sections for each of the different sign types and summarized and expanded on in the table below.

The table below provides general color and finish information to assist the designer in selecting the intended colors for signs in the installation. For control purposes, colors and finishes are based on color and finish palettes of specific manufacturers. These colors and finishes serve as the baseline for actual color selections. Designers may select other manufacturers, but all colors and finishes shall match the baseline selections.

SIGN ELEMENT OR MATERIAL	COLOR(S) OR FINISH	MANUFACTURER OR COLOR STANDARD
Vinyl surface applied or surface screenprint letters, arrows, rules, logos, emblems, and other graphics	White (exception: yellow at Military ID Sign Type 2B)	Standard White, Federal Standard 595, Color 17875 Yellow Federal Standard 595 Color 33696
Individual letters for monument signs	Dark Bronze Anodized	Gemini, Inc.
Individual letters for wall mounted building identification signs	Dark Bronze Anodized Gold Anodized	Gemini, Inc.
EFS Finish A for monument signs	110 Vandyke Sandblast Finish	Dryvit
EFS Finish B for monument signs	Match Benjamin Moore 1127 Sedona Brown	Dryvit
Travertine Finish for monument signs	Light to medium natural travertine with grout to match mid range of travertine color; honed finish	Select from availability in Guam
Typical aluminum signboards and posts	North Creek Brown 1001	Benjamin Moore
Aluminum signboard at Military ID Sign Type 2	Red	Red, Federal Standard 595, Color 31400
Aluminum signboard at accessible parking signs	Blue	Standard Blue, Federal Standard 595, Color 15092
Letters and graphics on traffic control signs	Per MUTCD (Manual on Uniform Traffic Control Devices)	Per MUTCD
Letters and graphics on parking regulation signs	Per MUTCD	Per MUTCD

SIGN PLACEMENT

Signs should be positioned for maximum visibility and legibility. Signs should also be consistently installed so that the viewer can develop an association between the position of the sign and the type of information provided.

All traffic control signs, including bus route signs, direction signs, and parking regulation signs must conform to the placement standards shown in the MUTCD. Placement of all other signs shall conform to this section.

Positioning of signs should not obstruct views or create traffic hazards. Identification, warning, motivation, and information signs along open area roads should be placed laterally a minimum of 6' from the edge of paved shoulders or curbs *(Figure 6.7)*.

In urban areas, signs should be placed laterally a minimum of 6' from the edge of roadways or paved shoulders and 2' from the face of any curb *(Figure 6.8)*. A clearance of 1' from the face of curb is permissible where sidewalk width is limited or where existing poles are close to the curbs *(Figure 6.9)*.

Where two-sided signs (signs readable on both sides) are required, place the sign to allow maximum visibility and readability from either approach to the sign. Follow the sign placement guidelines above when placing two-sided signs along roadways.

For placement of military building entry signs, building number signs, centralized facility signs, community facility signs, recreational facility signs, morale signs, and warning signs, refer to UFC 3-120-01, Section 2C – Sign Placement.

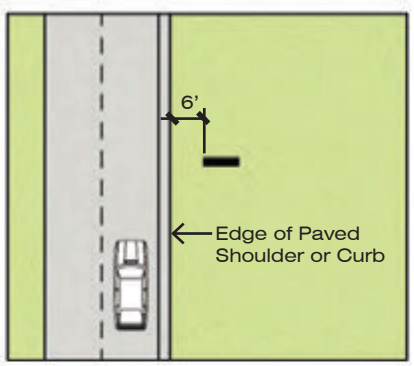

Figure 6.7 Open Area Road Sign Placement

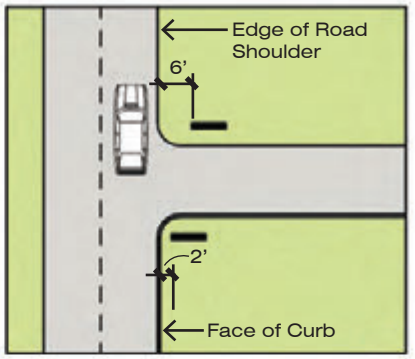

Figure 6.8 Urban Sign Placement

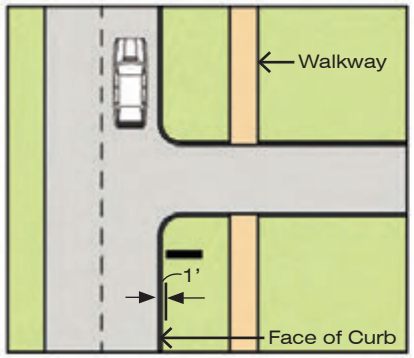

Figure 6.9 Urban Sign Placement Limited Space

ACCESSIBILITY CONSIDERATIONS

On military installations, any building that is used by the general public or civilians must comply with the ADA-ABA Accessible Guidelines. The general idea of the ADA-ABA accessibility guidelines is to provide access to all areas and spaces within buildings and sites that the public is allowed to use. New work and renovations must never decrease accessibility to facilities.

These guidelines are not intended to be a comprehensive or complete guide to meeting the requirements of ADA-ABA as it applies to signage. Designers must consult the ADA-ABA guidelines when dealing with any aspect of accessibility in their projects.

Although the ADA-ABA primarily focuses on interior signs, there are several exterior signs in which accessibility standards may apply:

- Signs marking the accessible routes to building entrances, especially where the accessible route is not clear
- Signs identifying outdoor facilities, such as toilet and bathing facilities, that are required to be accessible
- Signs marking accessible passenger loading zones and parking spaces
- Signs indicating accessible outdoor amenities, such as telephones

Any of the above situations should be coordinated with the requirements of ADA-ABA. The installation sign type for accessible parking stalls is discussed later in this chapter.

The following sign design criteria are also affected by ADA-ABA Accessibility Guidelines: character proportion, character height, use of characters and pictorial symbols, finish and contrast, and mounting location and height. Refer to UFC 3-120-01, Chapter 3, The ADA, Section 3B – Characters for a discussion of these criteria.

Facilities and portions of facilities and amenities that are required to be accessible must display the international symbols of accessibility. *Figure 6.10* displays the most common accessible symbols that shall be used for accessible signs in the installation. Consult the ADA-ABA Accessibility Guidelines for additional information.

Figure 6.10 International Symbols for Accessibility

Sign Types

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OVERVIEW OF SIGN TYPES

There are seven basic sign types used in Marine Corps Base Guam:

- **Exterior Identification Signs**
  These include freestanding and wall or fence mounted signs that identify military units and facilities, community facilities, recreation facilities, and bus routes
- **Direction Signs**
  These include freestanding signs that provide directional information for users to destinations in the installation and signs identifying street names
- **Regulatory Signs**
  These include freestanding and wall or fence mounted signs that regulate traffic in the installation, signs that warn users of enforced regulations, and signs that regulate parking
- **Motivation Signs**
  These include freestanding signs that display community and organizational motivational messages and events
- **Informational Signs**
  These include freestanding signs that provide information on static displays and places or items of interest in the installation and signs that provide directional information for pedestrians
- **Wall Mounted Signs**
  These include signs identifying facilities and building numbers that are mounted directly onto building exterior walls
- **Electronic Signs**
  These signs include electronic billboard or marquee signs to display installation, community service, morale, and advertising types of messages

Certain sign types, such as military identification signs and community facilities signs, have sign type options for monument signs or sign board and post signs. Designers should coordinate with the users, as well as the DRB, determine to which types of signs should be used on projects, based on preferences and/or project need.

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Exterior Identification Signs

Military Identification Sign - Type 1

Military Identification Sign - Type 2A

Military Identification Sign - Type 2B

Centralized Facility Sign

Community Facilities Sign - Type 1A

Community Facilities Sign - Type 1B

Community Facilities Sign - Type 2A

Community Facilities Sign - Type 2B

Community Building Entry Sign

Recreation Facility Sign

Bus Route Sign

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MILITARY IDENTIFICATION SIGN – TYPE 1

This sign type is used to identify military activities and facilities and should carry one facility name and/or unit name and any secondary information required to identify the unit component (such as headquarters). No unit mottoes or names or titles of individuals are permitted.

Type 1 Military Identification Signs are used to identify the highest level flag bearing organizations in the installation. Signs are intended for command level organizations or highest level units.

Construction

Concrete sign panel with EFS finish; concrete pillar with 10"x10" travertine finish in running bond pattern, vertically cut and aligned vertically

Colors

Dark bronze letters; smooth EFS finish; travertine with honed finish; see sign colors section on Page 6-10

Dimensions

As shown

Typography/Graphics

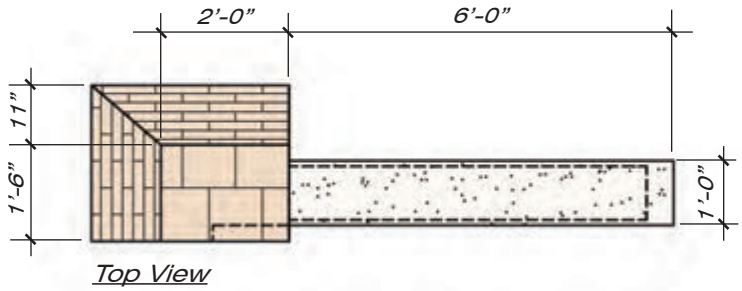
- Lettering: unit name and secondary information in upper and lower case letters (up to 3 lines/15 characters per line), 4" capital letter height, center justified between edge of shield and edge of sign
- Letterform: Helvetica Medium
- Material: Anodized dark bronze metal individual letters, surface mounted to concrete sign panel; 1/2" letter depths

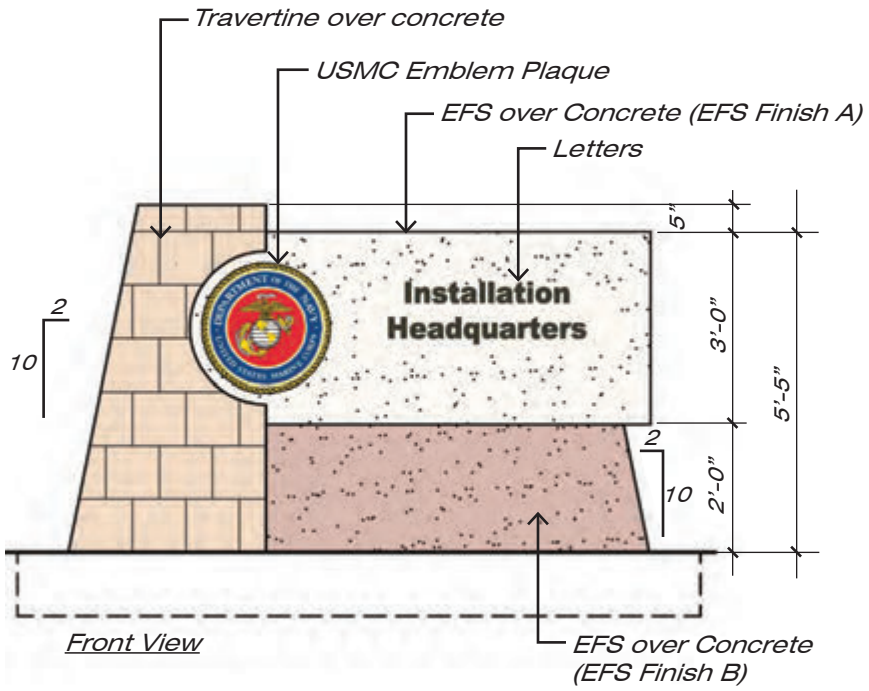
Shield

USMC emblem; 2' diameter, bronze metal plaque with UV fade-resistant, baked on colors with polyurethane finish

Layout

As shown





MILITARY IDENTIFICATION SIGN – TYPE 2A

This sign type is used to identify military activities and facilities and should carry one facility name and/or unit name and any secondary information required to identify the unit component (such as headquarters). No unit mottoes or names or titles of individuals are permitted.

Type 2A Military Identification Signs are used to identify lower echelon flag bearing units. Tenant units and headquarters with authorized organizational emblems may also use this sign at the discretion of the Installation Commander

Construction

Concrete sign panel with Exterior Finish Systems (EFS) finish; concrete pillars with 10"x10" travertine finish in running bond pattern, vertically cut and aligned vertically

Colors

Dark bronze letters; smooth EFS finish; travertine with honed finish; see sign colors section on Page 6-10

Dimensions

As shown

Typography/Graphics

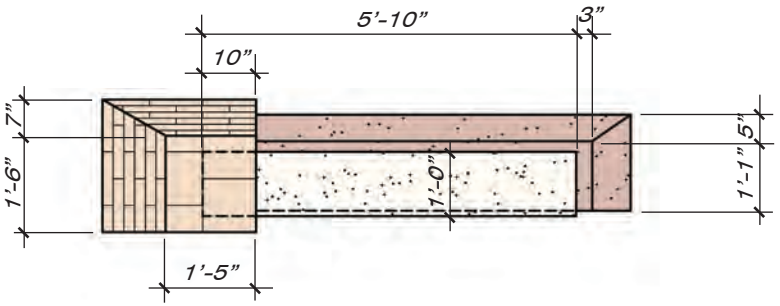
- Lettering: unit name and secondary information in upper and lower case letters (up to 3 lines/15 characters per line), 4" capital letter height, left justified
- Letterform: Helvetica Medium
- Material: Anodized dark bronze metal individual letters, surface mounted to concrete sign panel; 1/2" letter depths

Emblem

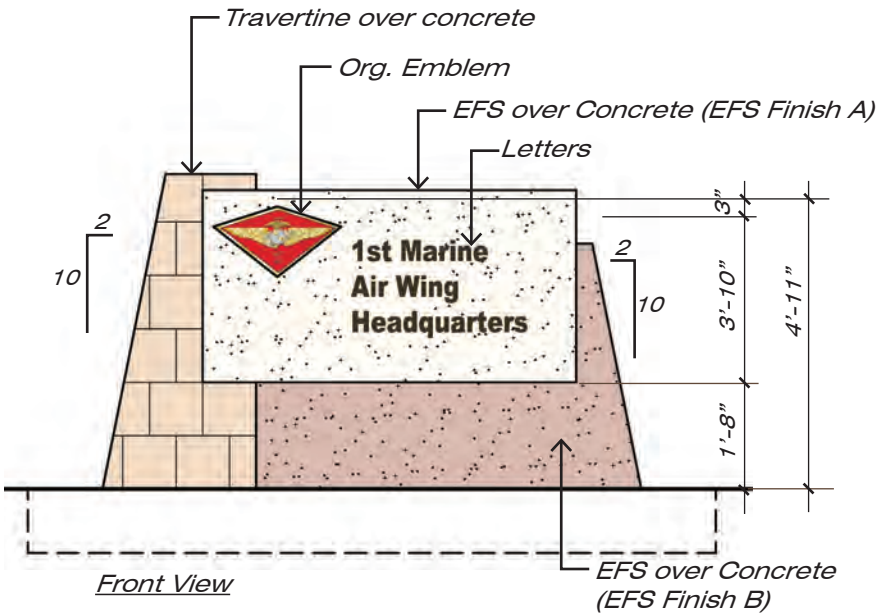
Authorized emblem; bronze metal plaque with UV fade-resistant, baked on colors with polyurethane finish

Layout

As shown



Top View



Front View

MILITARY IDENTIFICATION SIGN – TYPE 2B

This sign type is used to identify military activities and facilities and should carry one facility name and/or unit name and any secondary information required to identify the unit component (such as headquarters). No unit mottoes or names or titles of individuals are permitted.

Type 2B Military Identification Signs can be used in lieu of military ID sign Type 2A to identify lower echelon flag bearing units.

Construction

Aluminum signboard supported on 4"x4" non-removable square aluminum posts, fully grouted for additional strength; anodized aluminum finish; stainless steel fasteners; commander name panel can be removable to facilitate name changes

Colors

Yellow letters, numbers, and rules on red background; North Creek Brown posts; sign colors section on Page 6-10

Dimensions

As shown

Typography/Graphics

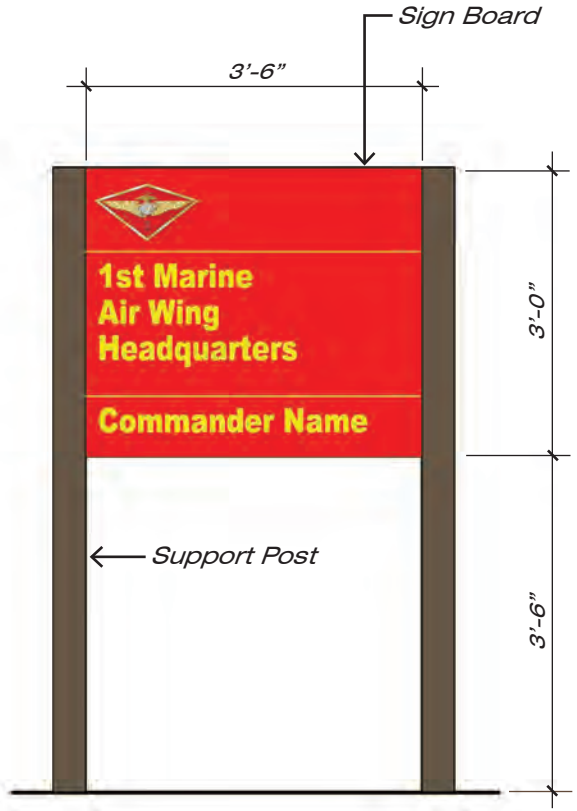
- Lettering: unit name in upper and lower case letters (up to 3 lines/17 characters per line), 3" capital letter height, flushed left
- Lettering: Commander's name in upper and lower case letters, 3" capital height, flushed left
- Letterform: Helvetica Medium
- Rules: 3mm (1/8") wide
- Application: vinyl surface applied or surface screenprint letters and rules

Emblem

Authorized emblem; vinyl surface applied or surface screenprint

Layout

As shown and as specified in UFC 3-120-01, Figure 4.18 Military Identification Sign Type B2 Layouts



CENTRALIZED FACILITIES SIGN

This sign type is used to identify several community or recreational activities that are located in a common area (usually with shared parking).

Construction

Aluminum signboard surface attached directly to concrete upright panel with EFS finish; concrete pillar with 10”x10” travertine finish in running bond pattern, vertically cut and aligned vertically

Colors

Signboard: white letters, numbers, and rules on North Creek Brown background; smooth EFS finish; travertine with honed finish; see sign colors section on Page 6-10

Dimensions

As shown

Typography/Graphics

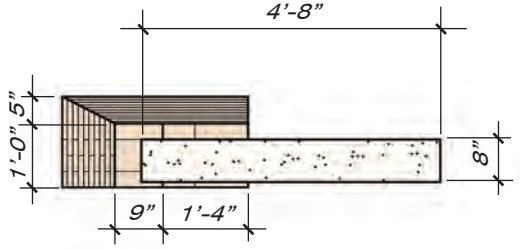
- Primary lettering: center name in upper and lower case letters (up to 3 lines/15 characters per line), 4” capital letter height, flushed left
- Secondary lettering: facilities list in upper and lower case letters (up to 6 lines/20 characters per line), 3” capital letter height, flushed left
- Letterform: Helvetica Medium
- Rules: 3mm (1/8”) wide
- Application: vinyl surface applied or surface screenprint letters and rules

Emblem

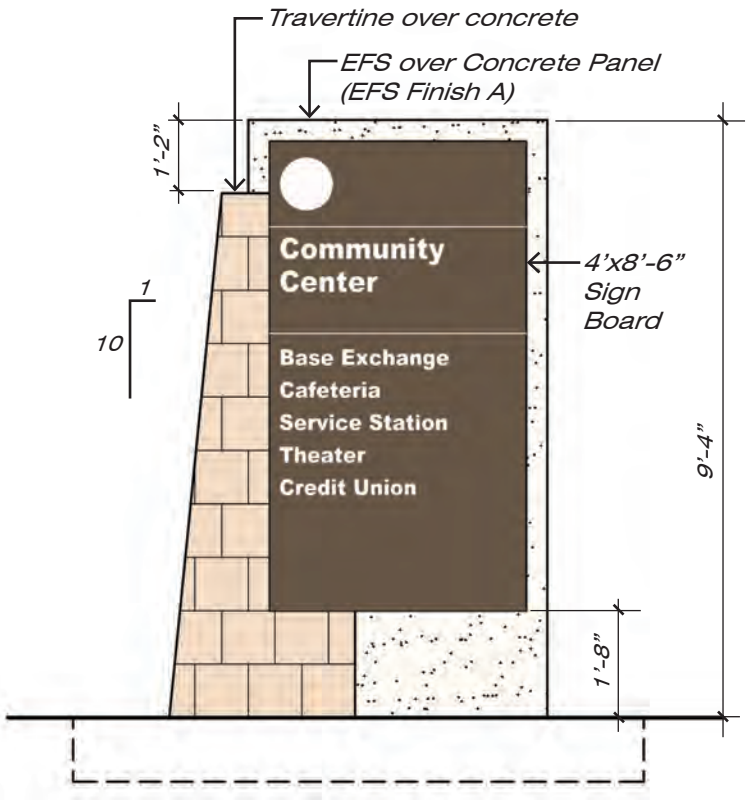
Approved graphic symbol at upper left corner; vinyl surface applied or surface screenprint

Layout

As shown and as specified in UFC 3-120-01, Figure 4.35 Centralized Facilities Type C1 Layout A



Top View



Front View

COMMUNITY FACILITIES SIGN – TYPE 1A

This sign type is used to identify major community facilities such as the Commissary and Installation Exchange. The installation command will determine which facilities may use this sign based on scale, importance, and frequency of use.

Construction

Concrete signboard with EFS finish; concrete pillar with 10”x10” travertine finish in running bond pattern, vertically cut and aligned vertically

Colors

Dark bronze letters; smooth EFS finish; travertine with honed finish; see sign colors section on Page 6-10

Dimensions

As shown

Typography/Graphics

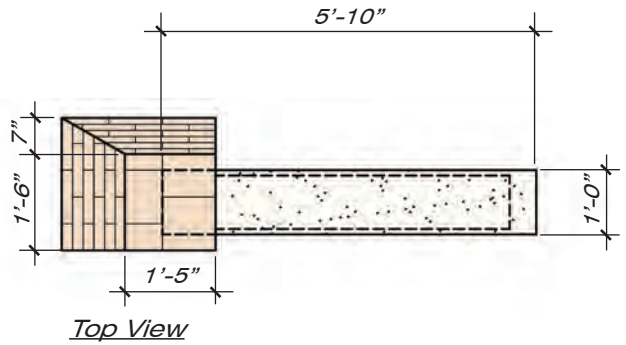
- Lettering: facility name in upper and lower case letters (up to 3 lines/15 characters per line), 4” capital letter height, left justified
- Letterform: Helvetica Medium
- Material: Anodized dark bronze metal individual letters, surface mounted to concrete sign panel; 1/2” letter depths

Emblem

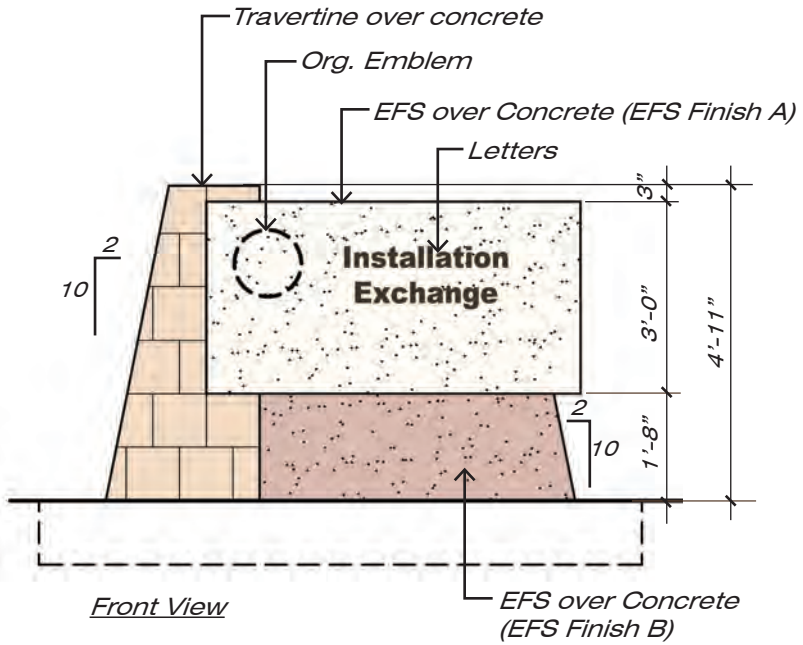
Authorized emblem; bronze metal plaque with Ultraviolet (UV) fade-resistant, baked on colors with polyurethane finish

Layout

As shown



Top View



Front View

COMMUNITY FACILITIES SIGN – TYPE 1B

This sign type is used to identify major community facilities such as the Commissary and Installation Exchange. The installation civil engineer will determine which facilities may use this sign based on scale, importance, and frequency of use.

Type 1B Community Facilities sign can be used as an option to Type 1A Community Facilities sign.

Construction

Aluminum signboard supported on 4”x4” non-removable square aluminum posts, fully grouted for additional strength; anodized aluminum finish; stainless steel fasteners

Colors

White letters, numbers, and rule on North Creek Brown background; North Creek Brown posts; see sign colors section on Page 6-10

Dimensions

As shown

Typography/Graphics

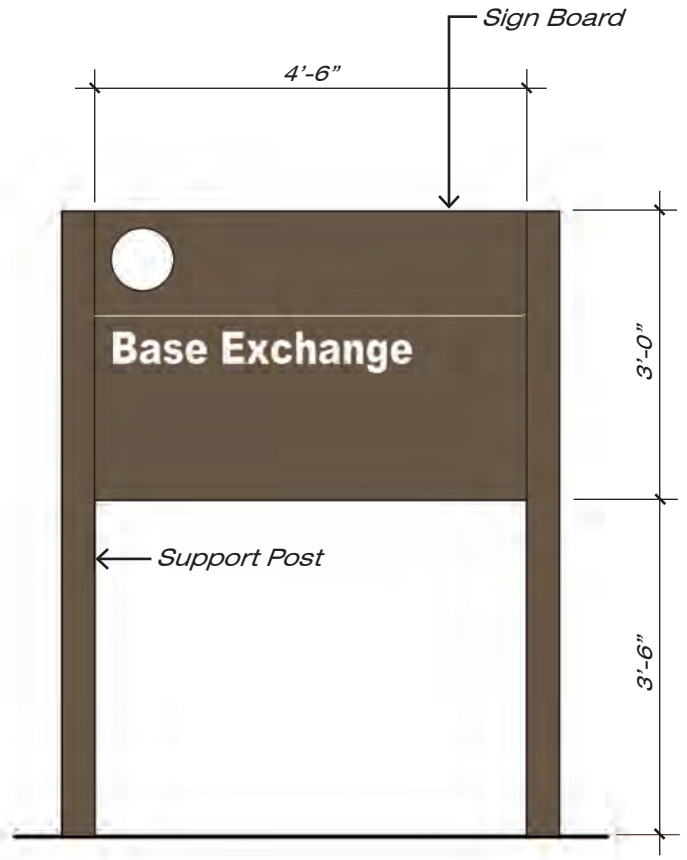
- Lettering: facility name in upper and lower case letters (up to 3 lines/17 characters per line), 4” capital letter height, flushed left
- Letterform: Helvetica Medium
- Rule: 3 mm (1/8”) wide
- Application: vinyl surface applied or surface screenprint letters and rules

Emblem

Authorized emblem; vinyl surface applied or surface screenprint

Layout

As shown and as specified in UFC 3-120-01, Figure 4.38 Community Facilities Sign Type C2 Layouts



COMMUNITY FACILITIES SIGN – TYPE 2A

This sign type is used to identify small scale community facilities such as the Child Care Center, the Youth Center, and the Credit Union.

Construction

Concrete signboard with EFS finish; concrete pillar with 10”x10” travertine finish in running bond pattern, vertically cut and aligned vertically

Colors

Dark bronze letters; smooth EFS finish; travertine with honed finish; see sign colors section on Page 6-10

Dimensions

As shown

Typography/Graphics

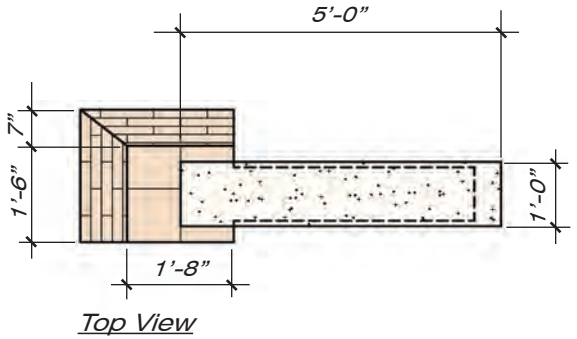
- Lettering: facility name in upper and lower case letters (up to 3 lines/15 characters per line), 4” capital letter height, left justified
- Letterform: Helvetica Medium
- Material: dark bronze individual letters, surface mounted to concrete sign panel; 1/2” letter depths

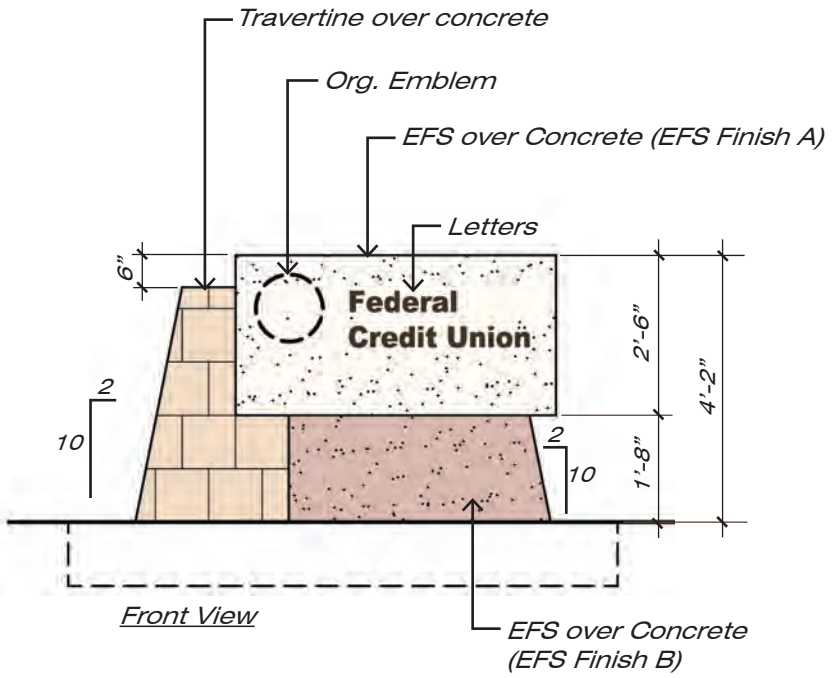
Emblem

Authorized emblem; bronze metal plaque with UV fade-resistant, baked on colors with polyurethane finish

Layout

As shown





COMMUNITY FACILITIES SIGN – TYPE 2B

This sign type is used to identify small scale community facilities such as the Child Care Center, the Youth Center, and the Credit Union.

Type 2B Community Facilities sign can be used as an option to Type 2A Community Facilities sign.

Construction

Aluminum signboard supported on 4”x4” non-removable square aluminum posts, fully grouted for additional strength; anodized aluminum finish; stainless steel fasteners

Colors

White letters, numbers, and rule on North Creek Brown background; North Creek Brown posts; see sign colors section on Page 6-10

Dimensions

As shown

Typography/Graphics

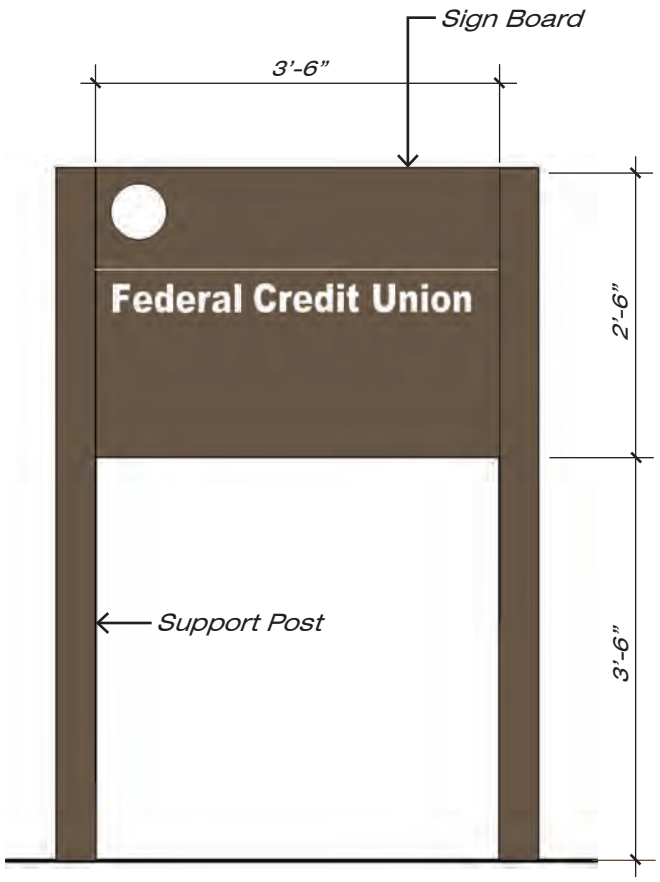
- Lettering: facility name in upper and lower case letters (up to 3 lines/17 characters per line), 3” capital letter height, flushed left
- Letterform: Helvetica Medium
- Rule: 3mm (1/8”) wide
- Application: vinyl surface applied or surface screenprint letters and rule

Emblem

Authorized emblem; vinyl surface applied or surface screenprint

Layout

As shown and as specified in UFC 3-120-01, Figure 4.41 Community Facilities Sign Type C2 Layouts and Figure 4.42 Community Facilities Sign Type C3 Layouts



COMMUNITY BUILDING ENTRY SIGN

This sign type is used to identify those activities that are reached through a separate entry point in cases where the building has more than one primary entrance.

Community building entry signs are always wall mounted. Place sign at door entry as shown.

Construction

Aluminum signboard mounted directly on wall; anodized aluminum finish; stainless steel fasteners

Colors

White letters, numbers, and rule on North Creek Brown background; see sign colors section on Page 6-10

Dimensions

As shown

Typography/Graphics

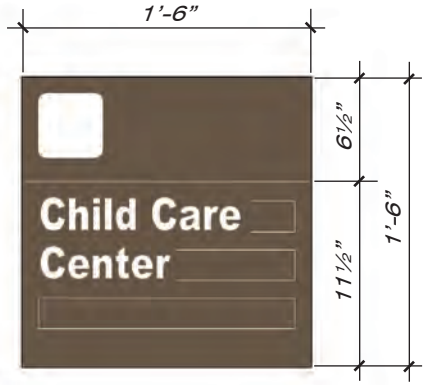
- Lettering: facility name in upper and lower case letters (up to 3 lines/10 characters per line), 2” capital letter height, flushed left
- Letterform: Helvetica Medium
- Rule: 3mm (1/8”) wide
- Application: vinyl surface applied or surface screenprint letters and rule
- Braille: Per ADA-ABA Accessibility Guidelines requirements for entry signs

Emblem

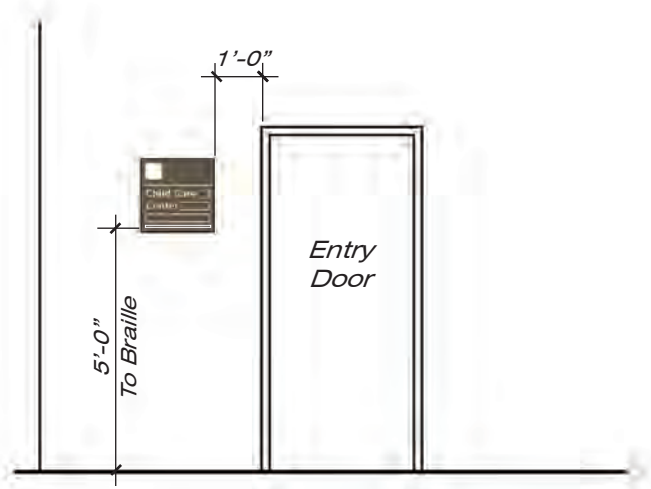
Authorized emblem; vinyl surface applied or surface screenprint

Layout

As shown and as specified in UFC 3-120-01, Figure 4.44 Community Building Entry Sign Type C4 Layouts



Sign Panel



Placement at Entry Door

RECREATION FACILITY SIGN

This sign is used to identify recreation facilities such as tennis courts and playing fields.

Mount recreation facility signs on fence enclosures, walls, or 2"x2" square aluminum posts with black forest green anodized aluminum finish. See UFC 3-120-01 Figure 4.45 Recreational Facility Sign Type C5 for mounting standards.

Construction

Anodized aluminum signboard with stainless steel fasteners

Colors

White letters, numbers, arrows, and rule on North Creek Brown background; see sign colors section on Page 6-10

Dimensions

As shown

Typography/Graphics

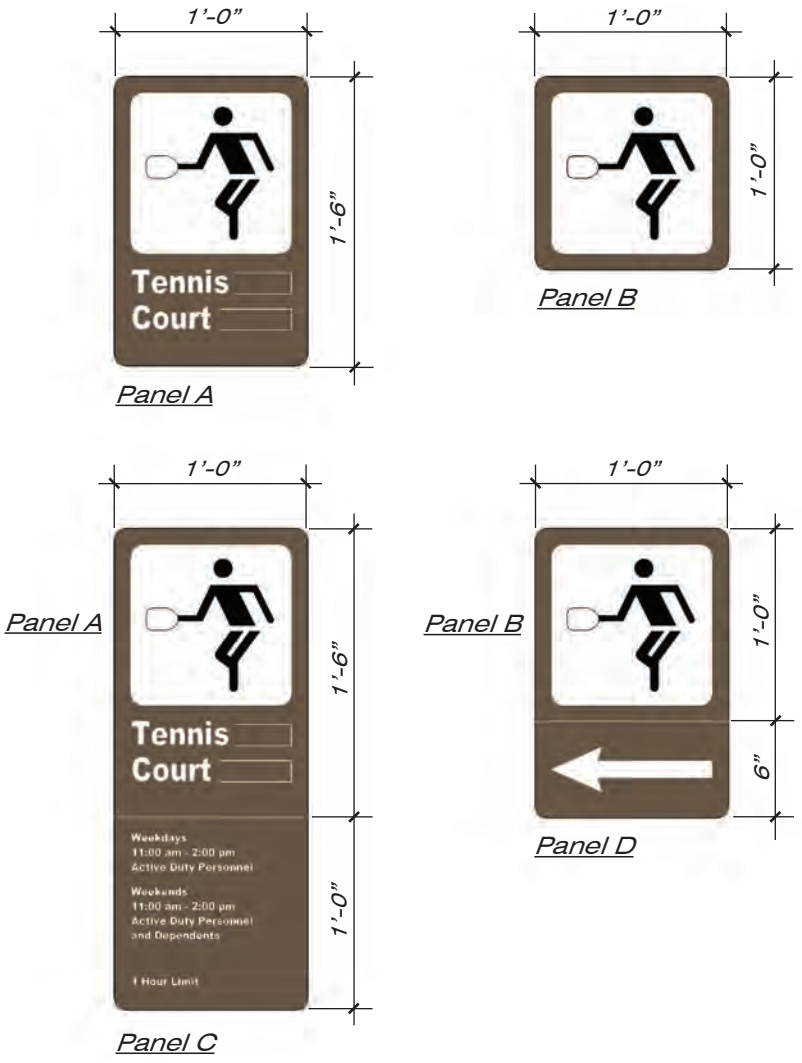
- Panel A Lettering: facility name in upper and lower case letters (up to 2 lines/9 characters per line), 1-1/2" capital letter height, flushed left
- Panel C Message text: upper and lower case letters (up to 10 lines/26 characters per line), 1/2" capital letter height, flushed left
- Letterform: Helvetica Medium
- Rule: 3mm (1/8") wide
- Arrow: 2-3/4" x 10" arrow
- Application: vinyl surface applied or surface screenprint letters and rule

Emblem

Authorized emblem; vinyl surface applied or surface screenprint

Layout

As shown and as specified in UFC 3-120-01, Figure 4.46 Recreational Facility Sign Type C5 Panels, A, B, C, and D



BUS ROUTE SIGN

This sign is used to identify bus stops along prescribed bus routes in the installation.

Mount signs on 2”x2” square aluminum posts with black forest green anodized aluminum finish. Refer to UFC 3-120-01 Figure 4.47 Bus Route Sign Type C6 Placement for mounting standards.

Construction

Anodized aluminum signboard with stainless steel fasteners

Colors

White letters, numbers, and rule on North Creek Brown background; see sign colors section on Page 6-10

Dimensions

As shown

Typography/Graphics

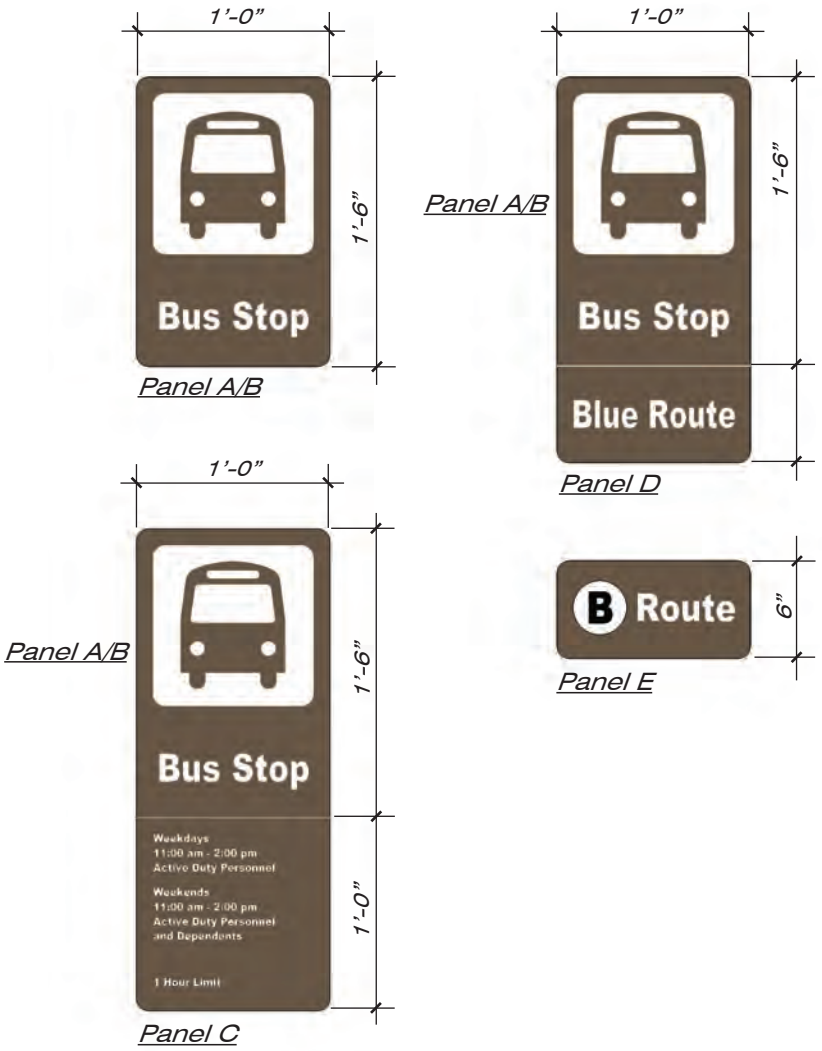
- Bus Stop lettering: facility name in upper and lower case letters, 1-1/2” capital letter height, centered
- Panel C Message text: upper and lower case letters (up to 10 lines/26 characters per line), 1/2” capital letter height, flushed left
- Panel D lettering: upper and lower case letters, 1-1/2” capital letter height, centered
- Letterform: Helvetica Medium
- Rule: 3mm (1/8”) wide
- Application: vinyl surface applied or surface screenprint letters and rule

Emblem

Bus symbol; vinyl surface applied or surface screenprint

Layout

As shown and as specified in UFC 3-120-01, Figure 4.48 Bus Route Sign Type C6 Layouts



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Direction Signs

Directional Sign

Street Name Sign

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DIRECTIONAL SIGN

This sign is used to help drivers find their destinations in the installation more easily.

Construction

Aluminum signboard supported on 4”x4” non-removable square aluminum posts, fully grouted for additional strength; anodized aluminum finish; stainless steel fasteners

Colors

White letters, arrows, rules, and border on North Creek Brown background; North Creek Brown posts; see sign colors section on Page 6-10

Dimensions

As shown

Typography/Graphics

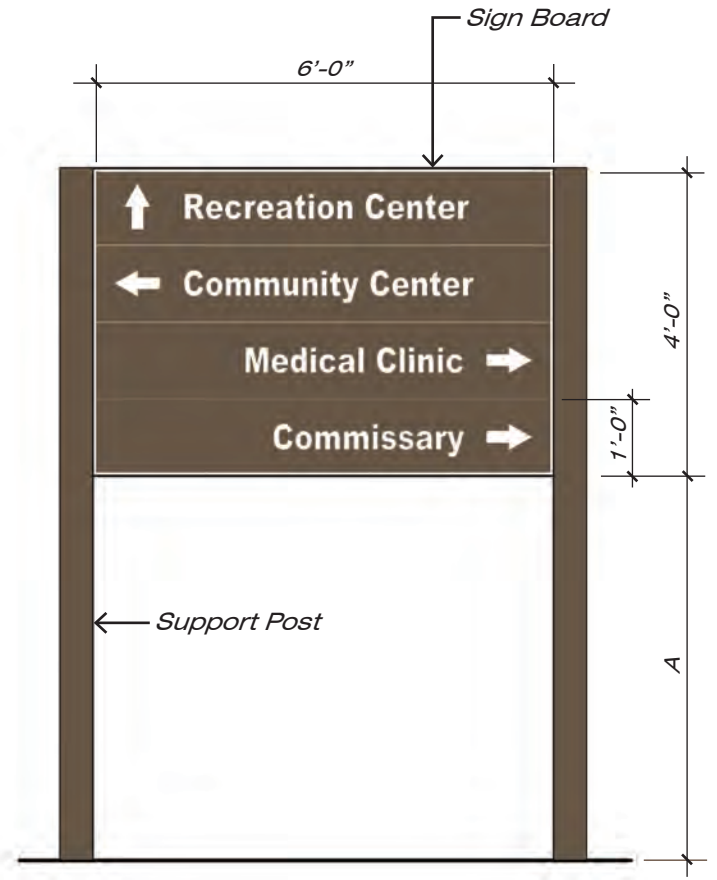
- Lettering: facility name in upper and lower case letters (up to 4 lines/17 characters per line), 4” capital letter height, flushed left or right to arrow
- Letterform: Helvetica Medium
- Arrows: MUTCD Arrow Proportions per UFC 3-120-01, Figure 5.3, Type D2
- Rules: 6mm (1/4”) wide
- Border: 19mm (3/4”) wide
- Application: vinyl surface applied or surface screenprint letters, arrows, rules, and border

Emblems

No emblems allowed

Layout

As shown and as specified in UFC 3-120-01, Figure 5.10 Directional Sign Type D2 Layout



A = 5’-0”; 7’-0” if visual clearance over objects is required.

STREET NAME SIGN

Standard installation street name sign.

Street name signs shall be mounted on 2” round galvanized steel posts. Refer to MUTCD manual for mounting standards.

Construction

Anodized aluminum signboard with stainless steel fasteners

Colors

Reflective white letters, numbers, arrows, rules, and border on reflective North Creek Brown background; see sign colors section on Page 6-10

Dimensions

As shown

Typography/Graphics

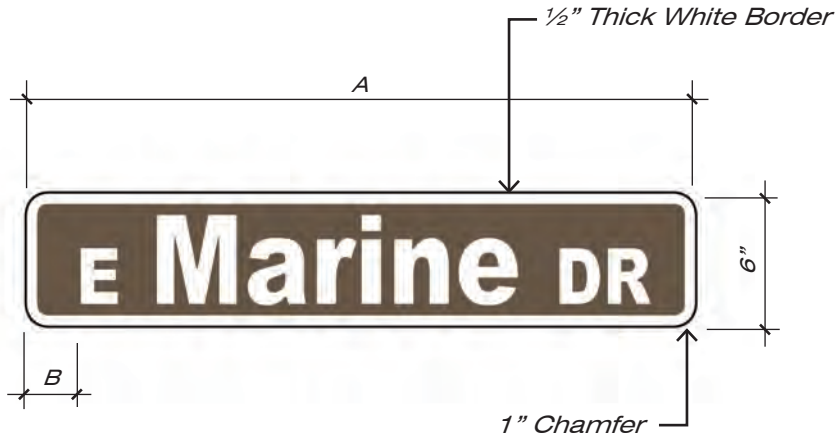
- Street name lettering: upper and lower case letters, 4” capital letter height, centered
- Secondary information: upper case letters, 2-1/2” capital letter height, left or right justified as required
- Letterform: Helvetica Medium
- Border: 13mm (1/2”) wide
- Application: vinyl surface applied or surface screenprint letters, arrows, rules, and border

Emblems

No emblems allowed

Layout

As shown and as specified in UFC 3-120-01, Figure 5.11 Directional Sign Type D3 Typical Panel



A = 1’-0” minimum; increase by increments of 6” as required to fit street name

B = 2” minimum

Regulatory Signs

Traffic Control Signs

Installation Warning Sign - Type 1A

Installation Warning Sign - Type 1B

Parking Regulation Signs

Accessible Parking Regulation Sign

Parking Reserve Sign

Parking Signs Mounting Standards

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TRAFFIC CONTROL SIGNS

These signs are used to regulate vehicular traffic in the installation. Refer to the MUTCD published by the Federal Highway Administration for highway standards in the United States.

Any deviation from the accepted highway safety signs could create serious safety hazards. It is important to continue the use of familiar highway signs in the installation. Traffic control signs should follow the standard shapes, designs, and colors as specified in the MUTCD.

Construction

Follow MUTCD standards and regulations

Colors

Follow MUTCD standards and regulations

Dimensions

Follow MUTCD standards and regulations

Typography/Graphics

Follow MUTCD standards and regulations

Layout

Follow MUTCD standards and regulations

INSTALLATION WARNING SIGN – TYPE 1A

This sign is used to define areas of controlled or restricted access. Displayed at the installation perimeter, at controlled and/or restricted areas or facilities, and facilities protected by Intrusion Detection Equipment (IDE).

Use Sign Panel A for the installation warning sign. Use Sign Panel B at controlled or restricted personnel and vehicle entry points. Utilize additional warning signs on the following page as needed to post additional notices.

Construction

Aluminum signboard supported on 4"x4" non-removable square aluminum posts, fully grouted for additional strength; anodized aluminum finish; stainless steel fasteners

Colors

Reflective white letters and rule on reflective North Creek Brown background; see sign colors section on Page 6-10

Dimensions

As shown

Typography/Graphics

- Warning lettering: upper case, 5" capital letter height, centered
- Heading: upper and lower case letters (one line/25 characters), 2" capital letter height, flushed left
- Message text: upper and lower case letters (up to 8 lines/44 characters per line), 1" capital letter height, flushed left
- Citation text: upper and lower case letters, 3/4" capital letter height, flushed left
- Letterform: Helvetica Medium
- Rule: 3mm (1/8") wide
- Application: vinyl surface applied or surface screenprint letters, arrows, rules, and border

Layout

As shown and as specified in UFC 3-120-01, Figure 6.5 and Figure 6.6

Controlled or Restricted Area Sign
Sign Panel B

Installation Warning Sign
Sign Panel A

ADDITIONAL WARNING SIGNS FOR TYPE 1A WARNING SIGNS

These signs are used to supplement Type 1A Installation Warning Signs described on previous page.

Install Sign Panels C, E, F, and G beneath Installation Warning Signs as required to post additional notices. Utilize Sign Panel D alone or in conjunction with Sign Panels C, E, F, and G.

Construction

Anodized aluminum signboard with stainless steel fasteners

Colors

Reflective white letters on reflective North Creek Brown background; see sign colors section on Page 6-10

Dimensions

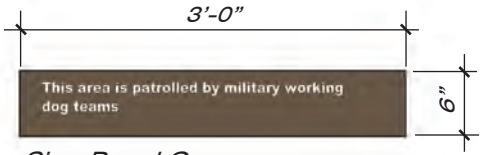
As shown

Typography/Graphics

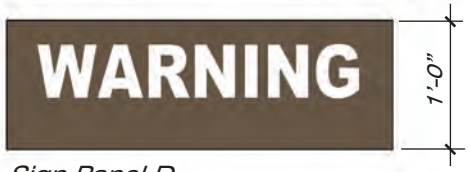
- Sign Panel C: see UFC 3-120-01 Figure 6.7 Base Warning Sign Type E1 Panel C for lettering specifications
- Sign Panels D, E, F, and G: see UFC 3-120-01 Figure 6.8 Base Warning Sign Type E1 Panels D, E, F, and G for lettering specifications
- Application: vinyl surface applied or surface screenprint letters

Layout

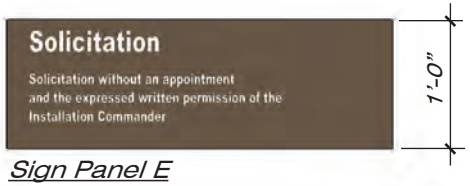
As shown and as specified in UFC 3-120-01, Figure 6.7 Base Warning Sign Type E1 Panel C and Figure 6.8 Base Warning Sign Type E1 Panels D, E, F, and G



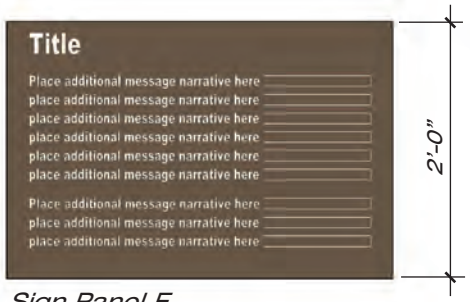
Sign Panel C



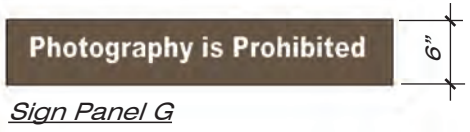
Sign Panel D



Sign Panel E



Sign Panel F



Sign Panel G

INSTALLATION WARNING SIGN – TYPE 1B

This sign is similar to Type 1A Installation Warning Signs but smaller. It is displayed at the installation perimeter, at controlled and/or restricted areas or at facilities, and facilities protected by IDE.

Use Sign Panel A1 to post area boundaries. Use Sign Panel B1 Controlled Area and Restricted Area signs to post area boundaries and the interior and exterior doors of buildings.

Construction

Aluminum signboard supported on perimeter fences, walls, and doors of buildings; anodized aluminum finish; stainless steel fasteners

Colors

Reflective white letters and rule on reflective North Creek Brown background; see sign colors section on Page 6-10

Dimensions

As shown

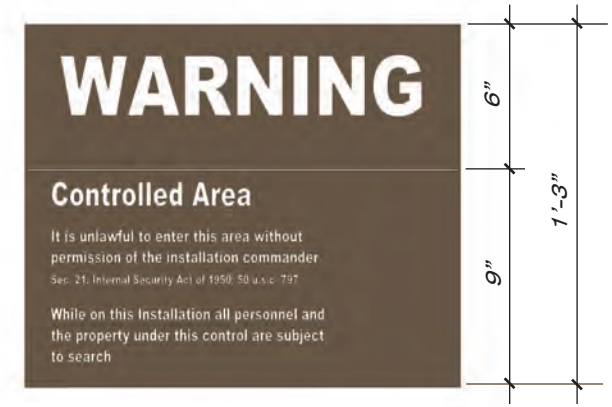
Typography/Graphics

- Warning lettering: upper case, 2-1/2” capital letter height, centered
- Heading: upper and lower case letters (one line/25 characters), 1” capital letter height, flushed left
- Message text: upper and lower case letters (up to 8 lines/44 characters per line), 1/2” capital letter height, flushed left
- Citation text: upper and lower case letters, 3/8” capital letter height, flushed left
- Letterform: Helvetica Medium/Helvetica Regular
- Rule: 3mm (1/8”) wide
- Application: vinyl surface applied or surface screenprint letters, arrows, rules, and border

Layout

As shown and as specified in UFC 3-120-01, Figure 6.9 and Figure 6.10

Sign Panel A1



Sign Panel B1

PARKING REGULATION SIGNS

These signs are used to identify general and restricted parking areas. These signs are designed to meet the specific needs of the USMC Main Cantonment and to supplement the MUTCD national standards.

Use Sign Panels A, B, C, D, E, F, G, and H to identify general and restricted parking areas and to define specific parking regulations (such as the hours and days of regulation).

Construction

Aluminum sign panel, reflective to comply with MUTCD; stainless steel fasteners

Colors

- Panels A, B, E, F, G, and H: standard green “P” symbol, letters, arrows, and borders on white background
- Panels C and D: black “P” symbol and standard red circle with slash, borders, and letters on white background

Dimensions

As shown and as specified in UFC 3-120-01 Figure 6.12 Parking Regulation Sign Type E1 Layouts

Typography/Graphics

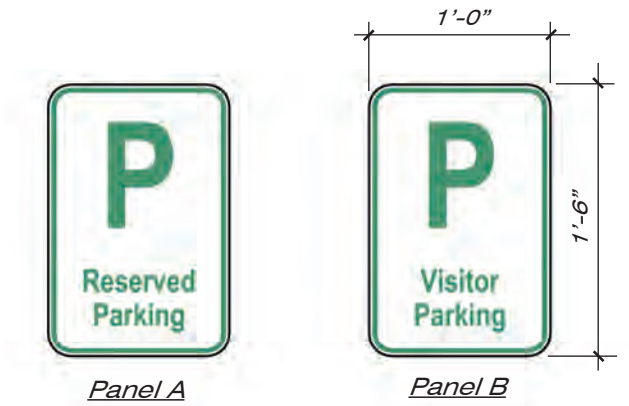
- Upper and lower case letters, centered, and sized as shown in UFC 3-120-01 Figure 6.12 Parking Regulation Sign Type E1 Layouts
- Letterform: Helvetica Medium

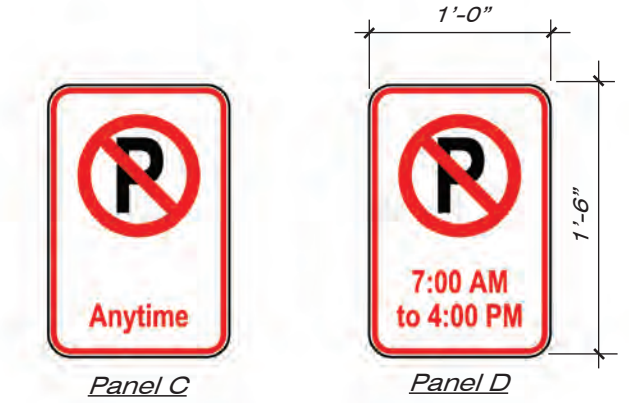
Layout

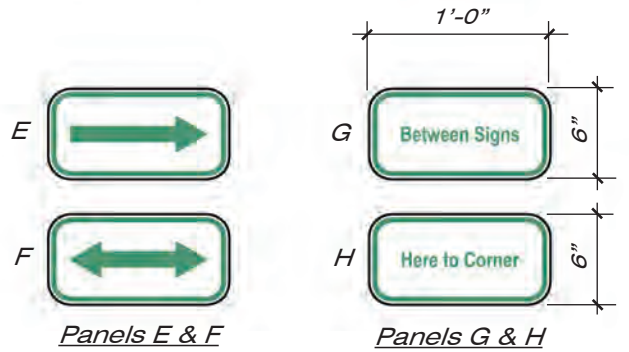
As shown and as specified in UFC 3-120-01 Figure 6.12 Parking Regulation Sign Type E1 Layouts

Post Mounting

Post Mount Type A (see Parking Signs Mounting Standards on Page 6-46)







ACCESSIBLE PARKING REGULATION SIGN

This sign combination is used to identify handicap accessible parking stalls. These signs are designed to meet the requirements of the ADA-ABA Accessibility Guidelines.

Use these signs to identify parking stalls that are required to be accessible per the ADA-ABA Accessibility Guidelines.

Construction

Aluminum sign panels, reflective to comply with MUTCD; stainless steel fasteners

Colors

Reflective white letters, ADA symbol, and borders on blue reflective background; see sign colors section on Page 6-10

Dimensions

As shown

Typography/Graphics

- Reserved Parking text: upper and lower case letters, 2” capital letter height, centered
- Message text: upper case letters, 3/4” capital letter height, centered
- Van Accessible text: upper case letters, 1-1/2” capital letter height, centered
- Letterform: Helvetica Medium/Helvetica Regular
- ADA symbol: white international symbol for accessibility
- Borders: 1/4” thick at Reserved Parking and Van Accessible sign panels; 1/8” thick at ADA symbol panel
- Application: Vinyl surface applied or surface screen print letters, symbols, and borders

Layout

As shown

Post Mounting

Post Mount Type A (see Parking Signs Mounting Standards)

PARKING RESERVE SIGN

This sign is used to identify reserved parking stalls for commanding officers, senior officers, senior non-commissioned officers (NCOs), expecting mothers, and other dignitaries.

Whenever possible, designate reserved parking by area, rather than by individual spaces, as the designations change frequently and numerous signs add to visual clutter.

Construction

Reflective aluminum anodized sign panel with stainless steel fasteners

Colors

Reflective white letters, numbers, borders, and rule on North Creek Brown background; see sign colors section on Page 6-10

Dimensions

As shown

Typography/Graphics

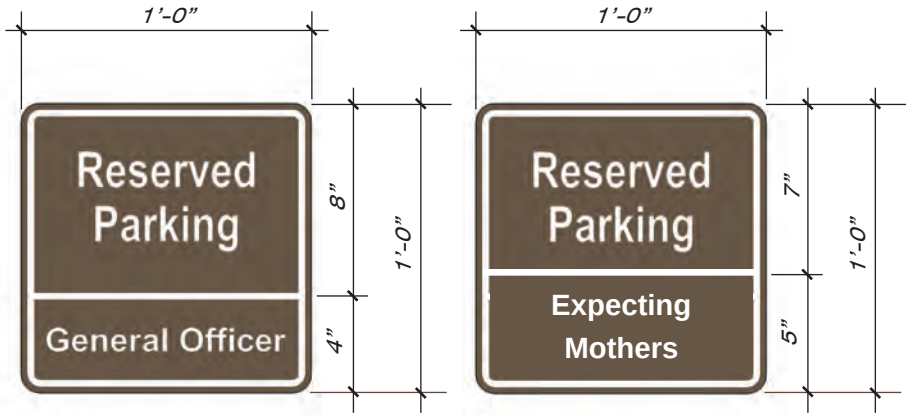
- Reserved Parking text: upper and lower case letters, 1-1/2" capital letter height, centered
- Panel A title: upper and lower case letters , 1" capital letter height (up to 2 lines/13 characters per line), centered
- Panel B title: upper and lower case letters, 1-1/2" capital letter height (one line/9 characters), centered
- Letterform: Helvetica Medium

Layout

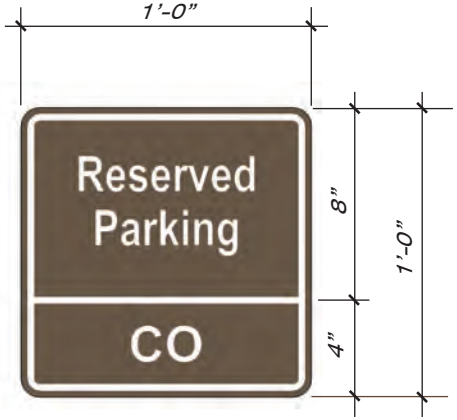
As shown and as specified in UFC 3-120-01, Figure 6.13 Parking Regulation Sign Type E2 Panels A and B

Post Mounting

Post Mount Type B (see Parking Signs Mounting Standards)



Panel A



Panel B

PARKING SIGNS MOUNTING STANDARDS

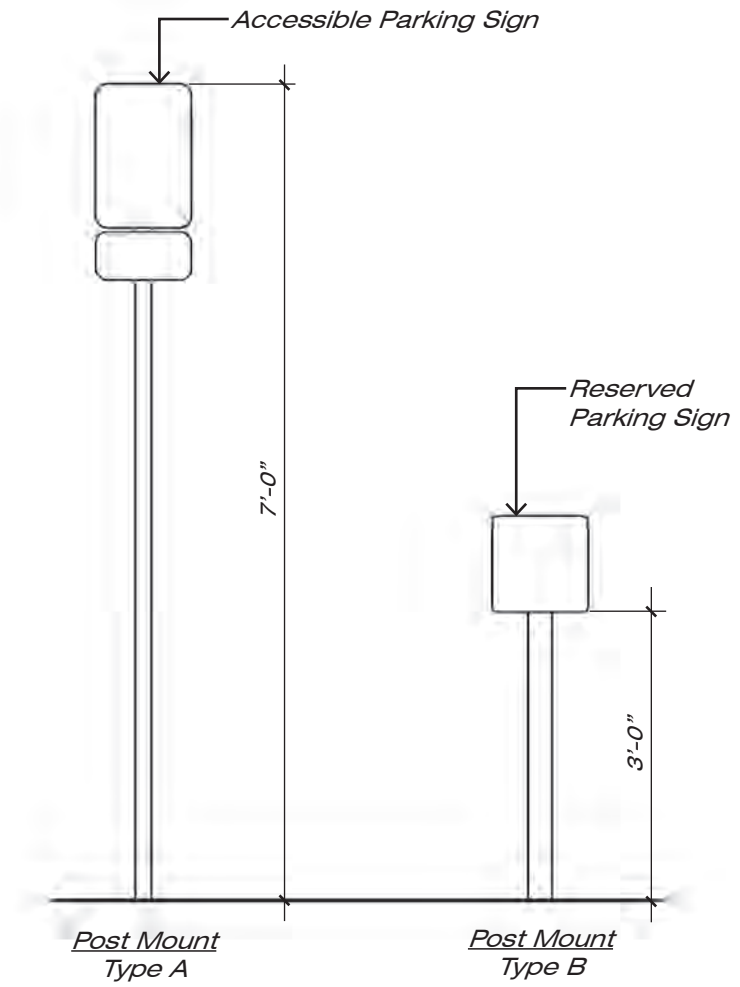
These mounting standards are for accessible parking regulation signs and reserve parking signs.

Post Mount Type A

- Post material: 2” round galvanized steel breakaway post
- Accessible Parking Regulation Signs Sign types:
- Sign mounting height: as shown
- Breakaway post features:
  - Post breaks away with set amount of force from any angle of incidence (360 degrees), irrespective of speed of impact
  - Anchor is driven flush with grade and breakaway coupler shears level to eliminate metal shards that may stick out after post breaks away
  - Anchor is reusable after post breaks away making replacing posts possible without having to change the anchoring system
  - Breakaway post system is engineered to withstand maximum wind load capability for Guam

Post Mount Type B

- Post material: 3” square anodized aluminum with North Creek Brown finish
- Sign types: Reserved Parking Signs, Panels A, B, and C
- Sign mounting height: as shown



Motivation Signs

Standard Changeable Letter Sign

Unit Morale Sign

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STANDARD CHANGEABLE LETTER SIGN

This sign is used to support and promote safety campaigns, fund raising drives, special events, and other worthwhile programs.

The installation command is responsible for approving, installing, and monitoring the use of these signs. In general, use of these signs should be kept to a minimum.

Construction

Aluminum signboard supported on 4"x4" non-removable square aluminum posts, fully grouted for additional strength; aluminum railings for individual letter tiles; anodized aluminum finish; stainless steel fasteners

Colors

Reflective white letters on North Creek Brown letter tile background; North Creek Brown sign panel, letter tile railings, and posts; see sign colors section on Page 6-10

Dimensions

As shown

Typography/Graphics

- Changeable message title: upper case letters (one line/up to 12 tiles), centered
- Changeable message: upper case letters (up to 4 lines/12 tiles per line), centered
- Tiles: 3" upper case letters, Helvetica Medium, centered on a 4-1/2" tile; width of tile varies with letter width; multiple alphabets, including punctuation marks should be prepared on tiles
- Tile and letter tile railing material
- Application: vinyl surface applied or surface screenprint letters and rules

Layout

As shown and as specified in UFC 3-120-01 Figure 7.11 Sign Panel Tiles, Figure 7.12 Sign Grid, and Figure 7.13 Sign Panel Layout

Changeable Letter Tile
3" Upper Case Letter Centered on Tile

UNIT MORALE SIGN

This sign is used to express unit pride and spirit. May show unit emblem, mottoes, awards, and other elements related to unit morale.

Construction

Aluminum signboard supported on 4”x4” non-removable square aluminum posts, fully grouted for additional strength; anodized aluminum finish; stainless steel fasteners

Colors

No restriction on color but should appear on North Creek Brown background; North Creek Brown posts; see sign colors section on Page 6-10

Dimensions

As shown

Typography/Graphics

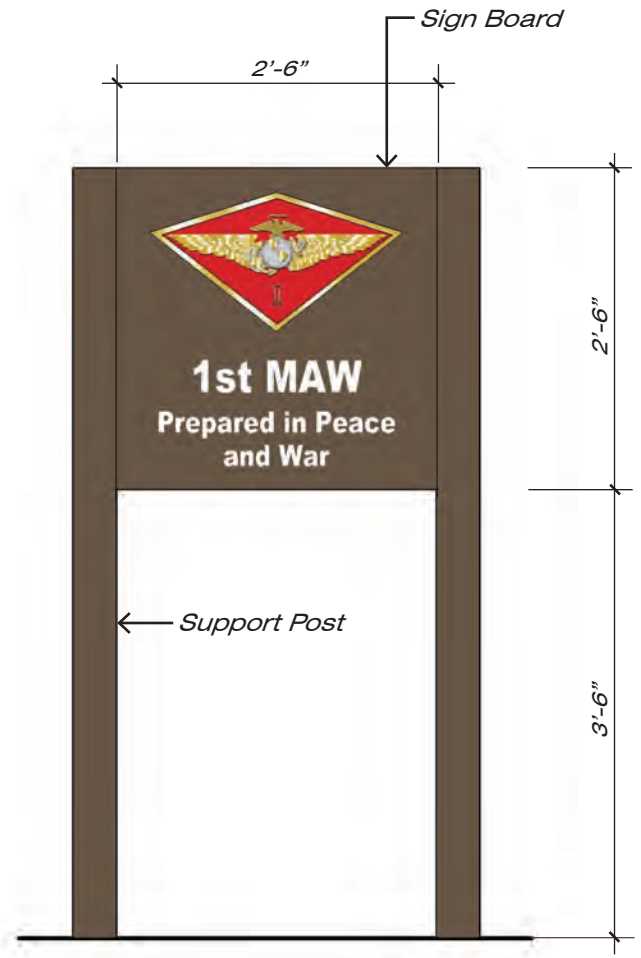
- Lettering: may vary per unit’s message
- Letterform: may vary per unit’s desired letter font
- Application: vinyl surface applied or surface screenprint letters, arrows, rules, and border

Emblems

Per unit’s organizational emblem

Layout

As shown



Informational Signs

Interpretive Sign

Pedestrian Information Sign

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INTERPRETIVE SIGN

This sign is used to provide educational information and directional guidance for visitors. Interpretive signs may be used to display information relating to both large scale and small scale exhibits.

Construction

National Park Service style frame; rectangular anodized aluminum backing panel supported on 2”x3” non-removable rectangular anodized aluminum frame-posts; viewing plane angled at 30-degrees to horizontal; stainless steel fasteners

Colors

North Creek Brown backing panel, framing, and posts; see sign colors section on Page 6-10

Dimensions

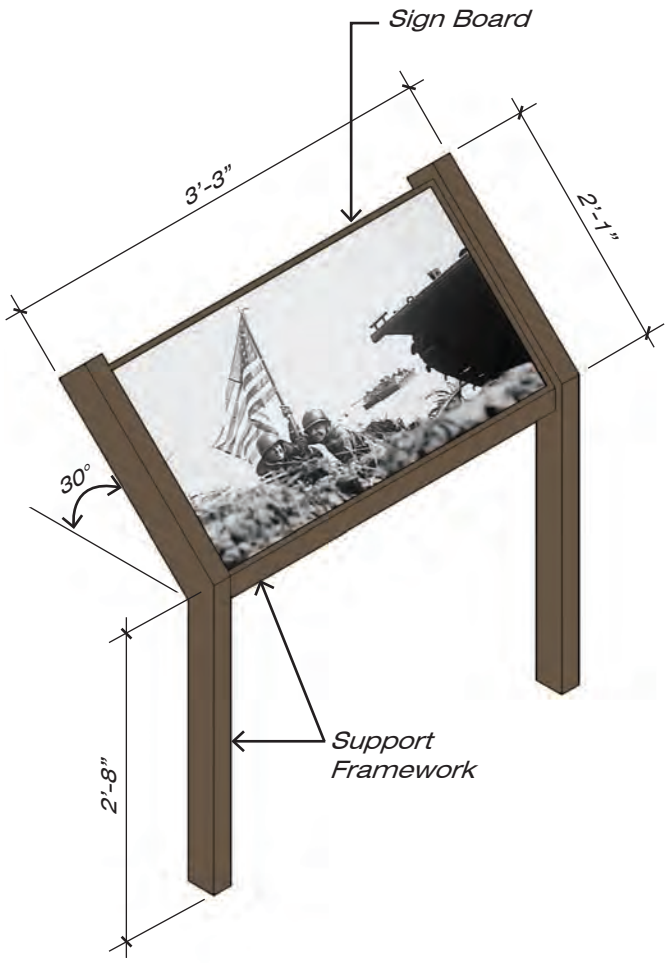
As shown

Typography/Graphics

- Graphic information: silkscreened or digitally printed graphics embedded in fiberglass with UV resistant resins
- Durability: mar resistant and graffiti proof graphics
- Letterform: Helvetica medium or other font to complement the graphic information being displayed

Layout

As shown



PEDESTRIAN INFORMATION SIGN

This sign is used to provide directional guidance for pedestrians. Useful in large parking areas at facilities such as community centers and office complexes.

Construction

Aluminum signboard supported on 4”x4” non-removable square aluminum posts, fully grouted for additional strength; anodized aluminum finish; stainless steel fasteners

Colors

White letters, arrows, and rules on North Creek Brown background; North Creek Brown posts; see sign colors section on Page 6-10

Dimensions

As shown

Typography/Graphics

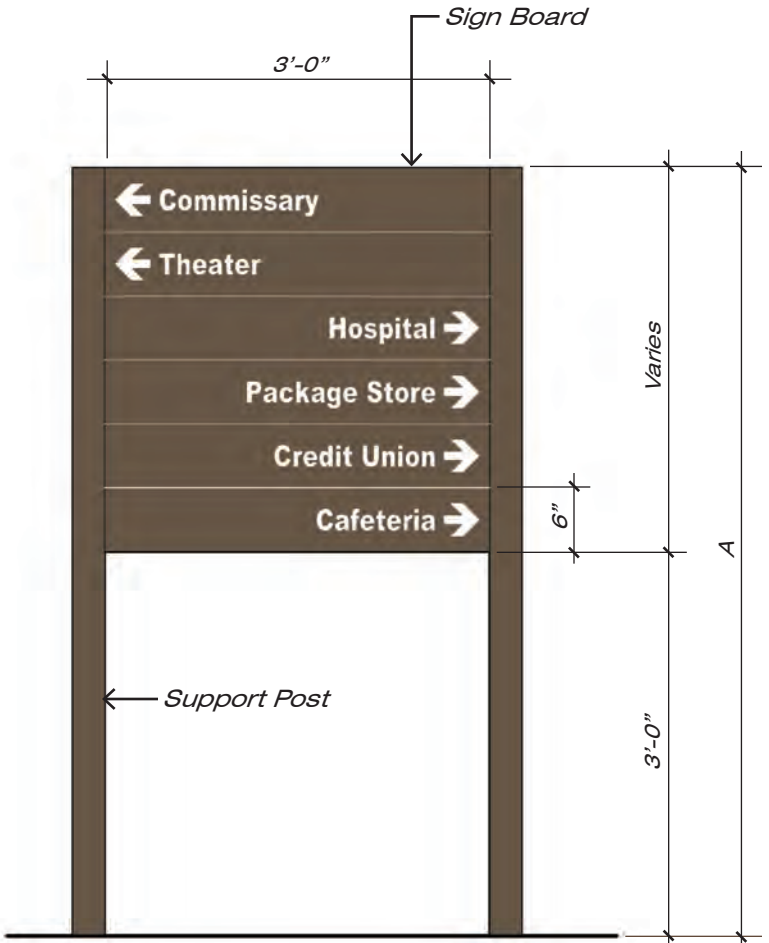
- Lettering: facility name in upper and lower case letters (up to 6 lines/17 characters per line), 2” capital letter height, flushed left or right to arrow
- Letterform: Helvetica Medium
- Arrows: per UFC 3-120-01 Figure 8.7 Pedestrian Information Sign Type G3 Layout
- Rules: 3mm (1/8”) wide
- Placement: lettering and graphics on both sides of signboard to permit viewing by people moving in both directions
- Application: vinyl surface applied or surface screenprint letters, arrows, rules, and border

Emblems

No emblems allowed

Layout

As shown and as specified in UFC 3-120-01, Figure 8.7 Pedestrian Information Sign Type G3 Layout



Wall Mounted Signs

Building Identification Sign

Building Number Sign

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BUILDING IDENTIFICATION SIGN

This sign is used to supplement the freestanding identification signs described elsewhere in this Signage chapter. In some situations, wall mounted signs better complement installation architecture and reduce maintenance requirements.

Construction

Individual dimensional letters of bronze metal construction surface applied directly to wall (do not use pin mounting); stainless steel fasteners

Colors/Finishes

Colors should complement the predominant building color while providing contrast with the background for visibility. Use dark bronze finish on light colored backgrounds and gold finish on dark colored backgrounds; see sign colors section on Page 6-10

Size

As shown. Use minimum 12” letters for one and two story buildings and larger letters for larger buildings. Limit messages for wall mounted signs to a maximum of four words. 3/4” to 1” minimum letter depths.

Typography

- Letterform: Helvetica Medium; 12”, 18”, and 24” capital letter heights as required to stand out against architectural detail of the building
- Material: Premanufactured anodized dark bronze metal individual letters

Placement

Placement of the message on the building is a matter of judgment. Refer to UFC 3-120-01, Chapter 10, Sections 10.11 and 10.12, Message Placement on Single Story Buildings and Message Placement Multi-Story Buildings

12” CAP Height

18” CAP Height

24” CAP Height

Dark Bronze Anodized Finish

Gold Anodized Finish

Note: Utilize manufacturer’s Standard Dark Bronze and Gold Anodized finishes. Colors shown are examples only.

BUILDING NUMBER SIGN

This sign is used to identify facility numbers on buildings in the installation.

Construction

Aluminum signboard, surface mounted to building facade with stainless steel fasteners

Colors

White letters and numbers on reflective North Creek Brown background; see sign colors section on Page 6-10

Dimensions

As shown for single numbers and multiple numbers

Typography

- Numbers: designated facility number, center justified
- Letterform: Helvetica Medium; 6” number height
- Application: vinyl surface applied or surface screen print numbers

Emblem

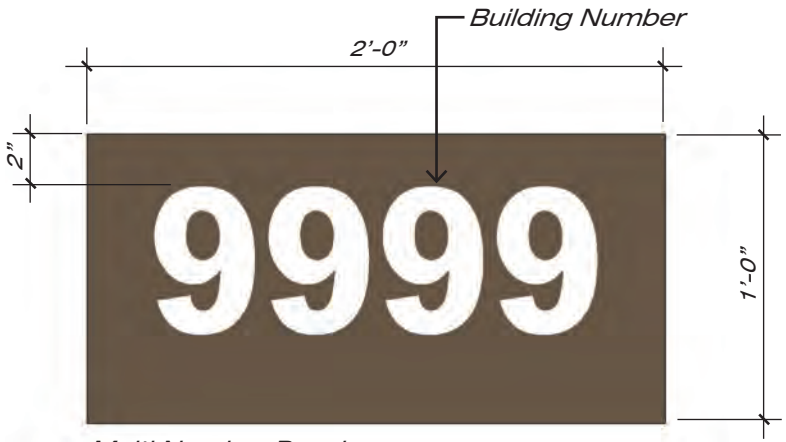
No emblems allowed on the signboard

Layout

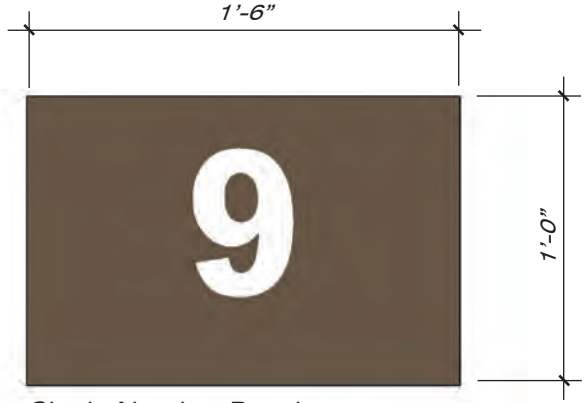
As shown for single numbers and multiple numbers

Placement

Placement of the building number sign on the building is a matter of judgment. Refer to UFC 3-120-01, Chapter 10, Sections 10.11 and 10.12, Message Placement on Single Story Buildings and Message Placement Multi-Story Buildings. The Installation civil engineer will select the most appropriate solutions for the architectural style of the building for consistency.



Multi Number Panel



Single Number Panel

Electronic Signs

Electronic Sign - Type 1

Electronic Sign - Type 2

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ELECTRONIC SIGN – TYPE 1

This sign is used by installation, Morale, Welfare and Recreation (MWR), and Exchange and service type organizations to display installation and community related messages and advertising.

Utilize Type 1 electronic signs at entry gates or along entry roads leading into the installation.

Construction

Concrete sign panel with EFS finish; concrete pillar with 10”x10” travertine finish in running bond pattern, vertically cut and aligned vertically; 3’x5’ electronic sign set into concrete sign panel

Colors

EFS finish; travertine with honed finish; see sign colors section on Page 6-10

Dimensions

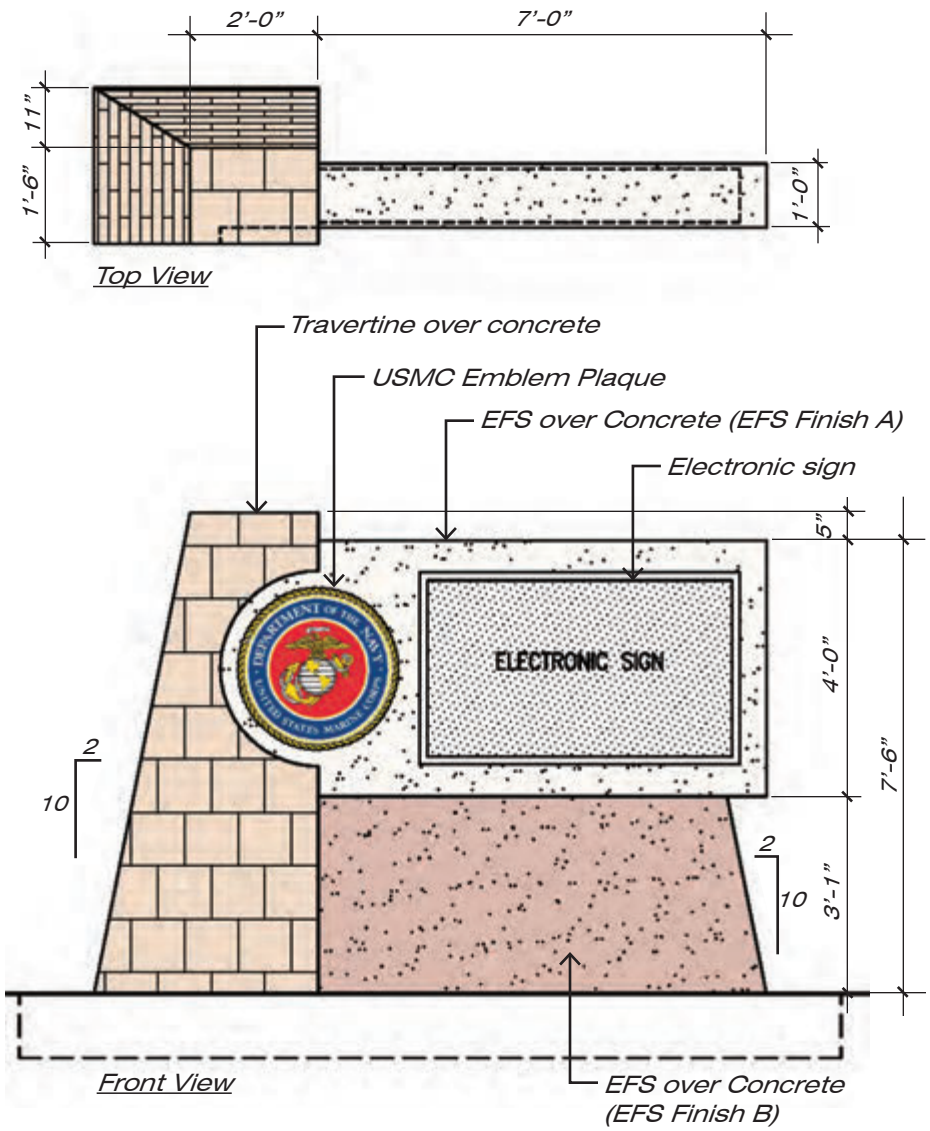
As shown

Shield

USMC emblem; 30” diameter, bronze metal plaque with UV fade-resistant, baked on colors with polyurethane finish

Layout

As shown



ELECTRONIC SIGN – TYPE 2

This sign is used by installation, MWR, and Exchange and service type organizations to display installation and community related messages and advertising.

Utilize Type 2 electronic signs at community service areas and along interior roads where appropriate. The installation planning department will make the final determination on where these signs may be installed.

Construction

Concrete sign panel with EFS finish; concrete pillar with 10”x10” travertine finish in running bond pattern, vertically cut and aligned vertically; 3’x5’ electronic sign set into concrete sign panel

Colors

EFS finish; travertine with honed finish; see sign colors section on Page 6-10

Dimensions

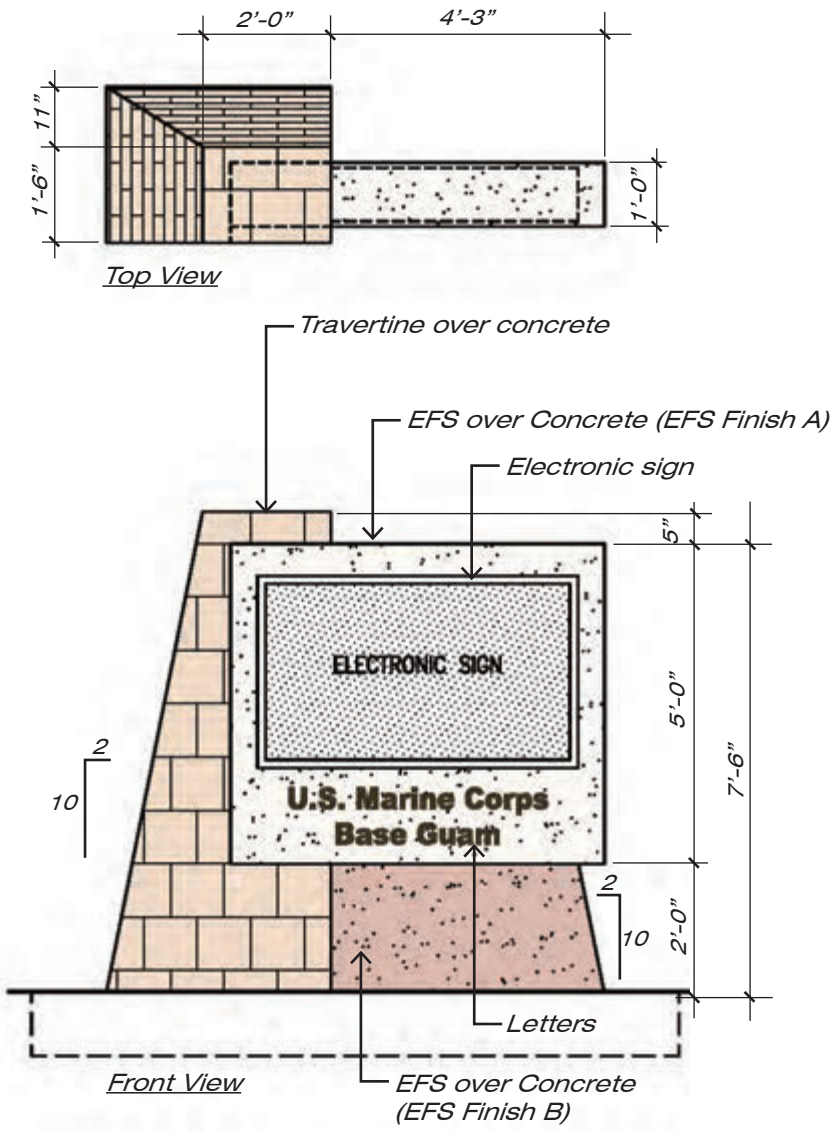
As shown

Typography/Graphics

- Lettering: installation name in upper and lower case letters (up to 2 lines/18 characters per line), 4” capital letter height, center justified on sign panel
- Letterform: Helvetica medium
- Material: Anodized dark bronze metal individual letters, surface mounted to concrete sign panel; 1/2” letter depths

Layout

As shown



This chapter addresses implementation of the design guide chapters of the Marine Corps Base Guam Installation Appearance Plan (IAP). Implementation considerations are described and discussed further in the following sections:

Design Review Board is a selected group of individuals who review projects to ensure adherence with the IAP guidelines.

Hierarchy of Elements provides structure for identifying the relative visual impacts of the design guide concepts on the installation.

Project Selection Criteria describes the criteria for prioritizing and selecting installation appearance projects.

Maintenance addresses key maintenance procedures that affect installation appearance.

Concept Designs graphically illustrate the implementation of the design guides on two areas of the installation.

DESIGN REVIEW BOARD

The purpose of the Design Review Board (DRB) is to review all projects at Marine Corps Base Guam to ensure that they meet the intent of the IAP. Projects include new construction, renovations, additions, and alterations.

The DRB provides continuity and vision in implementing the installation appearance standards. Members should include architects, landscape architects, planners, color experts, and construction administrators. During the initial period of Marine Corps Base Guam standup, experienced Naval Facilities Engineering Command (NAVFAC) design professionals who are familiar with the Installation development plan should be utilized. Ultimately, the DRB should consist of members from both NAVFAC and the Marine Corps Base Guam Facilities Department. At least one person should have exterior color expertise.

The DRB review process shall focus on site design, architecture, building color, signage, and landscaping. Aspects of each of these areas of focus are discussed as follows.

Site Design

Marine Corps Base Guam will be constructed over a period of several years. Diligent attention to site design will be required during the development period to ensure visual balance and consistency rather than a visual patchwork of development areas.

The DRB shall ensure that the site design elements of each project relate to the overall master plan and meet installation appearance goals. In general, the DRB shall consider the physical layouts of buildings, streets, pathways, parking, landscaping, site amenities, utilities and service elements, and other site features that may enhance the overall value of the project site and installation as a whole.

Architecture and Design Review Phases

DRB members should participate in the Functional Analysis Concept Development (FACD) process to provide timely input on the site plan, building massing and architectural character. Architectural review by the DRB should occur concurrently with the standard government review phases for design drawings and contract documents. At a minimum, architectural review should occur during schematic design and design development and include the review of plans and specifications. The DRB may also require review during final design if necessary.

In general, the DRB shall review architectural designs for compliance with the character intent of the installation and appropriateness with the unique tropical conditions of Guam. Criteria such as scale, massing, proportion, rhythm, and texture should be considered. Architectural features, such as roofs, fenestration, and accessory elements should also be reviewed for their contributions toward the overall building design and character and compatibility with local practices for Guam as outlined in these IAP guidelines.

Building Color

Review of proposed building colors and application processes is important and should be conducted by the DRB in accordance with the Color Review Process described in Chapter 4 Building Color.

Signage

Proposed signs in the installation should be reviewed by the DRB to ensure compliance with the IAP guidelines and prevent the proliferation of unneeded and uncoordinated signs. Technical drawings illustrating sign designs and their proposed locations should be submitted to the DRB for approval each time new or replacement signs are proposed.

In general, the DRB shall review signs for construction, layout, font assignments and sizes, graphics, accuracy of message, and mounting. It is also recommended that an up-to-date master signage plan and database be developed to map and track the locations and conditions of all major installation signs to facilitate ongoing maintenance requirements.

Landscaping

The DRB should ensure that all projects include appropriate landscaping where applicable. This should include projects involving streetscapes, public areas, and individual facilities.

The DRB shall review the appropriateness and extent of landscape design proposals in meeting the character intent of the installation, technical requirements of the project, and meeting aesthetic and sustainable design and low impact development (LID) measures.

In general, the DRB shall consider landscaping coverage, planting materials, placement of trees, shrubs, and ground cover, functional and aesthetic intent, and the use, selection, and placement of site amenities. Review of landscape designs shall be conducted by the Base Landscape Architect or qualified landscape design professional.

IAP PROJECT SELECTION CRITERIA

The following shall be considered when selecting or prioritizing future installation appearance projects for the base:

- Ability to address high visibility areas
- Benefits for large number of viewers / users
- Stakeholder priorities
- Funding opportunities
- Ability to serve as a prototype for other similar projects

Using these criteria, the Installation should maintain a current and prioritized list of possible projects for implementation when funding becomes available. The DRB should be responsible for maintaining the list.

MAINTENANCE

Regular upkeep of facilities and site amenities is essential to maintain base aesthetics and pride of the installation. This is especially important in the hot, humid, and high-salt environment of Guam which tends to fade paint, accelerate rusting of metals, and promote the growth of mold and mildew. Regular maintenance will help control these occurrences.

A good maintenance program balances periodic repairs, refurbishments, and replacements with cleaning and upkeep to sustain an orderly and attractive environment. At a minimum, a good maintenance program should include the following on a regular basis:

- Repainting of facilities. Delaying required repainting may result in additional costs for surface preparation, including repairs to exterior wall substrates.
- Refurbishment and replacement of faded and peeling signs. For safety and convenience, identification signs, directional signs, and regulatory signs should be replaced or refurbished before fading and peeling occurs. Maintenance of a signage database will facilitate scheduling of repairs and replacements.
- Maintenance of landscaping. Maintenance contracts should be established to make the most efficient use of labor to keep landscaping neat, trimmed, and ordered.
- Clean up and organization of industrial areas. Maintenance and repair yards and storage and staging areas tend to become cluttered, untidy, and equipment strewn. Keeping these areas clean and organized will present a professional looking and visually tolerable industrial area.

The DRB should be involved in setting standards for on-going maintenance and reviewing the language of proposed maintenance contracts.

CONCEPT DESIGNS

The intent of the concept designs is to graphically illustrate for designers how different elements and principles of the design guidelines in Chapters 2-6 may be applied to achieve the intended results of the IAP.

The following concept designs highlight site design strategies and elements outlined in the IAP guidelines:

Concept Design 1, Typical Administrative/Training District Landscaping

Concept Design 2A, Promenade Adjacent to Buildings

Concept Design 2B, Promenade Adjacent to Parking Lots

Note: The locations shown on the concepts are not site specific, and whole or specific aspects of the plans may be applied to different areas of the installation where appropriate.

Concept Design 1, Typical Administrative/Training District Landscaping

This concept design illustrates the application of IAP guidelines to a typical area in the Administrative/Training District with headquarters, industrial shops and parking. This preliminary design also shows suggested treatment along the base perimeter that borders Route 3. Specific design features are key-noted on the plans and referenced to the specific IAP chapter in the Concept Plan Features table.

Concept Design #1 features include:

- Along Route 3 base perimeter native trees in natural groupings planted outside the Anti-Terrorism/Force Protection (AT/FP) and security setback
- Parking lot landscaping of medium canopy trees to provide shade and meet sustainability goals
- Street trees lining the roadways to enhance the streetscape and meet sustainability goals
- Building arcades and covered walkways to provide protection from the elements
- A variety of planting placed at strategic areas around buildings for shading, screening, and aesthetics. In general, the amount of landscaping should reflect the relative prominence of the buildings – e.g. more landscaping for headquarters than a shop.
- Prominent building entries punctuated with landscaping, entry plazas with sitting areas, and decorative pavers or patterned paving to highlight the entry and enhance the entry experience
- Reinforced grass paving for a portion of the maintenance road to reduce the amount of hardscaping and increase the amount of pervious surfaces

CONCEPT PLAN FEATURES

ITEM	FEATURE	IAP REF
1	Route 3 Installation Boundary	CH2, SD, 2-5
2	Local Streets - Non-residential	CH2, SD, 2-14
3	Perimeter Patrol Roads	CH2, SD, 2-15
4	Walkways	CH2, SD, 2-19
5	Building Siting	CH2, SD, 2-22
6	Parking Lots	CH2, SD, 2-25
7	Arcades/Covered Walkways	CH3, AR, 3-27
8	Street Trees: Roadway Types, Local	CH5, LA, 5-18
9	Street Trees: Roadway Types, Perimeter Patrol Road	CH5, LA, 5-18
10	Parking Lot Planting	CH5, LA, 5-19
11	Facility Planting	CH5, LA, 5-20
12	Screening and Buffering	CH5, LA, 5-23
13	Security Fence	CH5, LA, 5-29
14	Pavers and Paving	CH5, LA, 5-32
15	Benches	CH5, LA, 5-42
16	Military ID Sign	CH6, SNG, 6-20

IAP Reference Key:

IAP Chapter — Chapter Title
CH, SD, 2-28
IAP Page

LEGEND

A	Large Canopy Tree	D	Single Trunk Palm
B	Medium Canopy Tree	E	Bench
C	Small Canopy Tree	F	Reinforced Grass Paving

0 20 50 100 175
Scale in Feet

Concept Design 1, Typical Admin/Training District Landscaping

Concept Design 2A, Promenade Adjacent to Buildings

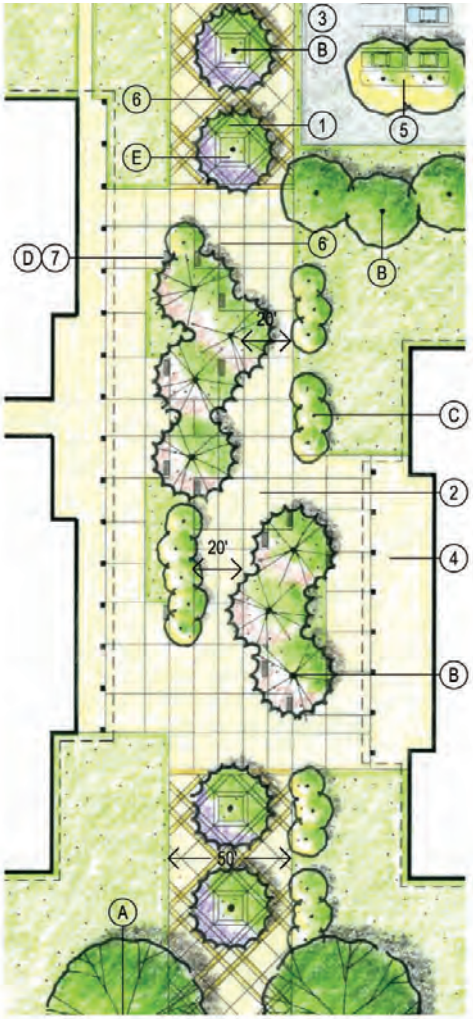
This concept design illustrates two options for the preferred treatment of promenades that run alongside and between buildings. Specific design features are key-noted on the plans and referenced to the specific IAP chapter in the Concept Plan Features table.

Option 1 illustrates a wide promenade leading up to the plaza with trees located along the centerline of the promenade, on-grade planters to break up the plaza, and bench seating.

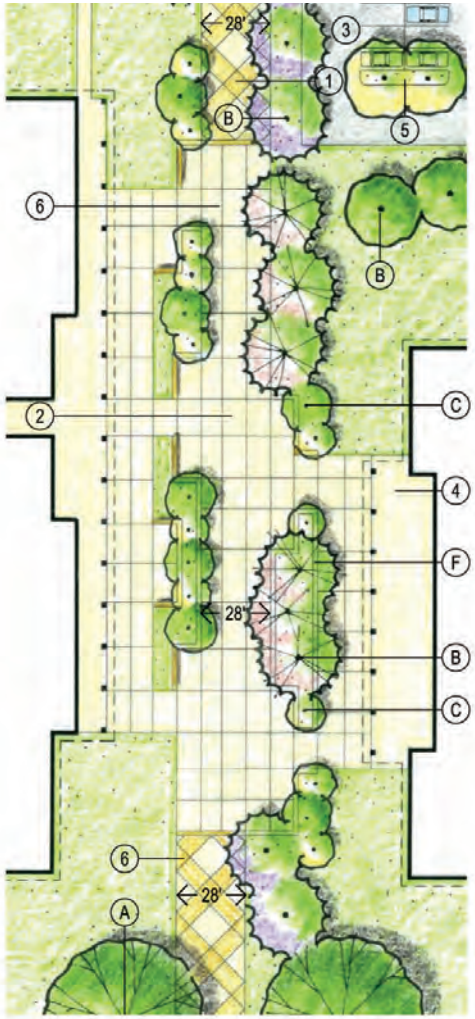
Option 2 illustrates a moderately wide promenade leading up to the plaza with trees located at the perimeter of the promenade, planters to break up the plaza, and seatwalls surrounding the planters.

The following summarizes the major features and recommendations of the plans:

- Creation of a plaza that extends between the buildings and integrates the promenade walking path
- On-grade planting areas and raised planters to break up the expanse of plaza paving and provide for the planting of trees, shrubs, and groundcovers
- Sitting areas to encourage the use of the plaza for social gatherings and to provide rest stops for pedestrians
- Benches and seat walls to define the edges of planters/ planting areas and provide sitting areas
- Shade and ornamental trees to provide shading at the sitting areas, enhance the visual appearance of the plaza, provide visual screening between the buildings, and help reduce the urban heat island effect
- Simple paving treatment that contrasts with the main promenade paving pattern to distinguish the plaza area as an arrival node



OPTION 1: 50' WIDE PROMENADE WITH TREES ALONG THE CENTERLINE AND BENCHES AT THE PLAZA



OPTION 2: 28' WIDE PROMENADE WITH TREES AT THE PERIMETER AND SEATWALLS AT THE PLAZA

ITEM	FEATURE	IAP REF
1	Promenades	CH2, SD, 2-18
2	Plazas and Courtyards	CH2, SD, 2-24
3	Parking Lots	CH2, SD, 2-25
4	Arcades	CH3, AR, 3-27
5	Parking Lot Planting	CH5, LA , 5-19
6	Pavers and Paving	CH5, LA, 5-32
7	Benches	CH5, LA, 5-42

IAP Reference Key:

IAP Chapter — Chapter Title
CH, SD, 2-28
IAP Page

LEGEND

A	Large Canopy Tree
B	Medium Canopy Tree
C	Small Canopy Tree
D	Bench
E	10' Square Tree Well
F	Seatwall

Concept Design 2A, Promenade Adjacent to Buildings

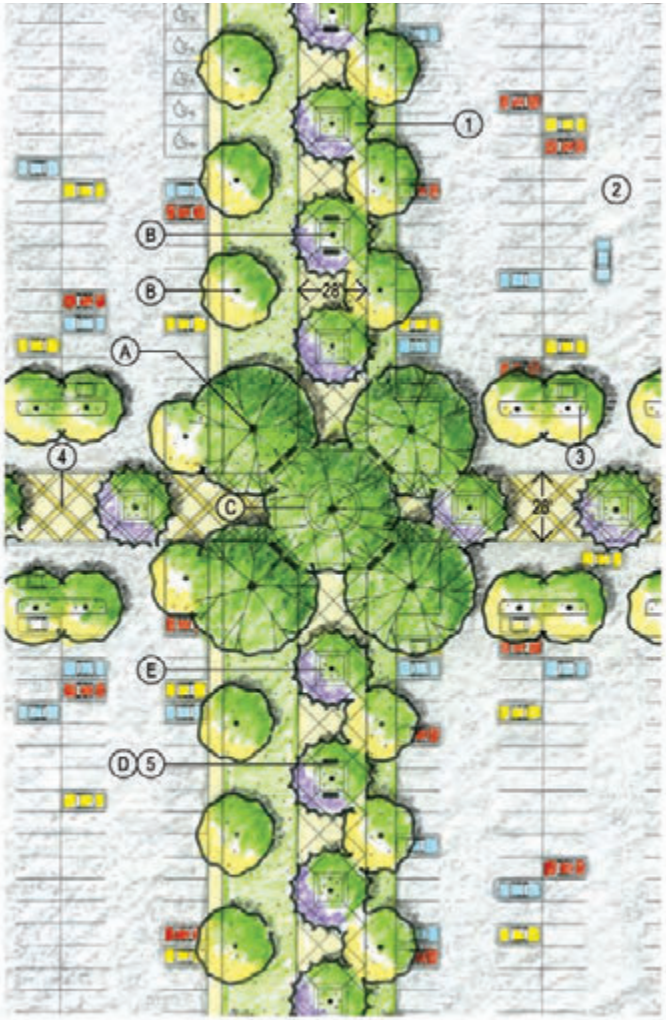
0 20 40 100
Scale in Feet

Concept Design 2B, Promenade Adjacent to Parking Lots

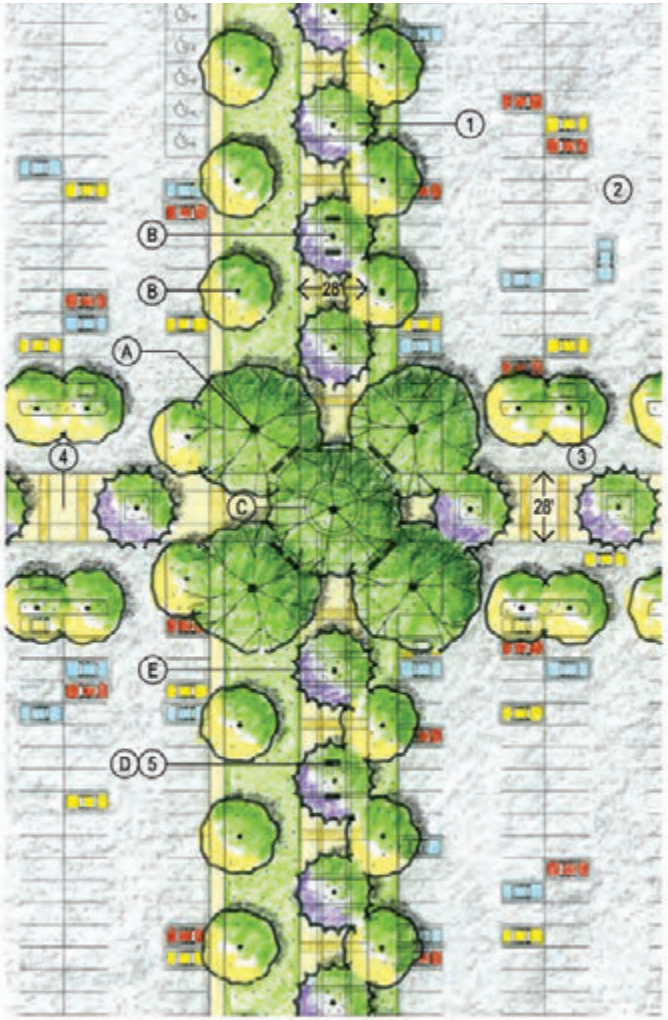
This concept design illustrates three options for the preferred treatment of promenades that run alongside parking lots. Specific design features are key-noted on the plans and referenced to the specific IAP chapter in the Concept Plan Features table.

The following summarizes the major features and recommendations of the plans:

- Interesting but simple paving patterns that enhance the surface appearance of the promenades (Note: diagonal patterning shown on Options 1 and 3 recall the designs of traditional Chamorro weaving)
- Integration of pavers, score lines, stamped concrete, or a combination thereof to break up the promenade paving and provide strategic areas for the placement of concrete isolation joints
- Surface level on-grade planting areas along the middle of the promenades (Options 1 and 2) with shade trees to provide shading, enhance the visual appearance of the promenade, and establish a rhythm along the walking path
- Shade trees along the edges of the promenade (Option 3) to provide dual shading for the promenade and adjacent parking, enhance the visual appearance of the promenade, and provide screening between the promenade and parking
- Enlarged octagonal paving area, central planter with seating wall, and grouping of large canopy trees at the corners and center of the intersection of promenades to enhance the crossing node
- Benches at strategic locations along the promenade to provide for rest areas for pedestrians
- Grassing between the promenade and parking lots to separate the promenade from the parking areas, create planting areas for shade trees for the parking lots, and soften the expanse of the combined surface paving. Note: trees are desired within the parking lot, but are not shown so that the landscaped features of the promenade are highlighted.



OPTION 1: DIAGONAL PAVING PATTERN



OPTION 2: LINEAL PAVING PATTERN

ITEM	FEATURE	IAP REF
1	Promenades	CH2, SD, 2-18
2	Parking Lots	CH2, SD, 2-25
3	Parking Lot Planting	CH5, LA, 5-19
4	Pavers and Paving	CH5, LA, 5-32
5	Benches	CH5, LA, 5-42

IAP Reference Key:

IAP Chapter — Chapter Title

CH, SD, 2-28

IAP Page

LEGEND

A	Large Canopy Tree
B	Medium Canopy Tree
C	Seatwall
D	Bench
E	10' Square Tree Well

0 20 40 100

Scale in Feet

Concept Design 2B, Promenade Adjacent to Parking Lots

OPTION 3: COMBINATION DIAGONAL AND LINEAL PAVING PATTERN

ITEM	FEATURE	IAP REF
1	Promenades	CH2, SD, 2-18
2	Parking Lots	CH2, SD, 2-25
3	Parking Lot Planting	CH5, LA, 5-19
4	Pavers and Paving	CH5, LA, 5-32
5	Benches	CH5, LA, 5-42

IAP Reference Key:

IAP Chapter — Chapter Title
CH, SD, 2-28
IAP Page

LEGEND

A	Large Canopy Tree
B	Medium Canopy Tree
C	Seatwall
D	Bench
E	10' Square Tree Well

0 20 40 100
Scale in Feet

Concept Design 2B, Promenade Adjacent to Parking Lots

APPENDIX A: Landscape Design for Minimal Maintenance

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All landscapes require some degree of maintenance. However, maintenance can be reduced through the selection of appropriate landscaping material, careful siting, and proper installation. The landscape planning phase is the ideal time to make decisions that can greatly reduce ongoing maintenance costs.

The following guidelines should be applied to ensure that landscape projects are designed for minimal maintenance:

Landscape Plan

- Use a registered landscape architect to prepare landscape plans
- Designate existing landscape features to remain onsite and protect them during construction
- Install high quality plant material of the appropriate size
- Use plants that are wind-resistant, drought-resistant, low maintenance and pest-resistant wherever possible; often the best plants are native plants that occur naturally in the area and are capable of surviving on natural rainfall
- Use plants that require little, if any, fertilizer or pesticides to minimize pollutants
- Allow plants to conform to their natural shape; this allows the plant to mature in a healthy manner, and saves on resources required for trimming
- Select plants that physically fit within the area to be landscaped, not only at the time of planting but through full maturity of the plant

Neisosperma or Fagot (Neisosperma oppositifolia); native tree that has high wind, drought and salt tolerance, and is low maintenance

Pandanus or Kafu (Pandanus tectorius); native tree that has high wind, salt and drought tolerance, and grows well in a variety of soils.

Trees

- Locate trees so branches do not touch buildings, causing mechanical damage, noise, and easy access for brown tree snakes, rats and insects
- Locate trees to minimize leaf litter on roofs
- Plant trees instead of shrubs whenever possible for maximum effectiveness with the lowest required upkeep
- Do not plant trees, except soft-wood species such as Plumeria, closer than 6.1m (20ft) from new or existing utility lines
- Do not plant soft-wood species trees such as Plumeria and palms closer than 1.8m (6ft) from new or existing utility lines
- Minimize the use of trees with brittle branches
- Install root control barriers for trees with aggressive root systems to protect roads, sidewalks, curbs and utilities from root intrusion
- Use a root control system consisting of time-release nodules impregnated with an herbicide and permanently affixed to a flexible and permeable geotextile fabric in lieu of rigid panels to reduce root intrusion between individual panels
- Wrap utility lines with a flexible root control barrier to reduce root damage

Avoid planting trees too close to buildings; the accumulated leaf litter can provide a growing medium for unwanted plants

Install root control barriers to reduce root damage

- Provide physical barriers to minimize 'girdling' trees and palms located in turf areas (e.g., tree guards and tree wells – mulched areas around the base of a tree or a group of trees); girdling is the cutting away of the bark and cambium of a plant in a ring that can kill the plant by interrupting the circulation of water and nutrients

  If tree guards are installed, inspect them every year to ensure that they are not restricting the growth of the plants; adjust any tree guards that constrict the trunk or branches; leave room for air to circulate

  If mulch is applied around trees and palms:

  - Use a 50mm (2-inch) layer for soils that are not well drained, and up to 100mm (4 inches) if drainage is good
  - Do not use excessive applications of finely textured mulch, which may cause oxygen deprivation; use a 25 to 50mm (1 to 2-inch) layer only
  - Do not pile mulch directly against the trunks and stems of trees which may cause inner bark (phloem) stress, fungal and bacterial diseases, and make trees more susceptible to borers; keep mulch 75 to 150mm (3 to 6 inches) away from the trunks of young trees and 200 to 300mm (8 to 12 inches) away from the trunk of mature trees
  - Do not pile mulch directly against the trunks of palms to avoid potential disease and insect problems; keep mulch 150mm (6 inches) away from the trunks of palms
  - Do not use mulch that is not properly composted
  - Do not use mulch in perpetually wet soils which need as much oxygen as possible
  - Mulch out to the dripline

Use of inorganic mulch prevents line trimmer damage of palm trunk (Note: organic mulch is preferred as it is less of a danger during typhoons)

Use of tree guard prevents line trimmer damage and keeps mulch away from tree trunk

Shrubs and Groundcovers

- Limit higher maintenance shrubs and groundcovers to visual high impact areas
- Do not plant shrubs closer than 1.5m (5ft) to buildings, structures or sidewalks
- Plant low-growing shrubs and groundcovers adjacent to roadways
- Do not plant hedges within 9.1m (30ft) of a major intersection
- Restrict the use of vines to fences, trellises and structures other than buildings as many climb by means of tendrils which can damage wood or masonry walls and make maintenance more difficult and expensive
- Limit the use of annuals which need to be replanted every year
- Plant groundcover or install stone riprap instead of turf on slopes greater than 3:1 for easier and safer maintenance
- Plant groundcover or install mulch in shady areas where grass will not grow well
- Avoid large monoculture plantings that are more susceptible to insect and disease problems
- Plant groundcover or install mulch in long, narrow planting areas where mowing would be difficult with the appropriately sized equipment for the scale of the task

Plant groundcover on slopes steeper than 3:1

Organic mulch installed in long, narrow planter

Turf Areas

- In turf areas, do not place trees or other features too close together or too near the edge of the turf so as to create spaces that are too narrow for efficient mowing
- Allow for the access and maneuverability of maintenance equipment
- Provide rounded tops and bottoms at slopes to facilitate mowing and minimize erosion
- Provide a break and/or barrier between turf and groundcover areas to prevent turf from encroaching
- Add organic matter into the soil to retain moisture and allow for good drainage

Locations of trees and other features allows for use of riding mowers

Physical break between turf and groundcover areas

Plastic header provides barrier between turf and groundcover areas

Building Perimeter Treatment

- Provide a minimum 600mm (2ft) wide concrete maintenance strip around the perimeter of buildings; this maintenance strip may double as a walkway if the width is increased to 900mm (3ft); this treatment:
  - Allows room for building painting, window washing, and other regularly scheduled maintenance procedures
  - Provides increased air circulation around the building, which will reduce the occurrence of mold and rot
  - Keeps plants away from the buildings, thereby reducing easy access for termites, cockroaches and other insects
  - Allows for visual inspection for the entry points of insects and pests into the buildings
- Avoid the use of inorganic mulch (e.g., gravel or coral) maintenance strips as the mulch can become projectiles during typhoons

Concrete maintenance strip (Note: downspouts should not discharge at walkway)

Irrigation

The average annual rainfall on Guam is 80 to 90 inches, but is locally variable. On the northern limestone plateau, where Naval Computer and Telecommunications Station Finegayan is located, rainfall averages 85 to 105 inches annually. The rainy season normally begins in July and continues until November. January to May is the dry season, with June and December being the transitional periods.

Only a temporary irrigation system is required during the plant establishment period based on Guam's annual rainfall and direction from Naval Facilities Engineering Command Marianas.

For best results, it is recommended to complete planting between the months of June through September to take advantage of the seasonal rains so plants are established before the dry season commences in December or January. Plantings completed in early November typically do not survive unless they are regularly watered.

APPENDIX B: Guidelines for Minimizing Wind Damage to Trees

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PRE-STORM

After a tree has been selected and planted so as to minimize hazards, there remain cultural practices that will affect its survival during a typhoon.

- Allow trees to adjust to the wind environment; If newly planted trees need to be staked, loosely tie the tree where the stem can bend and move with the wind; ensure that no girdling occurs by continuing to loosen the ties
- Keep trees as healthy as possible:
  - Healthy trees adjust more quickly to changes in the environment and are more wind firm
  - Pest damage and old wounds are structurally weaker than normal solid wood
  - Roots that are constrained, diseased or damaged during construction are subject to greater stress as the top of the tree increases in size
- Do not overfertilize the tree with nitrogen or overwater the soil; both of these practices can increase crown surface area and decrease the rooting area
- Practice proper pruning techniques
- Eliminate co-dominant branches; co-dominant branches (forks) are structurally weak and subject to split and cracks
- Eliminate lopsided crowns; more wind load on one side produces twisting which weakens the crown and stem
- Prune trees to have one main stem; eliminate branches with tight or narrow crotches which are potential weak spots
- Prevent damage to the trunks of palms from line trimmers; wounds to the trunks of palms do not heal over as in trees, thereby weakening the trunk
- Remove weak and diseased trees and palms as part of the landscape maintenance program
- Do not overprune palms; removing too many fronds may expose the bud or growing point to more wind and potential damage

POST-STORM

Much of the damage caused by storms is to vegetation. Basic tree care after a storm includes:

- Prune broken limbs to minimize the risk of decay entering the wound; prune smaller branches at the point where they join larger ones; for larger branches, prune back to the trunk or a main limb
- Repair torn bark to eliminate hiding places for insects and help wounds heal faster

Many trees have an outstanding ability to recover from storm damage. Only restore trees that have major limbs, trunks, and roots intact. In general:

- Mature, healthy trees can survive the loss of a major limb
- Young trees can sustain quite a bit of damage, yet still heal quickly
- A healthy tree can be saved even though it has been damaged, if enough strong limbs remain
- For marginal trees, resist the temptation to immediately cut it down; remove the damaged limbs and monitor the tree's health

Remove the damaged tree if:

- It has already been weakened by disease
- The lower trunk is split, cracked or broken
- The remaining tree structure is highly susceptible to breakage due to poor initial structure
- The tree has lost its crown
- Most of the damage to the canopy is large diameter (>8 inch) branches
- Major roots are severed or broken
- The tree is leaning towards a target

After a storm, trees that have been wholly uprooted with the rootball intact may be encountered. These trees may be saved by:

- Covering the exposed roots as soon as possible with wet burlap, sand, mud or other material to keep the roots from drying out before they can be righted
- Trimming the shattered roots, if any, just before righting the tree
- Installing guy wires to hold the tree in place, after it is restored to its original position, until the root system can regenerate
- Watering the tree well; water slowly for a long period
- Monitoring for insects and diseases

For single trunk palms left standing, it is often difficult to determine whether the bud or growing point has been damaged. In general:

- Remove hanging or dead fronds
- Remove fronds that could impede new growth at the bud or growing point, so new fronds can emerge
- Leave bent fronds attached to the palm until new fronds fully emerge; these fronds provide energy to the palm
- Water the palm well
- Allow for at least 6 months or longer for palms to put out new growth