AIR COMBAT COMMAND

U.S. AIR FORCE

Installation Development and Design (ID2)

[Mountain Home Air Force Base, Idaho]

Base Operations Facility, Mountain Home AFB

ID2

10 January 2011

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[1.1] Document Scope, Applicability and Audience

HQ ACC/A7P

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

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

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

Applicability

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

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

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

Audience

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

[1.2] Development and Design - A Holistic Approach

HQ ACC/A7P

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

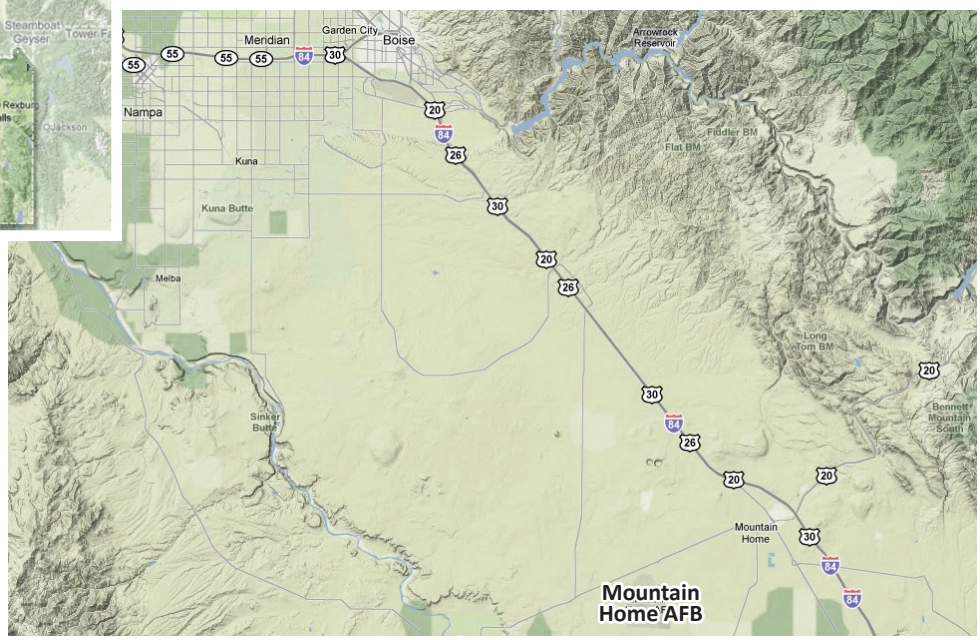
Green design is not optional. Implementing green building design (functional constraints) objectives are required to produce a complete and usable facility or a complete and usable improvement to an existing facility. A green building design approach forms the functional and technical foundation for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

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

Installation

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

There is plentiful undeveloped land within the Base's perimeter. The Base's built-up area consists of fairly homogeneous zones of development. Each



of these zones has adequate space for the further development of additional facilities, large enough to accommodate another complete wing if needed. Future development should occur first on the many infill sites within the built-up area since the infrastructure needed is already in place, providing an economical and ecological solution to future facility siting needs.

There is a heritage of masonry structures here, primarily concrete masonry. Many innovative project designs have been accomplished using this material. (*see figure 1.1*). The preference is for designs that are highly-responsive to functional and contextual conditions, which allows building solutions to be uniquely well-suited to their purpose. Designers will find guidance on site development and facility design in this ID2 that will allow flexibility to create one-of-a-kind solutions that are both practical and inspirational while retaining a positive relationship with the existing built environment.

Mountain Home AFB is located in a semi-arid environment with an annual precipitation of 8-10 inches. Due to this minimal rainfall, the Base and surrounding area relies on a local underground aquifer for its domestic water supply. It is reported that the overall depth of the aquifer is declining up to a foot per year due to the high rate of water withdrawal by the Base and nearby private agricultural operations. Wise water use must become the basis of operations for the Base, and a way of life for residents of Mountain Home AFB. This means careful use of potable water for human consumption, with the treatment of sanitary sewage effluent to allow its re-use for landscape irrigation.

Being a semi-arid region, this Base needs to have amenities that let the airmen and their families find respite from the region's bright sunshine and summer heat. Many of the Base's operational buildings include good examples of sunshade covers over exterior patio areas, which allow outdoor activities to take place on many more days of the year. Buildings at Mountain Home AFB need to be responsive to sunlight, bringing it into interior environments as natural lighting while mitigating the undesirable effects of glare and heat gain.

This Base is located in an area that is remote from other communities. The nearest town, Mountain Home, Idaho, is 12 miles away. Because of this distance, there is an increased need for recreational activities and outdoor amenities on Base to serve its residents. Parks, biking and walking paths, and other such improvements need to be readily available to single airmen, as well as airmen with families. These types of amenities create a sense of community and encourage healthy and active lifestyles.

Figure 1.1
366th Component Maintenance Complex (Avionics Building)

Installation Goals

Incorporate sustainable development and green design principles into every facility and site design project at Mountain Home AFB.

Use the Sustainable Design Scorecard and Air Combat Command design guidance to create solutions that meet federal requirements for conserving water and energy, and for sustaining the environment. Innovations that go beyond these requirements are encouraged.

Make the places where people work and play at Mountain Home AFB functional and pleasant places to be.

Embrace the principles of good architectural and site design to create highly functional and inspirational solutions. Interiors should be full of natural light, and have thoughtful interior material and color selections. Building layouts should meet the functional requirements as efficiently as possible, and that functionality should be inherent in the building's shape and form. Site development around buildings should tie them into their surroundings, allowing the buildings to fully function as part of the Base community.

Make re-use of infill sites a priority in locating new buildings.
Leverage existing roadways, parking areas and Base utilities by locating new facilities on currently vacant infill sites. Where appropriate, consider removing infrequently-used roadways to create larger infill sites.

Create a sense of pride in the community at Mountain Home AFB.
Every project should be considered relative to its visual affect on the community at large. Include participation of people who will be affected and seek the opinions of users in all design projects. Seek to have every project be thoughtfully designed to blend with the neighboring facilities.

Figure 1.2
Pedestrian Walkways Connecting Adjacent Buildings

Foster a quality of life that encourages healthful outdoor activities.
Make outdoor activities a priority. Accommodate bike use with proper trails. Link outdoor activities with pathways to encourage more pedestrian use (*see figure 1.2*). Extend indoor activities outdoors by having courtyards and plazas that invite indoor activities outside.

[1.3] Development and Design, Requirements and Evaluation Metrics

HQ ACC/A7P Requirements

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

Installation Requirements

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

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

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

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

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

HQ ACC D2 Board Evaluations

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

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

Installation Evaluation Metrics and Evaluations

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

[1.4] Organization of the Document

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

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

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

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

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

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

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

[2.1] Installation Image

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

Figure 2.1
Extend Interior Uses to Outdoor Spaces

Answering these questions provides insight into how to make installations better places in which to work, live and recreate. It benefits visitors as well, by making wayfinding easier. It provides insight into how an installation's appearance can be improved by changes to its public spaces (shopping, community services, parks), by adding landmarks, and by improving the visual character of its primary and secondary streets. Every community improvement project - for example a street reconstruction, new building, or park rehabilitation - can contribute to creating a more mentally coherent and attractive community. In most cases, projects undertaken to provide safer roads or construct a new, more efficient facility can also contribute to an improved community image.

This image analysis, along with the other guidance included in this ID2, when aggregated, are intended to assist Installation leadership and project designers in improving the visual image of Mountain Home AFB. Examining the design of all new facilities in the larger context of the Base's image will assist designers in creating new buildings which complement existing forms and urban patterns (*see figure 2.1*).

Installation Image Analysis

Mountain Home AFB has a relatively simple street system that responds to two important physical elements. The north-south section of Gunfighter Avenue, from the Main Gate to its intersection with Falcon Street, serves as the main entry road and the eastern organizing element. This road bisects the Installation's developed area, separating the family housing areas to its east from the orthogonal grid of streets extending off of the flight line to its west.

The runway, with its northwest/southeast orientation, causes this street grid to intersect the main entry road at an angle of approximately 45-degrees. Three roads extend from the flight line to the north-south section of Gunfighter Avenue. Two of them are Aardvark and Phantom Avenues. An extension of Gunfighter Avenue forms the third. Near its intersection with Falcon Street, Gunfighter Avenue makes a 45-degree bend and extends west to Alpine Street along the flight line. Of the three streets, Aardvark and Gunfighter appear to serve as primary paths, and Phantom Avenue has the appearance of a minor pathway or more neighborhood street.

The eastern end of Aardvark Avenue, near Gunfighter Avenue, has been realigned to match up with the beginning of Mellen Drive. While this change creates a safer intersection, it obscures the fact that two different street patterns come together at this point. A similar condition occurs where Gunfighter Avenue crosses Falcon Street. Here the change in Gunfighter's direction occurs just before the intersection, when most motorists are slowing down for the upcoming traffic signal. At both intersections, no visual cue exists to inform a person that they are changing direction and passing from one street pattern to the other. Because Aardvark carries a high percentage of people working or visiting the flight line/industrial area, creating a landmark feature at this intersection would be appropriate. Such a landmark would also assist people wishing to find the beginning of Mellen Drive. This landmark might be a static heritage display or a sculpture related to flight.

- *Provide a landmark at the intersection of Gunfighter Ave. with Aardvark Avenue & Mellen Drive*

Installation Image

At the intersection of Gunfighter and Falcon, a prime location to site a landmark would have been on the location of the Family Readiness Center. Since this location is occupied, an alternate option might be to create a symbolic gate through which motorists pass as they continue along Gunfighter Avenue. This "gate" might be civic-scale columns flanking the road west of the Falcon Street intersection, which could include the Gunfighter logo or other symbol indicating that a person is approaching the Wing Headquarters.

- *Provide a landmark just beyond the intersections of Gunfighter Avenue and Falcon Street*

Alpine and Liberator Streets are primary paths, intersected by Aardvark and Gunfighter Avenues. Alpine Street runs along the facility-side of the flight line. It runs along the Installation's strongest architectural edge, which is formed by the large hangars, maintenance buildings, fire station and other operations buildings that serve the flight line. Land uses along the opposite side of Alpine are less dense, with several of the infill sites on this side. An overhead power line runs along the street's eastern side. Newer structures along Alpine include landscape plantings, softening the area's industrial feel. Future development along Alpine should include landscape plantings and building setbacks similar to those that exist (*see figure 2.2*).

- *Include landscape plantings and use similar building setbacks for projects along Alpine Street*

Liberator Street connects to the Base's commercial vehicle gate at its north end. It has the most industrial image and "feel" as a result of the overhead power lines that run along both sides of the street for some distance. There are also a number of other utility and industrial uses adjacent to it, from about Evander Way south to Phantom Avenue. South of Phantom, the street is flanked by a ballfield and vacant land before arriving at the Wing Headquarters building. The headquarters building's placement, together with a communications building across the street, momentarily constricts the previously open travel corridor until 2nd Avenue is reached. Vacant land abuts both sides of the street until one arrives at the vehicle maintenance complex, which is effectively the south terminus of Liberator Street.

Figure 2.2
Walkway/Paths with Integrated Landscaping

Desert Street appears to function more as a neighborhood street, yet has a wide variety of land uses adjacent to it. The fitness center with its sportsfields, and the airmen's dormitory complex, flank it for one block. The emerging community services complex that includes the former BX and commissary, as well as the child development center and base theater, are located along the next block. At the intersection of Desert and Gunfighter Avenue, the base chapel, Wing Headquarters complex and the Heritage Area occur. By continuing south on Desert to where the street name changes to Alder Street, one arrives at the Gunfighter Club. This concentration of housing, community service and other land uses implies that Desert Street, while not a primary path, should still be treated as an important public route. Creating a consistent image along this street would be one way to reinforce its importance to the community. Part of the spine trail proposed in Section 3.3 would follow Phantom Avenue in this area of importance.

- *Create a consistent and welcoming visual image along Desert Street and Phantom Avenue*
- *Include front yard landscaping and building setbacks similar to existing buildings*
- *Create community trail with periodically spaced tree clusters along Desert Street and Phantom Avenue*

Implementing an attractive streetscape design along Desert Street would improve its aesthetics and increase pedestrian use. Elements in the streetscape design could include shifting the sidewalks away from the street edge where possible; periodically spacing clusters of large trees to provide shade; visually screening parking lots adjacent to the street corridor; and providing shade structures with seating scattered along the corridor or in adjacent green

Figure 2.3
Attractive Landscaping along Street and Walkways

Figure 2.4
Use of Windbreaks to Create Boundaries and Protect Trails

spaces. These improvements would create a more pedestrian friendly street, which may, in turn, assist the Base in encouraging and supporting more active lifestyles (*see figure 2.3*).

- *Relocate walks away from street edge and screen adjacent parking lots*
- *Create community trail along Desert Street with tree clusters and shade structures*

Similar streetscape improvements could be implemented along Mellen Drive and Phantom Avenue. Periodically spaced shade structures could serve as local landmarks and provide resting places for persons using the proposed spine trail following Mellen Drive (*see figure 2.5*). Along with carefully-placed clusters of shade trees, the shade structures would improve the area's street aesthetics and make it more memorable. Strengthening the outer edge of the new family housing areas by expanding the windbreaks is an improvement that could be considered (*see figure 2.4*). This would provide a strong outer boundary for these neighborhoods and better define them.

- *Create community trail along Desert Street with tree clusters and shade structures*
- *Plant windbreaks along edges of new housing areas to create boundary*

Figure 2.5
Fire Station: Shade Structure Example

Figure 2.6
Native Plants Planted in Cluster Groupings

Large parking lots exist in front of the current and former commissary and BX. Adding clusters of trees in a few locations as recommended in the "Green Infrastructure in Parking Lots" section in Chapter 5.2 would break up the large expanse of pavement in front of the buildings. The former commissary and BX are being redeveloped for new community uses, which most likely will have parking demands which are lower than their previous uses. Removal of a portion of the unneeded pavement can provide space for both tree clusters and a corridor for the proposed Base spine loop trail.

- *Add tree clusters to commissary and BX parking lots*
- *Reduce amount of pavement at former commissary and BX for tree clusters and trail*

Improving the image of Mountain Home AFB will make the Base more memorable, distinguishing it from other installations and creating a sense of place. The Base's location within an intermountain basin near the Snake River, yet surrounded by several series of distant mountains, should be considered when crafting an image. Taking cues from this larger landscape, and building upon the Installation's positive elements, can create a sense of place unique to Mountain Home AFB.

- *Create a Base landscape that reflects the regional context in plant selection and placement*
- *Restore unused portions of the Base to native grasses and sagebrush, if possible*
- *Cluster plantings in public spaces to create oases, as in mountain glades and along streams* (*see figure 2.6*)
- *Celebrate the abundant sunshine and blue sky by providing shade along walkways and trails*

[3.1] Reuse Opportunities

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

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

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

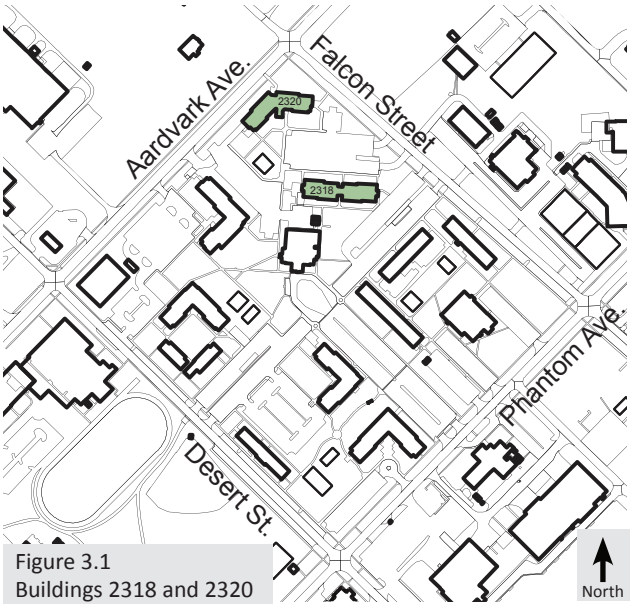


Figure 3.1
Buildings 2318 and 2320

Mountain Home AFB has a history of reusing existing buildings by re-purposing structures often built for other uses. A recent and on-going example is the Sagebrush Inn (*see figures 3.1 and 3.2*) conversion project where two former dormitory buildings (2318 and 2320) are being converted into temporary lodging using a hotel suite concept. Other examples exist where former dormitories were converted to office or educational space. Along the flight line, several hangars and other structures built for specific aircraft or past missions have been adapted to other uses in support of the Base's current mission.

Figure 3.2
Sage Brush Inn Conversion Project

Current Reuse Projects

Old Commissary (2610) - This large (50,000 SF) single-story building is being converted to serve a variety of community service organizations. Locating a number of organizations in the same building will improve efficiency and reduce travel time for military families accessing the organizations' services and decrease on-base traffic associated with these services.

Figure 3.3
Buildings 2607, 2630, and 2610

The former BX (2607) is located next to the Old Commissary (*see figure 3.3*). This building has been re-purposed to serve a number of community and base support uses including the Envision Store. The former Mini-Mart/Class 6 store (2630) directly across the parking lot from the Old Commissary has been renovated for use by the Child Development Center. West of this building is a former Credit Union building (2620) which has been removed.

The large parking area that once served the former BX, Commissary, Mini-Mart/Class 6 store and Credit Union will be decreased in size to better match the buildings' new uses. Installation staff reported that up to 60% of the existing parking lot will be removed as a result of the building occupancy changes. This decrease in paved area provides a design opportunity to improve the visual quality of this community services area by using new landscaping to separate and screen parking, and create safe and convenient pedestrian connections between buildings (*see figure 3.4*). Installing green infrastructure will provide additional shade, cleanse and infiltrate on-site storm water, and moderate heat island effects due to transpiration and pavement shading. The potential may also exist to site a new building within the redeveloped parking area, depending upon its size and use.

Figure 3.4
Former BX/Commissary Potential Redevelopment to Accommodate Proposed Base Trail

Buildings Not Considered for Reuse

Not every building is a candidate for reuse. Building condition, size, configuration and location may make reuse impractical or at odds with installation-wide planning goals. Examples of this situation exist at Mountain Home AFB. When the new Logistics Resources Center is constructed, several older structures will be demolished. These include Buildings 1325, 1206, 1211 and 1212. Buildings 1351-1354, 1207-1209, 1300 and 1301 will be taken down under the CE Maintenance Facility MILCON. Building 1205 will be demolished using SRM funding.

Buildings 1325 and 1351-1354 (*see figure 3.5*) are on the northern outer edge of the Base's industrial area. Uses in Building 1325 were relocated to space nearer

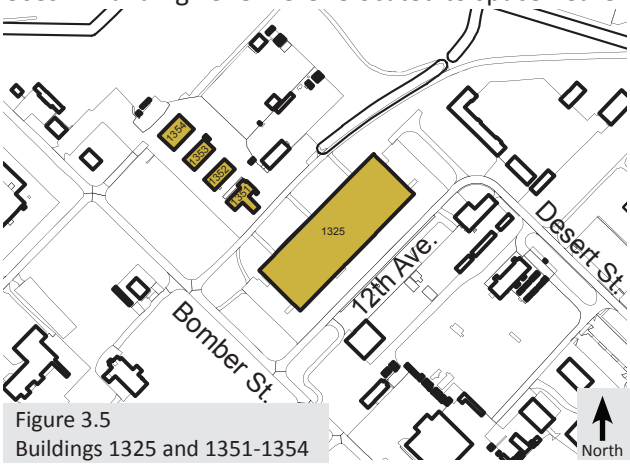


Figure 3.5
Buildings 1325 and 1351-1354

to the center of the flight line/industrial area. These vacated structures will be removed. The vacant land will be held available for use for new facilities should a change or expansion of the mission for Mountain Home AFB occur. Reusing these sites when new structures are required will help control expansion of the size of the Base.

Figure 3.6
Buildings 1206, 1207 and 1209-1212

Buildings 1206, 1207, 1209, 1210, 1211 and 1212 (*see figure 3.6*) are former warehouse/support buildings dating back to the creation of the Base. The location of these buildings is adjacent to the new Logistics Readiness Center. Rather than reuse these outdated and functionally obsolete structures, the land under these buildings will provide space for a portion of the POV parking for the Logistics Readiness Center as well as space for other future facilities.

[3.2] Infill Opportunities

All infill opportunities are based on Base Civil Engineering Squadron input and master planning for the Base.

Several newer buildings and housing areas completed at Mountain Home AFB demonstrate an understanding of the value of infill projects. On the flight line, the new Airfield Operations building (261), Fire Station (206) and Squadron Operations buildings (210 and 278) were sited on infill locations. Similarly, the Avionics Maintenance building (920) is located across the street, on an infill site.

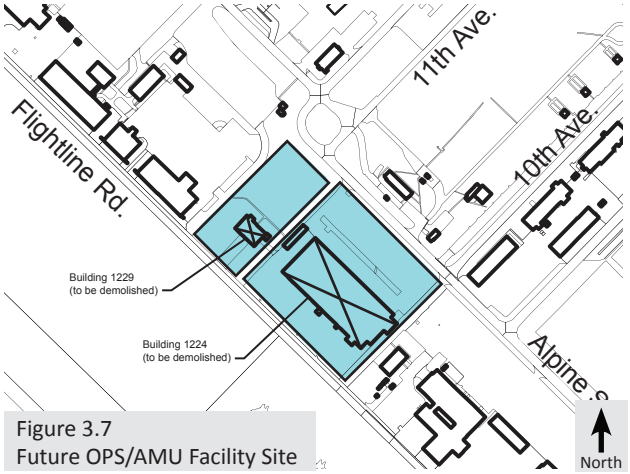


Figure 3.7
Future OPS/AMU Facility Site

All programmed MILCON projects at Mountain Home AFB are planned to occur on infill sites along or adjacent to the flight line, increasing the density of facilities in this area. A new Deployment facility will be located on the site currently occupied by Building 1229. Building 1224, immediately to its south, will be demolished in the future to provide a site for a new OPS/AMU facility (*see figure 3.7*). After it is demolished, the site of the former Parachute Shop (263) will serve as an infill site for a smaller structure along the flight line, whose use is yet to be determined.

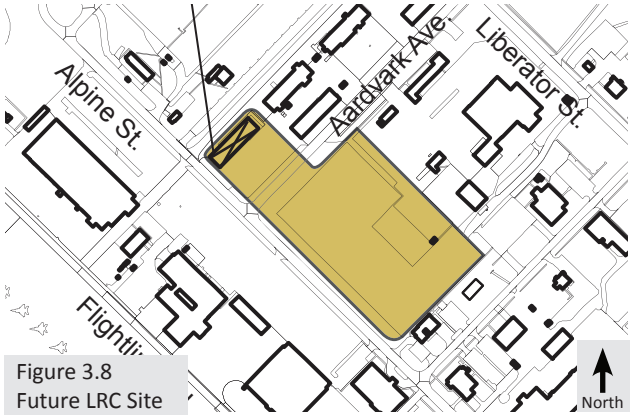


Figure 3.8
Future LRC Site

Other planned projects include a new Logistics Readiness Center (LRC) (*see figure 3.8*) on Alpine Street between Aardvark and 7th Avenues. This facility will displace a recreational vehicle storage lot which is being moved closer to the Base campground. POV parking for the new LRC will be located on the former site of an obsolete warehouse. Further south along Alpine Street, a future MXG facility (*see figure 3.9*) is planned between Building 840 and Gunfighter Avenue.

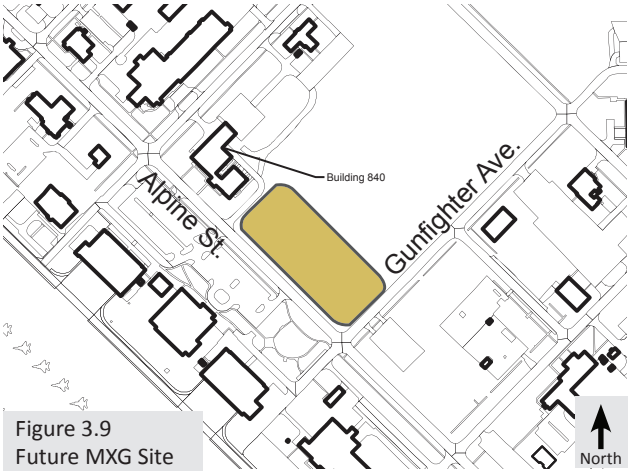


Figure 3.9
Future MXG Site

The current Civil Engineering facility will be replaced by staging construction of a new building within the confines of the existing CE complex. Current Buildings 1300, 1301 and 1208 will be removed to allow phased construction of the new complex (*see figure 3.10*). This concept facilitates the continued use of other existing CE facilities, which will remain.

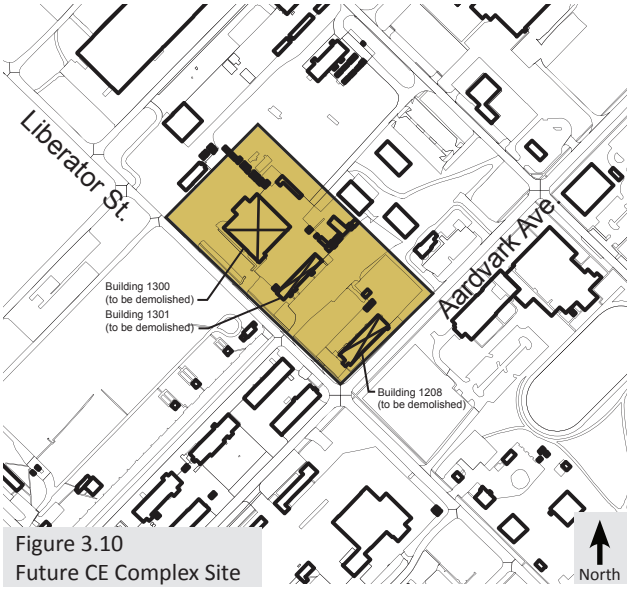
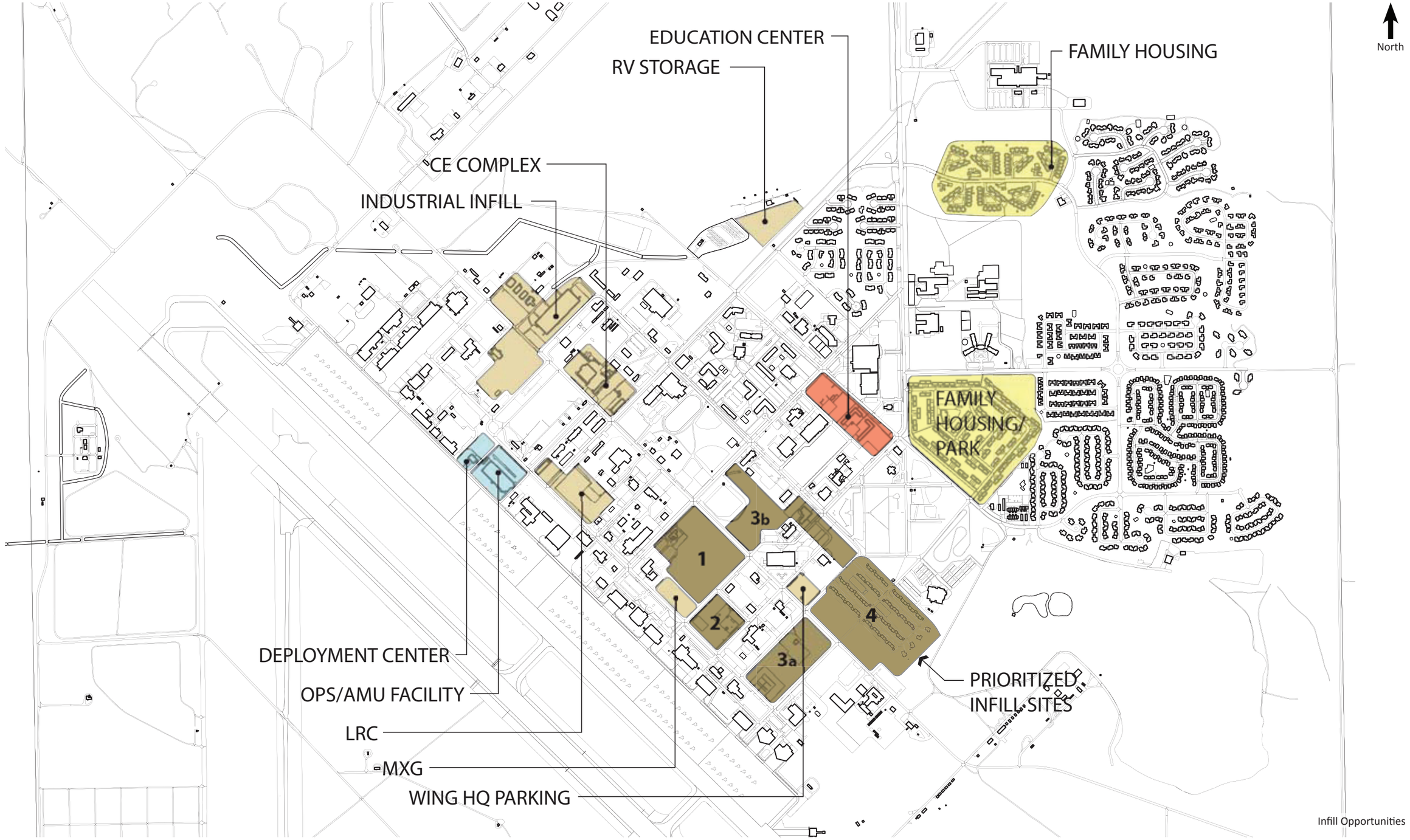


Figure 3.10
Future CE Complex Site



Infill Opportunities

Several large infill sites have been identified and held to serve yet unidentified future needs. Base CE personnel have reviewed these sites for infill and classified them into two groups. The sites in the first group have been assigned priorities regarding their reuse. All future uses on these sites would be related to the Installation's mission. The second group of sites includes land that could be used for mission-related activities, community and family housing purposes.

Priority Infill Sites

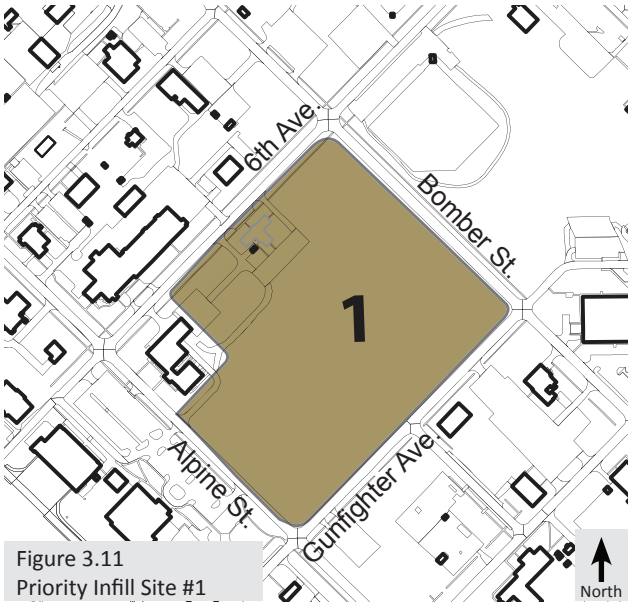


Figure 3.11
Priority Infill Site #1

Priority Infill Site #1

This site includes the remainder of the block that contains Building 840 and the planned MXG facility. This 16.8 acre site is bounded by Phantom Avenue on the north, Liberator Street on the east and Gunfighter Avenue on the south (*see figure 3.11*). Wing Headquarters (512) is diagonally across the street from the site's southeast corner. A number of communications facilities are located along a portion of the south side of Gunfighter Avenue. This adjacent land use may influence the types of facilities that should be placed on this key site.

This is a key site because of its significant size and its central location along the flight line. These two factors should be taken into consideration when future uses are considered for this location. New facilities that do not require this extent of property should be located on other adjacent but smaller sites.

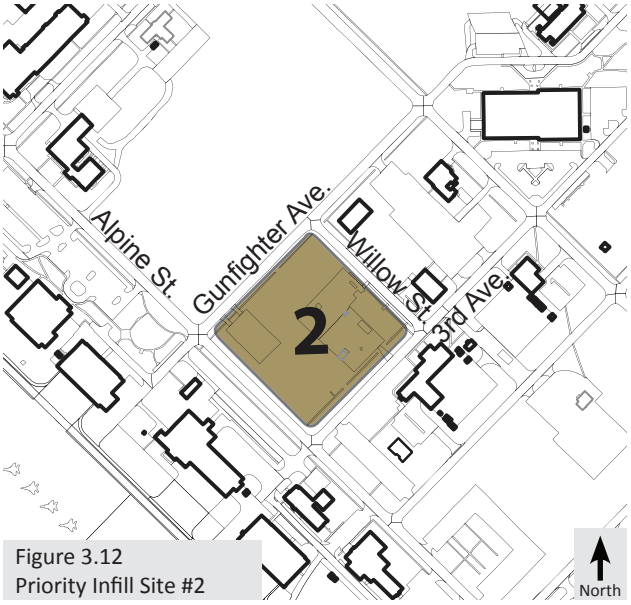


Figure 3.12
Priority Infill Site #2

Priority Infill Site #2

This site abuts a portion of Infill Priority Site #1, along the south side of Gunfighter Avenue. This 6.3 acre site is bounded on the west by Alpine Street, with 3rd Avenue on its southern edge (*see figure 3.12*). A Communications facility is located east of the vacant property. If it were feasible and desirable to close the portion of Gunfighter Avenue from Alpine to Liberator Streets, this site could be combined with the future MXG and/or Infill Priority Site #1 to create a large development site. Further study would be needed to determine the impact on local transportation patterns and the extent of utility relocation that might be necessary to combine Infill Priority Sites #1 and #2.

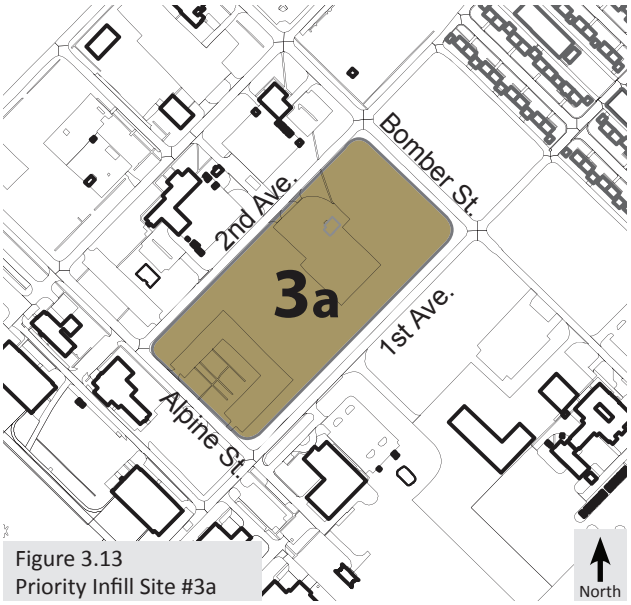


Figure 3.13
Priority Infill Site #3a

Priority Infill Sites #3

Installation CE staff prioritized two sites as being of equal importance for redevelopment. Infill Priority Site #3a is located southwest of the Wing Headquarters building (512) between 2nd and 1st Avenues, with Liberator Street acting as its eastern boundary and Alpine Street as its western boundary (*see figure 3.13*). The former B-1B Bomber Squadron Operations building is located south of this site. Like Infill Priority Sites #1 and #2, the western edge of this site abuts the flight line, suggesting that the use of this 12.2 acre infill site should have a strong connection to the flight line mission.

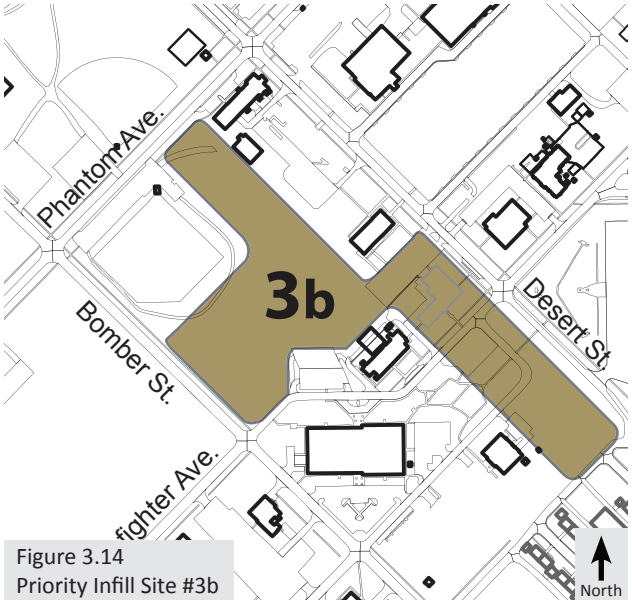


Figure 3.14
Priority Infill Site #3b

Infill Priority Site #3b (*see figure 3.14*) is located north of the Wing Headquarters building (512) behind the adjacent Communications buildings (1501 and 1506). Building 1506 will be removed in the future to increase the size of this infill site. Other land uses on the block that contains this irregularly shaped site include a baseball field, the Base Theater (1613), and two other Operations buildings (1609 and 1610). Since this 13.0 acre site is located next to the Wing Headquarters, it may be appropriate to reserve this site for future needs that are associated with the headquarters function.

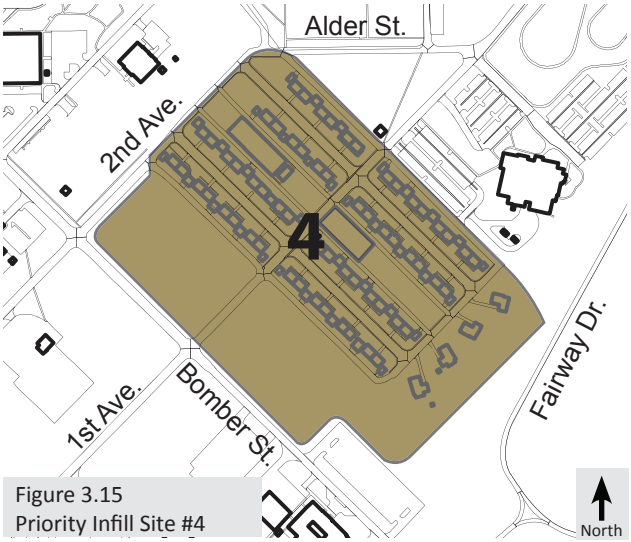


Figure 3.15
Priority Infill Site #4

Priority Infill Site #4

The current Eagle View housing area dates back to the early development of Mountain Home AFB (*see figure 3.15*). The housing units were built as four-plex structures that have been remodeled into duplex units. Sound levels that occur in this historic housing area exceed those allowed in newly constructed family housing areas. Should the Base mission expand or aircraft operations increase, it may become desirable to relocate the families from this housing to other housing units further from the flight line. Reuse of the Eagle View housing units for another use is unlikely. Once cleared, the former Eagle View housing area could be combined with vacant land to its west, which would form a 26.6 acre site that would extend approximately 1,300 feet south of 2nd Avenue between Walnut and Bomber Streets. This site would adjoin the Combined Club (195) on the east, the Golf Course on the south, the 726 Air Control Squadron, and Infill Priority Site #3 on the west, and the Wing Headquarters complex (510 and 512) on the north. While this is the largest of the identified infill sites, its location on the edge of the Base's developed area makes it less attractive for development than the other sites.

Secondary Infill Sites

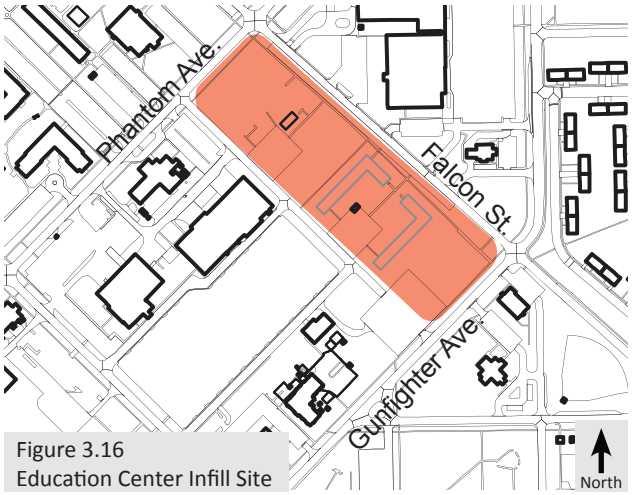


Figure 3.16
Education Center Infill Site

New Education Center Infill Site

A relatively large infill development site (*see figure 3.16*) exists between the Old Commissary (2610) and the current BX (2607) and Commissary (2610). Two existing residential structures (2603 and 2604) will be demolished to provide a redevelopment site that is 10.0 acres in size. Falcon Street runs along the long dimension of this rectangular site with Phantom and Gunfighter Avenues at each end. The west side of this site abuts the former BX and Commissary site, which is being redeveloped to house several community services. The Installation intends to locate the new Education Center on this easily accessible infill site. The new Education Center should be designed to respond to the redevelopment occurring on the former BX and Commissary site.

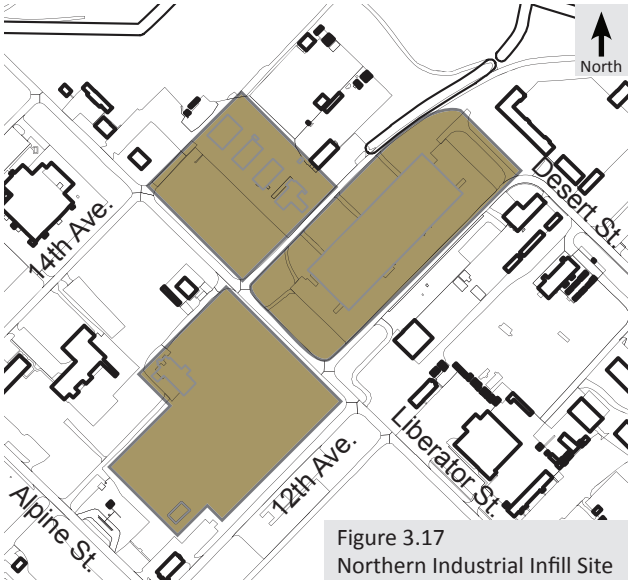


Figure 3.17
Northern Industrial Infill Site

Northern Industrial Infill Sites

Three sites exist adjacent to the intersection of Bomber Street and Evander Way (*see figure 3.17*). This area currently contains vacant and soon to be vacated buildings which are not suitable for reuse and will be demolished. The three site's total area is about 22.6 acres and they are located on the northern edge of the industrial area. In the future, these sites could be used for a yet to be determined industrial use, if the Base mission is expanded or after the prioritized sites have been redeveloped.

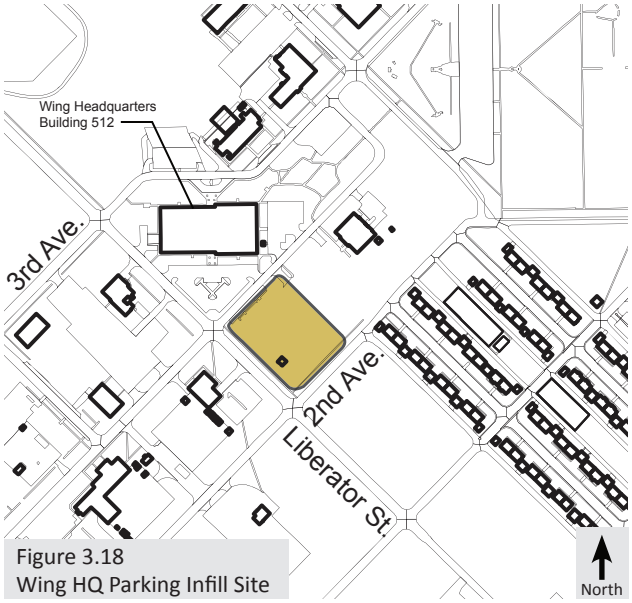


Figure 3.18
Wing HQ Parking Infill Site

Wing HQ Parking Infill Site

A large infill development site exists to the southeast of the existing Wing Headquarters building (512) site (*see figure 3.18*). This parking infill area should be utilized in order to meet Anti-Terrorism/Force Protection standards for vehicular traffic that currently are not being met by the existing parking lots and drives.

Family Housing Areas

Building Series 4400 and 4200

The older housing area that includes building series 4400 will be demolished after new family housing is constructed to replace it. Building series 4200 is located south of the 4400 series and it appears that this housing area was partially demolished in the past, leaving a few units near the south side of its site. When the 4400 series is demolished, current plans are to create a park on this site, to extend the

community open space that exists in the Heritage Area, which is to the west across Falcon Street. Drainage improvements will also be made in the area to eliminate flooding and improve stormwater flow to the south, along the golf course edge.

While a need may exist to use a portion of the 4400 building series site for additional sports fields, consideration should be given to using a portion of this area, along with some of the adjacent 4200 building series site, as an area for future family housing. Two relatively recent family housing areas are located to the east. The recently completed Temporary Housing facility is immediately north of the site on Eagle Drive. To buffer the proposed family housing from the more intense land use of the BX and Commissary, sports fields or open space could be located along Gunfighter Avenue and Falcon Avenue. Roads in the new family housing area could be reoriented to correspond to the pattern of the adjacent new housing connecting to Eagle Drive and Falcon Street. In-filling this site with a mixture of family housing, recreation facilities and open space would extend the Base's family housing area to the commercial and community services area to the west, as well as create a connection to the Heritage Area. Trails could be extended from the family residential neighborhoods to the north and east through this area, to create a greater sense of community continuity and to encourage non-motorized transportation.

[3.3] Circulation

Vehicular Circulation

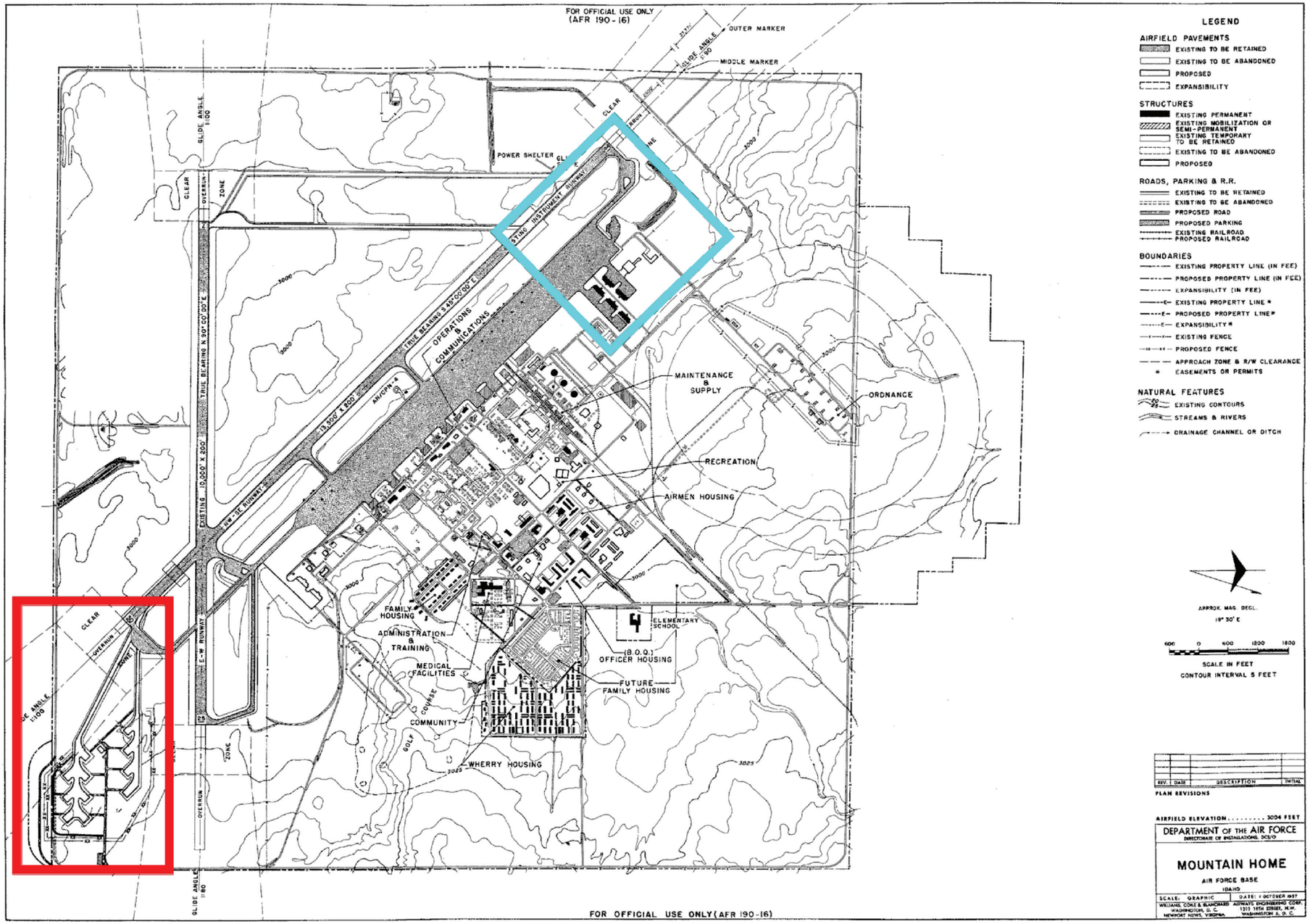
The street pattern at Mountain Home AFB takes its cues from two major influences, the flight line and the base entry road. The street gird for facilities associated with flight line and base operations form a rectilinear pattern that extends northeast from the runway. The base entry road appears to have been extended directly south from an existing highway, now Idaho State Highway 67, which cuts diagonally from the town of Mountain Home to Grand View, Idaho. The base entry road served as the termination of the grid, intersecting it at an angle of approximately 45 degrees.

The majority of the Installation's original flight line, industrial area, airmen housing, bachelor officer quarters and first family housing area (now called Eagle View) conformed to this grid pattern. Later family housing areas varied from the original roadway pattern, designed to respond more to the base entry road with its strong north-south orientation.

A 1957 Installation Master Plan (*see page 3-10*) drawing indicates that, with the exception of the street patterns in the newer family housing areas, most of the existing circulation patterns present today date back to the Installation's establishment. Minor irregularities like the north-south offset along Alpine Street at 11th and 12th Avenues, and the jog in Gunfighter Avenue near Building 512, were present in the Base's original layout.

Gunfighter Avenue, which is the main base entry road, serves as the major circulation spine for non-commercial traffic entering and leaving the base. Aardvark and Phantom Avenues, along with the southwest extension of Gunfighter Avenue, provide connections from the main base entry road to the flight line and industrial area. Recent traffic signal and intersection improvements at the intersection of Aardvark Street and Gunfighter Avenue have established Aardvark as the primary route to the flight line and industrial area.

No traffic signal exists at Phantom Avenue, making it difficult to make the left turn required to get onto Gunfighter Avenue when leaving the Base. This intersection could be realigned to intersect Gunfighter at a right angle, similar to the new intersection at Gunfighter and Aardvark Avenues. In making this change, Phantom Avenue could be made to align



SAC stubbed parking apron (background right) and planned 1½ Christmas tree alert aprons (foreground left). Mountain Home Air Force Base. Directorate of Installations. Master Plan of October 1957. Collection of K.J. Weitze.

1957 Mountain Home AFB Master Plan

Existing Circulation Map

with the unnamed street that runs between the three schools. This would be valuable if additional housing is developed east of the schools in the future. The jog in Gunfighter Avenue near Building 512, along with the fact that it is the final of the three roads that access the flight line and industrial area, decreases its attractiveness as a through-route.

The hierarchy of roads parallel to the flight line is more difficult to discern. Alpine Street serves as the main road adjacent to the flight line buildings. This street serves flight line operations and the industrial uses along it. Liberator Street extends in both directions to First Avenue on the south, and then the street name changes to Bomber Street and extends beyond the edge of the developed portion of the Base to the south and east. The north terminus of Liberator Street connects to the Grandview Gate, which is the commercial vehicle entrance to the Base. This street is the primary commercial vehicle route from the edge of the Base to the Base's operational and commercial areas. Commercial traffic branches off from Liberator Street at various locations, depending upon their final destination.

Desert Street begins at the Eagle View Family Housing area at one end, and extends north to the CE complex and former warehouse area. This street serves less to support mission operations than Alpine and Liberator Streets. Interestingly, Desert Street has a large concentration of community facilities and higher-density housing along it. This occurs because Desert Street runs along the edge of several different land use zones. The Fitness Center, a number of sports fields, unaccompanied airmen housing, former BX and Commissary, Base Theater, Chapel and Heritage Area all are located along this roadway.

One block further out from the flight line, Falcon Street extends from the Golf Course and new family housing area at its south end to the campground north of Aardvark Avenue. South of its intersection with Gunfighter, the street is very residential in character. North of Gunfighter, Falcon Street is flanked by community facilities such as the Credit Union, BX and Commissary, Youth Development Center, Bowling Alley, Arts and Crafts Center, Sage Inn, and the other edge of the unaccompanied airmen housing area.

Pine Street extends one block, from Phantom Avenue behind the BX to Aardvark Avenue. This street has community uses including the Youth Development Center, Outdoor Adventure Center and sports fields along one side, and family housing along the other side. This is a minor street that serves only traffic associated with these land uses.

Removal should be considered for minor streets that no longer serve a purpose. Specifically, this comment applies to many of the avenues between Alpine and Liberator Streets. Many of these date back to the Base's original development and are vestiges of former land use. Removal of some of these seldom used roads would allow aggregation of currently separated sites into larger redevelopment or infill parcels.

- *Change the northern end of Phantom Avenue to align with the school road*
- *Remove any unneeded minor streets as infill or redevelopment occurs*

Figure 3.19
Pedestrian Circulation from Fitness Center

Pedestrian Circulation

Sidewalks parallel one or both sides of most roads in older portions of the Base. In this area, the streets were constructed higher than the adjacent ground surface. The walks follow this lower elevation, rising gently to gutter-level openings in the curb at street intersections. These walks have a dual purpose of

North

MAIN SPINE TRAIL

SPUR TRAILS

Existing Pedestrian Circulation

serving as pedestrian routes and acting as weirs to convey stormwater from the streets to infiltration areas paralleling the walks. During rainstorms, some sections of walk may become temporarily inundated until the water infiltrates into the soil.

The lack of shade along most walkways discourages use during hotter times of the year. The walk alignments follow the street grid, increasing walking distances and placing pedestrians close to traffic. Both situations make sidewalk use less attractive. Placing walkways five to ten feet from the road's edge would improve the walking experience.

Planning is underway by Base CE to create an enhanced walkway which will extend from near the center of the Base and run through the industrial area. It will follow the route of an overhead power line which will be buried during an upcoming utility upgrade project. Undergrounding the power line will improve aesthetics and eliminate the conflict between shade trees and overhead power lines. A wider walkway, intermittently placed shade structures, and irrigated plantings will enhance the user experience (*see figure 3.19*).

- *Complete undergrounding electric Circuit "B" to create the enhanced walkway*
- *Provide shade along walkways with tree clusters or shade structures*
- *Move walks away from road edges to improve the walking experience*

Trails

Mountain Home AFB lacks a comprehensive trail system that could provide an alternate means of transportation for Base residents. A limited number of trails exist in family housing areas, connecting homes to playgrounds and providing neighborhood walking paths. These do not extend into other areas of the Installation (*see figure 3.20*)a.

Opportunities exist to create trails to link community service, commercial, and family housing areas together. A spine trail could be extended along Mellen Drive from Gunfighter Avenue to Falcon Street. At the southern end of Mellen Drive, this spine trail could extend west along the south side of Falcon Street. The existing sidewalk along Fir Street would tie the spine trail to the Family Housing Office and Heritage Area trail. The spine trail would continue along Falcon Street to its intersection with Gunfighter Avenue, providing access to the Family Readiness

Figure 3.20
Pedestrian and Bike Trails

Center. The trail could then cross Gunfighter Avenue and continue along the south side of Falcon Street to the redevelopment area that includes the former BX and Commissary. Here, a spur trail could continue to extend along Falcon Street to Aardvark Avenue, connecting the Youth Development Center, Bowling Alley, Arts and Crafts Center, Library, Sage Inn and north edge of the unaccompanied airmen housing area.

The spine trail would extend west through the former BX/Commissary redevelopment area, to provide access to the new community uses housed here, as well as tie to the Child Development Center and Chapel. Upon reaching Desert Street, the spine trail would turn and run along the north side of Desert Street, crossing Phantom Avenue and continuing to the intersection with Aardvark Avenue. Prior to reaching Aardvark Avenue, the trail spur would cross to the south side of Desert, at a new mid-block pedestrian crossing located near the Fitness Center.

To create a complete loop, a trail could run along Aardvark Avenue back out to Gunfighter Avenue, where it would cross that street to join with the spine trail along Mellen Drive. Additional spurs

could be created to tie in Eagle View Housing Area and to provide access to the heart of the flight line at Building 261.

Beginning at the intersection of 1st Avenue and Walnut Street, to serve both the Eagle View Housing Area and the Gunfighter Club, a trail spur could run west to the intersection of Alder, Walnut and Desert Streets. This spur would cross Alder and continue along the edge of the Heritage Area. Crossing Gunfighter, it would pass the Chapel and join the spine trail near the southern end of the former BX/ Commissary redevelopment project. This spur would also connect the Wing Headquarters to the trail system via existing walks along Gunfighter Avenue.

The spur trail to the flight line would occur along Phantom Avenue. This short and direct route would begin at the spine trail where it intersects Phantom Avenue on Desert Street and then travel two blocks west to the Base Operations Building and Alpine Street.

Additional trails could be constructed to enhance the loop spine trail as use increases. Extensions should occur to connect existing walking paths in family housing areas. A spur trail along the east side of Alpine Street might be extended to encourage airmen to bike to work on the flight line and in the industrial area.

- *Construct a spine trail to create a community-wide loop trail*
- *Extend spurs out from the spine to key destinations*

On-Street Bike Trails

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

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

[3.4] Utilities

Power, communications, natural gas, potable water, and sanitary sewer services are available throughout the Installation's developed areas. Utilities on Base generally parallel roadways. Overhead electric distribution lines serve much of the Installation between Liberator and Falcon Streets. Underground electric distribution lines exist along the flight line and Alpine Street. Power lines have been buried on sites where redevelopment has occurred, such as at the current and former BX/Commissary sites, as well as in all new and renovated family housing areas. A plan exists to bury the "B" circuit distribution line that runs through the older portion of the Installation. A portion of this circuit follows Liberator Street, which will improve the visual character of this main thoroughfare.

An installation stormwater drainage system does not exist at Mountain Home AFB. Instead stormwater is managed at a sub-watershed or site level. Road drainage in many areas flows to curb cuts or walk ramps where it flows to infiltration areas. A large drainage channel extends along the north edge of the developed area near Falcon Street. This channel carries water from areas along Falcon Street, as well as from the flight line further west. The need exists along the Installation's southern edge to create a similar channel. This channel would begin near the intersection of Falcon Street and 1st Avenue and run south, passing between the Gunfighter Club and golf course. The channel would outlet into a large storm drain pipe which crosses under the runway before emptying into a natural drainageway to the south. The new family housing areas appear to be served by conventional storm drainage systems which outlet to drainage ways.

[3.5] Land Use

Many portions of the developed area at Mountain Home AFB contain a mixture of land uses. Land use can be characterized as being fairly homogenous as you approach the flight line or when you are east of the portion of Gunfighter Avenue that serves as the base entry road. Most land uses between Alpine and Desert Streets support the flight line or operating the Installation. The Fitness Center and associated sportsfields are located in this zone and provide a buffer between the zone's industrial land uses and the adjacent airmen housing area. Eagle View Family Housing Area is located adjacent to this zone because it was constructed early in the installation's history. Newer family housing areas have been located farther away from the flight line.

The portion of Mountain Home AFB with the greatest intermixing of land uses is a triangular-shaped area bounded by Aardvark Avenue on the north, Gunfighter Avenue on the east, and Desert Street on the west. This area includes unaccompanied airmen housing, a variety of community services, commercial facilities including the BX and Commissary, the Heritage Area, and a newer family housing area. The mix of land uses appear to work well together. Creating a continuous walking system throughout this area would allow residents to walk to nearby attractions and allow the area to be promoted as a walkable neighborhood. New walkways set back from the road edge should replace existing walks that are adjacent to curbs.

Family housing areas constitute the primary land use east of the base entry road. A cluster of school buildings located along Gunfighter Avenue buffer the more intensive land use associated with the BX and Commissary from the housing areas to the east. The new Temporary Family Housing facility is located adjacent to the schools, again providing an appropriate transition in land use.

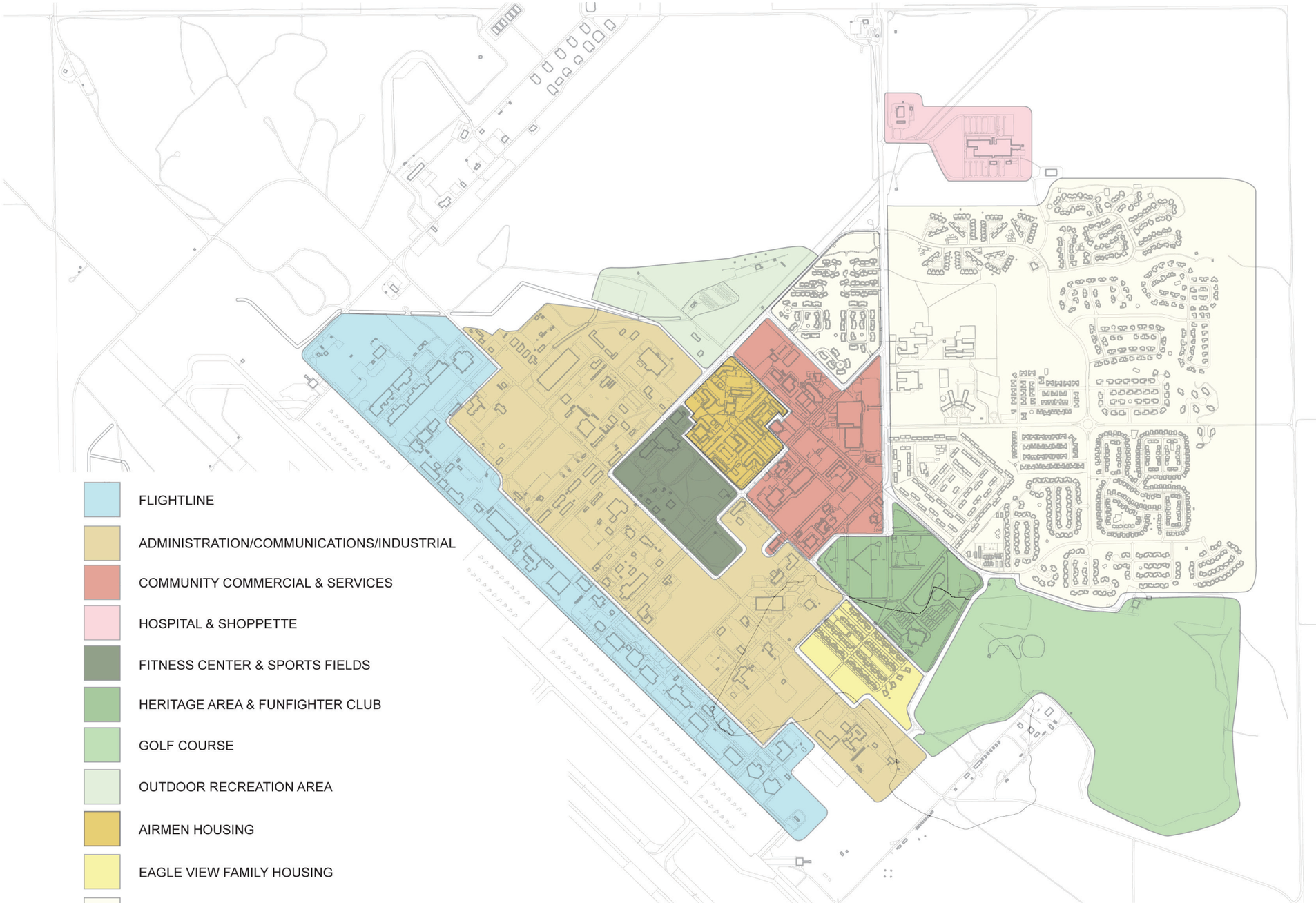
The Base Hospital is located north of the large family housing neighborhood. This land use along with the adjacent Shopette "floats" at the edge of the Installation's developed area. While a road connects it to the adjacent neighborhood, the land use relates more to Gunfighter Avenue and its proximity to the Main Gate. Space exists across the road from the Shopette for another community use that relates to the Hospital.

Land uses at Mountain Home AFB reflect the Installation's continued evolution and changing mission. The concentration of industrial and operational land uses near the flight line supports efficient military operations. The concentration of newer residential neighborhoods east of Gunfighter Avenue creates a sense of community. The varying densities, building masses and architectural styles in these neighborhoods contribute to this positive perception. Demolition of the remaining obsolete housing units will provide space for additional housing development, further enhancing the land use in place. Adequate land exists to include open space in these developments.

The infill strategies described earlier in this document are consistent with existing land uses. Implementing the infill strategies will reinforce existing land uses, provide room for growth and help obtain the goal of creating a greater density of land uses adjacent to the flight line.

A large expansion of the military mission at Mountain Home AFB could be accommodated by adding a second flight line along the west side of the runway. Community areas east of the runway would need to be enlarged to serve the larger Base population. Creative redevelopment of older residential areas, along with the expansion of newer housing areas to meet this need, is possible.

- *Add sidewalks to create a walkable neighborhood near the center of the Base*
- *Space exists for another community use near the Shopette and Hospital*
- *Infill uses proposed in this ID2 will reinforce existing land use patterns*
- *Space exists west of the runway to accommodate a second, large military mission*


North
FLIGHTLINE
ADMINISTRATION/COMMUNICATIONS/INDUSTRIAL
COMMUNITY COMMERCIAL & SERVICES
HOSPITAL & SHOPPETTE
FITNESS CENTER & SPORTS FIELDS
HERITAGE AREA & FUNFIGHTER CLUB
GOLF COURSE
OUTDOOR RECREATION AREA
AIRMEN HOUSING
EAGLE VIEW FAMILY HOUSING
FAMILY HOUSING & SCHOOLS

Land Use Map

[3.6] Constraints

The Installation's gently sloping topography made the site attractive for use as an airfield. Past cycles of development at Mountain Home AFB served the then current mission and often involved "recycling" building sites to keep the Installation compact. The current development strategy continues this approach, minimizing risk. A dramatic expansion of mission could introduce or acerbate constraints which currently appear to be manageable.

Constraints that could impact future development, and strategies to minimize their impact, include:

Shallow Depth to Bedrock
Areas north of the CE complex have shallow depths to bedrock, dramatically increasing the cost to install underground utilities and to dig building footings.

- *Follow infill development strategy to reuse previously developed parcels with adequate soil depth.*

Potable Water Supply
Local groundwater levels are declining. Efficient water use and re-use is important in minimizing groundwater drawdown.

- *Use potable water efficiently.*
- *Avoid use of potable water for landscape irrigation.*

Landscape Irrigation Water
Irrigation is essential for the survival of landscape plantings at Mountain Home AFB. Pumping local groundwater to use for landscape irrigation is at odds with larger sustainability.

- *Irrigate landscape areas with appropriately treated effluent from Installation wastewater treatment plant*

Stormwater Management
High intensity, short duration rainstorms create temporary ponding in some areas.

- *Stormwater should be viewed as a resource, not a nuisance.*
- *Appropriately-sized infiltration Best Management Practices (rain gardens, bioretention cells, infiltration trenches) should be included in new project designs and retrofitted into areas where drainage problems exist.*

Former Landfills and Construction Debris Dumps
Former landfills and construction debris dumps occur outside of the Installation's developed area.

- *Reuse of infill sites, compact growth and directing growth away from these locations should minimize this concern.*
- *Consider recycling concrete in debris dumps to aggregate, for future construction projects.*
- *Reclaim former landfills and construction debris dumps by placing soil over areas and planting with native grasses.*

[3.7] Green Infrastructure

Green infrastructure enhances the quality of life for people while mitigating negative impacts associated with land development and operations. Existing parks, open space, undisturbed vacant land, natural drainage, and the Installation's landscape plantings comprise Mountain Home AFB's green infrastructure. The Installation is located within an intermountain basin with a semi-arid climate regime. Past land uses which occurred before the site was developed as an air base disturbed and degraded the area's natural vegetation. Supplemental moisture is needed to support many of the components of the Installation's green infrastructure.

- *Innovative irrigation water sources including harvested rainwater, reuse of grey water and the use of reclaimed wastewater effluent for irrigation need to be pursued to conserve groundwater sources.*

Significant Parks and Green Spaces

The harsh and dry climate at Mountain Home AFB creates a challenge in the development of green spaces. Supplemental irrigation is required to establish and maintain green spaces with landscape plantings and lawns. The Installation has a surprising number of significant green spaces, varying in both size and character (*see figure 3.21*). Most of these green spaces include a mixture of lawn areas with shade trees, and in some cases flowering ornamental trees and shrubs. Only the turfgrass field inside the running track at the Fitness Center and the lawn areas near the current and former schools are without trees.

Entry Road Plantings along Gunfighter Avenue, from Main Gate to Aardvark Avenue
This green space provides a welcoming appearance.

- *The green space should establish the visual character occurring along most of the installation's primary roads.*

Green Space on Northwest and Southwest Corners of Aardvark and Gunfighter Avenues
This key green space marks the edge of the developed area.

- *The visual prominence of this space could be enhanced by adding a monumental scale sculpture or static display.*

Former Railroad Right-Of-Way Along North Side of Aardvark Avenue
This continuous green space runs parallel to one of the primary roads. The windbreak to the north creates a sense of enclosure.

- *This linear park is highly visible and will contain a segment of the proposed spine trail.*

Sports Field/Open Space at Aardvark Avenue and Falcon Street
This open space is large enough for sporting events as well as informal play. It provides a buffer between the airmen dormitories and family housing to the east.

- *Existing shade trees around its perimeter could be expanded to provide additional shade and better define the playing area.*

Building Courtyards and Green Space in Airmen's Housing Area
Lushly planted courtyards between adjacent buildings, as well as green common spaces within the dorm complex, provide inviting outdoor spaces. Mature trees provide nearly continuous overhead canopies in some areas.

- *These areas should be managed carefully to reflect their unique character within Mountain Home AFB. Additional shade trees and other plantings would enhance some areas.*

Figure 3.21
Static Display Park Green Space

Fitness Center Track and Field
This field includes a running track and practice field.

- *Shade tree plantings outside of its perimeter fence could enhance the experience of people viewing activities or waiting to use the field* (*see figure 3.22*).

Figure 3.22
Fitness Center Track and Field

Park at Phantom Avenue and Desert Street
This green space includes tennis courts and a shade pavilion, and is located between two ballfields.

- *Additional shade trees and ornamental plantings could better define this green space and improve its appearance.*

Heritage Area and Park
The open space displays the various aircraft stationed at the Installation and includes a large picnic pavilion.

- *Additional clusters of shade and ornamental trees would enhance the park's beauty and could serve as backdrops when viewing some of the aircraft* (*see figure 3.23*).

Credit Union Green Space at Corner of Gunfighter Avenue and Falcon Street
This small triangular site, on the inside edge of the jog in Gunfighter Avenue, provides a welcome contrast to the expansive parking area in front of the Commissary and BX.

- *Additional plantings could enhance this area.*

Former VAQ Sites
This area on the west side of Falcon Street, between Gunfighter and Phantom Avenues, includes mature shade and ornamental trees.

- *A concerted effort should be made during the design of the proposed Education Center to preserve these trees.*

Gunfighter Park
This small park has mature trees.

- *When the housing area containing the park is demolished, preservation of the trees in the park, as well as in the surrounding neighborhood, should be a priority.*

Lawns Adjacent to Current and Former Schools
These treeless level lawns are unique. While shade and ornamental trees occur near the buildings, these lawn areas are open.

- *A study should be conducted to determine the frequency of use of each field. A determination should be made if it is justified to irrigate the two lawn areas near the closed schools, based upon the use study. Shade trees could be added near the periphery of lawns to remain. A landscape planting plan should be developed for the elementary school that also provides an outdoor classroom for educational use.*

Figure 3.23
Heritage Area and Park

Significant Green Resources

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

Mature Tree Canopy in Older and Redeveloped Family Housing Areas

Eagle View, as well as several of the redevelopment family housing areas, contain a collection of mature trees.

- *These urban forests should be managed to protect the health of these trees and increase the diversity of species through new tree plantings. Creating a forest of trees of all ages by annual tree planting should be a priority.*

Building Courtyards and Green Space in Airmen's Housing Area

These areas demonstrate the value of building forms which create and shelter outdoor spaces. The less windy, partially shaded courtyard promotes plant growth, causing increases in local humidity and human comfort (*see figure 3.24*).

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

Scattered Landscape Areas within the Flight line, Industrial, and Administrative Areas

Some of these trees are survivors from the early development of the Base. Others were planted as part of building construction or renovation projects, or quite possibly were planted by past building residents who desired to have shade and green space near their buildings.

- *These spaces stand out within this highly developed area. Existing plantings should be managed to extend their effective life. New plantings should be included as part of new construction and major renovation projects within this zone, to extend the benefits of green infrastructure throughout the installation.*

Base-wide Windbreaks

Multi-row windbreaks have been planted along the northern edges of the Installation's developed area, as well as around the west and south edges of the Eagle View housing area. As they mature, these irrigated tree plantings will buffer the wind, provide wildlife habitat and create a sense of enclosure.

- *Additional windbreaks should be planned to buffer other areas on Base, including new housing areas.*

Figure 3.24
Building Courtyards

Recently Completed MILCON and Renovation Projects with Landscape Plantings
Green infrastructure is needed on new construction projects to comply with several Executive Orders regarding sustainable design. Stormwater quality and quantity issues can be cost-effectively addressed using bioretention and bio-infiltration plantings.

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

Undeveloped Land Surrounding the Installation's Developed Area
The natural areas surrounding the built-up portion of the Installation should be viewed as providing green services to the Installation. These plantings hold soil in place, reduce the erosion power of stormwater, provide wildlife habitat and food, sequester carbon and release oxygen.

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

Golf Course

The existing golf course was purposely not included in the green infrastructure listing. The course's tee boxes, fairways and greens are clothed with green, irrigated grass and the course is a recreational resource. These factors do not, however, imply that the course provides any environmental benefits beyond the golf course's boundary.

- *Continued irrigation of the golf course is part and parcel of the issue of the use of potable water at Mountain Home AFB for landscape irrigation. The current use of partially-treated waste water on the course will come to an end with the pending water quality requirements issued by the State of Idaho, unless an upgrade to the wastewater treatment plant is completed. This will leave the Base with the only option of irrigating the course completely with potable water.*

Landscape Irrigation Water Budget

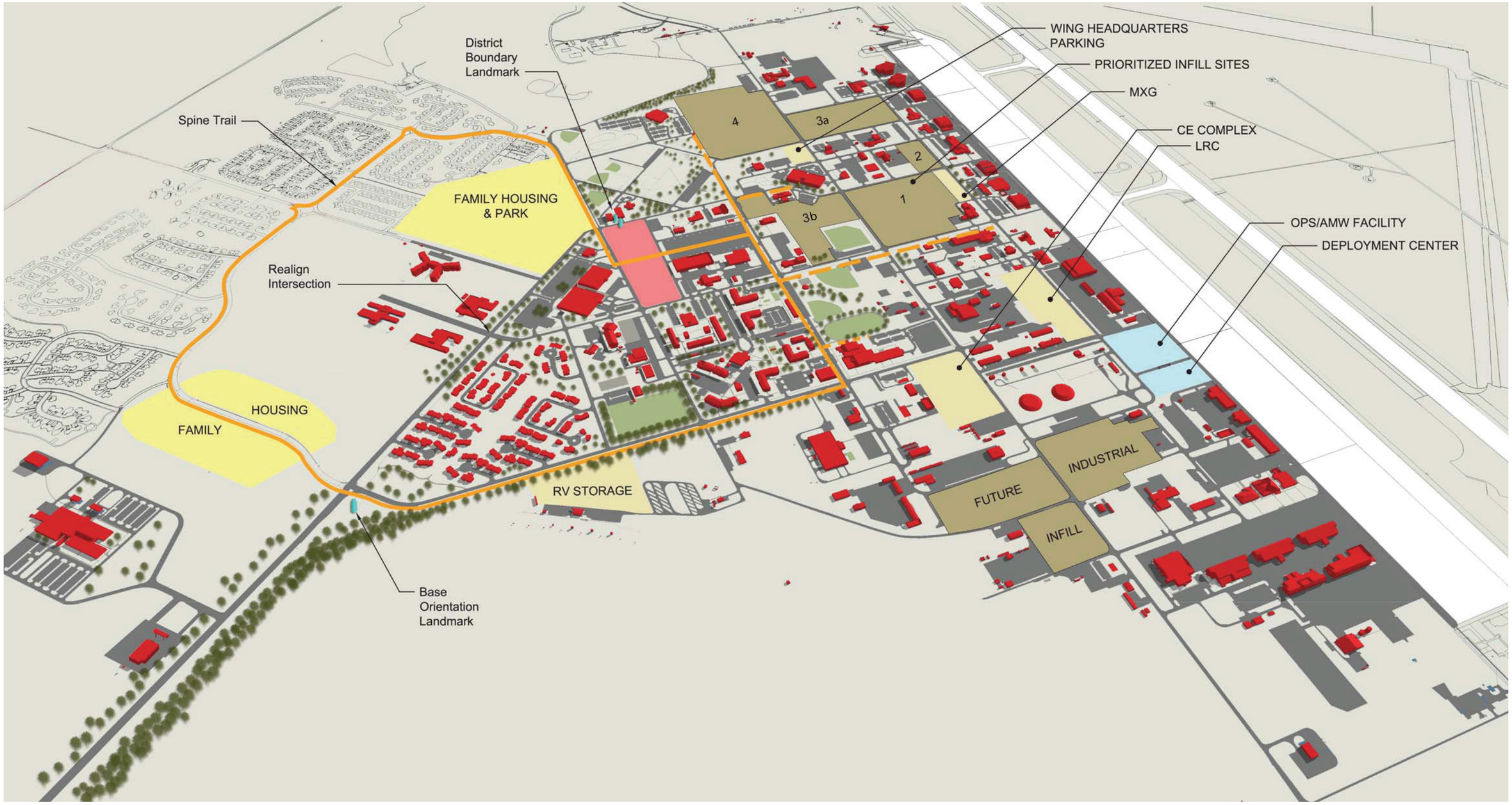
With the decline in the local aquifer level, the Base may be required to stop using well water for landscape irrigation. To irrigate under this scenario, fully-treated wastewater conforming to state law would be the only significant source of water for landscape irrigation. If this were to occur, decisions would need to be made to determine what areas of the Installation landscape would be watered with the resources available. The list of areas to be irrigated would also need to be prioritized to ensure that the highest value landscapes received the available water.

The preceding discussion regarding water use at the golf course is intended to point out that fresh potable water is a finite resource. Whether landscape areas at Mountain Home AFB are irrigated with well water, or appropriately treated wastewater, the demand for landscape irrigation cannot exceed the available supply of water. The Installation needs to determine the water demand of different types of landscape areas that exist on the Base and then create an inventory of all irrigated landscape areas on Base. Using this information, the total demand for irrigation water can be calculated. This information would give Base leadership a basis for making decisions in the future regarding how different areas of the Base landscape would be managed.

- *Pursue wastewater treatment plant upgrade to allow use of treated wastewater for irrigation.*
- *Determine water demand for various types of on-Base landscape areas, develop inventory of irrigated sites and calculate total Base irrigation water demand.*

[4.1] Illustrative Plan

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



Illustrative Plan

[5.1] Sustainable Development & High Performance Green Buildings

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

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

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

Mountain Home AFB is located in a region that has high temperatures in the summer along with low humidity. This climate allows for some innovative cooling solutions such as evaporative cooling, which is energy efficient. Also, operable windows allow natural ventilation during moderate weather, without humidity becoming an issue. Another benefit of this summer climate is that the breezes and low humidity allow natural evaporative cooling of people. In this climate outdoor areas that are shaded and partially sheltered from the wind afford an extension of the interior environments into the outdoors, especially if they are located next to buildings where the users are able to access them readily. Finally, there are reasons to keep the roof colors light at this Base, as the cooling degree days outnumber the heating degree days.

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

Building orientation should take into account the prevailing winds and sun angles, and building fenestration should take advantage of these natural resources. Operable windows can be utilized during the spring and fall, because of the relatively low humidity of the region. And every building should be designed with the idea that daylight and views should be available to all the occupants, as much as functionally possible. Transfer of daylight internally via clerestory windows, transoms, and glass lites is encouraged. Appropriate sun control measure should be incorporated into designs to limit heat gain and glare within the facility.

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

Mountain Home AFB obtains all of its potable water by pumping it from a local aquifer. Current levels of water use exceed the aquifer's ability to naturally replenish itself. Strategies to correct the current overuse of this precious resource must be considered in all new development and green building projects. Water saving features should be incorporated into facility designs as much as possible. Use of waterless urinals, low flow fixtures, and HVAC systems that

minimize water use are all strategies to consider for decreasing interior water use.

Irrigation of landscape plantings is the other major water use at Mountain Home AFB. Without the supplemental moisture provided by landscape irrigation systems, Mountain Home AFB's landscape would consist only of patches of native sagebrush separated by areas of widely-spaced bunch grasses. Using recycled or reclaimed water for landscape irrigation is common in arid areas. Currently, Mountain Home AFB uses some of the effluent from its wastewater treatment plant for irrigation on the Base golf course. Upgrades to the Base's treatment plant are needed to continue this use in the future.

To create a sustainable landscape for the Base's public open spaces, parks, sports fields and other prominent community areas, a change needs to be made from use of potable water for landscape irrigation to the use of fully-reclaimed water from the wastewater treatment system for this purpose. Long-term it will be the responsibility of the Base Civil Engineer and the designers of all new facilities to ensure that the Base's landscape is developed in a manner which is tied to the amount of water available for irrigation. Inevitably, priorities will need to be established which ration the available amount of water to the public landscapes that will provide the most benefit to the Base.

One other option that should be explored on a project by project basis is the possible use of grey water for landscape irrigation. In this case, grey water from hand washing and other minor uses could be collected and stored for use as irrigation water. The irrigation method would need to take the presence of soaps and other sediment into consideration when the system was designed. Currently, the state of Idaho Department of Environmental Quality defines all water coming from a building as *"wastewater"*, not greywater. The Plumbing Bureau of Idaho has jurisdiction over what gets reused and what is allowed to be reused. The bureau's definition of wastewater may be changing soon which would allow the use of greywater systems. Currently Mountain Home AFB has a permit that allows the use of *"wastewater"* to irrigate the golf course.

Annual rainfall is low enough at the Base that a traditional storm drainage system to carry away stormwater has not been developed on most of the Base. The Base's original roads were elevated 1-to-2 feet above the surrounding terrain, allowing water to drain off into shallow depressions along their edges, where the majority of water infiltrates into the site's sandy soils. In more densely developed areas, drainage is picked up in short segments of underground pipe which outlets into a series of drainage ditches (*see figure 5.1*), then drains to a single outfall. In the recently developed residential areas, more traditional piped drainage systems occur.

Figure 5.1
Rock-Lined Swale

A variety of innovative landscaping solutions could be used in this manner to achieve an interesting, varied landscape that responds to sustainable site design principles. The concept of infiltrating stormwater into the ground as near to the location where it is created should be incorporated in all projects where this is possible.

The site's naturally sandy soils and flat topography create abundant opportunities to incorporate sustainable site techniques, such as bioretention/ rain gardens into new construction projects. These make excellent places to plant species that require more water. Water infiltrated into these areas will also benefit local groundwater conditions, potentially providing water to deeply rooted trees.

Linear bioretention gardens could be developed along existing roadways to improve infiltration in the existing rock-lined swales, as well as enhance the visual character along these roads. These gardens could be long and fairly narrow. It would be important to select plants that can withstand the reflected heat from the rock mulch. Typically, native plants perform best in this situation. The use of short grasses, such as an improved variety of turf-type Buffalo grass could be considered for use in these areas. It would be prudent to design and install a few of these gardens in select locations and monitor their performance for two to three years before undertaking a large scale installation of them.

While limited precipitation occurs during the year, rainwater harvested from building roofs and paved areas should be directed to rain gardens or shallow depressions in lawn areas that are at least 10 feet away from buildings.

Along open drainage ditches, "off-line" infiltration areas can be developed (*see figure 5.2*). These are areas adjacent to, but out of the direct flow, in the ditch. After a storm, as stormwater flows through the ditch, some of its water would run into these "backwater" areas allowing it to infiltrate into the ground. These can be designed to decrease or eliminate flows during smaller-sized storms, which typically comprise the majority of rainstorms.

In densely developed areas along the flight line and in the industrial area, it may not be possible or desirable to locate bioretention gardens. In this case, water should be piped to an open area at the perimeter of the site where it could be placed into an infiltration basin that could be planted with native grasses.

Where irrigation systems are used, irrigation controllers that are connected to weather data should be required. These controllers use National Weather Service data to calculate moisture needs. Additionally, soil moisture monitors can be installed and connected to the controllers to further improve their performance.

Figure 5.2
Curb Cut Directing Rainwater to Open Drainage Ditch

Sustainability Recommendations

The recommendations described below are derived from the specific information obtained at Mountain Home Air Force Base. They are intended for further definition, and to assist in the development of projects that would have a direct and viable impact on the sustainability of the Installation.

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

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

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

- *Currently the Base obtains its power from Idaho Power, which produces 52% renewable energy from its hydro-electric power plants. The Base has the ability to increase its current energy efficiency by introducing other sources of renewable energy such as solar power from photovoltaic panels, geothermal electrical energy, and wind energy from wind turbines. The seemingly continuous winds across the Base allow for almost continuous energy generation from wind turbines that could be placed on the edges of the Base where they would not have an effect on the flying mission.*

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

- *Continue to implement the required 2% reduction per year of water consumption based on the Executive Order through the following:*
  - *Implement the next generation of low flush toilets and urinals, and introduce automatic faucets on hand wash sinks.*
  - *Reduce the amount of water used for irrigation on Base by using more native plant species that are able to survive with little to no irrigation.*

- *An increase in composting efforts on the Base would help to reduce the amount of waste being sent to the landfill.*

- *Remove or schedule for reuse all unused or undesirable buildings to bring the square feet per FTE closer to the benchmark average.*

- *Future development of the Installation should consider improving the overall density of the Base, and providing proximity to supporting services.*

[5.2] Site Development

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

Parking

Avoid Over-Development

When constructing new facilities or renovating existing facilities, a review of existing available parking should be conducted to determine if some or all of the required new parking can be provided by using existing parking lots. Shared parking between two or more facilities might be possible. The most sustainable parking stall is one that is used on nearly a daily basis. Seldom-used parking stalls consume land, require expensive periodic maintenance, contribute to the heat island effect, and generate stormwater runoff.

- *Analyze parking needs thoroughly*
- *Consider feasibility of shared-use parking lots*
- *Avoid constructing seldom-used parking stalls*

Green vs. Piped Systems

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

Figure 5.3
Parking Lot Stormwater Infiltration Method

- *Infiltrate stormwater into the ground near where it's created* (*see figure 5.3*)
- *Use stormwater as resource instead of viewing it as an expensive nuisance*
- *Avoid piped solutions except in intensely developed areas*

Permeable and Porous Pavements

Innovative pavement systems which allow stormwater to drain through them are becoming more common. A key factor of success in using these materials is rapidly draining the soils under them. Mountain Home AFB's soils probably meet this requirement. Testing in New Hampshire has demonstrated that snow on permeable asphalt melts faster, with no ice accumulation. Porous concrete infiltrates snow melt water without damage. Use of permeable and porous pavements should be considered when site size constraints prevent using green infrastructure to accomplish the same goals. Porous concrete is not appropriate for areas used by heavy vehicles or in truck loading areas where trucks turn on a continuous basis. It is appropriate for most POV or small vehicle parking areas which constitute a large portion of pavement on most Bases.

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

- *Consider use of permeable or porous pavements where traffic loads permit*
- *Limit the extent of pavement to the least amount needed to meet functional needs*

Green Infrastructure in Parking Lots

New and reconstructed existing parking lots should incorporate green infrastructure concepts. Due to the limited amount of precipitation received at

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

In parking lots less than two parking bays wide, or where a continuous bioswale island isn't possible, bio-swale openings can be designed into the pavement areas. These non-paved areas should be the same size as four standard parking stalls to provide adequate area for shade trees. Pavement surfaces would slope to these openings, demarcated with vehicle wheel stops. Native grasses, shrubs and well-adapted shade trees could be planted in the openings to cleanse runoff.

Soils in the bioswales should be amended to be equal portions by volume of sand and compost. This soil mixture will allow rapid infiltration of stormwater while retaining moisture to support plant growth. Plant growth will increase infiltration over time. The organic matter in the compost will serve as a filter and remove or retain certain contaminates.

- *Manage stormwater within parking lots*
- *Properly prepare soils in bioswales and retention gardens to ensure long term success*

Access and Accessibility

Vehicle access to a new or redevelopment site should use best practices relative to traffic flow and distance of site entry and exit points to existing road intersections. The relatively flat topography at Mountain Home AFB allows site accessibility requirements to be easily met.

When a POV parking lot with accessible parking stalls is separated from the facility it serves by a street, a clearly-marked pedestrian crossing should be established to provide a reasonably direct travel route for persons using the lot.

- *Locate POV parking near new facilities when possible insuring that AT/FP requirements are maintained, which automatically provides a minimum of 33' separation between new facilities and the parking lot.*
- *Provide clearly-marked pedestrian crossings when remote parking is required*

Open Space and Recreation

Several recommendations regarding open space and recreational facilities have been made in previous sections of the ID2. An overriding consideration in the development of new open spaces or the renovation of existing open spaces should be to focus on a level of quality that can be sustained at Mountain Home AFB. Wind, sun and temperature extremes during the year provide clues on what features are needed for successful site development at the Base. Wind protection in the form of plantings and structures can provide relief from hot summer winds, as well as the chill of bitter winter winds. Shade structures and overhead canopies of trees provide shelter from hot and intense sunlight.

- *Create sustainable outdoor areas at Mountain Home AFB that buffer winds and provide shade*
- *Provide shade to increase outdoor use*

Landscape Plantings

To survive at Mountain Home AFB, landscape plant selections for community open spaces must take into consideration the area's harsh environmental conditions, and regionally native or well-adapted plant species should be used (*see figure 5.4*). Clustering plantings to create plants in close association will be more successful in this setting than attempting to create a landscape of specimen plants. Determining the irrigation requirements for the proposed plantings and then confirming that an adequate supply of water is available for the plantings is the final step in the design process.

Figure 5.4
Use Native Plants That Require Minimal or No Water

Long-term success for landscape plantings is directly tied to proper site preparation. Inadequate site preparation will result in landscape plantings that will never reach their potential, and in many cases do not reach maturity. Depending upon soil conditions, this may vary from little more than correctly digging the planting hole and carefully backfilling soil around the plant roots. In other cases, it may require a complete removal and replacement of existing site soils with prepared soils to improve drainage or provide a more conducive environment for plant roots. Correcting compacted soil conditions is necessary on most construction sites.

Two chronic problems occurring in recent landscape planting projects at Mountain Home AFB are overplanting during construction and improper pruning as part of on-going maintenance. Plant spacing in projects should be based on the plant's ultimate size and the designer's intent. Almost every project observed at Mountain Home AFB has too many plants in areas often too small for the species. One example is at Building 920, where ground junipers occur on a berm planting bed in front of the building. A narrow band of grass separates the ground juniper bed from the adjacent walk. The narrow band of turf must be mown with a push mower. Because the ground junipers are planted too closely in a bed much too small for the variety, the outer edge of the plants must be continually trimmed, creating an 8-10 inch vertical edge, rather than the feathery edge most likely envisioned by the designer.

Small ornamental trees in front of the same building suffer a worse fate. Instead of having an upright form with an umbrella shaped canopy, the ornamental trees are repeatedly sheared to form upright cubes. Rather than receiving pruning to elevate their developing canopy as these plants grew, they were cut into an unnatural and unhealthy geometric form. The only sustainable solution to the issues with both the ground junipers and ornamental trees is to remove plants and replant at proper spacing. To alleviate the issue of improper planting, the designer could provide a sketch showing the mature plant size and form relative to the building façade. While this will not prevent bad pruning, it would convey design intent and set a standard to be followed.

- *Use native or well-adapted plant species* (*see figure 5.5*)
- *Cluster plantings to create natural-like communities of plants*
- *Prepare sites correctly prior to plantings*
- *Match planting space to mature plant size*
- *Require landscape architects to provide elevations showing desired mature plant sizes and forms*

Figure 5.5
Native Landscape at Mountain Home AFB

[5.3] Architectural Design

Mountain Home AFB is located in the high plains of Idaho, approximately 12-miles from Mountain Home, Idaho. Neither the city of Mountain Home, nor the surrounding farmland and ranches, has a distinct local design character. If anything, the city of Mountain Home may be characterized by a typical railroad town style of architecture, built around the turn of the last century. This style of architecture consists of a two-story face brick street façades, usually with ornate pediments or cornices. The first floor incorporates large storefront windows, while the second floor typically has tall double-hung windows. Whereas examples of this type of architecture can be found on the main street in the city, the inconsistency in the location of these types of buildings, with adjacent infill of varying age and quality, hardly produces a cohesive local design character. And regarding the local farmsteads and ranches, most of these appear to have been constructed in the last 50-years, and reflect either typical residential or agricultural style architecture common throughout the upper Great Plains. In short, Mountain Home AFB has little local design character to draw upon for guidance.

Mountain Home AFB has seen sporadic building campaigns over several decades since its inception during World War II. This has led to a mix of architectural styles and materials in use on the Base, which tends to produce a disjointed and vague architectural identity. In an attempt to create a unified Base identity, the following recommendations should be considered for all new construction and renovation work at the Base. These recommendations incorporate the good design practices already in use on the Base, while at the same time affording the designer the latitude to explore new and unique solutions to the specific design issues at hand. At all times, sustainable design and high-performance green building principles should inform the design decisions regarding a specific project.

Figure 5.6
Visitors Officers Facility: Residential Zone

Building Zones

Mountain Home AFB is divided into three (3) districts: Zone 1, Residential; Zone 2, Community, including Dormitories and Services; and Zone 3, Flight Line / Mission. The architecture in each zone needs to respond to the unique requirements of the facilities located within it, as well as the overall context of the Base. Building forms, massing, scale, and siting will vary from zone to zone, while still maintaining an overall sense of cohesiveness within the Base through the use of materials and detailing.

Zone 1, Residential

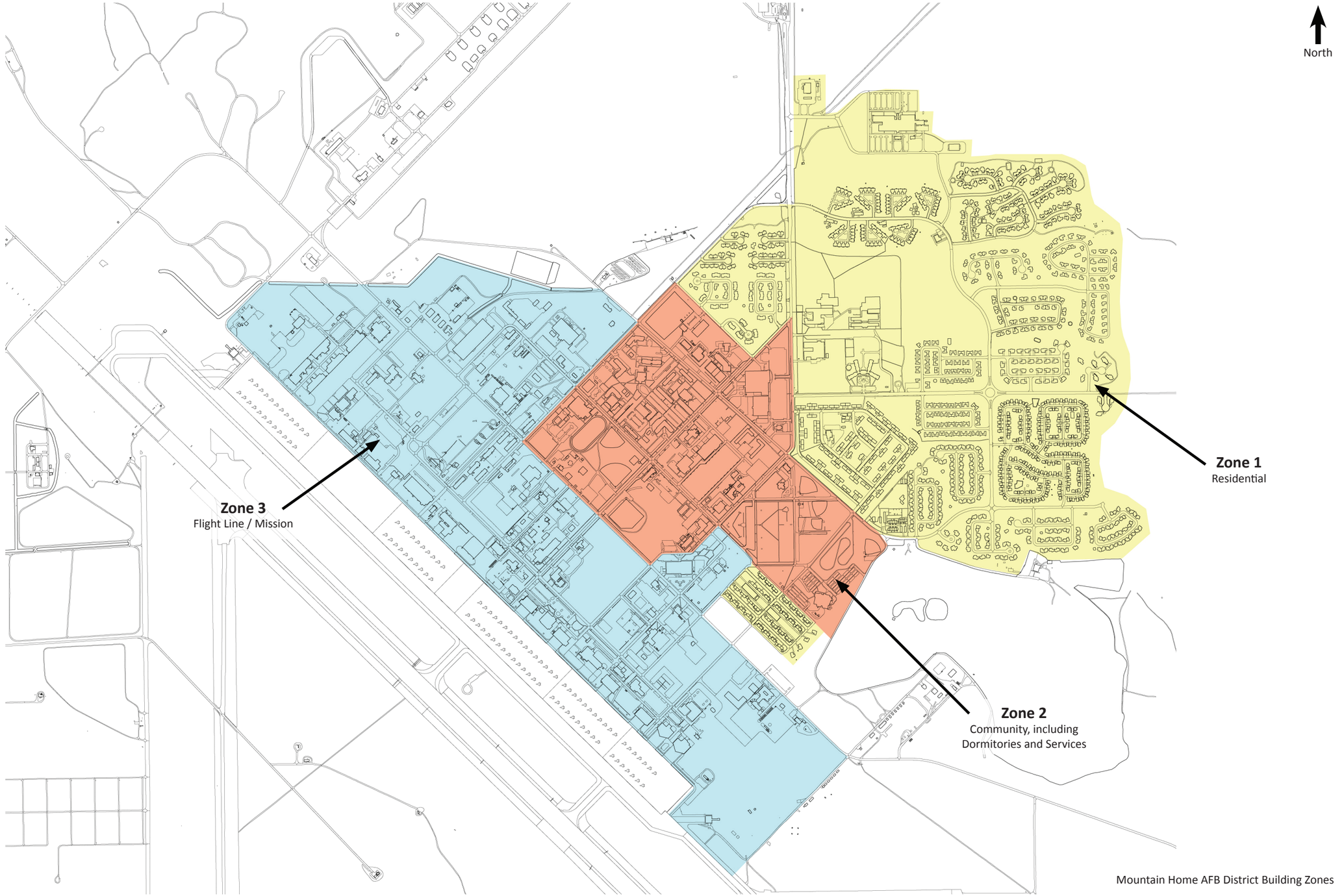
Zone 1, Residential, incorporates all single family housing on the Base. The Base is in the process of replacing the majority of its existing stock of single family housing, with a number of these construction projects complete. The Base Housing and Visiting Officers facilities (*see figure 5.6*) are good examples of recent projects.

It is anticipated that single-family housing on Base will be privatized in the future, and it is therefore excluded from consideration in the Installation Development and Design guide.

Figure 5.7
Typical Dormitory: Community Zone

Zone 2, Community, including Dormitories and Services

Zone 2, Community, includes dormitories, dining hall, library, theater, bowling alley, bank, base exchange, commissary, fitness center, youth center, child development center, hospital, and convenience stores. The majority of the facilities in this zone were constructed in the past 20-30 years, with the exception of the recently completed base exchange and commissary. Most facilities have seen some sort of renovation work throughout the years, the most notable being the addition of sloped standing seam metal roofs to the dormitories, (*see figure 5.7*) and the complete renovation of the fitness center. The buildings in this zone typically align with the street grid, which is set approximately 45-degrees from north to match the runway orientation.



Mountain Home AFB District Building Zones

Figure 5.8
Wing Headquarters: Flight Line/Mission Zone

Zone 3, Flight Line / Mission

Zone 3, Flight Line / Mission, contains the majority of facilities on Base. These include the hangars, Base communications, Wing Headquarters (*see figure 5.8*), flight line support and maintenance, and civil engineering facilities. This zone has the greatest age variance on Base, with certain wood-framed facilities being original to the Base, and recently completed facilities such as Fire/Crash Rescue and Base Operations (*see figure 5.9*). Most of the original wood-framed facilities are slated for demolition. The buildings in this zone typically align with the runway, owing to their support role of runway operations. An exception to this is the Wing Headquarters facility, which is sited square with the ordinal directions, to emphasize its important position on Base. Buildings in this zone tend to be simple in their massing and complexity, owing to their functional requirements.

Figure 5.9
Base Operations Facility: Flight Line/Mission Zone

Architectural Order

Plan Complexity and Geometry

Typically, the existing facilities at Mountain Home AFB are fairly simple in plan and geometry. This is a function of the utilitarian uses of most of the facilities, such as the hangars. Furthermore, facilities tend to be fairly square in plan, with the interior functions not really informing the exterior massing. An exception to this is the recently renovated Fitness Center, which consists of additions to connect the existing gymnasiums and pool, and incorporates a curved standing seam metal roof on each of the various building masses to tie-together the entire complex (*see figure 5.10*).

Figure 5.10
Fitness Center: Curved Standing Seam Metal Roof

Future construction projects should attempt to articulate more the building footprint, which could serve a number of functions: to allow more daylight and views into the occupied portions of the building; to create sheltered exterior plazas and courtyards; and to create more functionally responsive plans to the programmatic requirements of the facility (*see figure 5.11*). Whereas each of the aforementioned concepts might be achieved with a square plan, a square or rectilinear plan should not be the default design solution.

Figure 5.11
Hospital: Daylit Waiting Area

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

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

Building Scale and Proportion

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

Most facilities on Base are simple one-story buildings, since land is readily available. An exception to this is the Base Hospital and Wing Headquarters facilities, which are multi-story to both house their programmatic requirements, as well as to emphasize their importance on Base (*see figure 5.12*).

Even though land is readily available, future facilities should carefully consider multi-story solutions. A multi-story solution may more appropriately address the programmatic requirements of the facility, as well as present more opportunities for daylight and views. Furthermore, facilities located near the flight line may benefit from the larger massing of a multi-story solution, in relationship to the large adjacent hangars. Of course, costs must be weighed in any design solution, but the additional costs of stairs and elevators in a multi-story facility may be offset by the reduced amount of exterior skin. A good example of a recent multi-story project is the Base Operations facility. The scale of this facility is appropriate in relation to the adjacent hangars (*see figure 5.13*).

Figure 5.13
Base Operations Facility: Building Scale

Standing seam metal roofs have been added to many facilities on Base. Whereas this may address on-going maintenance concerns with a low-slope roof, the design of these new roofs must carefully take into consideration the overall aesthetic of the facility. Heavy fascia and soffits tend to overpower the buildings below, and the articulation of the roof should follow the geometry of the building. Furthermore, the roof slope should be chosen to complement the facility, and not overpower it. Finally, the building mass which is created by a large sloped roof will require additional material and labor and may not be as sustainable as other roofing options.

- *Consider multi-story solutions to address programmatic requirements with small site impact*
- *Scale new facilities to relate to adjacent context*
- *Incorporate thoughtful roof designs to avoid over-powering building*

Figure 5.12
Wing Headquarters: Multi-Story Facility

Massing and Typical Bay Spacing

Owing to the fact that most existing facilities on Base are one-story and fairly square in plan, building massing has not been much of an issue. However, with the introduction of sloped standing seam metal roofs on more recent facilities, building massing plays a more important role, even on one-story facilities.

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

Examples of buildings which use sloped standing seam metal roofing are plentiful on this Base. Notable buildings that have used this roofing technique most successfully are the Avionics Building and MXG Facility, which allow the interior spaces to contain elevated ceiling heights and also utilize daylighting techniques that are designed into the roofing shapes (*see figures 5.14 and 5.15*).

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

Figure 5.15
MXG Facility: Elevated Ceiling for Daylight Infiltration

Figure 5.14
Avionics Building: Sloped Standing Seam Metal Roofing

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

Figure 5.16
Fire Station: Sun Control Device

Siting and Orientation

The typical facility located in Zones 2 and 3 at Mountain Home AFB is aligned with the street grid, which is set approximately 45-degrees from north to match the runway orientation. The runway was laid out to take advantage of the prevailing winds, with no regard to sun orientation for the facilities. Whereas orientation to the runway is important for the large hangars supporting the runway, for other facilities an orientation closer to the ordinal directions may be more beneficial from a solar perspective. One notable exception to the typical orientation on Base is the Wing Headquarters facility, which is sited square with the ordinal directions. This was done not to take advantage of solar orientation, but rather to set the building apart from the remainder of the Base and to emphasize the facility's importance.

Figure 5.17
Anti-Terrorism/Force Protection Barricades

When siting future facilities to be built on Base, sustainable design and high-performance green building principles need to be taken into consideration. HQ ACC has emphasized the importance of daylight and views within their facilities, as well as the performance of the exterior building envelope in regard to energy use reduction. Careful analysis of each facility needs to be conducted during the concept development process to verify the most beneficial orientation of the building, regardless of alignment with the existing street grid and adjacent facilities. Furthermore, sun control devices shall be incorporated into the design as appropriate, and as required to mitigate solar heat gain for those facilities which cannot be optimally oriented (*see figure 5.16*).

Efficient land use is another factor to consider when siting buildings, along with the requisite guidance relative to Anti-Terrorism and Force Protection. On this Base, there is abundant land mass and plentiful infill opportunities that makes these factors easier to deal with. It is important to keep in mind that future buildings may share the standoff distances created between buildings, which will allow better utilization of the land and infrastructure of the Base (*see figure 5.17*).

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

Symmetry and Hierarchy of Elevations

Mountain Home AFB has few historical buildings, and as such, the concept of symmetry is not prevalent on Base. Building design has tended to reflect the prevailing trends when the facilities were constructed, with symmetry being a minor consideration. A more prevalent design concept on Base is the modern credo of "Form follows Function", with the building massing and fenestration reflecting the interior uses. Once again, a notable exception to this is the Wing Headquarters facility, which is a highly symmetrical building, emphasizing its importance on Base.

Existing facilities on Base tend to emphasize the main elevation, with less attention paid to the remaining facades. Often times, this is a function of the facility's use, with the main elevation serving as access for Base personnel, and the remaining elevations accessing more industrial areas. A prime example of this are the hangars, with their large doors facing the runway, and little if any articulation of the remaining sides of the building (*see figure 5.18*).

Figure 5.18
Hanger: Articulation to the Front Side of Building

Figure 5.19
Base Operations Facility: Articulation along all Facades

More recent projects on Base have attempted to articulate all facades that are visible from the street system and public parking areas. These buildings create a more human scale on those sides accessible to personnel. A good example of this is the recently completed Base Operations facility (*see figure 5.19*).

Future construction and renovation efforts on Base should continue this trend of articulating the building facades that are accessible or visible to Base personnel. At all times, the main entry to the facility needs to be maintained as the primary focus of the exterior elevations, in order to enhance way-finding on the Base. There are many good examples of architectural solutions on this Base that enhance building entrance identification, such as the Avionics building, the Base Operations building, the Fire/ Crash Rescue building, and the Squadron Operations facility (*see figure 5.20*).

- *Articulate all building facades visible to Base personnel*
- *Emphasize building entry*

Figure 5.20
Avionics Building: Enhanced Entrance Identification

Open Spaces

Mountain Home AFB has a surplus of open space located on Base, but this open space is not necessarily being used as a benefit. Buildings tend to be sited in the middle of a parcel of land surrounded by expanses of paved parking lots, and few facilities have a relationship to each other. Furthermore, the area experiences continual wind at many times during the year, making unprotected open space unpleasant.

A few recent facilities have incorporated exterior plazas, to great success. These areas utilize intensive plantings, along with some sort of constructed sun shelter to create a sense of enclosure. Also, these plazas are incorporated into the overall site and building design, utilizing the building for protection from the sun and/or the wind. Good examples of such plazas are found at the Airfield Maintenance facility, the Fire/Crash/Rescue building, and the Avionics facility. These plaza areas extend interior spaces into the outdoors and allow the occupants to utilize this area for additional enjoyment in a natural setting (*see figures 5.21 and 5.22*).

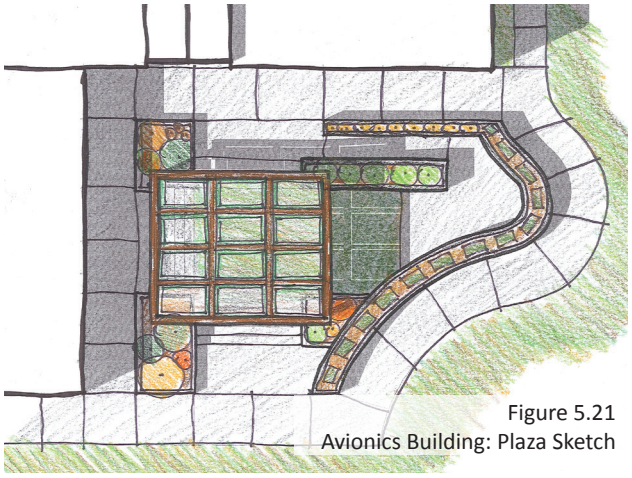


Figure 5.21
Avionics Building: Plaza Sketch

Another concept of open space is the courtyard, usually created by the siting of more than one building. A courtyard creates a sheltered space, and allows landscaping to be concentrated in one area, where it is easier to maintain and to be enjoyed by Base personnel. Landscaping requires less water, and the concentration of development becomes a focal point for the surrounding buildings, both visually and functionally. A current example of a successful courtyard is located between three dormitories, and includes a gazebo as a focal point (*see figure 5.23*).

Figure 5.23
Dormitory Courtyard

Figure 5.22
Avionics Building: Plaza View

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

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

Architectural Elements

Materials

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

Figure 5.24
Typical Split Face Block with Horizontal Banding

Figure 5.25
MXG Facility: Typical Banding of Medium Tan Colors

The predominant exterior building material on Base is concrete masonry units in a medium tan color. These masonry units include split-faced, burnished, smooth, and fluted styles. Face brick in a medium tan color is also found on Base. Other lesser-used materials are concrete panels, red face brick, and dark brown concrete masonry units. Architectural precast concrete in a limestone color is used for window sills and accent banding.

Prefinished metal wall panels are utilized on larger facilities, such as the hangars. Standing seam metal roofs in a light tan color are utilized on a number of facilities, and will be addressed later in this section.

Exterior materials for new facilities should be selected to complement the overall aesthetic of the Base. Masonry in medium tan colors, incorporating details and banding in complementary materials, is recommended (*see figures 5.24 and 5.25*). There are many examples at this Base of innovative designs that incorporate horizontal banding in this fashion, such as the Avionics facility, the Squadron Operations facility, and the Youth Center. Metal wall panels may be used as appropriate for the facility's function and scale, but should be protected from abuse at the building base and openings (*see figure 5.26*). Other exterior materials, such as composite metal wall panels, may be considered. Exterior insulation finish

Figure 5.26
Fitness Center: Metal Wall Panels

systems (E.I.F.S.), due to their poor performance history and lack of comprehensive manufacturer's warranty, are prohibited by HQ ACC, and may not be used at Mountain Home AFB.

- *Use masonry colors that complements other architecture on Base*
- *Incorporate masonry horizontal banding and accents*

Fenestration

Building fenestration should be designed to enhance the exterior image of facilities, as well as to incorporate daylight and views into the building interior. Primary concerns regarding building fenestration should be its effect on the building envelope performance, as well as compliance with Anti-Terrorism/Force Protection requirements.

In the design of new facilities, prominence of the building's main entrance must be achieved. The main entrance must be welcoming, sheltered, and visible to the building's occupants to enhance security. Glazed aluminum swinging doors are the standard on Base, oftentimes with surrounding sidelites and transoms. This type of entrance should be continued with future building projects. All building entrances must be handicap accessible (*see figures 5.27 and 5.28*).

Figure 5.27
Base Operations Facility: Main Entry - Exterior

The majority of buildings on Base utilize thermally-broken aluminum frame windows, with high-performance glazing. Examples of fixed windows, and operable sliding, casement, and awning windows, are evident on Base. The type of window selected should serve the user's requirements. Operable windows are encouraged where appropriate, to enhance the indoor air quality of a facility, and to give the building's occupants greater personal control over their thermal environment (*see figure 5.29*).

Figure 5.29
Operable Windows

Figure 5.28
Base Operations Facility: Main Entry - Interior

The type of glazing selected for exterior windows and doors should be carefully analyzed in regard to thermal performance, and its effect on the overall building envelope. Whereas clear and bronze-tinted glazing is predominant on Base, other glazing tints may be considered as appropriate to the individual project. Additional glazing coatings, beyond the standard Lo-E coating, should be considered to improve glazing performance, as well as the inclusion of various gases in the interstitial space in insulating glass units. Finally, all exterior glazing must comply with Anti-Terrorism/Force Protection requirements.

The predominant aluminum finish on Base is dark bronze anodized. Continued use of dark bronze anodized frames is discouraged, because research has shown that dark window frames increase interior glare. Other aluminum finishes should be considered as appropriate to the overall aesthetic of a new facility.

Daylight and views must be analyzed when designing the fenestration of a new facility. Meeting HQ ACC's requirements for daylight and views may require a much greater amount of glazing than is found in the typical building on Base, and these recommendations may inform the design of the building footprint as well (*see figure 5.30*). Long, linear buildings, as well as multi-story facilities, have greater opportunities for introducing daylight and views into the building interior, and these concepts should be considered in the initial concept development phase of a project (*see figure 5.31*).

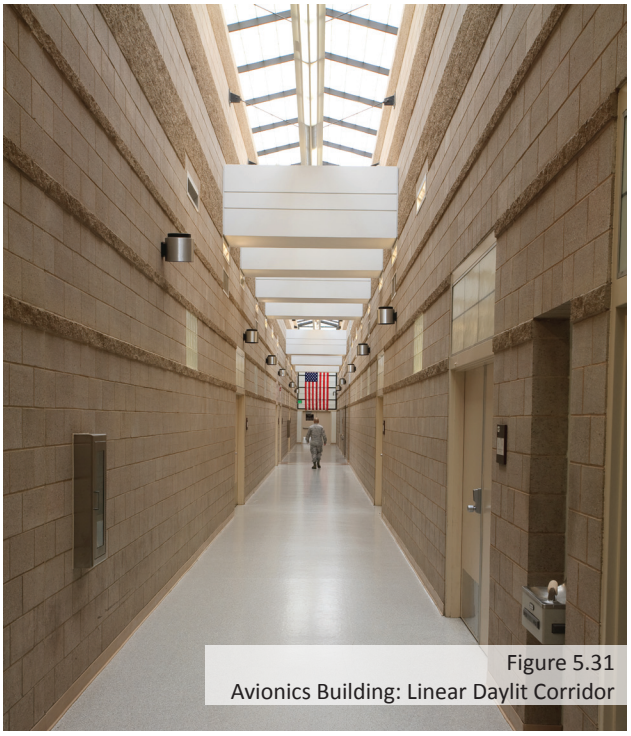


Figure 5.31
Avionics Building: Linear Daylit Corridor

Figure 5.30
Fitness Center: Open, Daylit Entry Lobby

Figure 5.32
Avionics Building: Insulated Translucent Panels

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

Another option for introducing daylight into a facility is the use of insulating translucent panels, which may be used both for vertical applications or skylights (*see figure 5.32*). These panels have been successfully used at many existing facilities on Base, such as the recently completed flight line Operations facility. The benefit of this type of product is that the thermal performance is greater than a typical insulating glass unit. Furthermore, these units provide opportunities for natural daylighting into facilities, but because they are not glass, they do not present hazards to occupants in the case of an explosive event. Translucent panels have been approved for use in lieu of glazing by the US Army Corps of Engineers Protective Design Center, and no further design analysis is required (unlike glazing assemblies). Pre-manufactured translucent skylight assemblies are encouraged; however, translucent panels shall not be used as part of a roof assembly without prior coordination and concurrence of HQ ACC/A7PS. Wherever skylights are utilized on a facility, careful detailing must be included to prevent water leakage, unacceptable snow build-up, etc. Insulating glass unit skylights should be avoided because of their tendency for water spotting and dirt build-up.

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

Roof Features and Forms

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

The type of roof system selected for a project should be a direct reflection of the building form (*see figure 5.33*). Buildings with large floor plates should consider a low-slope membrane roofing in a light color, complying with reflectivity requirements of sustainable design and high-performance green building principles. As an option, a sloped standing seam metal roof may be used, such as those

Figure 5.33
Family Housing Office: Low Sloped Hip Roof

Figure 5.34
Building 1784: Roof Color Compliments Building Facade

currently installed on many of the hangars. Because of the shear mass of these hangar facilities, the additional height of a sloped roof does not dwarf the building below. For smaller facilities, a sloped standing seam metal roof may be used, provided that the geometries of the building floor plate do not create an overly complicated roof form, which would be prone to water infiltration. For these types of facilities, a low-slope membrane roofing may be more appropriate in providing a long life-span and low maintenance roof. Standing seam metal roofs on existing facilities are typically a light tan color, which could be used on new building projects. As an option, the designer may consider a lighter roof color to comply with reflectivity requirements of sustainable design and high-performance green building principles. Ultimately, the exposed roof color should complement the overall aesthetic of the building (*see figure 5.34*).

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

Figure 5.35
Fitness Center: Curved Standing Seam Metal Roof

A recent successful roofing project on Base is the renovated Fitness Center, which incorporates a series of curved standing seam metal roofs into a visually complementary facility (*see figure 5.35*). Care should be exercised when doing these types of roofs to include proper detailing and installation to insure a weather-tight finished product.

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

Facilities on Base have utilized a roof feature over the main entrance, often times to great success. This roof feature both announces the location of the main entrance, as well as provides protection from the elements (*see figure 5.36*). This design feature should be encouraged in future projects. Care should be taken to insure any exposed structure is not conducive to roosting birds.

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

Figure 5.36
Base Operations Facility: Roof Feature over Main Entry

Other Building Features

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

The design of porticos and canopies should complement the facility architecture, as well as provide opportunities to create pleasant exterior spaces adjacent to the facility. Porticos and canopies should provide protection from the elements, as appropriate, and should provide a sense of enclosure and space. These exterior "rooms" enhance the quality of life for Base personnel, and oftentimes create a more human scale for a facility (*see figures 5.37 and 5.38*).

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

Figure 5.38
Avionics Building: Adjacent Plaza with Canopy

- *Integrate downspouts into the facility design*
- *Incorporate porticoes and canopies to create outdoor rooms*

Figure 5.37
Fire Station: Exterior Portico

[6.1] Acronyms and Abbreviations

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

CEP	Programs Flight
CER	Communications Equipment Room
CFM	Cubic Feet per Minute
CEO	Operations Flight
CES	Civil Engineer Squadron
CEV	Environmental Flight
CMU	Concrete Masonry Units
COE	Corps of Engineers
COMM	Communications
CPSC	Consumer Product Safety Commission
CPT	Cone Penetration Test
CRC	Criteria Review Conference
CS	Communications Squadron
CSC	Consolidated Support Center
CSP	Corrugated Steel Pipe
D2 Board	Development and Design Review Board
dBA	Decibels (acoustic)
DCG	Design Compatibility Guide
DDC	Direct Digital Control
DGS	Deployable Ground Station
DOC	Department of Commerce
DoD	Department of Defense
DODDS	Department of Defense Dependents Schools
DOE	Department of Energy
DX	Direct Expansion
ECP	Entry Control Point
eGP	Electronic General Plan
EIA	Electronic Industries Association
EIAP	Environmental Impact Analysis Process
EIFS	Exterior Insulation Finish System
EMCS E	Energy Monitoring Control System
EO	Executive Order
EPA	Environmental Protection Agency
ERP	Environmental Restoration Program
ETL	Engineering Technical Letter
F	Fahrenheit
FF	Federal Flammability
FFA	Federal Flammability Agency
FFE	Finished Floor Elevation
FGS	Final Governing Standards
FM	Factory Mutual Global
FOC	Fiber Optic Cable
FOD	Foreign Object Damage
FR	Flame Retardant
FS	Federal Standard
FSP	Final Sketch Plan
GFI	Ground Fault Interrupter

GIS	Geographical Information System
GPG	Grains per gallon
GPS	Global Positioning System
HDPE	High Density Polyethylene
Hi-X	High-Expansion
HM/HW	Hazardous Materials/Hazardous Waste
HQ	Headquarters
HVAC	Heating, Ventilating and Air Conditioning
IAPMO	International Association of Plumbing and Mechanical Officials
IAW	in accordance with
IBC I	International Building Code
ID2	Installation Design and Development
IDS	Intruder Detection System
IEEE	Institute of Electrical and Electronics Engineers, Inc.
IEQ	Indoor Environmental Quality
IESNA	Illuminating Engineering Society of North America
IP	International Protection
IPC	International Plumbing Code
IR	Infrared
ISA	Installation Sustainability Assessment
ISO	International Organization for Standardization
IWW	Industrial Waste Water
LAN	Local Area Network
LED	Light Emitting Diode
LEED	Leadership in Energy and Environmental Design
LPS	Lightning Protection System
LSC	Life Safety Code
LV	Low Voltage
MCP	Military Construction Program
MDOS	Medical Operations Squadron
MUTCD	Manual on Uniform Traffic Control Devices
MV	Medium Voltage
MWR	Morale, Welfare, and Recreation
NAGPRA	Native American Graves Protection and Repatriation Act
NEC	National Electrical Code
NEMA	National Electrometric Manufacturers Association
NESC	National Electric Safety Code
NFC	National Fire Code
SD&HPGBD	Sustainable Development and High Performance Green Building Design

[6.2] Installation Functional Constraints and Considerations

6.2.1 General

The following section 6.3 provides installation-centric background information and identification of functional-technical considerations necessary for a fully successful design. It identifies preferred systems and technical components and is intended to describe best practices related to planning, architecture, engineering and interior design. It identifies materials, furnishing, systems, practices, approaches, and finishes historically used and having proven success over time. It is not intended to serve as a comprehensive list of all applicable building codes, regulations, directives, references or to identify facility centric or unique user requirements. Functional-Technical Constraints and Considerations need to be specifically addressed in the Basis of Design analysis written during the concept development phase and the design development phase. Understanding the driving forces behind these constraints and considerations will greatly contribute to a successful project outcome.

6.2.2 Brand Name References

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

[6.3] Mountain Home AFB Technical Design Guide

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[SECTION 1] REGIONAL DESCRIPTION

1.1 Geographic Location & Characteristics

Mountain Home Air Base is located in South Central Idaho in a high desert savannah, adjacent to the Owyhee Mountain Range. It is approximately 80 kilometers (50 miles) southeast of Boise, Idaho in Elmore County, Idaho. It is at 43°07' latitude and 115° 42' longitude and falls within the Mountain Time Zone. Elevation above sea level is approximately 975 meters (3,200 feet).

The terrain of the Base is relatively flat with approximately 17 meters (55 feet) of drop from the northeast corner of the Base to the southwest corner (5.6 kilometers (3.5 miles)).

The surface soils are generally silts and silty sands overlaying basalt. The basalt is at varying depths throughout the site and extensive soil borings are required to determine locations and depths.

1.2 Climate

Semi-arid region with the following monthly average mean temperature and average precipitation:

- Annual Average Temp. 10.6 C (51° F)
- January Monthly Temp. -1.7° C (29° F)
- July Monthly Temperature 23° C (74° F)

- Annual Average Rainfall 263 mm (10.35 in)
- Average Annual Snowfall 330 mm (13 in)

Temperature Extremes
- Summer 38° C (101° F)
- Winter -18° C (0° F)

- Prevailing winds are from the north, northwest.
- Amount of sunny days per year averages 274 days.

1.3 Infrastructure

1.3.1 Transportation

Roads

The Base is connected to urban areas by Route 67 and Interstate 84. Roads on Base are generally asphaltic
concrete over a frost-free ground base with concrete curbs and gutters.

1.3.2 Utilities

Water Distribution System
Water is supplied to the Base from six wells. Depth of wells are generally 186 meters (610 feet) and they have high mineral content. Water is stored in two elevated water tanks, one ground level water tank and one below ground water tank. Capacity of the elevated tanks are 757 082 liters (200,000 gallons) and 946 353 liters (250,000 gallons). Capacity of ground level water tank is 1 892 710 liters (500,000 gallons). The capacity of the below ground water tank is 3 785 410 liters (1,000,000 gallons).

Sewage System (Sanitary and Storm)
The Base sewage treatment plant was built in 1998 and consists of sequencing batch reactors and lime stabilization treatment. Clean, treated wastewater can be used for irrigation, dust control, or other uses, or pumped to a system of new rapid infiltration basins, or discharged to a surface stream if necessary. The treatment system includes removal of nitrogen to provide additional protection for the aquifer from which the base derives drinking water. The treated sludge complies with current sludge management regulations and produces a Class A material suitable for use as a fertilizer or in range reclamation.

The only underground storm drainage system on base is located in the Flight Line

area. Oil-water separators have been phased out in most areas of the base and shall not be incorporated into new projects. Refer to Civil Engineering Standards outside of the Flight Line. Most runoff is collected in roadside depressions or french drains. Drainage is normally disposed of by evaporation/ percolation.

Electrical System

Commercial electrical power is provided from an on-base substation by Idaho Power Company. The buss and switching capacity is currently 25 MVA. The primary and backup transformers are rated at 30 MVA and 14 MVA, respectively. The distribution voltage provided to the government switch yard is 12470/7200 volts.

The Base is served by two alternately routed lines. The primary line operator at 138 kV and the backup at 69 kV.

The government's reclosers are located in a switchyard adjacent to the Idaho Power Co. substation. Eight McGraw-Edison type USA vacuum reclosures are utilized.

There is one overhead line, located in Idaho Power easements throughout the base, serving the Oasis housing area and school. This system is owned and maintained by Idaho Power Co. The remainder of the Base is served by eight government circuits, circuit A through H, routed from the switch yard.

Natural Gas System

Natural gas is supplied by Intermountain Gas Co.

The gas supply is distributed throughout base from two main points with metering stations.

Jet Fuel

A jet fuel line is installed to service flight line.

Telephone System

U.S. West provides service for residential and commercial lines. A separate Base communication system is provided by 366 Communications Squadron.

Cable TV

Century Communications provides TV cable service throughout the base with either overhead or underground cable. All underground cable shall be installed in 51-mm (2-inch) conduit.

[SECTION 2] CADD STANDARDS

2.1 General

Mountain Home Air Force Base uses AutoCAD Map 2000 for CADD software; MicroStation (95 or later version) files are acceptable. CADD layering requirements are outlined below. All Standard AutoCAD fonts shall be used.

2.2 Civil Engineering CAD Layering Standards

1. All CADD layering standards and naming conventions shall follow the Tri-Services Spatial Data Standard (TSSDS). The latest publicized version of the TSSDS shall be used. The TSSDS can be accessed via the internet at the following web address: https://cadbim.usace.army.mil/

2. All new buildings will be located by their geodetic coordinates.

3. All blocks and cells shall come from the TSSDS cell/block libraries, and be modified to fit design specifications.

4. All blocks will be created on layer O.

5. The contractor shall provide all projects in DWG format compatible with AutoCAD Map 2000 format on ZIP disk or CDROM.

6. All information shall be drawn to full (1:1) scale in Model Space and to a scale (i.e. ¼”=1’ or 1:400) in Paper Space.

7. All text shall be in accordance with the TSSDS requirements for the entities that it applies to.

8. There will be no numerical layer names. All layers will be in an abbreviated format; example: utilities = util, text = txt.

9. The Contractor shall provide a typed copy of layer names, limits, Lt scale, pen configurations, etc., and contents submitted as part of the Design Analysis and the final submittal of the disks.

2.3 Mandatory Layer Names

1. All layering names and conventions shall comply with the names and conventions specified in the TSSDS.

2.3.1 Mandatory Layer Names (Civil Site Plans Only)

LAYER NAME	TO INCLUDE	COLOR
BORDER	Border, Title Block, N Arrow, Scale 8	(Dark Grey)
TXT	Title Block, Text, Notes, Dims 11	(Dark Green)
STRUCT	Bldg. Outlines 4	(Cyan)
STRUCT T	Bldg. Numbers	(Red)
CONTOURS	Index & Intermediate Index/ 4	(Cyan)
	Intermediate/ 1	(Red)
UTILS	All 7	(White)
PAVED	Paved Roads 2	(Yellow)
PAVED T	Street Names 1	(Red)
UNPAVED	Unpaved Roads 1	(Red)

Any specific questions regarding layering standards may be referred to the project engineer.

2.3.2 Recommended Layer Titles

Proposed Layers for a CIVIL/SITE Drawing:
Layer List: O (Not Used), BORDER, KEYMAP, SITEPLAN, FTPRINT, SOILBOR, CONTOURS, GRADING, LANDSCP, LAWNSPR, PAVING, WATER, SEWER, STDRAIN, ELECT, COMM, PHONE, NATGAS, SECTIONS, DETAILS, DEMOL, NEW, DIMS, TXT, MISC

Proposed Layers for a FOUNDATION Drawing:
Layer List: O (Not Used), BORDER, DEMOL, EXISTING, NEW, DIMS, TXT, MISC, KEYMAP, FDPLAN, SECTIONS, DETAILS, MISC

Proposed Layers for an ARCHITECTURAL Drawing:
Layer List: O (Not Used), BORDER, KEYMAP, FLPLAN, DOORS (SWINGS), WDWS, DIMS, TXT,DEMOL, NEW, SECT, DETAILS, SCHED, INTELV, MISC

Proposed Layers for a STRUCTURAL Drawing:
Layer List: O (Not Used), BORDER, KEYMAP, FLPLAN, DEMOL, NEW, BLDGSECT, STRDET, DIMS, TXT, MISC

Proposed Layers for a Roof Drawing:
Layer List: O (Not Used). BORDER, KEYMAP, FLPLAN, ROOFPLAN, ROOFFRMG, DEMOL, NEW, DIMS, TXT, MISC

Proposed Layers for an EXTERIOR ELEVATIONS Drawing:
Layer List: O (Not Used), BORDER, KEYMAP, NELEV, SELEV, EELEV, WELEV, DIMS, TXT, MISC

Proposed Layers for a MECHANICAL DRAWING:
Layer List: O (Not Used), BORDER, KEYMAP, FLPLAN, DIMS, TXT, WATER, SEWER, HVAC, SPRINKLER, SCHED, MISC

Proposed Layers for a HVAC Drawing:
Layer List: O (Not Used), BORDER, KEYMAP, FLPLAN, DIMS, TXT, HVAC, CONTROLS, SCHED, MISC

Proposed Layers for a LIGHTING Drawing:
Layer List: O (Not Used), BORDER, KEYMAP, FLPLAN, ELEDT, DIMS, TXT, DIAG/SCHEM (DIAGRAMS/SCHEMATICS), SCHED, MISC

Proposed Layers for an ELECTRICAL Drawing:
Layer List: O (Not Used), BORDER, KEYMAP, FLPLAN, ELECT, DIMS, TXT, DETAILS, DIAGRAMS, SCHED, MISC

Proposed Layers for a COMMUNICATIONS / TELEPHONE Drawing:
Layer List: O (not Used), BORDER, KEYMAP, FLPLAN, PHONEJCK, COMMDEV, CIRCUITS, PANELS, DIMS, TXT, DETAILS,DIAGRAMS, SCHED, MISC

[SECTION 3] LANDSCAPE AND SITE DEVELOPMENT STANDARDS

3.1 Introduction

For general landscape design principles for Air Force installations, reference the Air Force Landscape Design Guide at: http://www.afcee.af.mil/

Landscape installation and maintenance methods should conform to industry standards. Reference to these criteria can be found in the Landscape Specification Guidelines, prepared by the Landscape Contractor's Association.

An important reference for selection and approval of nursery stock is the ANSI Z-60, American Industry Standards for Nursery Stock, 1996 (or current issue).

3.2 Landscape Design Criteria

3.2.1 Topsoil and Amendments

Landscape Design shall embody sustainable strategies, use native species, and not rely on potable water for irrigation.

Soil tests should be performed at all new project sites to determine the composition of surface soil, top 150-200 mm (6-8 in), pH, organic content, and available nitrogen, phosphorus, and potassium. Amending of topsoil will generally include addition of organic matter, nitrogen, and sulfur or gypsum to lower pH.

For dryland seeded areas, existing surface soil removed from the site, stockpiled, and replaced in areas that were disturbed may be acceptable. Where budgets permit, incorporate 2.3 cubic meters (3 cubic yards) of organic matter per 9.2 square meters (1000 square feet) into the top 100 mm (4 in) of soil prior to seeding.

Topsoil provided from off-site shall be a sandy loam as described by the USDA textural class and shall have a maximum particle size of 19 mm (¾ in) with a maximum of 3 percent retained on a 6.25 mm (¼ in) mesh screen and a minimum of 5 percent passing through a 120-mesh screen. Topsoil shall contain 5-20% organic matter. Topsoil shall be obtained from well-drained areas and shall not contain more than 5 percent water by volume. Topsoil shall be free of debris, noxious weeds, toxic substances, or any other material that may be harmful to plant growth. The pH shall be between 6.5 and 7.0, soluble salts shall not exceed 4 mmhos/cm (600ppm).

3.2.2 Organic and Inorganic Mulches

Organic mulch, consisting of a coarse grade shredded or ground bark, shall be applied to a depth of 75-100 mm (3 to 4 in) within the root zones of all plant materials to maintain soil moisture, reduce soil temperature, reduce weeds, prevent mechanical damage, reduce soil compaction, and prevent erosion. Organic mulches add organic matter to the soil as decomposition occurs. No weed barrier shall be used under organic mulches.

Mycorrhizal fungi shall be added to the upper half of backfill in tree plantings to enhance root growth and aid in plant establishment.

Use weed barrier fabric, rather than black polyethylene (plastic) within planting beds. Plastic sheeting reduces air and moisture movement in the upper soil levels, and alters the beneficial fungi population in the soil that assist to establish healthy plants. It is acceptable to use the plastic sheeting (6-10 mil polyethylene) in conjunction with river rock (i.e. road shoulders) or other locations where water percolation is not desired.

Limit the use of lava (volcanic) rock. Do not use as a mulch for plants. Lava rock absorbs heat, which is then reflected back to the plant roots and foliage. Lava rocks also absorb water, reducing soil moisture and

water available to plant roots.

River rock mulch use may be limited to primary vehicular routes and VIP areas. River rock mulches (to 63 mm size (2½ in)) have been used extensively on base which adds to the reflective heating affect. Permeable weed barrier fabric shall be placed under rock unless polyethylene is specified. Reuse of existing river rock within a project site may be allowed only if it is pressure washed and sifted to minimize weed problems.

Where plant materials are specified in rock mulch areas, organic mulch shall be applied around the root zones, as described above, and edging provided to separate different mulch materials. Construction projects excavating in rock shoulder areas shall remove rock and weed barrier prior to digging and replace with new materials or equivalent.

3.2.3 Irrigation

As previously stated as a landscape objective, it is essential that strong consideration be given to minimizing irrigated turf areas. ACC policy is to not use potable water for irrigation. Turf should be concentrated to those locations of high visibility, areas needing a more formal appearance, or for quality of life criteria.

Select and maintain similar grass varieties suited to appropriate development zones. Design larger turf areas in shallow depressions to passively collect rainwater where feasible. Also use these areas for tree and shrub plantings. Provide quality irrigation design for tree, shrub, and groundcover areas. Rigid pipe is preferred over polyethylene tubing due to maintenance concerns. For facilitating visual inspection of the irrigation system, multi-outlet emitters or bubblers placed on fixed risers are preferred in lieu of providing numerous emitters on emitter line buried under mulch. In addition, “blowing down” emitter lines to winterize causes significantly more repair problems than rigid pipe. Create drainage patterns within each project site to capture and utilize runoff.

Mountain Home AFB encourages compliance with the installation watering schedule, limiting irrigation of plants to certain hours of the day. Due to high temperature, humidity levels and wind conditions in the summer months, irrigating during mid-day should be infrequent. Controllers should be programmed primarily to apply the correct amount of water at night and early in the morning.

Sprinkler head layout and design should provide sufficient overlap to compensate for wind. Overlap beyond 50% (head to head) is recommended for exposed locations. Contracts shall provide for a one-year warranty on irrigation equipment and operation.

3.2.4 Landscape Elements

Use drought resistant turf and plant varieties, and/or those indigenous or well adapted to local conditions. Use of native species is encouraged wherever possible. See PLANTLIST for acceptable plant and turf species.

Plant material selection should provide for variety and year-round interest. To enhance the attractiveness of design, use a mixture of plants which vary in height, color, texture, and seasonal characteristics. Avoid symmetry, use an informal arrangement for appearance and ease of maintenance. Do not use plants that drop a large amount of fruit.

Shrubs should be planted a minimum of .9 m (3 ft) away from buildings, small trees at least 10 ft (3 m) away, and larger trees at least 6.1 m (20 ft) unless it is of specific architectural intent, i.e. to screen, provide scale, etc. Location of plantings and other features within 9.1 m (30 ft) of inhabited facilities

shall comply with DOD force protection measures. Design of site improvements such as fencing, berms, planters, bollards, and landscaping shall consider applicability to force protection and mitigating effects of potential threat.

Use berms to screen and provide interest. Berms should be limited to no steeper than 1:5 slope to allow retention of bark and mulch.

Existing trees and shrubs are to be preserved in accordance with industry standards where specified. These protection measures shall include fencing outside the drip line, watering, fertilization, pruning, etc. to maintain in optimum condition.

Newly planted trees should not be pruned, except to remove dead, broken, or crossing branches. Trees should not be topped or the leader pruned. All work should be performed by a certified arborist.

Trees should not be staked unless the prevailing wind will not allow for establishment. If a tree requires staking, performance of work shall conform to industry standards.

If a project requires the removal of trees, ensure that any sale or use of the wood conforms to AFR 126-1.

3.2.5 Lawn and Plant Material Edging

Lawn edging separates lawn areas from shrub planting areas. Wood edging shall not be used. A 150 mm (6-in) wide by 300 mm (12-in) deep concrete curb or mow edge, reinforced with #4 bars top and bottom, shall be used where appearance and durability are a high priority and where budgets permit.

An alternate design using a machine made curb-type concrete edging is also acceptable. Appropriate separation between differing mulch materials around plantings may include steel and plastic edging, as well as the concrete, see paragraph 4.4.3.

Lawn surface shall be flush with top elevation of concrete mow edge in order to be functional. For proper containment, finished grades of mulch materials shall be approximately 25 mm (1in) below top elevation of concrete, steel, or plastic edging.

3.2.6 Maintenance and Warranty

A minimum 120 day establishment period shall be provided for all landscape projects. All plant material and installed irrigation systems shall be included under warranty for a minimum 12 month period.

3.2.7 Windbreaks

Hot and cold climate extremes are characteristic weather conditions at Mountain Home AFB, however wind is a prevailing factor. Controlling both summer and winter wind through windbreaks can effect improvement in livability and energy efficiency. Windbreaks also serve to reduce dust, noise, erosion, and provides habitat for wildlife.

Past examples of windbreak design exist on base. Many of the windbreaks were planted through a cooperative effort with the US Department of Agriculture, Natural Resources Conservation Service Plant Materials Center in Aberdeen Idaho. The windbreaks generally include three to five rows of plants with approximately 3.6-6.0 m (12-20 ft) between rows. Windbreaks are setback a minimum of 15.2 m (50 ft) from fences, 24.3 m (80 ft) from residences, and 30.4 m (100 ft) from other buildings. Plant species used in the past include Siberian Peashrub, Rocky Mountain Juniper, Hybrid Poplar, Green Ash, Austrian Pine, Lilac, Shubert Chokecherry, and Honeysuckle.

Evergreen trees should be planted 1.8 m (6 ft) on center. Deciduous trees should be planted 3.0 m (10 ft) on center, and deciduous shrubs should be planted 1.5 m (5 ft) on center. Planting windbreaks on slightly raised berms is highly encouraged to increase elevation of trees and relieves flatness of the area. Weed barrier fabric should be placed at the base of each row of plants and drip irrigation provided during establishment.

Windbreaks should be planted to provide functional results within five years.

3.2.8 Reduction of Foreign Object Debris (FOD)

Landscape projects which are located adjacent to the base flight line, runways, taxiways, or aircraft parking areas, shall consider critical design criteria to reduce foreign object debris or FOD. No deciduous plant materials shall be allowed on the flight line side of the security wall. Mulch materials shall be selected for stability, so as not to become airborne during high winds. Organic mulches shall not be used along the flight line. Plant materials, such as tall grasses and fruit-bearing trees and shrubs that are attractive to birds, shall be avoided.

3.3 Exterior Signage

Main design concept on exterior signage is to limit the number of signs. Provide directional signs only for high traffic areas. Also the size of the sign should be kept at a minimum. The standard for readability is 2.54 mm (1 inch) of letter height for each 7.6 m (25 ft) of view distance.

All exterior signage shall comply with ACC Standards.

3.4 Fencing/Screens

Main design concept governing the use of fencing or screens is to use low maintenance materials.

As a guide, consider the following:

- Industrial/Flight Line Split face concrete masonry unit.
- Residential (single family) – Vertical cedar fencing.
- Community/Administrative - Split face concrete masonry unit. Specific design considerations are as follows:
- Orient openings into screened area away from main circulation path if possible.
- If split face masonry is not in budget use metal screening.
- Items to be screened should include outside mechanical/electrical units, dumpster areas, and recycle bins. For dimensions of a single dumpster screen, see Civil Engineering Standards.

3.5 Site Lighting

The main design concept governing site lighting is to use low maintenance materials which have clean, simple designs and which are available from local sources.

- Bollard lighting shall be used to enhance high traffic areas (i.e., administrative building entrances, dormitories) and shall be made of concrete.
- Lighting in residential areas shall be as described in the Electrical Standards, Exterior Lighting Section.
- Height of fixture for parking is generally 7.6 m (25 ft) to 10.6 m (35 ft). Height for pedestrian walkways shall be 4.4 m (14 ft 6 in) to 4.6 m (15 ft 0 in).

3.6 Site Furnishings & Play Equipment

The concept for site furnishings is to have a very durable material, which has a similar texture or finish throughout the different types of furnishings.

Where possible metal and concrete shall be used as the primary materials.

Playgrounds shall be in full accordance with Consumer Products Safety Commission and ASTMs for playground equipment and surfacing. The playground design shall be officially reviewed and approved by a certified National Playground Safety Inspector (NPSI) and the installation of the playground shall have a final inspection by a certified NPSI. The playground equipment shall comply with ASTM F 1487-98 and the playground surfacing with ASTM F 1292. The new handicap accessibility standard is ASTM F 1951 (previously ASTM PS 83). Equipment for the playground shall be certified by the International Play Equipment Manufacturers Association (IPEMA).

Wood playground equipment shall not be used.

MOUNTAIN HOME AIR FORCE BASE PLANT LIST

DECIDUOUS TREES - TALL	
Linden	Tilia cordata, Tilia tomentosa
Lanceleaf Cottonwood	Populus acuminata
Poplar	Poplar spp.
Sweet gum	Liquidambar styraciflua
Silver Maple	Acer saccharinum
Marshals Seedless Green Ash	Fraxinus pennsylvanica ‘Marshals’
Idaho Locust	Robinia ‘Idahoensis’
Black Locust	Robinia pseudoacacia
Honeylocust	Gleditsia triacanthos ‘inermis’
Hackberry	Celtis occidentalis
English Oak	Quercus robur
Catalpa	Catalpa speciosa
London Plane	Platanus acerifolia
Weeping Willow	Salix babylonica
DECIDUOUS TREES - MEDIUM	
Amur Maple	Acer ginala
Flowering Crab	Malus sp.
Paul’s Scarlet Hawthorn	Crataegus oxycantha
Russian Olive	Elaeagnus augustifolia
Golden Raintree	Koelreuteria paniculata
Washington Hawthorn	Crataegus phaenopyrum
Flowering Plum	Prunus sp.
Flowering Cherry	Pyrus calleryana
Lilac	Syringa sp.
DECIDUOUS SHRUBS	
Sagebrush	Artemisia spp
Rabbitbrush	Chrysothamnus spp
Bitterbrush	Purshia tridentata
Buffaloberry	Shepherdia argentea
Mountain Mahogany	Cercocarpus montanus
Bluebeard	Caryopteris spp

Russian Sage	Perovskia spp.
Parry Agave	Agave parryi
Butterfly Bush	Buddleia davidii
Narrow leaf yucca	Yucca glauca
Broadleaf Yucca	Yucca baccata
Japanese Barberry	Berberis thunbergii
Cotoneaster	Cotoneaster species
Rose of Sharon	Hibiscus syriacus
Potentilla	Potentilla fruticosa
Spirea	Spirea sp.
Burning Bush	Euonymus alata var. compacta
Siberian Pea shrub	Caragana arborescens
Skunkbush Sumac	Rhus trilobata
Dwarf Blue Arctic Willow	Salix purpurea 'Nana'
Blueleaf Honeysuckle	Lonicera koralkowii
EVERGREEN TREES	
Colorado Blue Spruce	Picea pungens 'Glauca'
Norway Spruce	Picea abies
Scotch Pine	Pinus sylvestris
Austrian Pine	Pinus nigra
Blue Atlas Cedar	Cedrus atlantica
Rocky Mountain Juniper	Juniperus scopulorum
Black Hills Spruce	Picea glauca densata
EVERGREEN SHRUBS	
Juniper	Juniperus sp.
Mugo Pine	Pinus mugo var mughus
Pyracantha	Pyracantha sp.
ORNAMENTAL GRASSES	
Great Basin Wildrye	Elymus cinaereus
Fountain grass	Pennisetum
Indian Ricegrass	Oryzopsis hymenoides
PERENNIAL FLOWERS	
Yarrow	Achillea milifolium
Coreopsis	Coreopsis spp.
Hens and Chicks	Echeveria spp.
Euphorbia myrsinites	Euphorbia myrsinites
Blanketflower/Goblinflower	Gaillardia aristata
Penstemon	Penstemon spp
Gayfeather	Liatris spp
Red Hot Poker	Kniphofia spp
Blue flax	Linum perenne
Prairie coneflower	Ratibida columnifera
Wild buckwheat	Eriogonium umbellatum
Daylillies	Hemerocallis fulva or 'Stella D'Oro
Stonecrop	Sedum spp
Mullein	Verbascum

Evening Primrose	Oenothera spp
Dusty Miller	Senecio spp
Powis Castle Artemisia	Artemisia 'Powis Castle'
Silver Mound Artemisia	Artemisia 'Silver Mound'
Creeping Phlox	Phlox spp.
Black-eyed Susan	Rudbeckia hirta
Purple coneflower	Echinacea purpurea
Lupines	Lupinus spp
Blackfoot Daisy	Melampodium leucanthum
Desert Four o'clock	Mirabilis multiflora
Mounding peppergrass	Lepidium medium
Perky Sue	Hymenoxys argentea
Datura, Jimsonweed	Datura meteloides
Sundrops	Calylophus spp.
Purple aster	Aster biglovii
Shasta Daisy	Chrysantemeum maximum
Annual sunflower	Helianthus annuus
Rockcress	Arabis spp.
Thyme	Thymus spp.
Sedum	Sedum spp.
Dusty Miller	Senecio cinearia
Crown Pink	Lychnis coronaria
Lamb's Ear	Stachys byzantina
Basket of Gold	Aurinia saxitilis
Iris	Iris spp.

RECORD OF TERMITICIDE USE ON MOUNTAIN HOME AFB

(To Be Filled Out Daily) Application Site_____

Date of Application_____ Wind Speed_____ Direction_____

Time Application Started_____ Time Application Stopped_____

Name of Company_____

Names and Certification Numbers of all Applicators/Technicians Treating Structure

_____

_____

_____

Type of Treatment (Circle One) Pre-treatment Post-Treatment

Brand Name of Termiticide Used_____

Percentage Dilution Rate (ex. 1%, 0.5%)_____

Gallons of Dilution Used_____

Gallons of Concentrate Used_____

Square Footage of Slab Area Treated_____

Linear Footage of Foundation Wall Treated Outer_____ Inner_____

Linear Footage of Expansion Joints/Control Joints Treated_____

Number of Critical Areas (pipes, drains, cleanouts, bath traps)_____

Application Technique Used to Treat Foundation Wall. (Circle One) Rodding

Trenching

Rodding/Trenching

[SECTION 4] ARCHITECTURAL STANDARDS

4.1 Architectural General Design Considerations

Utilize all steel members to the extent that no combustible materials are present overhead up to and including the roof deck. Utilize clear span steel joists to permit future alterations of non-load bearing partition walls. Do not use skylights on flat roofs for general lighting.

For insulation, utilize only all mineral fiber (rock, slag, polyiso, or glass) board or batts and expanded perlite boards. Loose fill in hollow masonry cores shall be water repellent vermiculite or perlite. Recommend utilization of rigid board insulation (polystyrene not acceptable) around exterior walls (inside of structure) to include foil facing (inside of structure) with foil taping of joints. This selection avoids short circuiting and provides reflective (radiant) comfort during heating for occupants. Use R-19 (walls) and R-30 (ceiling) as minimums. Use rigid insulation around foundation, R-8 (minimum). Ensure use of vapor barrier around full interior of facility. Ensure vapor barrier integrity (e.g. lap and tape seams, gasket penetrations, etc.). Use of capillary vapor barrier at slab may be eliminated based on geotechnical report.

Use factory finished color for fascias, soffits, and other exterior items.

Exterior doors will be insulated (R-11) metal with baked enamel finish or double-glazed glass with anodized aluminum finish.

Window frames will be anodized aluminum with thermal break frame, slider, horizontal or vertical profile with minimum R value of 3. Keep glazing facing the prevailing winter winds to a maximum of 10% of total wall surface. Specify double pane glazing with low emissivity metallic coating/low R value.

Incorporate weather-stripping in exterior and sound attenuated areas. Ensure stripping matches exterior finish.

Use mechanical security locks, not electrical, on doors and windows. Install screen material (aluminum, bronze or plastic coated 18 X 18 mesh insect cloth)

Use acoustical treatment on flight line facilities to reduce aircraft noise.

Use exposed down spouts. Gutters and downspouts will be well integrated and de-accentuated in the architectural concept. Gutters shall be minimized.

Ice and snow guards shall be surface glued.

Do not emphasize extraneous wall attachments with paint. Items such as down spouts, conduit, switches, bells, horns, mechanical louvers, etc., should be painted to match the adjacent wall color.

4.1.1 Building Hardware

- Door Hardware: Satin Chromium finish.
- Verify locks and hardware match in color.
- 114 mm (4 ½ in) hinges unless specific application requires a larger size.
- Ball bearing hinges on heavy, high use doors.
- All locks shall be compatible with “Best” locks with 7-pins removable core.
- Use low profile panic hardware for doors where applicable.
- Incorporate coat hooks on the back of latrine stall doors.
- Dormitories, use satin bronze.
- Use of spring hinges is preferred in lieu of closer when allowed by code.
- Magnetic switches for security door shall be integrated with door and door frame. No surface mounted.

4.1.2 Building Signage/Graphics

Building identification signs:
The standard for building number signs is 8" x 24", 1/8" aluminum, brown background with 4" white letters. BLDG precedes the number for the building (i.e. BLDG 1300). Signs should be placed on front corner of the building facing the street. Street address numbers will be installed on front doors if there is a glass front entrance, if not they will be placed on the building facing the street in the white/brown format.

Moving signs:
Do not use moving or revolving signs.

Monument:
Use of pole-mounted or AAFES concession monument signs shall be designed by Base personnel.

Lettering Size:
For signs other than those covered by ACCR 88-1-1, size lettering according to the functional viewing distance. This will keep sign size to a minimum.

AAFES Signs:
Logo and lettering supplied by AAFES is required to be light to dark bronze and comply with the following:

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

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

- Facility name shall be spelled out completely with individual letters.

- Logo and letters shall be mounted directly to the building fascia or exterior wall adjacent to the facility's main entrance. The back edge of logo and letters shall be 6.4 mm (1/4 in) from the face of the wall or fascia.

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

- Signage shall be cast lettering. Cast lettering signage should be mounted in the location:

    1. As close to the main entry, when the main entry is visible from the main street.

    2. On a section of building wall visible from the main street.

- Letters are not to be mounted on channels or tracks mounted to the building.

- Appropriate size, and color for each facility and location shall be approved by the Base architect.

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

- Letters shall be upper case, Helvetica Medium style.

Lighted Signs:
Internally lighted signs create a commercial impression that is not compatible with ACC goals. When night visibility is functionally required, use external flood or spot lights

that illuminate both the sign and adjacent landscape or building. Illumination of the sign with its surroundings makes a better impression and improves orientation.

Unit Emblems:
Unit emblems are used to better advantage when located in landscape space in front of buildings, rather than painted or mounted on buildings.

4.2 Mountain Home AFB General Interior Design Standards

4.2.1 Interior Design Concept

- Provide a comprehensive and consistent interior design policy for all facilities on Mountain Home AFB.
- Provide a Base interior design policy for all facility construction; guidance for architectural.

4.2.2 Compatibility

Interior design compatibility at Mountain Home AFB shall be a cohesive approach to coordination of interior materials, construction details, finish colors, and furnishings.

The above shall be attained in the following manner:

1. Structural Interior Design (SID):
Services include the selection and coordination of interior materials and finishes that are structural surfaces or built-in features, which are integral or attached to the structure. This includes pre-wired workstations.

2. Comprehensive Interior Design (CID): Services include structure related finish selections as well as selection, arrangement, coordination of furnishings package (including procurement information, installation instructions, drawings, and cost estimates).

4.2.3 Construction /Design Program Guidelines

- Sprinkler heads to be recessed
- Electrical panels to be painted to match or to coordinate with wall in which they are located.
- All conduits and cabling to be concealed in wall construction, (phone, electrical, computer, etc.).
- Base standards for interior window treatment shall be 25.4 mm (1in) mini-blinds, color to be coordinated with the interior color scheme (neutral).
- Application of vertical blinds and draperies will be architecture and aesthetic requirements (color to be neutral).
- All electrical switch plates, receptacles, communication plates, and covers shall be colored white (the exception to this would be a direct need to change the color because of a special design feature or design statement to the project).
- Placement of thermostat, fire extinguishers or visible control devices mounted on walls or ceilings shall be coordinated with the interior design features.
- Lighting shall be coordinated into the overall interior design. Indirect lighting is preferred.
- Wall finishes may be composed of: gypsum board on steel studs, gypsum board on block walls or other similar systems. Walls can be covered with paint, vinyl wall covering, brick, tile, stone, or other similar system. Painted walls are to have a medium orange peel textured spray-on finish.
- Vinyl wall covering should be type 2 and shall be of a pattern or texture to help hide seams.

- These areas may have the following finish material: painted block walls or similar systems where applicable.

    1. Equipment/Utility rooms
    2. Storage rooms
    3. electrical rooms
    4. mechanical rooms

- These areas shall received RFP wainscoting 2.44 meters (8 feet) high or match height of CMU module where applicable.

    1. Maintenance bays or areas
    2. Large bay areas

- Exposed structures, mechanical and ducting in maintenance and large bay areas to be painted to match adjacent wall.

- Areas that warrant, due to high traffic, may incorporate bumper guards (similar to those used in hospitals), color to be neutral.

- Carpeting shall comply with Air Force carpet standards.

- Base Molds: interior base molds shall be vinyl type, roll goods only. Inside and outside corners shall be wrapped (no pre-formed corners). In dormitories the molds shall be carpet with vinyl cap in all carpeted areas.

- Natural finish/painted concrete floors, are limited to:

    1. Maintenance bays
    2. Utility rooms
    3. Electrical rooms Mechanical rooms

    * All unfinished concrete floor shall have a waterproof sealer or a combination hardener/sealer.

- Sheet Vinyl/Vinyl Composition Tile may be used in some facilities. Commercial grade sheet goods should be used where applicable, usage is limited to:

    1. Utility rooms
    2. Large equipment storage rooms
    3. Areas with cost limitations

- Ceramic/Quarry Tile shall be used in high traffic areas.

- The following are acceptable floor finishes to be used as function and budget allow:

    1. ceramic/quarry tile
    2. low profile rubber flooring
    3. athletic flooring
    4. carpet/carpet tile
    5. natural slate or stone
    6. stained concrete finish

- Entry Mats: All major entry areas to facilities shall have a recessed mat similar or equal to “tredline series”, removable grid type with carpet strips (color coordinated).

- Light Reflective, non-metallic surface floor hardness will be premixed, ready to use, dry shake, ready to apply, place, finish and cure at the job site. Application to concrete floors is limited to:

    1. Aircraft hangar bays
    2. Maintenance bays

- Ceilings: exposed ceilings are allowed only:

    1. when used as a deliberate design element
    2. maintenance bay areas
    3. utility/mechanical rooms

- Lay-In Ceilings: standard lay-in acoustical ceilings shall be, regular edge profile/ fissured/white/non-directional. Tee-bars to be color white.

- Type: 2x2 size shall be standard in all areas.

- Sheetrock ceilings may be used for soffits and appropriate areas requiring a smooth surface (design feature).

- Interior Signage: All interior signage shall be compatible to Modulex Interior 20 PaperFlex by ASI Sign Systems.

4.2.4 CID/Comprehensive Interior Design & SID/ Structural Interior Design

The following items to be included for CID and SID projects for the designing agents usage:

- Furniture styles for CID's will be coordinated by Mountain Home AFB Interior Design Element/CEC will review all CID and SID packages. Review comments will be directed to the appropriate project manager for coordination.
- Mountain Home AFB, Interior Design Element/CEC will review all CID and SID packages. Review comments will be directed to the appropriate project manager for coordination.
- Existing furnishings of users required for a project shall become part of the CID package, to be incorporated for floor plan layouts and marked accordingly. These items to be identified at pre-design meetings.
- Substitutions or changes made by users after completion of the CID and SID packages is to be approved by the BASE Commander with coordination through the Base architect for review.
- Photographs of presentation boards cannot be used in place of actual presentation boards for the design review process.
- CID and SID packages/presentation boards to be accompanied by a cover letter stating action required for review and suspense dates.
- Designing agents must allow at least 12 working days from receipt of review packages by Mountain Home AFB, for review process, before the design review meetings.
- Interior design can be accomplished only by a professional interior designer. Air Combat Command defines a professional interior designer as a person qualified by education and experience. Designers who work on ACC projects must have a 2, 3 or 4 year Interior Design Degree plus work experience equal to 6 years combined education experience. The designer is preferred to have at least one year's experience working on government projects. If this is not the case, a senior designer who meets these criteria should carefully review the project before any presentation is made.
- The Base architect will be the spokesperson for all CID and SID coordination and decisions.

4.2.5 Color/Finishes

- Color for interiors will be determined by user needs within the parameters of functionalism, maintenance and psychological impact.
- Only one species of wood finish will be used throughout an entire facility (e.g., all red oak, etc.). This pertains to doors, interior casework, base molds, door jambs/trim, furnishings, etc.
- All other wood finishes shall be approved by Base architect.
- Metal interior doors requiring paint shall be a color that coordinates with the door jamb/trim, base mold and adjacent wall.

4.2.6 Base Level Projects/Self Help

- Interior finish coordination for Self Help projects will be selected from the Mountain Home AFB standard Architectural Color and Finishes binders.

- Furnishings procured shall be made as a total package coordinated with existing furnishings.

- Artwork: shall be coordinated by the Base architect for facility standards, applicable to all “common areas”. Common areas shall apply to the following:

    1. entry areas
    2. conference rooms
    3. hall corridors
    4. break rooms
    5. reception rooms
    6. open office areas

- Artwork may be coordinated by users in the following areas:

    1. private offices

- All furniture items for procurement entered into Base Supply and Base Contracting shall be accompanied by an Interior Design Standards Approval Letter, available through Base architect.

- It is the responsibility of the user to order and install purchased items, with assistance from the Base architect.

- It is a future goal for each facility to be standardized in one major furniture manufacturer. This allows for the following:

    1. flexibility in internal changes
    2. a consistent and cohesive building environment
    3. cost savings in quantity procurement
    4. service/maintenance control

[SECTION 5] CIVIL ENGINEERING STANDARDS

5.1 Storm Water Drainage

Presently storm water piping systems are located on the airfield and in the vicinity of Gunfighter Avenue between North Mellon and Aardvark Avenue. Collected storm drainage either goes off base to the Snake River system or into infiltration/evaporation areas located on base. Existing storm water and industrial waste requiring processing are treated at the point of generation through oil/water separators.

Future designs of storm water drainage shall be as follows:

5.1.1 Existing Parking Maintenance Areas

Storm water should be routed via surface drainage to on-site storm swales to collect runoff from rain event. Storm swales should blend in with existing landscaping theme (i.e., perimeters landscaped with minimal planting and washed river rock; 10 mil polyethylene sheeting placed for weed control will deter rapid infiltration and allow for natural evaporation of water) . Free floating pollutant will be easily recognized through visible observation and clean up can be performed through the utilization of absorbent pads.

Industrial waste generated from shop areas can be directed to the sanitary sewer system. Shop areas are to be designed to minimize the quantity of industrial waste generated.

5.1.2 Operations and Maintenance

This is a self operating system and requires little or no maintenance.

5.1.3 New Construction

Do not build any new drop inlet/separator systems for handling storm water runoff from vehicle parking/maintenance areas either through Real Property Maintenance (RPM) or Military Construction (MILCON) projects. Construct surface drainage systems to storm swales as indicated for existing areas above. Utilize curb cuts where concrete gutter elevations are sufficiently higher than surrounding grade. (See Typical PCC Curb and

Gutter Detail for requirements.) Utilize catch basin to pipe to existing drainage swale or new french drain where curb cuts are not possible. Utilize storm water inlets which do not contain catches at the bottom for debris to collect.

Storm water collected from roof or landscaped areas can be directed to french drains, dry wells or swales that are not lined with 10 mil polyethylene sheeting.

5.2 Pavement (Roads & Airfield)

For pavement subgrades, utilize existing soil, type ML cohesive. Do not assume ML for large projects. For large projects, tests shall be conducted as the supporting foundation for all pavements. Do not import other soil types for fill purposes as this leads to differential heaving. Compact to 95% (minimum) of the maximum possible density (ASTM 1557). Include provisions for contractor supplied testing in quantity and quality to assure sufficient compaction or testing of asphalt or concrete. Instructions for testing should be identified by the construction inspector, not the contractor. Maintain a moisture content of 2% above optimum in accordance with (IAW) ASHTO T99. This measure utilizes the clay content to seal off the capillary tubes in the existing soil to prevent the formation of ice lenses, which attribute to differential frost heave.

For pavement work, conduct a life-cycle cost analysis MIL HDBK-1190 for alternate pavement systems. If systems have comparable present values, bid the systems against each other to permit possible award to the more favored system. Large paving project

should be designed to recycle existing Portland cement concrete (PCC) and asphaltic concrete (AC) pavements to be demolished. Airfield pavements shall be designed for frost susceptible subgrades which require Non Frost Susceptible (NFS) base and subbase courses. Roads and parking area pavements shall be designed for non frost susceptible subgrade as long as a 150 mm (6 inch) NFS base course is used. Design for differential frost heave IAW AFM 88 -6, Chap 4. Design for Rigid Airfields Pavements IAW AFM 88-6, Chap 3. Design for Rigid Other than Airfields Pavements IAW AFM 88 -7, Chap 5. Design for Flexible Airfields Pavements IAW AFM 88-6, Chap 2. Design for Flexible Other than Airfields Pavements IAW AFM 88-7, Chap 3. Provide concrete curb and gutter (barrier type) at the edges of all pavements for shoulder control (against unraveling) and for protection against mud-pumping. Curbing within 38 meters (125 feet) of the flight line (red line) shall use rolled type curb a maximum of 76 mm (3 inches) high. Ensure that all areas that use expansion board are covered with a colored joint sealant.

5.3 Parking Design

Location of parking lots shall comply with Department Defense Antiterrorism/Force Protection Construction Standards requirement. Locate parking behind buildings. Screen parking from view. Trees and shrubs at entrances and exits to parking lots shall be placed so as not to restrict visibility. Use small lots rather than large lots. Include sidewalks in front of parking spots for access. Have good building access for visitors and service vehicles.

Ensure dumpster locations are screened large enough to handle the current size dumpsters and can be accessed by a trash truck during normal duty hours with the parking lot full. (See Dumpster Enclosure Detail for minimum size requirements for a single dumpster.) (See Landscape Standards for screen wall requirements.) Include small storage areas either attached to or adjacent to the main building for storage of lawn care equipment, etc.

Identify parking requirements of both the users and visitors. Provide handicapped parking. Use separate smaller parking lots of 50 cars or less, rather than one large lot of 200. If a large lot exists or is required by functional layout, reduce its apparent size by landscaping 10 percent of the area within the lot. Break up large parking lots with trees and shrub walls. Include parking lights and walk area lighting by photo cell.

5.4 Pavement Marking

Airfield striping to be designed based on Engineering Technical Letter (ETL) 94-01 and AFI 32-104Z Standards for Airfield Marking. Airfield striping at Mountain Home AFB shall use water based paints.

5.5 Standards for Preconstruction Subterranean Termite Treatment

All contracts which specify pesticide use “must” be reviewed and approved by the MAJCOM Entomologist. Forward PWS to:

HQ/ACC/CEOO Attn. Entomologist
129 Andrews St. suite 102
Langley AFB, VA 23665-2769

All new construction of structures which contain cellulose materials (i.e. sheet rock, wood paneling, cellulose insulation, cabinetry etc.) will be treated for the prevention of Subterranean Termites during the construction phase.

Pesticide used for preconstruction treatment of Subterranean Termites must be EPA registered, approved for use in the state of Idaho, and must state on the label that it is approved for the prevention/ treatment of Subterranean Termites.

Blueprints of structure should be available for pesticide applicators to determine square footage of slabs, linear feet of foundation and load bearing walls and critical treatment areas such as expansion joints and control joints. Where the slab is penetrated by pipes, conduit, bath traps, drains, clean outs etc. are critical treatment areas and require different rates of treatment than horizontal barrier areas.

Preconstruction treatments for Subterranean Termites must be made in strict compliance to the labeled directions and any additional requirements set forth in these standards. The dilution rate will be the maximum allowable rate and volume listed on the label for Subterranean Termites. All termiticide applications must be covered with plastic sheeting to protect the treated area if concrete cannot be placed within 24 hours after treatment. (Samples of tank mixtures may be taken for verification of accuracy.)

Contractors and/or pesticide applicators must submit in writing the following information to the Pest Management section at Mountain Home AFB before any pesticide is applied.

- The names of individuals who will be applying any pesticides.
- Copies of Idaho Pesticide Applicators licenses for each individual.
- A label and MSDS of the product which will be utilized.

Pest Management personnel certified and trained in termite treatments will provide Quality Assurance during all phases of the pesticide application. The Pest Management facility at building 1337 is the only area authorized on Mountain Home AFB for the mixing of pesticides and filling of pesticide dispersal equipment. Pest Management personnel will supervise all mixing and filling procedures to ensure pesticide formulations are within contract specifications.

Contractors will transport termiticides to the mixing site (building 1337) and return any excess back to that site at the end of each day. Termiticides must be in the original labeled containers. No pesticides may be stored at any site on Mountain Home AFB without prior written approval. All packaging, containers, residues, and rinsates must be disposed of by the contractor. No pesticides and their residue will be disposed of on Mountain Home AFB.

Periodic inspections will be made by Mountain Home AFB Pest Management personnel to ensure standards are being met by all applicators. Soil samples may be drawn. One hundred parts per million shall be the minimum acceptable termiticide residue for a soil sample taken within one year of the treatment.

A "Record of Termiticide Use" form will be given to the contract applicator each day treatments are being made. This form will be available at the Pest Management shop and must be completed and returned at the end of each day of application. Pesticide application will only be made during normal duty hours, 0700-1600 hrs, (Monday-Friday). Contractors must notify Pest Management personnel 24 hours in advance of any application to insure shop access for mixing chemicals. Wind speed is a critical factor at Mountain Home AFB for all chemical applications. Idaho State Law established a 16-km/hr (10-mph) maximum wind speed during chemical application. Contractors shall be delayed from applying termiticide when wind speeds exceed 16 km/hr (10 mph).

5.6 Water/Wastewater Utility Managment and Control System

All water wells and lift stations on Mountain Home AFB are fully automated. The base UMCS system is a Tano/Acquatrol radio transmitted (SCADA) system installed at the central water plant which communicates with the remote sites. Tano/Acquatrol W1500 Remote Telemetry units are installed at each site to control and monitor all field points.

The following point schedule is an example of points that should be monitored or controlled at Mountain Home AFB:

5.6.1 Water Wells

- Pump start and stop status
- Remove control of pump
- Phase current for each motor phase
- Phase protection (shutdown and monitoring)
- Totalization of water flow
- Motor runtime
- Temperature of building
- Static water levels

5.6.2 Lift Stations

- Pump start and stop status
- Remove control of pumps(s)
- Wet well water level
- Wet well high and low level alarms
- Dry well high level alarm
- Pump alternation
- Motor runtime
- Temperature of the building

Water meters shall be installed on all new facilities. The number and location of fire hydrants in relationship to new facilities shall be per requirements. Hydrants shall be painted Mason Blanc. Post indicator valves shall be painted red. Non-metallic pipes shall have plastic tape with metal tracer wire located above the pipe. Pipes susceptible to corrosion shall be designed with a Cathodic Protection System.

Installation of new utilities crossing newly paved roads shall be by jacking or boring methods. Exception to cut and trench road is on a case-by-case basis and must be approved by the Base Civil Engineering.

[SECTION 6] MECHANICAL SYSTEM CONSIDERATIONS

6.1 Heating, Ventilation, & Air Conditioning (HVAC)

6.1.1 General

1. Do not provide HVAC in vestibules, hallways, projection rooms, and storage rooms.

2. Humidification and humidity control shall not be provided without justification being provided. If provided, water softeners must be utilized in all water for humidifiers.

3. Do not install under-slab floor ducting for HVAC (AFR 88-15).

4. Grills and louvers shall have factory-applied finish.

6.1.2 Cooling Systems, General

1. Design Conditions (for non-Critical facilities):

    - Indoor: 25.5° C (78° F) Dry Bulb
    - Outdoor: 36.1° C (97° F) DB, xx° C (64° F) WB
    - IAW AFR 88-15 para 15-112c and AFM 88-29.

2. Design Conditions (for Critical facilities):

    - Indoor: 25.5° C (78° F) Dry Bulb
    - Outdoor: 37.2° C (97° F) DB, xx° C (64° F) WB
    - IAW AFR 88-15 para 15-112c and AFM 88-29.

3. The following policies apply to mechanical refrigeration:

    - Condensing units shall be air-cooled. To the greatest extent possible air conditioning condensing units should be of the weatherized type and installed outside of the building, hidden from plain view. (IAW AFR 88-15, para 15-112).
    - Avoid using centrifugal chillers.
    - A central mechanical system shall normally be provided unless specific engineering cost analysis indicates sub-systems to be more economical (IAW AFR 88-25, para 15-69).
    - Control systems shall be designated to comply with ETL 83-1.
    - New refrigerant will be R-410A or R-134A or other types that will not adversely effect the earth's ozone layer.
    - Controlled environments, such as computer rooms, will use direct expansion A/C equipment and will have separate systems from facility comfort cooling requirements.

4. Evaporative cooling shall be used in general in shop areas without critical requirements and in occupied storage areas. The following policies apply:

    - Evaporative coolers shall have a cellulose material impregnated with anti-rot salt and rigidifying saturants.
    - Media efficiency shall be 76% at 183 meters per minute (600 fpm) face velocity with no entrainment of pad water.
    - Evaporative cooling shall be designed to provide max tem. difference possible following the net.

5. See Section 7.1.7 for additional design criteria for heating/cooling systems.

6.1.3 Heating Systems, General

1. Design Conditions (for non-Critical facilities):
   - Indoors: 21° C (70° F)
   - Outdoor: –13° C (8° F).
   - AFM 88-29.

2. Design Conditions (for Critical facilities):
   - Indoors: 21° C (70° F)
   - Outdoor: –17.8° C (0° F).
   - AFM 88-29

3. Natural gas is available for use at most locations. See Section 7.1.4 for additional information.

4. Family Housing units are heated with either natural gas or electricity. Most family housing utilizes natural gas for water heating, with some structures utilizing electric water heaters.

5. Domestic boilers shall be designed to be shut down during summer.

6.1.4 Natural Gas Distribution

1. The natural gas distribution system is owned and operated by MHAFB.

2. Underground distribution piping shall be polyethylene (PE), Yellow "Plexco" piping or equal.

3. Mains shall be 102-mm (4-in) diameter; service runs to buildings shall be 51-mm (2-in) minimum diameter.

4. Standard burial depth of gas piping at MHAFB shall be 30" to top of pipe.

5. Pressure in the "industrial" area is 345 kPa (50 psig). The housing area is at 379 kPa (55 psig). The only connection between the two gas systems is located on North Mellen Street.

6. A continuous tracer wire shall be installed with the piping and stubbed up at the building per UPC. Tracer wires shall not be wrapped around piping. Plastic warning tape shall be placed above buried piping. Use of a metallic warning tape alone is not acceptable, as it is not compatible with the utility detection equipment used at MHAFB.

7. Low Pressure vs. Medium inside buildings use 2 in. regulating.

6.1.5 Controls and Sensors

1. New facilities will be designed to be compatible with a future EMCS. Monitor (thermostat and pressure gauge) temperature and pressure on inlet/outlet of both tube and shell side of converter. Do not locate thermostats on exterior walls, near exterior door, or in private office space.

2. Automatic Control System: Temperature controls will be used to fullest extent consistent with economy of operation. They will be adequately protected against unauthorized adjustments or tampering (locking covers). Heating systems shall be provided with a control for positive cut-off above 18° C (65° F) outside temperature. Use non-electric thermostatic valve on each converter. Provide battery backup for automatic setback thermostats.

6.1.6 Energy Conservation

1. Insulate all heating/cooling pipes. Insulate all duct work carrying conditioned air through unconditioned spaces. Use heat recovery for domestic hot water (DHW) if economically feasible.

2. Locate water heaters close to point of use. Specify DHW maximum temperature at 49° C (120° F) for stored DHW. Use DHW heaters with an "R" value of 14 or greater without use of exterior insulation jackets. Avoid the need for electric heat tapes for plumbing

pipes; design with passive insulation.

3. Recover heat from exhaust air if cost efficient. Minimum = 2.5. Ensure unrestricted airflow around radiators. Recover heat from light fixtures if cost effective. Use evaporative coolers rather than mechanical coolers to maximum extent. Provide well-sealed dampers to close ducts during off-season.

4. Use a few large boilers/chillers rather than several small boilers/chillers. Use radiant heat in areas such as high bays. (Refer to File DE 335-85 for restrictions). Use electric ignition rather than pilot lights on oil/gas water heaters and furnaces. Use boilers with a minimum efficiency of 80% and furnaces with a minimum efficiency of 90%.

5. Where fans are used, put them on separate switches from lights when bathroom is for multi-users.

6. Compare use of air curtains vs. heating and cooling losses for facilities with high traffic between interior and exterior if no vestibules are used.

7. Use automatic setback thermostats or seven-day clocks where feasible. Also, consider using heating and cooling heat band thermostats.

8. Load calculations are required.

6.1.7 Additional Design Criteria for Heating/ Cooling Systems

1. Systems that may see freezing conditions shall be protected with a minimum of 30% propylene glycol in chilled water and heating water systems. Snowmelt systems shall use 50% propylene glycol.

2. Bladder or diaphragm type expansion tanks shall be used, not compression tanks. Expansion tank connections to the main shall be off the side of the pipe; ceiling suspended tanks shall be furnished with an automatic air vent. The air vent is for filling the system, not everyday use. All expansion tanks shall be installed with isolation valves that are permanently labeled “leave open at all times” or with the handles removed.

3. Industrial air vents (high volume, cast iron bodies, stainless steel trim) shall be used off of air separators.

4. Circulating pumps in hot water heating systems shall be located to draw suction from the boiler and expansion tanks.

5. Each heating or chilled water coil shall have the following:

    - Isolation valves on the supply and return, wafer type valves shall not be used for this application.
    - Strainer prior to control valve or automatic flow control valve.
    - Control valve.
    - Automatic flow control valve (Griswald, Autoflow or similar) shall be used. Manual flow control valves (circuit setters) shall not be used for coil balancing unless the body size is greater than 64 mm (2 ½ inches). Split coils at air handlers only require one flow control device since some variation in flow between the coils will not appreciably affect coil performance.
    - Manual air vent, 6.4 mm (¼ in) ball valve with candy cane outlet, coin operated air vents are not allowed.
    - Pressure and temperature test plugs across the strainer and the coil.
    - Drain plug on terminal coils or drain cock with hose connection on air handler unit coils
    - Unions on the supply and return, unless the piping connections are grooved couplings or flanged.

6. Base mounted pumps shall be installed with suction diffusers unless 5 diameters of straight pipe can be provided to the inlet of the pump.

7. Liberally install pressure and temperature test plugs across chillers, boilers, pumps, coils, and straining devices.

8. All pumps shall have a single pressure gage (with snubber) ganged across the pump inlet, outlet and suction diffuser (if applicable). 6.4 mm (¼ in) black threaded ASTM A-53 pipe with 6.4 mm (¼ in) ball valves (not needle valves or petcocks) shall be used to make the manifold.

9. Dial type bimetallic thermometers in separable socket shall be used (not liquid filled "mercury" types).

10. Generally, pump away from boilers and heat exchangers. Generally, pump through chillers. Designs which vary from this concept shall include a justification.

11. Make-up shall be made as close to the "point of no pressure change" in the system as possible.

12. Chilled water systems shall not allow variable flow through the chiller, heating water system should not allow variable flow through the boiler if possible. Chillers shall be packaged, outdoor, air-cooled type. Chillers shall be ground mounted. Chillers shall be sized for the sum of the peak loads.

13. Chilled water loops shall contain the volume recommended by the chiller manufacturer. Generally, chilled water loops shall have 3 gallons per ton as a minimum system volume. Install storage tanks if the loop is too short to provide the minimum system volume.

14. Chilled water systems shall have relief valves at the point of no pressure change.

15. Size triple duty valves and manual calibrated balancing valves for a minimum of 1.5 meters (5 ft) pressure drop at design flow, do not line size these items unless 1.5 meters (5 ft) can be obtained.

16. Only provide one strainer in the mechanical room per system (i.e. strainers are often provided as standard equipment in suction diffusers and air separators.) If neither of these are used or feasible install one strainer in-line.

17. Provide a pot feeder assembly for each system.

18. Pumps shall be non-overloading over the entire pump curve. Primary/secondary pump systems are encouraged. Booster pump systems are strongly discouraged.

19. Boilers shall be installed with 102 mm (4 in) minimum house keeping pads.

20. Label ports on three-way control valves as to "normally closed", "normally open" and "common". Typically chilled water valves will fail to bypass and heating water coils will fail to heat.

21. Duct systems shall have the following features:

    - Use of interior duct lining products shall be kept to a minimum.
    - Factory fabricated 45 degree high efficiency take-off shall be used on duct systems, not spin-ins.
    - Flexible duct shall be installed at ceiling diffuser connections; maximum length of flexible duct shall be 1.8 meters (6 ft).

6.2 Plumbing

6.2.1 General

1. The Uniform Plumbing Code (latest edition) has been adopted by the USAF.

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

6.2.2 Pipe and Pipe Fittings

1. Water pipes shall be designed for a maximum velocity of 2.4 meters per second (8 fps), or manufacturer's recommendation, whichever is less.

2. Velocity shall be limited to 1.2 meter per second (4 fps) in all copper and brass piping when transporting water above 66° C (150° F).

3. Where feasible, single, rather than multiple, stack venting should be provided.

4. Compressed air piping shall be black steel with malleable iron fittings.

5. Coordinate corrosion protection criteria with the 366 CES/CEE corrosion engineer. Wherever possible, utilize plastic pipe for buried lines.

6. Drainage systems: Position manholes at every 45-degree and 90 degree, and a minimum of 91.4 meters (300 feet) apart. Keep main building sewer at 102 mm (4 in) minimum for future add-ons.

7. Limit the use of overhead piping systems except for slab ongrade. Then ensure piping is within the heated space.

6.2.3 Valves

1. Utilize non-constricting ball valves instead of gate valves.

2. Building main water service needs "corporation stop" at main, shut off valve (with valve box, 102 mm (4 in) min) at nearest location (not in roadway), and exposed, hand-operated, labeled valve inside building.

6.2.4 Piping Specialties

1. Mechanical rooms with equipment requiring "blow down" will plumb low down through an exterior wall.

2. Use floor drain to capture leakage and condensation, if it occurs.

3. Use floor drains with concealed cleanouts. Have cleanout at building exterior for building sewer system.

4. Utilize dielectric unions between all dissimilar metals.

6.3 Well/Pumps Control System

1. All water well/lift stations on Mt. Home AFB are fully automated.

2. The Base UMCS system is a Tano/Acquatyrol radio transmitted (SCADA) system installed at the central water plant which communicates with the central computer.

3. Tano/Acquatrol W1500 Remote Telemetry units are installed at each site to control and monitor all field points.

6.4 Energy Monitoring & Control System

1. Energy monitoring and control system

   (EMCS) features will be required in the design of a facility. (See attached EMCS diagram at the end of the section.) Coordinate with the 366 Civil Engineering EMCS Shop. EMCS design and facilities is to be in accordance with AFMAN(I) 32-1093. Guide specification CEGS-13820 is to be utilized for building preparation for EMCS. The HVAC system and associated EMCS will be designed using Direct Digital Control (DDC) technology. DDC may be described as the direct operation of Heating, Ventilation and Air Conditioning (HVAC) local loop control devices, such as valves, dampers, and actuators, by a digital computer. Control actions are determined by stored programs using inputs from real-time sensors. The digital computer and its associated software replace the local loop pneumatic (electric or electronic analog) sensors.

2. The DDC system is in compliance with Engineering Technical Letter (ETL) 86-16. Future Military Construction Program (MPC) and O&M DDC designs must comply with ETL 86-16, as well as, ETL-83-1.

3. The DDC system at Mt. Home AFB is manufactured by Johnson Controls. All DDC equipment shall be compatible with the existing Johnson Controls infrastructure. The Johnson Controls system is a microprocessor-based network designed for maintenance management and the local automatic control of HVAC equipment in an energy efficient manner. The system is comprised of a network of stand-alone units, each capable of DDC and supervisory control. The network control modules consist of a microcomputer that allows the base to perform manual operations, coordinate systems for demand reduction, view facilities status in real-time, and generate reports. In order to maintain coordinated system growth, future DDC procurements shall be compatible with the existing DDC network. Contact EMCS shop for the specific computer requirements required for each project.

4. The means of communication between buildings is by buried single-mode tube fiber optic cable. At a minimum, an eight fiber cable will be supplied for each EMCS installation. All fiber optic cables will be installed in 102-mm (4-in) PVC conduits with four way inner duct. Each four inch PVC will be installed from the building to a (BIDDS) communications manhole. Coordinate with the EMCS shop on manhole locations. A maximum of two gradual ninety degree bends, vertically or horizontally is allowed without the installation of pull boxes in the conduit.

5. The following HVAC point schedule is an example of points that should be monitored or controlled in facilities at Mt. Home AFB:

   - Outside Temperature (° C (° F))
   - Air Flow Monitor (normal/low)
   - Hot Deck (° C (° F))
   - Return Air Temp (C ° (° F))
   - Supply Temp to Each Zone (° C (°F))
   - Humidity for Each Zone (%)
   - Chilled Water Return (° C (° F))
   - Tower Fan Status (on/off)
   - Economizer Control
   - BTUs Heating
   - Tons Cooling
   - Motor Run Time (elapsed)
   - Filter Media
   - Chiller Safeties
   - Start/Stop Monitor (normal/low)
   - Cold Deck (° C (° F))
   - Mixed Air Temp (° C (° F))
   - Room Air Temp for Each Zone (° C (° F))
   - Chilled Water Supply (° C (° F))
   - Chiller Start/Stop Control
   - Chill Water Pump Status (on/off)
   - Air Handler Safeties (Freezestats, Firestats)
   - Hot Water Supply and Return Temps (° C (° F))

- Moisture Alarms in Raised Floor Areas
- Emergency Generator Status (off/ on/ready)
- Condenser Water Supply & Return Temps (° C (° F))

This is only an example and not meant to be binding or exhaustive.

6.5 Fire Protection Systems

1. All fire protection systems shall be coordinated with MHAFB Standard 12, “Fire Safety Systems”.

2. Fire hydrants shall have the following features:

    - Hydrant valve seats shall be resilient plastic/rubber type. Metal-to-metal valves shall not be used.

    - Hydrants shall be installed to provide a minimum clearance of 18” between grade level and the center of the 4½ inch (pumper) connection.

[SECTION 7] STRUCTURAL ENGINEERING STANDARDS

7.1 Seismic Design Criteria

7.1.1 Ground Motion

1. 0.2 second Spectral Response Acceleration (5% of Critical Damping, Site Class B), Maximum Considered Earthquake: SS=.30

2. 1.0 second Spectral Response Acceleration (5% of Critical Damping, Site Class B), Maximum Considered Earthquake: S1=.10

7.1.2 Site Classification

1. When soil properties are not otherwise determined by means of a site-specific geotechnical investigation, Site Class D shall be assumed.

7.2 Wind Loads

7.2.1 Basic Wind Speed

1. 40 meters/second (90 mph) 3 second gust.

   Note: Specified wind speed per Figure 1 of U.S. Army Corps of Engineers (USACE) TI 809-01, dated 3 August 1998.

7.3 Snow Loads

7.3.1 Ground Snow Load

1. 170 kg/m2 (35 psf)

   Note: This ground snow load has been carried over from Army TM 5-809-01/Air Force AFM 88-3, Chapter 1, dated May 1992, as directed by ACC. This value exceeds the 75 kg/m2 (15 psf) value specified in TI 809-01, dated 3 August 1998.

7.4 Foundation Design Criteria

7.4.1 Frost Penetration

Minimum depth to bottom of foundation

1. Heated Structures: 940 mm (3 feet, 1 inch)
2. Unheated Structures: 1245 mm (4 feet, 1 inch)

Note: Specified footing depths based on Figure 1 of U.S. Army Corps of Engineers (USACE) TI 809-01, dated 3 August 1998, for a maximum frost penetration of 1625 mm (64 inches).

7.5 Soil Bearing Capacity

Maximum allowable design soil bearing pressure for foundations shall be determined for each site by means of a site-specific geotechnical investigation. In the absence of such, with the approval of the Base Civil Engineering Office, a value of 95 kPa (2000 psf) may be assumed. A one-third increase in allowable bearing pressure is permissible for short duration loads. All footings shall bear on a 300 mm (1 foot, 0 inch) layer of compacted select structural fill.

[SECTION 8] ELECTRICAL STANDARDS

8.1 High Voltage Work Requirements

Before any power outages or distribution work will be authorized there must be a face to face meeting between the contractor in charge of the outage and the Exterior Electric Shop in order to coordinate the details and material to be used.

All contractors working with the base's high voltage systems must comply with OSHA standard 1910.269(a)(1)(iii), 1910.269(I)(1), and must submit written proof that employees have been trained to work around high voltage lines or equipment. Contractors are required to submit current certifications for every individual involved with preparing High Voltages splices and elbows.

Any work on or near energized distribution lines or equipment requires a lockout/tagout and hot line hold before any work begins.

All distribution lines and equipment to be worked, which are de-energized for any reason, must be properly grounded out using proper grounding sets on both sides of the work area.

All distribution tools and equipment used for working on the distribution system such as; Bucket Trucks, Hot Sticks, Rubber Goods require dielectric testing. Written certification of all tests must be made available to the Government upon request.

8.2 Transmission & Distribution

Existing transmission and distribution information is described in Section 1.0 - Regional Description.

New distribution is comprised of overhead and underground installations. As a general rule the overhead distribution system will be extended using class 2 wood poles to accommodate new facilities. However, all distribution system installations in housing areas will be installed via underground duct banks without exception. Additionally when the proposed distribution system passes within 15 meters (50 feet) from the front of a new facility the installation will be underground.

8.3 General

All High voltage underground cable shall be Copper EPR with a 100% jacketed concentric neutral. No drain wire or shielding.

The use of full size underground manholes is not allowed. Use sector boxes where possible. Large two cover pull boxes are ok with no elbows.

All fused cutouts on primary DIP poles, or in-line will be load break type, rated for 200 amps. Fuse size will be determined by the actual requirement. The Exterior Electric Shop will determine fuse size for all transformers and in-line cutouts.

All underground primary cables will be marked with phase letter corresponding to the phase from which it originates, and markings to show where the cable feeds to and from.

All primary cables entering or leaving a sector box will be trained to allow easy removal and installation of the elbows.

All sector boxes will have ground sleeves or basements. Sector boxes should be sized to provide at least one spare take off point for future use. Ground connections that are made in transformers, sector boxes, and on poles will be high compression crimp type, no mechanical connections are allowed.

No existing primary underground cable will be reused in conjunction with a new installation. If distribution work requires anything more than a disconnect/reconnect situation, the entire cable shall be replaced with new. Any modifications to an existing cable run requires complete replacement of the cable.

8.4 Service Entrance

All primary voltage underground feeders, including installations under new roadways shall be in concrete-encased rigid conduit. Primary underground feeders under existing roadways will be bored or jacked. Use "stirrup" connectors to connect service feeders to overhead conductors.

8.5 Grounding IAW ETL 90-6, AND AFI 32-1065

Provide separate grounding conductors and rods for surge (lightning) arrestors and service neutrals. Provide insulated grounding conductors to all grounding type outlets. Metallic conduit shall not constitute a safety ground. Include in specifications: Use three-point ground test and instrumentation in accordance with IEEE Std 81-1983 paragraph 8.2.1.2. Perform test in presence of the government inspector. Submit results and indicate type of test performed.

Provide Cathodic Protection IAW ETL 91-6, and AFI 32-1045

When Lightning Protection has been identified as a requirement it shall be provided IAW ETL 90-6, AFI 32-1065, and NFPA 780. For buildings located within the Munitions

area, a drawing of the system with test results must be submitted for approval prior to building acceptance.

All outdoor equipment shall be painted green in accordance with the standard colors identified in the BDS Architectural/Structural section.

8.6 Transformers

Provide service transformers with delta primary and wye secondary connections for three phase services. Base primary service is 12470/7200 V. All service transformers shall have two 2-1.2% taps above and below rated voltage. Provide low percent Z transformers where short circuit currents permit. Screen all exterior transformers from major circulation routes or common areas. Load break switch, primary bayonet fusing, loop fed, load break bushings, 4 point counter poise grounding, lightning protection.

Pad-mount transformer enclosures shall be provided and the façade shall match with the adjacent facility. Provide at least a 1.4-meter (4-ft) clearance around all distribution equipment located within an enclosure. Pad mount distribution equipment not located in an enclosure shall have a minimum clearance of 3 meters (10 feet).

8.7 Panel Boards

Provide typed panel schedules. Provide manual bypass for all auto transfer generator panels. 25% spare capacity, provide load calculations in the design analysis.

8.8 Interior Lighting

Provide wire guards for all open fluorescent lamps. Utilize energy saver 32-34 watt fluorescent lamps with energy saver ballast in administrative and similar areas. Use high-pressure sodium lights in bay areas where color rendition is not vital. Provide seismic zone 2 protection for all fixtures, especially ceiling grid mounted fluorescent fixtures. Provide Certified Ballast Manufacturer (CBM) listed ballast. All ballasts shall have 0.90 power factor or greater. LED Exit lights, Emergency Lighting IAW ETL 94-5. Use Compact Fluorescent lights as opposed to incandescent lights.

8.9 Exterior Lighting

For parking lot lighting and roadway applications, use 250W HPS with photocell activation. Parking lot light poles shall be round and tapered, and have an anodized bronze finish.

The lamp wattage for street lighting varies between 250W and 400W, check with exterior electric shop for each application. All existing housing and new housing area street lighting shall be 100W metal halide, use 3-meter (9-foot 9-inch) Tapered fluted light poles, black color and 43-cm (17-in) diameter base (match existing poles in the Dunes housing area). For roadway lighting use anodized bronze finished, horizontal fixtures (Cobra Head Style), 10.5-meter (35-ft) high steel poles with 3.6-meter (12-ft) long single arm support. The poles shall be set back 1.5 meters (5 ft) from the curb. Each pole shall have a 15-cm (6-in) high concrete base for roads, and parking lot poles shall have a 60-cm (24-in) high concrete base.

Use 1000W or 400W Metal Halide for outdoor sports field lighting, with timers/photo cell activation.

Use 250W HPS with quartz backup, or fluorescent for security lighting.

Airfield Lighting IAW AFMAN 32-1076

8.10 Wiring Devices

Provide new devices and plates whenever an area is renovated. All devices shall be recessed except in mechanical rooms and utility areas. Provide devices rated at 20 amps where heavy use or electrical load dictates the need for 20 amp devices. All wiring shall be copper. No aluminum allowed.

8.11 Automatic Controllers

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

8.12 Generators

Automatic Transfer Switches: Provide a bypass switch to allow all power to be disconnected from the transfer switch while maintaining power to the facility. This will allow maintenance of the switch without causing an outage.

Emergency Generator Rooms: Provide generator rooms with automatic louvers and exhaust fans for ventilation. Provide overhead and side lighting to minimize shadows. Provide water outlet, bay or double doors to allow replacement of generator, minimum 800 mm (30 inches) working clearance all sides. Provide sound dampers. Auto-transfer switches and start panels shall be located in the generator room.

A monitoring system shall be installed on RPIE generators. The existing system is an Onan network control and monitoring system. The Monitoring and Control system shall include at least the following remote capabilities: generator status, fuel level, coolant temp, oil pressure, transfer status, phase availability to load, generator voltage level, battery voltage level, and start/stop capability.

Each RPI generator should have a phone line installed next to the transfer switch. Per AFI 32-1063/ACC Supplemental I, at least 72 hours of fuel storage in a double walled tank must be provided as part of each installation. All permanently installed generators must include a quick disconnect switch to allow for the rapid installation of a mobile unit during extended down time for the RPIE unit.

8.13 Over-Current Protective Devices

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

8.14 Electrical Identification

Provide plastic panel board and disconnect labels. Labels shall be laminated (black with white core) engraved with 6.4-mm (1/4-in) high letters. Attach to front exterior of enclosures. Labels shall match plan designations. Provide non-ferrous phase and circuit identification labels in all enclosures for feeder circuit conductors. Provide underground marker tapes for all underground conductors. If underground conductors are not in metallic conduit, provide marker tape with foiled backing to facilitate detection.

8.15 Power Factor Correction

Add power factor (PF) capacitors to induction motors (10 HP or larger) to correct PF to 0.90 (+0.05, -0.00). Switch PF capacitors in with the motor. Size capacitor IAW IEEE 141, NEMA MG2 and motor manufacturer recommendations.

8.16 Power Service

Power requirements for buildings shall be 480 or 208/120 depending on building function.

8.17 Electrical Related Work

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

All electrical equipment shall be supported to meet seismic protection for zone 2. Use automatic setback thermostats in areas not normally occupied 24 hr/day, 7 day clock, battery backup. Emphasize maintainability in all designs

8.18 Raceways

Conduit run in concrete shall be PVC unless steel conduit is needed for a specific reason, i.e. to limit fault currents. Underground primary voltage feeders shall be in concrete encased conduit. All penetrations of fire resistance rated walls shall be fire stopped IAW NEC Article 300-21. Highlight compliance with NEC Articles 300-5(g) and 300-7(1) regarding moisture seals.

8.19 Conductors

Aluminum conductors smaller than No. 4 AWG may not be used IAW ETL 83-3. In mission critical facilities, housing, dormitories, and transient quarters, aluminum conductors may only be used for service entrances. The smallest branch circuit conductors acceptable are No. 12 AWG. Conductors No. 6 AWG and larger shall have heat resistant insulation.

8.20 Color Coding

Color coding for all three phase circuits shall be in accordance with the following:

	480V	208V
Phase A	Yellow	Black
Phase B	Brown	Red
Phase C	Orange	Blue
Neutral	White	White
Ground	Green	Green

8.21 Conduits Bored & Jacked Under Roadways

All new utility lines shall be run in 15-cm (6-in) PVC underground conduit and concrete encased under new roadways only, provide 1 spare conduit from transformer to building.

Underground lines shall have PVC to Schedule 80 Steel transition when going from underground to overhead.

8.22 Meters IAW ETL 94-2

Digital electrical meters shall be provided for all new facilities and all major remodels. The meter multiplier shall be clearly marked on the inside of the meter. Calculations determining the meter multiplier shall be submitted to the Contracting Officer for approval. Meters shall be generally located in rear of building or near service entrance. Each meter shall be wired to the EMCS system.

8.23 O&M Manuals

Provide one set of hard covered O&M manuals and four sets of O&M manuals on CD ROM.

8.24 As Built Drawings

All field changes shall be annotated on the As Built drawings prior to facility acceptance.

8.25 Intra-Building Wiring Policy

See Section 10, Telecommunication Standards.

[SECTION 9] SECURITY SYSTEM STANDARDS

The security system at Mt. Home AFB consists of a central computer located at Building 1013 – Law Enforcement Building. The computer communicates with all security panels located on base. This computer will only support security panels manufactured by Mycroft Technologies. Model number ACS-4400-X is of sufficient capacity to support most building security requirements. The prom chips in this panel must be compatible with the central computer software, which was developed by SMF Systems, San Francisco, Calif. In order to maintain coordinated system growth, security panels shall be compatible with the base IDS system.

All security panels will be located in a secure area of the building. Door contacts and motion detectors will be zoned separately. Under the floor or above the ceiling motion detectors or other sensors will be zoned separately. Duress alarm sensors and duct detectors will also be zoned separately. Every sensor shall be home run wired to the ACS-4400 security panel.

Electrical metal tubing (E.M.T.) will be used during security system installation. Install a 19-mm (¾-inch) conduit (E.M.T) from the security panel to the building's main telephone backboard (home run panel). Route a 24 AWG four wire Cat 5 telephone cable in this conduit.

Magnetic card readers with keypads shall be installed to permit entry into a secure area. Mycroft Technologies card reader ASC/1150 is supported by our system. The keypad shall be mounted on the outside of the primary entrance into the classified area. If the keypad is mounted on an external wall exposed to the elements, a NEMA enclosure with hinged cover will be installed to protect the card reader. If at all possible the keypad should be mounted in a vestibule.

Style of card reader used at Mountain Home AFB is mandatory:
Mycroft Technologies ACS 1150 magnetic card reader / keypad. This style of card reader interfaces with the Mycroft 4400 DGP through an RS-485 serial communication port at the back of the reader. The annunciated lights produce red, green and amber colors for access. It has a 12-digit keypad arranged in two columns with short beeps to echo the keystrokes.

It is recommended the following hardware be used during installation:

Microwave Motion Detectors:
DUALTEC 450T this series of detector senses motion and passive infrared (body heat). When the PIR detector senses a change in infrared the microwave instantly becomes alert. If motion is detected within a specific time period the sensor will alarm. It takes motion as well as heat to send an alarm once the system is armed. Maximum range is 15.2 meters by 12.2 meters (50 feet by 40 feet) which is obtained at a mounting height of 2.3 cm (7 feet 6 inches). Sensitivity is between 2 and 4 steps within field of view.

Magnetic Door Switch:
SENTROL 2507-A. The magnet closes a set of contacts sealed in the stationary portion of the two piece switch. The magnet is mounted to the door and the switched portion to the door jamb. When the security system is armed and the door opened, it also opens a normally closed circuit.

Duress Switch:
ADEMCO 269. Personnel activated switch with a keyed reset. Like operation to the magnetic switch, only difference being that it is manually operated and reset with a key.

Security Cable:
BELDON 9418. 18-gauge 4-conductor cable is used on all devices, except on card readers where the cable size must be 20-gauge 4 conductor according to the C.O.E

The Civil Engineering EMCS Shop will perform all software programming necessary for the central computer to communicate with the building ACS-4400 security panel. 366TH CES/CEIOA (208) 828-6575

[SECTION 10] TELECOMMUNICATION STANDARDS

This section describes telephone, pre-wiring, computer support, and other communication requirements that must be addressed in the project design. These criteria are as follows:

10.1 CATV

Century Communications is the current base-wide cable TV contractor. All components of the on-base distribution system are owned and maintained by the base wide cable TV contractor. This includes cable, amplifiers, splitters, etc. installed within the building.

New construction and remodeling projects should make provisions for conduit, outlets, lockable enclosures, power and building entrance. However, in all cases the contractor is liable for a complete and functional system.

10.2 Phone Standard

Phone standard is Type A.

10.3 Intra-Building Wiring

INTRA Building Wiring Policy - Follow requirements of Engineering Technical Letter (ETL) 87-9.

10.4 General Communications - Computer System Requirements

Computer System requirements (C-CS) are as follows:

A 3 meters by 3.5 meters (10 feet by 12 feet) Communication Equipment Room (CER) is required for a facility that has significant communications systems (C-CS) requirements. Unoccupied facilities and small facilities such as guardhouses, utility control buildings, storage bunkers, etc. will normally not require a CER. The CER normally serves as the entrance facility for all incoming C-CS ducts and service and as the main location for C-CS equipment such as PABXs, electronic key systems, main LAN hubs/routers/servers, etc. All CER spaces shall be environmentally controlled spaces, to be maintained at the same temperature conditions as occupied administrative areas.

10.4.1 Location

The CER should be located on the first floor with an exterior wall and be provided with double doors (recommended door size: 1.8 meters wide by 2.4 meters high (6 feet wide by 8 feet high)) without a center support to ensure that large equipment can be easily moved in the room. CERs and telecommunications closets (TC) must not be co-located with other building utility services such as HVAC, Generators/ Transformers, etc. due to the sensitivity of newer C-CS equipment to Electro-Magnetic Interference.

10.4.2 Power

The CER must have adequate power to support the C-CS equipment. In addition to normal power outlets, the CER requires 1 quad 20 amp dedicated branch circuit next to the backboard, and 1 quad 20 amp dedicated branch circuit next to the racks. The designer should coordinate power requirements with the base C-CS personnel and/or the Designated Engineering and Installation (E&I) group. In addition, the room should also have normal convenience outlets on all walls in accordance with NEC and/or local code requirements.

10.4.3 Supporting Structures

As a minimum requirement, the CER should have ¾-inch plywood backboards on all walls, from no greater than one foot above the finished floor level to no less than 2.1 meters (7 feet) above the finished floor level. Depending on the C-CS requirements, a floor mounted main distribution frame (MDF) may be required to support cable terminations.

10.4.4 Grounding

Grounding IAW ETL 90-6, must meet the appropriate NEC requirements and practices. As a minimum, provide a single-point ground for all Communications-Electronics equipment for the building within the CER. Provide a copper ground plate (bus bar with minimum 5 cm wide by 61 cm long (2 inches wide by 24 inches long) in the CER with 2.5 cm (1-inch) standoffs. The ground plate will be installed 2.1 meters (7 feet) above ground level on a wall (preferably an outside wall) within the CER. Provide a ground riser with a No. 1 or larger wire directly connected to the provided ground plate with no taps. The resistance of the ground riser must be 5 ohms or less measured for the main ground point. All connections of wire-to-wire and/or wire-to-ground rod must be cadwelded. The designer should coordinate with the base Communications-Computer Systems Officer (CSO) for communications equipment that needs more specific grounding.

10.4.5 Size Requirements

See Table 1.

10.5 Telecommunications Closet (TC)

A telecommunications closet (TC) is required for each floor with 929 square meters (10,000 sq. ft.) of usable building footage in a facility. A TC serves as the interface from the CER to the individual voice/data outlets in the facility and as a location for enterprise hubs for data LAN equipment. Note the CER may also function as a TC for the area in the facility where it is located.

10.5.1 Location

The TC should usually be located close to the center of the area it serves. The critical item relative to the location is that the installed length of all distribution cables (horizontal cables) run from the TC to the outlets must be less than 90 meters (295 feet) to support LAN data requirements.

10.5.2 Power

Each TC should have a least two 20 amp dedicated branch circuits to support data hubs, but can be greater depending on the planned equipment for the room. The room should also have normal convenience outlets on all walls in accordance with NEC and/or local code requirements.

10.5.3 Supporting Structures

The TC should have ¾-inch plywood backboards on all walls, from no greater than one foot above the finished floor level to no less than 2.1 meters (7 feet) above the finished floor level.

10.5.4 Grounding

Grounding must meet the appropriate NEC requirements and practices. As a minimum, provide a No. 6 ground wire or larger connected with a direct home run to the ground plate in the CER. This grounding

Table 1. CER Size Requirements

Building Usable Square Meters (SF)	CER Size Sq. Meters (SF)	# of Entrance Conduits
< 1,858 (20,000)	37 (400)	2
1,858 (20,000) to 9,290 (100,000)	46 (500)	4
9,290 (100,000) to 18,580 (200,000)	84 (900)	5
Every Add'l 18,580 (200,000)	+56 (+600) increment	-1

(Not less than 2:1 ratio Length to Width)

must be 10 ohms or less measured at the grounding point.

10.5.5 Size

Minimum size for a TC is 3 meters by 3.5 meters (10 feet by 12 feet); however specific dimensions could vary depending on the type of facility. Contact Base Civil Engineering for any variances. The TC size should be provided in accordance with (IAW) EIA/TIA-569, Chapter 7, Table 7.2-1.

10.6 Entrance Facilities

All facilities should have entrance conduit into the CER with the minimum number as indicated in Table 1. One of the ducts requires two 5 cm (2-inch) inner-ducts, and one of the ducts requires four 2.5 cm (1-inch) inner-ducts; the rest are spare. If the general area where the new facility will be located is served by a manhole (MH) and duct system, or if the impact of the new facility will greatly develop the area, then a new MH/duct system should be designed to connect the facility to the existing MH/duct system. See the referenced USAF/LEE letter for additional guidance. For projects where an extensive new MH/duct system will be required, it is critical that the appropriate E&I agency be consulted as soon as possible in the design definition process.

10.7 Wiring

10.7.1 Voice

All voice wiring should meet the minimum EIA/TIA Category 5 requirements. Consult with the base CSO for outlet type requirements such as RJ-11 vs. RJ-45 jacks for voices and whether there are any special keying or wiring requirements. The voice riser cable from the CER to each TC should be sized at a minimum of 30% of the total pair distribution planned for the TC rounded up to the next 100 pair count. The riser conduit design should include spare capacity for a second riser cable of equal size.

10.7.2 Data

All copper data wiring should meet the minimum EIA/TIA Category 5 requirements. All fiber cabling should meet the minimum ANSI/EIA/TIA/492AAA requirements. Installed length of copper data cables must be less than 90 meters (295 feet). The minimum size fiber optic riser cable from the CER to each TC is 6 strands. Coordinate with the base CSO for additional requirements. The riser conduit design should include spare capacity for a second fiber optic cable of equal size.

10.7.3 Outlets

The design should provide for an outlet box and wiring to support two voice, two data, and future fiber optic cable outlets every 9.3 square meters (100 square feet) of usable floor space. The designer should coordinate outlet requirements with the base CSO. In areas where conduits are used, the minimum size to serve a single outlet box should be 2.5 cm (1-inch) diameter to allow installation of copper and fiber optic cable. Pinouts for the voice and data jacks will conform to the EIA/TIA 568A standard.

10.7.4 Secure Wiring

All secure communications requirements should be wired IAW AFSSI 30-30, and AFSSM 70-11.

The figure shown on this page, extracted from EIA/TIA-569 Figure 2.2-1 Intrabuilding Elements, illustrates the typical relationships between the major telecommunications pathway and elements within a building.

All Undergournd cable shall be installed in 51-mm (2-inch) conduit.

[SECTION 11] ENVIRONMENTAL ENGINEERING STANDARDS

The following guidelines are intended to provide standardized guidance for environmental issues at Mountain Home AFB. These guidelines are then followed by a short guide specification (SECTION 01061) intended to be used only for smaller contracts. For larger contracts, Project Managers should consider requiring the use of the Unified Federal Guide Specifications in lieu of the attached MHAFB Guide Specification 01061. Review of the unified guide specifications at "www CCB.org" is encouraged in all cases. Project Managers should consult with the Environmental Global Flight in selecting which guide specification(s) to use.

This document is provided in PDF and MS-WORD format.

Following the Guide Specification are several forms, checklists and samples to assist the designers and engineers as well as the contractor performing the work.

1) WASTE DISPOSAL AND RECYCLING PLAN:
This plan is required in the environmental specification section whenever applicable.

2) HAZARDOUS MATERIALS REPORTING FORM:
This form is required as an attachment to the environmental specification section whenever hazardous materials may be used in the contract. An estimate of hazardous material quantities is required, as are manufacturer specific material data safety sheets.

3) HAZARDOUS MATERIALS MONTHLY USAGE LOG:
This form is required as an attachment to the environmental specification section whenever hazardous materials may be used in contracts ranging over an extended period of time.

4) PRECON CHECKLIST:
This checklist is used at all preconstruction conferences prior to the Contracting Officer's issuance of the notice to proceed. Designers should use this checklist as additional guidance while writing the specifications. Project managers are requested to make this form available with the RFP and Design Packages.

5) PROJECT CHECKLIST:
This checklist should be used by all project managers and designers to assist them in addressing environmental concerns. Please use this while consulting or coordinating with the Environmental Global Flight.

11.1 Environmental Guidelines

11.1.1 Asbestos & Lead Based Paint Materials

Projects involving asbestos containing materials for renovation or removal can reference 366th Wing Plan 3206-07 (or most current version) for project management procedures, policies, and required notifications. All asbestos/lead paint surveying and documentation will be the responsibility of the designer. MHAFB has an asbestos and lead database showing test results on some of the structures.

Contractor work involving asbestos and lead based paint removals shall comply with current regulations and including 40 CFR Part 61, 40 CFR Part 745, OSHA 1910, and OSHA 1926.

The contractor shall dispose of all asbestos materials off-base in an approved landfill.

Lead containing materials will have to be tested in order to determine proper disposal procedures.

11.1.2 Waste Disposal

All waste disposal activities must be coordinated in advance with the Hazardous Waste Program Manager (208- 828-6351). Non hazardous construction debris generated by the contractor must be disposed of off-base. Weight tickets and descriptions of debris must be provided to the Environmental Global Flight, building 1297.

11.1.3 Recycling Center

MHAFB's recycling center accepts all metals, cardboard, newspapers, and other mixed paper products. The recycling center can also assist with coordinating collection and pick up of recyclables. Contractors are encouraged to participate by recycling these products at the base recycling center. This list changes due to market fluctuations. Contact the recycling center for most current items (208-828-4212).

11.1.4 Soil Farm

A soil farm may be available on base, with prior authorization and coordination, for treatment of a small quantity of soils contaminated with hydrocarbons. Space is limited. Check with the Environmental Global Flight (208-828-6351) prior to developing plans to use this space.

11.1.5 Environmental Permits

Processing of required environmental permits (i.e., air emissions, storm and industrial water discharge, etc.) prior to releasing the contract for execution shall be the sole responsibility of the designer(s). Please inform the Environmental Global Flight of all environmental permit applications. These may vary on a case-by-case basis.

11.1.6 Sanitary Drains

Unless it is deemed necessary, it is preferred that oil/water separators are not used in draining areas where petroleum, oils and lubricants are encountered. If installing an oil/water separator, an above ground system is preferred.

11.1.7 Liquid Storage Tanks

Above ground storage tanks are required and shall meet all current regulations and code requirements. All tanks storing a hazardous liquid will either be of double walled construction, or secondary containment will be provided. Contact the Environmental GlobalFlight for more specific information.

11.1.8 Green Procurement

Whenever technically feasible and cost effective, products installed in the project will use as much recycled material as possible in accordance with 366th Wing Plan 3213-08 (or most current version).

[SECTION 12] FIRE SAFETY STANDARDS

This section describes the fire protection conditions and requirements that help the designer select appropriate fire protection equipment for the project. Each specific fire detection or suppression system selected should be explained in detail. The criteria shall be prepared and "signed off" by the base fire department (MIL HDBK-1008C and most current NFPA Standards as applicable).

12.1 Emergency Light & Power Systems

Provide lead calcium batteries rather than nickel cadmium batteries for backup systems.

All exit signs shall be white with red letters, with properly oriented arrows when applicable. All internally illuminated signs must use low maintenance low energy consuming lighting. Light emitting diodes (LED) that actually spell out the word EXIT are required. Refer to Engineering Technical Letter (ETL) 91-5.

Emergency egress lighting shall be integral to overhead lights. Stand alone wall units are discouraged.

Alarm Panel, pull stations, and enunciators shall all be keyed the same. Simplex "B" key or Firelite 17003.

12.2 Fire Alarm & Detection Systems

Utilize lead calcium rather than nickel cadmium batteries for fire alarm panels.

Ensure disconnect breaker is inaccessible to the public.

Provide dedicated locked out breaker for alarm panel.

Provide an alphanumeric graphic enunciator with keyed silence switch at entrances to facilities.

When existing detectors are hidden by a new drop ceiling, a detector light should be installed below the new ceiling to allow visibility from space below. All heat and smoke detectors will have a latching LED alarm.

The fire alarm control panel shall have the capability, of reporting alarm and trouble by zone as directed by AHJ. The initiating devices shall be Style D (Class A) The fire alarm control panel must also have "walk-test" capability. Submittals shall provide for the layout of all fire alarm system components.

All panels will come complete with software and training necessary for performing any in-house reconfigurations of the installed system. Training shall be performed by a true factory representative. The training of on site personnel should be the primary focus, with production of training videos and materials as a byproduct.

Provide a supervised override switch on all fire alarm panels where shut down of air handlers or electrical power is installed. This function will facilitate testing of the fire alarm system without shutting down equipment or power

12.2.1 Fire Alarm Reporting System, Radio Type

Provide a radio fire alarm system for all new facilities. The system will be compatible with the Monaco D-700 RF central receiving system. The transceivers will require the antenna package (VHF omni directional antenna). The required frequency will be 138.2875. The radio system reports alarms to the central communication center. The system shall indicate the area of alarm and the radio link shall be supervised and operated using two way data transmission IAW NFPA 72 standards.

The contractor shall be certified by the Manufacturer.

The contractor shall have all the necessary equipment to install the Radio Transceiver i.e. Watt meter, Volt meter ,etc.

12.3 Sprinkler Systems

Sprinkler systems layout shall not be included in contract drawings. Shop drawings shall be submitted by the Contractor before construction proceeds. The designer and installer must be certified by the State of Idaho's Fire Marshal. Documents and specifications will be reviewed in accordance with MIL-HDBK-1008C, NFPA 13, and NFPA 24. All mechanical penetrations of fire-rated walls, roofs, floors, etc shall have barrier of equal or superior protection. If penetrations require the application of a sealant, as a minimum, add a general reference on the drawings. All fire related design and specifications must be closely coordinated with the base fire department or Technical Services Branch (contact the Fire Prevention Office).

Where wet pipe sprinkler systems are installed, ensure non-heated areas have dry pendant sprinkler heads.

Alphanumeric graphic enunciator alarm panel and signals can be painted red or painted to match walls. Pull boxes must be painted red so that they can be easily seen.

12.4 Fire Extinguishers & Cabinets

Fire extinguisher cabinets must use recessed or semi-recessed mounted, 68.6 cm (27 in) high by 30.5 cm (12 in) wide by 20.3 cm (8 in) deep, non-lockable, and mounted 152.4 cm (60 in) from floor to top of cabinet. Cabinet color shall be brushed aluminum.

Fire ratings between wall shall be shown on the architectural floor plan either in a schedule or on the drawing itself (preferred method). This requirement will then be referenced on the mechanical and electrical sheets to ensure wall penetrations are sealed to maintain fire-rating integrity.

12.5 Material Fire Ratings

Interior finish material for exits, stairwells, corridors, and sleeping areas shall be Class A fire rated. Flame spread will be 25 or less; smoke development of 50 or less. All other areas Class B fire rated will have flame spread 75 or less; smoke development of 100 or less.

12.6 Fire Hydrants

For new facility designs, determine the fire hydrant requirements. Refer to Engineering Technical Letter (ETL) 91-3 and MILHDBK-1008C for guidance.

[6.4] Mountain Home AFB Environmental Guide Specification

Mountain Home AFB
ENVIRONMENTAL SPECIFICATION

ENVIRONMENTAL PROCEDURES

Updated 01 July 2010

PART 1 GENERAL

1.1 SUMMARY

The contractor is responsible for complying with all Air Force, local, state, and federal laws and regulations regarding protection of the environment and resources.

1.2 QUALITY CONTROL

The contractor and subcontractors shall establish and maintain a quality control system for environmental protection of all items set forth in this contract. Record any problems in complying with laws, regulations, ordinances, and corrective actions taken.

***1.2.1** Notifications:*
The Contracting Officer (CO) will notify the contractor in writing whenever noncompliance with Federal, state, or local laws, regulations, or permits is observed. In such cases, the contractor shall provide written response to the CO, outlining the proposed corrective actions and take such actions after receiving approval from the CO. If prompt action to comply with pertinent laws or regulations is not taken, the CO may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions will be granted for work stoppage due to the contractor's noncompliance with environmental laws and regulations. Additional costs or damages will not be allowed to the Contractor for any such suspension.

***1.2.2** Work Areas:*
The Contractor is responsible for cleanup and restoration of all areas utilized during this contract action. All restoration and cleanup activities will be at the contractor's expense and to the satisfaction of the Government Representative. If the contractor fails or refuses to restore the area to its original condition or better at the end of the contract field effort, the CO shall have the necessary work performed and charge the cost to the Contractor.

1.3 HAZARDOUS MATERIALS (HAZMAT)

***1.3.1** Contractor's Use of Hazardous Materials on Base:*
There are two categories of contractors using HAZMAT on MHAFB. Contractor's hazardous materials will NOT be bar-coded. Contractor categories and Hazardous Materials (HM) tracking requirements are as follows:

a. Long term contractors: These contractors have been awarded a contract (of any type) that has an estimated or expected duration of 6 months or more and hazardous materials are expected to be used during performance of the work. Examples of these types of contracts include, but are not limited to: US Army Corps of Engineers' projects, MAJCOM projects and base maintenance contractors. The AF3952s will be valid for the duration of the contract whenever possible. Long term contractors must complete ALL requirements listed in part 1.3.2.

b. Short term contractors: Short term contractors have been awarded a contract (of any type) that has an estimated or expected duration of less than 6 months and are expected to use hazardous materials during performance of the work. These contracts will be evaluated by the 366 CES/CEAN HAZMAT Manager and/or the MHAFB Hazardous Materials Management Process (HMMP) Team on a case by case basis. Contractors in this category may be required to track all, partial, or none of their HAZMAT dependent upon the type of work to be done, and the types and quantities of HAZMAT to be used. The Government Representative must contact the 366 CES/CEAN HAZMAT Program Manager (HMPM) for determination of these types of contracts.

1.3.2 *HAZMART Tracking Procedures for Contractors:*

For the purposes of establishing the required HAZMART account and processing hazardous materials authorization requests, ALL contractors must submit the following to 366 CES/CEAN HMPM, Bldg 1297 prior to bringing the requested hazardous materials onto Mountain Home Air Force Base (MHAFB). :

A completed "MHAFB Contractor's Hazardous Materials Reporting Form," included in Attachment 5 of the MHAFB HAZMAT Monitor's Handbook shall be submitted. This form will list all hazardous materials intended to be used during the contract with either actual or maximum estimated quantities. The Reporting Form is also available from the HAZMART at (208) 828-2360/2690, or the HMPM at 208-828-6351.

A copy of a manufacturer specific Material Safety Data Sheet (MSDS) must be provided for each hazardous material listed on the reporting form.

[**SHORT TERM CONTRACTORS STOP HERE** and await determination. If, after submitting the paperwork from Section 1.3.2, your Government Representative notifies you that you MUST track any or all of your hazardous materials, continue on from here for all hazardous materials that are required to be tracked. If you are NOT required to track ANY hazardous materials, you are finished at this point.]

Once approved by the 366 CES/CEAN HMPM, the package will be logged into 366 CONS/LGCB database systems on Submittal Form 3000. The product information will be entered, by HAZMART personnel, into EESOH-MIS material tracking system, which will generate an approved AF Form 3952. Where possible the AF Form 3952 will be approved for the duration of the contract. The contractor shall be responsible to maintain the AF Form 3952 and MSDS for each hazardous material and submit them for inspection upon request. The contractor shall be responsible for providing proper storage (e.g. flammable, combustible, corrosive, secondary containment, etc.) and practice safe usage and handling of materials.

1.3.3 *Monthly Reporting:*

The contractor will keep track of actual hazardous materials usage quantities and report the quantities monthly to the HAZMART. This will be done by maintaining the "Contractor's Hazardous Materials Monthly

Usage Reporting Form," included in Attachment 6 of the MHAFB HAZMAT Monitor's Handbook, and faxing it directly to the HAZMART and furnishing a copy to the Government Representative on or before the 5th day of each month. The fax number to the HAZMART is 208-828-2335 where this form is also available.

1.3.4 *Adding a New Hazardous Material:*
If a hazardous material needs to be used which had not been previously authorized or included on the initial "MHAFB Contractor's Hazardous Materials Reporting Form", the contractor shall provide items in Section 1.3.2 above to the Government Representative and await the return of the packet with approved AF Form 3952s.

1.3.5 *Closing out the HAZMART Account upon Completion:*
Upon completion of the contract, the contractor must contact the HAZMART and ensure that all hazardous materials used during the contract were reported to the best accuracy possible. Only containers of hazardous materials that were completely consumed during performance of the work need to be accounted for. ALL leftover, full, partially full or empty hazardous materials containers not used during performance of the work are the property of the contractor and will be removed from MHAFB upon completion of the contract unless specific prior arrangements have been made with the Government Representative in coordination with the HMPM.

1.3.6 *Reserved Right of MHAFB HMMP Team:*
The team reserves the right to include any and all contractors, regardless of contract duration or scope of work, or tenant/vendor functions or facilities, upon determination of the HMMP Team, in any or all requirements stated in the MHAFB HAZMAT Monitor's Handbook.

1.3.7 *Storage Containers:*
All storage containers 55 gallons or greater must have appropriate secondary containment to satisfy federal requirements. Notify the Government Representative of any storage tanks (i.e. refueling/dispensing tanks, etc) brought on base. The Government Representative will coordinate with 366 CES/CEAN at 208-828-1761 to ensure that the Contractor properly maintains and stores any storage tanks on base.

1.4 HAZARDOUS WASTE

Notify the Government Representative if any hazardous substance or waste, as defined by the Environmental Protection Agency (EPA), is produced as a by-product of work activities. Note: In general, hazardous wastes are usually generated when the following materials are used during the project:

- Paints
- Cleaners (any type), solvents, thinners
- Sealants / adhesives
- Gasoline or similar type fuels.

The Government Representative will coordinate with 366 CES/CEAN at 208-828-6351 to ensure that the Contractor properly stores, transports, and disposes of any wastes generated. The Contractor shall be responsible for the proper handling, transporting, and manifesting/disposal of such substances; and the cost incurred for complying with these tasks.

1.4.1 *Hazardous Waste Transportation:*
Notify the Government Representative before transporting any hazardous substance or waste, as defined by the EPA, while at MHAFB. Identify the type and quantity of each substance, the origin and destination on/off MHAFB, and intended route of travel. By law, hazardous waste cannot be transported onto MHAFB.

1.4.2 *Ownership:*
Hazardous waste generated by construction operations remains the property of the Contractor and shall be manifested and removed from MHAFB for proper disposal. The Contractor is required to coordinate with the 366 CES/CEAN 208-828-6351 through the Government Representative for proper storage, characterization, transport and disposal of waste from MHAFB.

1.4.3 *Compliance with Regulations:*
Contractor operations shall be in compliance with the Resource Conservation and Recovery Act (RCRA), 40 CFR, and Idaho Rules, Regulations and Standards for Hazardous Waste, (Idaho Code 58.01.05) at all times.

1.4.4 *Limits:*
No more than 55 gallons, total, of hazardous waste shall be accumulated by the Contractor on site. The Contractor must coordinate with the 366 CES/CEAN 208-828-6351 through the Government Representative for the location where hazardous waste is to be accumulated, the containers used for storage, and transportation off of MHAFB.

1.4.5 *Control Plan:*
Submit a Hazardous Materials/Hazardous Waste Control Plan to the Government Representative for approval and coordination if any materials will be used that are corrosive, flammable, toxic, or reactive.

1.4.6 *Hazardous wastes shall be manifested off of MHAFB.*
Comply with all applicable regulations and laws when transporting hazardous waste and materials. These include, but are not limited to, Department of Transportation (DOT), EPA, and Idaho Department of Environmental Quality (IDEQ) regulations (40 CFR, 29 CFR, IDAPA 58.01). The 366 CES/CEAN 208-828-6351 is the only approval authority for hazardous waste transportation/disposal for MHAFB. The Contractor is required to coordinate with the Asset Management Flight Environmental Section 208-828-6351 to manifest hazardous waste off of MHAFB.

1.4.7 *Universal Waste:*
Universal waste consists of designated items that, by law, have to be collected, managed and disposed via special direction. Coordination with the Central Collection Facility (CCF) at Building 1296 (828-2726/2396) is required for manifesting and/or courtesy storage. These items consist of batteries of all sizes and types (except lead/acid vehicle batteries), fluorescent or incandescent bulbs of all sizes and types, pesticides and mercury containing items such as thermostats, thermometers, etc. If at any time universal waste is encountered or expected to be encountered, contact the 366 CES/CEAN Hazardous Waste Program Manager at 828-6351, or the CCF for clarification or assistance.

1.4.8 *Suspect Pesticide Containing Soil:*
Pesticides, mainly chlordane, can be expected in the soil under all building slabs, and outside and inside of the foundation walls. All soil within these defined areas that are excavated during demolition or construction activities shall be placed back into excavation as near the point of origin as possible. If working in an area where a building has been demolished and the foundation is not identifiable the entire area needs to be considered for possible pesticide contamination. Under no circumstances shall the soil be transported off the project site unless prior approval has been obtained from CEAN Compliance and proper sampling/analysis has been conducted. The definition of “project site” will be the immediate vicinity of the construction/demolition activities within the project boundaries. When moving soils into the former foundations locations and during grading, the Contractor shall keep the soil moist to minimize fugitive dust. Soils shall have a 6-inch layer of top soil over all landscaped/turf areas prior to placement of sod/seed. If Contractor chooses to crush foundations for re-use on site, the Contractor shall keep these

materials wet to minimize fugitive dust. Concrete sampling for characterization may be required PRIOR to crushing if concrete is to be moved off-site; Contractor will work with CO and 366th CEAN to determine extent and type of sampling/analysis required. Fines from the crushing operation of building foundations shall be treated and dealt with as contaminated soil.

1.5 ASBESTOS AND LEAD CONTAINING MATERIALS

In the event asbestos or lead abatement is required, the contractor shall file the appropriate advanced notification(s) to the appropriate regulatory authority. Submit notification copies to the Government Representative and the Environmental Office prior to the start of work. The contractor shall ensure that the details of the abatement plan (containment/work area, clean rooms, load-out, clearance samples) have been reviewed by a certified industrial hygienist and meet applicable Federal and OSHA regulations for asbestos and/or lead abatement projects.

1.6 SPILLS

1.6.1 *Uncontrolled Spills:*

In the event of an uncontrolled spill, the contractor shall notify the MHAFB Fire Department by calling 911 if using a phone on the MHAFB system or 828-1117. (*NOTE: Calling 911 from a cell phone or an off-base phone system will reach emergency services at the City of Mountain Home and then will be rerouted to MHAFB, delaying response). MHAFB Fire Department will initiate the notification system. Notify the CO of all spills regardless of substance or quantity. The Government Representative will coordinate with 366 CES/CEAN, 208-828-6351, to ensure that all spills have been properly contained, cleaned-up, and reported. When the contractor reports a spill, it shall note if the spill falls into 1 of the 3 categories:

- Class I Spill: Less than 2 lineal feet in any plane dimension
- Class II Spill: Not over 10 lineal feet in any plane; not over 50 square feet; and not of a continuous nature
- Class III Spill: Over 10 lineal feet in any one dimension; over 50 square feet; and/or of a continuous nature

1.6.2 *Spill Response Plan:*

Develop a spill response plan (Site Specific Contingency Plan (SSCP)) that addresses prevention and control of spills for each type chemical and fuel used or stored at each site occupied under this contract. Contact the POL/Fuel Storage Tanks Protocol Manager at MHAFB, 366 CES/CEAN; phone 208-828-6351 for assistance in developing the SSCP. CES/CEAN has a SSCP template form available for Contractor review and use as a form. The SSCP must include the name of the individual (and an alternate individual) who will report any spills or hazardous substance releases and who will follow up with complete documentation. Each employee must be familiar with the plan so risk of spills is minimized and response to spills can be dealt with in a manner to minimize impact to the environment. The Contractor shall be responsible for all costs associated with cleanup and restoration of sites contaminated by chemicals from Contractor activities. The elements of the plan should include the following:

- PREVENTION:
  Methods and procedures established by the Contractor to prevent spills from occurring. Examples include ensuring connections are tight, providing containment when drawing off chemicals from a container or transferring chemicals, closing containers when not in use, and using proper equipment for the job.

- CONTROL:
  Procedures to control the spread of a substance or chemical should spill, release or leak occur. The intent is to minimize environmental contamination without physical harm to people in the area.
- SUPPLIES:
  Provide necessary supplies and equipment on hand to control any spills, leaks, or releases. These include pads and other absorbent material, trays, mats to cover manholes and drains, etc.
- TRAINING:
  The Plan must ensure employees, including subcontractors working on the job, are educated and trained in the prevention and response procedures that are tailored to the specific site and task.
- PROCEDURE OUTLINE:
  An outline of expected procedures to be followed in the event of a release or spill of a chemical is provided for the Contractor's use. The Contractor is ultimately responsible for ensuring spills do not occur and responding in a manner to prevent harm to people and minimize environmental contamination. The person discovering the spill or release is responsible for initiating the Spill Response Plan and providing initial defensive actions without undue risk of personal injury. Implement the following actions as necessary upon discovery of the spill or release.
  - Initiate evacuation if required.
  - Notify the base Fire department at 828-1117. The caller should provide the following information to the base fire department if known or can be reasonably determined:
    a. Name, and company, of individual reporting the spill
    b. Location and size of the spill or release:
       - Class I Spill: Less than 2 lineal feet in any plane dimension
       - Class II Spill: Not over 10 lineal feet in any plane; not over 50 square feet; and not of a continuous nature
       - Class III Spill: Over 10 lineal feet in any one dimension; over 50 square feet; and/or of a continuous nature

    c. Number of injured personnel and nature of injuries (if applicable)
    d. Substance spilled or released, based on knowledge, labels, signs, etc.
    e. Estimated rate of substance release
    f. Time spill occurred
    g. Extent to which spill has traveled
    h. Any additional information that might aid the Fire Department, such as other potential hazards at the site
    i. Stop the spill or release at the source whenever possible without risking personal injury.
    j. Contain the spilled material to prevent further spread and release to drainage ditches, pipes, manholes, storm water drop inlets, etc.
    k. Secure the area to ensure unauthorized personnel do not approach or become endangered.
    l. Ensure all sources of ignition are restricted and prevented in the area when flammable substances are involved.
    m. Contact the Government Representative and CEAN 208-828-6351 and inform them of the situation. The Government Representative is to ensure the proper paperwork is completed for release. If the release is over the reportable quantity, CEAN is to make all state and federal notifications.

Note: Small spills that can be contained and cleaned up by the Contractor without any damage to the environment may not require all the steps above. Ultimately, the responsibility rests with the Contractor to properly clean up the spill to EPA and State of Idaho Department of Environmental Quality standards. In all cases, the Government Representative must be notified as soon as possible.

1.7 RECYCLING

1.7.1 *Requirements:*

Recycling is required to the maximum extent practicable for all waste generated by the contractor. Demolition projects must utilize deconstruction practices as much as feasible. All materials removed from facilities prior to demolition for re-use must be weighed and weights must be reported to 366 CES/CEAN monthly or at the end of the project if lasting less than one month.

Any concrete waste generated by contracting activities shall be recycled on base only if the contractor is willing to crush the concrete to 1" or less in size and stockpile in an area designated by the Governments Representative.

Asphalt waste generated by contracting activities shall be recycled on base only if the contractor is willing to mill the asphalt first and stockpile in an area designated by the Government Representative.
If the above activities are not performed by the contractor, all concrete and asphalt waste will be shipped off base for proper disposal.

MHAFB recycle center shall be used on applicable projects. Contact the base recycling center, at 208-828-4212, for the latest recycling information concerning what materials are currently accepted and to make arrangements for on-site bins.

1.7.2 *Sorting:*

Recycling shall consist of sorting and delivering recyclable items to the appropriate recycle processors, which are private or government entities currently accepting material for the purpose of recycling. The MHAFB recycling center reserves the right to not accept the contractor's recyclables, at their discretion.

1.7.3 *Recyclables:*

Recyclable items include: wood, all metals, cardboard, plastics, and paper. Contact the base recycling center, 208-828-4212, for the latest recycling information or to make arrangements for on-site bins.

1.7.4 *Waste Disposal and Recycling Plan:*

Submit a Waste Disposal and Recycling Plan for the Government's approval prior to contract start. When preparing the plan, the contractor may contact the MHAFB Recycle Center at 208-828-4212 or the Solid Waste Manager at 208-828-1853 for advice and suggestions on how to best satisfy the recycling requirement. Submit the plan to the CO for coordination with the MHAFB Environmental Section, 366 CES/CEAN. The plan shall include, at a minimum:

- Brief description of work done under the contract
- Identification of the major waste stream (categories of waste, e.g. wood, fixtures, cardboard, etc) to be generated
- Intended method and location of disposal or recycling for each waste system
- Reference Section 1.4.7 Universal Waste: Universal waste consists of designated items that, by law, have to be collected, managed and disposed via special direction. Coordination with the Central Collection Facility (CCF) at Building 1296 (828-2726/2396) is required for manifesting and/or courtesy storage.

1.7.5 *Disposal:*

The contractor may choose to dispose of any or all of the waste streams in the following manner:
Dispose of any or all of the waste streams off-base. Recover any or all of the waste streams by sending them to an off-base recycling company or center.

Turn in of some waste streams to the MHAFB recycling program with the Government's approval. The acceptance of these waste streams depends on the Government's ability to process the waste stream and the contractor's ability to adequately prepare the waste stream to meet the Government's condition requirements. The Government is currently encouraging the recycling of the following items on MHAFB: wood, all scrap metal, corrugated cardboard, paper and plastics.

1.7.6 *Refuse Disposal:*

Refuse shall be defined as debris other than organic materials like trees, brush, leaves, grass, stumps, etc. Place refuse in containers that are emptied on a regular schedule. Conduct all handling and disposal of refuse to prevent contamination of the environment. Dispose of refuse off site, in accordance with all local, state, and federal rules and regulations, following coordination with the 366 CES/CEAN and the CO, at the Contractor's expense.

1.7.7 *Asbestos/Lead Disposal:*

All asbestos containing materials shall be disposed of off-base by the contractor at an approved landfill. Lead containing materials may be considered hazardous waste and will need to be tested in order to determine if it's hazardous or solid waste for disposal purposes.

1.7.8 *Additional Restrictions:*

Scales available for use are located at DRMO, building 1322. Weight tickets must be forwarded to 366 CES/CEAN on a monthly and/or end of project basis.

Do not deposit any refuse in existing containers or dumpsters. Do not pour, drain, or wash cleaners and other solutions into plumbing fixtures, sanitary sewers, or storm sewers. Refuse shall not be burned. Burning of vegetation or tree stumps will not be allowed unless the work site is in an area approved for burning and approval is obtained from the Government Representative in conjunction with the base Fire Chief and Wildland Fire Program Manager.

1.8 PROTECTION OF ENVIRONMENTAL RESOURCES

Protect environmental resources within the project boundaries and those affected outside the limits of permanent work under this contract during the entire period of this contract. Confine activities to areas defined in the drawings and specifications.

1.8.1 *Protection of Land Resources:*

Do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without special permission from the Government Representative except as otherwise specified or indicated. Do not compact root zones. All ground disturbance and equipment and materials staging must be at least 10' radius from tree trunks. Trees to remain on site will have a chain link or wooden fence erected around the drip line area to prevent accidental/root zone damage. Do not disturb, drive through, or fill areas designated as wetlands. All construction activity, equipment staging, and material staging must stay within pre-approved site boundaries. Any unapproved or unnecessary destruction of land resources will be corrected at the contractor's expense to the satisfaction of the Government Representative.

1.8.2 *Protection of Water Resources:*

Keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters. If the project disturbs 1 or more acres of contiguous land, comply with EPA requirements for NPDES storm water construction general permits and comply with the conditions of the permit. Once

Notice of Intent (NOI) is submitted, the EPA requires a review period of 7 calendar days prior to start of construction. Submit for information purposes a printed copy of the NOI and a copy of the Storm Water Pollution Prevention Plan (SWPPP), through the Government Representative, to the MHAFB CES/CEAN Office. In all cases of land disturbance, each storm water removal and treatment structure must be in conformance with the "Catalog of Storm Water Best Management Practices for Idaho Cities and Counties". These best management practices shall be employed to control storm water runoff. Ensure there are no unauthorized discharges to the storm water collection system. Ensure all discharges to the sanitary sewer system are in accordance with the requirements of the wastewater treatment plant NPDES and wastewater land application permits.

1.8.3 *Protection of Air Quality:*

Control dust particles, aerosols, and gaseous by-products from construction and demolition activities, processing, and preparation of materials at all times, including weekends, holidays, and hours when work is not in progress. Control hydrocarbons and carbon monoxide emissions from equipment to Federal and state allowable limits at all times.

If required by the contract, portable concrete batch plant, portable rock crushing plant, hot mix asphalt plant, and associated generators must be permitted in State of Idaho by the contractor prior to construction. Copies of the permits must be submitted to the CO and coordinated through the Government Representative and the 366 CES/CEAN. Location of the plant(s) must be coordinated through the Government Representative. The Contractor shall provide monthly through-put quantities and generator hours to 366 CES/CEAN through the Government Representative. While operating at MHAFB, contractors are responsible for their own permit requirements/conditions.

1.8.4 *Protection of Acoustic Environment:*

Use low noise emission equipment and products certified by the EPA to the maximum extent possible. Refer to: "40 CFR 204 Noise Emission Standards for Construction Equipment"

1.8.5 *Excavation:*

Exercise care when excavating trenches near trees. Where roots are 2 inches in diameter or greater, excavate the trench by hand and tunnel under the roots. When large roots are exposed, wrap them with wet heavy burlap for protection and to prevent drying. Trenches dug by machines adjacent to trees having roots less than 2 inches in diameter shall have the sides, hand trimmed making a clean cut of the roots. Trenches having exposed tree roots shall be backfilled within 24 hours unless the roots are adequately protected by moist burlap or canvas.

1.8.6 *Landscape Restoration:*

Restore all landscape features, such as trees, plants, shrubs, grasses, etc, damaged or destroyed during Contractor operations outside and within the work areas. Restoration shall be to a condition similar to that which existed prior to construction activities unless otherwise indicated on the drawings or in the specifications. Areas that were not improved prior to disturbance will be semi-improved with a seed mix reviewed and approved by 366 CES/CEAN 208-828-6668. This restoration shall be done at no additional cost to the Government. If the Contractor fails or refuses to repair the damage promptly, the CO may have the necessary work performed and charge the cost to the Contractor.

1.8.7 *Landscape Replacement:*

Replace trees in kind with a minimum 4-inch caliper nursery stock. Shrubs, vines, and ground cover shall be replaced in kind; size to be approved by the Contracting Officer.

- PLANT MATERIALS:
  All plant material shall meet specifications outlined in ANSI Z60.1, "American Standard for Nursery Stock."
- GRASS REPLACEMENT:
  Replace grass areas in kind by sod or seeding. Sod shall be required in all regularly maintained lawn areas and shall be installed in accordance with American Sod Producers Association Guideline Specifications to Sod. Do not use Kentucky bluegrass sod. Zone appropriate Turf Type Tall Fescue shall be used.
- GRASS SEEDING:
  Install grass seeding on a minimum 4-inch topsoil and according to Landscaping Specification Section [OR as recommended by the local county extension service]. Do not use Kentucky bluegrass or annual ryegrass seed. Zone appropriate Turf Type Tall Fescue shall be used.
- PLANT SPECIES:
  Acceptable replacement plant species will be coordinated with the Environmental Section.

1.9 PROTECTION OF CULTURAL RESOURCES

1.9.1 *Definition:*

Cultural resources shall be defined as historic or prehistoric artifacts, pictographs, human remains, and any other evidence of historic human activity, including but not limited to: old bottles, cans, and whole or fractured tools, arrowheads, spear points, or pottery. Any man-made object may be a cultural resource. All man-made objects shall be identified to the Government Representative.

1.9.2 *Disturbance of Cultural Resources:*

Do not disturb any site that contains evidence of cultural resources. If evidence of cultural resources is discovered, stop work and notify the Government Representative. The Government Representative will then notify the MHAFB Cultural Resource Manager at 208-828-4247 or 208-828-6351. Do not resume work until notified by the Government Representative or CO.

1.9.3 *Impact to Any Historical, Archaeological Cultural Resource, Biological Resources or Wetlands:*

The contractor shall provide a historical, archaeological, and cultural resources plan; a biological resources plan; and a wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural, and biological resources and wetlands known to be on the project site: and/or identifies procedures to be followed if historical, archaeological, cultural, and biological resources and wetlands not previously known to be onsite or in the area are discovered during construction. The plan shall include methods to assure the protection of known or discovered resources and shall identify lines of communication between Contractor personnel and the Government Representative.

1.9.4 *Disturbances or Damage to Flora and Fauna:*

The Contractor shall minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. The Contractor shall be responsible for the protection of threatened, endangered, species of concern, migratory birds, or otherwise protected animal and plant species, including their habitat in accordance with the MHAFB INRMP, Federal, State, Regional, and local laws and regulations. Protection of migratory birds, particularly burrowing owls, is of particular concern on MHAFB. Migratory birds, their eggs, and their occupied nests may not be destroyed. Burrowing owls may be present from March through July and occupy abandoned badger holes. Unoccupied badger holes may be filled to prevent conflicts during construction, if unoccupied status is confirmed by Mr. Carl Rudeen. Contact Mr. Carl Rudeen at (208) 828-1785 or (208) 828-6351 with any questions or for assistance. If species of

concern are encountered within the project footprint, contact the MHAFB Natural Resources Manager at 208-828-6668 or 6351.

1.10 BACKFLOW PROTECTION DEVICES

Use backflow protection devices if tapping into a hydrant to gain a water source for activities.

1.11 OZONE DEPLETING SUBSTANCES (ODS)

Products using Class I ODS are prohibited for use at MHAFB. Currently, the only Class I ODS waiver being approved for use on base is for aircraft fire suppression systems.

1.12 RADIOACTIVE MATERIALS

1.12.1 *Request to bring radioactive materials or nuclear devices on Mountain Home:*
Submit requests to bring radioactive materials or nuclear devices on Mountain Home AFB 30 days prior to planned activities using the material or devices. Such devices include those required to test soil density by nuclear methods, lead paint meters, and any apparatus containing radioactive material. Requests shall be submitted to the CO for review by the MHAFB Radiation Safety Officer (RSO) at the 366 ADS/SGGB 208-828-7270. The request shall include the following:

- A description of the proposed activities on Nuclear Regulatory Commission (NRC) Form 241, Report of Proposed Activities in Non-Agreement States. Include proposed activities, locations of use, and traffic routes to be used.
- The procedures established to ensure the health and safety of personnel while the device is on MHAFB.
- A current and valid copy of the applicable NRC or Agreement State license. The license must state Mountain Home AFB by name, or state approval for work at temporary work sites where the NRC or Agreement State maintains jurisdiction. In lieu of a license, submit a written certification of exemption from NRC licensing requirements, and cite the applicable exemption of 10 CFR 150.10 or 150.11.
- The most current leak detection test results. Provide new results to the CO if updating of the leak detection test is required during the Project.
- A copy of that part of the contract describing work to be done at MHAFB and the inclusive dates of the work
- Agreement State licensees using NRC regulated materials shall supply a copy of the NRC Form 241 approved by MHAFB's NRC Region according to 10 CFR 150.20.

1.12.2 *Prior Permission:*
Obtain permission from the CO prior to storing the radioactive devices at MHAFB overnight.

1.12.3 *Monitoring:*
The RSO may make periodic checks to ensure proper radiation safety practices are being followed.

1.13 MAINTENANCE OF POLLUTION CONTROL FACILITIES

Maintain all constructed facilities and portable pollution control devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

1.14 GREEN PROCUREMENT

1.14.1 For all procured goods and services, the contractor shall ensure that the recovered content associated with those items is met, as identified in the EPA Comprehensive Procurement Guideline (CPG). The USEPA website for CPG information is at http://www.epa.gov/cpg/products.htm. The products on this list are designated items that meet recycled content requirements. These items are or can be made with recovered materials and should be used by procuring agencies in carrying out the objectives of green procurement. The Recovered Materials Advisory Notice (RMANs) for each product specifies recommended percentages of recycled materials that should be contained in each product. Items that are not listed on the EPA CPG are not subject to the green procurement program.

1.14.2 When making purchases, any decision to acquire items not meeting EPA CPG and RMAN standards must be based on one of four listed waivers and a written documentation must be prepared. The written documentation applies for all purchases greater than $2500 (purchases less than $2500 are exempted from written documentation by Executive Order 13101). Where repetitive purchases of the same items are made, an annual blanket determination can be used. The exemptions for not meeting recycled content products can be claimed based on one of the four criteria:

a. Are not available within a reasonable period of time; or
b. Fail to meet the performance standards set forth in applicable project specifications or fail to meet reasonable performance standards; or
c. Are not available from a sufficient source to maintain a satisfactory level of competition (must be available from two or more sources); or
d. Available at an unreasonable price, if the price of the recycled content product exceeds the cost of a comparable non-recycled item, the price is considered unreasonable.

1.14.3 *Concerning items not meeting USEPA recycled content standards:*

a. When procuring items not meeting USEPA recycled content standards it must be based on one of the four exemptions listed above and requires written documentation. The requirement applies to all purchases greater than $2500 but less than $100,000. Required documentation forms (Recovered Materials Determination Form and Certification) are available by contacting 366 Asset Management Flight Environmental Section.

1.15 MISCELLANEOUS

1.15.1 *Excavation:*

Exercise care when excavating/digging trenches. If unknown items (i.e. storage tanks, pipes, buried waste, etc) are discovered during excavation or trenching activities, STOP WORK IMMEDIATELY and contact the Government Representative. The Government Representative will coordinate with 366 CES/CEAN (208-828-6351) to ensure that proper procedures are followed for removal or abandonment.

PART 2 PRODUCTS

2.1 GREEN PROCUREMENT

***2.1.1** EPA Comprehensive Procurement Guideline (CPG):*

For all procured goods and services, the contractor shall ensure that the recovered content associated with those items is met, as identified in the EPA Comprehensive Procurement Guideline (CPG). The USEPA website for CPG information is at http://www.epa.gov/cpg/products.htm. The products on this list are designated items that meet recycled content requirements. These items are or can be made with recovered materials and should be used by procuring agencies in carrying out the objectives of green procurement. The Recovered Materials Advisory Notice (RMANs) for each product specifies recommended percentages of recycled materials that should be contained in each product. Items that are not listed on the EPA CPG are not subject to the green procurement program.

***2.1.2** Purchases:*

When making purchases, any decision to acquire items not meeting EPA CPG and RMAN standards must be based on one of four listed waivers and a written documentation must be prepared. The written documentation applies for all purchases greater than $2500 (purchases less than $2500 are exempted from written documentation by Executive Order 13101). Where repetitive purchases of the same items are made, an annual blanket determination can be used. The exemptions for not meeting recycled content products can be claimed based on one of the four criteria:

- **a.** Are not available within a reasonable period of time; or
- **b.** Fail to meet the performance standards set forth in applicable project specifications or fail to meet reasonable performance standards; or
- **c.** Are not available from a sufficient source to maintain a satisfactory level of competition (must be available from two or more sources); or
- **d.** Available at an unreasonable price, if the price of the recycled content product exceeds the cost of a comparable non-recycled item, the price is considered unreasonable.

***2.1.3** Concerning items not meeting USEPA recycled content standards:*

- **a.** When procuring items not meeting USEPA recycled content standards it must be based on one of the four exemptions listed above and requires written documentation. The requirement applies to all purchases greater than $2500 (including GPC) but less than $100,000. Required documentation forms (Recovered Materials Determination Form and Certification) are available by contacting 366 Environmental Flight. The exemption forms will be used according to the following:

- **b.** Purchase's greater than $2500 but less than $100,000 will be signed by the procurement originator's supervisor, or designated representative. The determination and certification form will be filed with the purchase paperwork (including GPC), Form 9, or contract purchase.

- **c.** If the purchase is $100,000 or greater, the contractor shall contact 366 Environmental Flight or the CO to obtain information on signatory authority. All forms (the determination and certification forms) will be filed with and kept in the contract file.

- **d.** When repetitive purchases of the same items are made, an annual blanket determination can be approved.

PART 3 EXECUTION

3.1 DISPOSAL

The contractor may choose to dispose of any or all of the waste streams in the following manner:

3.1.1 *Dispose of any or all of the waste streams off-base:*
Recover any or all of the waste streams by sending them to an off-base recycling company or center.

3.1.2 *Turn in of some waste streams to the MHAFB recycling program with the Government's approval:*
The acceptance of these waste streams depends on the Government's ability to process the waste stream and the contractor's ability to adequately prepare the waste stream to meet the Government's condition requirements. The Government is currently encouraging the recycling of the following items on MHAFB:

a. Wood
b. All Scrap Metal
c. Corrugated Cardboard
d. Paper
e. Plastics

3.2 SAMPLE WASTE DISPOSAL AND RECYCLING PLAN

A sample Waste Disposal and Recycling Plan is provided on the following page.

WASTE DISPOSAL AND RECYCLING PLAN

CONTRACT # MTH - XXXXXXXX
CONTRACT TITLE Repair building XXXX
CONTRACTOR'S NAME XYZ CONXTRUCTION
CONTRACTOR'S POINT OF CONTACT
NAME Joseph Slump
PHONE NUMBER 888-777-6543

Briefly describe the work to be done under the contract:

Renovate 6000 sq. ft. in building XYZ. Plumbing, electrical, and mechanical systems are scheduled to be replaced. Floor plan to be changed with new floors, walls, and ceilings. Asbestos abatement planned on existing floor tile mastic and insulation.

Identify the major waste stream materials (categories of waste, e.g., wood, fixtures, cardboard, etc.) to be generated:

Scrap Metal
ACM
Wood Waste
Fixtures
Mixed Demo
Debris Inert Debris

Denote the intended method and location of disposing or recycling of each waste stream:

Scrap Metal:
Existing water pipe (copper), ductwork (steel), and electrical wiring (copper) will be turned in to the MHAFB Recycling Center.

ACM:
All asbestos containing material will be transported off base to the (insert name of the firm to receive the material) company

Wood Waste:
Contractor will keep re-usable wood scraps and turn in smaller scraps to the MHAFB Recycling Center free of other bulk building material.

Plumbing and Electrical Fixtures:
Contractor will salvage existing fixtures to be removed for re-use in later projects or sale to others. Fixtures will be removed from Mt Home AFB prior to the end of the contract. List of re-used items will be provided to 366 CES/CEVQ.

MHAFB Contractor's Hazardous Materials Reporting Form

1. Company Information	2. Project Name / Govt Contract Number	3. Contract Start/End Dates	4. Submission Date

5. On-site Project POC Name / Cell Phone #	6. Govt QAE Name/Phone #	7. HAZMART Account #	8. Project On-Base Location

9. Manufacturer and Product Name/Description (ex: Sherwin Williams gloss white latex paint)	10. NSN / Part #/ID # (if applicable)	11. Container Type (can, tube, drum, bag, etc)	12. Container Size *(LB, OZ, GL,PT,QT, LT, KG)*	13. Projected Total Quantity

Page_____ of _____

MHAFB Contractors Hazardous Materials Reporting Form

- Continuation Sheet -

1. Company Information	2. Project Name / Govt Contract Number	3. Contract Start/End Dates	4. Submission Date

9. Manufacturer and Product Name/Description (ex: Sherwin Williams gloss white paint)	10. NSN/Part #/ID # (if applicable)	11. Container Type (can, tube, drum, bag, etc)	12. Container Size *(LB, OZ, GL,PT,QT, LT, KG)*	13. Projected Total Quantity

Page_____ of _____

MHAFB CONTRACTOR'S HAZARDOUS MATERIALS REPORTING FORM INSTRUCTIONS

1. Company name, address and telephone number.
2. Project name or identifying description and government contract number.
3. As written.
4. Date that this form was submitted to the QAE or HAZMART.
5. Name and phone, or cell number of the contractor's on-site project manager, foremen, or contact person.
6. Name and phone, or cell number of government Quality Assurance Evaluator (QAE) assigned to the project.
7. HAZMART account number – assigned by the HAZMART once an account is established for this project.
8. Location, or nearest location or building number where the actual work is to take place.
9. Manufacturer's name and product description of the hazardous material being reported.
10. National Stock Number (NSN) from MSDS, part number, or a number or code identifying the container or material.
11. As written.
12. Container sizes for the product reported: LB = pound, OZ = ounce, GL = gallons, PT = pint, QT = quart, LT = liter, KG = kilogram. Ounces is the most preferred.
13. Known or projected total quantity or amount of this material expected to be used in this project.

Additional Information

A manufacturer-specific Material Safety Data Sheet (MSDS) is required for each item listed on this form and must be turned in with this form.

For additional guidance, refer to the MHAFB HAZMAT Monitor's Handbook available from 366th CES/CEAN HAZMAT Manager, at COM: (208) 828-6351, or DSN: 728-6351.

Contact Information

366 CES/CEAN	(208) 828-6351
366 CES Hazardous Materials Program Manager	(208) 828-6351
HAZMART Pharmacy	(208) 828-2360/2690

MHAFB HARDOUS MATERIALS MONTHLY USAGE LOG

Contractor Name:_____ Proj. #_____

POC Name / Number:_____ Date:_____

FAX THIS DOCUMENT TO: 208-828-2335

Manufacturer and Product Name/Description (ex: ACME gloss white paint)	NSN or Part # (if applicable)	Container Type (can, tube, drum, bag, etc)	Container Size (LB, OZ, GL, PT, QT, LT, KG)	Number of Containers Used This Reporting Period

Page ___ of ___

Environmental Office (366 CES/CEAN) - Preconstruction Checklist		page 1 of 2		
Project Name:		OPR: 366 CES/CEAN		
Project Number:		Date:		
#	**ITEM**	Yes	No	N/a
1	SPILL REPORTING & CLEAN-UP: Call 911 if using a Base phone line (call 828-1117 if using a cell phone) in the event of a chemical spill or release of all Hazardous Materials. All spills shall be reported regardless of size or if cleaned up. Also notify 366 CES/CEAN at 828-6351. The contractor is responsible for clean-up of spills. If the spills are not cleaned up to the Government's satisfaction, the Government may charge the contractor for additional cleanup costs incurred.			
2	GENERAL: Contractor shall comply with all applicable State and Federal environmental laws and regulations, including, but not limited to: the Clean Air Act, the Resource Conservation and Recovery Act, the Clean Water Act, the Occupational Safety and Health Act, and others. Questions concerning compliance with environmental standards may be directed to the 366 CES/CEAN at 828-6351.			
3	HAZARDOUS MATERIALS: Contractor shall submit Material Safety Data Sheets (MSDS) through appropriate channels to the HAZMAT Program Manager (Bldg 1297, 1100 Liberator Ave, Ph 828-6351) for approval prior to bringing material on base. Contractor shall maintain MSDS for all materials for as long as the materials remain on-base. Contractor must handle and store hazardous materials IAW all local, state and federal laws and IAW MHAFB HAZMAT Monitors Handbook.			
4	HAZARDOUS WASTE: Contractor shall dispose of all hazardous waste off Mountain Home AFB (MHAFB) in accordance with 40 CFR 260 et seq, unless directed otherwise. Copies of hazardous waste manifests, receiving records, and characterization documents shall be submitted to 366 CES/CEAN through appropriate channels for all waste generated on MHAFB. CEAN is the only office authorized to sign hazardous waste manifests as the generator for Haz. Waste leaving the Base.			
5	RECYCLING: Contractor shall coordinate all recycling efforts with 366 CES/CEAN prior to starting the project. Weight tickets must be forwarded to 366 CES/CEAN on a monthly basis and/or end of a short project. Weight estimates are acceptable. Contact number is 828-4212.			
6	DECONSTRUCTION: Demolition projects must utilize deconstruction practices as much as feasible. All materials removed from facilities prior to demolition for re-use must be weighed and weights must be reported to 366 CES/CEAN on a monthly and/or end of project basis			
7	AFFIRMATIVE PROCUREMENT (Green Procurement): Contractor shall purchase environmentally preferable materials containing recycled materials as much as possible in accordance with Executive Order 13423, RCRA Section 6002, and 366 Wing Plan 3213-(Current Version)			
8	NATURAL RESOURCES: The contractor shall not remove, cut, deface, injure, or destroy natural resources including trees, shrubs, especially sagebrush, vines, grasses, or wetlands without permission from the Environmental Flight except as otherwise specified. The contractor shall not disturb or drive through wetland areas, including playas, vernal pools, or slick spots. The contractor shall comply with the Integrated Natural Resource Management Plan. The contractor will complete Natural and Cultural Resource Training provided by CES/CEAN prior to the start of construction.			
9	CULTURAL RESOURCES: The contractor shall comply with MHAFB's Cultural Resource Management Plan. If cultural resources, including artifacts, either historical or prehistoric, or human remains, are discovered during the course of performance of the contract, the contractor shall stop work immediately, leaving the cultural materials in place, and, through appropriate channels, notify CES/CEAN at 828-6351. Examples of cultural materials include but are not limited to: cans, bottles, arrowheads, ceramics, pottery, military items, papers, wooden artifacts, etc. Any man-made object may be a cultural resource. When Natural and Cultural Training is required by the contract, the contractor shall complete the Natural and Cultural Training, as provided by the CES/CEAN, prior to the start of construction. For questions and concerns call the Cultural Resource Manager at 828-6351.			
10	STORM WATER. On contracts requiring disturbance of 1 or more acres of land, the contractor shall submit Notice of Intent (NOI) to EPA and allow EPA review period of 7 calendar days prior to the start of construction. The contractor shall implement adequate erosion control measures as required by the Storm Water National Pollution Discharge Elimination System (NPDES) Permit. The contractor shall ensure there are no unauthorized discharges to the storm water system. All discharges to the base sanitary sewer system shall be in accordance with the requirements of the Wastewater Treatment Plant NPDES Permit. For more information call 366 CES/CEAN at 828-6351. The attached web page is for small construction activity waivers, http://cfpub.epa.gov/npdes/stormwater/waiver.cfm .			

Natural Infrastructure (366 CES/CEAN) - Preconstruction Checklist		page 2 of 2		
Project Name:				
#	**ITEM**	Yes	No	N/a
11	SOLID WASTE: Non-hazardous solid waste shall be disposed of in a permitted off-base landfill in accordance with all posted restrictions and restrictions of this construction contract. All disposals shall be in accordance with the contractor's Waste Disposal and Recycling Plan. All waste loads shall be covered to prevent litter. Prior to the start of construction the contractor shall submit to CES/CEAN a copy of the contractor's Waste Disposal and Recycling Plan.			
12	ASBESTOS: Contractors shall brief all employees including subcontractor's that MHAFB facilities contain asbestos containing materials (ACM) unless otherwise directed. If asbestos work or abatement is required, the contractor shall conform to 40 CFR Part 61, subpart M; OSHA 1910 and 1926. When required, the contractor shall be responsible to file with IDEQ/EPA and 366 CES/CEAN the 10 day notification (and re-notifications, if applicable) for asbestos work. The notification(s) will be sent to both offices at the same time. ACM can also be encountered in the form of active, or abandoned underground water or sewer lines. These lines may, or may not appear on the contractor's dig permit. See the dig permit instructions for assistance. All contractors must use an approved off-base landfill for asbestos containing materials.			
13	LEAD and LEAD BASED PAINTS: Contractor's shall brief all employees including subcontractor's that MHAFB facilities contain lead based paint unless otherwise directed. If lead work or abatement is required, the contractor shall conform to 40 CFR 745, subpart L; OSHA 1910 and 1926. When required, the contractor will be responsible to file with EPA and 366 CES/CEAN the 5 day notification for lead work. The notification(s) will be sent to both offices at the same time. Lead containing materials may be considered hazardous waste and will need to be tested in order to determine if it's considered hazardous or solid waste for disposal purposes.			
14	REQUIRED BY CEAN PRIOR TO CONSTRUCTION: • NPDES Storm Water – for projects over 1 acre. Copies of NOI and SWPPP • For Rock Crushers, Hot Mix Asphalt Plants, Batch Plants, and Associated Generators, the Contractors must have a processed Idaho Permit for their equipment prior to moving the equipment to the project. – CEAN requires copies of all permits and – (after operations begin) copies of all the through-put quantities (include generator hours).			
15	REQUIRED BY CEAN PRIOR TO ACCEPTANCE OF FINAL DESIGN: (when applicable) • A copy of Idaho Department of Environmental Quality (IDEQ) project review and IDEQ approval of all water and waste-water projects. • A copy of all checklists submitted to IDEQ for the project design review. The IDEQ Checklists include "Drinking Water Systems", "Drinking Water Pumping Stations", "Storage Reservoir Designs" "Wastewater Collection Systems", "Wastewater Pumping Stations", "Well Construction Designs", "Well house & Equipment Designs", "Well Site Evaluations".			
16	AIR QUALITY: • The contractor must control dust particles, aerosols, and gaseous by-products from construction and demolition activities, processing, and preparation of materials at all times, including weekends, holidays, and hours when work is not in progress. • Control hydrocarbons and carbon monoxide emissions from equipment to Federal and Idaho State allowable limits at all times. • In addition, the contractor is required to use low-noise emission equipment and products certified by the EPA to the maximum extent possible. • Class I Ozone Depleting Substances are prohibited and substitutes for Class II Ozone Depleting Substances shall be used whenever technically and economically feasible. • Burning without the consent of the CO and CEAN is prohibited.			

CEAN REPRESENTATIVE: _____ DATE: _____

CONTRACT ADMINISTRATOR'S SIGNATURE:_____DATE:_____

CONTRACTOR'S SIGNATURE:_____DATE:_____

PROJECT CHECKLIST FOR ENVIRONMENTAL CONCERNS

Project Manager_____ **Date**_____

Project # / Title_____

For assistance and coordination please contact:
366 CES/CEV ENVIRONMENTAL FLIGHT (208-828-6351)

This checklist is designed to assist project managers and designers on identifying environmental concerns that may apply to a project. The checklist covers **Compliance and P2 (CEVC/P)**, **Conservation (CEVA)**, and **Restoration (CEVR)** concerns.

Please check the appropriate box(s) and coordinate with the applicable environmental protocol manager.

Yes	No	Environmental Concern
		CEVC/P
☐	☐	Will there be any air emissions including dust, heavy equipment, and painting?
☐	☐	This also applies to any new emission sources. (Air Quality)
☐	☐	Will there be any portable material processing plants including localized generators? (Air Quality)
☐	☐	Will there be any radioactive materials? (Air Quality/Haz-Waste)
☐	☐	Will any Halon or Ozone depleting substances (ODS) being used or removed? (Air Quality)
☐	☐	Are the materials used in the project eligible for Green Procurement? (Pollution Prevention)
☐	☐	Will there be demolition and/or renovation of lead and/or asbestos materials? (LBP Asbestos)
☐	☐	Are any Hazardous/EPCRA Materials to be used or recovered? (Haz-Mat)
☐	☐	Will any Hazardous Materials be stored on base? (Haz-Mat)
☐	☐	Will any flammable liquids be used or stored on base? (Haz-Mat)
☐	☐	Will any Hazardous Waste be generated, as detailed in 40 CFR 261? If you are unsure, check “yes”. (Haz-Waste)
☐	☐	Note: Use of these materials typically generate hazardous wastes: paints, cleaners (any type), solvents, thinners, sealants/adhesives, gasoline or similar type fuel
☐	☐	Will any spill containment be needed? (Haz-Waste/Haz-Mat/Spills)
☐	☐	Will there be any non-hazardous material disposed of? (Solid Waste/Recycling)

Yes	No	Environmental Concern
☐	☐	Can any material be recycled or reused? (Solid Waste/Recycling)
☐	☐	Will POL tanks be removed or installed? (Tanks/POL)
☐	☐	Will the project disturb a land area of a 1 acre or more? (Water Quality)
☐	☐	Will any drinking water and/or wastewater components be installed or used? (Water Quality)
☐	☐	Is the project within 50 feet of a production well? (Water Quality)
		CEVA
☐	☐	Are any historical sites involved, or buildings 45 years old or older? (Cultural Resources)
☐	☐	Are any wetland areas, including playas, vernal pools, or slickspots involved? (Natural Resources)
☐	☐	Is there sagebrush or other native plants in the project area? (Natural Resources)
☐	☐	Are any large trees on site? Will the project compact soil or otherwise interfere with the root zone? (Natural Resources)
☐	☐	Are endangered or threatened species located near the project area? Any raptors, burrowing owls, or other protected birds? (Natural Resources)
		CEVR
☐	☐	Are any IRP sites involved? (IRP)
☐	☐	Are any monitoring wells within 50 feet of the project site? (IRP)
☐	☐	Will project involve removal or disturbance of soils? (IRP)
☐	☐	Does the project involve the drilling of wells to the regional aquifer? (IRP)