

FAMCAMP Service Facility  
**Design Analysis**

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## TABLE OF CONTENTS

Cover Sheet

Table of Contents

FAMCAMP Service Facility Design Narrative.....	1 - 6
Architectural Analysis .....	2 - 3
Structural Analysis .....	3 - 6
Mechanical Analysis.....	6
Electrical Analysis.....	6 - 7
Plumbing Analysis.....	7

Outline Specifications

# FAMCAMP Service Facility

## Design Narrative

### I. General Notes

- A. **Codes:** The design of this facility must comply with all current applicable National, State, Local, and Military Codes, Standards and Regulations. The design must also comply with Base/ MAJCOM design and environmental standards.
- B. **General:** The intent of these documents is to provide a general description of the designated facility. The documents are not intended to represent specific national, regional, or local conditions. All systems including civil, architectural, structural, mechanical, electrical, and plumbing are to be designed and coordinated for specific national, regional and local conditions.
- C. **Equipment:** Where equipment manufacturer and model number have been designated, they are only provided as a design reference. Equipment selected should be equal in size, shape, and performance to those designated.
- D. **Trade Standards:** Where the design deviates from local or regional trade practices, which are not governed by codes, regulations, or standards and should be implemented in order to provide the most applicable design solution, the design should be modified accordingly. The modifications should not be performed prior to a thorough review of modification affects.

### II. Purpose

This prototype is designed to be site adapted to such regional factors as climate, soil conditions, utility access, and the availability of materials. Toward this purpose, the structures which comprise the FAMCAMP Service Facility are easily converted to a standard steel frame structure or stick construction. This logic is applied throughout the prototype to account for changes to the exterior finish system, structural slab, roofing options, and partition wall construction.

### III. Function

FAMCAMP Service Facility is designed as a support structure to outdoor recreational activities. The prototype design splits the active functions of camp operations and family gathering from the support functions including the laundry, vending, and toilet rooms. These functions are separated by the incorporation of an outdoor Breezeway which not only takes advantage of covered outdoor space for circulation, but provides a physical separation for the family gathering and office areas from the noise and odors of the Laundry and Toilet Rooms. The FAMCAMP Service Facility may be accessed from both the front and rear elevations through the open Breezeway. The following *Table 3.1* outlines the program areas of a FAMCAMP Service Facility:

Table 3.1

<b>FAMCAMP SERVICE FACILITY</b>	<b>ASSIGNABLE</b>
Multi-Purpose Room	458
Office	130
Vestibule	80
Men's Toilet Room and Shower	277
Women's Toilet Room and Shower	274
Laundry and Vending	293
Storage	16
Breezeway (non-assignable)	769
<b>Total Assignable Area</b>	<b>1528</b>

#### IV. Architectural Analysis

##### A. Finishes:

In general the facility has been designed as a load bearing masonry structure. The exterior finishes include a brick veneer, prefinished standing seam metal roof and stained wood.

The unconditioned areas have sealed concrete floors, with painted CMU walls.

At the toilets and showers the walls have ceramic tile installed over CMU. The floors in the wet areas should have non-slip coatings applied, and the ceilings are plaster and wallboard.

##### B. Multi-Purpose Room

The Multi-Purpose Room is a general use space for family gatherings. Its design includes upper and lower cabinets, a sink, a refrigerator, and power to support both counter top appliances and free standing vending machines.

The Breezeway increases the potential for cross-ventilation of the Multi-Purpose Room allowing it to take advantage of windows on every elevation.

##### C. Office and Vestibule

The Office and Vestibule areas support managerial functions of the FAMCAMP Service Facility. Office functions include areas for clerical work and record keeping activities. The Office is positioned on an outside corner of the Maintenance Facility to increase visibility over the front of the building as well as access to the entry vestibule. The vestibule is a place for check-in/out and fee payment. Although the Vestibule shown in the prototype is part of the interior volume of the Multi-Purpose Room and Office, moderate climates would allow this area to be an outdoor seating area thus increasing the potential for use of the Breezeway.

##### D. Toilet Rooms and Showers

The FAMCAMP Service Facility is provided with both men's and women's restrooms and dedicated shower facilities. These spaces are separated from the Multi-Purpose Room by the Breezeway which increases the potential for cross-ventilation while separating the Toilet Rooms and Showers from the family gathering space.

The toilet and shower facilities have been designed with handicap accessible fixtures.

#### **E. Laundry and Vending**

To support extended visits to the outdoor recreation area, the FAMCAMP Service Facility includes both coin operated washer / dryer connections and vending machines. The laundry facility is grouped with the toilet rooms and showers to control the effect of noise and humidity on the Multi-Purpose Room. This relationship will allow the Laundry to remain open during non-office hours. The washer's drain is connected to an integral lint capture basin to account for possible local code restrictions and for ease of maintenance. The Storage Room is designed with adjustable shelving to hold cleaning supplies and vending support space as well as provide a location for a water softener or hot water heater.

#### **F. Handicap Accessibility**

Further consideration should be given to the overall accessibility of the facility upon site adaptation including parking accessibility.

### **V. Structural Analysis**

#### **A. Substructure**

##### **1. *References***

The publications listed below form a part of this section to the extent referenced.

American Concrete Institute (ACI)

ACI 318                      (1997) Building Code Requirements for Structural  
Concrete and Commentary

American Society for Testing and Materials (ASTM)

ASTM A305                  Reinforcing Steel, A615 GR60

American Society of Civil Engineers (ASCE)

ASCE 7                      (1995) Minimum Design Loads for buildings and Other  
Structures

Uniform Building Code (UBC)

UBC (1997)

**2. Foundations - Substructure**

Foundations shall be cast-in-place reinforced concrete and shall be soil supported where permitted by soil conditions.

ASCE 7-95 shall be used as a source of criteria for structural design loads and load combinations. The criteria from ASCE 7-95 may be supplemented but not supplanted by applicable criteria contained in other nationally recognized codes, standards, and specifications.

In addition to criteria found in ASCE 7-95, the following minimum uniformly distributed design floor live loads shall be used. Where criteria differ, the more stringent shall govern. These live loads are minimum. If, during the final design process it is determined the actual loading is greater, use the actual loading.

- Storage or Work Areas.....250 psf Uniform Loading
- Non-Storage/Work Areas..... 100 psf Uniform Loading

As an additional requirement, all concrete foundation members supporting masonry shall be designed such that the sum of the live and dead loads, creep, and shrinkage deflections of a support member shall not exceed  $L/600$ , where  $L$  is the length of a member between supports.

Location of all floor drains, penetrations, slab depressions, or other items affecting the concrete shape or configuration shall be shown on the foundation structural drawings.

Concrete shall have a minimum 28 day compressive strength of 3000 psi.

**3. Geotechnical Study - Substructure**

The substructure shall be designed by a qualified geotechnical engineer who will, based upon adequate soil borings, provide comprehensive design and construction recommendations for the foundations and the soil preparation for the foundations.

**4. Floors - Substructure**

The minimum slab thickness for foundations shall be as follows:

Building	Minimum Slab Thickness
FamCamp Service Facility	5"

### 5. *Sealing of Exposed Slabs - Substructure*

The concrete floors on all exposed slabs shall be sealed with a floor hardener to inhibit the formation of concrete dust.

Where applicable, provide raised concrete housekeeping pads for equipment. Minimum thickness shall be 4" unless dictated otherwise by equipment.

If the slab, due to soils conditions, cannot be soil supported with a foundation meeting the deflection criteria noted in 1.3 above, Contractor shall provide a structurally supported system on drilled piers or spread footings, as recommended by the geotechnical engineer.

In seismic zones, seismic design shall be in accordance with UBC.

## B. Building Shell

### 1. *References*

The publications listed below form a part of this section to the extent referenced. The publications are referenced in the text by basic designation only.

#### American Concrete Institute (ACI)

ACI 318 (1997) Building Code Requirements for Structural Concrete and Commentary

ACI 530/530.1 (1995) Building Code Requirements for Masonry Structures and Specification for Masonry Structures

#### American Institute of Steel Construction (AISC)

AISC ASD Manual (Ninth Ed.) Manual of Steel Construction Allowable Stress Design

#### American Iron and Steel Institute (AISI)

AISI-01 (1996) Cold Formed Steel Design Manual

#### American Society of Civil Engineers (ASCE)

ASCE 7 (1995) Minimum Design Loads for Buildings

#### Departments of the Army, the Navy, and the Air Force

TM-5-809-3 (October, 1992) Masonry Structural Design for Buildings

ANSI/TPI-1 (1995) National Design Standard for Metal Plate  
Connected Wood Truss Construction

ANSI/AF&PA-NDS (1997) National Design Standard for Wood  
Construction

Uniform Building Code (UBC)  
UBC (1997) Uniform Building Code

## **2. *Structural Design Criteria - Building Shell***

The Building Shell shall consist of load bearing reinforced CMU walls designed and constructed in accordance with ACI 530 and TM 5-809-03 and shall support pre-engineered wood trusses fabricated in accordance with ANSI/TPI-1-1995.

Where wood beams are required, design and furnish beams in accordance with ANSI/AF&PA-NDS-1997.

Where steel columns are required design and fabricate in accordance with AISC ASD Manual - Ninth Edition.

Minimum wind and snow loads shall be as indicated in ASCE 7. If local building codes require higher values than ASCE 7, the higher value shall be used.

In seismic areas, the design shall comply with UBC 1997.

Trusses shall be anchored to load bearing walls to satisfy up lift requirements.

## **VI. Mechanical Analysis**

In order to condition the vestibule, office, and multipurpose rooms, a DX air handling unit is proposed. Options for heating are dependent on the ambient temperature of the region. A heat pump model may be applicable; however, electric or gas heat may be advantageous in certain locales.

Additional ventilation has been proposed in the toilet, shower, and laundry room areas. These areas are served by two roof-mounted exhaust fans.

## **VII. Electrical Analysis**

Power distribution shall be accomplished by a pole or pad mounted 3N 4 wire 120/208 transformer providing power thru a single main disconnect.

Lighting shall be accomplished with fluorescent sources, non-metallic, gasketed fixtures shall be provided in all damp, wet or corrosive locations. Exterior lighting shall be accomplished by wall mounted high pressure sodium sources. The lighting shall be controlled by a series of switches, time clocks and photocells.

The fire alarm system shall be of the addressable type.

### **VIII. Plumbing Analysis**

Due to the public-use nature of this building, consideration should be given to utilizing high-quality, tamper-resistant plumbing fixtures and piping systems (concealed flushometers, self-closing faucets, tamper-resistant bolts/screws). Also, ADA compliance is a requirement.

A means of preventing lint (from washers) from entering the sewer system (especially a septic tank drainfield) is required.

In areas of the country susceptible to freezing conditions, the water piping shall be “in-slab” and made drainable. Verify available heating sources and shutdowns of the facility during certain times of the year; design accordingly.

Water-conserving fixtures shall be considered, and sanitary sewers designed accordingly.

Provide a hose connection in the breezeway to allow the manager to hose off the area.