

### 3.0 PHYSICAL FITNESS FACILITY (PFF) <VER>(REV 3.0 – 30 JUN 2012)</VER>

#### 3.1. GENERAL REQUIREMENTS:

Comply with the American College of Sports Medicine (ACSM) Health/Fitness Facility Standards and Guidelines and the most current version of the Technical Criteria – U.S. Army Physical Fitness Facilities (here-after referred to as “Technical Criteria”), except where modified by this document.

##### 3.1.1. FACILITY DESCRIPTION

Army PFF are to be designed and constructed as a functional, safe, visually appealing facility that rivals “state-of-the-art” facilities found in local communities and on college campuses. Spaces are to be bright and open with minimal permanent walls to provide flexibility as requirements change. Natural daylighting and views shall be provided to the maximum extent possible. Interior ambiance shall be welcoming, dynamic, and fun. In general terms, the PFF consists of a gymnasium, weight areas (free-weights, circuit, and cardio), aerobics room, other fitness/recreation related spaces (such as racquetball, spinning classroom, sauna, etc.). The PFF supports not only the Soldier, but their family members, along with retirees, DoD Civilians, and others visiting the Installation.

##### 3.1.2. FACILITY RELATIONSHIPS

Army PFF should be located near housing areas and other recreational facilities. The PFF will be used for training and also for recreation for the installation community.

##### 3.1.3. ACCESSIBILITY REQUIREMENTS

All PFF and aquatic facility functional areas shall be barrier-free and accessible to people with disabilities as required by the Architectural Barriers Act (ABA) Accessibility Standard for Department of Defense (DOD) Facilities. Site, sidewalks, building, and pool designs shall enable people with disabilities to act independently and enjoy the full range of programs provided. Level changes may be included, but must be accommodated by ramps suitable for wheelchair access, both indoors and outdoors. Accessible entry to pools may be accomplished by utilizing any ABA compliant means of entry.

##### 3.1.4. BUILDING AREAS:

There are four standard PFF that are comprised of various standards modules. The total gross areas for the four sizes are provided below. For more detailed information, refer to the Technical Criteria.

###### A. STANDARD FACILITIES:

- 1) **X-small:** 24,340 square feet.
- 2) **Small:** 40,460 square feet.
- 3) **Medium:** 59,820 square feet.
- 4) **Large:** 82,350 square feet.

B. In accordance with the criteria in Appendix Q, all interior space within the PFF, with the exception of the jogging track, will be considered full-scope even if referred to as a balcony or mezzanine. The area of the jogging track is not included in the total gross area of the facility, as the jogging track is counted as a lump sum of one.

##### 3.1.5. ADAPT BUILD MODEL

None available. Due to varying site conditions and varying program requirements there is not one facility design that will work everywhere. Refer to the Technical Criteria for standard requirements for the individual functions within the facility

#### 3.2. FUNCTIONAL AND OPERATIONAL REQUIREMENTS

### 3.2.1. FUNCTIONAL SPACES

#### A. GENERAL:

1) The functional space and design must comply with the Army Standards for the facility type, along with the PFF functional criteria. The Army Standard for PFF is provided in Attachment A. The Technical Criteria is provided in Attachment B.

B. SPACE CONFIGURATION: Arrange spaces in an efficient and functional manner. Structure interior spaces to allow maximum flexibility for future modifications. Provide glass panels between functions when appropriate to enhance the open concept of the PFF. Maximize use of natural lighting and daylighting within the constraints of the applicable codes and UFC 4-010-01. Arrange active spaces visible from the lobby to provide a high energy feel when entering the facility. Per the requirements of the Technical Criteria, locate the Control Counter with direct visual and physical access to the Lobby and the Free Weight Area.

1) Concepts such as exposed structure in lieu of acoustical tile ceilings may be utilized in many different areas. Spaces shall be as open as possible to provide flexibility to accommodate shifts in trends in fitness and recreation.

2) Circulation schemes must support easy way-finding within the building. Consider locating the control desk on the right side as you enter the facility to avoid cross traffic conflicts when entering the facility. Ensure wet circulation is kept separate from dry circulation.

3) Locate electrical distribution equipment installed within the facility, including dry-type transformers and electrical panels, within dedicated electrical rooms/closets.

#### C. PRIMARY SPACES:

1) **Fitness Module**. Includes spaces for Free-weights, Circuit equipment, and Cardiovascular (Cardio) equipment. Also provides storage, stretching and fitness assessment areas.

2) **Exercise Module**. Includes a sub-dividable space with storage and sound system for Aerobics and other exercise classes.

3) **Gymnasium Module**. Includes a large open space sized appropriately for basketball and volleyball. Provides for storage and inclusion of an optional indoor jogging track.

4) **Structured Activity Module**. Provides flexibility for the installation to address their specific fitness needs. Activities to be chosen for include: Racquetball Courts, Combatives Room, Climbing Wall, Spinning Classroom, Functional Training Area, Small Group Fitness Room, and Sauna and/or Steam Room. The option also exists for the installation to utilize space in their Structured Activity Module to increase the size of their Fitness Module.

5) **Locker/Shower/Toilet Room**. Includes locker rooms with adjacent toilet area and shower area for each gender. Requires individual shower and dressing stalls for both genders.

6) **Support Areas**. Includes administration area that should be located away from the main entry, public area which includes the control desk, lobby, and public toilets, and housekeeping with includes laundry and janitor functions.

7) **Miscellaneous Areas**: Includes Mechanical, Electrical, and Communication Rooms. In addition includes circulation and accounts for the structure of the building.

### 3.3. SITE FUNCTIONAL REQUIREMENTS

A. GENERAL: Organize the site to be compatible with the site planning and style of adjacent existing structures. Locate the building to reflect local climatic conditions. For example, provide protection from prevailing winds and glare. Locate the building to take advantage of passive solar heating and day lighting. Locate parking for easiest access to main entry. Provide required service drives for the fitness module storage and Mechanical area. Comply with all ATFP requirements when considering site planning and landscaping.

B. PARKING: It is difficult to determine the number of parking spaces required for a PFF. Based on the American College of Sports Medicine's "Health/Fitness Facility Standards and Guidelines", for initial parking calculations, assume 1 parking space for every 300 gross square feet of facility. This will provide adequate

parking for all staff and approximately 60 percent of the maximum facility participants. However, many factors may result in the adjustment of this number of parking spaces, either up or down. A parking needs survey needs to be conducted to determine a more accurate need for parking, and the number of parking spaces provided adjusted accordingly. This survey needs to consider the following aspects at a minimum:

- 1) Current parking available in close proximity to the PFF.
- 2) The number of spectators that can be accommodated in the gymnasium.
- 3) Proximity of the PFF to troop housing.
- 4) Availability and use of public transportation.
- 5) The type of unit (administrative vs. training, etc.)
- 6) The amount of shift work

#### 3.4. SITE AND LANDSCAPE REQUIREMENTS

A. **LANDSCAPING:** A plant selection that is easy to maintain and enhances the visual quality of the facility in all seasons. Indigenous species are preferred. Assess the growth characteristics of selected plant material when considering line of sight requirements to either flight pavements or facilities. Comply with the local Installation landscape standards.

B. **SUSTAINABILITY:** Take into consideration sustainable design issues when designing the landscape. Select plants that require little to no additional water beyond normal rainfall. Avoid plants that require an irrigation system or, if irrigation is required, consider a gray water or storm water irrigation system.

#### 3.5. ARCHITECTURAL REQUIREMENTS

A. **BUILDING EXTERIOR:** Design the facility to enhance or compliment the visual environment of the Installation. The building entrance shall be architecturally defined and easily seen. When practical, exterior materials, roof forms, and detailing shall be compatible with the surrounding development and adjacent buildings on the Installation and follow locally established architectural themes. Use durable materials that are easy to maintain. Provide large glass areas where fitness equipment is located to provide visual interest from the outside, and views from the inside. Use glass in other areas as appropriate, taking into consideration glare, direct solar heat gain, and other functional requirements. Design the building exterior using energy efficient strategies and technologies to meet overall energy performance requirements. Exterior colors shall conform to the Area Design Guide.

B. **TRIM AND FLASHING:** All exterior metals including gutters, downspouts, and fascias shall be factory pre-finished metal, aluminum, or galvanized steel base metal with baked-on or bonded high-performance fluoropolymer coating, fabricated and installed in compliance with SMACNA Architectural Sheet Metal Manual.

C. **BIRD HABITAT MITIGATION:** Provide details necessary to eliminate the congregating and/or nesting of birds at, on, or in the facility.

#### D. **DOORS & FRAMES:**

##### 1) **Exterior Doors and Frames**

a) **Main Entrance Doors:** Provide aluminum storefront doors and frames with Architectural Class 1 anodized finish (color selected by the Contracting Officer from the manufacturer's full line of standard colors), fully glazed, and with medium or wide stile are preferred for entry lobbies or corridors. Storefront systems shall comply with wind load requirements of applicable codes and UFC 4-010-01 requirements. Framing systems shall have thermal-break design.

b) **Side Entrance/Exit Doors:** Exterior doors and frames opening to spaces other than corridors or lobbies shall be insulated hollow metal and comply with SDI/DOOR A250.8 Recommended Specification for Standard Steel Doors and Frames. Fire-rated openings shall comply with NFPA 80 Standard for Fire Doors and Other Opening Protectives, and the requirements of the labeling authority. Door and frame installation shall comply with applicable codes and UFC 4-010-01 requirements. Provide a local alarm as part of the hardware on all doors

other than the main entrance door. This alarm shall sound at the door and shall notify the control desk if the door is opened. This alarm requirement is separate from the security forces requirements in paragraph 6.

c) **Exterior Door Finish Hardware:** All hardware and accessories in the facility shall be consistent and shall conform to BMHA A156 Series Standards, Grade 1. Coordinate door hardware and security requirements with the functional requirements, the Technical Criteria for U.S. Army Physical Fitness Facilities, and the electrical security/fire alarm system requirements of this document. Provide bored Locks in accordance with BHMA A156.2 Bored and Preassembled Locks and Latches. Provide all hardware necessary to meet the requirements of NFPA 80 for fire doors and NFPA 101 for all exit doors and BHMA A156.3 Exit Devices. Provide closers on all exterior doors, fire-rated doors, and restroom doors. The Main Entrance door is considered a high traffic door that requires a high quality door closing mechanism complying with BHMA A156.4 Door Controls - Closers with adequate strength to ensure safe and easy operation in a high wind environment. Hardware finish shall be US 26D/652 Satin Chrome over Nickel, steel base metal. Doors leading directly outside from functional areas (such as gymnasium, locker rooms, etc.) do not require any hardware on the exterior side of the door.

## 2) Interior Doors and Frames

a) **Wood Doors:** Provide flush wood solid core doors complying with National Wood Window and Door Association (NWWDA) I.S.-1A. Stile edges shall be non-finger jointed hardwood compatible with face veneer. Provide Architectural Woodwork Institute (AWI) Grade-A hardwood face veneer for transparent finished doors; provide AWI Sound Grade hardwood face veneer for painted doors. Transparent finished doors are preferred.

b) **Hollow Metal Doors:** Comply with SDI/DOOR A250.8. Doors shall be minimum Level 2, physical performance Level B, Model 2; factory primed. Hollow metal doors shall be mounted in hollow metal frames.

c) **Hollow Metal Frames:** Comply with SDI/DOOR A250.8. Frames shall be minimum Level 2, 16 gauge, with continuously welded corners and seamless face joints; factory primed.

d) **Side Lites:** Provide ¼" clear tempered glass at all door lites.

e) **Interior Door Finish Hardware:** Door hardware and security requirements must be coordinated with the functional requirements, the room-by-room criteria, and the electrical security/fire alarm requirements. Hardware finish shall be US 26D/652 Satin Chrome over Nickel, steel base metal.

## 3) <NATATORIUM\_NO>Not Used</NATATORIUM\_NO><NATATORIUM>Interior Doors and Frames, Natatorium

a) **Hollow Metal Doors:** Comply with SDI/DOOR A250.8. Doors shall be minimum Level 2, physical performance Level B, Model 2; factory primed. Hollow metal doors shall be mounted in hollow metal frames. Doors shall be 316L stainless steel, painted with high performance coating (to avoid corrosion).

b) **Hollow Metal Frames:** Comply with SDI/DOOR A250.8. Frames shall be minimum Level 2, 16 gauge, with continuously welded corners and seamless face joints; factory primed. Frames shall be 316L stainless steel, painted with high performance coating (to avoid corrosion).

c) **Side Lites:** Provide ¼ inch clear tempered glass at all door lites.

d) **Interior Door Hardware:** Door hardware and security requirements must be coordinated with the functional requirements, the room-by-room criteria, and the electrical security/fire alarm requirements. At a minimum, provide closers on all fire-rated doors, locker room doors, and restroom doors. If possible, utilize "airport" entrances to locker rooms and other applicable areas to minimize wear on finishes and hardware. Hardware finish shall be type 316L stainless steel.

e) **NOTE:** As an alternative to stainless steel door and frames, FIB-R-DORS could be utilized. These would be the best doors and frames for doors leading directly to the pools.

f) Interior doors shall be rated the same as the wall in which they are installed. **<NATATORIUM>**

4) **Programmable Electronic Key Card Access Systems:** Provide Key Card System on all doors to rooms from corridors other than service doors such as: Janitor's closets, communication rooms, electrical rooms, mechanical rooms.

## E. WINDOWS:

1) **Exterior Windows:** Provide non-operable windows.

2) **Exterior Glass and Glazing:** Provide the thickness required to provide necessary sound deadening properties for the exterior walls. The rating of the exterior glass shall be within 5 decibels of the wall to which it is installed. In addition, glazing must comply with ATFP and Energy requirements.

3) **Interior Windows:** Provide minimum ¼ inch clear tempered glass. Provide STC rated windows that meet required STC rating of the wall it is located.

F. **THERMAL INSULATION:** Provide exterior wall, floor, and roof/ceiling assemblies with thermal transmittance (U-values) required to comply with the proposed energy calculations for the facility. Do not install insulation directly on top of suspended acoustical panel ceilings.

G. **EXTERNAL LOUVERS:** Design exterior louvers to exclude wind-driven rain, with bird screens and made to withstand a wind loads in accordance with the applicable codes. Wall louvers shall bear the AMCA certified ratings program seal for air performance and water penetration in accordance with AMCA 500-D Laboratory Methods of Testing Dampers for Rating and AMCA 511 Certified Ratings Program for Air Control Devices. Interior Doors and Frames

H. **MOLD PREVENTION:** Design and construct buildings to maintain space humidity at reasonable levels. Building construction shall be relatively air tight. Locate vapor barriers, if used, where temperature is above dewpoint in both heating and cooling seasons, and not under insulation installed on top of a ceiling at a ventilated attic. Do not ventilate crawl spaces. Install a vapor barrier on ground surfaces of crawl spaces. Acoustical ceiling tiles shall have factory applied mold preventive and sag resistant physical properties.

I. **SPECIAL ACOUSTICAL REQUIREMENTS:** Design and construct exterior walls and roof/ceiling assemblies, doors, windows and interior partitions to provide for attenuation of external noise sources such as airfields in accordance with applicable criteria. Provide additional acoustical control for reverberation in gymnasiums and natatoriums.

### 3.5.1. FINISHES AND INTERIOR SPECIALITIES

#### A. GENERAL:

1) Appearance retention is the top priority for building related finishes. Provide low maintenance, easily cleaned room finishes that are commercially standard for the facility occupancy specified, unless noted otherwise.

2) In general, use neutral tones with contrasts. Bright color accents or schemes may be considered for areas where appropriate. Facility should have a bright and energetic feel.

#### B. FINISHES:

1) **Gypsum Board:** Comply with ASTM C36 Gypsum Wallboard. Minimum panel thickness shall be 5/8 inch. Provide moisture resistant panels (glass-mat panels are preferred) at locations subject to moisture. Consider use of impact resistant gypsum board.

2) **Minimum Paint Finish Requirements:** All paints used shall be listed on the "Approved product list" of the Master Painters Institute, (MPI). Follow application criteria recommended by MPI guide specifications for the substrate to be painted and the environmental conditions existing at the project site. Except factory pre-finished material, provide surfaces receiving paint with a minimum of one prime coat and two finish coats. Lead paints are unacceptable.

a) **Exterior Paint Systems:** For exterior applications provide an MPI gloss Level 5 finish (semi-gloss), unless otherwise specified.

b) **Interior Paint:** In wet areas, provide an MPI Gloss Level 5 (semi-gloss) finish.

3) **Casework:** Provide casework complying with AWI Section 400, Custom Grade flush overlay cabinets with stained wood. Work surfaces and counters shall be solid surfacing material or a material with at least the same durability qualities. Laminate countertops are not allowed. Install casework complying with AWI Section 1700.

#### C. INTERIOR SPECIALTIES:

- 1) **Signage:** Provide interior signage for overall way finding and life safety requirements. The comprehensive interior plan shall be from one manufacturer and shall include the following sign types: (1) Lobby Directory; (2) Directional Signs; (3) Room Identifications signs; (4) Building Service signs; (5) Regulatory signs; (6) Official and Unofficial Signs; (7) Visual Communication Boards.
- 2) **Bulletin Boards:** Provide bulletin boards in the lobby and main corridors. Bulletin boards shall fit into an overall architectural theme. The intent is to avoid randomly placed bulletin boards that are not coordinated with the interior finishes, colors, and/or theme. Coordinate placement of bulletin boards with the user.
- 3) **Corner Guards:** On gypsum board walls, provide surface-mounted, high impact integral color rigid vinyl corner guards where necessary to reduce the potential for damage (i.e. in areas subject to high traffic and where carts or other mobile pieces may be used.). Provide stainless steel corner guards at all outside corners of ceramic tile walls where necessary to reduce the potential for damage (i.e. in areas subject to high traffic and where carts or other mobile pieces may be used.).
- 4) **Window Treatments:** Provide window blinds or an appropriate type of window treatment on all exterior windows in administrative spaces. Provide permanent shading devices and other measures to reduce glare in activity spaces while still allowing for natural daylighting and views into and out of the facility.

### 3.6. STRUCTURAL REQUIREMENTS

- A. **GENERAL:** Design and construct as a complete system in accordance with APPLICABLE CRITERIA.
- B. **RUNNING TRACK:** Structural design shall account for a suspended running track. Attach the track to the roof system structural framing. Design suspended running track to dampen all vibrations from users.

### 3.7. SEE PARAGRAPH 6.7 THERMAL PERFORMANCE – NOT USED

### 3.8. PLUMBING REQUIREMENTS

Provide facilities with a fully functional plumbing system that complies with the International Plumbing Code (IPC). Utilize the criteria within the Technical Criteria for US Army Physical Fitness Facilities for fixture counts in the locker/shower rooms.

### 3.9. COMMUNICATIONS AND SECURITY SYSTEMS

- A. **GENERAL:** Communications design must be performed and stamped by a Registered Communications Distribution Designer (RCDD) with 2 years related experience. The information systems designer must prepare the test plan, and witness and certify the testing of telecommunications cabling. See Paragraph 6 for possible additional requirements.

#### B. TELECOMMUNICATION SYSTEMS:

- 1) **General:** Design telecommunications design in accordance with the Technical Criteria for Installation Information Infrastructure Architecture (I3A)
- 2) **Service:** Coordinate service with local NEC personnel.
- 3) **System:** Provide a fully operational system from the demarcation point to each outlet.
- 4) **Gymnasium:** Provide an outlet, in a recessed floor box, at each scorer's table, directly connected to an outlet at the scoreboard location.

#### C. AUDIO/VISUAL SYSTEMS:

- 1) **PA Systems:** System may be integrated into Fire Alarm/MNS if allowed by the installation. Without AHJ approval for a combined system, separate MNS and PA systems should be provided. Locate the master station at the Control Desk with input for music source and to allow desk personnel to make announcements. Locate the PA speakers as required in the Technical Criteria for US Army Physical Fitness Facilities. If speakers are mounted on/in a wall, ensure they are mounted at least 8 feet above the floor. Provide announcement configuration capability by room, zone or all-call, except in offices.
- 2) Other systems as required in the Technical Criteria for US Army Physical Fitness Facilities.

D. CABLE TV (CATV):

- 1) **Service:** Cable Television service will be by the Installation provider. Provide a two inch conduit with nylon pull cord from the communications room to the designated interface point.
- 2) **System:** Provide a CATV system to distribute incoming television signals and user supplied. Distribution point shall be the communications room. Outlets shall be in the lobby, all exercise modules, break rooms and activity rooms. Coordinate the number of outlets in exercise rooms with the user. Run cables in conduit and install a nylon pull cord in each conduit.

E. MASS NOTIFICATION SYSTEMS:

- 1) **General:** A Mass Notification System (MNS) shall be integral to the fire alarm system and shall be connected to the base MNS.
- 2) **Speakers:** Speakers shall be located throughout the facility, providing total coverage. If speakers are mounted on/in a wall, ensure they are mounted at least 8 feet above the floor.

3.10. ELECTRICAL REQUIREMENTS

A. **GENERAL:** Electrical power, lighting and telecommunications shall be provided to the facility as specified below, in accordance with APPLICABLE CRITERIA, GENERAL TECHNICAL REQUIREMENTS, all IEEE Standards (including Recommended Practice) where the scope is applicable to this design effort, all UL Standards where the UL scope is applicable to this design effort and where itemized, in the combined interdisciplinary areas cited. Select electrical characteristics of the power system to provide a safe, efficient, and economical distribution of power based upon the size and types of loads to be served. Use distribution and utilization voltages of the highest level that is practical for the load to be served. Power shall be provided for all installed equipment requiring power including but not limited to lighting, HVAC, convenience receptacles and government furnished government installed equipment. The effect of nonlinear loads such as computers, other electronic equipment and electronic ballasts shall be considered and accommodated as necessary. Voltage drop shall not exceed the maximum allowed per ASHRAE 90.1. Transient voltage surge protection shall be provided on service equipment.

- 1) Perform a short circuit study as an integral part of selecting and sizing electrical distribution components (all equipment shall be fully rated; that is, do not use series-combination rated equipment).
- 2) Perform a coordination study to ensure that protective device settings are appropriate for the expected range of conditions (depending on the design and construction schedule, it is acceptable to design adequate protective devices with adjustable features, followed by a coordination study required during construction to specify the correct settings).
- 3) Circuit breakers disconnect switches, and other devices that meet the OSHA definition of energy-isolating device shall be lockable.
- 4) Do not exceed 5 percent combined voltage drop on feeders and branch circuits if the transformer providing service is located within the facility. If the transformer is located exterior to the facility, limit the combined voltage drop for service conductors, feeders, and branch circuits to 5 percent. Individual voltage drop on branch circuits should not exceed 3 percent. Branch circuits supplying sensitive circuits should be limited to 1 percent voltage drop.
- 5) When facility electrical design includes a 480/277V power distribution system, mechanical systems and lighting systems shall generally be fed from the available 480/277V power distribution system.
- 6) Locate electrical distribution equipment installed within the facility, including dry-type transformers and electrical panels, within dedicated electrical rooms/closets. Electrical Panels dedicated to serving equipment within a dedicated Mechanical Room are allowed to be installed in the Mechanical Room provided the electrical panels are provided with the required access, dedicated electrical spaces, and working clearances. Panels shall be lockable and keyed to one master key.
- 7) In general, to minimize sound transmission, do not install "back-to-back" outlet boxes.

B. **INTERIOR POWER:** Provide interior power per the general electrical requirements and per the Technical Criteria – U.S. Army Physical Fitness Facilities unless revised by the requirements of this RFP. Unless indicated

otherwise, provide NEMA 5-20R duplex receptacles. Locate receptacle outlets to eliminate the need for extension cords.

- 1) **Lobby.** Power to circuits as needed to Control Desk, for computer terminals (2 minimum in the X-small and Small, 3 minimum in the medium, 4 minimum in the large and X-large), counter mounted video monitors, multiplex video receiver, tape backup, sound processor for multiple paging sources, music source (such as a CD player) and sound amplifier.
- 2) **Gymnasium/Suspended Running Track.** Scorer's table is generally located for one designated court, at mid court, and requires one (1) quad receptacle outlet with dedicated 20 amp circuit in recessed floor boxes, centered under the anticipated table location, but outside the court boundaries. Solid brass cover plates shall be provided for these outlets for when scoreboard equipment is not in use to provide good ball return value and skid resistance.
- 3) **Fitness Module (Cardio, Circuit, Free Weight).** Provide a dedicated circuit to each piece of fitness equipment. Provide dedicated circuits to fitness equipment rated for the ampacity required by the equipment manufacturer; however, the minimum acceptable ampacity is 20A..
- 4) **Miscellaneous Areas – Offices.** In copy/file/work/break room, provide outlets at built-in counter area for microwave, coffee pot, refrigerator, and other cooking devices. Provide ground fault protection of outlets within 6 feet of any water source.
- 5) **Housekeeping Receptacles** – In general, provide housekeeping receptacles in finished areas located so that no point on the floor of a finished area is farther than 25 feet from a general use receptacle.

C. **INTERIOR LIGHTING:** Provide interior lighting and control per the Technical Criteria – U.S. Army Physical Fitness Facilities unless revised by the requirements of this RFP. When “PL Lamp” is indicated by Technical Criteria – U.S. Army Physical Fitness Facilities, provide multi-tube, 4-pin, compact fluorescent lamp. Pay particular attention to issues such as glare, heat generation, and impact protection for the fixtures in Fitness Facility activity spaces. Provide fluorescent luminaires with electronic programmed start fluorescent ballasts. Use of luminaires for air handling purposes is not recommended. Flush edge lens door frames are minimum and chamfered edge lens door frames are preferred.

- 1) **Lobby.** Provide recessed wall wash downlight accent lighting to improve wall surface brightness and illuminate architectural features to assist visitor way finding in the main lobby, to functional areas, and in the waiting spaces for office suites. Low profile LED lighting is acceptable under cabinet lighting.
- 2) **Gymnasium/Suspended Running Track.** High Intensity Discharge (HID) fixtures are not required. Lighting selected shall be identified as suitable for the intended use and lighting design shall meet IESNA recommendations for Basketball Sports-Lighting, Class III (Class of Play). Fixtures shall be mounted not less than 25 feet above the finished floor. Fixtures with 80 percent direct and 20 percent indirect lighting are preferred. For overhead and wall mounted locations, protect luminaires (including EXIT signage and emergency lighting) with wire cages and/or provide appropriate shatterproof enclosed luminaires. Switching for lighting control shall provide different lighting options to take into account natural lighting and different activities (such as boxing matches). Lighting control shall be located in a controlled area to avoid accidental and unauthorized switching.
- 3) **Fitness Module (Cardio, Circuit, Free Weight).** When ceilings heights do not allow pendant mounted or suspended lighting, 2 x 2 or 2 x 4 lay-in recessed direct/indirect or recessed “volumetric” lighting fluorescent fixtures may be used. Independent slide or toggle controls may be used to control fixtures by groups. Grouping needs and/or preferences will be determined by circuit capacity and by location and amount of natural daylighting. If fixtures requiring remote ballasts are used, where possible install the remote ballasts above ceiling and provide with above ceiling access adequate to service the remote ballasts. Additional contribution of natural light via windows and/or skylighting is highly recommended.
- 4) **Exercise Module.** When ceilings heights do not allow pendant mounted or suspended lighting, direct 2 x 2 or 2 x 4 lay-in fluorescent fixtures may be used but are not recommended due to lower light quality (excessive glare and static light distribution; e.g. causes greater eye fatigue over long periods of time). Natural light via windows may be provided, but direct sun-light and glare must be avoided. Windows providing internal views to other spaces is desirable.
- 5) **Miscellaneous Areas and Offices.** Indirect lighting, to reduce computer glare, would be preferred. Provide recessed wall wash downlight accent lighting to improve wall surface brightness and illuminate architectural features to assist visitor way finding to functional areas and in the waiting spaces for office suites.

D. GENERAL SITE LIGHTING: Ensure that parking areas and the facility have adequate lighting for safety, evacuation, and security measures. Lighting for all exterior applications shall be controlled by a photosensor and astronomical time switch that is capable of automatically turning off the exterior lighting when sufficient daylight is available or the lighting is not required.

E. CATHODIC PROTECTION SYSTEM: Corrosion protection for the facility shall be provided by coordinated material specification and/or provision of a cathodic protection system to assure corrosion will not compromise system operation for the 50 year infrastructure design lifetime of the facility. Provide an appropriate Cathodic Protection System when the design analysis of a corrosion engineer indicates cathodic protection is recommended to assure corrosion will not compromise system operation for the 50 year infrastructure design lifetime of the facility.

### 3.11. HEATING VENTILATING AND AIR CONDITIONING (HVAC) REQUIREMENTS

A. Provide a HVAC system that is in compliance with applicable mechanical UFCs such as UFC 3-410-01, UFC 3-400-02 and applicable ASHRAE Standards such as ASHRAE Standard 62.1 Ventilation for acceptable Indoor Air Quality unless other requirements are provided within this document or the Technical Criteria for US Army Physical Fitness Facilities

B. Provide facilities with a fully functional HVAC system that is automatically controlled by a Building Automation System (BAS). Do not locate HVAC equipment above the gymnasium or inside the gymnasium or in any area with wood floor due to any possible risk of a leak causing water damage. Provide for air flow from the dry side of the Men's And Women's Locker/Dressing/Shower/Toilet space to the exhaust intakes in the wet area.

C. Provide for connection to energy monitoring and control system (EMCS) for monitoring purposes.

D. Steam Room – Maintain space temperature at 100 degrees F minimum, 110 degrees F maximum. Humidity 100 percent relative.

E. Sauna - Provide a separate dry heat system with individual temperature controls and a timer. Provide secure controls. Provide passive ventilation.

F. Gymnasium/Basketball/Volleyball Courts - Provide durable air grill covers and do not place air grills in line with basketball nets.

G. Racquetball Courts - Ventilating ducts must be installed flush with the ceiling or wall surfaces. Locate supply and return vents in the rear one-third of the ceiling and/or the upper one-third of the back wall.

### 3.12. SEE PARAGRAPH 5.9 ENERGY CONSERVATION REQUIREMENTS

### 3.13. FIRE PROTECTION REQUIREMENTS

#### A. FIRE SUPPRESSION SYSTEMS:

1) Provide facilities with automatic sprinklers that provide 100 percent coverage of the facility in accordance with UFC 3-600-01. Racquetball Courts - Any fire suppression or detection equipment must be protected and flush with the wall or ceiling surface.

2) Gymnasium/Basketball/Volleyball Courts - Provide protection for sprinkler heads, exit signs, manual pull stations, and other exposed components. Minimize equipment that protrudes into activity space or raise it above 6 feet for safety considerations.

B. FIRE DETECTION AND ALARM SYSTEMS: The fire alarm system shall consist of a fire alarm panel integrated with the MNS, transceiver, initiating devices, and notification devices. The fire alarm system shall be compatible with existing Installation fire alarm system and base MNS, and shall be coordinated with Base Fire Chief and\ or AHJ. The system shall be a Class A, addressable system. All audible alarm appliances shall be voice type with a selection of prerecorded announcements. Provide industrial type protective covers for manual pull stations in the gymnasium. See Paragraph 6 for possible additional requirements.

- 3.14. SEE PARAGRAPHS 5.12 AND 6.14 SUSTAINABLE DESIGN – NOT USED
- 3.15. SEE PARAGRAPH 6.15 ENVIRONMENTAL – NOT USED
- 3.16. SEE PARAGRAPH 6.16 PERMITS – NOT USED
- 3.17. SEE PARAGRAPH 6.17 DEMOLITION – NOT USED`
- 3.18. SEE PARAGRAPH 6.18 ADDITIONAL FACILITIES – NOT USED
- 3.19. EQUIPMENT AND FURNITURE REQUIREMENTS
- 3.19.1. FURNISHINGS – NOT USED
- 3.19.2. EQUIPMENT – NOT USED
- 3.20. FACILITY SPECIFIC REFERENCES
- A. Attachment A - The Army Standard for Physical Fitness Facilities
- B. Attachment B – Technical Criteria for U.S. Army Physical Fitness Facilities
- C. Attachment C – **<NATATORIUM>**Natatorium**</NATATORIUM><NATATORIUM\_NO>**Not Used**</NATATORIUM\_NO>**
- D. Additional reference material for comparable private sector facilities is accessible from the American College of Sports Medicine website: [http://www.acsm.org/AM/Template.cfm?Section=Home\\_Page](http://www.acsm.org/AM/Template.cfm?Section=Home_Page)
- E. Examples of private sector State-of-the-Art athletic facilities may be found at the Athletic Business websites: <http://www.architecturalshowcase.com/galleries/ArchitecturalShowcase.aspx>
- F. Each pool and spa must comply with VIRGINIA GRAEME BAKER POOL AND SPA SAFETY ACT, PUBLIC LAW 110-140.



**DEPARTMENT OF THE ARMY**  
**ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT**  
**600 ARMY PENTAGON**  
**WASHINGTON, DC 20310-0600**

DAIM-ZA

OCT 16 2009

MEMORANDUM FOR

Commander, US Army Corps of Engineers (CEMP), 441 G St NW,  
Washington, DC 20314  
Installation Management Command (IMCOM), 2511 Jefferson-Davis Highway,  
Arlington, VA 22202

SUBJECT: Army Standard for Physical Fitness Facility (PFF)

1. The enclosed Army Standard for the Physical Fitness Facility is approved for implementation. The standards apply only to the Active Component and not the Reserve Component. Only the Assistant Chief of Staff for Installation Management has authority to approve exceptions to this standard. Waivers from the Army Standard must be approved in accordance with AR 420-1.
2. These standards are mandatory for Military Construction, Army (MCA) projects in the FY2012 program and beyond. Designs based on these Army Standards, Standard Design, and Standard Criteria will be developed consistent with MILCON Transformation methodologies.
3. The points of contact (POC) for the Facilities Design Team are Mr. Jay Clark, USAESCH, james.t.clark@usace.army.mil, 256-895-1673; Ms. Janet MacKinnon, IMWR-CR, janet.mackinnon@us.army.mil, 703-681-1544; Mr. Hyuk Pak, DAIM-ODF, hyuk.pak@us.army.mil; and Mr. David Marquardt, HQ USACE, David.D.Marquardt@usace.army.mil, 202-761-7419.

Encl  
as

A handwritten signature in black ink, appearing to read "Robert Wilson".

ROBERT WILSON  
Lieutenant General, GS  
Assistant Chief of Staff  
for Installation Management

# THE ARMY STANDARD FOR PHYSICAL FITNESS FACILITIES

## **Description:**

Physical fitness is the cornerstone of readiness. It is an essential and critical element of Soldiering. The Army emphasizes the importance of a high level of physical capability for the occupational tasks that Soldiers are required to perform. Staying fit is enhanced today with the growing popularity and use of cardiovascular and strength equipment among Soldiers. Physical Fitness Facilities are required by the Army to promote the strength and fitness of the soldiers. Physical fitness and sports support Army Core values. In addition, Physical Fitness Facilities provide one of the most popular sources of recreation for the soldiers and their families. Sample Surveys of Military Personnel (SSMP) consistently show fitness/sports facilities as first in use and importance to soldiers and family members.

## **Applicability:**

- This Army Standard applies immediately to all new permanent Physical Fitness Facilities.
- The Army Standard applies to Army facilities worldwide.
- The Army Standards for Physical Fitness Facilities are derived from the American College of Sports Medicine (ACSM) (as directed by DoD Memorandum), Unified Facilities Criteria UFC 4-740-02, TI 800-01 - Appendix H, and the Technical Criteria for U.S. Army Physical Fitness Facilities dated October, 2003.
- All geographic districts shall incorporate the mandatory design criteria described herein in close coordination with the USACE designated Center of Standardization (COS) for Physical Fitness Facilities.

## **Waivers:**

- Only the Assistant Chief of Staff for Installation Management has authority to approve exceptions to the Army Standards.
- Waivers from the Army Standard must be requested in accordance with (IAW) AR 420-1 and the Army Facilities Standardization Program Charter, latest edition.
- All waiver requests to this Army Standard require COS conflict resolution prior to submission by the Garrison Commander.
- Garrison Army Standard waiver request submissions must be received in sufficient time to allow completion of Facility Design Team review and development of recommendations or course of action for the Army Facilities Standardization Committee (AFSC) to consider prior to implementation into project design.
- Late submissions and/or project delays are NOT sufficient stand-alone justification for accelerated review or other dispensation for not meeting the Army Standard contained herein.
- All waiver requests shall include compelling rationale of functional and operational deviations to include substantiating documentation in sufficient detail for the Army to assess implications of approving the waiver.
- All HQDA approved waivers shall be documented in installation mater plans thereby serving as the installation's modified standards.

## THE ARMY STANDARD FOR PHYSICAL FITNESS FACILITIES

Item	Mandatory Criteria																		
Facility Size	<p>Physical Fitness Facility (PFF) facility sizes will be determined based on the following installation population table. The "PFF population" includes 100% full-time soldiers (Active, Reserve Component, including other military services), 25% of family members, and 10% of DoD civilians in CONUS (when the civilian workforce is more than 60% of the total work force). At OCONUS locations include 100% of the full-time DoD civilians.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Size</u></th> <th style="text-align: left;"><u>Population</u></th> <th style="text-align: left;"><u>Total Gross Square Feet</u></th> </tr> </thead> <tbody> <tr> <td>X-small</td> <td>251 – 1000</td> <td>27,771</td> </tr> <tr> <td>Small</td> <td>1001 – 3000</td> <td>44,347</td> </tr> <tr> <td>Medium</td> <td>3001 – 6000</td> <td>64,799</td> </tr> <tr> <td>Large</td> <td>6001 – 10,000</td> <td>89,448</td> </tr> <tr> <td>X-large</td> <td>10,001 – 15,000</td> <td>120,125</td> </tr> </tbody> </table> <p>For every 5000 in population over 15,000, add increments of 30,677 square feet. These gross building areas are exact.</p>	<u>Size</u>	<u>Population</u>	<u>Total Gross Square Feet</u>	X-small	251 – 1000	27,771	Small	1001 – 3000	44,347	Medium	3001 – 6000	64,799	Large	6001 – 10,000	89,448	X-large	10,001 – 15,000	120,125
<u>Size</u>	<u>Population</u>	<u>Total Gross Square Feet</u>																	
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Facility Consolidation	<p>A PFF may be combined with other facility types of a recreational or support nature, with the approval of FMWRC. Examples of facilities that could be combined are Natatoriums, Outdoor Pools, Outdoor Sport Facilities, Recreation Centers, etc.</p>																		
Energy and Sustainability	<p>Facilities shall be designed to meet energy and sustainable design and development requirements as established by Federal Law and Department of the Army policy.</p>																		
Accessibility	<p>All portions of the PFF shall comply with the Architectural Barriers Act (ABA).</p>																		
Control Desk	<p>Must be located directly inside the main entrance in order to control who enters the facility. Must be located adjacent to, and with direct, unobstructed, visual and physical access to, the free weight area for safety concerns. Shall also be located adjacent to the lobby seating area. Must be able to monitor either visually, or with video-surveillance, the following areas:</p> <ul style="list-style-type: none"> <li>• Cardio and Circuit areas</li> <li>• Gymnasium</li> <li>• Group Exercise Rooms</li> <li>• Entrance to Locker Rooms</li> <li>• Entrance to Racquetball Courts</li> </ul> <p>Counter heights shall be provided for standing height along with a lower area to meet ABA requirements. Lockable storage space must be provided for towels, balls, and other required equipment that will be issued from this desk.</p>																		

## THE ARMY STANDARD FOR PHYSICAL FITNESS FACILITIES

<p>Fitness Module - Cardiovascular Area</p>	<p>Floor mounted electrical outlets in a grid or linear configuration, with circuits sized for the load from fitness equipment, are required to allow flexibility in equipment arrangement and to avoid cord tripping hazards. Cardiovascular area shall be designed to provide a minimum of 2 different “environments”. These environments include Cardio Theater, external views, internal views, large group interaction, and small intimate groupings. Some portion of the Cardiovascular area must be contiguous with the Circuit and Free Weight Areas. Ceiling heights and flooring material must be as specified in the Technical Criteria for U.S. Army Physical Fitness Facilities.</p>
<p>Fitness Module - Circuit Area</p>	<p>Must be designed so that the entire circuit area is contiguous and that circuit equipment space is not dispersed into the Cardiovascular and/or Free Weight areas. In addition, the Circuit Area must be contiguous with the Free Weight Area and a portion of the Cardiovascular Area. Ceiling heights and flooring material must be as specified in the Technical Criteria for U.S. Army Physical Fitness Facilities.</p>
<p>Fitness Module - Free Weight Area</p>	<p>Must be directly accessible, visually and physically, to the Control Desk so that staff may see and respond to any emergency immediately. Mirrors must be provided on at least half of 2 perpendicular walls. Mirrors must extend from 18 inches above the floor to a height that provides full body visibility. For safety reasons for the weight lifters, all lighting fixtures in this area must be primarily indirect (&gt;75% up-lighting). The Free Weight Area must be contiguous with the Circuit Area and a portion of the Cardiovascular Area. Ceiling heights and flooring material must be as specified in the Technical Criteria for U.S. Army Physical Fitness Facilities.</p>
<p>Fitness Module - Receiving/Equipment Repair/Storage</p>	<p>This room must be located on an exterior wall with vehicular access and oversized double doors (8 foot wide minimum) or roll-up doors for delivery of fitness equipment. Doors into the fitness module must also be able to accommodate movement of equipment.</p>
<p>Fitness Module - Fitness Assessment and Stretching</p>	<p>The Fitness Assessment area must be located within the Fitness Module to provide space for fitness testing and consultation. The Fitness Assessment shall provide privacy for talking about sensitive health issues and for testing such as Body Fat Composition and other health tests. The stretching area shall be located near the entrance to the Fitness Module and shall be an open area to allow for stretching prior to working out.</p>

## THE ARMY STANDARD FOR PHYSICAL FITNESS FACILITIES

<p>Exercise Module</p>	<p>Shall be 1 room that can be divided into 2 smaller rooms by use of a movable wall. When the area for this function exceeds 5000 square feet, the function may be divided into 2 or 3 smaller rooms. All sections of the room must be accessible from the main circulation path. Dimensions of the room shall ensure that it is a usable space when opened for 1 large class or divided for smaller classes. Mirrors must be provided on the wall behind the instructor and either one perpendicular wall or the back wall, and must extend from no more than 1 foot above the floor to a height that provides full body visibility. Open storage cubbies must be provided for user's personal items. Flooring must be solid maple strip flooring that meets or exceeds the Maple Flooring Manufacturers Association (MFMA) specifications for a "second or better" grade, with an appropriate substrate that eliminates dead spots and provides for adequate impact absorption. Synthetic flooring, designated for aerobic classes, may be provided only if the general population served by this facility is primarily active-duty military, these areas will not be used primarily for standard aerobic classes, and are approved by FMWRC. A waiver will be required for any other type of flooring proposed. Ceiling heights must be as specified in the Technical Criteria for U.S. Army Physical Fitness Facilities. Enclosed, lockable storage rooms, configured for one-way patron flow, must be provided for each room, or section of a room, to provide space for storage of items such as mats, fit balls, medicine balls, bands, steps, dumb bells, etc.</p>
<p>Gymnasium</p>	<p>In facilities with more than 2 basketball courts authorized, courts may be provided in 1 large gymnasium or in a primary and secondary gymnasium. Minimum of 10 foot safety zone required between courts and walls or other surfaces (such as bleachers). Minimum of 15 foot safety zone required between courts. Flooring in the gymnasium shall be appropriate for basketball and volleyball, and shall comply with the appropriate Deutsches Institut für Normung (DIN) standards for gymnasium flooring. Court markings and function fixtures (such as backboards) must comply with the requirements of the Governing body of the sport (such as National Collegiate Athletic Association (NCAA)). The secondary gymnasium will be designed to meet the programming requirements of the installation and shall consider more non-traditional sports such as indoor soccer, in-line hockey, etc. Clear heights must be as specified in the Technical Criteria for U.S. Army Physical Fitness Facilities to accommodate both Basketball and Volleyball. An enclosed, lockable storage room must be provided for each gymnasium for equipment. Doors must be sized to allow for movement of large items such as rolls of floor mats, volleyball standards, portable basketball goals, etc.</p>

## THE ARMY STANDARD FOR PHYSICAL FITNESS FACILITIES

Indoor Jogging Track	<p>A 3-lane indoor jogging track with banked corners is required in at least 1 PFF on an installation. For a specific project, this must be programmed as an additional line item in the 1391, as it is in addition to the building areas provided in “Facility Size” above.</p>
Structured Activity Module	<p>The Structured Activity Module provides flexible space that can be used to meet the installation’s requirements along with the latest in fitness trends. Must be designed in accordance with the use that the user intends. Structured activities include, but are not limited to, Combatives Room, Racquetball Court(s), Spinning Studio, Climbing Wall, Health and Wellness offices, concessions area (such as a “smoothie bar” or mini-mart), and Child Care. Or, the space for Structured Activity may be used as additional space for one of the other functional modules, to include spectator space for racquetball courts, an additional exercise room, or to provide both saunas and steam rooms. If the user has selected a Climbing Wall for their facility, it must be located so as to be under constant staff supervision. Racquetball courts must be designed in accordance with the rules of the United States Racquetball Association, to include exact court size. Combatives Room shall be designed to accommodate mats on walls and floor, and shall minimize inside corners for safety. Child Care room shall be designed to FMWRC-CYS standards. Enclosed, lockable storage is required for each structured activity other than Racquetball.</p>
Locker Rooms	<p>The following functions are mandatory in the general area referred to as “Locker Room”.</p> <ul style="list-style-type: none"> <li>• Locker/Dressing Area</li> <li>• Grooming Area</li> <li>• Shower Area with private shower stalls and drying booths. Gang showers are NOT allowed.</li> <li>• Restroom facilities</li> <li>• Sauna or Steam Room</li> </ul> <p>A separate men’s and women’s locker room shall be provided. All locker room functions, listed above, must be provided for each gender. Locker Rooms must be arranged so that the restroom functions are close to the entrance of the locker room, and do not require that people needing to use the restroom must pass through the locker and/or shower area. Separate saunas, steam rooms, etc. will be provided for men and women. Lockers must be a minimum of 15 inches wide and 18 inches deep. Minimum height is 30 inches per half locker. Use of “Z” lockers to provide additional height is required. There will be a combination of full-height and half-height lockers, the ratio of which is determined by the installation based on climatic concerns.</p>

## THE ARMY STANDARD FOR PHYSICAL FITNESS FACILITIES

Sauna/Steam Room	A sauna or a steam room must be provided in the Physical Fitness Facility. The installation will determine their preference. Separate saunas/steam rooms must be provided for each gender. Shared saunas or steam rooms are NOT allowed. Controls shall be accessible to staff only. Access to the saunas/steam rooms shall be through the locker rooms only.
Laundry	Shall provide adequate area and mechanical/electrical support for industrial style washers (extractors) and dryers (tumblers) with additional space for utility sink, folding table, and storage for a minimum of 2 laundry carts if not located adjacent to control desk.
Administration	An administration area must be provided that includes office space for the facility manager along with other program staff in accordance with the table below. It is not required that the administration area be adjacent to the control desk.
Lobby	Shall be adjacent to the main entrance and control desk. Must be visible from the control desk so staff can monitor the area. Must provide area for seating for approximately 5% of the total number of participants. Must also provide direct access to public toilets.
Public Toilets	Must be accessible from the lobby and gymnasium. Primary users of these restrooms will be spectators.
Elevator	In multi-story applications, an elevator to comply with ABA and to provide a means to move fitness equipment to the upper level(s) is required.
Location	PFF shall be located close to barracks and/or other MWR type facilities to allow users to walk and/or minimize the need to drive.
Private Operated Vehicle (POV) Parking / Service Deliveries	<ul style="list-style-type: none"> <li>• Minimum of 1 parking space per every 300 square feet of gross building area. A portion of this parking may be in adjacent underutilized parking areas. Additional parking will be required if the gymnasium is used to hold large tournaments. In addition, additional parking will be required if a parking needs survey indicates a lack of parking.</li> <li>• Provide signage and pavement markings per the ABA.</li> <li>• Provide sufficient access for turnaround/backing space for tractor trailer deliveries of equipment to the Fitness Storage/Equipment Repair Room.</li> </ul>
HVAC	Physical Fitness Facilities must be conditioned (air conditioned and heated) and must comply with the Technical Criteria Document for Army Physical Fitness Facilities, which is based on the American College of Sports Medicine (ACSM). A waiver is required to deviate from the requirements specified in the Technical Criteria document

## THE ARMY STANDARD FOR PHYSICAL FITNESS FACILITIES

Telecommunications	<ul style="list-style-type: none"><li>• Telecommunications infrastructure will meet the USAISEC Technical Guide for Installation Information Infrastructure Architecture (I3A) and ANSI/TIA/EIA 568 and 569 requirements.</li><li>• The facility must connect to the Installation telecommunications (voice and data) system through the outside plant (OSP) underground infrastructure per I3A guidance. Connections to the OSP cabling system shall be from each facility main cross connect located in the main telecommunications room or telecommunications equipment room to the closest OSP access point.</li><li>• Telecommunications outlets will be provided IAW the Technical Guide for Installation Information Infrastructure Architecture (I3A Guide). Telecommunications outlets will be provided per the I3A technical guide based on functional purpose of the various spaces with the facility as modified by user special operational requirements.</li><li>• Telecommunications Room. A Telecommunications Room (TR) shall be provided for the voice and data network. There shall be a minimum of one TR on each floor, designed in accordance with the I3A Guide and ANSI/EIA/TIA-569-B.</li></ul>
Drinking fountains	Drinking fountains shall be directly adjacent to, or within, each functional module. Determination of whether the drinking fountain is placed within the module is dependent upon the flooring material and potential for damage or injury. Drinking fountains shall NOT be located on wood floors.

# THE ARMY STANDARD FOR PHYSICAL FITNESS FACILITIES

## GENERAL DESIGN PHILOSOPHY:

The Army currently has 244 facilities at 110 installations world-wide. The majority of these facilities are in adequate condition, but almost all installations currently have a deficit in the amount of Physical Fitness Facility (PFF) space based on their population. The new standard reflects a modular approach which takes into account the current trends in training, fitness, and recreation, and uses the current PFF inventory at the installation to maximize efficiencies and to provide uniform opportunities across the Army.

The PFF Standard Criteria was developed around standardized modules for various physical fitness activities. The concept was that the Army would look at all of the PFF assets at a given installation and compare what was existing against what is authorized through the use of a Quantity Questionnaire (QQ). The QQ is part of the PFF Standard criteria, and was developed to allow the sports and fitness personnel to determine their existing assets. Once the existing assets have been entered, the form automatically determines deficits. This would then enable Installation master planners to determine whether the addition of some modules to an existing PFF would help alleviate major deficiencies. In addition, these authorized areas could be used to custom design a facility to address major deficiencies in certain modules across the installation. In effect, an installation could choose to build just an aerobics center if there were no exercise module existing in any of the PFF.

## GUIDANCE:

Facility Category Code: The Category Code does not automatically imply a specific GSF limit.

<b>CATEGORY CODE</b>	<b>DESCRIPTION</b>
74028	Physical Fitness Facility

U.S. Army Physical Fitness Facilities must comply with the latest version of the Technical Criteria for U.S. Army Physical Fitness Facilities (dated no earlier than October, 2003), to include any amendments issued after the date of the latest publication, except as modified by the Army Standard above.

Reference Criteria: The designs should use latest editions of the following design criteria:

- Architectural Barriers Act (ABA)
- American College of Sports Medicine's Health/Fitness Facility Standards and Guidelines
- IBC – International Building Code
- NFPA 101, Life Safety Code
- AR 405-70, Utilization of Real Property
- AR 420-1, Army Facilities Management
- DA PAM 415-28, Facility Guide To Army Real Property Category Codes
- UFC 3-600-01, Design: Fire Protection Engineering for Facilities
- UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings
- UFC 4-023-03, Security Engineering: Design to Resist Progressive Collapse

## THE ARMY STANDARD FOR PHYSICAL FITNESS FACILITIES

- ETL 1110-3-491, Sustainable Design for Military Facilities
- USAISEC Technical Guide for Installation Information Infrastructure Architecture (I3A)
- ANSI/TIA/EIA-568-B Commercial Building Telecommunications Cabling Standard
- ANSI/TIA/EIA-569-B Commercial Building Standard for Telecommunications Pathways and Spaces

The Corps of Engineers Center of Standardization (COS) provides the first line technical compliance review. The Facilities Design Team in conjunction with the COS will resolve any issues where there may be conflicting, unclear or no compliance measurement threshold. Resolution may require senior leadership guidance or amendment of the Army Standard. Only the ACSIM can approve adjustments or changes to the requirements in an Army Standard. The Army Standard is not intended to provide compliance criteria detailed in references, regulations, industry standards, or standard design.

Physical Fitness Facilities must be designed to allow natural day lighting while controlling glare and heat gain. Spaces should be provided with large windows, translucent panels, clerestory windows and other techniques to maximize day lighting and improve the quality of life in these facilities.

Army PFF in the past have been a series of dark concrete block rooms with different functions placed inside. The intent of the new standard is to provide open areas appropriately designed for their function. Concepts such as exposed structure in lieu of acoustical tile ceilings may be utilized in many different areas. Also, spaces shall be as open as possible to provide flexibility to accommodate shifts in trends in fitness and recreation. Designers are strongly encouraged to review the State of the Art facilities published each June in the Athletic Business magazine.

Extremely large installations will consider providing mega facilities (larger than the "large" size indicated in the attached Authorized PFF Space Allowance chart), sized by using the increments, to minimize the total number of facilities on the installation to maximize staffing and other efficiencies.

In the attached Authorized PFF Space Allowance chart, all areas provided are the ideal net area based on equipment sizes and other functions. Actual net areas may vary +/- 5% from what is shown unless noted otherwise in this standard.

Traffic patterns must be considered when laying out the lobby and control desk to minimize potential conflicts with cross traffic for people signing in. It is preferable that the control desk be located on the right side when you enter the facility.

Deutsches Institut für Normung (DIN) standards referenced above in the Gymnasium may be found in the American College of Sports Medicine (ACSM) book, "Health/Fitness Facility Standards and Guidelines".

The preference for flooring in the Gymnasium is an appropriately designed solid maple floor. Where 2 Gymnasiums are provided in a facility, it is recommended that the second Gymnasium be designed to be more multi-purpose oriented. Synthetic athletic

## THE ARMY STANDARD FOR PHYSICAL FITNESS FACILITIES

flooring may be used in the primary Gymnasium when requested by the installation and approved by the COS and FMWRC.

It is preferred that the climbing wall be located off of the lobby, under supervision of the control desk, as a design feature of the facility. However, another option would be to locate the climbing wall in a lockable room.

The chart on the following page lists the total area for each functional area that should be provided for an entire installation based on their authorized population. The PFF buildings are allocated on the basis of authorized population (AP) which includes 100% of active duty military and 25% of their dependents. Retirees are not counted in the AP at this time. DoD civilians are included at 10% only if they exceed 60% of the total workforce for CONUS installations. OCONUS installations are authorized at 100% of the civilian population in their AP.

It is difficult to determine the number of parking spaces required for a PFF. Based on the American College of Sports Medicine's "Health/Fitness Facility Standards and Guidelines", for initial parking calculations, assume 1 parking space for every 300 gross square feet of facility. This will provide adequate parking for all staff and approximately 60% of the maximum facility participants. However, many factors may result in the adjustment of this number of parking spaces, either up or down. A parking needs survey needs to be conducted to determine a more accurate need for parking, and the number of parking spaces provided adjusted accordingly. This survey needs to consider the following aspects at a minimum:

1. Current parking available in close proximity to the PFF.
2. The number of spectators that can be accommodated in the gymnasium.
3. Proximity of the PFF to troop housing.
4. Availability and use of public transportation.
5. The type of unit (administrative vs. training, etc.)
6. The amount of shift work.

**THE ARMY STANDARD FOR PHYSICAL FITNESS FACILITIES**

<b>AUTHORIZED PFF SPACE ALLOWANCE</b>							
<b>CRITICAL FUNCTIONAL AREAS &amp; TOTAL PFC BUILDING AREA</b> (Areas in square feet)		<b>X-SMALL</b> (Facility or Post)	<b>SMALL</b> (Facility or Post)	<b>MEDIUM</b> (Facility or Post)	<b>LARGE</b> (Facility or Post)	<b>X-LARGE</b> (Facility or Post)	<b>INCREMENT</b> (each 5000 over 10,000)
<b>Minimum Population:</b>		<b>251</b>	<b>1001</b>	<b>3001</b>	<b>6001</b>	<b>10001</b>	<b>1</b>
<b>Maximum Population:</b>		<b>1000</b>	<b>3000</b>	<b>6000</b>	<b>10,000</b>	<b>15000</b>	<b>5000</b>
<b>Fitness Module</b>	Cardiovascular Area	550	1,350	2,550	4,000	6,000	2,000
	Circuit Area	800	1,350	1,650	2,300	3,300	1,000
	Free Weight Area	975	1,885	3,055	5,200	7,995	2,795
	<b>subtotal</b>	<b>2,325</b>	<b>4,585</b>	<b>7,255</b>	<b>11,500</b>	<b>17,295</b>	<b>5,795</b>
	Storage - 10% of Cardio/Circuit/Free	233	459	726	1,150	1,730	580
	Stretching/Fitness Assessment	225	400	575	750	925	175
<b>Exercise Module</b>	Large Group Exercise	1,200	1,650	2,800	4,500	6,750	2,250
	<b>subtotal</b>	<b>1,200</b>	<b>1,650</b>	<b>2,800</b>	<b>4,500</b>	<b>6,750</b>	<b>2,250</b>
	Storage - 10%	120	165	280	450	675	225
<b>Structured Activities</b>	Racquetball Court(s)						
	Combatives Room						
	Climbing Wall						
	Spinning Classroom						
	Small Group Exercise Room						
	Concessions Area						
	Child Care						
	Other:						
	Other:						
<b>subtotal</b>	<b>4,740</b>	<b>5,183</b>	<b>6,310</b>	<b>8,002</b>	<b>12,104</b>	<b>4,102</b>	
<b>Gym Module</b>	Basketball Courts (Gymnasium)	9,775	17,400	25,200	33,000	41,400	8,400
	Storage	700	1,050	1,400	1,750	2,100	350
	<b>subtotal</b>	<b>10,475</b>	<b>18,450</b>	<b>26,600</b>	<b>34,750</b>	<b>43,500</b>	<b>8,750</b>
<b>TOTAL NET OF MODULES</b>		<b>19,318</b>	<b>30,892</b>	<b>44,546</b>	<b>61,102</b>	<b>82,979</b>	<b>21,877</b>
<b>SUPPORT AREA ALLOWANCES:</b>							
<b>Sauna, Lockers, Showers, Toilets</b>		<b>2,400</b>	<b>3,800</b>	<b>5,850</b>	<b>8,800</b>	<b>11,800</b>	<b>3,000</b>
<b>Admin</b> (Including internal circulation)		<b>514</b>	<b>741</b>	<b>1,377</b>	<b>1,471</b>	<b>1,589</b>	<b>120</b>
<b>Lobby</b> (Including control desk & public toilets)		<b>817</b>	<b>1,467</b>	<b>2,226</b>	<b>3,098</b>	<b>3,617</b>	<b>519</b>
<b>Misc.</b> (ME, Circ., Struct., other functions not listed)		<b>4,722</b>	<b>7,447</b>	<b>10,800</b>	<b>14,978</b>	<b>20,141</b>	<b>5,161</b>
<b>TOTAL GROSS AREAS:</b>		<b>27,771</b>	<b>44,347</b>	<b>64,799</b>	<b>89,449</b>	<b>120,125</b>	<b>30,677</b>

Note: Areas are not provided for the individual functions within the Structured Activity Module as these are determined in conjunction with the Installation during the Design Charrette. The spaces selected must total no more than the Structured Activities subtotals shown above.

# Technical Criteria



## Technical Criteria for U.S. Army Physical Fitness Facilities

Standard Criteria

Updated June, 2010

Originally developed for the Corps of Engineers  
by  
Hastings & Chivetta Architects in association with Construction Engineering & Management

*Updated by the US Army Engineering and Support Center, Huntsville*



**Technical Criteria for U.S. Army Physical Fitness Facilities**



**Developed for the Corps of Engineers**

**Updated April, 2010**

U.S. Army Engineering and Support Center, Huntsville

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# I

## Executive Summary



### A. Summary of Findings

#### Facility Allocation

Four Physical Fitness Facility (PFF) building programs are developed and presented herein. The PFF buildings are allocated on the basis of authorized population (AP) which includes 100% of active duty military and 25% of their dependents. Retirees are not counted in the AP at this time. DoD civilians are included at 10% only if they exceed 60% of the total workforce for CONUS installations. OCONUS installations are authorized at 100% of the civilian population in their AP. The four PFF total building program areas include the following:

<b>X-Small</b>	251 to 1,000 AP	27,771GSF (Gross Square Feet)
<b>Small</b>	1,001 to 3,000 AP	44,347GSF
<b>Medium</b>	3,001 to 6,000 AP	64,799GSF
<b>Large</b>	6,001 to 10,000 AP	89,448GSF

To calculate PFF building program for APs that exceed 10,000, an “Increment” building program is provided to increase the Large building program. The Increment program is intended to serve each additional 5,000 persons over 10,000 and includes 30,677SF. Thus, a total AP of 20,000 would require a Large PFF of 89,448SF + two 30,677SF Increments for a total of 150,802SF.

#### Facility Evaluation - Program Area

A breakdown of the Critical Function Modules (CFM) or components in the PFF is provided on page 5. Existing and new facilities should be inventoried and measured to assess compliance with these program areas. A PFF is considered to be in compliance with the PFF requirements when the following occurs:

- *If Fitness, Exercise and Shower/Locker/Toilet CFM components and their subcomponents individually meet a minimum of 95% of the net square foot required space, the CFM are considered in compliance.*
- *If the number of Racquetball or Squash Courts required in the Structured Activity Component is met, even if the courts are smaller than the required area, the component is considered to be in compliance. If compliance is not met, the required courts should be added by using a net increase of 850SF per court.*
- *If the Gymnasium component has the required number of courts sized at 50'x94' regardless of whether the required bleacher and storage areas are met, the Gym Component is considered to be in compliance. If this requirement is not met, new Gymnasium modules should provided per the PFF Space Allowance Table shown on page 5.*

- *If there is one track, and the gross area of the PFF meets area required to serve the AP, regardless of whether the track meets the required CFM area, this component is considered to be in compliance.*
- *If PFF components are brought into compliance with the above standards and the facility is a maximum of 10% over the allowed gross square foot area, the facility is considered to be in compliance. If the component sizes cannot be sized to meet the space standards defined above without exceeding a 10% overage, the PFF should be renovated or replaced to achieve a more efficient building design.*

**Facility Evaluation - Quality Standards**

Standards for new construction should meet the quality standards described in Section IV - Building Design Criteria. Renovation of existing facilities should be evaluated on a case by case basis.

SAMPLE

# II

## Design Concepts



### A. Background

#### *History of Development*

Headquarters, Family, Morale, Welfare, and Recreation Command (FMWRC), with the Corps of Engineers, have developed new design standards for Physical Fitness Facilities (PFF) for military bases in and out of CONUS. This report presents four PFF buildings to serve authorized populations ranging from 250 to 10,000. The facilities are categorized as X-Small, Small, Medium and Large. Standard increments have also been developed to accommodate populations over 10,000.

In order to function as a PFF, a facility must, at a minimum, include the following Critical Function Modules (CFM):

- Fitness Module (cardiovascular, circuit and free weight areas)
- Exercise Module (exercise rooms for instruction i.e. aerobics)
- Structured Activity Module (racquetball and other activities)
- Gymnasium Module (suitable for basketball and volleyball)
- Locker / Shower / Sauna Module



To test the adequacy of the indoor spaces for each PFF, national participation statistics were used to predict the recreational interests of active duty personnel. The national participation statistics, from a civilian survey of approximately 50% men - 50% women, were adjusted to fit a military base demographic of 80% men - 20% women. National survey responses were narrowed to the 18-44 year age group which represents 96.9% of the active duty army personnel.

Each module was tested and adjusted to verify its ability to accommodate the recreation, fitness and health interests of Active Duty (AD) personnel during peak times. Peak use varies from activity to activity. For activities requiring instruction or teams, peak use fluctuates between 50-60% of the hours of operation. For walk-in and individual activities such as fitness or running peak use varies between 80-90% of operating hours. The total hours of operation are 100 per week and reasonable attendance is assumed. Utilization worksheets for all four facilities are provided in the Appendix.

#### *Findings*

Utilization testing of Fitness, Exercise and Non-Structured Modules confirms that program areas are adequately sized to meet demand even when civilian statistics for fitness are nearly tripled. Module areas that fall short of meeting peak demand are Gymnasium (Medium and Large), Racquetball (Medium and Large) and Jogging Track (Large)

***Recommendations***

Gymnasium Module

- a) Constructing additional courts is not recommended to meet the short fall. A 50' x 94' court is a large area relative to the number of participants that can be accommodated for a basketball or volleyball game. Constructing and maintaining new courts is not an economically feasible solution to providing more game time. Programming half-court games, extending program hours, and providing outdoor courts are all viable alternatives.
- b) Recreation trends over the past ten years show steady interest in basketball but a downward trend in volleyball. Overall, national participation for volleyball for all age groups dropped from 25.1% in 1989 to 11.7% in 1999. This trend may result in a lower demand for volleyball court time.

Racquetball Court

- a) Recreation trends over the past ten years show a steady decline in racquetball of 8.2% in 1989 to 3.2% in 1999. Meeting the shortage in peak demand can be satisfied by using the Structured Activity Space for an additional court. The contingency space for every building size easily accommodates an additional racquetball or squash court.

Jogging Track

- a) Exercise walking, jogging and running are popular activities. Walking has grown 20% over the past ten years and is becoming a staple of recreational activity for all age groups. National statistics do not separate survey responses by indoor track, treadmill or outdoor participation. Notwithstanding, each facility will provide a minimum of one suspended track surrounding the gymnasium. Facilities in extreme climates can expand track areas by looping the track around other indoor components. Need should be reviewed on a case by case basis.

SAMPLE

**B. Physical Fitness Facility (PFF) Space Allowance Table**

Net and gross areas PFFs are itemized below. These spaces have been sized and tested for ability to meet peak demand based on a recommended square foot per person area published by the National Intramural-Recreation Sports Association (NIRSA) Space Standard for Indoor Facilities.

CFM Component	NIRSA Recommended Area
Exercise Module - Aerobics	50SF per participant
Exercise Module - Non-Structured	125SF per participant
Gymnasium Court - Basketball	14 participants + 4 rotating in
Gymnasium Court - Volleyball	16 participants + 4 rotating in
Fitness Module	50SF per equipment station 65SF per free weight station
Structured Activity - Racquetball	4 participants per 800SF Court
Indoor Track	1 runner/ 20 lineal feet

An "Increment" program area is provided to increase the X-Large facility to serve authorized populations that exceed 15,000. The Increment area will serve 5,000 persons. Thus, a population of 19,000 requires an X-Large PFF plus one Increment.

AUTHORIZED PFF SPACE ALLOWANCE							
CRITICAL FUNCTIONAL AREAS & TOTAL PFF BUILDING AREA (Areas in square feet)	X-SMALL	SMALL	MEDIUM	LARGE	X-LARGE	INCREMENT	
Minimum Population:	251	1,001	3,001	6,001	10,001	1	
Maximum Population:	1,000	3,000	6,000	10,000	15,000	5,000	
Fitness Module	Cardiovascular Area	550	1,350	2,550	4,000	6,000	2,000
	Circuit Area	800	1,350	1,650	2,300	3,300	1,000
	Free Weight Area	975	1,885	3,055	5,200	7,995	2,795
	Stretching/Fitness Assessment	225	400	575	750	925	175
	Storage	233	459	726	1,150	1,730	580
Exercise Module	Large Group Exercise	1,200	1,650	2,800	4,500	6,750	2,250
	Storage	120	165	280	450	675	225
Structured Activities	Racquetball Courts, Climbing Wall, Spinning Classroom, Combatives, Concesssions, Child Care, etc.	4,740	5,183	6,310	8,002	12,104	4,102
Gym Module	Basketball Courts (Gym)	9775	17,400	25,200	33,000	41,400	8,400
	Storage	700	1,050	1,400	1,750	2,100	350
<b>TOTAL NET OF MODULES:</b>		<b>19,318</b>	<b>30,892</b>	<b>44,546</b>	<b>61,102</b>	<b>82,979</b>	<b>21,877</b>
<b>SUPPORT AREA ALLOWANCES:</b>							
Sauna, Lockers, Showers, Toilets		2,400	3,800	5,850	8,800	11,800	3,000
Admin	Director's Office	120	120	120	120	130	10
	Program Mgr's Office	0	100	100	100	110	10
	Support Staff Workstations	128	128	256	320	384	64
	Copy/file/work/break Room	160	240	160	170	180	10
	Storage	20	29	32	36	40	5
	Classroom/Training Room	0	0	420	420	420	0
	Classroom/Training Storage	0	0	60	60	60	0
Internal Circulation (20%)		86	123	230	245	265	21
Lobby	Estimated Lobby	230	440	650	880	1,090	210
	Est. Control Counter/Storage	300	512	725	938	1,151	213
	Estimated Public Restrooms	287	515	851	1,280	1,376	96
Miscellaneous (M/E, Circ., Struct., and other functions not listed – janitor, laundry, etc.)		4,722	7,447	10,800	14,978	20,141	5,161
<b>TOTAL GROSS AREAS:</b>		<b>27,771</b>	<b>44,347</b>	<b>64,799</b>	<b>89,448</b>	<b>120,125</b>	<b>30,677</b>

**C. Allocation of Facilities – Programming**

***Method of Allocation***

Physical Fitness Facilities are allocated on the basis of Authorized Population (AP). Authorized population is counted as follows:

- 100% of Active Duty personnel (AD)
- 25% of AD Dependents
- 10% of Civilians (in CONUS) if they are 60% of the total workforce
- 100% of Civilians (OCONUS) regardless of percentage of workforce

***New Construction***

If no PFF exists on post, the procedure for allocating facility size is to calculate AP and reference the Authorized PFF Space Allowance Table on Page 5. Recommendations are presented in Section III of this manual to establish criteria for designing, constructing and equipping a new facility.

***Existing Facilities***

If there is an existing PFF on the installation, the procedure for assessment is:

- Calculate total AP
- Determine the Authorized PFF Space Allowance (see below)
- Measure PFF from outside wall to outside wall (gross square feet)
- Inventory and measure interior spaces (net square feet)
- Compare actual net and gross areas to Authorized PFF Allowances
- Identify deficits
- Identify surplus
- Analyze the facility for conformity to minimum ISR quality standards
- Record inadequacies or inefficiencies (surplus areas)

Since facilities are allocated solely on the basis of authorized population, it is important to accurately calculate the total authorized population. Army guidelines provide for only 25% of dependents to be counted in the AP. DoD statistics report that Fifty-percent of active duty personnel are married with an average of 2.83 dependents. Failure to accurately count the total Authorized Population may result in a facility that is undersized. Some of the consequences of an under-programmed PFF will be overcrowding and shortened life-span of building resources and equipment.

***Assumption***

A chart illustrating a prototypical demographic breakdown of an Authorized Population of 1,000 persons is shown on the next page. Studies to test module sizes assume the peak user group for this prototype is AD personnel that makes up 74% of the total AP. The current DoD demographic profile for activity duty personnel in the DA is 85% Men and 15% Women. The DoD projects that within ten years the demographic split will be 80% Men and 20% Women. An overall male/female demographic for a total installation with an AD split of 80/20 Men/Women is estimated to be 60% Men and 40% Women.

Estimated Authorized Population		1000	total
	<b>Active Duty</b>	<b>739.0</b>	<b>74%</b>
<b>A</b>	Married	369.5	
<b>B</b>	Unmarried	369.5	
<b>C</b>	Ratio of Dependents/Married (based on DOD statistics)	2.83 x 369.5	1045.7
<b>D</b>	<b>Actual Base Population</b>	<b>1784.7</b>	
<b>E</b>	Married	100% x A	369.5
<b>F</b>	Unmarried	100% x B	369.5
<b>G</b>	Dependents	25% x C	261.4
	<b>Total Authorized Users</b>	<b>1000.4</b>	

10-Year Projected AD Breakdown = 80% Men, 20% Women

Demographic Profile of Adult Population			
<b>H</b>	100% of AD Unmarried Men	80% x B	295.6
<b>I</b>	100% of AD Unmarried Women	20% x B	73.9
<b>J</b>	100% of AD Married Men	80% x A	295.6
<b>K</b>	100% of AD Married Women	20% x A	73.9
<b>L</b>	Female Spouses	100% x J	295.6
<b>M</b>	Male Spouses	100% x K	73.9
	<b>Adult Population</b>		<b>1108.5</b>

Projected Males on Base	60%	H+J+M	665.1
Projected Females on Base	40%	I+K+L	443.4
			<b>1108.5</b>

The two charts above illustrate the demographic profile of a CONUS installation with a civilian workforce of less than 60%. This installation qualifies for an X-Small PFF. The AP of 1,000 is comprised of 50% unmarried AD and 50% married AD with 2.83 dependents. This emulates the 2001 DoD statistic for the DA overall. The chart demonstrates that a PFF designed to accommodate an AP of 1,000 may have an actual installation population of 1,784.

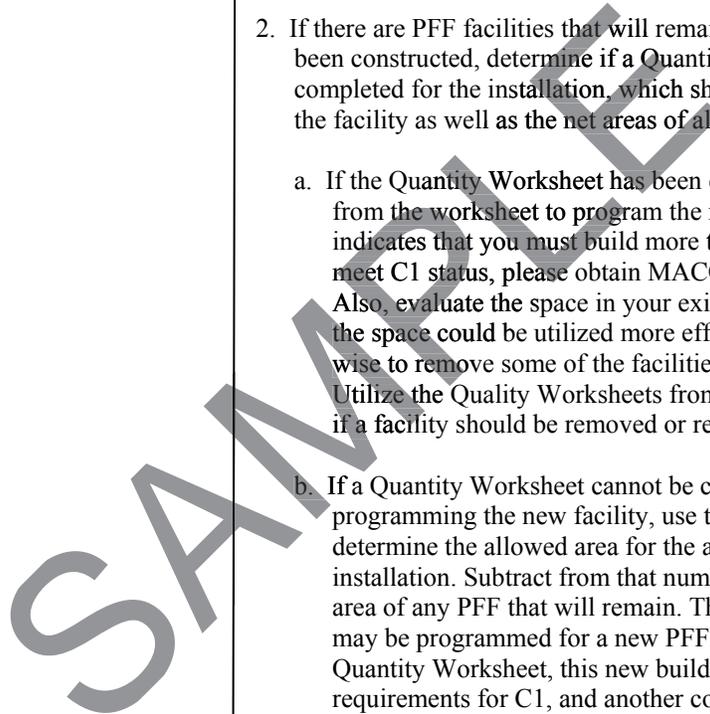
The total Dependents (G) are assumed to be spouses and children. Children are expected to visit the PFF during off-peak times. The peak user group, creating demand in early morning and after-work hours, is expected to be adults. The lower chart illustrates that the actual adult population is 1,108 with a projected demographic of 60% Male and 40% Female.

It is unlikely that all 1,108 adults will visit the PFF at peak times. Some AD will be on-duty and spouses may be at home with children. For purpose of this study, the peak user group for all facilities is assumed to be 74% of the AP which equates to almost 100% of the AD personnel. The demographic profile of 80/20 Men/Women is used, even though 60/40 represents the overall base demographic. Depending on the MACOM and installation mission, the AD demographic may change, affecting participation statistics and utilization. Adjustments should be made to PFF Space allowances if the Male/Female population shifts more than 10% in either direction. See Section IV - Appendix for guidance in making adjustments.

**Programming**

Programming a Physical Fitness Facility (PFF) requires several steps to accommodate the Army's goals to provide adequate PFF facilities at every installation.

1. Determine if there are any PFF(s) existing on the installation already. If a PFF(s) already exists on the installation, determine whether the existing PFF(s) will be demolished or converted to some other use as part of this project, or shortly after the new facility is constructed, such that this new facility will be the only PFF on the installation. If no PFF exists, or the existing one will be removed from the inventory once the new one is built, use the gross areas provided in the PFF Space Allowance Table on Page 5 which is based on the authorized population of the installation. This includes instances where a entirely new community is being developed away from the main installation.
  
2. If there are PFF facilities that will remain after the new facility has been constructed, determine if a Quantity Worksheet has been completed for the installation, which shows the total gross area of the facility as well as the net areas of all the functional modules.
  - a. If the Quantity Worksheet has been completed, use the results from the worksheet to program the new facility. If the result indicates that you must build more than authorized in order to meet C1 status, please obtain MACOM approval as required. Also, evaluate the space in your existing PFF(s) to determine if the space could be utilized more efficiently, or if it would be wise to remove some of the facilities from your inventory. Utilize the Quality Worksheets from the ISR to help determine if a facility should be removed or renovated.
  - b. If a Quantity Worksheet cannot be completed before programming the new facility, use the Standard Criteria to determine the allowed area for the authorized population of the installation. Subtract from that number the total gross building area of any PFF that will remain. The result is the amount that may be programmed for a new PFF. Realize that without the Quantity Worksheet, this new building may not meet the requirements for C1, and another construction or renovation project may be required in the out years.
  
3. In the overall gross areas for PFF, a "Miscellaneous Area" has been provided to accommodate circulation, wall thickness, and mechanical/ electrical spaces, and other required spaces not identified elsewhere. This area is calculated at 20% of the total net area of the functional modules. If there are larger mechanical and/or electrical requirements, this additional space must be added during the programming phase. **FUNCTIONAL MODULES MAY NOT BE REDUCED IN AREA TO ACCOMMODATE MECHANICAL AND/OR ELECTRICAL REQUIREMENTS.** Areas provided for each functional module are directly related to the requirements in the Installation Status Report (ISR). Reduction of these areas will result in a lower "C" rating for the installation, even after the construction of a brand new facility.



4. Computation of Gross Areas. The gross area of facilities will be computed according to the definition in Chapter 5 of TI 800-01.
5. New PFF(s) will be designed in accordance with this document, the approved Army Standard, the UFC 4-740-02, and other criteria maintained by the US Army Corps of Engineers Center of Standardization.

SAMPLE

**III** Functional Relationships  
& Module Design Criteria



**A. Component Descriptions**

**Lobby**

A well-designed lobby serves to not only welcome visitors to the fitness facility, but also to motivate them. Functionally, the lobby provides a passageway to organize the building. Referred to as “public space” the lobby physically leads visitors from the exterior to the control point. The control desk should be adjacent to the entry for check-in/out and equipment issue. This facilitates monitoring and restricting access to the building and gives all visitors an arrival destination. From the control point, users can be easily directed to major activity areas and support spaces. Open views into the gymnasium, fitness facility and other activity modules instantly define building function and capture user attention. These views also enable supervision of activities from the control desk.

Features that make the lobby an inviting space include lounges to provide refuge for anyone waiting for a friend or for court time. However, recreation facility lounge areas should not resemble airport waiting areas with tandem seating. Instead, seating should be placed to invite socialization and relaxation with features that include an oversized television, comfortable seating and kiosk or message center. Small cafe-style tables and chairs may be provided if vending machines are available.

The shape of the lobby can either be classically geometric or a lineal concourse. The mall concept is newer and integrates retail thinking. A long passageway increases visual connection to fitness elements, thereby advertising activities. Lobby orientation is influenced by other factors including sun angles, tree coverage and pedestrian /vehicular circulation. Site context, massing and material selection also impact lobby design.

The aesthetic impact of the lobby relies on the placement and quality of finish materials. Durability and maintainability play a significant role in the selection of finishes for high-traffic areas. In general, warm colors and soft textures are most successful at creating an ambiance that invites users to linger in the transitory space. Terrazzo or porcelain tile floors add durability and quality. Suitable wall materials include burnished or split-face block, masonry or epoxy-painted concrete masonry units. Lobby lighting should allow for natural light through large windows and clerestories and should be provided with a combination of natural and artificial light sources to utilize daylighting and daylight harvesting within the space. Various ceiling heights and drywall bulkheads help to define lobby functions.

More than any other space in the facility, the lobby furnishings and fixtures contribute to forming the user’s impression of the building. Furniture, display cases, refuse containers, plants, graphics and signage should all be carefully coordinated.

### *Gymnasiums*

Large volume gyms are often neglected by designers because function overwhelms creative possibilities. However, with careful planning, these “big-box” spaces will respond to a wide variety of program needs.

No other space can accommodate multiple activities as well as the gymnasium. Through the use of simple devices like divider curtains, concurrent basketball, volleyball, and even tennis is possible. Suspend the running track above the floor and runners or walkers can overlook floor activities. Such a large volume can incorporate interior views at many levels to look across to racquetball courts, high ceiling lobbies, or climbing walls. Views to the exterior offer visual variety from the inside and add interest in the facility to passersby. Windows have the added benefit of bringing in natural light in what traditionally has been an artificially lit and harsh environment. In short, careful planning of even the most utilitarian elements can make the gymnasium the visual and functional hub of the facility.

High performance materials, color, lighting, and ventilation are key elements that make gymnasiums attractive spaces. Ventilation systems should be designed with adequate air changes to maintain a suitable activity environment. Recommendations are provided in Section IV of this report. Color and lighting impact overall design. Neutral colors for walls and white ceilings can be easily combined with accent colors. Light colors are also reflective, making a large-volume space easier to illuminate. Darker colors hide marks on the walls, but absorb light requiring greater levels of artificial illumination. Selection and placement of light fixtures is crucial to achieving even but not harsh illumination. Downlighting alone may cause hot spots and glare on the playing surface. Indirect lighting alone may not provide sufficient light for competitive play. The preferred solution is a combination of indirect and direct lighting that illuminates the entire space with a minimum amount of glare. Recommendations for light level are provided in Section IV.

Suspending the running track helps to reduce the apparent volume of the gym module, as well as provide an opportunity to introduce accent colors and decorative elements via the railings and structural supports for the track. Accenting selected elements within the entire space can create a sense of energy and excitement, or in softer tones create a more relaxed atmosphere. Every element within the volume must be considered for its functional and visual impact on the whole.

Bleacher seating, basketball backstops, and divider curtains are other elements that provide opportunities for accenting and highlighting the space. Not only used for activity control, divider curtains form one of the strongest visual elements in the space. Careful consideration of mounting height and the proportion of solid versus open mesh material can prevent divider curtains from blocking views, lowering light levels, and constricting an otherwise light and open volume.

Flooring materials have the greatest impact on user satisfaction. Select high performance wood floors that utilize neoprene shock pads for impact absorption to reduce injuries while maintaining near perfect ball return characteristics. Maple floors are the industry standard, but a wide variety of appearance grades are possible. Lower grades may reduce cost for the same performance, but allow undesirable visual variation in the boards. Synthetic sports floors also offer competitive cost and performance characteristics while allowing the introduction of colors and durability. To repeat, careful planning and a reasonable understanding of how each element affects the visual quality of the space are key to creating a superior gymnasium. Technical guidelines for track and flooring elements are in Section IV.

The layouts follow regulations from nationally recognized sports associations like the United States Volleyball Association (USAV) and the National Collegiate Athletics Association (NCAA). It is required that new courts conform to competitive standards nationwide. The correct volume for the gymnasium module starts with the proper court dimensions, clear heights, and sideline allowances. Minimum clear height of the gymnasium is 28' from floor to lowest element.

As of October, 2003, the governing bodies for Volleyball and Basketball, along with some of the facility requirements, are listed below. Current regulations shall be followed. Actually Army requirements are defined further in this document.

#### **Regulation Information from the USA Volleyball Rule Book**

USA Volleyball (USAV) is the national governing body for the sport of volleyball in the United States and is recognized by the Federation International de Volleyball (FIVB) and the United States Olympic Committee (USOC).

#### **Ceiling Height**

The playing space is free from any obstructions to a height of 7 m (23') from the playing surface.

#### **Playing Court**

The playing court measures 18 m x 9 m (59' x 29'6").

#### **Center Line**

The axis of the center line divides the court into two team courts measuring 9m x 9 m (29'6" x 29'6") each.

#### **Lines**

All lines on the court are 5 cm (2") wide.

#### **Boundary Lines**

Boundary lines: Two sidelines and two end lines mark the playing court. All boundary lines are drawn inside the dimensions of the playing court.

#### **Attack Lines**

Attack lines are drawn in each team court so that the edge of the attack line farthest from the center line is 3 m (9'10") from the axis of the center line. Extensions of the attack lines outside the court shall be marked with five 6" lines spaced 8" apart to a total length of 70" (for national competition).

**Area Around the Court (Free Zone)**

The free zone surrounds the court with a recommended minimum width of 2 m (6'6").

**Net Height** FIVB, USAV, California Beach Volleyball Association (CBVA), Women's Professional Beach Volleyball Association WPVA

Net height for men, coed mixed 6, & outdoor is 2.43 meters or 7'11-5/8".

Net height for women, boy's 14-and-under & reversed mixed 6 is 2.24 meters or 7'4-1/8".

Net height for 12-and-under is 2.13m or 7'0".

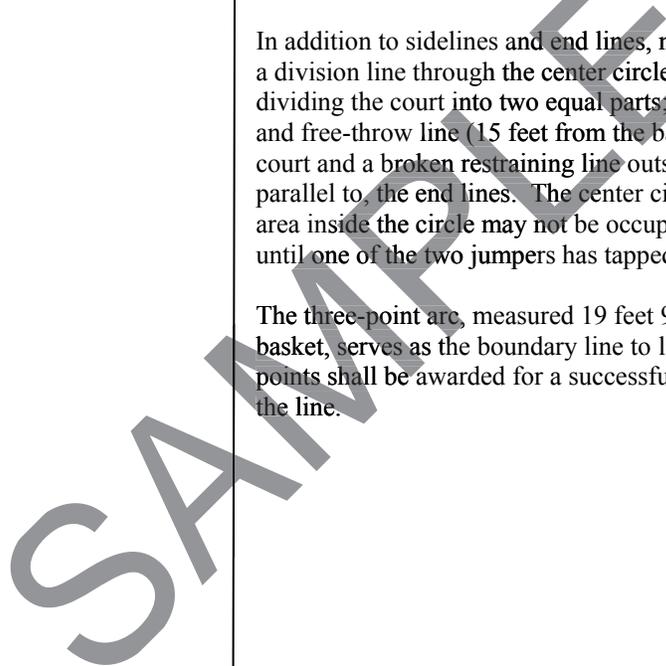
Net height for girl's 10-and-under is 1.98m or 6'6".

**Information from the NCAA for Basketball Court Dimensions and Markings**

The ideal playing area is 50 feet wide by 94 feet long with at least 3 feet (preferably 10 feet) of open area outside the boundaries.

In addition to sidelines and end lines, markings include a center circle; a division line through the center circle from sideline to sideline, dividing the court into two equal parts; a free-throw lane (12 feet wide) and free-throw line (15 feet from the backboard) at each end of the court and a broken restraining line outside the court 6 feet from, and parallel to, the end lines. The center circle has a 6-foot radius. The area inside the circle may not be occupied by the eight nonjumpers until one of the two jumpers has tapped the ball.

The three-point arc, measured 19 feet 9 inches from the center of the basket, serves as the boundary line to let the referee know that three points shall be awarded for a successful field-goal attempt from beyond the line.



***Fitness Module***

Strength, cardiovascular and free-weight areas have moved from the dark recesses of gymnasium basements to become the most sought after and visible components of fitness facilities. High schools have incorporated fitness training into standard curriculum. Colleges now recognize that students come to their campus with a well-founded interest in fitness and wellness pursuits. Most young recruits will also be familiar with an array of workout equipment. Since military readiness is inextricably connected with fitness, this component should offer a stimulating environment that promotes an ongoing interest in physical proficiency.

Because of this enhanced purpose, army fitness modules should be designed for function and aesthetics. Many private sector facilities are used as much for socialization as fitness. Aesthetics in these private niche facilities is largely market-driven with interiors that sometimes resemble a nightclub. Community and collegiate recreation centers must appeal to a wider group satisfying more diverse expectations. These facilities generally benefit from a timeless design approach. Army fitness facilities should adopt a similar tactic. Newer thinking in fitness design integrates all equipment into one area, but creates separations in function by using halfwalls, dropped ceilings, and changes in flooring materials. Free weight equipment must be directly visible and directly accessible to the reception (control) desk. Recommended free weight flooring is rubber or synthetic flooring material. Dispersing cardiovascular equipment within lobbies or overlooks helps to bring movement throughout the facility and addresses differing individual workout needs. Army fitness facilities shall have cardiovascular equipment located in at least 2 areas of the facility. Cardiovascular “theaters” include overhead mounted television monitors. In all, electrical considerations must be taken into account to power not just existing equipment, but future equipment as well. In addition, future needs and flexibility must be considered.

Lighting is crucial to providing a stimulating fitness environment. Indirect lighting and a visual connection to indoor and outdoor vistas will have a positive influence on the users’ frame of mind. For safety reasons, primarily indirect lighting must be used in the free-weight area. An exposed, painted ceiling can contribute a high-tech look, providing some other acoustical elements are incorporated to offset the hard-surface. Wall materials should be durable but not institutional. Mirrors, graphics, soft textures and wallcarpeting will help to soften the entire fitness environment. Recommendations for finishes are provided in Section IV of this report.

Regardless of the finishes and other design features, inadequate ventilation and temperature control will result in an undesirable workout experience. Mechanical systems should be capable of adjusting to different internal loads and occupancies at different times of the day. Recommendations for temperature and humidity levels are provided in Section IV of this report.

***Exercise Module***

Over the past 30 years, group fitness activities have maintained steady growth and progression. Aerobic classes of the seventies were characterized by strained muscles and high impact movement in bare feet. Frequent injuries quickly taught instructors serious lessons about exercise safety. Since that time, improvements in flooring, footwear, equipment and instruction technique have helped to generate safer, low impact movements that prevent injury.

Today, the list of popular classroom activities continues to grow including step aerobics, conditioning, yoga, martial arts, kick-boxing, dance, urban rebounding, etc. All of these activities provide aerobic or “cardio” conditioning. Some programs incorporate strength training by using steps, handheld weights, elastic bands and stability balls.

Fitness programs that support military readiness may include many of the above activities combined with individualized workouts in the fitness module. Providing adequate programming will be the greatest challenge for PFF facility operators. In addition, young recruits may have a desire for activities that imitate extreme sports. Flexibility in classroom design will be essential to accommodate a variety of programs.

The staff for each PFF should monitor the popularity of programs and equip the exercise modules accordingly. The desire to participate in group exercise will be influenced not only by trend, but also by the quality of the space. In addition, the quality of the instructors will play a significant role in the participation in exercise programs. A skilled and enthusiastic instructor will quickly create demand. Hiring and retaining proficient instructors is key to filling group programs.

Each PFF is programmed with a minimum of 1 large group exercise studio, which is provided with a movable wall to allow for dividing the space into 2 separate spaces. Storage is provided for both sides of the room and is designed for flow-through circulation to minimize down time during the class. Design criteria for the exercise module is provided in Section IV and includes data for flooring, lighting and environmental conditions.

***Structured Activity Module***

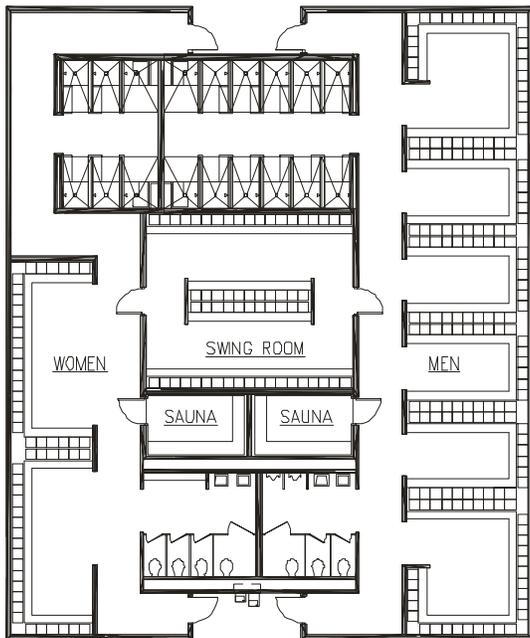
Structured activity areas have very specific design requirements. However, the orientation of these components is subjective.

Racquetball courts can be provided with this allocation, or other elements that could include a spinning studio, climbing wall, squash court, etc.

Racquetball participation is on the decline in the United States decreasing from 8.2% in 1989 to 3.2% in 1999. These spaces are expensive to construct and are not easily adapted to other use. A careful review of the need for racquetball courts should be reviewed by each installation before constructing new or additional courts. That said, court play is exciting to watch. A highly competitive game will draw spectators who may be on the way to or from their own activities. Views into racquetball from the lobby or main corridor system add vitality to the building.

The United States Racquetball Association (USRA) and International Racquetball Federation (IRF) provide specification criteria for court design and construction. Courts shall be built to USRA/IRF standards to ensure they are suitable for all types of play, including international matches. Design criteria for racquetball courts is provided in Section IV of this report.

SAMPLE



**Sauna, Lockers, Showers, Toilet**

Important locker room design elements include aesthetics, environment, layout and location. Every effort should be made to provide a direct connection between locker facilities and major activity spaces. Design options for consideration include family change rooms or satellite uni-sex change rooms for after-hour use. Convertible locker room space that is accessible from both male or female locker rooms will provide a “swing” space to increase locker room capacity for special events. An example of a locker room design incorporating swing space is shown in the left margin.

Other key objectives in locker room design include selecting eye catching colors, using maintenance-free materials and providing an adequate ventilation system. Every material used in the shower, toilet, locker and sauna area has color. Coordinating these color finishes, as well as other building materials, should be done in consultation with design professions. In general, multicolored schemes are more appealing than pallets that are limited to shades of gray or neutrals. Manufacturers have broadened color options over the last decade and simplified the specification process. Most tile manufacturers provide preset tile patterns in sheets. Standard patterns are cost effective and require minimal color selection. These floor patterns are an excellent method of adding design quality for very little money. Coordinating wall tile patterns, wall graphics, paint, toilet and shower partitions, and locker room flooring will tie these elements together and unify the entire locker room space.

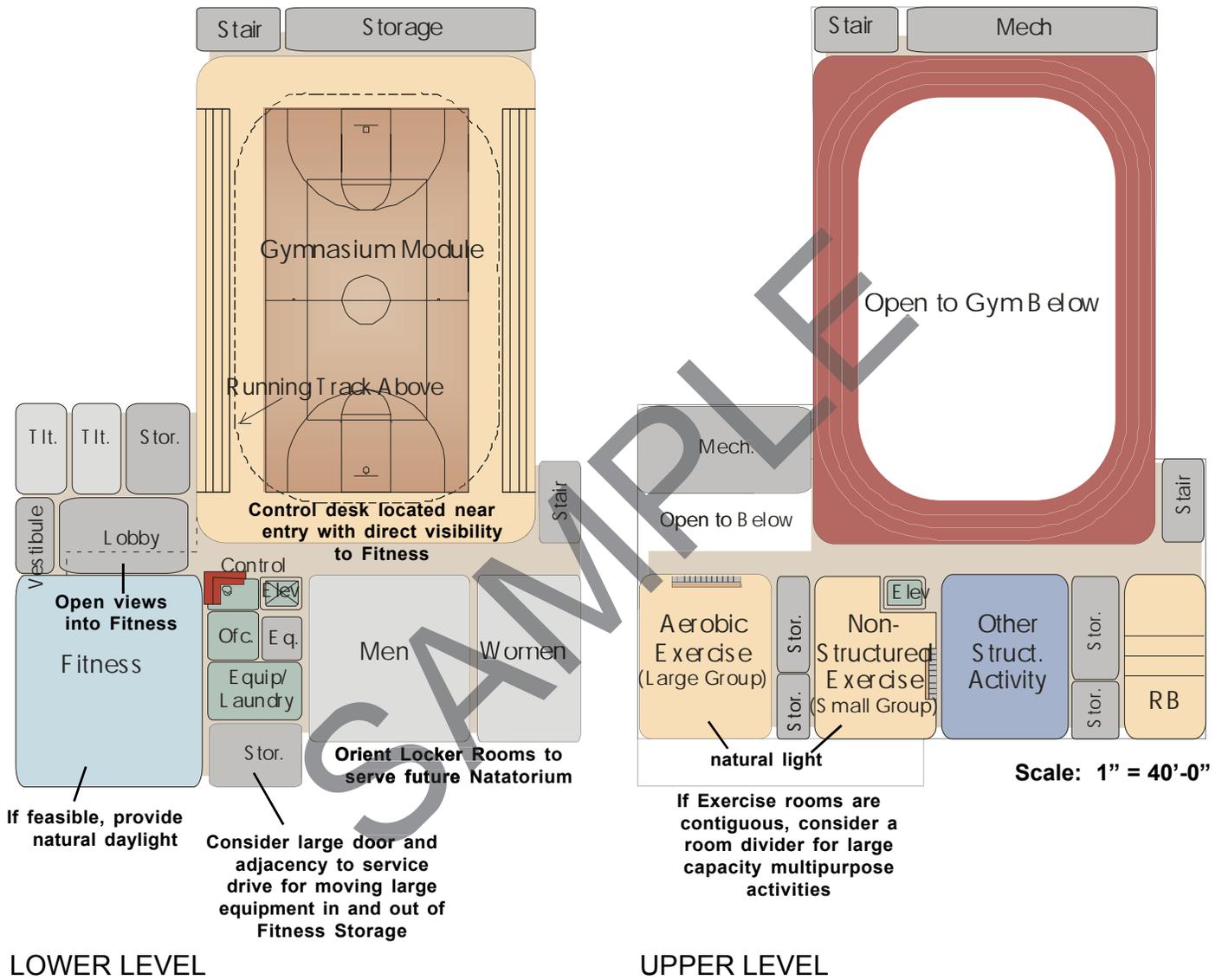
Concrete masonry unit (CMU) wall construction is recommended for locker room areas. Wall finishes in wet areas should be nonporous materials such as glazed ceramic wall tile, glazed CMU, or unglazed porcelain tile. Wall tile can be carried throughout non-wet areas or CMU can be filled and painted with an epoxy coating. Slip resistant materials or unglazed porcelain tile should be used for floors in all wet areas. Epoxy grouts for floor tile should be darker to offset the discoloration that will come with time. Antimicrobial, pvc-backed carpet with welded seams is an ideal finish for locker areas. The carpet provides an acoustical element to help muffle the sound of metal locker doors.

Recommended ceiling materials include plaster ceilings in wet areas and a moisture-resistant suspended ceiling in locker room areas.

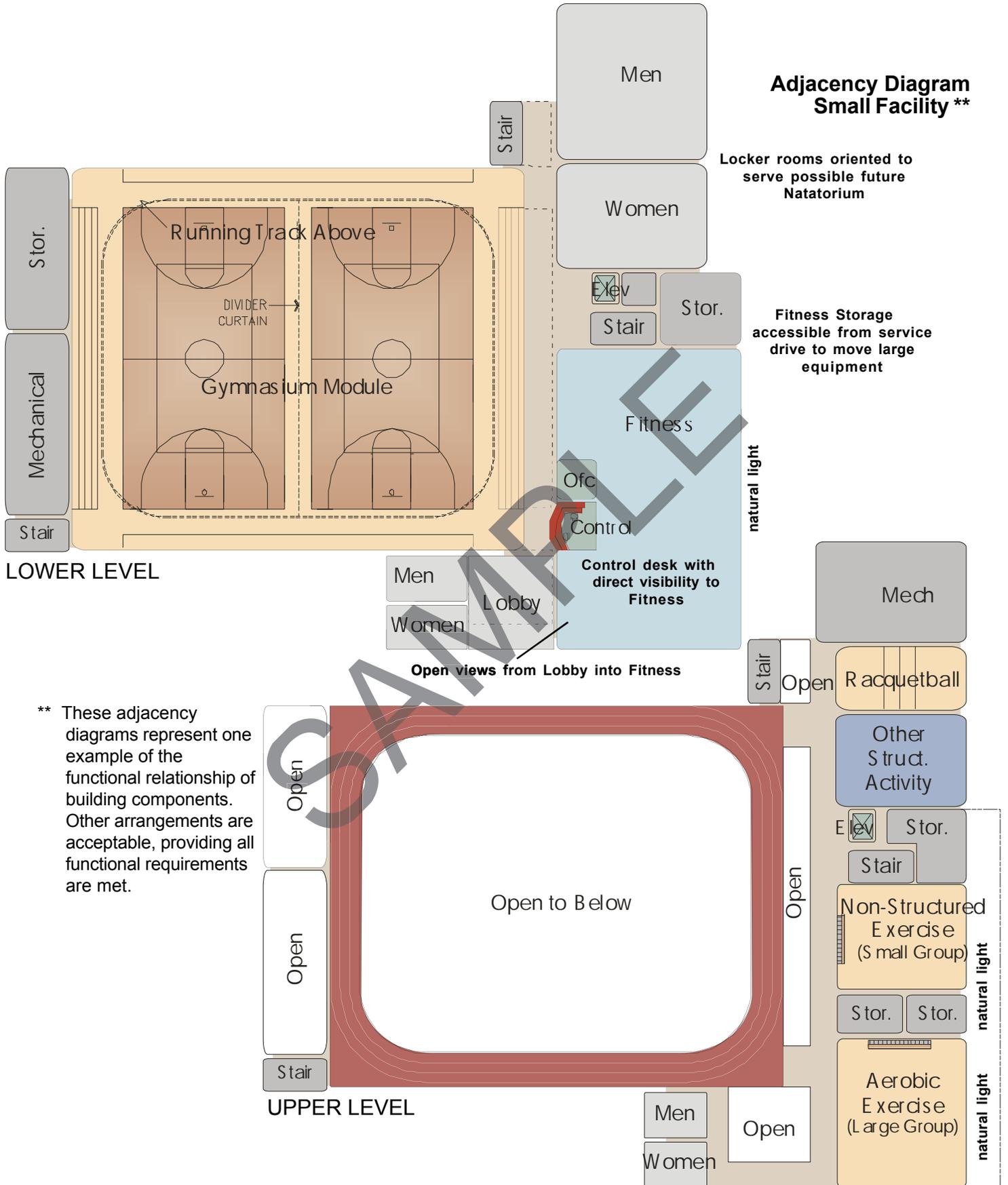
Maintenance of wet areas and locker rooms is the final, and most important, component in providing an appealing recreational experience. Even though most users may change and shower in a short period of time before departing, every user in the facility will take notice of neglected locker room areas. Instituting adequate procedures and daily inspection will go a long way to extending the life-span of finishes.

Specific recommendations for materials and finishes can be found in Section IV of this report.

Adjacency Diagram - X-Small Facility \*\*



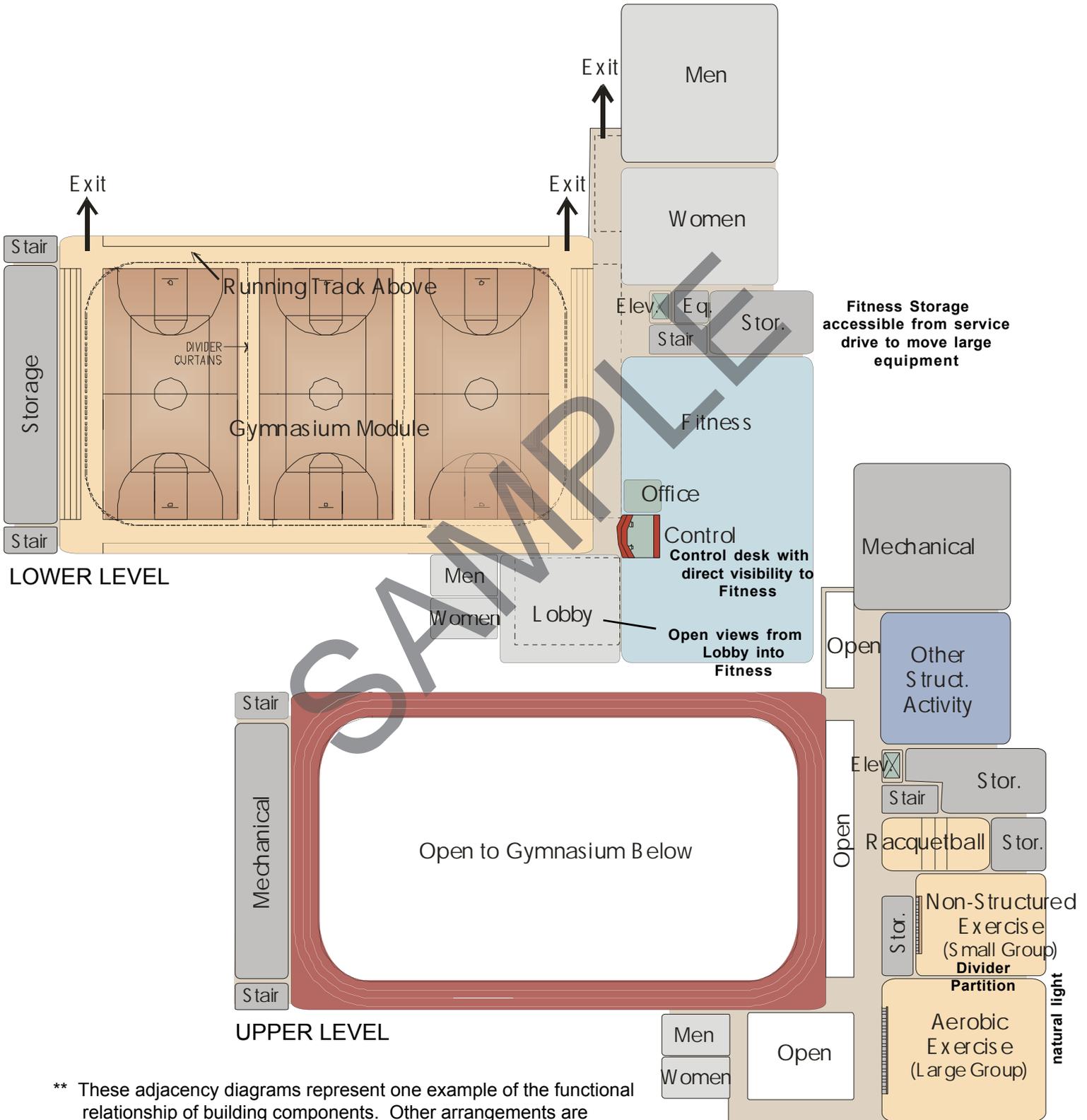
\*\* These adjacency diagrams represent one example of the functional relationship of building components. Other arrangements are acceptable, providing all functional requirements are met.



\*\* These adjacency diagrams represent one example of the functional relationship of building components. Other arrangements are acceptable, providing all functional requirements are met.

Scale: 1" = 40'-0"

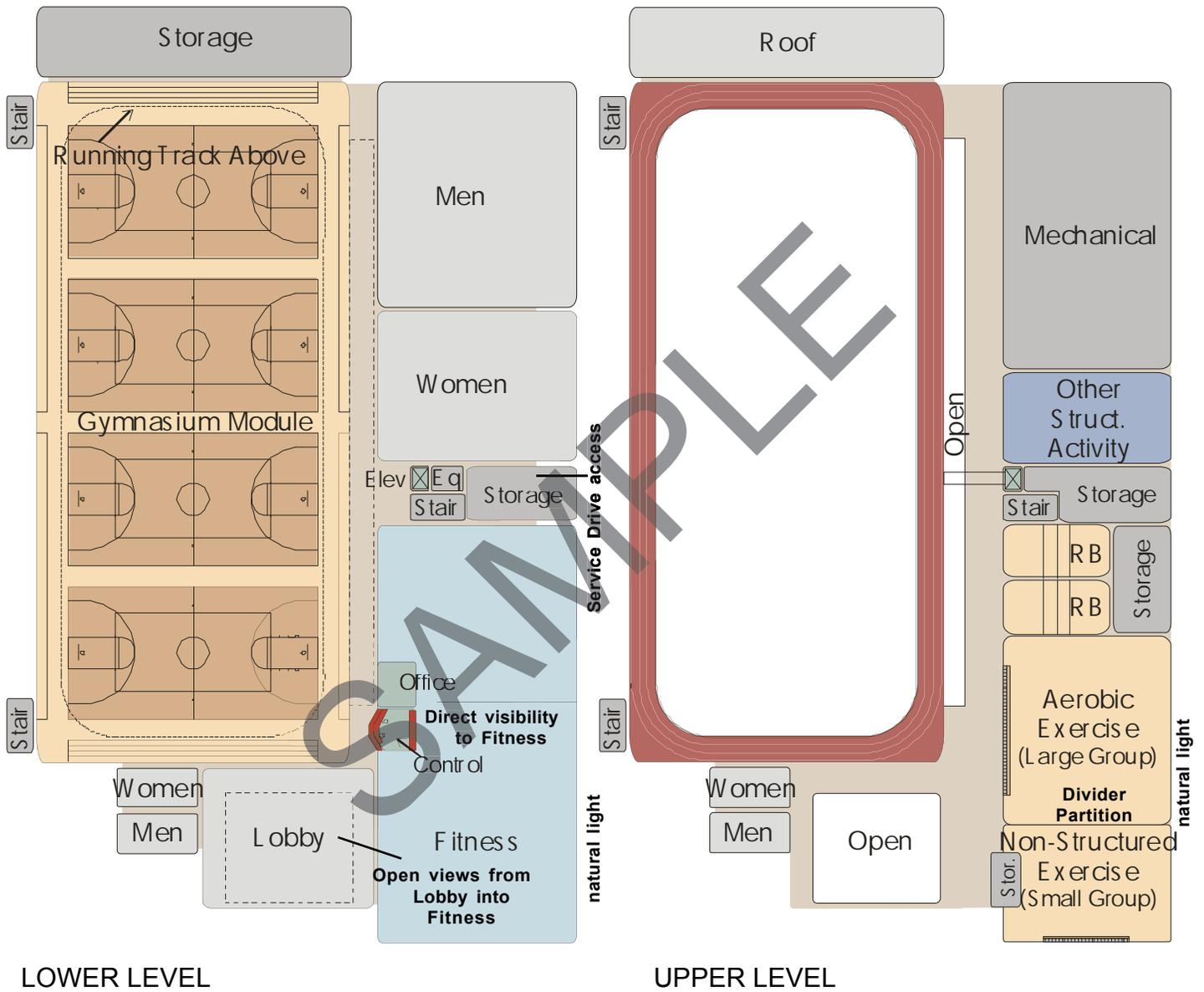
Adjacency Diagram - Medium Facility\*\*



\*\* These adjacency diagrams represent one example of the functional relationship of building components. Other arrangements are acceptable, providing all the functional requirements are met.

Scale: 1" = 50'-0"

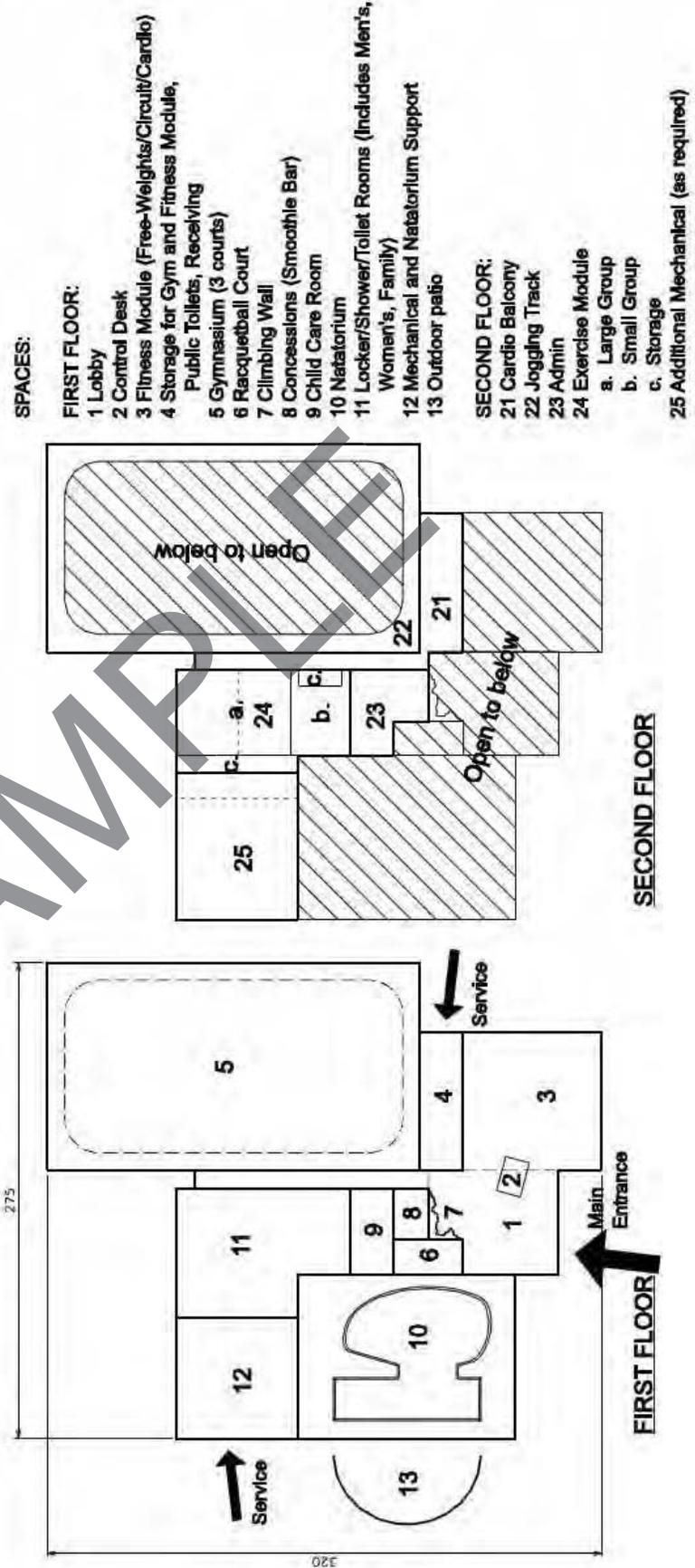
Adjacency Diagram - Large Facility\*\*



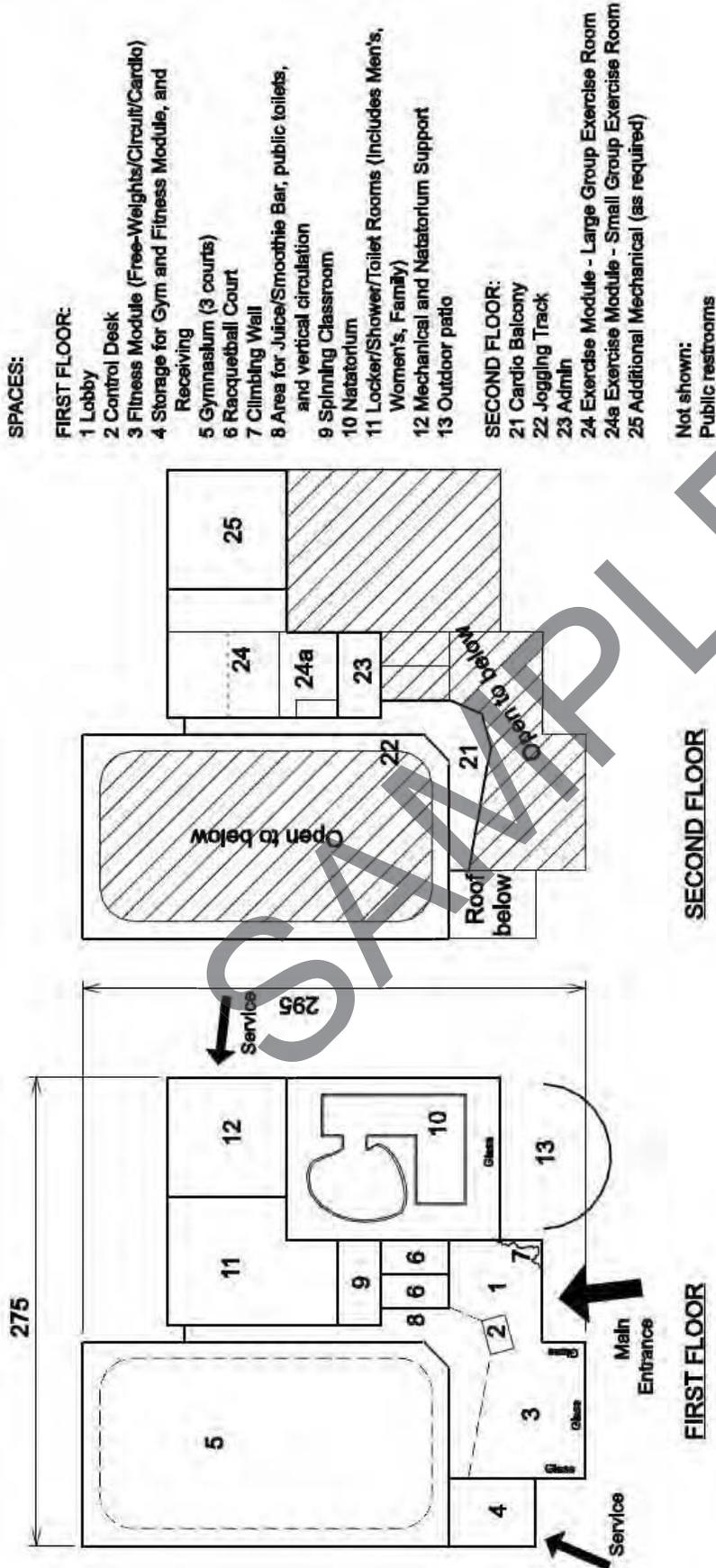
Scale: 1" = 60'-0"

\*\* These adjacency diagrams represent one example of the functional relationship of building components. Other arrangements are acceptable, providing all the functional requirements are met.

The diagrams on pages 22 and 23 indicate other possible arrangements for a Medium PFF. Both of these illustrate an attached natatorium.



SAMPLE



**IV** Building Design Criteria

**A. Component Descriptions**

**A. Site Criteria**

Site considerations for recreation facilities are generally no more restricting to placement and orientation than general construction of any large facility. The few exceptions are critical for proper performance of the most common site failures; water transmission and uneven settling under the 35K/ square foot or greater loads typical to recreation facility foundations. If feasible, building siting should be close to outdoor sports fields.

**Soils testing:** Retain a qualified geo-technical engineer to take borings on site and recommend foundation systems and pavement designs. Update existing soils testing older than 5 years, with new borings intermediate to the old locations. With new, undeveloped sites, it is recommended to increase the number of test borings beyond the four corners and one to two intermediate borings typical to a soils report of minimum scope. Maintaining floor flatness for slabs on grade and minimizing cracking requires an understanding of soils conditions across a 170' x 170 to 285' proposed footprint. To avoid being over-conservative in foundation sizing, in soils replacement, or groundwater protections allow the geo-tech to take ample borings to allow for a firm judgment. A 40 to 60 foot boring grid across the site, in variable soils conditions, is considered minimum. Expect a minimum 100 foot grid in historically stable soils.

Soils analysis will reveal most potential problems with situating a recreation facility on a particular site. Typical recreation facility foundations require a drilled or driven pier and grade beam application. Spread footings have a limited application to resist recreation facility loading, and would be confined to smaller one-story projections off the larger two story, open volumes.

Electrical system grounding and lightening protection grounding should be coordinated with the project geotechnical engineer.

**Groundwater and runoff:** The control of water flow around the site, site runoff and below grade ground water is critical to ensuring the long term viability of activity spaces that utilize special sports flooring. The technical guidelines point out that sports floor products are susceptible to failure in the presence of below grade moisture. Moisture contribution to concrete slabs on grade will warp wood floors and delaminate the adhesives in synthetic flooring. Properly installed vapor barriers beneath slabs can resolve most problems.

Caution: the presence of ground water within the frost depth of the foundation system typically warrants the use of a complete subsurface drainage system and/or the use of perimeter foundation drains. Loose or clayey soils will argue for piping all roof and site runoff into a controlled storm drainage system. Water flow across the recreation facility site from other properties will argue for foundation drains for the entire facility perimeter. Minimum recommendation for any soils conditions are: 1) foundation drain, and 2) minimize roof runoff onto grade. Pipe water away whenever possible.

Site drainage design must meet local agency requirements.

**Substandard soils:** It is not uncommon for recreation facility slab-on-grade tolerances to require the removal and replacement of subsurface soils unable to reach proper compaction, offer the engineer reasonable confidence that compaction will be consistent, or provide adequate resistance to overall loads. One element often overlooked in judging the adequacy of soils is the ability of the construction crew to use heavy crane equipment, without risk to the stability of a prepared subbase. Soils must be capable of resisting rutting and pumping while maintaining an optimum moisture content. All other elements being equal, the stability of the subbase to an adequate depth, and the consistency of the same over the whole area of the proposed slabs prevent the most common slab failure problems. Explain floor tolerance and moisture content requirements to the geo-technical engineer at the time of testing.

Potential actions to be taken to meet these criteria are, from least to most expensive:

1) straight compaction of existing soils, 2) amendment and “churning” of soils to a recommended depth followed by compaction of existing soils, 3) removal and replacement of defective soils to recommended depths.

Project engineer should reserve a contingency budget amount to anticipate some replacement of deficient soils. If soils are deficient throughout the site, drilled piers may extend further into the ground than anticipated. It is recommended that a reserve of an additional 20% of the estimated cost of drilled piers, be held against the cost of correcting unexpected soils conditions. If not used, the amount can revert to a general building contingency.

Rocky conditions are another category of deficiency in that drilled piers must find stable stone to rest upon if piers are not designed to resist loads via the friction of the entire surface area of the pier. Stone layers of uncertain thickness must be removed. A unit price per cubic yard for stone removal should be set at the beginning of the project. Soils testing cannot pinpoint all areas of unacceptable stone that would impede drilled piers. Rock removal is therefore by nature an unknown quantity. The best the engineer can do is anticipate the potential expense based on soils testing report and size the contingency fund accordingly. For any project of large scale, “getting out of the ground” is the most potentially trying part of the process. Awareness of the problems involved in any project, will help reduce after the fact finger-pointing.

**Parking:** It is difficult to determine the number of parking spaces required for a PFF. Based on the American College of Sports Medicine’s “Health/Fitness Facility Standards and Guidelines”, for initial parking calculations, assume 1 parking space for every 300 gross square feet of facility. This will provide adequate parking for all staff and approximately 60% of the maximum facility participants. However, many factors may result in the adjustment of this number of parking spaces, either up or down. A parking needs survey needs to be conducted to determine a more accurate need for parking, and the number of parking spaces provided adjusted accordingly. This survey needs to consider the following aspects at a minimum:

1. Current parking available in close proximity to the PFF.
2. The number of spectators that can be accommodated in the gymnasium.
3. Proximity of the PFF to troop housing.

4. Availability and use of public transportation.
5. The type of unit (administrative vs. training, etc.)
6. The amount of shift work.

Parking shall comply with ABA and Installation requirements. Vehicular access is required to the Mechanical Room and the Storage Room serving the Fitness Module at a minimum.

**B. General Systems Criteria**

**HVAC:** Outside mechanical heating and cooling is not recommended. Air movement should be controlled with use of a vestibule / airlock with two sets of entry doors

**Mechanical System Noise Control:** Noise from the building services should not interfere with the usage of the space. Noise criteria (NC) are a generally accepted, single number standard to determine what amount of sound can exist in a space and still allow full usage. The NC standards are subjective criteria but derived from multiple signal curves calculated along the entire audible range. The NC measure mechanical noise, and more specialized criteria for dampening specific sound frequencies require further engineering. NC standards simply establish how much sound can be contributed to a space before it becomes annoying and no longer falls within the accepted NC class for that usage.

To achieve the criteria at any level, follow these general guidelines: Provide mass in the walls around mechanical equipment spaces. Recommend concrete block masonry be used, whenever possible.

All ductwork shall sheet metal and be constructed for laminar airflow, in accordance with SMACNA guidelines. Minimum 2” thick insulation in all large ductwork, plenums, and fan casings. 1” minimum thickness elsewhere. Liner shall be an erosion resistant glass fiber duct lining. Minimum density should be 2.0 pcf.

Large ducts over 60” shall be subdivided into chambers with metal septums to avoid rumbling (oil canning) of the duct.

Flex duct is suitable for branch ductwork only. Flex duct leading to diffusers or grilles should be at least 5 feet in length and have one 90 degree bend before reaching the diffuser.

Select air handling units to minimize noise generation. Acoustically isolated enclosures and floor supports are common. (Even a lined fan housing can achieve significant reductions of 8 to 10 db in noise level over the system.) Manufacturers of sound isolated pre-engineered housings must provide guarantees that the internal isolation is free from short circuiting.

Avoid locating roof top units RTU’s directly overhead or horizontally adjacent to noise sensitive spaces. Recommend locating RTU’s only over support spaces such as storage rooms or rest rooms. When located on roofs, provide concrete curbs and sound isolating spring cushions. Roof structure shall be designed to resist static deflection below .025” under dead load and dynamic deflection under unit operation.

Avoid direct metal to metal contact between RTU and ducts by utilizing neoprene or canvas duct connectors.

Rotating variable speed drives must be designed to prohibit sustained rotating speeds of less than 400 rpm.

All pumps require flexible connections for all attached piping and conduit.

Airflow velocity shall be held to the criteria established for the particular NC standards. Refer to NC criteria set for each module. (Assumes 1” duct liner and ducted return) All values in feet per minute (FPM)

Lobby:	NC 30 to 35	840 to 1020	Main Supply 460 to 540 Branch w/ 5’ runout
Gyms:	NC 30 to 35	1020 to 1200	540 to 640
Fitness:	NC 30 to 35	1020 to 1200	540 to 640

Utilize low velocity and pressure air distribution system to prevent airflow noise at diffusers. Generally the closer the diffuser to the occupants, the greater the NC reduction *at the diffuser* below the ambient noise level expected for the usage. NC reductions of 8 NC (where diffusers are 12’ or less away) to only 3 NC (where diffusers are 20’ or more away) are recommended.

Initial duct system design shall plan for medium pressure drop silencers. Silencers shall be located about 3 duct diameters from fan housings.

Fan powered terminals or variable air volume (VAV) boxes shall not be located directly over noise sensitive spaces (NC 35 or less). Volume dampers shall not be located at the diffusers but back at the takeoff point of the branch duct. Recommend locating no closer than 10’ from discharge point, with one 90 degree bend between dampers and diffusers.

Avoid using perforated face diffusers, double vane grilles and registers of any kind.

[ Each value to be inserted under Acoustical Performance for their respective modules]

Lobbies:	NC-30-35
Gymnasium:	NC-30 to 35
Fitness:	NC-30 to 35
Racquetball	NC-40
Sauna	NC-30

**C. General Construction and Design Criteria**

Data and design information for each module follows.

## **General**

In addition to this document, compliance with UFC 4-740-02, Fitness Centers, is required. Where the information in this document conflicts with the UFC, this document takes precedence.

### **PROGRAM AREAS:**

Refer to the table at the end of the Army Standard for Physical Fitness Facilities for the square footage for each of the functional areas of a Physical Fitness Facility (PFF).

### **RESTROOMS:**

Restrooms shall be provided on each level of the PFF to accommodate staff and users.

### **CEILING REQUIREMENTS:**

Where acoustical lay-in ceilings are provided, the following recommendations apply:

**Surface light reflectance:** No less than 0.80. Lighting placement and lamping types shall be considered when designing the ceiling. Increase lighting output with off-white colors and/or panels with not less than 0.80 light reflectance.

**Sound absorption for acoustical panels:** No less than .55NRC

**Overstock:** Provide 2% for future replacement.

### **WALL MATERIALS:**

Walls through out the Physical Fitness Facility shall be extremely durable and impact resistant. Use bullnose CMU corner units at all outside corners. On gypsum board walls, use corner protectors on outside corners in high traffic areas, or where the potential for impact is significant.

### **WALL FINISHES:**

Where paint is used, paint shall be water based epoxy, semi-gloss finish. Apply one coat compatible primer with two finish coats of 5 to 6 mils DFT.

**Surface light reflectance:** No less than 0.50. Lighting placement and lamping types shall be considered when designing the walls. Increase lighting output with light colors and/or panels with not less than 0.50 light reflectance.

**Ferrous metals** (window and door frames): water based epoxy. Apply one coat primer compatible with finish coat, and as barrier coat to factory primer. Two finish coats of 5 to 6 mils DFT.

### **FLOOR FINISHES:**

VCT is not allowed in the PFF unless specifically allowed in this document.

**Surface light reflectance:** No less than 0.20. Lighting placement and lamping types shall be considered when designing the floor. Increase lighting output with off-white colors and/or textures with not less than 0.20 light reflectance.

**OPTIONS:**

Consider using electronic locks, with codes established by the patron, on lockers.

In addition, consider providing lockable cubbies, similar to those shown below, where cubbies are required. Coordinate with the users for their preference.



## **FITNESS MODULE (Cardio, Circuit, and Free Weights)**

### **FUNCTION/DESCRIPTION:**

Dedicated area providing space for three separate functions within the Fitness Module (Cardiovascular (Cardio), Circuit (Selectorized), and Free Weights). Cardiovascular: training equipment such as treadmills, stationary bicycles, stair climbers, ellipticals, etc. Free Weight: free weight and plate loaded equipment, benches, and storage racks. Circuit: equipment with pin selected weights.

Because participants have different personal requirements for the environment in which they work out, the cardiovascular area shall be divided into at least 2 different areas to provide different opportunities.

The circuit area and free weights must be collocated in the same area. In addition, at least 50% of the cardio area shall be collocated with the circuit and free-weights. The rest of the cardio area shall be in a different area(s) of the facility. Options for the rest of the cardio requirement include a balcony overlooking other activity areas, nooks with views to the outside or other activity areas, an area close to the entrance to the jogging track, etc. A cardio theater shall be provided in at least one of the cardio areas. Cardio theaters, open ceilings, color and lighting will all help to draw users into the space.

Also within this area shall be an open space for stretching, along with an enclosed office type area for fitness assessments.

### **ESSENTIAL DESIGN REQUIREMENTS:**

- Free weight area must be visually and directly physically accessible from the control desk to ensure staff can monitor the activity in the free weight area. There are no exceptions to this requirement.
- For safety reasons, primarily indirect lighting (minimum 70% indirect) is required in the free weight area, as a minimum, so that users are not looking directly into overhead lighting while lifting weights.
- Approximately 50% of the Cardiovascular area must be contiguous with the Circuit Area and the Free Weight area. The installation may desire a visual/acoustical separation between the free weights and the other functions. The remaining portion of the Cardiovascular area shall be located elsewhere throughout the facility.
- Mirrors are required in the free weight and circuit areas as a minimum.

### **DIRECT ADJACENCIES:**

- For safety reasons, the free weight area must be visually and directly physically accessible from the control desk. The free weight area has the highest potential for injury, and staff at the control desk must be able to see and to respond to any incident or unsafe activity within the space. Separation between the free weight area and the control desk by walls, other equipment, or major circulation is detrimental to complying with this requirement.
- A direct adjacency to the lobby and open circulation will accommodate supervision from the control area, and allow this space to become a major focal point.

- The Fitness Module Storage/Equipment Repair area shall be adjacent to and directly accessible to the Fitness Module. This storage/repair area must also have exterior access for transfer of fitness equipment. Doors shall be minimum of 8' wide to facilitate the moving of equipment.
- Other key adjacencies for this function include Control Area and Locker Rooms.

**CEILING HEIGHT:**

Minimum of 12'-0" ceiling height with 14'-0" preferred. This clear height is to the lowest element. This becomes especially important where the structure is left exposed, thereby exposing pipes, ducts, conduit, structure, etc. It is also strongly recommended that at least a portion of this space be two-story in height.

**CEILING FINISHES:**

In lower spaces, provide ceilings of highly light reflective and sound absorbent materials. Consider 2'x 2' lay-in, wet-formed mineral fiber acoustical panels, on standard "T" shaped pre-finished metallic grid system. 15/16" or 9/16" wide "T" grids are preferred. Non-directional fissured face designs are preferred to reduce installation cost and waste. Tegular (routed edges) tiles are preferred. In taller spaces, exposed structure is acceptable provided acoustical treatment is provided in the space.

**WALLS:**

Provide 1/4" tempered mirror glass with 15 year warranty silver coating on at least half of two perpendicular walls in free weight and circuit area. Mount bottom of mirrors at 18" above the finish floor, to a height that provides full body visibility or align with door head height. Provide a solid molding (solid rubber, wood, metal) at the bottom of the mirrors to help ensure weight plates leaned up against the wall will not come in contact with the mirror. Molding shall extend 3/4" – 1 1/2" from wall at a distance of no more than 3/4" below the mirror (1 1/2" half-round mounted at the bottom of the mirrors would work, as would a piece of 1x or 2x wood mounted at the bottom of the mirrors).

**Wall Base:** Extend the flooring material (see below) up the face of wall to approximately 18" a.f.f. and cap with a finished hardwood wainscot trim or other molding as defined in "Walls" paragraph above. Above average physical abuse to the lower half of walls is typical to Fitness modules. Rubber wainscot resists foot scuffs, "tipping" of free weights against walls, and impact from equipment. To optimize adhesion, the paint finish must be deleted directly behind rubber wainscots. Utilize the molding to conceal and secure the top edge of this material. Other materials may be used between the floor and the molding as long as equal or better protection is provided to the wall to greatly reduce the damage caused by free weights, shoes, etc.

Some portion of the wall must also be glazing to the exterior. Around the cardio and circuit there must be clear glazing. Translucent glazing may be used in all areas and may supplement the clear glazing mentioned above.

**FLOORING:**

**Rubberized flooring:**

Recommended for use throughout the Fitness Module, to include Free-weights, Circuit, and Cardio.

Critical item: It is recommended to perform a moisture test in order to measure retained and film forming moisture at the surface of the slab. The directly adhered rubber products recommended herein have maximum moisture content standards that cannot be exceeded prior to application of the flooring and over the entire warranty period of the floor. In deficient substrates, additional floor treatment may be necessary to meet these moisture constraints. It is recommended that the selected flooring manufacturer make recommendations suitable to their products and warranty requirements.

**Type:** Granulized new rubber, granulized EPDM, or both used in combination with polyurethane binders. Directly adhered. Recycled rubber not acceptable due to potential of off-gassing. Tiles are not recommended due to difficulty of cleaning joints. Surface shall be non-porous with as few joints as possible, and all joints shall be tight, and preferably sealed, such that no liquid may enter into the joint.

**Finish:** Due to color variations inherent to the products, single, solid color floors are not recommended, instead a speckled finish is preferred. Material shall be a minimum of 3/8" thick. Greater thicknesses are available and may be used when above peak-time activity is typical to the facility. Note: Flooring in excess of 3/8" may require special transitions to avoid access conflicts with the Americans with Disabilities Act.

**Material Weight:** Density no less than 65 lbs./cu.ft.

**Durability:** Shore A hardness of no less than 60.

**Transitions:** If required, use solid rubber transition strips sized to match the heights of the dissimilar materials.

#### **PLUMBING:**

**Water fountains:** Required within this module. Provide one unit minimum in the Fitness Module of the X-Small, Small, and Medium PFF. Provide a minimum of two units in facilities larger than a Medium. A unit consists of either two water fountains in a single unit combination, or two separate units side by side to allow for one unit to be mounted at ADA height. Electrically cooled unit required. Water fountains shall be fed from dedicated 120V, 20A circuits. It is recommended that water fountains be placed outside normal traffic paths and recessed into the wall plane if possible.

#### **MECHANICAL (HVAC):**

Mechanical heating, ventilation, and humidity control of the module is mandatory. Shall exceed the current ASHRAE requirements.

**Operating range:** System able to maintain 68 - 74 degrees (F) year-round at 50% relative humidity or less. Shall meet or exceed ASHRAE 62 for the ventilation rate.

**Air movement / control:** Fully ducted supply. Natural (non-mechanically driven) ventilation is not allowed. Ceiling fans shall be provided throughout. Maximum 144 sq. ft. floor area served per fan. Independent wall mounted or infrared remote controls. It is not recommended that fans be controlled in groups.

**Temperature controls:** Independent to room, solid state and programmable. Ability to control peak and off-peak temperatures with 24 hour or one-touch setback programming recommended.

### **LIGHTING**

Indirect (80% minimum) direct (20% maximum) lighting is required in the free weight area. If necessary, supplement with other lighting to overcome shadows from obstructions or to highlight certain areas. However, no direct down lighting is to be provided where the free-weight area is located.

**Lighting control:** Use of occupancy sensors to activate lighting by motion detection, is recommended. In addition, grouping of lights so that a portion of the lights may be turned off, especially if natural daylighting is provided, is required. Independent slide or toggle controls may also be used to control fixtures by groups. Grouping needs and/or preferences will be determined by circuit capacity.

**Light level:** 40 footcandles at the floor, minimum.

Additional contribution of natural light via windows, clerestories, and/or skylights to utilize daylighting and daylight harvesting within the space is highly recommended. Again, care must be taken to avoid glare and direct illumination over the free weight area.

### **POWER**

Convenience and specialized outlets required.

**Convenience power (general cleaning and service):** Provide receptacles rated 125V AC, 20A. Space receptacles at 10'-0" o.c. minimum around the perimeter of the room and at freestanding columns located more than 10'-0" from the walls or the nearest outlet.

**Specialized (equipment) power:** 120V, 20A dedicated circuits, unless equipment manufacturer's data indicates a larger circuit is required for the treadmills. Provide one per piece of equipment, minimum. In addition, convenience outlets must be provided for all of the cardio equipment to support built-in cardio theaters and other personal electrical requirements. In addition, additional electrical power may be required to support the fitness data systems, such as FitLinxx. Use floor mounted, dual or quad outlet, recessed boxes as required to meet equipment count. Solid brass cover plates, flush mounted. Power requirements in this Technical Criteria manual are for CONUS installations. OCONUS power requirements should be addressed on a location by location basis.

**Critical item:** Floor boxes must be mounted above the substrate at a height equal to the thickness of the finish floor system. (i.e. 3/8" for rubber), including the thickness of the box cover plate. Cover plates with flip-up or hinged lids are not recommended. Where outlets are in use, cover plates should be removable or lay flush so as to not contribute to a tripping hazard.

**Critical item:** Early determination of equipment purchase and a preliminary equipment layout is highly recommended in order to determine in-floor power needs and box locations. The fitness module should be designed to the equipment whenever possible.

Spacing (preliminary): 8'-0" on center, each way.

### **TECHNOLOGY/AV:**

Data, sound and video required. Provide as required for Cardio Theater and personal fitness tracking systems. Cardio Theater may be mounted to a wall, suspended from ceiling, or supported by posts from the floor. Consult with the user when determining cardio theater requirements.

**Data outlets:** Dedicated and located at points to be determined by project engineer as follows: Data outlets at cardiovascular equipment floor boxes to accommodate computerized equipment input / outputs, as occurs. 1 data port per each power outlet provided. In addition, data outlets are required in the cardio and circuit areas to support the fitness data systems, such as FitLinxx.

**Data ports:** required for workstations used to track and/or monitor fitness performance. 1 workstations minimum per 100 patrons / hourly at peak time. Centralized location. Data port required for card access device to monitor access security and peak occupancy. Data ports as required around the perimeter of room for mobile monitoring workstations. 1 data port per convenience outlet location.

### **SOUND:**

**Sound system:** Flush recessed ceiling speakers, 25 watt minimum output rating, capable of reproducing the entire audible range for (CD quality) music, minimum.

**Sound sources:** Commercial amplifier, filtered for EM interference.

- Public Address / microphone station
- Cassette / CD combination unit
- Television monitors.
- Optional: VHS or DVD playback device.

Locate sound equipment in a centralized control location. Typically provide a lockable, glass door vertical rack for mounting the A/V equipment. Sound amplification requirements are determined by the combined sound source output and the desired reproduction sound level minus the acoustical performance rating of the space. See "acoustical performance" guidelines below.

### **ACOUSTICAL PERFORMANCE:**

**Acoustic performance:** No extraordinary sound reduction treatments are required. In order to analyze the potential need for additional sound reduction, the following criteria apply: Optimum peak sound level is 40 to 50 db constant (at 1000hz minimum), during peak operation times. - PNC (Preferred Noise Criteria) Curve 55 to 60. Recommended average

coefficient of sound absorption of all materials in combination is no less than .50. ("Live" acoustics are desirable). Acoustical ceilings that follow these guidelines are mandatory. Sound absorption via ceiling materials shall be no more than 5db of the total desired reduction. Provide acoustic wall panel material where needed to bring noise levels and reverberation down to acceptable levels.

**WINDOWS AND DOORS:**

Provide views into adjacent spaces and/or public ways. Aluminum or hollow metal frames are recommended. Tempered glass should be typical to the module.

**FIXED EQUIPMENT:**

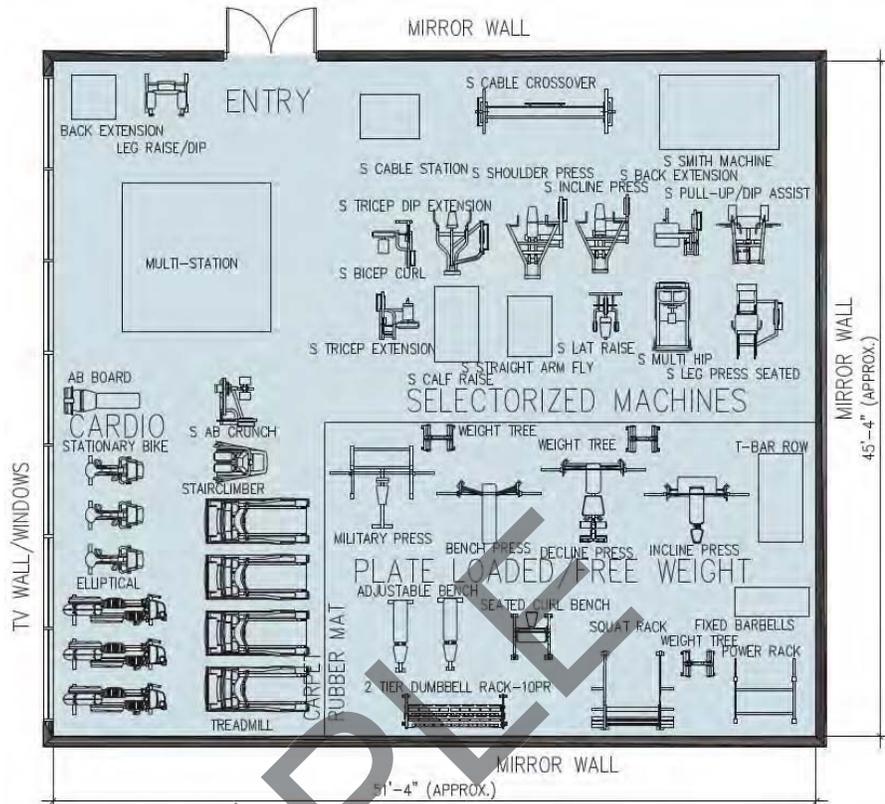
**Cubbies:** Provide storage cubicles (minimum quantity based on ½ of the number of pieces of equipment) within the room for personal items. These may either be open, or may be provided with a lockable door. If doors are provided, provide an electronic combination locking mechanism for each door that allows the user to set their own combination. See "Architectural Casework" in the Exercise Module for more details.

**ARRANGEMENT:**

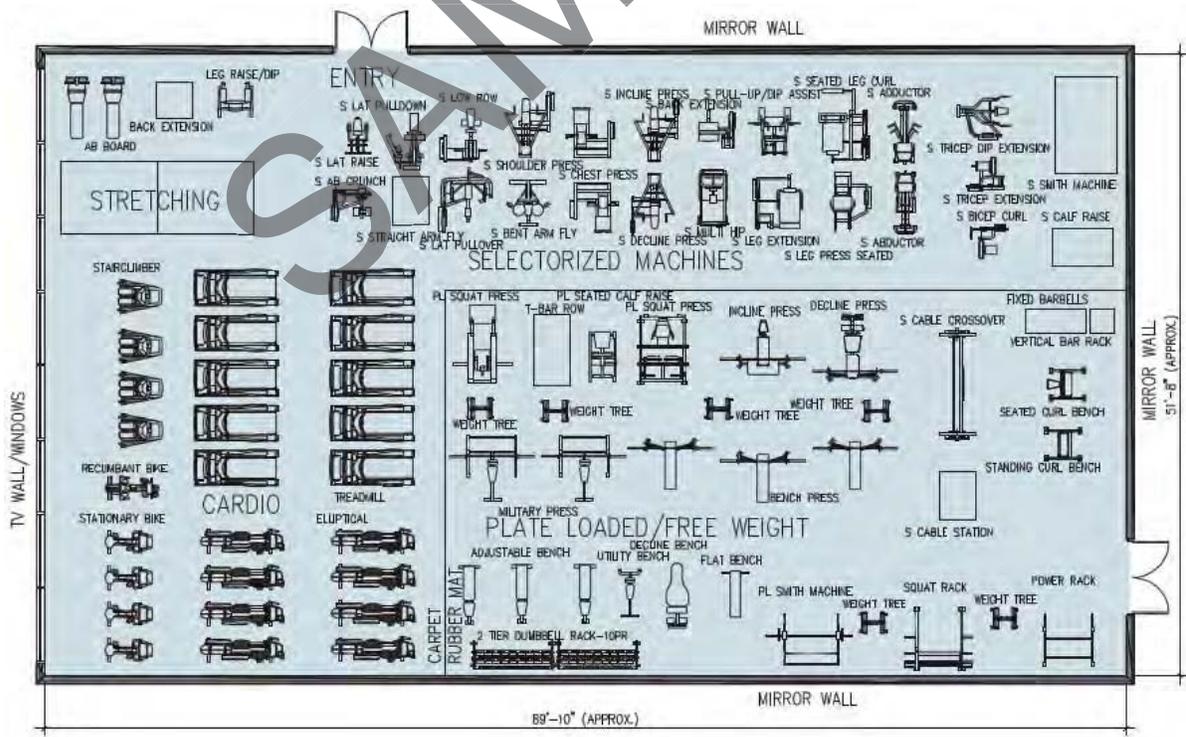
Provided below are diagrams for different sizes of the PFF that illustrate all of the equipment provided within the required space. As mentioned earlier in this document, a portion of the Cardio will be located elsewhere throughout the building. The equipment and space shown is the minimum to be provided. Other arrangements are allowed as long as all criteria is met. The diagrams do NOT indicate the relationship to the Control Desk, which MUST be physically and visually accessible to the Free Weight area.

Following the diagrams is the listing of equipment that will be provided as the standard for each size of facility.

X-Small:

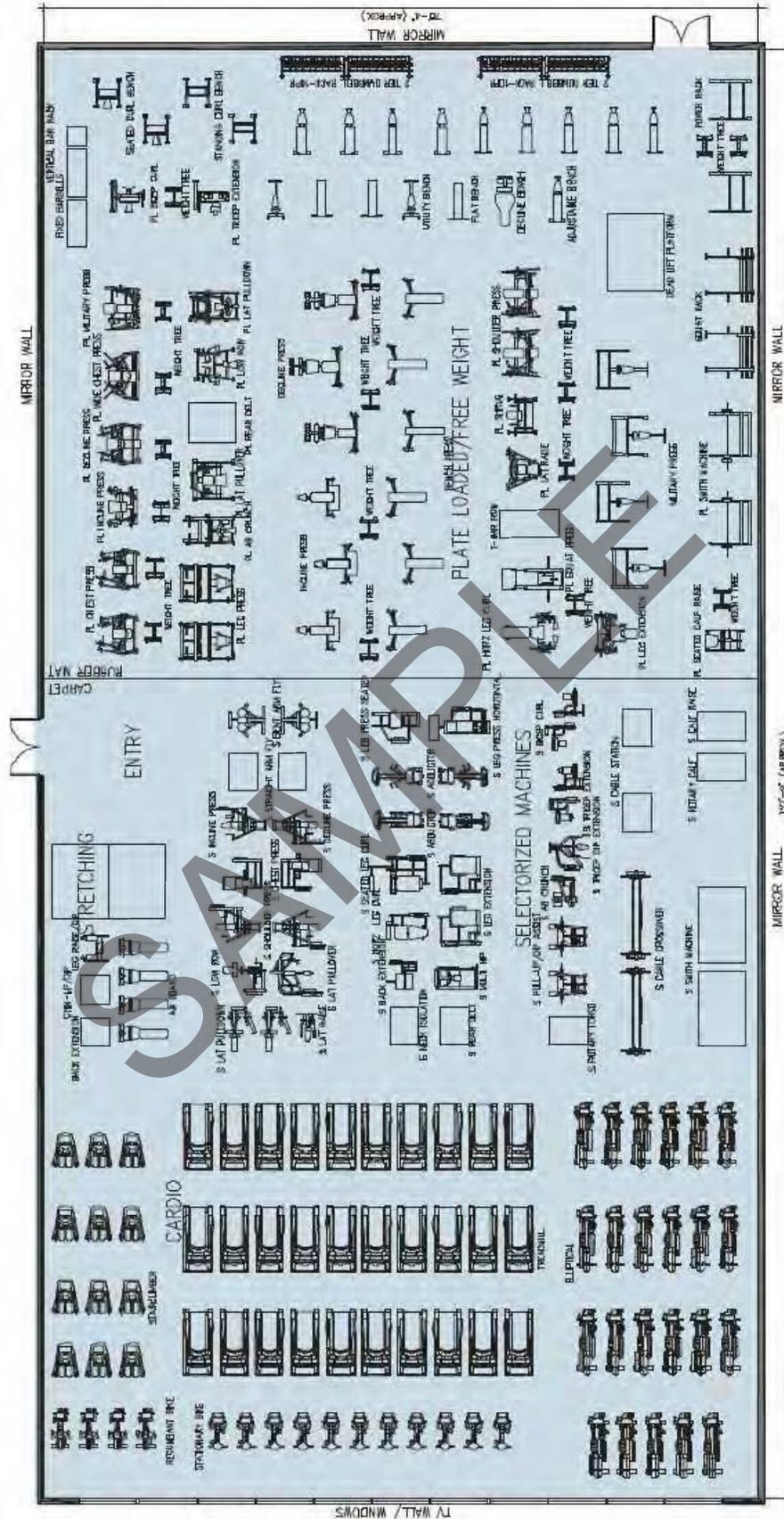


Small:





Large:



	X-SMALL	SMALL	MEDIUM	LARGE	INCREMENT
<b>MODULE SIZE</b>					

**Cardiovascular Equipment**

**Commercial Grade Electronically Controlled**

Treadmill	4	10	20	30	16
Elliptical Trainer	3	8	14	23	10
Cross Trainer/Hiker	A	A	A	A	A
Stationary Bike (Upright)	3	5	10	15	8
Stationary Bike (Recumbent)	B	B	B	B	B
Stairclimber/Stepper	1	4	7	12	6
Rowing Machine	0	0	0	0	0
Skier	0	0	0	0	0
Kayak Machine	0	0	0	0	0
Skate Machine	0	0	0	0	0
<b>Subtotal</b>	<b>11</b>	<b>27</b>	<b>51</b>	<b>80</b>	<b>40</b>

SAMPLE

	X-SMALL	SMALL	MEDIUM	LARGE	INCREMENT
<b>MODULE SIZE</b>					
<b>Strength Equipment</b>					
<b>Commercial Grade Selectorized/Stack Weight Machines</b>					
Multi-Station (Ex. 6 stations)	1	0	0	0	0
Leg Extension	C	1	2	2	1
Leg Curl (Seated)	C	1	1	1	1
Leg Curl (Horizontal/Prone)	D	D	1	1	D
Leg Curl (Standing/Kneeling)	D	D	D	D	D
Leg Press (Seated/45deg)	1	1	1	1	1
Leg Press (Horizontal/Supine)	D	D	1	1	D
Leg Press (Lunge)	0	0	D	D	D
Calf Raise (Seated)	1	1	1	1	1
Calf Raise (Standing/Donkey)	D	D	D	D	D
Calf Raise (45deg)	D	D	D	D	D
Rotary Calf	D	D	1	1	D
Abductor	0	1	1	2	0.5 K
Adductor	0	1	1	2	0.5 K
Multi-Hip Machine (Rotary Hip)	1	1	1	1	0.5 K
Hip Extension	0	0	0	0	D
Glute Isolation	0	0	0	0	D
Bent Arm/Pectoral Fly	C	1	1	2	0.5 K
Straight Arm Fly/Rear Delt	1	1	1	2	0.5 K
Chest Press (Seated)	C	2	2	2	1
Chest Press (Horizontal/Supine)	D	D	D	D	D
Incline Press	1	1	1	1	0.5 K
Decline Press	0	1	1	1	0.5 K
Lat Pulldown	C	1	2	2	0.5 K
Lat Pullover	0	1	1	1	0.5 K
Low Row	C	1	1	1	0.5 K
High Row	0	0	0	0	D
Rear Deltoid (Seated)	0	0	0	1	0.5 K
Rear Deltoid (Horizontal/Prone)	0	0	0	D	0
Back Extension	1	1	1	1	1
Lateral/Deltoid Raise	1	1	1	1	1
Shoulder/Overhead Press	C	1	1	2	1
Bicep Curl	1	1	1	2	1
Tricep Extension	1	1	1	2	1
Tricep Dip Extension (Press)	1	1	1	1	0.5 K
Wrist Curl	0	0	0	0	0
Neck Isolation	0	0	0	1	0
Smith Machine (H)	1	1	2	2	1
Cable Crossover w/ Chin-up Bar	1	1	1	2	1
Cable Station (2 sided)	1	1	1	2	0.5 K
Ab Crunch	1	1	1	1	0.5 K
Rotary Torso	0	0	0	1	0.5 K
Pull-up/Dip Assist	1	1	1	2	0.5 K
<b>Subtotal</b>	<b>16</b>	<b>27</b>	<b>33</b>	<b>46</b>	<b>20</b>

	X-SMALL	SMALL	MEDIUM	LARGE	INCREMENT
MODULE SIZE					
<b>Strength Equipment</b>					
<b>Commercial Grade Plate Loaded Machines</b>					
Leg Extension	0	0	0	1	0.5 K
Leg Curl (Seated)	0	0	0	1	0.5 K
Leg Curl (Horizontal/Prone) (F)	0	0	0	D	D
Leg Curl (Standing/Kneeling)	0	0	0	D	D
Squat Press (Seated/45deg/Hip) (F)	0	1	1	2	1
Squat Press (Vertical/Hack) (F)	0	1	1	1	1
Squat Press (Horizontal/Supine) (F)	0	D	D	D	D
Squat Press (Jammer/Ground Based) (F)	0	0	0	D	D
Calf Raise (Seated)	0	1	1	1	1
Calf Raise (Standing)	0	D	D	D	D
Calf Raise (45deg)	0	D	D	D	D
Rotary Calf (F)	0	D	D	D	D
Tibia Dorsi Flexion	0	0	0	0	D
Abduction (F)	0	0	0	0	0
Adduction (F)	0	0	0	0	0
Glute Isolation	0	0	0	0	0
Chest Press (Seated) (F)	0	0	1	2	1
Chest Press (Horizontal/Supine) (F)	0	0	D	D	D
Wide Chest Press (F)	0	0	0	1	0.5 K
Incline Press (F)	0	0	1	1	1
Decline Press (F)	0	0	1	1	1
Military/Shoulder Press (F)	0	0	1	1	0.5 K
Lat Pulldown (F)	0	0	0	1	1
Lat Pullover (F)	0	0	0	1	0.5 K
Low Row (F)	0	0	0	1	0.5 K
High Row (F)	0	0	0	0	D
Rear Deltoid (Seated) (F)	0	0	0	1	0.5 K
Rear Deltoid (Horizontal/Prone) (F)	0	0	0	D	D
Back Extension	0	0	0	0	0
T-Bar/Lever Row (J)	1	1	1	1	0.5 K
Lateral/Deltoid Raise (F)	0	0	0	1	0.5 K
Shoulder Press (F)	0	0	1	2	0.5 K
Shrug (F)	0	0	0	1	0.5 K
Bicep Curl	0	0	0	1	1
Tricep Extension	0	0	0	1	1
Tricep Dip Extension (F)	0	0	0	0	D
Wrist Curl	0	0	0	0	0.5 K
Hand Grip Isolation	0	0	0	0	0.5 K
Neck Isolation (F)	0	0	0	0	0
Smith Machine (F)	0	1	1	2	0
Ab Crunch	0	0	0	1	0.5 K
Rotary Torso	0	0	0	0	0
<b>Subtotal</b>	<b>1</b>	<b>5</b>	<b>10</b>	<b>26</b>	<b>16</b>

	X-SMALL	SMALL	MEDIUM	LARGE	INCREMENT
<b>MODULE SIZE</b>					

### Strength Equipment

#### Commercial Grade Free Weight Equipment/Benches

Dumbbell Sets (10pr)	G	G	G	G	G
Dumbbell Rack-1 Tier/5pr	0	0	0	0	0
Dumbbell Rack-2 Tier/10pr	1	2	3	4	2
Fixed Barbell Set (10 Assorted)	1	1	2	2	1
Fixed Barbell Rack	G	G	G	G	G
Weights (Assorted 2.5#-45#)	G	G	G	G	G
Weight Tree/Rack	G	G	G	G	G
Bars (Assorted/Loose)	G	G	G	G	G
Bar Rack	G	G	G	G	G
Benches (Assorted)	2	6	10	16	9
Squat Rack (F) & Bar	1	1	2	2	1
Bench Press (F) & Bar	1	3	4	6	4
Incline Press (F) & Bar	1	1	2	3	1
Decline Press (F) & Bar	1	1	2	3	1
Military/Shoulder Press (F) & Bar	1	2	2	4	1
Dead Lift Platform/Rack (F) & Bar	0	0	1	1	0.5 K
Power Cage/Rack (F) w/ Bar	1	1	1	2	1
Curl Bench (Seated)	1	1	2	2	1
Curl Bench (Standing)	0	1	1	2	D
Leg Raise/Dip	1	1	1	1	1
Chin-Up/Dip	0	0	0	1	0.5 K
Back Extension	1	1	1	1	1
Abdominal Board	1	2	3	4	2
<b>Subtotal</b>	<b>14</b>	<b>24</b>	<b>37</b>	<b>54</b>	<b>27</b>

### Equipment Summary

#### Cardiovascular Equipment

Electronically Controlled	11	27	51	80	40
<b>Subtotal</b>	<b>11</b>	<b>27</b>	<b>51</b>	<b>80</b>	<b>40</b>

#### Strength Equipment

Selectorized/Stack Weight Equipment	16	27	33	46	20
Plate Loaded Equipment	1	5	10	26	16
Free Weight Equipment/Benches	14	24	37	54	27
<b>Subtotal</b>	<b>31</b>	<b>56</b>	<b>80</b>	<b>126</b>	<b>63</b>

<b>TOTAL</b>	<b>42</b>	<b>83</b>	<b>131</b>	<b>206</b>	<b>103</b>
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**Notes:**

- (A) Cross Trainer may be substituted for Elliptical Trainer.
- (B) Recumbent may be substituted for upright configuration.
- (C) Inclusive in Multi-Station machine as an example.
- (D) Alternate configurations may be substituted for typical exercise configuration (Ex. Horizontal, Standing, Kneeling, etc.).
- (E) Dip extension may be substituted for extension configuration.
- (F) Integral weight storage consideration to reduce Weight Tree & space requirements.
- (G) Actual count dependant on station count & requirements.
- (H) Plate Loaded Smith Machine may be substituted for Selectorized/ Stack Weight Smith Machine
- (J) Rear Deltoid may be substituted for T-Bar Row
- (K) For “.5” Equipment quantity for “Incremental” Module Size, select a total quantity of pieces that does not exceed the allowance shown in the Subtotal.

SAMPLE

## **EXERCISE MODULE (Large Group Exercise)**

### **FUNCTION/DESCRIPTION:**

Classroom(s) to accommodate instructional fitness programs that may include aerobics, martial arts, yoga, step-conditioning, kick boxing, etc. The exercise module shall be one large room that can be divided, through use of a movable wall (not accordion fold partition), into 2 separate group exercise areas. Consider use of an electrically operated wall system. Rooms shall facilitate flexible arrangements for a variety of setups. Equipment setup and tear down time will affect the rollover of exercise modules.

### **ESSENTIAL DESIGN REQUIREMENTS:**

- Storage rooms for convenient access to exercise equipment. The storage room shall be a flow-through design. In other words, the storage room shall be a linear arrangement with adjustable shelves/bins on both sides with a door at each end, so that patrons may enter one end of the room, pick up their equipment, and leave from the other end, without causing a traffic flow problem.

### **DIRECT ADJACENCIES:**

- Storage rooms shall be provided for each side of the group exercise room if the room can be divided.
- Drinking fountain shall be located directly outside of this space if a wood floor is provided. Otherwise, the drinking fountain may be located within the space.

### **CEILING HEIGHT:**

10'-0" minimum.

### **CEILING FINISHES:**

Provide ceilings of highly light reflective and sound absorbent materials. Consider 2'x 2' lay-in, wet-formed mineral fiber acoustical panels, on standard "T" shaped pre-finished metallic grid system. Tegalur (routed edges) tiles are preferred.

Accent functional areas or improve aesthetics by the addition of single layer, gypsum board "dropped" soffits or bulkheads on metal studs. Use of dropped soffits allows concealment of lower items (i.e. ceiling fans, structure, or utilities) while allowing the majority of ceiling to be increased in height. Install around perimeters of rooms, or across ceilings in an arrangement of "false beams." Area of solid, sound reflective surfaces should not exceed 15% of the total ceiling area. "Modular" soffit arrangement: Where possible, design and size soffits and bulkheads to allow the use of full acoustical panels in each direction. For non-modular areas, center ceilings by using balanced border widths where panels are cut to fit. Coordinate lighting: With direct lighting (recessed in ceiling) locate bulkheads and acoustical panel arrangements with the optimum lighting locations first, then consider the pattern of the panels and placement of bulkheads. Where soffits exceed 36" in width and/or 12" in depth, consider supplemental lighting in the bottom of the soffit to avoid shadowed areas across the ceiling plane or at upper portions of wall planes.

An open ceiling, exposed to the structure, is also acceptable as long as acoustic panels and/or banners are provided to provide the same level, or better, of acoustical treatment as an acoustical tile ceiling would.

**WALLS:**

**Mirrors:** Provide ¼" tempered mirror glass with 15 year warranty silver coating on 50% of at least two perpendicular walls. Mount mirrors with the bottom no more than 12" (8" preferred) above the finish floor to a height that provides full body visibility or align with door head height.

**FLOORING:**

**Aerobic floor:** Machine milled and formed solid maple strip flooring that meets or exceeds MFMA (Maple Flooring Manufacturers Association) specification for a "second or better" grade.

**Size and construction:** 25/32" thick x 2 ¼" width minimum. Provide a floating system with two bonded bi directional plywood backing layers, supported on neoprene cushion pads (¾" high) and continuous 7/16" to ¾" thick EPDM cushion pad or other approved flooring system which is DIN certified for aerobic use. Floor will have noticeable flex but with firm feel during aerobic activities.

**Alternate floor:** Synthetic flooring, designated for aerobic classes, may be provided only if the general population served by this facility is primarily active-duty military, and these areas will be used more for martial arts, boxing, etc., with very limited aerobic classes with repetitive impact on the legs and joints.

**PLUMBING:**

**Water fountains:** Required within or adjacent to this module, as described above. Provide one unit minimum with any size module. A unit consists of either two water fountains in a single unit combination, or two separate units side by side to allow for one unit to be mounted at ADA height. Electrically cooled unit required. Water fountains shall be fed from dedicated 120V, 20A circuits. It is recommended that water fountains be placed outside normal traffic paths and recessed into the wall plane if possible. Do not install water fountains where wood flooring is located.

**MECHANICAL (HVAC):**

Mechanical heating, ventilation, and humidity control of the module is mandatory. Shall exceed the current ASHRAE requirements.

**Operating range:** System able to maintain 66 - 72 degrees (F) year-round at 60% relative humidity or less. Shall meet or exceed ASHRAE 62 for the ventilation rate.

**Temperature controls:** Independent to room, solid state and programmable. Ability to control peak and off-peak temperatures with 24 hour or one-touch setback programming recommended.

**Air movement / control:** Fully ducted supply and return. Use spiral duct if existing ceiling is exposed structure. Directional diffusers mounted to spiral duct system shall be engineered for maximum throw and even distribution. Ceiling-mounted diffusers will be standard 2x2 units with directional vanes. Return air may be centralized. Natural (non-mechanically driven) ventilation is not allowed. Provide ceiling fans.

**LIGHTING:**

When ceilings heights do not allow pendant mounted or suspended lighting, indirect 2 x 2 or 2 x 4 lay-in fluorescent fixtures may be used. Direct 2 x 2 or 2 x 4 lay-in fluorescent fixtures may also be used, but are not recommended due to lower light quality (excessive glare and static light distribution; e.g. causes greater eye fatigue over long periods of time). Lighting shall be switched to allow for different levels of lighting. Natural light via windows may be provided, but direct sun-light and glare must be avoided. Windows providing internal views to other spaces is desirable.

**Lighting control:** Use of occupancy sensors to activate lighting by motion detection, is recommended. In addition, grouping of lights so that a portion of the lights may be turned off, especially if natural daylighting is provided, is required. Independent slide or toggle controls may also be used to control fixtures by groups. Grouping needs and/or preferences will be determined by circuit capacity. Lighting on each side of the movable wall shall be controlled separately so each side of the room can function independently.

**Light level:** 40 footcandles at the floor, minimum.

**POWER**

Convenience outlets required.

**TECHNOLOGY/AV:**

Provide recessed A/V rack with commercial grade amplifier, or amplifier and input/output control device, with minimum 2 microphone inputs. 400 watt minimum continuous output rating. CD/DVD/MP3 player with remote control. Provide two microphone outlets wired to locations remote from one another within the module for directed activities.

**SOUND:**

Ceiling mounted speaker for music reproduction. Sound system: Recessed ceiling speakers, 50 watt minimum output rating, capable of reproducing CD quality sound.

**ACOUSTICAL PERFORMANCE:**

Aerobic activity will require partitions to be sound rated to 53 STC minimum. Where glass walls are used to enhance interior views, front these walls to interior circulation and not into other activity spaces. One exception is the gymnasium. All other sound performance characteristics are comparable to the Fitness Module.

**WINDOWS AND DOORS:**

Hollow metal interior windows from traffic or lobby areas are recommended. Tempered safety glass is typical where glazing is 18" or closer to the floor. Tempered or laminated

safety glass above that point depends on the potential for impact from adjoining activities. It is recommended tempered glass be used when precise potential cannot be determined. Adding horizontal mullions at 32-36" A.F.F. also reduces risks from casual contact with glazing. Aluminum frames should be used when consistent with the interior design of adjacent spaces.

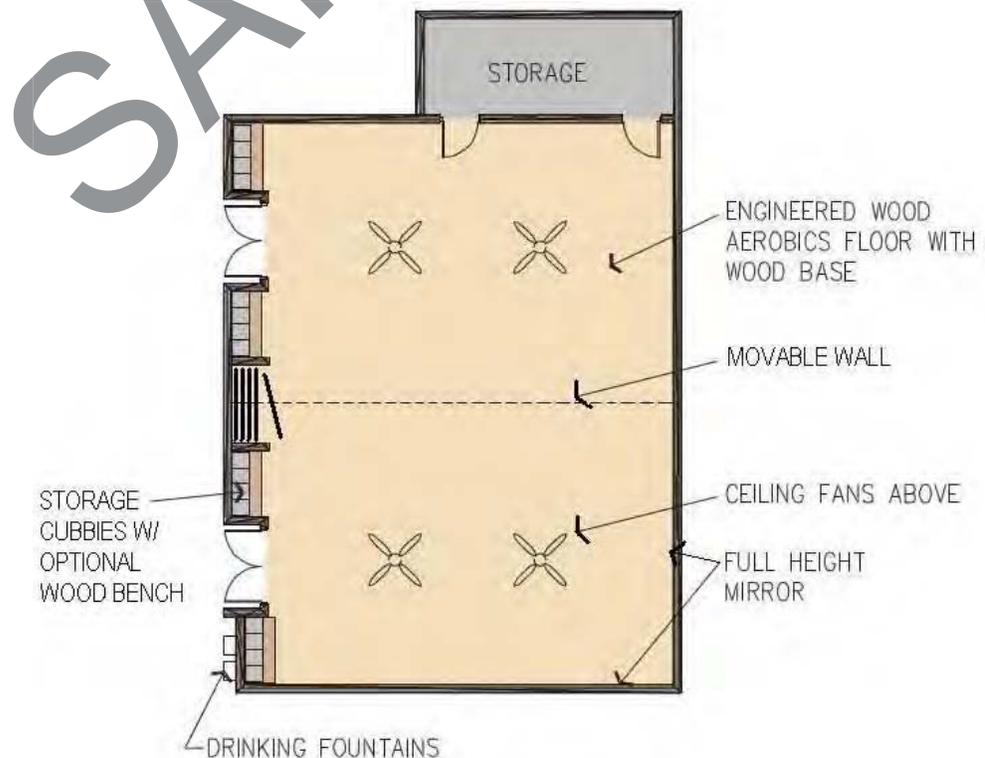
**FIXED EQUIPMENT:**

**Architectural Casework:** Provide storage cubicles along one wall of the module for incidental storage during activities: Provide minimum of one cubicle for 75% of the total number of participants at room's maximum occupant load (based on 50 sq. ft. per person). Cubicle design is generally an open face cube in modular "banks" aligned on one wall to counter top height or vertically with the tallest cubicle 5'-0" above finish floor. Cubicles shall be minimum 14" x 14" (18" x 18" preferred) face opening x minimum 15" deep. Construct cubicles of ½" minimum particle board shell with ½ plywood horizontal shelves. Entire construction veneered with .048 horizontal grade, high pressure plastic laminate. As an alternative, if solid wood or hardwood veneer-core plywood is used throughout, the surfaces may be finished and sealed with a polyurethane, or equal, coating. The coating must be cleanable and able to withstand moisture without degrading. Edge trim of cubicle frames shall be solid hardwood (bonded) or 3 mil PVC edging routed into panel edge. Use of plastic laminate edges is not allowed. If counter height, provide solid surfacing counter top with eased edge front and minimum 1" tall lip where the counter abuts the wall.

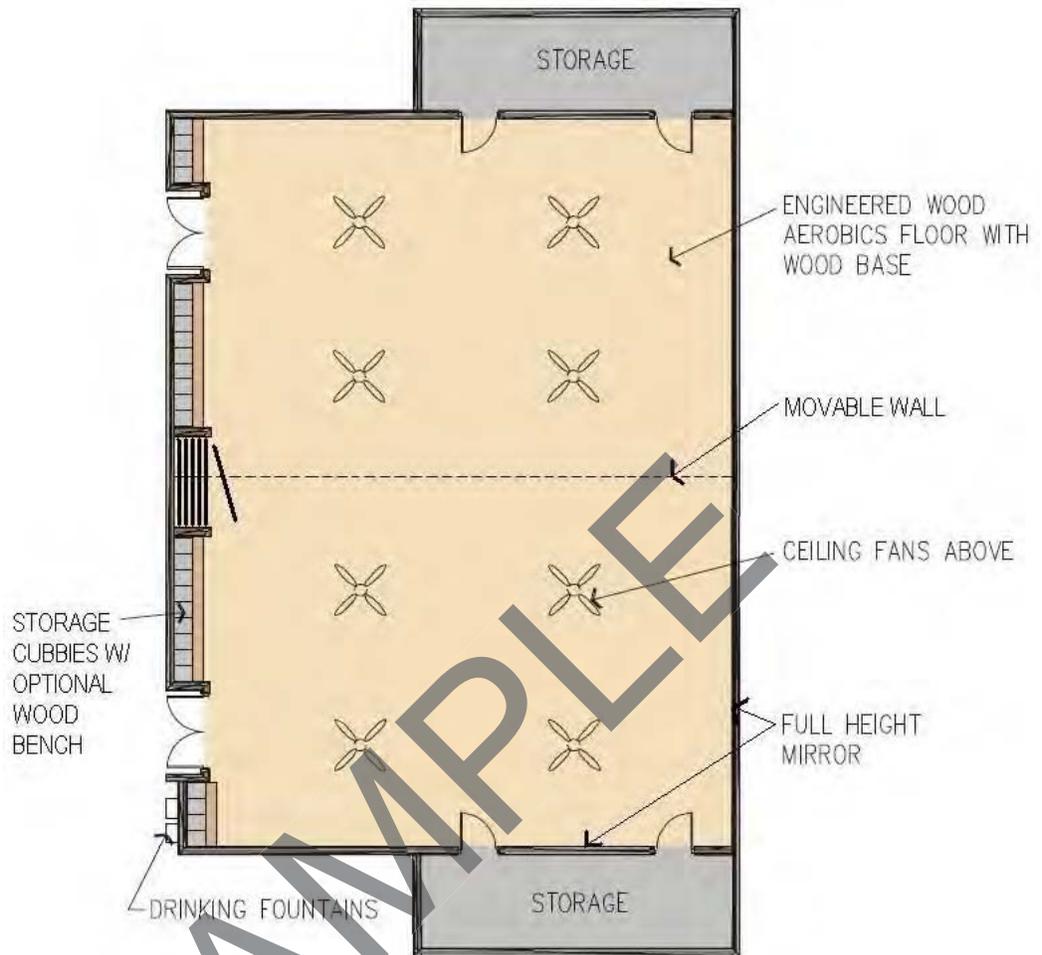
**ARRANGEMENT:**

Provided below are recommended arrangements for a X-Small and Small facility and for a Medium and Large facility. It is desirable for storage to be provided for both halves of the X-Small and Small facilities provided the space provided in each storage room is adequate to be functional and meet the needs of the user.

**X-Small/Small:**



Medium/Large:



## **STRUCTURED ACTIVITY MODULE**

### **FUNCTION/DESCRIPTION:**

The Structured Activity Module is discretionary space allocated for each facility size to allow the installation to determine what other activities are required at their installation. This space must be designed to accommodate the unique requirements of each activity. Some uses of this space may include a climbing wall, spinning studio, racquetball or squash court(s), permanent combatives room, small group exercise room, increased fitness areas, etc. Other uses could include a Health Assessment area, child care, and concessions area. The installation will determine the required areas during the design process.

SAMPLE

## **RACQUETBALL**

### **ESSENTIAL DESIGN REQUIREMENTS:**

- It is preferred that these are located in a visible area, such as off the lobby. Courts shall be provided with full-height glass back walls for spectators. An area shall be provided for spectators. Seating may be accomplished by movable or built-in seating.
- Inside dimensions of Racquetball courts are 20' x 40' x 20' high. Finished assembly size of courts, including wall thicknesses, are approximately 1'-2" larger than interior dimensions.
- Strongly recommend use of panelized racquetball court construction, as opposed to plaster on concrete.
- Racquetball facilities are essentially rooms within a room. Exterior envelope, floor and roof system are assumed to be existing. With regard to special treatment of the building envelope: the floor substrate should follow the same guidelines for the Fitness module whether wood floors for courts or synthetic floors in the adjacent seating / waiting area are under consideration. Floor tolerances and wall tolerances require precise construction in court systems. If space is tight, the exterior walls or interior partitions must be plumb to within ¼" in 10'-0" in the vertical and horizontal planes prior to starting the walls for the courts. Courts construction must also wait until environmental conditions within the building envelope meet recommended minimums and can be maintained during and after construction.

### **FINISHES:**

**General:** The necessary clear space above the inside height of the Racquetball court must take into account the thickness of the court roof, the height of lighting housings, clearance for ductwork overhead, and the depth of structural elements that are part of the floor/roof assembly above. As a preliminary guideline, allow 2'-0" plus the depth of the structure system above 20'-0" to accommodate these elements.

**Material:** Pre-formed high density (62 lbs / cu.ft.) resin core racquetball court panels on concealed T- spline system. Prefinished systems are preferred for their reduced life-cycle maintenance. **Face design:** Smooth. Recommend use of the same panels for the entire ceiling.

**Panel Edge design:** Flush butt joints with no more than a 3/32" gap between panels. Impact resistance: high impact and 80 shore A durability rating.

**Metal wall studs:** 33ksi yield strength, load bearing studs, 18 gauge minimum. Typically 4" studs for 20' height, spaced at 16" o.c. Six inch (6") studs are preferred.

**Face finish:** Smooth and flush. Surface variations equal to or less than 3/32" gaps or variations in plane at panel joints. System walls "float" in relation to one another. Inside corners are kept loose with 1/16"- 1/8" gap at the vertical corners.

Critical item: Wall finish panels do not extend to the floor. End of panels are held off the substrate ½" minimum to allow walls to contract and expand without warping the surface. See floor guidelines below.

**Back wall:** Glass wall. Competition courts generally prefer that the back wall run full height, but can use an 8'- 12' high glass partition at the floor line and use a solid wall panel system for the remaining height. Glass wall system: ½" thick tempered glass walls and doors. Tall vertical walls (above 8'-0" a.f.f.) will require use of vertical glass stiffeners. Glass is structural and utilizes upper and lower channels only to retain 8' - 10'-0" high glass systems, with added edge panel hardware for tall glass systems.

Caution: Review glass panel attachments to floor line with supplier to provide proper support and understanding of the floor to floor transition between spectator floor and the court floor. If both systems are not wood systems, court substrate will be recessed approximately 2 ½" in relation to the spectator area. Back wall doors shall be frameless glass doors with face finish to match wall system. In resin core applications, manufacturers of panels offer face panels for door applications. Door frames, where used, shall be heavy gauge aluminum with adjustable stops to provide a flush installation within regulation tolerances for court wall faces.

Critical Item: No surface fasteners or projecting hardware shall be used on the interior court face for any components. Accessory items, including doors and frames shall all use concealed fasteners. Door hardware shall be flush and recessed in the face of the door on the court side. Door width shall be no less than 34" clear for ADA use.

**Sound absorption for panels:** Fiberboard may be mounted directly behind resin core panels to reduce "drum" effect of hard panels systems. Sound batts are also provided to reduce transfer noise to other spaces or in multi-court applications.

**Surface light reflectance:** No less than .80.

**Humidity resistance:** No special protection.

**Fire resistance:** Use only Class A rated materials as determined by Underwriters Laboratories (UL) Fire resistive gypsum board mandatory when used as part of the ceiling system.

#### **RACQUETBALL COURT FLOORING:**

**Floor tolerances:** No more than ¼" in 10'-0" each direction, non-averaged for the full length of the floor. Follow wood flooring supplier's recommendations for leveling uneven substrates.

**Materials:** Machine milled and formed solid maple strip flooring that meets or exceeds MFMA (Maple Flooring Manufacturers Association) specification for a "second or better" grade.

**Size and construction:** 33/32" thick x 2 ¼" width minimum, bonded to 2 layer bi-directional ½" thick plywood panels. Provide a system with ¾" thick wood or metal and wood composite support sleepers mechanically fastened to floor panels or equal system. Cushion pads on the underside of the sleepers is optional. Expansion control is critical to floor system. DIN certified system for court use.

**Floor Edge treatments:** Racquet ball court floors do not extend to the wall surfaces. Floor edge is held back from wall a maximum of 3/16" at head walls and ½" maximum at side walls, to allow for expansion and contraction of floor system.

**Floor finish:** Catalyzed polyurethane finish system requiring multiple sanding and application steps for a sanding sealer / primer base coat and two finish coats of gloss urethane. Floor striping is accomplished between the first and second finish coats.

**Court striping:** Flooring striping is handled by the flooring manufacturer. Front and side wall striping is prefinished with resin core laminate panels. Consult with a national racquetball association like USRA (United States Racquetball Association) for standards particular to competition in the project region.

#### **PLUMBING:**

**Water fountains:** 1 per 150 patrons at peak time use. Provide one drinking fountain near spectator area, but not necessarily directly adjacent to courts. It is undesirable for water to be available where it could be carried onto courts. Electrically cooled unit required. Water fountains shall be fed from dedicated 120V, 20A circuits.

#### **MECHANICAL (HVAC):**

Mechanical heating, ventilation, and humidity control of the module is mandatory. Shall exceed the current ASHRAE requirements.

**Operating range:** For racquetball courts, system shall be able to maintain 60 - 68 degrees (F) year-round at 50% or less relative humidity.

**Air movement / control:** Fully ducted supply and return. Passive or plenum return not recommended. Supply diffusers are to be heavy gauge fixed metal grilles with four-way air movement and blade-type vanes. Return air grilles may be perforated plate or blade type. All diffusers to be prefinished, designed to be impact resistant. Preferred location is back wall supply and return. Natural (non-mechanically driven) ventilation is not allowed.

**Temperature controls:** Independent to courts, with all controls centrally located, solid state and programmable. Ability to control peak and off-peak temperatures with 24 hour or one-touch setback programming recommended. Ductwork shall be insulated sheet metal rectangular or circular duct routed adjacent to diffuser locations. Use flexible duct drops to diffusers. Natural (non-mechanically driven) ventilation is not allowed.

#### **TECHNOLOGY/AV:**

No technology requirements.

**SOUND:**

**Sound system:** Flush recessed speakers, 25 watt minimum output rating, capable of reproducing the entire audible range for human speech. Link speakers to paging system with input / output modes for single court or all court paging. Provide at least one speaker location in spectator / waiting area with court speaker at back upper wall.

**WINDOWS AND DOORS:**

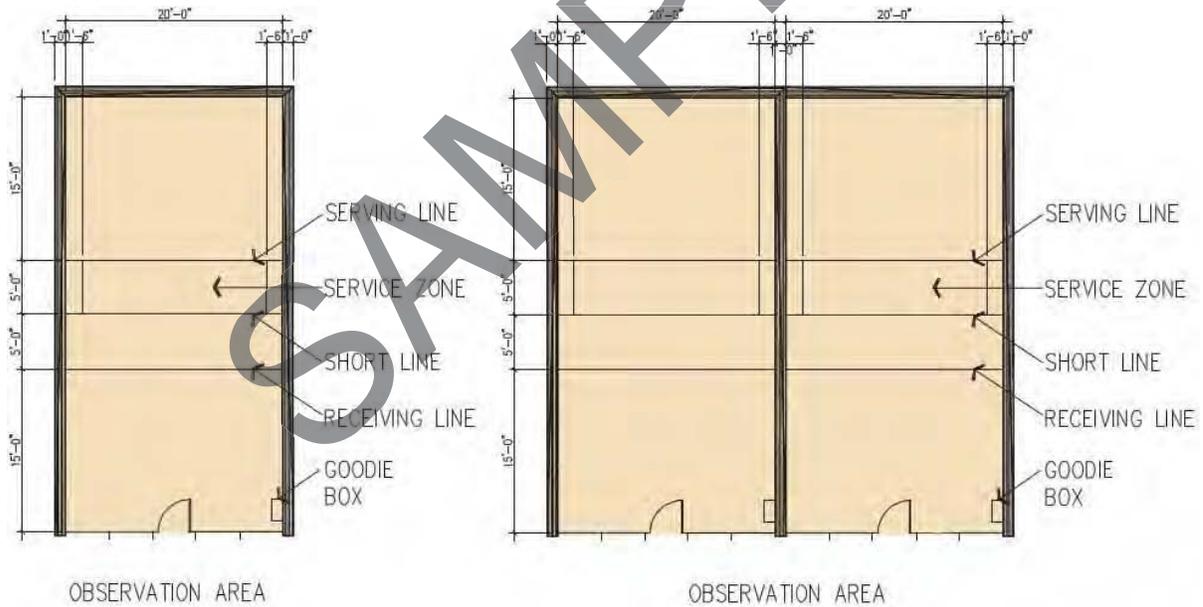
Glass doors integral to the glass wall system shall be provided.

**FIXED EQUIPMENT:**

**"Goody box:"** A "goody box" shall be provided in each court as a place for the storage of small valuables during play be provided for each court. Court manufacturers offer a recessed metal box with flush cover and concealed fasteners, accessible from the interior side of the court only.

**ARRANGEMENT:**

Provided below are arrangements for 1 and 2 racquetball courts. Markings must meet the current guidelines of the governing organization. Based on user preferences, more than 2 courts may be provided.



## **SMALL GROUP FITNESS**

### **ESSENTIAL DESIGN REQUIREMENTS:**

- Small Group Exercise Room: follow the requirements for the Exercise Module (Large Group Fitness) above.
- Must have one-way flow-through storage room directly accessible to the space.
- Cubbies shall be provided based on 75% maximum occupancy based on 125 square feet per person.
- Mirrors and flooring shall be coordinated with the users prior to design to determine anticipated usage of the room.

SAMPLE

## **CLIMBING WALL**

### **ESSENTIAL DESIGN REQUIREMENTS:**

- Climbing wall must be controlled for safety concerns.
- Appropriate and adequate flooring and safety zone is required. Assume a depressed slab in this area.
- Consider a bouldering area in this area as well.

### **DIRECT ADJACENCIES:**

- The climbing wall must be visually and physically accessible from the Control Desk or a fully staffed area for control and safety. The climbing wall should be located in an open area, preferably off of the lobby and in direct view of the Control Desk. Locating it in a separate locked room is acceptable, but not desirable.

### **CEILING HEIGHTS:**

25'-0" minimum. Heights up to 40' are ideal.

### **MECHANICAL (HVAC):**

Mechanical heating, ventilation, and humidity control of the module is mandatory. Shall exceed the current ASHRAE requirements.

**Operating range:** If located in the open lobby area, temperatures should be appropriate for a combination of all of the functions. In a separate room, the system must be able to maintain 66 - 72 degrees (F) year-round at 60% relative humidity or less. Shall meet or exceed ASHRAE 62 for the ventilation rate.

**Temperature controls:** Independent to room, solid state and programmable. Ability to control peak and off-peak temperatures with 24 hour or one-touch setback programming recommended.

**Air movement / control:** Fully ducted supply and return. Use spiral duct if existing ceiling is exposed structure. Directional diffusers mounted to spiral duct system shall be engineered for maximum throw and even distribution. Ceiling-mounted diffusers will be standard 2x2 units with directional vanes. Return air may be centralized. Natural (non-mechanically driven) ventilation is not allowed.

### **TECHNOLOGY/AV:**

No technology requirements.

### **SOUND:**

**Sound system:** Flush recessed speakers, 25 watt minimum output rating, capable of reproducing the entire audible range for human speech. Link speakers to paging system.

## **COMBATIVES**

### **ESSENTIAL DESIGN REQUIREMENTS:**

- Room shall not have any external corners within the room. Columns, if required, must be fully buried within the wall, so the wall surface is perfectly flat. The room shall be sized to accommodate 1 or 2 mats as required by the installation. Floors and walls shall be provided with padding. Padding on walls shall be provided to 8' above the floor.
- A storage room must be provided. Unlike the group exercise rooms, this storage room does not have to be a one-way flow-through configuration.
- Space is required for hanging bags.
- Provide cubbies (minimum of 12 for 1 mat, 24 for 2 mats) for storage of small items inside the room.
- The following drawings indicate the preferred arrangement for this space.

### **DIRECT ADJACENCIES:**

- No special requirements.

### **CEILING HEIGHTS:**

10'-0" minimum

### **CEILING FINISHES:**

Provide ceilings of highly light reflective and sound absorbent materials. Consider 2'x 2' lay-in, wet-formed mineral fiber acoustical panels, on standard "T" shaped pre-finished metallic grid system. Tegular (routed edges) tiles are preferred. Hold down clips may be desirable.

### **PLUMBING:**

**Water fountains:** 1 per 150 patrons at peak time use. Provide one drinking fountain near this function. Electrically cooled unit required. Water fountains shall be fed from dedicated 120V, 20A circuit(s).

### **MECHANICAL (HVAC):**

Mechanical heating, ventilation, and humidity control of the module is mandatory. Shall exceed the current ASHRAE requirements.

**Operating range:** System able to maintain 66 - 72 degrees (F) year-round at 60% relative humidity or less. Shall meet or exceed ASHRAE 62 for the ventilation rate.

**Temperature controls:** Independent to room, solid state and programmable. Ability to control peak and off-peak temperatures with 24 hour or one-touch setback programming recommended.

**Air movement / control:** Fully ducted supply and return. Use spiral duct if existing ceiling is exposed structure. Directional diffusers mounted to spiral duct system shall be engineered

for maximum throw and even distribution. Ceiling-mounted diffusers will be standard 2x2 units with directional vanes. Return air may be centralized. Natural (non-mechanically driven) ventilation is not allowed.

**LIGHTING:**

Provide indirect 2 x 2 or 2 x 4 lay-in fluorescent fixtures may be used. Direct 2 x 2 or 2 x 4 lay-in fluorescent fixtures may also be used, but are not recommended due to lower light quality (excessive glare and static light distribution; e.g. causes greater eye fatigue over long periods of time). Lighting shall be switched to allow for different levels of lighting.

**Lighting control:** Use of occupancy sensors to activate lighting by motion detection, is recommended.

**Light level:** 40 footcandles at the floor, minimum.

**POWER**

Locate convenience outlets to avoid safety concerns with cut outs in the wall padding. Best locations would be where no padding is required, and at a corner of the floor mat.

**TECHNOLOGY/AV:**

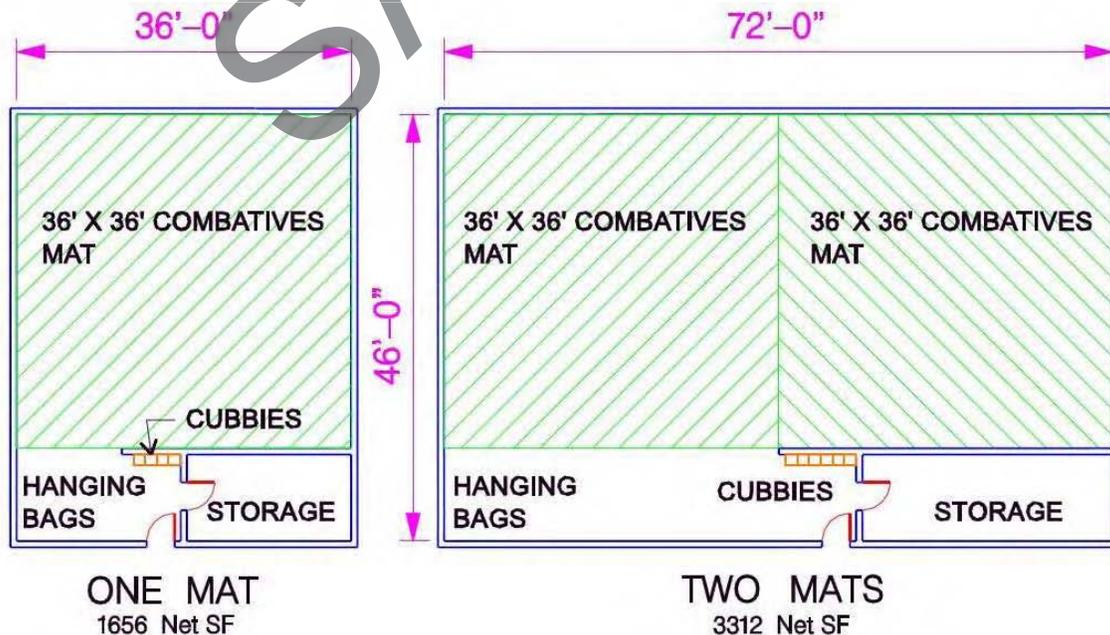
No technology requirements.

**SOUND:**

**Sound system:** Flush recessed speakers, 25 watt minimum output rating, capable of reproducing the entire audible range for human speech. Link speakers to paging system.

**ARRANGEMENT:**

Provided below are recommended arrangements for 1-mat and 2-mat Combatives Rooms.



## **CONCESSIONS**

### **ESSENTIAL DESIGN REQUIREMENTS:**

- This describes the optional food and beverage sales or expanded retail functions that will be provided in a separate area that is highly visible and accessible to patrons to encourage business. Vending can also be provided at a self-service standalone space with vending machines. The vending area, if a standalone space, should be identifiable, visually screened but not totally enclosed, and visually accessible from the control desk.
- Coordinate with the user to determine level of service desired along with the proposed operators. Different operators may have different requirements for security, equipment, layout, etc.

### **DIRECT ADJACENCIES:**

- Should be located adjacent to the lobby to serve spectators, visitors, and users upon entering or leaving the facility.

### **CEILING HEIGHTS:**

9'-0" Minimum

SAMPLE

## **CHILD CARE**

### **ESSENTIAL DESIGN REQUIREMENTS:**

- Must comply with all Child and Youth Services (CYS) requirements. Please refer to the Army Standard and the Standard Design for Child Development Centers. These documents may be downloaded from <https://eportal.usace.army.mil/sites/COS/CDCIT/default.aspx>

### **DIRECT ADJACENCIES:**

- The Child Care area shall be located close to the main entrance/lobby so that patrons may drop off their children shortly after arriving at the facility.
- It may be desirable to provide cardio equipment in an arrangement such that the users can watch their children in the child care area. In this instance, the cubbies and shelves in the attached drawings may be relocated to other walls, and a glass wall provided.
- The layouts shown in the attached drawings are mandatory unless otherwise modified by this section.
- Child Care shall NOT be located on any floor other than the ground floor.
- The Child Care Room must also have direct access to the exterior. It is ideal if this door leads to a playground area.

### **CEILING HEIGHTS:**

8'-0"

### **CEILING FINISHES:**

Salient characteristics include ease of accessibility to mechanical system above ceiling, durable, and shall provide an aesthetically pleasing surface, free of sags or other defects.

### **WALL FINISHES:**

Salient characteristics include easy to clean, repairable, easy to maintain, and durable. Wall material shall have the ability to absorb pushpins. Wall surface shall be able to withstand tape peeling. Where drinking fountains and/or lavatories are provided, a minimum 48" tall wainscot that is impervious to water and able to withstand daily sanitizing is required. This material shall extend to the floor and at least 18" horizontally in both directions from the centerline of the equipment.

### **FLOOR AND BASE:**

Salient characteristics include seamless, easy to clean and maintain. A base material, appropriate for the flooring material used, is required. Base shall be seamless except at inside corners. Base shall be sealed to floor with USDA or NSF approved caulking.

### **PLUMBING:**

A drinking fountain (non-refrigerated, similar to Halsey Taylor model HRFGE) is required on the wall near the toilet area as shown, mounted so that top of drinking fountain is 17" above

finished floor. Plumbing for toilet/lavatory area, diaper changing table, and food preparation sink area is also required.

**MECHANICAL (HVAC):**

One exhaust fan providing 100 to 150 cubic feet per minute shall be provided directly over the diaper changing station. Room temperature shall be measured and maintained at 1 foot above finished floor. Temperature will be designed for 68 °F in the winter and for 78 °F in the summer.

Humidity Control. A relative humidity of between 35 and 50 percent will be maintained to prevent drying of mucous membranes, to control the spread of diseases, and to prevent mold growth.

**POWER:**

All electrical outlets, except for those mounted above countertops, shall be mounted 54" above the finish floor, and shall be Hospital grade, tamper resistant safety type. Outlets provided above countertops shall be located no less than 18" from the edge of the countertop. Two electrical outlets to be provided above the backsplash (food preparation counter/sink). Electrical outlet to be provided for under the counter refrigerator. Electrical outlet, data port and intercom phone connection at sign in desk to be provided. Provide task lighting at sign in desk, installed on underside of upper cabinets. A minimum of 1 (one) outlet will be provided above the cubbies in the program area and will be mounted horizontally.

**TECHNOLOGY/AV:**

No technology requirements.

**SOUND:**

**Sound system:** Flush recessed speakers, 25 watt minimum output rating, capable of reproducing the entire audible range for human speech. Link speakers to paging system.

**WINDOWS AND DOORS:**

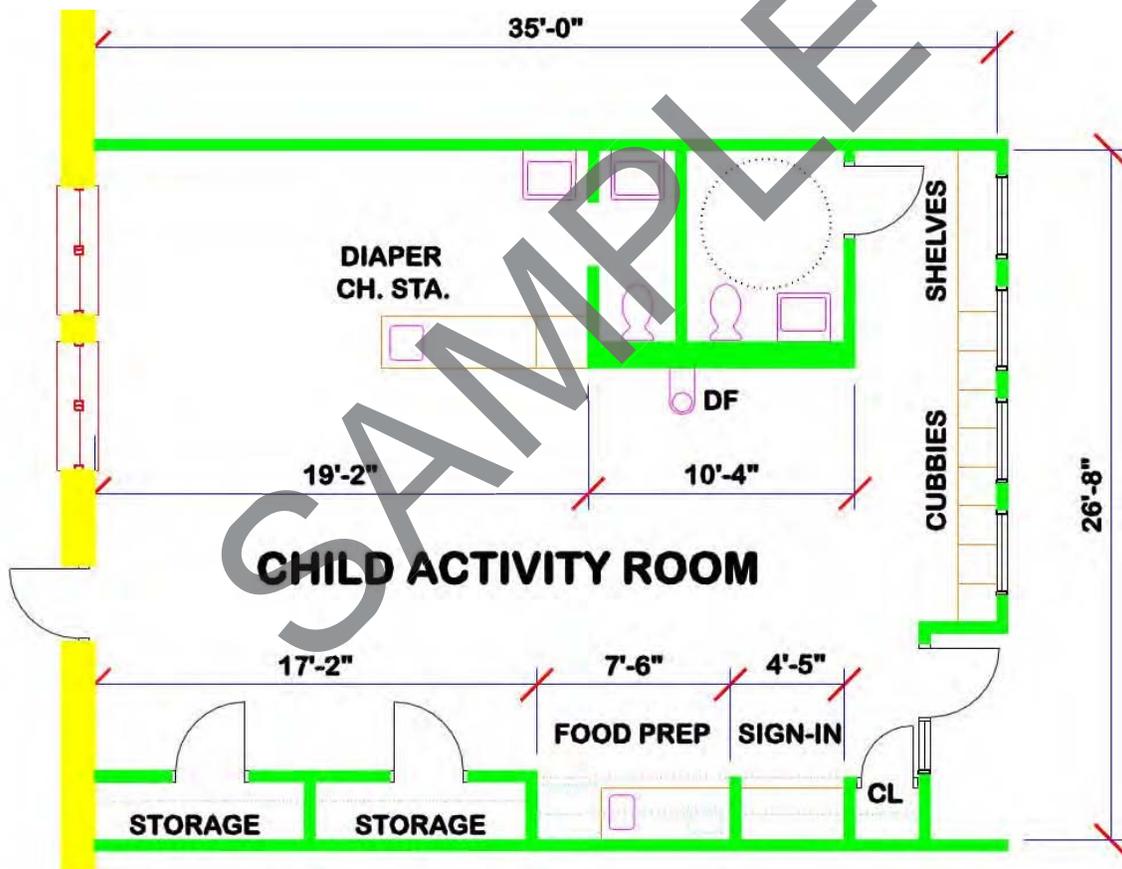
Doors, frames, and hardware shall be able to withstand constant opening and closing. Doors shall be provided with finger guards at the hinges, on the Activity Room side, up to a minimum height of 48". Finger guard shall be roll type. On exterior doors, finger guards shall not conflict with weather stripping. Interior doors shall be a minimum of half-height glass, with a clear width opening of 34 inches and shall be provided with a 12-inch wide side lite on the latch side of the door. Exterior door shall be provided with flush panic hardware, shall have a clear width opening of 34 inches, open at least 110 degrees to ensure ease of crib emergency evacuation, and direct exiting onto the outdoor play space. Interior and exterior doors shall swing in the direction of exit travel. Door thresholds and hardware will be designed to facilitate the exit of a crib containing five infants by a single adult. The thresholds will have a low profile. Doors shall be provided with self-closing device.

**FIXED EQUIPMENT:**

- **CABINETRY:** Salient characteristics include easy to clean, maintain, and repair. Cabinets shall be durable and be able to withstand impacts (examples: food carts, push toys, etc.), without showing damage. Cabinets shall be a minimum of Architectural

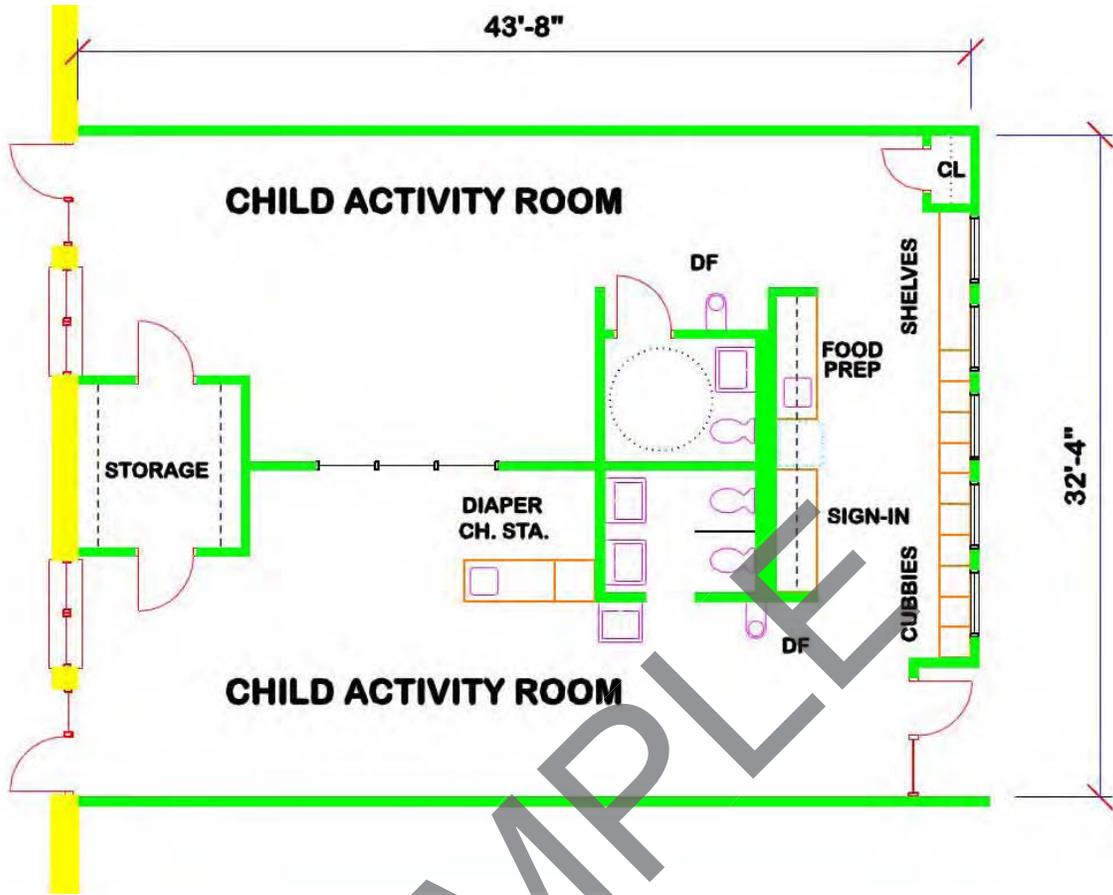
Woodworking Institute (AWI) 400B, Custom Grade, High Pressure Laminate clad. Counter top shall have integral back splash, and shall be solid surfacing, solid phenolic, or better. Counter tops of cabinets will have rounded/radius corners and edges.

- (a) A 3'-6" wide sign-in desk with 6 lockable storage units in an overhead cabinet, and an adjacent 18 inch wide coat closet.
- (b) 8 foot wide base and wall cabinets with stainless steel sink. Sink shall be provided with gooseneck faucet. Sink bowl shall be a minimum of 21" W x 15-3/4" D x 8" H. Space shall be provided for an undercounter refrigerator. Base cabinets shall be lockable, and may not have a protruding handle. All base cabinets in the facility shall be keyed alike.
- (c) 14-15 pre-school cubbies, 8"-12" wide x 15" deep x 46"-49" tall permanently attached to walls (pre-manufactured). Provided by Building Contractor.
- (d) One diaper changing station approximately 2 foot wide by 5 foot long cabinet with sink integral to diaper changing surface, and retractable stairs. Refer to illustrations in the Army Standard Design.



**Small Child Care**

933 Square Feet



**Large Child Care**

1412 Square Feet

## **GYMNASIUM**

### **FUNCTION/DESCRIPTION:**

The gymnasium is a dedicated space for team activities and competitive play, which includes basketball and volleyball. Multiple court gymnasiums with divider curtains will accommodate simultaneous activities. In facilities with 3 or more courts, the option exists to provide two separate gymnasiums. One of the gymnasiums shall be provided with the wood floor. The second gymnasium may be more of a multi-purpose space, if desired by the installation. If programmed, a suspended indoor jogging/walking track shall be provided, typically around the perimeter of the gymnasium.

### **ESSENTIAL DESIGN REQUIREMENTS:**

- Minimum clear heights must be maintained.
- Safety padding must be provided on the wall behind backstops. Doors, windows, electrical panels, etc. shall not be located in this area for safety reasons. This will require careful planning of door locations, as well as any other item that may be on or in the wall that would result in no padding.
- Floor must be striped for basketball and volleyball, with a tournament basketball court located perpendicular and centered within 2 regular basketball courts. All basketball courts shall be to NCAA standards.
- Gymnasium storage must be provided that opens directly into the gymnasium.
- If a tournament court is provided, it must be perpendicular, and superimposed over the normal courts. Retractable bleachers must be provided to provide spectator space for the tournament court. It is recommended in gymnasiums with 3 courts, that the tournament court is superimposed over 2 courts. However, if the installation prefers, the tournament court may be centered within the gymnasium.

### **DIRECT ADJACENCIES:**

- Restroom facilities, other than those in the locker rooms, will be provided to support the gymnasium spectators.
- Team Locker Rooms can be provided adjacent to the Gymnasium for game use, but the area for these elements must be deducted from the structured activity module.
- Adjacency to the Control Desk is required for check-in and equipment issue.
- Drinking fountains. Drinking fountains are not to be provided where there is a wood floor.

### **INDIRECT ADJACENCIES:**

- Activity Components
- Locker Rooms

### **CEILING HEIGHT:**

Minimum unobstructed height is 28'-0". Lights, speakers, structure, etc., must be above the 28' height.

### **CEILING FINISHES:**

**General provisions:** Exposed structural and mechanical systems are typical.

**Structural Considerations:** Roof trusses are typically designed to minimum load values for the spans involved resulting in the most economical truss (by weight) that can be provided. Gymnasiums have additional truss mounted loads that must be taken into account:

- Suspension of basketball backstops
- Divider Curtains and drapes for temporary backdrops
- Ductwork
- Lighting, Temporary Theater Lighting and Sound Equipment
- Company or squad decorative banners
- Suspended jogging track

The Engineer also has the responsibility of reviewing the pattern of the truss webs to coordinate passage of HVAC ductwork and installation of the correct lighting pattern. This should be done in consultation with the structural engineer at the earliest possible date.

**Acoustical Decking:** Provide a flat panel, or exposed cell perforated metal deck with cell depth as required. Minimum sound absorption factor shall be 0.47, with a NRC of 1.00. Absorption values of 0.68 to 0.83 are easily reached for long span acoustical decks. Obtain highest level possible in new construction. Design sound quality should be "lively" with no reverberation.

Critical item: Applied acoustical treatments are not recommended.

**Ceiling Finish:** "Dry-fall" or "wet-fall" paint system for decking and trusses. Deck painted in white or off white preferred for maximum lighting distribution. Contrasting color of trusses and ductwork offer an opportunity for accent colors.

### **WALL MATERIALS:**

Recommended wall construction for gymnasiums is an interior wythe of 8 inches thick to 12 inches thick concrete block, with 2 inches of rigid insulation in the wall cavity and a veneer system suitable to the context of surrounding buildings. The two most common structural systems for tall multi-wythe masonry walls are 1) load bearing masonry, or 2) steel frame with non-load bearing in-fill partitions. Concrete masonry units (CMU) recommended to be moisture controlled Type 1, normal weight, hollow core.

**Safety:** Minimum safety requirements provide for wall-mounted padding, meeting all applicable safety requirements, to be permanently affixed to the walls behind each backboard.

### **WALL FINISHES:**

Standard block with water based epoxy coating, semi-gloss. Apply a heavy acrylic block filler spray applied and backrolled to a pinhole free surface, and two epoxy finish coats of 5 to 6 mil Dry Film Thickness (DFT). Ferrous metals (doors and frames): water based epoxy.

Apply one coat primer compatible with finish coat, and as barrier coat to factory primer. Two finish coats of 5 to 6 mils DFT.

**FLOORING:**

**BALLCOURTS:**

**Substrates:** Where possible, provide a min. 4 inch thick, level concrete slab on grade over properly graded crushed stone sub-base, with a 10 mil polyethylene sheet vapor barrier located directly between the slab and the subbase. Where continuous water is anticipated beneath floors due to local conditions, a subsurface drainage system is recommended.

**Ballcourt floors:** Machine milled and formed solid maple strip flooring that meets or exceeds MFMA (Maple Flooring Manufacturers Association) specification for a "second or better" grade. Expect some visual variation in color in the wood, but otherwise free from defects. Flooring materials to meet DIN Standards. Provide all lines for basketball (per NCAA specifications) and volleyball. In gymnasiums with 2 or more courts, there will be a tournament cross-court as well. Synthetic flooring may only be provided with approval from the Installation and the Center of Standardization (COS).

**Size and construction:** 25/32 inches thick x 2 ¼ inches width minimum. It is extremely desirable to provide 25/32" thick flooring with the same wear depth as 33/32" thick flooring for extended longevity through multiple sandings. Provide a floating system with two bonded bi directional plywood backing layers, supported on solid neoprene cushion pads (3/4 inch high) for an overall performance of 90% or better ball rebound with 53% or better force reduction, or other approved gymnasium flooring system which meets these DIN standards. Floor will be rigid but with minor "give" during normal play.

**Flooring accessories:**

Holes for volleyball support posts shall be drilled through the wood floor. Inserts are cast in place with the formation of the slab on grade, or post drilled. Coverplates are used to conceal holes through wood floors when netting equipment is not in use.

**Court overruns:** Provide 10'-0" of unobstructed space around the perimeter of each regulation-size basketball court. Provide 15'-0" minimum between courts.

**NATURAL LIGHTING:**

It is recommended that natural light be allowed into gymnasium spaces through the use of windows and / or overhead skylights. Wall construction will control the ease and relative cost of creating such openings. Avoid glare in window placement, and consider use of translucent wall panels to avoid glare and control heat gain. Linear skylights may be used to enhance natural lighting and enhance visual appeal of the module. Recommend an aluminum framed, gable type skylight with laminated safety glass. Glass should have visible light transmittance of no less than 56% to provide significant light to the floor. Again, pay close attention to direct sunlight and glare.

**PLUMBING:**

**Water fountains:** 1 unit per two courts. A unit consists of either two water fountains in a single unit combination, or two separate units side by side to allow for one unit to be mounted at ADA height. Electrically cooled unit required. One cuspidor minimum adjacent to fountains. Water fountains shall be fed from dedicated 120V, 20A circuit(s). Water fountains shall be located outside of the gymnasium, in close proximity to an entrance to the gymnasium, to avoid damage to the wood flooring. It is recommended that water fountains be placed outside normal traffic paths and recessed into the wall plane if possible.

**MECHANICAL (HVAC):**

Mechanical heating, ventilation, and humidity control of the module is mandatory. Shall exceed the current ASHRAE requirements.

**Operating range:** System able to maintain 68 - 74 degrees (F) year-round at 50% relative humidity or less. Shall meet or exceed ASHRAE 62 for the ventilation rate.

**Temperature controls:** Independent to room, solid state and programmable. Ability to control peak and off-peak temperatures with 24 hour or one-touch setback programming recommended.

**Air movement / control:** Fully ducted supply and return. Spiral duct for exposed use within gym module. Main supply with one branch duct per court, minimum. Directional diffusers mounted to spiral duct system shall be engineered for maximum throw and even distribution over courts areas. Return air may be centralized but locate low to floor. No through-wall relief dampers. Natural (non-mechanically driven) ventilation is not allowed. Smoke and combustion duct detectors will be required.

**Acoustical performance:** Insulate all supply ducts and moderate air flow to reduce noise. Isolate all air handling equipment in a separate mechanical space dedicated for that use. Provide sound dampening for all equipment.

**LIGHTING:**

High Intensity Discharge (HID) fixtures are not required. Lighting selected shall be identified as suitable for the intended use and lighting design shall meet IESNA recommendations for Basketball Sports-Lighting, Class III (Class of Play). In general, lighting levels shall be a minimum of 50 foot candles at floor level, adjustable up to 80 foot candles. Fixtures shall be mounted not less than 28' above the finished floor. For overhead locations, protect luminaires with wire cages and/or provide appropriate shatterproof enclosed luminaires. Switching for lighting control shall provide different lighting options to take into account natural lighting and different activities (such as boxing matches, etc.). Do not locate fixtures directly above basketball backboards. Lighting control shall be located in a controlled area to avoid accidental and unauthorized switching.

**POWER:**

Scorer's table is generally located for one designated court, at mid court, and requires one (1) 4-outlet, 20 amp power outlet and two (2) Cat5 or better data connections, both in recessed floor boxes, centered under the anticipated table location, but outside the court

boundaries. Solid brass cover plates shall be provided for these outlets for when scoreboard equipment is not in use to provide good ball return value and skid resistance.

### **TECHNOLOGY/AV:**

At a minimum, all facilities shall provide electronic scoreboards. Scoreboards to be visible to officials and players and be appropriate for programmed sports. If consistent with the mission of the facility, consider providing video connections, wall mounted in gymnasium for portable video camera use, with outlet linked via cable, to monitoring equipment (i.e. video recording, multiplex video control /output, TV monitors, or base wide cable system). Provide one recessed floor box mounted (1) 4-outlet, 20 amp duplex power outlet centered under the anticipated scorer's table location, but outside the court boundaries. Provide two directly interconnected communications outlets in gymnasiums for time clock and scoreboard connections. One outlet shall be recessed floor mounted with cover at the scorer's table location and one shall be wall mounted at the scoreboard location. Each outlet shall consist of one Cat 6 communications jack and one coaxial TV connector.

### **SOUND:**

Wall mounted speakers for public announcements.

Sound system: Built-in system for announcing events in the Gymnasium. Wall mounted speakers, 50 watt minimum output rating, capable of reproducing human speech, minimum. If multipurpose functions are considered, provide speakers capable of CD quality sound reproduction of music.

### **WINDOWS AND DOORS:**

Views into the space from the lobby/control counter are required to the greatest extent possible. Views to other spaces and admittance of natural light are also recommended. Non-operable windows are mandatory for temperature / humidity control. Aluminum or hollow metal frames are recommended. Aluminum only for exterior openings. Tempered safety glass should be typical to the module. The potential for injury does not warrant selective location of safety glass. Avoid locating doors directly behind backstops for safety reasons.

**Sun Shading devices:** If natural lighting through windows is anticipated, shading devices may be necessary to avoid glare across courts at certain times of the day. Permanently mounted shading elements limit design flexibility and are unnecessary for a majority of module use time. A more cost effective solution to glare is a reduction in visible light transmittance of 38% to 18% in exterior insulated glazing, when floor level or tall windows are desired, without cost of shade devices. It is recommended to minimize east and west facing glazing, and provide adequate exterior shading on south facing glass.

**Storage:** A storage room is required per the standard. The storage room shall be provided with a minimum of one pair of 4'-0" W x 8'-0" H doors with no center mullion (opening size 8'-0" x 8'-0"). Consider a roll-up door as an option.

### **FIXED EQUIPMENT:**

**Basketball backstops:** Two per court, overhead mounted and electrically operated forward folding type. Mounted to trusses with provided pipe support frame.

**Rectangular glass backboard:** NCAA official size (3'-6" x 6'-0") fabricated from ½ tempered glass with continuous edge gasket mounted with aluminum flange and breakaway rims.

**Goals:** Safety reflex type, with 5/8" steel rod ring and "no-tie" steel attachments. 120 thread, retarding type netting.

**Divider Curtains:** For multi court gyms, divider curtains shall be provided between each standard basketball court. Curtains to be electrically operated vertical-folding/rolling mesh fabric with solid vinyl bottom panels. Curtain shall be fully retractable to the bottom of the structure. Curtains are mounted to bottom of trusses on steel subframes. Lower panels are of solid polyester reinforced vinyl fabric, 18 oz./ sq. yd. min weight, to a height of 2'-8" above the finished floor. Middle Mesh is vinyl coated polyester mesh weighing not less than 6 oz. / sq. yd.- from 2'-8" to 18' above the finished floor. Upper curtain portion is generally open to structure above.

**Volleyball:** Steel posts of hollow tubes 3 ½" diameter with powder coated or zinc plate finish. Nets are tensioned to the posts by use of a ratchet winches with removable handles.

**Floor plates and sleeves:** Galvanized steel tubing, mated to the post diameter, is cast into the floor and the hole is covered with a solid brass plate with removable lid. Solid brass floor covers required to provide good ball return value and skid resistance. Use of flip up cover plates is not allowed. Plate lid must be removed from the area of play to prevent injury.

**Nets:** Specifically designed for volleyball use, black, with heavy web sides and bottom. Double sewn vinyl top binding with rope cable and antenna (for out of bounds markers).

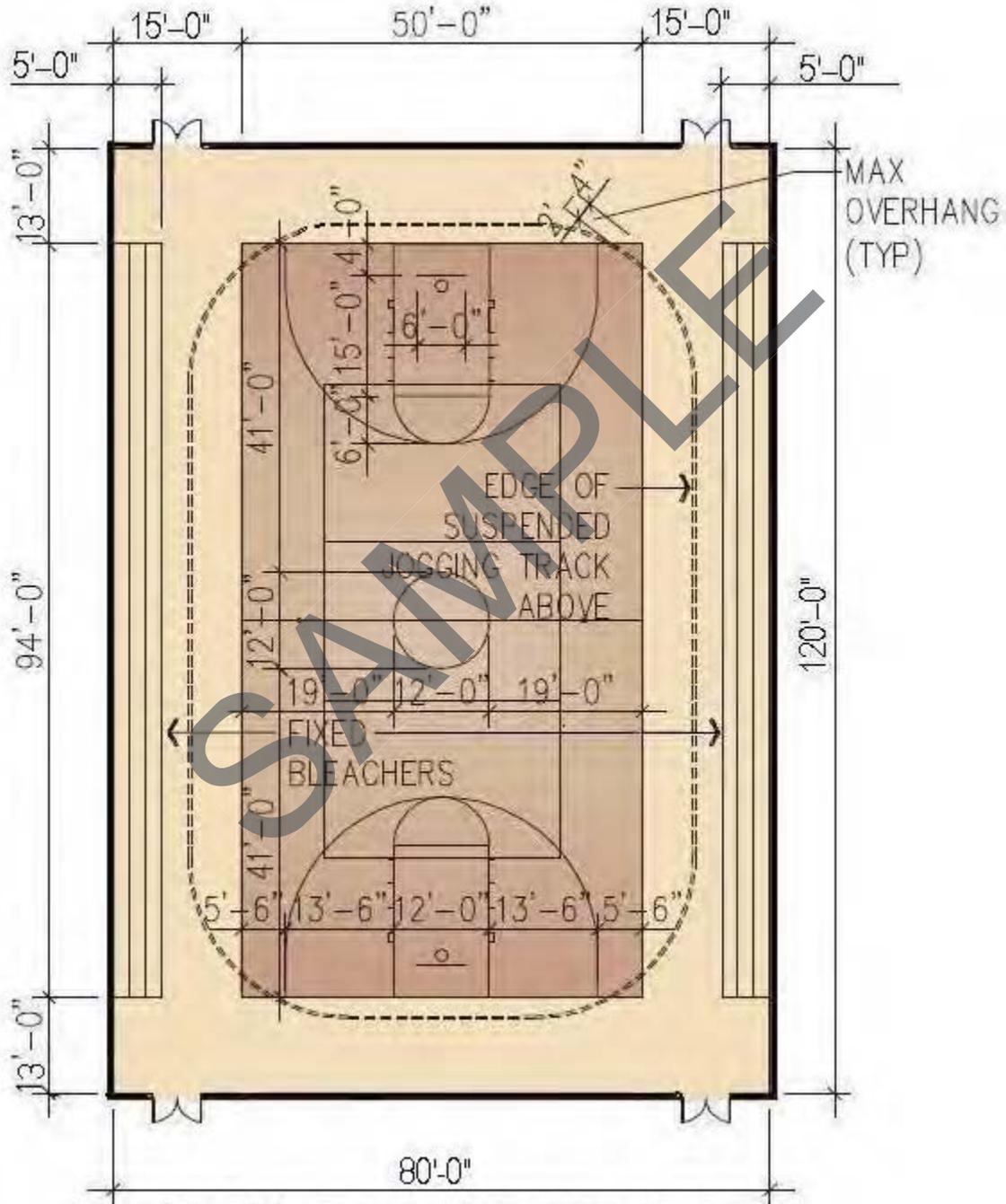
**Post padding:** All posts must be padded during use. Provide a 6'-0" high, 1" polyurethane foam core, vinyl covered pad. Designed to wrap the pipe with Velcro closures.

**Bleachers:** If a tournament court is provided (which is typically the case), retractable, wall-mounted bleachers shall be provided on both sides of the tournament court, the full length of the court. These bleachers shall be electrically operable with manual override, and shall be sized to accommodate normal spectator requirements, as allowed to provide the adequate safety zone around the basketball court, and to ensure adequate headroom under the track. Bleachers on the side wall(s) of the standard basketball courts shall be 3 row, tip and roll, aluminum bleachers (purchased by others). In the diagram below, these are referred to as "fixed bleachers" in that the rows are fixed. These fixed bleachers shall be provided for as many courts as possible.

**Miscellaneous:** Two shot clocks shall be provided for each court (assume 1 shot clock for each backboard). For intramural courts, a minimum of 1 score board is required for each court. Two score boards may be required if a single board can not be viewed by spectators. For tournament courts, either 2 score boards or a center hung 4-sided score board shall be provided.

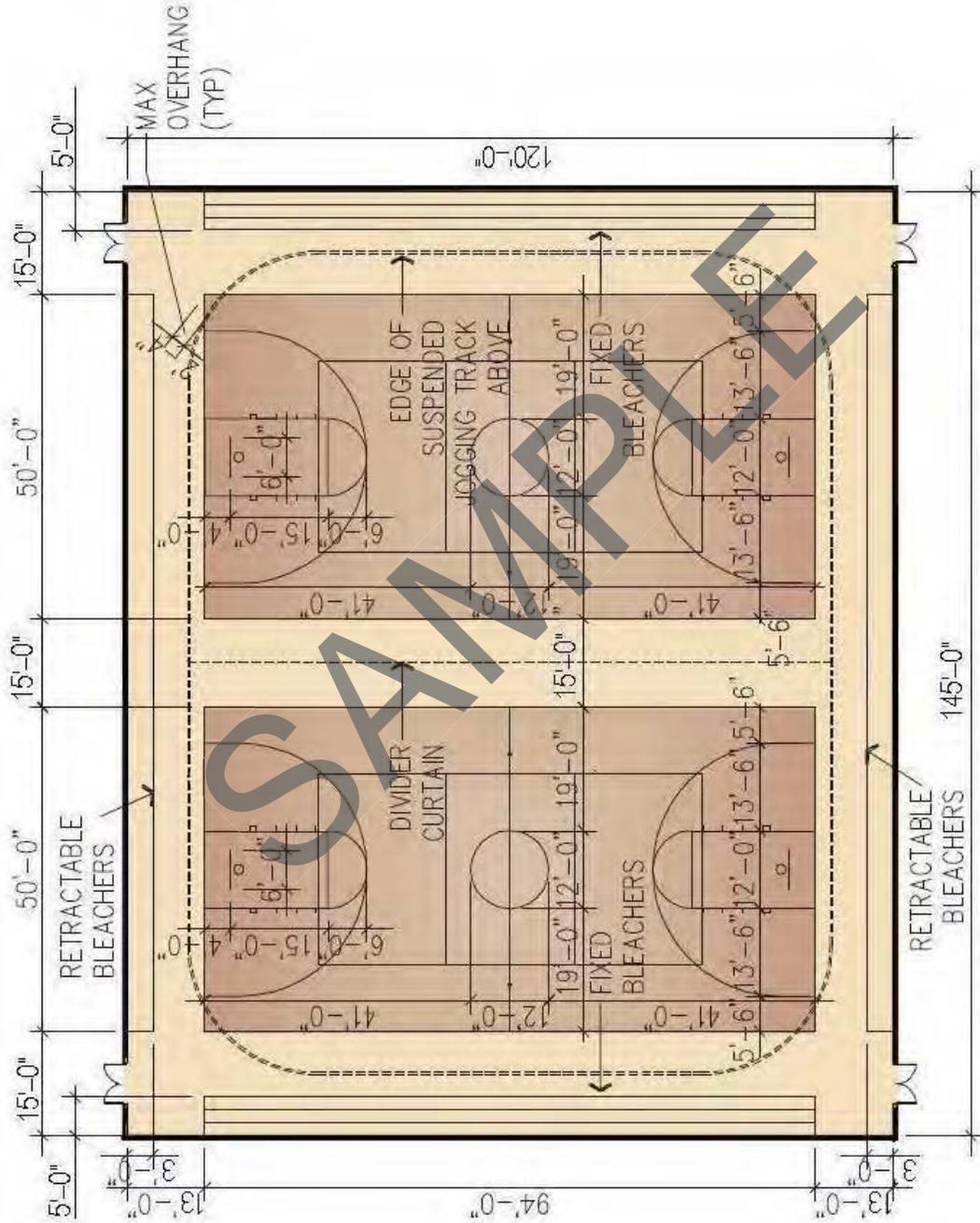
**ARRANGEMENT:**

Provided below is the recommended layout for a 1-court gymnasium with a jogging track. It is slightly less than the area shown in the Army Standard, however it complies with all safety requirements. If no jogging track is to be provided, the length of the gymnasium may be reduced from 120'-0" to 114'-0", with the extra space added to the Structured Activity Module for use in functional areas elsewhere in the facility.



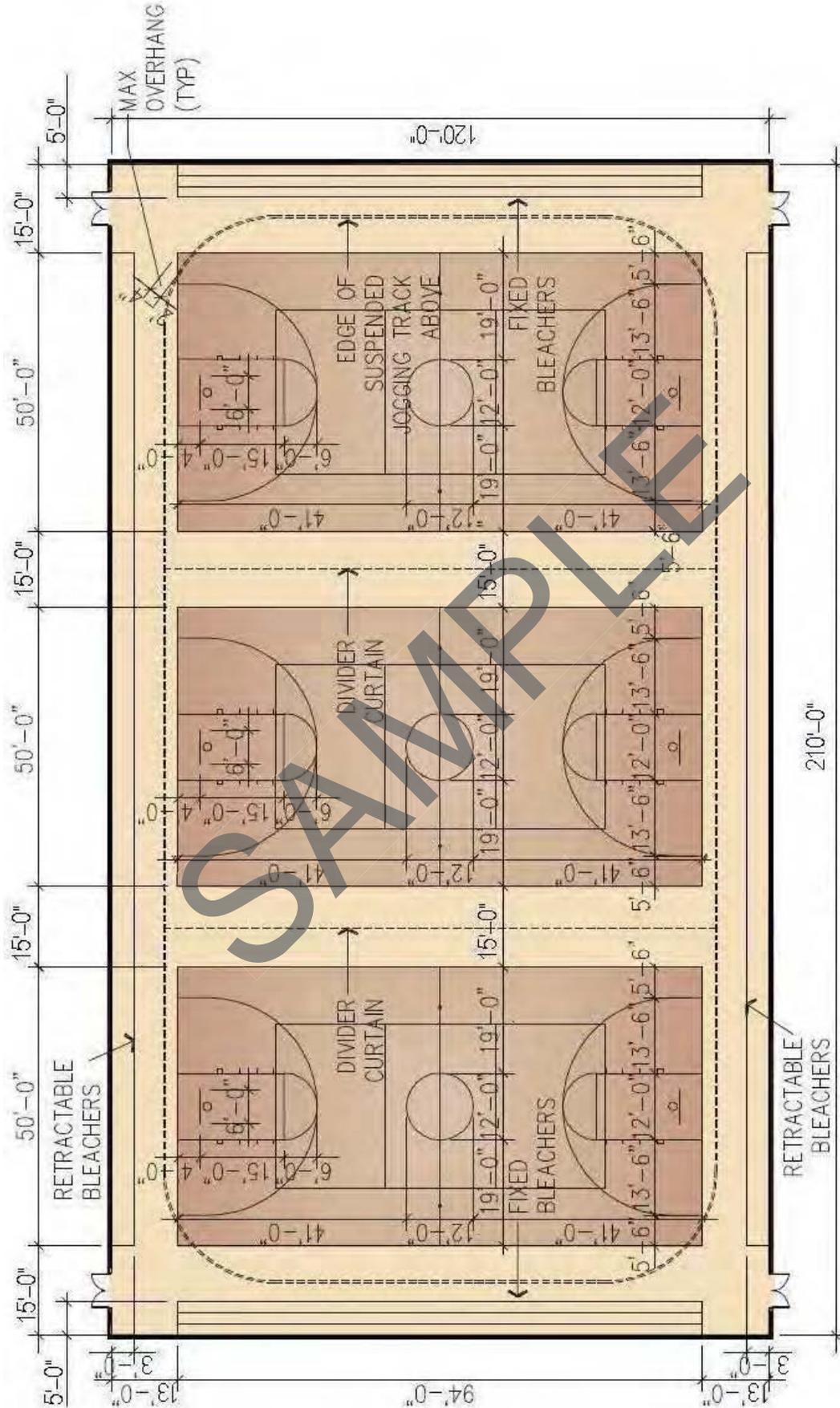
**1 Court Gymnasium WITH a jogging track**

Provided below are the recommended layouts for a 2-court and a 3-court gymnasium. In most cases a jogging track and/or a tournament court will be provided, which will result in the larger layouts shown below. If a jogging track is provided, but no tournament court, the retractable bleachers shown will not be provided. There will be no reduction in the dimensions. If neither a tournament court nor a jogging track is included in the project, the gymnasium will be reduced to the dimensions as shown in the smaller diagrams on page 37, with the building area saved added to the Structured Activity Module for use in functional areas elsewhere in the facility.



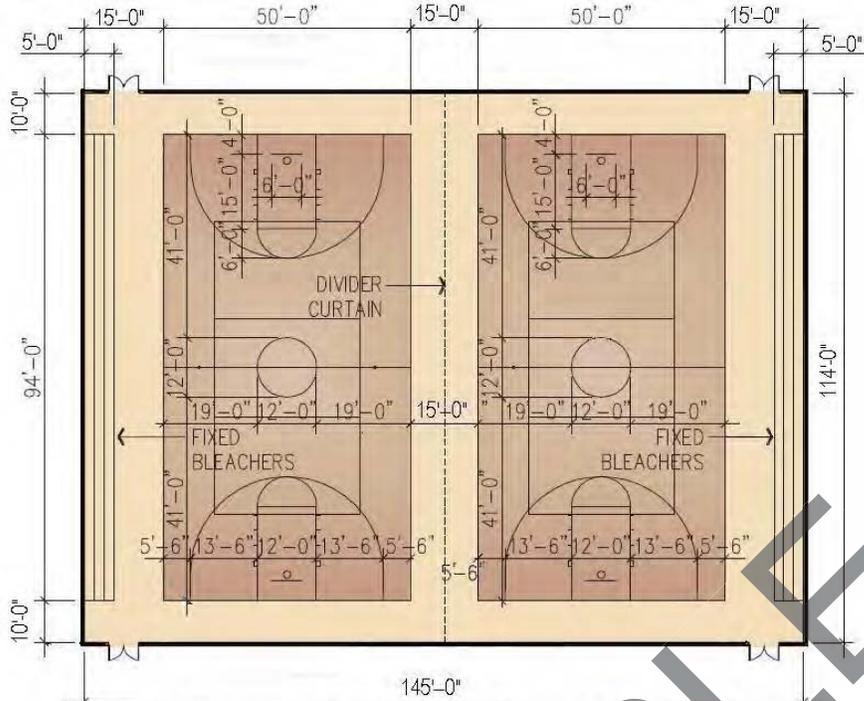
**2 Court Gymnasium WITH a tournament court and/or a jogging track**

Tournament court is not shown, however it would be perpendicular to and centered over the 2 courts shown.

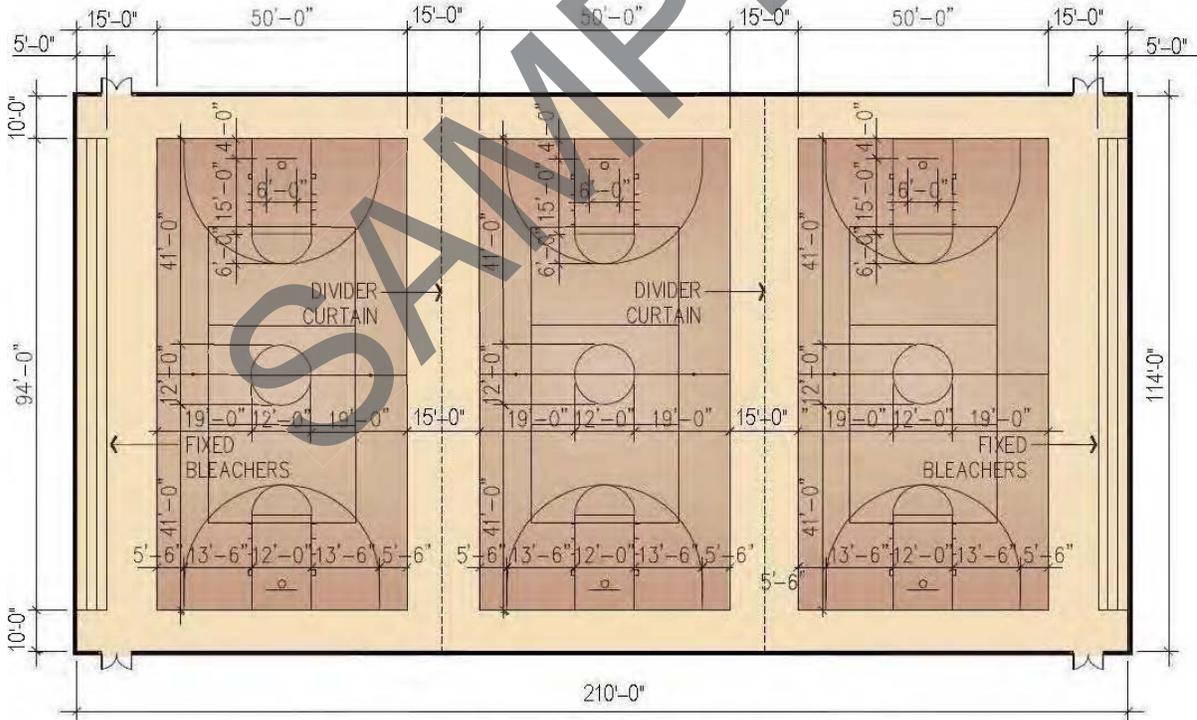


**3 Court Gymnasium WITH a tournament court and/or a jogging track.**

Tournament court not shown, however it can be perpendicular to and centered over 2 courts, or over all 3 courts.



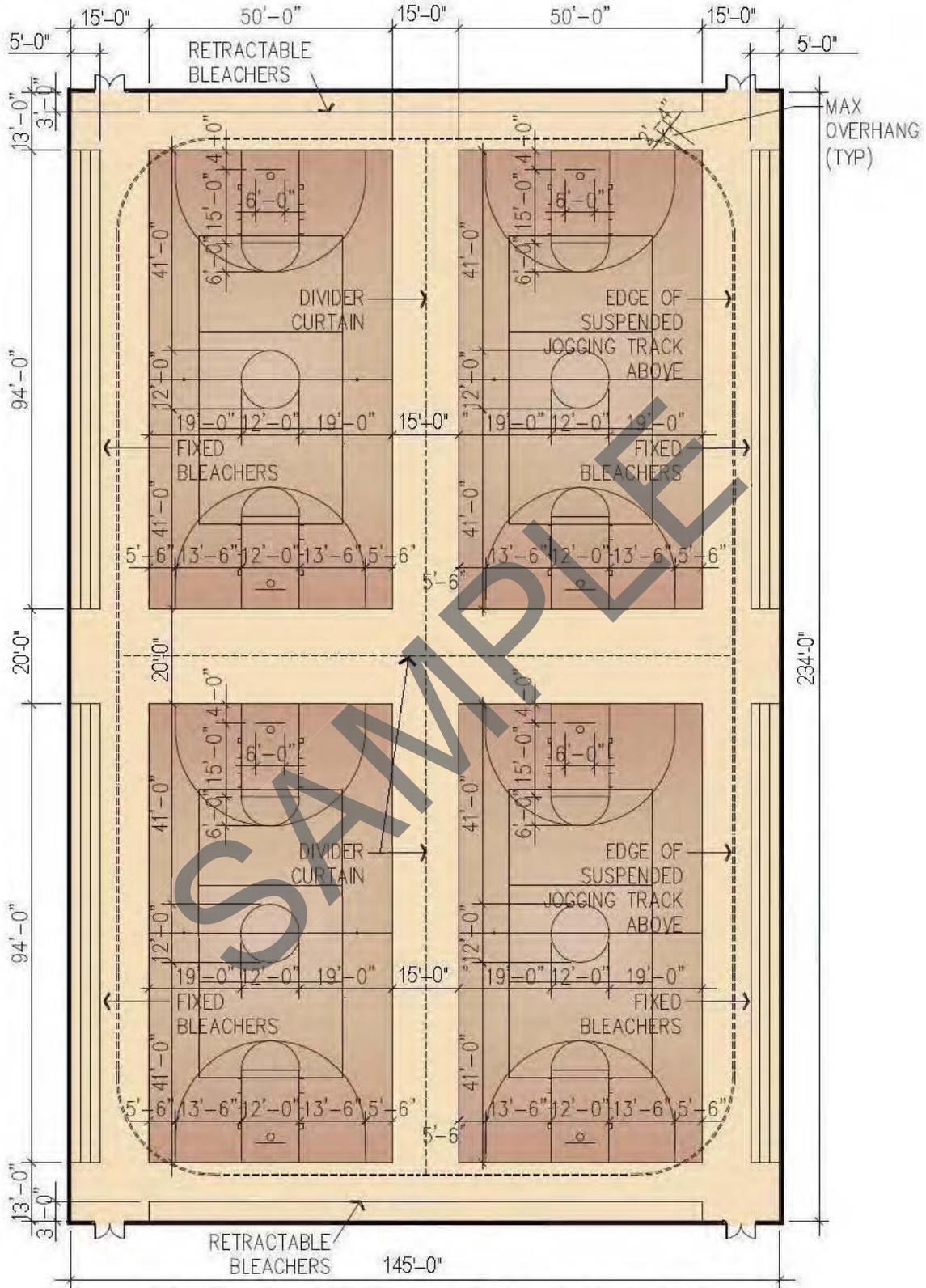
2 Court Gymnasium WITHOUT a tournament court and a jogging track.



3 Court Gymnasium WITHOUT a tournament court and jogging track

Provided below are recommended layouts for a 4-court gymnasium. Often times, a 4-court gymnasium will be broken into 2 separate gymnasiums. Coordinate with the user to determine their needs. In most cases a jogging track and/or a tournament court will be provided, which will result in the layouts shown below. If all 4 courts are to be in one gymnasium, option A is better for intramural play as fixed bleachers are provided for each court. Option B is better if a tournament court is required, and less emphasis on intramural play since it will allow for the retractable bleachers on both sides. Option A, as shown, is slightly larger than Option B. If a tournament court is not provided, the retractable bleachers will not be provided, however there is no reduction in the dimensions. If neither a tournament court nor a jogging track is included in the project, the gymnasium will be reduced by the 6' retractable bleachers (2 sets of 3' deep), and the space savings added to the Structured Activity Module for use in other functional areas.

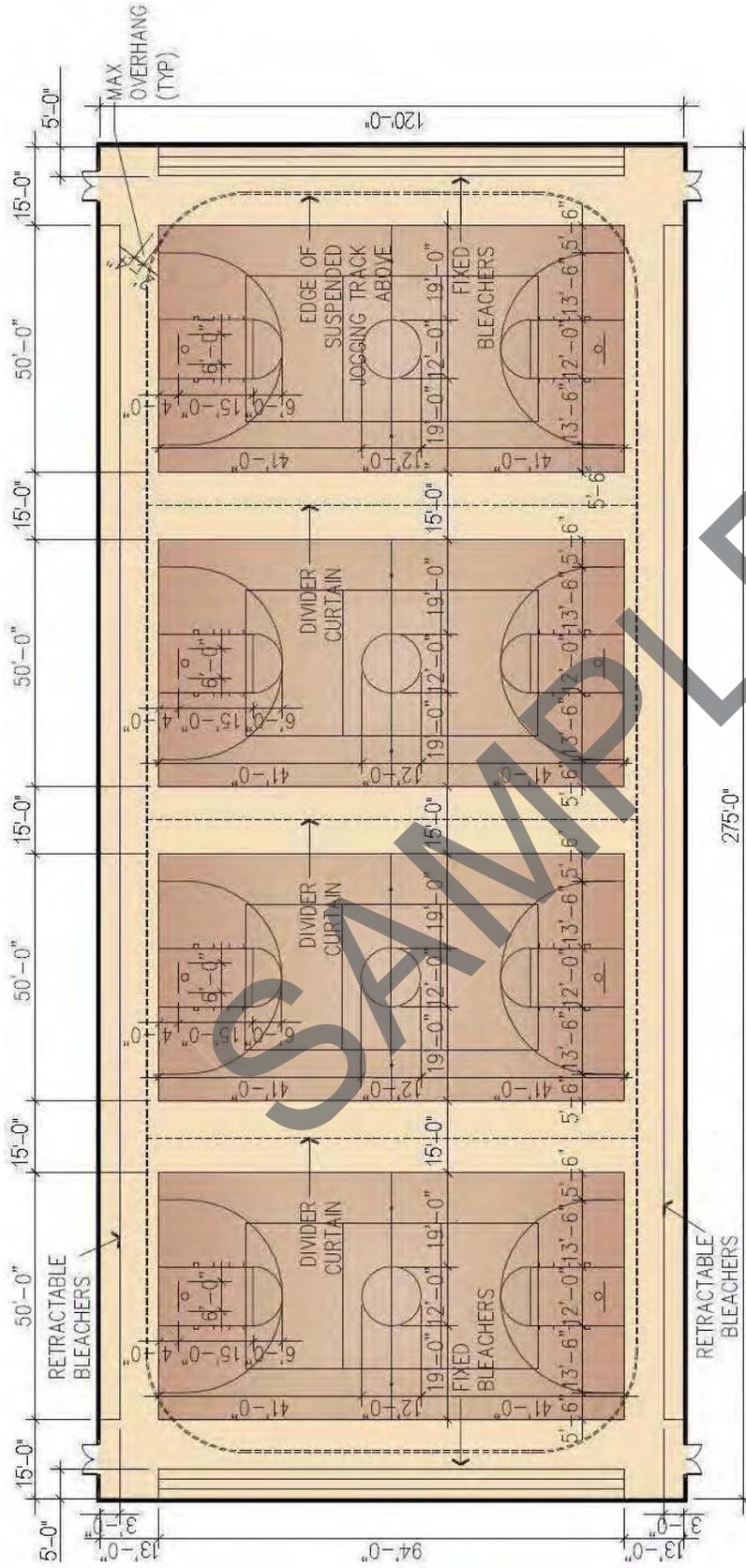
SAMPLE



**4 Court Gymnasium WITH a tournament court and/or a jogging track**

Tournament court is not shown, however it would be perpendicular to and centered over 2 courts

**OPTION A**



**4 Court Gymnasium WITH a tournament court and/or a jogging track.**  
 Tournament court not shown, however it will be perpendicular to and centered over 2 courts.

**OPTION B**

## **INDOOR JOGGING TRACK**

### **FUNCTION/DESCRIPTION:**

The indoor track provides space for running, jogging, and walking. It is expected that the track will be suspended above the gym area as shown in the previous diagrams.

### **ESSENTIAL DESIGN REQUIREMENTS:**

- Track shall have 3 lanes.
- The inner-most lane of the track shall NOT have banked corners to accommodate ADA requirements. The other lanes shall have banked corners
- The lobby, and track entrance, shall be located as close to the middle of a straight-a-way as possible.
- Lane width shall be 42”.
- The minimum radius of the inside corners is 20’

### **DIRECT ADJACENCIES:**

- The jogging track shall be directly adjacent to a lobby area with space for stretching. In addition, some pieces of cardiovascular equipment may be located in this lobby area. The lobby area will open directly on to the track without a door to avoid potential conflicts of opening the door while standing on the track. The larger the opening between lobby and track, the better.

### **CEILING HEIGHTS:**

Minimum 10’

### **FLOORING:**

Resilient, cushioned running surface, such as rubber or urethane, with permanent lane lines.

### **PLUMBING:**

Water fountains: An electrically cooled water cooler must be provided in or adjacent to the track lobby area.

### **MECHANICAL (HVAC):**

Mechanical heating, ventilation, and humidity control of the module is mandatory. The requirements are the same as the space in which the track is located.

### **WINDOWS AND DOORS:**

It is ideal to provide views to the outside along the track. However, it is important to avoid glare and direct sunlight.

### **FIXED EQUIPMENT:**

Provide cubbies in the lobby area for storage of smaller personal items.

## **LOCKERS, SHOWERS, TOILET, SAUNA**

### **FUNCTION/DESCRIPTION:**

Support space to facilitate showering and changing before and after physical activities. Half and full lockers are provided in each locker room. Showers are programmed to provide individual cubicles with dressing compartments.

### **ESSENTIAL DESIGN REQUIREMENTS:**

- Individual shower stalls and drying booths for both the men's and women's locker rooms are required.
- If a whirlpool is provided within a locker/shower area, ensure that maintenance can be performed outside of the locker/shower area.

### **DIRECT ADJACENCIES:**

- Main corridor system
- Major activity components such as Fitness and Gymnasium
- If a natatorium is included as part of the project, or anticipated as an addition in the future, the locker rooms shall be designed to provide an entrance to the natatorium in the wet portion of the locker/shower/toilet area.

### **CEILING HEIGHT:**

10'-0" minimum in locker area except where furred down. 9'-0" minimum in shower and toilet areas.

### **MATERIAL DEFINITION:**

"Wet areas" are defined as rooms where direct contact at walls and floors with water is expected. This includes showers, drying areas, and toilet / grooming areas directly adjacent to the showers. Wet areas may be considered "humid" space.

"Humid" is defined as above 60% relative humidity during typical room function over the entire period of normal hours of operation. Humid areas include locker rooms adjacent to showers and toilet rooms open to shower areas. Humidity varies by degree with "high" humidity occurring only in areas with continuous open water sources such as whirlpools, steam rooms, and swimming pool areas.

### **CEILING FINISHES:**

**General provisions:** Highly light reflective and sound absorbent materials for locker areas. Provide 2'x 4' or 2'x 2' lay-in, wet-formed mineral fiber acoustical panels, on "humid" rated "T" shaped pre-finished metallic grid system. 15/16" or 9/16" wide "T" grids are preferred. Non-directional fissured face designs are preferred to reduce installation cost and waste. Provide "Flush" (Square edge) edge design.

**Sound absorption for acoustical panels:** No less than .55NRC for standard tiles, .70 for film or ceramic faced units.

**Locker Room - Humidity and mold resistance:** Manufacturers offer "plastic" film faced units, ceramic, and painted finishes for humidity and mold control. Most standard tiles are "non-sag" but not mold resistant. Units should be treated for low moisture absorption and mold formation. The most expensive (high humidity resistant) to least expensive (adequate humidity resistance) ceiling tile options are: 1) Aluminum grid with ceramic faced tiles, rated for wet (pools) conditions. Use with extreme peak load activities and constant humidity (100%) produced by existing, deficient air handling systems or constant shower activity. 2) Factory applied paint finish for steel grids rated for "humid" conditions with ceramic faced "high humidity" tiles or "high humidity," unfaced tiles. Recommended as best cost to benefit ratio. 3) Factory applied paint finish for steel grid with "humid" rated tiles. Lower initial cost offset by higher maintenance costs.

**Toilet and Shower - Humidity and mold resistance:** Provide veneer plaster finish on gypsum board or true plaster on mesh lath or plaster base (board) ceilings in shower rooms. Toilet rooms can use painted, suspended gypsum board ceilings. Where shower / toilet room combinations exist, use plaster finished ceilings of either type. Epoxy paint system typical throughout. Use dropped soffits or false gypsum board beams between toilet / shower areas and locker rooms. This will divide ceiling systems and provide a barrier, at the ceiling line, for odor and moisture confinement to the higher humidity areas.

#### **WALL MATERIALS:**

Provide ceramic tile, full height in showers, behind toilets and urinals (as per most health codes), and as a 4' high wainscot throughout the room(s). Minimum acceptable is "full" height ceramic tile defined as 6' - 8' above the finished floor at toilets, full height at showers and deleted elsewhere. Use gloss finish tiles. Consider creating a pattern of accent tiles or trims in complimentary colors to improve visual appearance. Avoid using darker colors as the main background color. Partial height ceramic tile or fiberglass panels in shower units are not allowed. Use bullnose edge tiles at all outside corners. Use coved base tiles to match wall or floor system. Do not use wood base. Do not use rubber or vinyl base in wet areas.

Where ceramic tile is not used, epoxy paint system is required for optimum moisture and stain resistance.

#### **FLOORING:**

**Locker rooms:** Slip-resistant quarry/porcelain tile floor to match shower and toilet rooms. As an alternative, only when approved by the user, solution dyed, level loop nylon carpet, with microbial treatment for resistance to mold and mildew can be used. Carpet to be 26 oz yarn weight, 45-60 oz finished weight with woven polypropylene backing. 5/64 gauge minimum. 10 year wear / abrasion warranty. Minimum pile height .166" to .1875".

**Shower and toilet rooms:** Ceramic mosaic tile. 2" x 2" preferred. Mud set with floors sloped to drain. Slope to drain in showers (located one per cubicle), keep flat in toilet rooms with slight depression around floor drains. Overall floor slope should not exceed 1/2" in 10'-0". Wet and dry skid resistance is the priority. Non-glazed mosaic tiles for floor use are typically provided with a roughened face texture. Natural (flat) finish tile may also be satisfactory.

**PLUMBING:**

Plan on grouping toilets and urinals. Whenever possible, provide back to back plumbing for efficiency. Locker rooms and wet areas should be separated by a full-height barrier. Provide automatic sensors for faucets and toilets/urinals. One, electrically cooled, two station unit, designed for ADA use, shall be provided in each locker room or one unit shall be located directly outside the main entrance to the locker rooms.

**Floor drains:** Provide one drain per shower, and one floor drain per 250 square feet of floor area. Typically, one drain centered near toilet / urinal wall is adequate for unexpected overflows.

**MECHANICAL (HVAC):**

Mechanical heating, ventilation, and humidity control of the module is mandatory. Shall exceed the current ASHRAE requirements.

Operating range: System able to maintain 70 - 78 degrees (F) year-round at 50% relative humidity or less. Shall meet or exceed ASHRAE 62 for the ventilation rate.

**Temperature controls:** Independent to room, solid state and programmable. Ability to control peak and off-peak temperatures with 24 hour or one-touch setback programming recommended.

**Air movement / control:** Fully ducted supply and return. Dedicated supplemental exhaust for toilets. Passive or plenum return not recommended. Supply diffusers are to be adjustable metal grilles with four-way air movement and blade-type vanes. Return air grilles may be perforated plate or blade type. All diffusers to be pre-finished.

Ductwork shall be insulated sheet metal rectangular or circular duct routed adjacent to diffuser locations. Use flexible duct drops to diffusers. Natural (non-mechanically driven) ventilation is not allowed.

**TECHNOLOGY/AV:**

Ceiling mounted speaker for public announcements.

Sound system: Flush recessed ceiling speakers, 10 watt minimum output rating, capable of reproducing human speech, minimum. Speakers shall be weatherproof in wet areas.

Provide for wall-mounted flat-screen televisions throughout the locker rooms.

**WINDOWS AND DOORS:**

Views into the space are prohibited. Aluminum or hollow metal frames are recommended. Natural light can still be provided by use of translucent glazing panels.

**FIXED EQUIPMENT:**

Lockers, benches, wall mounted hair/hand dryers. Lockers must be a minimum of 15" wide and 18" deep. Minimum height is 30" per half locker. Use of "Z" lockers to provide additional height is required. There will be a combination of full-height and half-height lockers, the ratio of which is determined by the installation based on climatic concerns. Lockers shall not be metal or plastic laminate faced, and shall be durable. Solid plastic or color through phenolic is preferred. Lockers will allow for user supplied locks or be electronically locking, based on installation requirements.

**SAUNA**

**FUNCTION/DESCRIPTION:**

**General provisions:** A sauna is a supplemental space within the locker area. Guidelines for this module assume the presence of changing rooms and construction quality similar to the gymnasium module. Sauna rooms can take the form of:

- 1) a custom built space of any size with heating equipment and finishes designed specifically for that space,
- 2) a prefabricated assembly shipped broken down to the site and reassembled in place with all heating, lighting, controls, and accessories provided, or
- 3) a hybrid of a field constructed enclosure, utilities and controls, and specialized room finishes, purchased separately and installed on site. The guidelines provided herein are suitable for building any of the three types listed above.

**ESSENTIAL DESIGN REQUIREMENTS:**

- Separate saunas must be provided for men and women. Saunas shared by both genders are not allowed.
- Sauna controls are to be accessible to staff only.
- Provide a panic button in sauna, which is connected to the control desk.

**DIRECT ADJACENCIES:**

Locker Room, Shower, Toilet, Cool-down area

**CEILING HEIGHT:**

8'-0" minimum.

**CEILING FINISHES:**

Plaster veneer over gypsum / cement composition board. Moderately light reflective, smooth trowel finish.

**WALLS:**

Sauna interior finish: ½" thick x nominal 4" wide natural finish redwood tongue and groove boards.

The veneer wall system should be placed over a 3 mil continuous sheet of polyethylene film to act as a vapor barrier and seal the room. The vapor barrier is attached to 1 ½" thick treated wood furring strips at 24" o.c. To insulate the sauna partition and reduce heat loss, in-fill the space between the furring strips with 1 ½" thick extruded polystyrene rigid insulation.

Ferrous metals: Do not use any ferrous metal products within the sauna interior. It is recommended that all fasteners and hardware are stainless steel. Exceptions are noted below.

**FLOORING:**

Machine milled and formed ¾" thick minimum, solid redwood strip flooring mounted on cross aligned ¾" thick redwood sleepers. (Overall floor thickness of 1 ½"). Floor boards are visually run in a single direction in an open slat design with ¼" gaps between boards. Floor loose laid in 2' x 2' modules for easy removal for periodic maintenance / cleaning of the concrete substrate. Recess slab as required.

**PLUMBING:**

No plumbing provisions for this module.

**MECHANICAL (HVAC):**

Outside mechanical heating and cooling is not applicable. Air movement is accomplished via passive ceiling and floor mounted vents, typically 24 square inches total for every 100 plan square feet, assuming 8'-0" ceiling height.

4 air changes per hour.

Temperature controls: Independent to room - Range 170 to 180 degrees F.

Relative humidity 5%.

**WINDOWS AND DOORS:**

Door must open outwards.

**EQUIPMENT CRITERIA:**

**Seating benches:** Expect to provide continuous 24" deep x 18" high, two tier bench seating constructed from 2 x 4 solid redwood boards. Benches are generally arranged along two walls contiguous with one another. Redwood grade for benches is premium grade. Fully sanded and sealed. All edges of every board in the bench construction shall be eased and sanded smooth.

**Sauna dry heat system:** Estimate 1.7 KW per 100 square feet of sauna. Coordinate power with electrical provisions for the space. Factory wired timer for the heating unit is typically provided. Thermostatic and / or heat setting control is usually an option purchased with the

equipment. Controls remote from heating unit housing will need to be coordinated in advance and wired by others during construction.

Provide a unit with a grated 30# or 60# (greater heat storage capacity) lava rock compartment.

Sauna accessories: Room temperature and humidity gauge, wall mounted. Optional towel or robe pegs, wall mounted.

**ARRANGEMENT:**

Provided below are illustrations of locker/shower/toilet/sauna rooms for different sizes of PFF. Another consideration, which is not shown in the diagrams below is the inclusion of a “convertible” locker room. The convertible locker room is a smaller room with lockable access from both the men’s side and the women’s side. When needs shift, one of the doors can be locked to provide a larger ratio of lockers to a specific gender.

**X-Small:**



**X-Small - Sauna, Lockers, Toilet Module**

**Sauna, Lockers, Toilet**  
Total Square Feet = 2,550 (288 total lockers )  
Men - 144 Lockers - 48 full, 96 double tier  
Women - 84 Lockers - 28 full, 56 double tier

Small:



Small - Sauna, Lockers, Toilet Module

Sauna, Lockers, Toilet  
Total Square Feet = 3,630 (354 total lockers)  
Men - 231 Lockers - 77 full, 154 double-tier  
Women - 123 Lockers - 41 full, 41 double tier

Medium:



Medium - Sauna, Lockers, Toilet Module

Sauna, Lockers, Toilet  
Total Square Feet = 5,887 (573 total lockers)  
Men - 372 Lockers - 124 full, 248 double tier  
Women - 201 Lockers - 67 full, 134 double tier

Large:



Large - Sauna, Lockers, Toilet Module

- Sauna, Lockers, Toilet
- Total Square Feet = 9,022 (855 total lockers)
- Men - 557 Lockers - 185 full, 372 double tier
- Women - 298 Lockers - 100 full, 198 double tier

## **LOBBY AREA**

### **FUNCTION/DESCRIPTION:**

A transitional space used for visitors and users to check-in upon entry and orient themselves to various activities. Also provides a waiting area. A control counter is required within the lobby to facilitate security procedures and to issue and collect equipment such as basketballs, volleyballs, towels, etc. The Lobby area consists of the Entry Lobby, Waiting/Display area, Control Counter, Equipment Storage, and Vending. The breakdown of individual spaces in the Lobby Area is provided in the chart at the end of the Administrative section.

### **ESSENTIAL DESIGN REQUIREMENTS:**

Control Counter Requirements:

- Staff **MUST** have direct visual and physical access to free-weight area. The free-weight area is the location with the largest potential for injury. The staff at the desk must be able to see and respond to any unsafe behavior or incidents immediately. Providing elements that obstruct or impede this are not acceptable.
- Staff must be able to control who enters the building, and be able to provide a convenient check-in arrangement.
- Staff must have visual access or total coverage video-surveillance of cardiovascular area, circuit area, gymnasium and exercise areas.
- Staff must have visual access or video-surveillance of the entrances to the locker room and the general area of the racquetball courts.
- Storage must be provided behind the counter or in an adjacent room for issue items such as balls, towels, racquetball goggles, etc.

### **DIRECT ADJACENCIES:**

- Entry Vestibule and vertical circulation to upper level areas.
- Control Counter must be adjacent to the free weight area, and must have direct access to this area, for safety reasons.
- The preferred adjacency for the lobby is as a link between the gymnasium and the rest of the facility so that the gym can function independently during off hours when the remainder of the building is shut down.

### **INDIRECT ADJACENCIES:**

- Corridor system to activity areas.
- Restrooms.
- Laundry.

### **CEILING HEIGHT:**

10'-0" and above preferred with 9'-0" min. to lowest ceiling element over control desk.

The intent for lobby ceiling design is to encourage interest and traffic into the facility. Bright, open volumes with views into the facility provide that impression. Though higher ceilings will

require an increase in heat / cooling input, it is recommended that the facility utilize the largest volume possible within the space criteria guidelines.

**CEILING FINISHES:**

Highly reflective and sound absorbent materials. If an acoustical lay-in ceiling system is used, consider options for face design that introduce a distinctive element to the lobby space. Recommend use of tegular tiles if a lay-in system is used. Consider lighting placement and lamping types while considering ceiling design. The lobby is the primary area to consider decorative fixtures which may require areas of the ceiling reserved for pendant hung fixtures and/or up-lighting of ceiling features. See lighting guidelines below.

**Additional Considerations:** Other ceiling treatments are acceptable, as described below.

Accent functional areas, "mirror" floor patterns, or improve aesthetics by the addition of single layer, gypsum board "dropped" soffits or bulkheads on metal studs. Use of dropped soffits allows concealment of lower items (i.e. ceiling fans, structure, or utilities) while allowing the majority of ceiling to be increased in height. Install around perimeters of rooms, or across ceilings in an arrangement of "false beams." Area of solid, sound reflective surfaces should not exceed 15% of the total ceiling area. "Modular" soffit arrangement: Where possible, design and size soffits and bulkheads to allow the use of full acoustical panels in each direction. For non-modular areas, center ceilings by using balanced border widths where panels are cut to fit.

If the lobby is a part of an overall large volume area, it is also appropriate to not provide a ceiling. Provide sound absorption through either suspended or wall-mounted acoustical panels or baffles. Consider use of a lower element over the control desk to provide a visual focal point and to bring the scale down to a more human scale.

**Coordinate lighting:** With direct lighting (recessed in ceiling) locate bulkheads and acoustical panel arrangements with the optimum lighting locations first, then consider the pattern of the panels and placement of bulkheads. Consider pendant hung decorative lighting. Where soffits exceed 36 inches in width and/or 12 inches in depth, consider supplemental lighting in the bottom of the soffit to avoid shadowed areas across the ceiling plane or at upper portions of wall planes.

**WALL MATERIALS:**

Consider use of accent materials or textures.

**FLOORING:**

Selection criteria are based on appearance, durability, and yearly maintenance.

Recommendations include terrazzo, porcelain tile, and ceramic tile. Each material has certain advantages / disadvantages. Sealed colored and patterned concrete may be considered as an option for lobby and circulation areas. Plain sealed concrete is not acceptable.

Resilient Tile is not allowed for lobby due to aesthetics and durability. Carpet is not allowed due to high frequency traffic and direct adjacency to the outside.

Each entry shall have a recessed mat, constructed of pre-finished metal retaining strips with nylon fiber, or shredded rubber inserts. Semi-open design. Floor mat recesses shall span the width of the entry opening or vestibule and be 4'-6' long in the direction of travel. Mats are intended to be removable to facilitate periodic cleaning of the mat and the floor recess. Floor drains under the mats are optional but recommended for heavy rainfall or snowfall locations.

**NATURAL LIGHTING:**

Lobby appeal is enhanced by a combination of natural and artificial light. Centrally located skylight or clerestory window for hub type lobby or several smaller skylights/clerestories for linear spaces is highly recommended. Attempt to position natural light to accent control area. The Army prefers the use of clerestory windows over the use of skylights.

**PLUMBING:**

One, electrically cooled, two station unit, designed for ADA use, linked to the public restroom function in or adjacent to the lobby. The drinking fountain count throughout the facility must meet code for peak occupancy levels.

**MECHANICAL (HVAC):**

Outside air infiltration should be controlled with use of a vestibule / airlock with two sets of entry doors.

**Operating range:** System able to maintain 68 to 76 degrees (F) year round at 50% relative humidity or less. Shall meet or exceed ASHRAE 62 for the ventilation rate.

**Temperature controls:** Independent to zone.

**LIGHTING:**

Main module lighting to be a combination of 1) recessed fluorescent down lighting (PL lamps) with pendant hung decorative lighting or 2) pendant hung direct / indirect fluorescent fixtures. Decorative wall sconces or other decorative fixtures are recommended to accent functions or highlight focal points.

Provide lobby lighting control center at control desk. Dimming function is not required but should be considered as an option.

Provide down lighting directly over all control desk counters.

Provide display lighting within casework for merchandising or issue functions at Control desk.

Provide under cabinet lighting of counters where wall cabinets are used. Low profile LED lighting is acceptable under cabinet lighting. In addition, linear low profile fluorescent or "puck" style metal halide is acceptable. Metal halide system requires concealed low voltage power supply.

**POWER:**

Power to circuits as needed to Control Desk, for computer terminals (2 minimum in the X-small and Small, 3 minimum in the medium, 4 minimum in the large and X-large), counter mounted video monitors, multiplex video receiver, tape backup, sound processor for multiple paging sources, music source (such as a CD player) and sound amplifier.

Utilize custom raceway in casework. See Architectural Woodworking guidelines above.

**TECHNOLOGY/AV:**

Main power and communications needs are at the Control Desk.

Empty conduit routing, (recommend 2" min. diameter) for present or future video cabling from security camera sources around facility. Stub up into base cabinets and continue up into ceiling cavity above control desk.

**SOUND:**

PA system shall be provided, and shall be controlled from the Control area. PA system shall be able to broadcast through the entire facility at once, or multiple rooms, or a single room. Shall be able to broadcast voice and music.

**WINDOWS AND DOORS:**

Window and Door requirements shall meet the Force Protection / Anti Terrorism requirements.

Aluminum framing preferred, with hollow metal frames acceptable.

Provide aluminum entrance frames with an insulated aluminum door (i.e. as if for exterior use) with an insulated glass insert for all exterior frames. Option exists to continue use of aluminum framing and aluminum / glass doors within the lobby for openings visible from within the lobby area. Aluminum finishes may then match in color / sheen and durability.

Utilizing aluminum window system framing to create large open views into adjacent activity spaces and /or to the exterior is highly recommended. Window shading devices may become necessary for tall glass with south to southwest exposures. Consider afternoon sun angles and control desk locations to avoid glare conflicting with the control desk monitoring functions.

Tempered glass is typical to the module.

Door hardware: Satin stainless steel or satin finish chrome preferred. High frequency ball bearing butt hinges are an acceptable minimum. Continuous gear-operated hinges preferred. Concealed or surface applied pivot hinges are not recommended. Continuous hinges will require custom color coordination with the door frames.

**FIXED EQUIPMENT:**

**Architectural Woodwork:** For the control counter, provide a visually attractive focal point for 1) entering patrons, 2) control and security functions, and 3) information. The control area shall be contiguous with both the Lobby and Fitness modules. Expect to provide counters and casework for a minimum of two stations / control personnel within a desk area in a small facility. Add 1 person for each size larger than a small. Make provisions for lower counter for ADA access. Provide two tier counter system, more to block view of countertop clutter and controls, than as a privacy barrier. Direct visual control of lobby and fitness areas is critical. "Back wall" (if available) counters may be standard seating height for more extended paperwork functions. A minimum of 50% of the counter shall be standing height.

**Casework: Premium grade.** Recommend all wood construction for flexibility in configuration. Solid wood fronts, veneer plywood exposed sides and knee spaces. Interior dividers may be fused and bonded vinyl or plastic laminate particle board. Recommend only 3/8 inch thick min. plywood for shelving 3'-0" wide and under (1/2 inch thick otherwise), with wood veneer or fused and bonded vinyl finish. Solid wood face edging for shelving and door edges recommended. PVC edging is an alternative.

**Counters:** Solid 1/2 to 3/4 inch thick polymer resin counters. Provide 1 1/2 inch dia. half round edges. Avoid square edges toward patrons. Provide stone or solid surface counters for durability (Plastic laminate is not acceptable). Drawer and door hardware: to be commercial grade. Drawer glides to be side mounted, and use ball bearings and/or nylon wheels with minimum 75 lb. capacity for drawers less than 2.0 cu. ft, minimum 100 lb. capacity for drawers between 2.0 and 4.0 cu. ft., and minimum 150 lb. capacity for drawers larger than 4.0 cu. ft. Guides shall be provided with positive out and in stops. Use concealed door hinges and an integral pull or any metal cabinet pull style. Plastic or nylon pulls are not allowed. Provide through the counter grommets for covering holes needed for computer and device wiring from counter mounted devices.

## **ADMINISTRATIVE**

### **FUNCTION/DESCRIPTION:**

Administration space (offices, work/break room, meeting space) for facility director and staff.

The breakdown of individual spaces in the Administrative Area is provided in the chart at the end of this section.

### **DIRECT ADJACENCIES:**

Typically, offices are centralized with individual offices connected to an open office core for shared administrative services. The office suite does not have to be adjacent to the control desk. It is preferred that this area be away from the main entry, as it is desired that the facility portrays an active facility upon entering, as opposed to an administrative facility. If a large Training/Conference Room is provided, it is strongly desired that this room be accessible from the corridor as well as the admin office area. The door into the admin office area should be lockable to avoid access during after hour meetings or training.

### **CEILING HEIGHT:**

9'-0" minimum.

### **CEILING FINISHES:**

Highly reflective and sound absorbent materials. Provide 2'x2' lay-in, wet formed mineral fiber acoustical panels, on standard "T" shaped pre-finished metallic grid system. 15/16" or 9/16" wide "T" grids are base selection criteria. Tegular (routed edges) tiles are preferred. Random fissured, non-directional face design preferred. Main offices or conference / office space may benefit from continuing a textured or decorative face tile from centralized office entry points in an office suite. Avoid solid gypsum board ceilings. Perimeter soffits are acceptable. Maintain access above ceilings for HVAC maintenance and future data network upgrades.

### **WALLS:**

Acrylic latex paint with "eggshell" finish is minimum. Vinyl Wall Covering may also be considered.

### **FLOORING:**

Carpet is principle material for centralized office suites. Carpet tiles are preferred, the minimum is commercial, solution dyed nylon in 26 oz yarn weight, 45 oz total finished weight. Provide carpet with static control. Increasing total finished weight closer to 60oz is preferred. Carpet should be darker tones and patterned to hide stains. Provide vinyl or rubber base. VCT is allowed in the Administrative areas where carpet is not desired or appropriate.

### **PLUMBING:**

In the copy/file/work/break room, provide a minimum 1 compartment kitchen-style sink, plus water hook-up for icemaker in refrigerator.

**MECHANICAL (HVAC):**

Outside air is not recommended. Air movement should be controlled with ducted supply to each office. Variable air volume (VAV) devices are recommended for thermostatically controlling individual offices. Office temperature controls may be centralized as a minimum, with individual controls preferred.

Utilize main corridors as ducted or plenum return air paths for office suites.

Provide acoustically lined ducts when routing ducts across several grouped offices.

For sound transfer control between offices, always maintain at least two elbow turns in hard ductwork prior to connecting the main duct run to a flex duct to ceiling diffusers.

**Operating range:** System able to maintain 68 to 76 degrees (F) year round at 50% relative humidity.

**LIGHTING:**

Flush edge lens frames are minimum; chamfered lens frames preferred. Indirect lighting, to reduce computer glare, would be preferred. Add recessed fluorescent downlighting for accent effects in main office or waiting spaces to office suites. Lay-in lighting fixtures with integral HVAC diffusers in a slot arrangement on the fixture frame do not provide a good distribution of air and tend to increase air noise; therefore, these are not recommended.

**POWER:**

In copy/file/work/break room, provide outlets at built-in counter area for microwave, coffee pot, refrigerator, and other cooking devices. Provide ground fault protection of outlets within 6 feet of any water source.

**TECHNOLOGY/AV:**

Data and telephone cable routed to adjacent to convenience outlets, on desk wall if identifiable at time of design. See furniture considerations below.

Competitive sports or training may require the use of video taping to gauge performance. Offices for fitness directors may benefit from a TV and VCR bracket mounted 72' a.f.f. for the purpose of reviewing video tapes.

**SOUND:**

None. Avoid extending paging systems into offices or office suites.

**ACOUSTICAL PERFORMANCE:**

Office walls should maintain an STC (sound transmission class) rating of 45 or better to ensure a minimum level of privacy. This can be achieved typically with a single layer of gypsum board on each side of a metal stud wall extended fully to floor-roof deck above.

If less sound transfer is of primary concern, add 2" thick sound batting to dividing walls in sensitive offices. One additional layer of gypsum board on the room side one is seeking to protect will increase the STC rating to 50-53. Monitor and seal all tops of walls, duct, and pipe penetrations through walls. Sound insulate toilet and roof drain piping in walls shared with offices.

**FIXED EQUIPMENT:**

**Kitchenette Cabinets: Premium grade.** Solid wood fronts. Solid wood face edging for shelving and door edges recommended.

**Counters:** Solid ¾" thick polymer resin counters. Plastic laminate counters not allowed. Drawer glides to use nylon wheels or ball-bearing drawer guides, rated for 50 lbs. minimum.

**MISCELLANEOUS:**

**Furniture Considerations:** It is preferred that offices are designed in anticipation of a particular grouping of furniture. It is anticipated that private offices will be outfitted with a modular U-shaped workstation with a conferencing peninsula with 2 guest chairs. Provide adequate shelves and file storage along with a vertical unit to provide space for coat storage. Open offices will typically be a modular 8' x 8' U-arrangement with a guest chair at the end of one leg of the "U". A vertical unit with file drawers and hanging space should be provided at the other end of the "U". Each office will have an ergonomic desk chair. Once satisfied with a basic arrangement, then power and data ports can be located with greater confidence.

Provide space in kitchenette area for a minimum 18 cu. ft. refrigerator at the end of the counter

<b>AUTHORIZED PFF SPACE ALLOWANCE</b>							
<b>ADMIN &amp; LOBBY DETAILED AREAS</b> (Areas in square feet) 2/11/10		<b>X-SMALL</b> (251-1000)	<b>SMALL</b> (1001-3000)	<b>MEDIUM</b> (3001-6000)	<b>LARGE</b> (6001-10,000)	<b>X-LARGE</b> (10,001-15,000)	<b>INCREMENT</b> (each 5000 over 15,000)
<b>Admin</b>	Director's Office	120	120	120	120	130	10
	Program Mgr's Office	0	100	100	100	110	10
	Support Staff Workstations	128	128	256	320	384	64
	Copy/file/work/break Room	160	240	160	170	180	10
	Storage	20	29	32	36	40	5
	Classroom/Training Room	0	0	420	420	420	0
	Classroom/Training Storage	0	0	60	60	60	0
	Internal Circulation, (20%)	86	123	230	245	265	21
<b>subtotal</b>		<b>514</b>	<b>741</b>	<b>1,377</b>	<b>1,471</b>	<b>1,589</b>	<b>120</b>
<b>Lobby</b>	Estimated Lobby	230	440	650	880	1,090	210
	Est. Control Counter/Storage	300	512	725	938	1,151	213
	Estimated Public Restrooms	287	515	851	1,280	1,376	96
	<b>subtotal</b>		<b>817</b>	<b>1,467</b>	<b>2,226</b>	<b>3,098</b>	<b>3,617</b>

## **LAUNDRY**

### **FUNCTION/DESCRIPTION:**

Laundry for cleaning and distribution of towels and/or sports gear, and includes extractor(s), tumbler(s), laundry sink, folding table, storage cabinet, and space for laundry carts.

### **DIRECT ADJACENCIES:**

- Laundry may need to be in close proximity to the Control Area depending upon staffing levels and anticipated usage.
- A connection to a service corridor and one outside wall is also preferred.

### **CEILING HEIGHT:**

9'-0" minimum.

### **CEILING FINISHES:**

Highly reflective and moisture resistant materials. Provide 2'x2' or 2'x4' lay-in, wet formed mineral fiber acoustical panels, on phosphatized or otherwise humidity controlled "T" shaped pre-finished metallic grid system. 15/16" or 9/16" wide "T" grids are base selection criteria.

**Face design:** Random fissured, non-directional face ceramic frit (film faced tile) is minimum and preferred.

**Edge design:** "Flush" (square) edge. Avoid textured surface tiles or expending resources on decorative tiles. Laundry issue rooms will require flat, cleanable tiles to maintain their appearance.

**Impact resistance:** Standard durability rating. High impact resistance preferred.

**Humidity:** Non-sag, humidity controlled tiles.

**Material specifications and lighting:** 2' x 2' or 2' x 4' lay-in recessed fluorescent fixtures with prismatic lenses, mounted in the ceiling grid are minimum. Fixtures to be rated for damp conditions.

### **WALLS:**

Must be appropriate for damp/humid location.

### **FLOORING:**

Sealed concrete floors preferred. Provide 4" raised concrete platforms for washers and dryers.

### **PLUMBING:**

Provide one exposed hot and cold water manifold with taps at each machine, to serve washing machines. Provide one individual floor drain for each machine, located to the back right corner. Manifold and drains should fall within a 2'0" alleyway created behind any bank of machines. Pipe manifold shall be 36" high at individual taps. Insulate all cold and hot water lines. Provide a laundry sink.

**MECHANICAL (HVAC):**

Outside air is not recommended. Air movement should be controlled with ducted supply and make up air balanced against dryer exhaust. Variable air volume (VAV) devices are recommended for thermostatic control. Ducted return air.

Dryer exhaust ducts will impact headroom clearances if dryers are not located directly on an outside wall. Size dryer equipment as early in the design process as possible. Locate or group dryer ducting and plan for an exhaust route to the outside when locating space.

If gas operated dryers are used, path for vertical flues shall be provided.

Operating range: System able to maintain 68 to 76 degrees (F) year round at 50% relative humidity. Shall meet or exceed ASHRAE 62 for the ventilation rate.

**TECHNOLOGY/AV:**

One data and telephone port.

**SOUND:**

None. Avoid extending paging systems into Laundry rooms.

**ACOUSTICAL PERFORMANCE:**

Guard against sound transfer to adjacent modules with full height walls minimum.

**EQUIPMENT CRITERIA:**

The following is provided as a planning guideline. Commercial washer extractors and dryer tumblers shall be used.

X-Small: Provide one 25 lb minimum commercial washer extractor and two 25 lb minimum dryer tumblers.

Small: Provide one 35 lb minimum commercial washer extractor and two 35 lb minimum dryer tumblers.

Medium: Provide two 30 lb minimum commercial washer extractors and three 30 lb minimum dryer tumblers.

Large: Provide two 50 lb minimum commercial washer extractors and three 50 lb minimum dryer tumblers.

For facilities larger than a large: Provide three 50 lb minimum commercial washer extractors and four 50 lb minimum dryer tumblers.

## **CORRIDORS**

### **FUNCTION/DESCRIPTION:**

General building circulation serves to connect spaces visually as well as physically. Corridors should be broken into two main functions, central public axis and service corridors. Service corridors are isolated by doors for security and privacy when possible, and connect loading and off-loading entries to mechanical rooms and main corridors, when required.

### **CEILING HEIGHT:**

Public corridors: 10'-0" and above with minimum 9'-0" to lowest ceiling element.

Service corridors: No less than 9'-0"

Ceiling heights serve to identify main public corridors and may vary based on the width and visual axis desired within the facility. Gymnasium and Fitness modules utilize high ceilings and connecting corridors should take advantage of vertical views by use of tall interior window systems when possible. Generally, lobby and main corridor ceiling heights should match, with lower ceilings reserved for service corridors and corridors leading to auxiliary spaces serving the main module. If the corridor ceiling must be lower than the Lobby, then the transition between the lobby and corridor needs to be designed so that it is apparent that the corridor is the primary circulation path.

### **CEILING FINISHES:**

Highly reflective and sound absorbent materials. Provide 2'x2' or 2'x4' lay-in, wet formed mineral fiber acoustical panels, on standard "T" shaped pre-finished metallic grid system. 15/16" or 9/16" wide "T" grids are base selection criteria. See optional considerations below.

**Ceiling design:** Public corridors are to follow level of finish and design utilized in the Lobby module. This includes continuation of dropped soffits or false beam patterns utilized in the Lobby module. Refer to design considerations in that module for more details. Service corridors out of public view and secondary corridors not visually connected to main corridor ceilings may reduce finishes to minimums.

**Material Specification & Lighting:** Refer to Lobby module guidelines.

**Special considerations:** Main corridors will serve as routes for hidden utilities. Use accessible ceilings as much as possible. Avoid large areas of dropped gypsum ceilings as accents in corridors unless dedicated accessible paths for utility routing can be accommodated. Use of gypsum board decorative ceilings should take into account HVAC and plumbing valves, damper and control locations above hard ceilings. These will require access doors to service these devices that will detract from the visual impact of the space.

Where service corridors will be opened to the outside air on a regular basis, use high humidity rated acoustical tiles.

**FLOORING:**

Public corridors can extend the Lobby module finishes. Hard durable surfaces are required. Resilient (VCT) tile is not allowed.

Service corridors: resilient tile preferred with clear or tinted sealed concrete as a minimum.

**PLUMBING:**

A drinking fountain may be required along main corridors. When required, provide one electrically cooled two station unit, designed for ADA use.

**TECHNOLOGY/AV:**

Expect main conduit routing and data cable routing to take place in corridor ceilings.

**SOUND:**

Ceiling mounted voice quality only speakers every 24'-0" o.c. in Main Corridors for paging system. Option to upgrade to music quality speakers if broadcasting of CD quality source is expected. Provide speakers with wide dispersion, 120 degrees or more, for ceilings 12 feet and lower.

SAMPLE

**V** Appendix

**DEMAND-BASED STUDY OF CRITICAL FUNCTION MODULES**

A study of utilization for each CFM in the Physical Fitness Facility was conducted using National Sporting Goods Association (NSGA) statistics for indoor activities. The NSGA surveys sports participation annually for 64 indoor and outdoor activities. The results are published as Series I and Series II. For purpose of this study, data for activities deemed to be appropriate for programming in a typical PFC were extrapolated from both Series I and II Publications and include:

<u>CFM Component</u>	<u>NSGA Activity</u>	<u>NIRSA Recommended Area</u>
Exercise Module	Aerobic Exercising	50SF per participant
Exercise Module	Calisthenics	50SF per participant
Exercise Module	Step Aerobics	50SF per participant
Exercise Module	Martial Arts	125SF per participant
Exercise Module	Kick Boxing	125SF per participant
Gymnasium Module	Basketball	14 participants (10 + 4 rotating)
Gymnasium Module	Volleyball	16 participants (12 + 4 rotating)
Fitness Module	Exercising w. Equipment	50SF per equipment station 65SF per free weight station
Structured Activity	Racquetball	4 participants per 800SF Court
Indoor Track	Exercise Walking	1 runner per 20 lineal feet
Indoor Track	Running / Jogging	1 runner 20 lineal feet

Assuming that the recreational interests of the AD population are similar to civilians, NSGA participation data is utilized to test each building component for meeting peak demand. Peak contact times vary from activity to activity. For instance, classroom activities require an instructor and participants meeting at a specific time. In a typical day with 16 hours of operation, it is feasible to program classes for two hours in the morning, two hours over lunch, and four hours in the evening. On weekends peak times are expected to be mid morning to late afternoon. Thus, the analysis tests a projected group of participants against a peak window of time that is approximately 55% of the total hours of operation per week.

Individual activities, such as exercising with equipment, have longer peak times (90% of hours of operation). While busiest peak times are anticipated to be early morning, users will access Fitness at all times of the day and evening.

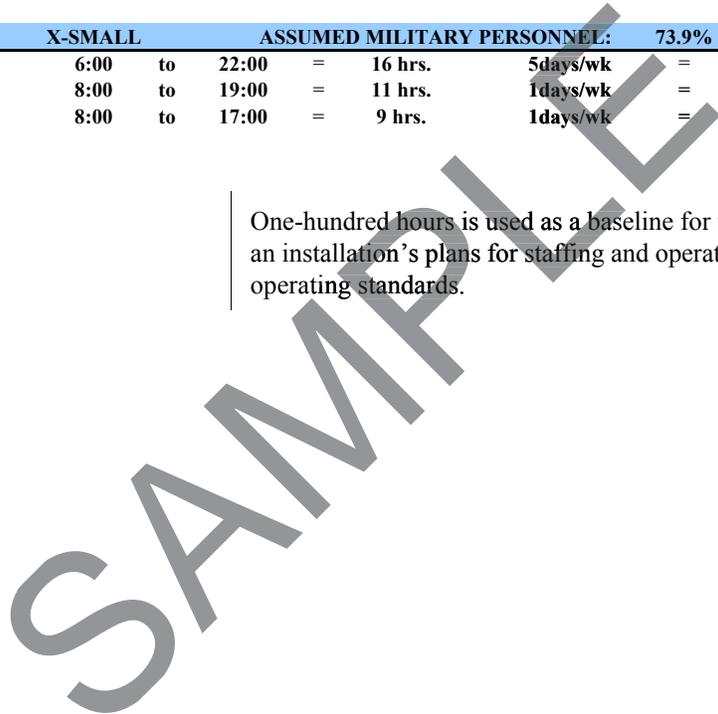
The Gymnasium component is anticipated to have the greatest difficulty meeting peak demand because this activity requires a large number of users coming together simultaneously. Team activities are usually scheduled at lunchtime and evening. The number of players is small relative to the amount of space required for court play. Some court activities will have to be conducted in later hours of daily operation or throughout the weekend. Peak gymnasium hours are anticipated to be approximately 60% of the total hours of operation.

The Indoor Track is expected to have a shortfall of peak time. However, many participants will satisfy their needs by running or walking outdoors. Peak time for the indoor track is projected to be 80% of operating hours. As with fitness, individual participants can access the track at all hours of the day or evening.

The tables on the following pages show a total of available **contact hours** for each activity. A contact hour is defined as one user occupying one station for one hour. For example, if an Aerobics Room is 1,200 SF and NIRSA safety standards require 50SF of space for each occupant, then there are 24 **stations** in the room. For each one hour class there are 24 available contact hours. If the facility is operational for 100 hours a week, there are 2,400 available contact hours per week. The objective of this study is to compare the total peak contact hours for each CFM to a reasonable projection of participants to determine if each CFM is sized sufficiently to meet peak demand. Standard hours of operation are estimated to be 100 per week based on the following schedule:

PFC TYPE: (250-1000 Pop.)	X-SMALL	ASSUMED MILITARY PERSONNEL:				73.9%	x 1,000	=	739
WEEKDAY HOURS (M-F)	6:00	to	22:00	=	16 hrs.	5days/wk	=	80 hrs.	
WEEKEND HOURS (SA)	8:00	to	19:00	=	11 hrs.	1days/wk	=	11 hrs.	
WEEKEND HOURS (SU)	8:00	to	17:00	=	9 hrs.	1days/wk	=	<u>9 hrs.</u>	
								100 hrs.	

One-hundred hours is used as a baseline for the study and does not affect an installation's plans for staffing and operation under the Army baseline operating standards.



**X-Small Facility - maximum population of 1,000 persons - approx. 74% peak users- 100 hours of operation per week**

Aerobic Exercise	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>1,200 SF</b>							
Aerobic Exercising	11.4%	84	x 3 hrs/wk	252 hrs/wk	50 SF/user	24 stas.	
Step Aerobics	3.0%	22	x 3 hrs/wk	67 hrs/wk	50 SF/user	24 stas.	
Calisthenics	5.7%	42	x 3 hrs/wk	126 hrs/wk	50 SF/user	24 stas.	
<b>TOTALS</b>		<b>148</b>		<b>445 hrs/wk</b>	<b>50 SF/user</b>	<b>24 stas.</b>	<b>2400hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>90%</b>	<b>of Stations in Use</b>					<b>22 stas.</b>
<b>PEAK UTILIZATION RATE</b>	<b>55%</b>	<b>of Hours of Operation =</b>		<b>55 hrs/wk</b>	<b>x</b>	<b>22 stas.</b>	<b>= 1188hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>1188hrs/wk</b>	<b>minus</b>	<b>445.16 hrs/wk</b>	<b>= 743hrs/wk</b>

Non-Structured Exercise	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>1,000 SF</b>							
Martial Arts	3.0%	22	x 2 hrs/wk	44 hrs/wk	125 SF/user	8 stas.	
Kick Boxing	2.2%	16	x 2 hrs/wk	32 hrs/wk	125 SF/user	8 stas.	
<b>TOTALS</b>		<b>38</b>		<b>76 hrs.</b>	<b>125 SF/user</b>	<b>8 stas.</b>	<b>800hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>90%</b>	<b>of Stations in Use</b>					<b>7 stas.</b>
<b>PEAK UTILIZATION RATE</b>	<b>55%</b>	<b>of Hours of Operation =</b>		<b>55 hrs/wk</b>	<b>x</b>	<b>7 stas.</b>	<b>= 396hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>396hrs/wk</b>	<b>minus</b>	<b>76 hrs.</b>	<b>= 320hrs/wk</b>

Fitness Module (Weight/Cardio)	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>2,325 SF</b>							
Exercising with Equipment	24.5%	181	x 3 hrs/wk	544 hrs/wk	55.4 SF/user	42 stas.	
<b>TOTALS</b>		<b>181</b>		<b>544 hrs/wk</b>	<b>55.36 SF/user</b>	<b>42 stas.</b>	<b>4200hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>					<b>34 stas.</b>
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation =</b>		<b>90 hrs/wk</b>	<b>x</b>	<b>34 stas.</b>	<b>= 3024hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>3024hrs/wk</b>	<b>minus</b>	<b>544 hrs/wk</b>	<b>= 2480hrs/wk</b>

Fitness Module (Weight/Cardio)	LNS Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>2,325 SF</b>							
Exercising with Equipment	65.0%	480	x 3 hrs/wk	1440 hrs/wk	55.4 SF/user	42 stas.	
<b>TOTALS</b>		<b>480</b>		<b>1440 hrs/wk</b>	<b>55.36 SF/user</b>	<b>42 stas.</b>	<b>907hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>					<b>34 stas.</b>
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation =</b>		<b>90 hrs/wk</b>	<b>x</b>	<b>34 stas.</b>	<b>= 3024hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>3024hrs/wk</b>	<b>minus</b>	<b>1440 hrs/wk</b>	<b>= 1584hrs/wk</b>

Gymnasium Module	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>10,200 SF</b>							
Court Size is 50 x 94 for a total playing area of:							
Volleyball	6.4%	48	x 3 hrs/wk	143 hrs/wk	392 SF/user	16 players	
Basketball	18.3%	135	x 3 hrs/wk	406 hrs/wk	470 SF/user	14 players	
<b>TOTALS (Average for SF/Per and Stations)</b>		<b>183</b>		<b>549 hrs/wk</b>	<b>430.8 SF/user</b>	<b>15 players</b>	<b>1500hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>					<b>15 players</b>
<b>PEAK UTILIZATION RATE</b>	<b>60%</b>	<b>of Hours of Operation =</b>		<b>60 hrs/wk</b>	<b>x</b>	<b>15 players</b>	<b>= 900hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>900hrs/wk</b>	<b>minus</b>	<b>549 hrs/wk</b>	<b>= 351hrs/wk</b>

Note: VB assumes 12 players + 4 rotating players for each court. BB assumes 10 players + 4 waiting to rotate in for each court.

Racquetball Court	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>850 SF</b>							
Racquetball	3.1%	23	x 2 hrs/wk	46 hrs/wk	213 SF/user	4 occup.	
<b>TOTALS</b>		<b>23</b>		<b>46 hrs/wk</b>	<b>212.5 SF/user</b>	<b>4 occup.</b>	<b>400hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>					<b>4 occup.</b>
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation =</b>		<b>50 hrs/wk</b>	<b>x</b>	<b>4 occup.</b>	<b>= 200hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>200hrs/wk</b>	<b>minus</b>	<b>46 hrs/wk</b>	<b>= 154hrs/wk</b>

Jogging Track	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>3,000 SF</b>							
Running / Jogging	14.6%	108	x 2 hrs/wk	216 hrs/wk		48 occup.	
Exercise Walking	28.8%	213	x 2 hrs/wk	425 hrs/wk		48 occup.	
<b>TOTALS</b>		<b>321</b>		<b>641 hrs/wk</b>		<b>48 occup.</b>	<b>4800hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>60%</b>	<b>of Stations in Use</b>					<b>29 occup.</b>
<b>PEAK UTILIZATION RATE</b>	<b>80%</b>	<b>of Hours of Operation =</b>		<b>80 hrs/wk</b>	<b>x</b>	<b>29 occup.</b>	<b>= 2304hrs/wk</b>
<b>AVAILABLE PEAK HOURS FOR ADDITIONAL PROGRAMMING</b>				<b>2304hrs/wk</b>	<b>minus</b>	<b>641 hrs/wk</b>	<b>= 1663hrs/wk</b>

**Small Facility - maximum population of 3,000 persons - approx. 74% peak users- 100 hours of operation per week**

Aerobic Exercise	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>1,650 SF</b>							
Aerobic Exercising	11.4%	252	x 3 hrs/wk	757 hrs/wk	50 SF/user	33 stas.	
Step Aerobics	3.0%	67	x 3 hrs/wk	201 hrs/wk	50 SF/user	33 stas.	
Calisthenics	5.7%	126	x 3 hrs/wk	378 hrs/wk	50 SF/user	33 stas.	
<b>TOTALS</b>		<b>445</b>		<b>1335 hrs/wk</b>	<b>50 SF/user</b>	<b>33 stas.</b>	<b>3300hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>90%</b>	<b>of Stations in Use</b>				<b>30 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>55%</b>	<b>of Hours of Operation</b>		<b>= 55 hrs/wk</b>	<b>x</b>	<b>30 stas.</b>	<b>= 1634hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>1634hrs/wk</b>	<b>minus</b>	<b>1335.5 hrs/wk</b>	<b>= 298hrs/wk</b>

Non-Structured Exercise	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>1,000 SF</b>							
Martial Arts	3.0%	66	x 2 hrs/wk	131 hrs/wk	125 SF/user	8 stas.	
Kick Boxing	2.2%	48	x 2 hrs/wk	95 hrs/wk	125 SF/user	8 stas.	
<b>TOTALS</b>		<b>113</b>		<b>226.707 hrs/wk</b>	<b>125 SF/user</b>	<b>8 stas.</b>	<b>800hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>90%</b>	<b>of Stations in Use</b>				<b>7 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>55%</b>	<b>of Hours of Operation</b>		<b>= 55 hrs/wk</b>	<b>x</b>	<b>7 stas.</b>	<b>= 396hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>396hrs/wk</b>	<b>minus</b>	<b>226.71 hrs/wk</b>	<b>= 169hrs/wk</b>

Fitness Module (Weight/Cardio)	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>4645 SF</b>							
Exercising with Equipment	24.5%	544	x 3 hrs/wk	1632 hrs/wk	56 SF/user	83 stas.	
<b>TOTALS</b>		<b>544</b>		<b>1632 hrs/wk</b>	<b>55.96 SF/user</b>	<b>83 stas.</b>	<b>8300hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>66 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation</b>		<b>= 90 hrs/wk</b>	<b>x</b>	<b>66 stas.</b>	<b>= 5976hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>5976hrs/wk</b>	<b>minus</b>	<b>1632 hrs/wk</b>	<b>= 4344hrs/wk</b>

Fitness Module (Weight/Cardio)	LNS Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>4,645 SF</b>							
Exercising with Equipment	65.0%	1440	x 3 hrs/wk	4321 hrs/wk	56 SF/user	83 stas.	
<b>TOTALS</b>		<b>1440</b>		<b>4321 hrs/wk</b>	<b>55.96 SF/user</b>	<b>83 stas.</b>	<b>8300hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>66 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation</b>		<b>= 90 hrs/wk</b>	<b>x</b>	<b>66 stas.</b>	<b>= 5976hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>5976hrs/wk</b>	<b>minus</b>	<b>4321 hrs/wk</b>	<b>= 1655hrs/wk</b>

Gymnasium Module	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>17,400 SF</b>							
Court Size is 50 x 94 for a total playing area of:							
Volleyball	6.4%	143	x 3 hrs/wk	428 hrs/wk	392 SF/user	32 court/s	
Basketball	18.3%	406	x 3 hrs/wk	1219 hrs/wk	470 SF/user	28 players	
<b>TOTALS (Average for SF/Per and Stations)</b>		<b>549</b>		<b>1647 hrs/wk</b>	<b>430.8 SF/user</b>	<b>30 players</b>	<b>3000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>				<b>30 players</b>	
<b>PEAK UTILIZATION RATE</b>	<b>60%</b>	<b>of Hours of Operation</b>		<b>= 60 hrs/wk</b>	<b>x</b>	<b>30 players</b>	<b>= 1800hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>1800hrs/wk</b>	<b>minus</b>	<b>1647 hrs/wk</b>	<b>= 153hrs/wk</b>

Note: VB assumes 12 players + 4 rotating players for each court. BB assumes 10 players + 4 waiting to rotate in for each court.

Racquetball Court	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>850 SF</b>							
Racquetball	3.1%	69	x 2 hrs/wk	138 hrs/wk	213 SF/user	4 occup.	
<b>TOTALS</b>		<b>69</b>		<b>138 hrs/wk</b>	<b>212.5 SF/user</b>	<b>4 occup.</b>	<b>400hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>				<b>4 occup.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation</b>		<b>= 50 hrs/wk</b>	<b>x</b>	<b>4 occup.</b>	<b>= 200hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>200hrs/wk</b>	<b>minus</b>	<b>138 hrs/wk</b>	<b>= 62hrs/wk</b>

Jogging Track	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>4,200 SF</b>							
Running / Jogging	14.6%	325	x 2 hrs/wk	649 hrs/wk		66 occup.	
Exercise Walking	28.8%	638	x 2 hrs/wk	1275 hrs/wk		66 occup.	
<b>TOTALS</b>		<b>962</b>		<b>1924 hrs/wk</b>		<b>66 occup.</b>	<b>6600hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>60%</b>	<b>of Stations in Use</b>				<b>40 occup.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>80%</b>	<b>of Hours of Operation</b>		<b>= 80 hrs/wk</b>	<b>x</b>	<b>40 occup.</b>	<b>= 3168hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>3168hrs/wk</b>	<b>minus</b>	<b>1924 hrs/wk</b>	<b>= 1244hrs/wk</b>

**Medium Facility - maximum population of 6,000 persons - approx. 74% peak users- 100 hours of operation per week**

Aerobic Exercise	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>2,800 SF</b>							
Aerobic Exercising	11.4%	504	x 3 hrs/wk	1513 hrs/wk	50 SF/user	56 stas.	
Step Aerobics	3.0%	134	x 3 hrs/wk	402 hrs/wk	50 SF/user	56 stas.	
Calisthenics	5.7%	252	x 3 hrs/wk	756 hrs/wk	50 SF/user	56 stas.	
<b>TOTALS</b>		<b>890</b>		<b>2671 hrs/wk</b>	<b>50 SF/user</b>	<b>56 stas.</b>	<b>5600hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>90%</b>	<b>of Stations in Use</b>				<b>50 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>55%</b>	<b>of Hours of Operation</b>		<b>= 55 hrs/wk</b>	<b>x</b>	<b>50 stas.</b>	<b>= 2772hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>2772hrs/wk</b>	<b>minus</b>	<b>2671 hrs/wk</b>	<b>= 101hrs/wk</b>

Non-Structured Exercise	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>2,150 SF</b>							
Martial Arts	3.0%	131	x 2 hrs/wk	262 hrs/wk	125 SF/user	17 stas.	
Kick Boxing	2.2%	95	x 2 hrs/wk	191 hrs/wk	125 SF/user	17 stas.	
<b>TOTALS</b>		<b>227</b>		<b>453.414 hrs/wk</b>	<b>125 SF/user</b>	<b>17 stas.</b>	<b>1720hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>90%</b>	<b>of Stations in Use</b>				<b>15 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>55%</b>	<b>of Hours of Operation</b>		<b>= 55 hrs/wk</b>	<b>x</b>	<b>15 stas.</b>	<b>= 851hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>851hrs/wk</b>	<b>minus</b>	<b>453.41 hrs/wk</b>	<b>= 398hrs/wk</b>

Fitness Module (Weight/Cardio)	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>7,300 SF</b>							
Exercising with Equipment	24.5%	1088	x 3 hrs/wk	3263 hrs/wk	55.7 SF/user	131 stas.	
<b>TOTALS</b>		<b>1088</b>		<b>3263 hrs/wk</b>	<b>55.73 SF/user</b>	<b>131 stas.</b>	<b>13100hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>105 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation</b>		<b>= 90 hrs/wk</b>	<b>x</b>	<b>105 stas.</b>	<b>= 9432hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>9432hrs/wk</b>	<b>minus</b>	<b>3263 hrs/wk</b>	<b>= 6169hrs/wk</b>

Fitness Module (Weight/Cardio)	LNS Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>7,300 SF</b>							
Exercising with Equipment	65.0%	2881	x 3 hrs/wk	8643 hrs/wk	55.7 SF/user	131 stas.	
<b>TOTALS</b>		<b>2881</b>		<b>8643 hrs/wk</b>	<b>55.73 SF/user</b>	<b>131 stas.</b>	<b>13100hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>105 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation</b>		<b>= 90 hrs/wk</b>	<b>x</b>	<b>105 stas.</b>	<b>= 9432hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>9432hrs/wk</b>	<b>minus</b>	<b>8643 hrs/wk</b>	<b>= 789hrs/wk</b>

Gymnasium Module	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>24,600 SF</b>							
Court Size is 50 x 94 for a total playing area of:						14,100 SF	3 court/s
Volleyball	6.4%	286	x 3 hrs/wk	857 hrs/wk	392 SF/user	48 players	
Basketball	18.3%	813	x 3 hrs/wk	2438 hrs/wk	470 SF/user	42 players	
<b>TOTALS (Average for SF/Per and Stations)</b>		<b>1098</b>		<b>3295 hrs/wk</b>	<b>430.8 SF/user</b>	<b>45 players</b>	<b>4500hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>				<b>45 players</b>	
<b>PEAK UTILIZATION RATE</b>	<b>60%</b>	<b>of Hours of Operation</b>		<b>= 60 hrs/wk</b>	<b>x</b>	<b>45 players</b>	<b>= 2700hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>2700hrs/wk</b>	<b>minus</b>	<b>3295 hrs/wk</b>	<b>= -595hrs/wk</b>

Note: VB assumes 12 players + 4 rotating players for each court. BB assumes 10 players + 4 waiting to rotate in for each court.

Racquetball Court	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>850 SF</b>							
Racquetball	3.1%	138	x 2 hrs/wk	276 hrs/wk	213 SF/user	4 occup.	
<b>TOTALS</b>		<b>138</b>		<b>276 hrs/wk</b>	<b>212.5 SF/user</b>	<b>4 occup.</b>	<b>400hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>				<b>4 occup.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation</b>		<b>= 50 hrs/wk</b>	<b>x</b>	<b>4 occup.</b>	<b>= 200hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>200hrs/wk</b>	<b>minus</b>	<b>276 hrs/wk</b>	<b>= -76hrs/wk</b>

Jogging Track	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>5,300 SF</b>							
Running / Jogging	14.6%	649	x 2 hrs/wk	1298 hrs/wk		84 occup.	
Exercise Walking	28.8%	1275	x 2 hrs/wk	2550 hrs/wk		84 occup.	
<b>TOTALS</b>		<b>1924</b>		<b>3849 hrs/wk</b>		<b>84 occup.</b>	<b>8400hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>60%</b>	<b>of Stations in Use</b>				<b>50 occup.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>80%</b>	<b>of Hours of Operation</b>		<b>= 80 hrs/wk</b>	<b>x</b>	<b>50 occup.</b>	<b>= 4032hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>4032hrs/wk</b>	<b>minus</b>	<b>3849 hrs/wk</b>	<b>= 183hrs/wk</b>

**Large Facility - maximum population of 10,000 persons - approx. 74% peak users- 100 hours of operation per week**

Aerobic Exercise 4,500 SF	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
Aerobic Exercising	11.4%	841	x 3 hrs/wk	2522 hrs/wk	50 SF/user	90 stas.	
Step Aerobics	3.0%	223	x 3 hrs/wk	670 hrs/wk	50 SF/user	90 stas.	
Calisthenics	5.7%	420	x 3 hrs/wk	1259 hrs/wk	50 SF/user	90 stas.	
<b>TOTALS</b>		<b>1484</b>		<b>4452 hrs/wk</b>	<b>50 SF/user</b>	<b>90 stas.</b>	<b>9000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>90%</b>	<b>of Stations in Use</b>				<b>81 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>55%</b>	<b>of Hours of Operation</b>		<b>= 55 hrs/wk</b>	<b>x</b>	<b>81 stas.</b>	<b>= 4455hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>4455hrs/wk</b>	<b>minus</b>	<b>4451.6 hrs/wk</b>	<b>= 3hrs/wk</b>

Non-Structured Exercise 2,500 SF	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
Martial Arts	3.0%	219	x 2 hrs/wk	437 hrs/wk	125 SF/user	20 stas.	
Kick Boxing	2.2%	159	x 2 hrs/wk	318 hrs/wk	125 SF/user	20 stas.	
<b>TOTALS</b>		<b>378</b>		<b>755.689 hrs/wk</b>	<b>125 SF/user</b>	<b>20 stas.</b>	<b>2000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>16 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation</b>		<b>= 50 hrs/wk</b>	<b>x</b>	<b>16 stas.</b>	<b>= 800hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>800hrs/wk</b>	<b>minus</b>	<b>756 hrs/wk</b>	<b>= 44hrs/wk</b>

Fitness Module (Weight/Cardio) 11,500 SF	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
Exercising with Equipment	24.5%	1813	x 3 hrs/wk	5438 hrs/wk	55.8 SF/user	206 stas.	
<b>TOTALS</b>		<b>1813</b>		<b>5438 hrs/wk</b>	<b>55.83 SF/user</b>	<b>206 stas.</b>	<b>20600hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>165 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation</b>		<b>= 90 hrs/wk</b>	<b>x</b>	<b>165 stas.</b>	<b>= 14832hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>14832hrs/wk</b>	<b>minus</b>	<b>5438 hrs/wk</b>	<b>= 9394hrs/wk</b>

Fitness Module (Weight/Cardio) 11,500 SF	LNS Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
Exercising with Equipment	65.0%	4801	x 3 hrs/wk	14404 hrs/wk	55.8 SF/user	206 stas.	
<b>TOTALS</b>		<b>4801</b>		<b>14404 hrs/wk</b>	<b>55.83 SF/user</b>	<b>206 stas.</b>	<b>20600hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>165 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation</b>		<b>= 90 hrs/wk</b>	<b>x</b>	<b>165 stas.</b>	<b>= 14832hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>14832hrs/wk</b>	<b>minus</b>	<b>14404 hrs/wk</b>	<b>= 428hrs/wk</b>

Gymnasium Module 31,800 SF	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
Court Size is 50 x 94 for a total playing area of:						18,800 SF	
Volleyball	6.4%	476	x 3 hrs/wk	1428 hrs/wk	392 SF/user	64 players	
Basketball	18.3%	1354	x 3 hrs/wk	4063 hrs/wk	470 SF/user	56 players	
<b>TOTALS (Average for SF/Per and Stations)</b>		<b>1830</b>		<b>5491 hrs/wk</b>	<b>430.8 SF/user</b>	<b>60 players</b>	<b>6000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>				<b>60 players</b>	
<b>PEAK UTILIZATION RATE</b>	<b>60%</b>	<b>of Hours of Operation</b>		<b>= 60 hrs/wk</b>	<b>x</b>	<b>60 players</b>	<b>= 3600hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>3600hrs/wk</b>	<b>minus</b>	<b>5491 hrs/wk</b>	<b>= -1891hrs/wk</b>

Note: VB assumes 12 players + 4 rotating players for each court. BB assumes 10 players + 4 waiting to rotate in for each court.

Racquetball Courts 1,700 SF	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
Racquetball	3.1%	230	x 2 hrs/wk	461 hrs/wk	213 SF/user	8 occup.	
<b>TOTALS</b>		<b>230</b>		<b>461 hrs/wk</b>	<b>212.5 SF/user</b>	<b>8 occup.</b>	<b>800hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>				<b>8 occup.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation</b>		<b>= 50 hrs/wk</b>	<b>x</b>	<b>8 occup.</b>	<b>= 400hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>400hrs/wk</b>	<b>minus</b>	<b>461 hrs/wk</b>	<b>= -61hrs/wk</b>

Jogging Track 6400 SF	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
Running / Jogging	14.6%	1082	x 2 hrs/wk	2164 hrs/wk		102 occup.	
Exercise Walking	28.8%	2125	x 2 hrs/wk	4250 hrs/wk		102 occup.	
<b>TOTALS</b>		<b>3207</b>		<b>6414 hrs/wk</b>		<b>102 occup.</b>	<b>10200hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>60%</b>	<b>of Stations in Use</b>				<b>61 occup.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>80%</b>	<b>of Hours of Operation</b>		<b>= 80 hrs/wk</b>	<b>x</b>	<b>61 occup.</b>	<b>= 4896hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>4896hrs/wk</b>	<b>minus</b>	<b>6414 hrs/wk</b>	<b>= -1518hrs/wk</b>

**Maximum authorized population of 20,000 - 100 hours of operation per week:**

**Base Population:**

(15,001-20,000)

Aerobic Exercise	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>9,000 SF</b>							
Aerobic Exercising	11.4%	1681	x 3 hrs/wk	5044 hrs/wk	50 SF/user	180 stas.	
Step Aerobics	3.0%	447	x 3 hrs/wk	1340 hrs/wk	50 SF/user	180 stas.	
Calisthenics	5.7%	840	x 3 hrs/wk	2519 hrs/wk	50 SF/user	180 stas.	
<b>TOTALS</b>		<b>2968</b>		<b>8903 hrs/wk</b>	<b>50 SF/user</b>	<b>180 stas.</b>	<b>18000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>90%</b>	<b>of Stations in Use</b>				<b>162 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>55%</b>	<b>of Hours of Operation</b>		<b>= 55 hrs/wk</b>	<b>x</b>	<b>162 stas.</b>	<b>= 8910hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>8910hrs/wk</b>	<b>minus</b>	<b>8903.2 hrs/wk</b>	<b>= 7hrs/wk</b>

Non-Structured Exercise	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>5,000 SF</b>							
Martial Arts	3.0%	437	x 2 hrs/wk	875 hrs/wk	125 SF/user	40 stas.	
Kick Boxing	2.2%	318	x 2 hrs/wk	636 hrs/wk	125 SF/user	40 stas.	
<b>TOTALS</b>		<b>756</b>		<b>1511.38 hrs/wk</b>	<b>125 SF/user</b>	<b>40 stas.</b>	<b>4000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>32 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation</b>		<b>= 50 hrs/wk</b>	<b>x</b>	<b>32 stas.</b>	<b>= 1600hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>1600hrs/wk</b>	<b>minus</b>	<b>1511.4 hrs/wk</b>	<b>= 89hrs/wk</b>

Fitness Module (Weight/Cardio)	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>23,000 SF</b>							
Exercising with Equipment	24.5%	3626	x 3 hrs/wk	10877 hrs/wk	55.8 SF/user	412 stas.	
<b>TOTALS</b>		<b>3626</b>		<b>10877 hrs/wk</b>	<b>55.83 SF/user</b>	<b>412 stas.</b>	<b>41200hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>330 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation</b>		<b>= 90 hrs/wk</b>	<b>x</b>	<b>330 stas.</b>	<b>= 29664hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>29664hrs/wk</b>	<b>minus</b>	<b>10877 hrs/wk</b>	<b>= 18787hrs/wk</b>

Fitness Module (Weight/Cardio)	LNS Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>23,000 SF</b>							
Exercising with Equipment	65.0%	9603	x 3 hrs/wk	28809 hrs/wk	55.8 SF/user	412 stas.	
<b>TOTALS</b>		<b>9603</b>		<b>28809 hrs/wk</b>	<b>55.83 SF/user</b>	<b>412 stas.</b>	<b>41200hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>330 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation</b>		<b>= 90 hrs/wk</b>	<b>x</b>	<b>330 stas.</b>	<b>= 29664hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>29664hrs/wk</b>	<b>minus</b>	<b>28809 hrs/wk</b>	<b>= 855hrs/wk</b>

Gymnasium Module	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>48,600 SF</b>							
Court Size is 50 x 94 for a total playing area of:						28,200 SF	6 court/s
Volleyball	6.4%	952	x 3 hrs/wk	2856 hrs/wk	392 SF/user	96 players	
Basketball	18.3%	2709	x 3 hrs/wk	8127 hrs/wk	470 SF/user	84 players	
<b>TOTALS (Average for SF/Per and Stations)</b>		<b>3661</b>		<b>10983 hrs/wk</b>	<b>430.8 SF/user</b>	<b>90 players</b>	<b>9000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>				<b>90 players</b>	
<b>PEAK UTILIZATION RATE</b>	<b>60%</b>	<b>of Hours of Operation</b>		<b>= 60 hrs/wk</b>	<b>x</b>	<b>90 players</b>	<b>= 5400hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>5400hrs/wk</b>	<b>minus</b>	<b>10983 hrs/wk</b>	<b>= -5583hrs/wk</b>

Note: VB assumes 12 players + 4 rotating players for each court. BB assumes 10 players + 4 waiting to rotate in for each court.

Racquetball Courts	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>3,400 SF</b>							
Racquetball	3.1%	461	x 2 hrs/wk	921 hrs/wk	213 SF/user	16 occup.	
<b>TOTALS</b>		<b>461</b>		<b>921 hrs/wk</b>	<b>212.5 SF/user</b>	<b>16 occup.</b>	<b>1600hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>				<b>16 occup.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation</b>		<b>= 50 hrs/wk</b>	<b>x</b>	<b>16 occup.</b>	<b>= 800hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>800hrs/wk</b>	<b>minus</b>	<b>921 hrs/wk</b>	<b>= -121hrs/wk</b>

Jogging Track	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>6,400 SF</b>							
Running / Jogging	14.6%	2164	x 2 hrs/wk	4328 hrs/wk		150 occup.	
Exercise Walking	28.8%	4250	x 2 hrs/wk	8501 hrs/wk		150 occup.	
<b>TOTALS</b>		<b>6414</b>		<b>12828 hrs/wk</b>		<b>150 occup.</b>	<b>15000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>60%</b>	<b>of Stations in Use</b>				<b>90 occup.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>80%</b>	<b>of Hours of Operation</b>		<b>= 80 hrs/wk</b>	<b>x</b>	<b>90 occup.</b>	<b>= 7200hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>7200hrs/wk</b>	<b>minus</b>	<b>12828 hrs/wk</b>	<b>= -5628hrs/wk</b>

**Maximum authorized population of 25,000 - 100 hours of operation per week:**

**Base Population:** (20,001-25,000)

Aerobic Exercise	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>11,250 SF</b>							
Aerobic Exercising	11.4%	2102	x 3 hrs/wk	6306 hrs/wk	50 SF/user	225 stas.	
Step Aerobics	3.0%	558	x 3 hrs/wk	1675 hrs/wk	50 SF/user	225 stas.	
Calisthenics	5.7%	1049	x 3 hrs/wk	3148 hrs/wk	50 SF/user	225 stas.	
<b>TOTALS</b>		<b>3710</b>		<b>11129 hrs/wk</b>	<b>50 SF/user</b>	<b>225 stas.</b>	<b>22500hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>90%</b>	<b>of Stations in Use</b>				<b>203 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>55%</b>	<b>of Hours of Operation =</b>		<b>55 hrs/wk</b>	<b>x</b>	<b>203 stas.</b>	<b>= 11138hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>11138hrs/wk</b>	<b>minus</b>	<b>11129 hrs/wk</b>	<b>= 8hrs/wk</b>

Non-Structured Exercise	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>6,250 SF</b>							
Martial Arts	3.0%	547	x 2 hrs/wk	1094 hrs/wk	125 SF/user	50 stas.	
Kick Boxing	2.2%	398	x 2 hrs/wk	796 hrs/wk	125 SF/user	50 stas.	
<b>TOTALS</b>		<b>945</b>		<b>1889.22 hrs/wk</b>	<b>125 SF/user</b>	<b>50 stas.</b>	<b>5000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>40 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation =</b>		<b>50 hrs/wk</b>	<b>x</b>	<b>40 stas.</b>	<b>= 2000hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>2000hrs/wk</b>	<b>minus</b>	<b>1889.2 hrs/wk</b>	<b>= 111hrs/wk</b>

Fitness Module (Weight/Cardio)	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>28,750 SF</b>							
Exercising with Equipment	24.5%	4532	x 3 hrs/wk	13596 hrs/wk	55.8 SF/user	515 stas.	
<b>TOTALS</b>		<b>4532</b>		<b>13596 hrs/wk</b>	<b>55.83 SF/user</b>	<b>515 stas.</b>	<b>51500hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>412 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation =</b>		<b>90 hrs/wk</b>	<b>x</b>	<b>412 stas.</b>	<b>= 37080hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>37080hrs/wk</b>	<b>minus</b>	<b>13596 hrs/wk</b>	<b>= 23484hrs/wk</b>

Fitness Module (Weight/Cardio)	LNS Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>28,750 SF</b>							
Exercising with Equipment	65.0%	12004	x 3 hrs/wk	36011 hrs/wk	55.8 SF/user	515 stas.	
<b>TOTALS</b>		<b>12004</b>		<b>36011 hrs/wk</b>	<b>55.83 SF/user</b>	<b>515 stas.</b>	<b>51500hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>412 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation =</b>		<b>90 hrs/wk</b>	<b>x</b>	<b>412 stas.</b>	<b>= 37080hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>37080hrs/wk</b>	<b>minus</b>	<b>36011 hrs/wk</b>	<b>= 1069hrs/wk</b>

Gymnasium Module	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>57,000 SF</b>							
Court Size is 50 x 94 for a total playing area of:							
Volleyball	6.4%	1190	x 3 hrs/wk	3570 hrs/wk	392 SF/user	112 players	
Basketball	18.3%	3386	x 3 hrs/wk	10158 hrs/wk	470 SF/user	98 players	
<b>TOTALS (Average for SF/Per and Stations)</b>		<b>4576</b>		<b>13728 hrs/wk</b>	<b>430.8 SF/user</b>	<b>105 players</b>	<b>10500hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>				<b>105 players</b>	
<b>PEAK UTILIZATION RATE</b>	<b>60%</b>	<b>of Hours of Operation =</b>		<b>60 hrs/wk</b>	<b>x</b>	<b>105 players</b>	<b>= 6300hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>6300hrs/wk</b>	<b>minus</b>	<b>13728 hrs/wk</b>	<b>= -7428hrs/wk</b>

Note: VB assumes 12 players + 4 rotating players for each court. BB assumes 10 players + 4 waiting to rotate in for each court.

Racquetball Courts	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>4,250 SF</b>							
Racquetball	3.1%	576	x 2 hrs/wk	1152 hrs/wk	213 SF/user	20 occup.	
<b>TOTALS</b>		<b>576</b>		<b>1152 hrs/wk</b>	<b>212.5 SF/user</b>	<b>20 occup.</b>	<b>2000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>				<b>20 occup.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation =</b>		<b>50 hrs/wk</b>	<b>x</b>	<b>20 occup.</b>	<b>= 1000hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>1000hrs/wk</b>	<b>minus</b>	<b>1152 hrs/wk</b>	<b>= -152hrs/wk</b>

Jogging Track	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>6,400 SF</b>							
Running / Jogging	14.6%	2705	x 2 hrs/wk	5410 hrs/wk		150 occup.	
Exercise Walking	28.8%	5313	x 2 hrs/wk	10626 hrs/wk		150 occup.	
<b>TOTALS</b>		<b>8018</b>		<b>16036 hrs/wk</b>		<b>150 occup.</b>	<b>15000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>60%</b>	<b>of Stations in Use</b>				<b>90 occup.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>80%</b>	<b>of Hours of Operation =</b>		<b>80 hrs/wk</b>	<b>x</b>	<b>90 occup.</b>	<b>= 7200hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>7200hrs/wk</b>	<b>minus</b>	<b>16036 hrs/wk</b>	<b>= -8836hrs/wk</b>

**Maximum authorized population of 30,000 - 100 hours of operation per week:**

<b>Base Population:</b>		<b>(25,001-30,000)</b>					
<b>Aerobic Exercise</b>	<b>Average Particip.</b>	<b>Projected Participants</b>	<b>Desired Times / Wk.</b>	<b>Desired Contact Hrs.</b>	<b>Max. SF/Person</b>	<b>Stations in Module</b>	<b>Available Contact Hrs.</b>
<b>13,500 SF</b>							
Aerobic Exercising	11.4%	2522	x 3 hrs/wk	7567 hrs/wk	50 SF/user	270 stas.	
Step Aerobics	3.0%	670	x 3 hrs/wk	2010 hrs/wk	50 SF/user	270 stas.	
Calisthenics	5.7%	1259	x 3 hrs/wk	3778 hrs/wk	50 SF/user	270 stas.	
<b>TOTALS</b>		<b>4452</b>		<b>13355 hrs/wk</b>	<b>50 SF/user</b>	<b>270 stas.</b>	<b>27000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>90%</b>	<b>of Stations in Use</b>				<b>243 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>55%</b>	<b>of Hours of Operation =</b>		<b>55 hrs/wk</b>	<b>x</b>	<b>243 stas.</b>	<b>= 13365hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>13365hrs/wk</b>	<b>minus</b>	<b>13355 hrs/wk</b>	<b>= 10hrs/wk</b>

<b>Non-Structured Exercise</b>	<b>Average Particip.</b>	<b>Projected Participants</b>	<b>Desired Times / Wk.</b>	<b>Desired Contact Hrs.</b>	<b>Max. SF/Person</b>	<b>Stations in Module</b>	<b>Available Contact Hrs.</b>
<b>7,500 SF</b>							
Martial Arts	3.0%	656	x 2 hrs/wk	1312 hrs/wk	125 SF/user	60 stas.	
Kick Boxing	2.2%	477	x 2 hrs/wk	955 hrs/wk	125 SF/user	60 stas.	
<b>TOTALS</b>		<b>1134</b>		<b>2267.07 hrs/wk</b>	<b>125 SF/user</b>	<b>60 stas.</b>	<b>6000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>48 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation =</b>		<b>50 hrs/wk</b>	<b>x</b>	<b>48 stas.</b>	<b>= 2400hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>2400hrs/wk</b>	<b>minus</b>	<b>2267.1 hrs/wk</b>	<b>= 133hrs/wk</b>

<b>Fitness Module (Weight/Cardio)</b>	<b>Average Particip.</b>	<b>Projected Participants</b>	<b>Desired Times / Wk.</b>	<b>Desired Contact Hrs.</b>	<b>Max. SF/Person</b>	<b>Stations in Module</b>	<b>Available Contact Hrs.</b>
<b>34,500 SF</b>							
Exercising with Equipment	24.5%	5438	x 3 hrs/wk	16315 hrs/wk	55.8 SF/user	618 stas.	
<b>TOTALS</b>		<b>5438</b>		<b>16315 hrs/wk</b>	<b>55.83 SF/user</b>	<b>618 stas.</b>	<b>61800hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>494 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation =</b>		<b>90 hrs/wk</b>	<b>x</b>	<b>494 stas.</b>	<b>= 44496hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>44496hrs/wk</b>	<b>minus</b>	<b>16315 hrs/wk</b>	<b>= 28181hrs/wk</b>

<b>Fitness Module (Weight/Cardio)</b>	<b>LNS Particip.</b>	<b>Projected Participants</b>	<b>Desired Times / Wk.</b>	<b>Desired Contact Hrs.</b>	<b>Max. SF/Person</b>	<b>Stations in Module</b>	<b>Available Contact Hrs.</b>
<b>34,500 SF</b>							
Exercising with Equipment	65.0%	14404	x 3 hrs/wk	43213 hrs/wk	55.8 SF/user	618 stas.	
<b>TOTALS</b>		<b>14404</b>		<b>43213 hrs/wk</b>	<b>55.83 SF/user</b>	<b>618 stas.</b>	<b>61800hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>494 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation =</b>		<b>90 hrs/wk</b>	<b>x</b>	<b>494 stas.</b>	<b>= 44496hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>44496hrs/wk</b>	<b>minus</b>	<b>43213 hrs/wk</b>	<b>= 1283hrs/wk</b>

<b>Gymnasium Module</b>	<b>Average Particip.</b>	<b>Projected Participants</b>	<b>Desired Times / Wk.</b>	<b>Desired Contact Hrs.</b>	<b>Max. SF/Person</b>	<b>Stations in Module</b>	<b>Available Contact Hrs.</b>
<b>65,400 SF</b>							
Court Size is 50 x 94 for a total playing area of:							
Volleyball	6.4%	1428	x 3 hrs/wk	4284 hrs/wk	392 SF/user	128 players	
Basketball	18.3%	4063	x 3 hrs/wk	12190 hrs/wk	470 SF/user	112 players	
<b>TOTALS (Average for SF/Per and Stations)</b>		<b>5491</b>		<b>16474 hrs/wk</b>	<b>430.8 SF/user</b>	<b>120 players</b>	<b>12000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>				<b>120 players</b>	
<b>PEAK UTILIZATION RATE</b>	<b>60%</b>	<b>of Hours of Operation =</b>		<b>60 hrs/wk</b>	<b>x</b>	<b>120 players</b>	<b>= 7200hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>7200hrs/wk</b>	<b>minus</b>	<b>16474 hrs/wk</b>	<b>= -9274hrs/wk</b>

Note: VB assumes 12 players + 4 rotating players for each court. BB assumes 10 players + 4 waiting to rotate in for each court.

<b>Racquetball Courts</b>	<b>Average Particip.</b>	<b>Projected Participants</b>	<b>Desired Times / Wk.</b>	<b>Desired Contact Hrs.</b>	<b>Max. SF/Person</b>	<b>Stations in Module</b>	<b>Available Contact Hrs.</b>
<b>5,100 SF</b>							
Racquetball	3.1%	691	x 2 hrs/wk	1382 hrs/wk	213 SF/user	24 occup.	
<b>TOTALS</b>		<b>691</b>		<b>1382 hrs/wk</b>	<b>212.5 SF/user</b>	<b>24 occup.</b>	<b>2400hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>				<b>24 occup.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation =</b>		<b>50 hrs/wk</b>	<b>x</b>	<b>24 occup.</b>	<b>= 1200hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>1200hrs/wk</b>	<b>minus</b>	<b>1382 hrs/wk</b>	<b>= -182hrs/wk</b>

<b>Jogging Track</b>	<b>Average Particip.</b>	<b>Projected Participants</b>	<b>Desired Times / Wk.</b>	<b>Desired Contact Hrs.</b>	<b>Max. SF/Person</b>	<b>Stations in Module</b>	<b>Available Contact Hrs.</b>
<b>6,400 SF</b>							
Running / Jogging	14.6%	3246	x 2 hrs/wk	6492 hrs/wk		150 occup.	
Exercise Walking	28.8%	6376	x 2 hrs/wk	12751 hrs/wk		150 occup.	
<b>TOTALS</b>		<b>9621</b>		<b>19243 hrs/wk</b>		<b>150 occup.</b>	<b>15000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>60%</b>	<b>of Stations in Use</b>				<b>90 occup.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>80%</b>	<b>of Hours of Operation =</b>		<b>80 hrs/wk</b>	<b>x</b>	<b>90 occup.</b>	<b>= 7200hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>7200hrs/wk</b>	<b>minus</b>	<b>19243 hrs/wk</b>	<b>= -12043hrs/wk</b>

**Maximum authorized population of 35,000 - 100 hours of operation per week:**

**Base Population:**

(30,001-35,000)

Aerobic Exercise	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>15,750 SF</b>							
Aerobic Exercising	11.4%	2943	x 3 hrs/wk	8828 hrs/wk	50 SF/user	315 stas.	
Step Aerobics	3.0%	782	x 3 hrs/wk	2346 hrs/wk	50 SF/user	315 stas.	
Calisthenics	5.7%	1469	x 3 hrs/wk	4407 hrs/wk	50 SF/user	315 stas.	
<b>TOTALS</b>		<b>5194</b>		<b>15581 hrs/wk</b>	<b>50 SF/user</b>	<b>315 stas.</b>	<b>31500hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>90%</b>	<b>of Stations in Use</b>				<b>284 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>55%</b>	<b>of Hours of Operation =</b>		<b>55 hrs/wk</b>	<b>x</b>	<b>284 stas.</b>	<b>= 15593hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>15593hrs/wk</b>	<b>minus</b>	<b>15581 hrs/wk =</b>	<b>12hrs/wk</b>

Non-Structured Exercise	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>8,750 SF</b>							
Martial Arts	3.0%	766	x 2 hrs/wk	1531 hrs/wk	125 SF/user	70 stas.	
Kick Boxing	2.2%	557	x 2 hrs/wk	1114 hrs/wk	125 SF/user	70 stas.	
<b>TOTALS</b>		<b>1322</b>		<b>2644.91 hrs/wk</b>	<b>125 SF/user</b>	<b>70 stas.</b>	<b>7000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>56 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation =</b>		<b>50 hrs/wk</b>	<b>x</b>	<b>56 stas.</b>	<b>= 2800hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>2800hrs/wk</b>	<b>minus</b>	<b>2644.9 hrs/wk =</b>	<b>155hrs/wk</b>

Fitness Module (Weight/Cardio)	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>40,250 SF</b>							
Exercising with Equipment	24.5%	6345	x 3 hrs/wk	19034 hrs/wk	56 SF/user	721 stas.	
<b>TOTALS</b>		<b>6345</b>		<b>19034 hrs/wk</b>	<b>56 SF/user</b>	<b>721 stas.</b>	<b>72100hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>577 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation =</b>		<b>90 hrs/wk</b>	<b>x</b>	<b>577 stas.</b>	<b>= 51912hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>51912hrs/wk</b>	<b>minus</b>	<b>19034 hrs/wk =</b>	<b>32878hrs/wk</b>

Fitness Module (Weight/Cardio)	LNS Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>40,250 SF</b>							
Exercising with Equipment	65.0%	16805	x 3 hrs/wk	50416 hrs/wk	56 SF/user	721 stas.	
<b>TOTALS</b>		<b>16805</b>		<b>50416 hrs/wk</b>	<b>56 SF/user</b>	<b>721 stas.</b>	<b>72100hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>577 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation =</b>		<b>90 hrs/wk</b>	<b>x</b>	<b>577 stas.</b>	<b>= 51912hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>51912hrs/wk</b>	<b>minus</b>	<b>50416 hrs/wk =</b>	<b>1496hrs/wk</b>

Gymnasium Module	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>73,800 SF</b>							
Court Size is 50 x 94 for a total playing area of:							
Volleyball	6.4%	1666	x 3 hrs/wk	4998 hrs/wk	392 SF/user	144 players	
Basketball	18.3%	4741	x 3 hrs/wk	14222 hrs/wk	470 SF/user	126 players	
<b>TOTALS (Average for SF/Per and Stations)</b>		<b>6407</b>		<b>19220 hrs/wk</b>	<b>431 SF/user</b>	<b>135 players</b>	<b>13500hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>				<b>135 players</b>	
<b>PEAK UTILIZATION RATE</b>	<b>60%</b>	<b>of Hours of Operation =</b>		<b>60 hrs/wk</b>	<b>x</b>	<b>135 players =</b>	<b>8100hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>8100hrs/wk</b>	<b>minus</b>	<b>19220 hrs/wk =</b>	<b>-11120hrs/wk</b>

Note: VB assumes 12 players + 4 rotating players for each court. BB assumes 10 players + 4 waiting to rotate in for each court.

Racquetball Courts	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>5,950 SF</b>							
Racquetball	3.1%	806	x 2 hrs/wk	1612 hrs/wk	212.5 SF/user	28 occup.	
<b>TOTALS</b>		<b>806</b>		<b>1612 hrs/wk</b>	<b>212.5 SF/user</b>	<b>28 occup.</b>	<b>2800hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>				<b>28 occup.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation =</b>		<b>50 hrs/wk</b>	<b>x</b>	<b>28 occup. =</b>	<b>1400hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>1400hrs/wk</b>	<b>minus</b>	<b>1612 hrs/wk =</b>	<b>-212hrs/wk</b>

Jogging Track	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>6,400 SF</b>							
Running / Jogging	14.6%	3787	x 2 hrs/wk	7574 hrs/wk		150 occup.	
Exercise Walking	28.8%	7438	x 2 hrs/wk	14876 hrs/wk		150 occup.	
<b>TOTALS</b>		<b>11225</b>		<b>22450 hrs/wk</b>		<b>150 occup.</b>	<b>15000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>60%</b>	<b>of Stations in Use</b>				<b>90 occup.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>80%</b>	<b>of Hours of Operation =</b>		<b>80 hrs/wk</b>	<b>x</b>	<b>90 occup. =</b>	<b>7200hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>7200hrs/wk</b>	<b>minus</b>	<b>22450 hrs/wk =</b>	<b>-15250hrs/wk</b>

**Maximum authorized population of 40,000 - 100 hours of operation per week:**

**Base Population:** (35,001-40,000)

Aerobic Exercise	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>18,000 SF</b>							
Aerobic Exercising	11.4%	3363	x 3 hrs/wk	10089 hrs/wk	50 SF/user	360 stas.	
Step Aerobics	3.0%	894	x 3 hrs/wk	2681 hrs/wk	50 SF/user	360 stas.	
Calisthenics	5.7%	1679	x 3 hrs/wk	5037 hrs/wk	50 SF/user	360 stas.	
<b>TOTALS</b>		<b>5935</b>		<b>17806 hrs/wk</b>	<b>50 SF/user</b>	<b>360 stas.</b>	<b>36000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>90%</b>	<b>of Stations in Use</b>				<b>324 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>55%</b>	<b>of Hours of Operation =</b>		<b>55 hrs/wk</b>	<b>x</b>	<b>324 stas.</b>	<b>= 17820hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>17820hrs/wk</b>	<b>minus</b>	<b>17806 hrs/wk</b>	<b>= 14hrs/wk</b>

Non-Structured Exercise	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>10,000 SF</b>							
Martial Arts	3.0%	875	x 2 hrs/wk	1750 hrs/wk	125 SF/user	80 stas.	
Kick Boxing	2.2%	636	x 2 hrs/wk	1273 hrs/wk	125 SF/user	80 stas.	
<b>TOTALS</b>		<b>1511</b>		<b>3022.76 hrs/wk</b>	<b>125 SF/user</b>	<b>80 stas.</b>	<b>8000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>64 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation =</b>		<b>50 hrs/wk</b>	<b>x</b>	<b>64 stas.</b>	<b>= 3200hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>3200hrs/wk</b>	<b>minus</b>	<b>3022.8 hrs/wk</b>	<b>= 177hrs/wk</b>

Fitness Module (Weight/Cardio)	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>46,000 SF</b>							
Exercising with Equipment	24.5%	7251	x 3 hrs/wk	21753 hrs/wk	56 SF/user	824 stas.	
<b>TOTALS</b>		<b>7251</b>		<b>21753 hrs/wk</b>	<b>56 SF/user</b>	<b>824 stas.</b>	<b>82400hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>659 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation =</b>		<b>90 hrs/wk</b>	<b>x</b>	<b>659 stas.</b>	<b>= 59328hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>59328hrs/wk</b>	<b>minus</b>	<b>21753 hrs/wk</b>	<b>= 37575hrs/wk</b>

Fitness Module (Weight/Cardio)	LNS Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>46,000 SF</b>							
Exercising with Equipment	65.0%	19206	x 3 hrs/wk	57618 hrs/wk	56 SF/user	824 stas.	
<b>TOTALS</b>		<b>19206</b>		<b>57618 hrs/wk</b>	<b>56 SF/user</b>	<b>824 stas.</b>	<b>82400hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>659 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation =</b>		<b>90 hrs/wk</b>	<b>x</b>	<b>659 stas.</b>	<b>= 59328hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>59328hrs/wk</b>	<b>minus</b>	<b>57618 hrs/wk</b>	<b>= 1710hrs/wk</b>

Gymnasium Module	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.	
<b>82,200 SF</b>								
Court Size is 50 x 94 for a total playing area of:							47,000 SF	10 court/s
Volleyball	6.4%	1904	x 3 hrs/wk	5712 hrs/wk	392 SF/user	160 players		
Basketball	18.3%	5418	x 3 hrs/wk	16253 hrs/wk	470 SF/user	140 players		
<b>TOTALS (Average for SF/Per and Stations)</b>		<b>7322</b>		<b>21966 hrs/wk</b>	<b>431 SF/user</b>	<b>150 players</b>	<b>15000hrs/wk</b>	
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>				<b>150 players</b>		
<b>PEAK UTILIZATION RATE</b>	<b>60%</b>	<b>of Hours of Operation =</b>		<b>60 hrs/wk</b>	<b>x</b>	<b>150 players</b>	<b>= 9000hrs/wk</b>	
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>9000hrs/wk</b>	<b>minus</b>	<b>21966 hrs/wk</b>	<b>= -12966hrs/wk</b>	

Note: VB assumes 12 players + 4 rotating players for each court. BB assumes 10 players + 4 waiting to rotate in for each court.

Racquetball Courts	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>6,800 SF</b>							
Racquetball	3.1%	921	x 2 hrs/wk	1843 hrs/wk	212.5 SF/user	32 occup.	
<b>TOTALS</b>		<b>921</b>		<b>1843 hrs/wk</b>	<b>212.5 SF/user</b>	<b>32 occup.</b>	<b>3200hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>				<b>32 occup.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation =</b>		<b>50 hrs/wk</b>	<b>x</b>	<b>32 occup.</b>	<b>= 1600hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>1600hrs/wk</b>	<b>minus</b>	<b>1843 hrs/wk</b>	<b>= -243hrs/wk</b>

Jogging Track	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>6,400 SF</b>							
Running / Jogging	14.6%	4328	x 2 hrs/wk	8656 hrs/wk		150 occup.	
Exercise Walking	28.8%	8501	x 2 hrs/wk	17001 hrs/wk		150 occup.	
<b>TOTALS</b>		<b>12828</b>		<b>25657 hrs/wk</b>		<b>150 occup.</b>	<b>15000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>60%</b>	<b>of Stations in Use</b>				<b>90 occup.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>80%</b>	<b>of Hours of Operation =</b>		<b>80 hrs/wk</b>	<b>x</b>	<b>90 occup.</b>	<b>= 7200hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>7200hrs/wk</b>	<b>minus</b>	<b>25657 hrs/wk</b>	<b>= -18457hrs/wk</b>

**Maximum authorized population of 45,000 - 100 hours of operation per week:**

<b>Base Population:</b>		<b>(40,001-45,000)</b>					
<b>Aerobic Exercise</b>	<b>Average Particip.</b>	<b>Projected Participants</b>	<b>Desired Times / Wk.</b>	<b>Desired Contact Hrs.</b>	<b>Max. SF/Person</b>	<b>Stations in Module</b>	<b>Available Contact Hrs.</b>
<b>20,250 SF</b>							
Aerobic Exercising	11.4%	3783	x 3 hrs/wk	11350 hrs/wk	50 SF/user	405 stas.	
Step Aerobics	3.0%	1005	x 3 hrs/wk	3016 hrs/wk	50 SF/user	405 stas.	
Calisthenics	5.7%	1889	x 3 hrs/wk	5667 hrs/wk	50 SF/user	405 stas.	
<b>TOTALS</b>		<b>6677</b>		<b>20032 hrs/wk</b>	<b>50 SF/user</b>	<b>405 stas.</b>	<b>40500hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>90%</b>	<b>of Stations in Use</b>				<b>365 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>55%</b>	<b>of Hours of Operation =</b>		<b>55 hrs/wk</b>	<b>x</b>	<b>365 stas. =</b>	<b>20048hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>20048hrs/wk</b>	<b>minus</b>	<b>20032 hrs/wk =</b>	<b>15hrs/wk</b>

<b>Non-Structured Exercise</b>	<b>Average Particip.</b>	<b>Projected Participants</b>	<b>Desired Times / Wk.</b>	<b>Desired Contact Hrs.</b>	<b>Max. SF/Person</b>	<b>Stations in Module</b>	<b>Available Contact Hrs.</b>
<b>11,250 SF</b>							
Martial Arts	3.0%	984	x 2 hrs/wk	1969 hrs/wk	125 SF/user	90 stas.	
Kick Boxing	2.2%	716	x 2 hrs/wk	1432 hrs/wk	125 SF/user	90 stas.	
<b>TOTALS</b>		<b>1700</b>		<b>3400.6 hrs/wk</b>	<b>125 SF/user</b>	<b>90 stas.</b>	<b>9000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>72 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation =</b>		<b>50 hrs/wk</b>	<b>x</b>	<b>72 stas. =</b>	<b>3600hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>3600hrs/wk</b>	<b>minus</b>	<b>3400.6 hrs/wk =</b>	<b>199hrs/wk</b>

<b>Fitness Module (Weight/Cardio)</b>	<b>Average Particip.</b>	<b>Projected Participants</b>	<b>Desired Times / Wk.</b>	<b>Desired Contact Hrs.</b>	<b>Max. SF/Person</b>	<b>Stations in Module</b>	<b>Available Contact Hrs.</b>
<b>51,750 SF</b>							
Exercising with Equipment	24.5%	8158	x 3 hrs/wk	24473 hrs/wk	56 SF/user	927 stas.	
<b>TOTALS</b>		<b>8158</b>		<b>24473 hrs/wk</b>	<b>56 SF/user</b>	<b>927 stas.</b>	<b>92700hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>742 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation =</b>		<b>90 hrs/wk</b>	<b>x</b>	<b>742 stas. =</b>	<b>66744hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>66744hrs/wk</b>	<b>minus</b>	<b>24473 hrs/wk =</b>	<b>42271hrs/wk</b>

<b>Fitness Module (Weight/Cardio)</b>	<b>LNS Particip.</b>	<b>Projected Participants</b>	<b>Desired Times / Wk.</b>	<b>Desired Contact Hrs.</b>	<b>Max. SF/Person</b>	<b>Stations in Module</b>	<b>Available Contact Hrs.</b>
<b>51,750 SF</b>							
Exercising with Equipment	65.0%	21607	x 3 hrs/wk	64820 hrs/wk	56 SF/user	927 stas.	
<b>TOTALS</b>		<b>21607</b>		<b>64820 hrs/wk</b>	<b>56 SF/user</b>	<b>927 stas.</b>	<b>92700hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>742 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation =</b>		<b>90 hrs/wk</b>	<b>x</b>	<b>742 stas. =</b>	<b>66744hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>66744hrs/wk</b>	<b>minus</b>	<b>64820 hrs/wk =</b>	<b>1924hrs/wk</b>

<b>Gymnasium Module</b>	<b>Average Particip.</b>	<b>Projected Participants</b>	<b>Desired Times / Wk.</b>	<b>Desired Contact Hrs.</b>	<b>Max. SF/Person</b>	<b>Stations in Module</b>	<b>Available Contact Hrs.</b>	
<b>90,600 SF</b>								
Court Size is 50 x 94 for a total playing area of:							51,700 SF	11 court/s
Volleyball	6.4%	2142	x 3 hrs/wk	6426 hrs/wk	392 SF/user	176 players		
Basketball	18.3%	6095	x 3 hrs/wk	18285 hrs/wk	470 SF/user	154 players		
<b>TOTALS (Average for SF/Per and Stations)</b>		<b>8237</b>		<b>24711 hrs/wk</b>	<b>431 SF/user</b>	<b>165 players</b>	<b>16500hrs/wk</b>	
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>				<b>165 players</b>		
<b>PEAK UTILIZATION RATE</b>	<b>60%</b>	<b>of Hours of Operation =</b>		<b>60 hrs/wk</b>	<b>x</b>	<b>165 players =</b>	<b>9900hrs/wk</b>	
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>9900hrs/wk</b>	<b>minus</b>	<b>24711 hrs/wk =</b>	<b>-14811hrs/wk</b>	

Note: VB assumes 12 players + 4 rotating players for each court. BB assumes 10 players + 4 waiting to rotate in for each court.

<b>Racquetball Courts</b>	<b>Average Particip.</b>	<b>Projected Participants</b>	<b>Desired Times / Wk.</b>	<b>Desired Contact Hrs.</b>	<b>Max. SF/Person</b>	<b>Stations in Module</b>	<b>Available Contact Hrs.</b>
<b>7,650 SF</b>							
Racquetball	3.1%	1036	x 2 hrs/wk	2073 hrs/wk	212.5 SF/user	36 occup.	
<b>TOTALS</b>		<b>1036</b>		<b>2073 hrs/wk</b>	<b>212.5 SF/user</b>	<b>36 occup.</b>	<b>3600hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>				<b>36 occup.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation =</b>		<b>50 hrs/wk</b>	<b>x</b>	<b>36 occup. =</b>	<b>1800hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>1800hrs/wk</b>	<b>minus</b>	<b>2073 hrs/wk =</b>	<b>-273hrs/wk</b>

<b>Jogging Track</b>	<b>Average Particip.</b>	<b>Projected Participants</b>	<b>Desired Times / Wk.</b>	<b>Desired Contact Hrs.</b>	<b>Max. SF/Person</b>	<b>Stations in Module</b>	<b>Available Contact Hrs.</b>
<b>6,400 SF</b>							
Running / Jogging	14.6%	4869	x 2 hrs/wk	9737 hrs/wk		150 occup.	
Exercise Walking	28.8%	9563	x 2 hrs/wk	19127 hrs/wk		150 occup.	
<b>TOTALS</b>		<b>14432</b>		<b>28864 hrs/wk</b>		<b>150 occup.</b>	<b>15000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>60%</b>	<b>of Stations in Use</b>				<b>90 occup.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>80%</b>	<b>of Hours of Operation =</b>		<b>80 hrs/wk</b>	<b>x</b>	<b>90 occup. =</b>	<b>7200hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>7200hrs/wk</b>	<b>minus</b>	<b>28864 hrs/wk =</b>	<b>-21664hrs/wk</b>

**Maximum authorized population of 50,000 - 100 hours of operation per week:**

**Base Population:**

(45,001-50,000)

Aerobic Exercise	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>22,500 SF</b>							
Aerobic Exercising	11.4%	4204	x 3 hrs/wk	12611 hrs/wk	50 SF/user	450 stas.	
Step Aerobics	3.0%	1117	x 3 hrs/wk	3351 hrs/wk	50 SF/user	450 stas.	
Calisthenics	5.7%	2099	x 3 hrs/wk	6296 hrs/wk	50 SF/user	450 stas.	
<b>TOTALS</b>		<b>7419</b>		<b>22258 hrs/wk</b>	<b>50 SF/user</b>	<b>450 stas.</b>	<b>45000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>90%</b>	<b>of Stations in Use</b>				<b>405 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>55%</b>	<b>of Hours of Operation =</b>		<b>55 hrs/wk</b>	<b>x</b>	<b>405 stas.</b>	<b>= 22275hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>22275hrs/wk</b>	<b>minus</b>	<b>22258 hrs/wk</b>	<b>= 17hrs/wk</b>

Non-Structured Exercise	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>12500 SF</b>							
Martial Arts	3.0%	1094	x 2 hrs/wk	2187 hrs/wk	125 SF/user	100 stas.	
Kick Boxing	2.2%	796	x 2 hrs/wk	1591 hrs/wk	125 SF/user	100 stas.	
<b>TOTALS</b>		<b>1889</b>		<b>3778.45 hrs/wk</b>	<b>125 SF/user</b>	<b>100 stas.</b>	<b>10000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>80 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation =</b>		<b>50 hrs/wk</b>	<b>x</b>	<b>80 stas.</b>	<b>= 4000hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>4000hrs/wk</b>	<b>minus</b>	<b>3778.4 hrs/wk</b>	<b>= 222hrs/wk</b>

Fitness Module (Weight/Cardio)	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>57,500 SF</b>							
Exercising with Equipment	24.5%	9064	x 3 hrs/wk	27192 hrs/wk	56 SF/user	1030 stas.	
<b>TOTALS</b>		<b>9064</b>		<b>27192 hrs/wk</b>	<b>56 SF/user</b>	<b>1030 stas.</b>	<b>103000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>824 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation =</b>		<b>90 hrs/wk</b>	<b>x</b>	<b>824 stas.</b>	<b>= 74160hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>74160hrs/wk</b>	<b>minus</b>	<b>27192 hrs/wk</b>	<b>= 46968hrs/wk</b>

Fitness Module (Weight/Cardio)	LNS Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>57,500 SF</b>							
Exercising with Equipment	65.0%	24007	x 3 hrs/wk	72022 hrs/wk	56 SF/user	1030 stas.	
<b>TOTALS</b>		<b>24007</b>		<b>72022 hrs/wk</b>	<b>56 SF/user</b>	<b>1030 stas.</b>	<b>103000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>824 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation =</b>		<b>90 hrs/wk</b>	<b>x</b>	<b>824 stas.</b>	<b>= 74160hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>74160hrs/wk</b>	<b>minus</b>	<b>72022 hrs/wk</b>	<b>= 2138hrs/wk</b>

Gymnasium Module	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>99,000 SF</b>							
Court Size is 50 x 94 for a total playing area of:							
Volleyball	6.4%	2380	x 3 hrs/wk	7140 hrs/wk	392 SF/user	192 players	
Basketball	18.3%	6772	x 3 hrs/wk	20317 hrs/wk	470 SF/user	168 players	
<b>TOTALS (Average for SF/Per and Stations)</b>		<b>9152</b>		<b>27457 hrs/wk</b>	<b>431 SF/user</b>	<b>180 players</b>	<b>18000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>				<b>180 players</b>	
<b>PEAK UTILIZATION RATE</b>	<b>60%</b>	<b>of Hours of Operation =</b>		<b>60 hrs/wk</b>	<b>x</b>	<b>180 players</b>	<b>= 10800hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>10800hrs/wk</b>	<b>minus</b>	<b>27457 hrs/wk</b>	<b>= -16657hrs/wk</b>

Note: VB assumes 12 players + 4 rotating players for each court. BB assumes 10 players + 4 waiting to rotate in for each court.

Racquetball Courts	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>8,500 SF</b>							
Racquetball	3.1%	1152	x 2 hrs/wk	2303 hrs/wk	212.5 SF/user	40 occup.	
<b>TOTALS</b>		<b>1152</b>		<b>2303 hrs/wk</b>	<b>212.5 SF/user</b>	<b>40 occup.</b>	<b>4000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>				<b>40 occup.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation =</b>		<b>50 hrs/wk</b>	<b>x</b>	<b>40 occup.</b>	<b>= 2000hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>2000hrs/wk</b>	<b>minus</b>	<b>2303 hrs/wk</b>	<b>= -303hrs/wk</b>

Jogging Track	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>6,400 SF</b>							
Running / Jogging	14.6%	5410	x 2 hrs/wk	10819 hrs/wk		150 occup.	
Exercise Walking	28.8%	10626	x 2 hrs/wk	21252 hrs/wk		150 occup.	
<b>TOTALS</b>		<b>16036</b>		<b>32071 hrs/wk</b>		<b>150 occup.</b>	<b>15000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>60%</b>	<b>of Stations in Use</b>				<b>90 occup.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>80%</b>	<b>of Hours of Operation =</b>		<b>80 hrs/wk</b>	<b>x</b>	<b>90 occup.</b>	<b>= 7200hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>7200hrs/wk</b>	<b>minus</b>	<b>32071 hrs/wk</b>	<b>= -24871hrs/wk</b>

**Maximum authorized population of 55,000 - 100 hours of operation per week:**

<b>Base Population:</b>		<b>(50,001-55,000)</b>					
<b>Aerobic Exercise</b>	<b>Average Particip.</b>	<b>Projected Participants</b>	<b>Desired Times / Wk.</b>	<b>Desired Contact Hrs.</b>	<b>Max. SF/Person</b>	<b>Stations in Module</b>	<b>Available Contact Hrs.</b>
<b>24,750 SF</b>							
Aerobic Exercising	11.4%	4624	x 3 hrs/wk	13872 hrs/wk	50 SF/user	495 stas.	
Step Aerobics	3.0%	1229	x 3 hrs/wk	3686 hrs/wk	50 SF/user	495 stas.	
Calisthenics	5.7%	2309	x 3 hrs/wk	6926 hrs/wk	50 SF/user	495 stas.	
<b>TOTALS</b>		<b>8161</b>		<b>24484 hrs/wk</b>	<b>50 SF/user</b>	<b>495 stas.</b>	<b>49500hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>90%</b>	<b>of Stations in Use</b>					<b>446 stas.</b>
<b>PEAK UTILIZATION RATE</b>	<b>55%</b>	<b>of Hours of Operation</b>		<b>= 55 hrs/wk</b>	<b>x</b>	<b>446 stas.</b>	<b>= 24503hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>24503hrs/wk</b>	<b>minus</b>	<b>24484 hrs/wk</b>	<b>= 19hrs/wk</b>

<b>Non-Structured Exercise</b>	<b>Average Particip.</b>	<b>Projected Participants</b>	<b>Desired Times / Wk.</b>	<b>Desired Contact Hrs.</b>	<b>Max. SF/Person</b>	<b>Stations in Module</b>	<b>Available Contact Hrs.</b>
<b>13,750 SF</b>							
Martial Arts	3.0%	1203	x 2 hrs/wk	2406 hrs/wk	125 SF/user	110 stas.	
Kick Boxing	2.2%	875	x 2 hrs/wk	1750 hrs/wk	125 SF/user	110 stas.	
<b>TOTALS</b>		<b>2078</b>		<b>4156.29 hrs/wk</b>	<b>125 SF/user</b>	<b>110 stas.</b>	<b>11000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>					<b>88 stas.</b>
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation</b>		<b>= 50 hrs/wk</b>	<b>x</b>	<b>88 stas.</b>	<b>= 4400hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>4400hrs/wk</b>	<b>minus</b>	<b>4156.3 hrs/wk</b>	<b>= 244hrs/wk</b>

<b>Fitness Module (Weight/Cardio)</b>	<b>Average Particip.</b>	<b>Projected Participants</b>	<b>Desired Times / Wk.</b>	<b>Desired Contact Hrs.</b>	<b>Max. SF/Person</b>	<b>Stations in Module</b>	<b>Available Contact Hrs.</b>
<b>63,250 SF</b>							
Exercising with Equipment	24.5%	9970	x 3 hrs/wk	29911 hrs/wk	56 SF/user	1133 stas.	
<b>TOTALS</b>		<b>9970</b>		<b>29911 hrs/wk</b>	<b>56 SF/user</b>	<b>1133 stas.</b>	<b>113300hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>					<b>906 stas.</b>
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation</b>		<b>= 90 hrs/wk</b>	<b>x</b>	<b>906 stas.</b>	<b>= 81576hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>81576hrs/wk</b>	<b>minus</b>	<b>29911 hrs/wk</b>	<b>= 51665hrs/wk</b>

<b>Fitness Module (Weight/Cardio)</b>	<b>LNS Particip.</b>	<b>Projected Participants</b>	<b>Desired Times / Wk.</b>	<b>Desired Contact Hrs.</b>	<b>Max. SF/Person</b>	<b>Stations in Module</b>	<b>Available Contact Hrs.</b>
<b>63,250 SF</b>							
Exercising with Equipment	65.0%	26408	x 3 hrs/wk	79224 hrs/wk	56 SF/user	1133 stas.	
<b>TOTALS</b>		<b>26408</b>		<b>79224 hrs/wk</b>	<b>56 SF/user</b>	<b>1133 stas.</b>	<b>113300hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>					<b>906 stas.</b>
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation</b>		<b>= 90 hrs/wk</b>	<b>x</b>	<b>906 stas.</b>	<b>= 81576hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>81576hrs/wk</b>	<b>minus</b>	<b>79224 hrs/wk</b>	<b>= 2352hrs/wk</b>

<b>Gymnasium Module</b>	<b>Average Particip.</b>	<b>Projected Participants</b>	<b>Desired Times / Wk.</b>	<b>Desired Contact Hrs.</b>	<b>Max. SF/Person</b>	<b>Stations in Module</b>	<b>Available Contact Hrs.</b>
<b>107,400 SF</b>							
Court Size is 50 x 94 for a total playing area of:						61,100 SF	13 court/s
Volleyball	6.4%	2618	x 3 hrs/wk	7854 hrs/wk	392 SF/user	208 players	
Basketball	18.3%	7449	x 3 hrs/wk	22348 hrs/wk	470 SF/user	182 players	
<b>TOTALS (Average for SF/Per and Stations)</b>		<b>10068</b>		<b>30203 hrs/wk</b>	<b>431 SF/user</b>	<b>195 players</b>	<b>19500hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>					<b>195 players</b>
<b>PEAK UTILIZATION RATE</b>	<b>60%</b>	<b>of Hours of Operation</b>		<b>= 60 hrs/wk</b>	<b>x</b>	<b>195 players</b>	<b>= 11700hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>11700hrs/wk</b>	<b>minus</b>	<b>30203 hrs/wk</b>	<b>= -18503hrs/wk</b>

Note: VB assumes 12 players + 4 rotating players for each court. BB assumes 10 players + 4 waiting to rotate in for each court.

<b>Racquetball Courts</b>	<b>Average Particip.</b>	<b>Projected Participants</b>	<b>Desired Times / Wk.</b>	<b>Desired Contact Hrs.</b>	<b>Max. SF/Person</b>	<b>Stations in Module</b>	<b>Available Contact Hrs.</b>
<b>9,350 SF</b>							
Racquetball	3.1%	1267	x 2 hrs/wk	2534 hrs/wk	212.5 SF/user	44 occup.	
<b>TOTALS</b>		<b>1267</b>		<b>2534 hrs/wk</b>	<b>212.5 SF/user</b>	<b>44 occup.</b>	<b>4400hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>					<b>44 occup.</b>
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation</b>		<b>= 50 hrs/wk</b>	<b>x</b>	<b>44 occup.</b>	<b>= 2200hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>2200hrs/wk</b>	<b>minus</b>	<b>2534 hrs/wk</b>	<b>= -334hrs/wk</b>

<b>Jogging Track</b>	<b>Average Particip.</b>	<b>Projected Participants</b>	<b>Desired Times / Wk.</b>	<b>Desired Contact Hrs.</b>	<b>Max. SF/Person</b>	<b>Stations in Module</b>	<b>Available Contact Hrs.</b>
<b>6,400 SF</b>							
Running / Jogging	14.6%	5951	x 2 hrs/wk	11901 hrs/wk		150 occup.	
Exercise Walking	28.8%	11689	x 2 hrs/wk	23377 hrs/wk		150 occup.	
<b>TOTALS</b>		<b>17639</b>		<b>35278 hrs/wk</b>		<b>150 occup.</b>	<b>15000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>60%</b>	<b>of Stations in Use</b>					<b>90 occup.</b>
<b>PEAK UTILIZATION RATE</b>	<b>80%</b>	<b>of Hours of Operation</b>		<b>= 80 hrs/wk</b>	<b>x</b>	<b>90 occup.</b>	<b>= 7200hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>7200hrs/wk</b>	<b>minus</b>	<b>35278 hrs/wk</b>	<b>= -28078hrs/wk</b>

**Maximum authorized population of 60,000 - 100 hours of operation per week:**

**Base Population:**

(55,001-60,000)

Aerobic Exercise	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>27,000 SF</b>							
Aerobic Exercising	11.4%	5044	x 3 hrs/wk	15133 hrs/wk	50 SF/user	540 stas.	
Step Aerobics	3.0%	1340	x 3 hrs/wk	4021 hrs/wk	50 SF/user	540 stas.	
Calisthenics	5.7%	2519	x 3 hrs/wk	7556 hrs/wk	50 SF/user	540 stas.	
<b>TOTALS</b>		<b>8903</b>		<b>26710 hrs/wk</b>	<b>50 SF/user</b>	<b>540 stas.</b>	<b>54000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>90%</b>	<b>of Stations in Use</b>				<b>486 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>55%</b>	<b>of Hours of Operation =</b>		<b>55 hrs/wk</b>	<b>x</b>	<b>486 stas.</b>	<b>= 26730hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>26730hrs/wk</b>	<b>minus</b>	<b>26709.74 hrs/wk =</b>	<b>20hrs/wk</b>

Non-Structured Exercise	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>15,000 SF</b>							
Marital Arts	3.0%	1312	x 2 hrs/wk	2625 hrs/wk	125 SF/user	120 stas.	
Kick Boxing	2.2%	955	x 2 hrs/wk	1909 hrs/wk	125 SF/user	120 stas.	
<b>TOTALS</b>		<b>2267</b>		<b>4534.135 hrs/wk</b>	<b>125 SF/user</b>	<b>120 stas.</b>	<b>12000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>96 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation =</b>		<b>50 hrs/wk</b>	<b>x</b>	<b>96 stas.</b>	<b>= 4800hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>4800hrs/wk</b>	<b>minus</b>	<b>4534.135 hrs/wk =</b>	<b>266hrs/wk</b>

Fitness Module (Weight/Cardio)	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>69,000 SF</b>							
Exercising with Equipment	24.5%	10877	x 3 hrs/wk	32630 hrs/wk	56 SF/user	1236 stas.	
<b>TOTALS</b>		<b>10877</b>		<b>32630 hrs/wk</b>	<b>56 SF/user</b>	<b>1236 stas.</b>	<b>123600hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>989 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation =</b>		<b>90 hrs/wk</b>	<b>x</b>	<b>989 stas.</b>	<b>= 88992hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>88992hrs/wk</b>	<b>minus</b>	<b>32630 hrs/wk =</b>	<b>56362hrs/wk</b>

Fitness Module (Weight/Cardio)	LNS Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>69,000 SF</b>							
Exercising with Equipment	65.0%	28809	x 3 hrs/wk	86427 hrs/wk	56 SF/user	1236 stas.	
<b>TOTALS</b>		<b>28809</b>		<b>86427 hrs/wk</b>	<b>56 SF/user</b>	<b>1236 stas.</b>	<b>123600hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>989 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation =</b>		<b>90 hrs/wk</b>	<b>x</b>	<b>989 stas.</b>	<b>= 88992hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>88992hrs/wk</b>	<b>minus</b>	<b>86427 hrs/wk =</b>	<b>2565hrs/wk</b>

Gymnasium Module	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>115,800 SF</b>							
Court Size is 50 x 94 for a total playing area of:							
Volleyball	6.4%	2856	x 3 hrs/wk	8568 hrs/wk	392 SF/user	224 players	
Basketball	18.3%	8127	x 3 hrs/wk	24380 hrs/wk	470 SF/user	196 players	
<b>TOTALS (Average for SF/Per and Stations)</b>		<b>10983</b>		<b>32948 hrs/wk</b>	<b>431 SF/user</b>	<b>210 players</b>	<b>21000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>				<b>210 players</b>	
<b>PEAK UTILIZATION RATE</b>	<b>60%</b>	<b>of Hours of Operation =</b>		<b>60 hrs/wk</b>	<b>x</b>	<b>210 players</b>	<b>= 12600hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>12600hrs/wk</b>	<b>minus</b>	<b>32948 hrs/wk =</b>	<b>-20348hrs/wk</b>

Note: VB assumes 12 players + 4 rotating players for each court. BB assumes 10 players + 4 waiting to rotate in for each court.

Racquetball Courts	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>10,200 SF</b>							
Racquetball	3.1%	1382	x 2 hrs/wk	2764 hrs/wk	212.5 SF/user	48 occup.	
<b>TOTALS</b>		<b>1382</b>		<b>2764 hrs/wk</b>	<b>212.5 SF/user</b>	<b>48 occup.</b>	<b>4800hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>				<b>48 occup.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation =</b>		<b>50 hrs/wk</b>	<b>x</b>	<b>48 occup.</b>	<b>= 2400hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>2400hrs/wk</b>	<b>minus</b>	<b>2764 hrs/wk =</b>	<b>-364hrs/wk</b>

Jogging Track	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>6,400 SF</b>							
Running / Jogging	14.6%	6492	x 2 hrs/wk	12983 hrs/wk		150 occup.	
Exercise Walking	28.8%	12751	x 2 hrs/wk	25502 hrs/wk		150 occup.	
<b>TOTALS</b>		<b>19243</b>		<b>38485 hrs/wk</b>		<b>150 occup.</b>	<b>15000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>60%</b>	<b>of Stations in Use</b>				<b>90 occup.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>80%</b>	<b>of Hours of Operation =</b>		<b>80 hrs/wk</b>	<b>x</b>	<b>90 occup.</b>	<b>= 7200hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>7200hrs/wk</b>	<b>minus</b>	<b>38485 hrs/wk =</b>	<b>-31285hrs/wk</b>

**Maximum authorized population of 65,000 - 100 hours of operation per week:**

**Base Population:**

(60,001-65,000)

Aerobic Exercise	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>29,250 SF</b>							
Aerobic Exercising	11.4%	5465	x 3 hrs/wk	16394 hrs/wk	50 SF/user	585 stas.	
Step Aerobics	3.0%	1452	x 3 hrs/wk	4356 hrs/wk	50 SF/user	585 stas.	
Calisthenics	5.7%	2728	x 3 hrs/wk	8185 hrs/wk	50 SF/user	585 stas.	
<b>TOTALS</b>		<b>9645</b>		<b>28936 hrs/wk</b>	<b>50 SF/user</b>	<b>585 stas.</b>	<b>58500hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>90%</b>	<b>of Stations in Use</b>				<b>527 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>55%</b>	<b>of Hours of Operation =</b>		<b>55 hrs/wk</b>	<b>x</b>	<b>527 stas.</b>	<b>= 28958hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>28958hrs/wk</b>	<b>minus</b>	<b>28935.5 hrs/wk</b>	<b>= 22hrs/wk</b>

Non-Structured Exercise	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>16,250 SF</b>							
Martial Arts	3.0%	1422	x 2 hrs/wk	2843 hrs/wk	125 SF/user	130 stas.	
Kick Boxing	2.2%	1034	x 2 hrs/wk	2068 hrs/wk	125 SF/user	130 stas.	
<b>TOTALS</b>		<b>2456</b>		<b>4911.98 hrs/wk</b>	<b>125 SF/user</b>	<b>130 stas.</b>	<b>13000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>104 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation =</b>		<b>50 hrs/wk</b>	<b>x</b>	<b>104 stas.</b>	<b>= 5200hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>5200hrs/wk</b>	<b>minus</b>	<b>4911.98 hrs/wk</b>	<b>= 288hrs/wk</b>

Fitness Module (Weight/Cardio)	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>74,750 SF</b>							
Exercising with Equipment	24.5%	11783	x 3 hrs/wk	35349 hrs/wk	56 SF/user	1339 stas.	
<b>TOTALS</b>		<b>11783</b>		<b>35349 hrs/wk</b>	<b>56 SF/user</b>	<b>1339 stas.</b>	<b>133900hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>1071 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation =</b>		<b>90 hrs/wk</b>	<b>x</b>	<b>1071 stas.</b>	<b>= 96408hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>96408hrs/wk</b>	<b>minus</b>	<b>35349 hrs/wk</b>	<b>= 61059hrs/wk</b>

Fitness Module (Weight/Cardio)	LNS Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>74,750 SF</b>							
Exercising with Equipment	65.0%	31210	x 3 hrs/wk	93629 hrs/wk	56 SF/user	1339 stas.	
<b>TOTALS</b>		<b>31210</b>		<b>93629 hrs/wk</b>	<b>56 SF/user</b>	<b>1339 stas.</b>	<b>133900hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>80%</b>	<b>of Stations in Use</b>				<b>1071 stas.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>90%</b>	<b>of Hours of Operation =</b>		<b>90 hrs/wk</b>	<b>x</b>	<b>1071 stas.</b>	<b>= 96408hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>96408hrs/wk</b>	<b>minus</b>	<b>93629 hrs/wk</b>	<b>= 2779hrs/wk</b>

Gymnasium Module	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>124,200 SF</b>							
Court Size is 50 x 94 for a total playing area of:							
Volleyball	6.4%	3094	x 3 hrs/wk	9282 hrs/wk	392 SF/user	240 players	
Basketball	18.3%	8804	x 3 hrs/wk	26412 hrs/wk	470 SF/user	210 players	
<b>TOTALS (Average for SF/Per and Stations)</b>		<b>11898</b>		<b>35694 hrs/wk</b>	<b>431 SF/user</b>	<b>225 players</b>	<b>22500hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>				<b>225 players</b>	
<b>PEAK UTILIZATION RATE</b>	<b>60%</b>	<b>of Hours of Operation =</b>		<b>60 hrs/wk</b>	<b>x</b>	<b>225 players</b>	<b>= 13500hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>13500hrs/wk</b>	<b>minus</b>	<b>35694 hrs/wk</b>	<b>= -22194hrs/wk</b>

Note: VB assumes 12 players + 4 rotating players for each court. BB assumes 10 players + 4 waiting to rotate in for each court.

Racquetball Courts	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>11,050 SF</b>							
Racquetball	3.1%	1497	x 2 hrs/wk	2994 hrs/wk	212.5 SF/user	52 occup.	
<b>TOTALS</b>		<b>1497</b>		<b>2994 hrs/wk</b>	<b>212.5 SF/user</b>	<b>52 occup.</b>	<b>5200hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>100%</b>	<b>of Stations in Use</b>				<b>52 occup.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>50%</b>	<b>of Hours of Operation =</b>		<b>50 hrs/wk</b>	<b>x</b>	<b>52 occup.</b>	<b>= 2600hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>2600hrs/wk</b>	<b>minus</b>	<b>2994 hrs/wk</b>	<b>= -394hrs/wk</b>

Jogging Track	Average Particip.	Projected Participants	Desired Times / Wk.	Desired Contact Hrs.	Max. SF/Person	Stations in Module	Available Contact Hrs.
<b>6,400 SF</b>							
Running / Jogging	14.6%	7033	x 2 hrs/wk	14065 hrs/wk		150 occup.	
Exercise Walking	28.8%	13814	x 2 hrs/wk	27627 hrs/wk		150 occup.	
<b>TOTALS</b>		<b>20846</b>		<b>41693 hrs/wk</b>		<b>150 occup.</b>	<b>15000hrs/wk</b>
<b>PEAK ATTENDANCE</b>	<b>60%</b>	<b>of Stations in Use</b>				<b>90 occup.</b>	
<b>PEAK UTILIZATION RATE</b>	<b>80%</b>	<b>of Hours of Operation =</b>		<b>80 hrs/wk</b>	<b>x</b>	<b>90 occup.</b>	<b>= 7200hrs/wk</b>
<b>AVAILABLE PEAK CONTACT HOURS FOR PROGRAMMING</b>				<b>7200hrs/wk</b>	<b>minus</b>	<b>41693 hrs/wk</b>	<b>= -34493hrs/wk</b>

SAMPLE

# NATATORIUMS

## 1.0 GENERAL

### 1.1. INSTALLATION REQUIREMENTS

At least one indoor pool on each Army installation must have an area with a minimum depth of 11'-6" and be provided with at least one- 1 m board to accommodate training requirements.

### 1.2. Not UsedPROJECT REQUIREMENTS

The table below indicates the requirements for the natatorium for this project. As shown in 1.2-1 Table: Project Requirements, various options exist within the natatorium such as size of pool, lap pool or free-form multi-functional pool, inclusion of whirlpool, and diving/depth requirement. Requirements are indicated by an "X" in the left column.

1.2-1 Table: Project Requirements

POOL TYPE:	
<PT1>X</PT1>	25-yd x 17.5-yd lap pool (6 lanes)
<PT2>X</PT2>	25-m x 25-yd lap pool
<PT3>X</PT3>	50-m x 25-yd lap pool
<PT4>X</PT4>	Pool with 6230-sq. ft. of water surface area with 3-4 25-yd lap lanes, and a free-form area with zero depth entry and play features.
<PT5>X</PT5>	Pool with 12,460-sq. ft. of water surface area with 4-6 25-yd lap lanes, and a free-form area with zero depth entry and play features.
POOL OPTIONS:	
<PO1>X</PO1>	Movable bulk head provided in a 50-m x 25-yd pool
<PO2>X</PO2>	Whirlpool included in deck area
<PO3>X</PO3>	Separate diving tank (40' x 40' x minimum 13' deep) to include 2-1 m boards, and 1-3 m board/platform
<PO4>X</PO4>	Diving area included in main pool, but separate from lap lanes (such as an "L-shaped" pool. Diving area designed to appropriate safety requirements.
<PO5>X</PO5>	Diving area included in main pool at one end of the lap lanes. Diving area designed to appropriate safety requirements.
<PO6>X</PO6>	Depth to minimum of 11'-6" feet for programming flexibility
<PO7>X</PO7>	Depth to maximum of 6 feet
<PO8>X</PO8>	Separate 20 x 50 pool for therapy and training
<PO9>X</PO9>	Pool to be used for competitive swimming events (Pool then must comply with USA Swimming regulations)
<PO10>X</PO10>	Other: «POOL_OPTION_OTHER»

### 1.3. FUNCTIONS WITHIN THE NATATORIUM

A natatorium contains the following functions. The net areas for these functions are shown in 1.3-1 Table: *Functional Areas*.

- Indoor Pool
- Associated deck around the pool
- Seating area, which may include bleachers if desired and programmed by the installation.
- Pool Office
- Staff Room/First Aid Station
- Storage
- Mechanical Room
- Chemical Storage
- Pool Equipment
- Showers/lockers/toilets, which should be combined with the similar area for the Physical Fitness Facility. Ensure this area is designed to accommodate wet bathers in the wet areas only, and ensure showers are provided for entry into pool area. If separate showers/locker/toilet areas are provided for the natatorium, they must comply with the requirements for the same spaces in the Physical Fitness Facility Standards (such as individual shower stalls with dressing booths, etc.)
- Family Changing Rooms. These must be provided for natatoriums, and are not typically provided in a Physical Fitness Facility
- Miscellaneous area (circulation, building structure, etc.)

1.3-1 Table: *Functional Areas*

Function/Space	Net Area 25 yd x 6 lane pool	Net Area 25 m x 25 yd pool	Net Area 50 m x 25 yd pool
Pool Surface Area	3964	6229	12,420
Pool and Deck Area	7791	10,986	18,653
Seating Area	199	312	621
Pool Office	100	120	144
Staff Room/First Aid	200	240	288
Storage	199	312	621
Showers/Lockers/Toilets to include Family Changing Rm	1790	2015	2800
Pool Equipment	300	350	500
Chemical Storage	40	40	60
Mechanical Room	850	1151	1895
Miscellaneous (circulation, structure, etc.)	1275	1726	2843
<b>TOTAL:</b>	<b>12,744 SF</b>	<b>17,252 SF</b>	<b>28,425 SF</b>

#### 1.4. References

- (i) ASME/ANSI A112.19.9
- (ii) ASME/ANSI A112.19.17
- (iii) ASTM F2387

- (iv) Consumer Product Safety Act
- (v) FINA
- (vi) USA Swimming

#### 1.5. Conflicts in Criteria

Where industry standards, to include the American College of Sports Medicine (ACSM) Health/Fitness Facility Standards and Guidelines, provide guidance which conflicts with the information provided below, the designer shall comply with the more stringent requirements.

## 2.0 FACILITY REQUIREMENTS

Structures and finishes must be capable of resisting corrosion from moisture and chemical vapor, but many structural systems will fulfill this requirement. Natatorium structures pose opportunities for interesting geometry, lighting, and material use. Both interior and exterior walls should be masonry construction with brick, composite material siding, metal panels, stucco, or similar materials that are architecturally compatible with the installation specific guidelines. All surfaces shall be moisture and mildew resistant and easily cleanable. Dressing rooms, shower rooms, drying areas, and toilets shall be considered wet areas. All walls and floors in wet areas shall be impervious to water and able to be hosed down for cleaning. Wet area floors shall be non-slip, pitched to floor drains, and shall have coved bases at walls and equipment bases. Consider the need to provide elevated concrete pads for lockers and other equipment to facilitate cleaning and help eliminate the corrosive effects of frequent exposure to water.

### 2.1. Natatorium Design

The basic challenge for enclosing pool areas is to economically span the required height and distance for pool and deck width with moisture resistant materials, such as concrete, galvanized steel, laminated wood, glass, and aluminum. Special care should be taken when enclosing existing outdoor pools because the existing slope of the deck away from the pool may cause problems with corrosion or standing water if adequate drainage and dehumidification is not provided.

The minimum pool ceiling height above the water surface for natatoriums is 19 feet, 9 inches for facilities with 1-meter diving boards. A minimum ceiling height of 26 feet, 4 inches is required for facilities with 3-meter diving boards. Natatoriums should not have deck-level windows in walls facing pool ends to prevent glare. Deck level windows at the side should be tinted.

The pool office and/or staff room must have direct visual access of the pool for control and for better communication during an emergency or other incident.

### 2.2. Provisions for people with disabilities

All aquatic facility functional areas shall be barrier-free and accessible to people with disabilities as required by law. Site, building, and pool designs should enable people with disabilities to act independently and enjoy the full range of programs provided. Level changes may be included, but must be accommodated by ramps suitable for wheelchair access, both indoors and outdoors. Accessible entry to pools may be accomplished by utilizing zero entry depth ramps with ADA-ABD compliant handrails or by lift and assistance equipment designed specifically for people with disabilities. The need for special equipment, such as transfer benches, crane lifts, or ramps into the pool shall be considered during the design process. Consider the need for specialized therapeutic training to support medical facilities or other installation-specific programs.

### 2.3. Interior Design

Interior surfaces, details, finishes, fixtures, and fittings should be carefully selected for resistance to wear, impact, and vandalism. Because of the high humidity associated with pools and showers, all materials selected shall be resistant to water and mildew. Utilize professional interior designers with experience in aquatic facility design. Interior design selections shall be based on consideration of anticipated use, maintenance characteristics, life cycle cost, fire protection, and other safety requirements.

#### 2.4. Interior Signage

Interior signage is important to support the functionality of the facility and for wayfinding. Use signs with words and graphic symbols, where appropriate. Interior signage shall comply with accessibility requirements for the visually impaired. Interior signage should be horizontal only and in upper and lower case text, except where specifically required to be in all capital letters according to ADA requirements.

#### 2.5. Interior Finishes

The safety and hygiene of customers shall be considered in every aspect of the design development. Floor and deck surfaces in wet areas must be slip resistant. Wall surfaces should be selected to minimize abrasions in case of accidents or stumbles by customers and staff. Coordinate material, finish, color, texture, and furniture selections to compliment the overall building design and image. Use colors, textures, and finish materials on the walls and floors to help define circulation patterns. Select surface materials and furnishings to express a warm, intimate, and relaxed atmosphere. Use local materials to the greatest extent practicable to reinforce the user's sense of place or region.

#### 2.6. Flooring

Utilize non-skid ceramic tile, concrete, or other skid resistant material for bathhouse or natatorium floors and in other administration areas. All floors shall have adequate slope and drains to prevent standing water.

#### 2.7. Interior Walls

Walls should be constructed with nonabrasive materials, like smooth block or brick. Walls may be painted CMU block, painted masonry, moisture resistant gypsum board, Portland cement plaster, or high strength gypsum plaster. Ceramic tile may be installed either full height or as a wainscot.

#### 2.8. Ceilings

Ceilings should utilize acoustic, moisture-resistant materials, like sealed wood, moisture resistant gypsum board, plaster, galvanized metal, or other factory finishes impervious to water and mildew.

#### 2.9. Acoustics

Acoustics must be considered in the design to minimize reverberation. Use of ceiling and/or wall mounted panels should be considered as long as the panels are appropriate for the humid environment, and will not require constant maintenance.

In accordance with the American College of Sports Medicine's "Health/Fitness Facility Standards and Guidelines, 2<sup>nd</sup> Edition", an indoor pool should have a STC rating of 45 to 55 and a measured reverberation time of 0.8 to 1.4 s. The recommended maximum background Noise Criterion (NC) level for an indoor pool is 35-40.

#### 2.10. Furniture, Fixtures, and Equipment

Choose interior furniture, fixtures, and equipment (FF&E) that is durable, comfortable, and attractive. Consider modular or systems furniture components that match for the office, staff break area, and training room. Check-in and concession counter fronts are high maintenance and require highly durable materials because of the wear and tear. Consider metal, solid surface composite materials, or stone for the front counter panels and counter tops. Provide corrosion resistant and graffiti resistant furniture and materials in dressing rooms.

#### 2.11. Ladders and Grab Rails

Steps and ladders shall be recessed or set into the pool wall. No ledges or projections are permitted under the water surface. Recessed ladders shall be provided in other areas. Grab rails and recessed steps are recommended over projecting ladders. Maximum spacing between grab rails shall be approximately 60 feet. Locate grab rails and recessed steps at both ends of the long walls near the corners for 25-meter pools. Intermediate grab rails shall be provided on 50-meter or uniquely shaped pools. Locate a ladder with grab rails

no more than 16 feet, 5 inches from a diving board or water slide to get users out of the water quickly. This enables users to essentially head right back toward the edge of the pool directly, so the next diver or slider can proceed safely. Position ladders so that swimmers don't have to cross the landing areas of diving boards and water slides if at all possible. This allows lifeguards to keep their focus at all times on the area around the board or slide by eliminating the need to track an exiting swimmer that has to leave the immediate area of the board or slide, which makes supervising the next diver or slider problematic.

#### 2.12. Depth Markings

Provide pool depth markings every 10 feet or less. Depth markers are required at each 2 feet increment (or less) of water depth, at maximum and minimum depths, at transitions between deep and shallow water, and at diving areas. Shallow pool areas 5 feet or less shall be labeled "NO DIVING." Depth markers shall be located on the pool deck beside the pool edge and on the vertical side of the pool wall or gutter system above the water line so they are visible from inside the pool. The figures shall be at least 4 inches high, in a color that contrasts with the background. Mark a black or dark blue line at least 4 inches wide on a sloping pool bottom wherever the depth reaches 5 feet.

#### 2.13. Competitive Swimming

The type of competitive swimming events to be hosted at an aquatic facility has a major impact on the planning of the facilities to be provided. Facility requirements and rules may vary depending upon the different institutions that may be desired to sanction competitive events. For example, lane bottom and target wall marking requirements are different for many of the major governing institutions that sanction major events. Consider the impact of specific institutional and host nation requirements if competitive swimming will be a part of the program requirements. Major swimming institutional organizations include:

- **AAU** – Amateur Athletic Union
- **FINA** – Federation Internationale de National
- **NCAA** – National Collegiate Athletic Association
- **NFSH** – National Federation of State High School Associations
- **USS** – USA Swimming

#### 2.14. Lane and Area Dividers

Lane and area dividers consist of a set of continuous floats strung on a cable or cord. They are attached at hoops anchored in the pool walls.

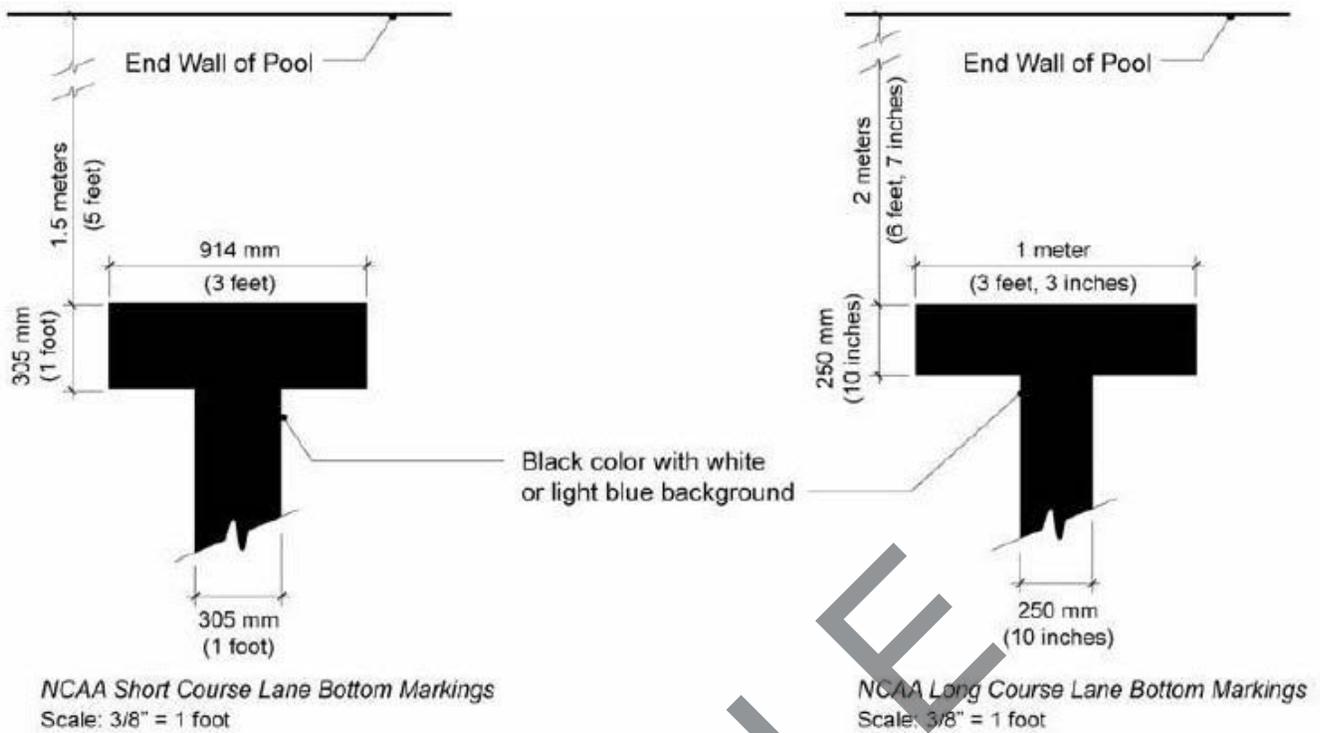
#### 2.15. Racing Lanes and Target Markings

Provide racing lane and target markings according to the appropriate governing entity that may be involved in competitive events (NCAA, FINA, etc.). Consider the need for a recall line (for backstroke events) suspended above the racing course at least 4 feet above the water surface. For a 25-meter course, it shall be located 40 feet from the starting end. For a 50-meter course, it shall be located 50 feet from the starting end. Consider the need for finish contact pads. If utilized, contact pads shall be a minimum of 6 feet, 6 inches wide by 2 feet in depth. They shall be installed in a fixed position in the center of the lane and flush with the water level.

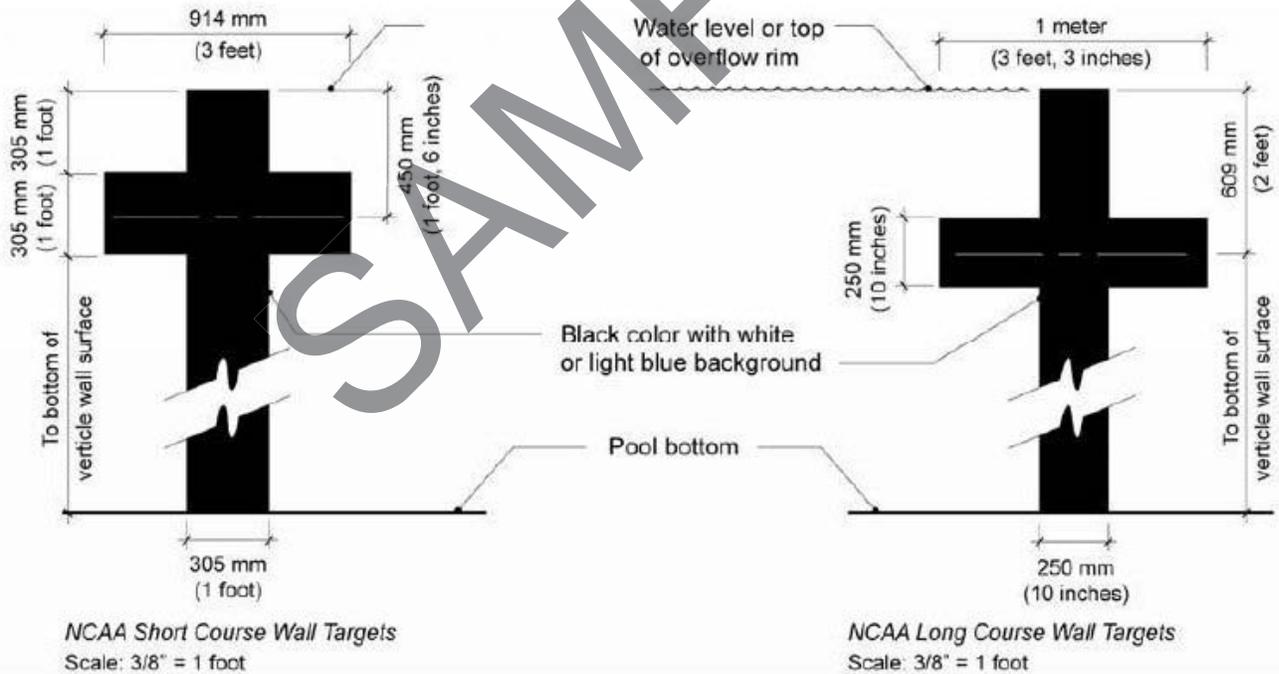
#### 2.16. Starting Platforms

When competitive swimming is a program requirement, starting platforms shall be supplied for each course lane in the pool area. Starting platforms shall be 2 feet, 6 inches above the water level. The front edge shall be flush with the vertical end wall of the course. Platform widths shall be a minimum of 20 inches. Platforms shall be sloped at not more than 10 degrees and shall be covered with a non-skid finish. Number starting platforms beginning with lane one to swimmer's right as they face the course. Provide anchors embedded into the pool deck, as appropriate for the starting platforms to be utilized.

##### 2.15-1 Figure: Racing Lane Bottom Markings



2.15-2 Figure: Racing Lane Wall Targets



## 2.17. Diving and Deep Water Areas

These areas are used for competitive diving, recreational diving, scuba training, survival training, and other activities requiring deep water. Diving and deep water areas may be accommodated in three possible ways:

- The preferred method is to locate diving areas adjacent to the deep end of a general use pool as demonstrated in the typical "L" shaped configuration.
- Incorporate the diving area into the deep end of a general use pool.

- Provide a separate pool exclusively for diving or deep water training and programs.

#### 2.18. Diving Boards and Stands

Provide springboards, as desired, that are manufactured from aluminum, fiberglass, or wood coated with a non-skid surface. For springboards of 3 meters (10 feet) or more, an open-grating type of construction is required to permit divers to view the water below. Springboard dimensions are 16 feet long and 1 foot, 8 inches wide. The installation should be level. The number of springboards depends on the size of the diving area to be included. Springboard anchors should be embedded in the pool deck or other surface of sufficient mass. The fulcrum should be adjustable through a range of 2 feet forward from a point 5 feet, 6 inches from the rear anchor of the board. The fulcrum mechanism should be covered to prevent injury to fingers or toes. Diving boards over 2 feet in height must have 3 feet high handrails extending to the water's edge. Provide a water surface agitator to increase diver visibility utilizing water jets from the overflow system or air bubble inlets in the pool bottom. Pool Depths for diving boards must meet FINA Standards as follow: For 1 meter boards, at least 11'-6" water depth. For 3 meter boards or platforms, at least 13' water depth.

#### 2.19. Heating, Ventilation, and Air Conditioning (HVAC)

Mechanical systems for natatoriums must be capable of maintaining an indoor air temperature 83°-89°F (3° higher than water temperature), water temperature of 80°-86°F (Lap swimmer/Swim Teams like it 80°-82°F; Instruction, Recreation, Water Exercise ask for 82°-86°F), relative humidity of 50-60%, and ventilation of at least 4 complete air changes per hour during high occupancy. Pool water temperature shall be monitored and be provided as an input to the HVAC Control System in order to maintain the indoor air temperature 3° higher than the water temperature. Deterioration of materials from condensation should be anticipated and minimized with proper mechanical design and wall transmission values. Air velocity in the immediate pool area should be minimal.

#### 2.20. Plumbing

Water for showers shall be heated to at least 90°F. Provide automatic mixing valves on showers where hot water is over 105°F. Shut off valves shall be provided at all plumbing fixtures. Floor drains shall be provided in all dressing rooms, shower rooms, toilet areas, and janitor's closets. Provide domestic hot and cold water, sanitary and storm drainage, plus propane or natural gas systems (if required). Provide metering that provides a pulse input into the Utility Monitoring and Control System for gas service, if utilized. Hot and cold water shall be supplied to all restrooms, sinks, and janitor's closets. Hot water temperature shall not exceed 105°F at the outlet. Provide hose bibs to enable hose access to the entire pool deck. Provide a water meter that provides a pulse input into the Utility Monitoring and Control System to monitor water usage.

#### 2.21. Electrical

Electrical power, lighting and telecommunications shall be provided to the facility in accordance with APPLICABLE CRITERIA in accordance with GENERAL TECHNICAL REQUIREMENTS, in accordance with all IEEE Standards (including Recommended Practice) where the scope is applicable to this design effort, in accordance with all UL Standards where the UL scope is applicable to this design effort and where itemized, in the combined interdisciplinary areas cited and where itemized herein. Provide electric service and distribution equipment, wiring receptacles and grounding, interior and exterior lighting and control, emergency lighting, telephone, communication systems, fire alarm, other health and safety alarms, and intrusion systems in accordance with NFPA 70, National Electrical Code; IEEE/ANSI C2, National Electrical Safety Code; and the latest Installation design requirements. Perform a short circuit study as an integral part of selecting and sizing electrical distribution components (all equipment shall be fully rated; that is, do not use series-combination rated equipment). Perform a coordination study to ensure that protective device settings are appropriate for the expected range of conditions (depending on the design and construction schedule, it is acceptable to design adequate protective devices with adjustable features, followed by a coordination study required during construction to specify the correct settings.) Circuit breakers, disconnect switches, and other devices that meet the OSHA definition of energy-isolating device must be lockable. Do not exceed 5 percent combined voltage drop on feeders and branch circuits if the transformer providing service is located within the facility. If the transformer is located exterior to the facility, limit the combined voltage drop for service conductors, feeders, and branch circuits to 5 percent. Individual voltage drop on branch circuits should not exceed 3 percent. Branch circuits supplying

sensitive circuits should be limited to 1 percent voltage drop. Service grounding system and all wiring methods must meet the current NFPA 70 requirements. All electrical equipment must be Underwriters Laboratories (UL) listed or published proof of safety and performance from an approved independent testing laboratory shall be provided. All service equipment must be Underwriters Laboratories (UL) listed as service equipment. Alternately, published proof from an approved independent testing laboratory may be provided. Provide electrical metering of the natatorium and provide monitoring of the electrical meter by Utility Monitoring and Control System.

Provide interior power per the general electrical requirements unless revised by the requirements of this RFP. When facility electrical design includes a 480/277V power distribution system, mechanical systems and lighting systems shall generally be fed from the available 480/277V power distribution system. All electrical outlets shall feature ground-fault circuit-interrupter protection for personnel.

Provide a sufficient number of floor and wall electrical outlets to accommodate current needs and potential future growth.

Provide an electric wall clock visible from the pool deck area. General convenience receptacles and special power outlets shall be specification grade.

#### 2.22. Fire Protection and Life Safety

All new and refurbished buildings shall have automatic fire detection and fire suppression systems, which shall be monitored to send signals to the installation fire station, central control, or monitoring facilities. All materials and equipment shall be UL listed. Equipment selections should not be considered in isolation, but shall be reviewed in unison with the overall fire strategy for each building and installation.

#### 2.23. Communications and Data

Two-way communication stations shall be provided at the check-in area and the office. At least one telephone and data outlet with high-speed Internet connections shall be provided in the check-in and office area.

#### 2.24. Public Address System

A centrally controlled public address and two-way communication system is required for all pool facilities. Incorporate a public address (PA) capability with the phone system to allow paging from all staff phones, where possible. Provide a PA system at the control desk if it cannot be incorporated in the phone system. At least one public address speaker shall be provided in each dressing room, office, check-in, public toilet, and lobby. One indoor speaker shall be provided for every 800 sq. feet of net floor area.

#### 2.25. Closed Circuit TV

A closed circuit TV system is required to address safety concerns, to monitor authorized access, and for general pool supervision. The system must oversee the lobby and entrances to the pool, and must provide full coverage of the entire pool area.

#### 2.26. Interior Lighting

All artificial lighting fixtures in a given space shall be capable of independent switching and shall be located to allow for re-lamping from floor or catwalk surfaces with the aid of portable ladders or scaffolding, if necessary. Lights located above the pool shall be avoided unless a catwalk system is provided.

Skylights or open air configurations may be appropriate for the entry control, food service, and some administrative areas. Beyond the obvious constraints of modesty, which requires visual screening up to 8 feet, glass is possible in all areas of the dressing rooms, toilets, showers, etc. The opportunity for energy savings and day lighting offer a design freedom that exists in few other building types. Where a solar assessment shows an active solar application to be cost effective, it shall be included to supplement pool water or space heating requirements.

Indoor swimming pool areas: Provide interior wall mounted indirect ambient uplighting controlled with a “daylighting” light sensing control system. Lighting shall also be controlled with an automated time clock with a manual ON/OFF timed override feature. Select, locate and shield luminaires to avoid direct glare. Select luminaires to avoid a direct component that would result in direct glare. This is especially important considering that the water and a wet deck provide specular surfaces. The lighting design should avoid direct and reflected glare on the water surface. Also consider maintenance and accessibility. Locate luminaires above the deck and at the edge of the pool to allow for access and relamping. Target Horizontal Illuminance ( $\pm 10\%$ ): For recreational class of play: 300 lux (30 fc). For other classes of play, see IESNA RP-6.

Fluorescent fixtures with low temperature, energy efficient ballasts and lamps are appropriate for most areas unless other lighting requirements are identified. Provide wet area rated fixtures in designed wet areas like the showers, dressing areas, and toilets. Utilize daylight lamps for most applications, because cool white lamps are too cold. Consider light fixtures that minimize glare and shadowing. Where natural light is available, provide lighting control systems, including ambient light dimmers to automatically reduce the intensity levels of artificial lighting.

#### 2.27. Filtration, Circulation, and Heating Systems

Locate all pool mechanical equipment and chemical storage areas away from public access. Doors or openings shall be sized to permit the replacement of all equipment and ventilation is required for motors and heaters.

#### 2.28. Chemical Storage

Provide a separate chemical storage room or structure for chlorine and other chemicals. Locate this storage area within the mechanical equipment compound or in a room adjacent to the pool equipment that is not accessible to the public. Doors shall be secure from break-ins and warning signs shall be posted concerning gaseous chlorine storage and the need for protective clothing and equipment. The chemical storage room shall be fire and explosion proof and shall have a vent fan capable of one complete air change in one to four minutes. An OSHA approved eye wash station, gloves, protective goggles, and gas masks are required in the pool equipment and chemical storage areas.

### 3.0 POOL DECK DESIGN

The hard surfaced areas around pools serve as a circulation system and lounging area for pool users. Optional amenities, such as concession areas and spectator seating areas, may require additional deck space to accommodate the desired programs.

#### 3.1. Deck Size and Capacity

The deck area normally required for natatoriums is normally .75 to 1.5 times the pool water area. Minimum and preferred dimensions follow:

SIDES	Preferred: 10 feet	Minimum: 9 feet
SHALLOW END	Preferred: 20 feet	Minimum: 15 feet
DEEP END	Preferred: 20 feet	Minimum: 20 feet

#### 3.2. Materials and Surface Finishes

Pool decks shall be constructed of an impervious material, such as concrete, bluestone, ceramic tile, glazing tile, or other hard, non-slip surface. The perimeter 10 feet area around the pool is considered a wet area and needs to be designed to prevent slipping when wet. Water shall not be allowed to puddle or pond on the deck area. All areas shall be pitched to provide positive drainage away from the pool with a minimum slope of 1/4 inch per foot and not more than 1/2 inch per foot. Water depths and “No Diving” signs that are integral to the deck surface shall be placed at the pool edge and inside the pool.

#### 3.3. Spectator Seating

Seating for spectators shall be provided, as needed, according to the program requirements. The anticipated peak number of spectators shall be accommodated. For a small number of spectators, a raised platform with informal seating may be sufficient. Consider the need for portable bleachers for up to 600 people that can be rolled for convenient storage or moved for use at other sport facilities on the installation. For larger numbers, the following guidelines are suggested:

- Bleacher seating with 18 inches of length provided for each spectator.
- Provide 6 to 8 sq. feet of space for each spectator.
- Provide access so that spectators are not walking on the pool deck. In addition, direct access to the exterior would be beneficial for large swim meets.
- Locate spectator seating parallel to the racing lanes in the pool.
- Permanent bench seating shall be constructed from concrete, wood, non-corrosive metal (aluminum), or recycled plastic.
- Spectator seating shall be stepped in elevation to allow maximum visibility.

#### 3.4. Deck Drains

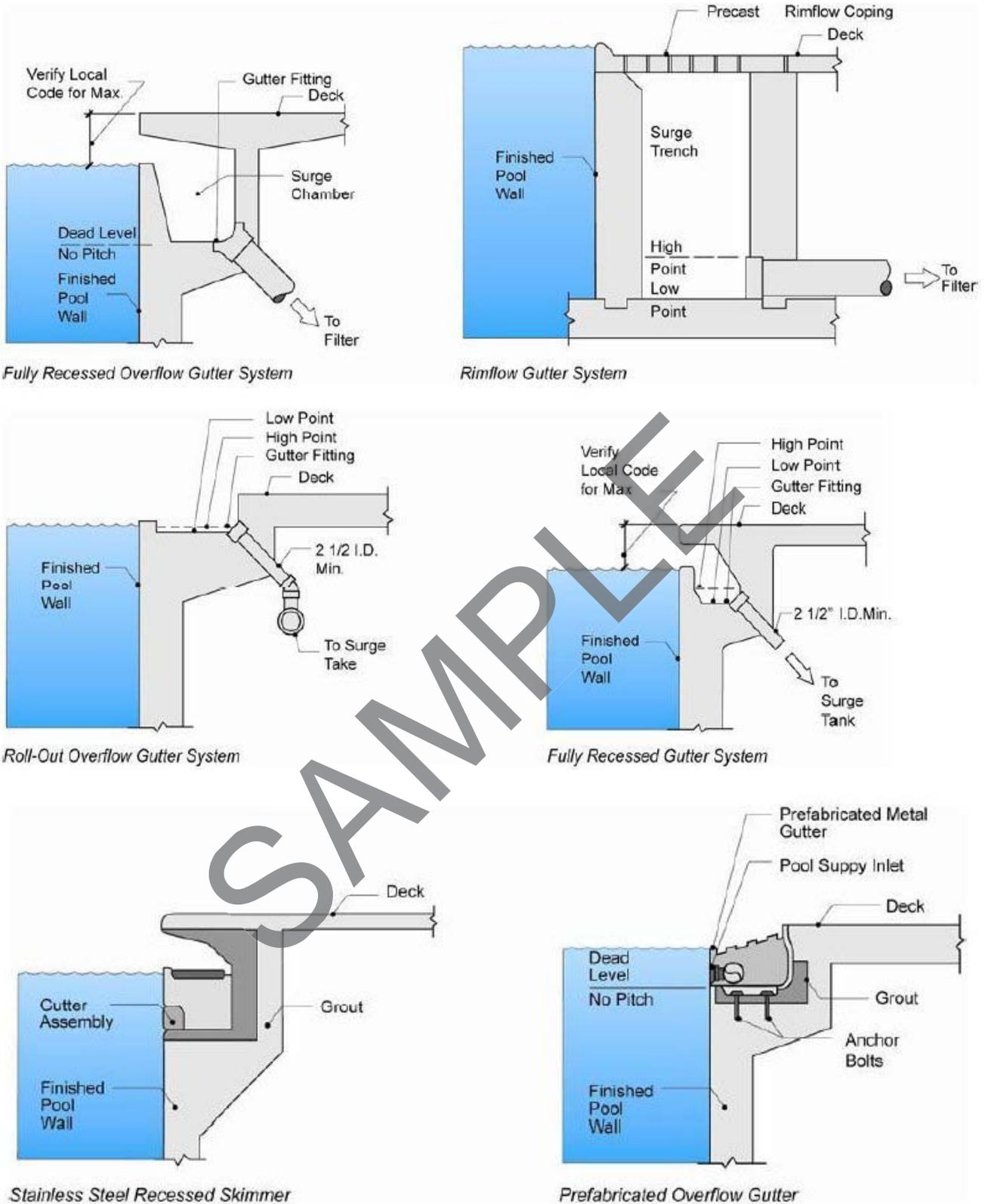
Drains on the deck must be drained to the sewer, and not be recirculated back into the pool.

### 4.0 TECHNICAL REQUIREMENTS

#### 4.1. Overflow Systems

A continuous overflow perimeter system is recommended in the main pool. Examples of this system are shown in *4.1-1 Figure: Overflow Rim Systems*. Prefabricated, stainless steel surge gutter systems are preferred because they provide constant skimming of the surface water to help remove debris and provide surge storage capacity for water displaced by swimmers. Scuppers that utilize a thin layer of water falling over a weir may be used to skim water from wading and training pools; however they do not adequately handle the surge requirements of main pools. Antiquated scum gutters offer little surface collection effectiveness and are generally used in conjunction with surge storage tanks and pump pits.

*4.1-1 Figure: Overflow Rim Systems*



#### 4.2. Circulation and Filter Systems

All portions of the water distribution system serving the swimming pool and auxiliary facilities shall be protected against backflow. Water introduced into the pool, either directly or into the circulation system, shall be supplied through air gap fittings. There shall be no direct physical connection between the sanitary or storm sewer system

and any drain from the swimming pool recirculation system. Provisions shall be made for complete, continuous circulation of water through all parts of the swimming pool by appropriately sized, non-corrosive pipes. Heavy grades of schedule 40 polyvinyl chloride (PVC) or schedule 80 in active seismic zones may be utilized for most circulation piping requirements. The valves and draining system for the pool shall be sized to prevent flooding (surcharging) of the sanitary or storm drainage system. Circulation piping shall be designed for a maximum velocity of 10 feet per second. All suction piping shall be designed for a maximum of 6 feet per second. A hair and lint filter of stainless steel with removable basket shall be provided to filter and remove leaves, hair, and other solids entering the drainage system. A centrifugal circulation pump shall be provided of sufficient capacity to provide the minimum turnover rate to the pool, plus an additional allowance of 30%. Minimum turnover rates shall be:

- Main Pools: Six turnovers in 24 hours
- Wading Pools: Twelve turnovers in 24 hours

#### 4.3. Recirculation System Minimum Requirements

A recirculation system, consisting of pumps, piping, filters, feeders, water conditioning equipment, city water make-up, surge tank, and other accessories shall be provided to clarify and disinfect a swimming pool volume of water in six hours or less, thus providing a minimum turnover rate of four times in 24 hours. For pools subject to heavy usage, the turnover rate shall be increased to three hours. Under normal operating conditions, water shall be re-circulated from the main drain and through the overflow gutter into the circulating pumps. Approximately 30% of the water shall enter the main drain, while 70% "skims" over the gutter system through the surge tank and hence into the pumping system. Additional information concerning swimming pool layout and recirculation requirements can be found at the National Swimming Pool Foundation website. All integral capacity motors shall meet the requirements for Premium Efficiency Motors per EPA Act 05.

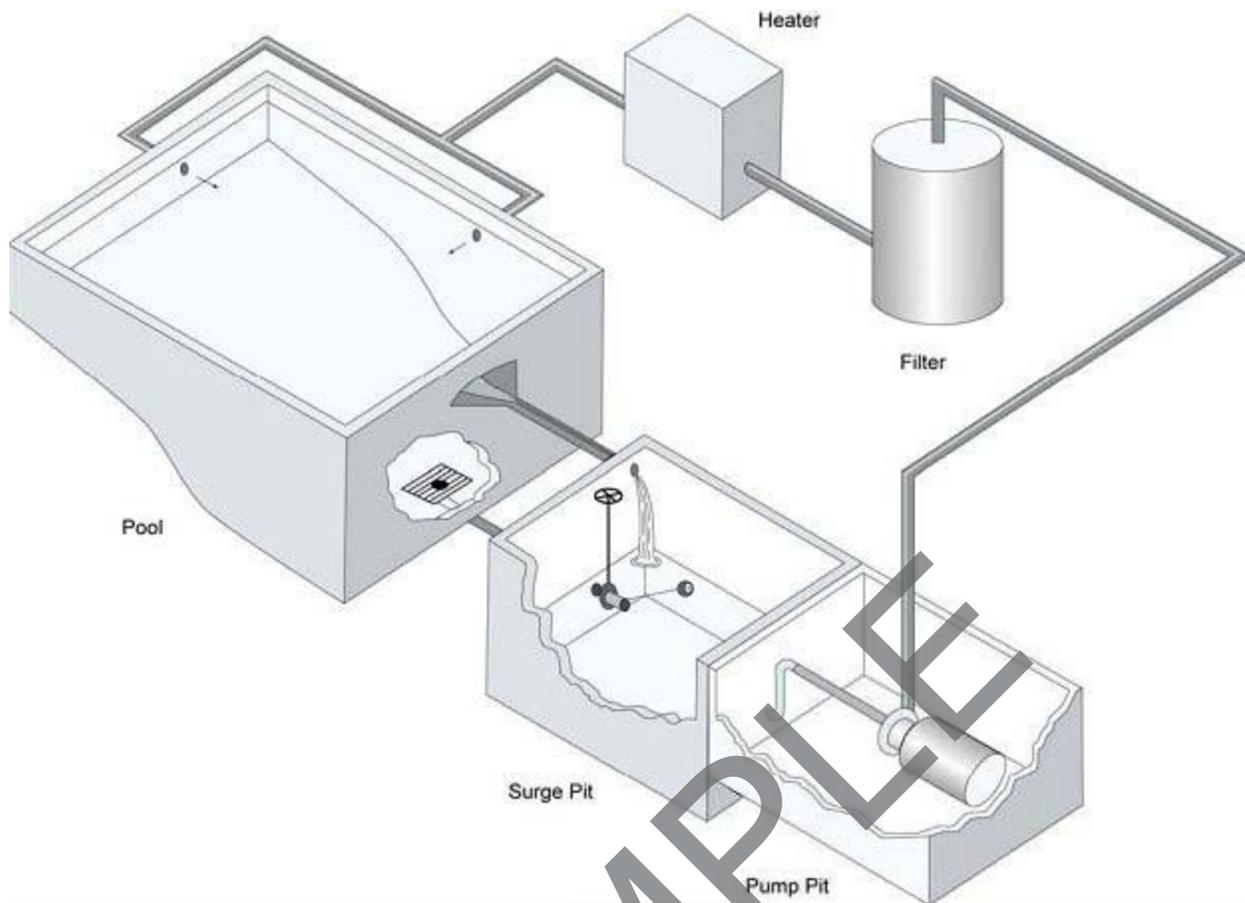
#### 4.4. Surge Tanks and Surge Control

Circulation systems shall be equipped with concrete, cast-in-place surge tanks, unless the maximum surge requirements of a pool can be handled by a surge gutter system. The purpose of the surge tank is to allow water displaced by pool occupants to be collected in the surge tank and later returned to the pool as occupancy decreases. Provide flow control valves to modulate water flow from the main drain and from the surge tank. New gutter systems may eliminate the need for surge tanks, because the displaced water may be contained within the gutter overflow system. A surge tank and pump pit diagram is provided in *4.4-1 Figure: Surge Tank and Pump Pit*.

#### 4.5. Motor Controls and Auxiliaries

Provide magnetic starters for the control of the circulation pump, including a stainless steel enclosure to prevent corrosion. Use non-corroding metallic components, such as aluminum and stainless steel, for all electrical and control items subject to corrosion.

*4.4-1 Figure: Surge Tank and Pump Pit Diagram*



#### 4.6. Pumps

Pumps are utilized to displace a liquid or gas to create a directed flow and many different types of pumps may be required for pool equipment, such as chemical feed pumps, transfer pumps, vacuum pumps, circulation pumps, booster pumps, hydrotherapy pumps, and compressor pumps. Centrifugal style pumps are generally used for all circulation pumps that must be sized appropriately to handle the required capacity. Utilize mesh-bucket filters immediately in front of circulation pumps to protect the internal components of the pump from larger, solid objects and to strain hair and lint from the re-circulating water. A pump pit may be required adjacent to the surge tank to circulate water for filtration, heating (if required), and return it to the pool.

#### 4.7. Flow Meters

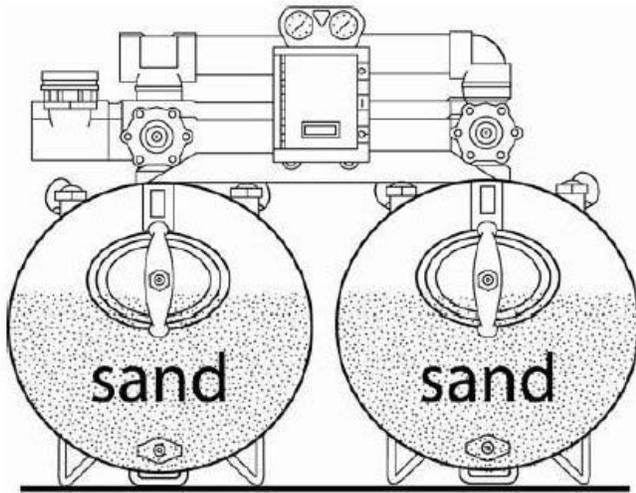
Provide a flow meter in each main line serving a swimming pool or wading pool. Flow meters are also demanded by the health department codes in most states and provinces. Install flow meters on a straight, uninterrupted section of pipe at least 10 pipe diameters down-stream from the last fitting with about five diameters distance "clean run" beyond so that the smooth, linear flow is not disturbed to ensure accurate readings. In addition, provide a mercury type manometer flow meter at the discharge of the circulating pump to control primary flow and backwash. Provide a flow control valve so that the operator may manually control the circulation rate of the pump, thereby maintaining the turnover rate throughout a filter cycle from clean to dirty.

#### 4.8. Filters

Filtration is the physical process of removing solids which would interfere or impede the disinfection process if not removed. Filters only remove solids and any dissolved elements must be removed as part of the disinfection process. The two major types of pool filters are sand filters and diatomaceous earth (DE) filters that both offer equal levels of effectiveness. Utilize high rate sand pressure type filtration banks that are National Swimming Pool Foundation (NSPF) approved because their effectiveness actually improves over time due to the buildup of trapped soil that becomes increasingly dense and resistant to water flow. Filters must be backwashed

periodically according to the manufacturer's specifications and discharged directly into the sanitary or storm sewer where allowed by code.

4.8-1 Figure: Multi-Cell High Rate Sand Filters



Multi-Cell High Rate Sand Filters



Multi-Cell High Rate Sand Filters

#### 4.9. Drains and Inlets

In accordance with VIRGINIA GRAEME BAKER POOL AND SPA SAFETY ACT, PUBLIC LAW 110-140, each public pool and spa in the United States shall be equipped with anti-entrapment devices or systems that comply with the ASME/ANSI A112.19.8 performance standard, or any successor standard; and each public pool and spa in the United States with a single main drain other than an unblockable drain shall be equipped, at a minimum, with 1 or more of the following devices or systems designed to prevent entrapment by pool or spa drains:

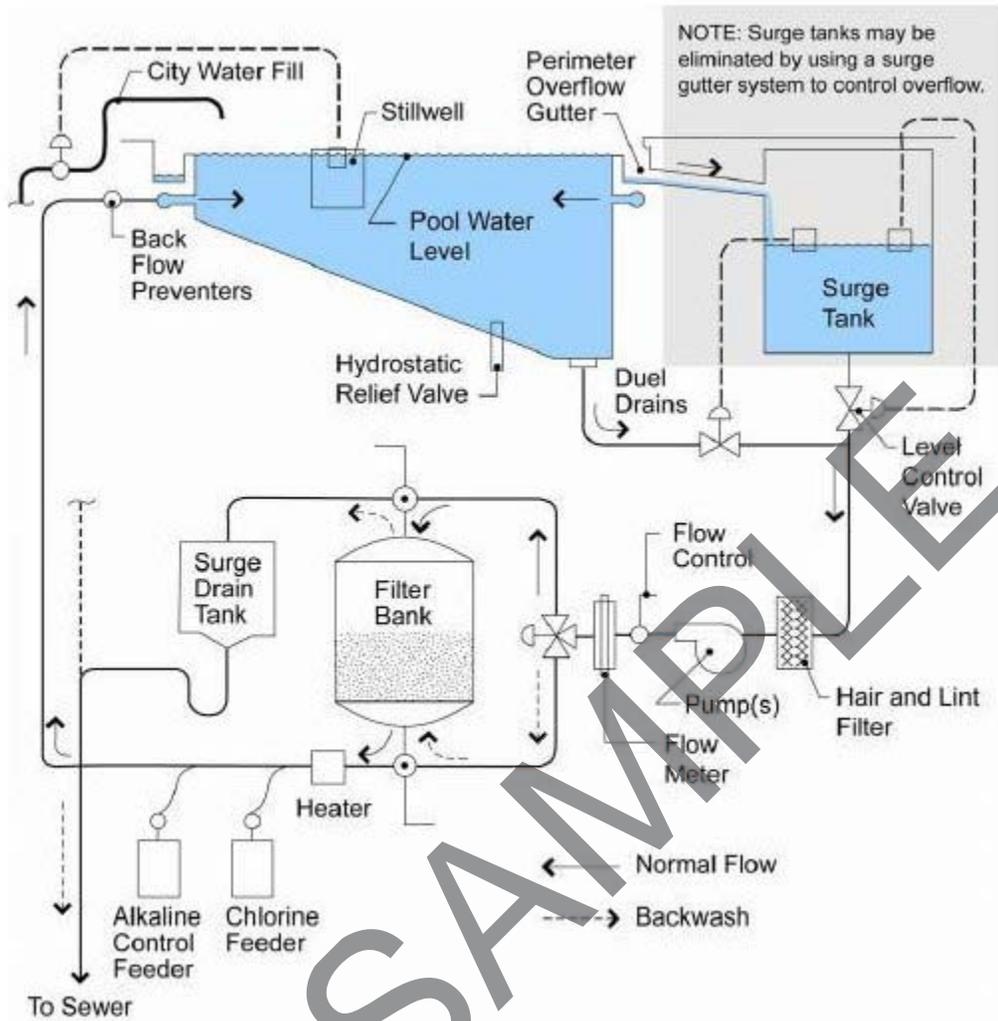
- (i) Safety vacuum release system.--A safety vacuum release system which ceases operation of the pump, reverses the circulation flow, or otherwise provides a vacuum release at a suction outlet when a blockage is detected, that has been tested by an independent third party and found to conform to ASME/ANSI standard A112.19.17 or ASTM standard F2387.
- (ii) Suction-limiting vent system.--A suction-limiting vent system with a tamper-resistant atmospheric opening.
- (iii) Gravity drainage system.--A gravity drainage system that utilizes a collector tank.
- (iv) Automatic pump shut-off system.--An automatic pump shut-off system.
- (v) Drain disablement.--A device or system that disables the drain.
- (vi) Other systems.--Any other system determined by the Commission to be equally effective as, or better than, the systems described in (I) through (V) of this paragraph at preventing or eliminating the risk of injury or death associated with pool drainage systems.

Dual main pool drains are mandatory to prevent entrapment hazards. Inlets and drains shall not protrude into the pool or allow entrapment of extremities. Drains and drain covers to be tamper proof and entrapment proof. Refer to the current guidance provided by the Consumer Product Safety Commission publication "Guidelines for Entrapment Hazards: Making Pools and Spas Safer" for information regarding the prevention of entrapment hazards. At least one main drain will be provided in the deepest part of the swimming pool. For pools at least 30 feet wide, multiple drains will be spaced no more than 15 feet from a side wall.

Each drain shall have a removable but secure grate that has sufficient area to maintain water velocity at or below 1 foot, 6 inches per second. One inlet shall be provided for each 300 sq. feet or 15,000 gallons, whichever is greater and all inlets will be located on the pool sides or floor in a manner that completely distributes the water. Utilize butterfly, ball and globe style inlet valves made partially or completely of PVC or other high quality plastic for new pools and renovations. Fresh water may also be supplied through a fill spout at least 6 inches above the pool deck.

To prevent injuries and to slightly disturb the water for better diver visibility in the diving area, this spout shall have no sharp edges and be located under one of the diving boards.

4.9-1 Figure: Water Circulation Systems Schematic



#### 4.10. Heating and Water Temperature

Heaters are necessary for all indoor pools. The selected water heater shall have the capacity to bring the pool up to the desired temperature within 24 hours. Pool heaters to meet the requirements of EPA05 and ASHRAE 90.1. See paragraph 2.19 for air and water temperatures.

#### 4.11. Water Quality

The design and method for pool disinfection must be coordinated with the installation. Use of chlorine gas, although cost effective and efficient, as a disinfectant in swimming pools is discouraged due to safety issues and the availability of less dangerous disinfectants (e.g., sodium hypochlorite, calcium hypochlorite). When economical, consideration should be given to the use of sodium hypochlorite generators that produce disinfectants from sodium chloride (salt).

Automatic Chemical Controllers are required which measure ORP and pH (this is part of the BLS).

An Ultra Violet (UV) System is strongly recommended for supplemental disinfection/ sanitation.

#### 4.12. Pool Lighting

Surface lighting will provide at least 30-foot candles of illumination on the deck and pool area. Overhead flood lights should be mounted at least 20 feet above the water surface. Select flood lighting lamps to allow 1 watt per square foot minimum. Consult the specific requirements of the appropriate regulatory agency if competitive swimming events will be conducted. USS rules for championship meets require a minimum of 40-foot candles of illumination 3 feet above the water.

For nighttime or indoor competition, 100-foot candles are necessary at start and turning ends. Area lighting should be designed to reduce direct glare and reflections on the water surface. Ground fault circuit interrupters (GFCI) are required for all electrical equipment (vending machines, pool lights, water coolers, etc.). Provide power sources for additional lighting that may be needed for television, movies, and special events.

4.13. Underwater Lighting Criteria

Verify with the installation if underwater lighting is desired. Underwater lighting types and dimensions shall conform to the National Electric Code (NEC) Article 680 regulations. Underwater lights require 0.5 to 2.0 watts per square foot of water area and should be sized accordingly. Box connections for dry or wet niches should be a minimum of 4 feet away from the side wall of the pool and 8 inches above the deck. Underwater light fixtures are available at standard voltage (120 volts), and at low voltage (12 volts).

Low voltage wiring should be used for all dry or wet niche lighting fixtures. This requires a transformer located, by code, a specific distance away from the pool wall and above deck. Either wet niche or dry niche fixtures may be used as described in 4.13-1 Table: *Underwater Lighting Criteria*. If lights are provided at the start and finish ends of a pool used for competitive events, provide a turn-off switch for racing.

4.13-1 Table: *Underwater Lighting Criteria*

	Description	Installation Technique	Installation Depth	Servicing Technique
<b>Wet Niche</b>	Completely sealed but removable fixture that is constantly surrounded by water.	Mounted into recess in pool wall.	Maximum depth of 6100 mm (2 feet) from pool water surface.	Extra rubber covered electrical cord is coiled in the niche. Fixture is removed from niche and lifted to deck for servicing.
<b>Dry Niche</b>	Permanently enclosed fixture that doesn't come into contact with water.	Installed behind pool wall and covered by glass sealed to a metal frame with gaskets.	Can be installed at any depth, usually 6100 mm (2 feet) below shallow water surface.	Serviced via a pipe tunnel or manhole behind the pool wall.