

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE N/A	PAGE OF PAGES 1 198
---	--	--	----------------------------	--------------------------

2. AMENDMENT/MODIFICATION NO. 0002	3. EFFECTIVE DATE SEP 23, 2004	4. REQUISITION/PURCHASE REQ. NO. N/A	5. PROJECT NO. (If applicable) SPEC. NO. 1389
---------------------------------------	-----------------------------------	---	--

6. ISSUED BY DEPARTMENT OF THE ARMY U.S. ARMY ENGINEER DISTRICT, SACRAMENTO SACRAMENTO, CALIFORNIA 95814-2922	CODE	7. ADMINISTERED BY (If other than Item 6) DEPARTMENT OF THE ARMY U.S. ARMY ENGINEER DISTRICT, SACRAMENTO SACRAMENTO, CALIFORNIA 95814-2922	CODE
--	------	---	------

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)	(√)	9A. AMENDMENT OF SOLICITATION NO. W91238-04-R-0028
	×	9B. DATED (SEE ITEM 11) AUG 31, 2004
		10A. MODIFICATION OF CONTRACTS/ORDER NO. N/A
		10B. DATED (SEE ITEM 13) N/A
CODE	FACILITY CODE	

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers is extended, is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:
 (a) By completing Items 8 and 15, and returning 1 copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)
N/A NOTE: ITEM 13 BELOW IS N/A.

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

(√)	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A. N/A
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER (Specify type of modification and authority) N/A

E. IMPORTANT: Contractor is not, is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)
 Fitness Center
 Hill AFB, Utah

1 Encl.

1. Revised Pages: Attachment No 10 (Replace existing in its entirety), 01010-2, Section 01011 (Replace existing in its entirety), 01012-6

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)	
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
_____ (Signature of person authorized to sign)		BY _____ (Signature of Contracting Officer)	

06/02/2004 – Final space revisions for 100%

Space requirements for 6000 SM facility.....

Sq.ft. requirements for spaces – Fitness Center:

Space	SM	sq.ft.
Lobby	92.9	1000
Administration		
Director office	18.5	200
Training room	27.8	300
NCOIC	13.9	150
Specialist	13.9	150
Intramural	13.9	150
Copy/work room	13.9	150
Reception/control	13.9	150
Breakroom	13.9	150
Support		
Laundry room	18.5	200
Equipment room	27.8	300
Control room (CCTV)	9.29	100
Assessment room	9.29	100
Storage	132.38	1425
Locker rooms		
Men's	371.6	4000
Women's	325.2	3500
Gym	1578	16,985
Group Exercising		
Stretching	18.6	200
Small exercise	74.3	800
Large exercise	279	3000
Equipment Exercise		
Stretching	18.6	200
Cardiovascular	372	4000
Resistance weight	185.5	2000
Free weights	185.5	2000
Racquetball courts		
3 courts @ 74.3 ea.	222.9	2400
Senior Exercise space	74.3	800

Juice bar	27.8	300
Massage room	33.4	360
Climbing wall	46.4	500

HAWC sq.ft. requirements for spaces – Fitness Center:

Reception/lobby	27.8	300
Office space		
Office	13.9	150
Office	13.9	150
Office	9.2	100
Office	9.2	100
Office	9.2	100
Nutrition		
Office	9.2	100
Office	9.2	100
Relaxation room	7.4	80
Classroom	120	1300
Computer room	9.2	100
Ergometry		
Space	7.4	80
Wellness	9.2	100
Library	13.9	150
Kitchen	18.5	200
Storage	38.7	417
Locker rooms		
Men's	16.2	175
Women's	16.2	175

Total for Fitness Center: 4233 SM x .30 = 1270 (bldg support) = 5503 SM - Grand total

Total for HAWC: $382.4 \times .30$ (bldg support) = 114.69 + 382.3 = 496.99 SM

Grand total for Fitness Center: 5503 + 497 = 6000 SM

List of First Floor Spaces:

Lobby	92.9	1000
Administration		
Director office	18.5	200
Training room	27.8	300
NCOIC	13.9	150
Specialist	13.9	150
Intramural	13.9	150
Copy/work room	13.9	150
Reception/control	13.9	150
Breakroom	13.9	150
Support		
Laundry room	18.5	200
Equipment room	27.8	300
Control room (CCTV)	9.29	100
Assessment room	9.29	100
Storage	132.38	1425
(...Some storage area to be located on second floor. Coordinate locations With Fitness Center Staff....)		
Locker rooms		
Men's	371.6	4000
Women's	325.2	3500
Gym	1578	16,985
Stretching	18.6	200
Cardiovascular	372	4000
Resistance weight	185.5	2000
Free weights	185.5	2000
Racquetball courts		
3 courts @ 74.3 ea.	222.9	2400
Juice bar	23.2	250
Climbing wall	46.4	500

List of Second Floor Spaces:

HAWC	382.3	4114
Group Exercising		
Stretching	18.6	200
Large exercise	279	3000
Small exercise	74.3	800
Senior Exercise space	74.3	800
Massage room	33.4	360
Indoor Running Track	(locate in gymnasium)	
Public Restrooms	(included as part of building support)	
Storage	(coordinate locations with Fitness Center Staff)	

Filename: sq.ft. requirements for attachment 10 040920.doc
Directory: C:\data_____PROJECT LOCATIONS\HILL AFB\1389
Fitness Center\EBS\specs\amend02
Template: C:\Documents and Settings\ghill\Application
Data\Microsoft\Templates\Normal.dot
Title: Items to incorporate for Fitness Center RFP:
Subject:
Author: Richard.Nehring
Keywords:
Comments:
Creation Date: 09/20/2004 8:56 AM
Change Number: 4
Last Saved On: 09/20/2004 9:33 AM
Last Saved By: Hill
Total Editing Time: 4 Minutes
Last Printed On: 09/20/2004 9:33 AM
As of Last Complete Printing
Number of Pages: 4
Number of Words: 451 (approx.)
Number of Characters: 2,574 (approx.)

PART 1 GENERAL

1. DESCRIPTION OF PROPOSED CONSTRUCTION

1.1 General Scope of Work

The work consists of design and construction of a Fitness Center of approximately 64,583 SF(**Gross**) and an outdoor running track located at Hill Air Force Base, Utah. The facility's primary function will be to provide adequately sized, and fully configured fitness center to support combat readiness and improve the physical fitness of the active duty and reserve personnel.

The project includes space for lobby, administration, locker rooms, gymnasium, group exercise, equipments space, racquetball courts, a Health and Wellness Center and all necessary support. The facility shall meet current Hill AFB Base Standards, United Facilities Criteria, National Fire Protection Association and other applicable code requirements, as well as meet the users needs for a quality environment.

Administrative: Includes offices for director, OIC, NCOIC, Specialist, intramural. Copy/workroom, reception/control area, break room.

Support: Includes laundry room, equipment room, control room, Assessment room and storage

Locker rooms: Includes men's and women's locker rooms, HAWC staff men's and women's locker rooms.

Fitness Area: Includes Gym group exercising, equipment exercise, racquetball courts, senior exercise space, juice bar, and massage room.

HAWC Areas: Includes reception/lobby, 5 offices, 2 nutrition offices, relaxation room, computer room, 4 ergometry rooms, Wellness, library, kitchen, storage, classroom

The structure will be permanent construction. Project includes site work, access and area paving, HVAC, fire protection, EMCS, and all necessary features (interior and exterior) to yield a complete and useable facility for its intended use. The project is located in the main cantonment area of Hill Air Force Base and is bounded by Building 10570 directly to the north of the project site and 11th street on the south side. All electronic systems designed and installed must be Year-2004 and beyond compliant.

Connection to base utilities including waste treatment shall be part of this project. Existing asphalt surface running track at the site will require demolition to allow for construction of the new facility. Existing utilities will require to be built over or relocated.

1.2 Organization of this RFP Document

1.2.1 General

This Document is organized in a new format established for design-build projects. Refer to the Table of Contents for the Outline of this Document. The general subject matter is included as follows:

CHAPTER 00010**TABLE OF CONTENTS****1. PROGRAM REQUIREMENTS**

1.1 1 - PROGRAM SUMMARY

1.2 11 - PROJECT PROGRAM

2. PERFORMANCE REQUIREMENTS

2.1 111 - FACILITY PERFORMANCE

2.1.1 A - SUBSTRUCTURE

a. A1 - FOUNDATIONS

(1) A11 - STANDARD FOUNDATIONS

(2) A13 - FLOORS ON GRADE

2.1.2 B - SHELL

a. B1 - SUPERSTRUCTURE

(1) B11 - ELEVATED FLOORS

(2) B12 - ROOFS

b. B2 - EXTERIOR ENCLOSURE

(1) B21 - EXTERIOR WALLS

(2) B22 - EXTERIOR WINDOWS AND OTHER OPENINGS

(3) B23 - EXTERIOR DOORS

c. B3 - ROOFING

(1) B31 - ROOF COVERINGS

(2) B32 - ROOF OPENINGS

2.1.3 C - INTERIORS

a. C1 - INTERIOR CONSTRUCTION

(1) C11 - PARTITIONS

(2) C12 - INTERIOR DOORS

(3) C14 - OTHER INTERIOR OPENINGS

(4) C15 - STAIRS

(5) C16 - INTERIOR FINISHES

b. C2 - INTERIOR FIXTURES

(1) C21 - IDENTIFYING DEVICES

(2) C22 - STORAGE FIXTURES

(3) C23 - WINDOW TREATMENT

(4) C24 - ACCESSORY FIXTURES

(5) C25 - FIXED SEATING

(6) C29 - OTHER INTERIOR FIXTURES

2.1.4 D - SERVICES

a. D1 - CONVEYING SYSTEMS

(1) D11 - ELEVATORS AND LIFTS

b. D2 - WATER AND DRAINAGE

(1) D21 - WATER SUPPLY

(2) D23 - DOMESTIC WATER

(3) D24 - SANITARY WASTE AND VENT

(4) D25 - RAIN WATER DRAINAGE

c. D3 - HVAC - HEATING, VENTILATING, AND AIR CONDITIONING

(1) D31 - ENERGY SUPPLY

(2) D32 - HEAT GENERATION

- (3) D33 - REFRIGERATION
 - (4) D34 - AIR DISTRIBUTION
 - (5) D35 - HYDRONIC AND STEAM DISTRIBUTION
 - (6) D36 - HVAC CONTROLS
 - (7) D39 - OTHER HVAC ELEMENTS
 - d. D4 - FIRE PROTECTION
 - (1) D43 - FIRE DETECTION AND ALARM
 - (2) D45 - FIRE PROTECTION SPECIALTIES
 - e. D5 - ELECTRICAL POWER
 - (1) D52 - SERVICE AND DISTRIBUTION
 - (2) D53 - BRANCH CIRCUITS
 - f. D6 - ARTIFICIAL LIGHTING
 - (1) D61 - INTERIOR LIGHTING
 - (2) D62 - EXTERIOR AREA LIGHTING
 - (3) D63 - ATHLETIC LIGHTING
 - g. D7 - TELECOMMUNICATIONS
 - (1) D71 - VOICE AND DATA
 - (2) D72 - SOUND REINFORCEMENT
 - (3) D73 - TELEVISION
 - h. D9 - OTHER SERVICES
 - (1) D92 - SURVEILLANCE AND SECURITY CONTROLS
 - (2) D94 - CATHODIC PROTECTION
- 2.1.5 E - EQUIPMENT AND FURNISHINGS
- 2.1.6 F - DEMOLITION
- 2.1.7 G - SITEWORK
- a. G1 - SITE PREPARATION
 - (1) G12 - EARTHWORK
 - b. G2 - SITE IMPROVEMENTS
 - (1) G21 - PAVEMENTS AND SURFACING
 - (2) G22 - SITE FIXTURES AND EQUIPMENT
 - (3) G23 - LANDSCAPING
 - c. G3 - SITE SERVICES
 - (1) G31 - WATER SUPPLY
 - (2) G32 - SANITARY SEWER
 - (3) G33 - STORM SEWER
 - (4) G39 - OTHER SITE SERVICES

3. END OF TABLE OF CONTENTS

CHAPTER 1**PROGRAM SUMMARY****1. BASIC FUNCTION**

- 1.1 Project: The work consists of design and construction of a Fitness Center and an outdoor running track located at Hill Air Force Base, Utah. The facility's primary function will be to provide adequately sized, and fully configured fitness center to support combat readiness and improve the physical fitness of the active duty and reserve personnel.

2. SPACES

- 2.1 Interior Spaces: See Chapter 11

- 2.2 Exterior Spaces: The project includes spaces of the following types:

- 2.2.1 Outdoor Athletic (SP7 Spaces): Spaces used primarily for athletic activities, including running track and athletic field.
- 2.2.2 Outdoor Building Services (SU1 Spaces): Spaces for trash collection, trash removal, and delivery and loading.
- 2.2.3 Outdoor Utility Equipment (SU2 Spaces): Dedicated spaces for outdoor elements of heating and cooling and electrical power services.
- 2.2.4 Automotive (SV2 Spaces): Spaces for parking private vehicles, access roads, and driveways.

3. PROGRAM

- 3.1 Project Program: The project programs, entitled USAF Fitness Facility Design Guide, is include as part of this RFP see Attachment 12.

4. EXISTING CONDITIONS

- 4.1 The proposed project site is located in the main cantonment area of Hill Air Force Base and is bounded by Building 10570 directly to the north of the project site and 11th street on the south side.
- 4.2 The project site is currently vacant except for an existing asphalt running track which will be demolished.
- 4.2.1 See Chapter G for removal of features.

END OF CHAPTER 1

CHAPTER 11**PROJECT PROGRAM**

- 1. THE PROJECT PROGRAM ARE EXPLAINED IN THE FOLLOWING TEXT, THE REQUIREMENTS DOCUMENT (RD) AND THE USAF FITNESS FACILITY DESIGN GUIDE. BOTH THE REQUIREMENTS DOCUMENT (RD) AND THE USAF FITNESS FACILITY DESIGN GUIDE ARE INCLUDED AS PART OF THIS RFP, AND CONSISTS OF THE FOLLOWING:**
- 1.1 Program Narrative.
 - 1.1.1 The basic project is to design and construction of a Fitness Center of approximately 64,583 SF **(gross)** and an outdoor running track. The facility's primary function will be to provide adequately sized, and fully configured fitness center to support combat readiness and improve the physical fitness of the active duty and reserve personnel.
 - 1.1.2 The building will be constructed using concrete foundation, concrete slab on grade. The walls and roof shall be supported by structural system. The exterior wall material for this project shall be brick, the color shall be "Tumble Weed" as manufactured by Interstate Brick, West Jordan, Utah. The roof, fascia and canopies shall be standing seam metal, the color shall be "Dakota Brown". Comply with Hill AFB Architectural Design Guide (attached herein).
 - 1.1.3 The overall design of this project must comply with the Hill AFB Facility Design Standard, USAF Fitness Facility Design Guide and be compatible with the Hill AFB Architectural Compatibility Standards. A copy of these documents are included in this RFP. See Attachments 12, 13 and 14.
 - 1.1.4 Due to the desire of the users to retain the bubble and the force protection requirements. The Fitness Center will be a combination 1 and 2 story building. It is desired to situate the new building on the site to take advantage of the spectacular mountain views to the east and morning sunlight from an easterly - southern exposure for natural daylighting purposes in the new facility. The main entrance will be from the south or southeast. Locate access for delivers, service entrance, fire and mechanical room access from the north to northwest side of new building. The front entrance is off of 11th Street. The main entrance will be 2 story glass store front.
- 1.2 Mission Statement.
 - 1.2.1 The existing fitness and HAWC programs are located in two geographically separated facilities resulting in fragmented operations which are economically unfeasible to staff on a full-time basis. The Hess Physical Fitness Center, built in 1966, is the primary fitness center, containing most of the required core functional area; however, the building is deficient in several respects. This facility is undersized by 47% for the existing program. The weight room, lockers and exercise equipment area become extremely overcrowded. The mechanical and electrical loads are undersized, resulting in poor heating, ventilation and lighting. The Westside Gym is located in a 1942 historical warehouse complex and is used mainly by the civilian population. It contains the HAWC and the fitness area. This site is in an obscure, difficult to reach location, two-three miles from the main fitness center, not easily accessible to the airmen living on base.
 - 1.2.2 The facility will provide an adequately sized and fully configured fitness center required to support combat readiness and improve the physical fitness of the active duty and reserve personnel. Adequate sports courts, racquetball courts, fitness area, group exercise area, a Health and Wellness Center, and locker rooms are needed to support the military personnel assigned to Hill AFB. The existing running track must be relocated.
- 1.3 Relationship Diagram.
 - 1.3.1 See Attachment 9
- 1.4 Area Requirements.

- 1.4.1 **Administration/ Main Lobby:** Provide air lock entry, aluminum storefront entrance door system all across entrance. Provide a grated area trap transition (recessed foot grille) in air lock entry to prevent dirt, ice and snow accumulation in the new facility. This area will be 2 story (with the exception of the air lock entry) and have views facing to the south or southeast. Provide "card swipe" and turnstile features for access. Provide CCTV in admin area for monitoring of all activity spaces. Most of the activity spaces along the spine should be visible from the control point. Provide a small seating area. Provide trophy case and health kiosk for brochures and facility orientation plan. Provide space for vending machines. Provide a direct view to lobby/entrance. Locate offices with view facing to the south or southeast exterior. Provide for daylighting Provide door sidelites 12" width min. for visual interface between admin spaces at offices. Provide for the following: Director office, training room, ~~conference room~~ room/conference room, NCOIC office, intramural office, specialist office, break room, control room, assessment office, administration area for Xerox/fax, reception area, laundry room and equipment room. Provide one open stair and elevator. Provide semi-circular reception desk/counter with toss in for discarded towels. Provide area for rock climbing wall (Option Item). Provide control room for security system, control for sound system, PA system, Fitlinx system, marquee system and three computers one for CCTV, one for inside marquee and one for outside marquee. In the control room, provide a continuous 2'-6" width x 20'-0" length countertop at 34" above finished floor. Provide space for Fitlinx system kiosk. Provide a ceiling mounted bracket for a 42" plasma screen (NIC) in Main lobby. In the break room, provide continuous countertop and base cabinets with sink and continuous over head cabinets. Provide a ceiling mounted bracket for a 42" plasma screen (NIC) in break room. Provide a CCTV monitor connection in Directors office. Provide a CCTV monitor connection at reception desk. Provide Air Force logo in the lobby, minimum size to be 10'-0" x10'-0". See attachment 27.
- 1.4.2 **Public Restroom:** Provide public restrooms separate from locker restrooms. Both Men's and Women's public restrooms will include a diaper changing station.
- 1.4.3 **Juice Bar:** Provide controlled lighting, power outlets, communication lines and data lines. Provide plumbing, 3 compartment sink (residential grade), wash basin sink ~~dishwasher and ice machine,~~ dishwasher **(GFGI)** and ice machine **(GFGI)**. Provide a 2'-0" width two tier continuous countertop workspace. Provide a ceiling mounted bracket for a 42" plasma screen (NIC). Provide space and receptacles for commercial refrigerator and ice machine . Provide continuous wall cabinets 30" height x 1'-0" depth minimum. Mount the wall cabinets a minimum of 18" above the countertop. Provide two shelf tiers minimum in the cabinets. Provide power operated overhead coiling grill for security.
- 1.4.4 **Laundry:** Provide capacity for 2 commercial washers ~~and 3 commercial dryers~~ **(GFGI)** and 3 commercial dryers **(GFGI)**. Provide shelf storage for soap and related supplies. Provide a 2'-6" width x 12'-0" length continuous countertop workspace for folding towels and other laundry items - away from the main desk. Locate countertop over top of commercial washers and dryers. Coordinate the countertop workspace location with Fitness Center personnel. The commercial washers and dryers will be front loading. Provide cabinet storage for laundry items (i.e. soap and related items). Provide a double door 2 (3'-0" x 7'-0").
- 1.4.5 **Support Storage:** Provide Shelving cabinetry for equipment checkout, basketballs, volleyballs and other fitness items.
- 1.4.6 **Janitor Closet:** Provide a floor mounted mop sink with hose connection. Provide storage for cleaning supplies, including a janitor cart. Provide storage for mops and brooms. Should be lockable and vented.
- 1.4.7 **Service Entrance:** Provide a (10'-0"x10'-0") roll-up insulated door at the service/delivery entrance. Provide paved access to service entrance for light trucks. Provide direct access from service entrance to main corridor. Locate service entrance at northeast side of new building.
- 1.4.8 **Equipment Repair and Receiving:** Provide shelving and clothes rack. Provide area for part and equipment storage. Provide 2'-6" width x 12'-0" length continuous workbench at 34" above finished floor (A.F.F.). Provide 2 (3'-0"x7'-0") lockable entry doors.

- 1.4.9 **Men's Locker Room:** Provide sauna room and steam room. Provide non-slip floor surface, typically unglazed ceramic mosaic tile. Provide 14" minimum width laminated wood benches (clear finish) at 18" A.F.F. directly in front of all lockers, except in front of handicapped lockers. Provide a minimum space of 2'-2" between locker and nearest edge of bench, except at handicapped lockers. Provide space for 450 built-in lockers, some of these locker will be handicapped accesible. Coordinate with Fitness personal on how many will be handicapped accesible. Handicapped accesible lockers and bench will comply with ADA. Locker can be arranged on island and along walls. Lockers shall be min.18" deep x 15" wide, and two-tiered Z-type lockers, each 36" high. Lockers shall have a padlock eye in the door latching mechanism to accommodate personal locks. Lockers shall be able to have a shelf and multiple coat hooks inside. Provide a continuous sloping hood on top of lockers. Lockers will be placed on raised curb and permanently installed. Provide 3 private showers with changing areas. Remainder of showers to be gang type, wall mounted. Provide a separate 10'-0" long (min.) vanity countertop in addition to the lavatory rim mounted countertop. Both shall have continuous mirrors. Provide two full length mirrors, ~~12" width minimum~~, in the dressing area. Provide sufficient electrical outlets at vanities. Provide wall mounted hair dryers. Provide restrooms. Do not locate restroom stalls within the locker room area. Provide a barrier separation between the Men's and women's locker rooms above ceiling so the is no chance of looking in on the women's locker room. Provide ceiling fans in the dressing areas and locker room.
- 1.4.10 **Women's Locker Room:** Provide sauna room and steam room. Provide non-slip floor surface, typically unglazed ceramic mosaic tile. Provide 14" minimum width laminated wood benches (clear finish) at 18" A.F.F. directly in front of all lockers, except in front of handicapped lockers. Provide a minimum space of 2'-2" between locker and nearest edge of bench, except at handicapped lockers. Provide space for 250 built-in lockers, some of these locker will be handicapped accesible. Coordinate with Fitness personal on how many will be handicapped accesible. Handicapped accesible lockers and bench will comply with ADA. Locker can be arranged on island and along walls. Lockers shall be min.18"deep x 15"wide, two-tiered Z-type lockers, each 36" high. Lockers shall have a padlock eye in the door latching mechanism to accommodate personal locks. Lockers shall be able to have a shelf and multiple coat hooks inside. Provide a continuous sloping hood on top of lockers. Lockers will be placed on raised curb and permanently installed. Provide all private showers enclosure with attached changing areas. Provide a separate 10'-0" long (min.) vanity countertop in addition to the lavatory rim mounted countertop. Both should have mirrors. Provide two full length mirrors, ~~12" width minimum~~, in the dressing area. Provide sufficient electrical outlets at vanities. Provide wall mounted hair dryers. Provide restrooms. Do not locate restroom stalls within the locker room area. Provide ceiling fans in the dressing areas and locker room.
- 1.4.11 **Sauna Room (Men & Women's Locker Rooms):** Sauna room shall be large enough to accommodate 15 adults. Provide for a clock, securable thermostat controls. Provide a duress alarm button to signal back to the reception desk. Provide seating/reclining areas for patrons. Provide headrest and backrest. Provide natural ventilation that allows air to flow freely from the inlet and outlet, located on opposite walls at approximately the same height. Provide manual louvers to adjust the flow of the air from the inside of the sauna, and consider using outside air to supply the sauna. Provide convection heater, stone bed and heat enclosure. Provide heat sensing device 12" below ceiling. Provide wall lighting. Provide bucket and ladle.
- 1.4.12 **Steam Room (Men & Women's Locker Rooms):** Steam room shall be large enough to accommodate 15 adults. Provide for a vapor proof clock, securable thermostat controls. Provide a duress alarm button to signal back to the reception desk. Provide seating/reclining areas for patrons. Provide a steam generator, include insulated steam head with fragrance reservoir, match escutcheon, and auto-drain. Provide heat sensing device 12" below ceiling. Provide ceiling mounted vapor proof halogen light. Provide an all-glass entry door with an aluminum frame including handles. Glass shall be tempered.
- 1.4.13 **Gymnasium:** Provide two main full basketball courts, 94' x 50' each striped according to NCAA standards. Provide Air Force logo, see attachment 27, minimum 5'-0" x 5'-0", one per each main court

diagonally opposite each other. Provide two volleyball courts with stripping. Locate volleyball courts one per each basketball court. Provide floor recessed metal sockets for volleyball netting setup. The basketball goals shall be lowered from the ceiling. The basketball goals shall be placed as to not interfere with the elevated running track. The basketball goals shall be power operated. Provide 10'-0" run around perimeter around the basketball courts and a 20'-0" space between them. Provide floor-recessed receptacles for scoreboard connections at these locations. Provide power retractable curtain that can separate the two basketball courts. At one side of the main court, provide power retractable bleachers 4 tiers high x length to match the long dimension of basketball court. Provide 8 fiberglass basketball goals. Provide glass for natural daylighting and views to exterior at indoor running track level. Provide alcoves for drinking fountains. Provide rubberized flooring at drinking fountain recessed alcoves. Provide 2 electronic scoreboard with shot clocks, public address system and flush mounted outlets for scorekeeper. Provide a double door 2 (3'-0"x 7'-0") for moving large equipment in/out of the new facility. Provide light fixtures with protective wire covering to guard against impact. Provide 2 10'-0"x10'-0" lockable storage rooms, one at each side of bleachers. Provide area for lockable storage and controls for power bleachers and power curtains in one of the 10'-0" x 10'-0" storage room spaces. Provide smooth split face integrally colored CMU from finish floor to 12'-0" min. above finished floor.

- 1.4.14 **Racquet Ball Courts:** 3 Racquet ball courts, 40' x 20' ea. Provide a shatterproof glass back wall/door for viewing and officiating. Provide transition spaces for stretching space outside each court for warm up and cool down. Provide 14" wide laminated wood benches (clear finish) in the transition space. These spaces should be "recessed" off of the main circulation spine. Provide mounting sockets and netting for wally-ball. Provide viewing area at the second floor.
- 1.4.15 **Senior Fitness Room:** Provide continuous mirrors on at least two walls to start 12" above finished floor to 84" above finished floor. Provide alcoves for drinking fountains. Provide rubberized flooring at drinking fountain recessed alcoves. Provide a continuous stretching bar along one wall. Provide recessed, built-in lockable cabinet for 42" plasma TV screen, DVD, VCR and sound system. Provide a ceiling mounted bracket for a 42" plasma screen (NIC). Provide ceiling fans.
- 1.4.16 **Massage Room:** Provide power outlets and controlled lighting. Provide space for two visually separated massage tables, chairs and equipment (NIC). Provide a small wash basin (rim mounted) and cabinet for storage materials. Provide dedicated HVAC control. Provide 3 12"Wx18"Dx72"H lockers. Provide a changing room. Locate in a remote area of the second floor that is free of noise and distractions.
- 1.4.17 **Group Exercising (Large and Small Exercise Rooms):** This will include area for stretching, large exercise room and small exercise room. Provide a min 12'-0" clear ceiling height in the large exercise room. Locate facing east, southeast or south, provide continuous glass in even increments (as structural allows) from 12" A.A.F. to 84" A.A.F. Provide alcove for drinking fountain or conveniently locate drinking fountain outside the group exercise room. Provide rubberized flooring at drinking fountain alcoves. Provide hardwood floor for group (aerobic) exercising. Design the group exercise to allow for flexibility in use. Provide method of fastening padding on walls for use during combative sports and provide storage space for the mats. Provide a continuous stretching bar on at least one wall. Provide securable storage for mats, aerobic equipment, etc. Provide acoustical separation from the rest of the facility. The room should be able to be closed off. Provide a visual connection to the rest of the facility via aluminum glass storefront. Provide a stretching area outside the group exercise area (This could be a widened corridor). Make provisions for future use. Allow for power outlets and data lines. Provide a ceiling mounted bracket for 42" plasma TV screen (NIC). Coordinate the location of bracket with Fitness Center personnel. Provide for natural daylighting. Provide control lighting system. Provide for a sound system that is contained in a recessed securable area for a 42" plasma TV, DVD, VCR and sound. The control should be easily accessible to the instructor. Provide continuous mirrors on two walls to start at 12" above finished floor to 84" above finished floor. Provide ceiling fans in both large and small exercise rooms. Provide recessed, built-in lockable cabinet for 42" plasma TV screen, DVD, VCR and sound system in large and small exercise rooms. Provide a

moveable securable sound attenuated partition in order to divide the large exercise room in half..

- 1.4.18 **Fitness Equipment Spaces:** This will include an area for stretching, a cardiovascular room, a resistance weight training room, and a free weights training room (see area tabulations). Locate facing east, southeast or south, provide continuous glass in even increments (as structural allows) from 12" above finished floor to 84" above finished floor. Provide a min 12'-0" clear ceiling height in the cardiovascular and weight training rooms. Provide ceiling fans in cardiovascular, and weight rooms. Provide double doors at the free weight room and the machine weight room - 2(3'-0" x 7'-0") doors - one per each room. Provide a drinking fountain recessed alcove for each of the room - spaces. Provide rubberized flooring at drinking fountain alcoves. Provide rubber type floor surfacing (Dinoflex) in cardiovascular equipment room, resistance weight training room and the free weights room. Provide CATV, cable outlet and eight mounting brackets for 8 - 42" plasma screens (NIC) at proper viewing height (minimum 7'-4" above finished floor to bottom of the monitor). Coordinate the location of TV brackets with Fitness Center personnel. When locating the ceiling mounted fans, insure that they do not interfere with the plasma screen viewing. Provide recessed power and data receptacle outlets in the floor for each individual machine. Provide for stereo sound system. Provide a min. 2'-0" aisle space (sideway) between each piece of equipment. Provide alcove for drinking fountain within the fitness equipment rooms. Provide rubberized flooring at drinking fountain alcoves. Provide towel dispensers throughout cardio and weight training area. Provide adjacent storage for replacement equipment, mats, and etc.. Provide stretching areas as an integral part of individual exercise rooms. Use these spaces as transition spaces for warm up and cool down. Separate machine weights and free weights spaces from the cardiovascular space by a hard wall. It is preferred to locate the cardiovascular space some distance away from the weight training spaces. Provide FM antennae broadcast capability of video monitors. Provide sufficient power, data, and communications outlets. Provide 110 volt flush floor outlets for each piece of cardio equipment as required. Provide as much natural light as possible. Use general lighting throughout to provide for flexibility. Provide mirrors on at least two walls at the resistance weight training and the free weights training spaces to start at 12" above finished floor to 84" above finished floor (note: mirrors are not necessary in the cardiovascular space). Provide sound-absorbing material to reduce echo. Provide area for Fitlinx system kiosk outside of the weight training area. Provide recessed floor data connections and wires for approximately 100 pieces of exercise equipment for Fitlinx system. A data connection should typically occur at each piece of equipment. Provide floor recessed receptacles all along the outside walls of the cardio room at 6'-0" o.c. (for future possible cardio equipment). Provide floor recessed receptacles along one wall at the free weight room and the machine weight room. Provide the receptacles at 6'-0" o.c. Locate the floor receptacles (for power and data) for the cardio equipment at the front of the machine. Contractor will provide a fitness equipment layout (to scale) to show all the locations of fitness and cardio equipment (to scale) to insure that all of the equipment will fit into the spaces with adequate circulation and that all other requirements are met. Contractor will provide this floor plan layout at or before the completion of the design charrette to present to Fitness Center personnel for review. See Attachment 11 for exercise equipment list.
- 1.4.19 **Storage:** Provide storage room locations throughout the facility. Coordinate the location and size of the spaces with the Fitness Center personnel.
- 1.4.20 **HAWC Reception/Lobby:** Provide securable aluminum glass storefront entrance to lobby/reception area. Provide seating for 5 to 10 people (This differs from the Design Guide and is a user requirement. Provide space for display materials. Provide comm. and data connections for CATV. Provide pass window for receptionist. Includes a private office behind receptionist space for an information manager. Locate reception/lobby entrance near the elevator and main stair. Provide telephone and data lines in receptionist/information manager's office.
- 1.4.21 **Office Space:** Provide five secure hard walled lockable offices. Provide ~~two secure hard walled lockable offices. Provide three hard walled offices.~~ Provide telephone and data lines for each office. Locate all offices with an exterior window view to the east, southeast or south.
- 1.4.22 **Nutrition Counseling:** Provide two rooms. Provide telephone and data outlets for each office. Locate

all offices with an exterior window view to the east, southeast or south.

- 1.4.23 **Relaxation Room:** Provide electrical outlet. Provide controlled adjustable lighting. Provide acoustic treatment to reduce sound transmission into the room. Provide comfortable seating for 1 to 2 people (NIC). Should be located in a remote area or the HAWC that is free from noise and distractions.
- 1.4.24 **Classroom:** Provide seating space for 50 people in a classroom arrangement. Provide a moveable sound attenuated partition to separate the space in 1/2. Provide power outlets for audio visual equipment, telephone and data lines. Provide recessed receptacle for power and data connection at ceiling, one for each half of classroom space for overhead projector. Provide ceiling mount support for projectors. **Provide manuel projection screens, one in each classroom.** Coordinate location, support, data and power requirements for projectors with the HAWC personnel. Located classroom adjacent to kitchen. Each classroom with have it own projector. Provide controlled lighting. Design the room to be closed and securable. Locate classroom to be adjacent off of main lobby at second floor and to be accessible to the main Fitness Center Staff after HAWC closes. Classrooms must be securable from other HAWC offices and kitchen after HAWC closes. Provide a white erasable marker board, one per each half of classroom space. Marker board dimensions are 48" high x 72" long each. Mount marker boards at 34" above finished floor. See Attachment 9 for additional information.
- 1.4.25 **Computer Resource Lab:** Provide communication and data ports for phone and computer printer. Provide for task lighting. Design room to be closed and securable. Locate in office staff area for efficient utilization by staff. Provide cabinet along one wall to store office supplies. Provide a 2'-6" width x 10'-0" length countertop at 34" above finished floor.
- 1.4.26 **Ergometry Fitness Testing:** Provide 4 spaces. Each space must be private and quiet. Provide for a testing computer with data connection. Provide for a testing bike. Locate room adjacent to the wellness assessment room. Provide a computer communications data port for each room.
- 1.4.27 **Wellness Assessment:** Provide 1 space - room. Can be zoned together with the ergometry.
- 1.4.28 **Resource Library:** Provide for storage for educational materials. Provide a continuous countertop - 2'-6" width x 10' length at 34" above finished floor with task lighting. Provide telephone, data ports and power outlets. Combine this space with the reception/lobby area.
- 1.4.29 **Kitchen/Food:** Provide kitchen demonstration island with range, full size dishwasher, vegetable sink and countertop workspace. Provide an overhead mirror above so that people standing in the back can see. Provide a 26" width continuous countertop workspace with stainless steel double sink with disposal and sprayer. Locate top of countertop at 36" above finished floor. Provide continuous overhead closed cabinets. Cabinet dimensions shall be 30" height x 1'-0" depth with two tier shelves. Provide 18" minimum clear space between top of countertop and underside of cabinets. Provide space for a 2'-6" x 6'-0" refrigerator, smooth top stove (with overhead hood/exhaust ventilation, see Chapter D34, 2.2.5) . Provide space in cabinets for microwave. Provide 110 volt and 220 volt outlets for all appliances as applicable. Locate room adjacent to the classroom. Provide a moveable securable sound attenuated partition to separate and secure the kitchen from the classroom. See Attachment 9 for additional information.
- 1.4.30 **Janitor Closet and Storage:** Provide floor mount utility sink. Provide space for cleaning supplies, mops & brooms. Provide additional storage space within for written materials. Locate near Ergo stations.
- 1.4.31 **Staff Locker Rooms:** Provide one ~~unisex~~ mens shower and dressing area. Provide towel hook in dressing area. ~~Access to the shower/dressing area shall be from both the men and women's locker rooms. Both door shall be lockable from the inside of shower/ dressing area~~ Provide one toilet, and one lavatory/vanity and 3 lockers ~~ea. for male & female.~~ Provide one womens shower and dressing area. Provide towel hook in dressing area. Provide one toilet, and one lavatory/vanity and 3 lockers. Must be handicap accessible. Must provide 5'-0 min turn around space for handicap.
- 1.4.32 **Public Restrooms:** Provide public restrooms for the second floor. Both second floor public restrooms

will include a diaper changing station.

1.4.33 **Circulation:** Provide two open stair, one near main entrance adjacent to elevator to provide access to the HAWC. One near the gymnasium to provide access to the 2nd floor exercise areas and indoor running track. Provide elevator in the main lobby area. Provide smooth split face integral colored CMU in the main circulation spaces to at least 12' high. This is a maintenance free surface and very durable. Provide a 4'-0" minimum circulation walkway at the second floor level to connect the indoor running track, HAWC, racquetball overlook, exercise spaces, public restrooms, massage and other building support functions at the second floor level. A portion of this walkway should overlook the main entrance lobby/reception/climbing wall areas on first floor. From the HAWC reception/lobby area, also provide a view to these spaces on first floor.

1.4.34 **Support Entrances:** Locate access for deliveries, service entrance, fire and mechanical room access from the north to northwest side of new building.

1.5 Space Finishes and Fittings.

1.5.1 **Lobby:**

- a. Flooring: Mud scraper or proper wet transition area (walk-off recessed foot grills) at the air lock entry. The remaining area should be a combination of carpeted areas (seating area) and porcelain pavers with porcelain paver base. A resilient rubber matting/flooring (finish to coordinate with other finishes in the lobby) needs to be provided in front of the climbing wall (Option Item) that protects the climbers if they fall. Provide the Air Force logo graphic symbol into the floor surfacing material as a graphic arts design minimum size to be 10'-0" x 10'-0". See attachment 27. A jpeg file of the logo will be provide at the design charette.
- b. Walls: Painted.
- c. Ceiling: 2' x 2' tegular acoustical ceiling tile.
- d. Furniture: Trophy case, health kiosk, event schedule board, Fitlinx system, Automatic blood pressure measuring machine, semi-circular reception desk/counter with toss in for discarded towels.

1.5.2 **Main Circulation Space:**

- a. Flooring: Space should be a combination of carpeted areas (seating area) and porcelain pavers with porcelain paver base.
- b. Walls: Smooth face integral color CMU. Crash rails and corner guards to be provided as required by function.
- c. Ceiling: 2' x 2' tegular acoustical ceiling tile.

1.5.3 **Administration:**

- a. Flooring: Carpet with resilient base.
- b. Walls: Painted.
- c. Ceiling: 2' x 2' tegular acoustical ceiling tile.
- d. Furniture: Standard office furniture (NIC).

1.5.4 **Juice Bar:**

- a. Flooring: Porcelain pavers with porcelain paver base.
- b. Walls: Painted
- c. Ceiling: 2' x 2' tegular acoustical ceiling tile.
- d. Furniture: Built-in cabinetry with a sink.

1.5.5 **Break Room:**

- a. Flooring: Resilient flooring with resilient base.
- b. Walls: Painted
- c. Ceiling: 2' x 2' tegular acoustical ceiling tile.
- d. Furniture: Built-in cabinetry with a sink. Table and chairs (NIC).

1.5.6 **Support Areas:**

- a. Flooring: Resilient flooring with resilient base.

- b. Walls: Painted.
- c. Ceiling: 2' x 2' tegular acoustical ceiling tile.
- d. Furniture: Workbench in Equipment Repair (NIC).

1.5.7 Locker Rooms (Moisture resistant finishes):

- a. Flooring: Unglazed ceramic mosaic tile (slip-resistant).
- b. Locker Room Walls: Smooth face integral color CMU .
- c. Restroom & Shower Walls: Ceramic glazed tile wainscot (42") in the restroom with ~~paint~~ painted CMU above. Full-height ceramic tile in the shower areas.
- d. Ceiling: Moisture resistant gypsum board in Locker rooms and Restrooms. Portland cement plaster ceiling in the Shower.
- e. Furniture: Built-in phenolic lockers (CFCI) will continuous sloping top, attached to base and walls. Wood-laminated benches (CFCI). Lockers shall be on a minimum 4" concrete base. Towel holders (CFCI) need to be approximately 4-5' high.

1.5.8 Gymnasium:

- a. Flooring: Floating Hardwood (Area Elastic Floor), ~~possibly provide rollout protective floor covering for special events.~~ Provide Air Force logo graphic arts symbol one per each of the main basketball courts diagonally opposite each other. (Follow similar procedure as for the lobby logo).
- b. Walls: Smooth face integral color CMU . Crash padding (CFCI) (removable) where appropriate. CMU shall be extended from finish floor to roof.
- c. Ceiling: Open to Structure, color: white.
- d. Furniture: Telescoping bleachers, divider curtain (increase flexibility) (CFCI).

1.5.9 Group Exercise (Large and Small Exercise Rooms):

- a. Flooring: Durable, multi-use surface (Combination Surface). Floor surface must meet impact IAW DIN standards.
- b. Walls: Painted. Crash padding (removable) where appropriate. Mirrors on at least two walls at a minimum of 12" above the floor. Room divider in the large exercise room.
- c. Ceiling: Open to Structure, color: white.
- d. Furniture: Continuous stretching bar (CFCI) on at least one wall. Punching bags ~~and speed-bags~~ (GFGI) and speed bags (GFGI). Provide recessed, built-in lockable cabinet (CFCI) for 42" plasma TV screen, DVD, VCR and sound system (NIC) in large and small exercise rooms. Divider curtain (CFCI).

1.5.10 Senior Fitness Room:

- a. Flooring: Durable, multi-use surface (Combination Surface). Floor surface must meet impact IAW DIN standards.
- b. Walls: Painted. Crash padding (removable) where appropriate. Mirrors on at least two walls at a minimum of 12" above the floor.
- c. Ceiling: Open to Structure, color: white.
- d. Furniture: Continuous stretching bar (CFCI) on at least one wall. Punching bags ~~and speed-bags~~ (GFGI) and speed bags (GFGI). Provide recessed, built-in lockable cabinet (CFCI) for 42" plasma TV screen, DVD, VCR and sound system (NIC) in senior fitness room.

1.5.11 Fitness Equipment Spaces (Cardiovascular, Resistance Weight & Free Weight):

- a. Flooring: Permanently adhered impact flooring with a nonporous, high density rubber/elastic surface (Point Elastic Floor - Dinoflex). ~~Interlocking impact flooring tiles are not acceptable.~~
- b. Walls: Painted. Crash padding (removable) where appropriate. Mirrors on at least two walls at a minimum of 12" above the floor. Sound-absorbing materials shall be used to reduce echo in this space.
- c. Ceiling: Open to Structure, color: white.
- d. Furniture: Average 50 sq. ft per equipment station approximate, coordinate with user, towel dispensers & spray disinfectant, trash receptacles, equipment storage. Contractor will provide an equipment layout plan drawing to insure that all equipment fits into the fitness equipment spaces with adequate circulation all around at or before the completion of the design charrette to the

Fitness Center personnel for review. Contractor will coordinate this layout plan with the Fitness Center personnel. The fitness equipment is GFGI.

1.5.12 Racquetball Courts:

- a. Flooring: Floating Hardwood (Area Elastic Floor), refer to the Ramsey/Sleeper Architectural Graphic Standards and the ACSM standards for reference material regarding Racquetball Courts.
- b. Walls: Painted hard plaster, concrete, nonsplintering durable wood or laminated composition panels. Back wall/door shall be shatter-proof glass.
- c. Ceiling: Open to Structure, color: white.
- d. Furniture: Wallet lock-boxes (CFCI).

1.5.13 Massage Room:

- a. Flooring: ~~Resilient flooring~~ carpet with resilient base.
- b. Walls: Painted.
- c. Ceiling: 2' x 2' tegular acoustical ceiling tile.
- d. Furniture: Massage tables (NIC), chairs (NIC), equipment (NIC), built-in cabinetry and a sink and 3 lockers.
- e. Adjustable lighting.

1.5.14 HAWC Reception/Lobby/Waiting:

- a. Flooring: Carpet with resilient base.
- b. Walls: Painted.
- c. Ceiling: 2' x 2' tegular acoustical ceiling tile.
- d. Furniture: Seating for five to ten people (NIC).

1.5.15 HAWC Office Space, Nutrition Counseling & Classroom:

- a. Flooring: Carpet with resilient base.
- b. Walls: Painted.
- c. Ceiling: 2' x 2' tegular acoustical ceiling tile.
- d. Furniture: Standard office and classroom furniture (NIC).

1.5.16 HAWC Computer Resource Lab:

- a. Flooring: Carpet with resilient base.
- b. Walls: Painted.
- c. Ceiling: 2' x 2' tegular acoustical ceiling tile.
- d. Furniture: Built-in Cabinetry (CFCI) and standard resource lab furniture (NIC).

1.5.17 HAWC Ergometry Fitness Testing:

- a. Flooring: Carpet or resilient flooring with resilient base.
- b. Walls: Painted.
- c. Ceiling: 2' x 2' tegular acoustical ceiling tile.

1.5.18 HAWC Wellness Assessment Rooms:

- a. Flooring: Carpet or resilient flooring with resilient base.
- b. Walls: Painted.
- c. Ceiling: 2' x 2' tegular acoustical ceiling tile.
- d. Furniture: Testing equipment (NIC).

1.5.19 HAWC Resource Library:

- a. Flooring: Carpet with resilient base.
- b. Walls: Painted.
- c. Ceiling: 2' x 2' tegular acoustical ceiling tile.
- d. Furniture: Reading tables with task lighting, storage for education materials (NIC).

1.5.20 HAWC Kitchen/Food Demonstration:

- a. Flooring: Resilient flooring with resilient base.
- b. Walls: Painted.

- c. Ceiling: 2' x 2' tegular acoustical ceiling tile.
- d. Furniture: Cabinetry (CFCI).

1.5.21 **HAWC Relaxation Area:**

- a. Flooring: Carpet with resilient base.
- b. Walls: Painted.
- c. Ceiling: 2' x 2' tegular acoustical ceiling tile.
- d. Furniture: Comfortable lounge seating for 1 to 2 people (NIC).
- e. Adjustable lighting

1.5.22 **Public Restroom:**

- a. Flooring: Unglazed ceramic mosaic tile (slip-resistant).
- b. Walls: Ceramic glazed tile wainscot (42") with paint above.
- c. Ceiling: Moisture resistant gypsum board.
- d. Furniture: Diaper Changing Station.

1.5.23 **Indoor Track (Option Item):**

- a. Flooring: Resilient running surface, such as rubber. Provide color samples of resilient track surfacing material to Fitness Center Staff for selection prior to application.
- b. Walls: Painted. Provide railing around the inside of the track.
- c. Ceiling: Open to Structure.
- d. Furniture: Digital Clock (CFCI).

1.6 Roof:

- 1.6.1 The roof and fascia will be a standing seam metal. Provide a canopy at all exterior doors where is not a roof overhang. Any and all building canopies will comply with Hill AFB Design guide. Provide roof fascias (min. 1'-6") and soffits and associated architectural detailing to enhance appearance of building. Provide compression fitted (not screwed) snow bars at all building roof perimeter. Provide a 3'-0" min roof overhang will be provided at building perimeter.

1.7 Color Scheme:

- 1.7.1 Provide for a variety of color but coordinated color scheme throughout the facility. Coordinate all color selections with the Fitness Center people having the final selection/choice on the colors.

1.8 **Option Items**

- 1.8.1 Indoor elevated running track: The indoor track will be at the same elevation as the second floor. The indoor track should not interfere with building circulation. Locate track in gymnasium space suspended from the roof structure. Track will be open to the gymnasium floor space below. The track should be a minimum of **as close as possible to** 1/11 of a mile in length, based on the inside radius, and have a minimum width of 12'-0". The turns should have a minimum inside radius of 8'-0" and a minimum outside radius of 20'-0". Provide a minimum of four lanes striped with each lane being 3'-0" wide. Provide a digital clock. Provide a resilient running surface, such as rubber. Provide a stretching, warm up, and cool down area with drinking fountains. Provide glass for natural daylighting and views to exterior. Provide glass from 12" above track surface to 84" above track surface. Provide roll down fabric curtain for the glass to shield from excessive direct sunlight or glare. Provide recessed lighting under the indoor running track to enhance the bleachers area. The square footage of the indoor elevated running track will be counted as 50%.
- 1.8.2 Indoor climbing wall shall be ~~40'-0"~~ **25'-0"** horizontal length x 40'-0" vertical height with difficulty range from 5.5 to 5.12 with interchangeable rock handholds with a minimum T-nut density of 2 square foot to allow for best route setting. The climbing wall height will be as high as the structure will allow. ~~The climbing wall~~ design should include a combination of roughly 10% slab, 20% vertical, 50% slightly overhanging and 20% substantially overhanging elements. Provide lead routes with established anchor points no further than 5 ft. apart starting at 10' from the ground. Provide large diameter belay bars (-1/2" min O.D.) along entire top plate of wall, except where wall angles exceed steepness for safe

top-roping. Provide four belay stations w/ anchors. The anchors could be recessed into floor. Design must meet or exceed the recommended minimum fall zone of 6 ft. from the furthest protrusion of the climbing surface. Features will include highly sculpted aretes, dihedrals, overhangs, and micro-relief such as fossils and edging features. Design must meet or exceed all CWIG standards. The frame of the wall is to be welded steel frame construction attached to the facility walls, floor, and ceiling in a method that will not compromise the integrity of the facility. The climbing terrain shall have a durable high-friction troweled surface of 1/4 inch average thickness. A minimum of one **2'-0" x 4'-0"** access door is to be installed, allowing access to the inside of the wall for maintenance and storage. This door should match the surface of the wall and serve as climbing terrain. The climbing wall system will be designed to safely integrate with the facility. Provide Safety flooring designed for impact absorption, durability, and dust control, will cover at least the recommended 6 ft. fall zone as described above. Provide climbing holds that vary in size and shape. The number of holds is suggested to equal 1 per 3 square feet of climbing surface. Locate climbing wall in the two story area near main entrance to fitness center with views to east/southeast.

- 1.8.3 Outdoor Track Lighting: Provide the required number of pole mounted high pressure sodium fixtures to meet the lighting level of the IES Lighting Handbook for outdoor track. Lights shall be controlled by photocell/timer with manual override.
 - 1.8.4 11th street running track POV turnout: Also provide for 50 parking spaces at track and field vicinity including a turn-off from 11th street to allow access. The 50 parking spaces will have one-way flow of traffic and the stalls will be angled to 60 degrees. The parking shall be sited south of 11th Street and north of new track.
- 1.9 Additional Requirements:
- 1.9.1 Required additional information for the above listed spaces can be located in the USAF Fitness Design Guide. See Attachment 12

END OF CHAPTER 11

CHAPTER 111**FACILITY PERFORMANCE****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide built elements and site modifications as required to fulfill needs described in the project program.
- 1.1.2 The complete project comprises the following elements:
 - a. Substructure (A): Elements below grade and in contact with the ground.
 - b. Shell (B): The superstructure, exterior enclosure, and the roofing.
 - c. Interiors (C): Interior construction, stairs, finishes, and fixtures, except fixtures associated with services and specialized equipment.
 - d. Services (D): Mechanized, artificial, automatic, and unattended means of supply, distribution, transport, removal, disposal, protection, control, and communication.
 - e. Equipment and Furnishings (E): Fixed and movable elements operated or used by occupants in the functioning of the project.
 - f. Demolition (F): Removal of unneeded and undesirable existing elements.
 - g. Sitework (G): Modifications to the site, site improvements, and utilities.
- 1.1.3 Code: Make all portions of the project comply with the code. The code referred to herein consists of all applicable local, State, and federal regulations, including those listed below:
 - a. Federal Regulatory Requirements:
 - (1) Americans with Disabilities Act of 1990, as a public accommodation, as implemented in:
 - (a) 28 CFR 35, Department of Justice regulations relating to State and local governments, including ADAAG.
 - (b) 28 CFR 36, Department of Justice regulations, including ADAAG-1994.
 - (2) Uniform Federal Accessibility Standards (UFAS), dated August 7, 1994.
 - (3) 29 CFR 1910-1997, Occupational Safety and Health Standards, as a work place.
 - b. Building codes used for design at Hill AFB include:
 - (1) ICC International Building Code, 2003
 - (2) NFPA 101, Life Safety Code, 2003
 - (3) ICC International Plumbing Code, 2003
 - (4) ICC International Mechanical Code, 2003
 - (5) NFPA 13, Installation of Sprinkler Systems, 2002
 - (6) NFPA 54, National Fuel Gas Code, 1999
 - (7) NFPA 70, National Electrical Code, 2002
 - (8) NFPA 72, National Fire Alarm Code 2002
 - (9) NFPA 90A, Installation of Air- Conditioning and Ventilating Systems,
 - c. Standards: The following Hill AFB, Air Force, and Army standards are to be followed:
 - (1) Hill AFB Architectural Compatibility Standards
 - (2) Hill AFB Base Facility Design Standards, dated 8 Apr 2004
 - (3) UFC 3-600-01 Fire Protection for Facilities Engineering, Design and Construction, dated January 16, 2004
 - (4) Air Force ETL 01-02: Fire Protection for Facilities Engineering, Design, and Construction
 - (5) Army TI 800-01: Design Criteria, Chapter 11 Energy Conservation
 - (6) UFC 4-010-01 Design: DoD Minimum Antiterrorism Standards for Buildings, dated 8 Oct 2003
 - (7) UFC 3-520-01 Design: Interior Electrical Systems, dated 10 Jun 2002
 - (8) Air Force AFJMAN 32-1080: Electrical Power Supply and Distribution, dated 28 Feb 1995
 - (9) Air Force ETL 02-12: Communications and Information System Criteria for Air Force Facilities, dated 27 Jun 2002
 - (10) Air Force AFM 88-9/Chapter 3: Electrical Design-Lightning and Static Electricity Protection, dated 29 Mar 1985

- (11) ASHRAE Standard 90.1-2001 Energy Standards for Buildings except Low-Rise Residential Buildings
 - (12) UFC 1-200-01 Design: General Building Requirements, dated 31 July 2002(change reference in this UFC from "IBC 2000" to "IBC 2003")
 - d. Occupancy: The project is a mixed occupancy, according to the code, which includes Group A (Assembly), B (Business), and E (Educational) occupancies.
- 1.1.4 Environmentally Responsible Design: In addition to other requirements, provide design and construction that minimizes adverse effects on the exterior environment, enhances the quality of the indoor environment, and minimizes consumption of energy, water, construction materials, and other resources.
- a. Achieve at least a Certified rating in accordance with U.S. Green Buildings Council LEED Green Building Rating System; selection of specific credits to achieve is the responsibility of Design-Builder unless otherwise indicated; comply with criteria specified in current LEED Rating System documentation as well as related criteria specified in other chapters.
 - b. The goals listed below are some of those that are applicable to the project.
 - (1) The goals indicated as "required" must be achieved.
 - (2) The goals indicated as "desirable" will be given high priority in evaluating proposals.
 - (3) The goals indicated as "if possible" must be achieved if the design and site considerations allow.
 - (4) The goals indicated "as specified" have different requirements specified in other Chapters.
 - c. Sitework:
 - (1) Bicycle and cyclist facilities: Desirable.
 - (2) Minimum surface disturbance: Desirable.
 - (3) Sediment and erosion control: Required.
 - d. Water Conservation:
 - (1) Reduction of potable water use for sewage conveyance: Desirable.
 - e. Energy Conservation:
 - (1) Minimum energy efficiency: Required.
 - (2) Improvement of efficiency through basic building commissioning: Required.
 - (3) No use of CFC-based refrigerants: Required.
 - (4) No use of HCFC's or Halon: Desirable.
 - f. Conservation of Materials and Resources:
 - (1) Central location for collection and storage of recyclables: Required.
 - (2) Recycling and/or salvaging of construction waste: Desirable.
 - (3) Use of salvaged or refurbished materials: Desirable.
 - (4) Use of materials containing recycled content: Desirable.
 - (5) Use of local/regional materials: Desirable.
 - (6) Use of rapidly renewable materials: Desirable.
 - (7) Use of certified wood: Desirable.
 - g. Indoor Environmental Quality:
 - (1) Smoking will be prohibited in the building.
 - (2) Minimum ventilation performance: Required.
 - (3) Increased ventilation effectiveness: Desirable.
 - (4) Location for make-up air intake ventilation shall be 10 feet above ground level to comply with the new anti-terrorism policy.
 - (5) Use of materials that are low-emitting, non-toxic, and chemically inert: Required.
 - (6) Control of sources of indoor pollutants: Required.
 - (7) Provision of daylighting: Desirable.
 - (8) Provision of views to outdoors: Desirable.
 - (9) Humidity control and monitoring: Desirable.
 - h. Substantiation:
 - (1) Preliminary Design Stage: LEED Checklist annotated to show specific credits to be achieved with brief description of how they will be achieved.

- (2) Design Development and Construction Documents Stages: LEED Checklist annotated to show status of design related to specific credits to be achieved and a comprehensive checklist of certification document specified in LEED Reference Guide annotated to show status of preparation of documentation.
- 1.1.5 Food Preparation, Storage, Serving, and Demonstration Facilities: Located, designed, and constructed to allow efficient operations, to minimize contamination and spoilage of foods, to allow easy maintenance and cleaning, and to provide effective protection against the entrance and harborage of pests.
 - a. Substantiation:
 - (1) Construction Documents: Material and equipment specifications.
 - 1.1.6 Athletic Spaces (SP7 Spaces):
 - a. Court and Field Designs: As described in the project program.
 - (1) Basketball: NCAA rules.
 - (a) Indoor: Wood Flooring.
 - (2) Racquetball: U.S. Racquetball Association rules.
 - (3) Track and Field: NCAA rules.
 - (4) Volleyball: USA Volleyball rules.
 - (a) Indoor: Wood Flooring.
 - (5) Weightlifting: USA Weightlifting rules.
 - 1.1.7 Sustainable Design Considerations:
 - a. Sustainable Design Techniques:
 - (1) Sustainable Design techniques shall be considered as they relate to site design, site engineering, building design, and building engineering. Techniques which conserve energy, improve livability, and can be justified by life cycle cost analysis as cost effective are encouraged. Integration of energy conservation systems with the building design (lighting, structure, mechanical systems, and aesthetics) is essential to facilitate usability and maximum energy savings. The following paragraphs define the goals and general objectives for inclusion of Sustainable Design Considerations in this project. This information is taken from US Army Corps of Engineers, ETL 1110-3-491. The listing is not all inclusive, and the techniques suggested may not be cost effective at a given location or site. Additional consideration in the technical evaluation will be given to designs which incorporate and identify Sustainable Design techniques included in the proposal.
 - b. Goals and Objectives of Sustainable Design:
 - (1) The overall USACE goal of Sustainable Design is to be Environmentally responsible in the delivery of facilities. The key traditional elements for decision making in the facility delivery process are cost, quality and time. These elements need to be expanded to include the ecological and human health impacts of all decisions.
 - c. Sustainable Design and Construction of the Built Environment. Design and construction of sustainable buildings should be in accordance with the following concepts:
 - (1) Site Work and Planning--Environmentally sensitive planning looks beyond the boundary of the project site to evaluate linkages to transportation and infrastructure, ecosystem and wildlife habitat and community identification. Site planning evaluates solar and wind orientation, local micro climate, drainage patterns, utilities and existing site features to develop optimal siting and appropriate low maintenance landscape plant material (note: in this project, building location and orientation are already set);
 - (2) Building Layout and Design--Optimize building size, and maintain an appropriate building scale for the environment and context of the building or a building component. Layout the rooms of a building for energy performance and comfort, and design for standard sizes to minimize material waste. Pay careful attention to the location of exterior windows. Avoid structural over-design and the resultant waste. Design components of the built environment for durability and ease of adaptation to other uses, and for waste recycling (note: in this project, building size and scale and layout of rooms basically are already set);

- (3) Energy--Building orientation and massing, natural ventilation, day-lighting, shading and other passive strategies, can all lower a building's energy demand and increase the quality of the interior environment and the comfort and productivity of occupants (note: in this project, building orientation and massing are already set);
 - (4) Building Materials--Environmentally preferable building materials are durable and low maintenance. Within the parameters of performance, cost, aesthetics and availability, careful selection and specification can limit impacts on the environment and occupant health;
 - (5) Indoor Air Quality--Indoor air quality is most effectively controlled through close coordination of architecture, interiors and MEP design strategies that limit sources of contamination before they enter the building. Construction procedures for IAQ and post-occupancy user guides also contribute to good long-term IAQ;
 - (6) Water--Site design strategies that maximize natural filtration of rainwater and consideration. Water conservation is enhanced by low flow plumbing fixtures, water appropriate landscaping and HVAC and plumbing system design;
 - (7) Recycling and Waste Management--Waste and inefficiency can be limited during construction by sorting and recycling demolition and construction waste, reuse of on-site materials and monitoring of material use and packaging. Accommodating recycling into building design reduces waste while generating revenues, and;
 - (8) Building Commissioning, Operations and Management--Effective building commissioning is essential to ensure proper and efficient functioning of systems. Facilities operations benefit from the monitoring of indoor air quality and energy and water saving practices, waste reduction and environmentally sensitive maintenance and procurement policies.
- d. Documentation of Sustainable Design. The Contractor shall analyze the project using the United States Green Building Council's (USGBC) "Leadership in Energy and Environmental Design (LEED) Green Building Rating System and report the finding to the Contracting Officer. See also "Sustainable Facility Guide", 3/31/00, prepared by John Barrie Associates Architects Inc. and the United States Air Force Air Combat Command. The project shall meet a "certified" rating (minimum 26 points of maximum 69 points), including all prerequisites, in accordance with LEED's Green Building Rating System Version 2.1 rating tool. LEED certification by USGBC is not required.
- 1.1.8 In addition to the requirements of this chapter, comply with requirements of Chapter 1 - Program Summary and Chapter 11 - Program.
- 1.2 Amenity and Comfort:
- 1.2.1 Thermal Performance: Design and construct to provide comfortable interior environment in accordance with the code and the following:
- a. Summer Interior Design Conditions:
 - (1) Daytime Setpoint: 78 deg F, plus or minus 2 deg F except as specified in the project program or in Chapter D3.
 - b. Winter Interior Design Conditions:
 - (1) Daytime Setpoint: 72 deg F, plus or minus 2 deg F except as specified in the project program or in Chapter D3..
 - (2) Night Setback: 55 deg F.
 - c. Outside Air Design Conditions:
 - (1) Summer Outside Air Design Temperature: 92 deg F dry-bulb; 64 deg F wet-bulb.
 - (2) Summer Outside Air Design Temperature: 2.5 percent MCWB cooling design condition listed in the 2001 ASHRAE Fundamentals Handbook.
 - (3) Winter Outside Air Design Temperature: 10 deg F dry-bulb.
 - d. Energy Design Wind Speed: 10 mph.
- 1.3 Health and Safety:
- 1.3.1 Fire Resistance: Provide Type II-B construction in accordance with ICC International Building Code.
- 1.3.2 Fire Protection System: Provide wet type automatic sprinkler system in accordance with NFPA 13.

Backflow prevention devices on fire systems are required to be Utah State approved. Contractor to provide proof of this approval.

- 1.3.3 Environmental Sanitation and Safety:
- 1.3.4 Plumbing System: Provide toilet for both gender in every occupied facility to support basic sanitary and hygienic requirements. Construction of plumbing system shall be in accordance with the International Plumbing code, Federal, State and other local regulations. Plumbing fixture requirements by number of occupants shall be in accordance with the AFMAN 32-1070, Chapter 4.
- 1.3.5 Prevention of Accidental Injury: As required by code and as follows:
 - a. Safety Glazing: As defined by 16 CFR 1201; provide in locations required by code and glazed areas subject to human impact.
 - b. Other requirements specified in other Chapters.
 - c. Substantiation:
 - (1) Preliminary Design: Identification of building elements that require special accident prevention measures.
 - (2) Design Development: Identification of safety measures taken, detailed description of design criteria, and structural analysis of load-resisting elements prepared by licensed structural engineer.
 - (3) Construction Documents: For load-resisting elements, structural design calculations and drawings sealed by licensed structural engineer.
- 1.3.6 Lightning Hazard: Verify lightning protection design is required to prevent damage to occupants, structure, services, and contents due to lightning strikes per AFM 88-9, Chapter 3: electrical Design Lightning and Static Electricity Protection.
- 1.3.7 Health Hazards:
 - a. Design to prevent growth of fungus, mold, and bacteria on surfaces and in concealed spaces.
 - b. Hazardous Construction Materials: Design and construct to comply with the requirements of the code.
 - c. Indoor Air Quality: Design and construct to comply with the code and the following:
 - (1) Acceptable air quality as defined by ANSI/ASHRAE 62-2001.
 - (2) Substantiation:
 - (a) Design Development: Identification of methods to be used to comply with requirements; ventilation design calculations. Identification of unusual indoor contaminants or sources and methods to mitigate their effects on occupants.
 - (b) Construction Documents: Specifications showing that construction materials are not contaminant sources and do not adversely affect air quality.
 - (c) Commissioning: Field measured outside and supply air quantities for each space and its associated air handler.
- 1.3.8 Electrically-Operated Equipment and Appliances: UL listed for application or purpose to which they are put; suitable for wet locations listing for exterior use.
- 1.4 Structure:
 - 1.4.1 Earthquake Loads: Accommodate loads as prescribed by code.
 - 1.4.2 Substantiation:
 - a. Preliminary Design: Detailed listing of design criteria and preliminary analysis, prepared by a licensed structural engineer.
 - b. Construction Documents: Detailed design analysis by licensed structural engineer.
- 1.5 Durability:
 - 1.5.1 Expected Service Life Span: Expected functional service life of the built portions of this project is 25 years.

- a. Service life spans of individual elements that differ from the overall project life span are defined in other Chapters.
 - b. Substantiation: Since actual service life cannot be proven, substantiation of actual service life is not required; however, the following are reasonable indicators of anticipatable service life:
 - (1) Preliminary Design or Design Development: Service life expectancy analysis, for each element for which life span is specified; including:
 - (a) Length of effective service life, and aesthetic service life if specified, with action required at end; e.g. complete replacement, partial replacement, refurbishment.
 - (b) Conditions under which estimate will be valid; e.g. expected uses, inspection frequency, maintenance frequency, etc.
 - (2) Design Development: Replacement cost, in today's dollars, for each major element that has a service life expectancy less than that of the project; include both material and labor cost, but not overhead or profit; base costs on installing in existing building, not as a new installation.
 - (3) Design Development: Life cycle cost of project, over the specified project service life, excluding operating staff costs; include costs of:
 - (a) Replacement of each element not expected to last the life of the project; identify the frequency of replacement.
 - (b) Energy for operation of equipment and systems, from energy analysis specified under "Operation and Maintenance".
 - (c) Routine cleaning of exposed materials; identify type of cleaning and frequency.
 - (d) Deduct salvage value of replaced elements.
 - (e) Calculate costs in today's dollars, disregarding the time value of money, inflation, taxes, and insurance.
- 1.5.2 Animals: Do not use materials that are attractive to or edible by animals or birds.
- 1.5.3 Insects: Do not use materials that are edible by insects, unless access by insects is prevented.
- 1.6 Operation and Maintenance:
- 1.6.1 Space Efficiency: Minimize floor area required while providing specified spaces and space relationships, plus circulation and services areas required for functions.
- 1.6.2 Energy Efficiency: Minimize energy consumption while providing function, amenity, and comfort specified.
- a. Provide energy efficient design using procedures and values specified in ASHRAE 90.1-2001.
 - (1) Provide at least 10 percent less energy consumption than that of an equivalent minimally-complying baseline building, demonstrated by comparing the actual Design Energy Cost to the Energy Cost Budget of a prototype building, both calculated in accordance with ASHRAE 90.1.
 - b. Substantiation:
 - (1) Design Development: Detailed listing of design criteria and design analysis showing compliance, prepared by a licensed mechanical engineer.
 - (2) Design Development: Energy cost of all energy-consuming equipment and systems over the first year of operation; include analysis of probable change in annual cost over time due to aging but disregarding inflation and rate changes.
- 1.6.3 Water Consumption: Minimize water consumption.
- 1.6.4 Ease of Operation: Provide facility, equipment, and systems that are easily operated by personnel with a reasonable level of training for similar activities.
- a. Minimize the need for specialized training in operation of specific equipment or systems; identify all equipment and systems for which the manufacturer recommends or provides training programs.
 - b. Train Government's personnel in operation of equipment and systems.
- 1.6.5 Ease of Maintenance: Minimize the amount of maintenance required.
- a. Substantiation:

- (1) Design Development: Maintenance cost for first year of operation, based on use of maintenance contracts; estimate of the impact that aging materials will have on maintenance costs; description of maintenance activities included in estimated cost.
- 1.6.6 Ease of Repair: Elements that do not meet the specified requirements for ease of repair may be used, provided they meet the specified requirements for ease of replacement of elements not required to have service life span equal to that specified for the project as a whole; the service life expectancy analysis and life cycle cost substantiation specified for service life are provided; and Government' acceptance is granted.
- 1.6.7 Ease of Replacement:
 - a. Elements Not Required to have the Expected Service Life Span Equal to that Specified for the Project as a Whole: Make provisions for replacement without undue disruption of building operation.

2. ELEMENTS AND PRODUCTS

- 2.1 In addition to requirements specified in other chapters, provide products and elements that comply with the following.
- 2.2 Where "no substitutions" is indicated, use only the product (or one of the products) specified.
- 2.3 Elements Made Up of More Than One Product:
 - 2.3.1 Where an element is specified by performance criteria, use construction either proven-in-use or proven-by-mock-up, unless otherwise indicated.
 - a. Proven-In-Use: Proven to comply by having actually been built to the same or very similar design with the same materials as proposed and functioning as specified.
 - b. Proven-by-Mock-Up: Compliance reasonably predictable by having been tested in full-scale mock-up using the same materials and design as proposed and functioning as specified. Testing need not have been accomplished specifically for this project; when published listings of independent agencies include details of testing and results, citation of test by listing number is sufficient (submittal of all test details is not required).
 - c. The Design-Builder may choose whether to use elements proven-in-use or proven-by-mock-up, unless either option is indicated as specifically required.
 - d. Where test methods accompany performance requirements, use those test methods to test the mock-up.
 - 2.3.2 Where a type of product is specified, without performance criteria specifically applicable to the element, use the type of product specified.
 - 2.3.3 Where more than one type of product is specified, without performance criteria specifically applicable to the element, use one of the types of products specified.
 - 2.3.4 Where a type of product is specified, with applicable performance criteria, use either the type of product specified or another type of product that meets the performance criteria as proven-in-use or proven-by-mock-up.
 - 2.3.5 Where more than one type of product is specified, with applicable performance criteria, use either one of the types of products specified or another type of product that meets the performance criteria as proven-in-use or proven-by-mock-up.
 - 2.3.6 Where neither types of products nor performance criteria are specified, use products that will perform well within the specified life span of the building.
- 2.4 Products:
 - 2.4.1 Where a product is specified only by a manufacturer name and model number/brand name, use only that model/brand product.

- 2.4.2 Where the properties of a product are specified by description and/or with performance criteria, use products that comply with the description and/or performance criteria.
- 2.4.3 Where manufacturers are listed for a particular product, use a product made by one of those manufacturers that also complies with other requirements.

END OF CHAPTER 111

CHAPTER A
SUBSTRUCTURE

1. PERFORMANCE**1.1 Basic Function:**

- 1.1.1 Provide substructure as required to support the completed and occupied building safely and without uncontrolled subsidence or other movement.
- 1.1.2 Substructure comprises the following elements:
 - a. Foundations (A1): Structures responsible for transferring dead loads, live loads, and environmental loads of completed building to the earth in such a way that the building is supported evenly and without movement.
- 1.1.3 Where substructure is integral with elements defined within another element group, meet requirements of both element groups.
- 1.1.4 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance.

1.2 Amenity and Comfort:

- 1.2.1 Thermal Performance: Provide thermal resistance as necessary to maintain interior comfort levels specified and in accordance with code and the following:
- 1.2.2 Water Penetration: Prevent ground water penetration into the interior of the building, under any circumstances.
- 1.2.3 Acoustical Performance: Limit sound transmission through substructure as follows:
 - a. Ambient Sound Level: Maintain ambient sound levels in enclosed, occupied substructure spaces within noise criteria (NC) ranges specified in Chapter C - Interiors during normal hours of occupancy.
 - b. Vibration Control: Use substructure elements that will not resonate at frequencies that are characteristic of ambient underground sound and vibration sources at the project site.

1.3 Health and Safety:

- 1.3.1 Fire Resistance: Design and select materials to provide fire resistance in accordance with code.
- 1.3.2 Substance Exclusion: Prevent accumulation of harmful chemicals and gases such as radon and methane in spaces below substructure and subsequent penetration into occupied spaces.
- 1.3.3 Vermin Protection: Provide permanent protection against infestation of construction by ground dwelling termites and other vermin.

1.4 Structure:

- 1.4.1 Capacity: Provide loadbearing substructure members as required by code and designed to distribute dead loads, live loads, and environmental loads so that bearing capacity of soil is not exceeded. Contractor's Geotechnical Engineer shall prepare the Geotechnical Report for the design of the concrete foundations and slabs on grade of this building.
 - a. Extend bearing portions of substructure to levels below frostline at project location; not less than 3 ft below finish grade.
- 1.4.2 Dead Loads: Accommodate loads from weights of building materials, construction itself, and all fixed service equipment.
- 1.4.3 Live Loads: Accommodate loads from use and occupancy of the building, either uniformly distributed loads as prescribed by code or concentrated loads, whichever are more demanding structurally. Roof live loads are non-reducible.

- a. Uniformly Distributed Loads: As required by code for building occupancy.
- 1.4.4 Environmental Loads: Accommodate loads from all environmental forces in accordance with code and the following:
- a. Earthquake: In accordance with requirements of Chapter 111 - Facility Performance.
 - b. Wind: Overturning forces attributable to design wind speed at project location applied to full building height. Basic wind speed shall be 90 miles/hour using exposure C.
 - c. Snow: Ground snow load shall be 47 PSF using exposure C..
- 1.4.5 Substantiation:
- a. Preliminary Design: Soil investigation report, detailed listing of design criteria, and preliminary analysis, prepared by a licensed structural engineer.
 - b. Construction Documents: Detailed design analysis by licensed structural engineer.
- 1.5 Durability:
- 1.5.1 Corrosion Prevention: Provide supplementary protection for underground metal elements, sufficient to prevent corrosion completely for the service life of the element without maintenance.
- a. 3 inches of concrete cover is considered to be permanent protection.
 - b. See Chapter D9 for requirements for cathodic protection.
- 1.5.2 Resistance to Salt Water: At coastal locations, provide substructure elements made of materials that will resist deterioration by exposure to salt water.
- a. Substantiation:
 - (1) Construction Documents: Design details and specifications for corrosion resistant features.
- 1.6 Operation and Maintenance:
- 1.6.1 Provide substructure elements that will endure for the lifetime of the building with no maintenance.

2. PRODUCTS

- 2.1 Use the following:
- 2.1.1 Reinforced concrete.
 - 2.1.2 Reinforced masonry.
- 2.2 Do not use any of the following:
- 2.2.1 Precast, prestressed concrete.
 - 2.2.2 Treated wood.

END OF CHAPTER A

CHAPTER A1**FOUNDATIONS****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide foundations as required to support the completed and occupied building safely and without uncontrolled subsidence or other movement.
- 1.1.2 Foundations comprise the following elements:
 - a. Standard Foundations (A11): Includes spread footings below columns and linear spread footings below loadbearing walls.
 - b. Floors on Grade (A13): All elements necessary for slab foundations, including trenches, pits, and sumps, equipment bases, integral thermal insulation, slab moisture protection, and subdrainage system.
- 1.1.3 Where foundations are integral with elements defined within another element group, meet requirements of both element groups.
- 1.1.4 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance and Chapter A - Substructure.

1.2 Amenity and Comfort:

- 1.2.1 Thermal Performance:
 - a. Minimum thermal performance values for individual foundation elements are also specified in other chapters.
- 1.2.2 Water Protection:
 - a. Waterproofing: Provide permanent waterproofing at portions of foundation that extend below water table.
- 1.2.3 Acoustical Performance:
 - a. Vibration Control: Use foundation elements that are designed to avoid sympathetic vibration at frequencies within the audible range of 500-4000 Hz.

1.3 Structure:

- 1.3.1 Capacity: Provide loadbearing foundation members as required by Chapter A - Substructure.
 - a. Minimum Wall Thickness: Not less than thickness of superstructure walls supported by foundation walls.
 - b. Minimum Wall Thickness: 8 in.
 - c. Footings: Minimum compressive strength of 3000 psi and minimum thickness of 12 in.
 - d. Footing Depth: Minimum 36" depth from finished grade to bottom of footing.

2. PRODUCTS**2.1 Use the following:**

- 2.1.1 Concrete spread footings.

2.2 Do not use any of the following:

- 2.2.1 Wood foundation systems.
- 2.2.2 Steel foundation systems.

END OF CHAPTER A1

CHAPTER A11**STANDARD FOUNDATIONS****1. PERFORMANCE**

1.1 Basic Function:

- 1.1.1 Provide standard foundations as required to support the completed and occupied building safely and without uncontrolled subsidence or other movement.
- 1.1.2 Standard foundations comprise the following elements:
 - a. Spread footings below columns, piers, and loadbearing walls.
- 1.1.3 Where standard foundations are integral with elements defined within another element group, meet requirements of both element groups.
- 1.1.4 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter A - Substructure, and Chapter A1 - Foundations.

1.2 Health and Safety:

- 1.2.1 Termite Protection: Provide protection against infestation of ground-dwelling termites, in accordance with vermin protection provisions of Chapter A and as follows:
 - a. Treatment of soil adjacent to and beneath standard foundation elements with EPA-approved chemicals prior to foundation construction.
 - b. Substantiation:
 - (1) Design Development: Product data and EPA certification of chemicals to be used.

2. PRODUCTS

2.1 Use one of the following:

- 2.1.1 Reinforced concrete spread footings.
- 2.1.2 Masonry footings.

2.2 Do not use any of the following:

- 2.2.1 Wood foundation systems.
- 2.2.2 Steel foundation systems.

END OF CHAPTER A11

CHAPTER A13

FLOORS ON GRADE

1. PERFORMANCE

1.1 Basic Function:

- 1.1.1 Provide floors on grade as required to enclose habitable spaces and support interior functions without subsidence, structural cracking, or other uncontrolled movement.
- 1.1.2 Floors on grade comprise structural slabs, individual pavers, and framed flooring systems that are installed over fill or at excavated and compacted grade, including all depressions in the floor, such as trenches, pits, and sumps. Floors on grade also include equipment bases, under floor and perimeter drainage, thermal insulation at floor edge, and moisture barriers installed integrally with floor system. Minimum depth of concrete slab on grade shall be 6 inches. ~~A minimum of 0.4 percent deformed steel reinforcement shall be provided in slabs in each direction.~~ **Provide a minimum ratio of 0.001 of deformed steel reinforcement in each direction to gross concrete area per foot wide slab. Spacing of deformed steel reinforcement shall not exceed 16 inches.** All slabs on grade shall be placed in checkerboard or lane fashion. Crack control joints may be construction joints, expansion joints, contraction joints or isolation joints with a maximum spacing of 15 feet O.C. in each direction. The length of this area shall not exceed 1 1/4 times the width.
- a. Floor Flatness (FF): Provide floors on grade engineered and constructed to achieve degree of flatness as follows, when measured in accordance with ASTM E 1155-1996(R01):
- (1) Specified Overall Value (SOV): 25.
 - (2) Minimum Localized Value (MLV): 17.
- b. Floor Levelness (FL): Provide floors on grade engineered and constructed to achieve degree of levelness as follows, when measured in accordance with ASTM E 1155-1996(R01):
- (1) Specified Overall Value (SOV): 25.
 - (2) Minimum Localized Value (MLV): 17.
- 1.1.3 Where floors on grade are integral with elements defined within another element group, meet requirements of both element groups.
- 1.1.4 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter A - Substructure, and Chapter A1 - Foundations.

1.2 Amenity and Comfort:

- 1.2.1 Thermal Performance: Provide thermal properties at edges of floors on grade as necessary to maintain interior comfort levels specified and in accordance with code.
- a. Vapor Retardation: Limit vapor transmission through floor construction to maximum rate of 0.1 perms at locations where impermeable applied interior finishes such as resilient flooring, wood flooring, or acrylic terrazzo are used.
- (1) Use supplementary vapor retarder if necessary to meet requirements.
 - (2) Use method of sealing joints between vapor retarder elements that will be effective given available construction practices.
- 1.2.2 Waterproofing: Provide permanent waterproofing for floors on grade that could potentially come into contact with ground water.
- 1.2.3 Vibration Control: Use elements for floors on grade that are designed to avoid sympathetic vibration at frequencies within the audible range of 500-4000 Hz.
- 1.3 Health and Safety:
- 1.3.1 Radon Exclusion: Prevent accumulation of radon and subsequent penetration into building interior, in accordance with substance exclusion provisions of Chapter A - Substructure.

- 1.3.2 Termite Protection: Provide protection against infestation of ground-dwelling termites, in accordance with vermin protection provisions of Chapter A.
- 1.4 Durability:
 - 1.4.1 Floor Classifications: For concrete floors on grade, comply with composition and finishing recommendations of ACI 302.1R-1996 for floor classifications based on type of anticipated traffic and intended use.
 - 1.4.2 Water-Cement Ratio: For concrete slabs on grade that are partly or completely exposed to freezing conditions, limit water-cementitious materials ratio as recommended by ACI 302.1R-1996.
 - a. Moderate to Severe Exposure: Maximum 0.50.
 - 1.4.3 Air Content: For concrete slabs on grade that are partly or completely exposed to freezing conditions, provide air content in accordance with recommendations of ACI 201.2R-2001.

2. PRODUCTS

- 2.1 Use one of the following:
 - 2.1.1 Concrete floor slab throughout the project, coordinate with floor finishes - see interior finishes.

END OF CHAPTER A13

CHAPTER B**SHELL****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide permanently enclosed spaces for all functional areas shown in the project program, unless otherwise indicated. Provide a physical enclosure that keeps out weather, unwelcome people, animals, and insects without requiring specific action by occupants, while providing convenient movement of occupants between inside and outside, desirable natural light, and views from inside to outside. Provide level floor areas, comfortable ceiling heights, and essentially vertical walls.
- 1.1.2 The elements forming usable enclosed space and separating that space from the external environment comprise the shell and consist of:
 - a. Superstructure (B1): All elements forming floors and roofs above grade, and the elements required for their support, insulation, fireproofing, and firestopping.
 - b. Exterior Enclosure (B2): All essentially vertical elements forming the separation between exterior and interior conditioned space, including exterior skin, components supporting weather barriers, and jointing and interfacing components; not including the interior skin unless an integral part of the enclosure.
 - c. Roofing (B3): All elements forming weather and thermal barriers at horizontal and sloped roofs and decks, and roof fixtures.
- 1.1.3 Exterior Surfaces Exposed to View: Surfaces visible from street or ground level, plus surfaces visible from windows of same building and adjacent existing buildings.
- 1.1.4 Where shell elements also function as elements defined within another element group, meet requirements of both groups.
- 1.1.5 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance.

1.2 Amenity and Comfort:

- 1.2.1 Thermal Performance: Provide construction that will have thermal resistance as necessary to maintain interior comfort levels specified and in accordance with code and the following:
 - a. Energy Efficiency: As specified in Chapter 111.
 - b. Condensation: None on interior surfaces under normal interior temperature and relative humidity conditions, during 98 percent of the days in the coldest 3 months of the year.
 - c. Components That Have Surfaces Facing Both Interior and Exterior Environment: Condensation Resistance Factor (CRF) as required to meet requirement above, when tested in accordance with AAMA 1503.1-1998.
- 1.2.2 Air Infiltration: Maximum of 0.06 cfm per square foot of exterior surface area, measured in accordance with ASTM E 283-1991(R99) at differential pressure of 6.24 psf.
 - a. Use supplementary air barrier if necessary to maintain performance over entire shell.
 - b. Use method of sealing joints between elements that will be effective given available construction practices.
- 1.2.3 Water Penetration: Design and select materials to prevent water penetration into the interior of the building, under conditions of rain driven by 100 mph wind.
- 1.2.4 Natural Light: Provide fenestration in shell as required to meet requirements for natural light as specified in Chapter C and in accordance with code.
- 1.2.5 Acoustical Performance: Design and construct the shell to limit sound transmission as follows:
 - a. Ambient Sound Level: Maintain ambient sound levels in perimeter spaces within Noise Criteria

- (NC) ranges specified in Chapter C - Interiors during normal hours of occupancy.
- b. Exterior Noise Level: Maintain maximum average daytime and nighttime noise level from interior sound sources in accordance with local regulations, measured at the project property line.
- 1.2.6 Cleanliness of Exterior Surfaces: Design and select materials to:
- a. Prevent attraction and adherence of dust and air-borne dirt and soot, and minimize appearance of settled dust and dirt.
- 1.2.7 Appearance: Design and select materials to provide exterior appearance with characteristics as follows:
- a. Providing a traditional architectural style, which complies with Hill AFB Architectural Comptibility Standards, and Hill AFB Base Facility Design Standards. Use brick veneer (ASTM C 216, Grade SW & Type FBS and ASTM C 652, Grade SW & Type HBX with min. compressive strength of 4000 psi) . Mortar (ASTM C 270, Type S). Fill all mortar joints completely.
 - b. Concealing mechanical equipment and plumbing equipment from view from the street.
- 1.3 Health and Safety:
- 1.3.1 Fire Resistance: Design and select materials to provide fire resistance in accordance with code.
- 1.3.2 Accidental Injury: Design and select materials to protect pedestrians and building occupants in accordance with code and the following:
- a. Prevent ice and snow from falling off building elements onto pedestrians, building occupants, and vehicles.
- 1.4 Structure:
- 1.4.1 Structural Performance: Design and select materials to support all loads without damage due to loads, in accordance with code.
- a. Special Loads: In addition to loads defined by code, design for loads from elevators.
 - b. Design and provide shell elements to resist loosening or detachment in winds equivalent to the code design wind speed.
 - c. Use brick veneer (ASTM C 216, Grade SW, Type FBX and ASTM C 652, Grade SW & Type HBX with min. compressive strength of 4000 psi) with joint mortar (ASTM C 270, Type S, fill all mortar joints completely). No thin wall veneer is allowed.
 - d. Substantiation:
 - (1) Preliminary Design: Detailed listing of design criteria and preliminary analysis, prepared by a licensed structural engineer.
 - (2) Construction Documents: Detailed design analysis by licensed structural engineer.
 - (3) Construction Documents: Detailed design analysis by licensed structural engineer (for structures engineered by their manufacturer or fabricator, engineer-of-record may provide detailed design criteria, with design analysis postponed until construction stage).
 - (4) Construction: For structures engineered by their manufacturer or fabricator, detailed design analysis prepared by and shop drawings stamped by a licensed structural engineer, with approval of engineer-of-record recorded.
- 1.4.2 Construction Loads and Erection Stresses: Accommodate temporary construction loads and erection stresses during construction.
- 1.5 Durability:
- 1.5.1 Service Life Span: Same as building service life, except as follows:
- a. Load-Bearing Structural Members: Minimum of 50 years.
 - b. Wall Primary Weather-Barrier Elements: Minimum 50 years functional and aesthetic service life..
 - c. Transparent Elements (Glazing): Same as other wall primary weather-barrier elements, except accidental breakage is considered normal wear-and-tear.
 - d. Joint Sealers: Minimum 10 years before replacement.
 - e. Surfaces Exposed to View: Minimum 20 years aesthetic service life; in addition, deterioration

- includes color fading, crazing, and delamination of applied coatings.
- f. Roof Covering Weather-Barriers: Minimum 20 years, fully functional.
- 1.5.2 Water Penetration: Design and select materials to prevent water penetration into the interior of shell assemblies, under conditions of rain driven by 100 mph wind.
- a. Exception: Controlled water penetration is allowed if materials will not be damaged by presence of water or freezing and thawing, if continuous drainage paths to the exterior are provided, and water passage to the building interior is prevented.
- b. Substantiation: In addition to requirements specified for proven-in-use and proven-by-mock-up construction, drawings showing paths of water movement, with particular attention to changes in direction or orientation and joints between different assemblies.
- 1.5.3 Weather Resistance: Design and select materials to minimize deterioration due to precipitation, sunlight, ozone, normal temperature changes, salt air, and atmospheric pollutants.
- a. Deterioration includes corrosion, shrinking, cracking, spalling, delamination, abnormal oxidation, decay and rot.
- b. Surfaces Exposed to View: Deterioration adversely affecting aesthetic life span includes color fading, crazing, and delamination of applied coatings.
- (1) Coating Salt Spray Resistance: No deterioration when tested in accordance with ASTM B 117-2002 for 1000 hour exposure with 5 percent salt fog at 95 degrees F.
- c. Joint Components and Penetration Seals: Capable of resisting expected thermal expansion and contraction; use overlapping joints that shed water wherever possible.
- d. Transparent Elements (Glazing): No haze, loss of light transmission, or color change, during entire expected service life.
- (1) Test Criteria: Less than 1 percent change in haze, transmission, and color over 2 years exposure, when tested after natural exposure conditions or accelerated light and water conditions simulating natural exposure at project, in accordance with ASTM D 1003-2000; accelerated exposure documented with comparison to natural conditions.
- e. Service Temperature: Low temperature equal to historically-recorded low; high temperature equal to that expected due to any combination of air temperature and heat gain from solar and other sources.
- f. Freeze-Thaw Resistance: Adequate for climate of project.
- g. Corrosion Resistance: In locations exposed to the outdoor air or in potential contact with moisture inside shell assemblies, use only corrosion-resistant metals as defined in this Chapter.
- h. Ozone Resistance: Do not use materials that are adversely affected by ozone.
- i. Substantiation:
- (1) Design Development: Details of proven-in-use materials and test reports.
- 1.5.4 Impact Resistance: Design and select materials to resist damage due to impact in accordance with code and the following:
- a. Minimize damage from windborne debris propelled at up to 100 mph.
- b. Design and select materials to resist damage from hail of size up to 1/2 inch.
- c. Minimize damage due to potential vandalism.
- d. Minimum performance values for individual shell elements are also specified in other chapters.
- e. Substantiation:
- (1) Design Development: Identification of building elements required to resist impact damage, quantification of impact criteria, materials to be used, and methods of substantiation.
- (2) Design Development: Proven-in-use or proven-by-mock-up data.
- 1.5.5 Moisture Vapor Transmission: Design to prevent deterioration of materials due to condensation of moisture vapor inside assemblies.
- a. Use supplementary vapor retarder if necessary to meet requirements.
- b. Use method of sealing joints between elements that will be effective given available construction practices.
- c. Substantiation:

- (1) Design: Identification of building elements providing moisture barrier, materials to be used, and data showing performance.
 - (2) Design Development: Proven-in-use or proven-by-mock-up data.
- 1.5.6 Wear Resistance: Design and select materials to provide resistance to normal wear-and-tear in accordance with code and the following:
- a. Elements Within Reach of Pedestrians: Minimize degradation from rubbing and scratching caused by pedestrians.
 - b. Minimize degradation caused by windblown sand and acid rain.
 - c. Substantiation:
 - (1) Design Development: Identification of building elements required to resist wear, quantification of wear criteria, materials to be used, and methods of substantiation.
 - (2) Construction Documents: Proven-in-use or proven-by-mock-up data.

2. PRODUCTS

2.1 Corrosion-Resistant Metals:

- 2.1.1 Hot-dipped galvanized steel, with minimum zinc coating of 0.90 oz/sq ft total both sides.
- 2.1.2 Aluminum.

2.2 Coated Finishes:

- 2.2.1 Use one of the following:
 - a. Fluoropolymer coating (70 percent Kynar 500 (tm) or Hylar 5000(tm)), minimum two coats.

2.3 **Brick**

2.3.1 **Brick veneer**

2.3.2 **Jumbo Brick**

~~2.3a.~~ Do not use:

~~2.3.4(1)~~ Pre-engineered metal building.

~~2.3.2 Air supported structure.~~

~~2.3.3 Different metals subject to galvanic action in direct contact with each other.~~

~~(2) Pre-engineered glazed structure.~~

~~2.3.4(3)~~ Aluminum in direct contact with concrete or cementitious materials.

~~2.3.5(4)~~ Materials and products that require field finishing on surfaces exposed to the weather.

~~2.3.6(5)~~ Wood trim.

3. METHODS OF CONSTRUCTION

3.1 Do not use:

- 3.1.1 Different metals subject to galvanic action in direct contact with each other
- 3.1.2 Aluminum in direct contact with concrete or cementitious materials.
- 3.1.3 Materials and products that require field finishing on surfaces exposed to the weather.
- 3.1.4 Wood trim.

END OF CHAPTER B

CHAPTER B1

SUPERSTRUCTURE

1. PERFORMANCE

1.1 Basic Function:

- 1.1.1 Provide structural elements, above grade supporting all anticipated loads without failure or damage.
- 1.1.2 Do not use any electrically-operated or fuel-powered construction for support of floor or roof members.
- 1.1.3 The superstructure comprises:
- a. Elevated Floors (B11): Floor construction above grade, including balcony, mezzanine, and ramp floors, floors elevated for access, stair construction if part of the structure, and roof decks intended for occupant live load; and the elements required for their support, insulation, fireproofing, and firestopping.
 - b. Roofs (B12): Roof construction, including canopies, and elements required for their support, insulation, fireproofing, and firestopping.
 - c. Walls and frames. No columns are allowed on Gymnasium, Cardiovascular room, Weight Training room and Small and Large Exercise rooms. All CMU (ASTM C 90, Type I or II with minimum compressive strength of 1500 PSI) and Brick (ASTM C 652, Grade SW, Type HBX with minimum compressive strength of 4000 PSI) walls will be fully grouted. Minimum thickness of these walls will be 8 inches.
 - d. ~~Design basic superstructure to support indoor climbing wall (Option item).~~
Design basic superstructure to support indoor climbing wall (Option item). **Contractor shall design superstructure in base bid to support indoor climbing wall (Option item) so that if the indoor climbing wall option is not awarded, it can be added at a future date. Contractor will provide supporting calculations and determinations to show design adequacy for support of indoor climbing wall.**
 - e. Design basic superstructure(walls, frames and roof) to support indoor elevated running track (Option item). Running track will be suspended from the roof structure. The floor of running track will be at the same elevation as the second floor. Track footfall vibration and its effect on the basketball backboards is a critical design element and shall be minimized. Vibration analysis is required for slightly perceptible response. Contractor will provide adequate support structure at roof and walls in base bid so that if the indoor running track option is not awarded, it can be added at a future date. Contractor will provide supporting calculations and determinations to show design adequacy for support of indoor running. Handrail for the indoor running track shall be designed to resist loads per code. Floors for second floor and indoor running track are concrete.
- 1.1.4 Where superstructure elements also must function as elements defined within another element group, meet requirements of both element groups.
- 1.1.5 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance and Chapter B - Shell.

1.2 Amenity and Comfort:

- 1.2.1 Water Penetration: Where roof coverings as specified in Chapter B3 are not used over roofs provide supplementary waterproof construction providing equivalent protection.
- 1.2.2 Vibration: Isolate structure from sources of vibration.

1.3 Health and Safety:

- 1.3.1 Fire: Provide members with combustibility, flame spread, and smoke generation characteristics not greater than allowed by code.
- 1.3.2 Fire Resistance: Design and select materials to provide fire resistance in accordance with code.

- a. Provide firestopping at openings in fire-rated superstructure elements that is rated at not less than the required fire resistance of the penetrated element.

1.4 Structure:

1.4.1 Capacity: Design and provide load-bearing structural members of capacities required by code.

1.4.2 Dead Loads: Design to resist loads from weights of materials, construction, and fixed service equipment.

1.4.3 Live Loads:

- a. Floors: Resist uniformly distributed, concentrated, and impact loads without live load reductions.
- b. Roofs: Resist uniformly distributed, concentrated, and impact loads. No live load reduction is allowed

1.4.4 Environmental Loads:

- a. Wind: Basic wind speed of 90 mph, Importance Factor of 1.00, Exposure C, in accordance with code.
- b. Snow: Ground snow load of 47 psf, snow exposure factor in accordance with code, snow load importance factor of 1.0.
- c. Earthquake: In compliance with provisions of code.

1.4.5 Structural Serviceability: Comply with requirements and recommended design procedures of ASCE 7-2002.

1.5 Durability:

1.5.1 Moisture Resistance of Load-Bearing Members: Use materials that are not damaged by contact with water or moisture vapor.

- a. Materials that will corrode in the presence of water may be used if protected from water.
- b. Materials that will rot or be damaged by fungus may be used if protected from water.

1.5.2 Impact Resistance of Load-Bearing Members: Use materials that are not easily damaged by common hand tools.

1.5.3 Portions of Superstructure Exposed on Exterior: Comply with requirements of Chapter B for water penetration, weather resistance, impact resistance, and wear resistance.

2. PRODUCTS

2.1 Do not use:

2.1.1 Wood structural members.

2.1.2 Non-reinforced load-bearing masonry.

2.1.3 Steel stud bearing walls.

2.2 Fireproofing:

2.2.1 If applied fireproofing is required, use one of the following:

- a. Concealed:
 - (1) Sprayed-on cementitious.
- b. Interior, Exposed But Out of Reach:
 - (1) Sprayed-on medium-density cementitious.
- c. Exposed within Reach:
 - (1) Intumescent.

2.2.2 Do not use:

- a. Sprayed-on mineral fiber.

END OF CHAPTER B1

CHAPTER B11
ELEVATED FLOORS

1. PERFORMANCE

1.1 Basic Function:

- 1.1.1 Provide all floor construction above grade, including balcony, mezzanine, running track (Option Item), stair construction if part of the structure, and the elements required for their support, insulation, fireproofing, and firestopping, as well as finishing, if an integral part of the floor construction.
- a. Floor Flatness (FF): Provide suspended floors that are engineered and constructed to achieve degree of flatness as follows, when measured in accordance with ASTM E 1155-1996(R01):
 - (1) Specified Overall Value (SOV): 25.
 - (2) Minimum Localized Value (MLV): 17.
 - b. Floor Levelness (FL): Provide suspended floors that are engineered and constructed to achieve degree of levelness as follows, when measured in accordance with ASTM E 1155-1996(R01):
 - (1) Specified Overall Value (SOV): 20.
 - (2) Minimum Localized Value (MLV): 13.
- 1.1.2 Where floor elements also must function as elements defined within another element group, meet requirements of both element groups.
- 1.1.3 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter B - Shell, and Chapter B1 - Superstructure.

1.2 Amenity and Comfort:

- 1.2.1 Thermal Performance:
- a. Shall comply with ASHRAE 90.1.

1.3 Durability:

- 1.3.1 Exposed Interior Structural Floor Surfaces: Comply with requirements for floor finishes specified in Chapter C.

2. PRODUCTS

2.1 Structure Supporting Floors:

- 2.1.1 Use one or more of the following:
- a. Structural steel beams, columns, girders, and joists.
 - b. Cast-in-place reinforced concrete beams, columns, walls, girders, and joists.
 - c. Precast concrete beams, columns, tees, and hollow slabs with 3" topping.
 - d. Open-web steel joists or joist girders.
 - e. Provide column free space at all activity spaces (i.e. gymnasium, exercise and cardio spaces).
- 2.1.2 Do not use:
- a. Wood structural members.

2.2 Elevated Floors and indoor elevated running track (Option Item):

- 2.2.1 Use one or more of the following:
- a. Concrete-filled composite steel deck, minimum 2-1/2 inches concrete thickness from top of steel deck.
 - b. Cast-in-place reinforced concrete slabs, minimum 6 inches thick.
 - c. Precast concrete tees or hollow core slabs covered with minimum 3 inches concrete.
- 2.2.2 Do not use:
- a. Any construction with openings to floor below.
 - b. Wood structural members.

2.3 Balcony Floors:

2.3.1 Use one of the following:

- a. Same construction as other floors.

2.4 Stairs and Stair Landings: See Chapter C15.

END OF CHAPTER B11

CHAPTER B12**ROOFS****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide all roof construction, including canopies, and elements required for their support, insulation, fireproofing, and firestopping.
- 1.1.2 Where roof elements also must function as elements defined within another element group, meet requirements of both element groups.
- 1.1.3 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter B - Shell, and Chapter B1 - Superstructure.

1.2 Amenity and Comfort:

- 1.2.1 Thermal Performance: Shall comply with ASHRAE 90.1

1.3 Health and Safety:

- 1.3.1 Column-Beam Fire Resistance:
 - a. Supporting Roofs: unprotected non-combustible.
 - b. Supporting Canopies: unprotected non-combustible.

1.4 Durability:

- 1.4.1 Exposed Roof Deck Surfaces: Comply with requirements for roofing weather barrier specified in Chapter B31.

2. PRODUCTS**2.1 Structure Supporting Roofs:**

- 2.1.1 Use one of the following:
 - a. Structural steel beams, columns, girders, joists, and wind-bracing.
 - b. Open-web steel joists or joist girders.
- 2.1.2 Do not use:
 - a. Wood structural members.
 - b. Unfireproofed structural steel.
 - c. Precast concrete structural frame.
 - d. Steel stud bearing walls.

2.2 Roof Decks:

- 2.2.1 Use one or more of the following:
 - a. Steel deck without concrete fill.
- 2.2.2 Do not use:
 - a. Any construction with openings to floor below.
 - b. Precast concrete.
 - c. Wood structural members.

2.3 Canopy Decks:

- 2.3.1 Use one or more of the following:
 - a. Steel deck without concrete fill.

2.4 Insulation on Top of Decks: See Chapter B31.

2.5 Vapor Retarder:

2.5.1 Use one of the following:

a. Plastic sheet.

2.6 Roof Deck Finish Surface: See Chapter B31.

END OF CHAPTER B12

CHAPTER B2**EXTERIOR ENCLOSURE****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide an essentially vertical separation between exterior and interior conditioned space, that keeps out weather, uninvited people, and animals and insects, without unusual action by occupants, while providing convenient movement of occupants between inside and outside, desirable natural light, and views from inside to outside.
- 1.1.2 The elements forming the vertical separation comprise the exterior enclosure and consist of:
 - a. Exterior Walls (B21).
 - b. Exterior Windows and Other Openings (B22).
 - c. Exterior Doors (B23).
- 1.1.3 Where exterior enclosure elements also must function as elements defined within another element group, meet requirements of both element groups.
- 1.1.4 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance and Chapter B - Shell.

1.2 Amenity and Comfort:

- 1.2.1 Thermal Performance: Comply with ASHRAE 90-1.
- 1.2.2 Water Penetration: As specified in Chapter B.
- 1.2.3 Airborne Sound Isolation: Achieve the following minimum outdoor-indoor level reductions (OILR values) for perimeter spaces, when tested in accordance with ASTM E 966-2002 and classified in accordance with ASTM E 413-1987(R99):
 - a. Quiet space (NC values of 20-30) and very loud exterior noise source (dBA values of 70-80): OILR 42.
 - b. Moderately noisy space (NC values of 30-40) and deafening exterior noise source (dBA values above 80): OILR 37.
 - c. Very noisy space (NC values of 50-60) and deafening exterior noise source (dBA values over 80): OILR 33.
- 1.2.4 Glazing Appearance:
 - a. Use gray tinted glazing.

1.3 Health and Safety:

- 1.3.1 Safety Glazing: Do not use fully tempered glass more than 25 feet above grade.
- 1.3.2 Fire Resistance:
 - a. All Materials of Exterior Enclosure: Non-combustible, no exceptions.

1.4 Structure:

- 1.4.1 Structural Performance: No requirements in addition to those specified in Chapter B.
- 1.4.2 Substantiation:
 - a. Design Development: Design accomplished by an engineer experienced in the design of architectural elements and cladding.
 - b. Construction: Proven-by-mock-up construction, with laboratory test of full-scale mock-up.

1.5 Durability:

- 1.5.1 Ambient Temperature Change: Allow for daily expansion and contraction within and between elements

caused by temperature range from most extreme low temperature to 70 degrees F greater than the most extreme high temperature, in any year, without causing detrimental effect to components and anchorage.

- 1.5.2 Water Penetration: As specified in Chapter B.
 - a. Where interior skin is not integral part of exterior enclosure, test without interior skin installed.
- 1.5.3 Impact Resistance:
 - a. Elements Adjacent to Traffic Lanes: Resist damage from accidental delivery and service vehicular impact 10 mph maximum velocity.
- 1.5.4 Glass:
 - a. Type and thickness in accordance with ASTM E 1300-2002 combined with other applicable factors; minimum thickness for each lite shall be 1/4 inch.
 - b. Glazing must comply with UFC 40-010-01 Department of Defense Minimum Antiterrorism Standards for Buildings.

2. PRODUCTS

- 2.1 Construct the exterior enclosure as indicated in Chapter B Shell

END OF CHAPTER B2

CHAPTER B21**EXTERIOR WALLS****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide physical separation between exterior and interior conditioned space, that keeps out weather, uninvited people, and animals and insects.
- 1.1.2 The elements forming the physical separation comprise the exterior walls and consist of the supporting structure, the exterior skin, vapor retarders, air barriers, and insulation, the interior skin if an integral part of the wall, exterior screens and railings, balcony walls and parapets, exterior soffits unless they do not form a weather barrier, firestopping and draftstopping within wall and between wall and floors, and other exterior wall elements.
- 1.1.3 Where exterior wall elements also must function as elements defined within another element group, meet requirements of both element groups.
- 1.1.4 Wall shall be designed to consider future expansion. Coordinate with Fitness Center personnel to determine location of future expansion.
- 1.1.5 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter B - Shell, and Chapter B2 - Exterior Enclosure.

1.2 Amenity and Comfort:**1.2.1 Thermal Performance:**

- a. Shall comply with ASHRAE 90-1
- b. Exterior Soffits and Ceilings: Same requirements as exterior walls.

1.2.2 Appearance:

- a. Surface Texture: Provide exterior wall surfaces with multiple contrasting textures with visual interest.

1.3 Structure:

- 1.3.1 Wind Design: No damage when tested in accordance with ASTM E 330-2002 at 1.5 times positive and negative design wind loads using 10 second duration of maximum load.
 - a. Unit Brick Veneer: Maximum deflection of 1/720 of span.

1.4 Durability:

- 1.4.1 Water Penetration: Drain water, moisture, and condensation entering assembly to the exterior.
- 1.4.2 Joint Sealers in Exterior Skin: Life span expectancy equal to that specified for primary weather barriers.
- 1.4.3 Impact Resistance:
 - a. Finish Systems: Resistant to permanent damage to supporting structure and exterior skin when tested in accordance with EIMA 101.86-1995 with a test force of 25-49 inch-lbs.

2. PRODUCTS**2.1 Supporting Structure of Walls:**

- 2.1.1 Do not use any of the of the following for the supporting structure of walls:
 - a. Non-load-bearing unit masonry assemblies.
 - b. Secondary structural steel members.
 - c. Wood stud framing.
 - d. Steel stud bearing walls.

2.2 Balcony Walls: Same requirements as walls, except thermal performance is not required.

2.3 Exterior Skin of Exterior Walls:

2.3.1 Use one of the following:

- a. Brick veneer.
- b. Jumbo brick.

2.3.2 Do not use:

- a. Precast concrete.
- b. Stone.
- c. Tile.
- d. Wood.
- e. Thin brick.

2.4 Joint Sealers in Exterior Skin:

2.4.1 Use one of the following:

- a. Silicone sealant.
- b. Polyurethane sealant.

2.4.2 Do not use:

- a. Hollow neoprene gaskets.

2.5 Air Barrier:

2.5.1 Vapor Retarder:

- a. Use one of the following:
 - (1) Plastic sheet.

2.6 Insulation:

2.6.1 Use one or both of the following:

- a. Board insulation.
- b. Batt insulation.

2.7 Exterior Ceilings and Soffits:

2.7.1 Use one of the following:

- a. Portland cement plaster at soffits.
- b. Portland cement stucco on metal lath at soffits
- c. Linear vented pre-finished metal soffit

2.7.2 Do not use:

- ~~a. Portland cement stucco.~~
- ~~b-a. Gypsum exterior soffit board.~~
- ~~c. Linear metal ceiling.~~

END OF CHAPTER B21

CHAPTER B22**EXTERIOR WINDOWS AND OTHER OPENINGS****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Fill, cover, close, or otherwise protect all openings in the exterior walls (other than doors) so that the entire exterior enclosure functions as specified, using windows and other opening elements as specified, without using components that must be installed at changes of season.
- 1.1.2 The elements comprising exterior windows and other openings include windows, fixed glazing other than glazed walls, ventilation openings, protection devices for openings, and elements that form or complete the openings, unless an integral part of another element.
- 1.1.3 See Chapter B21 for glazed walls and Chapter B23 for doors.
- 1.1.4 Where exterior window and other opening elements also must function as elements defined in another element group, meet requirements of both element groups.
- 1.1.5 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter B - Shell, and Chapter B2 - Exterior Enclosure.
- 1.1.6 All exterior glass/windows must be laminated glass in accordance with AT/FP requirements.

1.2 Amenity and Comfort:

- 1.2.1 Thermal Performance of Elements Forming Exterior/Interior Separation: Shall comply with ASHRAE 90-1.
- 1.2.2 Air Infiltration:
 - a. Mechanical Ventilation Openings: Automatically closed when ventilation is not required. Unless ducted, maximum of 0.3 cfm/sq ft of crack when closed, measured in accordance with ASTM E 283-1991(R99) at differential pressure of 1.57 psf.
- 1.2.3 Acoustical Performance:
 - a. Window Sound Transmission Class: Minimum 31 STC, as measured in accordance with ASTM E 90-2002 and classified in accordance with ASTM E 413-1987(R99).
 - b. Louvers: No objectionable air movement noise.

1.3 Health and Safety:

- 1.3.1 Fire Resistance: Rating as required to maintain fire resistance rating of exterior wall in which they occur.
- 1.3.2 Forced Entry Resistance:
 - a. Openings At the Ground Floor: Class I in accordance with ASTM F 1233-1998, minimum, and Grade 10, minimum, in accordance with ASTM F 588-1997.
 - b. Openings Above the Ground Floor: Class I in accordance with ASTM F 1233-1998, minimum, and Grade 10, minimum, in accordance with ASTM F 588-1997
- 1.3.3 Openable Openings and Ventilation Openings: Equipped with means of keeping insects, birds, and animals out.

1.4 Structure:

- 1.4.1 Lintels: Constructed to span openings and support loads imposed by exterior wall; maximum deflection of 1/360 of span, vertically and horizontally.
- 1.4.2 Wind Design: No damage when tested in accordance with ASTM E 330-2002 at 1.5 times positive and negative design wind loads using 10 second duration of maximum load.

- a. Members Not Supporting Glass: Maximum deflection of 1/180 of span.
- b. Members Supporting Glass: Maximum deflection of flexure limit of glass; with full recovery of glazing materials.

1.5 Durability:

- 1.5.1 Air Intake and Exhaust Openings: Minimize rainwater penetration and protect adjacent interior spaces from damage from water.
 - a. Maximum Water Leakage: 0.01 oz/sf under most extreme conditions.
 - b. Test Air Velocity: For exhaust openings: 0; for intake openings: normal operational velocity.
 - c. Substantiation:
 - (1) Construction: Identify air velocity; show AMCA 511-1999(R2002) certified water penetration ratings.
- 1.5.2 Water Penetration: Design openings and components of openings to positively drain water to exterior of the building.
 - a. Top of Openings: If wall construction does not provide its own methods of drainage, use separate flashing to prevent water from entering opening components or the interior of the building.
 - b. Bottom of Openings: Integral or separate sill or flashing to prevent water running over or draining out of opening components from entering the wall construction below or the interior of the building.

1.6 Operation and Maintenance:

- 1.6.1 Operating Components: Remaining operable for 10 years under normal exposure conditions for the project site.

2. PRODUCTS

2.1 Windows (Fixed):

- 2.1.1 Window Operation: Use the following:
 - a. Horizontal sliding windows at all offices.
 - b. Fixed non-operable windows.
- 2.1.2 Glazing: Double pane insulated units.
- 2.1.3 Use one of the following:
 - a. Aluminum windows.
- 2.1.4 Do not use:
 - a. Wood windows.
 - b. Metal-clad wood windows.
 - c. Plastic-clad wood windows.
 - d. Tubular plastic windows.
 - e. Composite windows.

2.2 Fixed Glazing:

- 2.2.1 Glazing: Double pane laminated, insulated units.
- 2.2.2 Use one of the following:
 - a. Aluminum-framed storefront.
- 2.2.3 Do not use:
 - a. Wood windows.
 - b. Metal-clad wood windows.
 - c. Plastic-clad wood windows.
 - d. Tubular plastic fixed windows.
 - e. Composite windows.

2.3 Glazing:

- 2.3.1 Use the following:
 - a. Low E glass.
 - b. Laminated glass.
- 2.4 Ventilation Openings: Cover all natural and mechanical ventilation openings.
 - 2.4.1 Material: Aluminum, steel, or stainless steel.
 - 2.4.2 Use one of the following:
 - a. Stationary blade vents or louvers.
 - 2.4.3 Do not use:
 - a. Operable vents or louvers where operating parts are exposed on the exterior of the building.
- 2.5 Other Exterior Opening Elements: All components required to complete the opening.
- 2.6 Lintels:
 - 2.6.1 Use one of the following:
 - a. Brick veneer.
- 2.7 Joint Sealers: As specified in Chapter B21.

END OF CHAPTER B22

CHAPTER B23**EXTERIOR DOORS****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Secure all openings in the exterior wall that function to allow the entrance and exit of people, vehicles, and goods, so that the entire exterior enclosure functions as specified, using doors as specified, without using components that must be installed at changes of season.
- 1.1.2 The elements comprising exterior doors include doors of all sizes and uses, gates, and elements that form or complete the openings, unless an integral part of another element.
- 1.1.3 Where exterior door elements also must function as elements defined within another element group, meet requirements of both element groups.
- 1.1.4 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter B - Shell, and Chapter B2 - Exterior Enclosure.

1.2 Amenity and Comfort:**1.2.1 Thermal Performance:**

- a. Provide thermal performance without using supplementary storm doors.

1.2.2 Air Infiltration: Maximum of 0.20 cfm/ft of crack length, measured in accordance with ASTM E 283-1991(R99) at differential pressure of 1.57 psf.**1.2.3 Acoustical Performance:**

- a. Sound Transmission Class: STC values as follows, when measured in accordance with ASTM E 90-2002 and classified in accordance with ASTM E 413-1987(R99):
 - (1) Main Entrance Doors: STC 33.
 - (2) Other Pedestrian Doors: STC 36.
 - (3) Service Doors: STC 36.

1.2.4 Transparency:

- a. Provide fully glazed pedestrian doors at building entrances and corridor egress doors.
- b. Provide pedestrian doors at building exits. Exit from stairways to exterior with vision panels of at least 5 percent of door area.

1.2.5 Convenience and Accessibility:

- a. Door Handles: As required by code; where code and other requirements allow an option exit devices are to be provided at all exterior egress doors. All interior should be equipped with lever handles.
- b. Mode of Operation: Self-closing, with manual hold-open, unless otherwise indicated.
 - (1) Main Entrances: Manual.
 - (2) Service Entrances: Power-operated.
 - (3) Security Grilles: Power-operated.
- c. Power-Assisted and -Operated Door Control:
 - (1) Local actuators each side unless otherwise indicated.
 - (2) Use least obtrusive method of control/actuation possible.
- d. Dimensions: Minimum dimensions as follows:
 - (1) Service Entrances: 10' X 10'.

1.2.6 Appearance:

- a. Doors at Building Entrances: Match windows and window framing.

1.3 Health and Safety:

- 1.3.1 Emergency Egress:
 - a. Provide minimum aggregate width for building exit as required by code to accommodate occupant load.
 - b. Provide exit doors minimum 36 inches wide. Provide an alarm loud audible alarm at each egress exit door with exception of main entrance doors. Alarm system shall be integral in door panic hardware. Alarm signal will be sent back to the reception desk. Alarm system will have a disable feature.
- 1.3.2 Fire Resistance:
 - a. Doors Required by Code to be Fire Resistive: Fire resistance rating as required by code, for fire resistance rating of exterior wall in which doors occur, tested in accordance with a method acceptable to local authorities.
 - b. Doors into Stairs: Maximum 450 degrees F temperature rise rating at 30 minutes standard fire test exposure.
- 1.3.3 Physical Security:
 - a. Doors non-removable from outside without use of key.
 - b. Secure each exterior door using a "fail-secure" method that allows entrance plus exit from inside using only one motion.
 - (1) Exceptions: The following must not allow entrance:
 - (a) Exit doors opening from exit stairways directly to exterior (Exit Only function).
 - (b) Emergency exit doors that are not used for entrance (Exit Only function).
 - (2) Keys: Type as required to minimize unauthorized entry.
 - (a) Keying: Shall comply with Base Facility Design Standards..
 - (b) Contractor is required to coordinate keying of doors with Base locksmith and Fitness Center personnel before keying doors.
 - (3) Lock Functions:
 - (a) Shall comply with Base Facility Design Standards
 - (4) Lock Function Definitions: As described in ANSI/BHMA A156.3-2001 ("X" prefix), A156.5-2001 ("E" prefix), A156.12-1999 (F95-F106), and ; type of lock required may also be governed by other criteria.
 - (a) Shall comply with Base Facility Design Standards.
 - c. Forced Entry: Provide doors capable of resisting forced entry equivalent to:
 - (1) Swinging Doors: ASTM F 476-1984(R02) Grade 10.
 - (2) Exception for "Supervised" Doors: No forced entry requirement.
 - (a) "Supervised" Doors include: Main entrance doors.
- 1.3.4 Glazing in Doors: Comply with requirements for safety glazing, security, and forced entry specified in Chapters B and B2. Exterior glazing must comply with AT/FP requirements.
- 1.4 Structure:
 - 1.4.1 Lintels: Constructed to span door openings and support loads imposed by exterior wall with maximum deflection vertically and horizontally of 1/360 of span.
 - 1.4.2 Door Frames: Constructed to span door opening with maximum deflection vertically and horizontally of 1/360 of span.
- 1.5 Durability:
 - 1.5.1 Water Penetration: Design openings and components of openings to positively drain water to exterior of the building.
 - a. Top of Openings: If wall construction does not provide its own methods of drainage, use separate flashing to prevent water from entering opening components or the interior of the building.
 - b. Bottom of Openings: Integral or separate sill or flashing to prevent water running over or draining out of opening components from entering the wall construction below or the interior of the building.

- 1.5.2 Physical Endurance:
 - a. Doors, Frames, and Hardware: ANSI A250.4-2001 Level A using hardware specified.
 - b. Doors, Frames, and Anchors: NAAMM HMMA 862-1987 endurance test requirements.
- 1.5.3 Wear Resistance:
 - a. Door Surfaces: Scuff-resistant in areas where foot impact is likely; highly scratch-resistant in areas where hand contact is likely.
 - b. Door Handles: Highly scratch-resistant and of finish that will minimize appearance changes due to wear; satin or brushed finish.
- 1.5.4 Flexible Seal Materials: Minimize deterioration due to operation of doors, aging, and elements.
- 1.5.5 Swinging Doors: Control door swing to prevent damage due to impact, to either door or element impacted.
- 1.6 Operation and Maintenance:
 - 1.6.1 Service Life Span of Operating Components: Remaining operable for 10 years under normal exposure conditions for the project site.
 - 1.6.2 Ease of Use and Repair: Provide doors that will be easy to use by occupants, easy to repair or service, and with operating components easy to replace.

2. PRODUCTS

2.1 Follow Base Facility Design Standard

2.2 Main Entrance Doors:

- 2.2.1 Use one of the following:
 - a. Glazed bronze anodized finish aluminum doors.
- 2.2.2 Do not use:
 - a. Balanced doors.
 - b. Revolving doors.
 - c. Sliding doors.
 - d. Automatic doors.
 - e. Folding doors.
 - f. Bronze doors.
 - g. Stainless steel doors.
 - h. Wood doors.

2.3 Other Pedestrian Doors:

- 2.3.1 Provide weatherstripping and thresholds at all exterior doors.
- 2.3.2 Use one of the following:
 - a. Fully glazed doors (aluminum storefront) with a side-lite at all corridor egress doors.
- 2.3.3 Do not use:
 - a. Wood doors and frames.
 - b. Plastic doors and frames.

2.4 Service Doors:

- 2.4.1 Use one of the following:

~~2.5 Other Large Doors:~~

- ~~2.5.1 Use one of the following:
 - a. Overhead ceiling insulated door.~~

~~2.5.2~~ Do not use:

- ~~a. Overhead sectional doors.~~
- ~~b. Vertical lift doors.~~
- ~~c. Side coiling doors.~~
- ~~d. Steel doors.~~
- ~~e. Stainless steel doors.~~
- ~~f. Aluminum doors.~~
- ~~g. Wood doors.~~
- ~~h. Fiberglass doors.~~
- a. Overhead coiling insulated doors.

~~2.6.2.5~~ Other Exterior Opening Elements: All components required to complete door openings.

~~2.7.2.6~~ Lintels:

~~2.7.12.6.1~~ Use one of the following:

- a. Brick veneer.

~~2.8.2.7~~ Sills:

~~2.8.12.7.1~~ Use one of the following:

- a. Cast-in-place concrete at service entrance.
- b. Aluminum.

~~2.8.22.7.2~~ Do not use:

- a. Precast concrete.
- b. Unit masonry.
- c. Stone.

~~2.9.2.8~~ Concealed Flashings:

~~2.9.12.8.1~~ Use one of the following:

- a. Aluminum flashing.
- b. Galvanized steel flashing.

~~2.9.22.8.2~~ Do not use:

- a. Stainless steel flashing.
- b. Copper flashing.
- c. Plastic flashing.
- d. Paper flashing.
- e. Uncoated steel flashing.

~~2.10.2.9~~ Joint Sealers: Same as specified in Chapter B21.

~~2.11.2.10~~ Glazing in Doors: Glass.

~~2.11.12.10.1~~ Type: Double pane insulated glass units.

~~2.11.22.10.2~~ Use the following:

- a. Fully tempered glass.
- b. Laminated glass.

~~2.11.32.10.3~~ Do not use:

- a. Plain float or sheet glass.
- b. Heat-strengthened glass.
- c. Wired glass, except in fire-rated doors.

~~2.12.2.11~~ Door Louvers:

~~2.12.12.11.1~~ Louvers in Metal Doors: Same material as doors.

~~2.13.2.12~~ Hardware for Swinging Doors:

~~2.13.12.12.1~~ Use satin, stainless steel finish.

~~2.13.22.12.2~~ Use fire rated hardware on fire rated doors.

~~2.13.32.12.3~~ Hinges: Ball-bearing butt hinges.

~~2.13.42.12.4~~ Exit Devices: Unless specifically indicated as one type, mortise type.

~~2.13.52.12.5~~ Locksets: Unless specifically indicated as one type, mortise.

~~2.13.62.12.6~~ Door Closers: Unless specifically indicated as one type, surface overhead frame-mounted type or surface overhead door-mounted type.

~~2.13.72.12.7~~ Door Stops: Unless specifically indicated as one type, floor-mounted type or wall-mounted type.

~~2.13.82.12.8~~ Door Hold-Opens: Unless specifically indicated as one type, floor-mounted type or wall-mounted type.

END OF CHAPTER B23

CHAPTER B3**ROOFING****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide a weather-proof enclosure over the entire "top-side" of building that also excludes unwelcome people, animals, and insects without requiring specific action by occupants, while shedding water and preventing uncontrolled water infiltration, withstanding anticipated loading conditions, providing required access, and permitting the entry of desirable natural light.
- 1.1.2 Provide all fixtures needed on the roof due to the design or indicated in the project program. No roof mounted equipment.
- 1.1.3 Roofing comprises the following elements:
 - a. Roof Coverings (B31): Weather barriers, vapor retarders, insulation, wearing surfaces, water collectors and conductors; including coverings over plaza decks, balconies, and other exposed floors.
 - b. Roof Openings (B32): Skylights, ventilation openings, access openings, and other roof opening elements.
 - c. Roof Fixtures (B33): All elements attached to the roof, unless equipment or services.
- 1.1.4 Where roofing elements also must function as elements defined within another element group, meet requirements of both element groups.
- 1.1.5 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance and Chapter B - Shell.
- 1.1.6 Substantiation:
 - a. Post-Construction: Roof inspection conducted in the first spring after completion of roofing, after chance of snow has passed.

1.2 Amenity and Comfort:

- 1.2.1 Run-Off: Direct water run-off away from foundations without splashing or dripping.
- 1.2.2 Appearance:
 - a. Color: Dakota Brown (see Base Architectural Standards).

1.3 Health and Safety:

- 1.3.1 Roof Worker Safety: Design to provide safe design and safety measures as required by code and the following:
 - a. Provide permanent access to all areas of the roof in the form of fixed ladders.
- 1.3.2 Physical Security: Consider the roof area and all roof openings unsupervised.

1.4 Structure:

- 1.4.1 Rainwater Load: As required by code.
- 1.4.2 Roof Component Wind Resistance:
 - a. Uplift: Same pressure as specified in code for structural members.
 - b. Substantiation:
 - (1) Design Development: Identification of assemblies or methods used.
 - (2) Construction Documents: Identifying numbers on the construction drawings.
 - (3) Post-Construction: Reports of windstorms involving winds of over 25 mph within one year after completion of each roofing element, including wind speed, direction, duration, and results of inspection of roofing.

- 1.4.3 Snow Load:
 - a. Roof Opening Elements: Exceed code requirements by 15 percent.
- 1.5 Durability:
 - 1.5.1 Weather Resistance: Provide weather-exposed roof coverings and other components that comply with weather resistance specified in Chapter B and the following:
 - a. Minimization of Deterioration Due to Weather: For weather-barrier materials, minimization means no deterioration that adversely affects water penetration resistance at any time during the specified service life span.
 - b. Substantiation:
 - (1) Design Development: Identification of proven-in-use products and assemblies; in addition to substantiation items specified in Chapter 111, provide, for minimum of 3 existing applications, date of installation of roof covering; maintenance, repair, and replacement history; recommended inspection and maintenance program; detailed evaluation of similarities and differences of historical application from proposed application; estimated life span of similar assembly if constructed today.
 - (2) Design Development: As specified for service life span in Chapter 111, including service life analysis and life cycle cost analysis.
 - 1.5.2 Water Penetration: None, under conditions of rain driven at 50 mph, unless water paths are completely accessible.
 - a. Substantiation:
 - (1) Construction: Water flood tests of roof areas that can accumulate rainwater if primary drains are blocked, up to depth for which structure is designed.
 - (2) Construction: Reports of first 3 significant rainfalls after completion of each roofing element, including rainfall amount and intensity, wind speed and direction, and results of inspection of roof and underside.
 - 1.5.3 Minimum Slope:
 - a. Field of Roof: 3 inch per foot.
 - 1.5.4 Grease, Chemical Resistance: Wherever there is a possibility of the introduction of grease, oils, or chemicals onto the roof, provide materials that are not damaged by such leakage.
 - 1.5.5 Ice: Design to avoid damage due to ice formation and buildup on roofing.
 - 1.5.6 Snow: Provide snow guards.
 - 1.5.7 Wear Resistance:
 - a. Surfaces in Areas Occupied in Manner Similar to Interior Spaces: Same requirements as for the floor finishes for the equivalent interior space, as specified in Chapter C16.
 - b. Surfaces Subject Only to Maintenance Foot Traffic: Not punctured by ordinary materials or tools when stepped on.
 - c. Surfaces Subject to Other Traffic Levels: Durability appropriate to level of traffic anticipated.
 - d. Substantiation:
 - (1) Design Development: Proven-in-use products, or demonstration using tests appropriate to materials used, over same type of substrates as will be used in construction.
- 1.6 Operation and Maintenance:
 - 1.6.1 Ease of Service:
 - a. All components of roofing (not just roof covering) easily accessible by maintenance persons on foot without the use of portable ladders or other portable devices.
 - 1.6.2 Ease of Replacement: As specified in Chapter 111.

2. PRODUCTS

2.1 Roof Covering:

- 2.1.1 Use one of the following:
 - a. Any product indicated in Chapter B31.
- 2.1.2 Do not use any of the following:
 - a. Asphalt roll roofing.
 - b. Mineral-fiber-cement shingles.
 - c. Asphalt shingles.
 - d. Clay tile.
 - e. Concrete tile.
 - f. Metal shingles.
 - g. Slate shingles.
 - h. Wood shingles.
 - i. Built-up asphalt roofing.
 - j. Elastomeric membrane roofing.
 - k. Modified bitumen membrane roofing.
 - l. Fluid-applied roofing membrane.
 - m. Sprayed coated foam roofing.

2.2 Snow Guards:

- 2.2.1 Use the following:
 - a. Compression type
- 2.2.2 Do not use the following:
 - a. Screw-down type

2.3 Roof Openings:

- 2.3.1 Use one of the following:
 - a. Product specified in the code, provided the material complies with specified requirements.
 - b. Roof hatches, ridge vents and air intake vents.
- 2.3.2 Do not use:
 - a. Plastic unit skylights.
 - b. Metal-framed skylights.
 - c. "Drop-out" type heat/smoke vents.
 - d. Hinged heat/smoke vents.
 - e. Gravity ventilators.

END OF CHAPTER B3

CHAPTER B31**ROOF COVERINGS****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide a weather-resistive covering over the top side of the roof superstructure and any exposed floor superstructure.
- 1.1.2 Roof covering comprises all weather-resistive components, including the primary weather barrier, vapor retarders, insulation, water collectors and conductors, wearing surfaces, trim and accessories, but not including roof opening elements or roof fixtures.
- 1.1.3 Where roof covering elements also must function as elements defined within another element group, meet requirements of both element groups.
- 1.1.4 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter B - Shell, and Chapter B3 - Roofing.

1.2 Structure:

- 1.2.1 Roof Covering Substrate: Sufficiently rigid or dense to support water barrier in a manner that prevents puncture due to traffic on roof.
- 1.2.2 Wind Uplift: Where roof covering has a lower air transmission rate than the roof superstructure, provide means of preventing blow-off or ballooning due to low negative pressure over roof.

1.3 Durability:

- 1.3.1 Life Span: As specified in Chapter B, and the following:
 - a. Aesthetic Life Span: Significant degradation of appearance during the functional life span is not acceptable.
 - b. Manufacturer Approval of Design: Where roof covering manufacturer recommends or requires certain design features for satisfactory performance or for warranty, with manufacturer's requirements.
 - c. Manufacturer Warranty:
 - (1) Materials: 25 years, minimum.
 - (2) Installation and Workmanship: 10 years, minimum.
 - d. Substantiation:
 - (1) Proposal: Material type, expected functional life span, expected changes in appearance over life span, and manufacturer warranty available.
 - (2) Design Development: Material type and specification, expected functional life span, and manufacturer warranty available.
 - (3) Construction Documents: Quality assurance program to be implemented to ensure complete and correct installation of weather-barrier elements.
 - (4) Construction: Actual manufacturer warranty.
- 1.3.2 Water Penetration:
 - a. Water Barrier Type: Use a water barrier that is lapped for positive run-off or a membrane with sealed joints.
 - b. Fasteners Penetrating Water Barrier: Prohibited, unless fasteners are located under overlapping material.

2. PRODUCTS**2.1 Sloped Roofs:**

- 2.1.1 Use one of the following:

- a. Structural Standing Seam Metal roofing (double fold - mechanically seamed) of aluminum or factory-finished hot-dipped galvanized steel.
- 2.1.2 Do not use:
- a. Asphalt shingles.
 - b. Wood shingles.
 - c. Slate shingles.
 - d. Concrete tiles.
 - e. Clay tiles.
 - f. Mineral fiber-cement tiles.
- 2.2 Insulation Over Roof Superstructure:
- 2.2.1 Use one of the following:
- a. Rigid Insulation Board.
- 2.3 Flashing, Trim, and Accessories: Sheet metal.
- 2.3.1 Use one of the following:
- a. Factory-finished galvanized sheet metal.
- 2.3.2 Do not use:
- ~~a. Sheet metal.~~
 - b-a. Copper sheet metal.
 - e-b. Stainless steel sheet metal.
 - d-c. Lead sheet metal.
 - e-d. Flexible flashing.

END OF CHAPTER B31

CHAPTER B32**ROOF OPENINGS****1. PERFORMANCE**

1.1 Basic Function:

- 1.1.1 Close all openings in the roof with elements that exclude unwelcome people, animals, and insects without requiring specific action by occupants, while shedding water and preventing uncontrolled water infiltration, withstanding anticipated loading conditions, providing required access, and permitting the entry of desirable natural light.
- 1.1.2 Roof opening elements include skylights, hatches, vents, and other elements necessary to close openings or elements associated with those openings.
- 1.1.3 Where roof opening elements also must function as elements defined within another element group, meet requirements of both element groups.
- 1.1.4 In addition to the requirements of this chapter, comply with all applicable requirements of Chapters 111 - Facility Performance, Chapter B - Shell, and Chapter B3 - Roofing.

1.2 Amenity and Comfort:

1.2.1 Convenience:

- a. Provide a fixed ladder leading to each hatch from within mechanical room only, used for access to roof equipment or required by code.
- b. Access Hatches in Mechanical Room Only: Openable from inside, provided user unlocked from inside before exiting.

1.3 Health and Safety:

1.3.1 Ladder Safety: Comply with ANSI A14.3-2002.

1.3.2 Physical Security:

- a. Operable Openings: No unlocking devices accessible from outside.
- b. Access Hatches: Forced entry resistance of Class I in accordance with ASTM F 1233-1998, minimum.

2. PRODUCTS

2.1 Ventilation Openings In or On Plane of Roof:

2.1.1 Use one of the following:

- a. Ridge vents.
- b. Vents.

2.1.2 Do not use:

- a. Gravity ventilators.
- b. Louvered penthouses.

2.2 Access Openings:

2.2.1 Use the following:

- a. Hinged roof hatches.

2.2.2 Do not use:

- a. Stairway enclosures with door to roof.
- b. Ladders up outside of building.

END OF CHAPTER B32

CHAPTER C**INTERIORS****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide appropriately finished interiors for all spaces indicated in the program, equipped with interior fixtures as required to function properly for specific occupancies.
- 1.1.2 Interiors comprise the following assemblies:
 - a. Interior Construction (C1): All elements necessary to subdivide and finish space enclosed within the shell, including applied interior surfaces of the exterior enclosure.
 - b. Interior Fixtures (C2): All elements attached to interior construction that add functionality to enclosed spaces, except for elements classified as equipment or services fixtures.
- 1.1.3 Provide physical separation between spaces, constructed to achieve fire ratings required by code, appropriate security between adjacent spaces, and visual, acoustical, olfactory, and atmospheric isolation as necessary to maintain desirable conditions in each space.
- 1.1.4 Provide finishes for interior surfaces that are appropriate for the functions of each space.
- 1.1.5 Provide interior fixtures that are necessary for the proper functioning of each space.
- 1.1.6 Where interior elements also must function as elements defined within another element group, meet requirements of both element groups.
- 1.1.7 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance.

1.2 Amenity and Comfort:

- 1.2.1 Access: Provide access to all primary interior spaces from Circulation spaces (SC Spaces) (no access to any primary interior space exclusively through another primary interior space).
- 1.2.2 Natural Light:
 - a. Daylighting: Provide ambient natural lighting in primary spaces that is of intensity adequate for essential tasks when measured on a typical overcast winter day in midafternoon.
 - (1) Spaces for daylighting include the following types:
 - (a) Large Exercise Room
 - (b) Small Exercise Room
 - (c) Senior Exercise Room
 - (d) Cardiovascular Room
 - (e) Weight Room
 - (f) Resistance and Free Weight Training Rooms
 - (g) Elevated Indoor Running Track
 - (h) Offices/Training Room
 - (i) Main Entrance Lobby
 - (j) Climbing Wall
 - (2) Light Levels: Provide minimum light levels not less than those recommended in IESNA Lighting Handbook, 2000, for the types of tasks to be anticipated in each category of space.
 - b. Visual Comfort: Provide ambient natural light in primary spaces that is free of excessive direct or reflected glare, as defined in IESNA RP-5, 1999, Recommended Practice of Daylighting.
 - c. Daylight Control: Provide local devices to enable occupants to control brightness and glare from direct daylighting.
 - (1) Window treatments as specified in Chapter C23 are acceptable methods of complying with this requirement.

- 1.2.3 Acoustical Performance:
- a. Background Noise: Provide interiors that maintain ambient sound levels in primary spaces within the following Noise Criteria (NC) ranges, as defined in ASHRAE HVAC Applications Handbook, 2003, when adjacent spaces are occupied and are being used normally:
 - (1) Conference Room: 25-30.
 - (2) Semiprivate Office: 30-35.
 - (3) Gymnasium: 45-50.
 - (4) Relaxation & Message Rooms: 20-25.
 - b. Impact Insulation: Provide floor-ceiling construction, including floor structure, floor finish, and ceiling finish, to insulate primary spaces from undesirable impact noise when adjacent spaces are occupied and are being used normally.
 - c. Reverberation: Provide reverberation times in primary spaces for frequencies of 500-1000 Hz as follows:
 - (1) Classrooms: 0.6-0.8 seconds.
 - (2) Conference Rooms: 0.9-1.1 seconds.
 - d. Substantiation:
 - (1) Preliminary Design: Engineering calculations for representative spaces, predicting acoustical conditions.
- 1.2.4 Odor Control: Prevent unpleasant or noxious odors generated within a space from affecting occupants of adjacent spaces, by providing physical isolation of the spaces, separate ventilation, or a combination of isolation and ventilation.
- a. Control odors from spaces of the following types:
 - (1) Demonstration kitchen.
 - (2) Laundry.
 - (3) Toilet rooms.
 - (4) Locker or changing rooms.
 - (5) Trash collection.
 - (6) Trash removal.
 - (7) Discarded towel collection.
- 1.2.5 Appearance: Provide interiors that are pleasing in appearance and do not detract from the primary functions performed in each space. Provide a variety of colors but a coordinated color scheme through out the facility.
- 1.2.6 Texture: Provide interior elements and surfaces that are textured appropriately for primary functions to be accommodated within each space.
- a. For surfaces that are within normal reach of occupants, provide textures that are safe for occupants and require minimum maintenance.
 - b. For surfaces that are not within normal reach of occupants, provide textures that are comparable to those within normal reach.
 - c. For surfaces that are not within normal reach of occupants, design may provide textures that are generally of a coarser scale than those permitted within normal reach.
- 1.3 Health and Safety:
- 1.3.1 Egress: Provide egress from all interior spaces in accordance with code.
- 1.3.2 Fire Resistance: Design and select materials to provide fire resistance in accordance with code.
- a. Minimum performance values for individual interior elements are also specified in other chapters.
- 1.4 Structure:
- 1.4.1 Structural Performance: Provide interior construction and fixtures to support without damage all loads required by code.
- a. Special Loads: In addition to loads defined by code, provide for adequate support of wall-mounted or ceiling-mounted furnishings and equipment in spaces where such equipment is required by

program or is likely to be installed after construction because of intended function.

- (1) Adequate support is defined as the ability to sustain 150 percent of design loads without damage to building or equipment.
- (2) Special loads not described in the program include:
 - b. Substantiation:
 - (1) Design: Detailed listing of design criteria and preliminary analysis, prepared by a licensed structural engineer.
 - (2) Construction Documents: Detailed design analysis by licensed structural engineer.

1.5 Durability:

- 1.5.1 Service Life Span: Same as building service life, except as follows:
 - a. Interior Doors and Other Operable Elements: Minimum 15 years functional and aesthetic service life.
 - b. Interior Ceiling Finishes: Minimum 15 years functional and aesthetic service life; including suspended ceilings.
 - c. Interior Wall and Floor Finishes: Minimum 10 years functional and aesthetic service life.
 - d. Other Interior Construction: Minimum 15 years functional and aesthetic service life.
 - e. Substantiation: As specified in Chapter 111, including life cycle cost analysis.
- 1.5.2 Wear Resistance: Provide interior construction and fixtures that are suitable in durability for the degree and type of traffic to be anticipated in each space.
- 1.5.3 Water Resistance: At restrooms, locker rooms, steam rooms, laundry rooms, shower rooms, janitorial closets, and sauna, provide interior construction and fixtures that will not be damaged by water or high humidity.
- 1.5.4 Corrosion Resistance: At locker rooms, steam rooms, laundry rooms, shower rooms, and sauna, provide interior construction materials and fixtures that are inherently resistant to corrosion and rot.
- 1.5.5 Ultraviolet Resistance: In interior spaces exposed to direct sunlight, provide interior construction and fixtures that are inherently resistant to fading and discoloration.
- 1.5.6 Vandal Resistance: In spaces accessible to the public and not subject to continuous surveillance, provide interior construction and fixtures that are inherently vandal resistant or designed to be difficult to access or damage.

1.6 Operation and Maintenance:

- 1.6.1 Cleaning: Provide interior construction and fixtures that will not be damaged by ordinary cleaning and maintenance operations.

2. PRODUCTS

2.1 Design and construct interiors using the following materials and systems:

- 2.1.1 Wood.
- ~~2.1.2 Wood treated for fire retardancy.~~
- ~~2.1.3~~ 2.1.2 Portland cement plaster on metal lath and framing at ceiling over the men's and women's showers areas .
- ~~2.1.4~~ 2.1.3 Gypsum wallboard on metal framing and furring.
- ~~2.1.5~~ 2.1.4 Intergal colored CMU.

2.2 Do not use:

- 2.2.1 Cast-in-place concrete.
- 2.2.2 Exposed wood.

2.2.3 Particleboard of any type.

2.2.4 Gypsum plaster.

2.2.5 Wood framing.

3. METHODS OF CONSTRUCTION

3.1 The following existing interior elements must be preserved:

3.1.1 Fire-rated partitions around stairwells and shafts.

3.2 Construct the interiors using the following methods and techniques:

3.2.1 Shop fabricated fixtures and fittings.

3.2.2 Site-built wall panels.

3.3 Do not use:

3.3.1 Shop fabricated wall panels for field installation and finishing.

END OF CHAPTER C

CHAPTER C1**INTERIOR CONSTRUCTION****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide physical separation between spaces required by the program, constructed to achieve fire ratings required by code, appropriate security between adjacent spaces, and visual, acoustical, olfactory, and atmospheric isolation as necessary to maintain desirable conditions in each space.
- 1.1.2 Provide appropriately finished interiors for all spaces required by the program.
- 1.1.3 Interior construction comprises the following elements:
 - a. Partitions (C11): All types of space dividers, including demountable and operable partitions.
 - b. Interior Doors (C12): All interior doors, including hardware and frames, except for elevator doors.
 - c. Other Interior Openings (C14): Interior utility openings such as hatches and access panels, louvers and vents.
 - d. Stairs (C15): Those interior and exterior stair elements not a part of superstructure or exterior enclosure.
 - e. Interior Finishes (C16): All functional and decorative applied interior finishes, including secondary support structures.
- 1.1.4 Where interior construction elements also must function as elements defined within another element group, meet requirements of both element groups.
- 1.1.5 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance and Chapter C - Interiors.

1.2 Amenity and Comfort:

- 1.2.1 Airborne Sound Isolation: Design and construct interior construction to achieve the following minimum noise isolation class (NIC) values between adjacent spaces, when tested in accordance with ASTM E 336-1997 and classified in accordance with ASTM E 413-1987(R99), based on NC values specified in Chapter C:
 - a. Spaces of Like Function and Similar NC Value: NIC 36.
 - b. Quiet Space (NC Values of 20-30) and Noisy Space (NC Values of 40-50): NIC 42.
 - c. Substantiation:
 - (1) Design Development: Drawings indicating proven-in-use STC values for construction separating primary spaces and separating primary spaces from noise sources such as mechanical equipment.
 - (2) Construction Documents: Proven-in-use or proven-by-mock-up data substantiating STC values.
 - (3) Construction: Field tests of representative construction, conducted after all systems are in operation.

1.3 Health and Safety:

- 1.3.1 Fire Resistance: Design and provide interior construction to achieve fire resistance required by code.
 - a. Substantiation:
 - (1) Construction Documents: Identifying numbers on the construction drawings.
- 1.3.2 Safety: Design and provide interior construction to protect building occupants in accordance with code and the following:
 - a. Heights: Protect building occupants from falling from elevated interior running track.
 - b. Minimum performance values for individual interior construction elements are specified in other chapters.

- 1.3.3 Security: At interior construction separating tenants from public circulation spaces, provide materials and systems with the same performance characteristics as specified for exterior enclosure in Chapter B2, except for requirements related to weathering.
- 1.4 Structure:
 - 1.4.1 Seismic Loads:
 - a. Non-Fire Rated Ceiling Assemblies: Provide ceilings that have been engineered and installed to withstand seismic forces that are 20 percent greater than those required by code.
- 1.5 Durability:
 - 1.5.1 Dimensional Stability: At interior spaces exposed to high humidity, such as sauna, steam rooms, laundry rooms, and shower rooms, provide interior construction that will withstand continuous or intermittent exposure without significant changes in dimension, or sagging.
 - a. Substantiation:
 - (1) Construction Documents: Details of critical conditions.
- 1.6 Operation and Maintenance:
 - 1.6.1 Cleaning: At restrooms, steam rooms, laundry rooms, shower rooms, and janitorial closets, provide interior construction that will allow harsh chemical cleaning without damage.

2. PRODUCTS

- 2.1 Design and construct the interiors using the following:
 - 2.1.1 Portland cement plaster on metal lath over metal framing at ceiling over the men and women's shower areas.
 - 2.1.2 Gypsum wallboard on metal framing.
 - 2.1.3 Integral colored CMU.
- 2.2 Do not use:
 - 2.2.1 Gypsum plaster on gypsum lath over wood framing.
 - 2.2.2 Solid gypsum plaster on steel framing.
 - 2.2.3 Gypsum wallboard on wood framing.
 - 2.2.4 Wood paneling on wood framing.

END OF CHAPTER C1

CHAPTER C11**PARTITIONS****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide physical separation between spaces, constructed to achieve fire ratings required by code, appropriate security between adjacent spaces, and visual, acoustical, olfactory, and atmospheric isolation as necessary to maintain desirable conditions in each space.
- 1.1.2 Partitions comprise the following elements:
 - a. Fixed Partitions: Solid, stationary space dividers that are opaque and extend full height.
 - b. Partial Height Partitions: Fixed, solid, opaque visual barriers, including toilet compartments, and dressing cubicles.
 - c. Operable Partitions: Movable barriers that form solid, visual and acoustical subdivisions of a space.
 - d. Fixed, Open Protection and Control Devices: Barriers include interior railings.
- 1.1.3 Where partition elements also must function as elements defined within another element group, meet requirements of both element groups.
- 1.1.4 In addition to requirements specified in this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter C - Interiors, and Chapter C1 - Interior Construction.

1.2 Amenity and Comfort:

- 1.2.1 Visual Privacy: Provide partial height partitions at toilet rooms and dressing rooms that afford visual privacy between adjacent stalls.
- 1.2.2 Acoustical Isolation:
 - a. Fixed Partitions: Provide in-place FSTC values not less than NIC values required for interior construction in Chapter C1, when tested in accordance with ASTM E 336-1997 and classified in accordance with ASTM E 413-1987(R99).
 - b. Partial Height Partitions: Where partial height partitions are permitted, including commercial toilet partition systems, acoustical isolation is not required.
 - c. Operable Partitions: Provide system with proven-in-use STC value of 40.
- 1.2.3 Appearance:
 - a. Provide partitions that are smooth, split-face, scored CMU at all circulation routes (SC spaces).
 - b. Provide operable partitions that are compatible in appearance with fixed partitions in the same space, employing similar colors and textures.

1.3 Health and Safety:

- 1.3.1 Fire Resistance: Provide fire ratings as required by code, except for the following, which are in excess of those required by code:
 - a. Stairway Enclosures: 1 hour.
- 1.3.2 Sanitation: At spaces used for food preparation, provide smooth, impervious, and water-resistant partition surfaces and integral coved base that will allow chemical cleaning and sterilization without damage.

1.4 Structure:

- 1.4.1 Lintels: Constructed to span openings in partitions and support imposed loads with maximum deflection vertically and horizontally of 1/360 of span.
- 1.4.2 Vertical Loads: Provide partitions with sufficient strength to withstand anticipated vertical loads for wall-mounted handrails, equipment, and furnishings without excessive deflection or structural damage.
 - a. Partial Height Partitions: Withstand point load of 200 lbf applied every 2 feet to top of partition.

- 1.4.3 Horizontal Loads: Provide partitions with sufficient strength and rigidity to withstand anticipated horizontal loading conditions without excessive deflection or structural damage.
- a. Fixed Partitions: Withstand loading of 5 psf with maximum deflection of L/120, per ASTM E 72-2002.
 - b. Elevator Shaft Wall Partitions: Withstand intermittent air pressure loads of 5 psf with maximum deflection of L/120, per ASTM E 72-2002.
 - c. Partial Height Partitions: Withstand concentrated load of 200 lbf applied over not more than 10 sq in anywhere on partition surface.
- 1.4.4 Railings: Provide railings with sufficient strength and rigidity to withstand the following loads:
- a. Concentrated load of 200 lbf applied in any direction.
 - b. Uniform load of 50 lbf/ft applied in any direction.

2. PRODUCTS

2.1 Fixed Partitions:

- 2.1.1 Design and construct partitions using the following:
- a. Intergal colored concrete masonry units.
 - b. Gypsum board on metal framing.
- 2.1.2 Do not use:
- a. Cast-in-place concrete.
 - b. Brick.
 - c. Glass unit masonry.
 - d. Clay tile units.
 - e. Gypsum plaster on gypsum lath over wood framing and furring.
 - f. Solid gypsum plaster on steel framing.
 - g. Portland cement plaster on metal lath over metal framing .
 - h. Gypsum board on wood framing and furring.
 - i. Wood paneling on wood framing and furring.

2.2 Partial Height Partitions:

- 2.2.1 Design and construct partitions using the following:
- a. Manufactured metal or solid plastic toilet compartments and screens.
- 2.2.2 Do not use:
- a. Cast-in-place concrete.
 - b. Brick.
 - c. Concrete masonry units.
 - d. Glass unit masonry.
 - e. Clay tile units.
 - f. Gypsum plaster on gypsum lath over wood framing and furring.
 - g. Solid gypsum plaster on steel framing.
 - h. Portland cement plaster on metal lath over metal framing .
 - i. Gypsum board on wood framing and furring.
 - j. Wood paneling on wood framing and furring.

2.3 Operable Partitions:

- 2.3.1 Use the following:
- a. Accordion folding systems, manually operated.
- 2.3.2 Do not use:
- a. Individual panel.
 - b. Paired panel systems.
 - c. Continuously hinged panel systems, manually operated.

- d. Continuously hinged panel system, electrically operated.
- e. Accordion folding systems, electrically operated.

2.4 Interior Railings:

2.4.1 Use the following:

- a. Pipe and tube railings of stainless steel.
- b. Ornamental metal railings of aluminum.
- c. Ornamental glass-supported railings.

2.4.2 Do not use:

- a. Pipe and tube railings of steel.
- b. Pipe and tube railings of aluminum.
- c. Ornamental metal railings of steel.
- d. Ornamental metal railings of stainless steel.
- e. Ornamental metal railings of copper alloy.
- f. Ornamental metal railings of wrought iron.

END OF CHAPTER C11

CHAPTER C12

INTERIOR DOORS

1. PERFORMANCE

1.1 Basic Function:

- 1.1.1 Equip all openings in partitions that function to allow passage of people, and goods, so that openings can be closed and secured when not in use, using components as specified.
- 1.1.2 The elements comprising interior doors include doors of all sizes and uses, gates, and elements that form or complete the openings, unless an integral part of another element.
- 1.1.3 Where interior door elements also must function as elements defined within another element group, meet requirements of both element groups; interior doors function as partition elements when doors are closed.
- 1.1.4 In addition to the requirements of this Chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter C - Interiors, and Chapter C1 - Interior Construction.

1.2 Amenity and Comfort:

1.2.1 Acoustical Performance:

- a. Provide in-place FSTC values for partitions with interior doors that are not less than NIC values specified for interior construction in Chapter C1.

1.2.2 Convenience:

- a. Dimensions: Provide interior doors that are sized appropriately for people and goods likely to move between adjacent spaces.
- b. Height: Not less than 84 inches in height.
- c. Width: Not less than 36 inches in width.
- d. Closing Devices: Required on all doors; smooth closing motion, with slower latching speed than closing speed (no slamming).

1.2.3 Appearance:

- a. Provide interior doors coordinated with adjacent wall surfaces, using matching wood birch doors with a clear finish, 1-3/4" thick.

1.3 Health and Safety:

1.3.1 Fire Safety: Protect door openings in fire-rated walls and partitions in accordance with the code.

- a. Closers: Sufficient closing force to close and latch door despite drafts and wind, but not more than that specified by code.

1.3.2 Emergency Egress: Where doors must be latched or locked, comply with the code and the following:

- a. Locking Devices Requiring a Key for Egress: Not allowed.
- b. Exit Doors Having Occupant Load of 50 or More (Regardless of Occupancy): Use exit hardware that releases the locking/latching mechanism upon the application of a force in the direction of egress travel. Provide an alarm at each egress door with loud audible alarm sound and which sends the alarm signal back to the reception desk. Provide a disable feature on the alarm system.

1.3.3 Physical Security:

- a. Locks: Secure each room door using a keyed lockset that allows exit from inside using only one motion. Locks (cores) and locksets must comply with Hill AFB Locksmith Standards.
 - (1) Exceptions:
 - (a) The following must not have any locking feature at all:
 - (1) Doors to restrooms, shower rooms, locker rooms, and sauna.
 - (b) The following must be exit only, without key on outside:
 - (1) Exterior egress doors.

- (c) The following may have privacy lock function (without key):
 - (1) Doors to bathrooms, water closet compartments, shower compartments, or single person restrooms.
- (d) The following do not require keyed lock although they may require lockset for some other reason.
 - (1) Doors to closets within a secured room, unless otherwise indicated.
 - (2) Doors to restrooms, shower rooms, locker rooms, and laundry rooms.
 - (3) Doors into stairwells.
- (e) See Chapter D92 for remote unlocking requirements related to access/entry control functions.
- (2) Keys: As specified in Chapter B23.
 - (a) Keying: Shall Comply with Base Facility Design Standards.
 - (b) Contractor is required to coordinate keying of doors with Base locksmith and Fitness Center personnel before keying.
 - (3) Locking Functions: Appropriate to the space location and function and as follows:
 - (a) Exterior Doors: See Chapter B23.
- b. Lock Function Definitions: As described in Base Facility design Standards
- c. Forced Entry: Doors indicated in program capable of resisting forced entry equivalent to:
 - (1) Swinging Doors: ASTM F 476-1984(R02) Grade 10.
 - (2) Locks and Lock Cylinders: Per Base Facility Design Standards
- d. Glazing in Doors: Comply with requirements for safety glazing, security, and forced entry specified in Chapters C and C1. Exterior glazing must comply with AT/FP requirements.

1.4 Structure:

- 1.4.1 Door Frames: Constructed to span door opening with maximum deflection vertically and horizontally of 1/360 of span.

1.5 Durability:

- 1.5.1 Wear Resistance:
 - a. Door Surfaces: Scuff-resistant in areas where foot impact is likely; highly scratch-resistant in areas where hand contact is likely; applied protective surfaces for vulnerable areas are acceptable.
 - b. Door Handles and Knobs: Highly scratch-resistant and of finish that will minimize appearance changes due to wear; satin or brushed finish.
- 1.5.2 Flexible Seal Materials: Minimize deterioration due to operation of doors and aging.
- 1.5.3 Swinging Doors: Control door swing to prevent damage due to impact, to either door or element impacted.

1.6 Operation and Maintenance:

- 1.6.1 Ease of Use and Repair: Provide doors that will be easy to use by occupants, easy to repair or service, and with operating components easy to replace.
- 1.6.2 Life Span of Operating Components: Remaining operable for 10 years under normal exposure conditions for the project site.

2. PRODUCTS

2.1 Interior Pedestrian Doors:

- 2.1.1 Use the following:
 - a. Hollow steel doors and frames.
 - b. Solid Core flush wood doors.
 - c. **Glazed aluminum doors at activity spaces.**
- 2.1.2 Do not use:

- a. Plastic laminate faced doors.
- b. Stile-and-rail wood doors.
- ~~c. Glazed aluminum doors.~~
- ~~d-c.~~ Glazed bronze doors.
- ~~e-d.~~ Glazed stainless steel doors.

2.2 Security Grilles:

- 2.2.1 Use one of the following:
 - a. Overhead coiling grilles at Juice Bar.
 - b. Overhead coiling steel grilles at Juice Bar.
 - c. Overhead coiling aluminum grilles at Juice Bar.
- 2.2.2 Do not use:
 - a. Side coiling grilles.
 - b. Side sliding grilles.
 - c. Folding grilles.
 - d. Swinging gates.
 - ~~e. Steel grilles.~~
 - f.e. Stainless steel grilles.
 - ~~g. Aluminum grilles.~~

2.3 Fire Separation Doors Not Used for Egress:

- 2.3.1 Use one of the following:
 - a. Same type as for other doors.
- 2.3.2 Do not use:
 - a. Folding accordion doors.

2.4 Door Frames:

- 2.4.1 Use the following:
 - a. Steel frames.
 - b. Aluminum frames.
- 2.4.2 Do not use:
 - ~~a. Aluminum frames.~~
 - ~~b-a.~~ Wood frames.

2.5 Sills:

- 2.5.1 Use one of the following:
 - a. Aluminum.
- 2.5.2 Do not use:
 - a. Cast-in-place concrete.
 - b. Precast concrete.
 - c. Unit masonry.
 - d. Stone.

2.6 Glazing in Doors: Glass.

- 2.6.1 Use one of the following:
 - a. Fully tempered glass.
- 2.6.2 Do not use:
 - a. Plain float or sheet glass.
 - b. Heat-strengthened glass.
 - c. Wired glass, except in fire-rated doors.

2.7 Door Louvers:

- 2.7.1 Louvers in Metal Doors: Same material as doors.
- 2.7.2 Use fire rated louvers on fire rated doors.
- 2.7.3 Louver in Wood Doors: Use one of the following:
 - a. Steel louvers.

2.8 Hardware for Swinging Doors:

- 2.8.1 Use satin, chrome finish.
- 2.8.2 Use fire rated hardware on fire rated doors.
- 2.8.3 Hinges: Ball-bearing butt hinges.
- 2.8.4 Exit Devices: Unless specifically indicated as one type, mortise type or rim type.
- 2.8.5 Locksets: Unless specifically indicated as one type, bored (cylindrical).
 - a. Do not use rim type auxiliary locks, lock combinations requiring two hands for operation, interconnected locks, or bored (cylindrical locks).
- 2.8.6 Door Closers: Unless specifically indicated as one type, surface overhead frame-mounted type or surface overhead door-mounted type.
 - a. Do not use concealed overhead type, floor mounted type, or spring hinges.
- 2.8.7 Door Stops: Unless specifically indicated as one type, floor-mounted type or wall-mounted type.
 - a. Do not use overhead-mounted type.
- 2.8.8 Door Hold-Opens: Unless specifically indicated as one type, floor-mounted type or wall-mounted type.
 - a. Do not use overhead-mounted type, hold-open feature in closer alone without a separate stop, or magnetic hold-open type.
- 2.8.9 Door Hardware for Overhead Coiling Grille Door: Shall be per door manufacturer.

3. METHODS OF CONSTRUCTION

- 3.1 Use the following:
 - 3.1.1 Full welded hollow metal frames.
- 3.2 Do not use:
 - 3.2.1 Knock down frames.

END OF CHAPTER C12

CHAPTER C14**OTHER INTERIOR OPENINGS****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide interior openings between adjacent spaces when required for air movement, louvered where required for visual privacy, baffled where required for acoustical isolation, and equipped with automatic fire dampers where separations are fire-rated.
- 1.1.2 Provide interior openings where required for maintenance access to mechanical services and other concealed systems, designed to be as unobtrusive as possible.
- 1.1.3 Provide covers for interior expansion joints that protect joints from debris and provide safe and durable support for anticipated traffic.
- 1.1.4 Other interior openings comprise the following elements:
 - a. Louvers and vents.
 - b. Access doors and panels.
 - c. Hatches.
 - d. Expansion joint covers.
 - e. Elements forming or completing interior openings, including sills, jambs, heads, and operating hardware.
- 1.1.5 Where other interior openings are integral with elements defined within another element group, meet requirements of both element groups. Interior openings between adjacent spaces cannot degrade performance of partitions and other interior construction elements below the levels specified.
- 1.1.6 In addition to requirements of this Chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter C - Interiors, and Chapter C1 - Interior Construction.

1.2 Amenity and Comfort:

- 1.2.1 **Return Air Movement:** Provide properly sized and located interior openings to accommodate air return where required for proper operation of forced air heating and air conditioning systems.
- 1.2.2 **Visual Privacy:** Where air movement is required between adjacent spaces, provide interior openings equipped with sightproof louvers where required for protection of visual privacy.
- 1.2.3 **Acoustical Privacy:** Where air movement is required between adjacent spaces specified to be acoustically isolated, provide sound attenuators that will maintain NIC values specified in Chapter C1.
- 1.2.4 **Convenience:**
 - a. **Dimensions:** Provide access panels and hatches that are sized appropriately for access to services, and utilities concealed by other construction.
 - b. **Features:** Provide access panels and hatches with concealed hinges, recessed latch, keyed cylinder, hold-open device, and padlock hasp (for hatches).
- 1.2.5 **Appearance:**
 - a. **Compatibility:** Provide hatches that are compatible in appearance with the finished surfaces in which they are installed, employing similar colors, and textures.
 - b. **Contrast:** Provide access panels, louvers, and expansion joint covers that contrast sharply in material, and color with the finished surfaces in which they are installed.

1.3 Health and Safety:

- 1.3.1 **Fire Resistance of Elements Closing Openings:** As required by code.
- 1.3.2 **Tripping Hazard:** Provide floor expansion joint covers that are flush with finished floor surface to

present minimal tripping hazard.

1.4 Structure:

- 1.4.1 Pedestrian Expansion Joint Covers: Provide expansion joint covers for interior floors capable of supporting minimum 300 lb/linear ft at fully expanded position without damage.

2. PRODUCTS

2.1 Louvers and Vents:

- 2.1.1 Use one of the following:
- a. Metal louvers matching other metal fabrications.
- 2.1.2 Do not use:
- a. Prefabricated wood louvers.
 - b. Custom fabricated wood louvers.

2.2 Access Doors:

- 2.2.1 Use one of the following:
- a. Manufactured metal doors.
- 2.2.2 Do not use:
- a. Custom fabricated metal doors.
 - b. Custom fabricated wooden doors.

2.3 Expansion Joint Covers:

- 2.3.1 Use one of the following:
- a. Manufactured all-metal covers.
 - b. Manufactured metal covers with resilient filler.

3. METHODS OF CONSTRUCTION

3.1 Construct other interior openings using the following methods and techniques:

- 3.1.1 Field installation of prefabricated closure elements in site-fabricated openings for expansion joint covers.
- 3.1.2 Field installation of shop-fabricated closure elements for louvers and vents.

3.2 Do not use:

- 3.2.1 Shop installation of prefabricated closure elements for louvers and vents.
- 3.2.2 Shop installation of shop fabricated closure elements for access panels.

END OF CHAPTER C14

CHAPTER C15**STAIRS****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide interior stairs as necessary for access to and egress from all occupied spaces required by the program, in compliance with code and as follows:
 - a. Additional Stairs: In addition to stairs required by code, provide open interior stairs connecting these related functions: Lobby and 2nd floor.
- 1.1.2 Stairs comprise the following elements:
 - a. Structure supporting stairs, unless an integral part of superstructure.
 - b. Tread and riser construction, unless an integral part of superstructure.
 - c. Railings for interior stairs.
 - d. Integral stair finishes.
- 1.1.3 Where stairs are integral with elements defined within another element group, meet requirements of both element groups.
- 1.1.4 In addition to requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter C - Interiors, and Chapter C1 - Interior Construction.

1.2 Amenity and Comfort:

- 1.2.1 Stair Comfort:
 - a. Stair Steepness: Provide stairs with risers of not more than 7 inches and treads sized so that twice the riser height plus the tread depth totals 24 to 25 inches.
 - b. Landings: Provide stairs with maximum rise of not more than 10 ft between landings.
- 1.2.2 Appearance of Enclosed Stairs: Constructed to present a moderately finished appearance.
- 1.2.3 Appearance of Non-Egress Monumental Stairs: Constructed to present a highly finished appearance and with the following characteristics: cantilevered construction from a central support and open risers.

1.3 Health and Safety:

- 1.3.1 Safety of Stairs:
 - a. Slip Resistance: Design and construct exterior stairs so that treads have a minimum static coefficient of friction of 0.80, measured in accordance with ASTM D 2047-1999.
 - b. Risers: Design and construct stairs with closed risers at egress stairs.
 - c. Treads: Design and construct stairs with treads that have a maximum bevel or radius on leading edge of 1/2 inch.
 - d. Guards or Guardrails: Design and construct stairs so that there are no openings in guards or guardrails required by code that are large enough for a sphere with a diameter of 4 inches to pass through.
 - e. Alternating Tread Stairs: Do not employ alternating tread stairs, even if permitted by code.
- 1.3.2 Fire Resistance: Design and construct stairs of noncombustible materials, including handrails.

1.4 Structural:

- 1.4.1 Interior Stairs: Provide stairways, platforms, and landings capable of supporting loads in excess of those required by code, as follows:
 - a. Live Load: Minimum 150 psf.
 - b. Concentrated Load: Minimum 400 pounds at any point.
- 1.4.2 Handrails and Guardrails: Provide handrail and guardrail assemblies capable of resisting forces in excess of those required by code, as follows:

- a. Uniform Load: Minimum 50 lb/ft applied in any direction at the top.
- b. Concentrated Load: Minimum 200 pounds applied in any direction at any point along the top.
- c. Normal Load to Intermediate Rails or Guard: Minimum 50 pounds horizontally applied to area of not more than 1 foot square.

2. PRODUCTS

2.1 Design and construct stairs using the following materials and systems:

- 2.1.1 Preassembled metal stairs with poured-in-place concrete treads at egress stairs.
- 2.1.2 Tube railings at egress stairs.
- 2.1.3 Tempered glass railing assemblies at monumental stair.
- 2.1.4 Ornamental metal stairs at monumental stair.

2.2 Do not use:

- 2.2.1 Poured-in-place concrete stairs.
- 2.2.2 Precast concrete treads.
- 2.2.3 Metal spiral stairs.
- 2.2.4 Wood stairs.
- 2.2.5 Ornamental wood stairs and railings.

3. METHODS OF CONSTRUCTION

3.1 Construct stairs using the following methods and techniques:

- 3.1.1 Shop fabrication of metal stairs.
- 3.2 Do not use:
- 3.2.1 Site fabrication of metal stairs.

END OF CHAPTER C15

CHAPTER C16**INTERIOR FINISHES****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide appropriately finished interiors for all spaces required by the program.
- 1.1.2 Interior finishes comprise the following elements:
 - a. Wall finishes, including those applied to the interior face of exterior walls and to the vertical faces of superstructure elements.
 - b. Floor finishes.
 - c. Suspended ceilings and soffits.
 - d. Applied ceiling finishes.
 - e. Stair finishes, except for integral stair surfaces.
 - f. Finishes applied to other interior surfaces.
- 1.1.3 Where interior finishes are integral with elements defined within another element group, meet requirements of both element groups.
- 1.1.4 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter C - Interiors, and Chapter C1 - Interior Construction.

1.2 Amenity and Comfort:**1.2.1 Thermal Performance:**

- a. Interior Wall Finishes at Exterior Walls: Provide vapor permeance of 1 perm maximum when tested in accordance with ASTM E 96-2000.
- b. Interior Ceiling Finishes at Roof Level: Provide vapor permeance of 1 perm maximum when tested in accordance with ASTM E 96-2000.

1.2.2 Reflectivity:

- a. Glare: Provide interior finishes that will not result in discomfort glare due to excessive contrast with light sources.
 - (1) Ceiling Surfaces: Not less than 80 percent reflectivity, when measured in accordance with ASTM E 1477-1998a.
 - (2) Wall Surfaces: Not less than 50 percent reflectivity.
 - (3) Floor Surfaces: Not less than 30 percent reflectivity.
- b. Specular Reflections: Provide interior finishes that will minimize specular reflections.

1.2.3 Acoustical Performance:

- a. Sound Absorption: Provide acoustical absorption within interior spaces to achieve reverberation times within the limits specified in Chapter C - Interiors.
- b. Articulation Class: For open office areas, provide ceilings that have been tested per ASTM E 1111-2002 to provide Articulation Class (AC) values not less than 150.
- c. Sound Isolation: In areas where interior partitions stop at the ceiling and a plenum space extends above, provide ceilings tested in accordance with ASTM E 1414-2000a and classified in accordance with ASTM E 413-1987(R99) to provide minimum Ceiling Attenuation Class (CAC) values as follows:
 - (1) Similar Functions and NC Levels on Both Sides of Partition: CAC 40.
 - (2) Quiet Space (NC 20-30) Separated From Moderately Noisy Space (NC 30-40): CAC 45.
 - (3) Quiet Space (NC 20-30) Separated From Noisy Space (NC 40-50): CAC 50.
 - (4) Quiet Space (NC 20-30) Separated From Very Noisy Space (NC 50-60): CAC 55.
 - (5) Moderately Noisy Space (NC 30-40) Separated From Noisy Space (NC 40-50): CAC 45.
 - (6) Moderately Noisy Space (NC 30-40) Separated From Very Noisy Space (NC 50-60): CAC 50.
 - (7) Noisy Space (NC 40-50) and Very Noisy Space (NC 50-60): CAC 45.

- 1.2.4 Cleanliness:
- a. For Kitchen/Food Demonstration and Juice Bar, provide wall, ceiling, and floor surfaces that are USDA approved.
 - b. For spaces such as restrooms, locker rooms, showers, steam rooms and sauna, provide wall, ceiling, and floor surfaces that are inherently resistant to moisture and that can be cleaned by caustic agents without damage.
- 1.3 Health and Safety:
- 1.3.1 Slip Resistance: For spaces subject to floor wetting, including entry lobbies, and drinking fountain alcoves/areas, provide floor finishes with inherent slip resistance under wet conditions.
- a. At building entries, provide means for reducing or minimizing moisture and debris on shoe soles by use of a walk off mat or recessed foot grille.
 - b. At spaces such as kitchen/food demonstration, restrooms, locker rooms, wet areas in retail spaces, steam rooms, maintenance rooms, and showers/dressing areas, provide floor surfaces with minimum static coefficient of friction of 0.60 when wet, measured in accordance with ASTM C 1028-1996 or ASTM D 2047-1999.
- 1.3.2 Slip Resistance: At stairs and corridors, provide floor finishes with minimum static coefficient of friction of 0.60, measured in accordance with ASTM D 2047-1999.
- 1.3.3 Tactile Warning Surfaces: Provide floor surfaces that comply with ADAAG-1994 detectable warning requirements at potentially hazardous locations, including elevator entrance and top and bottom of stairs.
- 1.3.4 Static Generation: At computer installations, provide floor finishes that generate less than 3.5 kV at 20 percent relative humidity, when tested in accordance with AATCC 134-2001 using step and scuff tests with Neolite and leather soles.
- 1.3.5 Antimicrobial Properties: At Kitchen/Food Demonstration, Juice Bar, Vending, and Conference/Break rooms, provide wall, floor, and ceiling surfaces that will not support mold, mildew, or bacterial growth.
- a. Provide floor materials that are heat-welded to provide seamless surfaces.
 - b. For carpeted areas, no fungal growth, when tested in accordance with AATCC 174-1993(R98).
- 1.3.6 Flammability:
- a. Ceilings in Exits and Corridors: Provide ceilings with ratings not greater than the following, when tested in accordance with ASTM E 84-2001:
 - (1) Flame Spread: 25.
 - (2) Smoke Developed: 450.
 - b. Walls in Exits and Corridors: Provide wall surfaces with ratings not greater than the following, when tested in accordance with ASTM E 84-2001:
 - (1) Flame Spread: 25.
 - (2) Smoke Developed: 450.
 - c. Floors in Exits and Corridors: Provide floor surfaces with ratings not greater than the following:
 - (1) Critical Radiant Flux of 0.45 W/sq. cm, per ASTM E 648-2003.
 - (2) Smoke Density: 450 or less specific optical density, per ASTM E 662-2001.
 - d. Ceilings in Primary Spaces: Provide ceilings with ratings not greater than the following, when tested in accordance with ASTM E 84-2001:
 - (1) Flame Spread: 25.
 - (2) Smoke Developed: 450.
 - e. Walls in Primary Spaces: Provide wall surfaces with ratings not greater than the following, when tested in accordance with ASTM E 84-2001:
 - (1) Flame Spread: 25.
 - (2) Smoke Developed: 450.
 - f. Floors in Primary Spaces: Provide floor surfaces with ratings not greater than the following:
 - (1) Critical Radiant Flux of 0.45 W/sq. cm, per ASTM E 648-2003.
 - (2) Smoke Density: 450 or less specific optical density, per ASTM E 662-2001.

1.4 Durability:

- 1.4.1 Wall Finishes: Provide integral or applied wall surfaces that are appropriate for anticipated usage and traffic, offering durability not less than would be provided by applied wall coverings as follows, classified in accordance with ASTM F 793-1993 (R98):
- a. SP1 Customer Contact: Category V- Type II Commercial Serviceability.
 - b. SP2 Occupant Work: Category IV- Type I Commercial Serviceability.
 - c. SP3 Equipment Utilization: Category V- Type II Commercial Serviceability.
 - d. SP5 Assembly: Category V- Type II Commercial Serviceability.
 - e. SP6 Meeting and Instruction: Category V- Type II Commercial Serviceability.
 - f. SR1 Sanitary Facilities: Category V- Type II Commercial Serviceability.
 - g. SR2 Clothing, Locker Facilities: Category V- Type II Commercial Serviceability.
 - h. SR3 Food Facilities: Category V- Type II Commercial Serviceability.
 - i. SS2 Storage Rooms: Category IV- Type I Commercial Serviceability.
 - j. SS3 Heavy Storage: Category V- Type II Commercial Serviceability.
 - k. SC1 Corridors: Category V- Type II Commercial Serviceability.
 - l. SC2 Lobbies: Category V- Type II Commercial Serviceability.
 - m. SC3 Waiting Areas: Category V- Type II Commercial Serviceability.
 - n. SC4 Stairs: Category V- Type II Commercial Serviceability.
 - o. SU2 Utility Equipment Rooms: Category V- Type II Commercial Serviceability.
- 1.4.2 Interior Wall Finishes at Exterior Walls: Provide surfaces that will not be damaged by incidental condensation from windows.
- 1.4.3 Wall Protection: In service entrance, equipment receiving, conference, corridors and break room, provide impact resistant crash rails and corner guards or wall surfaces that are inherently resistant to impact damage due to rolling carts, gurneys, hand trucks, and chair backs.
- 1.4.4 Interior of Elevator Cab Protection: Provide brushed stainless steel hand rails over the wall panels.
- 1.4.5 Opening Protection: At partition openings intended to accommodate pedestrian traffic, provide protection of opening edges in the form of door frames (cased openings), or corner guards.
- 1.4.6 Flooring: Provide floor finishes that are appropriate for anticipated usage and traffic in each area, based on a 10 year replacement cycle. Floor finish in the interior of elevator cab to match the flooring used in lobbies and/or corridors.
- a. Substantiation:
 - (1) Design Development: As specified for service life span in Chapter 111, including service life analysis and life cycle cost analysis.

2. PRODUCTS

2.1 Design and construct interiors using the following materials and systems:

~~2.1.1 Ceramic mosaic tile.~~

~~2.1.22.1.1~~ Glazed wall tile.

~~2.1.32.1.2~~ Ceramic tile wall system, with insulation and vapor barrier at the steam rooms.

~~2.1.42.1.3~~ Porcelain Paver tile.

~~2.1.52.1.4~~ Suspended acoustical ceiling panels 2'-0" x 2'-0" - tegular.

~~2.1.62.1.5~~ Acoustical metal pan ceilings.

~~2.1.72.1.6~~ Translucent ceiling panels at interior of elevator cab.

~~2.1.82.1.7~~ Linear metal ceilings.

~~2.1.92.1.8~~ Gypsum board ceilings.

- ~~2.1.102.1.9~~ Moisture resistant gypsum board at locker rooms.
- ~~2.1.112.1.10~~ Athletic interlocking rubber (Formulated of **100% post-consumer recycled SBR, EPDM & Polyurethane rubber and polyurethane**) tile flooring. 3/8" thick min.
- ~~2.1.122.1.11~~ Cushioned wood flooring.
- ~~2.1.132.1.12~~ Wooden duckboard flooring system at sauna rooms.
- ~~2.1.142.1.13~~ Tongue and groove wood paneling of white or western cedar with vapor barrier at sauna room, wall panels shall be insulated.
- ~~2.1.152.1.14~~ Tongue and groove wood paneling of white or western cedar at sauna room for seating/reclining, back rests, headrests and ceiling at sauna room.
- ~~2.1.16~~ Resilient sheet flooring (Juice Bar Area Only).
- ~~2.1.172.1.15~~ Resilient tile flooring.
- ~~2.1.182.1.16~~ Sheet carpet, glued-down.
- ~~2.1.192.1.17~~ Carpet tile.
- ~~2.1.202.1.18~~ Stainless steel wall panels at interior of elevator cab.
- ~~2.1.212.1.19~~ Acoustical wall treatment.
- ~~2.1.222.1.20~~ Interior paints.
- ~~2.1.232.1.21~~ Interior transparent stains.
- ~~2.1.242.1.22~~ Smooth, ~~Split-face, Scored~~ scored Integrally colored Concrete Masonry Units.
- ~~2.1.252.1.23~~ Safety Flooring designed for impact absorption, durability and dust control at base of climbing wall.
- ~~2.1.262.1.24~~ Recessed Foot Grilles, with carpet inserts.
- ~~2.1.272.1.25~~ Removeable Wall Crash Pads.
- ~~2.1.28~~ ~~Integrally colored impact resistant vinyl/acrylic crash rails with integral shock absorbing cushions.~~
- ~~2.1.292.1.26~~ Integrally colored impact resistant vinyl/acrylic corner guards.

2.2 Do not use:

- 2.2.1 Quarry tile.
- 2.2.2 Portland cement terrazzo.
- 2.2.3 Precast terrazzo.
- 2.2.4 Thinset epoxy terrazzo.
- 2.2.5 Thinset polyacrylate terrazzo.
- 2.2.6 Luminous ceilings.
- 2.2.7 Linear wood ceilings.
- 2.2.8 Plastic laminate flooring.
- 2.2.9 Brick flooring.
- 2.2.10 Stone flooring.
- 2.2.11 Wood parquet flooring.

2.2.12 Resilient sheet flooring.

~~2.2.12~~2.2.13 Sheet carpet, stretched-in.

~~2.2.13~~2.2.14 Wallpaper.

~~2.2.14~~2.2.15 Flexible wood veneer wall covering.

~~2.2.15~~2.2.16 Stone facing.

3. METHODS OF CONSTRUCTION

3.1 Construct interior finishes using the following methods and techniques:

- 3.1.1 Install interior construction elements with integral finishes as follows:
- a. As possible, throughout the project.

END OF CHAPTER C16

CHAPTER C2**INTERIOR FIXTURES****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide elements fixed to interior construction that are necessary for complete and proper functioning of spaces required by the program.
- 1.1.2 Interior fixtures are functional items that are permanently attached to interior walls, ceilings, and floors, except for equipment items and items that are integral components of service systems, and comprise the following elements:
 - a. Identifying Devices (C21): Informational accessories, including room numbers, signage, and directories.
 - b. Storage Fixtures (C22): Non-furniture items intended primarily for storing or securing objects, materials, and supplies, including cabinets, casework, closet fixtures, lockers, and shelving.
 - c. Window Treatment (C23): Non-furnishing accessories for control of light, solar heat gain, privacy, and view at interior and exterior windows, including blinds.
 - d. Accessory Fixtures (C24): Specialty items intended to provide service or amenity to building interiors, including toilet and bath accessories, visual display surfaces, and basketball goals and volleyball nets.
 - e. Fixed Seating (C25): Multiple bleacher (retractable) seating that is attached to the building.
 - f. Other Interior Fixtures (C29): Other items fixed to interior construction that enhance comfort or amenity in building spaces, including sauna.
- 1.1.3 Where interior fixtures are integral with elements defined within another element group, meet requirements of both element groups.
- 1.1.4 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance and Chapter C - Interiors.

1.2 Amenity and Comfort:

- 1.2.1 Accessibility: Provide interior fixtures that are easily usable by disabled persons without outside assistance.
 - a. Provide interior fixtures that comply with ADAAG-1994.
- 1.2.2 Light and Glare: Provide interior fixtures that are not a source of direct or reflected glare.
 - a. Written and Graphic Information on Interior Fixtures: Clearly legible from typical viewing distances by occupants with normal eyesight.
 - b. Surfaces Containing Written or Graphic Information: Matte finished to reduce the incidence of veiling reflections.
 - c. Trans-Illuminated Surfaces: Luminance that is not more than 5 times brighter than surrounding surfaces under ambient lighting conditions for the space.
- 1.2.3 Convenience: Provide interior fixtures with fittings and controls that are manageable without special instruction or the need for excessive force.
- 1.2.4 Appearance: Provide interior fixtures that are coordinated in design with other elements of interior construction, using compatible materials, colors, textures, and design features.
- 1.2.5 Texture: Provide durable, low maintenance exposed surfaces for interior fixtures that are within reach of occupants engaged in activities normal for the particular space in which they are installed.
 - a. Flat, Exposed Metal Surfaces: Finishes that are satin or brushed, that is, non-reflective rather than smooth polished surfaces.
 - b. Flat Metal Surfaces: Coatings not permitted.
 - c. Hardware and Other Rounded Metal Surfaces: Finishes that are satin or brushed.

- d. Hardware and Other Rounded Metal Surfaces: Coatings not permitted.
- e. Plastic Surfaces: Matte, rather than glossy or polished finishes.
- f. Flat Wood Surfaces: Low-gloss finishes, transparent.
- g. Curved Wood Surfaces: Finishes that are transparent, semi-gloss.
- h. Concrete and Stone Surfaces: Honed or other textured, non-polished finishes.

1.3 Health and Safety:

- 1.3.1 Flammability: Provide interior fixtures made of materials with flame spread index of 25 or less and smoke developed index of 450 or less when tested in accordance with ASTM E 84-2001 at all locations throughout the project.

1.4 Structure:

- 1.4.1 Live Loads: Provide suspended interior fixtures or portions of fixtures designed for storage or support of persons or objects that have been engineered and installed to withstand 1.5 times the anticipated live loads without excessive deflection or permanent distortion.
- a. Substantiation:
 - (1) Construction Documents: Engineering calculations or proven-in-use substantiation.
- 1.4.2 Seismic Loads: Provide interior fixtures or portions of fixtures designed for storage or support of persons or objects that have been engineered and installed to withstand seismic forces that are 20 percent greater than those required by code.
- a. Application: For design purposes, apply the component seismic force at the center of gravity of the component nonconcurrently in any horizontal direction.
 - b. Substantiation:
 - (1) Construction Documents: Detailed design analysis by licensed structural engineer.

1.5 Operation and Maintenance:

- 1.5.1 Ease of Use:
- a. Language of Identifying Devices: All text in English.
 - b. Interior Fixtures with Movable Components: Easy to use without special instruction and designed to prevent misuse.
 - c. Hinges and Latches: Heavy duty hardware, easily adjustable, providing minimum anticipated service life of 20 years.
 - d. Mechanical Controls: Movable cranks, rotors, pulleys, and levers designed for trouble-free operation over a minimum anticipated service life of 20 years.
 - e. Substantiation:
 - (1) Design Development: Product data on hardware and other movable components of interior fixtures.
 - (2) Construction Documents: Details of interior fixtures, documenting construction features.
- 1.5.2 Ease of Repair: Provide interior fixtures at all locations that are designed to permit repair or replacement of individual components without removal of fixture.
- 1.5.3 Ease of Replacement or Relocation: Provide interior fixtures at all locations that are modular in form, detachable from substrate without damage to fixtures, and relocatable.
- 1.5.4 Theft Resistance: Provide interior fixtures at all locations that are attached to substrates with tamper-resistant or tamperproof fasteners to minimize theft and vandalism.

2. PRODUCTS

2.1 Identifying Devices:

- 2.1.1 Use one of the following:
- a. Dimensional characters at toilet rooms and locker rooms.
 - b. Building directories at entrance lobby.

- c. Backlighted, ceiling-mounted signage at Juice Bar.
- d. Wall-mounted room signs at all interior doors.
- e. All interior signage shall comply with Department of the Air Force Sign Standards, AFPAM 32-1098.

2.2 Storage Fixtures:

2.2.1 Use the following:

- a. Custom-built cabinetry.
- b. Built-in manufactured cabinetry or casework (12300) at kitchen, toilet rooms.
- c. Built-in clothing lockers at Locker Rooms.
- d. Shelving at Janitors Closets, Laundry Room and Storage Rooms.
- e. Storage fixtures at Large, Small and Senior Exercise Rooms.

2.2.2 Do not use:

- a. Built-in wardrobes.
- b. Closet shelves and hanging rods.
- c. Storage lockers.

2.3 Window Treatments:

2.3.1 Use the following:

- a. Vertical blinds vinyl - color white - throughout the project.

2.3.2 Do not use:

- a. Window shades.
- b. Interior shutters.
- c. Recessed curtain tracks.
- d. Surface-mounted curtain tracks.

3. METHODS OF CONSTRUCTION

3.1 Provide interior fixtures using the following methods and techniques:

- 3.1.1 Manufactured and prefinished specialty items for field installation throughout the project.

3.2 Do not use:

- 3.2.1 Field finishing of any interior fixtures.

END OF CHAPTER C2

CHAPTER C21**IDENTIFYING DEVICES****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide identifying devices fixed to interior construction that are necessary for direction to and identification of spaces as required by the program.
 - a. Room Label Signs: Provide room label signs for all spaces.
 - b. Directional Signs: Provide directional signs at all building lobbies, public corridors, and HAWC Reception/Lobby.
 - c. Architectural Signs: Provide architectural signs at Juice Bar.
 - d. Building Directories: Provide adequately sized directories at public building entrances and elevator lobbies on each floor.
- 1.1.2 Identifying devices comprise the following elements:
 - a. Room or function labels applied to doors or walls immediately adjacent to doorways.
 - b. Signs that provide guidance to, or information about, building functions or spaces, including directional signs.
 - c. Large decorative or architectural signs, including three dimensional graphics and illuminated lettering.
 - d. Building directories with replaceable information strips.
- 1.1.3 Text/Content of Identifying Devices: Some content will be provided by Government; remainder to be provided by Design-Builder for Government's review.
- 1.1.4 Where identifying devices are integral with elements defined within another element group, meet requirements of both element groups.
- 1.1.5 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter C - Interiors, and Chapter C2 - Interior Fixtures.

1.2 Amenity and Comfort:**1.2.1 Accessibility:**

- a. Provide identification devices that comply with ADAAG-1994.
- b. Room Labels: Dual signage for visually handicapped and normally sighted.
- c. Function Labels: Graphic and Braille signs for the following building services and functions:
 - (1) Stairways.
 - (2) Elevators.
 - (3) Toilets.
 - (4) HAWC Rooms.
- d. Directional Signs: Accessible graphic and Braille signs in addition to any that are mounted above head height.

1.2.2 Convenience:

- a. Room Label Signs: Provide signs with feature allowing Government to change information.
- b. Directories: Provide directories with feature allowing Government to prepare new listings directly, without involvement of sign company or other agency.

1.2.3 Appearance:

- a. Provide signage for entire project that is consistent in design with other interior features and coordinated with overall color scheme.
- b. Room Label Signs: Framed panel signs.
- c. Directional Signs: Framed panel signs.
- d. Architectural Signs: Custom designed, with three-dimensional characters and backlighting.

- e. Directories: Non-illuminated units that are wall-mounted, with glazed cover and concealed hinges.

1.3 Health and Safety:

- 1.3.1 Emergency Signs: In addition to exit signs required by code, provide the following types of signs:
 - a. Self-illuminating signs at electrical closets, equipment rooms, fire extinguishers, and defibrillation equipment cabinet.
 - b. Self-illuminating exit signs at stairways, mounted not more than 6 inches above the floor and immediately adjacent to stairway doors.

1.4 Operation and Maintenance:

- 1.4.1 Vandalism Resistance: For signs in public areas that are within reach, provide signs that are positively attached to substrate by concealed mechanical devices and not by double-sided tape, sealant, or adhesive.
- 1.4.2 Ease of Replacement: For building directories, provide system with message strips that are easily replaceable by Government's personnel.
- 1.4.3 Access to Lighting: For illuminated signage, provide signage with system of quick access to lamps for Government's maintenance personnel that will also prevent unauthorized tampering with lighting (Juice Bar).

2. PRODUCTS

2.1 Room and Function Label Signs:

- 2.1.1 Use the following:
 - a. Signs that comply with Air Force Pamphlet #88-40.

2.2 Directional Signs:

- 2.2.1 Use the following:
 - a. Signs that comply with Air Force Pamphlet #88-40.

2.3 Architectural Signs:

- 2.3.1 Use one of the following:
 - a. Suspended, three-dimensional metal and plastic signs to custom design at Juice Bar.
- 2.3.2 Do not use:
 - a. Three-dimensional metal characters, mounted away from wall and backlighted.
 - b. Three-dimensional metal and plastic characters, mounted on wall and transilluminated.

2.4 Directories:

- 2.4.1 Use the following:
 - a. Signs that comply with Air Force Pamphlet #88-40.

3. METHODS OF CONSTRUCTION

3.1 Provide identifying devices using the following methods and techniques:

- 3.1.1 Manufactured and prefinished sign systems for surface mounting throughout the project.

3.2 Do not use:

- 3.2.1 Signs cast into interior walls.

END OF CHAPTER C21

CHAPTER C22**STORAGE FIXTURES****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide storage fixtures attached to interior construction that are necessary for proper functioning of spaces required by the project program.
- 1.1.2 Storage fixtures comprise the following elements:
 - a. Closed Material and Utensils Storage: Provide modular storage cabinets and countertops with capacity adequate to accommodate required functions in spaces as follows:
 - (1) HAWC Kitchen/Demonstration Area.
 - (2) Main Reception Desk.
 - (3) Equipment Repair Area.
 - (4) HAWC Computer Resource Room.
 - b. Display Storage: Provide trophy case and display shelving with capacity adequate for intended uses in spaces as follows:
 - (1) Main Lobby.
 - c. Miscellaneous Lockable Storage Fixtures: Provide shelves with capacity adequate for anticipated occupancy in spaces as follows:
 - (1) Large, small and senior exercise rooms.
 - d. Open Material Storage: Provide storage racks or utility shelves and folding counter for material storage adequate for anticipated needs in spaces as follows:
 - (1) Laundry Room.
 - e. Other Storage Fixtures: Provide shelving/cabinetry for equipment check-out storage adequate for anticipated needs in spaces as follows:
 - f. Locker Storage: Provide securable lockers adequate for anticipated needs of the spaces as follows:
 - (1) Men's and Women's Locker Rooms and HAWC Locker Rooms.
- 1.1.3 Where storage fixtures are integral with elements defined within another element group, meet requirements of both element groups.
- 1.1.4 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter C - Interiors, and Chapter C2 - Interior Fixtures.

1.2 Amenity and Comfort:

- 1.2.1 Accessibility:
 - a. Amounts of Storage: Provide accessible storage comprising not less than 10 percent of available storage fixtures of each type, but in no case less than one of each type.
 - b. Countertops: Where work surfaces or countertops over storage fixtures are required, provide wheelchair access to not less than 10 percent of surface at maximum height of 34 inches from the floor.
- 1.2.2 Convenience:
 - a. Closed Material and Utensil Storage: Provide floor-mounted cabinets equipped with full-extension drawers, extension shelves, rotating corner storage shelves, and doors that open a full 180 degrees.
 - b. Closed Material and Utensil Storage: Provide wall-mounted cabinets equipped with adjustable shelving and doors that open a full 180 degrees.
 - c. Door Hardware: Provide hardware on all latching doors that complies with ADAAG-1994.
- 1.2.3 Stored Item Security:
 - a. Locks: Provide locking capability at storage fixtures as follows:
 - (1) Lockers: Padlock eye in the door latching mechanism to accommodate personal locks.
 - (2) Cabinets: Keyed locks.

(3) Casework: Keyed locks.

1.2.4 Ventilation: For athletic lockers, provide for air circulation through fixture by means of door louvers.

1.2.5 Appearance:

- a. Cabinetry: For closed storage fixtures, provide elements that are designed to complement interior finishes, with concealed hinges.
- b. Countertops and Work Surfaces: Provide light-colored surfaces that are seamless.
- c. Casework: For casework intended for display of objects, provide fixtures with clear glazing and surface finishes that are light-colored.

1.3 Health and Safety:

1.3.1 Combustibility: Provide storage fixtures throughout the project that are made of fire-retardant treated materials.

1.4 Structure:

1.4.1 Seismic Loads: Provide shelving units that have been engineered and installed to withstand seismic forces as specified in Chapter C2.

2. PRODUCTS

2.1 Built-In Cabinetry and Casework:

2.1.1 Use the following:

- a. Custom-made wood cabinets with stain finish.
- b. Manufactured wood cabinets with stain finish at HAWC kitchen.
- c. Solid plastic countertops.

2.1.2 Do not use:

- a. Plastic laminate clad cabinets and countertops.
- b. Metal cabinets.
- c. Stainless steel countertops.
- d. Ceramic tile countertops.
- e. Granite countertops.

2.2 Lockers:

2.2.1 Use the following:

- a. Phenolic two-tier Z-type lockers (15" wide x 18" deep x 36" high per unit, 72" total height). Provide zinc alloy recessed handles with nickel-plated finish for each locker. Lockers shall be able to have a shelf and a coat hook inside. Recessed locker handles shall have standard lock option, which will accept a padlock or combination lock. Lockers shall have a padlock eye in the door latching mechanism to accommodate personal locks..

2.2.2 Do not use:

- a. Wood lockers with plastic laminate finish.
- b. Wood lockers with natural wood finish.
- c. Metal frame and panel lockers with baked enamel finish.
- d. Expanded metal lockers with baked enamel finish.
- e. Stainless steel lockers.

2.3 Utility Storage Shelving:

2.3.1 Use the following:

- a. Metal frame and panel shelving with baked enamel finish.

2.3.2 Do not use:

- a. Wood shelving with plastic laminate finish.
- b. Metal frame and expanded metal shelving with baked enamel finish.

- c. Modular metal pallet rack system.

END OF CHAPTER C22

CHAPTER C23**WINDOW TREATMENT****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide window treatments attached to interior construction that are necessary for adequate control of light, glare, privacy, and views for spaces with exterior windows.
- 1.1.2 Window treatments comprise the following elements:
 - a. Window blinds at all exterior windows.
 - b. Window shades at window around the indoor running track.
- 1.1.3 Where window treatments are integral with elements defined within another element group, meet requirements of both element groups.
- 1.1.4 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter C - Interiors, and Chapter C2 - Interior Fixtures.

1.2 Amenity and Comfort:

- 1.2.1 Thermal Comfort: Provide window treatment throughout project that enhances interior thermal comfort.
 - a. Winter Conditions: With window treatment in closed position, improved winter thermal resistance (R) of not less than 0.5 IP.
 - b. Summer Conditions: With window treatment in optimum position, improved summer shading coefficient (SC) of not less than 50 percent.
 - c. Substantiation:
 - (1) Design Development: Product data on thermal properties of proposed window treatments.
- 1.2.2 Condensation Resistance: Provide window treatment throughout project that is water-resistant and made of non-corrosive materials that will not be damaged by contact with condensation on window surface.
- 1.2.3 Accessibility: Comply with ADA Accessibility Guidelines and the following:
 - a. Extent: Provide accessible controls for all window treatments, regardless of location.
 - b. Location: Where accessible window treatments are required, provide controls that are mounted so they can be reached from a wheelchair and are not more than 54 inches and not less than 15 inches from the floor.
 - c. Operating Force: Where accessible window treatments are required, provide controls that can be operated without tight grasping or pinching and by a force of not more than 5 lbf.
- 1.2.4 Light and Glare Control: Provide window treatment throughout project that will allow control of light transmitted through window assembly.
 - a. Full Open Position: Maximum reduction of light level of 10 percent.
 - b. Full Closed Position: Minimum reduction of light level of 50 percent.
- 1.2.5 Light and Glare Control with View: Provide window treatment at indoor running track and cardiovascular, weights and exercise rooms that will allow control of light, glare, and solar heat gain in closed position while retaining some level of view to exterior.
 - a. Full Open Position: Maximum reduction of or interference with view of 10 percent.
 - b. Full Closed Position: Maximum reduction of or interference with view of 30 percent.
- 1.2.6 Privacy: Provide window treatment throughout project except those listed in c23, 1.2.5 that will allow complete visual privacy for room interior from observers at any angle to window when window treatment is in fully closed position.
- 1.2.7 Convenience: Provide window treatment throughout project with controls that are conveniently located and easily operated.

- 1.2.8 Appearance: Provide window treatment throughout project that is coordinated with window modules and does not conflict with expression of architectural elements of interior construction.
- 1.3 Health and Safety:
 - 1.3.1 Combustibility: Provide window treatments throughout the project that are made of fire-retardant treated materials.
 - 1.3.2 Flammability: Provide window treatments made of materials with flame spread index of 25 or less and smoke developed index of 450 or less when tested in accordance with ASTM E 84-2001 at all locations throughout the project.
- 1.4 Durability:
 - 1.4.1 Colorfastness: Provide window treatment throughout project that is resistant to degradation from exposure to ultraviolet light.
 - a. Painted Aluminum: Maximum of 5 Delta E units (Hunter) color change as calculated in accordance with ASTM D 2244-2002 after 5 years of exposure in accordance with AAMA 2604-2002.
 - b. Substantiation:
 - (1) Construction Documents: Test results or proven-in-use data for proposed window treatments.

2. PRODUCTS

2.1 Window Blinds:

- 2.1.1 Use one of the following:
 - a. Vertical PVC blinds - color white.
 - b. Vertical PVC perforated blinds - color white - at cardiovascular, weight and exercise rooms.
- 2.1.2 Do not use:
 - a. Horizontal aluminum mini-blinds.
 - b. Horizontal aluminum blinds.
 - c. Horizontal wood mini-blinds.
 - d. Horizontal wood blinds.
 - e. Horizontal PVC mini-blinds.
 - f. Horizontal PVC blinds.
 - g. Vertical aluminum blinds.
 - h. Vertical fabric blinds.

2.2 Window Shades:

- 2.2.1 Use the following:
 - a. Vinyl mesh shade at indoor running track.

END OF CHAPTER C23

CHAPTER C24

ACCESSORY FIXTURES

1. PERFORMANCE

1.1 Basic Function:

- 1.1.1 Provide accessory fixtures as required to accomplish the design as required by code, as indicated in the project program, and as follows:
- a. Mirrors:
 - (1) Continuous mirror for each group of lavatories, unless otherwise indicated.
 - (2) One full length mirror in each locker room and one full length mirror in the women's dressing room.
 - (3) Full-height wall mirror in the resistance weight training, free weight training, large, small and senior exercise rooms.
 - (4) Other locations where indicated in project program, i.e. HAWC demonstration kitchen.
 - b. Grab Bars: Wherever required for safety and assistance in use of toilet and bath fixtures, and at toilets designed for the disabled and showers.
 - c. Waste receptacles.
 - (1) One for each paper towel dispenser.
 - (2) One for each two toilets in women's restrooms, for sanitary napkin disposal.
 - (3) One in each classroom, kitchen, break room, and locker room.
 - (4) Some other waste receptacles will be furnished by Government.
 - ~~(5) Some other waste receptacles are specified in Chapter E2.~~
 - d. Shower Fixtures:
 - (1) Closures that prevent water spillage onto floors and walls outside showers.
 - e. Baby Changing Station: One in each restroom.
 - f. Electric Hair Dryers: One for every 3 lavatories or less in a group.
 - g. Holders and dispensers for toilet, sink, and bath supplies furnished by Contractor.
 - (1) Toilet Paper: Roll, consumer-size; one dispenser per toilet.
 - (2) Towels: Paper, C-fold; one dispenser per 3 lavatories.
 - (3) Toilet Seat Covers: Paper; one dispenser per toilet.
 - (4) Hand Soap: Liquid, one dispenser for each lavatory.
 - (5) Women's Personal Supplies: Vending of sanitary napkins and tampons; for each group of 3 or more toilets.
 - h. Holders for bath linens and supplies furnished by Contractor.
 - (1) Towel bars or hooks, one in each shower compartment.
 - (2) Bar soap dish, in each shower and tub area.
 - i. Hooks for temporary storage of occupants' property; one in each toilet compartment.
 - j. Holders and dispensers for cleaning supplies, utensils, and tools furnished by Contractor.
 - (1) Mops and Brooms: 6 items to be hung up in each janitor's closet, plus shelf for supplies.
 - k. Visual Display Fixtures: Configuration as indicated in the program.
 - (1) Erasable surfaces, which are identified in the program as marker boards.
 - (a) Classrooms: 32 sq ft, minimum, usable area.
 - (b) Holders for writing materials, below and full length of each area of erasable surface.
 - ~~(2) Tackable surfaces, for standard push-pin use.~~
 - ~~(a) Where indicated as "secured", prevent removal of applied items while allowing full visibility.~~
 - ~~(3)~~(2) Projection surfaces,.
 - ~~(a) Projection equipment will be furnished by Government; see Schedule in Chapter E.~~
 - (a) Classrooms: For viewers in movable seating viewing slides, overhead projection (transparencies), and computer display projection, with projector in ceiling-mounted location.
 - (b) Classrooms: 32 sq ft, minimum, usable area.

~~(b)~~(c) Coordinate the surfaces and equipment provided with the room/space design, lighting, and sound reinforcement equipment, for optimum viewing at all normal seating locations, without hot spots, loss of resolution, excessive dimming of image, or difficulty of hearing.

~~(e)~~(d) Substantiation:

(1) Design Development: Audio-visual space layouts, showing normal seating locations, projection locations, and recommended projection equipment.

l. Stretch Bars.

(1) Full-length stationary wall-mounted stretch bars in the large, small and senior exercise rooms.

m. Divider Curtain.

(1) Power roll-up divider curtain in the gymnasium.

n. Crash Rails/Corner Guards

(1) Integrally colored impact resistant vinyl/acrylic crash rails and corner guards in the corridors. Crash rails in the conference/classroom areas.

o. Removeable Wall Crash Padding

(1) Athletic wall padding that is removeable for the large, small exercise rooms and the gymnasium.

1.1.2 Where accessory fixtures also must function as elements defined within another element group, meet the requirements of both element groups.

1.1.3 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter C - Interiors, and Chapter C2 - Interior Fixtures.

1.2 Amenity and Comfort:

1.2.1 Visual Properties of Projection Surfaces:

- a. Contrast and resolution sufficient to provide accurate viewing at all normal seating locations in the room or space.
- b. Ambient light rejection as required to provide minimum gain specified under design lighting conditions.
- c. Classrooms: Minimum gain of 1.0 at all locations within 30 degrees of viewing axis.

1.2.2 Convenience of Visual Display Surfaces:

- a. Except as otherwise indicated, required surface area must be accomplished within the "usable" areas as follows, although additional area is not objectionable:
 - (1) Erasable Surfaces: Not less than 30 inches above floor; not more than 72 inches above floor.
 - (2) Tackable Surfaces: ~~Not less than 36 inches above floor; not more than 72 inches above floor.~~
 - ~~(3)~~(2) Projection Surfaces: Not less than 36 inches above floor; not more than 84 inches above floor.
- b. Projection Surface Access: Either permanently exposed in locations required or easily assembled or lowered without the use of tools.
 - (1) ~~Surfaces Concealed When Not in Use: Access by up/down controls conveniently located near space entrance(s) and to session presenter location, if any, but minimizing likelihood of tampering by audience members.~~

1.2.3 Appearance of Visual Display Surfaces:

- a. Color: Light-colored surfaces are preferred.
- ~~b. Tackable Surfaces: Self-healing material or surface finish that minimizes visibility of ordinary thumbtack holes.~~
- e.b. Flatness: Permanently flat, without warp or bow.

1.2.4 Appearance of Divider Curtain:

- a. Color: To coordinate with gymnasium color scheme.
- b. Curtain Surface: Solid section of the curtain is a vinyl fabric. Mesh section of the curtain is a vinyl-coated mesh (45-50% openness).

1.3 Health and Safety:

- 1.3.1 Fire Retardance:
 - a. Projection Surfaces: Free-hanging and tensioned fabric screens flame retardant in accordance with code.
- 1.3.2 Slip Resistance:
 - a. Fixtures Expected to Support or Assist in the Support of Persons: Touchable surfaces knurled, cross-hatched, or peened.
- 1.3.3 Broken Glass Hazard: Provide only laminated glass for glass in fixtures.
- 1.3.4 Physical Security of Contents:
 - a. Vending Fixtures: Design and locking systems of type and durability appropriate to expected risk of theft based on value of commodity and amount of money likely to accumulate.
- 1.4 Structure:
 - 1.4.1 Grab Bars: Strength, design, anchorage, and support as required to withstand 250 pounds-force applied vertically at the center between supports and 250 pounds-force tension applied at any support; supports of sufficient rigidity to prevent rotation of bars under load.
- 1.5 Durability:
 - 1.5.1 Service Life Span:
 - a. Erasable Surfaces: Minimum of 20 years, including appearance.
 - 1.5.2 Indoor Units: Materials and finish complying with specified requirements for equivalent environments specified in Chapters C and C2.
 - 1.5.3 Wear Resistance:
 - a. Visual Display Surfaces: Comply with requirements of Chapter C16 for wall finishes for the building spaces in which installed, as a minimum.
 - b. Erasable Surfaces: Designed to withstand marking with any common writing/marketing materials without permanent damage, imprint, or visibility of erased markings.
 - ~~c. Tackable Surfaces: Tackable material and surface finish durability not less than would be provided by applied wall coverings complying with ASTM F 793-1993 (R98) Category V Type II Commercial Serviceability.~~
 - d.c. Projection Surfaces: Fragile surfaces protected from accidental damage by providing covering or concealment when not in use.
 - 1.5.4 Moisture Resistance:
 - a. Shower Curtains: Do not use plastic shower curtains unless treated with a permanent mildewcide.
 - b. Mirrors: Silvered surfaces protected from degradation due to presence of moisture.
- 1.6 Operation and Maintenance:
 - 1.6.1 Divider Curtain Operation and Maintenance:
 - a. Divider curtain shall roll-up on an anodized aluminum tube located in the center of the curtain. Power assembly shall be quiet, and permanently lubricated for a maintenance-free system.
 - 1.6.2 Frequency of Servicing: Government expects that refilling/emptying will occur at the following intervals; provide capacity appropriate to servicing interval and expected use, based on project occupancy:
 - a. Paper Towel Dispensers: Daily.
 - b. Toilet Paper Dispensers: Daily, with sufficient redundancy to prevent running out.
 - c. Toilet Seat Cover Dispensers: Daily.
 - d. Sanitary Napkin Disposal Receptacles: Daily.
 - e. Hand Soap Dispensers: Daily.
 - f. Waste Receptacles: Daily.
 - g. Personal Supplies Vendors: Daily.

- 1.6.3 Ease of Cleaning:
 - a. Waste Receptacles: Disposable liners or bags.
- 1.6.4 Ease of Repair:
 - a. Mirrors: Breakable glazing replaceable without disassembly of frame.
- 1.6.5 Theft Deterrence:
 - a. Toilet Accessories:
 - (1) In Public Restrooms: Secure to substrates using tamperproof or concealed concealed fasteners.

2. PRODUCTS

2.1 Reflective Surfaces of Mirrors:

- 2.1.1 Use the following:
 - a. Glass (Continuous mirror glass at all vanity countertops equal to length of vanity by 36" height minimum.
- 2.1.2 Do not use:
 - a. Polycarbonate plastic.
 - b. Acrylic plastic.
 - c. Stainless steel.

2.2 Toilet, Bath, and Laundry Accessories:

- 2.2.1 Use the following:
 - a. Stainless steel accessories.
- 2.2.2 Do not use:
 - a. Brass accessories.
 - b. Chrome-plated cast zinc accessories.
 - c. Enameled steel accessories.
 - d. Aluminum accessories.

2.3 Shower Closures:

- 2.3.1 Use the following:
 - a. Plastic shower curtains.
- 2.3.2 Do not use:
 - a. Fabric shower curtains.
 - b. Glazed shower doors.

2.4 Erasable Surfaces:

- 2.4.1 Use the following:
 - a. Porcelain enameled steel.
- 2.4.2 Do not use:
 - a. Natural slate.
 - b. Marker fabric wallcovering.
 - c. Baked enamel on wood fiber board.
 - d. Melamine on wood fiber board.
 - e. Painted surfaces.

2.5 Tackable Material:

- 2.5.1 Use one of the following:
 - a. ~~Natural cork.~~
 - b. ~~Compressed granulated cork.~~

~~2.5.2 Do not use:~~

- ~~a. Linoleum.~~
- ~~b. Wood fiberboard.~~
- ~~c. Gypsum board.~~

2.5 Projection Surfaces:2.5.1 Use the following:

- a. Front projection screens manufactured for the purpose.

2.5.2 Do not use:

- a. Rear projection screens.
- b. White painted gypsum board or plaster.

2.6 Stretch Bars:~~2.6.2.6.1 Visible Surfaces of Tackable Surfaces:~~ Use the following:

- a. 1-1/2" diameter hand sanded poplar or oak rails with three plated mounting brackets manufactured for the purpose.

2.7 Divider Curtain:~~2.6.12.7.1 Use one of the following:~~

- ~~a. Natural cork.~~
- ~~b. Vinyl wall covering.~~
- ~~c. Synthetic woven fabric.~~
- ~~d. Natural woven fabric.~~

~~2.6.2 Do not use:~~

- ~~a. Wood fiberboard.~~
- ~~b. Compressed granulated cork.~~
- ~~c. Linoleum.~~

~~2.7 Projection Surfaces:~~

- a. Vinyl fabric and vinyl-coated mesh (45-50% open area).

2.8 Crash Rails/Corner Guards:~~2.7.12.8.1 Use the following:~~

- ~~a. Front projection screens manufactured for the purpose.~~

~~2.7.2 Do not use:~~

- ~~a. Rear projection screens.~~
- ~~b. White painted gypsum board or plaster.~~

~~2.8 Stretch Bars:~~

- a. Integrally colored impact resistant vinyl/acrylic. Crash rails should include integral shock absorbing cushions.

2.9 Wall Crash Pads~~2.8.12.9.1 Use the following:~~

- ~~a. 1-1/2" diameter hand sanded poplar or oak rails with three plated mounting brackets manufactured for the purpose.~~

~~2.9 Divider Curtain:~~~~2.9.1 Use the following:~~

- ~~a. Vinyl fabric and vinyl-coated mesh (45-50% open area).~~

~~2.10 Crash Rails/Corner Guards:~~

~~2.10.1 Use the following:~~

- ~~a. Integrally colored impact resistant vinyl/acrylic. Crash rails should include integral shock absorbing cushions.~~

~~2.11 Wall Crash Pads~~

~~2.11.1 Use the following:~~

- ~~a. "Class A" fire rated 2" thick, 6 lb density wall pads.~~

END OF CHAPTER C24

CHAPTER C25**FIXED SEATING****1. PERFORMANCE****1.1 Basic Function:**

1.1.1 Provide seats for occupants and visitors of the type and in the quantity required by the project program and in accordance with the code.

a. Benches:

- (1) Application: At gymnasium (bleachers).
- (2) Backless and armless seats of bleacher depth, standard width, standard height, and no resilience.

1.1.2 Where fixed seating also must function as elements defined within another element group, meet the requirements of both element groups.

1.1.3 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter C - Interiors, and Chapter C2 - Interior Fixtures.

1.2 Amenity and Comfort:**1.2.1 Comfort:**

a. Seat Depth:

- (1) Bleacher (no back): 12 inches, edge to edge.

b. Seat Height: Plus or minus 1/2 inch.

- (1) Standard: 17 inches.

c. Seat Contour: Accomplished using seat base or padding.

- (1) Benches: None (flat).

d. Seat Pitch:

- (1) Benches: Flat (no pitch).

e. Seat Resilience:

- (1) None: Rigid.

1.3 Health and Safety:**1.4 Durability:**

1.4.1 Service Life Span: 30 years.

1.4.2 Vandal Resistance: Parts not easily removed without the use of tools.

1.5 Operation and Maintenance:

1.5.1 Ease of Maintenance: Not requiring any routine measures to maintain operation or finishes, other than washing with soap and water.

1.5.2 Ease of Repair:

- a. Seating Units: Modular units that can be replaced without removal of other units.

2. PRODUCTS**2.1 Benches:****2.1.1 Use the following:**

- a. Powered- telescoping wood bleachers (four-tiers) at gymnasium.

END OF CHAPTER C25

CHAPTER C29**OTHER INTERIOR FIXTURES****1. PERFORMANCE****1.1 Basic Function:**

1.1.1 Provide interior fixtures as required to accomplish the design as required by code, as indicated in the project program, and as follows:

a. Volleyball System:

(1) Two ceiling mounted, forward retracting, nets, antennas, padding, etc., unless otherwise indicated.

b. Basketball System:

(1) Ceiling mounted, forward retracting backstops and backboards and goals.

1.2 Health and Safety:**1.2.1 Basketball Backstop:**

a. Backstop shall be furnished with an automatic inertia type mechanism that will lock backstop in position should failure or malfunction occur.

1.2.2 Basketball Backboards:

a. a. Backboard shall meet all NCAA, NFHS and professional requirements.

1.2.3 Basketball Goals:

a. Goal shall be designed to protect players and equipment by absorbing shock loads due to slam dunking or hanging on the rim, at all level of competition.

b. Torsion rod/pivot mechanism shall be easily adjustable to meet the latest NCAA (BR-22, Paragraph 9) and FIBA requirements of rebound/elasticity (35 to 50 percent energy absorption) when mounted on any support structure.

c. Torsion rod/pivot shall be designed to decelerate downward motion of goal on impact, to provide maximum player safety and minimize undue stresses on the backboard and support system.

1.3 Structure:**1.3.1 Volleyball floor sleeve and cover plate:**

a. 3-1/2" I.D. steel tubing capped on the bottom and extended 9" below the finished floor level into concrete footing. Top of the sleeve is installed 1" below finished floor level. Solid Brass coverplate assembly is provided. Assembly shall consist of a brass mounting ring recessed into the floor with a special swivel hinge to prevent removal. The cover plate lies flat on the floor while equipment is in use and has a cork gasket on the underside to protect the finished floor from scratches. A special cover key is provided to prevent use by unauthorized individuals. The perimeter mounting collar and cover shall be flush-mounted.

1.3.2 Basketball Backstop:

a. Fully welded frame provides maximum stability and strength on frames up to 32'. The 2-1/2" x 1-1/2" rectangular steel tube sway bracing is precision cut at an exact, back-to-back triangulated design with maximum weld surface contact closer to the bank for superior rigidity. Ends of diagonal brace tubes shall be precision machine cut to provide maximum weld surface contact to form a unitized, back-to-back triangular type structural design to provide superior rigidity.

b. Adjustable hanger system allows for precise leveling of the backboard support frame to insure that the backboard is on a horizontal plane with the playing surface on every installation. Adjustable support hangers also provide for easy installation and precised plumbing of backstop frame assuring proper operation and performance.

c. Backstop shall be supported from 3-1/2" O.D. pipe anchored to roof framing members by means of heavy formed, die-cut steel support fittings. Each support fitting to the roof framing, must be capable of supporting a load exceeding 10,000 pounds, with sufficient attachment points to acquire

a 60:1 safety factor for support of the entire backstop superstructure system. Certified tests must be provided. All cap screws shall be rated a minimum SAE Grade 5. Grade 2 cap screws will not be approved as equal. Superstructure pipes to be reinforced with special truss-type bridging or bracing when truss centers exceed spans of 14'-0".

1.3.3 Basketball Backboards:

- a. Backboard frame shall be a welded, unitized construction fabricated from heavy wall rectangular steel tubing. Unitized frame shall be designed for use only on direct goal mounting type support structures. Backboard frame shall be furnished with heavy steel gusset plates in the top two corners incorporating keyhole slots for mounting the backboard to direct-mount type support structures. Front perimeter frame shall be secured to unitized rear frame with structural truss head rivets.
- b. Glass shall be provided in 1/2" thick, fully tempered (heat-treated) glass section with uniform load and impact strength.

1.3.4 Basketball Goals:

- a. Rim shall be fabricated from 5/8" diameter cold drawn alloy steel, round formed to an 18" inside diameter ring. Inside diameter of ring shall be positioned 6" from face of backboard by a heavy, 1/4" thick, formed steel hinged type housing.
- b. Heavy, 1/4" thick, formed steel goal mounting housing shall be fabricated with a keyhole type slot arrangement to facilitate mounting to backboard. Goal to be provided with standard mounting centers for attachment to any 3'-6" x 6'-0" rectangular backboard.

1.4 Operation and Maintenance:

1.4.1 Volleyball System:

- a. System shall be folded to the overhead storage position by means of a 3/4 H.P. electric winch with integral up-and-down limit switches. Hoist cable system shall be 1/4" dia. galvanized aircraft cable with 7,000-lb. ultimate breaking strength operating through 4" dia. swivel pulley assemblies rated at a minimum 9,000lb. load rating. Winch shall be controlled by a special dual-keyed, flush wall mounted momentary key switch, which cannot be instantly reversed, providing a safety provision and preventing damage to the winch or support system.
- b. Vertical drop frame assemblies shall be fitted with a net-tensioning winch, incorporating heavy-duty, self locking ratchet mechanism with a compression, disc-brake type release mechanism to eliminate sudden release of the cable tension when removing the net. Both frames shall be furnished with a 3/4" diameter. Acme screw-type height adjustment mechanism to easily adjust the net to men's 7' 11-5/8" or women's 7' 4-1/8" official net heights for competition without loosening the net tension. Height setting indicators shall be visible from the side of each frame.

1.4.2 Basketball Backstops:

- a. Support hangers shall be offset 1-1/2" behind centerline of drop frame to properly weight lock unit in playing position without the use of ropes, latches or springs.
- b. Backstop to operate with a 2-3/8" O.D. front brace assembly with a folding knee joint. Knee joint to incorporate precision investment castings with a special internal torsion spring design to lock brace assembly firmly in playing position. Knee joint assembly shall be designed with an in-line pivot design to maximize backstop stability during aggressive play. Hoist cable shall automatically disengage brace knee joint during the hoist cycle through a special three-pulley set-up.
- c. Backstops shall be provided as standard with a 3/4 H.P. Electric Winch. Hoist cable shall be 1/4" diameter galvanized aircraft cable with 7,000 lb. ultimate breaking strength. Swivel pulleys shall be furnished with a 4" diameter cast (ductile iron) pulley sheave with a maintenance free, oil-impregnated bearing for proper hoist cable routing to winch. Pulley assembly and attachment to 3-1/2" O.D. support structure shall be rated at a minimum 9,000 pound load rating. Certified tests results must be provided.
- d. All metal parts shall be painted one coat of flat black enamel.

1.4.3 Basketball Backboards:

- a. Unitized frame shall be designed to allow the bottom two goal mount holes to pass beneath the glass section to further alleviate stress on the glass. Backside of goal mount structure is provided with two mounting holes and hardware to independently secure backboard to a direct mount goal feature which relieves all stress and shock on the backboard frame conforming to the latest NCAA rules. Rear backboard frame shall be finished in a durable neutral gray powder coated finish.
- b. Official white border and target area is "fired in" permanently on front side of glass section so that it cannot wear away. Glass section shall be secured to unitized rear frame by means of an attractive, L-shaped brushed aluminum extrusion for optimum durability. Glass section shall be fitted with shock absorbing neoprene material to cushion and protect the glass section.
- c. Goal mounting holes (4) to be on standard 5" (horizontal) x 4-1/2" (vertical) mounting centers.

1.4.4 Basketball Goals:

- a. Goal shall incorporate a dual, precision, case-hardened, high-tensile steel alloy torsion rod pivot design to allow the goal to flex in a complete 180 degree radius as players hang on the front or sides of the rim. Goal shall instantaneously return to the playing position when load is released. Non-adjustable goals, goals pivoting on only one plane, or goals incorporating compression springs or shock absorber type mechanisms shall not be considered an equal.
- b. Rim shall be provided with a "tube-tie" net attachment system to eliminate the conventional wire-formed type net locks for additional player safety.
- c. Goal shall be furnished in a durable, official orange powder-coat finish. Durable, anti-whip type net and attachment hardware shall be provided.

2. PRODUCTS

2.1 Volleyball System::

2.1.1 Use the following:

- a. System shall consist of two vertical drop-frame units with folding side brace assemblies to automatically back fold entire unit (including net, antennas, padding, etc.) to the ceiling with a single electronically operated winch, without releasing tension on the net.

2.2 Basketball System:

2.2.1 Use the following:

- a. Backstops shall consist of a main, center mast of 6-5/8" O.D. heavy-wall structural steel tube with diagonal side sway and internal web bracing of 2-1/2" x 2-1/2" rectangular steel tubing. Goal shall mount directly through backboard and into a heavy structural steel weldment which shall be clamped to the vertical 6-5/8" O.D. center support to eliminate any strain on backboard should a player hang on the front mounted goal. The upper backboard extension assembly shall provide the official NCAA and NFHS regulation of 6" from the front of the backstop to the face of the backboard.
- b. Backboard shall be 3'-6" x 6'-0" to meet all NCAA, NFHS and professional requirements.
- c. Goal rim shall be fabricated from 5/8" diameter cold drawn alloy steel, round formed to an 18" inside diameter ring. Inside diameter of goal ring shall be positioned 6" from face of backboard.

END OF CHAPTER C29

CHAPTER D**SERVICES****1. PERFORMANCE****1.1 Basic Function:****1.1.1 Provide the following services:**

- a. Conveying Systems (D1): Mechanized means of conveying people and goods, as specified in the project program.
- b. Water and Drainage (D2): Means of delivery of water to points of utilization; automatic heating and conditioning of domestic water; and unattended removal of water, rainwater, and liquid waste.
- c. HVAC (D3): Artificial means of maintaining interior space comfort and air quality, including heating, cooling, ventilation, and energy supply.
- d. Fire Protection (D4): Automatic fire detection, suppression, and warning; automatic smoke control; and manual fire-fighting equipment.
- e. Electrical Power (D5): Energy to operate all electrically-operated devices, including those included under other services and those provided separately by the Government.
- f. Artificial Lighting (D6): Means of illuminating spaces and tasks, both interior and exterior, independent of reliance on natural light.
- g. Telecommunications (D7): Services that include voice and data transmission, telephone equipment, and sound reinforcement.
- h. Process Utilities (D8): Services that include specially processed water, special waste removal or treatment, air and gases, fuels, HVAC, special fire protection, special telecommunications, and special measurement and control.
- i. Other Services (D9): Services that include integrated facility controls and cathodic protection.

1.1.2 Utility Sources and Outlets:**1.1.3 Where services elements must also function as elements defined within another element group, meet the requirements of both element groups.**

- a. Where services elements are located outside the building in the site area, meet applicable requirements of Chapters G3.

1.1.4 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance.**1.2 Structure:****1.2.1 Supports for Piping, Conduit, Ducts, and Components: Attached to, and supported by, the superstructure, not to or by non-structural construction or sheet metal elements, so that they do not move or sag, using the following:**

- a. Supports that allow movement of the rigid linear elements (pipe, etc.) without undue stress on the piping, tubes, fittings, components, or the superstructure.
- b. Intermediate supports mounted between structural members to limit distance between supports.
- c. Supports capable of handling seismic forces in accordance with the code.
- d. Mounting frames, bases, or pads, designed for ease of anchorage or mounting.
- e. Rigid sway bracing at changes in direction of more than one-half of a right-angle, for all pipes.
- f. Substantiation:
 - (1) Design Development: Details of supports, including engineering analysis.

1.2.2 Structural Design of Components and Their Supports: In accordance with code.

- a. Safety Factor for Component Structural Elements: Two; based on weight of component.
- b. Anchors: Securely and positively attach all services components to superstructure.

1.2.3 Concealed or Buried Components: Design cover or concealment so that components are not subjected to damaging stresses due to applied loads.

1.3 Durability:

- 1.3.1 Expected Service Life Span: Same as the service life of the building, except as follows:
- a. Ducts, Piping, and Wiring in All Services: Same as the service life of the building.
 - b. All Components Permanently Installed Underground or Encased in Concrete: Same as service life of building.
 - c. Conveying Systems: Minimum 20 years.
 - d. Software and Firmware Integral to Operation of Services Equipment: Minimum 20 years functional life without reprogramming required and, specifically, unaffected by millennium date change (Y2K).

END OF CHAPTER D

CHAPTER D1**CONVEYING SYSTEMS****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide conveying systems required by the program or necessary to fulfill basic project functions.
- 1.1.2 Conveying systems are devices that move people between levels or from one area to another, and comprise the following elements: All components for passenger elevators, including items such as shaft rails, pit ladders, exhaust louvers, and car and hoistway doors; see Chapter C16 for requirements for car finishes.
- 1.1.3 Submittals: Submittals shall be provided by the Contractor to the Contracting Officer for approval in accordance with Specification Section: 01330 SUBMITTAL PROCEDURES, which is included in this document in the Technical Specifications of the Statement of Work.
- 1.1.4 Training Data: Information describing the training course for operating personnel, training aids and samples of materials to be used, training schedules, and notification of training.
- 1.1.5 Elevator System: A complete list of equipment and material, including illustrations, schedules, manufacturer's descriptive data and technical literature, performance charts, catalog cuts, installation instructions, brochures, diagrams, and other information required for fabrication and installation of the equipment. Data shall include calculations for reaction loads imposed on building by elevator systems and to demonstrate that the proposed elevator system conforms to paragraph SEISMIC REQUIREMENTS. Certified copies of list reports may be submitted in lieu of calculations. Calculations to demonstrate compliance with ASME A17.1, Rule XXIV shall be included. Spare parts data for each different item of material and equipment specified, after approval of detail drawings and not later than 12 weeks prior to date of beneficial occupancy. Data shall include a complete list of parts and supplies, with current unit prices and source of supply, and a list of parts recommended to be replaced and replacement interval required. Data shall include appropriate sizing of electrical protective devices.
- 1.1.6 Drawings: Elevator System. Detail drawings including dimensioned layouts in plan and elevation showing the arrangement of elevator equipment, anchorage of equipment, clearances for maintenance and operation; and details on hoistway, doors and frames, operation and signal stations, controllers, motors, guide rails and brackets, cylinder and plunge unit, and points of interface with normal power and fire alarm system.
- 1.1.7 Reports: Testing. Test reports in booklet form showing all field tests performed to adjust each component and all field tests performed to prove compliance with the specified performance criteria, upon completion and testing of installed system.
- 1.1.8 Operation and Maintenance Manuals: Six (6) complete copies of an O&M manuals in bound 8½ inch by 11 inch booklets shall include a brief description of all equipment and their basic operating features, manufacturer's name, model number, service manual, parts list, equipment layout diagrams and simplified wiring and control diagrams of the systems as installed. O&M manuals shall include routine maintenance procedures, possible breakdowns and repairs, and troubleshooting guides. Operation and maintenance manuals shall be approved prior to training course.
- 1.1.9 Qualifications: Hydraulic elevators shall be pre-engineered elevator systems, and provided by a company regularly engaged in the manufacture of elevator systems. The manufacturer shall either install the elevator system or provide letter of endorsement certifying that the elevator-system installer is acceptable to the manufacturer.
- 1.1.10 Regulatory Requirements: Design and fabrication shall be in accordance with ASME A17.1. Elevators shall provide accessibility and usability for physically handicapped in accordance with the

requirements for the handicapped in FED-STD 795 and 36 CFR 1191.

- 1.1.11 **Warranty:** Warranty service shall be provided for each elevator for a period of 12 months after date of acceptance by Contracting Officer. Emergency callback service shall be included and available 24 hours a day, 7 days per week, with an initial telephone response time of 1 hour and a response time of 4 hours for a mechanic to the site. Inspection and service for fire service operation and seismic requirements shall be performed every 6 months. Documentation of inspection and testing, and certification of successful operation shall be provided with each unit.
 - 1.1.12 **Mechanical Space:** The elevator machine room is to be located on the first floor adjacent to the elevators. This area is to vented to the exterior to ensure no odors enter the public space.
 - 1.1.13 **Operator Training:** The Contractor shall conduct a formal training course for operating Government personnel that shall include care, lubrication, adjustment and maintenance of elevator equipment. Field instructions shall cover all of the items contained in the operating and maintenance instructions, including demonstrations of routine maintenance operations. Contracting Officer shall be notified at least 14 days prior to date of starting the training course.
 - 1.1.14 **Provide conveying systems for moving people when any of the following conditions occur:**
 - a. Building or portion of building is more than 1 story tall and movement of people between floors is required.
 - (1) **Building Population:** In accordance with code for occupancy.
- 1.2 **Amenity and Comfort:**
- 1.2.1 **Accessibility:** Provide at least one accessible passenger elevator complying with code that serves every habitable level.
 - 1.2.2 **Views:** Where passenger conveying systems are located on exterior wall, provide windows to take advantage of views.
 - 1.2.3 **Sound Levels:** Maintain ambient sound levels in spaces that include or are adjacent to operating conveying systems within levels specified in Chapter C - Interiors.
 - 1.2.4 **Sound Levels:** Provide conveying systems that generate dBA levels at 6 feet that are not in excess of ambient sound levels specified in Chapter C - Interiors.
- 1.3 **Health and Safety:**
- 1.3.1 **Fire Resistance:** Where vertical conveying systems must pass through fire resistant floor construction, provide fire resistance in conformance with code.
 - a. **Shaft Enclosure:** Not less than 2 hour fire resistance rating.
 - b. **Doors:** Not less than 1-1/2 hour labeled fire protection rating.
- 1.4 **Durability:**
- 1.5 **Operation and Maintenance:**
- 1.5.1 **Ease of Use:** Provide conveying systems that operate automatically or in response to passenger input, without intervention by operators.
 - 1.5.2 **Minimization of Misuse:** Provide conveying systems with features and mechanisms that will prevent or minimize unsafe conditions or inconvenience attributable to vandalism, pranks, or deliberate sabotage.

2. PRODUCTS

- 2.1 Use the following:
 - 2.1.1 Passenger elevators 14240.

END OF CHAPTER D1

CHAPTER D11**ELEVATORS AND LIFTS****1. PERFORMANCE**

1.1 Basic Function:

- 1.1.1 Provide elevators required by the program or necessary to fulfill basic project functions.
- 1.1.2 Elevators move passengers vertically between levels and include the following elements:
 - a. Hydraulic Elevators: Power unit and control valves, hydraulic cylinder and plunger, controller, car platform and frame, car enclosure, guide rails, signal fixtures, hoistway entrances, door operator equipment and safety devices.
- 1.1.3 Where elevators and lifts are integral with elements defined within another element group, meet requirements of both element groups.

1.2 Amenity and Comfort:

- 1.2.1 Accessibility: Provide passenger elevators that comply with the Americans with Disabilities Act Accessibility Guidelines (ADAAG) and as follows:
 - a. Cars with Center-Opening Doors: Minimum interior clear dimensions of 51 inches deep and 80 inches wide, with controls located on front wall, either side.
 - b. Cars with Side-Opening Doors: Minimum interior clear dimensions of 51 inches deep and 68 inches wide, with controls located on front wall.
 - c. Height of Controls: Top button not higher than 48 in from finished floor.
- 1.2.2 Elevator must be large enough to accommodate a emergency body stretcher.
- 1.2.3 Views: Where elevators are located on exterior wall or interior atrium, provide observation cars.

1.3 Durability:

- 1.3.1 Railings: Provide protective railings at sides of passenger elevators that are made of brushed stainless steel.

1.4 Operation and Maintenance:

- 1.4.1 Passenger Elevator Duty: Operating characteristics as follows:
 - a. Minimum Load Capacity: 2500 lb.
 - b. Minimum Ultimate Elevator Speed:
 - (1) Up to 5 floors: 200 fpm.
- 1.4.2 Passenger Elevator Operating System: As follows:
 - a. Light Service: Single automatic operation.
 - b. Single Elevators: Selective collective operation.
- 1.4.3 Operating Features for All Elevators:
 - a. Key switch in one elevator car for independent operating service.

2. PRODUCTS

2.1 Passenger Elevators (14200):

- 2.1.1 Use one of the following:
 - a. Hydraulic elevators.

END OF CHAPTER D11

CHAPTER D2**WATER, DRAINAGE & UTILITIES****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Comply with UFC 1-200-01
- 1.1.2 Provide delivery of hot and cold domestic water to points of utilization and the removal of water, rainwater, and liquid waste.
- 1.1.3 Domestic Water Supply. Pressure in this area is estimated to be 70 pounds per square inch-gage. Water service shall be brought into the Mechanical Room .
- 1.1.4 The piping shall be extended to fixtures, outlets, and equipment. The domestic hot-water and cold-water piping system shall be arranged and installed to permit draining. The supply line to each item of equipment or fixture, except faucets, flush valves, or other control valves that are supplied with integral stops, shall be equipped with a shutoff valve to enable isolation of the item for repair and maintenance without interfering with operation of other equipment or fixtures. Supply piping to fixtures, faucets, hydrants, shower heads, ice machine, refrigerator and flushing devices shall be anchored to prevent movement.
- 1.1.5 Domestic Hot Water Requirements. Domestic hot water shall be sized as required to provide adequate hot water for the lavatories, sinks and showers.
- 1.1.6 Domestic Water Heating Systems. Domestic water heating is to be a gas-fired, ten year warranted unit with an operating temperature of 110 Degrees F (43.3 Degrees C). The size of the hot water Boiler and hot water storage tank shall be in accordance with the 1999 ASHRAE Applications Handbook. It shall service the entire building and shall be located in the mechanical room. It shall include a hot water recirculation loop and calibrated balancing valves. The water heater shall have adequate storage capacity.
- 1.1.7 Sanitary Sewer. All lavatory and sink drains and P-traps shall be coordinated with Architectural work. The building Sanitary Sewer shall be designed in accordance with the ICC International Plumbing Code. Coordinate location of floor sinks and floor drains with the structural discipline for floor sloping requirements. Floor drains and floor sinks shall be as specified in UFGS 15400A - PLUMBING, GENERAL PURPOSE Provide floor drains in the drying area & in each wet area for wash down with a hose bibs. Provision shall be made to collect condensate drains and drain to the sanitary sewer.
- 1.1.8 Interior Natural Gas System The natural gas line shall be sized in accordance with NFPA 54. Natural gas piping inside the building shall be in accordance with UFGS Section 15190A - GAS PIPING SYSTEMS. Natural gas piping shall be provided to each piece of HVAC equipment requiring it, and other areas as required for normal building occupant operations.
- 1.1.9 Natural Gas. The complete gas piping installation shall conform in all respects with NFPA 54. Piping connections to all gas burning equipment shall be made with rigid pipe and fittings. All buried gas pipe shall be polyethylene, rated for the pressures expected. Polyethylene valves shall be used for underground piping. All risers must be anodeless. Tracer wire shall be provided on all lines and shall be tied off at all risers. There is an existing 1-1/2 inch and a 3 inch line on 8th street to the North. The gas pressure is 35 psi.
- 1.1.10 Shut-Off Valves. A ball type gas shut-off valve and coupling shall be provided in an easily accessible place in the gas line to each equipment item.
- 1.1.11 Meter and Regulator. A gas meter and pressure regulator shall be provided at the outside wall. The gas meter shall have a maximum pressure drop across the meter of ½-inch W.C. (125 Pa). The gas pressure regulator shall be sized to reduce the gas pressure from that in the service line to 0.5 pounds

per square inch-gage (3.45 kPa). Regulator shall have automatic high pressure cut-off, manual reset low pressure cutoff, the orifice size, the spring range and the date of manufacture stamped on outer casing. Gas risers outside of the building shall be anodeless and have a full coating protection using coal tar epoxy and shall be wrapped up to 6-inches (152.4 mm) above grade.

1.1.12 Supply, Drain, Waste, and Vent Piping Systems. Piping system for outside of the five-foot line of the building are to be as specified under the civil portion of the design criteria. Runs are to be kept as short as possible. Metallic vent piping shall be used through the roof from at least 6 inches (152 mm) below the roof to the required point of termination above the roof. Supply, waste, and vent piping materials shall be;

a. Service	Above Ground	Below Ground
(1) Drain	Copper Type L	PVC/CPVC/ABS
(2) Waste	Cast Iron, Copper Type L	PVC/CPVC/ABS
(3) Vent	CI, Copper Type L	PVC/CPVC/ABS
(4) Gas	Black Steel	Polyethylene

- b. Acceptable materials for service connections shall be ductile iron, type K copper, and PVC plastic pipe. Acceptable materials for interior piping include type L copper. A back-flow preventer shall be installed on all sprinkling systems, and before any industrial process plumbing except for non-potable water systems. Water lines shall be inside the buildings thermal envelope. Pipes, and driving fountains shall not be placed in or on outside walls to prevent freezing. Avoid placement near outside air vent opening.
- c. Provide sufficient space and access for maintenance of fixtures and plumbing.
- d. Water injecting trap primers will not be allowed for installation at Hill AFB. Past experience has shown a tendency of these devices to be improperly installed. This creates a cross connection and associated water contamination. If a sewer gas problem exists, one option that is allowed would be the installation of a waterless type trap device with a rubber mechanism that seals off sewer gas but allows water to drain.

1.1.13 Vibration/Noise Isolation. Water hammer arresters shall be used to minimize water system noise in accordance with PDI-WH 201. Velocities in Domestic Water shall be a maximum of 4 feet per second (1.2 m/s).

1.1.14 Seismic Design. Seismic design shall be in accordance with UFGS Section 15070A SEISMIC PROTECTION FOR MECHANICAL EQUIPMENT Section 15070A and TI 809-04.

1.1.15 Water and drainage elements comprise the following:

- a. Water Supply (D21): Water sources and storage.
- b. Plumbing Fixtures: All fixtures necessary for sanitation, occupancy, and use, that are connected to water supply or drainage.
- c. Domestic Water (D23): All elements required to distribute water to fixtures, including piping and equipment for water cooling, heating and storage.
- d. Sanitary Waste (D24): All elements required for removal of sanitary waste, including piping, venting, discharge and disposal, and equipment.
- e. Rain Water Drainage (D25): All elements required for drainage of rain water from building areas in which it may accumulate and drainage of clear wastes from building services; not including gutters and downspouts (B31) or subdrainage (A).

1.2 Amenity and Comfort:

1.2.1 Noise:

- a. Design to prevent noise due to air trapped in piping systems.
- b. Locate risers in dedicated and sound attenuated chases.
- c. Minimize noise produced by fixtures.

1.2.2 Convenience:

- a. Fixture Heights: As specified in code.
- b. Fixture Configurations: As specified in code.

- c. Water Connections: Hot water on the left side of fixtures and cold water on the right side of fixtures.
- 1.2.3 Odors:
- a. Locate odor producing elements in areas separate from human occupancy in dedicated equipment rooms.
 - b. Do not locate sanitary waste vent openings where odors are noticeable by occupants or by occupants of adjacent properties or where odor-bearing air may enter building spaces.
 - c. Connect fixtures to prevent entry of sewer gases into occupied spaces.
- 1.2.4 Appearance:
- a. Vents: Conceal vents from view.
- 1.3 Health and Safety:
- 1.3.1 Health: Provide potable water.
- a. Public utility water can be considered to be potable.
- 1.3.2 Waste Disposal: Connect each fixture to sanitary drainage system for proper disposal of waste and harmful materials.
- 1.3.3 Pressure Control: Control pressures to protect the building, fixtures, equipment, and occupants from harm.
- a. Maximum Water Distribution Working Pressure: 70 psi.
 - b. Pressure Reduction: Use pressure reducing valves or regulators.
 - c. Air Removal: Remove air trapped in water distribution system.
- 1.3.4 Prevention of Sewer Gas Leaks:
- a. Provide waste system vents as required by code to avoid trap siphonage or compression.
 - b. Prevent entry of sewer gases from the sanitary sewer into building's sewer system.
- 1.3.5 Protection of Potable Water Supply: As required by code.
- 1.3.6 Waste Drainage: Provide drinking fountains, air conditioning equipment, and water coolers with indirect waste pipe for drainage.
- 1.3.7 Fire Hazards:
- a. Do not use combustible piping materials inside the building.
 - (1) Terminate combustible piping entering the building within 5 feet of penetration.
- 1.3.8 Hazard Labeling: Clearly label domestic hot water, domestic cold water, and sanitary waste and vent systems indicating the nature of contents and direction of flow.
- a. Conform to requirements of ANSI/ASME 13.1-1996(R2003).
- 1.4 Structure:
- 1.4.1 Insulated Pipes: Prevent compression of insulation by using pipe shields or saddles or dense insulation inserts.
- 1.5 Durability:
- 1.5.1 Joint Durability: Provide watertight joints.
- 1.5.2 Electrical Component Protection:
- a. Do not route piping through electrical rooms, switchgear rooms, transformer vaults, and elevator equipment rooms unless it is absolutely necessary.
 - (1) Where piping must be routed near electrical equipment, shield the electrical equipment with drip pans which drain to the nearest floor drain.
 - b. Substantiation: See tests specified under Operation and Maintenance.
- 1.6 Operation and Maintenance:

- 1.6.1 Capacity of Water Service: Provide adequate water flow and pressure to supply peak demand requirements. Comply with requirements specified in the code.
- a. Water Flow:
 - (1) Maximum Velocity: 8 fps at the design flow rate.
 - b. Water Supply Pressures:
 - (1) Service Main Working Pressure: 70 psi at 75 deg F.
 - (2) Water Distribution Working Pressure: 55 psi at 75 deg F.
 - c. Substantiation:
 - (1) Preliminary Design: Analysis and documentation of water supply source and flow conditions.
 - (2) Design Development: Piping design calculations and entrance locations.
 - (3) Construction: Prior to installation of plumbing fixtures and prior to concealment of piping, air and water tests of piping systems at 110 percent of operating pressure, maintaining pressure for 2 hours to demonstrate system is watertight.
 - (4) Construction: Functional tests of fixtures and equipment.
 - (5) Occupancy: Observation of function during full occupancy simulating extreme conditions.
- 1.6.2 Waste Pipe Sizing:
- a. Size piping as required by code.
 - b. Buried Piping Below Slabs: 2 inches diameter, minimum.
 - c. Pipes 3 inches in Diameter and Smaller: Sloped at 1/4 inch per foot, minimum, downward in the direction of flow.
 - d. Pipes 4 inches in Diameter and Larger: Sloped at 1/4 inch per foot, minimum, downward in the direction of flow.
 - e. Substantiation:
 - (1) Preliminary Design: Analysis and documentation of sewer discharge method and locations.
 - (2) Design Development: Drainage design calculations and documentation of piping outlets.
 - (3) Construction: Air and water pressure tests of piping systems; functional tests of drains and equipment under simulated full occupancy loads.
 - (4) Occupancy: Observation of function during full occupancy simulating extreme conditions.
- 1.6.3 Ease of Maintenance and Repair:
- a. Provide devices at each branch take-off which allow insertion of measurement devices to monitor flow and pressure levels in the water distribution system.
 - b. Isolation of Piping Segments and Equipment: Provide a means of isolating the following:
 - (1) Each building from main water service. Provide a shut-off valve located inside a valve box whose removable access cover is at grade level.
 - (2) Water meter from building piping.
 - (3) Each tenant space from building service, excluding locations where there is only one fixture with its own isolation valves.
 - (4) Each water branch from main service.
 - (5) Each vertical riser from piping below.
 - (6) Each water branch to fixtures or equipment from main vertical riser.
 - (7) Piping lower than the supply, to prevent unnecessary draining in the case of disconnection.
 - (8) Each plumbing fixture, storage tank, and item of equipment, so that removal of one will not necessitate shutdown of others.
 - (9) Individual fixtures and equipment. Provide an isolation device within 3 feet of pipe connection to item.

2. PRODUCTS

- 2.1 Equipment and Materials. All materials and equipment shall be the standard cataloged product of manufacturers regularly engaged in production of such materials and equipment, and shall be the manufacturer's latest standard design. Equipment shall comply with the requirements of Underwriters Laboratories, Inc. (UL), American Gas Association (AGA), Air Conditioning and Refrigeration Institute (ARI), American Society for Testing and Materials (ASTM), National Electric Manufacturers Association

(NEMA), American National Standards Institute (ANSI), National Fire Protection Association (NFPA) or other national associations as applicable. Equipment selection and layout shall make provision to observe the manufacturer's recommended clearances and code clearances.

- 2.2 Access Panels. Access panels/doors shall be provided as required for valves and appurtenances of the plumbing system in accordance with UFGS Section 15400A – PLUMBING, GENERAL PURPOSE. Coordinate with the Architectural discipline to ensure that UFGS Section 05500 - MISCELLANEOUS METAL includes provisions for access panels/doors. Panel location and sizes shall be provided.
- 2.3 Fixture Allowance. The buildings shall have restrooms and other plumbing fixtures as indicated on the Architectural Floor Plans. The restrooms shall have all fixtures as outlined in the referenced criteria, and as provided in UFGS Section 15400A - PLUMBING, GENERAL PURPOSE. Freeze proof wall hydrants shall be located on the building exterior wall so that, with 100 feet of garden hose, the area can be watered without crossing main entrances. All lavatory and sink faucets shall be ADA compliant.
- 2.4 The plumbing fixtures shall be as follows and as specified in UFGS Section 15400A, PLUMBING, GENERAL PURPOSE:
 - 2.4.1 Water Closets. Flushometer valve, low consumption, 1.6 gallon per flush (6.0 liter/flush), siphon-jet, elongated bowl, top supply spud, floor mounted. Seat: White plastic, elongated, open front.
 - 2.4.2 Water Closets (Handicapped). Top of bowl shall be 18 inches (455 mm) above the floor. (All other features shall be the same as indicated in 2.4.1).
 - 2.4.3 Urinals. Flushometer valve, low consumption, 1.0 gallon per flush, siphon jet, top spud, wall hanging, with integral trap. Back outlet.
 - 2.4.4 Service (Mop) Sinks. Precast terrazzo, 6-inch drop front, 24 by 24 by 12, corner. Trap standard, floor mounted. Faucet and Spout - Cast or wrought copper alloy, with top or bottom brace, with backflow preventer. Faucets shall have replaceable seat and the washer shall rotate onto the seat. Handles shall be lever type. Strainers shall have internal threads.
 - 2.4.5 Lavatories. Integral Bowl. Front overflow, D Shape bowl, self draining deck area with contoured back and side splash shields, faucet ledge. recessed in vanity counter top - Faucets shall be single control, mixing type. Shall be ADA compliant.
 - 2.4.6 Kitchen Sink shall have ledge back with holes for faucet and spout single bowl (24 x 21 inches) double bowl (32 x 21 inches) enameled cast iron. The JUICE BAR shall have one single and a triple bowl kitchen sink and wash basen. Provide a floor sink for the Juice Bar kitchen area. The HAWC KITCHEN & BREAK ROOM shall have a double bowl type sink. Faucet and Spout - Aerator shall have internal threads. Handle - Cast copper alloy, wrought copper alloy, or stainless steel. Single lever type. Drain Assembly - Plug, cup strainer, crossbars, jam nuts, washers, couplings, stopper, etc., shall be copper alloy or stainless steel. Double bowl with holes for faucet and spout, stainless steel, garbage disposal, ADA compliant.
 - 2.4.7 Floor Sinks
 - a. Provide a floor sink in the mechanical rooms, comm room, vending machine room, juice bar and ice machine. All cooling coil condensate drains shall be piped to the floor sink. Sink shall be square with 12 inch nominal overall width and 10 inch nominal depth and shall have an acid resistant enamel finish with cast iron body.
 - 2.4.8 Provide "bi-level"/two station wall mount electric water coolers at all drinking alcove locations. Match Elkay model #ELK EZTL8C-bi level.
 - 2.4.9 Shower. Provide ball joint, self-cleaning adjustable spray pattern shower heads connected to concealed pipe connected to copper alloy pressure balance single control type mixing valves with front access integral screwdriver stops. Anchor the mixing valves and the pipe to each shower head in wall to prevent movement. Flow shall not exceed 2.5 gpm at 80 psi flow pressure. Provide brass body drains with nickel bronze strainers for ceramic tile finished floor. Do not use central shower poles. Use

perimeter mounted showers. Provide handicap shower stalls for both men's and women's restrooms. They shall be ADA compliant.

a. Thermostatic Mixing Valves

- (1) A combination thermostatic and pressure-balanced shall be provided for each showerhead and shall be line size and shall be constructed with rough or finish bodies either with or without plating. Each valve shall be constructed to control the mixing of hot and cold water and to deliver water at a desired temperature regardless of pressure or input temperature changes. The control element shall be of an approved type. The body shall be of heavy cast bronze, and interior parts shall be brass, bronze, corrosion-resisting steel or copper. The valve shall be equipped with necessary stops, check valves, unions, and sediment strainers on the inlets. Mixing valves shall maintain water temperature within 5 degrees F of any setting.

- 2.4.10 All plumbing fixture valves shall be provided in accordance ICC International Plumbing Code. Valves shall be provided on supplies to equipment and fixtures. Valves 2 1/2 inches (65 mm) and smaller shall be chrome plated bronze with threaded bodies for pipe and solder-type connections for tubing. Valves 3 inches (80 mm) and larger shall have flanged iron bodies and bronze trim. Pressure ratings shall be based upon the application.
- 2.4.11 Clothes Washer & Dryer Outlets: Drainage and hot and cold water supply shall be provided for government supplied government installed clothes washers. Washer connection. Provide capacity for 2 commercial washers (front load) and 3 commercial dryers.
- 2.4.12 Corrosion Control:
- a. General: Corrosion control of Base facilities includes four basic areas.
 - b. Cathodic protection
 - c. Water treatment
 - d. Protective coating
- 2.5 Cathodic Protection: Cathodic protection is required for the following items:
- 2.5.1 Any ferrous material that comes in contact with the earth. This includes but is not limited to the exterior surface of underground pipes.
- 2.5.2 The interior surface of water storage tanks.
- 2.6 Equipment Placement: Do not place equipment near the drip line of roof overhangs or rain gutters. Place equipment where sliding snow from roofs will not fall on equipment and damage it.
- 2.7 Do not use:
- 2.7.1 Plastic piping inside the building.
 - 2.7.2 Buried steel piping.

3. METHODS OF CONSTRUCTION

3.1 Use the following practices and procedures:

- 3.1.1 Health: Maintain the safety of the potable water source at all times.
- a. Do not connect the potable water source to any non-potable water source.
 - b. Keep animals and vermin out of open pipes, tanks, and other system components.
 - c. Keep other contaminants out of the distribution systems, equipment, and water source.
 - d. Do not connect private potable water source to public potable water source.
- 3.2 Do not use:
- 3.2.1 Asbestos material.

END OF CHAPTER D2

CHAPTER D21**WATER SUPPLY****1. PERFORMANCE**

1.1 Water Supply

1.1.1 See Attachment 28 for existing water line information from the project area.

a. All piping, joints, fittings, valves, valve boxes fire hydrants, backflow prevention devices, and thrust restraint shall comply with UFC 3-600-01 and the National Fire Code. Piping shall comply with National Fire Protection Association 24. The new Fitness Center will require a fully automatic sprinkler system for fire protection throughout the new facility.

(1) In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter D - Services, and Chapter D2 - Water and Drainage.

END OF CHAPTER D21

CHAPTER D23**DOMESTIC WATER****1. PERFORMANCE****1.1 Domestic Water Service**

1.1.1 Water service connection shall be sized per demand of all fixture units.

- a. Acceptable pipe materials for Domestic Service Lines are PVC (ASTM 1785), Polyethylene Plastic (PE) conforming to AWWA C901, or other materials used as industry standard potable water service connections for commercial properties. Pressure and leakage test shall be per pipe manufacturer's requirements. Fittings and appurtenances shall be per manufacturer's requirements for installation.
- b. Bacteriological Disinfection shall be as prescribed by American Water Works Association (AWWA) C651.
 - (1) In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter D - Services, and Chapter D2 - Water and Drainage.

END OF CHAPTER D23

CHAPTER D24**SANITARY WASTE****1. PERFORMANCE****1.1 Sewer Service**

1.1.1 See Attachment 29 for existing sewer information in the project area.

a. Piping for sewer service connections shall be industry standard for sewer service for commercial facilities. Examples of acceptable pipe are: vitrified clay pipe, polyvinyl chloride (PVC) pipe, and acrylonitrile-butadiene-styrene (ABS) pipe. Pipe and joints shall be per manufacturer's requirements. Cleanouts or manholes are required at all direction changes. Minimum slope of pipe shall allow self cleaning velocities as prescribed in the National Plumbing Code.

(1) In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter D - Services, and Chapter D2 - Water and Drainage.

END OF CHAPTER D24

CHAPTER D25**RAIN WATER DRAINAGE****1. PERFORMANCE**

1.1

- 1.1.1 There is an existing storm drain line that is located on the southern edge of the new facilities footprint (see Attachment 16). This drain line will be relocated to the south of the project site and north of 11th Street.
- a. Storm Drainage
- (1) Piping for storm drainage shall be industry standard for the drainage of commercial facilities. Examples of acceptable piping material are: vitrified clay pipe, polyvinyl chloride (PVC) pipe, acrylonitrile-butadiene-styrene (ABS) pipe, Non-reinforced concrete pipe, reinforced concrete pipe, and corrugated metal pipe. Installation shall be per manufacturer's instructions. Drain structures such as curb inlets, catch basins, and manholes shall be pre-cast. Rims, covers and grates for drain structures shall be rated for H-20 traffic loading in traffic areas. Minimum design velocity of storm water in underground systems shall be 2 feet per second. Utilize 25 year storm for design purposes.
- b. Surface Drainage
- (1) Provide for positive slope drainage of the new track away from the interior playing field. Provide drainage for the new playing field with the total drainage system to tie into the storm drainage system for the base. Surface drainage within paved areas will be by sheet flow to curb and gutter, valley gutters and drop inlets. Drainage calculations shall be provided to indicate drain pipe size and size and number of drainage structures. Provide a minimum slope of 5% for 10'-0" around perimeter of new facility where no paving exists and a minimum slope of 2% if paving exists.
- (a) In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter D - Services, and Chapter D2 - Water and Drainage.

END OF CHAPTER D25

CHAPTER D3**HVAC - HEATING, VENTILATING, AND AIR CONDITIONING****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide artificial means of controlling temperature, velocity, and direction of air motion in the interior spaces enclosed by the shell, and reduction of airborne odors, particulates, and contaminant gases.
- 1.1.2 The HVAC system consists of the following elements:
 - a. Energy Supply (D31): Elements which provide energy used to maintain building comfort.
 - b. Heat Generation (D32): Elements required to heat building to maintain space comfort.
 - c. Refrigeration (D33): Elements necessary to generate the cooling required to maintain building comfort.
 - d. Air Distribution (D34): Elements required to distribute air to maintain building comfort.
 - e. HVAC Controls (D36): Elements required to control equipment which maintains building comfort.
 - f. Other Other Equipment (D39): Other elements required to maintain comfort.
 - g. Comply with UFC 1-200-01.
- 1.1.3 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance and Chapter D - Services.

1.2 Amenity and Comfort:

- 1.2.1 Space Temperature Setpoint: As specified in Chapter 111 and as follows:
 - a. Room Area: Summer: 78 deg F, plus or minus 2 deg F.
 - b. Room Area : Winter: [72] deg F, plus or minus [2] deg F.
 - c. Summer: Communication Room [75] deg F, plus or minus 2 deg F.
 - d. Winter: Communication Room: [50] deg F, plus or minus 5 deg F.
 - e. Summer: Storage & Janitor's Area: ventilation max 10 deg F above ambient F db
 - f. Winter: Storage & Janitor's area: [40] deg F
 - g. Summer: Elec & Mech Room: ventilation max 10 deg F above ambient F db
 - h. Winter: Elec & Mech Room : 40 deg F
 - i. Summer: Men's Locker & Women's Locker Room & Restroom 78 deg F, 50% relative humidity (max)
 - j. Winter: Men's Locker & Women's Locker Room & Restroom 72 deg F, 50% relative humidity (max)
- 1.3 Internal Loads: The contractor in coordination with the user shall be responsible for determining the correct internal loading from equipment and people. Assume for a starting point body counts in GYM - 20 persons playing basketball & 500 spectators, MENS LOCKER ROOM - 200 persons, WOMENS LOCKER ROOM - 100 persons, CONFERENCE ROOM - 25 persons, OFFICE (DIRECTOR'S) - 6 persons, LARGE EXERCISE - 80 persons exercising, SMALL EXERCISE - 25 persons exercising, SENIOR EXERCISE - 25 persons exercising, CARDIO - 100 persons exercising, WEIGHT (MACHINE) - 60 persons exercising, WEIGHT (FREE) - 60 persons exercising, JUICE BAR, LOBBY AREA - 100 persons. ADMIN OFFICES - 3 persons.
- 1.4 Energy calculations and economic analysis shall comply with UFC 3-400-01.
 - 1.4.1 Energy Consumption Studies: All new buildings and major renovations shall have energy consumption studies completed prior to design completion.
 - 1.4.2 Lighting: Lighting systems shall be designed to allow reduction of lighting levels by appropriately banking lighting circuits or providing separate switching of inner and outer lamps in three and four tube fluorescent fixtures. Consideration shall be given to the use of energy efficient lighting systems including ballasts, lamps and fixtures. Consideration should also be given for any task lighting that might be provided by systems furniture, and overhead lighting should be reduced accordingly.

Consideration shall also be given to task specific work conditions and lighting levels (foot-candles) and be in accordance with the Illuminating Engineering Society (IES) Lighting Handbook current edition. Lighting levels (foot candles) shall not exceed the maximum of 50 at the work surface. Lighting level requirements above this maximum level shall be coordinated through the Energy Management Office and Bioenviornmental Engineering Office.

- a. Occupancy Sensors: All new buildings and renovation of restrooms and conference rooms shall include the use of occupancy motion sensors for lighting control. Use of other occupancy sensors to control urinals, toilets and faucets should be considered when possible and economically feasible based on life-cycle analyses.
- 1.4.3 Make-Up Air: Where large quantities of make-up air are required, heat recovery will be considered and implemented if life cycle cost analysis shows it to be cost effective.
 - 1.4.4 Coordination: All designs shall be coordinated with the Base Energy Manager in CEOM who will also answer energy related questions.
 - 1.5 Additional referenced standards shall include the International Mechanical Code, applicable Occupational Safety and Health Act (OSHA) regulations, and the Mechanical and Electrical Seismic Protection parts of this document. A service platform and access ladder shall be provided for equipment installed where the underside of the equipment is more than 10 feet above the floor. HVAC systems shall be sized in accordance with ASHRAE standards and comply with NFPA 90A and 90B. The analysis and design should be based on the energy conservation criteria of the latest edition of ASHRAE Standard 90.1 and 90.2 unless specified otherwise in this document. Additional referenced standards shall include the International Building Code, International Mechanical Code, applicable Occupational Safety and Health Act (OSHA) regulations, and in accordance with UFGS SECTION 15070A SEISMIC PROTECTION FOR MECHANICAL EQUIPMENT. The architectural information indicates the minimum size of the mechanical room. The contractor shall increase the size of the room as required to allow the mechanical and electrical equipment to fit in the room, and to allow sufficient room for maintenance. All aspects of the design shall comply with UFC 4-010-01, DoD Minimum Antiterrorism Standards dated 8 October 2003.
 - 1.6 Load Calculations. Heat gain and loss calculations shall be, as a minimum, in accordance with the current edition of the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) Handbook of Fundamentals, and the latest edition of the ASHRAE Cooling and Heating Load Calculation Manual. Calculations shall be performed on a room-by-room basis. The cooling equipment shall be selected based on satisfying both the total and latent calculated loads. The calculation shall include a minimum 10 percent safety factor. Heating load calculations shall not consider lights or internal loads as supplementing the heating system. The calculations shall include a minimum 30 percent safety factor. The Computer-generated loads are acceptable provided complete input and output summaries are submitted during the design process. Load calculations shall include the design parameters listed in the Site Criteria paragraph
 - 1.7 Outdoor Equipment. Locate all outdoor ground mounted mechanical equipment in the area to the rear of the building. The rear is the North side of the building not visiable to front of the building. Enclose by brick & CMU wall. Comply with the UFC 4-010-01, DoD Minimum Antiterrorism Standards, dated 8 October 2003.
 - 1.8 Electrical Shock Prevention:
 - 1.8.1 Provide a means of disconnecting power at each piece of equipment.
 - 1.9 Refrigerants:
 - 1.9.1 Comply with the requirements of ASHRAE 15-2001.
 - 1.9.2 Prevent release of refrigerant to atmosphere.
 - 1.9.3 Prevent exposure of occupants to hazardous refrigerants.
 - a. Substantiation:

1.10 Indoor Air Quality: Provide sufficient ventilation to obtain acceptable indoor quality, determined using the Ventilation Rate Procedure of ANSI/ASHRAE 62-2001 .

1.10.1 Substantiation:

- a. Design Development: Engineering analysis.
- b. Occupancy: Field testing and survey of occupants.

2. PRODUCTS

2.1 HVAC System Type:

2.1.1 Use one or more of the following:

- a. Stand-Alone HVAC Systems:
 - (1) Communication Room split-system cooling.
- b. Central HVAC Systems:
 - (1) Hot water heating system.
 - (2) Chilled water supplied by two air-cooled chillers. One shall be sized for the peak temperatures experienced in the spring and fall. The second will be sized for the peak temperature in the Summer (see design temperature). During the Spring, Fall & Winter the smaller sized chiller will lead and the larger chiller will lag. During the Summer the large chiller will lead and the smaller chiller will lag.
 - (3) Variable volume air handlers & return fan with VFD drive with hot water coil air terminals units (SYSTEM). Provide each room with its own HVAC control (thermostatic control). Each room will be considered a zone. Provide one SYSTEM for the first floor and a second SYSTEM for the second floor.
 - (4) Provide heating, cooling & humidity control for the Men's & Women's Locker Room & Men's and Women's Restrooms.
 - (5) For each individual racket ball court provide a heating & cooling unit independent of the central air handling system.
 - (6) A single zone air handler with chilled or hot water coil will condition the Gym.

2.1.2 Do not use:

- a. Stand-Alone HVAC Systems:
 - (1) Air-cooled, self-contained air handlers.
 - (2) Rooftop unit.

END OF CHAPTER D3

CHAPTER D31
ENERGY SUPPLY

1. PERFORMANCE

1.1 Basic Function:

1.1.1 Provide natural gas for use by HVAC, plumbing, and process equipment as follows:

1.1.2 Comply with standards stated in this document._____

1.1.3 Substantiation:

- a. Preliminary Design: Identification of each piece of equipment requiring fuel.
- b. Design Development: Distribution system and equipment connections shown on drawings.
- c. Construction: Functional performance testing; proper fuel supply, combustion, and venting.

1.1.4 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter D - Services, and Chapter D3 - HVAC.

1.2 Amenity and Comfort:

1.2.1 Heating: Provide fuel to all fuel burning equipment that is used to maintain space comfort.

1.2.2 Leakage:

- a. Provide leak-free distribution systems.

1.3 Structural:

1.3.1 Seismic Protection:

- a. Provide fuel distribution system with the ability to flex where differential movement is anticipated.
- b. Provide fuel distribution system supports capable of supporting twice its installed weight.

1.4 Durability:

1.4.1 Expected Service Life Span: Provide a system which will last a minimum of 10 years in service without major repairs or operating expense.

1.4.2 Vandalism: Protect the service meter from unauthorized access.

1.4.3 Accidental Damage: Protect service meter from accidental damage by installing bollards to stop vehicles.

1.5 Operation and Maintenance:

1.5.1 Ease of Service:

- a. Provide shut-off valves as required by code.

2. PRODUCTS

2.1 Pipe: (15105)

2.2 All buried gas pipe shall be polyethylene, rated for the pressures expected. Polyethylene valves shall be used. All risers must be anodeless. Tracer wire shall be provided on all lines and shall be tied off at all risers.

2.3 Use one or more of the following for aboveground piping:

2.3.1 Materials permitted by code.

- a. Copper pipe with flared or brazed joints.
- b. Steel pipe with threaded or welded joints.

2.3.2 Do not use for aboveground piping:

- a. Aluminum-alloy pipe.

- b. Ductile iron pipe.
- c. Plastic pipe.

2.4 Fittings (aboveground):

2.4.1 Use one or more of the following:

- a. Materials permitted by code.
- b. Copper.
- c. Steel.

2.4.2 Do not use:

- a. Aluminum-alloy.
- b. Ductile iron.
- c. Plastic.

3. METHODS OF CONSTRUCTION

3.1 Construct the system using the following methods:

- 3.1.1 Install buried piping with tracer wire in accordance with Hill AFB Base Facility Design Standard.

END OF CHAPTER D31

CHAPTER D32**HEAT GENERATION****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide the necessary equipment and infrastructure to deliver heat to the conditioned spaces.
- 1.1.2 Where HVAC elements also must function as elements defined within another element group, meet the requirements of both element groups.
- 1.1.3 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility and Performance, Chapter D - Services, and Chapter D3 - HVAC.

1.2 Durability:

- 1.2.1 Temperature Endurance: Provide equipment designed for ambient temperatures ranging from 50 degrees F to 122 degrees F (10 degrees C to 50 degrees C).

2. PRODUCTS

- 2.1 Heating System Design. The heating system shall be a hot water. The specifications for this design shall be in accordance with UFGS Section 15569A WATER AND STEAM HEATING; OIL, GAS OR BOTH; UP TO 20 MBTUH, SECTION 15556A FORCED HOT WATER HEATING SYSTEMS USING WATER AND STEAM HEAT EXCHANGERS and SECTION 15565A HEATING SYSTEM; GAS-FIRED HEATERS.

2.1.1 Boilers

- a. The boiler capacity shall be based on the ratings shown in HYI-01 or as certified by the American Boiler Manufacturers Association, or American Gas Association. Boilers shall be the natural gas fired type and have the output capacity in kilowatts (kw). Boilers with a capacity less than 85 kw shall have an Annual Fuel Utilization Efficiency of at least 80 percent. Boilers with a capacity of greater than or equal to 85 kw shall have a combustion efficiency of at least 80 percent when fired at the maximum and minimum ratings allowed by the controls. Contractor shall be required to provide all permits required by both state and local agencies for the boiler installation. If required, low NoX burners shall be provided. Boilers shall be constructed, and equipped in accordance with ASME BPV IV. The boiler shall be furnished complete with the natural gas burning equipment, boiler fittings and trim, automatic controls, forced or induced draft fan, electrical wiring, insulation, piping connections, and protective jacket. The boiler shall be completely assembled and tested at the manufacturer's plant. Boiler auxiliaries including fans, motors, drives, and similar equipment shall be provided with at least 10 percent excess capacity to allow for field variations in settings and to compensate for any unforeseen increases in pressure losses in appurtenant piping and ductwork. However, the boiler safety devices shall not be sized for a 10 percent excess capacity. The boiler and its accessories shall be installed to permit ready accessibility for operation, maintenance, and service. Each boiler shall be either of the firetube, watertube, or cast iron type for water service as specified herein.

2.1.2 Firetube Boiler

- a. Boiler shall be self-contained, multipass, packaged type, complete with all accessories, mounted on a structural steel base. When the boilers is operating at maximum output, the heat input rates shall not be greater than 21 Kw per square meter of fireside heating surface. The volume heat input rate shall not be less than 2,070 Kw per cubic meter of furnace volume.

2.1.3 Watertube Boiler

- a. Boiler shall be self-contained, packaged type, complete with all accessories, mounted on a structural steel base. The heat input rate for finned tube styles shall not be greater than 38 Kw per square meter based on internal heater area. The heat input rate for other boilers shall not be greater than 21 Kw per square meter of fireside heating surface.

2.1.4 Cast Iron Boiler

- a. Boiler shall be of the rectangular, sectional type, self-contained, packaged type, complete with accessories, mounted on a structural steel base. Cast iron sections shall be free of leaks under all operating conditions. Access shall be provided to permit cleaning of internal tube surfaces.

2.2 Gas Fired Burners and Controls

- 2.2.1 Burner shall be provided complete with fuel supply system in conformance with the following safety codes or standards: Gas fired units shall conform to UL 795, Gas fired units less than 3,660 kw input shall conform to ANSI Z21.13.

- 2.3 The boiler water shall be treated to reduce corrosion and scaling. Provide filter type chemical feeders. The water treatment system shall be located within the mechanical room. The chemical treatment provided shall be compatible with the makeup water characteristics. A reduced pressure backflow preventer shall be provided for the boiler makeup water line. The selected boiler shall have the smallest footprint possible and shall be mounted on an anchored reinforced concrete housekeeping pad with a 6-inch (150 mm) clear space from the boiler to the edge of the pad. All manufacturers' specified maintenance clearances shall be provided in the mechanical room containing the boiler. The boiler shall be equipped with an ASME rated pressure relief valve. Boiler flue vents shall be UL Type B. Boiler combustion safety control shall be specified with LED readout. Boiler shall be located in Mechanical Room. The boiler shall be equipped with a boiler management system control center to stage and modulate the boiler. The system must be compatible and able to share information with the facility's energy monitoring and control system.

3. METHODS OF CONSTRUCTION

- 3.1 Do not use any of the following methods or procedures:

- 3.1.1 steam for heating.

END OF CHAPTER D32

CHAPTER D33**REFRIGERATION****1. PERFORMANCE**

1.1 Basic Function:

- 1.1.1 Provide the necessary equipment to generate the cooling required to maintain building comfort.
- 1.1.2 Where refrigeration elements also must function as elements defined within another element group, meet the requirements of both element groups.
- 1.1.3 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter D - Services, and Chapter D3 - Heating, Ventilating, and Air Conditioning (HVAC).

1.2 Health and Safety:

- 1.2.1 Construct condensing units to ASHRAE 15-2001, Safety Code for Mechanical Refrigeration.

1.3 Durability:

2. PRODUCTS

2.1 Refrigeration Units:

- 2.1.1 Cooling System Design. Cooling system shall be a chilled water system. Specifications for this design shall be in accordance with UFGS Section 15620A LIQUID CHILLERS and Section 15645A COOLING TOWER.

a. Chiller

- (1) Central cooling shall be provided two air cooled chillers, and shall serve the air handling units. Chiller shall be of the reciprocating, scroll, or screw compressor type Unit shall be factory-assembled, tested, and rated in accordance with ARI 590 and come complete with piping, wiring, and accessories. Parts weighing 23 Kg or more which must be removed for inspection, cleaning, or repair, shall have lifting eyes or lugs. Chiller shall be provided with factory installed insulation on surfaces subject to sweating including the liquid cooler, suction line piping, and cooling lines. Chiller shall be provided with a single point wiring connection for incoming power supply. Factory installed insulation shall be provided on all suction piping from the evaporator to the compressor and on the liquid cooler shell. Refrigerant Ozone depletion rate shall be a maximum of 0.05. Unit shall be sized for exterior installation located at grade level and visually screened by a concrete masonry wall. Unit shall be provided with refrigerant and oil. Motor and controls shall have weather resistant enclosures. The condenser coil shall be constructed of copper fins and tubes, or shall be coated to prevent corrosion from the salt air environment.
- (2) Controls Package
 - (a) Chiller shall be provided with a complete factory mounted and prewired electric or microprocessor based control system. Controls package shall be unit-mounted which contains as a minimum a digital display or acceptable gauges, an on-auto-off switch, motor starters, power wiring, control wiring, and disconnect switches. Controls package shall provide operating controls, monitoring capabilities, programmable setpoints, safety controls, and EMCS interfaces as defined below.
 - (b) operating controls
 - (1) Chiller shall be provided with the following adjustable operating controls as a minimum.
 - (2) Leaving chilled water temperature control
 - (3) Adjustable timer to prevent compressor from short cycling
 - (4) Automatic lead/lag controls (adjustable) for multiprocessor units

- (5) Load limiting
 - (6) Fan sequencing for air-cooled condenser
 - (7) System capacity control to adjust the unit capacity in accordance with the system load and the programmable setpoints. Controls shall automatically re-cycle the chiller on power interruption.
 - (8) Startup and head pressure controls to allow system operation at all ambient temperatures down to 40 degrees F.
- (c) Monitoring Capabilities
- (1) During normal operations, the control system shall be capable of monitoring and displaying the following operating parameters. Access and operation of display shall not require opening or removing any panels or doors.
 - (a) Entering and leaving chilled water temperatures
 - (b) Self diagnostic
 - (c) Operation status
 - (d) Operating hours
 - (e) Number of starts
 - (f) Refrigerant discharge and suction pressures
- (d) Programmable Setpoints
- (1) The control system shall be capable of being reprogrammed directly at the unit. No parameters shall be capable of being changed without first entering a security access code. The programmable setpoints shall include the following as a minimum.
 - (a) Leaving Chilled Water Temperature
 - (b) Time Clock/Calendar Date
- (e) Safety Controls with Manual Reset
- (1) Chiller shall be provided with the following safety controls which automatically shutdown the chiller and which require manual reset.
 - (a) Low chilled water temperature protection
 - (b) High condenser refrigerant discharge pressure protection
 - (c) Low suction pressure protection
 - (d) Chilled water flow detection
 - (e) Motor current overload and phase loss protection
 - (f) High motor winding temperature protection for hermetic motors
 - (g) Low oil flow protection
- (f) Safety Controls with Automatic Reset
- (1) Chiller shall be provided with the following safety controls which automatically shutdown the chiller and which provide automatic reset.
 - (a) Over/under voltage protection
 - (b) Phase reversal protection
 - (c) Chilled water flow interlock
- (g) Remote Alarm
- (1) During the initiation of a safety shutdown, the control system shall be capable of activating a remote alarm bell. In coordination with the chiller, the contractor shall provide an alarm circuit (including transformer if applicable) and a minimum 4-inch diameter alarm bell. Alarm circuit shall activate bell in the event of machine shutdown due to the chiller's monitoring of safety controls. The alarm bell shall not sound for a chiller that uses low-pressure cutout as an operating control.
- (h) Energy Management Control System (EMCS) Interface
- (1) The control system shall be capable of communicating all data to a remote integrated DDC processor through a single shielded cable. The data shall include as a minimum all system operating conditions, capacity controls, and safety shutdown conditions. The control system shall also be capable of receiving at a minimum the following operating commands. The actual connection to the basewide EMCS is a part of this contract.
 - (a) Remote Unit Start/Stop

(b) Remote Chilled Water Reset

2.1.2 Do not use:

a. Packaged terminal air-conditioners - Heat pumps.

END OF CHAPTER D33

CHAPTER D34**AIR DISTRIBUTION****1. PERFORMANCE****1.1 Basic Function:**

1.1.1 Distribute air to maintain the required space conditions.

1.1.2 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter D - Services, Chapter D3 - HVAC, and Chapter D36 - HVAC Controls.

1.2 Outside Air. The building shall be provided with outside air in accordance with ASHRAE 62, latest edition, based on occupancy and/or type of space. Air distribution systems shall be designed to insure that minimum outside air requirements are provided to the building year round. Infiltration shall not be considered as supplementing the outside air requirements.

1.3 Exhaust and Relief Air. Exhaust systems shall be designed in accordance with UFC 3-410-01FA 15 May 2003. Bathroom and janitor closet areas shall be exhausted at the rate of in accordance with ASHRAE 62. All general exhaust fans shall be controlled by the building energy management and control system. Restroom ventilation exhaust fans shall be interlocked with the lighting system. Provide a return fan and maintain a slight positive pressure inside the building with respect to the outside. Monitor and control building pressure such that pressure gradients are maintained whenever the associated air handler is operational.

1.4 Vibration and Noise Isolation. All piping, ductwork, air handlers, unit heater and equipment shall be properly isolated to prevent vibration and subsequent noise limited to 10 percent transmission of the lowest equipment RPM.

1.5 Seismic Design Requirements. Protective measures shall be in accordance with UFGS Section 15070A SEISMIC PROTECTION FOR MECHANICAL EQUIPMENT

1.6 Amenity and Comfort:**1.6.1 Air Movement:**

- a. Provide an air distribution system that limits the air velocity to 50 fpm, maximum at occupied levels.
- b. Adjustments: Provide an air distribution system which allows relocating supply diffusers, adjusting direction of airflow from supply diffusers, adjusting dampers, changing the thermostat setpoint, and duct volume dampers.
- c. Substantiation:
 - (1) Occupancy: Measure air movement at work station in accordance with ANSI/ASHRAE Standard 55-1992 with Addendum in areas where more than 10 percent of the occupants are uncomfortable and adjust air distribution system to make occupants comfortable.

1.6.2 Acoustical Performance:

- a. Air Distribution Background Noise: Provide systems which comply with the acoustical requirements of Chapter C - Interiors.
- b. Air Distribution Background Noise: Provide systems which comply with the acoustical requirements of Chapter C - Interiors and the following RC Levels as defined in ASHRAE HVAC Applications Handbook, 2003. Do not exceed the sound pressure level for any octave band at the specified RC.
- c. Provide equipment with sound ratings which comply with testing and rating requirements of ARI 880-1998.
 - (1) Substantiation:
 - (a) Design Development: Equipment acoustical performance data.
 - (b) Construction: Tested and rated air terminals.

1.6.3 Cleanliness: Provide filtration of the air distributed to the occupied spaces.

- a. Filter Efficiency: 85 percent arrestance per ASHRAE Standard 52.2-1999
 - b. Filter Efficiency: 25 percent atmospheric dust-spot efficiency per ASHRAE Standard 52.2-1999.
- 1.6.4 Odor: Provide exhaust to remove odors.
- a. Toilet Room Exhaust: 50 cfm per fixture.
 - b. Janitors Closet Exhaust: 2 cfm per sq. ft.
 - c. Locker Room Exhaust: 2 cfm per sq. ft.
- 1.6.5 Appearance:
- a. Diffuser Shape: Provide square diffusers.
 - b. Diffuser Color: Provide diffusers with ceiling matching color.
- 1.7 Duct System Design. The ductwork shall be sized using the SMACNA approved methods. Size low pressure supply; return and exhaust duct systems using the equal friction method. Do not use this method for medium or high pressure systems. The static regain method of design will be used for the high pressure supply air duct. Duct locations shall be coordinated with all disciplines. All ductwork shall be galvanized sheet metal and as specified in UFGS Section 15895 - AIR SUPPLY, DISTRIBUTION, VENTILATION, AND EXHAUST SYSTEM. Flexible duct run outs shall be insulated metallic. An acoustical analysis shall be performed for each air handler and air terminal unit, to assure the minimal noise transmission to the space. The Room Criteria shall be as follows:
- 1.8 offices (open plan) RC 30-35
- 1.9 offices (private), juice bar rm., massage rm., nutrition rm., counseling rm., relaxation rm., RC 25-30
- 1.10 conference/classrooms, computer resource lab, ergometry rm., fitness testing rm., library RC 25-30
- 1.11 Circulation, Sport areas and Public Lobbies RC 35-45
- 1.12 Per the 2003 ASHRAE HVAC Applications Handbook, the ductwork shall be insulated. Ductwork, ductwork openings, and plenums shall be designed to a maximum RC of 35. Duct and air distribution devices shall meet the velocity requirement indicated in the 2003 ASHRAE Handbook.
- 1.13 Durability:
- 1.13.1 Expected Service Life Span: Provide a system which will last a minimum of 10 years in service without major repairs or operating expense.
- 1.13.2 Aesthetic Life Span: Provide units exposed within the occupied space which will not fade, chip, or peel for a minimum of 10 years.
- 1.13.3 Exposed Units within Occupied Spaces: Heavy gage, galvanized sheet steel, painted casing.
- 1.14 Operation and Maintenance:
- 1.14.1 Operating Parameters:
- a. Propeller Fans: Do not use propeller fans at static pressure above 1 inch water gage.
 - b. Duct Construction: In accordance with SMACNA HVAC Duct Construction Standards-1995 with Addendum No. 1, based on the following:
 - (1) Supply Duct Pressure Class: 2 inches w.g.
 - (2) Return Duct Pressure Class: 2 inches w.g.
 - (3) Outside Air Duct Pressure Class: 2 inches w.g.
 - (4) Exhaust Duct Pressure Class: 2 inches w.g.
 - (5) Transfer Duct Pressure Class: 2 inches w.g.
 - (6) Duct Pressure Class: 2 inches w.g. for ducts between the supply fan and the terminal boxes. All other duct applications 1 inch w.g.
 - (7) Duct Seal Class A for Duct Pressure Classes 4 inches w.g. and above.

- (8) Duct Seal Class B for Duct Pressure Classes 3 inches w.g., 2 inches w.g.
 - (9) Duct Seal Class C for Duct Pressure Class 1 inch w.g., 0.5 inches w.g.
 - (10) Substantiation:
 - (a) Design Development: Identification of ducts to be tested; all duct systems.
 - (1) Allowable Leakage Rate: Definition of leakage rates for each system to be tested.
 - (a) Duct Pressure Class 4 inches w.g. and Duct Seal Class A; Leakage Rate: 5% of the total cfm thru the duct.
 - c. Maximum Air Velocity:
 - (1) For 4 Inches W.G. Duct Pressure Class: 2000 feet per minute.
 - (2) For 3 Inches W.G. Duct Pressure Class: 1800 feet per minute.
 - (3) For 2 Inches W.G. Duct Pressure Class: 1500 feet per minute.
 - (4) For 1 Inch W.G. Duct Pressure Class: 1500 feet per minute.
 - (5) For 0.5 Inches W.G. Duct Pressure Class: 1000 feet per minute.
 - d. Fans: Match fan pressure characteristics to the air distribution system pressure characteristics including the system effect factors; pressure characteristics based on ANSI/AMCA Standard 210-1999 fan ratings and system characteristics based on engineering calculations.
 - (1) Substantiation:
 - (a) Preliminary Design: Identification of the type of fan to be used.
 - (b) Design: Calculations showing the air distribution pressure characteristics and data supporting the selection of the fan.
 - (c) Construction: Calculations showing the air distribution systems pressure characteristics; AMCA seal and ratings on each fan used.
- 1.14.2 Ease of Use: Provide units with individual controls coordinated with controls specified in Chapter D36.
- 1.14.3 Ease of Cleaning: Provide units with removable access panels to allow cleaning.
- 1.14.4 Energy Efficiency:
- a. Substantiation:
 - (1) Preliminary Design: EER for proposed equipment.
 - (2) Design Development: Manufacturers published EER for equipment selected for this project.
 - (3) Construction: Equipment with manufacturers label listing EER for equipment.
- 1.15 A emergency cutoff switch (at control room) for the air distribution system throughout the facility is required. See ATRP for details.

2. PRODUCTS

- 2.1 Equipment. All materials and equipment shall be the standard cataloged product of manufacturers regularly engaged in production of such materials and equipment, and shall be the manufacturer's latest standard design. Equipment shall comply with the requirements of Underwriters Laboratories, Inc. (UL), American Gas Association (AGA), Air Conditioning and Refrigeration Institute (ARI), American Society for Testing and Materials (ASTM), National Electric Manufacturers Association (NEMA), American National Standards Institute (ANSI), National Fire Protection Association (NFPA) or other national trade associations as applicable. Equipment selection and layout shall make provisions to observe the manufacturer's recommended clearances and code clearances.
- 2.2 Air Handling Units. Air handling units shall be as specified in UFGS Section 15895 - AIR SUPPLY, DISTRIBUTION, VENTILATION, AND EXHAUST SYSTEM. The air handling units shall be located in the mechanical rooms, mounted on reinforced concrete housekeeping pads with a 6-inch (150 mm) clear space from the unit to the edge of the pad. Provide manufacturer's recommended service clearances and a minimum of 24-inch (610 mm) clearance around the entire unit. All components of the air-handling units shall be factory installed products of the same manufacturer. Units shall be equipped with a supply fan, cooling coil, mixing box, filter sections (25-30% efficiency and 85% efficiency ASHRAE 52-76 rated), access section, (variable frequency drive (VFD) and VFD rated motor if design is enhanced with this feature). Heating and chilled water circuits to air handlers shall be supplied with isolation valves, calibrated control valves, calibrated balance valves, and temperature and pressure plugs. A condensate

drain pan shall be supplied with each unit and shall be as specified in UFGS Section 15895 - AIR SUPPLY, DISTRIBUTION, VENTILATION, AND EXHAUST SYSTEM. Condensate drains shall be coordinated with the sanitary sewer design. Air handling unit locations shall be coordinated with all disciplines. Outside air shall be supplied to each unit in accordance with the system design parameters. Coordinated the locations of relief and exhaust louvers to prevent short cycling. The outside air duct shall have heavy gage expanded metal over the wind/rain louvers to preclude direct access to the interior ductwork. The VAV system shall have a supply fan and return fan, The air handling units shall be supplied with a variable frequency drive to control supply airflow to the system VAV boxes and return air to the air handling unit. A differential pressure transducer shall be supplied to signal the speed up or slow down in response to system pressure changes. AHU supply fans shall be as specified in UFGS Section 15895 - AIR SUPPLY, DISTRIBUTION, VENTILATION AND EXHAUST SYSTEM.

- 2.2.1 Single Duct Terminal Units. The zone air distribution systems shall utilize variable air volume terminal units with hot water reheat coils. At a minimum a room shall be considered a zone. i.e. no two room will be considered a zone. The heating coil shall be hot water type and hot water piping shall be equipped with modulating control valves, isolation valves, calibrated balance valves, and temperature and pressure plugs. The air terminal units shall be as specified in UFGS Section 15895 - AIR SUPPLY, DISTRIBUTION, VENTILATION, AND EXHAUST SYSTEM. All VAV boxes shall be pressure independent units. Insulation shall be provided for each VAV box to prevent condensation on the outside of the units.
- 2.2.2 Relief Vents. Relief vents shall be provided for relief and located to prevent short circuiting of relief air into outside air intake louvers.
- 2.2.3 Louvers. Louver materials shall be as specified in the Architectural Section. Combustion air louvers shall be sized in accordance with NFPA 54. Louvers located in mechanical room doors are not permitted. All louvers shall be sized to limit the free air face velocity to a maximum of 600 feet per minute (3.05 m/s) exhaust, or 500 feet per minute (2.54 m/s) air intake. Intake air louvers for the air handlers in the mechanical room shall be located at a minimum of ten (10) feet above finished floor. Louver sizes shall be coordinated with Architectural and Structural disciplines. All louvers shall utilize bird screens.
- 2.2.4 Provide ceiling fan in the areas indicated with wall switch & 2 speed as follows: 1) Group Exercise 2) Locker Rooms 3) Senior Fitness Rooms 4) Fitness Equipment Spaces. Provide one every 250 square foot of ceiling area.
- 2.2.5 Kitchen Exhaust
 - a. The kitchen hood shall be vented and constructed in accordance with the International Mechanical Code, for Residential type hoods.
- 2.2.6 Access Panels. Access panels/doors shall be provided as required for valves and appurtenances of the HVAC system in accordance with UFGS Section 15895 – AIR SUPPLY, DISTRIBUTION, VENTILATION, AND EXHAUST SYSTEM. Coordinate with the Architectural discipline to ensure that UFGS Section 05500 - MISCELLANEOUS METAL includes provisions for access panels/doors.
- 2.2.7 Volume Dampers. Manual balancing dampers shall be furnished with accessible operating mechanisms. Where operators occur in finished portions of the building, operators shall be chromium plated with all exposed edges rounded. Splitters shall be operated by quadrant operators or 3/16-inch (5 mm) rod brought through the side of the duct with locking set screw and bushing. Two rods are required on splitters over 8 inches (200 mm). Manual volume control dampers shall be operated by locking-type quadrant operators. Dampers and splitters shall be 2 gages heavier than the duct in which installed. Unless otherwise indicated, multi-leaf dampers shall be opposed blade type with maximum blade width of 12 inches (305 mm). Access doors or panels shall be provided for all concealed damper operators and locking set screws. Unless otherwise indicated, the locking-type quadrant operators for dampers, when installed on ducts to be thermally insulated, shall be provided with stand-off mounting brackets, bases, or adapters to provide clearance between the duct surface and the operator not less than the thickness of the insulation. Standoff mounting items shall be

integral with the operator or standard accessory of the damper manufacturer. Volume dampers shall be provided on all supply ducts to diffusers, outside air, return, and exhaust ducts to ensure proper balancing and mixing within the system. Dampers integral with registers or diffusers will not be considered volume dampers for the purpose of balancing.

- 2.2.8 Fire Dampers. Fire dampers shall be fire rated according to the areas being protected. Fire dampers shall conform to the requirements of NFPA 90A, UL 555, and UBC. Fire dampers shall be installed in accordance with NFPA 90A. Fire dampers shall be automatic operating type and shall have a dynamic rating suitable for the maximum air velocity and pressure differential to which it will be subjected. Fire dampers shall be approved for the specific application, and shall be installed according to their listing.
- 2.2.9 Diffusers, Grilles and Registers. Air distribution devices shall be factory-fabricated of steel, corrosion-resistant steel, or aluminum and shall distribute the specified quantity of air evenly over space intended without causing noticeable drafts, air movement faster than 50 feet per minute (0.25 m/s) in occupied zone, or dead spots anywhere in the conditioned area. Inlets and outlets shall be sound rated and certified according to ASHRAE 70. Diffusers and registers shall be as specified in UFGS Section 15895 - AIR SUPPLY, DISTRIBUTION, VENTILATION, AND EXHAUST SYSTEM and shall be color coordinated with the Architectural design.
- 2.2.10 Fans. Fans shall be tested and rated in accordance with AMCA 210. Fans may be connected to the motors either directly or indirectly with V-belt drive. V-belt drives shall be sized for not less than 150 percent of the connected driving capacity. Motor sheaves shall be variable pitch for 11.2 kilowatts and below and fixed pitch as defined by ARI Guideline D. Variable pitch sheaves shall be selected to drive the fan at a speed which will produce the specified capacity when set at the approximate midpoint of the sheave adjustment. When fixed pitch sheaves are furnished, a replaceable sheave shall be provided when needed to achieve system air balance. Motors for V-belt drives shall be provided with adjustable rails or bases. Removable metal guards shall be provided for all exposed V-belt drives, and speed-test openings shall be provided at the center of all rotating shafts. Fans shall be provided with personnel screens or guards on both suction and supply ends, except that the screens need not be provided, unless otherwise indicated, where ducts are connected to the fan. Fan and motor assemblies shall be provided with vibration-isolation supports or mountings. Vibration-isolation units shall be standard products with published loading ratings. Each fan shall be selected to produce the capacity required at the fan static pressure as calculated. Sound power level shall be indicated. The sound power level values shall be obtained in accordance with AMCA 300.
- 2.2.11 Centrifugal Fans. Centrifugal fans shall be fully enclosed, single-width single-inlet, or double-width double-inlet, AMCA Pressure Class I, II, or III as required for the planned system pressure. Impeller wheels shall be rigidly constructed, accurately balanced both statically and dynamically. Fan blades may be forward curved, backward-inclined or airfoil shape in wheel sizes up to 30 inch. Fan blades for wheels over 30 inch in diameter shall be backward-inclined or airfoil shape. Fan wheels over 36 inch in diameter shall have overhung pulleys and a bearing on each side of the wheel. Fan wheels 36 inch or less in diameter may have one or more extra-long bearings between the fan wheel and the drive. Bearings shall be sleeve type, self-aligning and self-oiling with oil reservoirs, or precision self-aligning roller or ball-type with accessible grease fittings or permanently lubricated type. Bearing life shall be L50 rated at not less than 200,000 hrs as defined by AFBMA 9 and AFBMA 11. Fan shafts shall be steel, accurately finished, and shall be provided with key seats and keys for impeller hubs and fan pulleys. Each fan outlet shall be of ample proportions and shall be sized for the attachment of angles and bolts for attaching flexible connections. Motors, unless otherwise indicated, shall not exceed 1800 rpm.
- 2.2.12 In-Line Centrifugal Fans. In-line fans shall have centrifugal backward inclined blades, stationary discharge conversion vanes, internal and external belt guards, and adjustable motor mounts. Fans shall be mounted in a welded tubular casing. Air shall enter and leave the fan axially. Inlets shall be streamlined with conversion vanes to eliminate turbulence and provide smooth discharge air flow. Fan

bearings and drive shafts shall be enclosed and isolated from the air stream. Fan bearings shall be sealed against dust and dirt and shall be permanently lubricated, and shall be precision self aligning ball or roller type. Bearing life shall be L50 rated at not less than 200,000 hrs as defined by AFBMA 9 and AFBMA 11.

- 2.2.13 Centrifugal Type Power Wall Fans Fan shall be V-belt driven centrifugal type with backward inclined, non-overloading wheel. Motor housing shall be removable and weatherproof. Unit housing shall be designed for sealing to the building surface and for discharging any condensate accumulation away from building surface. Housing shall be constructed of heavy gauge aluminum. Unit shall be fitted with an aluminum or plated steel wire discharge bird screen, manufacturer's standard gravity damper, an airtight and liquid-tight metallic wall sleeve. Motor enclosure shall be totally enclosed fan cooled type. Lubricated bearings shall be provided.
- 2.2.14 Cabinet Exhaust Fans Suspended cabinet-type ceiling exhaust fans shall be centrifugal type, direct-driven. Fans shall have acoustically insulated housing. Integral backdraft damper shall be chatter-proof. The integral face grille shall be of egg-crate design or louver design. Fan motors shall be mounted on vibration isolators. Unit shall be provided with mounting flange for hanging unit from above. Fans shall be UL listed.
- 2.3 Air Filters Air filters shall be listed according to requirements of UL 900. Each set of filters shall have a manahelic type pressure gage.
- 2.3.1 Extended Surface Pleated Panel Filter Pre-filters shall be 2-inch depth, sectional, disposable type of the size indicated and shall have an average efficiency of 25 to 30 percent when tested in accordance with ASHRAE 52. Initial resistance at 500 feet per min will not exceed 0.36 inches. Filters shall be UL Class 2. Media shall be nonwoven cotton and synthetic fiber mat. A wire support grid bonded to the media shall be attached to a moisture resistant fiberboard frame. All four edges of the filter media shall be bonded to the inside of the frame to prevent air bypass and increase rigidity.
- 2.3.2 Extended Surface Non-Supported Pocket Filters. Filters shall be approximately 30 inch in depth, sectional, replaceable dry media type of the size indicated and shall have an average efficiency of 80 to 85 percent when tested according to ASHRAE 52.1. Initial resistance at 500 feet per minute air velocity shall not exceed 0.45 inches. Filters shall be UL Class 1. Media shall be fibrous glass, supported in the air stream by a wire or non-woven synthetic backing and secured to a galvanized steel metal header. Pockets shall not sag or flap at anticipated air flows. Each filter shall be installed with an extended surface pleated panel filter as a prefilter in a factory preassembled, side access housing or a factory-made sectional frame bank.
- 2.4 Insulation. All piping, ductwork, air handlers, pumps, and other applicable equipment shall be insulated in accordance with UFGS Section 15080A - THERMAL INSULATION FOR MECHANICAL SYSTEMS
- 2.4.1 Insulation, Heating Water Pipes. Mineral fiber shall comply with Fed. Spec. HH-I-558 and cellular glass shall comply with ASTM C 552. Heating hot water less than 4-inch in diameter shall be insulated with 2-inch mineral fiber or cellular glass. Hot water pipes 4-inch in diameter or greater shall be insulated with 2-1/2 inch thick mineral fiber or cellular glass. All pipe hangers for insulated pipes shall utilizing high-density inserts and shields (or saddles) to protect the pipe insulation.
- 2.4.2 Insulation, Cooling Ductwork. Mineral fiber shall comply with Fed. Spec. HH-I-558 and cellular glass shall comply with ASTM C 552. Sheet metal supply and return ducts shall be insulated with 2 inch thick mineral fiber, except that return ducts in plenums or conditioned spaces do not need to be insulated. Insulation shall be applied to the outside of the duct. A vapor barrier coating, with a density of 12 kilograms per cubic meter, shall be provided on all cooling and cooling/heating duct insulation.
- 2.4.3 Insulation, Chilled Water Pipes. Mineral fiber shall comply with Fed. Spec. HH-I-558 and cellular glass shall comply with ASTM C 552. Chilled water piping less than 4-inch in diameter shall be insulated with 1-inch thick mineral fiber or 1-1/2inch thick cellular glass. Chilled water piping 4-inch in diameter and larger shall be insulated with 1-1/2 inch thick mineral fiber or 2-inch thick cellular glass. Vapor

barrier coating shall be provided. All pipe hangers for insulated pipes shall utilize high-density inserts and shields (or saddles) to protect the pipe insulation.

- 2.4.4 Condensate Drain Piping and Insulation. Condensate drains from the air handling unit in the Communications rooms and ice machines rough in shall meet the requirements set forth in the International Plumbing Code. Drain piping shall be either copper, ABS, PVC, or polyethylene. If the space above the ceiling is used as an air plenum, then the pipe selection shall be limited to copper. The piping shall include a trap of sufficient depth to overcome static pressure of the unit. All piping, except in the mechanical room, shall be insulated with 1-inch thick mineral fiber or 1-1/2 inch thick cellular glass. Piping shall be extended to the floor drain or floor sink.
- 2.5 Centrifugal Fan Heaters – Heaters shall be ceiling mounted. Heating elements and fan shall be housed in steel cabinets of sectionalized steel plates or reinforced with angle-iron frames. Cabinets shall be constructed of not lighter than (18 gauge) black steel. Each unit heater shall be provided with a means of diffusing and distributing the air. Fan shall be mounted on a common shaft, with one fan to each air outlet. Fan shaft shall be equipped with self-aligning ball, roller, or sleeve bearings and accessible means of lubrication. Fan shaft may be either directly connected to the driving motor or indirectly connected by adjustable V-belt drive rated at 150 percent of motor capacity.

3. METHODS OF CONSTRUCTION

- 3.1 Construct the system using the following methods:
- 3.1.1 Use standard commercial practice in HVAC distribution construction in accordance with SMACNA standard.

END OF CHAPTER D34

CHAPTER D35**HYDRONIC DISTRIBUTION****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Distribute heating water and cooling water to maintain the required space conditions.
- 1.1.2 System(s) required include low temperature water system and chilled water system.
- 1.1.3 Configuration - All Systems: Reverse return Heating Water. Hydronic Piping Locations. Hydronic piping system shall be designed to be efficient, easily balanced, and accessible. Main piping distribution lines routed shall be minimized to supply and return service for air handling systems within those areas only, and shall be located in corridors wherever possible. Use "k" copper if the copper pipe is to be used for applications above 120 degrees F.
- 1.1.4 Where hydronic distribution elements also must function as elements defined within another element group, meet the requirements of both element groups.
- 1.1.5 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter D - Services, and Chapter D3 - HVAC.

1.2 Amenity and Comfort:

- 1.2.1 Space Temperature Control: Coordination of HVAC distribution system's design and installation with zoning and space temperature requirements specified in Chapter D36 - Controls and Instrumentation.

1.3 Durability:

- 1.3.1 Expected Service Life Span: Provide a heating water and chilled water system which will last a minimum of 10 years in service without major repairs or operating expense.
- 1.3.2 Erosion Control: Provide a means of removing air from cooling water, and heating water distribution systems to prevent erosion. Design systems in a manner to prevent cavitation.
- 1.3.3 Corrosion Control: Drain condensate from cooling coils to prevent corrosion of associated equipment.
- 1.3.4 Pipe Stress and Strain Control: Provide pipe loops, bends, expansion joints, and flexible pipe connectors to reduce stress and strain due to expansion and contraction.

1.4 Operation and Maintenance:**1.4.1 Operating Parameters:**

- a. Building Systems:
 - (1) Chilled Water System Pressure: 125 psig, maximum.
 - (2) Water Velocity: 5 feet per second, maximum.
- b. Pumps: Match pump pressure and flow characteristics with the pressure and flow characteristics of the distribution system.
 - (1) Substantiation:
 - (a) Preliminary Design: Identification of the type of pump to be used.
 - (b) Design Development: Calculations showing the hydronic distribution water flow and pressure requirements and pump data supporting pump selection.
 - (c) Construction: Calculations showing the hydronic system pressure requirements; manufacturer's pump curve for each pump used.

2. PRODUCTS

- 2.1 Water Quality and Treatment. The Contractor shall provide water treatment system for boiler water systems. The Contractor shall provide a water quality test to confirm the water quality at Hill Air Force

Base. The following items are to be confirmed with the test:

- 2.1.1 pH.
- 2.1.2 Total hardness.
- 2.1.3 Calcium hardness.
- 2.1.4 M Alkalinity.
- 2.1.5 P Alkalinity.
- 2.1.6 Chlorides.
- 2.1.7 Silica.
- 2.1.8 Specific conductance in micro-mho/CC at 70 degrees F (21 degrees C)
- 2.2 The automatic water treatment system shall bring the water to an acceptable level in accordance with base and boiler and chiller manufacturer's specifications.
 - 2.2.1 Water Treatment: The following items be included as part of water treatment for HVAC facilities:
 - a. Conductivity meters and chemical feed equipment for condenser water systems on chillers (Open loop system with cooling tower).
 - b. A pot feeder for closed loop hydronic systems (both hot and chilled water systems).
 - c. Conductivity metering and chemical feed equipment for boiler water.
 - d. All systems requiring water treatment will be designed with sampling ports for the analysis of water conditions.
 - e. The automatic water treatment system shall bring the water to an acceptable level in accordance with base and boiler and chiller manufacturer's specifications.
- 2.3 Protective Coating. Protective coatings will be applied to the following items:
 - 2.3.1 Exterior surface of underground ferrous pipes.
 - 2.3.2 Exterior and interior surface of all storage tanks, both above and below ground.
 - 2.3.3 Steel structures such as towers and equipment support stands, etc.
- 2.4 Chilled Water Distribution Piping:
 - 2.4.1 Use one or more of the following:
 - a. Pipes 2 Inches in Diameter and Smaller:
 - (1) Standard weight, continuous welded steel pipe with threaded Class 125 cast iron fittings.
 - (2) Hard copper, Type L with brazed or silver soldered wrought copper fittings.
 - b. Pipes Larger than 2 Inches in Diameter:
 - (1) Standard weight, electric resistance welded pipe.
 - (a) Joints and Fittings:
 - (1) Welded Standard Class wrought steel fittings.
 - (2) Flanged Class 150 wrought steel fittings.
 - (3) Flanged Class 125 cast iron fittings.
 - (4) Flanged Class 250 cast iron fittings.
 - (5) Grooved ductile iron fittings.
- 2.5 Heating Water Distribution Piping:
 - 2.5.1 Use one or more of the following:
 - a. Pipes 2 Inches in Diameter and Smaller:
 - (1) Standard weight, continuous welded steel pipe with threaded Class 125 cast iron fittings.
 - (2) Hard copper, Type L with brazed or silver soldered wrought copper fittings.
 - b. Pipes Larger than 2 Inches in Diameter:

- (1) Standard weight, electric resistance welded pipe.
 - (a) Joints and Fittings:
 - (1) Welded Class Standard wrought steel fittings.
 - (2) Flanged Class 150 wrought steel fittings.
 - (3) Flanged Class 125 cast iron fittings.
 - (4) Grooved ductile iron fittings.
- 2.6 Provide pipe insulation requirements per 15080A Thermal Insulation for Mechanical Systems.

END OF CHAPTER D35

CHAPTER D36**HVAC CONTROLS****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Control System. The contractor shall be responsible for correct operation of the control system including, but not limited to, software, graphics, programming, control relays and control wiring. A 40-hour training course shall be provided in accordance UFGS Section 15951A - DIRECT DIGITAL CONTROL FOR HVAC.
- 1.1.2 Temperature Controls. Temperature controls shall be direct digital co designed per industry standard and in accordance with UFGS Section 15951A Control for HVAC controls.
 - a. HVAC Control Systems: All control systems shall be direct digital control (DDC). All damper and valve actuators shall be electronic with a control signal of either 0-10 VDC or 4-20ma.
- 1.1.3 The DDC System shall be installed according to the mechanical systems listed below. The Input/Output summary sheet will apply to all equipment included in the project design control scheme.
 - a. Chillers and associated pumps
 - b. Boilers and associated pumps
 - c. Air handlers and any associated VAV boxes
 - d. Exhaust Fans
- 1.1.4 All building DDC for HVAC equipment shall be 100% compatible with the existing base-wide Energy Monitoring and Control System (EMCS). The existing system is a Dorsett's, Inc. INFO-SCAN/MicroScan system manufactured by Dorsett's, Inc., 100 Woodlyn Drive, Yadkinville, NC 27055, Phone (800) 331-7605.
- 1.1.5 The DDC components used for HVAC control shall be the Dorsett's, Inc. MicroScan DDC products and shall be completely integrated into the EMCS in building 15. All communications connections will be made by the Contractor to government furnished communications media at the nearest telephone panel. Connection is via a dedicated 4 wire circuit modem link. All pair assignments will be furnished by the Government. Modems shall be integrated into the DDC equipment panels and provided by the DDC equipment manufacturer.
- 1.1.6 The EMCS integration shall include complete installation of all hardware and software. This shall include but not be limited to an INFO-SCAN database conforming to the I/O schedule, INFO-SCAN dynamic graphic displays, and all applications programming necessary to accomplish the specified sequences of operation. All points required for operation shall be provided in software and hardware.
- 1.1.7 The Contractor shall perform a complete point-to-point test of the completed DDC/EMCS installation. The test shall be conducted by measuring each analog value with a test instrument twice as accurate as the device being measured. The test equipment shall be certified traceable to NIST standards. Each value shall be calibrated in either hardware or software to the specified accuracy. All outputs shall be exercised on/off or full scale analog to verify operation of each channel and device. All digital inputs shall be tested by exercising the connected device such as a freeze-stat, smoke detector or differential pressure switch, with a simulated input condition. Pressure switches for filter status shall be calibrated to the specified pressure using a magnehelic gauge. All test results shall be recorded and documented by the contractor and included in the Operation and Maintenance Manuals furnished to the Government.
- 1.1.8 The contractor shall provide a portable testing and troubleshooting device for use with the completed DDC/EMCS. The portable device shall be supplied with the Dorsett's, Inc. Micro-Term DDC software complete with the project's database and communications software/hardware required to communicate to the DDC/EMCS system. The device shall be delivered to the EMCS Operations office in building 15 upon completion of system testing and training.

- 1.1.9 The contractor shall provide eight hours of training for the building operations, HVAC maintenance and EMCS operations personnel. The training shall be performed after installation of the system is completed and tested. The training shall consist of instruction on the operation of the system, maintenance of the system and troubleshooting problems with the hardware and software. Instruction topics shall also include operation of the portable test device and the EMCS central installation.
- 1.1.10 The telephone number for the EMCS Operations Manager (Mr. Steve Nalder) is (801) 331-7605.
- 1.1.11 Meters: All new buildings and major renovations will have electrical, water and natural gas meters installed.
- a. All utility meters shall be 100% compatible with the existing base-wide Energy Monitoring and Control System (EMCS) for remote collection of data. Recorded values for Electricity (kwh & kw), Natural Gas (cfpm), Water (gals) will apply. The existing system is a Dorsett's, Inc. INFO-SCAN/MicroScan system manufactured by Dorsett's, Inc. 100 Woodlyn Drive, Yadkinville, NC 27055, Phone (800) 331-7605.
 - b. The consumption data shall be completely integrated into the EMCS in building 15. All communication connections will be made by the Contractor to government furnished communications media at the nearest telephone panel. Connection is via a dedicated 4 wire circuit modem link. All pair assignments will be furnished by the Government.
 - c. The EMCS integration shall include complete installation of all hardware and software if necessary. This shall include but not be limited to an INFO-SCAN database conforming to the I/O schedule, INFO-SCAN dynamic graphic displays, and all applications programming necessary to accomplish the specified sequences of operation. All points required for operation shall be provided in software and hardware.
 - d. The Contractor shall perform a complete point-to-point test of the completed EMCS Installation. The test shall be conducted by measuring the digital input pulse value with a test instrument twice as accurate as the device being measured. The test equipment shall be certified traceable to NIST standards. The value shall be calibrated in either hardware or software to the specified accuracy. Digital input pulse signal shall be tested by exercising the connected metering device with a simulated input condition. All test results shall be recorded and documented by the contractor and included in the Operation and Maintenance Manuals furnished to the Government.
 - e. The telephone number for the Base Utility Manager (Mr. Dave Abbott) can be reached at (801) 777-5944.
- 1.1.12 Provide the elements necessary to control the building's indoor environment.
- a. Provide a building control system which controls the indoor environment, manages energy consumption, schedules preventative maintenance, controls interior lighting, controls exterior lighting, integrates fire alarm and security functions, monitors fuel consumption, monitors water usage, and monitors packaged equipment controls. Specify local thermostat, pressure gages etc for each monitoring & control point.
 - (1) Provide a thermostat for each room to maintain the required space conditions.
 - (2) Provide monitoring of major pieces of HVAC equipment. (include exhaust fan, unit heater, split dx units, etc)
 - (3) Monitor the following equipment:
 - (a) Air terminals.
 - (b) Air handlers.
 - (1) On-off status.
 - (2) Entering & mixed air temperature.
 - (3) Leaving air temperature.
 - (4) Entering chilled water temperature.
 - (5) Leaving chilled water temperature.
 - (6) Entering heating water temperature.
 - (7) Leaving heating water temperature.
 - (8) Supply fan airflow.
 - (9) Return fan airflow.

- (10) Outside airflow.
 - (11) Filter static pressure.
 - (c) Chillers.
 - (1) On-off status.
 - (2) Entering chilled water temperature.
 - (3) Leaving chilled water temperature.
 - (4) Entering condenser water temperature.
 - (5) Leaving condenser water temperature.
 - (6) Percent of full load.
 - (7) Chilled water flow.
 - (8) Safety controls.
 - (d) Boilers.
 - (1) On-off status.
 - (2) Safety controls.
 - (e) Pumps: On-off status.
 - (4) Control the following equipment:
 - (a) Air terminals.
 - (b) Air handlers.
 - (1) Start-stop.
 - (2) Entering air temperature.
 - (3) Leaving air temperature.
 - (4) Entering chilled water temperature.
 - (5) Leaving chilled water temperature.
 - (6) Leaving heating water temperature.
 - (7) Supply fan airflow.
 - (8) Return fan airflow.
 - (9) Outside airflow.
 - (10) Filter static pressure.
 - (c) Chillers.
 - (1) Start-stop.
 - (2) Entering chilled water temperature.
 - (3) Leaving chilled water temperature.
 - (4) Safety controls.
 - (d) Boilers.
 - (1) Start-stop.
- 1.1.13 Where control and instrumentation elements also must function as elements defined within another element group, meet the requirements of both element groups.
- 1.1.14 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter D - Services, and Chapter D3 - HVAC.
- 1.2 Amenity and Comfort:
- 1.2.1 Zoning and Space Temperature Control:
- a. Single thermostat and terminal unit or multiple thermostat and terminal unit each space.
 - b. Substantiation:
 - (1) Preliminary Design: Plans indicating occupancy types with special HVAC requirements shown.
 - (2) Design Development: Documents showing zoning, equipment locations, and air distribution. Equipment cut sheets.
 - (3) Construction: Testing, adjusting, and balancing report indicating initial airflow, final airflow, initial temperature, and final temperature of each conditioned space. Measurement of parameters during summer when the outside air temperature is within 10 percent of the summer design conditions, and during the winter when the outside air temperature is within 10 percent of the winter design conditions.

- (4) Construction: Report conforming to the requirements of AABC Test & Balance Procedures-1989, Fifth Edition.

1.3 Health and Safety:

- 1.3.1 Life Safety: Provide interconnection and coordination of HVAC controls with other life safety systems.
- 1.3.2 Fire Sources: Provide products which are rated for the specific locations where they are installed.

1.4 Durability:

- 1.4.1 Expected Service Life Span: Provide a system which will last a minimum of 10 years in service without major repairs or operating expense.
- a. Substantiation:
- (1) Design Development: Identification of a similar system in use in an existing facility for 3 years and manufactured by the existing controls system manufacturer.
- 1.4.2 Vandalism: Protect the system field panels from unauthorized access.
- 1.4.3 Accidental Damage: Protect thermostats from accidental damage.

1.5 Operation and Maintenance:

- 1.5.1 Energy Efficiency: Provide the following control functions or features:
- a. Holiday scheduling.
 - b. Night setback.
 - c. Outside air economizer.
 - d. Boiler staging.
 - e. Chiller staging.
 - f. Chilled water temperature reset.
 - g. Heating water temperature reset.
 - h. Variable speed pumping.
- 1.6 Testing, Adjusting, and Balancing. Testing, adjusting, and balancing shall be in accordance with UFGS Section 15990A - TESTING, ADJUSTING, AND BALANCING OF HVAC SYSTEMS.
- 1.7 Commissioning of HVAC Systems. Commissioning of HVAC system shall be in accordance with UFGS Section 15995A - COMMISSIONING OF HVAC SYSTEMS.

2. PRODUCTS

2.1 Building Control System Types:

- 2.1.1 Do not use:
- a. Pneumatic system.
 - b. Combination DDC/pneumatic system.
 - c. Electronic control system Single Loop Digital Control Systems.

3. METHODS OF CONSTRUCTION

3.1 Construct the system using the following methods:

- 3.1.1 Use direct digital control system.

3.2 Do not use any the following methods or procedures:

- 3.2.1 _Pneumatic control system.

END OF CHAPTER D36

CHAPTER D39**OTHER EQUIPMENT****1. PERFORMANCE**

1.1 Basic Function:

1.1.1 Provide equipment to maintain space conditions as indicated in the project program and as follows:

1.2 Sauna Heaters & Controls

1.2.1 Heaters shall be rust resistant material (stainless steel body and stainless steel heating elements), UL listed, and rock capacity with rocks in direct contact with the heating elements. Designed for commercial use.

1.2.2 Minimum 130 lbs of sauna stones

1.2.3 Separate wall mounted controls

a. Control with 9+1 timer (60 minutes on with 9 hour delay), thermostat, light switch and indicator light.

1.3 Steam Generators and Controls

1.3.1 ASME certified low-pressure vessel

1.3.2 NRTL Approved

1.3.3 All steel Construction with powder coat finish and stainless steel feet to prevent corrosion

1.3.4 controlled individually with optional low-voltage on/off control

1.3.5 room "over-temperature shut down" turns boiler elements off and indicators to show alarm

1.3.6 two or three wire alarm circuit switching provides for remote monitoring. Provides short bursts of steam when desired-imple push button in the steam room to provide a 15 to 20 second burst of steameven if the room is at set temperature and not calling for steam

1.3.7 Auto-blow down pressurized flush/drain system, on separate clock

1.3.8 Alarm circuit incorporate high temperature alerts, panic buttons, etc

1.3.9 external control system include indicator light-to show when bath is on.

1.4 Provide electrical power to the sauna heaters and steam generators.

1.4.1 Provide duress switch in the sauna and steam room. The information shall be transmitted to the control room and reception desk area.

1.5 Health and Safety:

1.5.1 Electrical Shock Prevention:

END OF CHAPTER D39

CHAPTER D4**FIRE PROTECTION****1. PERFORMANCE****1.1 Basic Function:**

1.2 General Fire Protection: Fire protection systems will be provided in accordance with UFC 3-600-01, Design: Fire Protection Engineering for Facilities & National Fire Protection Association (NFPA) standards. All new dry/wet fire suppression systems using water only as a fire suppressant shall have an approved double check valve backflow preventer. All new antifreeze loops shall have an approved reduced-pressure-principle backflow preventer to isolate the antifreeze loop from the rest of the fire suppression system. All aboveground sprinkler piping shall be Sch 40 black steel pipe. All control valves require a tamper switch. Each riser will have a separate flow switch for each floor level and each riser. Buried fire protection water service lines shall be buried at least 5 1/2-feet below grade. Fire sprinkler piping will be located in a heated area or in an insulated attic where temperatures are assumed not to drop below 40 degrees F. HALON type fire suppression system shall not be used. Sprinkler piping subject to temperatures below 40 deg F shall be Dry Pipe or AntiFreeze system.

1.3 Materials and Equipment. Materials and equipment shall be standard catalog products of manufacturers regularly engaged in production of such materials. All selected equipment shall be manufacturer's latest standard model. Materials and equipment shall have been tested by Underwriters Laboratories (UL) and listed in UL-04 or approved by Factory Mutual (FM) and listed in FM P7825.

1.4 Submittals. Submittals shall be provided by the Contractor to the Contracting Officer for approval in accordance with Specification Section: 01330 SUBMITTAL PROCEDURES which is included in this document in the Technical Specifications of the Statement of Work.

1.5 Designer Qualifications All hydraulic calculations and drawings showing the layout of the sprinkler system shall be done by a registered Fire Protection Engineer, a registered professional engineer shall meet the qualification stated in the UFC 3-600-01 17 April 2003. Written proof of registration and experience shall be submitted to the Contracting Officer for approval.

1.6 Calculations, Drawings, and Specifications Installation of fire protection equipment shall not begin until such time that the calculations, drawings, and specifications have been reviewed and approved as indicated above.

1.7 Operation & Maintenance (O&M) Manuals Six (6) complete copies of an O&M manuals in bound 8-1/2 inch by 11 inch booklets shall include a brief description of all equipment and their basic operating features, piping and equipment layouts, the manufacturer's name, model number, service manual, parts list and simplified wiring and control diagrams of the systems as installed. In addition, the booklets shall list step-by-step procedures required for system startup, operation, shutdown, routine maintenance procedures, possible breakdowns and repairs, and a trouble shooting guide.

1.8 Occupancy Ratings: The occupancy ratings shall be as stated in the Unified Facilities Criteria (UFC 3-600-01 17 April 2003).

1.9 Hydraulic Calculations. Hydraulic calculations shall be based on a static pressure and a residual pressure. The Contractor shall minimize the pressure drop from the Base water main point-of-connection, by doing things like increasing line sizes, reducing sprinkler head spacing, and providing low pressure drop backflow preventers, in order to meet the specified densities/area requirements with the available water supply. In all cases, sprinkler and hose stream demands shall be assumed to take place simultaneously. Calculations shall be based on the hydraulically most remote 3000 square feet, with a hose stream flow per the UFC-600-01. The hose stream flow shall be assumed to exist at the base of the riser.

1.9.1 Hydrant No. 3-11 Static 70 psi & Residual 62 psi @ 1063 gpm

- 1.10 Fire Riser and Fire Department Connection The riser(s) assembly shall be installed above grade in the mechanical room and shall be a minimum of 6-inch in diameter. The riser shall comprise of a pressure gauge, O.S.&Y. supervised control valve, second pressure gauge, third pressure gauge, main sprinkler system drain, and water flow indicator. A common 4-inch check valve connected to a 2-1/2 inch x 2-1/2 inch x 4 inch fire department connection shall serve all the risers in the new mechanical room. Also, an FM approved double check valve backflow assembly shall separate the riser assemblies from the potable water main. A test header will be provided to test the double check valve backflow assembly at full design flow. Flow indicator shall be connected to a local-alarm circuit, transmitted-alarm circuit, and power-supply circuit.
- 1.11 Local Fire Alarm Building exterior fire alarm indication shall be by an electrically operated bell located on an outside wall adjacent to the sprinkler riser. The transmitted alarm signal to the main fire station shall be under the electrical portion of this contract.
- 1.12 Sprinkler Heads Sprinkler heads in T-bar ceilings, unless indicated otherwise, shall be centered on the ceiling tiles in one direction. The sprinkler temperature ratings shall be suitable for the hazard being protected.
- 1.13 Areas With Finished Ceilings Sprinkler heads in areas with suspended or gypsum board ceilings shall be the concealed type. Sprinkler heads in light hazard areas shall be quick response type.
- 1.14 Exterior Areas and Areas Without Finished Ceilings Areas without suspended or gypsum board ceilings such as mechanical rooms, electrical rooms, com rooms, activity areas, etc. shall be upright type sprinkler heads. Sprinklers shall be the quick response type.
- 1.15 In the racket ball courts and gym sprinkler shall be protected by a pendent sprinkler guard.
- 1.16 Fire Protection: Fire protection systems will be designed and installed in accordance with Air Force Regulations and National Fire Protection Association (NFPA) standards. All new dry/wet fire suppression systems connected to potable water supplies and using water only as a fire suppressant shall have an approved double check valve backflow preventer and test station. All new dry/wet fire suppression systems connected to potable water supplies and using water with antifreeze or other chemical as a fire suppressant shall have an approved reduced pressure principle backflow preventer and test station. Installation of a backflow preventer in a vertical position shall be approved by the by the State of Utah. All sprinkler systems will be hydraulically designed as per NFPA 13. All aboveground sprinkler piping shall be Sch 40 black steel pipe, Sch 40 galvanized steel pipe, or Type 'K' copper tubing. All fire suppression control valves including post indicator valves (PIV's) require tamper switches. Buried fire protection water service lines shall be buried at least 5 1/2-feet below grade. Fire sprinkler piping will be located in a heated area or in an insulated attic where temperatures are assumed not to drop below 40 degrees F. HALON type fire suppression system shall not be used.
- 1.17 Provide services systems to protect life and property.
- 1.18 Fire protection comprises the following elements:
 - 1.18.1 Fire Detection and Alarm D43: Elements required to detect fires and communicate fire location to building occupants, building management, and public fire fighting agencies.
 - 1.18.2 Fire Protection Specialties D45: Elements required for manual fire-fighting by occupants.
- 1.19 Water Use:
 - 1.19.1 Provide a water supply to sprinkler systems that is sufficient to extinguish fires inside the structure.
- 1.20 Where fire protection elements also must function as elements defined within another element group, meet the requirements of both element groups.
- 1.21 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance and Chapter D - Services.

2. AMENITY AND COMFORT:

- 2.1 Leakage: Provide systems that are leak-free.
- 2.2 Accessibility: Provide clearances around system components for service and use.
- 2.3 Sound: Provide audible alarm system to signal building occupants of fire hazard.
- 2.4 Convenience: Provide an automatic system to signal building occupants of fire.
- 2.5 Hazards: Provide systems which minimize risk of injury and damage to property.
- 2.6 Substantiation:
 - 2.6.1 Preliminary Design: Fire protection areas identified.
 - 2.6.2 Design Development: Fire protection zones indicated on the drawings with riser locations identified.
 - 2.6.3 Construction: Functional performance testing in accordance with code.

3. HEALTH AND SAFETY:

- 3.1 Path of Egress: Provide systems which safeguard path of egress.
- 3.2 Fire Source: Provide system materials which do not contribute to the spread of the fire.
- 3.3 Fire Spread: Provide systems to limit spread of fire from storage area to office area.

4. STRUCTURAL:

- 4.1 Seismic Design: Provide support systems which sustain static (dead) loads twice the wet weight of the system.

5. DURABILITY:

- 5.1 Vandalism: Provide systems which are tamper-resistant.

6. OPERATION AND MAINTENANCE:

- 6.1 Ease of Use: Provide easy access to and working clearances around system components.
- 6.2 Unauthorized Use: Provide systems which minimize activation and use by unauthorized persons.
- 6.3 Substantiation:
 - 6.3.1 Preliminary Design: System layout indicating operator interface locations.
 - 6.3.2 Design Development: System equipment locations indicated on the drawings and manufacturer's product data indicating products to be used.

7. PRODUCTS**8. METHODS OF CONSTRUCTION**

- 8.1 Construct using the following methods:
 - 8.1.1 Commercial standard for construction of automatic sprinkler system in accordance with NFPA 13 code.

END OF CHAPTER D4

CHAPTER D43**FIRE DETECTION AND ALARM****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide automatic fire detection and automatic alarm systems as required by code and as follows:
- 1.1.2 In addition to protected premises system(s), provide a new on-premises supervising station with connection between protected premises and supervising station by same method currently used for other buildings.
- 1.1.3 Integrated systems performing all functions are preferred, subject to requirements of code for separated, independent systems.
- 1.1.4 Where fire detection and alarm elements also must function as elements defined within another element group, meet the requirements of both element groups.
- 1.1.5 Provide tamper switch for all valves at the riser and PIV located outside of the facility.
- 1.1.6 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter D - Services, and Chapter D4 - Fire Protection.

1.2 Health and Safety:

- 1.2.1 Detection, Alarm, Notification Methods: In accordance with NFPA 72-2002.
 - 1.2.2 Evacuation Plan: Multiple smoke zones and alarm notification of any zone or combination of zones in addition to general evacuation of entire premises.
 - 1.2.3 Provide a fire alarm remote monitor panel located at the entry area.
 - 1.2.4 Detection:
 - a. Upon detection of fire or smoke condition, automatic notification of occupants, building operations staff, and owner's central emergency staff.
 - 1.2.5 Alarms:
 - a. Manual stations at minimum of 150 feet intervals along means of egress paths.
 - b. Audible Alarms: Minimum of 15 dB over ambient noise, audible throughout common areas and means of egress.
 - c. Visual alarms, in locations required by code and public toilets and corridors.
 - d. Separate audible and visual signals for alarms and trouble notification in corridors.
 - 1.2.6 Fire Protection Controls:
 - a. Provide connections between alarm and detection system and fire suppression system activation sensors.
 - b. Upon Alarm: Shut down or deactivate the following:
 - (1) HVAC air distribution.
 - 1.2.7 Audible and visual trouble notification of operations staff, for alarm zone failures, annunciator zone failures, ground faults, backup power failure, water supply equipment failures.
 - 1.2.8 Error and Failure Prevention: Hard wired system; "tamper" sensors at sensitive points; products of only one manufacturer or certified by manufacturer as compatible.
- 1.3 Operation and Maintenance:**
- 1.3.1 Power Supplies:
 - a. Dedicated Battery Backup Power: For:
 - (1) Storage batteries shall be provided and shall be the sealed type requiring no additional water.

The batteries shall have ample capacity, with primary power disconnected, to operate the fire alarm system for a period of 24 hours. Following this period of operation via batteries, the batteries shall have ample capacity to operate all components of the system, including all alarm notification appliances in the total alarm mode for a minimum period of 5 minutes. Batteries shall be sized to deliver 50 percent more ampere/hours than required for the calculated capacities.

2. PRODUCTS

2.1 Control Systems for All Applications:

2.1.1 Use one of the following:

- a. Microprocessor-based hardware. Addressible fire alarm control panel.
- b. Transceiver shall be BT2-8 compatible with the Base existing Monaco D-700 radio monitoring system.

2.2 Fire/Smoke Detectors:

2.2.1 Use one of the following:

- a. Photoelectric smoke detectors.

2.3 Warning Devices:

2.3.1 Use one of the following:

- a. ~~Horns.~~
- b. ~~ADA Strobes.~~
- e-a. Combination horn/strobes.

END OF CHAPTER D43

CHAPTER D45**FIRE PROTECTION SPECIALTIES****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide equipment and fixtures to facilitate manual fire-fighting in accordance with the code.
- 1.1.2 Fire protection specialties comprise the following elements:
 - a. Cabinets for storage of Fire extinguishers
 - b. Knox Box
 - c. Fire protection specialties that will be provided by Government include:
 - (1) Fire extinguishers.
- 1.1.3 Provide portable fire extinguishers throughout the facility, of the type and size and in the locations required by NFPA 10-2002.
- 1.1.4 Where fire protection specialty elements also must function as elements defined within another element group, meet the requirements of both element groups.
- 1.1.5 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter D - Services, and Chapter D4 - Fire Protection.
- 1.1.6 Substantiation:
 - a. Design Development: Types, locations, and calculations of travel distances.

1.2 Amenity and Comfort:

- 1.2.1 Appearance: Extinguishers installed in wall-mounted brackets are not acceptable in appearance.

1.3 Health and Safety:

- 1.3.1 Accident Prevention:
 - a. Locate extinguishers and cabinets so that means of egress is not impeded, in accordance with code.
- 1.3.2 Fire Safety: Mount extinguishers in permanent location using mounting fixtures that will inhibit casual removal but allow ready use in case of fire.

1.4 Durability:

- 1.4.1 Expected Service Life Span: Same as life span of building.
- 1.4.2 Durability: As specified for interior fixtures in Chapter C.

1.5 Operation and Maintenance:

- 1.5.1 By-Products: Select extinguishing agent to minimize adverse effects of use on building equipment and finishes.
- 1.5.2 Ease of Use: For extinguishers intended for the use of occupants other than trained fire brigade members, weight of extinguisher may not exceed 12 pounds.
- 1.5.3 Ease of Alteration: Locate extinguishers and cabinets so that minor relocation of rooms and spaces normally expected during occupancy do not result in violation of the location requirements of NFPA 10-2002.

2. PRODUCTS**2.1 Cabinets:**

- 2.1.1 Use the following:

- a. Painted steel cabinets with vision panels and friction type latching device on cabinet door. Semi flush mounted. Shall be able to hold a 15# dry chemical fire extinguisher. Color: White.

2.1.2 Do not use:

- a. Painted steel cabinets.
- b. Aluminum cabinets.
- c. Stainless steel cabinets.
- d. Wood cabinets.

2.2 Knox Box

2.2.1 Use the following:

- a. Painted box that is approved by the Hill AFB Fire Department.

END OF CHAPTER D45

CHAPTER D5**ELECTRICAL POWER****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide electrical power with the appropriate characteristics to operate all electrically operated devices, including those in other services.
- 1.1.2 The electrical system comprises the following elements:
 - a. Service and Distribution (D52): Service entrance equipment, distribution equipment, transformers, motor control equipment, service and feeder wiring (conductors and raceways), monitoring, safety and control equipment, and other elements required for a complete functional system.
 - b. Branch Circuits (D53): Branch circuit wiring and receptacles and other branch circuit wiring systems.
 - c. Other Electrical Power Elements (D59).
- 1.1.3 Utility Revenue Meters: Meter incoming electrical service on the low-voltage side of the service transformer (secondary metering).
- 1.1.4 Where electrical power elements also must function as elements defined within another element group, meet the requirements of both element groups.
- 1.1.5 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Base Facility Design Standard and Chapter D - Services.

END OF CHAPTER D5

CHAPTER D52**SERVICE AND DISTRIBUTION****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Distribute electric power for equipment circuits, lighting circuits, receptacle circuits, and electrical utilization devices.
- 1.1.2 Main Electrical Service: Provide the service transformer to convert the utility distribution voltage to the building's utilization voltage.
- 1.1.3 The new Fitness Center shall be serviced with a new pad mounted transformer. The primary source available for the new Fitness Center is from an existing padmounted switch located around the new Fitness Center site near 11th Street. The existing padmounted switch shall be relocated to clear the new Fitness Center footprint. Reconnect all existing circuits to the relocated existing padmounted switch, except the feeder to the "Bubble". Provide a new feeder from the "Bubble" circuit in the existing relocated padmounted switch to a new padmounted switch located near the new Fitness Center for servicing the new padmounted transformer. Reconnect the existing "Bubble" feeder from the existing "Bubble" transformer to the new padmounted switch. Provide one spare circuit in the new padmounted switch. See attachment No. 18 for general guide. All existing and new primary underground service shall be clear or route away from the new facility foot print.
- 1.1.4 Primary Voltage: The Primary voltage at Hill AFB is 12,470 volts.
- 1.1.5 All new high voltage cable shall be 15 KV, 133 percent insulation, shielded, with EPR insulation.
- 1.1.6 Panelboard Locations: Locate panelboards in electrical rooms on each floor.. Do not locate panelboards in public corridors, hallways, or stairwells.
 - a. Provide separate panelboards for lighting, receptacles, and mechanical equipment.
- 1.1.7 Where service and distribution elements must also function as elements defined within another elements group, meet requirements of both groups.
- 1.1.8 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter D - Services, and Chapter D5 - Electrical, and attached Base Facility Design Standard dated 11 Mar 2004.

1.2 Health and Safety:

- 1.2.1 Protection from Breakage: Locate service and distribution equipment in closets and electrical rooms.
- 1.2.2 Intrusion: Protect electrical distribution equipment from unauthorized access and vandalism.

2. PRODUCTS

- 2.1 Transformers: All new transformers shall be 3-phase pad mounted. Primary voltage is 12470 volts delta primary. Transformers shall have loop feed with elbow arrestors, dead front, bushing wells with inserts installed, 4 hole spades, 3-phase gang operated on/off loadbreak switch, bayonet fusing, top level oil temperature gages, liquid level & pressure vacuum gages, drain valve with sampler, copper windings and two each 2-1/2% taps above and below normal. This will assure that the user voltage can be regulated within proper limits. All transformer manufacturers selected will have an authorized rewind shop within 50 miles of Hill Air Force Base.
- 2.2 Branch Circuit Panelboards:
 - 2.2.1 Busbars:
 - a. Use one of the following:
 - (1) Copper.

END OF CHAPTER D52

CHAPTER D53**BRANCH CIRCUITS****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Power: Provide adequate electrical power and safe and efficient distribution from panelboards to lighting, wiring devices, equipment, and appliances, based on the project program, other requirements and as follows:
- 1.1.2 Branch circuits comprise the following elements:
- a. Branch circuit breakers.
 - b. Conductors and cable from panelboards to fixtures, wiring devices, and mechanical equipment.
 - c. Raceways and boxes.
 - d. Wiring devices, including, but not limited to, receptacles, floor boxes and plates, wall switches, wall dimmers, remote control switching devices, and wall plates.
 - e. Provide GFCI receptacles for all hair dryers, wet location, and receptacles located in the locker rooms.
 - f. Provide lock out and tag out provision for all electrical panels and equipment.
 - g. Power for scoreboards, scoreboard controller and control wiring.
 - h. Power for the shot clocks and control wiring.
 - i. Power and control for bleachers, basketball backboards, curtains, and digital clock at the elevated indoor running track(option).
 - j. Provide power for three fitlinxx kiosks. 1.) Electrical outlets can be mounted either on the wall or the floor, but they shall be recessed and flush with the finished floor or wall to provide a flat surface for the Fitlinxx power plug. Recessed receptacles not flush with the finished floor or wall and with built-in flip-up doors will not work. Unused outlets on the circuit must be protected with insulating safety plastic plug and even with the outlets. Doing so prevents vacuum cleaners and other powered tools from connecting to the dedicated electrical circuit and causing damage to the system. All Fitlinxx equipment circuits must be dedicated to the Fitlinxx system. 2.) Each kiosk requires one dedicated 120 VAC / 20-amp circuit with one duplex circuit. Each electrical outlet must be located within three feet of the kiosk to ensure power cord reach and reduce trip hazard. 3.) Provide one dedicated 120 VAC / 20-amp circuit on one duplex outlet at the communication room for the fitlinxx server system. The outlet must be located within three feet of the network rack.
 - k. Provide minimum two dedicated 120 VAC / 20-amp wall mounted duplex receptacles in the communication for the communication equipment.
 - l. Provide dedicated circuit for each piece of cardio equipment and the actual receptacle configuration required per the equipment manufacturer recessed in the floor. The recessed receptacle should be located at the front of the machine and not creating a hazard for the exercising person.
 - m. Provide dedicated circuit for microwave, range top, oven stove, and dishwasher in the 'hawc' area.
 - n. Provide ceiling recessed power receptacle for ceiling mounted projector and provide empty conduit system from ceiling mounted projector to a floor recessed outlet box with pullwire for future installation of control wiring.
 - o. Provide power for ceiling fans with local 3 speed control mounted on wall.
 - p. Provide power and control for the coiling door at delivery area and coiling grilles at juice bar. The electrical controls shall have manual override.
 - q. Provide power for ice machine and all electrical appliances in the "juice bar" area.
 - r. Provide recessed power outlets for all television locations.
 - s. Pre-wire power for the outside marquee. Marquee will be purchased and supplied by the User. Outside marquee is manufactured by Young Signs Inc.
 - t. Provide floor recessed receptacles all along the outside walls of the cardio room at 6'-0" on center (for future possible cardio equipment).
 - u. Provide floor recessed receptacles along 1 wall at the free weight room and the machine weight

room. Provide the receptacles at 6'-0" on center.

- 1.1.3 Where branch circuits are integral with elements defined within another element group, meet requirements of both element groups.
- 1.1.4 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter D - Services, and Chapter D5 - Electrical Power, and attached Base Facility Design Standard dated 11 Mar 2004..
- 1.2 Amenity and Comfort:
 - 1.2.1 Accessibility: Comply with ADA Accessibility Guidelines and the following:
 - a. Location: Where ADA accessible devices are required, mount devices no higher than 48 inches and not less than 15 inches above the finished floor.
 - 1.2.2 Convenience:
 - a. Provide convenience receptacles at intervals no greater than 10 feet along the base of all wall areas including the gym areas.

END OF CHAPTER D53

CHAPTER D6**ARTIFICIAL LIGHTING****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide artificial means of lighting interior and exterior spaces.
- 1.1.2 Artificial lighting comprises the following elements:
 - a. Interior Lighting (D61): General room lighting, emergency lighting, and accent lighting.
 - b. Exterior Area Lighting (D62): General lighting of exterior spaces including walkways, parking areas, and security. Provide bollards for walkways near the facility.
 - c. Athletic Lighting (D63): Lighting for interior and exterior athletic activities.
- 1.1.3 Design lighting in accordance with recommendations of the following: IES Lighting Handbook
- 1.1.4 Where artificial lighting elements also must function as elements defined within another element group, meet the requirements of both element groups.
- 1.1.5 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance and Chapter D - Services.

1.2 Amenity and Comfort:

- 1.2.1 Light Levels: Provide maintained average illuminance values for all spaces that are based on the primary visual tasks to be accommodated, IES Lighting Handbook and are not less than the following, when measured at task height:
 - a. Category B (Lobbies and other spaces characterized by short stays and the need for simple orientation): General lighting throughout space of 5 fc.
 - b. Category C (Working spaces where simple visual tasks are performed): General lighting throughout space of 10 fc.
 - c. Category D (Spaces requiring performance of visual tasks of large size and high contrast): Task illumination of 30 fc.
 - d. Category E (Spaces requiring performance of visual tasks of high contrast and small size, or low contrast and large size): Task illumination of 50 fc.
- 1.2.2 Light Quality: Provide luminous environment in each space that is designed to complement the functions and the character of the space.

END OF CHAPTER D6

CHAPTER D61**INTERIOR LIGHTING****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide artificial lighting for all interior spaces that is adequate in quality and distribution for the performance of tasks typical for the type of space and the characteristics of the intended population, regardless of the availability of natural light.
- 1.1.2 Interior lighting comprises the following elements:
 - a. Luminaires for general illumination.
 - b. Accent lighting.
 - c. Emergency lighting.
 - d. Illuminated exit signs shall be green 'LED' type.
 - e. Ceiling grid troffer lights is acceptable to be 2'x4' as well as 2'x2'. Troffer luminaire fixtures shall be parabolic type fixtures with minimum of 24 cells if a 2'x4' fixture is used.
 - f. Provide adjustable lighting level control for the massage room and relaxation area.
- 1.1.3 Where artificial lighting is integral with elements defined within another element group, meet requirements of both element groups.
- 1.1.4 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Base Facility Design Standard, Chapter D - Services, and Chapter D6 - Artificial Lighting.

1.2 Amenity and Comfort:

- 1.2.1 Accessibility: Comply with ADA Accessibility Guidelines and the following:
 - a. Location: Where accessible lighting controls are required, provide devices that are mounted so they can be reached from a wheelchair and are not more than 54 inches and not less than 15 inches from the floor.
 - b. Operating Force: Where accessible lighting controls are required, provide controls that can be operated without tight grasping or pinching and by a force of not more than 5 lbf.
- 1.2.2 Light Levels: In compliance with Chapter D6.

1.3 Health and Safety:

- 1.3.1 Emergency Lighting: Provide emergency lighting that complies with code.
 - a. In addition to exit signs and means of egress lighting, provide emergency illumination of not less than 1 fc for a minimum of 1 hour in primary spaces.

1.4 Operation and Maintenance:

- 1.4.1 Power Consumption and Efficiency: Comply with requirements of Chapter D6 - Artificial Lighting and the following:
 - a. Lighting Controls: Provide level of control of lighting appropriate to type of space and Government's requirements for energy conservation.
 - b. Occupancy Controls: Provide lighting circuits for private offices that are controlled by devices that do not require action by occupants.
 - (1) All restroom ventilation system shall be linked with the local restroom lighting system. (ie lights "ON" fan "ON" lights "OFF"
 - c. Ballasts: Provide electronic or energy efficient ballasts with fluorescent lamps.

END OF CHAPTER D61

CHAPTER D62**EXTERIOR AREA LIGHTING****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide artificial lighting for exterior spaces, as required by the project program, that is adequate in quantity, quality, and distribution for the performance of tasks typical for the type of outdoor space and the characteristics of the intended user population.
- 1.1.2 Exterior area lighting comprises the following elements: Exterior luminaires, poles, standards, or other means of mounting the luminaires, power supply, and controls.
- 1.1.3 Where exterior area lighting is integral with elements defined within another element group, meet requirements of both element groups.
- 1.1.4 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Base Facility Design Standard, Chapter D - Services, and Chapter D6 - Artificial Lighting.

1.2 Amenity and Comfort:

- 1.2.1 Light Levels: Provide maintained average illuminance values for exterior spaces that are based on the primary visual tasks to be accommodated and are not less than the following, when measured at grade:
 - a. Parking Lots, High Activity: 1.5 fc, maximum uniformity ratio (average to minimum) of 4:1.
 - b. Parking Lots, Medium Activity: 1.0 fc, maximum uniformity ratio (average to minimum) of 4:1.
 - c. Parking Lots, Low Activity: 0.6 fc, maximum uniformity ratio (average to minimum) of 4:1.
 - d. Building Entrance Areas: 4 fc, maximum uniformity ratio (average to minimum) of 4:1.

1.3 Structure:

- 1.3.1 Provide poles for parking lot area lighting that are located to avoid damage by automobiles, mounted to bases that are structurally capable of withstanding moderate impact, or protected by bollards or similar structures.
- 1.3.2 Provide mounting system for exterior area lighting that is capable of withstanding 3-second wind gusts in excess of 120 mph.

1.4 Operation and Maintenance:

- 1.4.1 Minimum Outdoor Operating Temperature: Provide lighting systems that operate at temperatures as low as -20 degrees F.
- 1.4.2 Power Consumption and Efficiency: Comply with requirements of Chapter D6 - Artificial Lighting.
 - a. Lighting Controls: Provide daylight sensing controls, on-off switches, and programmable timing.

2. PRODUCTS**2.1 Lamps:**

- 2.1.1 Use one of the following types:
 - a. High pressure sodium lamps.

END OF CHAPTER D62

CHAPTER D63**ATHLETIC LIGHTING****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide artificial lighting for athletic activities, as required by the project program, that is adequate in quantity, quality, and distribution for the intended activities and the characteristics of the intended user population.
- 1.1.2 Athletic lighting comprises the following elements: luminaires, standards and other means of mounting the luminaires, power supply, and lighting controls.
- 1.1.3 Where athletic lighting is integral with elements defined within another element group, meet requirements of both element groups.
- 1.1.4 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter D - Services, and Chapter D6 - Artificial Lighting.

1.2 Amenity and Comfort:

- 1.2.1 **Light Levels:** Provide maintained average illuminance values that are based on the primary visual tasks to be accommodated, the class of play, the needs of spectators, and the IES Lighting Handbook.

1.3 Structure:

- 1.3.1 Provide mounting system for exterior lighting that is capable of withstanding 3-second wind gusts in excess of 100 mph for optional outdoor track.

2. PRODUCTS**2.1 Lamps:**

- 2.1.1 Use one of the following types:
 - a. Metal halide lamps at indoor areas and HPS for the optional outdoor track.

END OF CHAPTER D63

CHAPTER D7**TELECOMMUNICATIONS****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide the following telecommunications services:
 - a. Voice and Data (D71): Infrastructure for voice and data transmission and prewiring for all the voice and data.
 - b. Sound Reinforcement (D72): Public address and music systems.
 - c. Television (D73): Television distribution and reception.
- 1.1.2 Communications equipment room (CER) and telecommunications closet (TC):
 - a. Design must include a CER on the first floor and a TC to be located directly above the CER. Ref: ETL 02-12, para 8.3.3.2 thru 8.3.3.5 for requirements.
 - b. Use a CDX plywood with a 4" stand off in the CER and the TC.
- 1.1.3 Conduit Installation:
 - a. Provide four new conduits from manhole 77 through new manhole #1 to new manhole #2. (3) conduits will be 4" open PVC and (1) each will be 4" PVC with 4 each 1" inner duct.
 - b. Provide two new conduits from new manhole #2 to the communications room in Building 520. (1) conduit will be 4" open PVC and (1) 4" PVC with (4) each 1" inner duct.
 - c. Provide two new conduits from new manhole #2 to the new communications room in the gym. (1) conduit will be 4" open PVC and (1) 4" PVC with (4) each 1" inner duct.
- 1.1.4 Manholes:
 - a. Provide two new manholes at sites indicated on drawing (attachment 20). Manhole dimensions are 10' L x 8' W x 7' D.
- 1.1.5 Copper Cable:
 - a. Provide a 300 pair copper cable form MH77 to the new manhole #2.
 - b. Splice in manhole 77 new manhole #1 and new manhole #2 . Splice feeder cable using 3M SC-1 710 modular splice connectors. Cable counts will be provided by the 75 CS/SCMPT, Mr. Gerszewski, 586-8145.
 - c. Provide a 50 pair copper cable from new manhole.
 - d. Provide a 300 pair copper cable from new manhole #1 to new manhole #2.
 - e. Provide a 50 pair copper cable from new manhole #2 into existing Building 520 communication room.
 - f. Provide a 100 pair copper cable form new manhole #2 to new communications room in the new gym.
- 1.1.6 Fiber Optic Cable:
 - a. Install a 12 strand single mode fiber optic cable from Building 570 to the new communications room in the gym. See attachment 19.
- 1.1.7 Telephone:
 - a. Telephone stations will be terminated on 66 block patch panels. Terminations will be wired to TIA/EIA-568B termination configuration. Data connections will be terminated on a Hubbell 48 port patch panel.
 - b. Telecommunications outlets will be a 4 position/single gang face plate. Use Hubbell IFP140W outlets with two telephone jacks and two data jacks. (1) each CAT 5e to be split off with 4 pair terminated on two telephone jacks. (2) each CAT 5e to be terminated on the 2 data jacks. Station blocks will consist of 89D1 bracket and M150 terminals.
 - c. Data and voice jacks will be provided throughout the offices, admin and security room 6' on center along all walls.

1.2 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 -

Facility Performance and Chapter D - Services, and attached Base Facility Design Standard dated 11 Mar 2004.

2.

END OF CHAPTER D7

CHAPTER D71**VOICE AND DATA****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide means of conveying voice communication between rooms and spaces in the building and between the building and the Government's telephone network provider as follows.
- a. Point-to-Point Voice Communications For:
 - (1) Private two-way verbal communication.
 - (2) Group conversations among more than 2 stations, at user's option.
 - (3) Both handset and speaker operation, at user's option.
 - (4) Transfer of live call to another station, at user's option.
 - b. Recording and Management of Voice Messages:
 - (1) At and for each station.
 - (2) Incoming and internal messages.
 - (3) User-recorded reception message for each station.
 - (4) Automated answering of incoming voice telephone.
 - c. Automatic answering of incoming fax, from public telephone network; 1 incoming line.
- 1.1.2 Provide data outlets for the fitlinxx kiosks and equipment. There will be three fitlinxx kiosks in the facility and associated exercise equipment. One kiosk at the nautilus/free weight area, one kiosk at the cardiovascular, and one kiosk at the main entrance.
 General data network jack requirement: Each data network jack requires dedicated homerun cabling back to the central drop location (patch panel). Each network drop must be 300 wire-feet or less from the jack to the patch panel. All network drops must be terminated for T-568B standard wiring. Network jacks can be mounted either on the wall or on the floor. All network drops must be certified and labeled for Categor 5e compliance on all 4 pairs.
- a. Cardio area: each piece of Cardio equipment requires one data network jack and the jack must be located within three feet of the equipment to ensure cable reach and reduce trip hazard.
 - b. Fitlinxx kiosk area: each kiosk requires one data network jack adjacent to the electrical outlet and the jack must be located within three feet of the equipment to ensure cable reach and reduce trip hazard.
 - c. Patch Panel in communication room: Provide patch panel and network rack in communication room. All drops must be punched down into a rack-mounted patch panel. Patch panel must be at least 6 feet above the floor. If there are any questions regarding the patch panel position, call 866-316-5151 Ext 5135.
 - d. Telephone Line Rquirments: Provide a dedicated analog telephone line at the server location to enable remote dial-in access to the server by fitlinxx. Telephone line must be a dedicated analog line (POTS) to facilitate unscheduled, remote dial-in access to the server. Digital phone lines will damage the server modem(for information only) .
- 1.1.3 Where voice and data elements also must function as elements defined within another element group, meet the requirements of both element groups.
- 1.1.4 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter D - Services, and Chapter D7 - Telecommunications.

END OF CHAPTER D71

CHAPTER D72**SOUND REINFORCEMENT****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide the following sound reinforcement functions:
 - a. Sound transmission to all locations in the facility.
 - b. Music generation by AM/FM radio, cassette tape, and compact disc (media furnished by Government).
 - c. Provide rewiring for stereo speaker system in the large exercise, small exercise, and senior exercise areas.
 - d. Provide a complete PA system with sound/music throughout the whole facility. Except PA to the gym and RQ spaces will have sound transmission only but no music transmission. Provide volume control for the PA at cardio, weight training and exercise spaces.
 - e. The main PA system equipment shall be located in the control room.
- 1.1.2 Where sound reinforcement elements also must function as elements defined within another element group, meet the requirements of both element groups.
- 1.1.3 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter D - Services, and Chapter D7 - Telecommunications.

1.2 Operation and Maintenance:

- 1.2.1 Power Supplies: As specified in Chapter D51 and as follows:
 - a. Building power with power line conditioner for all systems.

END OF CHAPTER D72

CHAPTER D73**TELEVISION****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide rewiring for cable television system (CATV) with cable television outlets in the hawk, and exercise areas.
 - a. Rewiring cable television reception for futuresatellite dish at the roof .
 - b. At cardio plasma TV location provide a "Broadcast" wire connection so that a patron can tune his/her radio headset to the radio station which corresponds to the TV station.
 - c. Provide composite, component, or S-Video cables for connection to the plasma TV from the DVD, or VCR player.
 - d. Provide CATV outlet at lobby.
 - e. Provide CATV outlet at juice bar.
 - f. Provide CATV outler at fitness center break room.
 - g. Provide CATV outlet connections for 8 plasma TV's (42" - as measured diagonally) in cardio room to be mounted above the window height.
 - h. All CATV outlets shall be terminated at a location located in the communication room.
- 1.1.2 Where television elements also must function as elements defined within another element group, meet the requirements of both element groups.
- 1.1.3 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter D - Services, and Chapter D7 - Telecommunications.

END OF CHAPTER D73

CHAPTER D9

OTHER SERVICES

1. PERFORMANCE

1.1 Basic Function:

1.1.1 Other services include:

- a. Surveillance and Security Controls (D92): Elements for intrusion detection, access control, and visual and auditory monitoring.
- b. Cathodic Protection (D94): Elements for supplementary corrosion prevention using cathodic protection for underground metallic piping system.

1.2 Where services elements also must function as elements defined within another element group, meet requirements of both element groups.

END OF CHAPTER D9

CHAPTER D92**SURVEILLANCE AND SECURITY CONTROLS****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide remote surveillance of specified areas, and alarm as follows.
 - a. Provide a complete small local intrusion detection system(IDS) with balance magnetic switch to monitor all exterior doors. The IDS control panel shall be located in the control room. The IDS system shall transmit an audio alarm to the control room and indicated which exterior door(s) are opened. The activated exterior door audio alarm shall manually reset and silent at the control room IDS panel keypad by entering a code. Provide electrical power to support all the IDS equipment.
 - b. Provide duress switch at the control room to send signal to Base Security Police Office.
 - c. Provide turnstile with card swipe system.
 - d. Provide a local battery operated alarm at each egress exit door with loud obnoxious sound.
 - e. Provide electrical power for all the closed circuit television(CCTV) equipment.
 - f. Provide a complete CCTV pre-wiring system to all of the locations specified in the RFP. CCTV system(cameras, monitors, computer, recorder etc.) will be purchased by the User. Coordinate with the User purchased CCTV equipment to insure the installed CCTV wiring system will function with all the CCTV equipment. Information only: (the CCTV products are from the ADT company).
 - g. Provide a CCTV monitor outlet(connection) at the reception area.
 - h. Provide CCTV monitor outlet(connection) in the Director's Office. Provide a 16 bank CCTV monitor connections at the control room.
 - i. Provide CCTV camera outlet(connection) at all exterior doors.
 - j. Provide CCTV camera outlets(connections) for all exercise areas, weight room, corridors, and gym. Provide impact resistance enclosure for all the CCTV camera(NIC) in the gym. area. Provide minimum one pan, tilt and zoom control connection for one of the CCTV camera outlet at each of the above areas in paragraph j.
- 1.1.2 Integrated systems performing all functions are preferred, subject to requirements of code for separated, independent systems.
- 1.1.3 Data Communications Functions: As required to accomplish security functions.
- 1.1.4 Visual Communications Functions:
 - a. Point-to-Point Video Communication:
 - (1) Visual monitoring, for security .
- 1.1.5 Where surveillance and security control elements also must function as elements defined within another element group, meet the requirements of both element groups.
- 1.1.6 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter D - Services, and Chapter D9 - Other Services.

END OF CHAPTER D92

CHAPTER D94

CATHODIC PROTECTION

1. PERFORMANCE

1.1 Basic Function:

1.1.1 Cathodic protection is required for the following elements:

- a. Submerged metal pipes, ducts, conduits, and structural elements.
- b. Other buried metal pipes, ducts, conduits, and structural elements outside the building.

1.1.2 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter D - Services, and Chapter D9 - Other Services.

END OF CHAPTER D94

CHAPTER E

EQUIPMENT AND FURNISHINGS

1. PERFORMANCE

1.1 Basic Function:

- 1.1.1 Design the facility to accommodate the equipment and furnishings required by the Government, which are specified in the project program.
- 1.1.2 Where equipment or furnishings elements also must function as elements defined within another element group, meet requirements of both element groups.
- 1.1.3 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance.

END OF CHAPTER E

CHAPTER F
DEMOLITION

1. PERFORMANCE

1.1 Scope of Work:

- 1.1.1 Existing running track shall be demolished as part of this project. A requirement for control of fugitive dust from construction vehicles will be enforced during construction. Asphalt debris shall be managed by disposing in an off-base Class 1, 2, 3, or 4 permitted landfill.
- 1.1.2 Coordinate civil/site sedimentation control plan with Base EM if site disturbance is under 5 acres. If disturbance is over 5 acres, then Utah State approval is required.
 - a. Where requirements of another element group also apply to demolition or relocation operations, meet the requirements of that element group as well.
 - b. In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter G - Sitework, and Chapter G1 - Site Preparation.

1.2 Health and Safety: See Chapter 00830 for additional requirements.

1.2.1 Health Hazards:

- a. Whenever construction operations could result in worker contact with hazardous materials, follow recommendations of an American Board of Industrial Hygiene Certified Industrial Hygienist (CIH) employed by Design-Builder.

1.3 Structure:

- 1.3.1 Prevent movement or settlement of structures that are to remain.
- 1.3.2 Cease operations immediately if structures that are to remain appear to be in danger; do not resume operations until danger has been removed or remedied.
- 1.3.3 Coordinate demolition with grading so that final grades do not subside within one year after completion.

1.4 Durability:

- 1.4.1 Maintain temporary and permanent erosion and sediment controls during demolition and relocation operations or replace as soon as demolition or relocation is complete.

END OF CHAPTER F

CHAPTER G**SITWORK****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide all modifications to the site and site improvements and utilities required for proper functioning of the project and as indicated in the project program.
- 1.1.2 Sitework comprises the following elements:
 - a. Site Preparation (G1): All modifications to the site and grades required for construction of new work and for proper functioning of the project.
 - b. Other Site Construction: Miscellaneous site elements.
- 1.1.3 Athletic Facilities: Provide playing surfaces, enclosures, goals, fixtures, and equipment for sports as described in the project program and in accordance with requirements of Chapter 111 - Facility Performance.
- 1.1.4 Where site elements also must function as elements defined within another element group, meet the requirements of both element groups.
- 1.1.5 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance.

END OF CHAPTER G

CHAPTER G1**SITE PREPARATION****1. PERFORMANCE****1.1 Siting**

- 1.1.1 The new building perimeter shall have a minimum 82'-0" standoff distance from all parking lots and roads. Provide 33'-0" min. clear distance from face of new building to existing buildings and 20'-0" clear distance from fences. Provide a "Y" turn around at fire lane on west side of new facility. Each leg of the "Y" will be a min. 20'-0" wide. Provide gates at service entry and fire lane entry at back of building (adjacent to existing fitness facility). The fire lane shall be painted to say *Fire Lane Only - No Parking* and the service lane shall be painted to say *Service Lane Only - No Parking*. Provide for a dumpster pad, enclosed and screened. The appearance of the enclosure and screening shall match the new facility.
- 1.1.2 See Attachment No. 17 for dimensions and markings of new (outdoor) 440-yard running track and field. The new track shall be sited 75'-0" from the southern edge of 11th Street to the northern edge of new track. It also shall be sited an equal distance between building 547 (on the west side) and switching station (on the east side). The track will consist of a 1/4-mile of running surface, with six 3'-6" wide lanes, measured from center-line to center-line of white stripe markings. Provide color for resilient track surfacing to match colors: Sherwin Williams #SW 1005 "Silverado" (gray) and Sherwin Williams #SW 1803 "Ultimate Sky Blue". Alternate between these colors in the lanes with the inside lane being "Ultimate Sky Blue". Provide white lane striping between each lane to comply with NCAA standards for outdoor tracks. Provide color samples to Fitness Center Staff and Base CE-PM for selection prior to application. The total width of the track at any point shall be 22'-0". Provide a concrete curb for the rubber surface of track to butt into, but do not extend curb above running track surface. Any curbing height will pond water and be a tripping hazard. (OPTION ITEM) Also provide for 50 parking spaces at track and field vicinity including a turn-off from 11th street to allow access. The 50 parking spaces will have one-way flow of traffic and the stalls will be angled to 60 degrees. The parking shall be sited south of 11th Street and east of new track. (OPTION ITEM) Provide lighting for the outdoor track.
- 1.1.3 The Contractor staging area shall be located south of the project site; north of 11th Street and south of the new Fitness Center's footprint.
- 1.1.4 At locations where the new outdoor running track impedes on existing jogging trail, re-route the jogging trail to accommodate the new track. The existing width of the jogging trail shall be maintained.
- 1.2
- 1.2.1 Site preparation is comprised of the following elements:
- a. Earthwork (G12): Changing of grade levels, removal of soil and rock, modifying existing soils in preparation for construction, and temporary and permanent erosion and sediment control structures made of soil or rock.
- 1.2.2 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance and Chapter G - Sitework.

END OF CHAPTER G1

CHAPTER G12**EARTHWORK****1. PERFORMANCE****1.1 Geotechnical Design**

1.1.1 Refer to Attachment No. 25, "Geotechnical Support for Design", for geotechnical design criteria.

1.2 Topographical Requirements

1.2.1 Refer to Attachment No. 24 for topography requirements.

1.3 Pipe Bedding and Trench Backfill

1.3.1 Pipe bedding shall be per pipe manufacturer's requirements. Trench backfill shall be compacted in lifts not to exceed 8 inches in loose thickness. Minimum relative compaction under paved areas shall be 95% per ASTM D1557. An alternate backfill is to use controlled density fill (CDF) manufactured at a concrete batch plant. Jetting will not be allowed under any circumstances.

- a. Modify the site grades and soils as required for construction of buildings and utilities, for proper functioning of the project, and as indicated in the project program.
- b. Where earthwork elements also must function as elements defined within another element group, meet the requirements of both element groups.
- c. In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter G - Sitework, and Chapter G1 - Site Preparation.

END OF CHAPTER G12

CHAPTER G2**SITE IMPROVEMENTS****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide all elements required for finished and durable site surfaces, and outdoor improvements described in the project program.
- 1.1.2 Site improvements comprise the following elements:
 - a. Pavements and Surfacing (G21): Finished surfaces for vehicular, pedestrian, and sports and recreational traffic, other than turf.
 - b. Site Fixtures and Equipment (G22): Fixtures, equipment, and miscellaneous structures located out-of-doors, except those located on the roof or mounted on walls of buildings.
 - c. Landscaping (G23): Outdoor plants and elements supporting plants.
- 1.1.3 Where site improvements elements also must function as elements defined within another element group, meet the requirements of both element groups.
- 1.1.4 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance and Chapter G - Sitework.

1.2 Appearance:

- 1.2.1 Plants:
 - a. Outdoor: Provide an attractively landscaped site that looks tidy during non-growing seasons.
 - b. Substantiation:
 - (1) Design Development: Identification of types of plants to be used, with any seasonal variations in appearance.
- 1.2.2 Pavements and Surfacing: Provide rigid surfaces that are smooth, consistent in color and finish, sloped and drained to avoid ponding, and neatly finished at edges.
 - a. Vehicular Areas: Marked neatly to denote traffic lanes and parking spaces.
 - b. Pedestrian Areas: Designed to contrast visually with vehicular areas.
 - c. Athletic Areas: Color and texture in keeping with governing sports authority, with permanent game markings.

1.3 Durability:

- 1.3.1 Weather Resistance of Plants: Provide a concealed irrigation system for all plantings.
- 1.3.2 Pavements and Surfacing: Provide systems that are designed and engineered to withstand the types and intensity of traffic anticipated for the facility size and type.

2. PRODUCTS**2.1 Pavements and Surfacing:**

- 2.1.1 Use the following:
 - a. Rigid paving at sidewalks and curb.
 - b. Flexible paving at parking areas and vehicular access routes.
 - c. Modular pavers at locations that require pedestrian passage and visual accent.
 - d. Resilient sports surfacing at the new outdoor running track.
 - e. See section G23 for River Rock requirements including at all planter areas that are not turf, pavement or other surfacing.

2.2 Barriers:

- 2.2.1 Use the following:

- a. Fences at the location between the new building and the existing fitness center.

2.3 Landscape Plants:

- 2.3.1 Use the following:
 - a. Evergreen types.
 - b. Deciduous types.

END OF CHAPTER G2

CHAPTER G21**PAVEMENTS AND SURFACING****1. PERFORMANCE****1.1 Access Roads, Sidewalks, Handicap Access, Parking, Surface Drainage and Siting**

- 1.1.1 The new facility will comply with the DOD Force Protection Construction Standards (UFC-DOD minimum anti terrorism standards for buildings dated 8 OCT 2003), Seismic, (IBC chapter 16) and the UFC 1-200-01, Design: General Building Requirements, dated 8 OCT 2003, ADA, and United Federal Accessibility Standards (UFAS).
- a. Access Roads
- (1) Signage and barricades shall be installed per installation guidelines. Concrete curb and concrete curb and gutter shall be incorporated into the design. Extruded curbs are not allowed. Provide bollards at 4'-0" o.c. at sidewalk main entrance adjacent to 11th street for force protection purposes.
 - (2) Provide a fire lane and access at northwest side of new facility. Provide a separate delivery lane and access at northeast side of new facility. Provide separate gated entrances for fire lane access and delivery lane access. The fire lane and service lane must be marked/striped to say "Fire Lane Only - No Parking"; and the service lane must be marked/striped to say "Service Lane Only - No Parking". The fire and delivery lanes must be paved/marked and at a min. 20'-0" wide.
- b. Parking Lots
- (1) Rework a portion (the northwest corner) of the east parking lot (see Attachment 9) in order to extend the "buildable area" that the Contractor will have to site the building and rework the western edge of the west side parking (skills parking) lot as necessary to site the building and maintain the 82' stand-off requirement for force protection purposes. Also, rework east side parking lot paint striping to provide for handicapped parking spaces. Provide handicapped curb cuts (Utah Department Of Transportation (UDOT) - approved) at all parking lot/street sidewalk transitions. Handicap parking spaces and van accessible spaces shall be designed per Americans with Disabilities Act (ADA) standards. Handicap ramps shall be provided and an ADA accessible route must be designated. Contractor will reference the ADA and UFAS standards for handicapped parking space dimensions and the number of required spaces.
 - (2) Parking lots shall have a minimum slope of 2% and a maximum slope of 5%. Refer to Attachment No. 25, "Geotechnical Support for Design", for pavement design criteria. Parking lots shall be striped per number of spaces allowable. Pavement marking paint shall be white traffic paint.
 - (3) Handicap markings, paint and signs shall comply with ADA.
- c. Sidewalks
- (1) Provide a minimum 6'-0" wide sidewalk from Fitness Center entrance to 11th Street for access to track. Continue the 6'-0" sidewalk once across 11th Street directly to the new outdoor track. Provide a minimum 3'-0" wide sidewalk at perimeter of building on east, west and south sides. Provide a minimum 6'-0" wide sidewalk from existing east parking lot to Fitness Center entrance. Provide a 3'-0" wide sidewalk on both sides of existing east parking lot. Provide a 4'-0" wide sidewalk along 11th Street. Sidewalks shall be coordinated with the landscape plan. Joints shall be laid out and detailed. ADA accessibility is required for sidewalks with a maximum cross slope of 2 percent and a maximum slope of 5 percent in the direction of travel. The handicapped sidewalk entrance to the building must maintain no greater than a 1 foot rise to 20 feet run slope gradient in order to avoid installation of railing.
- 1.1.2 Provide exterior pavements and surfacing, as required by the project program and by code, that are adequate in extent and sufficiently durable to accommodate without damage the types of traffic that can be reasonably anticipated for the facility type and intended user population.
- a. Pavements and surfacing comprise the following elements:

- (1) Exterior paved or surfaced areas such as roadways, driveways, parking lots, walkways, and sports surfaces.
 - (2) Exterior steps and ramps not connected to buildings, including handrails and stair nosings.
 - (3) Appurtenances for roadways and driveways, including curbs, gutters, guardrails, pavement markings, and parking bumpers.
 - (4) Signs, including traffic signals, "stop," "yield, and directional signs, and parking space marking and identification.
- b. Where pavements and surfacing are integral with elements defined within another element group, meet requirements of both element groups.
 - c. In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter G - Sitework and Chapter G2 - Site Improvements.

END OF CHAPTER G21

CHAPTER G22

SITE FIXTURES AND EQUIPMENT

1. PERFORMANCE

1.1 Basic Function:

- 1.1.1 Provide all fixtures, equipment (other than that associated with services), and miscellaneous structures located out-of-doors that are required by the project program and that are required as a result of these and other requirements.
- 1.1.2 Site fixtures and equipment that are required include:
- a. Fences and Barriers: As specified in Chapter G and as follows:
 - (1) Site Enclosure Fence: Security Level 1.
 - b. Athletic fixtures and fixed equipment, including:
 - ~~(1) Soccer goals.~~
 - ~~(2)~~(1) Running Track.
 - c. Site furnishings, including:
 - ~~(1) Outdoor seating and tables.~~
 - ~~(2)~~(1) Waste receptacles. **(2) at fitness center, coordinate location with fitness center personnel.**
 - ~~(3)~~(2) Bicycle rack. **(1) at fitness center**
 - d. Outdoor signs, other than roadway and parking lot signs.
 - (1) Main building identification sign located at the main entrance as specified by base Engineer/Architect.
- 1.1.3 Where site fixtures and equipment elements also must function as elements defined within another element group, meet the requirements of both element groups.
- 1.1.4 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter G - Sitework, and Chapter G2 - Site Improvements.

1.2 Health and Safety:

1.2.1 Physical Security:

- a. Fences and Barriers Other Than Building Exterior Walls:
 - (1) Security Level 1: At locations where performance is specified as to inhibit passage of people.
 - (a) 7 feet high.
 - (b) Not easily climbable.
 - (c) Maximum opening size 2 inch.
 - (2) Substantiation:
 - (a) Design Development: Identification of security barriers and method of achieving performance.

1.3 Structure:

- 1.3.1 Bicycle Racks: Constructed of materials strong enough to resist forces generated by attempted forcible removal of bicycle.

1.4 Durability:

1.4.1 Service Life:

- a. Minor Site Structures: Same as for equivalent building elements.
- b. Other Fixed Site Improvements: 15 years under normal use and weather.
- ~~c. Athletic Nets: 5 years under continuous weather exposure.~~

- 1.4.2 Weather Resistance: Same as specified for components of exterior shell in Chapter B.

2. PRODUCTS

2.1 Fences:

2.1.1 Use one of the following:

- a. Vinyl-coated chain link fencing at location between the new building and the existing fitness center.
- b. Painted ornamental steel fencing at location between the new building and the existing fitness center.
- c. Extruded aluminum fencing at location between the new building and the existing fitness center.

2.1.2 Do not use:

- a. Wood board fencing.
- b. Wood panel fencing.

2.2 Permanent Site Fixtures:

2.2.1 Use products made of one of the following:

- a. Precast concrete.
- b. Aluminum.
- c. Stainless steel.

2.3 Site Furnishings:

2.3.1 Use products made of one of the following:

- a. Precast concrete.
- b. Aluminum.
- c. Stainless steel.
- d. Reinforced plastic.
- e. Recycled plastic.

2.4 Signs:

2.4.1 Match existing signs on building 520 or as directed by the base Engineer/Architect.

2.4.2 Use one of the following:

- a. Dimensional letter signs using aluminum, stainless steel, bronze, brass, glass, or plastic sheet letters.

2.4.3 Do not use:

- a. Signs painted on the face of the exterior wall.
- b. Box signs.
- c. Neon light signs.
- d. Electronic message boards.

END OF CHAPTER G22

CHAPTER G23**LANDSCAPING****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 Provide landscaping over all areas of the site not finished with paving, surfacing, or buildings.
- 1.1.2 Landscape planting features that are required are:
 - a. Turf areas for specific activities as follows:
 - (1) Sports and athletic surfaces at the new running track.
 - b. Turf for ornamental or erosion-control purposes.
 - c. Visual screening of the following:
 - (1) Utility areas, including trash collection.
 - d. Shade for outdoor activities.
 - e. Ornamental plantings at locations around the building.
- 1.1.3 Provide a permanently installed irrigation system.
- 1.1.4 Where landscaping elements also must function as elements defined within another element group, meet the requirements of both element groups.
- 1.1.5 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter G - Sitework, and Chapter G2 - Site Improvements.

1.2 Amenity and Comfort:**1.2.1 Shade:**

- a. Provide trees that will shade at least 50 percent of the outdoor area on site within 20 years.

1.2.2 Convenience:

- a. Irrigation Frequency: Maximum of as set forth in facilities standard document and local watering budgets, per zone.
- b. Irrigation Control: Automatically controlled.
 - (1) Separate frequency, time, and duration settings for each zone.
 - (2) Different plant hydrozones on separate irrigation zones.
 - (3) Manual over-ride.
 - (4) Seasonal programs, minimum of 2.
 - (5) Easily programmable, for daily adjustment of zone settings.
 - (6) Rain sensor over-ride.
 - (7) Location of Controllers: Inside at the mechanical room or as otherwise directed by the base Engineer/Architect; all controllers in the same location.
- c. Irrigation Timing: Preset to hours between 11 pm and 8 am; adjustable.
- d. Water Use Monitoring: Provide a meter separate from building water supply meter.
- e. Substantiation:
 - (1) Closeout: Annual irrigation program, with monthly schedules and interim procedures for plant establishment period.

1.2.3 Appearance:

- a. Plants: Selected, arranged, and planted for pleasant appearance throughout the year.
 - (1) Provide a neat and tidy urban landscape with ornamental feature plants.
 - (2) Design the landscape to look complete within a year after planting and to remain of basically the same appearance indefinitely without significant pruning.
- b. Plants in Beds: Bordered with permanent mulch or paving for tidy appearance.
- c. Mulch: Use only types of pleasant appearance.

1.3 Health and Safety:

- 1.3.1 Accidental Injury:
 - a. Do not locate irrigation equipment within the field of turf intended for foot traffic.
 - b. Plants Used to Inhibit Foot Traffic: Spiny leaves, such as on holly, may be used, but spines, like on spiny honey locust, may not.
- 1.3.2 Potable Water Contamination:
 - a. Prevent contamination of potable water supply by irrigation water.
- 1.4 Durability:
 - 1.4.1 Service Life: It is understood that ultimate survival of plants will depend on weather conditions as well as maintenance; however, the Design-Builder is responsible for providing plants that will survive under the specified conditions when maintained according to both the procedures specified and the procedures furnished by the Design-Builder at closeout.
 - a. Soil: Suitable for growing the plants provided, with adequate nutrients for the first year of growth, based on recommendations of established authorities.
 - (1) Substantiation:
 - (a) Design Development: Existing soil tests for pH, nutrients, and texture; identification of necessary soil amendments, or replacement with other suitable soil.
 - (b) Construction: Soil tests of replacement soil.
 - (c) Closeout: Recommended fertilizer types and application rates for each type of plants.
 - b. The Design-Builder shall provide maintenance of all plants, including irrigation, during the initial establishment period, as follows:
 - (1) Trees and Shrubs: 1 month.
 - (2) Seeded Turf: 30 days.
 - (3) Sodded Turf: 30 days.
 - (4) Other Plants: 30 days.
 - 1.4.2 Weather Resistance:
 - a. Mulch: Where soil would otherwise be exposed around individual plants, cover soil with mulch that allows penetration of precipitation but minimizes evaporation; type of mulch coordinated with erosion resistance requirements.
 - 1.4.3 Accidental Damage:
 - a. Plants in Beds: Where planting beds adjoin turf areas, edge of turf shaped for ease of mowing with motorized equipment without damage to plants in beds.
 - b. Street Trees in Pavement Wells: Root area protected from mechanical damage.
 - c. Irrigation Equipment: Designed and located to prevent damage by normal user traffic and plant maintenance equipment.
 - d. Irrigation Equipment: Concealed in ground or out of way of landscape maintenance equipment.
 - 1.4.4 Traffic Damage:
 - a. Turf: Do not use turf for regularly used vehicular or pedestrian traffic surfaces, except where turf is specifically required for foot traffic use (such as playfields).
 - b. Turf for Functional Traffic Surfaces: Grass type selected for best resistance to wear; Government understands turf specifically required for traffic purposes is subject to unavoidable damage that may result in the need to replace sod.
 - (1) Soccer field within running track.
 - 1.4.5 Insect and Disease Resistance: Avoid the use of plants and turf that are known to be subject to insect damage or disease.
 - 1.4.6 Underground Irrigation Piping and Equipment: Comply with requirements of Chapter D for water and drainage systems.
 - a. Prevent freezing of water-containing components.
- 1.5 Operation and Maintenance:

- 1.5.1 Irrigation Water Source: Same as building supply.
- 1.5.2 Irrigation Capacity: Sufficient to maintain landscape plantings with maximum contribution by precipitation equal to the Precipitation Allowance (PA).
 - a. Precipitation Allowance (PA): 25 percent of normal rainfall, maximum, in any month.
 - b. Application Rate: Enough water to soak soil to depth of 6-8 inches at each application; intermittent applications if necessary to avoid saturation to runoff; adjustable for less water on damp soil.
 - c. Irrigation Efficiency (IE): 55 percent, minimum, of applied water actually reaching plants, under normal wind conditions.
 - d. Locations of Irrigation Equipment: To provide complete coverage of landscaped area requiring irrigation, without overspray or runoff onto pavements, buildings, or unirrigated planted areas.
 - e. Variation in Application Rate at Individual Locations: Not more than 50 percent.
 - f. Sloped Areas: Prevent drainage out of lower outlets.
 - g. Operating Pressure: As low as possible as is compatible with results.
 - h. Substantiation:
 - (1) Design Development: Performance data on irrigation equipment.
- 1.5.3 Water Conservation: See Chapter G for basic water conservation requirements.
 - a. Coordinate irrigation design with plant selection requirements.
 - b. Maximum Turf Area: 25 percent of land area of site not occupied by buildings or pavements. Not including soccer field in running track.
 - c. Rain Sensors: To prevent operation in the rain.
 - d. Maximum Water Allowance: As required by code.
 - e. Substantiation:
 - (1) Design Development: Overall landscape design scheme; evapotranspiration and precipitation data for project location; preliminary Potential Water Usage calculations.
 - (2) Construction Documents: Proven-in-use data on plants for which plant factors less than 0.6, or other than those stated herein, have been used in calculations, showing survivability in the local climate.
 - (3) Closeout: Reference evapotranspiration data for locality, source of real-time data, and instructions for calculating actual irrigation application based on daily evapotranspiration data.
- 1.5.4 Ease of Maintenance:
 - a. Turf: Do not use areas of turf that cannot be mowed with motorized equipment.
 - b. Plants: Arranged for ease of access for weeding, mulching, and watering.
 - c. Shrubs and Woody Plants: Do not use plants that require routine annual or seasonal pruning.
 - d. Plants in Planters: Permanent irrigation and drainage system.

2. PRODUCTS

- 2.1 Turf:
 - 2.1.1 Use one of the following:
 - a. Tall fescue.
 - b. Kentucky Bluegrass.
- 2.2 Evergreen Ground Covers:
 - 2.2.1 Use the following:
 - a. select species as indicated on the base plant list.
- 2.3 Deciduous Ground Covers:
 - 2.3.1 Use one of the following:
 - a. select species as indicated on the base plant list.
- 2.4 Evergreen Shrubs:
 - 2.4.1 Use one of the following:

- a. select species as indicated on the base plant list.

2.5 Deciduous Shrubs:

2.5.1 Use one of the following:

- a. select species as indicated on the base plant list.

2.6 Vines:

2.6.1 Use one of the following:

- a. select species as indicated on the base plant list.

2.7 Shade Trees:

2.7.1 Use one of the following:

- a. select species as indicated on the base plant list.

2.8 Specimen Trees:

2.8.1 Use one of the following:

- a. select species as indicated on the base plant list.

2.9 Street Trees:

2.9.1 Use one of the following:

- a. select species as indicated on the base plant list.

2.10 Irrigation Systems:

2.10.1 Use one of the following:

- a. Overhead spray type at turf areas.
- b. Drip type at plant beds.
- c. Bubblers at trees and shrubs.

2.10.2 Do not use:

- a. Furrow type.

2.11 Underground Irrigation Piping:

2.11.1 Use one of the following:

- a. PVC plastic pipe.
- b. Polyethylene plastic pipe.

2.11.2 Do not use:

- a. Copper tubing.
- b. Galvanized pipe.

2.12 Mulch:

2.12.1 Use one of the following:

- a. Ground or shredded bark.
- b. Chipped bark or wood.
- c. Rounded riverbed gravel.
- d. Crushed or chipped marble or granite.
- e. Provide a 4' minimum width of River Rock landscape bed around the south, east and west perimeter sides of the building. Provide appropriate weed matting material beneath. River rock shall be a minimum 4" diameter.

2.12.2 Do not use:

- a. Peat moss.
- b. Processed wood fiber.

2.13 Edgings for Beds:**2.13.1 Use one of the following:**

- a. Brick.
- b. Concrete.
- c. Polyethylene plastic.

2.13.2 Do not use:

- a. Redwood.
- b. Western red cedar.
- c. Extruded aluminum.
- d. Galvanized steel, painted.

3. METHODS OF CONSTRUCTION**3.1 Turf:****3.1.1 Use one of the following methods of installation:**

- a. Sodding.
- b. ~~Seeding.~~
- c. ~~Hydroseeding.~~

3.1.2 Do not use:

- a. Sprigging.

END OF CHAPTER G23

CHAPTER G3**SITE SERVICES****1. PERFORMANCE****1.1 Basic Function:**

- 1.1.1 See Chapter D for basic requirements for services.
- 1.1.2 Provide the following site services:
 - a. Water Supply (G31): Means of supplying, collecting, storing, and distributing water for all purposes required in buildings and on site. See Chapter D2 for additional requirements.
 - b. Sanitary Sewer (G32): Means of removing, treating, storing, and recycling liquid waste generated in buildings on site. See Chapter D2 for additional requirements.
 - c. Storm Drainage (G33): Means of removing, controlling, and storing rainwater runoff from buildings and site areas. See Chapter D2 for additional requirements.
 - d. Other Site Services (G39): Including gas.
- 1.1.3 Utilities
 - a. Meters required on all of the utility systems for the building (electric, water, gas, etc.).
- 1.1.4 Where site services elements must also function as elements defined within another element group, meet requirements of both element groups.
- 1.1.5 In addition to the requirements of this chapter, comply with all applicable requirements of Chapter 111 - Facility Performance, Chapter D - Services, and Chapter G - Site Work.

END OF CHAPTER G3

CHAPTER G31**WATER SUPPLY****1. PERFORMANCE****1.1 Water Service**

- 1.1.1 All piping, joints, fittings, valves, valve boxes fire hydrants, backflow prevention devices, and thrust restraint shall comply with UFC 3-600-01 and the National Fire Code. Piping shall comply with National Fire Protection Association 24.
- a. The new Fitness Center will require a fully automatic sprinkler system for fire protection throughout the new facility.

1.2 Domestic Water Service

- 1.2.1 Water Service Connection shall be sized per demand of all fixture units. See Attachment 28 for existing water line information from the project area.
- a. Acceptable Pipe materials for Domestic Service Lines are PVC (ASTM 1785), Polyethylene Plastic (PE) conforming to AWWA C901, or other materials used as industry standard potable water service connections for commercial properties. Pressure and leakage test shall be per pipe manufacturer's requirements. Fittings and appurtenances shall be per manufacturer's requirements for installation.
 - b. Bacteriological Disinfection shall be as prescribed by American Water Works Association (AWWA) C651.

END OF CHAPTER G31

CHAPTER G32**SANITARY SEWER****1. PERFORMANCE****1.1 Sewer Service**

1.1.1 See Attachment 29 for existing sewer information in the project area.

- a. Piping for sewer service connections shall be industry standard for sewer service for commercial facilities. Examples of acceptable pipe are: vitrified clay pipe, polyvinyl chloride (PVC) pipe, and acrylonitrile-butadiene-styrene (ABS) pipe. Pipe and joints shall be per manufacturer's requirements. Cleanouts or manholes are required at all direction changes. Minimum slope of pipe shall allow self cleaning velocities as prescribed in the National Plumbing Code.

(1) Basic Function:

END OF CHAPTER G32

CHAPTER G33**STORM DRAINAGE****1. PERFORMANCE**

1.1 Storm Drainage

1.2 There is an existing storm drain line that is located on the southern edge of the new facilities footprint (see Attachment 16). This drain line will be relocated to the south of the project site and north of 11th Street.

1.3 Piping for storm drainage shall be industry standard for the drainage of commercial facilities. Examples of acceptable piping material are: polyethylene (PE), vitrified clay pipe, polyvinyl chloride (PVC) pipe, acrylonitrile-butadiene-styrene (ABS) pipe, Non-reinforced concrete pipe, reinforced concrete pipe, and corrugated metal pipe. Installation shall be per manufacturer's instructions. Drain structures such as curb inlets, catch basins, and manholes shall be pre-cast. Rims, coves and grates for drain structures shall be rated for H-20 traffic loading in traffic areas. Minimum design velocity of storm water in underground systems shall be 2 feet per second. Utilize 25 year storm for design purposes.

END OF CHAPTER G33

CHAPTER G39**OTHER SITE SERVICES****1. PERFORMANCE****1.1 Gas Service**

- 1.1.1 Existing steam lines in and around existing fitness center are not in acceptable conditions. Therefore, natural gas has been selected as the energy source of choice for the new facility. There are two existing natural gas sources currently at the project site area. One is a 1-1/2" direct line into the area and the other is a 3" line located just north of new project site, both are at a constant 35 psi.

END OF CHAPTER D39

CHAPTER X15

MECHANICAL

1. 15105 - PIPES AND TUBES

1.1 Steel Pipe:

END OF CHAPTER X15

17. TRANSMITTAL TO GOVERNMENT AGENCIES:
 17.1 SUBMITTAL DISTRIBUTION REQUIREMENTS

TITLE: FITNESS CENTER **LOCATION:** HILL AFB, UT
FY: 05 **PROJ NO.:** KRSM 923016

	M	D	R	A	C	B	G									
	A	I	E	E	O	C	E									
	J	S	S	A	N	E	O									
		T			S											
Charrette Submittal (1-week following Charrette) all drawings to be (ANSI "B" size/format	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Include cd of entire submittal to each addressee																
CONTEXTUAL PHOTOS	1	1		5	5		2	7								
SITE ANALYSIS PLAN	1	1		5	5		2	7								
SITE PLAN	1	1		5	5		2	7								
FLOOR PLAN	1	1		5	5		2	7								
EXTERIOR ELEVATIONS	1	1		5	5		2	7								
ARCHITECTURAL CROSS-SECTION	1	1		5	5		2	7								
SID	1	1		5	5		2	7								
CONCEPT DEVELOPMENT OF THE BUILDING'S PRIMARY INFRASTRUCTURE SYSTEMS	1	1		5	5		2	7								
SET OF COLOR SKETCH RENDERINGS (GROUND LEVEL AND BIRD'S EYE)	1	1		5	1		2	7								
MEETING MINUTES W/COMPLETED DES CHECKLIST AND LEEDS CHECKLIST	1	1		5	5		2	7								
DESIGN QUALITY CONTROL PLAN	1	1		1	5		2	1								
REPORT OF SUSTAINABLE DESIGN FEATURES, ENERGY SAVINGS REALIZED, AND TABULATION (WITH JUSTIFICATION) OF LEEDS	1	1		5	5		2	7								