

Design and Management Collegiate Strength & Conditioning Facilities



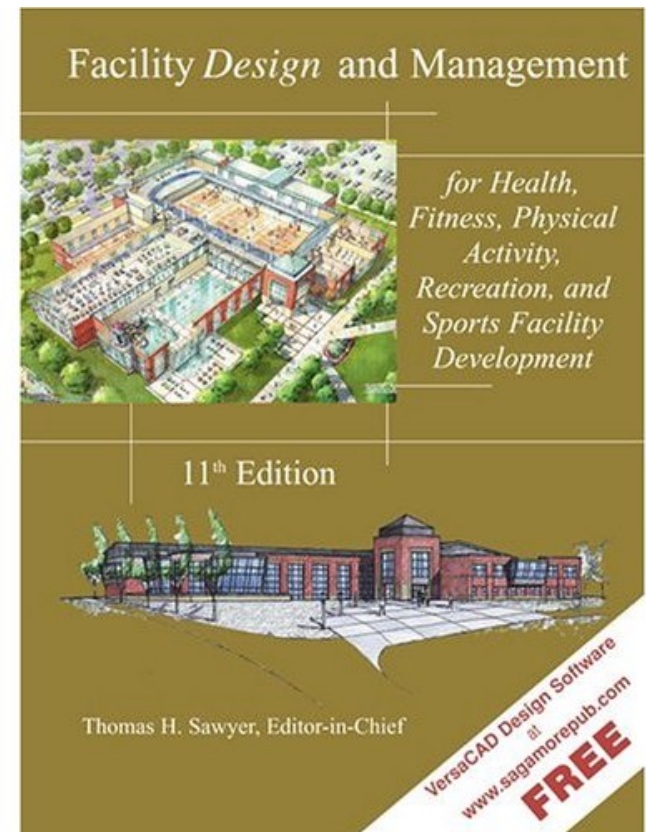
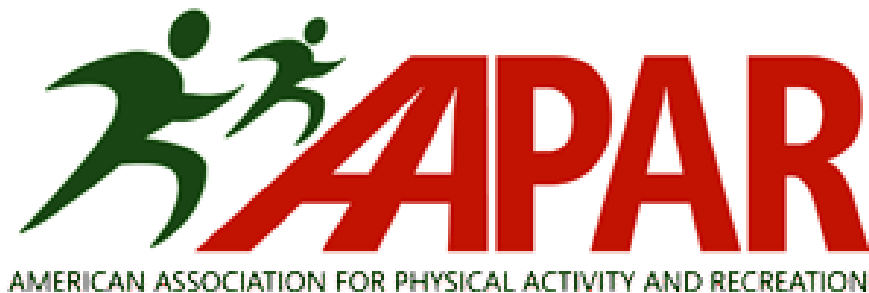
***2009 AAHPERD
National Convention***

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Session Sponsored by

- Council on Facilities and Equipment –
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Session Description

A well designed strength and conditioning facility is vital at the collegiate level. Discover trends based upon institution size or athletic level and consider the types of equipment used based upon facility access such as: athletic use only, recreational use only, or combined use facilities. Learn important principles for the design and management of a new or renovated facility to maximize space efficiency and safety for all users.

Session Objectives

- Describe the historical development of collegiate strength facilities
- Identify key design trends for strength facilities
- Review the status of collegiate strength facilities from a recent survey
- Examine collegiate case studies for facility strengths and weaknesses
- *Questions are acceptable at any time during this session*

Early Barbells

- Early barbells of hollow globes filled with sand or lead shot were replaced in the early 1900's by the iron plate-loading barbells used today.
- 1960's saw a gradual introduction of exercise machines into the still-rare strength-training gyms as general population interest in aerobic fitness rose.

The Popularity of Resistance Training

- During the 30-40 years, the popularity of resistance training increased greatly.
- Collegiate weight lifting facilities of yesteryear were a novelty as most athletes were advised that serious resistance training may hurt their flexibility and athleticism.

The Impact of the NSCA

- 1977, University of Nebraska strength coach Boyd Epley founded the National Strength and Conditioning Association (NSCA).
- NSCA founding influenced the establishment of the strength and conditioning coach at the University level and also led to the construction of strength and conditioning facilities at colleges and universities across the nation.

An Awakening of Interest

- 1980's and 1990's strength coaches began to demonstrate the benefits of resistance training on the field
- Researchers further studied the physiological impact of resistance training on the body which further awakened interest

Design Factors - **User Identification**

- Who are the facility users?
- Athletes (sport, in-season/off-season, team/individual, gender)
- Students (age, gender, fitness goals, class use, recreational use)
- Faculty/Staff
- Community Members (gender, age, interests)

Design Factors - **User Capacity**

- Total square footage
- Peak load of users – when does the peak occur? what is the number?
- Supervisory ratios – what is acceptable? what is ideal?
- Facility size and layout of equipment
- Consider flow patterns of participants when in use

Design Factors - Equipment

- Types of equipment
 - Free Weights, Machine Weights (selectorized), Plate Loaded Machines
 - Cardio – treadmills, steppers, ellipticals, bikes (standard, recumbent, spin), upper body ergometers
- Number of stations
- Size of stations
- Spacing ADA requirements -

Strength Equipment Considerations

- Training Population – PE Class, Athletes, Staff, Community Members or combination of all of these.
 - (Typical to put a room together for PE and athletics)
- Training philosophy –
 - Olympic Lifts, High Intensity Training (HIT)-Machines, Free Weights-Squat Bench, Incline, Military, Deadlifts, Trunk Strength, Posterior Chain Development, Dumbbells. etc.
- Do you need space for Dynamic Warm-ups, Trunk Strength and Speed/Agility/Quickness Training?

Weightroom Strength Equipment Considerations

- Square Footage of room
 - An ideal number is 100 sq. feet per person
- The floor plan of the room dimension
 - (square, rectangle, L, round walls)
- Obstacles in room
 - (ceiling height, doors, pillars, water fountains etc.)
- Number of people to accommodate in one session
(Often times restricted by square footage available in the room)

ADA Requirements

- Spacing ADA requirements-
 - Clear paths at least 36" wide
 - 60" diameter turning space between rows of equipment
 - 30" x 48" clear floor space for transfer onto equipment
- Aerobic Equipment - add an upper body ergometer (UBE)

ADA Requirements

- Most pulley machines have better accessibility such as:
- Dual stack functional trainer (with removable bench)
- Cable Cross-Over

Weight Room Preferences

- Equipment Preferences –
- Half Rack, Power Rack or Combo Rack, Platforms with Racks or Stand alone Platforms,
- Rotating Pads or Half Moon Fixed Pads on Glute Ham Machines,
- Pulleys with or without seats, cables (lubricated and wrapped in plastic) or Kevlar belts (harder to work with) on pulleys,
- Urethane coated plates and db's or steel ones, Olympic Bars, Power Bars, kilo or pound Bumpers, black or colored bumpers. Custom Logos or not

Equipment

- Lower the gauge the heavier duty the equipment
- Frame Important
 - Dimensions of base tubes and support beams 3" x 4" important
 - Poor support-rack will shake
- Industry Standards are 11-7 Gauge steel
 - (7 Gauge Power Lift few others)
- 9-11 Gauge Most Competitors

Wow Factor

- What Bells and whistles do you want?
- Custom work- Logos
- Mirrors
- Special Finishes
- Color Schemes

Weightroom Cardio Considerations

- # of users to accommodate at one time (peak load)
- Mixture of pieces (Treadmills, Ellipticals, Bikes, Spin Bikes, Upper Body Ergometer (UBE), Stairsteppers, Rowing Machines)
- Do any pieces need to be ADA compliant for individuals with disabilities?
- Are there any power restrictions in the room that would not allow you to have certain pieces? (110V vs. 220V)

Weightroom Flooring Considerations

- Square Footage
- How many people use the facility per day
- Does sound reduction need to be an issue?
- School Colors- Logos in Floors
- Moisture management, (Humidity)

Weight Room Flooring Considerations

- Poured Floor vs. Rolled, Square Tiles or Puzzle Lock type system
 - Mondo and other Track companies are doing weightroom floors now
 - Poured Floors no seams but, if get damaged, patchwork is never the same as original
 - Tile and rolled floors have seams but, can be moved to new space, replaced if damaged, and can be permanent depending on adhesive used
- Industry Standard is 3/8" Thick
 - Can get 1/2" Thick
 - Can get 1" Thick

Design Team – Practitioner Input

- Gain input from key program leaders:
- Athletic Director
- Strength Coaches
- Head Coaches
- Physical Education Department Chair
- Physical Education Teachers

Cost Projection Considerations

Cost Estimates

- 10,000-12,000 sq ft.
- Flooring –\$50,000 - \$210,000
- Weight Equipment – \$135,000 – \$300,000
 - Combo Rack \$5,000
- Cardio Equipment (20 pieces) avg. \$2,500 per piece \$50,000
- Dumbbells- \$30,000-40,000
- Plates- \$50,000-\$100,000
- Storage units- \$5,000-\$10,000
- Total to expect to pay = \$500,000 – \$750,000
Depending on Bells and Whistles

Case Study: What 500k will get you

- 15 back to back combo racks
- 30 platforms
- 2 set 5-150 lb. dumbbells (custom)
- Custom bumper plates
- 500lb. of weight per station
- 1 chin up bar
- 1 band attachment
- 5 glute-ham machines
- 5 pulley units
- 5 back extension machines
- Storage units (dumbbell and plate trees)
- Infinity flooring 1 inch
- Freight and set up

DI National Survey – 2008-09

- 110 Schools Participated; 85 items

- ***Facilities***

- Athlete-Only Facilities

None 10%; 1- 51%; 2- 24%; 3 or more- 15%

- Separate “football only” facilities- 9%

- Facility Age

34% 1-9 yrs; 32% 10-19 yrs; 22% 20+ yrs

- Major Facility Renovation Completed

63% 1-5 yrs; 13% 6-10yrs; 8% 11-15 yrs

DI National Survey – 2008-09

- ***Equipment***
- Free Weights 100%
 - Separate Area 47%
- Weight Machines –
 - Selectorized 92%, Plate Loaded 73%;
Separate Area 39%
- Cardio 83%
 - Separate Area 48%
- Olympic Lifts
 - 95% bumper plates, 35% Elieko bars

DI National Survey – 2008-09

- **Staffing**

Staff Numbers							
	0	1	2	3	4	5	6 or more
Full Time	2%	31%	30%	17%	6%	5%	9%
Part Time	68%	21%	6%	3%	1%	0%	1%
GA's	35%	16%	23%	14%	7%	2%	3%

- **Head Coach Certification**

CSCS 70%; USAWF 54%;SCCC 22%; other 21%

- **Staffing Pattern**

Full shift 49%; Split shift 10%; Team Assignments 40%

Collegiate Case Studies

University of Illinois

- Champaign, Illinois
- Big Ten Conference
- Separate Facilities –
- Olympic Sports, Football
and general student

Memorial Stadium Weight Room

- Strength & Conditioning /
Personal Performance
Center
- Primarily for football
- 15,000-square feet
- Renovated in 2008

Memorial Stadium Cost Estimates

- Largest football only weight room in the nation
- 17 combo-racks and platforms
- Custom dumbbells and plates @ 200k
- Mondo Floor
- 6 Total Vendors

Huff Hall Facility Overview

- 4,000 sq feet
- Olympic Sports Only
- Hours 6:00 am – 6:30 pm
- Coed facility
- Constructed 1924
- Renovated 2002
- Football has a separate facility that is also used by baseball, softball and soccer
- Men's & Women's Basketball also have a separate facility

Staffing

<i>Position</i>	<i>Number</i>
Head Strength Coach	1
Assistant Strength Coach	2
Graduate Assistant	1
Intern	0

Strength Staff Certification

<i>Certification</i>	<i>Number</i>
CSCS	4
USAWF Club Coach	2
SCCC	0
Other	0

Machines Available

- Lat Pull Down
- Cable Row
- Tricep Push Down
- Leg Extension
- Leg Curl
- Leg Press
- Adductor
- Abductor
- Four Way Hip Machine
- Seated Calf
- Neck Machine
- T-Bar Row
- Leg Press
- Hammer – Jammer & Landmine

Dumbbell Area

- 2 complete sets
- Range 5-150 lbs

Overview

<i>Strengths</i>	<i>Weaknesses</i>
Well equipped	# of Olympic lifting stations
Great flooring	Rigid scheduling for times & days
Separate cardio area	Need more floor space for warm up, core, dynamic exercises
Adequate certified staffing	No Plyo stations/space

Anderson University

- Anderson, IN Private Liberal Arts College
- 2700 students & 345 student athletes
- Heartland Conference
- NCAA DIII

Facility Layout

Free weights	25%
Machines	50%
Cardio Equipment	25%

Anderson Facility Specifics (Free Weight Area)

<i>Type</i>	<i>Number</i>
Bench Press	8
Squat	4
Platforms	2
Olympic Bars	16
Bumper Plates	Yes
Elieko Bars	No
Sufficient Collars	Yes

Anderson Dumbbell Area

- 2 complete sets
- Range
5-125 lbs

Weight Machines

Plate Loaded

- Flat Bench
- Close Grip Bench
- Incline Bench
- Military Press
- Lat Pull
- Shoulder Shrug
- Leg Curl
- Leg Press

Selectorized

- Lat Pull Down
- Low Row Machine
- Pec Dec
- Tricep Push Down
- Leg Extension
- Leg Curl
- Four Way Hip
- Seated Calf
- Abdominal Crunch
- Neck Machine

Cardiovascular Training Area

Treadmills	6
Elliptical machines	7
Standard bikes	5
Recumbent bikes	2
Spin bikes	0
Stair masters	0

AU Overview

<i>Strengths</i>	<i>Weaknesses</i>
4,590 sq feet	low/no certified professional staff
Great squat & platform space	limited hours 6:00AM - 8:00PM
Location – access for students & athletes	little/no conditioning or plyo space
Good facility visual appeal	1x machines limiting

California State University Northridge

- Northridge, California
- Big West Conference

Facility Overview

- Redwood Hall
- 3,500 sq feet
- 7,500 pounds of free weight
- 2,500 lbs. of dumbbells
- All Sports
- Hours 5:45 am – 6:30 pm
- Coed facility
- No Football
- Men's & Women's Basketball also have a separate facility

Staffing

<i>Position</i>	<i>Number</i>
Head Strength Coach	1
Assistant Strength Coach	1
Graduate Assistant	0
Intern	0

Strength Staff Certification

<i>Certification</i>	<i>Number</i>
CSCS	2
USAWF Club Coach	0
SCCC	0
Other	0

Facility Layout

Free weights	99%
Machines	0%
Cardio Equipment	1%

Facility Specifics (Free Weight Area)

<i>Type</i>	<i>Number</i>
Bench Press	10
Squat	10
Platforms	10
Olympic Bars	38
Bumper Plates	Yes
Elieko Bars	No (Uesaka)
Sufficient Collars	Yes

Dumbbell Area

- 1 complete set
- Range 5 -100 lbs

Overview

<i>Strengths</i>	<i>Weakness</i>
# of Olympic lifting stations	No Machines
Well equipped for BP, Squat and Platform work	Very little cardio equipment
Good conditioning area	Cannot accommodate the needs of all sports
Adequate certified staffing	Equipped for only one training philosophy

Taylor University

- Upland, IN
- Private Liberal Arts College
- Mid-Central College Conference
- NAIA
- 2000 students & 250 student athletes

Facility Overview

- Multiple Facility Model for small college
- Student Wellness Center (Kessler Center)
 - 5876 sq. ft. opened 2006
- Athlete-Only Facility (Fieldhouse)
 - 1330 sq. ft. opened in 1980's

Facility Layout

Wellness Center

Free weights	20%
Machines	30%
Cardio Equipment	50%

Fieldhouse

Free weights	75%
Machines	20%
Cardio Equipment	5%

Taylor Facility Specifics (Free Weight Area)

<i>Type</i>	<i>Wellness</i>	<i>Fieldhouse</i>
Bench Press	6	4
Squat	1	4
Platforms	0	3
Olympic Bars	9	10
Bumper Plates	No	Yes
Elieko Bars	No	No
Sufficient Collars	Yes	Yes

Fieldhouse Machines

- **Leg Extension**
- **Leg Curl**
- **Leg Press**
- **Four Way Hip Machine**
- **Neck Machine**
- **Jammer (plate loaded)**
- **Squat (plate loaded)**

Wellness Machines

- **Lat Pull Down**
- **Cable Row**
- **Low Row Machine**
- **Tricep Push Down**
- **Leg Extension**
- **Leg Curl**
- **Leg Press**
- **Adductor**
- **Abductor**
- **Seated Military Press**
- **Seated Lateral Raise**
- **Abdominal Rotary Torso**
- **Squat (plate loaded)**

Taylor Dumbbell Area

Wellness

- 4 complete sets
- Range
2.5-110 lbs

Fieldhouse

- 1 complete set
- Range
10-130 lbs

Cardiovascular Training Area

	<i>Wellness</i>	<i>Fieldhouse</i>
Treadmills	12	1
Elliptical machines	15	0
Standard bikes	7	0
Recumbent bikes	3	0
Spin bikes	1	0
Rowers	5	0

TU Overview

<i>Strengths</i>	<i>Weaknesses</i>
Separate Facilities	Age/condition of athlete facility
Extensive Hours Open	Lack of Certified Staff
Ample Cardio Equipment	Locations not centralized
Natural Lighting & Views (Wellness)	Equipment overload (Fieldhouse)

University of Florida

- Gainesville, Florida
- Southeastern
Conference

Griffin-Oakley S & C Complex

Facility Overview

- 11,000 sq feet
- 50,000 lbs. of free weights
- 150 training stations
- All sports
- Hours 5:00 am – 7:00 pm
- Co-ed facility
- Renovated 2008
- There is only one main facility

Staffing

- **Mickey Marotti**
CSCS, NSCA, MSCC
Director of Strength and Conditioning
- **Scott Holsopple**
Assistant Director for Strength & Conditioning
- **Karin Werth**
CSCS, USAW, SCCC
Assistant Director of Strength & Conditioning, Olympic Sports
Women's Basketball, Gymnastics and Soccer
- **Frank Piraino**
Coordinator, Strength and Conditioning
- **Mark Campbell**
SCCC and USAW
Coordinator
Assists with Football and Men's Track and Field
- **Matt Herring**
Men's Basketball, Men's & Women's Golf and Men's &, and Women's Tennis
- **Matt Delancey**
CSCS and USAW
Assistant Director of Strength and Conditioning, Olympic Sports
Volleyball, Men's & Women's Swimming, Men's Field Events, and Women's Vaulters
- **Steve Orris**
M.S., CSCS and USAW
Coordinator
Assists with Baseball and Softball

Strength Staff Certification

<i>Certification</i>	<i>Number</i>
CSCS	7
USAWF Club Coach	4
SCCC	3
Other	0

Facility Layout

Free weights	30%
Machines	40%
Cardio Equipment	30%

Facility Specifics (Free Weight Area)

<i>Type</i>	<i>Number</i>
Bench Press	10
Squat	15
Platforms	10
Olympic Bars	50
Bumper Plates	Yes
Elieko Bars	Yes
Sufficient Collars	Yes

SelectORIZED MACHINES AVAILABLE

- Lat Pull Down
- Cable Row
- Low Row Machine
- Pec Dec
- Tricep Push Down
- Leg Extension
- Leg Curl
- Leg Press
- Adductor
- Abductor
- Four Way Hip Machine
- Seated Calf
- Standing Calf
- Seated Military Press
- Seated Lateral Raise
- Abdominal Crunch
- Back Hyper Extension
- Abdominal Rotary Torso
- Neck Machine

Hammer Strength Machines

(plate loaded)

Flat Bench
Close Grip Bench
Incline Bench
Military Press
Lat Pull
Low Row
T-Bar Row
4-Way Neck
Shoulder Shrug
Leg Extension
Leg Curl
Leg Press
Squat
Standing Calf
Seated Calf
Bicep Curl
Jammer

Dumbbell Area

- 4 complete sets
- Range 5-150 lbs

Cardiovascular Training Area

<i>Equipment</i>	<i>Number</i>
Treadmills	8
Elliptical machines	3
Standard bikes	10
Recumbent bikes	0
Spin bikes	0
Stair masters	0

Overview

<i>Strengths</i>	<i>Weaknesses</i>
11,000 sq feet	Location
Well equipped	Scheduling
Well staffed	Conflict w/ football
Well maintained	A “recruiting tool”

Resources

- Howard, L. (2001). Removing barriers to health clubs and fitness facilities: A guide for accommodating all members, including people with disabilities and older adults. Chapel Hill, NC: Frank Porter Graham Child Development Center.
- Sawyer, T. (2005). The planning process. In T. H. Sawyer (Ed.), *Facility design and management for health, fitness, physical activity, recreation and sport facility development* (11th ed.) (pp. 25-35). Champaign, IL: Sagamore Publishers.
- Sawyer, T., and Stowe, D. (2005). Strength and cardiovascular training facilities. In T. H. Sawyer (Ed.), *Facility design and management for health, fitness, physical activity, recreation and sport facility development* (11th ed.) (pp. 366-380). Champaign, IL: Sagamore Publishers.

Questions?

Thank you for your
attendance