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ABSTRACT Current thinking on elementary and secondary school physical education emphasizes motivating young people to develop habits of physical exercise and expression that will persist into adulthood. To help foster such a lifetime commitment, athletic programs must provide a range of opportunities for students to realize their particular physical potentials. Accordingly, athletic facilities must accommodate numerous individual and group-oriented activities. The reviewed documents, previously cited in RIE, are restricted to issues of design and construction and concern indoor facilities (gymnasiums and wide-span structures), outdoor areas, and swimming pools. (Author)
Physical Education Facilities

Alan M. Baas

Rather than bury the gym, what needs burying is the concept which created it. With few exceptions, recently-built athletic facilities and sports complexes have been designed much as they were in the 1930's: spectator oriented, full of special purpose areas, and divided men's and women's areas. In general they ignore many user needs or fail to live up to the building's purpose.

... the multipurpose facility does more things for more people for less, and is our greatest hedge against obsolescence.

_Browne (1971)_

Current thinking on elementary and secondary school physical education emphasizes motivating young people to develop habits of physical exercise and expression that will persist into adulthood. To help foster such a lifetime commitment, athletic programs must provide a range of opportunities for students to realize their particular physical potentials. Accordingly, athletic facilities must accommodate numerous individual and group-oriented activities.

In physical activities, motivation is closely associated with availability. There is a growing recognition that conventional gymnasiums do not offer sufficient spaces to meet adequately individual needs and preferences. In response, many schools are entering into agreements with community agencies for the joint funding and use of wide-span structures large enough to shelter track and field events. Where possible, the tracks in such buildings are made wider than normal to permit multiple use for games such as volleyball.
and badminton. Synthetic surfaces and the technology of air-supported membranes offer cost-effective solutions for many school and community needs.

Much of the literature on school-community athletic facilities pertains to financing and operation. The documents cited in this review are restricted to issues of design and construction and, therefore, include very few dealing directly with school-community facilities.

Abstracts of the following documents can be located in *Research in Education*. The complete texts are available from the ERIC Document Reproduction Service (EDRS), commercial channels, or both. Publications can be ordered in either Xerox copy form (HC) or microfiche (MF).

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**GENERAL PLANNING INFORMATION**


Includes an extensive treatment of all areas and facilities for physical activities. Facilities for all levels of education and the community, including swimming pools, receive detailed attention. Appendixes include planning checklists, diagrams of various types of athletic courts, and a glossary of terms.


**New Jersey State Department of Education.** A Guide For Planning Physical Education and Athletic Facilities. Trenton: 1964. 48 pages. ED 014 845 MF $0.65 HC $3.29.

**Smoll, Frank L.** Areas and Facilities for Physical Education and Recreation. An Interpretive Bibliography. Madison: ERIC Clearinghouse on Educational Facilities, University of Wisconsin, 1970. 100 pages. ED 035 266 MF $0.65 HC $3.29.

**INDOOR FACILITIES: GYMNASIUMS**

The literature contains a variety of general observations on gymnasiums and related indoor facilities. Gyms should be located away from classrooms and have their own public entrances. If the gym is to be open to community use and for more
than school hours, it should be designed so that portions of it may be locked when unsupervised.

Recommended minimum sizes of gymnasiums are 84' x 98' x 22' for junior high schools, and 90' x 106' x 24' for senior high schools.

Provisions for basketball, volleyball, badminton, and paddle tennis are considered standard. Whenever possible, additional provisions should include areas for gymnastics, dance, wrestling, and remedial work. Swimming pools are valuable but are frequently too expensive for single school purposes.

Gymnasium ceilings, floors, and walls require special attention to ensure adequate acoustical and lighting effects. Acoustics should minimize distracting reverberation noise; lighting should be nonglare and shadow-free. All surfaces should be easy to clean and resistant to scars and stains.

The walls should have no hazardous projections or sharp corners. Radiators and other heating devices should be covered. Benches should, where appropriate, be attached to the floor.

Gym floors should never be located below the grade level and should be ventilated underneath to prevent dryrot.

In addition to providing general discussion and specifications of various athletic areas, the planning manuals listed in the bibliography of this review also describe seating arrangements, teaching and health services areas, lockers, showers, training rooms, and storage areas. There are also several documents dealing with gym renovation and maintenance.

Applegate, Lindsay M. “Saving the Old Gym Floor.” School Management, 16, 4 (April 1972), p. 34. EJ 034 551.


Includes recommendations for administrators in planning dance facilities and equipment, and offers adaptations for elementary, secondary, and college programs.


Analyzes current trends in physical education programs and facilities in England and discusses all aspects of indoor athletic accommodations, including diagrams and figures wherever relevant.

Dickey, Donald D. Athletic Lockers for Schools and Colleges: Their Design—Selection— and Purchase with Functional Tips and Suggestions for the Modern Athletic Locker Room. 1967. 29 pages. ED 031 041 MF $0.65 HIC $3.29. (Also available from Donald D. Dickey, P.O. Box 20338, Bloomington, Minnesota 55820. $1.50.)


Finchum, R. N. “Maintenance of School Gymnasiums.” School Activities (May 1965), ED 025 104 Document not available from EDRS. (Available from School Activities Magazine, Box 196, Tescott, Kansas.)

INDOOR FACILITIES: WIDE-SPAN STRUCTURES

When a proposed facility is to be funded and used jointly by a school and a community, it will frequently be designed along the lines of a field house rather than a gymnasium. Providing the most indoor space possible for all types of sports, the field house concept is familiar in the northern parts of this country where snows and wet weather prohibit extensive use of outdoor playing fields for a substantial part of the year. Field houses are distinguished from traditional gymnasiums by their dirt or turf floors and exceptional size.

Petersen (1963) presents a history and detailed treatment of field house planning and design. In addition to equipment and facilities, various aspects of field house operation and service receive attention.

Development of artificial surfaces and lightweight structures has made field house construction a plausible solution to many school and community recreation needs. In an interview for *American School & University*, Thiebert ("P. Richard Thiebert on Facilities. . . November 1971") suggests that lightweight membrane (either cable or air-supported) structures can best provide the large, wide-span shelters necessary for community involvement in lifetime programs of physical fitness. He recommends building athletic facilities to house "anything you enjoy doing" and condemns the "form of torture" characterizing conventional physical education approaches to enjoying and understanding human movement.

Thiebert notes that making sports facilities large enough to accommodate a range of activities also deters obsolescence by providing for changes in user needs. He notes that this factor is particularly impor-
tant in the design of secondary or elementary facilities. "To permit uses such as volleyball and badminton, he recommends indoor tracks be made 60 feet wide instead of the usual 32 or 40 feet. Although he stresses the value of large spaces, he also cautions that acoustical problems in such structures will require special solutions.

In another American School & University article, Browne (November 1971) proposes new ideas for multipurpose space, wide-span structures, found space, playing surfaces, and track and field layouts. He notes that technological advances in synthetic surfaces and turf make possible a variety of multiple-use facilities. Widespread use of tent and air structures cannot occur, according to Browne, until contractors and building officials become more familiar with technical aspects, and accurate cost predictions are available for their long-term use. His article identifies potential athletic uses in such existing wide-span spaces as shops, factories, and warehouses.

A publication by the Ontario Department of Education (1972) summarizes current information on air structures and identifies their relative merits. According to the document, advantages include low initial cost; speed of erection; ease of deflation, inflation, and repair; portability; adaptability for temporary functions; long span and high ceiling; integrated heating, ventilating, and air-pressure systems; and maximum utilization of daylight illumination.

Disadvantages are due in part to the fact that air structures are still in their developmental stages. Performance over long periods of time is still uncertain, and there are special thermal and acoustical problems. The types of construction used for foundations and services can limit portability. Municipal codes often restrict the number of people and uses such structures may shelter, and the slight increase in air pressure necessary to inflate the membrane can be uncomfortable for some people.

Other articles concerning lightweight and wide-span structures, including geodesic domes, appear in the bibliography.


Gives realistic advantages afforded by inflatable structures when used in physical education programs.


Recommends considering the use of geodesic structures for better physical education facilities.

OUTDOOR AREAS

Opinions vary on how much land is needed for outdoor athletics. At the elementary level average recommendations suggest three acres per three hundred students, plus one-half acre for each additional hundred students. Junior high schools should begin with twenty acres and add one acre for each hundred students; senior high schools should begin with thirty acres and add an acre per each hundred students.

Preparation of outdoor areas for athletic use requires specialized knowledge of grading and drainage principles, soil cultivation and seeding techniques, and types of hardsurfacing materials. ERIC files list several substantive documents dealing with these considerations.

England's Department of Education and Science (1966) presents guidelines for planning, layout, construction, and maintenance of all types of outdoor fields and hard-surface areas. It also considers the dual use of playing fields by school and community. Appendixes include maintenance costs of grass fields, specifications for playing fields and other games provisions, and analyses of seed mixtures and seed-turf. The document is amply illustrated and supplied with statistical information where necessary.

Specialized information about outdoor physical education facilities also appears in a publication by Delamater (1963). His treatment is intended for use by architects, engineers, designers, program specialists, administrators, and consultants. In addition to describing comprehensive planning and objectives for outdoor areas, he discusses site selection, common problems of space utilization, physical education play surfaces, sports lighting, and service facilities.
Physical Education Facilities

"Artificial Turfs: Easier to Maintain, Safer for Play, but Costs Still High." Nation’s Schools, 84, 6 (December 1969), pp. 60-61. ED 012 088.


Jones, Thomas E. How to Build a Track. Madison: University of Wisconsin, 1955. 86 pages. ED 035 161 MF $0.65 HC $3.29.

Gives general requirements for tracks, takeoffs, runways, circles, and field areas. Includes site selection, indoor tracks, and preparation for track meets. Amply illustrated.


Provides brief overview of general outdoor area requirements for a central K-12 school and presents drawings of regulation fields and courts.

SWIMMING POOLS

Two documents deal directly with swimming pool design and construction. Gabrielsen (1969) edits a lengthy presentation on all phases of swimming pool development and operation from earliest planning considerations to final programming. Both indoor and outdoor pools for community, school, and competitive use receive attention. Information is also given on water circulation, filtration, and treatment; pool equipment and accessories; bathhouses and auxiliary services; and all types of permanent and temporary enclosures.


In addition, a number of technical manuals on swimming pool equipment and filters appear in the bibliography.

National Sanitation Foundation. Diatomite Type Filters for Swimming Pools. Standard No. 9, Revised October, 1966. Ann Arbor, Michigan: 1966. 37 pages. ED 025 900 MF $0.65 HC $3.29. (Also available from National Sanitation Foundation, P.O. Box 1468, Ann Arbor, Michigan 48106. $1.00.)

—. Sand Type Filters for Swimming Pools. Standard No. 10, Revised October, 1966. Ann Arbor, Michigan: 1966. 32 pages. ED 025 899 MF $0.65 HC $3.29. (Also available from National Sanitation Foundation, P.O. Box 1468, Ann Arbor, Michigan 48106. $1.00.)

—. Recessed Automatic Surface Skimmers for Swimming Pools. National Sanitation Foundation Standard Number 11. Ann Arbor, Michigan: 1966. 18 pages. ED 019 842 MF $0.65 HC $3.29. (Also available from National Sanitation Foundation, P.O. Box 1468, Ann Arbor, Michigan 48106. $1.00.)


—. Swimming Pool Water Treatment Chemicals and/or Processes. Standard No. 22. Ann Arbor, Michigan: 1968. 42 pages. ED 025 905 Document not available from EDRS. (Available from National Sanitation Foundation, P.O. Box 1468, Ann Arbor, Michigan 48106. $0.50.)

—. 1968 Listing of Swimming Pool Equipment. Ann Arbor, Michigan: Testing Laboratory. 1968. 26 pages. ED 025 904 MF $0.65 HC $3.29. (1973 edition available from National Sanitation Foundation, Testing Laboratory, P.O. Box 1468, Ann Arbor, Michigan 48106. $0.50.)

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