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A Risk Management Program

for the

Proposed VPI&SU Recreational Sports and Fitness Center

by

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Thesis submitted to the faculty of the

Virginia Polytechnic Institute and State University

in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE in EDUCATION

in

Health and Physical Education

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September 1990

Blacksburg, Virginia

ACKNOWLEDGEMENTS

I would like to express my gratitude to Elyzabeth J. Holford for her patience, support, guidance and willingness to read the many rough drafts that were handed to her. Her help was indispensable to my research. I would also like to thank the members of my committee; Dr. R. Bos, Dr. M. Driscoll and Warren Kark for the discussions and recommendations that they added.

Special thanks go to my wife Tina, who provided encouragement and motivation throughout the entire research. Thanks also go to David, Beverly, Lisa, Phil, Angel, Tara, Cara, Ken, Debbie, and Becky for their support.

My parents deserve a grateful long distance thanks for their willingness to allow me to come to America to enhance my education.

Most of all, I would like to thank God Almighty for the daily source of my strength. Through Him, "all things are possible"!

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Chapter One

Attributes and Latitudes of the Study

Virginia Polytechnic Institute and State University (VPI&SU) has embarked upon a project of planning, designing and constructing a Recreational Sports and Fitness Center. This proposed building will host diversified activities. Because the center will be a building housing high levels of physical activity, the element of risk or danger is inevitably higher than in most other types of facilities. This risk can lead to more accidents and injuries, and ultimately to law suits. Lubell (1987) comments that:

> the 'sue syndrome' is nothing new. As long ago as the early 1800's, historian Alexis de Tocqueville commented that Americans had an extraordinary tendency to look to the courts to resolve their disputes. The rewards accruing to those who do look to the courts for redress, are increasingly more attractive (p. 194).

Gaskins (1989) performed a case analysis to determine if the number of cases involving facility designs that have been found negligent has increased. Her study concluded that America is becoming an increasingly litigious society. We do indeed live in a very litigious society in which recreational centers are far from immune. With the aid of a systematic facility wide program designed to reduce preventable injuries and to minimize the financial severity of potential claims (Kapp, 1987), the administrators at

VPI&SU can take steps to ensure that the proposed facility is as safe as can be conceived.

Appenzeller (1970) stated since "a safe environment within a sports facility is essential to participants' well-being, injuries attributed to unsafe conditions often result in litigation" (p. 259). It is not humanly possible to list all the situations that would cause a facility to be unsafe, but a risk management program can identify foreseeable risks and may prevent subsequent injury and litigation.

Cases relating to sports' facilities are usually initiated by the occurrence of an injury. Penman and Niccolai (1985) claim that injuries result to participants using sports' facilities for four basic reasons:

1. The facility may be inadequately maintained, such as, an improper chemical balance of pool water or moisture on a playing surface;
2. the facility may have been improperly designed, for example, gymnasium walls that are too close to court boundaries or courts located too close to one another; therefore, it may be unsafe for certain activities;
3. the facility may have a product associated with it which is defective, such as, a synthetic surface that was not properly installed or is in a state of extreme wear; and
4. the facility has an inherent risk of injury (p. 36).

Purpose of the Study

The purpose of this study was to present to the planning committee at VPI&SU, a systematic facility wide program, designed to reduce preventable injuries and accidents and to minimize the financial severity of potential claims. This program is important because the VPI&SU staff working on this project has no prior experience in planning and designing a recreational facility with a built in risk management program (M. Broughton, personal communication, August 25, 1989). The program and the recommendations cited could be extremely beneficial to the design process and operation of the new center.

Delimitations

The risk management program was limited to:

1. The areas of the facility that are well documented as causing problems from a liability standpoint, and
2. the design of the facility in relation to litigation.

Limitations

The principle limitation placed on the development of a risk management program was that the facility is still in the design phase, thus, the final details of the proposed facility are not yet available to this author. To address this limitation the risk management program addresses the design as shown in the August 21, 1989 drawings from Parkin Architects/Wiley and Wilson (Appendix A, p. 85).

A list of manufacturers and suppliers addresses are furnished in Appendix B. This list can be referred to for more information that is not fully considered in this program.

Justification

A risk management system is created to enable professionals to identify, evaluate and control loss to employers, employees, participants and the public in general. Although loss is not the only factor that can cause legal liability, it is the factor most often cited in aquatics (Clement, 1989, p. 39).

"'Sport generally continues to be one of those high-risk areas' says Richard Hunter, director of finance at the National Collegiate Athletic Association (NCAA)" (Lubell, June 1980, p. 96). Litigation may be the only remedy for correcting the abuses that have plagued sport for all to long, argues Appenzeller (1970). These two comments highlight the serious problem facing the recreation and fitness industry today. "Numerous cases involving recreational facilities that were deemed unsafe have entered the courts. Various court cases over the years have made the area of litigation a serious concern for facility owners" (Appenzeller & Appenzeller, 1980, p. 259).

In Woodring v. Board of Education of Manhasset (1981), a wrongful death suit was filed against the school district after a platform railing in the gymnasium gave way, throwing

a student to his death. The appellate court found that the school district (1) lacked a preventive maintenance program, (2) improperly constructed the platforms, (3) failed to regularly inspect gymnasium facilities, and (4) should have known that the injury was foreseeable. The student's family was awarded $1.4 million. This case highlights the serious nature of facility liability.

Although there are frequent suits filed as a result of injuries related to play and sports' facilities, it is surprising there are not more such suits. Horine (1985) reasons "It is impossible to make facilities `fail safe,' but it is the duty of the administrator to foresee potential dangers and eliminate them" (p. 72). To help discern these potential dangers, a systematic facility-wide program, designed to reduce preventable injuries and to minimize the financial severity of potential claims is needed (Kapp, 1987). The staff of VPI&SU Recreational Sports and Fitness Center can be better prepared to prevent injury and avoid litigation if the risk management program proposed in this thesis is utilized.

Potential litigation can be reduced by considering legal aspects during the planning and design phase. Horine (1985) gives the following recommendations for the construction phase, which could reduce future litigation:
1. follow recommended standards in the design process; if a deviation is made, document why and how the different method

is safer; 2. use common sense in design; 3. include a safety specialist on the design and planning team; and 4. purchase products from reputable firms with strong warranties (p. 216).

Berry and Wong (1986) noted that a "user of the facility is to be protected from known defects as well as from defects that would be discovered by the exercise of reasonable care" (p. 295). Implementation of a risk management program will enable the administrators of VPI&SU to exercise reasonable care towards the users.

Lubell (1987) comments that:

> risk management programs put sports' programs in a better position to launch an effective defense should they be sued. Risk management plans create a positive safety image, educate personnel about their expanding legal duties, and improve safety procedures and informed consent guidelines. Not only should a risk management plan reduce the potential for lawsuits, but more importantly, it should reduce the potential for injury (p. 196).

The VPI&SU facility is still in the planning and design stage. The opportunity to alter the design of the various components at an early stage may prove invaluable in terms of risk management. For instance, a decision to utilize a certain floor covering with the full knowledge that the

course of action is legally the most sound makes for logical planning.

Definitions

The following legal definitions were taken from Gifis, S.H. (1984). Law dictionary: N. Y. Barron's Educational Series Inc.

Assumption of Risk - An affirmative defense used by the defendant to a negligence suit claiming that plaintiff had knowledge of a condition or situation obviously dangerous to himself and yet voluntarily exposed himself to the hazard created by the defendant, thereby relieving him of legal responsibility for any resulting injury, 70 N.E. 2d 898 (p. 32).

Civil Law - Part of the law that is concerned with noncriminal matters, or may refer to the body of laws prescribed by the supreme authority of the state, as opposed to natural law, 244 P. 323 (p. 71).

Common Law - The system of jurisprudence, which originated in England and was later applied in the United States, which is based on judicial precedent rather than statutory laws, which are legislative enactments; it is to be contrasted with civil law. The common law is "generally derived from principles rather than rules; it does not consist of absolute, fixed and inflexible rules, but rather of broad and

comprehensive principles based on justice, reason, and common sense, 37 N.W. 2d 543 (p. 81).

Comparative Negligence - The allocation of responsibility for damages incurred between the plaintiff and defendant, based on the relative negligence of the two; the reduction of the damages to be recovered by the negligent plaintiff in proportion to his fault, 86 S.E. 2d 156 (p. 309).

Contributory Negligence - Conduct on the part of the plaintiff that falls below the standard to which he should conform for his own protection, and which is a legally contributing cause in addition to negligence of the defendant in bringing about the plaintiff's harm. At common law, any amount of contributory negligence would bar recovery by the plaintiff, Tort 416 [4th Ed. 1971] (p. 309).

Defendant - In civil proceedings, the party responding to the complaint; "one who is sued and called upon to make satisfaction for a wrong complained of by another, [the plaintiff], " 203 S.W. 2d 548 (p. 122).

Foreseeability - A concept used in various areas of the law to limit liability of a party for the consequences of his acts to consequences that are within the scope of a foreseeable risk, for instance, risks whose consequences a person of ordinary prudence would

reasonably expect might occur, 73 S.W. 2d 626 (p. 191).

Governmental Function - Activity done or furnished for general public good, "limited to legal duties imposed by state upon its creatures which it may not omit with impunity, but must perform at its peril," 279 P. 2d 472 (p. 205).

Governmental Immunity - Doctrine of implied limitation on the power of federal government to tax a state or any of its instrumentalities, and of the power of any state to tax the federal government of its instrumentalities (p. 205).

Liability - An obligation to go or to refrain from doing something; a duty which eventually must be performed; an obligation to pay money; signifies money owed, as opposed to asset; also used to refer to one's responsibility, tort liability, criminal liability (p. 269).

Negligence - Failure to exercise that degree of care which a person of ordinary prudence would exercise under the same circumstances. The term refers to conduct which falls below the standard established by law for the protection of others against unreasonable risk of harm, Restatement, Second, Torts Section 282 (p. 309).

Plaintiff - The one who initially brings the suit; "he who, in a personal action, seeks a remedy in a court of justice for an injury to, or a withholding of his rights," 147 F. 44 (p. 346).

Proximate Cause - That which in the natural and continuous sequence unbroken by any new independent cause produces an event, and without the injury would not have occurred, 323 P. 2d 108 (p. 63).

Reasonable Man [Person] - A hypothetical person who exercises "those qualities of attention, knowledge, intelligence and judgement which society requires of its members for the protection of their own interest and the interests of others," 43 S.W. 508 (p. 388).

Sovereign Immunity - A doctrine precluding the institution of a suit against the sovereign [government] without the sovereign's consent, 440 U.S. 410 (p. 447).

Statute - An act of the legislature, adopted pursuant its constitutional authority, by prescribed means and in certain form such that it becomes the law governing conduct within its scope (p. 483).

Willful and Wanton Negligence - An intentional act of an unreasonable character in disregard of a risk known, or so obvious that it must have been known, and so great as to make it highly probable that harm would follow. The act is usually accompanied by a conscious

indifference to the consequences amounting almost to willingness that they shall follow, 88 A. 895 (p. 512).

The following definition was found in Berry and Wong (1986):

Ordinary Care - Ordinary care involves reasonable diligence and exercise of good judgement. It is the care a reasonably careful person would use under similar circumstances (p. 294).

Summary

Chapter One introduces the fact that the risk of litigation in sports is a reality. A solid risk management program is a tool to help avoid this litigation. The delimitations and limitations of the study are outlined. The purpose of the study was to create a risk management program for the proposed facility at VPI&SU. The study was justified given the various legal cases relevant to liability in facilities. The chapter concludes with a definition of terms which provides the reader with a guide to the legal terms used frequently in this thesis.

Chapter Two

Methodology

The purpose of this research was to formulate a risk management program for the VPI&SU Recreational Sports and Fitness Center. This purpose was accomplished by the analysis of the literature in the field of planning and construction of recreational facilities as well as an analysis of legal cases pertinent to these facilities. The following procedures were utilized to accomplish this task.

Data Collection

The information which served as the foundation of the risk management plan was derived from a number of sources. These sources were:

1. recommendations and standards printed by national sport organizations,
2. current trends in facility design,
3. litigation and
4. VPI&SU Recreational Sports and Fitness Center plans dated August 21, 1989.

Recommendations and standards printed by national sport organizations were reviewed and applied where it was deemed necessary. The materials reviewed were from organizations such as the National Intramural Recreational Sports Association (NIRSA), the American Alliance of Health Physical Education Recreation and Dance (AAHPERD), and the National Collegiate Athletic Association (NCAA).

This author determined the current trends in recreational facility design to help in recommending which designs are best suited for the situation at VPI&SU. Certain materials were also suggested based on information from journals and books from the area of facility design. Recent periodicals such as Athletic Business, Architecture Review and Parks and Recreation served as an aid to collect this information.

Litigation information was derived from reported legal decisions and any relevant literature such as law reviews and state statutes. Court cases directly related to liability in recreational facilities were analyzed using the case analysis form found in Appendix C. These cases served as a basis for recommending certain features in the new facility.

The VPI&SU Recreational Sports and Fitness Center proposed plans as of August 21, 1989 were utilized to form the backbone of the risk management program. By having access to these facility plans, the risk management program was formed specifically to meet the needs of the new facility. VPI&SU Recreational Sports and Fitness Center plans were provided to this author by Virginia Tech's University Planning office.

Organization of Risk Management Program

After analysis of the sources, this author then examined the VPI&SU plans in light of the following three

key risk management factors as noted by Langendorfer, Gray, and Bruya, (1989):

1. identification of the risks,
2. evaluation of the risks (extent, nature, severity), and
3. development and implementation of risk management loss control strategies (p. 22).

These three risk management factors were then applied to nine facility areas. These are as follows:

1. swimming pool,
2. gymnasium,
3. locker rooms,
4. elevated track,
5. weight room,
6. racquetball and squash courts,
7. multi-purpose rooms,
8. general areas and
9. handicap requirements.

Chapter 5 is devoted to the recommended future strategies for the administrators of the facility. If implemented, the strategies form the basis of an evaluation of the risk management program.

Summary

Chapter Two reviews the methodology used in formulating the risk management program. The sources of data and data collection were discussed. Various sources were cited as to

where the data was collected. The risk management program has been broken into nine pertinent elements of the proposed facility and areas of these elements examined in close detail.

Chapter Three

Review of Literature

A thorough review of literature has been necessary to outline the problems facing the planning committee for the proposed facility. This review of literature explains the elements of negligence, the requirements of legal defenses, the legal designations of facility users, the special defence of immunity, the concepts of risk management and the issues of facility design.

Negligence

In general, most cases involving recreational centers focus on negligence. For this reason, this study reviews the concept of negligence. The elements of and defenses to negligence are discussed.

There are four major elements of negligence. Each of these must be proved by the plaintiff. The elements are:

1. Duty - obligatory conduct owed by a person to another person.
2. Breach of Duty - a failure to perform a duty owed to another or to a society; a failure to exercise that care which a reasonable man would exercise under similar circumstances.
3. Proximate Cause - was breach of duty or negligence on the part of the defendant the cause of the injury.

4. Injury or Damages - what injury or damages, if any, did the plaintiff suffer (McCann, Partner, Cooper, & Kelly, 1988, p. 20).

There are several common defenses available to defendants in negligence cases. Berry and Wong (1986) identify the following defenses:

1. No Negligence - the behavior of defendant didn't constitute negligence;

2. contributory Negligence - any act of the plaintiff that amounts to a lack of ordinary care and contributes to the proximate cause of the injury;

3. comparative Negligence - is a doctrine adopted in many states in an effort to alleviate the harshness of the contributory negligence doctrine;

4. assumption of Risk - means that the plaintiff has given prior consent to what would normally be an unpermitted, potentially injury-causing action. This consent effectively relieves defendant or obligation of any standard of care toward the plaintiff. Legal duty no longer exists between the two and therefore negligence cannot be found;

5. statute of Limitations - plaintiff has not filed a complaint within the states prescribed time period;

6. immunity - capacity of defendant, for example, status or position;

7. Good Samaritan Law - one who sees and attempts to aid another person who has been placed in imminent and serous peril through negligence of a third person; and

8. Waivers - the use of the waiver while generally not an absolute bar to liability, can often be used effectively to demonstrate that a plaintiff knowingly undertook the risks of the activity. It is worthwhile to have waivers so they can be used in evidence against the person bringing the suit (p. 298).

Berry and Wong (1986) noted that the "the doctrine of comparative negligence seems to divide the responsibility between the two negligent parties. The jury or fact finder determines the proportionate degree of negligence that will be attributed to all parties involved" (p. 312). Comparative negligence is not however recognized in the State of Virginia (Holford, 1989). The operable defense in Virginia is contributory negligence.

Facility Owners and Negligence

To establish a duty for owners, operators, supervisors, or possessors of land, the law requires that the status of the injured party be determined. Wong (1988) indicated there are three classes of persons: licensees, invitees, and trespassers.

Licensee. A licensee is "a person who is neither a customer, nor a servant, nor a trespasser, and does not

stand in any contractual relation with the owner of the premises, and who is permitted expressly or impliedly to go therein merely for his own interest, convenience, or gratification" (Gifis, 1984, p. 270).

"The owner of the facility owes only the duty of ordinary care for a licensee" (Berry and Wong, 1986, p. 294). Most courts have held that a land occupier's duty of care to licensees extends to situations where the occupier (owner) has actual knowledge of dangers which would not reasonably be observed by others.

Invitee. An invitee is one who comes upon the land of another by the other's invitation, whether expressed or implied. Another definition of an invitee which is more applicable to the Recreational Sports and Fitness Center is usually called the "invitation test." "It applies when the land occupier holds the premises as suitable for the purpose for which the visitor entered, 46 Wis. 2d 337" (Riffer, 1985 p. 301).

A public invitation test has been added to the business invitation test. This is outlined by Kaiser (1986):

1. An invitee is either a public invitee or a business invitee.
2. A public invitee is a person who is invited to enter or remain on land as a member of the public for a purpose for which the land is held open to the public.

> 3. A business invitee is a person who is invited to enter or remain on the land for a purpose directly or indirectly connected with business dealings with the possessor of the land (p. 92).

The facility owner owes an invitee a duty to use reasonable care to keep the premises safe. The owner also needs to warn the invitee of any hidden danger. There is generally no duty to warn of known dangers, obvious dangers, or dangers which should have been observed in the exercise of ordinary care. The owner of the facility is not an insurer of the invitee's safety (Riffer, 1985, p. 301).

Trespasser. "A trespasser is one who wrongfully interferes with or disturbs the possession of property" (Gifis, 1984). "Generally, a defendant owes no duty to a trespasser except to refrain from willfully or wantonly injuring him or her. This low standard is not easily breached" (Riffer, 1985, p. 309). Although not owed a duty, the trespasser should be made aware of any known dangers.

Practical Application. The intended user of the Recreational Sports and Fitness Center will be, for the most part, an invitee. The reason the user will be an invitee is because of the "invitation test" concept. The user is invited to enter or remain in the facility as a member of the public for a purpose for which the facility is held open for the public. "This user is to be protected from known defects that would be discovered by the exercise

of reasonable care. The owners of the facility are not an insurer of the safety of an invitee, that is, the owner does not guarantee safety under all possible circumstances, 83 N.E. 2d 616" (Berry and Wong, 1986 p. 295).

Those in charge of sports facilities are liable for any injury caused by the dangers that should have been discovered through the ordinary care shown to the public. Moreover, if they are aware of the danger, this awareness is imputed to the owner or operator, who becomes liable if they fail to take reasonable steps to remedy the problem or warn participants (Schubert, Smith and Trentedue, 1986 p. 238).

Immunities as Defenses

Immunities are a form of defense used by a government agency to shield public employees from liability. Immunity of a state extends to all subordinate bodies of the state.

Governmental Immunity. Riffer (1985) gives the following explanation:

> The governmental immunity doctrine has been justified at various times, and with varying degrees of support, primarily on five different grounds. One popular historical justification for this doctrine was the fear that absent such protection there would be unexpected and unplanned claims on the public fiscal.
>
> A second justification was that public policy required such a defense. A government that could be held liable for damages would eliminate or reduce

> public recreational areas. A third justification was that a sovereign was exempt from the suit on the logical and practical ground that there can be no legal right against the authority that makes the law on which the right depends. A fourth justification was that governmental units are not liable for the torts of their employees. A final justification was that under the concept of separation of powers a judicial branch's decision should not triumph over a decision made by the executive branch, a coequal branch of government (p. 167)

The Virginia Supreme Court most recently examined governmental immunity in Lentz v. Morris (1988). In its decision, the Court reviewed some of the reasons for the evolution of this doctrine. The Court found that failure to recognize the governmental immunity defense would be a disservice to the public (Holford, 1989).

Riffer (1985) suggests "the athletic activities provided by schools have generally been considered an exercise of a governmental function. A school was held immune from liability where a student was injured while using a swing because the furnishing of swings was a governmental function" (p. 170). It must be remembered that sovereign immunity does not prevent institutions from being sued; it is merely one defense which is available in states which utilize the doctrine.

Recreational Immunity Statute. Section 15.1-291 of the Virginia Code entitled "Liability of counties, cities, and towns in the operation of recreational facilities" reads as follows:

> No city or town which shall operate any bathing beach, swimming pool, park, playground or other recreational facility shall be liable in any civil action or proceeding for damages resulting from any injury to the person or property of any person caused by an act omission constituting simple or ordinary negligence on the part of any officer or agent of such city or town in the maintenance or operation of any such recreational facility. Every such city or town shall, however, be liable in damages for the gross or wanton negligence of any of its officers or agents in the maintenance or operation of any such recreational facility. The immunity created by this section is hereby conferred upon counties in addition to, and not limiting on, other immunity existing at common law or by statute (p. 191).

In Frazier v. City of Norfolk (1987) the Virginia Supreme Court tackled issues related to the Recreational Immunity Statute. Action was brought against the city for injuries sustained when a thirteen year-old child who was accompanying the church choir by playing the drums during a religious convention in the municipal hall. The Virginia

Supreme Court held that the "municipal hall was a 'recreational facility' for purpose of municipal liability statute, requiring showing of gross negligence on part of city." The city, therefore was immune from liability on the basis that the defendant had to prove that the city showed gross and wanton negligence and not just negligence.

Risk Management

Through the study of past court cases and pertinent literature, it is possible to present a working model of a risk management program for the VPI&SU Recreational Sports and Fitness Center. Even when a risk management program is in place, liability insurance should be purchased (Schubert, Smith and Trentedue 1986). Howard (1989) quotes Ronald L. Baron, executive director for the Center For Sports Law & Risk Management Inc. as suggesting:

> that the first step in starting a sports risk management program is to form a safety committee that will meet on a periodic basis to review potential trouble spots, ensure that facility and equipment inspections are done properly and ensure you're attempting to run a safe program (p. 101).

Penman and Niccolai (1985) note that in order to design safe facilities you must use recommended standards. These standards include common sense, conducting periodic safety inspections, keeping accurate records, purchasing quality building products and accessories and enlisting the

services of a sports design consultant during the predesign phase.

Direnfeld-Michael (1989) recommends the following five step risk management program:

1. hazard recognition;
2. listing and examining risk management techniques, exposure avoidance, loss prevention, loss reduction, segregation of exposure units, and contractual transfer for risk control;
3. selecting the apparent best techniques;
4. implementing chosen techniques and
5. monitoring and improving the risk management program (p. 43).

Any risk management program needs to focus on the recognition of a risk or known danger. By finding the dangers, one is then able to look into techniques for avoiding them. Literature clearly indicates the need to evaluate the situation at the earliest stage and then act upon that evaluation.

Given the rising cost of insurance, most facility operators should be concerned with risk management. Municipalities have banded together to form risk management pools, funding their coverage through joint contributions. "By consolidating their efforts and reducing potentially risky situations in their departments, some pools can acquire insurance at group

rates" (Tiffany, 1987 p. 65). These risk management pools for public and state entities are now allowed in Virginia.

A risk management program should safeguard the client and the facility owner, but not to scare people away from the program. Although an assumption of risk or waiver may be helpful in formulating a legal defense, no form can prevent an injured party from filing a lawsuit... Effective risk management can help safeguard the participant during an activity and help protect the facility operator if there is an injury. " By forcing close scrutiny, the development of a risk management plan can ultimately produce a better service to the participant: an exciting yet safe recreational program" (Ewert, 1989, p. 91).

Facility Design

Literature in facility design is helpful in creating sound, safe and logical recommendations for the planning of the different components of the facility. For example, thorough research prior to construction, can help avoid future problems.

> Had the whirlpool been built next to the pool, a lifeguard would have to be on duty at all times to cover liability, the solution was to create a 'wet room' complete with whirlpool, sauna and steam room. It's the solution to what we identified as a problem (Green River, 1988, p. 44).

Another example is evident when gymnasiums are designed to be multipurpose. Some gymnasium design problems have to be overcome and consequently compromises have to be made. One issue is the gymnasium floor. "If you're going to be using it for any kind of event that involves tables and chairs, you really need synthetic flooring," ("Diversity the rule", 1989, p. 54). Choice of flooring, location of certain equipment and integration are some examples of the need for planning with foreseeable risks in mind.

Recreational establishments must take reasonable care in the design of their premises. In Shetter v. Davis Brothers (1982) the court held that a pool builder which held itself out as an expert in pool design could be liable for the negligent design of a pool it built, but did not design, if it should have known of the dangers of the design yet failed to eliminate those dangers.

The nine pertinent areas of the proposed facility (as identified in Chapter Two of this thesis) merit review from a legal standpoint. Following is an overview of the problems that each area presents to the design committee.

The swimming pool is perhaps the most susceptible area for litigation. "Swimming as it turns out, is among the leading causes of injury and death" (Wiklund, 1989, p. 18). Penman and Niccolai (1985) states "presently there is more money involved in litigation pending in the courts related

to accidents in and around the swimming pool than to those of all other amateur and professional sports combined" (p. 43). Horine (1985) states "swimming pools provide immense opportunities for lawsuits" (p. 73). Kaiser (1986) comments "swimming pool litigation falls into one of the following groupings: 1. inadequate supervision, 2. dangerous water conditions, 3. slippery surfaces, 4. inadequate rescue equipment, and 5. accidents caused by other pool patrons" (p. 118). In Shetter v. Davis Brothers (1982), the court held that a pool builder may be liable for the negligent design of the pool, even where the builder did not prepare the design but merely complied with the plans furnished by the owner's architect.

Numerous cases have involved swimming pools, particularly diving into shallow water. In Erickson v. Muskin Corporation (1989), the plaintiff looked to recover from injuries sustained when he dived into shallow water and broke his neck. The judge entered judgement in favor of the plaintiff on jury verdict because of insufficient warning signs. In Dietrich v. Allstate Insurance Company (1989), the plaintiff sued the owner of a swimming pool for injuries sustained when she dove into the pool. Because of the poor lighting, judgement was in favor of plaintiff. In Glittenburg v. Wilcenski (1989), the plaintiff sued after she was injured from diving into the shallow end of the pool. The court of appeals held that the danger of diving

into the shallow end of the swimming pool was not open and obvious; that the pool owners owed duty to warn plaintiff regarding this danger; and that the recreational land use statute did not relieve pool owners of liability. In Amatulli v. Delhi Construction Corporation (1989) the plaintiff, an experienced swimmer and diver, dived into four feet of water and injured himself and consequently sued the manufacture of the pool. In Falgoust v. Richardson Industries, Inc. (1989), the 24 year old plaintiff who had been drinking beer most of the afternoon dived into a pool and broke his neck. He was awarded $950,000 because there were not adequate warning signs posted. In Ciofalo v. Vic Tanny Gyms, Inc. (1961), the plaintiff fell near the edge of the swimming pool and sued the owner because of the wet condition of the pool deck. The court found in favor of the defendant. The above mentioned cases are just a few of the cases involving people getting injured in and around swimming pools.

Water standards, deck construction, markings indicating water depths, drainage, slopes and lighting all bear on the outcomes of litigation related to design (Penman and Niccolai 1985, p. 44). If proper care in design is not taken then the swimming pool will become a potentially dangerous area.

The gymnasium is going to be the place where much activity will take place as evidenced by the participant use

of VPI&SU's present facility (Appendix D, p. 88). There will be numerous people playing basketball at any one time as the plans call for four basketball courts (Appendix E, p. 118). Court cases involving gymnasiums have focused on issues such as the distance between backboards and walls as well as the construction material of the doors.

In Stevens v. Central School District No.1 of the Town of Ramapo (1966) case, the appeals court affirmed the trial court judgement in favor of the plaintiff who went through a glass door while playing basketball. The door was two feet from the backboard. This distance was deemed to be unsafe for the style of play. In Thomas v. St Mary's Roman Catholic Church (1979), the court affirmed a $125,000 verdict for a basketball player who was injured because his momentum from a play carried him through a glass panel six feet from the edge of the basketball court. The court held that the school was negligent in placing breakable glass panels so close to a basketball court.

The design of the weight room will deal primarily, with the use of space. The proposed VPI&SU weight room will have 10,000 square feet (Appendix E, p. 121). 1500 members currently use the facility in War Memorial Gym (Appendix D, p. 99). The physical placement of equipment is also very important. There must be enough room between each machine or station to enable participant usage and traffic. Consideration should also be given to an area where people

can safely warm up and wait for a machine to become available.

Elevated tracks pose a problem when young children use them or walk on them. Care has to be taken in considering the design and height of the rail which encircles the track. The plans for the VPI&SU facility call for a balcony which joins an elevated track (Appendix E, p. 123). The projected use of the track is for up to thirty people at any one time (Appendix E, p. 123). Sufficient space must be provided for this number of runners to participate at any one time.

Locker rooms have some similar problems to those associated with pool decks. The floors are frequently wet which can lead to some serious injuries. In Harris v. My Fair Lady of Georgia, Inc. (1987), the plaintiff fell in the shower and sued the owner. The plaintiff was a member of the defendant health club and while using the facilities, slipped and fell in the shower, injuring her right ankle and leg. The plaintiff felt the shower area was improperly designed, constructed and maintained. The court ruled in favor of the plaintiff and this decision was then overturned in the appeals court. In Fleege v. Green Bay Packaging the plaintiff, while using crutches, slipped and fell in the women's shower room at a health club run by the defendant. The plaintiff alleged that she walked through the women's shower room to reach the swimming pool. The mat covering the floor through the shower room stopped a few feet before

the door to the pool. The plaintiff observed that there was water on the wet tile. She placed her crutches down on the wet tile, put her weight on the crutches and began to swing forward when her crutches went from under her. The tiles in the shower room were ceramic and were cleaned twice daily. The defendant health club was found not to be negligent.

In Patton v. Spa Lady Inc. (1989), the defendant was found vicariously liable for injuries when the plaintiff received a shock from an electrical outlet which was positioned over a sink vanity. The plaintiff leaned over the sink to inspect himself in the mirror and received a shock from the electrical outlet.

The multi-purpose rooms, as the names implies, will be used for a variety of purposes. The rooms need to be designed to make them safe for all the planned activities. If the rooms are not safe for a particular activity, then that activity will suffer because it would not be recommended for that activity to take place in the multi-purpose rooms. Activities planned for the multi-purpose rooms include aerobics, fencing, karate, gymnastics and a variety of other indoor recreational activities (Appendix E, p. 120). As so many diverse activities are being planned for these rooms, it is important that the design takes each safety matter related to the respective activities into consideration.

There will be two squash courts and six racquetball courts in the proposed facility (Appendix E, p. 122). It has been suggested that theses courts have glass backs for spectators (Appendix E, p.122). Problems with racquetball courts are few, but if care is not taken with the design then litigation is possible. For instance, glass walls should be shatterproof yet clear enough for viewing purposes.

Summary

Chapter Three reviews literature in the area of facility risk management. First the elements and defenses of negligence are examined. Facility owners and their relationship to negligence is then discussed. Third, the special defenses of governmental and recreational immunity are discussed. The chapter closes with a review of general risk management issues and facility design considerations.

Chapter Four

Risk Management Program

Introduction

This chapter constitutes a risk management program for the proposed VPI&SU Recreational Sports and Fitness Center. As noted in the methodology chapter of this thesis, a four part analysis as suggested by Langendorfer, Gray, and Bruya (1989) of the nine selected facility areas is covered by this program. The three part analysis is:

1. identification of the risks,
2. evaluation of the risks, and
3. development and implementation of risk management loss control strategies.

The nine facility areas analyzed are the: swimming pool, gymnasium, weight room, elevated track, locker rooms, multi-purpose rooms, racquetball and squash courts, common areas and considerations for the impaired.

Each facility area is assessed for individual risks and potential problems. These risks and problems are evaluated and then risk management loss control strategies are suggested to avoid liability for the potential risks and problems in each of the nine facility areas.

Swimming Pool

The swimming pool is an area that has perhaps the most potential for risk. The following are some of the pool elements that need attention at the design stage: location

of offices, shape of the pool bottom, warning signs, pool deck material, pool deck drainage, diving areas, humidity levels, pool gutters, starting blocks, chlorination safety, first aid provisions, instructional pool requirements, underwater lights, depth of pool, pool area barriers and determination of the size for capacity of pool.

Location of Offices. The location of the main aquatic office is important. The plans show the office to be located towards one end of the pool (Appendix A, p. 86). The manager of the facility needs to be able to observe all that is going on as does the lifeguard on duty. If the person on duty has to answer the phone, the distraction is minimal if the office is centrally located. For maximum benefit, the office should be located in the immediate proximity of the pool. All staff must be able to see all areas of the pool from the office. The front of the office needs to have a large window which faces in the direction of the pool and allows for maximum viewing of the surrounding area.

Shape of Pool Bottom. It is recommended that spoon and hopper shaped bottoms be avoided (Johnson 1984). Spoon and hopper shaped pool bottoms make it difficult for an individual to get out of the pool because of the sharp rise to the side of the pool. Another problem with spoon and hopper bottomed pools is that they tend to distort swimmers' perceptions of pool depth. In spoon and hopper bottomed

pools, the depth may be as much as eight feet in the middle, but only three or four feet at the sides.

By making the shape of the pool rectangular with sharp corners at the bottom, the problem of spoon or hopper shaped pools will be eliminated. Also, the depth change in the shallow area should not be greater than one foot for twelve feet of horizontal distance and the bottom surface should be of a non-slip texture.

Warning Signs. The installation of warning signs should be considered a part of the design of the facility (Bruya and Langendorfer, 1989). Warning signs should be placed in positions where they will be seen by every user. Designing the warning signs to be both noticeable and attractive, they can contribute to the aesthetic beauty of the swimming pool.

One idea is to use a standardized pool signage package that provides all relevant information about the pool. Holiday Corporation, for example, tried to standardize the way it marks water depths in a clear manner (Sheehan, 1986). Holiday Corporation went with a standard design that was consistent, easy to read and simple to follow.

A leading swimming pool manufacturer picked up where the federal government left off and funded additional research and design activities leading to an arguably "optimal" warning signs for their pools. This work got the attention of several government and industry groups. These

safety groups agreed to endorse these warning signs as "standard" (Wiklund, 1989).

Wiklund further adds "the warning signs should target the two major risks associated with swimming: drowning and injury from diving into shallow water". He states "the design of signs are enhanced by the use of simple pictures... showing either a diving injury in progress or the proper supervision of children" (1989, p. 18).

In Atkins v. Bisigier (1971), the following statement was made about the use of signs:

> a facility which wants to prohibit diving must do so explicitly. A sign stating swimming and diving at your own risk may be held insufficient for that purpose because those words could be construed to mean that swimming and diving were authorized activities, although the participant would assume the inherent risk of the sport. Even if the risk of danger is obvious, it may also be unreasonable for the facility not to reduce the risk of injury.

It is suggested that the use of signs installed in the most visually obvious parts of the physical environment of the facility is the most logical way to warn and inform users. The posting of the rules can be incorporated into the design of the facility by having wall sections designated to house the signs. Placing the signs where they can be seen is of the utmost importance. If this placing

can be planned at the design stage, the signs can be optimally located. Areas recessed where the rules can be displayed may enhance their visibility. The information to be displayed on the sign should be included within the materials given to the architects at the beginning of the design process. Signs that can be used to display warnings include wall signs, floor signs, waiting area signs, hanging signs and free standing signs. In the pool, signs need to be placed specifically around the shallow end, emphasizing no diving.

The marking of the depth of the pool is another important signage consideration. The pool needs to have the depth indicated both on the edge of the deck and on the vertical walls of all four sides of the pool. Every foot of depth change should be indicated. It may be a good idea to mark the depth in feet and meters as the student population at VPI&SU includes international students.

Pool Deck. Pool deck design and non-slip surfaces are very important. This is an area where standing water is common and when participants run around the pool deck, accidents that are preventable may occur. For example, in Owen v. Vic Tanny's Enterprises (1964), the plaintiff was awarded $2,000 when she fell on a pool deck as she left the pool area. The owners of the swimming pool were found negligent in the construction of the pool deck which was made of concrete. The recommended minimum width of the

deck should be 10 feet on the sides and twenty feet on the ends Baley and Matthews 1984). This space is required for land drills, swimming starts, the movement of swimmers around the pool during teaching sessions and to accommodate peak loads of swimmers during mass recreation swims.

It is suggested that the pool deck and the locker room be at the same elevation, which implies that no steps be used. Having steps increases the possibility of someone slipping upon entering the pool.

Pool Deck Drainage. The surface of the deck needs to be of a non-slip material and have a drain positioned for every 250 square feet of deck area to eliminate water build-up. The slope towards the drain should not exceed 1% because a greater slope foreseeably could cause a slip and fall incident (Penman, 1977, p. 256). The drain covers need to be designed to prevent tripping or foot injuries.

Diving Area. Diving areas are where the greatest hazards arise and, therefore, the greatest litigation potential exists. Although the current plans do not call for any diving boards (Appendix E, p.135), Leo Smith, a member of the planning committee, stated that diving boards may be implemented later. These boards he added, would be one meter boards (Personal Communication, L. Smith August 13, 1990). It is better not to have a diving well than to have one that is not deep enough or big enough. Diving accidents usually occur when an individual dives into

shallow water. Another problem is created when a large group of people dive into a small area of deep water. To ensure that no diving takes place, stairs should be installed at the shallow end of the pool for entering and exiting purposes. The placement of diving boards that are easy to remove will help to avoid unwanted diving. Signs around the pool emphasizing "no diving" will be needed to keep people from diving in from the side, particularly at the shallow end.

It is recommended not to install diving boards at the present time or in the future. The standard depth of a diving area is twelve feet (Facility Specification Guide, p. 18). The proposed depth of the pool is between 3-10 feet (Appendix E, p. 134).

Humidity Levels. Proper humidity control is an issue that transcends comfort. If not properly controlled, it can have deleterious effects on the building systems and formulas. For example, damage to the steel structure can occur when subjected to condensation which contains pool chemicals. Excessive humidity also supports bacteria that is unhealthy for pool patrons.

The following problems may result for improper humidity control:

moisture condensation on walls, windows and other cool surfaces, rust or corrosion on roof supports, swimmers complaining of humidity or chlorine odors, pool water

too hot or cold, frequent breakdowns of existing equipment and increasing energy costs ("Combatting Humidity" 1986, p. 43).

Ventilation and consistent air flow will help eliminate the problems associated with high humidity. Having a comfortable air flow, and a temperature of 75 degrees, not only prevents deterioration of the structure, but also reduces fatigue in swimmers, thus minimizing a potential drowning from excessive fatigue.

The air temperature in the swimming pool area should be thermostatically controlled and maintained at approximately five degrees above the water temperature. The relative humidity should not exceed 70% (Ezersky and Theibert, 1976, p 124). It is recommended that the planning committee for this facility seek the advise of engineers and architects to devise an appropriate nature of air exchange, which will accommodate each area of the facility.

Pool Guttering. Improper designed pool guttering can create problems when scum collects around the edge of the pool. Swimming pool users unfortunately have the tendency to spit or leave their gum in the pool gutters. This obviously causes a problem, particularly if the circulation system is not strong enough to remove everything that has collected in the pool guttering.

Another problem with the pool guttering is that swimmers may get their foot or body stuck in the gutter,

depending on the size and shape of the gutter. The shape of the guttering is often such that when participants leave the pool by the side, their foot either slips or gets stuck in the gutter. Entering the pool can be hazardous as well, due to poor design in pool guttering. If someone enters the pool from the side and slips upon entering, a serious injury could occur.

A deck level overflow coping system is a method utilized to keep the water clean and allow for easy entering and exiting of swimmers, which prevents crowding around the entering and exiting ladders. Deck level pool guttering may be the best form of pool guttering that is available. The deck-level overflow coping system is the most efficient way for treating the surface of a captive body of water regardless of the size, especially if the pool surface is large.

Starting Blocks. In a meeting of the planning committee it was decided to allow for starting blocks by inserting sleeves into the pool deck (Appendix F, p. 147). In Carlyle v. Walton et al., the plaintiff was a 14 year-old girl who tried out for the school swim team, although she had had no competitive swimming experience. The defendant, the coach, finished workouts by diving from the starting blocks that were located in the shallow end of the pool, 30 inches from the surface of the water where the depth was 3.5 feet. The plaintiff attempted her first

racing dives that day and on the third round lost her balance before the coach blew his whistle. She attempted a role dive and hit her head on the bottom of the pool, breaking her neck (Johnson, 1984, p. 48).

The planning committee has discussed the possibility of the pool being used as a competitive pool (Appendix F, p.146). This was highlighted by the fact that sleeves for starting blocks and a design allowing for the installation of timing pads was mentioned (Appendix F, p. 146). The length of the pool has been proposed at 50 meters and a width of 25 yards (Appendix F, p. 145). According to FINA standards, if the pool is going to be 50 meters in length and touch panels installed, the width must be 21 meters, 1.8 meters in depth and have 8 lanes 2.5 meters wide (Facility Specification Guide, p. 18).

Having the starting blocks in the shallow end of the pool can be a serious problem. When competitive swimmers practice, they need blocks to perform racing dives, these starting blocks should be located in the deep end of the pool, thus eliminating the problem.

The problem of starting blocks can be overcome by posting no diving from starting blocks signs strategically around the pool. Having starting blocks that are removable and having them in position only when there is a swim meet will eliminate the use of the starting blocks during recreational swim times. If the starting blocks remain up

for any period of time, they can be roped off, or have cones placed on them. The design of the pool needs to be concerned with the installation of easily removable starting blocks.

Chlorination Safety. The planning committee have decided not to go with gas chlorination but instead to use a form of electronic pool purification (Leo Smith, personal communication August 13, 1990). The Tarn Pure product is being evaluated.

Chlorine gas accidents in university and college swimming pools happen infrequently but when such accidents do occur the end result can be very severe. In the state of Washington, sixteen members of a swim team were overcome by chlorine poisoning while working out in a pool (Penman and Niccolai, 1985).

> Chlorine gas is by far the most common means used to disinfect pool water and it is the method that has the widest acceptance by state health departments. Chlorine gas is extremely poisonous and is stored in large tanks and if ruptured could cause death (Pope, 1980, p. 54).

In Morenz v. Leslie's Pool Mart (1980), the court held that an employee who was injured by fumes from pool chemicals could sue his employer, a company which manufactured pool chemicals for strict liability.

Pope (1980) comments:

> Most experts agree that gas chlorinators directly mounted on chlorine gas cylinders are safer than wall-mounted units which are connected to the cylinder with tubing. However, chlorine gas accidents can only be prevented by a thorough understanding of the material and its handling (p. 54).

Other safety measures recommended for utilization of chlorine gas includes: storage of tanks indoors in a fire-resistant building, storage of tanks and chlorinator in separate rooms, chaining or strapping tanks to rigid support to prevent spillage, and checking tanks daily for leaks ("Personal policies", 1987).

Electronic pool purification uses copper and silver for bacteria control. Tarn Pure uses the bactericidal properties of silver and the algaecidal properties of copper. Ions from these metals are released and passed through a solution and are caught in the filter media thus killing bacteria and algae at the same time (Tarn Pure Flyer).

The advantages of using an electronic pool purification system is that it is safer, not being effected by sunlight, is cheaper to maintain and feels much more comfortable to swim in. However it is more expensive to install and special instruction will be necessary for continued maintenance of the equipment.

Other chemicals available for keeping swimming pools clean include; bromine-based compounds and ozone based compounds. However, both of these materials are more expensive than chlorine (Goldberg, 1990, p. 30).

First-Aid Room. A room must be designated for first aid use only. This room needs to include a cot, stretcher, blankets, telephone, and all necessary first aid supplies, including plastic gloves. Emergency equipment such as oxygen also needs to be located in this room. This room and its equipment needs to be inventoried regularly. Access to this room should be limited to management and staff only. The first-aid room must to be clearly marked for users unfamiliar with the facility.

Instructional Pool. The VPI&SU plans have allowed for an instructional pool (Appendix F, p. 146). The shape of the main pool is to be L-shaped with the instructional pool at one end of the main pool (Appendix F, p. 146). The location of the instructional pool is suggested to be adjacent to the shallow end of the pool (Baley and Matthews, 1984). This location will substantially reduce the possibility of a young person from exiting the instructional pool and entering the deep end of the pool. The plans call the for pool to provide a shallow teaching and water aerobic zone (Appendix F, p. 145), but the plans show no specific depth of the instructional area. The instructional pool should have a depth of approximately three feet, have an

apron six to ten feet wide surrounding it, and have a bar constructed wall to enclose it. This bar like wall will help prevent unattended young children from wandering away from the instructional pool.

Pool Bottom. The bottom of the main swimming pool must be able to be seen by a diver. When the lights are reflected off the water, the natural magnification property of water makes it extremely difficult, if not impossible to see the variations in the depth of the pool bottom (Baley and Matthews, 1984, p. 195).

The bottom of the pool needs to be painted or tiled in a light color to help the diver see where he or she can safely dive. Also by having the bottom a light color, the depth of the pool becomes clearer.

Pool Lighting. Underwater lighting is very popular in swimming pools: However, problems have occurred with these lights. "A lifeguard was electrocuted when he touched a metal ladder because the underwater lights were on and an electrical short occurred" (Horine, 1985, p. 73). Another problem with underwater lights is that they can become very hot to the touch if the correct bulbs are not installed.

If underwater lights are to be placed in the pool, as suggested in the plans (Appendix E, p.135), care needs to be taken that all wires are grounded so to prevent shock. The lights need to be recessed as much as possible to reduce the opportunity of swimmers rubbing up against them when

standing by the pool side. An expert in underwater lighting needs to be consulted in this area.

Depth of Pool. In class B and C pools, water depths at the shallow end of the swimming area shall be 3 feet minimum with three feet six inches minimum for racing pools. Exceptions may be made in a recessed area of the main swimming pool, outside of the competitive and/or swimming course, when the pool is of an irregular shape with the permission of the state or local authority (Facility Specification Guide, p. 21).

Pool Barriers. "A projection of past deaths would indicate that at least 1,000 persons will die in swimming pool accidents in 1979. Some 400 of these will result in whole or part from a lack of pool barriers" (Philo, 1979, p. 560). Pool barriers help keep non-swimmers away from the edge of the pool as well as swimmers who walk along the edge.

Pool barriers need to be placed around the pool whenever there are people swimming. These barriers can be portable or set into the deck in such a way that they can be moved when needed. These barriers keep the swimmers from diving in from the sides and ensures that non-participants are not standing too close to the side of the pool.

A movable bulkhead has been suggested (Appendix E, p. 135). If a movable bulkhead is inserted then barriers keeping swimmers off it are important. The barriers must be

placed at each end of the bulkhead and signs posted to keep swimmers off.

Capacity of Pool. The size or capacity of the pool is important and needs to be determined at the planning and design phase. The size of the pool depends solely on the expected number of users and/or its intended use. In 1987-1988 141,737 swimmers used the existing War Memorial Gymnasium pool and 1,820 participated in intramural water polo (Appendix D, p. 98).

It is recommended that the starting point for the designer in determining the pool capacity is to consider the reason for construction of the pool. The expected number of users can be estimated by using the current figures from the existing facility. The problem of the proper size of the pool and the ability to manage it should always be taken into consideration in the early stages of design. Because of safety, cost should not dictate the decision on the capacity of the pool. However, if cost does dictate the size, the occupancy levels must meet recommended standards which are available from the National Spa and Pool Institute. Many persons have drowned in overcrowded, pools due to supervision problems.

Gymnasium.

The gymnasia of the proposed facility are also a risk management problem. The following areas or elements of a gymnasium are identified as areas of risk: distance behind

basketball backboards, distance between courts, type of dividers, type of doors, type of floor, volleyball standards, warning signs, wall surfaces and ventilation. Each of these elements of the gymnasium is evaluated and risk management loss control strategies are given.

Distance Behind Basketball Backboards. A common problem found in gymnasia, in which recreational basketball is played is the minimal distance from the backboard to the wall. Often courts are squeezed into the gymnasium to give as much length to the playing court as possible without a concern for the distance to the wall.

When designing a gymnasium, care has to be taken to ensure that it is safe beyond a reasonable doubt, if not, the owner puts himself or herself into a potential lawsuit situation. The basketball courts need not be the NCAA standard length, since NCAA regulation games will not be played in the facility.

The plans thus far have various suggestions for the size of the gymnasium. The different sizes include two, three and four basketball court capacities. The dimensions suggested are 108 feet x 258 feet (twelve feet between the backboards and the wall), 116 feet x 278 feet (sixteen feet between the backboards and the wall), 134 feet x 206 feet (twelve feet between the backboards and the wall), and 104 feet x 242 feet (ten feet between the backboards and the wall) (Appendix G, p. 161).

It is recommended that a minimum of twelve feet of unobstructed space beyond the end lines is needed. The suggested dimension of 116 feet x 278 feet with a sixteen feet space between the backboards and the wall is recommended. A determining factor for backboard to wall distance is the level of play. By observing current games and talking to recreational sports officials, design committee members can establish the level of play and the need for more or less space from backboard to wall. It is suggested to pad gymnasium walls and abutments where there is a possibility of collision. The padding should sufficiently protect the participants when they make contact with the wall.

Spacing. To provide adequate and safe space for participation, the application of the concept of 'foreseeability' should be applied. This is the ability to anticipate dangerous conditions beforehand and act to offset the danger (Bayless and Adams 1986). In Bauer v. Board of Education of the City of New York (1955), the school district was negligent when a gymnasium, which contained eight overlapping basketball courts, with a total measurement of 80 feet by 45 feet, was used simultaneously by 48 boys for basketball games. The lack of distance between the basketball courts is a problem which should be foreseen. It should be apparent that the chances of collisions between participants on overlapping basketball

courts is very high. Also with no or little space between the courts, there is no room for traffic, spectators or substitutes to stand.

"Although volleyball utilizes a smaller court, it needs much more space around the perimeter, particularly behind the end lines" ("Diversity the rule" 1989, p. 56). So not only does a design committee have to be concerned about the length of the basketball courts but also the width, and how many basketball, volleyball and badminton courts can be placed in one gymnasium.

The distance between the basketball, volleyball, and badminton courts needs to be as large as practically possible. If this means only going with three basketball courts instead of the planned four (Appendix E, 119), that is a logical decision to make. The courts need to be wide enough where a game of basketball, volleyball or badminton can be played without the limitations of court size. Badminton and volleyball courts are standard and are rarely changed so explicit planning must take place to ensure maximum room. The prior suggested 116 feet x 278 feet dimension for the distance from the end of the court to the back wall is also suitable for the distance between courts. These court dimensions allow for 10 feet between each of the four courts (Appendix G, p. 161).

Dividers. One way to ensure there will be no collisions from one court to another is to install dividers

or partitions. The proposed facility calls for two such dividers (Appendix E, p. 119). Dividers enable a gymnasium to be divided into smaller activity area units. However, dividers are potentially dangerous in themselves. If a divider is not fixed when in position, a participant who collides with the divider may move the divider into the next court. If the spacing between courts meets the suggested recommended standards of ten feet, then these dividers may not be necessary.

There are several types of dividers from which to choose from. There are dividers that roll out mechanically from the wall, dividers that lower from the ceiling, and sliding dividers that slide across a track on the ceiling. Placing the divider against the wall and having it pull out and retract mechanically would be more desirable because it is most solid and does not shift once in position. A mechanically operated divider allows only authorized personnel to operate it.

Doors. Glass doors are popular in gymnasiums because they allow people to look in on the activity taking place, however glass doors have been at the center of numerous court cases. In Eddy v. Syracuse University (1980), a student was playing with a frisbee and, in attempting to catch the frisbee, ran through a glass door. The plaintiff was awarded damages because the placement of the glass doors posed a foreseeable risk of injury. In Wilkerson v.

Hartford Accident and Indemnity Company (1982), a student was running a race in the lobby of a gymnasium to determine who would be first to run in the next relay race. The plaintiff tried to brace himself by pushing off the glass when he went through it. The court found in favor of the plaintiff and concluded that the School Board was negligent and responsible for the injuries of the plaintiff. "An Ohio football player lacerated his leg from his ankle to his knee when he crashed though a wire-reinforced plate-glass door window" (Penman and Niccolai, 1985, p. 37). Glass doors in gymnasia pose serious risks and should be avoided.

The number of doors to and from the gymnasium need to be kept at a minimum, but at the same time meet all required safety standards. Hardwood or metal doors with small one foot square windows are ideal. If glass windows are utilized in the doors to provide visibility between hallways and the gymnasium, then it is recommended that safety glass (or other material that will shatter into small pieces upon impact) be used. Doors must open out in the direction of the exit and away from the playing area to insure that there is no interference with ongoing activities when people are entering and exiting the gymnasium.

Flooring. Floors can present a problem particularly if they are slippery. Since the main gymnasium is frequently the site of many different activities, the floor surface must be carefully considered. Cost of maintenance,

durability, initial installation cost, aesthetic and acoustical factors, speed of conversion, and resilience to cigarette butt marring are some of the many factors to consider.

Injuries in aerobics have increased with the popularity of aerobics. If aerobic courses are held in the gymnasium, then the floor needs to be such that injuries such as rug burns, shin splints, and bruises are avoided. The problem arises however in what floor to choose when numerous other activities will also take place.

There are many synthetic floor coverings presently on the market for activity areas. The synthetic surface materials are manufactured primarily from polyvinyl chloride, urethanes, and other thermoplastics. The advantages of synthetics include; resiliency, greater sound absorption coefficients, produce very little wear on balls, and different kinds of street shoes can be warn. A disadvantage to a synthetic surface is the inability to slide. This is desirable when playing volleyball and basketball (Penman, 1977).

The type of floor depends on what type of activities are most likely to take place in the gymnasium. A hardwood floor is perhaps the most durable, but when perspiration drops onto the floor, a foreseeable danger of injury is created. Water on the floor can lead to a serious injury.

A carpeted floor is not desirable because it lends to injuries in basketball.

The proposed plans call for a sprung loaded wooden floor (Appendix D, p. 120). This type of floor is highly recommended if the gymnasiums are only intended for athletic activities. If conventions and meetings are going to be planned for the gymnasium, then the wooden floor is not recommended because the floor will be damaged by high heeled shoes, chair legs and the movement of heavy furniture. The plans call for such events as conventions and meetings (Appendix F, p. 147), so the suggested floor is the synthetic floor. Synthetic flooring allows for a diversity of activities with less harm to the floor. The upkeep of this floor is also less than the wooden floor which requires annual polishing and occasional stripping and refinishing depending on usage levels.

Volleyball Standards In Sanchez v. City of Espanola (1980), the court required the defendant city to pay one-half damages to the plaintiff when a volleyball standard fell and severely injured her foot. Volleyball standards are usually fixed into the floor. If the fixtures are not set correctly or do not allow for the standards to be fixed firmly, then the owners are held responsible. Attention to the location of the volleyball courts is important in establishing where the fixtures are to be set into the floor.

Volleyball is planned for the gymnasium (Appendix E, p. 119), so volleyball standards that hold the net in place need to be fixed to the floor. Complete standards can be installed for when volleyball is being played and removed when not needed. The guide ropes fix into the floor in pre-drilled holes and support the standards. These holes need to be recessed in such a way that participants cannot trip over them when the guide ropes to the standards are not in position.

Warning Signs. Warning signs need to be utilized to let the participants know the rules and regulations of the gymnasium. As with the swimming pool, standardized signs painted the same color throughout the building need to be placed in a position that everyone entering the gymnasium has an opportunity to read them.

Wall Surfaces. To minimize injury when participants make contact with the walls, the surface should be a nonabrasive material. The walls should be smooth to the touch at least six to eight feet from the floor. To accomplish this, a durable paint can be applied from the floor up to eight feet on the wall.

Humidity. "Condensation in a gymnasium can cause serious injuries particularly if the floor becomes wet. A professional player injured his back from condensation on the court in Louisiana" (Horine, 1985, p. 74). The Chicago Bulls, a member of the National Basketball Association, had

a similar problem in its play-off games. Condensation appeared on the floor because there was ice underneath the playing surface and the temperature in the building was high.

Many factors need to be considered when the quality of air is examined. It is important that the system has the ability to control odor and maintain air freshness. Humidity control should be kept between 40 and 60 % for the proper body heat dispensation and prevention of static electricity buildup on the body and on equipment.

As with the pool area, the planners of the facility should consult with engineers and architects to determine the proper air flow exchanges. For gymnasiums Penman (1977) suggests:

> an air exchange rate of 5 changes per hour minimum and preferably 12 changes per hour. Air movement should be held to a maximum of 1 mph (approximately 1.5 ft/sec) so that game projectiles used in badminton, volleyball and so on, are not adversely affected during play (p. 230).

Weight room

The weight room is an area in which risk is apparent. The risk usually is in the use of the weights and not in the actual design of the room, however, care still needs to be taken in the overall design of the weight room. "It is important during the planning process to describe the

facility in terms of overall design as well as to determine the number and type of weight training and exercise equipment to be included" (Hirschfeld, 1986, p. 46-48).

The following are some of the identified elements of risk common to all weight rooms: inadequate space, a non-resilient floor, lack of warning signs and inadequate ventilation.

Inadequate Space. The current facility in the War Memorial Gymnasium is 3,000 square feet and the administration beleives this will compromise occupants health and safety (Appendix D, p. 99). The current plans for the proposed weight room is 10,000 square feet (Appendix E, p. 121). This will improve the safety situation if the same amount of users occupy the new weight room as those that occupied the existing weight room in the War Merorial Gymnasuim. The most important factor in the design of weight rooms is the use of space. Machine and free weight users need room and patrons waiting to use the equipment also need ample space. An area for people to wait or stretch prior to lifting is important. Easily accessible water fountains help to eliminate unwanted traffic. Water fountains inside the weight room reduce entrance and exit traffic. Having one entry door and one exit door provides the opportunity monitor traffic flow. Also, each machine or free weight rack must be given appropriate space as recommended by the manufacturer.

Non-Resilient Floor. The floor should be made of an absolute traction material which prevents the lifter from slipping. If the floor is made of concrete it may crack when large weights are dropped (Penman, 1977). Rubber-backed, non-slip carpet is appropriate for weight rooms, where the floor will be battered by dropped weights and dumbbells. Excellent traction is vital; someone who slips while lifting a 300 pound weight could be seriously injured and the facility could be liable. The floor should also be made from a durable material that can sustain repetitive impacts from heavy weights.

The following floor surfaces may be taken into consideration: cushioned vinyl tiles and linoleum, artificial turf, carpet, polyvinyl chloride and polyurethane synthetic surface materials, and rubber surfaces. These surfaces decrease sound reverberation and prevent damage to concrete or wood floors.

Warning Signs. Signs should be in same form and colors as all the other signs utilized in the facility. Similar to the pool and gymnasium areas the warning signs should be incorporated into the overall design of the weight room to provide maximum visibility.

Ventilation. The air needs to be kept clean and fresh as there is always a potential humidity problem in this room. As mentioned in prior sections on ventilation, the planning committee should seek the expertise of architects

and engineers to ascertain appropriate levels of and mechanisms for ventilation. A ventilation rate of between four and six changes per hour is recommended. The maximum draft factor should be 1 ft/sec. The temperature of the weight room should be maintained between 65 and 70 degrees. A thermostat for temperature control is necessary in this area because of the great variation in the number of people using the facility at any given time.

Elevated track

The elevated track should be designed for use by adults and children. Parents who like to jog and leave their children unattended pose a serious problem for the design committee. The track will be suspended above the gymnasium and if proper care is not taken in the design of the elevated track, a serious injury could occur. The following is a list of the identified risks commonly found with an elevated track: inadequate barriers around track, width of track, a slippery surface and inadequate warning signs.

Barriers. An elevated track has to have barriers that protect the users. The barriers need to be high enough to ensure that someone cannot fall over. The barriers need to be at least three feet six inches high, which allows for a person of average height to lean on them and not fall. This height also should prevent young children from falling off the track. Making the barriers of glass or tight knit

fencing inhibits young children from climbing though the barrier.

Width of Track. The width of the track is an important consideration, particularly if thirty people are expected to use it as the plans suggest (Appendix E, p. 123). Overcrowding on the track could cause problems with runners bumping into each other. At a minimum, the width of the track needs to allow space for two people to run side-by-side. Running side-by-side on a regular basis should not be recommended to runners, but the space is necessary for runners to overtake and pass one another. The minimum width of the track is three and a half yards. This provides two running lanes of one and three quarter feet. The lanes need to be painted on the floor so not to cause confusion for the runners.

Track Surface. The surface of the track must have excellent traction and at the same time absorb the impact of the runner. A surface that has these characteristics will help a runner avoid shin splints or aching legs and minimize injury due to slipping. The surface of the elevated track needs to be similar to that found on outside tracks. A durable synthetic surface that is easy to clean and gives plenty of traction is the most desirable. Types of floor include 'Supreme Track', a four-ply construction, Dodge-Regupol indoor athletic surface, Balsam's Spartan latex-bound track and Balsam's Tartan track which consists of

poured polyurethane. Running surfaces which give upon impact are most desirable in preventing knee injuries.

Warning Signs. The use of warning signs around the track and on doors leading to the track are as important here as they are in the pool, the gymnasium and the weight room. The same sign format should be used on the track as was used on these other areas. These signs should include specific information on the direction for the runners to run and guidelines for overtaking runners.

Locker Rooms

The locker rooms are an area in which many accidents occur because of poor initial design. If time is taken at the planning stage to design safe locker rooms, potentials dangers can be minimized. The following is a list of elements that can be considered a risk: type of floor, electrical outlets, shower heads and the shower area.

Type of Floor. The type of floor is a very important consideration in the design of the locker rooms. The floor needs to be one that can be cleaned effectively and at the same time be virtually slip proof. Numerous cases dealing with falls in the shower and locker room area have entered the courts. In Adam Dante Corp v. Sharpe (1972), the defendant health club was negligent when a slippery film was left standing, although a sign was posted stating 'slippery when wet'.

The floor needs to have a non-slip surface that is resistant to fungus growth and dirt collection. Drains should be situated where water collects. The slopes to these drains should not be steep, but sloped enough to allow the water to drain freely from the surface. A slope of 1% is recommended (Penman, 1977, p. 256). Attention needs to be given to the size of the drains in light of children or adults getting their toes caught in the grill.

Electrical Outlets. The placement of electrical outlets in the bathrooms and shower area is another important consideration. An outlet placed next to a sink is not recommended. Also placement of electrical outlets in the general locker room area should be avoided.

Electrical outlets need to be placed away from areas that utilize water flow, such as; the sinks, toilets and showers. A dry area is recommended that includes mirrors and electric outlets. Electrical outlets should not be placed in the changing area. If outlets are needed there for maintenance purposes, then outlets with locks on them are suggested.

Height of Shower Heads. The height of the shower heads is important for convenience sake and from a liability standpoint. The shower heads should be placed at such a height that an average sized individual can stand comfortably underneath them, but at the same time not at a height where they cannot be reached for adjustment. If the

shower heads are too low, then there is the possibility of someone bumping into them. A recommended height of six feet six inches enables most shorter persons to adjust the shower head while most taller persons will not bump into the fixture.

Shower Area. The shower area is an area that can cause problems for recreation facilities. Accumulation of water in the shower area can lead to serious step and fall injuries.

The shower area should be large enough to accommodate the anticipated number of people wanting to shower at the same time. Waiting lines for showers are undesirable because of the amount of water present and people waiting to shower. Rails should be put into place to allow for easy access to and from the shower area for the impaired. Pegs and drying areas need to be positioned in such a way as not to cause a congestion of participants in the wet area.

Multi-purpose rooms

The multi-purpose rooms are areas of diversified activity. The design of the rooms is critical to accommodate all of the anticipated activities. The following is a list identifying the areas of risk involved: type of floor, ventilation, spacing, wall surface and doors for entering and exiting.

Floors. The floors in the three multi-purpose rooms are vitally important. With the variety of activities

planned for the rooms, the floor must be versatile. This is because all the planned activities may require different types of flooring. For instance, the sport of fencing requires a floor that allows the participant to "slide" his feet, whereas karate utilizes a floor with much more traction. On the other hand, aerobic floors are broken into two categories, surface material and cushion. Surface materials for aerobic classes can be carpeting, hardwood, or vinyl (PVC). The "cushion" is simply the material used beneath the surface. This material is often some type of closed-cell foam ("Getting floored" 1988, p. 48).

A suggestion for the planners to consider is the designation of one room as an aerobics room and the other two rooms for other activities. With this arrangement, the flooring of one room could be designed with aerobics in mind (as it is a popular activity). For instance, the floor will meet the demand of the daily aerobics use, and also the room can be furnished accordingly.

The following floors are listed in Athletic Business (April 1988): Aerobafloor, Aeroflor, Aerobest flooring systems, Exerflex, Polaris Foam Floor, Suspended Action Foam Block system, Aerobic Tile, Insta-mat and Aerobic Supreme. Choice of floor is as important as in the case of the elevated track.

Injuries to muscles can be attributed to the poor quality of the floor surface.

The other two rooms may house meetings and chairs could be set up. A floor that can be used for sport activities but also take the strain of chairs and street shoes is desirable.

Ventilation. As with the other areas of the facility, ventilation is important in the multi-purpose rooms. The same exchange of air flow as used in the weight room is applicable to the multi-purpose rooms.

Spacing. In Whitson v. Goodbody's Inc. (1989), the plaintiff, an aerobics' participant, sued a health club for personal injuries sustained in an aerobics class. The plaintiff was injured while participating in an aerobics class. During a particular exercise, the plaintiff was injured when another participant stepped on the plaintiff's left heel, rupturing his Achilles tendon. The defendant health club was awarded a summary judgement and the appeals court affirmed.

This case highlights the potentially serious problem involved with aerobics: spacing. The design of the rooms must accommodate planned participant levels for aerobics classes, so that each participant has sufficient space to carry out the various exercises safely. A space that allows a participant to swing his or her arms and legs freely is desired. A space of

seven square feet per participant is suggested. Expected numbers of participants can be estimated from the current number of participants in these activities. These figures can then be used to determine the amount of space needed to house aerobics classes.

Wall Surfaces. The wall surfaces in the multi-purpose rooms need to be non-abrasive. The recommendations concerning the gymnasium wall surfaces are applicable to the multi-purpose rooms.

Doors. A problem with a multi-purpose room is the traffic patterns: patrons coming and going during ongoing activities. Because there are numerous activities being performed in each of the rooms, it is an important safety measure to control as the flow of traffic.

There should be only one main door to each of the multi-purpose rooms. Building codes will require multiple exits that are easily opened from the inside of the room. However, the main entrance and exit should be the same door. Any other doors should be used for emergency exits only. The doors should be similar to those found in the gymnasium. Glass windows and doors with glass windows are not recommended for the multi-purpose rooms because of the possibility of a collision into the doors.

Racquetball and Squash Courts

Racquetball and squash courts pose little risk from a design standpoint, however the courts still need to be designed with safety for the participants in mind. Following is a list identifying the areas of risk involved: glass back walls, type of floor, wall materials, doors, warning signs, and ventilation.

Glass Back Walls. Glass back walls immediately bring to mind the same problems that exist with windows in gymnasium doors. The existing plans call for glass backed walls (Appendix E, p. 122). If the glass is not designed specifically to take the rugged wear and tear of racquetball or squash games, then there is a potentially great danger to participants. Racquetball and squash are fast games and participants will collide with the back wall frequently during the course of a game, they also hit their racket against the wall in attempting to hit the ball.

The material used needs to be durable, able to take constant impact, easily cleaned and provide clarity to the spectators. Acrylic meets all of these criteria and should be used.

Floor. The floor for the courts needs to supply traction, absorb a large amount of force that is applied to it, and provide stability - enough to control lateral movement so that participants do not

sprain or injure their ankles. A sprung-loaded wooden floor, similar to the one suggested for the gymnasiums is the most suitable.

Walls. The walls of a racquetball and squash court must be impact resilient. The planning committee should be aware that the walls currently found in War Memorial Gym are unacceptable because they have cracked and peeled under the constant, harsh use to which they have subjected. Pope and Pringle (1988) suggest "the biggest problem appears to be a 12-foot zone (p. 60)., the main hit zone. They reported that Clemson University, in order to overcome this problem, used a mix of Mantek Iron-Crete, a two-part multipurpose epoxy patching material" (p. 60). A similar material should be used in the construction of the back wall for the proposed racquetball courts.

Similar other areas of the facility, non-abrasive materials must be used for the wall surfaces.

Doors. The doors to the individual courts need to be small enough that the ball does not hit them too often and large enough for an adult to pass through, bending slightly if necessary. If the final plans call for a solid non-transparent back wall, then the frame of the door needs to be on the inside of the court flush with the back wall. Every effort must be made to

insure that the door does not protrude out into the hallway.

Warning Signs. The signs in this area of the facility should follow the format of all other warning signs throughout the building. It is important to place signs on the door or directly above the door of each court. In such a position, the participant cannot help but see the sign upon entering the court. The signs need to include the rules and policies of the facility in regards to the playing of racquetball or squash. Included in these rules should be the requirement of wearing protective eye glasses and having the racquet secured to your wrist in some way.

Ventilation. The planning committee should follow previously recommended procedures for ventilation, that is consult with engineers and architects to determine the proper air flow exchange. Ventilation systems should allow for an air change rate of five changes per hour minimum. Special attention will need to be given the difficulty of fitting fans into the design of the court because flat surfaces are required.

Common Areas

In every recreation facility there are areas in which non-recreational activities takes place. Recent legal cases have highlighted the problems associated with stairways, turnstiles, lighting outside the

facility and insufficient emergency medical equipment. A review of these cases indicates that the following areas of risk were most likely to be litigated: Unlit stairways, emergency or first aid room, sidewalks and types of floors within the facility.

Unlit Stairways. In Cleghorn v. City of Albany (1987), the plaintiff fell down an unlit stairway. The defendant was granted a summary judgement on the defense of governmental immunity.

It is important at the design stage to ensure the correct amount of light is available to all areas of the facility. Stairwells that are inadequately lit are dangerous and sufficient lighting needs to be available at all times. These lights together with other light that are needed on a constant basis should be on a separate control panel allowing for these lights to be easily monitored.

Emergency Room. An emergency room or a first aid room is needed to cover for emergencies including cardiac that may be needed. Most participants in recreational activities have not been pre-screened for fitness levels. The potential of serious problems occurring are quite possible.

A first aid or emergency room should centrally located to allow for quick access from anywhere in the facility. The room should be equipped with the basic

first aid supplies, as well as the more sophisticated equipment needed in resuscitation. Staff must also be well trained in handling an emergency situation.

Sidewalks. Public entities owe a duty to all reasonably foreseeable users of sidewalks to exercise care in maintaining the sidewalks in a reasonably safe condition for the activities for which they are normally used (Riffer, 1985, p. 205). To ensure that the sidewalks are safe, adequate lighting must be provided. Sidewalks must also be free of obstructions. Snow must be removed and sufficient salt provided to avoid slippery surfaces around the perimeter of the facility. The sidewalks around the facility need to provide a non-slip surface. For instance, some steps around the VPI&SU campus have been constructed with material that, when becomes wet, is extremely slippery.

Floors. A facility of this nature will have many pedestrian traffic. The floors between the various activity areas and the main entrance should be designed with a non-slip surface in mind. A carpeted surface is most desirable. A carpeted surface is easy to clean and maintain while providing a non-slip surface.

Considerations for the Impaired

Regardless of the type or severity of their limitations, individuals with handicapping conditions have rights to participate in publicly

> sponsored recreational programs. Administrators, program personal at recreation facilities, and program sponsors must become more aware of these rights and recognize their own responsibility to ensure them. If individuals cannot enter or move about a facility freely, they will not be able to participate in programs or activities. All recreation centers, gymnasia, swimming pools, stadia, weight rooms, dance studios, arts and crafts rooms, racquet sport courts, obstacle and par courses, adventure courses, playgrounds, and other facilities must be accessible (Stein, 1986, p. 49).

A suggestion to the planning and design committees is to initially communicate with impaired people and handicap organizations. If the appropriate steps are taken in the design stage and planning stage, a safe facility that meets the needs of the impaired can be provided. A facility which is safe for most participants may, never-the-less, be unsafe for an impaired person. Examples of places that can present hazards for the impaired include the shower area, stairways, door ways, swimming pool areas and the weight room. The planning committee must investigate the projected number of impaired users and

disabilities. With this information, appropriate design accommodations can be made.

Summary

Chapter four introduces the Risk Management Program. The nine facility elements of the risk management program: swimming pool, gymnasium, locker rooms, elevated track, weight room, racquetball and squash courts, multi-purpose rooms, common area and requirements for the impaired are evaluated and loss control strategies applied to each area within each of the facility elements.

Chapter Five

Evaluation of the Risk Management Program

In order to be effective, the risk management program that has been proposed here must be incorporated into the design and planning phase of the proposed facility. This risk management program cannot be evaluated until the facility has been built and occupied. To ensure that maximum safety is maintained, a strategy for the future is required. Equipment purchases, employee requirements, emergency procedures and continuing data acquisition are some of the concerns that must be addressed in relation to the risk management program.

Purchasing of equipment is vitally important to the facility in light of the problem of litigation. Appropriate equipment for specific activities should be purchased. This requires that employees properly research the available equipment and any existing equipment standards before purchase.

A risk management program can only be effective if employees are properly trained to address potential dangers outlined in this risk management program. If a problem arises, a systematic procedure must be implemented to ensure removal or correction of the problem. One method to address this concern is to develop an ongoing process of logging all incidents of

injuries. Employees should also be responsible for filing accurate maintenance reports. Another helpful data gathering tool is to provide participants the opportunity to make written comments and suggestions. By implementing these procedure, existing hazards can be readily discovered and appropriate action taken. A risk management program is only be effective if it is enforced

Recommendations for Future Research

This researcher has several recommendations for future research relating to the proposed VPI&SU Recreational Sports and Fitness Center. Once the construction of the facility has been completed, an ongoing risk management program is needed to ensure the facility is run safely and reasonable care is taken throughout the operation of the facility. The program should have several components. First the daily operating procedures for the facility should be published in a manual form and distributed to all employees. This sets what is legally referred to as the "standard of practice" for the facility. This operators manual must include at least the minimum requirements for physically maintaining the facility. SEcond, an employees handbook should be developed. Specific job descriptions as well as the general outline for appropriate employee behavior should be

delineated in this handbook. Third, a method for collection and storage of information relevant to risk management must be developed. As in any professional organization, there are books, journals and articles published on a consistent basis which addresses the liability issues facing recreation programs. A system should be developed to provide acquisition, compilation and dissemination of this information.

Summary

Presented in Chapter Five is a discussion of the evaluation of the risk management program and recommendations for future research. The factors in evaluating the risk management program include: purchase of equipment, employee requirements, a employee procedures. Recommendations for future research are creation of an operations manual, creation of a personnel manual and creation of a data acquisition system to monitor current facility management trends.

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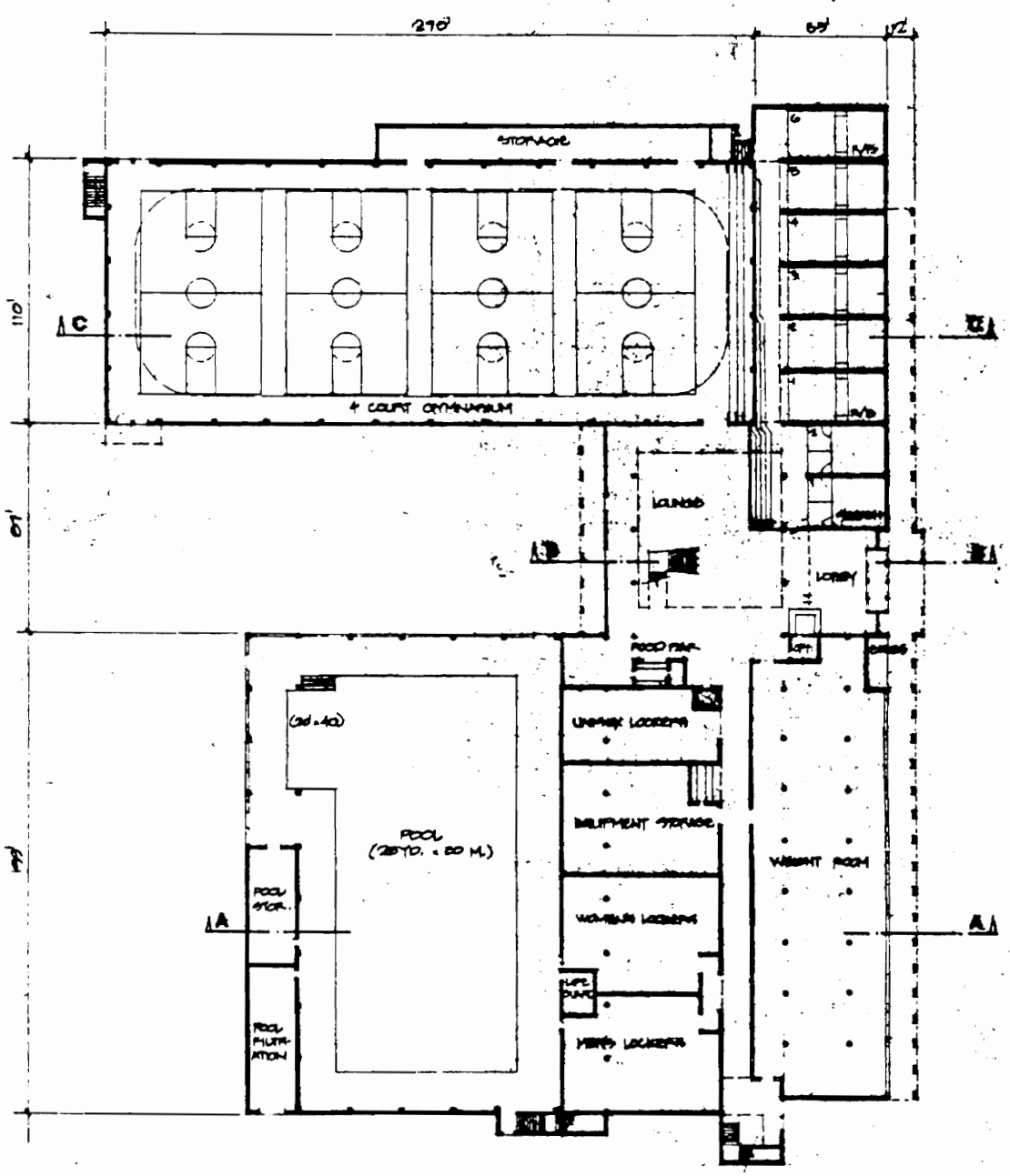
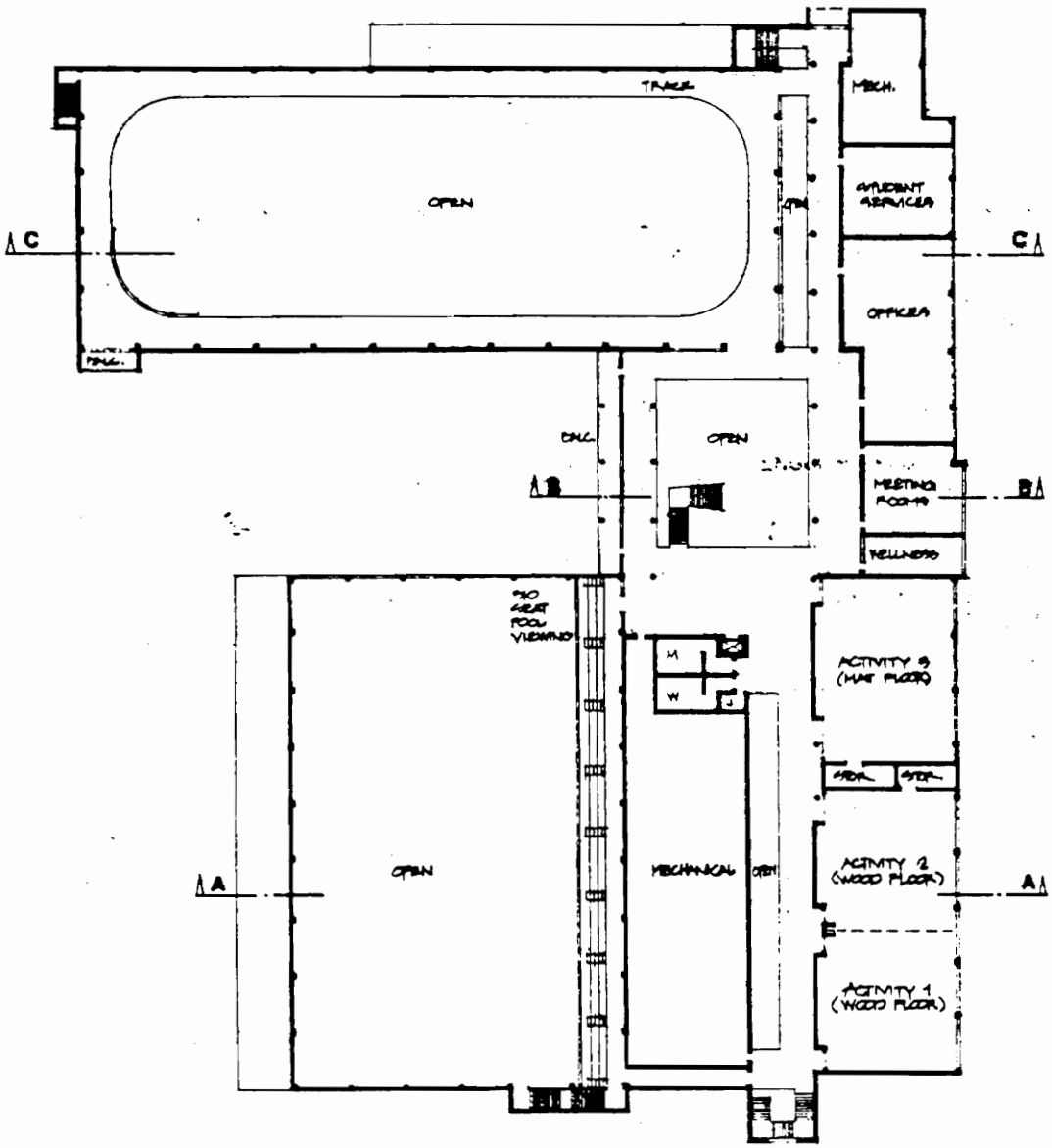
APPENDIX A



FIRST FLOOR PLAN 1/32" = 1'-0"

VPI & SU
RECREATIONAL SPORTS - FITNESS CENTER

Parkin Architects / Wiley & Wilson
August 21, 1989



SECOND FLOOR PLAN 1/32" = 1'-0"

Appendix B

Suppliers List

Although this is not conclusive, it does give the names and addresses of reputable suppliers in the area of recreation facility construction. These suppliers were taken from Athletic Business 1990 Buyer's Guide, and for further suppliers it is recommended to read this resource further.

Multi-Purpose Rooms

Flooring

Action Floor Systems Inc.
P.O. Box 469
Highway 51, South
Mercer, WI 54547

AGA Corporation
251 Industrial Park Road
P.O. Box 246
Amasa, MI 49903

American Athletic Inc.
200 American Avenue
Jefferson, IA 50129

Championship Sports Floors Inc.
P.O. Box 66
Hingham, MA 02043

Gymnasium

Basketball Court Surface

Continental Hardwood Floor Distributors Inc.
2305 Beltline Road, Suite 210
Carrollton, TX 75006

Superior Floor Company, Inc.
803 Jefferson Street
Wansau, WI 54401

Divider Curtains

Chanco Corp.
3131 W. Grand Ave.
Chicago, IL 60622

Volleyball Standards

Nissan Corp.
P.O. Box 3062
Cedar Rapids, IA 52406

Racquetball Courts

Doors

Altempco Glass Wall Systems
P.O. Box 1736
Arvada, CO 80001

Stratford Industries

2284 Paragon Dr.

San Jose, CA 95131

Flooring

Horner Flooring Inc.

South Maple St.

P.O. Box 380

Dollar Bay, MI 49929

Court Company

5389 Estate Office Dr.

Memphis, TN 38119

Lighting

Robbins, Inc.

4777 Eastern Ave.

Cincinnati, OH 45226

Wide-Lite

500 Wonder World Dr.

San Marcos, TX 78666

Weight Room

Multistation Machines

Nautilus Sports/Medical Industries

P.O. Box 809014

Dallas, TX 75380

Paramount Fitness Equipment Corp.
6450 E. Bandini Blvd.
Los Angeles, CA 90040

Flooring

Fitness First
P.O. Box 251
Shawnee Mission, KS 66201

Krailburg Corp.
600 W. Jackson Blvd. Suite 580
Chicago, IL 60606

Swimming Pool

Chemical Control System

Aqua Products
25 Rutgers Ave.
Cedar Grove, NJ 07009

Stranco
P.O. Box 389
Bradley, IL 60915

ITT Marlow Pumps
445 Godwin Ave.
Midland Park, NJ 07432

Deck Levels

Kinematics Ltd.
166 Broadway
Amityville, NY 11701

Starting Blocks

KDI Paragon Inc.
P.O. Box 256
12 Paulding St.
Pleasantville, NY 10570

Swimming Pool Equipment

Anti Wave Pool Products
1144 N.W. 53rd St.
Seattle, WA 98107

Locker Rooms

Shower Flooring

Atlantic Fitness Products
6701 Moriavia Park Dr.
Baltimore, MD 21237

Dir-Dek Corp.
Kendall International Center
2706 Horseshoe Dr.
Naples, FL 33942

Elevated Track

Flooring

Balsam America Track Company

14535 Chrisman Rd.

Houston, TX 77039

California Products Corp.

169 Waverly Street

Cambridge, MA 02139

Appendix C

Case Study Form

Citation_____

Facts of the Case_____

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Questions of Law_____

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Findings of the Trial Court_____

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Findings of the Appellate Court_____

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Rationale_____

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Significance_____

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Other Comments_____

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APPENDIX D

1989-90 BIENNIUM
PREPLANNING STUDY
FOR
VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
NEW CONSTRUCTION
RECREATIONAL SPORTS - FITNESS CENTER

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DRAFT
AUG 24 1989

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A. PROJECT JUSTIFICATION

This request is for authorization to construct a Recreational Sports - Fitness Center on the VPI and SU campus. This center will serve as the exercise, fitness and sport center for the student body and university community.

The quality of life on a residential campus such as Virginia Tech is closely allied with readily accessible and available recreational and fitness activities. This is true not only for the students of the University, but also for the faculty and staff, that is, the entire university community. In fact, a much greater sense of community can evolve from university-wide participation in the aforementioned activities.

Student recruitment and, more importantly, student retention are also allied with the availability and attractiveness of campus recreational facilities. Relative to recruitment, Ohio State University has found that its recreational facilities were second only to the quality of its academic offerings as a drawing card for prospective students (Managhan, 1984).

The University of California-Berkeley also views recreational facilities as a major asset in student retention.

"The academics are important and it's what initially attracts students to a campus, but at Berkeley, we care about students as people, and we want to provide them the opportunity to have fun, to meet each other and to have a healthy, wholesome environment in which to do that. We designed a building that functions as something much greater and much more expansive than just a gym. The focal point is all the sports activity, but beyond that we provide exhibits, museum displays and other kinds of things that have nothing to do with sports, but that are aesthetically appealing and make this whole building an exciting place to be." (Manning, 1985).

The psychological and physical benefits of exercise, fitness and sport are also important reasons for developing a broad spectrum of recreational facilities on campus. Although the psychological effects of exercise are a complex issue to study, Goff and Dimsdale (1985) writing in the Journal of Cardiopulmonary Rehabilitation state, "many studies suggest that exercise decreases tension and depression while improving self-esteem.

The psychological and physical benefits of exercise are well documented. The body of knowledge evolving from an array of research continues to reaffirm the value of regular, vigorous exercise. Typical of the conclusions drawn from this research is that stated in the Morbidity and Mortality Weekly Report of the National Center for Disease Control, July 10, 1987. "Sufficient clinical epidemiological and experimental evidence has accumulated over the past 30 years to strongly support the interpretation that habitual physical activity contributes to the prevention of coronary heart disease.

Recently evidence has emerged which suggests that a strong campus recreation program can reduce the dependence of students on the recreational use of alcohol and drugs. If this proves to be the case, it is a convincing argument for a full complement of recreational facilities.

At the present time the facilities in Memorial Hall, formerly known as the War Memorial Gymnasium, simply do not provide adequate space to allow Virginia Tech to develop a program which encourages the incorporation of exercise, fitness and sport into the lives of the students, faculty and staff. Space restrictions, thus, do not allow these individuals

to realize the benefits of such activity.

1. Program Information

a. Program Objectives

The present programmatic goal of the Recreational Sports Program at Virginia Tech is to provide a wide variety of recreational, fitness and sport activities for the student body. At the present time these activities include intramural team sports,intramural individual and dual sports, aquatics, club sports and fitness activities. The realization of the present objective, however, is largely precluded by lack of space and overcrowded facilities.

To give the reader some idea of the tremendous demand for recreational activity, thus recreational space, one needs only to comprehend the space requirements needed to accommodate the following intramural team sports:

Fall and Spring Semester, 1988 - 1989

Volleyball 282 teams
(2,962 participants)

Basketball 403 teams
(3,914 participants)

Water Polo 130 teams
(1,820 participants)

In addition, in 1987 - 1988, 141,737 swimmers used the pool, an estimated 138,240 students, faculty and staff played racquetball, 1,300 attended non-credit aerobic classes, 1,588 participated in individual and dual sport competition, and the 16 sport clubs enrolled 1,956 members.

On numerous occasions, students have made written requests to the Director of Recreational Sports for more space. The most frequent singular complaints found in the suggestion box in Memorial Hall are directed toward the shortage of space, the overcrowded conditions and the unreasonable hours that the building is available for open recreational sports.

In an attempt to satisfy the recreational appetites of the student body, Memorial Hall is now open 20 hours a day 5 a.m to 1 a.m., seven days a week. Even with this schedule we encounter frustration and, at times, comic relief in serving the students. For example, on a recent crisp February morning about 7 a.m. Sharon D. Yeagle, Recreational Sports Director, observed a group of students scrambling about on their hands and knees drying a wet basketball court in Memorial Hall with all of the paper towels available from nearby rest rooms. These students could not wait for the court to dry from a wet mopping by the maintenance staff; the students had to speed the drying to play basketball so as not to lose

any play time before the commencement of their eight o'clock classes. This example illustrates not only the student's express desire to use the basketball courts but also the dysfunction which results from overlapping activities due to overcrowded facilities.

The University hopes to achieve two goals with the construction of the proposed Recreational Sports - Fitness Center: (1) with the newly available space, to greatly expand accessibility to the presently scheduled recreational activities and (2) to add new activities in the areas of club sports, non-credit instruction, and fitness.

b. **Service Demands and Clients**

There are a number of areas in which new space would allow the University to greatly expand present programs. For example, the weight training club has 1,500 members utilizing 3,000 square feet of dismal, substandard space as its activity center. This space has inadequate ventilation, no windows, inadequate ceiling height with piping lining the ceiling and overcrowded conditions which compromise occupants health and safety. Not only is the area much too small for the present 1,500 member club, but also, the club has had to curtail membership due to lack of space.

The present swimming facility is another example where inadequate space severely limits recreational activity. The pool is the aquatic home of four competitive swimming teams:

the University varsity women's team,
the University varsity men's team,
the Blacksburg High School team, and
the Blacksburg Sunfish.

The pool, also operating 20 hours per day, is also the site for various credit classes such as Advanced Lifesaving and Water Safety Instructor, the indoor training site for the Kayak and SCUBA clubs, the competitive site for 130 intramural water polo teams, the location for non-credit aquatic fitness classes, and the locus of the Montgomery County Cardiac Rehabilitation Program. The pool cannot be used for recreational (Lap) swimming at all except during the scarce intervals when the pool is not being used by these instructional and competitive activities. Records show that, on the average, at least 300 swimmers who sign up are turned away on a daily basis. These persons are denied use of the pool because it is operating at peak capacity and cannot accommodate greater occupancy without severe compromises to health and safety.

A final example of the recreational activity limitations dictated by inadequate space is the realm of team sport competition. This semester VPI and SU has 403 intramural basketball teams playing three or four games each. The three-four game schedule constitutes the entire intramural season for the majority of these teams. In contrast, Purdue University, which has a full complement of recreational facilities, plays six or seven-game schedules.

In each of the aforementioned examples, construction of the proposed new facility would allow the University to expand accessibility to activities which are presently offered on a very limited basis. Many more students would be able to weight train, many more hours would be available for recreational (lap) swimming, and the intramural program could accommodate many more teams in sports such as basketball, volleyball and water polo, as well as to allow these teams to play reasonable schedules.

The proposed new construction would also allow new services to be instituted. Implicit in the name of the proposed new construction, the Recreational Sports - Fitness Center, are new services, namely, fitness and wellness programs. A Fitness Center is proposed for the new facility to serve the University communities present and future fitness and wellness needs.

The fitness center would be the site of fitness and wellness assessment and would serve to enhance students' awareness of the role that lifestyle plays in health promotion. Healthy behaviors such as the development of regular exercise routines, smoking cessation, sound nutritional practices, moderation of alcohol ingestion, and stress management would be addressed. Instruction would be provided via seminars, individual and group counseling, and computer assisted psycho-physiological monitoring to facilitate lifestyle modification.

As previously indicated, new space would also allow for new services in the area of club sports. We presently have 16 sport clubs in the Sport Club Federation. Recent surveys suggest the desire for 50 sport clubs on campus indicating the need for facilities to handle the equipment, instruction and activity of these 50 clubs.

The clients to be served by the proposed new construction would be the existing 22,361 undergraduate and graduate students at Virginia Tech as well as the 5,721 faculty and classified staff.

2. Facility Information

a. Existing Facility

The existing renovated facility, Memorial Hall, completed in 1975, was originally constructed primarily to accommodate instructional programs in health and physical education. The facility presently houses these programs as well as the Dean's offices of the College of Education, and the Division of Curriculum and Instruction of the College of Education.

As a center for recreational sports, Memorial Hall is woefully inadequate, primarily due to a simple lack of space for the student body that has grown to over 22,000, from a student body of 18,477 in 1975. Combined student body and faculty and staff in 1975 was 22,771 compared to the total of about 28,000 in Fall of 1988, a 26.6% increase. Additionally, Memorial Hall is conceptually designed as an instructional building, not a recreational sports facility which further undermines its efficiency as a recreational building.

The assignable area in existing Memorial Hall, according to the SCHEV program, is 121,960 square feet of instructional space, with 200,961 gross square feet. The proposed facility would add 108,933 assignable and 155,000 gross square feet of recreational space.

b. Interim Accommodations

No facilities on campus can accommodate the recreational sports program other than Memorial Hall. In the interim there is no other choice but to tax the existing facility to its limits and to turn students away in increasing numbers.

3. Analysis of Alternatives

a. Alternatives

Relative to the proposed new construction, four alternatives have been considered.

Do Nothing

The first alternative is simply to propose no future construction. This alternative mandates that the recreational sports program continue on a limited, space-restricted basis. The consequence of this alternative is that the quality of student life in the recreational domain will be profoundly compromised, and the existing facility will continue to operate at an abysmal, overcrowded, dysfunctional level.

Renovation/New Construction A

A second alternative considered was the renovation of Rector Fieldhouse in conjunction with an attenuated program of new construction. This alternative is flawed since Rector Fieldhouse must be shared with the intercollegiate athletic program. This sharing would remove the renovated fieldhouse from use by the recreational sports program for approximately 50% of the academic year at key times during the day, 1-6 p.m. and 7-10 p.m. weekdays, and on certain weekends. Additionally, frequently unscheduled intercollegiate athletic sessions would take precedence over recreational sports programs, leading to constant and inevitable interruptions. These limitations make this alternative fundamentally problematic in that it is wrought with compromises at the outset which would undermine the benefit to recreational sports participants.

Renovation/New Construction B

A third alternative which has been discussed is the utilization of a renovated Memorial Hall in conjunction with new construction. The disadvantage of this alternative is that very little additional space would be realized with renovation, since the space in Memorial Hall is being utilized very efficiently at the present time. The problem with the existing situation is that student demand exceeds the available space. Since the

existing facility is already taxed to its limits, the only solution which addresses the problem must deal with the need for additional space. The incremental amount of space gained by renovation of Memorial Hall would fall far short of meeting current space needs.

New Construction

The fourth and most promising alternative is the new construction proposed herein. The proposed new construction would provide a full complement of recreational sports for the student body, allowing them to use the facility more frequently and at more reasonable hours. This alternative relieves a great deal of frustration associated with overcrowded, unsafe conditions and constantly being turned away.

Neither intercollegiate athletics nor credit instruction would disrupt the recreational sports program. The facility would try to be an exercise and sport-based center for the entire university community.

b. Factors Considered

The primary factors considered in the four aforementioned alternatives were: (1) total recreational space, (2) the accessibility of the recreational space 20 hours per day, 7 days per week, 12 months of the year and, (3) adequate response to the needs demonstrated by and voiced by students, faculty and staff.

On the basis of these factors, the new construction proposed herein is clearly the best alternative to satisfy the long range client demands and University goals and aspirations for an enhanced quality of student life.

4. Proposed Facility

a. The mission of Virginia Polytechnic Institute and State University (VPI and SU) includes not only teaching, research and extension but also "preparing students for life" in a more general sense. Both the academic and physical environment contribute to the extent and type of values inculcated by their inhabitants. The primary function of recreation is the enhancement of living by enabling individuals to find fellowship, a sense of accomplishment, the enjoyment of physical activity and self discipline all of which contribute to human health and happiness. Through recreational programs, people develop interests and skills that enable them to make constructive use of leisure time, ultimately contributing to proper physical and mental health, safety, confidence and character development. The program objectives for the Recreational Sports - Fitness Center are to provide the physical facilities which will promote the constructive expenditure of energy and allow students to develop skills and attitudes which will prepare them for, and help them deal with the future.

The program objectives for the Recreational Sports - Fitness Center include:

1) Providing a comprehensive recreational program which would afford undergraduates, graduate students, faculty and staff of all ages, backgrounds and interests the opportunity to interact and engage in a variety of activities.

2) Creating, an environment which fosters leadership, cooperation and development of physical skills central to the immediate and long range happiness and success of the clients its serves.

3) Providing a program which responds to the demonstrated needs and desires of the University community, and relieves the frustration associated with the existing overcrowded conditions.

4) Advancing the quality of student life by supplying the groundwork for a broad educational experience to include excellence in academics as well as participation in cooperative, integrative activities such as recreational sports.

b. **New Initiatives (this section to be revised by VPI & SU as far as "PROJECT DESCRIPTION" section)**

1) The proposed project provides space for facilities not currently available on campus but required for achieving the program objectives referenced above.

a) The existing athletic facilities on campus were designed for, and are primarily used for instructional purposes. In this sense providing space for the primary purpose of recreation, as opposed to instruction is a new initiative.

b) A portion of the program is dedicated to wellness and fitness in an effort to address a future trend of health maintenance. This clinic would enhance awareness of healthy lifestyles and promote healthy behaviors through seminars and individual and group counseling.

2) Expansions

Expanded facilities will be provided for weight training, racquetball and squash, aquatics, club sports, aerobics, volleyball, basketball and a wide variety of other intramural sports, the full scope to which cannot be fully realized in the present facilities on campus.

3) Improvements

Improvements in the quality of student life will be the major impact of this proposed facility. Continuing to operate in the existing substandard facilities can only lead to frustration and a lack of awareness of the benefits of recreation and physical activity.

c. The proposed facility will answer the existing, major space deficit as demonstrated by data depicting client needs. The department of Recreational Sports estimates that the existing facilities are being used

at 120% capacity. This is arrived at by comparing the facility capacity to client demand.

d. In terms of proximity to existing facilities, the center would be located in the south west quadrant of campus near the intersection of Washington Street and Duck Pond Drive. While the master plan does not specifically depict an infill increment in this vicinity, several extenuating factors led to the selection of this site.

1) Massing

The anticipated size and scale of the center suggest that it be located remote from the pedestrian oriented core campus. While the 1983-1993 VPI and SU Master Plan shows 128,000 GSF capacity in increments 47 through 50 located behind the contiguous to Memorial Hall, this is not the site of choice for reasons outlined below. The proposed new construction not only exceeds Memorial Hall the increment capacity by 27,618 GSF, but allows no room for expansion, a key consideration in this proposal.

2) Expansion

In its attempt to raise awareness, articulate concerns and instill and an understanding of a sympathy for critical issues, the Master Plan does not document each possible solution to problems. Similarly, the Master Plan does not attempt clairvoyance in anticipating the total scope and disposition of all future facilities. The trends of fitness awareness and health maintenance indicate the possible need for expansion in year to come. The site proposed herein allows for contiguous future expansion whereas core campus site locations would not.

3) Parking

One of the strongest arguments for a building site on the core campus perimeter is the availability of proximate parking. While the University currently houses approximately 8,500 students on campus, there are about 13,800 students living off campus, a 1:1:6 ratio. The proposed site is located adjacent to two major student commuter parking lots, making the proposed facility easily accessible, and convenient for both campus residents and commuters alike.

4) Function

One of the primary objectives of the Master Plan is functional integration, resulting in a balance of academic, residential, service and athletic components. The impetus, therefore, is toward achieving a balanced mixture of functional uses as opposed to creating discreet zones of campus which would be spatially, functionally and architecturally distinct. The site proposed for the

Recreational Sports - Fitness Center makes progress toward reaching the goal of functional spatial and architectural integration.

e) Future Plans for the Facility: The facility is dedicated for the foreseeable future to recreational sports. A modular design approach is intended to accommodate future expansion in the event that client demand indicates the need for additional space.

B. PROJECT DESCRIPTION

1. Capacity and Size

The proposed Recreational Sports - Fitness Center will contain approximately 115,100 net assignable square feet to be used as follows:

USE	NASF
Four-court Gymnasium	28,700
Activity Rooms	9,600
Weight Rooms	10,000
Racquetball/Squash Courts	6,200
Jogging Track	8,200
Equipment Storage/Lockers	12,900
Health Food Service	1,400
Fitness Center/Lounge	4,200
Aquatics Center	27,700
Recreational Sports Labs	6,200
TOTAL	115,100

2. Construction Characteristics

a. Architectural Style

The proposed facility will be designed so as to integrate with the existing and planned adjacent building forms. Style and materials will respond to existing contextual clues.

b. Materials of Construction

Construction type will be non-combustible as defined by the Virginia Uniform Statewide Building Code. Reinforced concrete frame to the second floor level structural steel frame above. Existing soil at the site is silty clay, sandy silt, and high plasticity clay, suitable for supporting a shallow foundation system. A controlled fill will be constructed under the foundations and slab. Reinforced concrete shallow foundation system consisting of spread column footings and foundation grade beams bearing on compacted fill. Ground floor slab on grade. Reinforced concrete second floor and beam system. Structural steel and metal joist roof framing (protected) supporting metal roof deck.

Exterior walls will be precast concrete consistent with the exterior

cladding of existing adjacent buildings. Colors will be compatible with those found on existing buildings.

Windows will be insulated glass in aluminum fixed frame with operable sashes where appropriate and limited fixed glazing. Roofing will be a combination of standing seam metal roof and single ply membrane system unless functional, economic and/or aesthetic considerations suggest otherwise.

c. **Interior Finishes**

Wood floors will be used in: gymnasium, activity rooms, squash/racquetball courts and jogging track. Sealed concrete floors in locker rooms, weight rooms and storage areas. Vinyl tile on concrete in health food service, and recreational sports labs, resilient rubber tile in fitness center. Carpet in lounge and ceramic tile in aquatics center.

3. **Sitework and Utilities**

External Water Distribution

Water will be provided by an 8" line by extending the 12" line from the intersection of Washington Street and West Campus Drive to the new site. In addition to the existing fire hydrant located on the south side of the proposed building, another will be installed on the north side of the proposed building.

External Sanitary Sewer Collection

The existing 15" sanitary sewer near the building will be used. It is anticipated that the system will operate under gravity.

External Storm Drainage System

The existing 4' x 4' box culvert which is used as a storm sewer under the building site will be relocated around the proposed building. Drop inlets along the north side of the building and in other low lying areas around the building will be used. These will tie into the relocated 4' x 4' box culvert.

Earthwork

The proposed building is located on a relatively flat site, however, cut will occur on the north side next to Rector Field House to provide a more suitable slope. Additional soil will be excavated over the entire building site due to the current soils lack of bearing capacity. Since the soil excavated cannot be used as controlled fill according to the soils report, off site ground elevation to 2,054 feet. Erosion control will be provided according to the most recent edition of the Soil and Water Conservation Commission's Virginia Erosion and Sediment Control Handbook.

Landscaping

Planting will be provided at all areas of the proposed building, including the outside open area on the west side of the building, and all other areas disturbed by construction.

Site Improvements

Site improvements will include a short retaining wall on the north side of the building.

Walks

Concrete walks will be provided around the exterior of the building.

Paved Roads

A short paved road is anticipated to connect Spring Road with the handicap parking lot.

Paved Parking

A paved parking lot is anticipated for use by handicapped persons on the east side of the proposed building.

Fencing

No fencing is anticipated.

4. Building Systems

Heating System

Low pressure steam from the existing central coal-fired boiler distribution system located in an existing tunnel along West Campus Drive shall be utilized in a shell and tube converter for hot water heating. The water shall be pumped to heating coils located in air handling units.

The central heating system will be supplemented by passive solar design considerations utilized in establishing appropriate shading, glass areas, and thermal properties to maximize the solar contribution.

Cooling System

Chilled water for the cooling coils located in air handling units shall be provided from a chiller in the building. The cooling tower wall be located on the roof.

Temperature Control

Temperature control in spaces of similar use or exposure characteristics will be automatically controlled by modulation of multizone dampers or VAV terminals and handling unit control valves, in response to individual space thermostats. The building temperature controls shall be connected to the campus Powers System 600 energy management system.

Ventilation

The entire building shall be ventilated by air handling units located in mechanical equipment rooms. Air from these air handling units shall be tempered and ducted to the spaces. Generally, return air shall be returned from spaces and ducted back to air handling units. Outside air will be brought in through the air handling units for exhaust makeup and ventilation.

Toilet Ventilation

All toilets, service areas, and mechanical spaces shall be provided with mechanical exhaust systems.

Plumbing System
Provided completely in accordance with the Virginia Uniform Statewide Building Code and shall include the following systems: sanitary sewer, storm sewer, vent, domestic hot cold water, and plumbing fixtures.

Fire Protection Systems

Wet-pipe sprinkler fire suppression systems shall be installed as required by applicable fire and life safety codes.

Special Concerns

Provide indoor air quality by providing outdoor air for good quality indoor atmosphere.

Provide the proper ventilation and negative pressure in the pool area to prevent migration of chlorine from the pool area.

Electrical System

Electric power supply characteristics shall be as follows:

480/277 volts, 3 phase, 4 wire wye, grounded neutral for fluorescent and HID lighting, motors of 3/4 horsepower and larger, and larger power loads.

208/120 volts, 3 phase, 4 wire wye, grounded neutral for incandescent lighting, receptacles, small motors of 1/2

horsepower and below, and all lower energy and control power. It is assumed that the feeders from the new substation to the south will have been installed in the new duct bank along Tech Center Drive. A switch vault shall be installed on the east side of Tech Center Drive on the newly installed duct bank to the new substation. An underground dual circuit feeds, at 12,470 volt three phase, shall be extended in a duct bank from the new vault to a new underground vault at the east end of the new facility. In this vault shall be a manual transfer switch, fused switch, and transformer. Power shall be ducted into the electrical equipment room to a 480/277 volts, 3 phase, 4 wire main switchboard.

208/120 volt, 3 phase, 4 wire wye power shall be derived from 480-208/120 volt delta-wye connected dry type transformers located throughout the building.

The main service and distribution equipment shall be circuit breaker type housed in a free-standing building type switchboard.

a. Power Distribution

Electric power shall be distributed from the Main Switchboard to various panelboards throughout the building by means of conduit and wire or feeder bus duct. Dry type transformers shall be supplied from these panelboards.

All 480/277 volt and 208/120 volt panelboards shall be circuit breaker type with 2-row vertical arrangement and bolted type branch circuit breakers.

All wiring shall be installed in heavy wall rigid galvanized steel conduit. Conductors shall be type THW (600 volt) with copper wire unless otherwise specified.

b. Lighting

All low ceiling lighting through the building shall be fluorescent, except in certain special purpose rooms or areas where special effects are required. High ceiling areas shall be lighted with metal halide fixtures.

c. Communications

Provide empty conduit and cable tray systems, communication back-boards or cabinets, pull wires, and necessary grounding as required for voice, data and closed circuit television wire and cable.

Provide signal chimes throughout the building to tie in with existing campus system to audibly transmit periodic change of classes and events. This system shall be a continuation of and receive signals form the existing signal

system and shall employ electronic coded receivers electrically connected to the building 120 volt supply and signal devices.

Indicating clocks shall be provided throughout the building which shall be controlled electronically from the existing master clock located elsewhere on the campus. Signals shall be received over campus power lines and electrical system.

d. Emergency Power System:

Battery powered exit and egress lighting shall be provided.

e. Fire Detection and Alarm System

Provide all equipment and accessories for a complete electrically supervised closed circuit fire alarm system.

5. Relationship to Existing Facilities (to be completed by VPI & SU)

6. Project Schedule

General Assembly Approval	Mar 1990
Architect/Engineer Selection	Apr 1990
Request Authority to Initiate Project	Jul 1990
Project Criteria Phase Submission	Aug 1990
Preliminary Plans Phase Submission	Nov 1990
Working Drawings Phase Submission	Jun 1991
Receive Bids	Aug 1991
Award Contract/Initiate Construction	Sep 1991
Complete Construction/Occupy Facility	Aug 1993

D. PROJECT COSTS

1. Project Budget

For a detailed project budget, see Department of Planning & Budget Form H-1 and H-1A.

The proposed source of funding for this project is as follows:

	Source	Amount
1990 - 92 Biennium	0800	$25,000,000

2. Operating Budget

Maintenance and operative funds will be requested in the Auxiliary Enterprise Operating Budget Requests. Funds will be requested to reflect the project's completion date. Estimates for maintenance staff required

and costs have been made utilizing the current cost experiences of the University's Physical Plant Department. See Department of Planning and Budget Form H-1 for detailed cost information.

Recreational Sports Fitness Center

Phase II · Program Data

VIRGINIA POLYTECHNIC INSTITUTE
& STATE UNIVERSITY

Virginia Polytechnic Institute & State University

Building sub-committee:	Dr. Ron Bos, Chair Director Health, Physical Education & Recreation
	Ms. Sharon Yeagle Director, Recreational Sports
	Dr. D. David Ostroth Director of Student Activities
	Warren Kark University Architect/ Director of Facilities Planning
	Spencer Hall Director of Physical Plant
	Keith Furr Director of Health & Safety
	Jim Purdy Budget Analyst
Capital Outlay Consultants:	Mary Broughton Capital Outlay Architect
	Steve Gift Director of Capital Planning
Architect/Engineer Consultants:	Wiley & Wilson/Parkin Architects
	Bill Stuart Project Manager
	Preston Wade Principal in Charge
	David Body Project Architect/Designer
Special Consulants:	Aquatics Consultant Rowley International
	Recreational Sports Consultant Bill Manning
	Landscape Architects/Land Planners Higgins Associates, Inc.
	Acousitcs Consultant Paoletti/Lewitz Associates

The purpose of this questionnaire is to establish User desires and needs on a room by room basis and to identify important relationships between rooms. This instruction sheet will help you to understand what is meant by each heading.

Space Name: Descriptive name of space such as "office" or "Research Laboratory".

Function: Brief description of what the space is used for, as relates to the State Council for Higher Education of Virginia (SCHEV) classification system. See attached list.

Assignable Area: List the net assignable square footage (NASF) needed. For example, an 8'-0" by 10'-0" room is 80 NASF.

Concept: Give a short description of what the space is to be used for. Example: This space will be used for research team meetings, data analysis sessions, grant writing and other similar activities.

Special Features: List any special requirements. Example: This space should have a movable partition that allows the space to be equally divided. The partition must be of high acoustical quality. Windowless.

Other examples of special features: high ceilings, special lighting, special flooring, acoustical needs, special access needs, etc.

Equipment: List all equipment needs, such as furniture (free-standing and built-in), audio-visual equipment, built-in shelving, laboratory equipment, computers and/or printers, fume hoods, special instructional equipment, etc.

Services: List all service needs. Example: Two telephone connections, two computer lines, water connection, floor drain, 110 v. AC power outlets, hose bibbs, piped in medical gases, etc.

Adjacency: List other spaces that relate to this space and note ranking of importance of relationship to this space: 4 = Mandatory 3 = Important 2 = Desirable 1 = Undesirable

Total Area:

State Council for Higher Education of Virginia (SCHEV) Classification System

FUNCTION: CLASSROOM (Guide #1)

Space used by classes that do not require special-purpose equipment for student use, and related service space.

TEACHING LABORATORY (Guide #2)

Space used primarily by regularly scheduled classes that require special-purpose equipment for student participation, experimentation, observation, or practice in a field of study, and related service space.

INSTRUCTIONAL FACULTY OFFICE (Guide #3)

Space intended for office use by resident teaching faculty, teaching assistants, division/department heads, and clerical personnel of instructional departments, and related services.

PHYSICAL EDUCATION AND ATHLETIC ACTIVITY FACULTY (Guide #5)

Space used for instruction/physical education, research and/or training that requires special purpose equipment for staff/student experimentation or observation and related service space.

GENERAL USE (Guide #7)

Space intended for assembly such as theatre, auditorium, or concert, exhibition such as museum and gallery, lounge, and non-class meeting activities, and related service space.

RESEARCH FACULTY OFFICE (Guide #8)

Space intended for office use by resident research faculty, research assistants, research administrative staff, and clerical personnel, and related service space.

Virginia Polytechnic Institute & State University
Program Data/Phase II

SPACE NAME :

FUNCTION :

ASSIGNABLE AREA :

CONCEPT :

SPECIAL FEATURES :

EQUIPMENT :

SERVICES :

ADJACENCY :

TOTAL AREA :

June 1, 1989

I. PROGRAM SUMMARY

TYPE OF SPACE	*NASF*	*SUBTOTALS*
A. Activity Space		61,400
Gym - 4 court capacity	28,000	
Activity 1 wood floor	3,000	
Activity 2 wood floor	3,000	
Activity 3 mat floor	4,000	
Weight Room 1	8,000	
Weight Room 2	2,000	
Weight Room Office	200	
Racquetball - 6 courts	4,800	
Squash - 1 courts	1,400	
Jogging Track	7,000	
B. Support Space		20,800
Equipment storage/checkout	3,000	
Mens' lockers	3,000	
Womens' lockers	3,000	
Storage	5,000	
Health Food Service	1,300	
Wellness center	500	
Lounge/Lobbies	3,000	
Lockers - unisex	2,000	
C. Aquatics		21,000
Natatorium	19,500	
Storage	1,200	
Office/lifeguard	300	
D. Administrative		5,733
Offices	3,000	
Student Services	1,533	
Conference/meeting rooms	1,200	
TOTAL ASSIGNABLE		108,733
TOTAL GROSS @ 70% EFFICIENCY Includes Mechanical, Electrical, CNS and Filtration/Chlorine		155,333
TOTAL PROJECT COST		$25,000,000

Virginia Polytechnic Institute & State University
Program Data Phase II

ACTIVITY SPACE	*NASF*
Gym - 4 court capacity	28,000
Activity 1 wood floor	3,000
Activity 2 wood floor	3,000
Activity 3 mat floor	4,000
Weight Room 1	8,000
Weight Room 2	2,000
Weight Room Office	200
Racquetball - 6 courts	4,800
Squash - 2 courts	1,400
Jogging Track	7,000
SUBTOTAL	**61,400**

Virginia Polytechnic Institute & State University
Program Data Phase II

SPACE NAME : Gymnasia (4 court capacity)

FUNCTION : Physical Education (Guide #5)

ASSIGNABLE SF : 28,000

CONCEPT : Recreational and intramural competition to include basketball, volleyball, badminton courts, etc.

SPECIAL FEATURES : Retractable baskets
Divider curtains, probably 2
Space for spectators, but no bleachers
Intercom, paging and high quality sound system

EQUIPMENT : Audio capability from central control
Timing capability from central control
Closed circuit TV
Emergency telephone
Crash mats
Scoreboard

SERVICES : 110-220 volt electrical service

ADJACENCY : Storage
Jogging track

TOTAL AREA : 61,400 NASF

Virginia Polytechnic Institute & State University
Program Data/Phase II

SPACE NAME : Multi-Purpose Rooms (3)

FUNCTION : Physical Education (Guide #5)

ASSIGNABLE SF : 10,000 NASF

CONCEPT : To house aerobics, fencing, karate, dance, gymnastics and variety of other indoor recreational activities
2 Rooms @ 3,000 NASF each with wood floors
1 Room @ 4,000 NASF with mat floor

SPECIAL FEATURES : Spring loaded floors
2 floors wood (4,000 and 3,000)
1 floor composition
Fencing lanes
Air conditioned

EQUIPMENT : Mats for one of the rooms

SERVICES : 110-220 volt electrical service
Audio center
Recessed drinking fountains
Intercom, paging and high quality sound system
Air changes as required

ADJACENCY : Mat storage
Drinking fountain
Public telephone

TOTAL AREA : 61,400 NASF

Virginia Polytechnic Institute & State University
Program Data/Phase II

SPACE NAME : Weight Rooms (2)

FUNCTION : Physcial Education (Guide #5)

ASSIGNABLE SF : 10,000 NASF

CONCEPT : Facilities and equipment for free weights, weight machines, stationary bikes, etc. Basic weight training and fitness facility.
1 weight room @ 2,000 NASF
1 weight room @ 8,000 NASF

SPECIAL FEATURES : Should be able to be divided functionally into 2 areas: Instructional and Recreational. Should have central control desk or information center with view of entire facility.

EQUIPMENT :
- Free weights
- Stationary bikes
- Weight machines
- Rowing machines
- Stairmaster
- Mirrors
- Bulletin boards
- Instr. display

SERVICES :
- Adequate air flow
- Air conditioning
- Drinking fountain
- Audio input

ADJACENCY : Adjacent to multipurpose rooms

TOTAL AREA : 61,400 NASF

Virginia Polytechnic Institute & State University
Program Data/Phase II

SPACE NAME : Racquetball and Squash Courts

FUNCTION : Physical Education (Guide #5)

ASSIGNABLE SF : 5,500 NASF

CONCEPT : 6 Racquetball Courts, @ 800 NASF each = 4,800 NASF
2 Squash Courts @ 700 NASF each = 1,400 NASF
Racquetball Courts also to be used for walleyball

SPECIAL FEATURES : Handicapped access (1 court)
Security box or compartment (one per court)
Side walls removable for alternative use in future
Glass back walls for observation
Wall construction specifically designed to withstand damage from consistent use. Design in existing Memorial Gym is unacceptable.

EQUIPMENT : Timer and buzzer system for each court.

SERVICES : Adequate lighting with protective covering

ADJACENCY : Observation area
Bulletin boards, display board
Water fountains

TOTAL AREA : 61,400 NASF

Virginia Polytechnic Institute & State University
Program Data/Phase II

SPACE NAME : Jogging track

FUNCTION : Physical Education (Guide #5)

ASSIGNABLE SF : 7,000 NASF

CONCEPT : Jogging track for 30 runners. Need to consider whether or not to *bank curves* Recreational space for walking, jogging and running.

SPECIAL FEATURES : 3 or 4 jogging/walking lanes
Soft floor surface
Windows for outside view

EQUIPMENT : Audio system
Built-in timing display

SERVICES : 110 and 220 volt electrical service
Emergency phone connections
Air conditioning

ADJACENCY : Gymnasium
Outdoor recreational space
Water fountains

TOTAL AREA : 61,400 NASF

Virginia Polytechnic Institute & State University
Program Data/Phase II

SPACE NAME : Outdoor Recreational Space

FUNCTION : Physical Education (Guide #5)

ASSIGNABLE SF : N/A

CONCEPT : Unenclosed space surrounding/or adjacent to the enclosed facility to compliment functions contained in the building. Outdoor gathering place for students.

SPECIAL FEATURES : Sun deck, picnic area, spectator viewing for activities going on inside the building.

EQUIPMENT : Information kiosks, bulletin boards, picnic tables, possibly pavilion-type shelter

SERVICES : Outdoor hydrants, site lighting
Weatherproof electrical service
Access to restrooms inside building even when building is not open to the public.

ADJACENCY : Swimming pool
Restrooms

TOTAL AREA : N/A

Virginia Polytechnic Institute & State University
Program Data Phase II

Support Space	**NASF**
Equipment storage/checkout	3,000
Mens' lockers	3,000
Womens' lockers	3,000
Lockers - unisex	2,000
Storage	5,000
Health Food Service	1,300
Wellness Center	500
Lounge/Lobby	3,000
SUBTOTAL	**20,800**

Virginia Polytechnic Institute & State University
Program Data Phase II

SPACE NAME : Locker Rooms

FUNCTION : Physical Education (Guide #5)

ASSIGNABLE AREA : 8,000 NASF

CONCEPT : Changing clothes, showering, storing personal belongings
Mens lockers @ 3,000 NASF
Womens' lockers @ 3,000 NASF
Unisex lockers @ 2,000 NASF

SPECIAL FEATURES : Non-slip and non-abrasive floor surface in locker rooms serving swimming pool. Also, floor surface that allows easy maintenance.

EQUIPMENT : Hair dryers
Mirrors
Counters
Lockers and benches

SERVICES : 110 volt electrical service ground fault insulated as required
Showers and restrooms
Drinking fountains
Intercom, paging, sound system

ADJACENCY : Swimming Pool
Gymnasia
Multi-purpose rooms

TOTAL AREA : 20,800 NASF

Virginia Polytechnic Institute & State University
Program Data/Phase II

SPACE NAME : Equipment Storage/Check-out

FUNCTION : Physical Education (Guide 45)

ASSIGNABLE SF : 3,000

CONCEPT : Equipment storage, equipment check-out, laundry, locker room control, etc. Principle equipment room.

SPECIAL FEATURES : Service counter with retractable security door
Sink, drain
Work bench and tool area

EQUIPMENT : Storage racks
Laundry carts
Bulletin boards

SERVICES : 110 volt electrical service
Information outlets

ADJACENCY : Locker rooms
Showers

TOTAL AREA : 20,800 NASF

Virginia Polytechnic Institute & State University
Program Data/Phase II

SPACE NAME : Storage

FUNCTION : General equipment storage

ASSIGNABLE SF : 5,000 NASF

CONCEPT :

SPECIAL FEATURES : Adjustable steel shelves

EQUIPMENT :

SERVICES :

ADJACENCY : Loading dock

TOTAL AREA : 20,800 NASF

Virginia Polytechnic Institute & State University
Program Data/Phase II

SPACE NAME : Wellness Center

FUNCTION : Physical Education (Guide #5)

ASSIGNABLE SF : 500 NASF

CONCEPT : A center, with small instrument testing, for wellness/fitness information and testing.

SPECIAL FEATURES : Office included

EQUIPMENT : Blood pressure testing apparatus
Cholesterol testing apparatus
Scales for weighing
Bulletin boards
Literature racks
Magazine racks

SERVICES : Provide file space or method of recording data for individuals who want to monitor weight, blood pressure, cholesterol, etc., on a regular basis.
Electrical service
Information outlet

ADJACENCY : Health Food Center

TOTAL AREA : 20,800 NASF

Virginia Polytechnic Institute & State University
Program Data/Phase II

SPACE NAME : Health Food Center

FUNCTION : Physical Education (Guide #5)

ASSIGNABLE SF : 1,300 NASF

CONCEPT : Space for food and drink dispensers and tables and chairs for dining. Pleasant, comfortable atmosphere conducive to discussion, dining and possibly studying between activities.

SPECIAL FEATURES : Natural lighting via skylights and/or windows, no harsh lights. Comfortable area for students to gather in between activities.

EQUIPMENT :
Tables, chairs
Trash containers
Drinking fountain
Vending machines
Music

SERVICES :
110-220 volt electrical service
Hot and cold water service
Air conditioned

ADJACENCY : Lounge areas

TOTAL AREA : 20,800 NASF

Virginia Polytechnic Institute & State University
Program Data/Phase II

SPACE NAME : Lounge/Lobby

FUNCTION : Physical Education (Guide #5)

ASSIGNABLE SF : 3,000 NASF

CONCEPT : To act as control point, visitor observation area and lounge for students/visitors in between activities. Could be one large lounge/lobby or several small lounges throughout the building. However, single point of entry (i.e. lobby) is required.

SPECIAL FEATURES : Control center for lighting
Public address system control center
Only entry point!
Aesthetic center of building
Visitor center
Natural lighting via skylights or windows

EQUIPMENT : Turnstiles
Computerized check-in
Display cabinets
Telephones

SERVICES : 110 volt electrical service
Information outlets
Natural lighting via skylights or windows

ADJACENCY : Adjacent to as many activity areas as possible

TOTAL AREA : 20,800 NASF

Virginia Polytechnic Institute & State University
Program Data/Phase II

SPACE NAME : Mechanical Room

FUNCTION : Non-assignable space

ASSIGNABLE SF : To be decided

CONCEPT : To house mechanical and HVAC equipment, plumbing equipment. Minimize the amount of interior, enclosed space necessary to house mechanical equipment. Consider locating air handling units on roof if not aesthetically objectionable. Maximize building efficiency to the extent possible.

SPECIAL FEATURES : No return air plenums or duct liners permitted in any new construction on campus.

EQUIPMENT : To be decided

SERVICES : As required

ADJACENCY : As required

TOTAL AREA : To be decided

Virginia Polytechnic Institute & State University
Program Data/Phase II

SPACE NAME : Janitor closets/Electrical closets

FUNCTION : Non-assignable space

ASSIGNABLE SF : 35 NASF for typical Janitor closet. Electrical closet sized as required

CONCEPT : Janitor closet: Custodial service center for supply storage and clean up. Typical closet should be 5 feet by 7 feet.
Electrical closet: terminal point for electrical and communications network services (CNS) lines

SPECIAL FEATURES : Telephone backboard @ electrical closet for CNS distribution frame.
Mop hooks and storage shelving @ janitors closet.

EQUIPMENT : Floor sink and utility sink at Janitors closet.

SERVICES : Hot and cold water service @ janitors closet with 110 volt electrical service, ground fault insulated as required

ADJACENCY : As required

TOTAL AREA : To be decided

Virginia Polytechnic Institute & State University
Program Data Phase II

Aquatics	**NASF**
Natatorium	21,000
Swimming Pool	19,500
Support	1,200
Offices	300
Storage	1,440
Pool/Filtration	
SUBTOTAL	**21,000**

Virginia Polytechnic Institute & State University
Program Data: Phase II

SPACE NAME : Natatorium Swimming Pool

FUNCTION : Physical Education (Guide #5)

ASSIGNABLE SF : 9,675 NASF

CONCEPT : Receational pool, not competitive. For instruction and recreation use by students, faculty and staff.

SPECIAL FEATURES : 25 yards wide, approximately 43 yards long
Depths: (1) 3 feet, (2) 4-6 feet, (3) 6-10 feet
Underwater sound and viewing

EQUIPMENT : Scoreboard
Movable bulkhead

SERVICES : Handicapped accessible
Lighting in swimming pool

ADJACENCY : Locker rooms
Sun deck
Picnic area
Spectator viewing

TOTAL AREA : 21,000 NASF

Virginia Polytechnic Institute & State University
Program Data/Phase II

SPACE NAME : Natatorium/Support

FUNCTION : Physical Education (Guide 45)

ASSIGNABLE SF : 11,205 NASF

CONCEPT : Space adjoining swimming pool. Provide space for spectator observation but no bleachers.
This space should be dynamic and exciting. Consider using graphics or hanging banners on walls. Observation of pool from various vantage points is desirable.

SPECIAL FEATURES : Non-slip floor surface, also non-abrasive for compatibility with bare feet. Durable floor material that is easily cleaned/maintained.

EQUIPMENT : Life Guard chairs
Pool hooks and life saving equipment

SERVICES : 110 volt electrical service, ground fault insulated as required.
Adjustable lighting levels
Emergency telephone

ADJACENCY : Swimming Pool
Locker rooms

TOTAL AREA : 21,000 NASF

Virginia Polytechnic Institute & State University
Program Data/Phase II

SPACE NAME : Pool Filtration equipment room

FUNCTION : Physical Education (Guide #5)

ASSIGNABLE SF : To be provided by Aquatics consultant

CONCEPT : To service the swimming pool needs in terms of filtration, etc.

SPECIAL FEATURES : To be provided by Aquatics consultant.

EQUIPMENT : Pool filtration equipment

SERVICES : To be provided by Aquatics consultant

ADJACENCY : Swimming pool

TOTAL AREA : 21,000 NASF

Virginia Polytechnic Institute & State University
Program Data/Phase II

SPACE NAME : Natatorium Offices

FUNCTION : Physical Education (Guide #5)

ASSIGNABLE AREA : 300 NASF

CONCEPT : Three offices: 1) Equipment storage/check-in
2) Aquatics coordinator
3) Life guard

SPECIAL FEATURES : Check-out window for equipment storage room.

EQUIPMENT : Storage shelving

SERVICES : 110 volt electrical service
Information outlets

ADJACENCY : Swimming pool

TOTAL AREA : 21,000 NASF

Virginia Polytechnic Institute & State University
Program Data/Phase II

SPACE NAME :

FUNCTION :

ASSIGNABLE AREA :

CONCEPT :

SPECIAL FEATURES :

EQUIPMENT :

SERVICES :

ADJACENCY :

TOTAL AREA :

Administrative	**NASF**
Offices	
Director	3,000
Associate Director	
Secretarial	
Main Office/Workroom	
Staff Offices (typical of 6)	
Student Services	1,533
Conference/Meeting rooms	1,200
SUBTOTAL	**5,733**

Virginia Polytechnic Institute & State University
Program Data, Phase II

SPACE NAME : Conference/Meeting Rooms

FUNCTION : Physical Education (Guide #5)

ASSIGNABLE AREA : 1,200 NASF

CONCEPT : Large room divisible into 3 rooms; not necessarily of the same size, for meeting of large and small groups, seminars, conferences

SPECIAL FEATURES : Room should be darkable for showing slides

EQUIPMENT : Tables, chairs, build-in projection screens, operable partitions

SERVICES : 110 volt electric service
Information outlets
Dimmable incandescent lighting

ADJACENCY : Administrative offices
Student offices

TOTAL AREA : 5,733 NASF

Virginia Polytechnic Institute & State University
Program Data/Phase II

SPACE NAME : Student office cubicles

FUNCTION : Physical Education (Guide #5)

ASSIGNABLE SF : 1,533

CONCEPT : One large area subdivided into cubicles for sport clubs, supervisors, etc. Basically student office cubicles.

SPECIAL FEATURES : Work area: photocopying, collating, etc.
Meeting space: large table(s) for meeting of 10 or so people.
Computer terminals.

EQUIPMENT : Micro computer(s)
Photo copier

SERVICES : 110 volt electric service
Information outlets

ADJACENCY : Administrative offices
Meeting rooms

TOTAL AREA : 5,733 NASF

Virginia Polytechnic Institute & State University
Program Data Phase II

SPACE NAME : Administrative Offices

Function : Physical Education (Guide #5)

ASSIGNABLE AREA : 3,000 NASF

CONCEPT : Administrative offices to house staff members in charge of managing the facility office suite or complex should bereadily accessible from main entry/lobby without passing through turnstile or other check point required for facility patrons in general.

SPECIAL FEATURES : Located on building perimeter for view to the outside. Size of individual offices to be based on SCHEV standards and guidelines for size.

EQUIPMENT :

SERVICES : Electric service
Information outlets

ADJACENCY : Conference/meeting rooms
Front entry/lobby

TOTAL AREA : 5,733 NASF

APPENDIX F

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
UNIVERSITY ARCHITECT/FACILITIES PLANNING
(703)231-7356

M E M O R A N D U M

TO: Members of the Recreational Sports-Fitness Center Building Sub-Committee:

Dr. Ronald R. Bos, Chairman
Ms. Sharon Yeagle
Dr. D. David Ostroth
Mr. Warren Kark
Dr. Keith Furr
Mr. Spencer Hall
Mr. Jim Purdy

FROM: Mary Broughton

DATE: August 15, 1989

RE: Recreational Sports-Fitness Center

Attached for your review and record are conference notes reflecting discussions and/or decisions between the Architecture/Engineering consultant and VPI & SU for meetings of July 20, 1989 and August 1, 1989. This is to keep you apprised of project development in terms of program, schedule, budget, site design and building design as they evolve. Please advise should you have any comments, questions and/or revisions as they apply to these conference notes, and meeting minutes or if we can provide further information.

cc: File 5c
Dr. Tom Goodale
Dr. David Ford
Steve Gift

Broughton

Wiley & Wilson Architects.Engineers.Planners Lynchburg

D O C U M E N T A T I O N F O R M

___ W&W OFFICE CORRESPONDENCE
___ TELEPHONE LOG
_X_ CONFERENCE NOTES
___ MEMORANDUM

Date August 2, 1989
***Revised** August 10, 1989

To: Meeting Attendees

From: Bill Stuart

Subject VPI Recreational Sports and Fitness Facility

Comm. No. 89116

Conference notes of meeting held July 20, 1989 at VPI-SU, Office of University Architect.

Attendees:

Ron Bos
Sharon Yeagle
Warren Kark
Mary Broughton
Steve Gift
Bill Stuart
Dave Body

1. Site plans were presented for two different building configurations (Serpentine and Rectangular) and four different sites (west of Wallace, west of Animal Science, south of Rector Field House and south of Tennis Pavilion). A matrix was presented evaluating each site with all the selection criteria. Site 1a, west of Wallace with the serpentine buiding, was selected as the preferred site to be developed in the preplanning study.

2. The University directed the pool be increased to a 50 meter x 25 yard competitive pool with an "L" configuration to provide a shallow teaching and water aerobic zone.

3. The competitive pool will require some elevated spectator seating. Number of seats was not defined.

*4. The classroom at 1200 NASF needs to be reconfigured to allow a divider wall to make two 600 NASF components.

5. The direction was to evaluate whether the increase in scope can be accommodated within the 155,000 gross square feet and, if not, present option to the University.

/jg

Wiley & Wilson Architects.Engineers.Planners Lynchburg

D O C U M E N T A T I O N F O R M

___ [illegible]
___ TELEPHONE LOG
_X_ CONFERENCE NOTES
___ MEMORANDUM

Date August 2, 1989
*Revised August 10, 1989

To: Meeting Attendees

From: Bill Stuart

Subject VPI Recreational Sports and Fitness Facility

Comm. No. 89116

Conference notes of meeting held August 1, 1989 at VPI-SU, Office of the University Architect.

Attendees:

Ron Bos
Leo Smith
Warren Kark
Mary Broughton
Steve Gift
Bill Stuart
Dave Body

1. The drawings of the site plan, first and second floor plans, as well as building elevations were reviewed.

2. The current gross square foot of the facility is approximately 154,600 in simple measurements, the weight room and storage areas were reduced slightly. The decision to make the pool 50 meters with the L-shaped teaching pool and pool seats added about 8,000 gross square feet to the project. The budget has not been re-evaluated. In reality, the $900,000 as a line item being carried for the pool tank and filtration system is adequate for the larger pool. The entire facility, at 155,000 square feet at $98.50 per sq. ft. is in line with recent projects. An additional mechanical room may be needed at the east end near the racquet ball courts.

3. A list of the functional square footage versus the program square footage was distributed.

4. The outdoor area at the west end of the building was discussed as to the type of activities planned. There are no formal activities planned. This will be a picnic area, small receptions and informal activities, such as badminton, volley ball, frisbee. It was noted there is a large level space to the west across Duck Pond Road by I Lot that is graded for outdoor activity and is currently used by the archery club. It was pointed out that the existing willow tree near the east end of the facility will be lost; however, the more valuable hardwood trees in the grove will be saved.

5. The deck width of the pool was discussed and the fact that there are no bleachers on the deck, it was pointed out that the pool can be adjusted in a north-south direction within the space to increase the deck width on the north if the user wants a larger deck with movable bleachers for teaching. Asymmetric deck widths are desired to allow instruction on one side.

6. The possibility that the gymnasium will be used for other than recreational sports was discussed. It is possible that this room will be used for conferences, seminars, health fairs, dances, receptions, or possibly banquets. As such, the air handling unit should be designed to accommodate these functions. This will increase the air handling size and ductwork size as these activities have a more rigorous HVAC requirement.

7. In reviewing the floor plan, the comment was made that the main entrance stair could be moved to the center of the hole in the floor to make a free-standing element that would be more dramatic.

8. The use of the stair at the western end of the facility was discussed and the possibility it would have to be enclosed if it is an exit stair. The decision was made to investigate moving this stair next to the mechanical room and locker room, and possibly incorporate it with the seats at the west end of the seating area for the pool to give communications between the bleacher area of the pool and the pool deck. The current number of bleacher seats is 300. Everyone agreed this number was reasonable and no one had data that would indicate otherwise.

9. The possibility of eliminating the corridor between the gymnasium and the filter storage area on the first floor was discussed. The decision was to keep the corridor as it would be used by food service and for future expansion.

10. Some discussion of a pool bulkhead ensued with a decision not to have a movable bulkhead. This facility should be designed so as not to preclude athletic competition, but should not be designed expressly for competition with team rooms, spectator seating, etc. The minimum should be added, such as sleeves for starting blocks, built-in items for timing, touch pads ect.

11. The question was asked, "Could the administration space be increased and storage reduced?" VPI is to update program and give revised administration space, if required. The current decision was existing space is adequate; however, VPI Planning Office and the user will develop a simple layout to show the gross space allocation for sports club usage, conference room, as well as recreational sports staff.

12. The question "should a computer room be added to the facility" was not decisively answered. The decision was to see how the efficiency develops and, if the Wellness Center could be combined with the first floor main entrance and release some space for a future computer room.

*13. The first floor entrance and reception control should include several turnstiles. The office would be the control center for the building, including the sound racks, switching for the lights of the building, exit door alarms, etc.

14. VPI/SU will add a requirement to the MOU that all elevations of the building should include the mechanical equipment profile.

15. Some discussion of the cooling tower chilled water location versus the master chilled water plan versus what is funded, came to the conclusion that the master chilled water plan with the chiller in Wallace will not occur and this project should plan on the use of a chiller and cooling tower.

16. The question of skylights, their location, the use of skylights over the pool, and the exterior elevations of the building, particularly the pool, were discussed. The pool wall openings are envisioned to be a Kalwall, which is a translucent panel, so there will be little glare in the pool. The west elevation as shown is not correct, in that it was not envisioned to have such large openings. The suggestion was made that the west elevation in the pool room be glazed at a people level with sliding glass doors, providing access to the exterior beach area, and perhaps a large eyebrow solar shade. David Body has done a similar treatment at Vanderbilt.

17. At the south elevation, the intent was to have the windows at track level and a wall on the interior side of the track to shield the gymnasium from the light. The suggestion was made that perhaps the south elevation would be better served to have windows that would occur at the corners of the track and a solid wall at the track level to 1) enhance the south elevation, and 2) to prevent that area of the track from seeming like a long tunnel. The south elevation was further questioned as to why the semi-circular forms rather than rectangle, and that perhaps a better detail would be to back off the busy elevation on the south to a simpler elevation with sculpture and large masses providing the relief for the long wall. The possibility of providing a different level roof over the "L" on the pool, perhaps even a sloped metal roof, was discussed. A precast frame with brick infill was briefly investigated; however, the columns were too close and the effect was too spindly and did not work out well.

18. The north elevation with a standing seam metal roof was discussed. The intent was to tie the gable type roof to the Hillcrest and to add an element that would bring the building more into a human scale. The suggestion was made that perhaps a dormer or tower treatment could be used to emphasize the entry.

19. It was pointed out that the skylights will have to be justified with DEB and the thermal envelop maintained by increasing the insulation over the solid areas of the roof.

20. General discussion, with no conclusions, centered around if the curve building may increase the cost and floor covering for the gymnasium floor when the floor is used for other than sports activities. Deck level gutters on the swimming pool were discussed; however, the thinking now is conventional gutters will be used.

21. The question was asked of the user if the detailed equipment budget had been developed. The architect pointed out that Arizona State had a $1.1 million dollar budget, which was high; and USC had a $650,000 budget, which was low. Bill Manning, a sports consultant, would probably suggest a budget between $800,000 and $900,000 for equipment for this facility.

22. The schedule is to have the draft report to VPI on August 14 for their Integrated Capital Design Team review. This edition will have the drawings printed at the large size as they are now shown. After all comments are received and the pre-planning document is reissued for state review, the drawings will be reduced to 8-1/2 x 11.

If any participant has corrections or additions to these notes, please inform the writer and a revised edition will be issued.

/jg

D. **ADMINISTRATIVE**

Offices	3,000	--
Student Services	1,533	--
Conference/Meeting Rooms	1,200	--
Total ASF Administrative	**5,733**	**6,100**
Total Project ASF	**108,933**	**114,700**
Total Project GSF (includes Mechanical Electrical, CNS and Filtration/Cholrine)	**155,618** (@70% eff.)	**155,000** (actual)

PROGRAM SUMMARY
JULY 31, 1989

A. ACTIVITY SPACE

	PROGRAM	SCHEMATIC
Gym - 4 court capacity	28,000	28,000
Activity 1 wood floor	3,000	3,000
Activity 2 wood floor	3,000	3,000
Activity 3 mat floor	4,000	3,900
Weight Room 1	8,000	9,500
Weight Room 2	2,000	---
Weight Room Office	200	200
Racquetball - 6 courts	4,800	4,800
Squash - 2 courts	1,400	1,600
Jogging Track	7,000	7,300
Total ASF Activity Spare	**61,400**	**61,300**

B. SUPPORT SPACE

Equipment Storage/Checkout Laundry	3,000	3,000
Men's Lockers	3,000	3,000
Women's Lockers	3,000	3,000
Storage	5,000	2,700
Health Food Service	1,300	1,600
Wellness Center, Office	500	500
Lounge/Lobbies	3,000	3,000
Locker-unisex	2,000	1,900
Total ASF - Support Space	**20,800**	**18,700**

C. AQUATICS

Natatorium	19,500	23,500
Storage	1,200	1,200
Office/Lifeguard	300	400
Seating	—	3,500
Total ASF Aquatics	**21,000**	**28,600**

APPENDIX G

A LAND-GRANT UNIVERSITY

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Blacksburg, Virginia 24061

University Architect/Facilities Planning (703)231-7356

M E M O R A N D U M

TO: Members of the Recreational Sports-Fitness Center Building Sub-Committee:

Dr. Ronald R. Bos, Chair
Ms. Sharon Yeagle
Dr. D. David Ostroth
Mr. Warren Kark
Mr. Spencer Hall
Dr. Keith Furr
Mr. Jim Purdy

FROM: Mary Broughton

DATE: July 11, 1989

RE: Recreational Sports-Fitness Center

Attached please find abbreviated meeting minutes dated July 5, 1989 describing decisions reached at our meetings of June 29 and June 30 with the Architects for the captioned project. It is our intent to move forward with the decisions transcribed thereto. Please advise this office if you do not concur with the direction proposed.

Also attached is an agenda outlining discussions that took place at the meeting of June 29, 1989 regarding program verification and predesign issues. Following diagrams are included to help envision the height and area of building modules. The next work session with the Architects is scheduled for July 20 and July 21, 1989 to finalize program, site selection, spatial arrangement, building massing and other schematic design issues as may be identified by the Architects.

cc: Dr. David Ford
Steve Gift

July 5, 1989

Ms. Mary Broughton, AIA
University Architect/Facilities Planning
Virginia Polytechnic Institute and State University
Blacksburg, Virginia 24061

Virginia Tech
Recreational Sports Fitness Center
Project Code: 14314-208/Project No. 89009.00

Dear Mary:

In the interest of speed I am writing this letter to you with copy to Bill Stuart.

1. Program

   a. I attach a marked-up copy of your program for comment and approval. I believe that it reflects the discussion we had on Tuesday 29th June.

   b. We agreed that the underwater observation for the pool will be omitted.

   c. We agreed that the classroom shall be sub-divisible.

   d. We agreed that if the final design frees up any ASF it could be used for sedentary games area.

   e. Please discuss squash/racquetball versus computer room with Ron and Sharon and advise decision.

2. Site Studies

   The survey that we received for the 'Chicken Hill' site did not show land south of tennis facility where we discussed locating the building. Please send this if available preferably at 100th scale like the others.

3. The immediate schedule that we discussed for visits to Los Angeles and our visits to campus are as follows:-

7-12	pm	Arizona State
7-13	pm	Parkin Office/USC
7-14	am	John Wooden Center UCLA/Parkin Office
7-15	am	U.C. Berkeley/USF
7-20		On campus - Site study review
7-21		On campus - If required

8-07	On campus - Review
8-08	On campus - If required

Sincerely

David Body

DB:ad

cc: Bill Stuart
Bill Manning
John Parkin

RECREATIONAL SPORTS - FITNESS CENTER

June 1, 1989

I PROGRAM SUMMARY

TYPE OF SPACE	NASF	SUBTOTALS	
A. Activity Space		61,420	61,400
Gym 4 court capacity	27,520		28,000
Activity 1 wood floor	3,000		
Activity 2 wood floor	3,000		
Activity 3 mat floor	4,000		
Weight Room 1	8,000		
Weight Room 2	2,000		
Weight Room Office	200		
Racquetball - 6 courts	4,800		
Squash 2 court 2	500		1400
Jogging Track	5,200		7000 approx (4 court gym)
B. Support Space		20,600	20,800
Equipment storage checkout	3,100		3000 (inc laundry)
Mens' lockers	3,000		
Womens' lockers	3,000		
Storage	5,000		
Health Food Service	500		1300
Wellness center	1,000		500 (small office inc)
Lounge/Lobbies	3,000		
Lockers - unisex	2,000		
C. Aquatics		21,180	21,000
Natatorium	19,740		19,500
Storage	1,140		1,200
Office/lifeguard	300		
D. Administrative		5,733 ✓	
Offices	3,000		
Student Services	1,533		
Conference/meeting rooms	1,200		
TOTAL ASSIGNABLE		108,933	
TOTAL GROSS @ 70% EFFICIENCY Includes Mechanical, Electrical, CNS and Filtration/Chlorine		155,618	
TOTAL PROJECT COST		$25,000,000	

Alternate could be to trade racquetball/squash for a competition.

VIRGINIA POLYTECHNICAL INSTITUTE & STATE UNIVERSITY
PROGRAM VERIFICATION AND PREDESIGN MEETING
Thursday, June 29, 1989

The program is based on Program Data prepared by the University dated June 1st, 1989.

A. ACTIVITY SPACE

	SPACE	AREA ASF	DISCUSSION
1.	Gym 1	27,520	Functions No. of courts sizes Configuration Daylight Height Floor surface
2.	Activity 1	4,000	Functions Daylight Height Relationship to 3 & 4 Floor surface
3.	Activity 2	3,000	Functions Daylight Height Relationship to 3 & 4 Floor surface
4.	Activity 3	3,000	Functions Daylight Height Relationship to 3 & 4 Floor surface
5.	Weight Room 1	8,000	Daylight Height Relationship to 6
6.	Weight Room 2	2,000	Daylight Height Relationship to 5
7.	Weight Room Office	200	Discuss need
8.	Racquetball (6)	4,800	Construction Glass walls
9.	Squash (2)	1,400	Construction Glass walls
10.	Jogging track	8,200+	Discuss location No. of lanes Surface or elevated

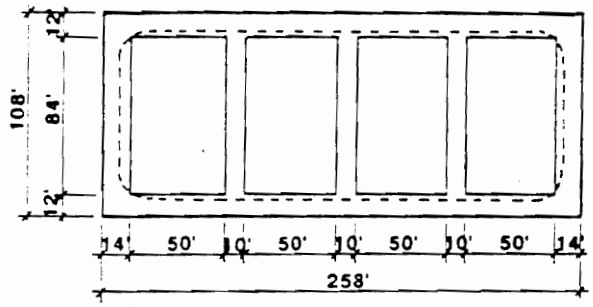
Sub Total		62,120	
B.	ADMINISTRATIVE SPACE		
1.	Offices etc.	3,000	Location Function
2.	Student services	1,500	Location Function
3.	Conference/Classroom	1,200	
Subtotal		5,700	
C.	SUPPORT SPACE		
1.	Equipment Storage/Checkout	3,000	Location Function/type of storage Pro shop Laundry
2.	Men's Locker Complex	4,000	Size Function Day lockers Residential student body Faculty/Staff Physical Education
3.	Women's Locker Complex	4,000	Size Function Day lockers Residential student Faculty/Staff Physical Education
4.	Storage (distributed)	4,000	Size
5.	Health Food Service	500	Operator Function Location Other food in area Storage
6.	Wellness Center	1,000	Functions Examination Information Classroom
7.	Lounge/Lobby	3,000	Functions
8.	Storage Lockers (unisex)	200	Functions Scattered/centralized

Subtotal		19,700	
D.	AQUATICS		
1.	Natatorium (25 yd x 43 yds)	21,180	Size Functions Bulkhead Handicapped Orientation Relationship to site Spectators
2.	Storage	3,000	Functions
3.	Filtration Chlorine	3,000	
4.	Whirlpool	1,000	Included or not
5.	Offices (3)	300	Function Division
Subtotal		28,480	
E.	SERVICES		
1.	Mechanical	5,000	Roof top/enclosed
2.	Electrical	400	
3.	Computer	400	
4.	Janitor	800	
Subtotal		6,600	
F.	OTHER PROGRAM ELEMENTS		
1.	First Aid/Training		
2.	Floor Hockey/Soccer		
3.	P.E. Base		
4.	Computer Lab/Study		
5.	Outdoor Rec Club Storage		
6.	Outdoor Basketball/Volleyball etc.		
7.	Other Items		

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
RECREATIONAL SPORTS - FITNESS CENTER

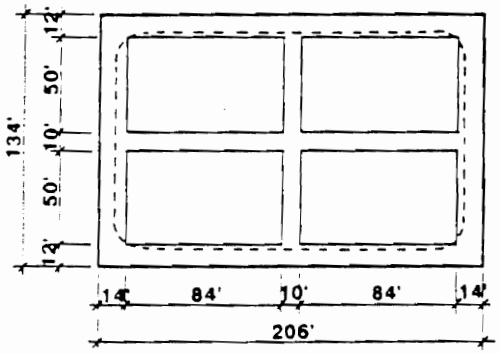
MAJOR SPACE ASSUMPTIONS

1. Multi-use Gymnasium (4 court, elevated track)



Area of Gym: 28,000 SF
Area of Track: 6,900 SF
Track: 8.0 laps to a mile

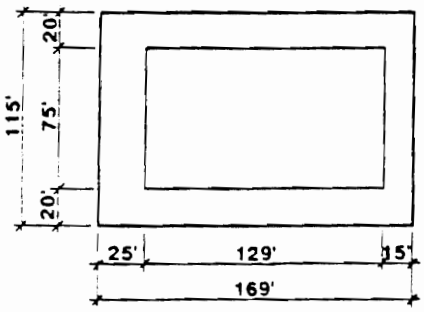
Alternate A



Area of Gym: 28,000 SF
Area of Track: 6,400 SF
Track: 8.1 laps to a mile

Alternate B

2. Aquatics Module (43 yd x 25 yd pool)



Area of Natatorium: 19,435 SF
Area of Pool: 9,675 SF

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
RECREATIONAL SPORTS - FITNESS CENTER

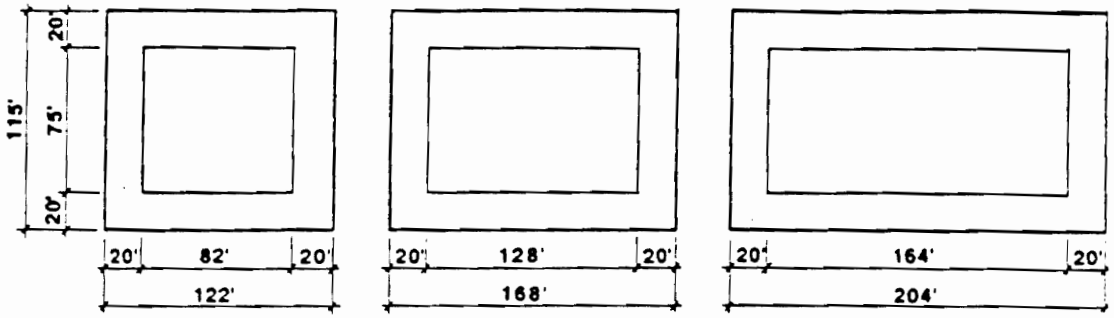
ALTERNATE SPACE ASSUMPTIONS

As part of the discussion and evaluation phase of the study, several alternative layouts of the Aquatics Module and the Multi-use Gymnasium were considered. These layouts are included for the record.

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
RECREATIONAL SPORTS - FITNESS CENTER

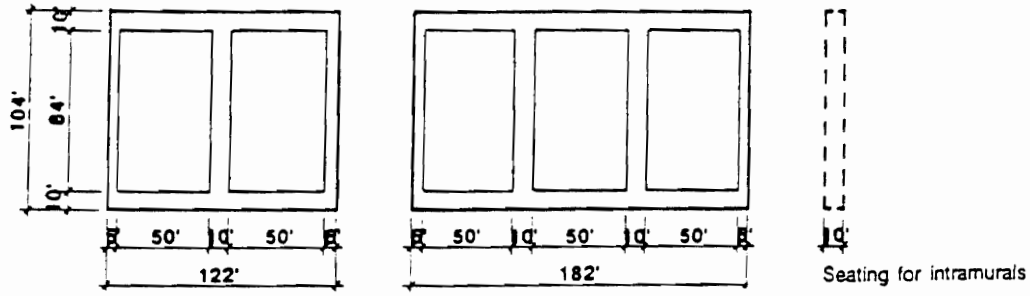
ALTERNATE SPACE ASSUMPTIONS

1. **Aquatics Module**

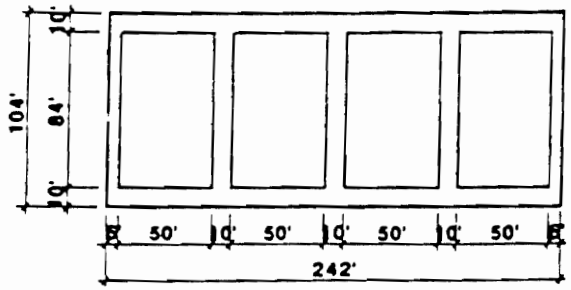


25 m x 25 yd | 39 m x 25 yd | 50 m x 25 yd

2. **Gymnasium (2, 3, & 4 Court, no track)**



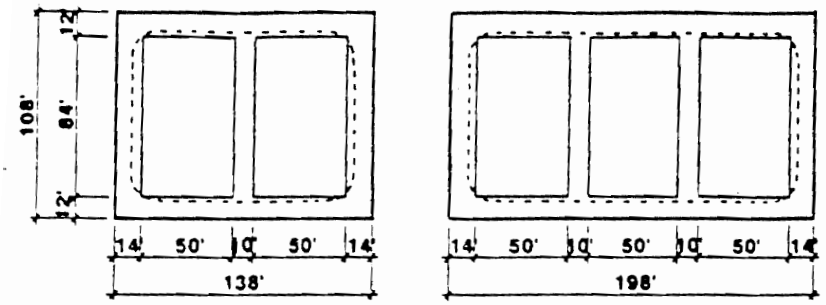
Seating for intramurals

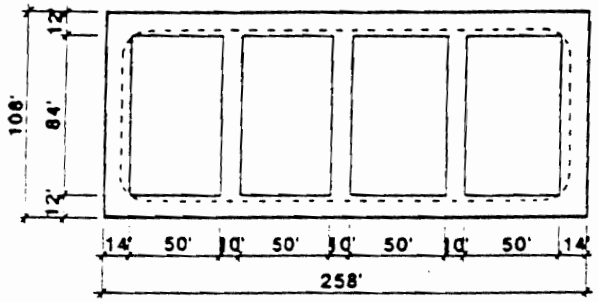


VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
RECREATIONAL SPORTS - FITNESS CENTER

ALTERNATE SPACE ASSUMPTIONS

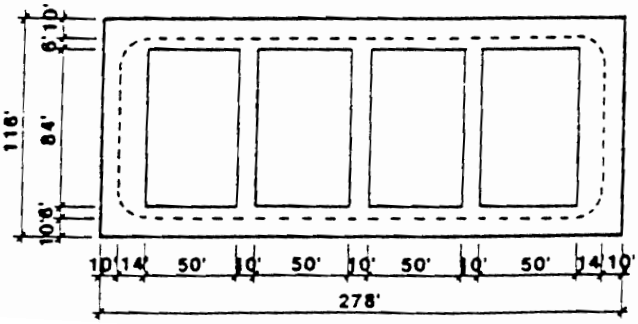
3. Gymnasium (2, 3,& 4 Court, elevated track)





Track: 220 yards long
8.0 laps to a mile

4. Gymnasium (4 Court ground level track)



Track: 239 yards long,
7.4 laps to mile

Parkin Architects

VIRGINIA TECH
RECREATIONAL/INTRAMURAL/WELLNESS COMPLEX

CONCEPTUAL PROGRAMS AND BUDGETS
FEBRUARY 14TH 1989

Four conceptual programs are presented based on the two days of discussions held at Virginia Tech on February 8th and 9th 1989.

MODEL 1

Represents an interpretation of the spaces included in the report from the sub-committee on recreational sports.

MODEL 2

Represents a reduced version of Model 1 which targets a facility of approximately 100,000 ASF exclusive of the Aquatics module.

MODEL 3

Represents a programs that would be appropriate if the building was constructed adjacent to the Field House which would be remodelled to provide the major increment of additional basketball courts and jogging track.

MODEL 4

Represents a program that would be appropriate if the building was constructed adjacent to and contiguous with Memorial Gym. The program could be significantly affected by a detailed look at renovation and reassignment of spaces in Memorial Gym.

ATTACHMENT B
APRIL 4 1989 JUNE 1 '89

A PROGRAMS

A ACTIVITY SPACE	MODEL 1 ASF	MODEL 2 ASF	MODEL 3 ASF	MODEL 4 ASF	
Gym 1	34400	40000	0	27,520 21500	27,500
Gym 2	1400	0	14000	0 14000	
Activity 1 Wood Floor	4000	3000	4000	3000 3000	4000
Activity 2 Wood Floor	3000	3000	3000	3000 3000	3,000
Activity 3 Mat Floor	3000	3000	3000	3000 3000	3,000
Weight Room 1	8000	8000	8000	8000 8000	8,000
Weight Room 2	2000	2000	2000	2000 2000	
Weight Room Office	200	200	200	200 200	- 0 -
Racquetball (8) (6)	6400	6400	6400	4800 4800	5,500 *
Squash (2)	1400	1400	1400	* 700 1400	
Jogging Track (elevated)	8200	0	0	8,200 5700	8,200
Climbing Wall	1000	0	0	0	0
Golf Dr./Softball/Archery	4000	0	0	0	0
Subtotal ASF	89600	67000	42000	61,420 66600	61,220

VIRGINIA TECH
RECREATIONAL/INTRAMURAL/WELLNESS COMPLEX

B ADMINISTRATIVE SPACE						
Offices etc.	3000	2500	3000	3,[illegible]	1000	[illegible]
Student Services etc.	1600	1600	1600	[illegible]533	1000	1,533
Conference/Classrooms	3000	1200	3000	1,200	0	1,200
Video Media	600	0	600		0	
Subtotal ASF	8200	5300	8200	5,733	2000	5,733
C SUPPORT SPACE						
Equipment Storage/Checkout	3000	3000	3000	3,[illegible]	0	3,[illegible]
Mens Locker Complex	3000	3000	3000	3,000	2000	6,000
Rehabilitation/Training	800	0	800	0	0	
Womens Locker Complex	3000	3000	3000	3,[illegible]00	2000	
Storage (distributed)	6000	6000	6000	5,[illegible]00	4000	
Health Food Service	1000	1000	1000	500	1000	500
Wellness Center	400	400	400	1,000	400	1,000
Lounge/Lobby	3000	3000	3000	3,[illegible]00	3000	3,000
Storage Lockers	2000	2000	2000	2,000	1000	
Sauna	400	0	400	0	0	
Subtotal ASF	23600	21400	23600	20,600	14400	15,600
D AQUATICS						
Natatorium 50m 25yd	23500	23500	23500	19,740	23500	21,[illegible]0
Storage	3000	3000	3000	1,140	3000	
Filtration/Chlorine	3000	3000	3000	0	3000	
Whirlpool Area	1000	1000	1000	0	1000	
Office/Lifeguard	300	300	300	300	300	
Subtotal ASF	30800	30800	30800	21,180	30800	21,[illegible]0
E SERVICES						
Mechanical	5000	5000	5000		5000	
Electrical	400	400	400		400	
Computer	400	0	400		400	
Subtotal ASF	5800	5400	5800		5800	
TOTAL ASF	158000	129900	110400	108,933	119600	109,[illegible]3
TOTAL GSF @ 70% EFF.	225714	185571	157714		170857	

VITA

Steven Andrew Barrett was born in Colchester, England on July 14, 1960. He completed his high school education at Monkwick Secondary School in Colchester, England in June of 1976. In January of 1984 he received an athletic scholarship to attend Liberty University. During his undergraduate studies, he was captain of the varsity soccer team, a resident assistant and a student assistant coach with the basketball team. In May of 1988 he graduated with a Bachelor of Science degree in Physical Education. In August of 1988 he began graduate studies in the Physical Education Department at VPI&SU. His concentration of study was in Sports Management. During his graduate career he held a graduate teaching assistantship supported by the Department of Physical Education. He married Tina Marie Pierson on November 25, 1989 in Buckhannon, West Virginia.

Steven Andrew Barrett

A RISK MANAGEMENT PROGRAM FOR THE PROPOSED VPI&SU RECREATIONAL SPORTS AND FITNESS CENTER

by

Steven A. Barrett

Committee Chairman: Elyzabeth J. Holford

Physical Education

(ABSTRACT)

Virginia Polytechnic Institute and State University (VPI&SU) has embarked upon a project of planning, designing and constructing a Recreational Sports and Fitness Center. Because the center will be a building housing high levels of physical activity, the element of risk or danger is inevitably higher than in other types of facilities. This risk can lead to more accidents and injuries and ultimately to law suits. With the aid of a systematic facility wide program designed to reduce preventable injuries and to minimize the financial severity of potential claims, the administrators at VPI&SU can take steps to insure that the proposed facility is as safe as can be conceived.