2002

DISC GOLF: SPORT FOR SUSTAINABLE COMMUNITY

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A RESEARCH PROJECT SUBMITTED IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
MASTER OF COMMUNITY PLANNING

UNIVERSITY OF RHODE ISLAND

2002

MASTER OF COMMUNITY PLANNING
RESEARCH PROJECT

OF
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DISC GOLF-
SPORT FOR SUSTAINABLE COMMUNITY

BY CRAIG HOTCHKISS

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[1] INFORMATION FROM CYBER-INTERNET SOURCES CURRENT AS OF JANUARY FIRST, TWO THOUSAND TWO.

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INTRODUCTION

This project, ***Disc Golf: Sport for Sustainable Community***, aims to promote the sport of disc golf as an environmentally reverent and cost effective, recreational opportunity for a sustainable community. This paper also suggests enhancements to the signs and maps of a disc golf course in order to include environmental interpretation aspects into the recreational facility. Reviewing the material will enable a community to determine potential disc course locations and designs.

This project describes the sport of disc golf to introduce the principal concepts for those who may be unfamiliar with the sport. In the United States, The President's Council on Physical Fitness and Sports has approved disc sports as worthy of attaining their recognition award. A goal of the council is "To increase physical activity participation and opportunities by encouraging the development of community, recreation, physical fitness and sports programs."(PCPFS, 1982). The game of disc golf requires a full motion low impact aerobic stroll. This activity portrays intergenerational behaviors prescribed for remedy and sustenance of health (Watson & Pulliam, 2000). Disc Golf's addition to the line up of competitive events in the 2001 World Games in Akita, Japan highlights the global presence of the sport. Disc sports are included in all levels of education, from elementary school physical education to collegiate courses, covering cognitive, psychomotor, and affective skills (Caporali, 1988). In order for continued establishment of this sport, facilities need appropriate incorporation into receptive community scenarios.

This educational integration of disc golf, and popular emergence of the sport in the collegiate realm predispose the sport to influence culture and society. "As the primary centers of teaching, research, and learning, institutions of higher education are significant leverage points that reflect and inform social mindsets." (Cortese, 1999; Sherman, C. 1998). Early in disc golf's development, it was recognized that; "Changing demographics and a quest for fitness have brought new trends to leisure activities and markets. New and emerging sports (such as disc golf) need for recreation professionals to keep pace with recreational markets to facilitate better planning." (Blair, 1978).

The Community Appraisal section suggests some basic social and environmental elements of course development. A disc facility established in Ninigret Park-Charlestown, RI is a case study of course development. Disc golf facilities, when properly installed, have minimal environmental impact in comparison to other facilities of equal capacity. Additionally, almost anyone can play recreational disc golf throughout a lifetime, which is conducive to intergenerational opportunity. Planning for recreational sustainability includes improving management of the public realm, adjusting the properties and activities of a park to the changing demands of the population it serves, renovating and repositioning existing assets, and using public open space for a variety of functions. (Alexander, 2000) "Sustainability" is not a new concept. Gifford Pinchot addressed it as the basis of the conservation movement of the early 1900s. "Conservation means the greatest good to the greatest number for the longest time."(Pinchot, 1910).

Though sustainable development is a national and international issue, it becomes locally defined through actions and decisions within cities, communities, and neighborhoods. When community groups assume stewardship of underused properties and turn them into recreational spaces, park agencies can save money on overhead and construction (Lopez, 1983; Caruso, 1996). Using recreation facilities may help protect undeveloped land from urbanization while expanding and improving the park and recreational system. Offering children a recreational disc facility that illustrates environmental responsibility is a chance for children to appreciate the ecology of their neighborhood. Including children in the design and installation phases of playground development is shown to encourage awareness of the need for citizen participation (Sutton & Kemp, 2002). This participation, when articulated through stewardship principles, develops a recreational opportunity capable of providing skills that may be applied to environmental sustenance issues pertinent to community development. "Planting projects that have the benefit of local neighborhood representation at the planning, planting, and maintenance stages have more opportunities for continued local involvement in the weeks and years after planting day."(Austin,2002) An educational disc golf course with tree stewardship training potential can facilitate community improvements. A focus on trees promotes an awareness of ecological responsibility, a key facet to a sustainable community system. "To survive, a system needs constant feedback and adjustments. Any system that ignores feedback and making adjustments will perish. Adjustments are needed now in many tree care practices that hurt more than help trees. We must work together to bring about the adjustments before more trees perish!"(Shigo, 1995)

The educational course section presents an environmental interpretation layout of a disc golf facility. Buckminster Fuller coaxed the innovation of this educational facility by proclaiming; "There are a number of measurable trends integrating today that suggest that a health, physical education, and recreation complex may be able to anticipate effectively many emerging trends of advance-education evolution, and that this complex may play a far more critical part in the lives of coming generations than such categories of education system disciplines have played in the past." (Fuller, 1979). Inducing this effectiveness in an ecologically astute community requires an appreciation of the environment in place. Educational disc facilities offer this hybrid facility in the community environment. Reasons for incorporating recreation into environmental education programs include, "acclimatizing" students, turning abstract information into concrete positive experiences, and providing skills for lifelong leisure (Schatz&Parker, 1995).

The inclusion of rotating interpretive signs on the disc course strives to emphasize environmental cognition. The arrangement of the signs depends on course layout, preferably on trails or at the tee areas. The content of the signs depends on the patrons and the intent of the educators. Educationally oriented recreation settings enhance cognitive outcomes with interactive devices (Carlson, 1995; McAvoy & Schleien, 2001). Systematic programming of course graphics should reinforce environmental education curricula. The promotion of quality course design and sensible activity helps to legitimize and bolster the integrity of this community recreational opportunity. Appropriate analysis of the course site should lead to the development of a playground that is fun, safe and sustainable.

1.

DISC GOLF

1.1 DISC GOLF- DESCRIPTION

Disc golf is played much like traditional 'ball' golf. Instead of a ball and clubs, players use a plastic disc. A golf disc (approximate cost US $8) is thrown from a tee area into an elevated metal basket on a pole. As a player progresses down the fairway (200-700 feet), they must make each consecutive shot from the spot where the previous throw has landed. The trees, shrubs, and terrain changes provide challenging obstacles for the golfer. Finally, the disc lands in the basket and the hole is completed.

A nine-hole disc golf course can be established on as little as five acres of land, and a championship-caliber 18-hole course on 20 acres or more. A disc golf course usually consists of 9, 18 or 27 holes. Disc golf courses can coexist with existing park facilities as well as traverse large tracts of land. The ideal location combines wooded and open terrain, and a variety of topographical features. Disc golf is a practical use of open space. Permanent disc golf courses are found worldwide. The need for more courses is constant, as the sport continues to grow in popularity. The Professional Disc Golf and Recreational Disc Golf Associations, along with numerous local organizations, promote standards for the design and installation of golf courses in order to encourage the course's success in the community.

Disc golf provides lower body conditioning, aerobic exercise, and promotes a combination of physical and mental abilities that allow very little risk of physical injury; these facets allow players to match their pace to their capabilities. Disc golf can be played from school age to old age, making it the one of the greatest lifetime fitness sports available.( )

Pie pans, film can lids and toy flying saucers were the predecessors of the modern discs, which were invented in 1964 by Ed Headrick (Appendix I). The smaller and heavier, beveled edge golf discs were introduced in 1983 (See section 1.2). Ed Headrick founded the Professional Disc Golf Association (PDGA) in 1975, which he turned over to the players in 1983. Since then, the PDGA has compiled the results of surveys administered to its members. These indicators highlight the growth of disc golf.

An estimated 5 million people have played disc golf. 50-75,000 people play regularly. Since 1977, the Professional Disc Golf Association has accrued over 16,000 members.

In 1975, there were five disc courses in the world. In 2000 there are over 1000 courses.

In 1996, the PDGA tour held 235 events, hosting 18,900 entrants with a purse total of $369,000.

In 1999 there were 335 events hosting 28,000 entrants, with a total purse of $675,000.

Courses exist throughout the world, with the largest quantities being; United States-900/ Europe-100/ Japan-75, Canada- 50/ Australia - 40

Between 1996 and 1999, the number of professionals in the sport increased from 308 to 371, an approximate increase of 15%.

The amateurs increased from 174 in 1996 to 325 in 1999.

Members in the PDGA consist mainly of 31- 40 year olds (52%), where 35% are over 40, and 23% are under thirty. A majority is male.

Looking at the educational component of the PDGA membership reveals that 42% are college graduates, 13% have a masters, 24% some college, 20% high school, and 1% grade school

Longest throw into basket- 520 feet. Distance Record- 217 meters

(Source: PDGA database and membership survey from www.pdga.com.)

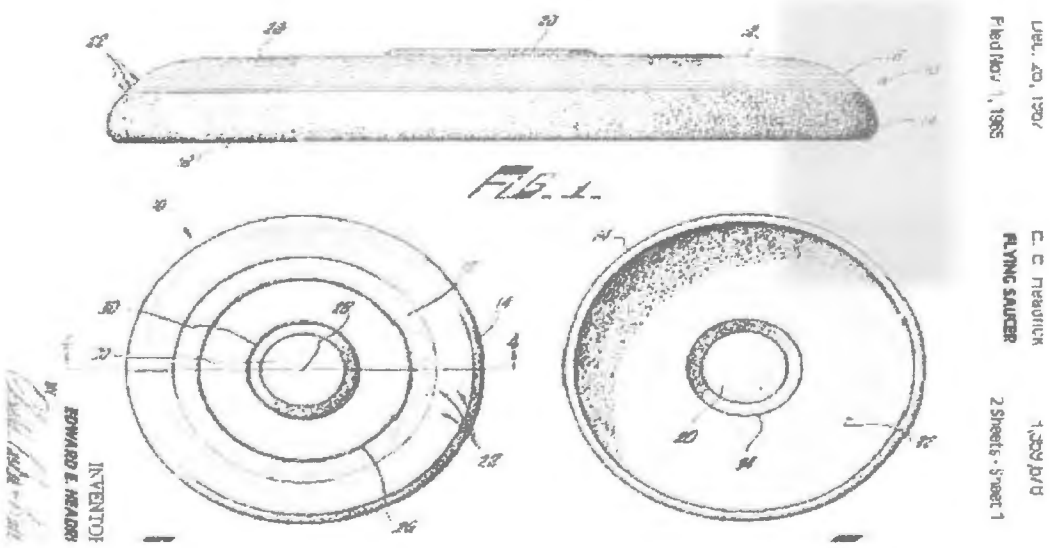
1.2 DISC GOLF- EQUIPMENT

Disc golf requires several simple pieces of equipment in order to offer a structured and enjoyable game. Equipment includes; Discs, tees, signs, and baskets.

Discs:

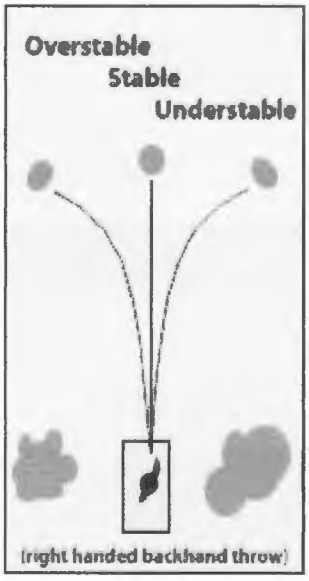
Plastic golf discs are produced in various diameters and weights (Approximately 20cm/ 170grams) (Figure 1.2a) (www.discgolfassoc.com/patent.htm.) The heft and profile of the disc influence the flight characteristics of the disc, namely speed, angle and distance. These characteristics describe the *stability* of the discs (Figure 1.2b-c). The density and flexibility of the discs varies, with more rigid discs used to throw long distances and softer plastic is used for short-range 'putting' so the disc collapses more readily when it strikes the chains over the basket. Carrying various discs enables players to efficiently negotiate obstacles encountered while playing through the course.

FIGURES 1.2 a - DISC DESIGN PATENT



What does *'stability'* mean in terms of discs? Stability refers to angle of the disc relative to distance traveled as it slows throughout flight (Figure 1.2c)(Innova Champion Discs, 1998). Let's assume you are a right-handed player, and are using a backhand throwing style:

Figure 1.2b- Disc Stability (http://shop.disclife.com/stability.html)



If you throw a disc straight and flat, and it continues flat

That disc is stable.

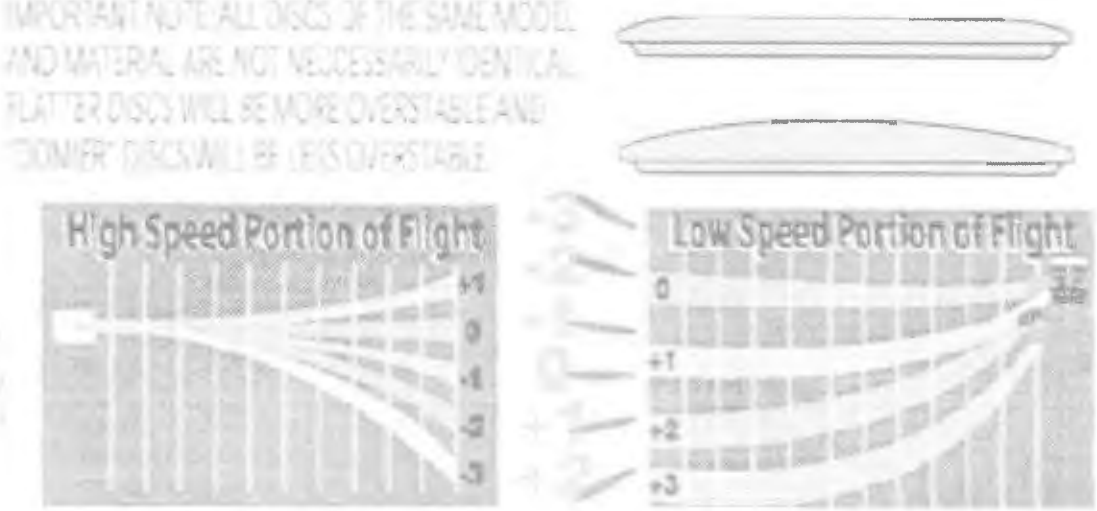
You throw the next disc flat as well, but it veers to the left.

That disc is over stable.

You throw a third disc, and it fades off to the right.

That disc is under stable.

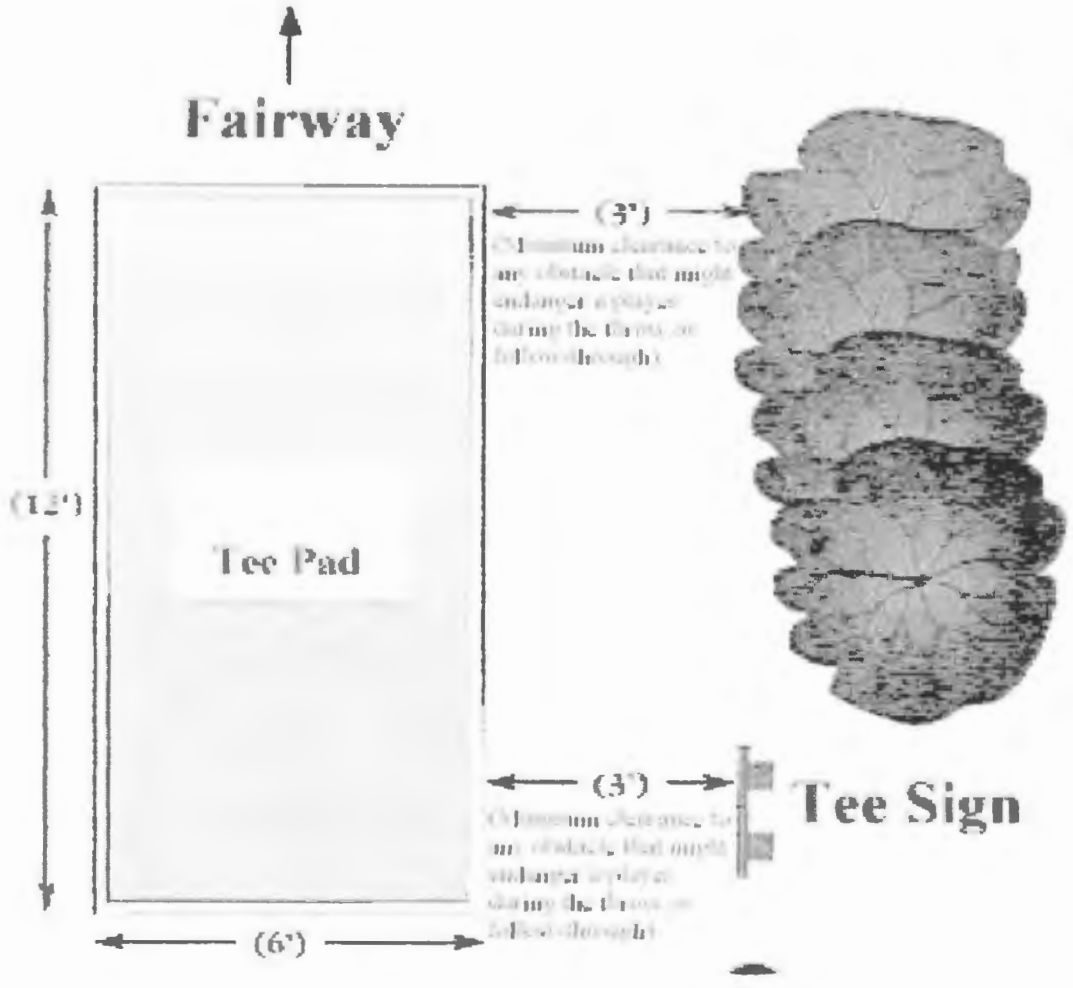
Figure 1.2c- DISC CHARACTERISTICS/ SELECTION GUIDE



Tees:

The tee area is a rectangular zone demarcated on the ground to indicate the place from where the player is to throw their initial 'drive' (Figure 1.2d) (www.innovadiscs.com/teearea.phtml). Each hole should have two tees, a short one for novice players and a longer one for advanced players. Alternate tee locations can diversify play options. Using a mat or a concrete surface can reduce erosion and prevent puddles.

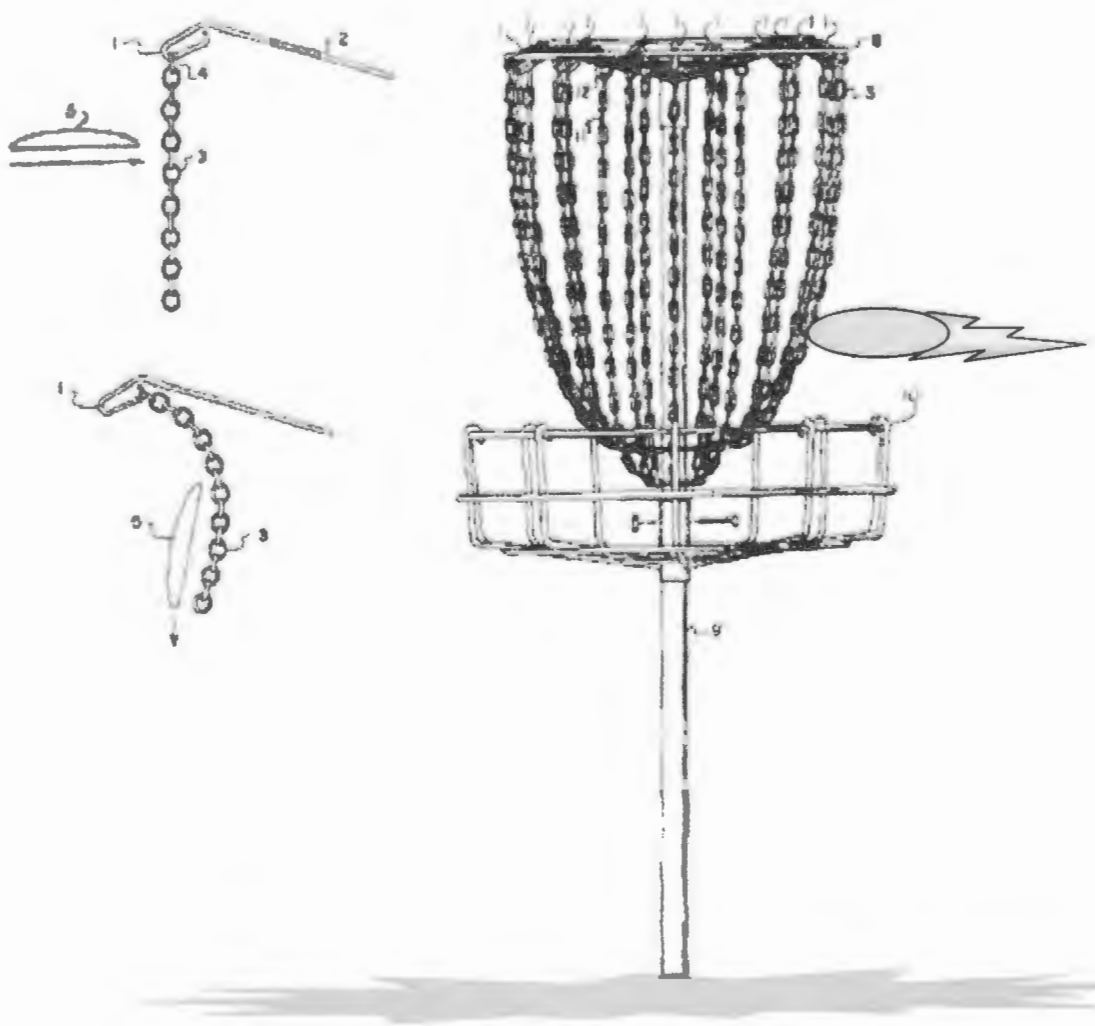
FIGURE 1.2d TEE AREA



Baskets:

A 'basket' consists of a round metal basket on a pole with chains hung above the basket in order to reduce the flight momentum of the discs (Figure 1.2e)(www.discgolfassoc.com/patent.htm). A disc at rest in the basket indicates the completion of the hole. Each hole may have a target set in cement with additional anchors so that the basket can be moved periodically to avoid soil compacting and erosion.

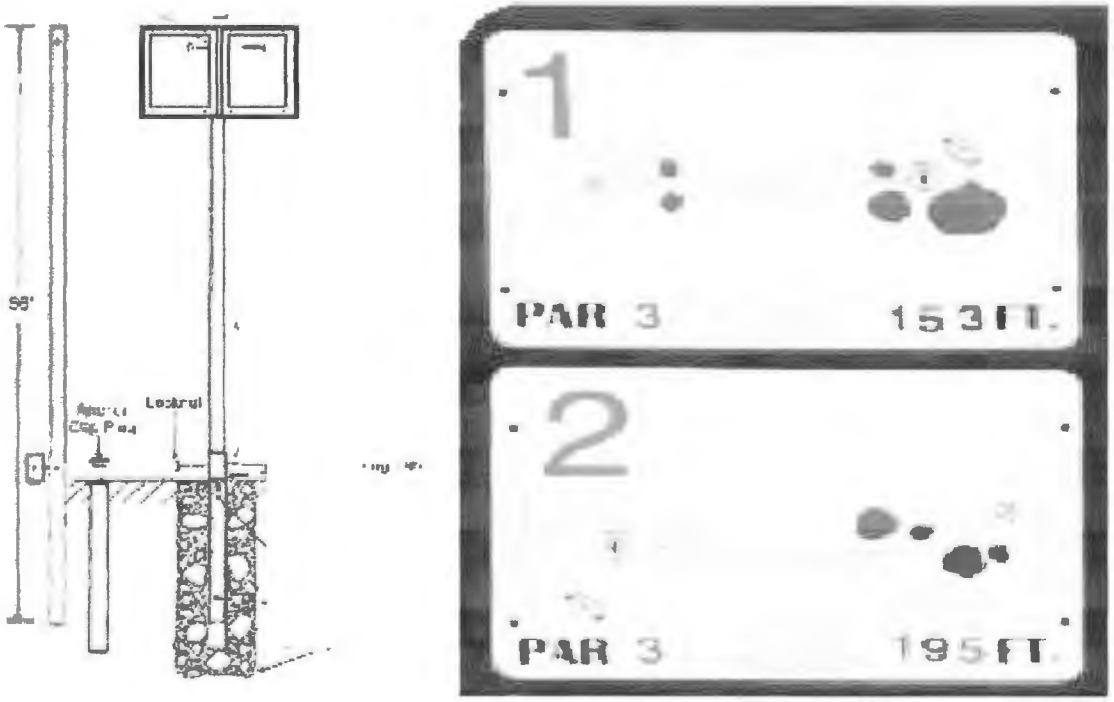
Figure 1.2e DISC GOLF BASKET TARGET



Signs:

Each hole should have a sign indicating the hole number, length, par and also point out the preferred flight path, hazards, out of bounds, roadways, etc. (Figure 1.2f) (www.discgolfassoc.com). Disc Golf Courses need signs like a road needs signs. A sign that says it's a Disc Golf Course is a minimum requirement. A sign should explain the rules of the game. Placement of signs should enable players to see the tee while approaching from the previous target.

Figure 1.2f TEE SIGN POST & TEE SIGNS



1.3 DISC GOLF- DESIGN

Disc golf course design, in order to provide a safe and fun community opportunity, requires site analysis, ecological interpretation and insightful layout. The arrangement of a disc course resembles a ball golf course, simply in reduced proportions (Figure 1.3a)(www.innovadiscs.com/corsdesign.phtml). Providing thoughtful course design ensures a recreational facility available for many in the community.

Figure 1.3a COURSE LAYOUT EXAMPLE

Holes should be designed to challenge players, but also to minimize the impact on the property and other users. Design methods should include approaches that seek to use natural clearings and areas of sparse trees, thus minimizing need for landscape alteration. The following section presents design principles and criteria.

The Disc Golf Course Design Group is a multi-national forum oriented about recognizing the site analysis, course design, installation and environmental affect aspects of the sport. The Disc Golf Design Group proposes the following disc course design principles;

A. Satisfy the design requirements of the people and organizations who approve use of the land and fund the equipment for the course.

B. Design course to be safe for both players and non-players who may pass near or through the course.

C. Design course with the potential for multiple configurations to serve not only beginners but also players with advanced skills.

D. Design a well balanced course with a range of hole lengths and a mixture of holes requiring controlled left, right and straight throws.

E. Utilize elevation changes and available foliage as well as possible while taking care to minimize potential damage to foliage and reduce chances for erosion(http://www.circularproductions.com/).

The design of disc golf courses is an integration of people and their environment. Creating a course requires design skills that entail social awareness, environmental knowledge, and disc golf equipment function. Realizing the above principles in an enjoyable facility, that safely offers a recreational experience, requires insightful application of certain course elements. While offering a basis for beginning the design of a course, the elements need to be specifically adapted to the site of the course. The elements are flexible but should not be disregarded. When in doubt contact the DGA or PDGA to inquire about available design assistance.

Course design is about applying the principles and equipment mentioned above in a fashion that is appreciative and complimentary to the site chosen for the course installation. The following suggestions illustrate some fundamental activities related to the site appraisal and design of a disc golf course. The navigation of a Disc Golf course should represent an enjoyable journey of play with variety and challenge. When designing a course, the focus must be on control and not on excessive length. Don't design a tee when the disc will probably land in someone's private yard or on the rooftop. Stay away from playground areas with swings and slides, athletic fields, picnic areas, and other high use places. As with other land-use evaluations, initiate any aerial graphic analysis with the elimination of these zones in order to derive appropriate site and layout potential (McHarg, 1969).

Ed Headrick presents a step-by-step approach to drafting the course layout.

Use ten squares to the inch graph paper and give a value of 10 ft each square to the inch, thus 1 in = 100 ft. On 8 x 10-inch paper this gives you an 800-foot by 1,000 ft area. If one page isn't large enough put 9 holes on a second page.

Make the top of the page North and use a compass to orient each hole.

Measure the hole and commit location of each Tee (Recreational, Advanced, Professional) and each hole (one through 18) with the top of the number aiming at the basket, and the hole number at the proper location.

Measure the distance to the first hazard and to the next until you reach the hole.

Then sketch in the preferred flight path with a dotted line from each tee.

Use your scale to locate the next tee, etc. to completion.

Write in each distance in feet for Recreational, Advanced, and Pro (RAP).

Every nine-hole course should have three left, right, and straight throws.

A three hundred-foot average distance hole is fine.

Course designer John Houck embellishes the above insight with further suggestions for comprehensive site appraisal as well as single hole design methods. This checklist will help to understand the analysis associated with course design strategies and installation.

1. Did you consider the prevailing winds?
2. Did you spend at least 8-10 hours walking the site, getting familiar with angles, trees, possible fairways and hazards before you started designing?
3. Did you look at the site after a rain to see where water collects and stays?
4. Did you look at the site to see where people like to picnic and play?
5. Do fairways aim north, south, east, and west, and directions in between?
6. Determine the unique topological or vegetative areas of the site. Did you find a good way to incorporate them (or, where necessary, avoid them)?
7. Suppose someone asked, "Why did you put this tee here instead of twenty feet to the left, right, front, or back?" Would you really have a good answer? How about the baskets?
8. Pick the 3-4 most scenic spots on this site. Will a player ever stand on any of these spots during a typical round?
9. Can you play the course using the same drive on 6 different holes?
10. On any hole, can the worst possible shot land in a street, playground area, picnic area, or ball field? (One of my rules of course design: imagine the worst shot you can, and someone will find a way to throw one that's worse.)
11. Are there at least 12 holes that you would consider good or very good holes?
12. Are there at least 6 holes that you would consider substantially different from any holes on any course within 300 miles?
13. If you have a hole that's more than 500 feet long, did you consider what would happen if you broke it into two shorter holes? Did you consider combining two consecutive short holes into one long hole?
14. Did you spend 3 times as many hours in the field as you did on paper? (www.circularproductions.com/articles.phtml)

This checklist should help to understand techniques of laying out a course. Considering the site of the course according to the above-mentioned principles, elements and checklist will begin to indicate the knowledge, skill and labor that is required to build a disc golf course. Refer to this section when considering community appraisal design skill, as well as when describing a comprehensive course development plan. Regional and National disc groups are available to help guide the design and installation. Once a course exists and can support play, the enjoyment and social benefit of the sport require adherence to criteria of behavior. These criteria have been put forth as the rules of disc golf.

1.4 DISC GOLF- RULES

The Professional Disc Golf Association publishes a set of criteria for appropriate course conduct regarding Equipment, Play and Tournaments. Disc golf course etiquette is similar to 'ball' golf. The scoring scheme is also similar. The rules regarding discs focus on appropriate sizes and weights and the avoidance of altering the characteristics of the discs in order to affect the flight path. Rules of play address facets of disc and player travel through the course. Tournament rules describe the structure, administration, scoring, and playing of an organized event.

In order to maintain an enjoyable and sensible experience in disc golf, the course rules should be taught and practiced. These basic rules of etiquette, while guiding the enjoyment of a game, should be emphasized for their social and environmental focus. The following is an example of a DGA's rules sign (Figure 1.4a) that should welcome players to a course.

Figure 1.4a- DGA Rules Sign

DISC GOLF RULES & REGULATIONS

(reprinted by permission of the DGA)

1) BE EARTH CONSCIOUS -- DON'T LITTER!
2) Disc Golf is played like ball golf, using a flying disc. One stroke is counted each time the disc is thrown, and when a penalty is incurred. The winner is the golfer with the lowest score.
3) Tee throws must be completed within the designated tee areas. Beginners should always use "short" tees, when provided.
4) After teeing off, the player whose disc is farthest from the hole always throws first. The player with the least amount of strokes on the previous hole is first to tee-off on the next hole.
5) Fairway throws must be made with the foot closest to the hole on the front edge of the lie where the last throw landed. The other foot may be no closer to the hole than the foot on this lie.
6) A run-up and normal follow-through, after release, is allowed more than 10 meters from the hole. Inside 10 meters, a player may not step past the point of his lie until after the disc thrown has landed.
7) A disc that comes to rest inside the Disc Pole Hole® basket or chains constitutes successful completion of that hole. A disc that comes to rest on top of the Pole Hole does NOT constitute a successful putt.
8) Any disc that comes to rest more than 2 meters above the ground is considered unplayable. The disc must be thrown from the ground directly below the disc. 1 throw penalty.
9) A throw that lands out-of-bounds must be played from the point where the disc went out-of-bounds. Water, roads, pavillions and walkways are normal disc golf out-of-bounds hazards.
10) Never throw until the players ahead of you are out of range, and until the fairway is completely clear of spectators and park guests.
11) Enjoy the game of Disc Golf! It's fun ... it's fast ... it's the sport of the future!

2.

COMMUNITY APPRAISAL FOR DISC COURSE INSTALLATION

2. COMMUNITY APPRAISAL FOR COURSE INSTALLATION

The purpose of this section is to explain a basic community analysis in order to identify, assess, and promote a disc course installation site. Designing a play area or facility requires understanding of some fundamental community facets. In this paper, example facets include; recreational inventory, demographic profile, available acreage, site quality, design skill, construction impacts, funding, and facility maintenance.

Identifying a site for a course is a primary step in the process of installation. There are other important facets of the community that need to be examined in order to assure the proper location, design, installation, and community reception of a disc golf facility. Beginning with the town and park administrators, interviews and communication should occur with sport clubs, school administrators, and an environmental consultant such as a biologist, forester or arborist. Obtaining insight about the potential interest and assistance of these people will help to guide the administrative responsibilities, and activity promotions associated with the course installation. A comprehensive plan for installation should be used to solicit help and allocate responsibility. Many schemes of accomplishment are available; so choose one that is most efficiently implemented by the available resources in the community.

2.1 COMMUNITY APPRAISAL- RECREATIONAL INVENTORY

Establishing an inventory of existing recreational facility provisions, capacity, and demand helps to take into account the context and use potential of a disc golf facility. In order to maintain the appreciation of a disc facility's being a significant land-use option, recreational analysis and course design should emulate and accommodate the style portrayed by your local, park and regional comprehensive plans.

Familiarize yourself with the park planning process and other issues facing your park district. Most parks have a "master plan" which is basically a planning document outlining the goals for the park in terms of recreation, conservation of natural areas and maintenance. It usually also discusses park history, current planning issues, budgets, etc. obtain this document and read it. This will help you to talk intelligently to park staff about your proposal and give you an idea of whether a course is even feasible in that particular park ( ). Research into the actual use of courses and other recreational facilities may offer insight into the appropriate development of recreational facility management. An example of such research by the La Mirada Regional Park in La Mirada California is presented in Figure 2.1a (La Mirada Parks and Recreation Survey,1981) - where the use of tennis courts was compared to a disc golf course. Notice the conclusion and the use/ cost comparison figures. Research like this needs to be done on a local level in order to help gauge the recreational capacity and demand, as well as more clearly show the potential contribution of a disc golf course. Contacting the PDGA may lead to contacts of locations where similar data collection has been attempted.

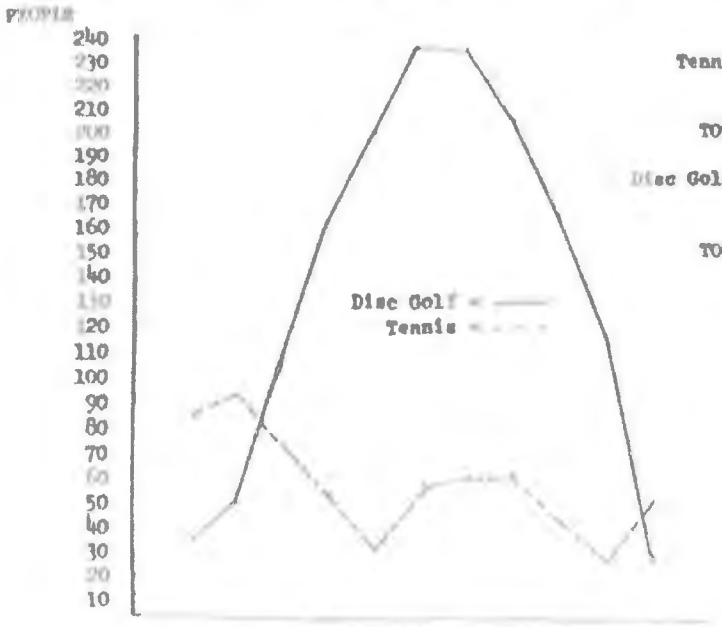
DISC GOLF RECREATION STUDY

This survey was conducted at the La Mirada Regional Park in La Mirada, California on three different days in the week of February 16, 1981. The data was accumulated on the hour beginning at 9 a.m. through 7 p.m. on a holiday, a weekday, and a weekend day during this week. This survey compares the free usage of twelve lighted tennis courts to the free usage of one 18 hole Championship, deluxe, Disc Golf course.

Findings: Disc Golf Use Rate = 520 people/day, or 47.3 people/hour - Capacity = 72 people/hour - 47.3÷65.7% Ca
Tennis Use Rate = 211 people/day, or 19.2 people/hour - Capacity = 48 people/hour - 19.2÷40.0% Ca

Cost Comparison - 18 Hole Championship Deluxe Disc Golf Course = Approximately $10,000
Twelve Lighted Tennis Courts = Approximately $20,000/court = $240,000

Conclusions - Disc Golf experienced 246.4% of the usage of the twelve tennis courts combined at 4% of the capital requirement.



		Data Compiled											
		9	10	11	12	1	2	3	4	5	6	7	TOTAL
Tennis	Day 1	35	34	28	24	15	16	12	23	26	12	29	254
	Day 2	23	27	21	4	5	22	18	18	8	8	9	163
	Day 3	28	33	25	25	10	16	29	21	9	6	14	216
	TOTAL	86	94	75	53	30	54	59	62	43	26	52	633
Disc Golf	Day 1	6	16	57	74	82	96	83	95	60	27	9	605
	Day 2	4	5	8	26	31	40	28	39	37	34	7	257
	Day 3	24	30	42	67	91	104	126	74	70	57	11	696
	TOTAL	34	51	107	165	204	240	237	208	167	118	29	1560

	9	10	11	12	1	2	3	4	5	6	7
Tennis	86	94	74	53	30	54	59	62	43	26	52
Disc Golf	34	51	107	165	204	240	237	208	167	118	29

Figure 2.1a- La Mirada Recreational Survey

2.2 COMMUNITY APPRAISAL- DEMOGRAPHIC PROFILE

For better focus on the leisure demand, compile a demographic portrait of the community that shows the proportions of age and distribution of interest groups. Knowing these community facets may help in course location, design, and activity. Demographic information may be obtained through numerous sources, particularly; Local Census Data / Town & Park Comprehensive Plan Data / School Data, Chamber of Commerce / Disc Golf and PDGA Demographics. Having this information will help in substantiating the proposal of courses. Design efforts should focus on community-oriented criteria and application since course location, length, and topography affect the appeal to various users.

There is a need to understand more clearly the breadth of participation in the sport of disc golf. Data on course patrons needs to be collected on the local level. When approaching a local body of government, data specific to the location is preferred. The PDGA statistics help, but primarily with the competitive facets of the sport. More information needs profiling in a course-by-course or town-by-town manner. Developing schemes to collect data may benefit from using surveys similar to that in Figure 2.2a. The New England Flying Disc Association distributed this survey in an attempt to find out who makes up the participating constituency. Modifying the survey is suggested in order to obtain a format that particularly addresses the issues and information required. Collaborating with groups and departments who may also wish to obtain such information is suggested, as this may expedite the collection or processing of information.

Figure 2.2a- Course User Survey- New England Flying Disc Association Membership Survey

Similar questionnaires may be placed at the entrances of the courses in an effort to specify the demographic profile of course patrons. Reviewing such material may enhance other efforts of course installation and activation, as well as evaluating courses.

2.3 COMMUNITY APPRAISAL- AVAILABLE SITES

Locating available and appropriate sites for a disc facility should be an exciting task by virtue of recognizing the opportunity of a location to become an environmental interaction playground. While it is easy for a disc player to see marvelous locations ripe for a course that would excite other players, developing a course that expresses its full potential as a community recreation opportunity requires applied insight. There is plenty of information available from courses in different community scenarios. Researching facilities in similar contexts as that which you are considering can help both in design and proposal. While there are many facets of course installation that can emulate other locations, most course installations are site specific. People soliciting help from another location should keep this in mind, and make efforts to ensure adequate local appraisal.

The ideal site for a course includes both open spaces and areas with trees. Disc golf is appropriate for many of the parks and open spaces that are designated for recreational use. The context of the site and density of site use, influence the area and layout required by a course design. Basic information needs to be collected regarding a site such as: location within the town or community, public or private ownership or administration, existing facility use criteria, utility and infrastructure, environmental integrity, surrounding uses, and the role played in a comprehensive plan. Research to see if the area has had a site analysis already completed. If so, review this work and incorporate it appropriately. This step can save an enormous amount of work. If no plan exists, or if the existing plans are too generalized, then some site-specific analysis may be appropriate.

2.4 COMMUNITY APPRAISAL- SITE QUALITY

When a potential course site has been identified, a site quality profile should be collected for each potential course design. This site profile consists of:

Environmental profile / Traffic and Circulation / Utilities and Community Context

Fundamental environmental profiles should include:

-Trees, shrubs, water bodies, possible fairways, possible hazards
-Where water collects and stays muddy.
-Where do people picnic, play, walk?
-Where are prevailing winds?
-Are there any unique topological or vegetative areas on site?
-Are the unique features included or avoided?
-Identify 3-4 most scenic spots on this site.
-What habitat is present?
-Are there any stewardship activities associated with the site?

Traffic and circulation profiles include aspects for both on site and off site movement.

-Roadways leading to the park or site.
-On site roads and pathways
-Parking areas
-Athletic areas and pathways of approach
-Signs

Community Context profiles include:

-Where is site in town? What are surrounding uses?
-Who are the guardians and clientele of site?
-Status of improvements or attention to the site.
-Historical attributes of the site.
-Any major events held on site?
-Are there any exemplary facets of the site that may be emphasized by a course?

Planning for a disc golf course entails environmental, social, and administrative analysis and explanation. Enlisting expertise to assist in the planning and appraisal phases of the project will help to avoid detrimental efforts and deviant pursuits.

2.5 COMMUNITY APPRAISAL- DESIGN SKILL

The decision to install a disc golf facility should be checked against available design skill and popular use requirement. The fun and safety of the sport revolve around sensitive design. A site that has been designated appropriate for course development must now show the specific placement of the course facilities. Determining the applicable skill early helps towards efficient proposal promotion and project expedition.

Two primary options for procuring a course design are a hired professional, or volunteer. The educational potential of site interpretation and course design expand the design options to include group sessions (design by committee), and classrooms. Identifying the design situation structures the project's proposal and exercise. For optimal course development all the ideas from the children, staff, playground committee, and community need to be combined and filtered through the site features and budget. Efforts should be made to display this effort to children in order to maximize the educational potential of the project. Ordinance accommodation, and community planning issues should be an educational opportunity as well as an integral administrative procedure.

Teaching course design principles is an opportunity to promote environmental awareness, engagement, and respect, all guised within the premise of recreation. Including children in the site appraisal, design and installation shows that they are an integral part in an effort that results in tremendous community benefit. Only by involving the children and giving them a stake can you hope for healthy respect for the facility and environment.

2.6 COMMUNITY APPRAISAL- PROPOSAL/ ADMINISTRATION

The equipment needed for an 18-hole course costs approximately $15,000. The costs associated with design, installation and maintenance vary and depend upon factors such as course context, course users, and environmental characteristics. Course proposals and funding schemes should clearly outline a comprehensive project along with alternative strategies of achievement. Examples of course proposals are available on the web for enhancement and use in your specific situation (Appendix II). There needs to be a critical mass of attention for the location, design, installation and activation of a disc course. Enticing and orchestrating this attention incurs administrative responsibility. Optimally there should be a disc golf group that may serve as core participants and organizers.

Obtaining initial capital and sponsorship should be an opportunity to expand awareness of the sport, as well as include unrelated interests in the provision of a disc golf recreational facility. The analysis of the site and community can be used to educate key administrators regarding the development of a project of this type. The findings of this appraisal can also assist in the 'build' or 'no build' decision upon completion of the appraisal. The findings can be used as a tool to gain support from financial partners, lenders, and the public sector (Fanning, 1995). The low cost and broad benefit of disc golf should be exploited when arranging funding for course development. Be prepared to answer questions and provide a demonstration for those unfamiliar with the sport.

2.7 COMMUNITY APPRAISAL- CONSTRUCTION IMPACTS

Disc golf courses have less impact than many commonly accepted land alterations for recreational activities, such as: ball golf, tennis courts, soccer or baseball fields, etc. A disc golf course leaves the structural integrity of existing vegetation largely intact. An integral part to the disc golf experience is the sense of place we develop from hurling plastic into the air spaces between various obstacles. As we play, however, we need to be aware of the ways that we affect the land, the plants, and the animals that share our course with us.

The PDGA has committed itself to seeing that the sport grows in an environmentally responsible way. The PDGA formed the PDGA Environmental Committee in 1998. The primary duties of the Environmental Committee will be to:

1. Educate players and course designers about the impacts of existing and proposed courses;
2. Provide specific input, advice, and general expertise in specific locations;
3. Store environmental documents and/or data from courses around the country for use by other course designers or operators. (www.pdga.com/environment_doc.phtml)

The PDGA Environmental Committee is comprised of members from all over the world. They can help you interface with parks departments, answer questions about environmental issues and course maintenance, and be a general contact for the PDGA regarding these issues. Disc golf is an environmentally reverent game. The installation of tees, baskets and fairways should be done so in the most unobtrusive manner and in configurations that may be adjusted to prevent excessive wear. Foot traffic associated with a disc course should be accommodated and guided to ensure enjoyable passage. Balancing this impact will require attention and maintenance.

2.8 COMMUNITY APPRAISAL- MAINTENANCE

A properly installed disc golf course requires minimal maintenance. Baskets should require no maintenance other than moving to prevent soil compaction and wear. Tee areas and footpaths support the most action and therefore need the most frequent attention. Material selection for tee areas and paths will determine the appropriate maintenance schedule. Initial use and feedback should help to determine what are the facility's comprehensive maintenance requirements. Disc course patrons may then consider the allocation of tasks to ensure sustainable maintenance. The PDGA strongly recommends that existing disc golf courses have a maintenance program in place. This is becoming increasingly important as the popularity of the sport soars and usage of the more popular courses continues to increase. There are many ways to accomplish this goal, but the three most frequently used ways are:

1. Establish a maintenance program using existing disc clubs as the core group.
2. Acquire funding from the entity in charge of land where the course is located.
3. Fund a maintenance program by charging players a nominal fee to play the course.

The overall goal of a disc golf course maintenance program is to lessen the impact of disc golf to a given area. Maintenance includes; physical structures such as trails, bridges, and trash receptacles; subtle changes in course design to steer people away from sensitive areas, player education, and sport promotion. Again, the minimal maintenance required in a disc golf facility when addressed by the broad range of participants, should not pose any unbearable degree of burden for anyone.

In addition to keeping baskets, tee signs, trash receptacles and tees in working order, the maintenance program should:

1. Establish easily recognized trails that draw foot traffic away from other areas.
2. Replant appropriate areas with native vegetation, or cover with wood chips, bark, gravel or other soil protectors.
3. Control weeds and other non-native vegetation, preferably without chemicals.
4. Take measures to protect sensitive small trees and shrubs. Use stakes to protect the trunks of small trees, and replant some new trees every year.
5. Preserve the aesthetic value of the course through the use of planting.(pdga.com)

A disc golf course alters the numbers of people that walk through a given area, and players walk through places that would otherwise not normally see much foot traffic. This can have several effects, the magnitude of which will vary widely from site to site and depending on the volume of players passing through the course. Proper maintenance can largely negate this effect. Each fairway should have a well-defined main trail that will draw the bulk of the foot traffic, especially in areas with dynamic topography. In high traffic areas, build in proper erosion control features into the course from the beginning. Block access to sensitive areas using brush or other traffic control objects, and the use of ground covering materials such as gravel or wood chips. Proper use of these techniques can reduce the impact of a disc golf course.

Disc golf course designers and players everywhere need to be aware of the effects of their activities, and be aware of the simple things they can do to help. Regular maintenance is required for heavily used courses, but when regular maintenance is performed, environmental impacts are minor.

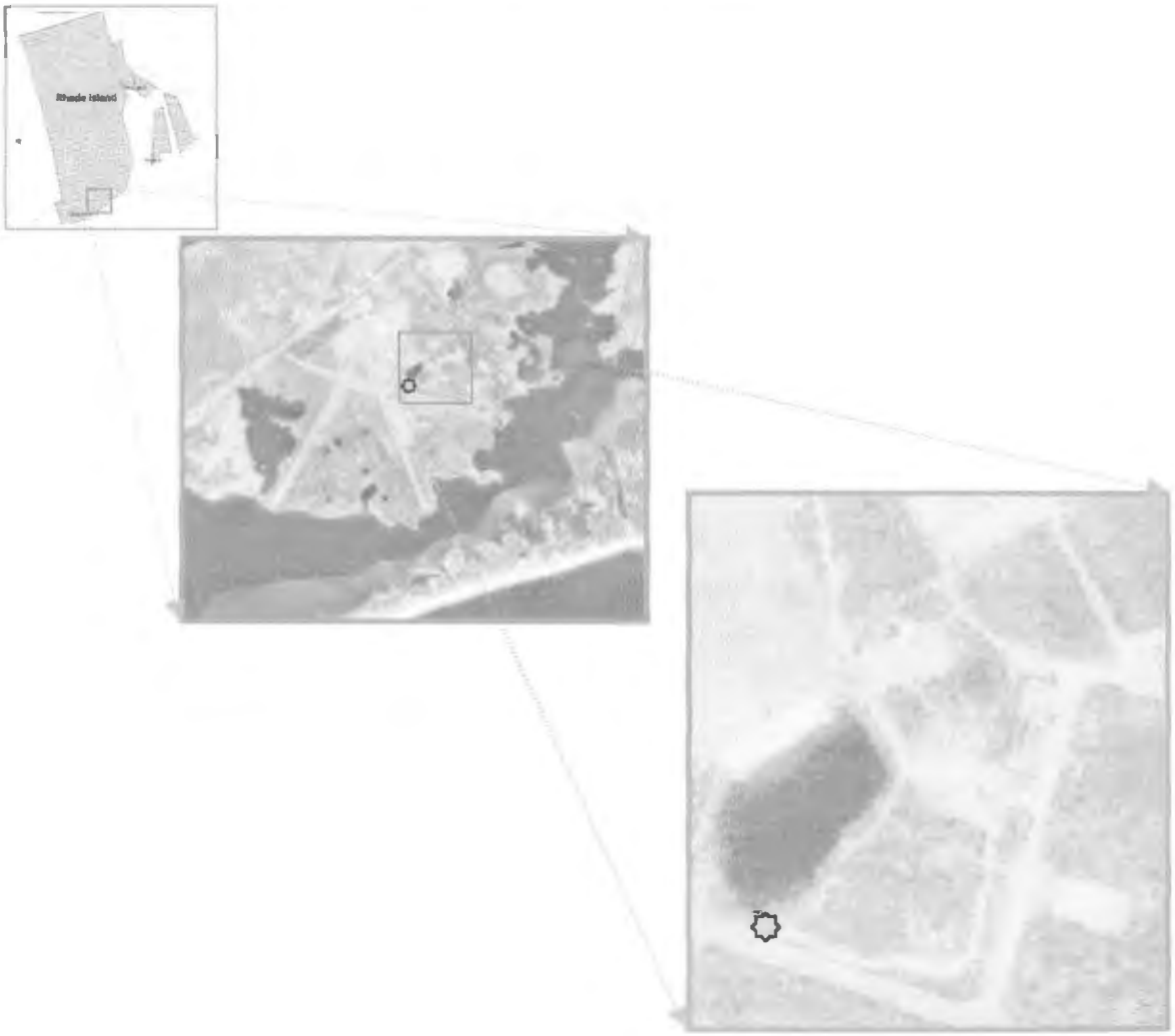
3.

COURSE DEVELOPMENT EXAMPLE

3.1 SITE EXAMPLE

Ninigret Park in Charlestown, Rhode Island is a former airstrip on the Atlantic Coast (172 acres)(Figure 3.1a)(http://ortho.edc.uri.edu). The Park is municipally operated and hosts numerous festivals, circuses, and local cultural events. The park contains an observatory, nature center, senior center, playground, bicycle track, tennis courts, parking lots, airstrips, walking trails, war memorials, and a nine-basket disc golf course. This site was chosen as it represents a course facility complimenting various park and community activities.

Figure 3.1a Rhode Island/ Ninigret Park/ Disc Golf Course Section



3.2 LAYOUT/ EQUIPMENT

The disc course in Ninigret Park consists of nine holes ranging from 100 to 400 feet long (Figure 3.2a). The first tee is next to Little Nini Pond, the ninth hole also finishes at the pond. The lay out of the course takes advantage of the trees that have succeeded the land's use as an airstrip. Equipping the course (Figure 3.2b) are; tee areas marked by a 6"x6" piece of lumber set in the ground, novice tees marked by DGA (8.5x11) signs on posts, and Mach II baskets are used on all nine holes.

Figure 3.2a Ninigret Park Disc Golf Course Layout- C. Hotchkiss graphics- T.M. Dyer design

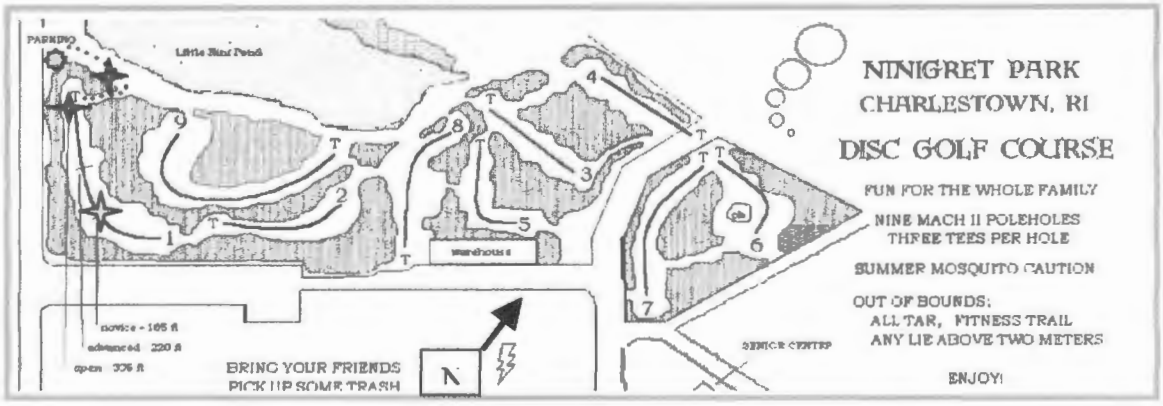


Figure 3.2b Ninigret Park Disc Golf Course Equipment

Rules Sign / Message board

Tee area w/ benches

Tee sign- fairway- basket

3.3 INTERVIEW WITH COURSE DESIGNER

This section describes various facets of the Ninigret Park disc golf course development according to notes from the course designer T.M. Dyer. Some of the facets are particular to this course, others are exemplary aspects that may be emulated in other course manifestation scenarios. The recreational inventory in this case was performed ad hoc based on the absence of any courses in the area. The demographic profile reflected evidence of the park as a community facility catering to all age groups. The allocated area in the park is sufficient to accommodate a course.

Dyer states: New Hampshire State Representative John Hunt owns a house near Ninigret Park. In January 1996, after visiting a disc golf course elsewhere in the U.S., and realizing that there were no such courses in Rhode Island, Representative Hunt requested the provision of a disc golf course in the park. Hunt agreed to donate the pole holes and tee signs for the course. The town of Charlestown agreed and allocated space within the park for a course. This area of the park also offers a fitness trail, picnic tables, roadways and fishing areas. The land is flat and heavily vegetated. While trees and shrubbery abound, there is still evidence of the land's former use as an airfield. In March of 1997, John contacted T.M. Dyer to tour the designated area to see the layout of the land in order to initiate course design. Installation commenced upon design approval by Parks and Recreation, and by June 1997 holes 1,6 and 7 had baskets and tee markers. Each hole has three tee markers labeled "Open", "Advanced" and "Novice". Course development has been on a volunteer basis. By May 1999 all nine holes were playable. The 'back-nine' are under development as of this writing. Most shrubs removed to develop the course have been invasive species, with there being popular acknowledgement of improvement.

Woodchips from residential and municipal tree work help to develop the course. The chip piles are spread to various depths to suppress vines and other vegetation as well as shape the fairways. Some chips have decomposed and now support turf growth. The potential for using course development as a channel for woodchip recycling is proven, and further organization and research on this issue is warranted.

Further contributions towards course development have come from The Rhode Island Tree Council with 50 Ash (Fraxinus pennsylvanica) (Appendix IV) and 25 Tulip (Liriodendron tulipifera) seedlings, and The National Arbor Day Foundation. These seedlings help to develop and delineate the course as well as provide some base material for the creation of a stewardship-training program that will use the course as an educational arboretum.

Maintenance is performed on a voluntary basis by several individuals. Richard Fenton has contributed to course beautification in the form of stonewall construction, turf maintenance, and course navigation signs. Todd Canuel has built benches from re-used lumber. The course in Ninigret Park has seen use by an increasing number of people. Witnesses have acknowledged use of the course by individuals, families and groups of all ages. The presence of these patrons shows that even a roughly developed facility has proven itself as an intergenerational recreational facility. Several disc golf events have been hosted in the park. Feedback from the municipal departments associated with the park has been positive. Aside from some park patrons misinterpreting the pole holes as deer feeders, the response to the new disc facility has been overwhelmingly enthusiastic.

4.

EDUCATIONAL COURSE FORMAT

4.1 INTRODUCTION

Play and learning are synonymous terms and represent an integrated, continuous process in the lives of children. The learning course aims to encourage this playing-learning association in a community recreational facility. The following section addresses disc golf course enhancements for creating an environmental interpretation playground. These alterations may easily be imposed on existing courses as well as incorporated into any phase of new course development.

Disc Golf is flexible in its application both educationally and recreationally. The learning disc concept seeks to provide a play environment for children of any age, encouraging citizens of different ages to mingle and play together. Lesson plans and activities may be honed for use in K-12 and collegiate curricula, as well as public planning process. Use of the course by various factions of the community helps to promote their goals as well as diversify the information which helps maintain interest by frequent users. Environmental learning disc is conducive to independent, individual learning as well as small group interaction and problem solving. Learning enhanced disc golf aims to stimulate curiosity, individual assertion, and promote holistic learning experiences that encourage a person's mind and body to become actively involved in the surrounding environment. Disc golf can be a great outdoor learning environment for children as well as an amenity to the whole community. Courses can be designed to blend in with the character of the surrounding neighborhood and to accommodate the existing natural topography of the site.

4.2 LEARNING COURSE

Nine disc golf holes of Ninigret Park serve as a model for an environmental interpretation course arrangement. The number and contents of adapted signs is dependent on the size, location and purpose of the course. Educators should consider the material they wish to convey and adjust the content to the course sign structures. Learning activity and inclusion to curriculum issues requires the educators to review lesson plans, curriculum structure and facility availability.

Within the learning course facility, maps and signs are used to convey course layout and environmental information. The course map provides a comprehensive site view (Figure 4.2a). The tee signs are incremental guides navigating a specific path within the comprehensive site (Figure 4.2b). Lesson sheets enable the tabulation of information presented along the course (Figure 4.2c). The learning play simply exemplifies the collaborative presentation of environmental interpretation and sporting exercise.

Interpretive signs are a means of imparting information about the environment. Signs display text and graphics at interesting sites, in this case a path among tees in a disc golf course. The intention is that these displays will increase the user's understanding of the surrounding environmental elements and features. The rotary three-window tee signs allow for three programs or themes to be simultaneously presented (A rotating disc is placed behind the tee sign and is turned by hand to the desired color and information). These signs communicate specific course environment and sport information by simple means of Identification, Information, Direction, Interpretation and Orientation. This next section is meant to illustrate the structure, form and capacity of a disc golf course's signs and maps.

This map conveys the Theme topic and arrangement of the learning signs on the course.

FIGURE 4.2a- Ninigret Park 18 Hole Plan- Comprehensive Site View- Bray illustration/ 3NXT design

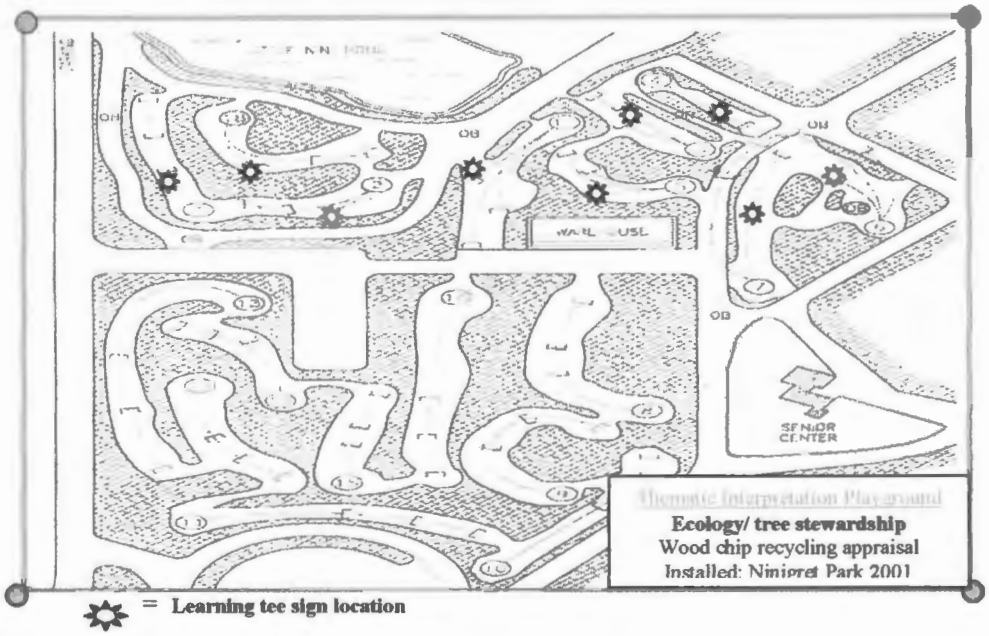
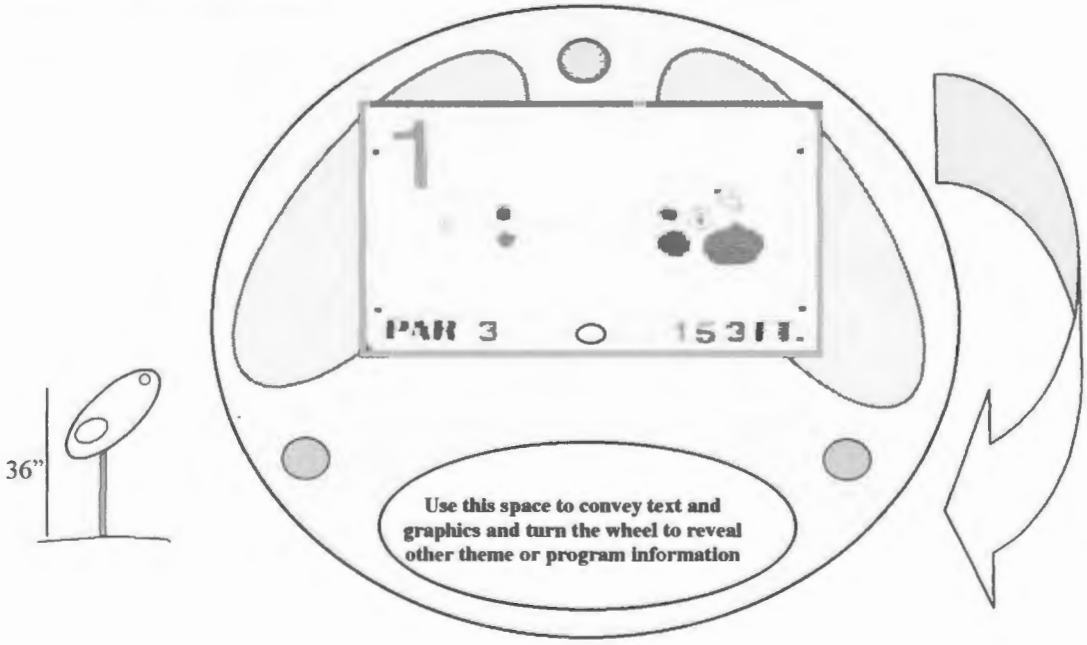


Figure 4.2b- Learning Course - Three-window example tee sign (24"dia.)

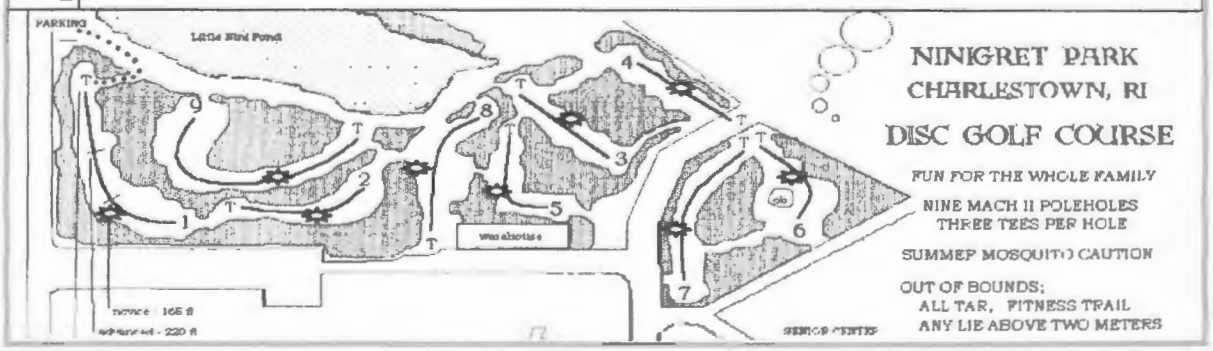


The learning adaptations of the tee signs do not interfere with the essential information regarding hole design, but simply augment the graphics with encouragement for environmental appraisal.

Figure 4.2c illustrates organization of information associated with the educational enhancement of a disc golf facility. This sample table represents the quantity of information with the design of a nine-basket/ one- theme, three-program disc golf course. Educational material may be integrated within this format or offered in a supplementary fashion.

Figure 4.2c- Lesson Plan Organizing Sheet

- LESSON PLAN- ORGANIZING SHEET –		
FACILITY-	PATRONS-	DATES-
LESSON THEME-	**PROGRAMS-** 0 0 0	
TEE # EDUCATIONAL INFORMATION		
1	**This Space is for writing the information that is to be conveyed on the tee signs**	
2	**The multiple color 'programs' allow for a theme to be explained in three styles or levels.**	
3	**For instance, the theme of wood chip recycling appraisal can be viewed as a micro-biological composting function, a landscape technique, as well as a form of community waste stream diversion.**	
4	**Providing this material simultaneously encourages cohesion by groups of varying intellect.**	
5	**The tee signs are simple enough to be operated by an individual, yet provide an activity that may compliment play. This allows for attentive accompaniment by non-players.**	
6		
7	**The vegetation here has arrived in the process of succession.** **A group of evergreen pioneers surrounded the target, what type are they?** **Habitats shifting as food sources change can cause adjustments to migratory requirements.**	
8		
9		



CONCLUSION

Disc Golf is becoming popular around the world with courses in over fifteen countries. In the last four years the total of courses worldwide has more than doubled to over 1500 courses total.(pdga.com) Disc golf is an environmentally and socially responsible activity. Disc courses may be arranged as thematic interpretation playgrounds, by including the component of academic subject material. Course location, maps and signs may promote environmental interpretation. While playing this learning disc, players gain exposure to fundamental mathematic, physiologic and environmental activities in the context of a game. Various lesson themes can be imposed on a generic course graphics structure. Educationally enhanced disc golf infuses an enjoyable sport with interpretive content. Combining sport and learning effectively should enable a style of education that advantageously exploits the enjoyable and beneficial aspects of both. The learning disc course, innovative and imaginative, may provide some insight to today's issues of education and community rejuvenation.

The learning course offers lesson opportunity for many groups in the community. Use of the learning course by numerous groups helps to vary the material presented. This variety broadens the exposure of information, as well as preserves intrigue during repeat visits. The benevolent returns to a community from a disc golf course are documented around the world. Hopefully review of this project will aid in the encouragement and development of disc golf courses, as well as course adjustments that promote environmental education.

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APPENDICES

APPENDIX –I

LETTER FROM ED HEADRICK- PRESIDENT, DISC GOLF ASSOCIATION

Dear Sir or Madam:

I am Ed Headrick, inventor of the modern Frisbee and founder and President of the Disc Golf Association. We have been the supplier of over 1,000 Disc Golf courses to universities, colleges and park departments, etc., over the past 25 years. In the United States we estimate the recreational use is in excesses of 2 million players per year and there are currently over 16,000 members in the Professional Disc Golf Associations which, I donated to the players to run in 1983.

Through the years I have donated many Disc Golf courses to universities, with the most recent being California State University of Monterey Bay. Unfortunately I am not in a position were I can donate enough hardware to supply the academic requirements of millions of students across America. Yes, Disc Golf is an academic resource, it teaches an amazing peace of mind to students who have never been taught to deal on a one on one basis with themselves. In Disc Golf, troubled students learn to participate in an activity that indeed changes their lives. My Frisbee taught millions of people to relate to another person through the medium of simply playing catch with a piece of plastic. Disc Golf teaches them to go one step further to play a simple and satisfying game with themselves, again with a piece of plastic.

To provide this sport to all universities, colleges, schools down to 1st grade, Hospitals and youth groups like the Boy Scouts and the YMCA's that rehabilitate patients, military bases, mental institutions and correctional facilities for young people is my goal in life. I will donate 25% of the price of a complete Disc Golf course to your facility, 9 holes or 18 holes including tee signs and rules sign. I will also assist you with the design of the course at no cost.

Please review our website and refer this offer to those people whom you hold responsible for the well being of your population. I assure you, you won't be disappointed with this decision and your goodness will be returned one thousand fold.

Disc Golf Association, Inc.
16 Maher Road
Watsonville, CA 95076
(831)722-6037 Fax (831)722-8176
steadyed@discgolfassoc.com

APPENDIX –II

GENERIC NEW COURSE PROPOSAL TEMPLATE[2]

Introduction

The game of disc golf has exploded in recent years, and is now being enjoyed by people all ages on nearly 900 courses worldwide. It is our belief that the game has grown to the point where XX INSERT PARK NAME and the community it serves can greatly benefit from the addition of a disc golf facility. We respectfully propose that you consider amending your park plan to include a request for $ XX INSERT FIGURE of state or local funds targeted to establish a XX INSERT NUMBER hole disc golf course within XX INSERT NAME Park.

What is Disc Golf?

The concept of the game is easier to understand when the term 'Frisbee® golf' is used, but since Frisbee is a registered trademark, we call the game disc golf instead.

The game is similar to traditional ball golf. Players use special Frisbees (golf discs) instead of balls and clubs, and throw them at an aboveground target instead of a hole in the ground. There are different types of golf discs used for different purposes, much like ball golfers use different clubs.

The object of the game is to throw a golf disc into the target for 'par' or better, i.e., in the fewest number of throws. The target is typically a steel basket over which chains hang, known as a Pole Hole®. The player begins by 'driving' from a designated concrete tee area and continues toward the target, throwing each consecutive shot from the spot where the previous throw has landed. Finally, a successful 'putt' sends the disc into the target, and the hole is completed. The combination of challenges to players, including distance, accuracy, wind, trees, shrubbery, water and terrain changes, offer plenty of action and excitement during the course of a game.

A complete, tournament-ready course of 18 holes typically utilizes 18 to 27 acres of land, depending on terrain and course design. Hole lengths typically run anywhere from 150 to 500 feet. Disc golf is enjoyed all year long, and in many types of weather conditions, including snow.

Nationally, the growth of disc golf is exploding. The game's governing body, the Professional Disc Golf Association (PDGA), reports an annual 15% growth rate, a total of 3 to 5 million persons who have tried the game, and a 1998 total of 700 U.S. disc golf courses. The statistics also showed a total of nearly 900 courses worldwide, up from 250 in 1990. The PDGA is on the Web at http://www.pdga.com.

Who Can Play?

You'll find men, women, and kids of virtually all ages playing on your disc golf course. Players are drawn by many of the same pleasures found in traditional ball golf: fresh air in a beautiful landscape, the camaraderie of friends, and the challenge and excitement of combining personal skill and speed to project an object toward a target. The rules are simple to grasp, allowing beginners to immediately have fun challenging themselves and their friends. A typical round of 18 holes takes 60 to 90 minutes to play.

Perhaps the greatest factor behind disc golf's broad accessibility is its low cost. Players need nothing more than an $8-$10 Frisbee, and since most courses are located in parks, there are little or no admission fees. This factor alone opens the game up to countless XX INSERT YOUR STATE residents who cannot afford many of today's other popular recreation activities. Bottom line: disc golf is fun for everyone regardless of age, gender or economic status.

---

[2]

Community and Park Benefits

Disc golf's high benefit-to-cost ratio makes it a positive choice for your 20XX plans. In addition to appealing to nearly all age and gender groups, the game is environmentally sound and serves a great number of people for a very low investment in time, energy and financial costs.

Disc golf courses differ from ball golf courses in that they fit into the existing flora of the park, rather than requiring the clear-cutting of trees or the manicuring and fertilization of fairways. They tend to utilize areas within parks that are otherwise underused, including thick woods and slopes, yet can easily co-exist with other activities such as hiking and dog walking. There is almost no noise pollution created, and players take great pride in the care of their course, cleaning up litter and reminding others to use trash receptacles. Installing a course also creates extra traffic in areas which might otherwise be remote, providing a year-round human presence and deterrent to the few parks guests who may have mischief on their minds.

By selling discs and other concessions on site, your park can realize an added income in excess of $10,000 per year. Finally, for less than the cost of installing one tennis court that can serve four people at a time, your park can install an 18-hole disc golf course and serve 72 people at any given time, all year round.

Costs and Land Requirements

A first class 18 hole disc golf course can be installed for as little as $22,000. This includes the purchase/construction and installation of 18 galvanized steel baskets, 36 cement tee pads, 18 tee signs, trashcans, seating and a message board. This figure is very flexible, as costs can be easily cut using inexpensive seating & trashcans and, most importantly, utilizing player volunteer efforts.

Baskets-

These estimates are based on the latest disc golf basket -- the lockable Mach V Pole Hole -- and two placement sleeves. Other types of baskets are available at similar prices. Each sleeve would be set in a cement hole measuring approximately 8 inches in diameter and 18-36 inches deep. Once in place, they are relatively maintenance free.

DGA Mach V Basket: $353.00 x 18 $6354.00
Locking Collar 4"x2" tubing: $9.00 x 18 $162.00
Anchor Assembly 18"x2" tubing: $17.00 x 36 $612.00
Concrete: 1 cubic yard $65.00
Total Basket costs: $7193.00

Tee Pads-

Each hole would have two cement tee pads, one closer to the basket for amateur players, and the other farther away for advanced players. Each would be flush to the ground or elevated depending on design & terrain factors, approximately 6x12 feet in length and 4 inches thick, requiring approximately 1 cubic yard of concrete. Once in place, they are relatively maintenance free.

Concrete, forms, fill and seed: $80.00 x 36 $2880.00

Signs, Message Board, Seating and Trash Cans

Tee signs are important in directing new players through the next hole and providing information about hole length, terrain and out-of-bounds areas. The message board serves as a player gathering place and communications outlet. Picnic tables offer occasional resting areas. Trashcans are also a critical component of the course, as their presence on each hole will considerably reduce the amount of course litter. If constructed of solid material, all these items are also relatively maintenance free.

Tee Signs (estimated): $60.00 x 18 $1080.00
Message Board (estimated): $250.00
Picnic Tables (estimated): $500.00 x 6 $3000.00
Trash Cans (estimated): $50 x 18 $900.00

Course Design and Development

XX INSERT CONTACT INFORMATION FOR LOCAL VOLUNTEER COURSE DESIGNERS, OR CONTACT THE PDGA FOR MORE INFORMATION ON FINDING A QUALIFIED DESIGNER.

Installation and Maintenance

Once a course is in place, maintenance costs are relatively low. Mowing, tree trimming, and seeding will be required as needed. Erosion concerns should be monitored regularly depending on terrain, and occasional maintenance can be required on heavy footpaths. Tee pads should be regularly checked for safe grade, signs checked for maintenance needs, and hazardous trees or limbs removed. A regular routine to empty trashcans will ensure a tidy course.

Installation and maintenance costs can be drastically offset by player volunteer efforts.

Maintenance labor and materials estimates:

Mowing: 15 hours week
Trash removal: 5 hours week
Seeding: $200 year
Tree Trimming Miscellaneous: 5 hours month

Installation labor requirements for disc golf holes will vary by terrain. Fieldgrass areas will need only mowing, while heavily wooded areas will require selective tree removal, including falling, chipping, stump removal and hole filling. While hole preparation time for a fieldgrass area may need only four hours of labor, a heavily wooded area may require 40 hours.

Installation labor estimates:

Baskets: 4 hours each
Tee Pads: 8 hours each
Holes: 16 hours each average
Signage: 1 hour each
Total installation labor hours (estimated): 667

Economic Summary for 18-Hole Course Installation

Total Basket costs: $7186.00
Concrete Tee Pads (estimated): $80.00 x 36 $2880.00
Tee Signs (estimated): $60.00 x 18 $1080.00
Message Board (estimated): $250.00
Picnic Tables (estimated): $500.00 x 6 $3000.00
Trash Cans (estimated): $50 x 18 $900.00
Installation labor (estimated): $10 per hour x 667 hours $6670.00
TOTAL ESTIMATED COSTS: $21,966.00

Amenities

Adding the following amenities will further increase the quality and enjoyment of your disc golf course: Drinking fountains/ Bathrooms/ Bridges over water hazards/ Practice putting area Concession/disc sales area/ Driving range/disc sports area

Space Requirements

Depending on terrain, each disc golf hole will require one to two acres of land.

XX HOW YOUR STATE RELATES TO U.S. Disc Golf

XX IN THIS SECTION, TALK ABOUT HOW YOUR STATE HAS GROWN WITH THE GAME, AND HOW ADDING DISC GOLF CAN INCREASE TOURISM.

BELOW IS SOME SAMPLE TEXT:

Michigan parks are leaders in supporting the mainstreaming of disc golf. With at least 31 courses currently maintained on a full-time basis, Michigan ranks sixth in the nation for number of courses, trailing only Texas (70), California (56), Iowa (46), Minnesota (43), and Colorado (35). Our state hosted the 1992 Professional Disc Golf World Championships, along with the 1991 and 1997 Amateur World Championships. In 2000, Michigan will have the honor of hosting the first ever combined Pro and Am World Championships.

As the sport continues its exponential growth, tourist dollars will begin to flow into Michigan and other states which offer first class courses, facilities and tournaments. We have already established a solid base on which to continue building Michigan's reputation for disc golf and recreational park excellence.

Michigan disc golf courses are currently installed in the following parks:

XXX, XXX, XXX

ABOUT YOUR CLUB OR STATE DISC GOLF ORGANIZATION

XX IN THIS SECTION, DISCUSS THE POSITIVE IMPACT YOUR LOCAL ORGANIZATION IS MAKING ON THE SPORT AND THE COMMUNITY. IF YOU'RE A NEW GROUP, TALK ABOUT YOUR PLANS AND POTENTIAL. SAMPLE TEXT FOLLOWS:

The MDGO is a non-profit organization made up of volunteer representatives from local disc golf clubs throughout the state of Michigan. Our goals are to encourage cooperation between and the expansion of clubs, and to further the growth of disc sports. We host an annual State Series of tournaments, along with two annual 'SuperTour' national events. The organization is currently hard at work preparing to host the upcoming ProAm Worlds 2000 Championships. Through local clubs the MDGO runs dozens of tournaments and player clinics, as well as programs with schools. Our members are committed to education, professionalism, and of course, fun.

Last year the MDGO initiated the Plant-a-Basket Program, pledging to buy the first basket for any new course in the state of Michigan that is open to the public. Four baskets were awarded in 1998. The program is coordinated by Mark Ellis, who serves as Competition Director on the Board of Directors for the Professional Disc Golf Association, and is also an MDGO club representative. For more information on the Plant-a-Basket Program, send email to mdgo@umich.edu. The MDGO is on the Web at http://www.inflightsports.com/mdgo.

Appendices

Testimonials from Parks Departments

XX INCLUDE TESTIMONIAL LETTERS FROM YOUR LOCAL AND REGIONAL COURSES.

Newspaper and Magazine Clippings

XX THE PDGA HAS A NUMBER OF THESE. TRY TO FIND LOCAL STORIES AS WELL.

APPENDIX –III

NINIGRET PARK PDGA COURSE LISTING- Website / Published Directory

APPENDIX –IV

REPORT TO RHODE ISLAND TREE COUNCIL (SEEDLING DONATION PROGRAM)[3]
NINIGRET PARK DISC GOLF COURSE - CHARLESTOWN. RI
FRAXINUS pennsylvanica[4] -

Fraxinus pennsylvanica

SIZE: 50 to 60' in height by about 1/2 that in spread, although can grow to over 80'.
HARDINESS: Zone 3 to 9.
TEXTURE: Medium in leaf; quite coarse in winter.
BARK: Similar to White Ash.

49 SEEDLINGS - PLANTED 5/15/00 - PHOTOS ON 10/10/01
Photos below featuring;

Tree #) h = Tree height (feet) (Top of leader from grade)
G = Girth at Grade (inches) (English measure calipers)

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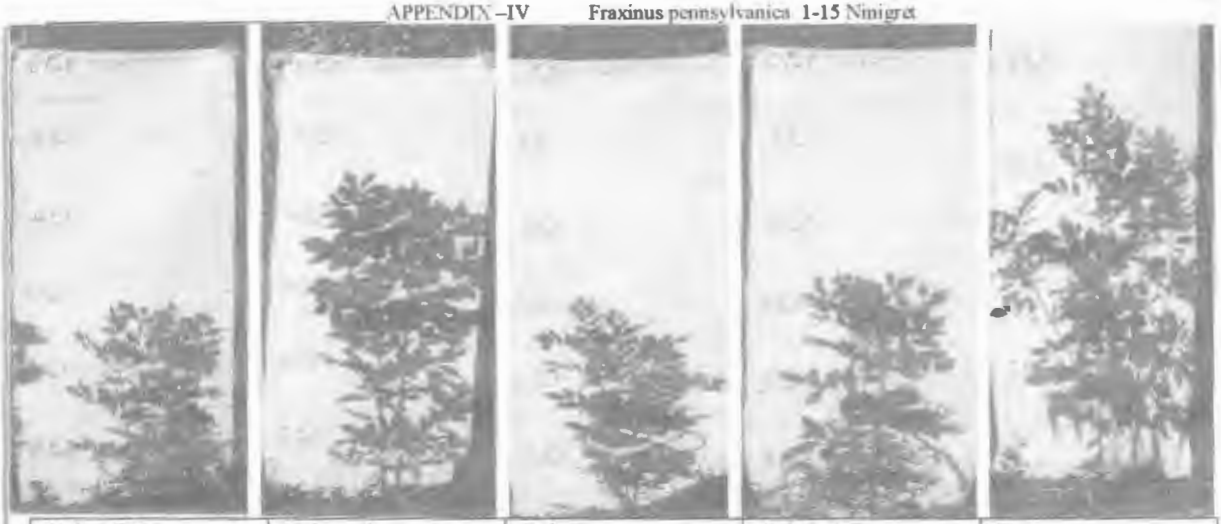
[3] Prepared by T.M. Dyer and Craig Hotchkiss - Courtesy of INXTinc. (Promoters of flying disc sports)
[4] Dirr, Michael,1990, Manual of Woody Landscape Plants, Stipes Publishing, Champaign, IL,

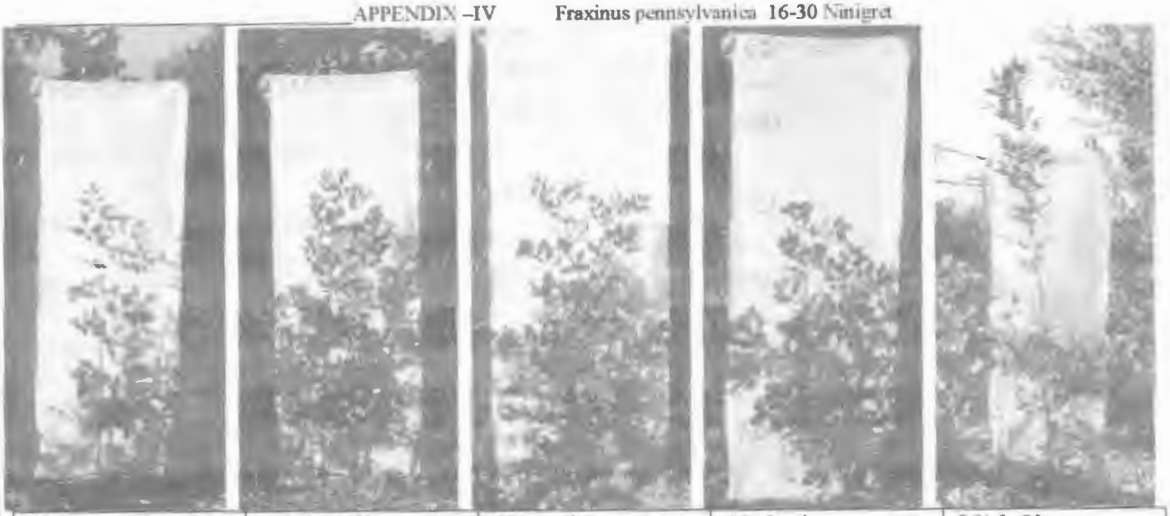
APPENDIX –IV Fraxinus pennsylvanica 1-15 Nmigret



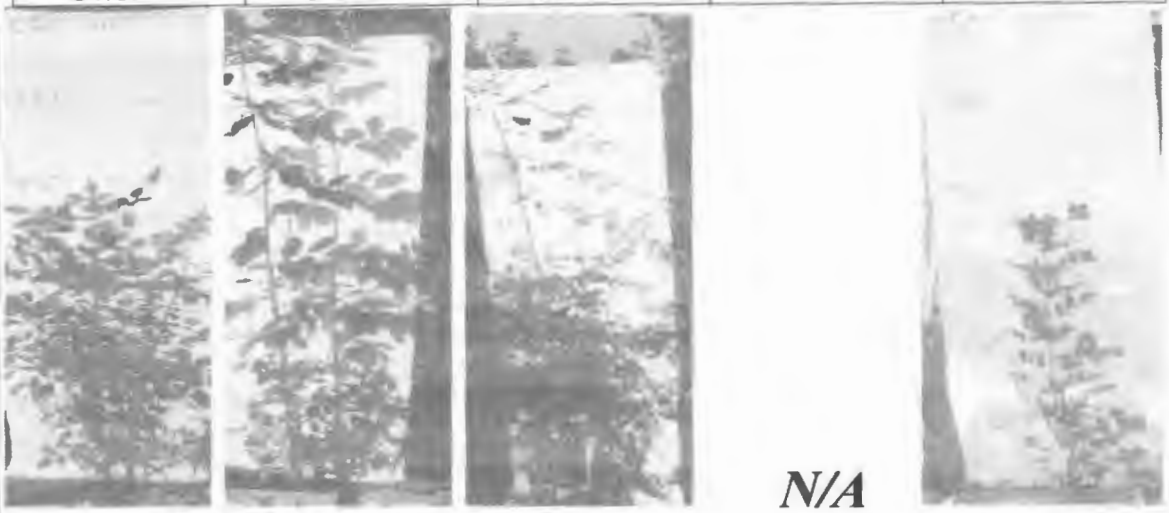
1) h 2.75'	2) h 4.5'	3) h 3'	4) h 3.25'	5) h 3.5'
G 9/16,1/2	G 15/16	G 11/16	G ¾	G 9/16,5/8

6) h 5'	7) h 7'	8) h 4.5'	9) h 3.5'	10) h 4'
G 9/16,11/116	G 1 7/16	G 11/16	G 7/8	G 5/8

11) h 5'	12) h 6.5'	13) h 4.5'	14) h 4'	15) h 3'
G 13/16	G 1 7/16	G 1 1/16	G 13/16	G 5/8

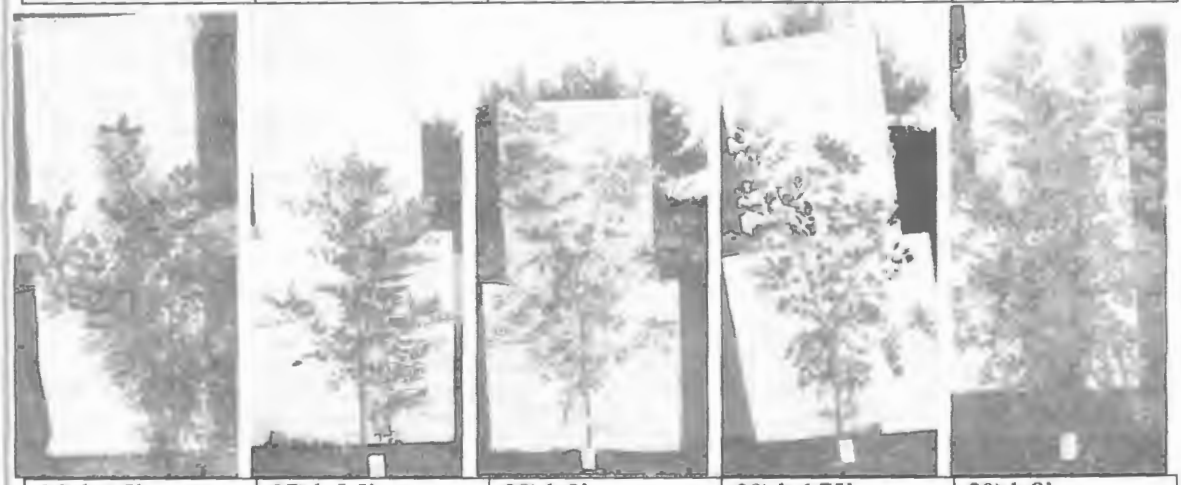


16) h 4'	17) h 4.5'	18) h 4'	19) h 4'	20) h 8'
G 9/16	G 1 ¼	G 13/16	G ¾	G 1 5/16

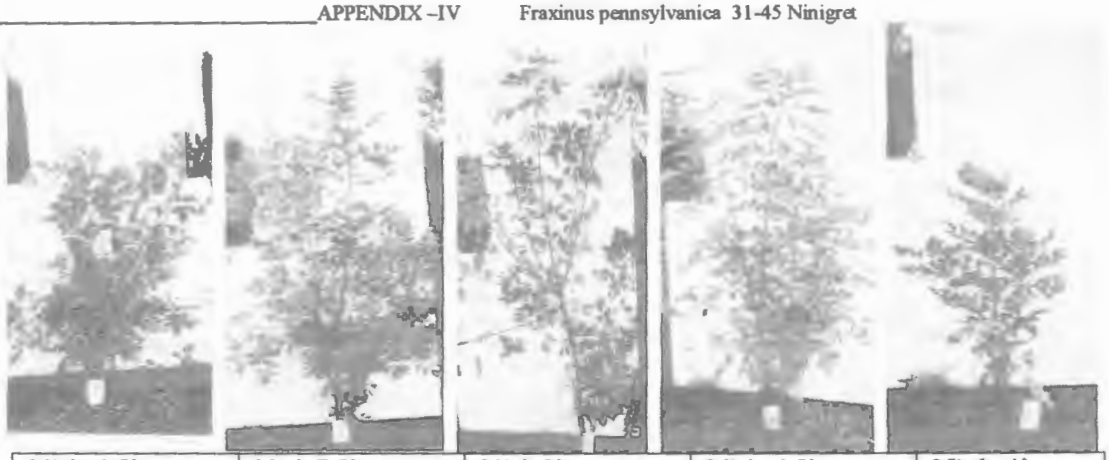


N/A

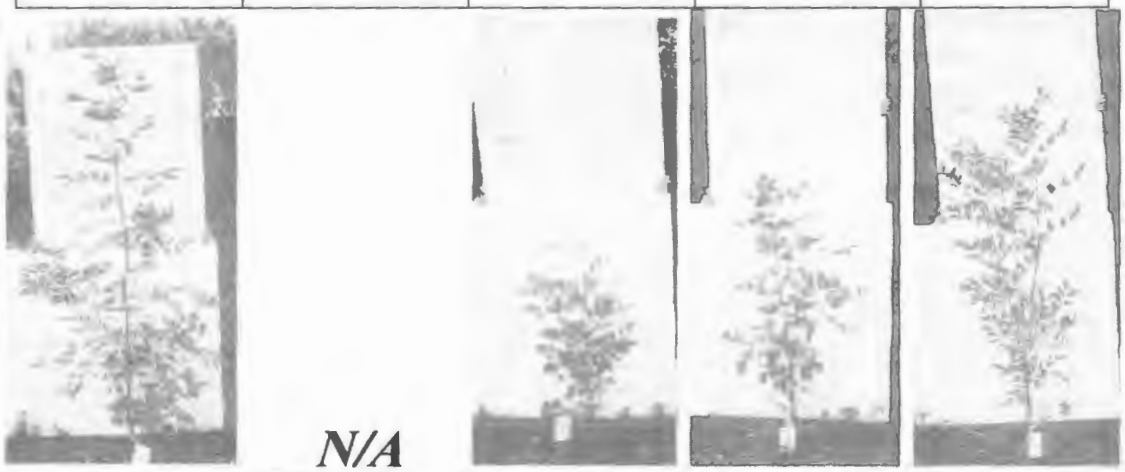
21) h 4'	22) h 6'a.w.	23) h 6'	24) h 3.5'	25) h 3.5'
G 7/8	G 1 ¼	G 15/16	G ½	G 5/8



26) h 4.5'	27) h 5.5'	28) h 8'	29) h 6.75'	30) h 8'
G 1 5/16,1 ¼	G 1 5/16	G 1.5	G 1 ¼	G 1 7/8, 1 7/8



31) h 4.5'	32) h 7.5'	33) h 8'	34) h 6.5'	35) h 4'
G 1 ¾	G 1 7/8	G 1 ¾	G 1 7/8	G 1 1/16



N/A

36) h 7.5'	37) h 5'	38) h 3'	39) h 4.5'	40) h 6'
G 1 ¼	G 7/8	G 5/8	G 7/8	G 1

41) h 5.5'	42) h 3.5'	43) h 6'	44) h 7'	45) h 4.5'
G 15/16	G 1 1/16	G 1 3/16	G 1 ½,1 1/16, 1 3/16	G 1 1/4

APPENDIX –IV Fraxinus pennsylvanica 46-49 Ninigret

46) h 5'	47) h 2'	48) h 4'	49) h 4.5'
G 1	G 1	G ¾	G 15/16

These trees were planted in the spring of 2000 as year old seedlings. An aggressive watering program was instituted. Plants were watered out of Little Nini pond twice a week for ten weeks, and then left to Mother Nature's care. There is an on going weeding program around the base of these trees including cutting back the surrounding invasive vegetation. **Displaying the results as well as the maintenance procedures is an essential facet for developing a tree stewardship training program within the learning arboretum course.**

✦ = Ninigret Park Disc Golf Course/ Fraxinus locations