



# Outdoor Recreation Facilities Guide

*A Guide for  
Illinois  
Communities*



Illinois  
Department of  
**Natural  
Resources**

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A GUIDE FOR ILLINOIS COMMUNITIES

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Illinois Department of Natural Resources

Rod Blagojevich, Governor

Sam Flood, Acting Director

February 2006

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# Introduction

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The intention of this publication is to provide background information, identify standards, and share recommendations for communities considering the construction or rehabilitation of outdoor recreation facilities. While this publication is primarily a technical manual, it also provides information on site development issues. Please note the following qualifying statements for each category.

## **Recommended Area**

- includes the court or field surface area plus additional support space

## **Dimensions**

- court or field dimensions with possible range of lengths and widths if appropriate

## **Orientation**

- when feasible, play courts and fields should be oriented to minimize sun interference for players during late afternoon hours (ie., the primary line of play for any game should be away from the setting sun). If such orientation is not feasible because of surface gradients or other site factors, then tall growing trees should be planted to serve as a barrier (unless such trees, tall buildings or surrounding hills already exist to screen the setting sun).

## **Surfaces**

- a range of surfaces may be acceptable
- [Appendix 1](#) includes a comparison of surface materials

## **Drainage**

- improves the quality of the turf
- reduces the likelihood a player will slip
- improves drying time
- generally, underdrainage tile should be located on 30' centers although this is highly dependent upon soil type and condition

## **Anticipated Costs**

- reflect approximate contractor installed costs using union labor in the Chicagoland area as of fall 2005
- anticipated costs for lighting, grading, topsoil removal and replacement, and surface drainage structures have not generally been included due to site variability

## **Irrigation**

- irrigation anticipated costs assume a water source is relatively near
- local plumbing codes must be consulted to determine appropriate equipment requirements

### **Lighting**

- guidelines reflect the 1988 recommendations of the Illuminating Engineering Society of North America
- horizontal footcandles (HFC) is “a measure of luminous flux density (lumens per square foot) reaching a horizontal surface, normally taken on the ground or three feet above ground.” (IES RP6-1988)
- vertical footcandles (VFC) is more difficult to calculate as it is a measure of light at a point in space. This measure is important for sports that involve playing a target in the air, such as tennis. VFC measures have not been included in this publication.
- initial footcandles is the amount of light on the court/field when the lighting system is first installed
- maintained footcandles is the amount of light on the court/field over the extended life of the lighting system
- Effective Projected Area (EPA) is a measure of the surface area of a given fixture and/or structure resisting wind force. EPA is a value normally supplied by a fixture manufacturer. The amount of EPA is used to determine the class of pole for the wind zone where installed (projected area x appropriate drag coefficient).
- pole strength is determined by the area (EPA) of the components being mounted to the pole. With a few exceptions, most areas within Illinois require light poles with a wind loading capability of 80 miles/hour
- a comparison of light pole materials is discussed in the lighting section of [Appendix 1](#)

### **Fencing**

- when the phrase ‘context specific’ appears, it implies that fencing is not a required part of the recreation facility but may be desirable for screening purposes or as a barrier depending upon the site’s characteristics and adjacent uses
- more specific information on fencing is contained in [Appendix 1](#)

### **Landscaping**

- the phrase ‘context specific’ implies that specific landscaping treatments are not required but may be used to provide desirable shade or screening

### **Parking**

- parking guidelines are based upon a review of local zoning ordinances and experience
- detailed information on parking is contained in [Appendix 1](#)

### **Maintenance**

- all recreation facilities, including accessible features and surfaces, require maintenance and on-going efforts to comply with evolving accessibility and safety standards

### **Accessibility**

- includes proposed or recommended guidelines for new recreation and sport facilities or areas published by the US Access Board ([www.access-board.gov](http://www.access-board.gov))
- access must be included in all new recreation facilities
- when renovations occur, access must be incorporated into the addition or alteration
- an accessible pathway must be provided from the designated handicapped accessible parking stall(s) to the recreation facilities and restroom facilities, if any
- an accessible surface for pathways is defined as a firm, stable, and slip resistant surface, e.g., concrete, asphalt, compacted crushed limestone (ag. lime) or materials of a similar character
- guidelines are consistent with requirements of the Illinois Accessibility Code or Americans with Disabilities Accessibility Guidelines (ADAG), whichever is more stringent

### **Design Considerations**

Standards shown within this book have been compiled from a variety of sources and some modifications and recommendations have been made based on experience. In general, to assure consistency of recreational experience for the user, size standards should be adhered to whenever possible. Local sports clubs and other user groups should be consulted to determine the ideal standard for a particular recreation facility in a given location. However, it may be necessary to make adjustments to accommodate site specific conditions such as spatial limitations, drainage conditions, or topography. Ultimately, the decision of whether to use a particular standard may be financially driven.

### **Caution!**

Recommendations contained in this publication are general in nature and may not apply to all situations. It is important for the user to apply good judgment based on local conditions and check local codes and the other legal requirements of public agencies that may have jurisdiction before proceeding.



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## Baseball/Softball Fields

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### Recommended Area

- Baseball Field: 2-2.5 acres for each field
- Softball Field: 1.7 acres for each field

### Dimensions

- see Figures 1, 2, 3, & 4 on pages 6-8

### Special Field Dimension Considerations

- many local and regional baseball/softball organizations have their own design standards to accommodate different age and physical abilities of the players. Invite baseball/softball organizations to join in the planning process so the final field satisfies the intended users' needs.
- temporary (removable) fences increase the usefulness of these fields for other baseball types or different recreation activities.
- in the design stage, if removable fencing is to be used, consider that some removable fencing systems have in-ground post sleeves and in-ground sleeves should be located during this phase
- softball fields may be used for youth baseball leagues
- the following tables show typical field dimensions for youth baseball and softball

### Youth Baseball Field Dimensions\*

(\*) Field dimensions for specific youth baseball organizations/associations should be referenced when considering regulation fields

Age Group	Baseline Length	Pitching Distance (front of pitching rubber to back point of home plate)	Recommended Distance From Homeplate to Backstop	Recommended Outfield Fence Distance	Radius Distance (from pitching rubber to outfield turf)
Little League (9 - 12 yr olds)	60'	46'	25'	200' (4' high fence)	50'
Pony League (9-10 yr olds)	60'	44'	20'	foul lines - 175' center field - 225'	50'
Pony League (11-12 yr olds)	70'	48'	30'	foul lines - 225' center field - 275'	65'
Pony League (13-14 yr olds)	80'	54'	40'	foul lines - 265' center field - 315'	80'

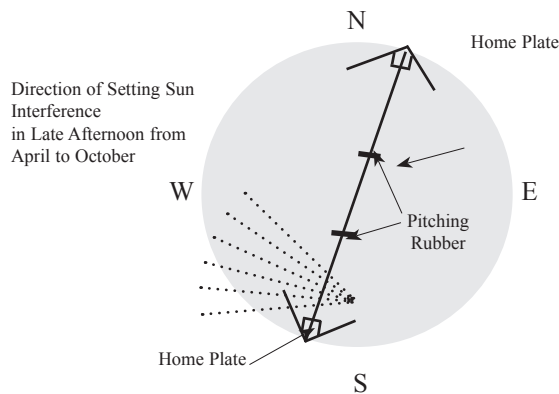
**Youth & Slow-Pitch Baseball Field Dimensions\* (Amateur Softball Association - ASA)**

(\* ) Field dimensions for specific youth softball organizations/associations should be referenced when considering regulation fields

	Baseline Length	Pitching Distance (front of pitching rubber to back point of home plate)	Home Plate to Backstop Distance	Minimum/Maximum Outfield Fence Distance (recommended)
Youth Fast Pitch 10 & U 12 & U 14 & U	55'	35'	25'	150'-175'
	60'	35'	25'	175'-200'
	60'	40'	25'	175'-200'
Adult 12" Slow Pitch	65'	50'	25'	265'-300'
Adult 16" Slow Pitch	55'	38'	25'	200'-250'

**Orientation**

- to minimize sun interference for the players, especially the batter and the pitcher, the field should be oriented so that the setting sun is generally at a right angle to the imaginary line between home plate, the pitching rubber, and second base (ie. S-SW to N-NE alignment or vise versa)



**Surfaces**

Baseball fields are typically composed of:

- skinned and turf infield
- turf outfield

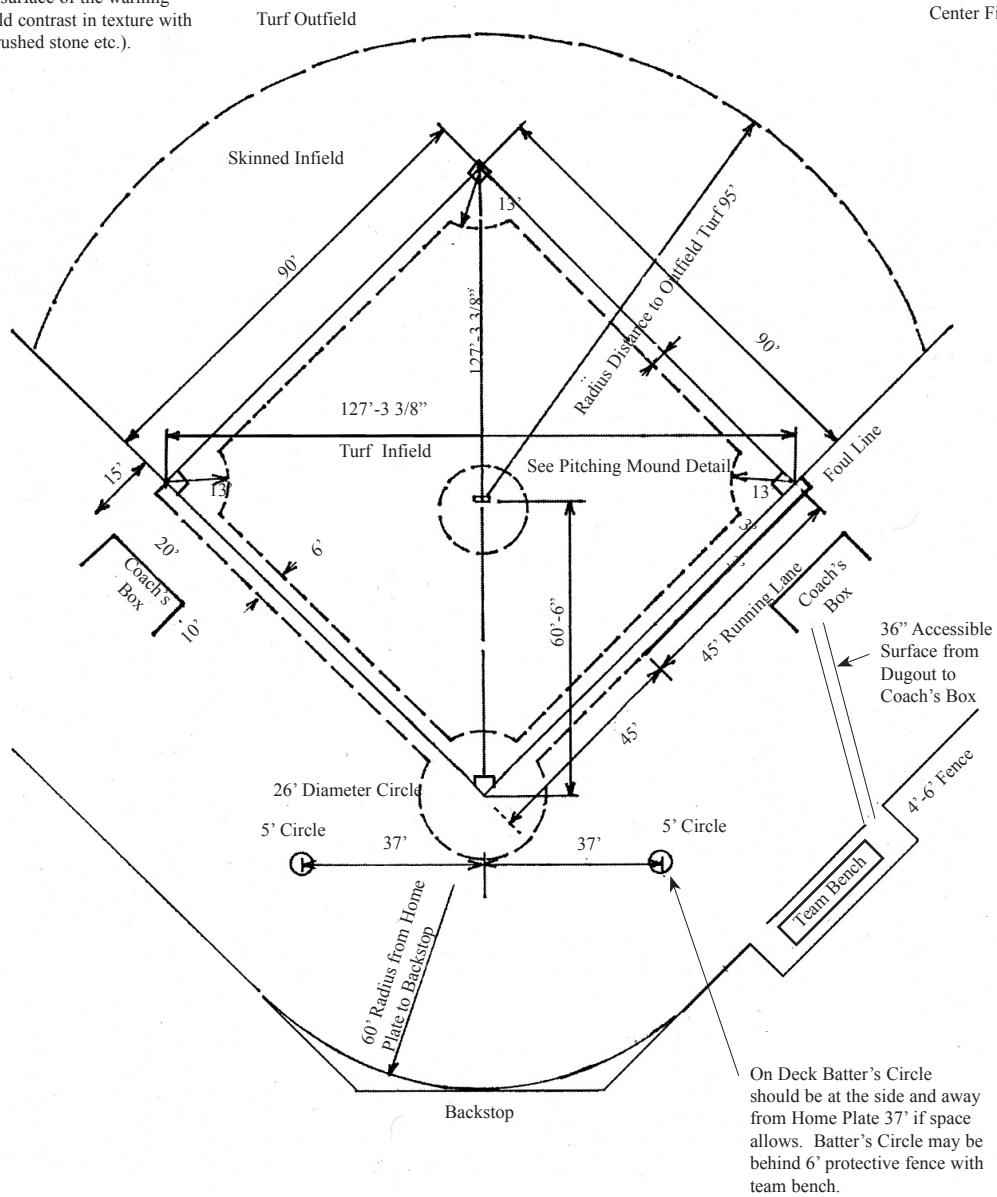
**Softball fields are typically composed of:**

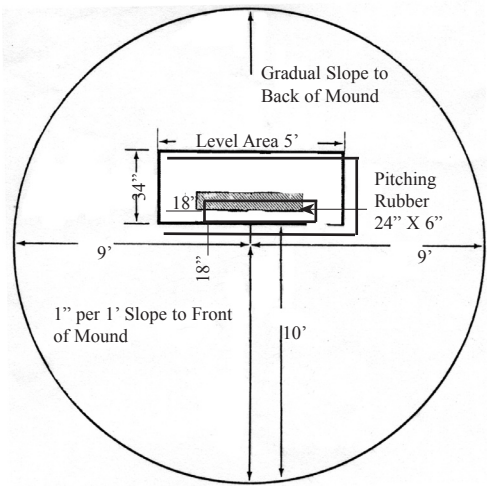
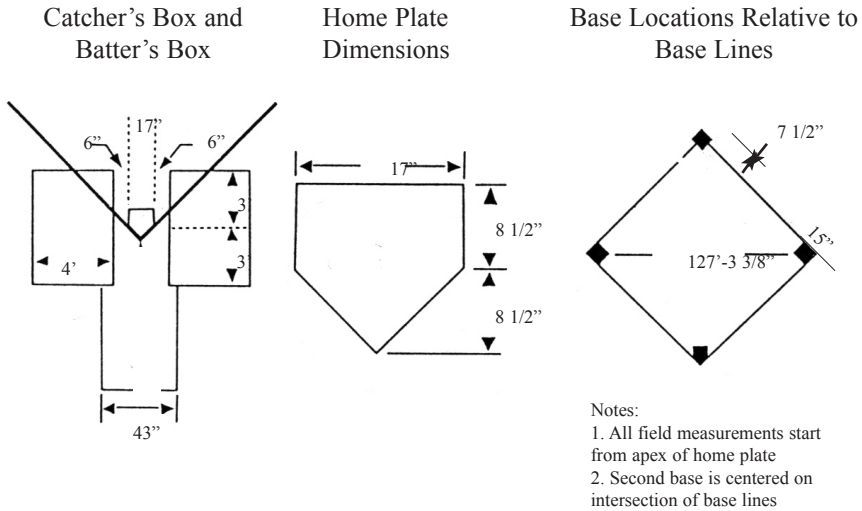
- skinned infield
- turf outfield

**Figure 1: Regulation Full-Size Baseball Field Dimensions**

A warning track, 10'-15' wide, is recommended in front of the outfield fence, the dugouts, and backstop. The surface of the warning track should contrast in texture with turf (eg. crushed stone etc.).

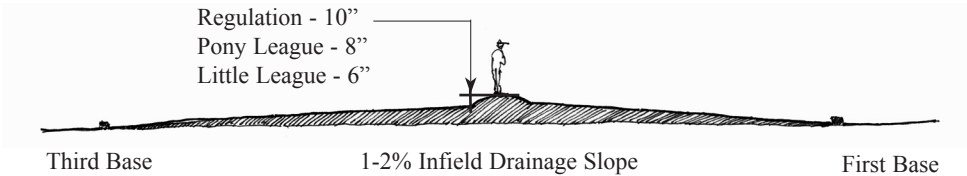
Recommended Outfield Distance:  
 Foul Lines 300-330'  
 Center Field 350-400'





**Pitching Mound Dimensions**  
 The Pitching Mound has a diameter of 18'. The Pitching Rubber is set within a 5' X 34" level area located 18 inches behind the center point of the Pitching Mound. From a point 6" in front of the Pitching Rubber, the ground slopes at a rate of 1" per 1'.

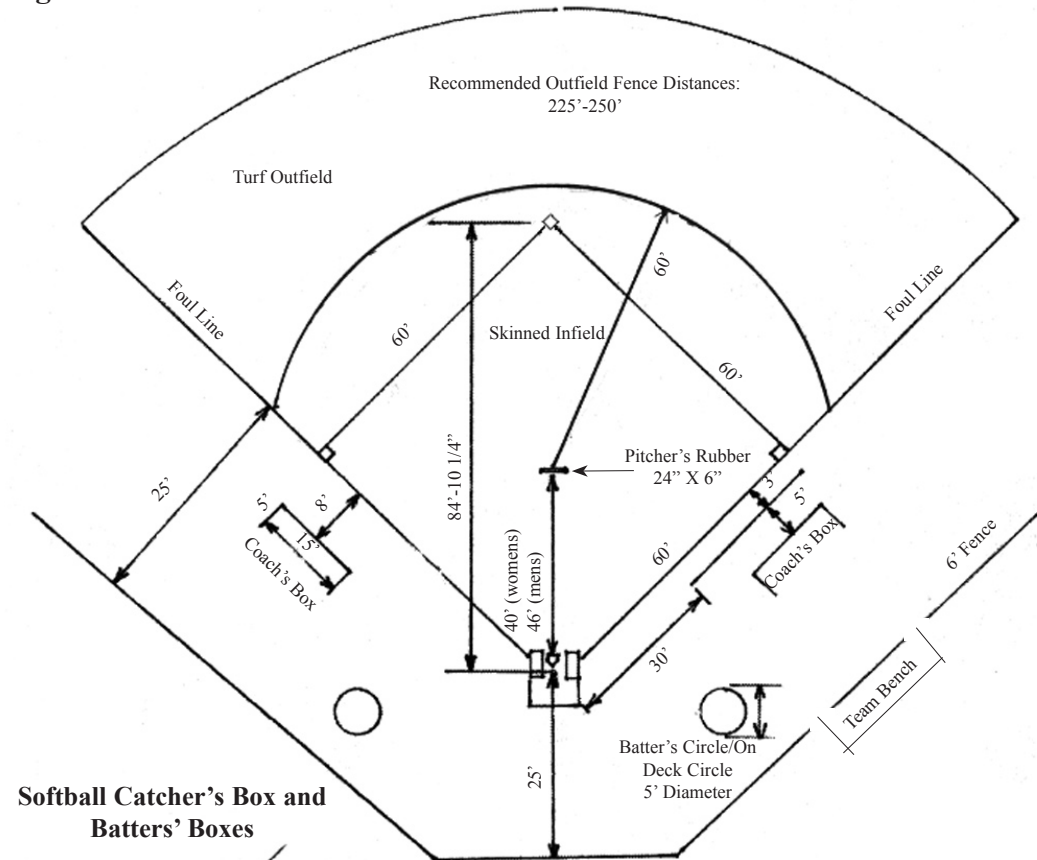
**Figure 2: Height of the Pitching Mound & Overall Infield Slope**



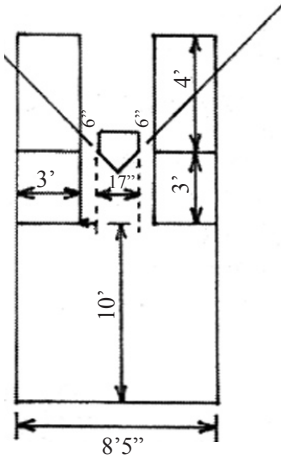
**Note:**  
 Baseball fields intended for Youth Baseball Leagues do not necessarily require a pitching mound



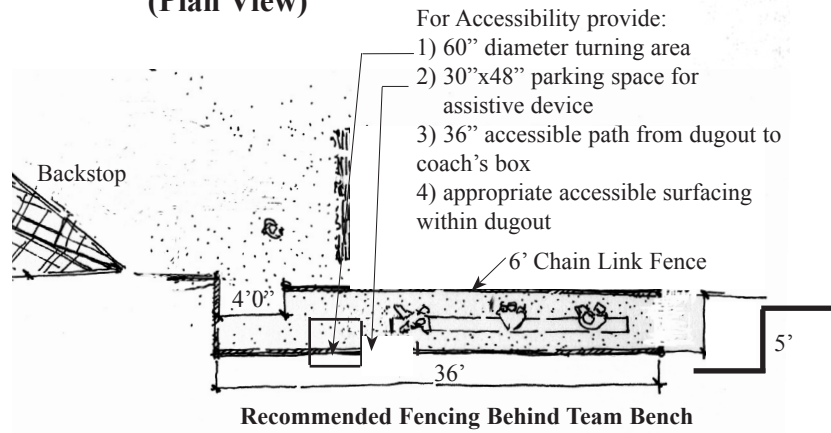
**Figure 3: Softball Field Dimensions**



**Softball Catcher's Box and Batters' Boxes**



**Figure 4: Dugout Configuration (Plan View)**



### Infield Mixture

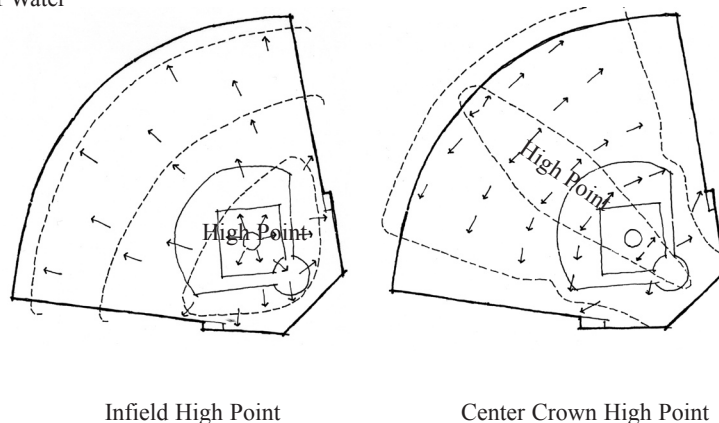
- skinned infields are typically composed of a mixture of sand (30-40%) and clay (60-70%)
- sand specifications: 80% or greater must be 16 to 64 mesh screened sand, 6-8% must be mason sand, no more than 8% should 12 to 16 mesh screened sand, and no more than 4% should be 64 to 80 mesh screened sand
- the infield mixture should be pulverized during the mixing process to reduce clumping
- commercially prepared infield top dressings (vitrified and/or calcined clay particles can also be added to the infield mixture to greatly enhance its water absorbing capabilities and playability after rains)
- some Illinois communities opt to use crushed limestone fines in place of infield mix. Crushed limestone fines, rougher in texture, increase the water infiltration rate but is more abrasive for players. Crushed limestone fines may be appropriate for dugouts, coaches box, and warning track areas
- infield turf requires a high degree of maintenance
- new dugouts and coach's boxes must have an accessible surface

### Drainage

- surface gradients should ideally range between 1-2% and not exceed a 2.5% slope
- an underdrainage system uses tile beneath the field to increase water infiltration
- generally the distance between tiles should not exceed 30', but this is highly dependent on soil type and condition

**Figure 5: Baseball/Softball Field Drainage Options**

Note: Arrows Indicate  
Direction of Water  
Movement



Infield High Point

Center Crown High Point

### Anticipated Costs

- turf
  - seed: (Baseball) 80,000 square feet @ \$.10/square foot = \$8,000
  - seed: (Softball) 72,000 square feet @ \$.10/square foot = \$7,200

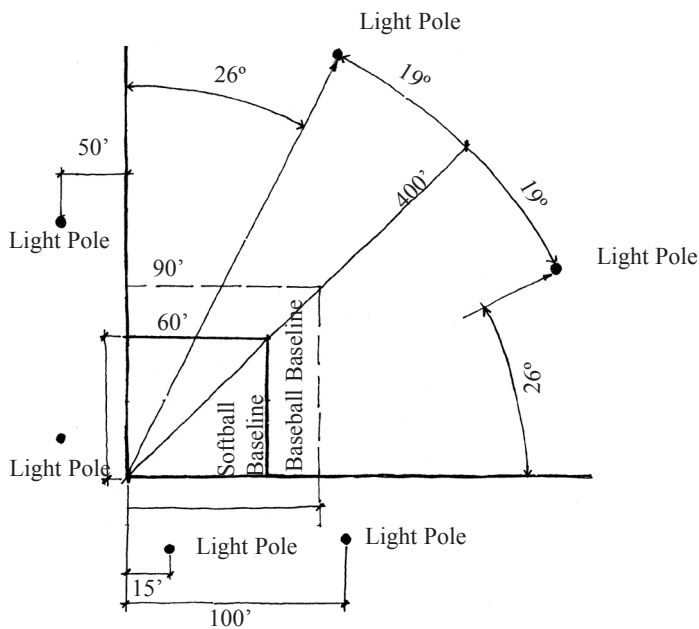
Desired Seed Mixture:	lbs./acre
Kentucky Bluegrass	50 lbs./acre
Perennial Ryegrass	30 lbs./acre
Creeping Fescue	20 lbs./acre

OR

- sod: (Baseball) 80,000 square feet @ \$.40/square foot = \$32,000
- sod: (Softball) 72,000 square feet @ \$.40/square foot = \$28,800
- infield mix:
  - 2" infield top dressing (if desired) 10 tons @ \$150/ton = \$1,500
  - (Baseball) 200 tons @ \$45 per ton = \$9,000
  - (Softball) 260 tons @ \$45 per ton = \$11,700
- 3 bases and home plate = \$410
- 6 benches (\$780 per bench) = \$4,680
- infield underdrainage = \$6,000
- irrigation
  - waterbox/quick coupler system = \$5,000
  - automated system for all turf areas = \$25,000
- backstop and side wing chainlink fencing = \$20,000-\$25,000
- sideline and outfield fencing
  - 4' galvanized chain link @ \$27.50 linear foot
- outfield fence protective cap @ \$3.00 per foot

### Lighting

- for amateur and high school leagues, infield illumination should measure 50 HFC and outfield illumination should measure 30 HFC (maintained light level)
- for recreational and social play, infield illumination should measure 30 HFC and outfield illumination should measure 20 HFC (maintained light level)
- while many fields use 1,500 watt metal halide lights on 70' poles, the height of the poles is dependent upon the number of poles and the size and number of fixtures necessary to obtain the desired level of illumination and setback from field
- electrically configure athletic field lights within isolated zone circuits so field lights may be switched off seasonally and after hours
- lighting should always be installed by an experienced, licensed electrician and comply with current Illinois and municipal electrical codes
- research all local codes and requirements early in the process. Many municipalities have stringent height and glare spill limitations.

**Figure 6: Six Light Pole Ball Field Configuration****Team Bench and Fencing**

- locate team benches at grade on either side of home plate
- 6' high safety fence in front of team benches is recommended to protect players from being struck by foul or thrown balls
- locate the side wing fence opening to protect players on the bench from foul balls
- some communities erect fencing behind team benches to protect the possessions of the players and limit fan interference
- backstops should be a minimum of 14' high
- use 6 gauge galvanized steel fence directly behind home plate for greater durability
- use 9 gauge galvanized steel fencing elsewhere
- it is recommended that outfield and side wing fencing be fitted with special fence tops (polyethelene caps) to help prevent player injury
- netting may be added to the backstop and side wing fencing if there is a potential for foul balls harming surrounding structures or spectators
- consider mower width when designing gate openings
- use of crushed stone under fencing reduces grass trimming
- see Figure 4 on page 8 for one dugout configuration



## Landscaping

- provide a shaded area for spectators

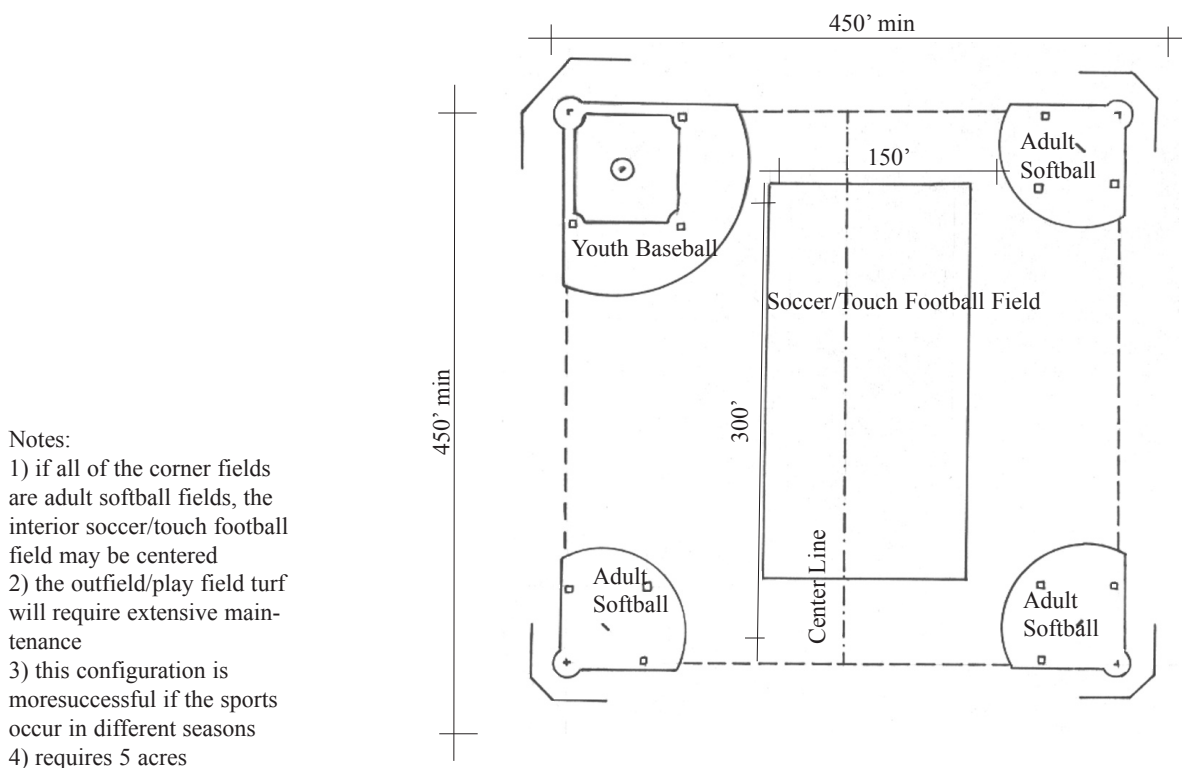
## Irrigation

- irrigation systems may consist of quick couplers, an automatic system, or a combination of the two systems
- quick couplers are in-ground hose attachments that provide access to a main water supply
- generally located behind second base as well as along field perimeter so maximum distance between quick couplers is 200'
- see [Appendix 1](#) for more information on quick couplers and automated irrigation systems

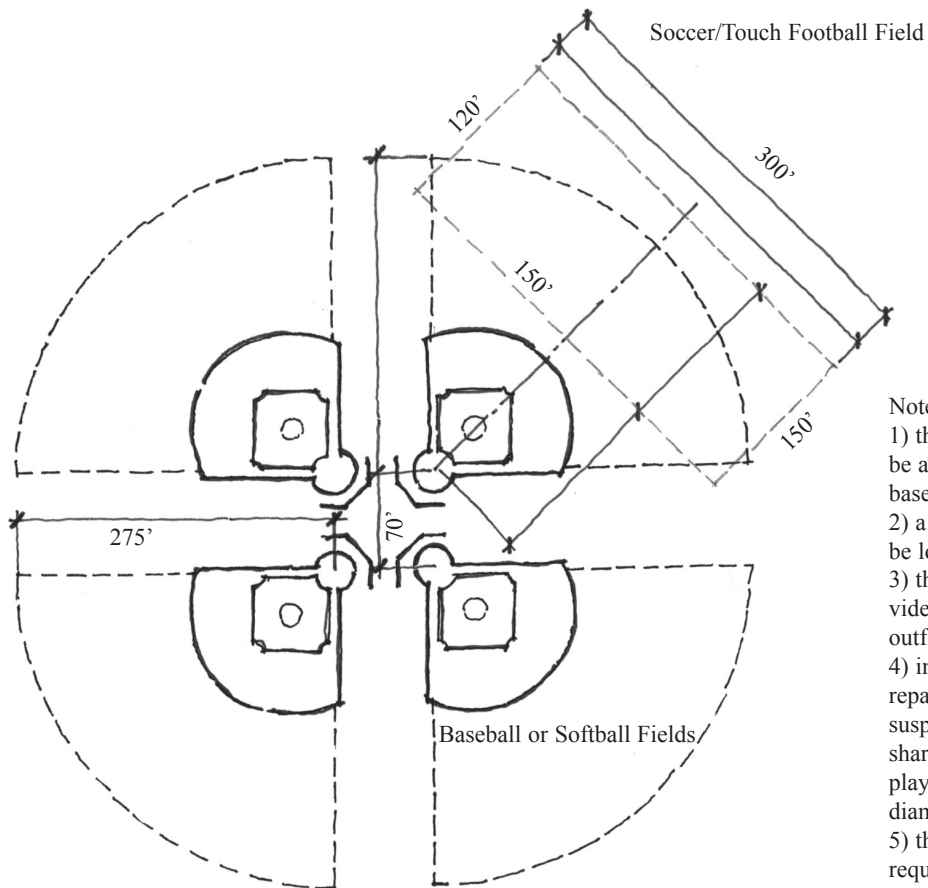
## Water Box

- provide a quick coupler for dampening the infield skinned area to reduce dust
- locate quick coupler either behind the pitching rubber or second base
- provide connection to a minimum 2" water line

**Figure 7: Four Corner Ball Field Configuration**



**Figure 8: Clover Leaf Ball Field Configuration with Possible Inclusion of Athletic Field:**



**Notes:**

- 1) this configuration may be altered to include five baseball/softball fields
- 2) a concession booth may be located in the center
- 3) this configuration provides more flexibility for outfield fences
- 4) in the event that the turf repair/replacements requires suspension of play in the shared field, baseball/softball play could continue at three diamonds
- 5) this configuration may require more extensive back-screening to prevent injury/damage from foul balls
- 6) requires a minimum 9 acres

**Parking**

- athletic fields/baseball fields: 10-15 parking spaces per acre of playing field

**Maintenance**

- skinned areas require frequent raking, dragging, and top dressing
- turf infield requires rolling, watering, and fertilizing
- turf maintenance may require slit seeding or selective resodding
- while irrigation improves the quality of the turf grass, it increases frequency of mowing and requires winterization

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## Soccer Field

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### Recommended Area

- unlike most sport fields, soccer fields may vary in size, within certain limits
  - Mens: 360' x 225' = 81,000 square feet (1.9 acres)
  - Boys: 300' x 165' = 49,500 square feet (1.14 acres)
  - Womens: 300' x 180' = 54,000 square feet (1.24 acres)
  - Girls: 240' x 120' = 28,800 square feet (.66 acres)
- maintain 30' of unobstructed space around the field's perimeter for a safety zone

### Dimensions

Category: Ages:	U13 - U19 13 years thru Adult		
Length	300'-390'	Width	150'-300'
Goal Size (height x width)	8' x 24'	Goal Area (width x depth)	18' from each post x 18' deep
Center Circle Radius	30'	Corner Arch Radius	3'
Penalty Arch Radius (center point 12' in from center of goal line)	30'	Penalty Mark	36' front and center of goal
Penalty Area	36' from each goal post x 54' deep		

Field dimensions for U6 to U12 small sided games, refer to the Illinois Youth Soccer Association website, [www.Illinoisyouthsoccer.org](http://www.Illinoisyouthsoccer.org), or call the Illinois Youth Soccer Association (847-290-1577).

### Surface:

- flat, level surface with grass cut to no more than 2.5 inches high, and with no dangerous defects such as exposed sprinkler heads.

### Goals:

- Posts and cross bars should be five inches wide, and the net should be secured to the posts and cross bar. For information on how to properly anchor a soccer goal, review [the Guidelines and Movable Soccer Goal Safety](#), which are available from the U.S. Consumer Safety Commission website, [www.cpsc.gov/cpscpub/pubs/soccer.pdf](http://www.cpsc.gov/cpscpub/pubs/soccer.pdf)

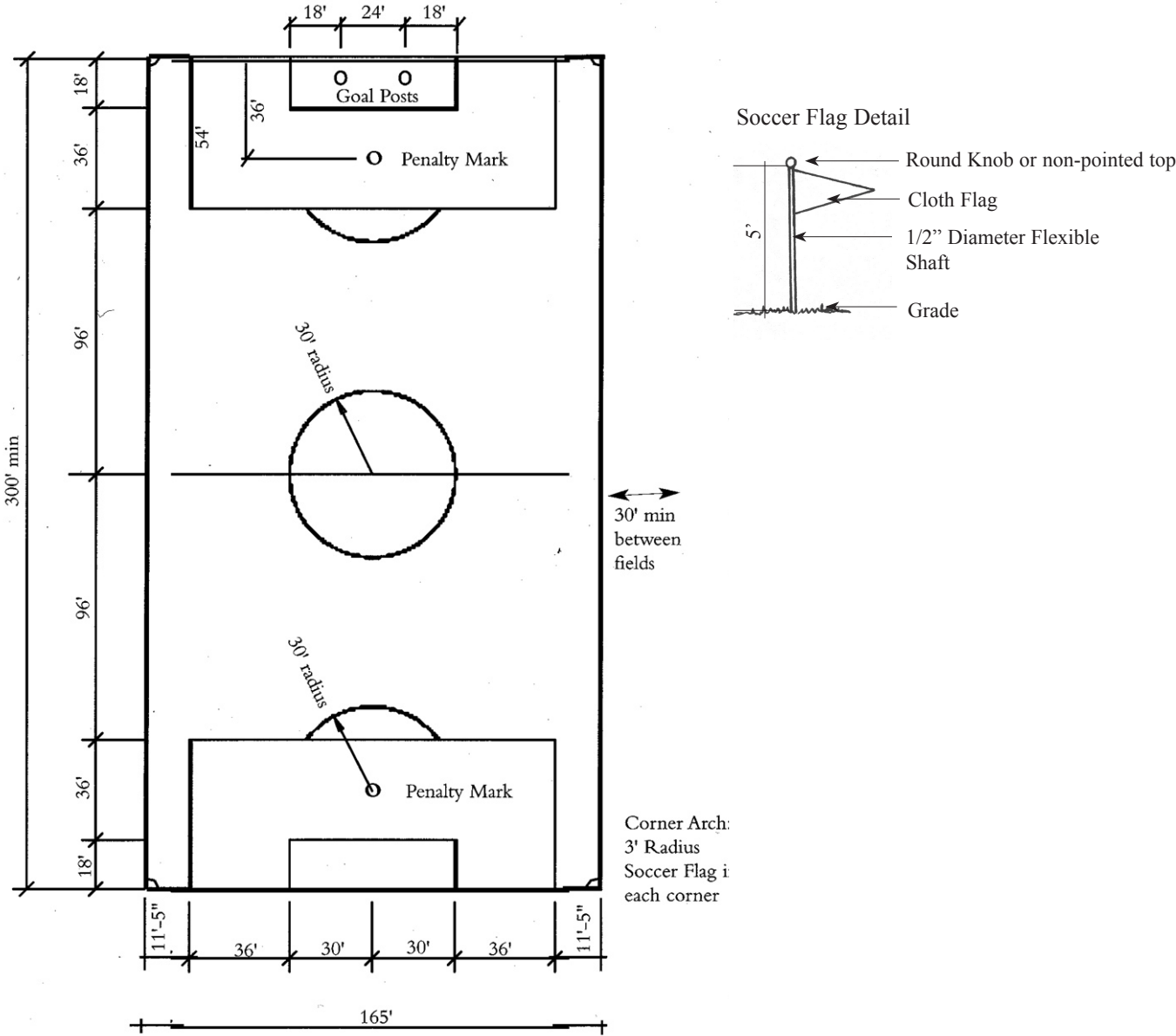
### Markings:

- Five-inch-wide white lines delineating regulation field, including restraint lines for spectators. The restraint lines should be painted a different color and a minimum of 5 feet from the edge of the touchline. Spectators and players should be on opposite sides of the field. The corner arc should be a one-yard radius.

**Orientation**

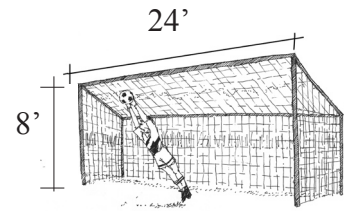
- if soccer play occurs in spring, summer, and fall, orient the length of the soccer field along a north-south axis
- if soccer play primarily occurs in fall, orient the length of the soccer field along a northwest-southeast axis

**Figure 9: Boys Soccer Field Dimensions**



### Goal Posts and Nets

- goal dimensions are 8' high x 24' wide
- width of goal posts should be greater than 4" but not exceed 5"
- goal may be portable or permanent
- portable goals facilitate field shifting to reduce turf damage
- top of the net should extend 2' behind crossbar
- net attaches to the crossbar, posts, and ground behind the goal
- allow level net area behind goal line



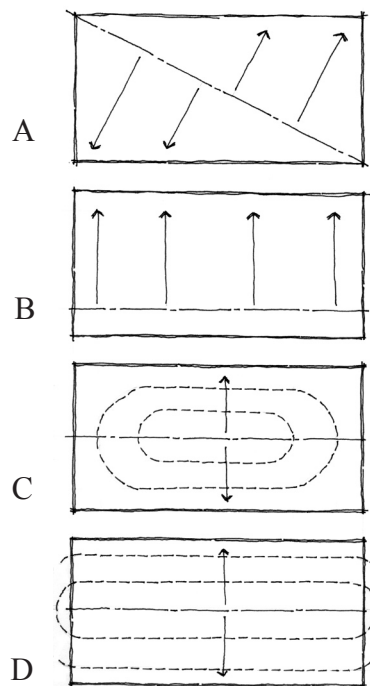
### Surfacing

- turf grass

### Drainage

- surface gradients should ideally range between 1-3% with a 2% optimal slope
- an underdrainage systems using pvc perforated pipe tile increases water infiltration
- generally, the distance between tiles should not exceed 30', although this is highly dependent on soil type and condition

**Fig. 10 Soccer Field Drainage Options**



Note: Arrows represent the direction of water movement

**Anticipated Costs**

- turf grass
- seed: (300' X 180') 54,000 square feet @ \$.10/square foot = \$5,400

Desired Seed Mixture:	lbs./acre
Kentucky Bluegrass	50 lbs./acre
Perennial Ryegrass	30 lbs./acre
Creeping Fescue	20 lbs./acre

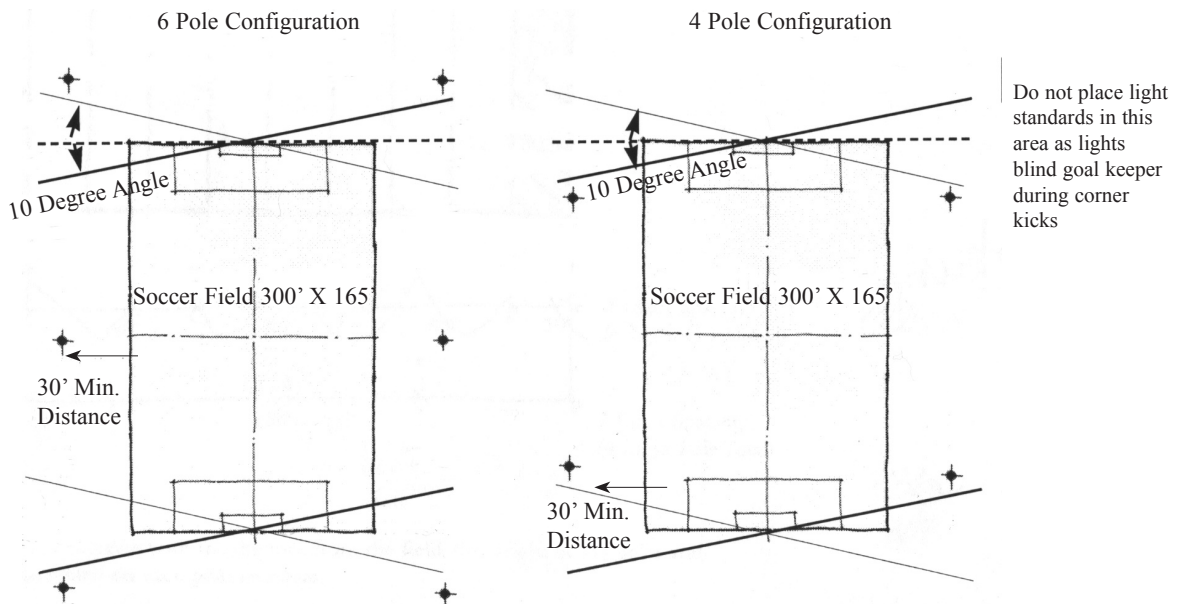
OR

- sod: (300' X 180') 54,000 square feet @ \$.40/square foot = \$21,600
- 2 goals and 4 flags = \$4,200
- grading, topsoil amendment, drainage, and irrigation expenses are highly site specific

**Lighting**

- for amateur or high school league play, soccer field illumination should measure 30 HFC (maintained light level)
- for recreational or social play, soccer field illumination should measure 20 HFC (maintained light level)
- light poles should be placed along the length of the field
- 4 or 6 light pole configurations are common

**Figure 11: Soccer Light Pole Configurations**





### **Fencing**

- fencing can be used to restrict soccer balls from entering undesirable areas

### **Landscaping**

- a thick hedge may serve as a fencing alternative
- consider providing a shaded area for observers

### **Irrigation**

- irrigation systems may consist of quick couplers, an automatic system, or a combination of the two systems
- quick couplers are in-ground hose attachments that provide access to a main water supply
- see [Appendix 1](#) for more information on quick couplers and automated irrigation systems

### **Maintenance**

- consider allowing sufficient space on either side of the field so that the field may be shifted during the season to reduce the typical pattern of wear in front of the goal areas and at center circle
- movable goals facilitate field shifting
- slit seeding helps maintain turf quality

### **Parking**

- 10-20 parking spaces
- see [Appendix 1](#) for more information on parking

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## Touch/Flag Football Field

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### Recommended Area

- 1 acre

### Dimensions

- touch football field: 300' X 120'
- add minimum width of 20' of unobstructed open space around field perimeter for safety zone
- see Figure 14 on page 27

### Orientation

- if the majority of play occurs in the fall, the length of the field should be oriented northwest-southeast
- if a significant amount of play occurs in the spring, the length of the field should be oriented north-south

### Surfaces

- turf grass

### Drainage

- grade the field to create a crown along the center of the touch football field from goal to goal
- field should slope downward between 1% and 3% with a 2% optimal slope
- underdrainage systems use perforated plastic pipe surrounded in aggregate stone laid out in a serpentine shape to increase water infiltration

### Anticipated Costs

- turf grass  
seed: (300' X 120') 36,000 square feet @ \$.10/square foot = \$3,600

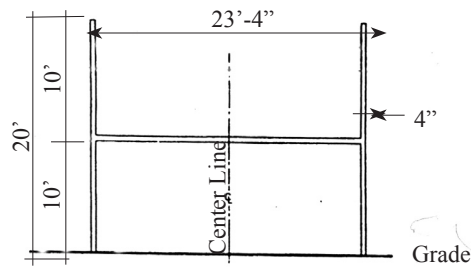
Desired Seed Mixture:	lbs./acre
Kentucky Bluegrass	50 lbs./acre
Perennial Ryegrass	30 lbs./acre
Creeping Fescue	20 lbs./acre

OR

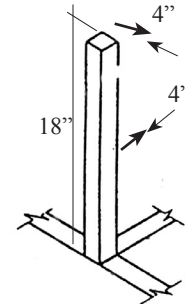
- sod: (300' X 120') 36,000 square feet @ \$.40/square foot = \$14,400
- 2 goals and 4 pylons = \$4,000
- underdrainage = \$18,000

### Goal Posts and Pylons

- goal posts may be permanently fixed at the ends of the field or temporarily set within in-ground using post sleeves thus increasing field flexibility
- red or orange pylons, constructed of soft flexible material, mark the corners of the touch/flag football field

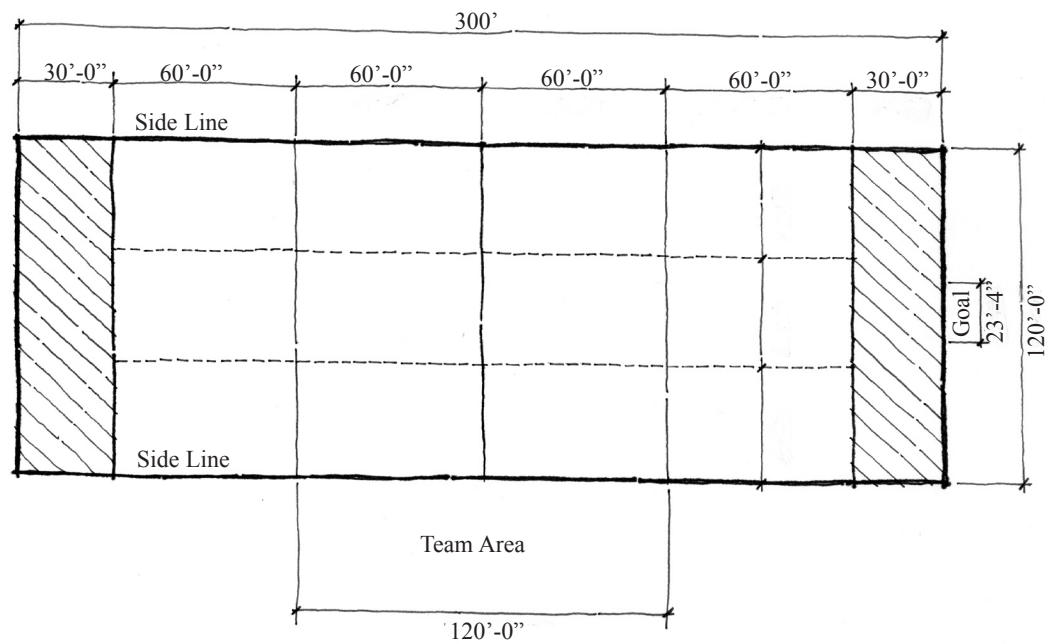


Goal Post



Pylon

**Figure 12: Touch/Flag Football Field Dimensions**



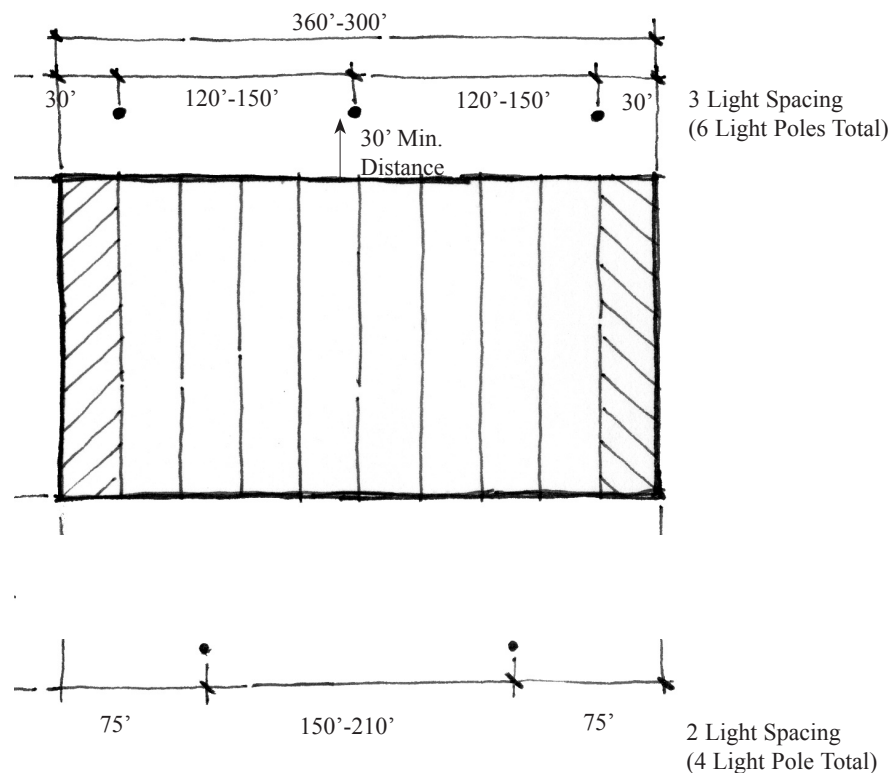
### Lighting

- football fields must be uniformly illuminated
- for amateur or high school leagues, football field illumination should measure 30 HFC or higher (maintained light level)
- for recreational or social play, football field illumination should measure 20 HFC or higher (maintained light level)
- locate light poles longitudinally along the length of the field
- configurations of 4 or 6 light poles are common
- typically football field light poles are 50' or higher

### Fencing

- context specific

**Figure 13: Touch/Flag Football Light Pole Configurations**



**Note:**

While the number of poles decrease with the distance from the field, the height of the poles and the number of fixtures mounted on each pole increases.

### **Landscaping**

- provide shade for observers

### **Parking**

- athletic fields/baseball fields: 10-15 parking spaces per acre of playing field
- see [Appendix 1](#) for more information on parking

### **Irrigation**

- irrigation systems may consist of quick couplers, an automatic system, or a combination of the two systems
- quick couplers are in-ground hose attachments that provide access to a main water supply
- see [Appendix 1](#) for more information on quick couplers and automated irrigation systems

### **Maintenance**

- slit seeding helps maintain turf quality
- irrigation increases turf durability

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## Multi-Use Fields

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### General

- multi-use fields may efficiently share infrastructure facilities such as lighting, irrigation, and nearby parking and washroom facilities
- soccer fields, touch football fields, and baseball outfields are often combined
- disadvantages of multi-use fields include increased wear on turf and scheduling conflicts

### Recommended Area

- dependent upon number and type of fields

### Orientation

- desirable orientation is consistent with previous description of individual athletic fields
- combining athletic fields may reduce the ability to position each athletic field for optimal orientation

### Lighting

- use illumination guidelines for the individual athletic fields

### Parking

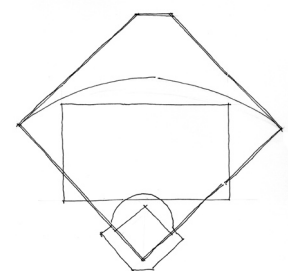
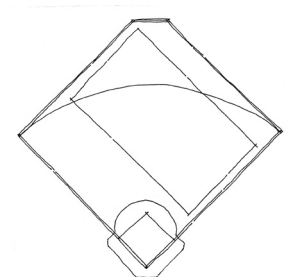
- athletic fields/baseball fields: 10-15 parking spaces per acre of playing field
- see [Appendix 1](#) for more information on parking

### Maintenance

- multi-use field will require frequent turf replacement or slit seeding
- irrigation increases turf durability

### Special Considerations

- by staggering start times, traffic congestion and parking difficulties at multi-use fields may be substantially reduced
- accommodating certain field overlap scenarios may require removable fencing and portable goals
- its preferable to maintain large open turf areas to accommodate changing field dimensions that may reflect shifting demographic character of surrounding neighborhood



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# Basketball Court

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## Recommended Area

- 5,040 square feet including 3' safety zone around the perimeter for junior play
- 7,280 square feet including 10' safety zone around the perimeter for high school, college, and professional play

## Dimensions

- full court basketball: 84' x 50'
- half court basketball: 42' x 50'
- mini court basketball: 40' x 60'
- circular basketball: 64' x 64'

## Orientation

- orient the length of the full basketball court along a north - south axis
- the goal of a half basketball court should face north

## Surfacing

- asphalt or concrete
- a colored, resilient acrylic surfacing may be applied to an asphalt surface

## Drainage

- slope the court .8 - 1.2% from end to end

## Anticipated Costs

- asphalt: 560 square yards of asphalt @ \$25.00/sq. yard = \$14,000
- resilient acrylic surfacing  
560 square yards @ \$7.50/square yard = \$4,200
- 2 goal standards and nets @ 1,250 each = \$2,500

## Lighting

- for amateur or high school leagues basketball court illumination should measure 20 HFC (maintained light level)
- for recreational or social play basketball court illumination should measure 10 HFC (maintained light level)

## Fencing

- context specific

## Landscaping

- context specific



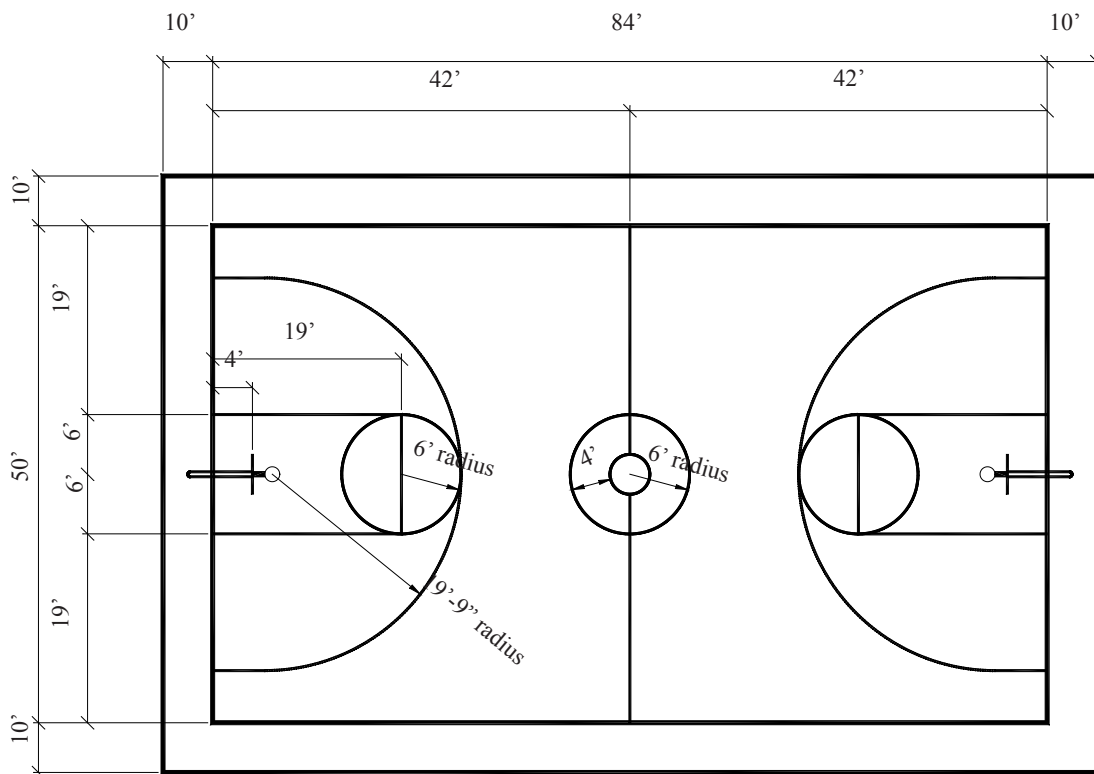
### Parking

- 5-10 spaces per court
- see [Appendix 1](#) for more information on parking

### Location of Basketball Standard

- basketball standard has a minimum 6' offset from post to hoop
- locate standard 2' behind the baseline so the face of the backboard projects 4' in front of the baseline

**Figure 14: Full Court Basketball Dimensions**



### Backboard Configuration and Net

- rim of the hoop is exactly 10' from the ground
- if more than 2 hoops exist, consider having one hoop 8' from the ground, for multi-age accessibility
- rectangular or fan shaped backboards are available
- backboard should either be white or transparent
- transparent backboards must be marked with a 3" border around the edge and a 18"x24" target area behind the hoop

- fiberglass backboards produce less noise than metal backboards
- despite the need for regular replacement, string nets are preferable to chain nets
- nylon strap nets are more durable than string and produce a sound similar to string nets

### Circular Basketball

- circular basketball contains 'pie shaped' courts with 3 nets
- the circle measures 64' in diameter with additional 3' safety zone beyond baseline

### Maintenance

- remove sand, soil or debris from the play surface on a regular basis

### Accessibility

- if parking is provided, connect the parking area to the basketball court with a 36" wide walk which is firm, smooth, and slip resistant (maximum 5% slope, maximum 2% cross slope)

Figure 15: Circular Basketball

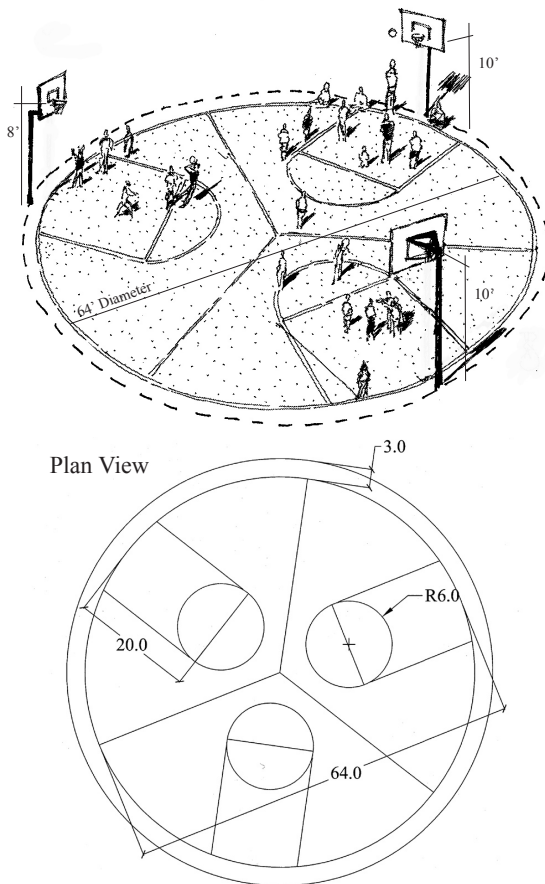
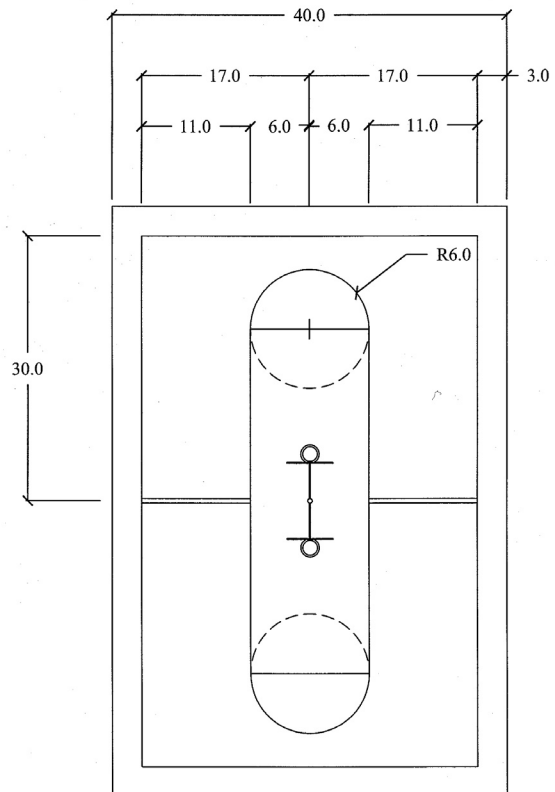


Figure 16: Half-court Basketball Option



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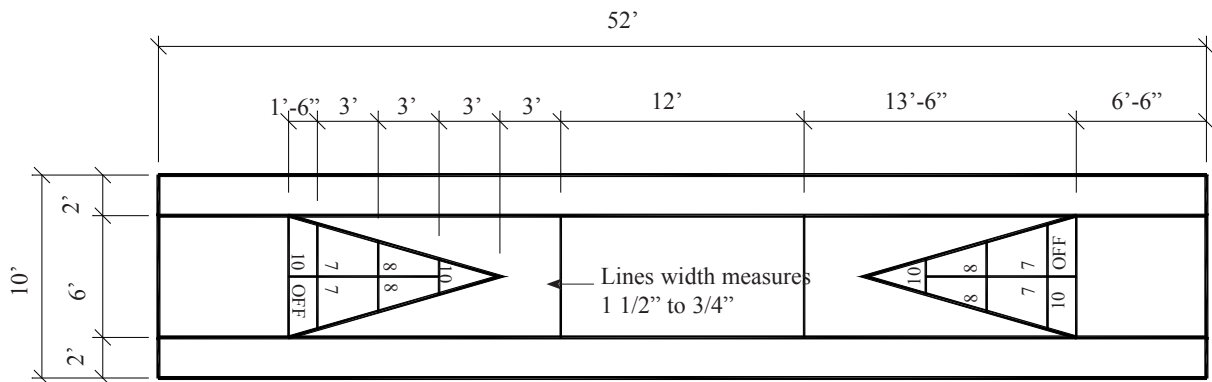
# Shuffle Board Court

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## Recommended Area

- 10' X 52' (520 square feet) single shuffle board court

**Figure 17: Shuffle Board Court Dimensions**



Note: Adjacent shuffleboard courts must be spaced 4' apart.

## Orientation

- orient the length of the shuffle board court along a north-south axis

## Surfacing

- smooth terrazzo or burnished concrete surface without expansion joints
- saw-cut necessary concrete joints
- broom finish concrete in out-of-bounds areas

## Drainage

- shuffle board court slopes .8-1.2%
- side alley may be depressed and contain drains to remove surface run-off

## Anticipated Costs

- concrete 784 square feet @ \$4.75 square foot = \$3,724

## Lighting

- shuffle board court illumination should measure 5-10 footcandles (maintained light level)

## Fencing

- context specific

### **Landscaping**

- context specific

### **Parking**

- no specific parking guidelines exist
- see [Appendix 1](#) for more information on parking

### **Court Markings**

- lines and numbers should be marked with either black acrylic paint or black shoe dye
- line width may vary from 3/4" to 1 1/2"

### **Maintenance**

- remove sand, soil, debris, and water from the play surface on a regular basis

### **Accessibility**

- if parking is provided, connect the parking area to the shuffle board court with a 36" wide walk which is firm, smooth, and slip resistant (maximum 5% slope, maximum 2% cross slope)

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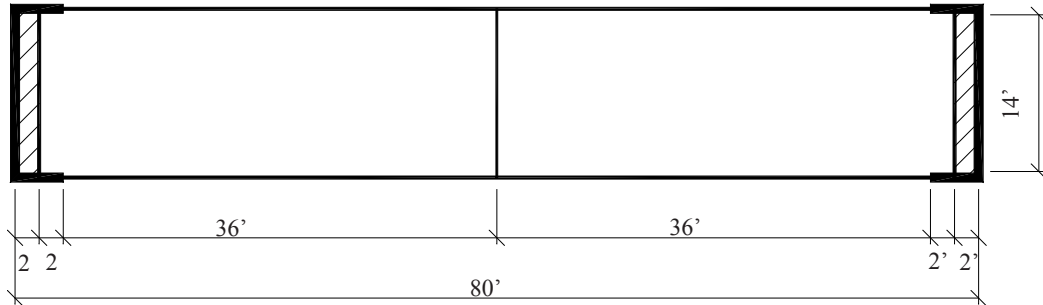
## Bocce Ball Court

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### Recommended Area

- 1,134 square feet (14' X 80')

**Figure 18: Bocce Ball Court Dimensions**



- bocce ball court: 14' X 80'
- ditches, measuring 2' wide and 6" deep, trap overthrown balls on each end of the court
- u-shaped backstops are located behind ditches
- minimum 2' separation between bocce ball courts

### Orientation

- orient the length of the bocce ball court along a north-south axis

### Surfacing

- clay, crushed fines, or artificial surfacing

### Drainage

- surface should be smooth
- provide underdrainage

### Anticipated Costs

- clay
- aggregate stone
- filter fabric
- backstops = \$3,000 total

### **Backstops**

- wooden backstops should extend from the bottom of the ditch to a height of 48” above the bocce ball court
- drill holes through the base of the wooden backstops to permit subsurface water movement

### **Lighting**

- bocce ball court illumination should measure 5-10 HFC (maintained light level)

### **Fencing**

- context specific

### **Landscaping**

- context specific

### **Parking**

- no specific guidelines exist
- see [Appendix 1](#) for more information on parking

### **Maintenance**

- clay court must be regularly raked
- clay must be periodically added

### **Accessibility**

- if nearby parking is provided, connect the parking area to the bocce ball court with a 36” wide walk which is firm, smooth, and slip resistant (maximum 5% slope, maximum 2% cross slope)

### **Special Considerations**

- locate a storage box nearby for extra clay
- consider fixing a lectern style score card holder adjacent to the court





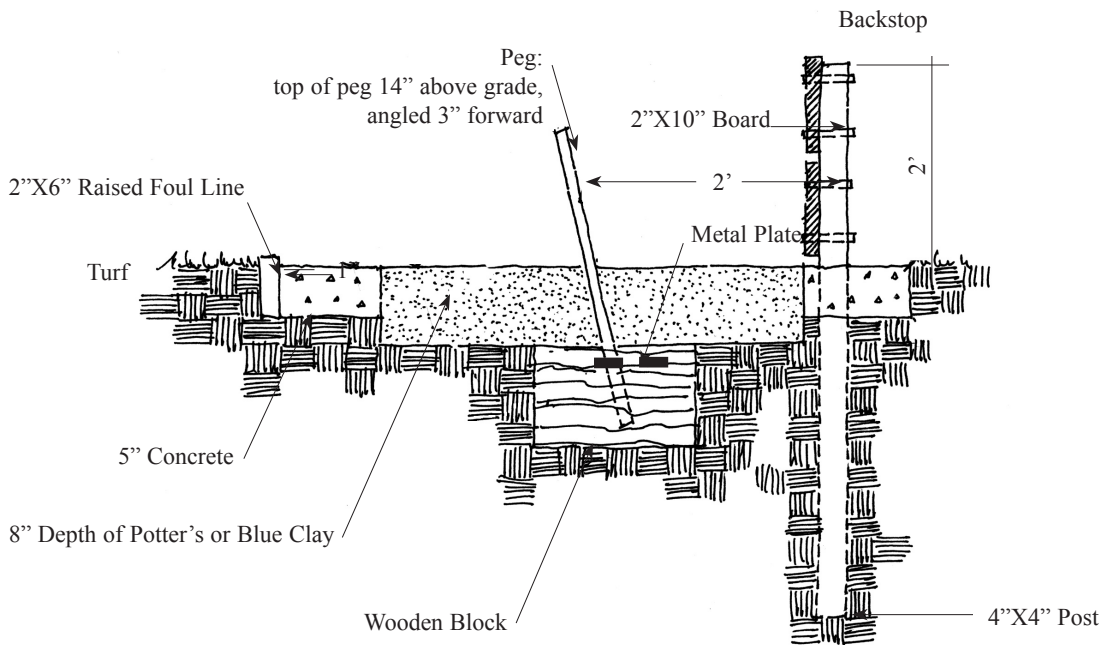
### Wooden Backstops

- 2' high, 6' wide, located 2' behind each peg
- backstops should be made of pressure treated lumber

### Pegs

- steel pegs measure 2'-3' long and 1" in diameter
- each peg is slanted 2"-3" forward toward the center of the court and project 14" above the clay surface
- pegs are anchored within oak blocks buried 8" beneath the clay
- oak blocks are preferable to concrete because wood can absorb force without crumbling

**Figure 20: Cross Section of Horseshoe Peg**



### Lighting

- horseshoe court illumination should measure 5 HFC (maintained light level)

### **Fencing**

- if horseshoe courts are close to other activity areas such as playgrounds or seating areas, consider erecting a 42” chainlink fence. Fencing adds another layer of containment for poorly thrown horseshoes and reduces the potential danger from the protruding steel pegs

### **Parking**

- no specific guidelines exist
- see [Appendix 1](#) for more information on parking

### **Accessibility**

- if nearby parking is provided, connect the parking area to the horseshoe pitch with a 36” wide walk which is firm, smooth, and slip resistant (maximum 5% slope, maximum 2% cross slope)

### **Maintenance**

- clay in peg area requires frequent raking and the regular addition of new clay
- keep moist for tournament play
- periodic replacement of wooden block required

# Sand and Hard Surface Volleyball Court

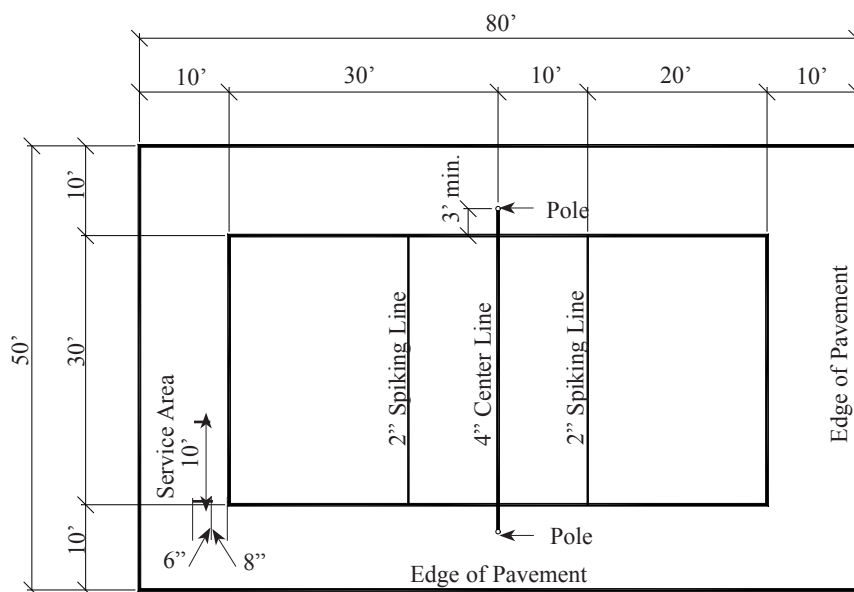
## Recommended Area

- 5,000 square feet including safety zone

## Dimensions

- volleyball court dimensions with safety zones: 80' x 50'
- minimum 10' safety zones along sides
- adjacent courts should be spaced 12' apart

**Figure 21: Volleyball Court Dimensions**



## Orientation

- orient the length of the volleyball court along a north-south axis

## Net

- net height varies by category:

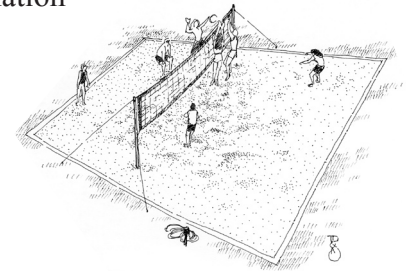
Category	Net Height
men	8'
co. rec	8'
women	7'4"
high school	7'4"
elementary school	6'6"

- while nets with cable at the top are recommended, strong rope is an acceptable alternative

- secure net with a winch and eyebolts at the top and bottom of the net
- padding of the winch or a removable winch reduces injury potential
- angle net posts outward 2” for tightening

### Lighting

- for amateur or high school leagues, outdoor volleyball court illumination should measure 20 HFC (maintained light levels)
- for recreational or social play, outdoor volleyball court illumination should measure 10 HFC (maintained light levels)



### Sand Volleyball Surfacing

- 12”-20” depth of high quality, clean sand
- sand should not be coarse or contain small pebbles
- sand should not be too fine as it turns mud-like in consistency when wet and will blow away when dry
- while washed mason sand is recommended, obtain sand samples prior to delivery and allow representatives of user groups to select desired sand texture

### Sand Volleyball Drainage

- sand volleyball court located on well-drained soils with no rocks may not require installation of an underdrainage system
- most permanent sand volleyball courts incorporate an under drainage system with plastic perforated tile encased in washed, non-compacting aggregate stone to enhance infiltration
- synthetic landscape textile surrounds the layer of aggregate stone and soil and prevents sand and soil layers from mixing

### Sand Volleyball Court Markings

- court boundaries must be marked with a material that will not hurt players: wooden boards and railroad ties are not appropriate materials
- rope (3/4” or greater) or webbing (1 1/5”) are suitable markers
- markers may be tied to deadman anchors and buried in the sand

### Water Spigot

- locating a drinking fountain with hose bib near the sand volleyball court provides water to cool hot sand and players
- water spigot provides a source of water for ice rink flooding

### Conversion of Sand Volleyball Court into Ice Rink

- secure plastic membrane to the surface of the sand volleyball court to stop water from flowing off the court

- suitable white plastic membranes are commercially available
- net posts must be removable
- rink conversion is most successful if double or triple court design

### **Sand Volleyball Anticipated Costs**

- sand: 231 square yards (6,250 square feet) @ \$44.00/square yard = \$10,164.00
- volleyball standards: \$850
- markers and anchors: \$250

### **Hard Court Volleyball Surfacing**

- asphalt or concrete surface
- asphalt may be painted with a colored acrylic surface

### **Hard Court Volleyball Drainage**

- slope the court from side to side with a minimum 1% slope

### **Hard Court Volleyball Anticipated Costs**

- asphalt : 556 square yards (5,000 square feet) @ \$25.00/square yard = \$13,900
- resilient acrylic surfacing 556 square yards @ \$7.50/square yard = \$4,170.00
- volleyball standards = \$850

### **Fencing**

- context specific

### **Landscaping**

- consider creating 2' earth berm adjacent to sand volleyball court

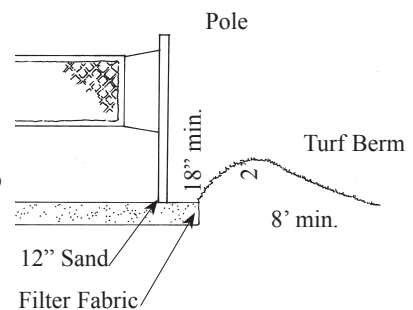
### **Parking**

- 5 spaces per court
- see [Appendix 1](#) for more information on parking

### **Accessibility**

- if nearby parking is provided, connect the parking area to the volleyballcourt with a 36" wide walk which is firm, smooth, and slip resistant (maximum 5% slope, maximum 2% cross slope)

Sand Volleyball Court Berm



### **Maintenance**

- rake sand
- remove sand, soil, water, and debris from hard volleyball court surface

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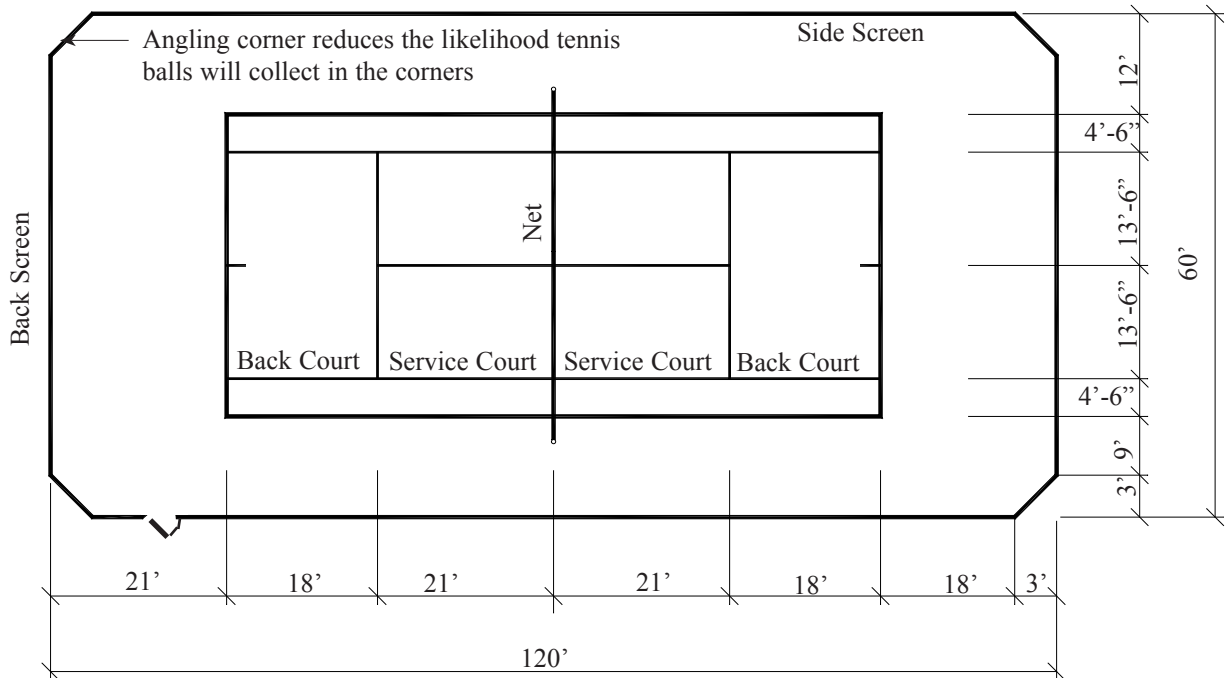
# Tennis Court

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## Recommended Area

- 7,200 square feet including surrounding safety zone per court

**Figure 22: Tennis Court Dimensions**



## Orientation

- orient the length of the tennis court along a north-south axis

## Surfacing

- asphalt, concrete, turf, or clay
- clay and turf courts are less frequently constructed due to their increased maintenance demands
- colored acrylic surfacing may be painted on concrete or asphalt surface courts to define the court markings
- commercially prepared surfacing adds cushioning to court surface

### Drainage

- asphalt or concrete courts require surface drainage
- grade the court to provide a 1% slope
- slope the surface downward from side to side, end to end, or from corner to corner
- high elevation point of the tennis court should not run along the net
- clay or turf courts require both surface drainage and an under drainage system
- consider running tile around the perimeter of the courts

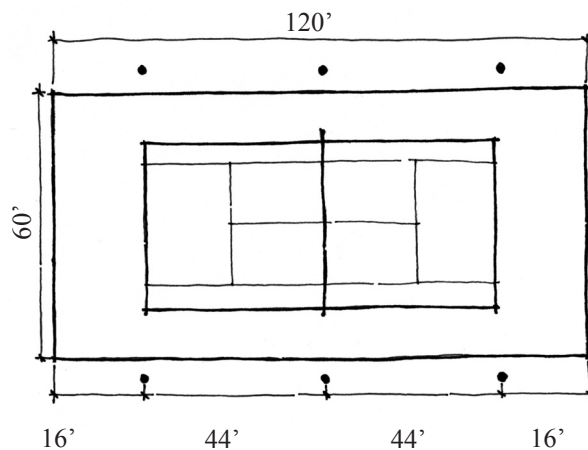
### Anticipated Costs

- asphalt paving: 800 square yards @ \$25.00/square yard = \$20,000
- acrylic surfacing: 7,200 square feet @ \$2.25 /square foot = \$16,200
- fencing: 360 feet @ \$49.00 /linear foot = \$17,640
- gates = \$800 each
- net and footings = \$950

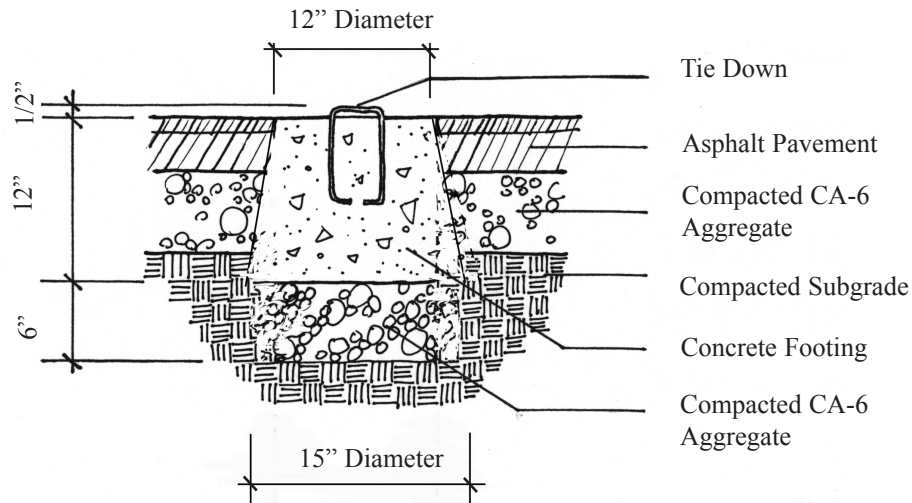
### Lighting

- for amateur or high school leagues, outdoor tennis court illumination should measure 30-40 HFC (maintained light levels)
- for recreational or social play, outdoor tennis court illumination should measure 20-30 HFC (maintained light levels)
- tennis court lights should be mounted 20' above the court surface
- lights may be coin operated or motion activated

**Figure 23: Tennis Court Light Pole Configuration**





**Figure 24: Tennis Court Net Anchor Detail****Fencing**

- height of the surrounding fence must be 10' - 12' at each end of the court
- surround court with 9 gauge chain-link with 1 3/4" mesh
- behind service areas, reinforce fence with wire to prevent distortion over time
- if wind screening is to be used, fence and footings should be designed to accommodate wind-loading
- aluminum fencing is preferred to galvanized steel as galvanized steel tends to have burrs
- wire fencing may be coated with colored polyvinyl chloride or acrylic powder coat

**Parking**

- 2 spaces per court
- see [Appendix 1](#) for more information on parking

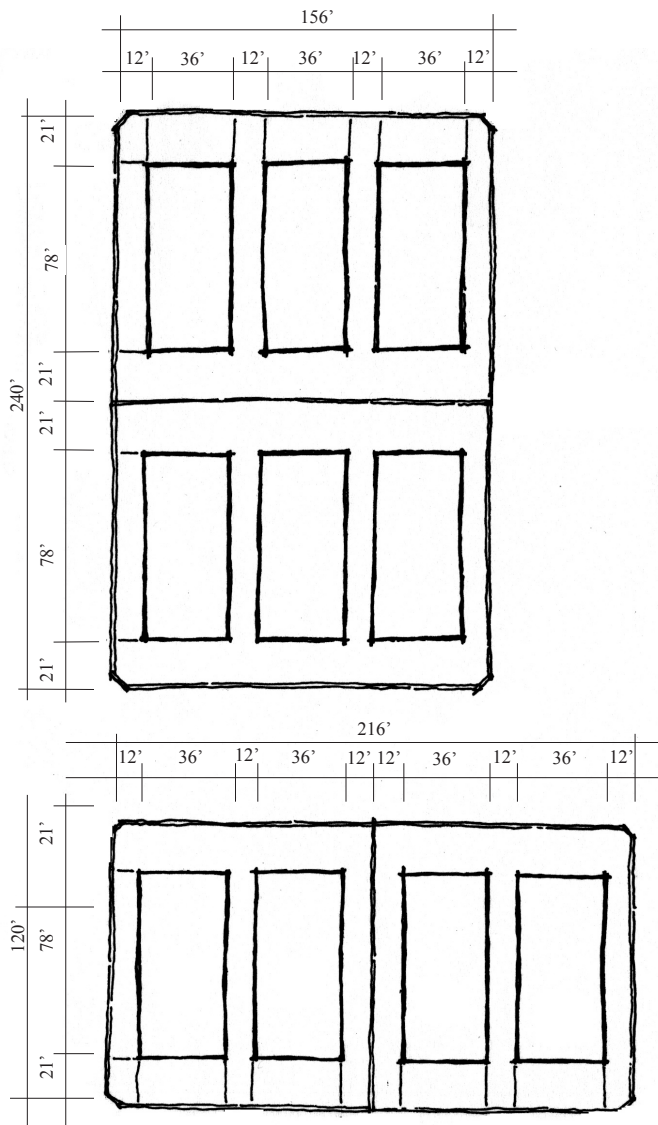
**Accessibility**

- if nearby parking is provided, connect the parking area to the tennis court with a 36" wide walk which is firm, smooth, and slip resistant (maximum 5% slope, maximum 2% cross slope)

**Maintenance**

- re-painting court surface will be required over time
- occasional removal of surface water with squeegee

**Figure 25: Four and Six Tennis Court Configurations**



**Multi-Court Configurations**

- allow 12' between side boundary lines of adjacent tennis courts
- when laying out a row of adjacent tennis courts consider partitioning every two courts with fencing to reduce interference from other courts

**Special Considerations**

- angling the fence corners reduces likelihood tennis balls will collect in the corners
- center of the court requires net tie-down so net is six inches lower in center versus the sides

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## Platform Tennis Court

---

### Recommended Area

- 1,800 square feet including surrounding safety zone per court

### Orientation

- orient the length of the platform tennis court along a north-south axis

### Surfacing

- raised level wood or aluminum platform, 1/4" spacing between 6" decks

### Drainage

- wood or aluminum platforms require surface drainage
- grade the court to provide a 1% slope
- slope the surface downward from side to side, end to end, or from corner to corner
- high elevation point of the platform tennis court should not run along the net
- many courts have a heating system installed beneath the deck to allow play in all weather conditions

### Anticipated Costs

- aluminum decking: 1800 square feet @ \$15.00/square foot = \$27,000
- fencing: 180 feet @ \$55.00 /linear foot = \$9900
- gates = \$800 each
- net and footings = \$950

### Lighting

- platform tennis court lights should be mounted 20' above the court surface
- lights may be coin operated or motion activated

### Fencing

- the court is surrounded by a 12' high superstructure with taut, 16-gauge "chicken wire" fencing

### Parking Guideline

- 2 spaces per court
- see [Appendix 1](#) for more information on parking

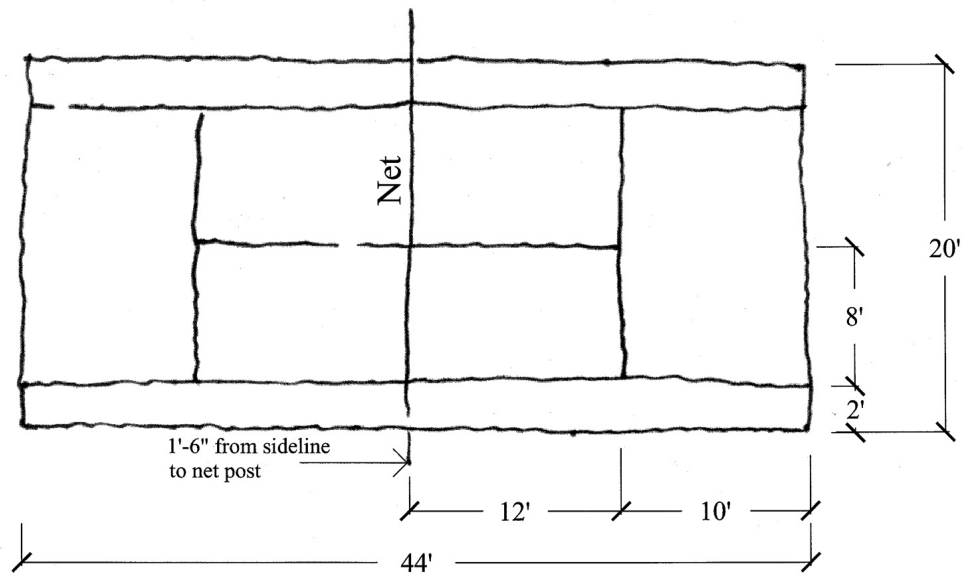
**Accessibility**

- if nearby parking is provided, connect the parking area to the tennis court with a 36" wide walk which is firm, smooth, and slip resistant (maximum 5% slope, maximum 2% cross slope)

**Maintenance**

- occasional removal of surface water with squeegee

**Figure 26: Platform Tennis Court Dimensions**



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# Disc/Frisbee Golf

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## Recommended Area

- Most courses are either 9 or 18 holes and can fit 2-3 holes per acre depending on terrain.

## Dimensions

- The average length per hole is 200-240 feet.
- Tee Pads are 6' wide by 12' feet long

## Surfacing

- Tee Pads are hard surface, textured 4" thick concrete or asphalt
- Targets need to be a well marked object, such as a post or basket



## Anticipated Costs

- 9-hole course:
- Pro Targets: \$3000
- Tee Signs: \$450
- Rules Sign: \$100
- Practice Target: \$600
- Concrete Tees: \$2800

## Landscaping

- context specific

## Parking

- The tee for the first hole should be closest to the regular parking area, as well as the target for the last hole
- see [Appendix 1](#) for more information on parking

## Maintenance

- turf maintenance may require slit seeding or selective resodding

Disc Golf Basket

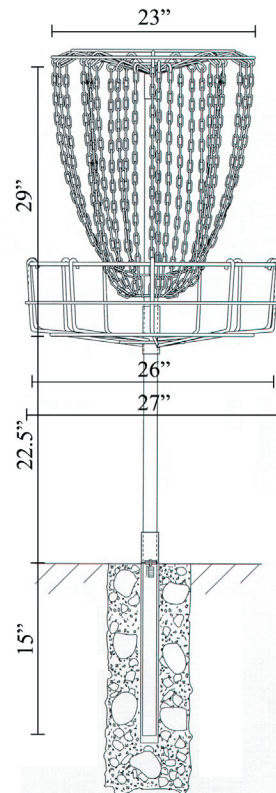
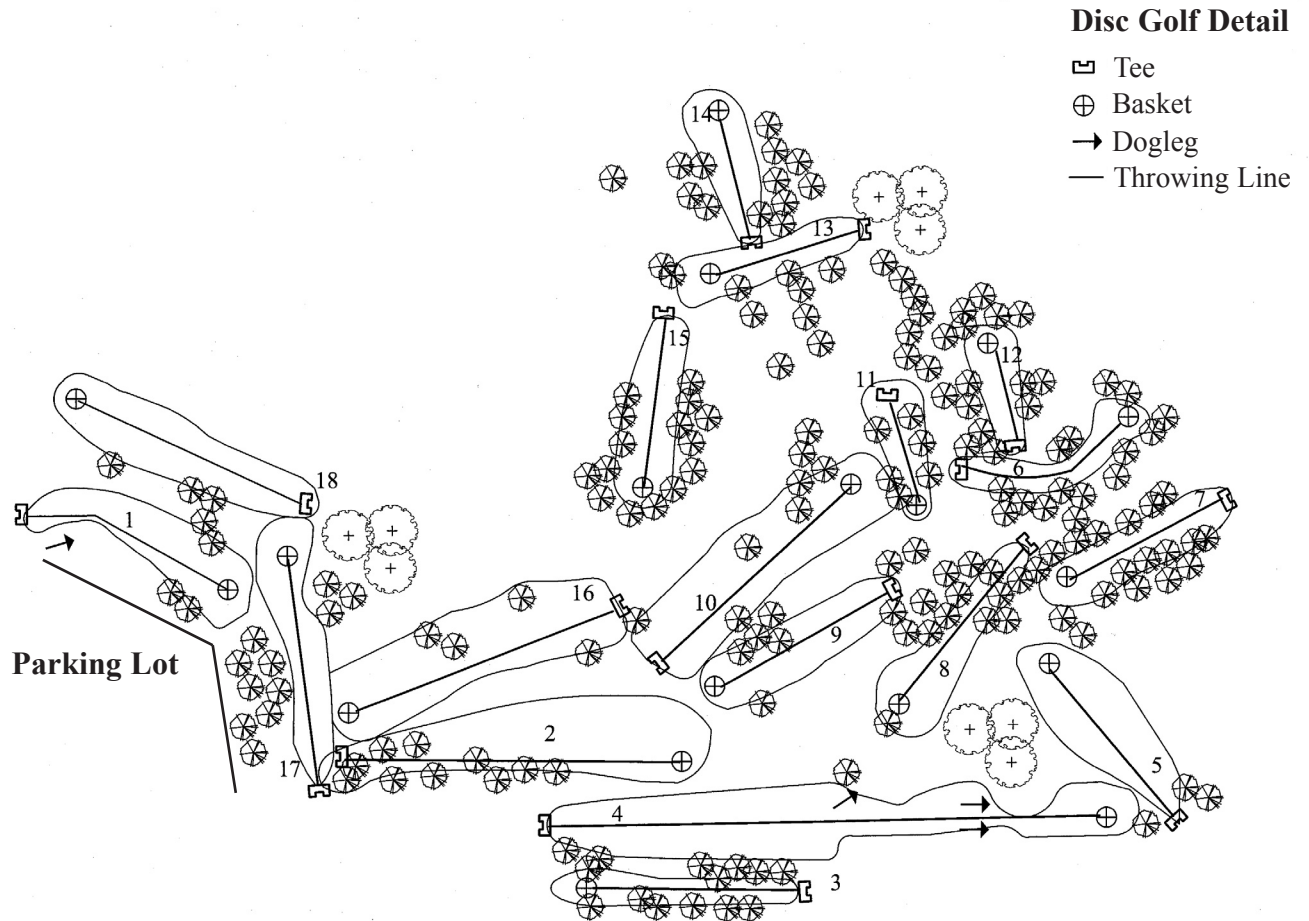


Figure 27: Disc Golf Layout



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## In-Line Skating/In-Line Hockey Rink

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### Recommended Area

- 28,000 square feet including 5,000 square feet for support area

### Dimensions

- full size in-line hockey dimensions: 180' X 90'
- junior hockey rink dimensions: 100' X 50'
- see Figure 28 on page 46

### Orientation

- orient the length of the rink along a north-south axis

### Surfacing

- asphalt or concrete surface with acrylic surfacing

### Drainage

- crown the court with sides sloping .8-1.2% downward from the center
- if concrete curb is used around perimeter, allow for water drainage

### Anticipated Costs

- asphalt: 1,800 square yards (16,200 square feet) @ \$25.00/square yard = \$45,000
- acrylic surfacing: 16,200 square feet @ \$2.25/square foot = \$36,450
- dasher board options:
  - 6" concrete curbing
  - 1' high portable dasher boards 180' X 90' = \$5,000
  - 22" high portable dasher boards 180' X 90' = \$16,000
  - 42" high permanent outdoor dasher boards with fencing  
180' X 90' = \$25-35,000
  - inflatable dasher boards 108' X 60' = \$27,000
- 7 benches @ \$780 each = \$5,460
- 2 goals @ \$360 each = \$720

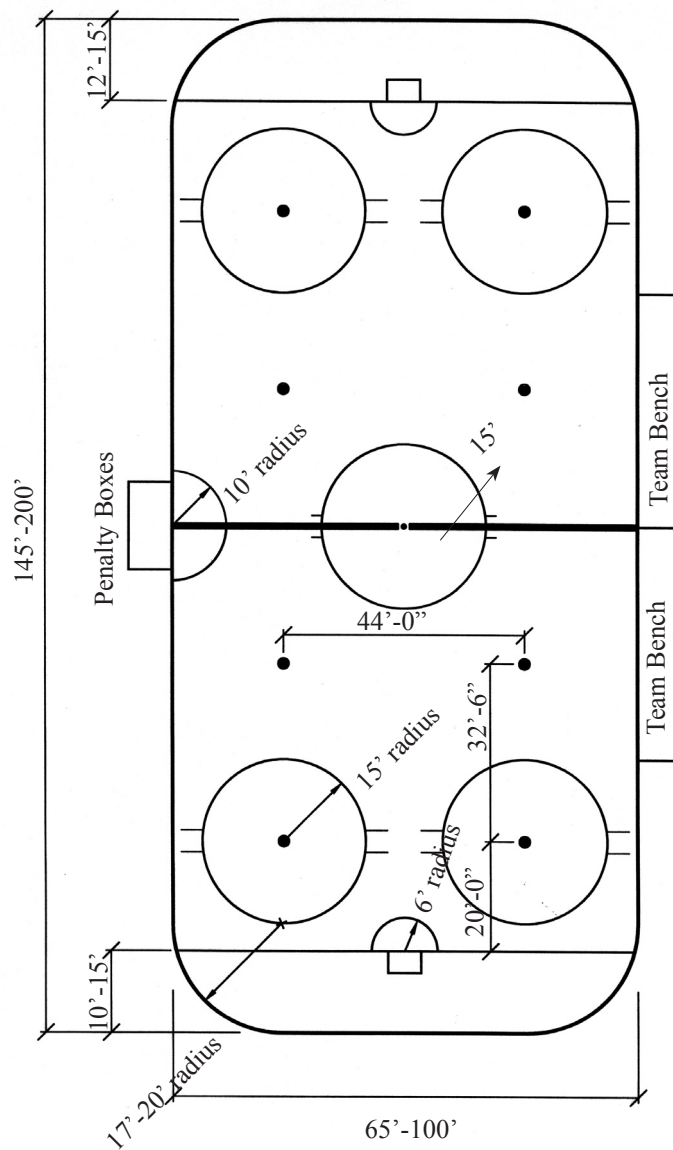
### Lighting

- while the Illuminating Engineering Society of North America has no formal recommendation for lighting standards for in-line skating/in-line hockey, outdoor ice hockey standards may serve as a guide: for amateur league ice hockey, illumination should measure 20-30 HFC (maintained light level), for recreational or social play, illumination should measure 10-20 HFC (maintained light level)

### Dasher Boards

- dasher boards range in height between 8" to 48" with 42" recommended
- dasher boards may be portable or permanent
- doors in dasher boards must swing away from playing surface
- curbing is an alternative to dasher boards

**Figure 28: In-Line Hockey Rink Dimensions**





- USA Hockey In-Line recommends encircling the entire in-line hockey rink with safety glass, 6 gauge galvanized steel fencing, or protective screening

### **Landscaping**

- context specific

### **Parking**

- see [Appendix 1](#) for more information on parking

### **Accessibility**

- if parking is provided, connect the parking area to the in-line hockey/skating rink with a 36" wide walk which is firm, smooth, and slip resistant (maximum 5% slope, maximum 2% cross slope)

### **Maintenance**

- remove sand, debris or soil from surface

---

# Ice Skating/Ice Hockey Rink

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## Recommended Area

- 22,000 square feet including 5,000 square feet for supporting activity area

## Dimensions

- ice hockey dimensions: 180'-210' X 80-100'
- see Figure 29 on page 49

## Orientation

- orient the length of the rink along a north-south axis

## Surfacing

- 4,000 psi concrete surface (one pour)

## Drainage

- consider drainage needs for thaw period

## Anticipated Costs

- concrete (4,000 psi): 16,200 square feet @ \$4.75 square foot = \$76,950
- 7 benches @ \$780 each = \$5,460
- 2 goals @ \$420 each = \$840

## Lighting

- for amateur league ice hockey illumination should measure 20-30 horizontal foot-candles (maintained light levels)
- for recreational or social play ice hockey illumination should measure horizontal 10-20 footcandles (maintained light levels)
- see Figure 31 on page 60

## Dasher Boards

- dasher boards range in height between 8"-48" with 42" recommended
- dasher boards may be portable or permanent
- access doors in the dasher boards should swing open away from the ice rink surface
- for the safety of spectators, ice hockey rinks should be encircled by safety glass, 6 gauge galvanized steel fencing, or protective screening

## Landscaping

- context specific

## Parking

- 45 spaces
- see [Appendix 1](#) for more information on parking

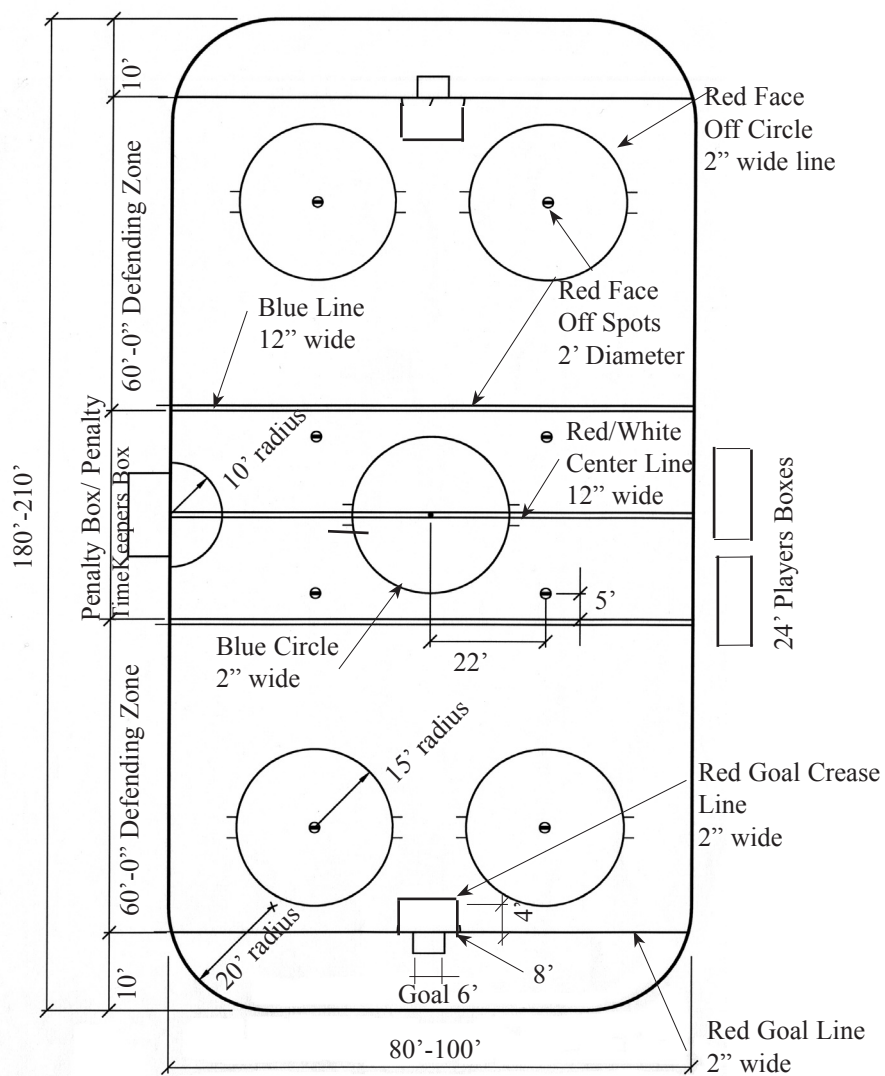
**Accessibility**

- if parking is provided, connect the parking area to the ice rink with a 36" wide walk that is firm, smooth, and slip resistant (maximum 5% slope, maximum 2% cross slope)

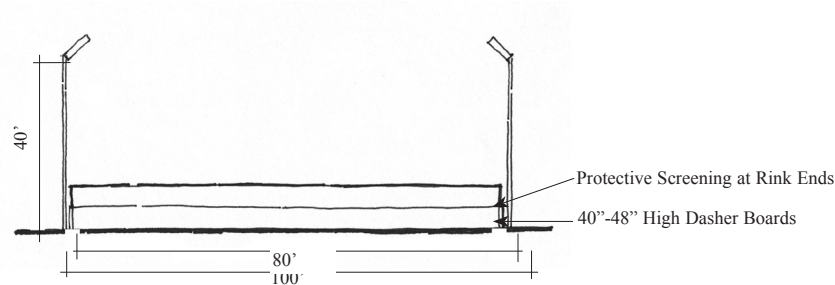
**Maintenance**

- ice grooming equipment is required

**Figure 29: Ice Hockey Rink Dimensions**



**Figure 30: Ice Hockey Rink Lighting**



### Cooling Strategies Overview

- cooled liquid circulated through pipes embedded in the concrete surface helps slow ice loss when temperature rise above freezing.
- ice rink measuring 180' x 90' contains 52,000' - 60,000' L.F. of pipe
- pipes are made of either steel or polyethylene
- most systems circulate brine or ethylene glycol solutions
- solution is cooled in chiller barrel
- Two cooling solutions:
  1. Brine Solution:
    - highly corrosive
    - excellent heat conductivity
    - requires lower horsepower to pump than ethylene glycol
  2. Ethylene Glycol:
    - lower cooled temperature
    - less corrosive
    - poorer heat conductivity
    - higher solution cost
    - requires more horsepower to pump ethylene glycol

### Special Considerations

- the rink location should be near a water source and consider adjacent drainage patterns
- if artificial ice, consider a covering to prevent melting by sun

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# Skate Park

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## Recommended Area

- 7,000 - 12,000 square feet

## Orientation

- orient elements north-south to minimize sun interference

## Surfacing

- concrete or metal plate over plywood structure
- surface drains may be necessary to prevent pooling water

## Drainage

- underdrainage reduces hydrostatic pressure

## Anticipated Costs

- freeform concrete: \$12/square foot
- shotcrete (for the bowl): \$7.15/square foot
- railing: \$87.50/linear foot
- pipe coping: \$54.00/linear foot

## Lighting

- Illuminating Engineering Society of North America does not provide lighting recommendations for skate parks. Recommended lighting levels for recreational or social play ice hockey may provide guidance. Ice hockey illumination should measure horizontal 10-20 footcandles (maintained light levels).

## Fencing

- skate parks should be fenced

## Landscaping

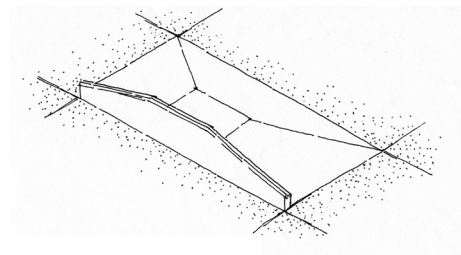
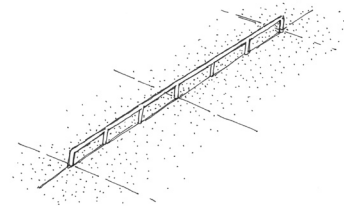
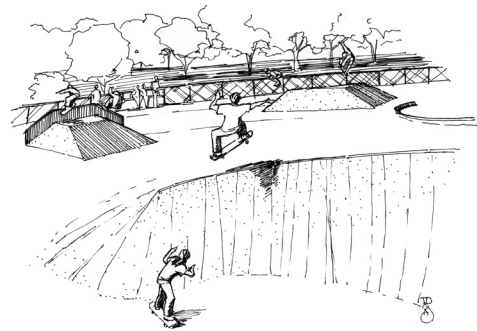
- screening the facility may be desirable depending upon the context

## Parking

- 5-10 parking spaces
- see [Appendix 1](#) for more information on parking

## Accessibility

- if parking is provided, connect the parking area to the skate park with a 36" wide walk



that is firm, smooth, and slip resistant (maximum 5% slope, maximum 2% cross slope)

### **Maintenance**

- inspect the facility and structures daily
- regular sweeping and washing required
- due to the harsh nature of the sport, elements will require replacement
- consider the replacement of elements during design development

### **Signage**

- explicitly state park rules and regulations
- encourage or require safety equipment such as helmets, wrist, elbow, and knee pads

### **Special Considerations**

- incorporate minimum 4-5 runs/routes in the skate park design
- offer areas suitable for beginners as well as intermediates and experts
- include free-style elements, such as bowls, and street course elements, such as fun boxes and grinding rails
- allow an adequate fall zone between elements
- incorporate opportunities for skaters to rest and watch
- use local skaters to serve as experts in the design process

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# Safety Town

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## Recommended Area

- 1-3 acres

## Surfacing

- concrete
- brick pavers
- asphalt paving

## Drainage

- surface gradients should ideally range between 1-3% with a 1% optimal slope

## Anticipated Costs

- concrete: \$4.75/square foot
- brick pavers: \$13.00/square foot
- overall development \$12,000-\$15,000
- asphalt paving: \$25.00/square yard
- ornamental fencing: \$55.00/linear foot
- directional signage: \$275/each

## Lighting

- not recommended for this application

## Fencing

- Safety Towns should be fenced for the safety of the patrons

## Landscaping

- consider creating a realistic town atmosphere

## Parking

- see [Appendix 1](#) for more information on parking

## Accessibility

- if parking is provided, connect the parking area to the safety town with a 36" wide walk that is firm, smooth, and slip resistant (maximum 5% slope, maximum 2% cross slope)

## Maintenance

- inspect the facility and structures daily
- regular sweeping and washing required

**Signage**

- Safety Town size street signs, rules signs





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# Splash Pads

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## Recommended Area

- Wide range from as small as 1600sf

## Surfacing

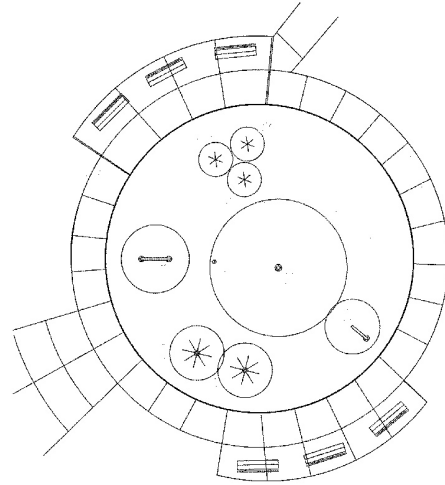
- poured-in-place concrete
- cast-in-place rubber surface

## Drainage

- area should be sloped to the drain fittings

## Anticipated Costs

- overall development \$50,000-\$100,000
- water to waste system
- recirculation system



## Lighting

- not recommended for this application
- power to run pump

## Fencing

- context specific

## Landscaping

- context specific
- provide shade for spectators



## Parking

- see [Appendix 1](#) for more information on parking

## Accessibility

- if parking is provided, connect the parking area to the splash pad with a 36" wide walk that is firm, smooth, and slip resistant (maximum 5% slope, maximum 2% cross slope)

## Maintenance

- inspect the facility and structures daily
- winter shut-down

## Signage

- rules signs should be posted

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# Rock Climbing Walls

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## Recommended Area

- Wide range from as small as 2000sf

## Surfacing

- wood chip surface
- cast-in-place rubber surface

## Drainage

- area should be sloped to the drain fittings

## Anticipated Costs

- overall development \$18,000-\$35,000

## Lighting

- not recommended for this application

## Fencing

- context specific

## Landscaping

- context specific
- provide shade for spectators

## Parking

- see [Appendix 1](#) for more information on parking

## Accessibility

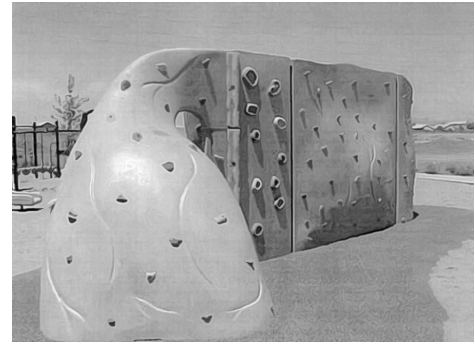
- if parking is provided, connect the parking area to the splash pad with a 36" wide walk that is firm, smooth, and slip resistant (maximum 5% slope, maximum 2% cross slope)

## Maintenance

- rake wood chip surface weekly

## Signage

- age appropriate signage required



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## Walks/Paths

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### Surfacing

- asphalt
- limestone screenings
- decomposed granite
- hardwood mulch

### Drainage

- surface gradients should ideally range between 1-3% with a 1% optimal slope

### Anticipated Costs

- asphalt: \$22.00/square yard
- limestone screenings: \$2.75/square foot
- decomposed granite: \$265.00/cubic yard
- hardwood mulch: \$3.50/square foot

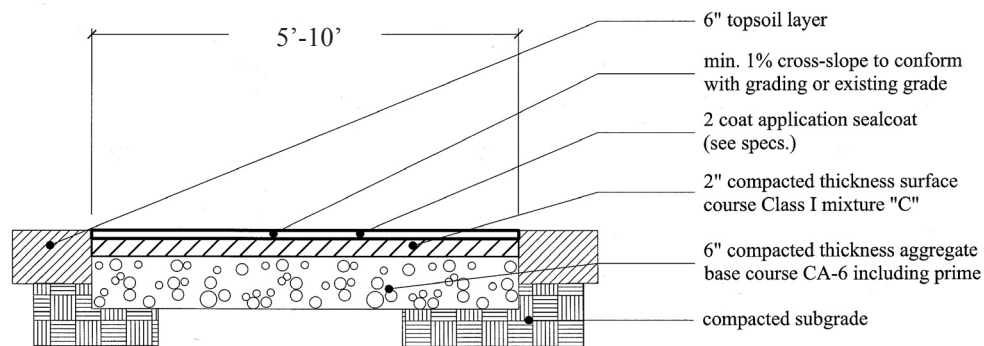
### Accessibility

- maximum 8% slope, maximum 2% cross slope

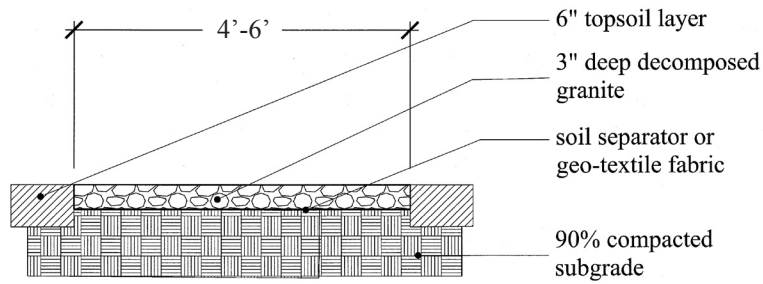
### Maintenance

- yearly re-sealing of asphalt path

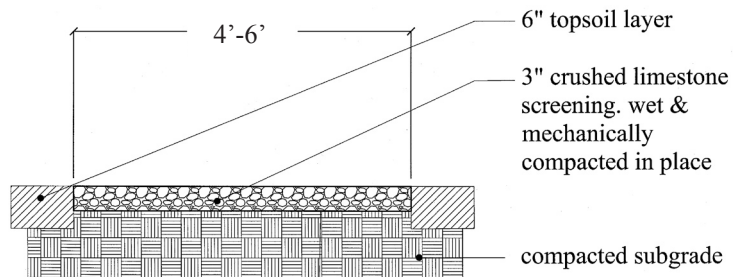
**Figure 31: Asphalt Path Detail**



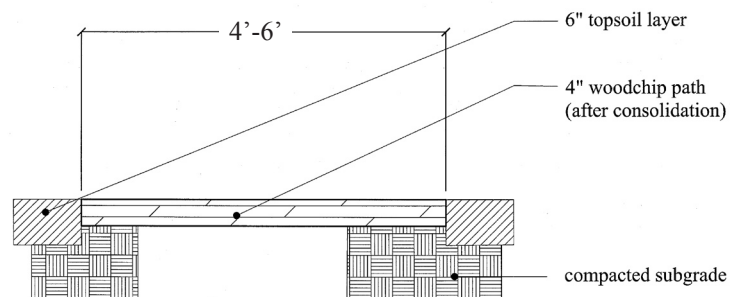
**Figure 32: Decomposed Granite Path Detail**



**Figure 33: Limestone Screenings Path Detail**



**Figure 34: Mulch Path Detail**



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## Appendix 1

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### Surfaces

- hard court surfacing may be either asphalt or concrete
- asphalt surfaces have been popular as asphalt is a ‘softer’ hard surface. Asphalt tends to be slightly less expensive, readily accepts color coating, and the results of cracking are less severe
- as color coated surfacing does not adhere to concrete, concrete court boundaries must be painted

### Comparison of Trail Surfaces

Material Type	Relative Expense	Durability	Maintenance	ADA Compliance
Asphalt	Moderate	Durable	Low	Compliant
Concrete	Expensive	Very Durable	Low	Compliant
Cinder*	Inexpensive	Moderately Durable	Groom out ruts	Not Compliant
Bound Gravel/ Crushed Stone	Moderate	Durable	Replenish over time	Compliant
Mulch**	Inexpensive	Moderately Durable	Replenish over time	Not Compliant

\* Cinder may be acidic and damage surrounding plant material

\*\*Some double shredded mulch products do meet ADA requirements

### Lighting

- wood poles are normally the least expensive pole material. Wood poles may warp and twist over time, causing a shifting of the aim of the sport light fixtures. Wood poles generally rot from the inside out, making it difficult to assess the structural integrity of the wood over a period of time. Other shortcomings include low aesthetic value and external mounting of electrical components
- concrete poles are more expensive than wood and sometimes less expensive than baseplate steel. Concrete poles may be direct buried. In Illinois, where corrosion from salt water spray is not a problem, concrete poles are less popular. Heavy weight for shipping and handling generally limit their use to areas within reasonable shipping distance to plants
- steel poles are the most common method of supporting sports lighting fixtures. Galvanizing is the most common finish on steel poles. Paint is available but typically does not have as long a life as galvanizing. Baseplate steel poles are secured to a concrete foundation with embedded anchor bolts. Direct buried concrete bases are also available. Depending on type of concrete foundation, curing time is 1 - 28 days. Steel

poles are available in mounting heights up to 140'; for most athletic field lighting needs poles range from 150' mounting height to 90' mounting height

- aluminum poles and fiberglass poles normally are not available for more than 40' mounting height. These poles have less EPA capability than similarly priced steel poles.
- due to various soil conditions throughout Illinois, all poles should be installed according to a foundation design created and stamped by a registered professional engineer
- example- in a wind zone of 80 mph, an EPA of 17 (6 fixtures) could be attached to a class "A" pole while an EPA of 29 (10 fixtures) would be attached to a class "B" pole. The class of pole will vary depending on the building code in use and the wind zone.
- prior to determining an appropriate foundation design for a sports lighting pole, a 25' boring (unless rock is struck) is necessary. A qualified engineer must perform the following tests on the soil sample including USCS standard penetration, unconfined compression, soil density, rock quality designation (if applicable), rock class (if applicable), sulfate concentration, ground water, plastic limit, and plastic index.
- most anticipated costs in this publications do not include light poles and fixtures due to the high degree of variability of sport and site requirements
- 6 - 60' steel pole with anchor base 8 fixtures and a 26 epa rating @\$12,000 each = \$96,000

### **Fencing**

- chain link fences are made from different materials such as galvanized steel, aluminum coated steel, and aluminum
- chain link fences maybe be coated with colored PVC
- PVC coating further decreases the likelihood of rusting
- if chain link fencing is intended as a barrier, the mesh size should not exceed 1 1/4"
- install slats in chain link fencing if the fence is intended as a barrier but mesh size exceeds 1 1/4"
- fences and gates should have no more than 2" clearance from the bottom to the ground
- depth of fence footing is dependent upon frostline and local code requirements
- deeper footings may be required if the site experiences heavy winds, erosion conditions or expansive soils

### **Irrigation**

- irrigation systems may consist of quick couplers, an automatic system, or a combination of the two systems
1. Quick Couplers
    - less expensive irrigation option

- locate quick couplers flush with the ground plane and use coupler heads designed for athletic fields
- quick couplers require manual operation and this approach to irrigation requires constant supervision

## 2. Automated Irrigation System

- more expensive upfront cost
- use pop-up heads designed for an athletic field
- recommended water pressure is 55 pounds per square inch
- this automated system reduces the need for constant supervision

### **Parking**

- the Illinois Accessibility Code requires 1 handicap accessible stall for every 25 stalls and 2 more handicap accessible spaces for every additional 50 spaces
- parking guidelines vary greatly by the type of recreation facility, the size of the park, and the age and type of community
- some communities choose to allow the zoning administrator or other municipal authority to determine the amount of parking required on a case by case basis
- in circumstances where the municipal ordinance requires substantially more parking spaces than are required to serve a new recreational facility, a text amendment to the zoning ordinance may save dollars that would otherwise be spent on unneeded parking and help maintain open space
- as a guideline, parking spaces should measure 9' wide X 18' long with a 26' aisle behind the space

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## Appendix 2

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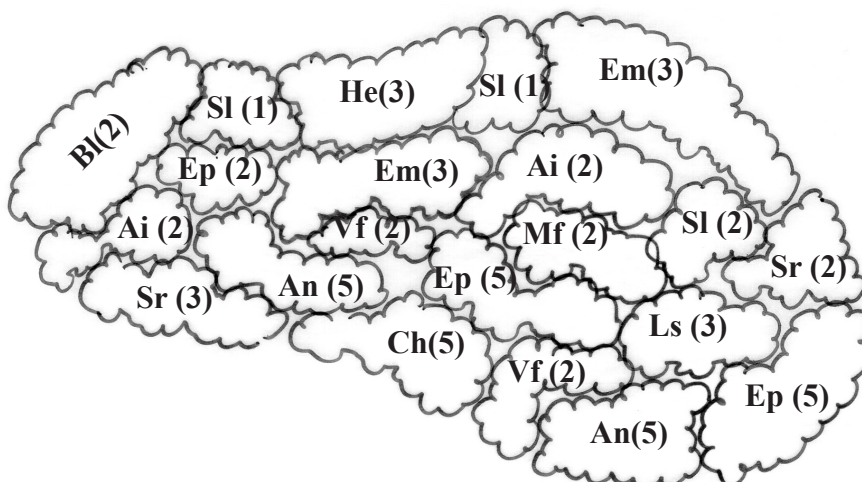
### Specialty Garden Plant Lists

#### Butterfly Garden:

These species of wildflowers attract butterflies with their colorful showy blooms. These flowers hold the promise of life-sustaining nectar for butterflies, some of which will fly several miles to find this valuable food:

Botanical Name	Common Name
Asclepias incarnata (Ai)	Marsh Milkweed
Aster novae-angliae (An)	New England Aster
Boltonia latisquama (Bl)	False Aster
Cassia hebecarpa (Ch)	Wild Senna
Echinacea pallida (Ep)	Pale Purple Coneflower
Eupatorium maculatum (Em)	Spotted Joe-Pye Weed
Helianthus spp (He)	Sunflowers
Liatris spicata (Ls)	Dense Blazing Star
Monarda fistulosa (Mf)	Bergamot
Silphium laciniatum (Sl)	Compass Plant
Solidago rigida (Sr)	Stiff Goldenrod
Vernonia fasciculata (Vf)	Smooth Ironweed

**Figure 35: Sample Butterfly Garden Plan**





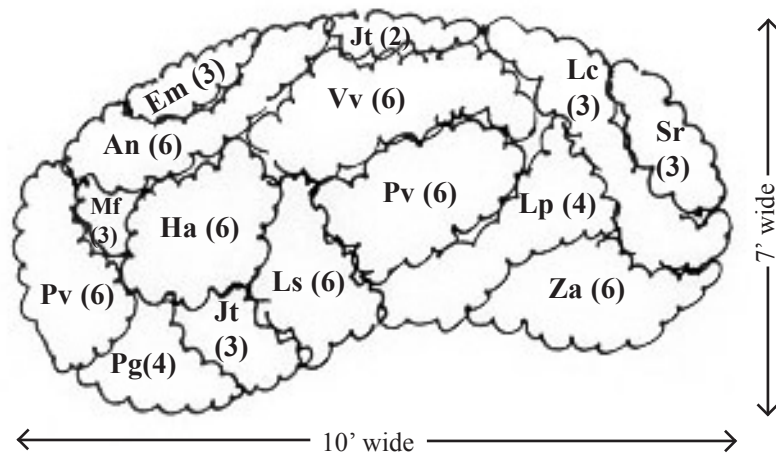
## Specialty Garden Plant Lists

### Rain Garden:

Rain Gardens are developing across Illinois as a low-cost method of improving water quality and making good use of rainwater runoff while creating habitat for native birds and butterflies. Rain gardens are landscaped areas at a low point in the site or by creating a shallow depression. By holding back the rainwater runoff from entering the storm sewers you are creating your own personal water quality system thus recharging the groundwater.

Botanical Name	Common Name
Aster novae-angliae (An)	New England Aster
Eupatorium maculatum (Em)	Spotted Joe-Pye Weed
Helenium autumnale (Ha)	Sneezeweed
Juncus torreyi (Jt)	Torrey's Rush
Liatris pycnostachya (Lp)	Prairie Blazing Star
Lobelia cardinalis (Lc)	Cardinal Flower
Monarda fistulosa (Mf)	Wild Bergamot
Phlox glaberrima (Pg)	Marsh Phlox
Veronicastrum virginicum (Vm)	Culver's Root
Zizia aurea (Za)	Golden Alexander

**Figure 36: Sample Rain Garden Plan**



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## Appendix 3

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### Special Illinois Parks and Recreational Facilities

Facility Type	Location	Local Contact
Community Garden	Buffalo Grove	Buffalo Grove Park District 530 Bernard Drive Buffalo Grove, 60089.3351 847.850.2100
	Collinsville	Collinsville Area Recreation 10 Gateway Drive Collinsville, 62234.6106 618.346.7529
Cross Country Skiing	Rockford	Rockford Park District 1401 N. 2nd Street Rockford, 61107.3086 815.987.8850
Environmental Center	Glenview	Glenview Park District The Grove 1930 Prairie St. Glenview, 60025.2800 847.657.3215
Equestrian Trails	Cook County Forest Preserve	Cook County Forest Preserve 536 N. Harlem River Forest, 60304 800.870.3666
	Lake County Forest Preserve	Lake County Forest Preserve 2000 N. Milwaukee Avenue Libertyville, 60048 847.367.6640
Ice Hockey	Winnetka	Winnetka Park District 520 Glendale Avenue Suite 100 Winnetka, 60093.2135 847.501.2040
Indoor Tennis Facility	Champaign	Champaign Park District 706 Kenwood Road Champaign, 61821-4100 217.398.2550

Inline Hockey/Skating	Morton Grove	Morton Grove Park District 6834 Dempster Street Morton Grove, 60053.2631 847.965.1200
Nature Center	Urbana	Anita Purvis Nature Center Urbana Park District 303 W. University Ave. Urbana, 61801-1746 217.367.1746
Rollerblading	Bensenville	Bensenville Park District 1000 W. Wood Street Bensenville, 60106.2080 630.766.7015
Safety Town	Glendale Heights	Glendale Heights Park and Recreation Department 250 Civic Center Plaza Glendale Heights., 60139.2691 630.260.6060
Skateboard	Deerfield	Deerfield Park District 836 Jewett Park Drive Deerfield, 60015.3291 847.945.0650
	Hoffman Estates	Hoffman Estates Park District 1685 W. Higgins Road Hoffman Estates, 60195.2998 847.885.7500
Sledding Hill	Northbrook	Northbrook Park District 545 Academy Drive Northbrook, 60062.2418 847.291.2960
	Geneva	Geneva Park District 710 Western Avenue Geneva, 60134.2986 630.232.4542
Waterpark	Wheaton	Wheaton Park District 666 S Main St. Wheaton, 60187.5283 630.665.4710

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## Appendix 4

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### References

Title: Time-Saver Standards for Site Planning  
Authors: Joseph DeChiara and Lee E. Koppelman  
Publisher: McGraw-Hill Book Company  
Place: New York  
Date: 1984

Title: Time-Saver Standards for Landscape Architecture  
Editors: Charles W. Harris and Nicholas T. Dines  
Second Edition  
Publisher: McGraw-Hill Publishing Company  
Place: New York  
Date: 1998

Title: The Sports Rules Book  
Author: Thomas Hanlon  
Publisher: Human Kinetics  
Place: Champaign, IL  
Date: 1998

Title: Anatomy of a Park  
Authors: Donald J. Molnar and Albert J. Rutledge  
Publisher: McGraw-Hill Book Company  
Place: New York  
Date: 1986, Second Edition

Title: Wilson Athletic Field & Court Manual  
Author: Wilson Sporting Goods Co.  
8700 W. Bryn Mawr Avenue  
Chicago, IL 60631  
<http://www.wilsonsports.com>  
Date: 1996

Title: Outdoor Sport Fields & Courts Guide  
Author: Wisconsin Department of Natural Resources  
Publisher: State of Wisconsin  
Place: Madison, Wisconsin  
Date: 1996

Author: Spence Restoration Nursery  
P.O. Box 546  
2220 E. Fuson Road  
Muncie, Indiana 47308  
Date: 2004

## Sport Specific References

### Baseball

Pony Baseball/Softball  
PO Box 225  
Washington, PA 15301  
<http://www.pony.org>

American Softball Association  
2801 NE 30th Street  
Oklahoma City, OK 73111  
405-424-5266

### Fencing

Article: Fencing Specs: Perimeter Choices for Landscape Architects  
Author: Valerie Buxton  
Date: January 1999  
Publication: Landscape Architect and Specifier News  
pp. 20-22

### Grass Seed Mixture

Title: Standard Specifications for Road and Bridge Construction  
Author: Illinois Department of Transportation  
Date: January 1997  
Publisher: Printed by Authority of the State of Illinois (6465-25,000-1-97)

### Ice Hockey/In-line Hockey Dasher Boards

In-Line Sport Systems, Inc.  
4814 Park Glen Road  
Minneapolis, MN 55416  
<http://www.borderpatrol.com>

### Ice Hockey Cooling Systems

Cooling Systems for Outdoor Ice Rinks  
<http://www.thermax/ice.com>  
Cimco Recreational Refrigeration  
<http://www.cimcorefrigeration.com>

### In-Line Hockey

Title: Official Rules of In-Line Hockey  
Author: USA Hockey In-Line  
Date: 1997  
Publisher: Triumph Books  
Place: Chicago

### Lighting Guidelines

Title: Recommended Practice for Sports & Recreational Area Lighting

Author: Illuminating Engineering Society of North America

Date: 1988

Publication Number: IES PR6-1988

(Note: This is the most current version of this publication but it does not reflect current lighting technology)

### Sand Volleyball

US Youth Volleyball Leagues

12501 S. Isis Avenue

Hawthorne, CA 90250-4149

1.888.988.7985

<http://www.volleyball.org>

### Skate Parks

Article Title: Designing “Totally Awesome” Skate Parks

Magazine: Illinois Parks and Recreation

Author: R. Gordon Leedy, Jr.

Date: January/February 1998

pp: 15-17

### Soccer

American Youth Soccer Organization

12501 South Iaia Avenue

Hawthorne, CA 90250

800.872.2976

<http://www.soccer.org/>

### Tennis

Title: USTC & TBA Tennis Court and Track Construction Guide Specifications

Author: U.S. Tennis Court and Track

Builders Association

Date: 1988

### Disc/Frisbee Golf

Professional Disc Golf Association

3841 Dogwood Lane

Appling, GA 30802

<http://www.pdga.com>

Disc Golf Association, Inc.

16 Maher Road

Watsonville, CA 95076

