

Bradys Run Park

Master Site Plan

DCNR Project BRC-TAG-10-146



This project was funded in part by a grant from the Community Conservation Partnerships Program, Keystone Recreation, Park, and Conservation Fund under the administration of the Pennsylvania Department of Conservation and Natural Resources, Bureau of Recreation and Conservation.

Partial funding was provided by a Community Development Block Grant administered by the United States Department of Housing and Urban Development.

Additional funding was provided by the Community Development Program of Beaver County.



Acknowledgements

Contributions of the following groups and individuals were essential to the success of the Beaver County Parks Master Plans. They are commended for their interest in the project, their perseverance, and the input they provided throughout the planning process.

Project Study Committee

- Doug Berg** - Beaver County Recreation Advisory Board / Baseball and Softball Representative
- James Camp** - Director, Beaver County Department of Public Works
- Patrick Geho** - President, Beaver County Chamber of Commerce
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- Tom King** - Director, Beaver County Department of Recreation and Tourism
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- Joseph West** - Department Manager of Planning, Beaver County Planning Commission
- Dan Woodske** - Marketing Director, Beaver Initiative for Growth

Key Person Interviewees

- Doug Berg** - Beaver County Recreation Advisory Board / Baseball and Softball Representative
- Marlin Erin** - Owner of Snitger's Bicycle Shop, avid cyclist/mountain biker
- Jack Hilfinger** - Assistant Park Foreman, Bradys Run Park
- Bill Wiggins** - Horseshoe Association

Public Meeting Attendees

This project was funded in part by a grant from the Community Conservation Partnerships Program, Keystone Recreation, Park, and Conservation Fund under the administration of the Pennsylvania Department of Conservation and Natural Resources, Bureau of Recreation and Conservation. Partial funding was provided by a Community Development Block Grant administered by the United States Department of Housing and Urban Development. Additional funding was provided by the Community Development Program of Beaver County.



Table of Contents

Acknowledgements

Table of Contents

Chapter 1: Background Data

Project Introduction	1
Study Format.....	2
Study Goal	2
Benefits Of Parks And Recreation	2
Introduction To Beaver County.....	3
Demographics	3
Existing Park System	6
Existing Planning Efforts	7

Chapter 2: Site Inventory and Analysis

<i>Existing Conditions Plan</i>	<i>11</i>
Base Mapping	13
Rights-Of-Way And Easements	13
Location, Size, Site Access, And Legal Status.....	13
Zoning And Adjacent Land Use.....	14
Existing Structures And Roads	14
Utilities.....	15
Water Features And Wetlands	16
Soils.....	17
Topography	19
Vegetation	19
Wildlife	21
Existing Recreational Facilities	23
<i>Site Analysis Plan</i>	<i>27</i>

Chapter 3: Public Design Process

Public Participation	31
Facility Design Guidelines.....	38
<i>Concept Plan (Sheets 1-7)</i>	<i>45</i>
Description Of Concept Plan	47
<i>Draft Master Plan (Sheets 1-7)</i>	<i>49</i>
Draft Master Plan Description	51
Park Program	52

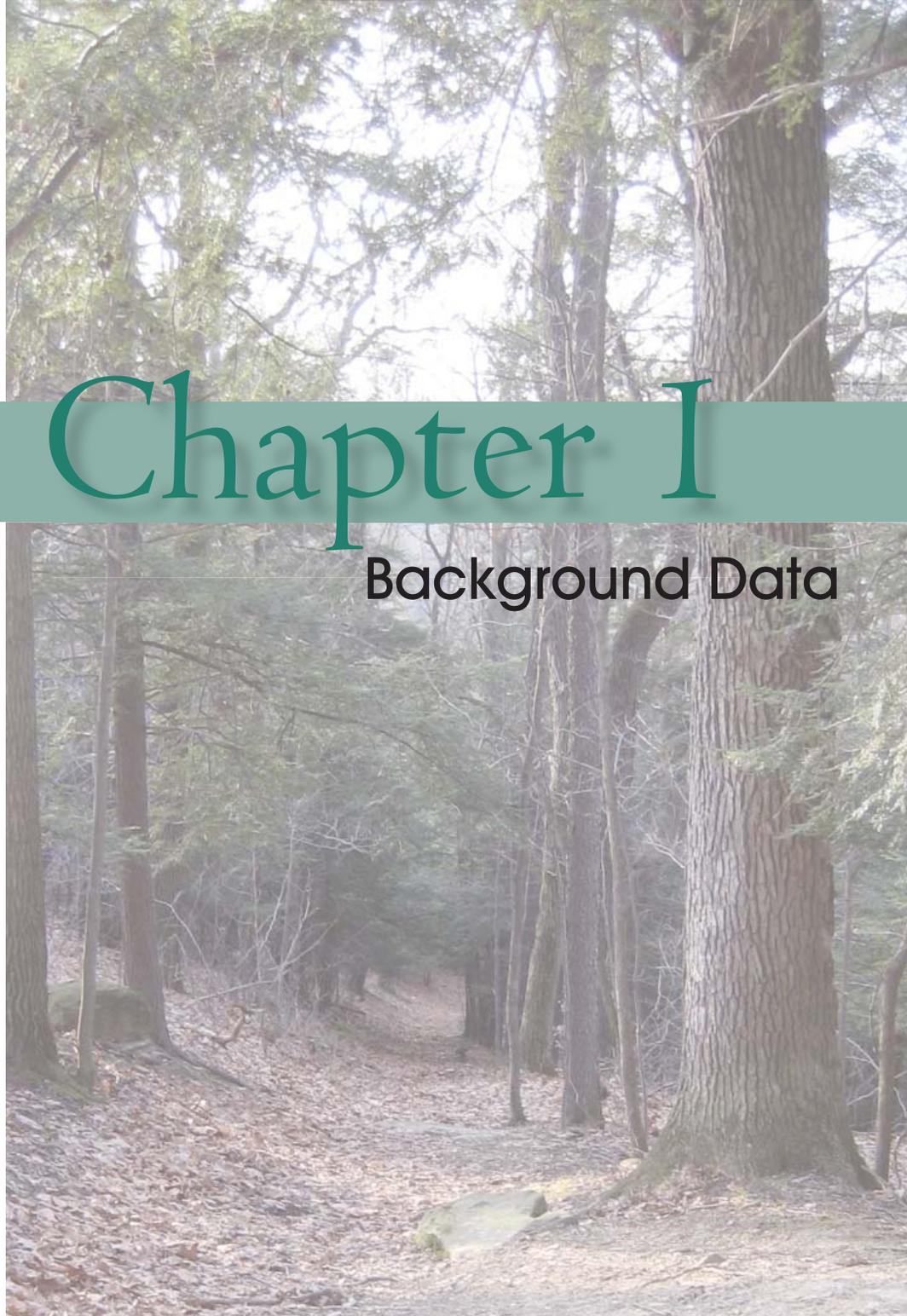
Table of Contents (Continued)

Chapter 4: Recommendations and Implementation

Proposed Recreational Facilities	57
Master Plan Description	57
<i>Final Master Plan (Sheets 1-7)</i>	<i>77</i>
Cost Opinion And Phasing	79
<i>Opinion of Probable Cost (Overall).....</i>	<i>83</i>
<i>Phasing Summary</i>	<i>93</i>
<i>Phase 1 Opinion of Probable Cost</i>	<i>95</i>
<i>Phase 2 Opinion of Probable Cost</i>	<i>97</i>
<i>Phase 3 Opinion of Probable Cost</i>	<i>99</i>
<i>Phase 4 Opinion of Probable Cost</i>	<i>101</i>
<i>Phase 5 Opinion of Probable Cost</i>	<i>103</i>
<i>Phase 6 Opinion of Probable Cost</i>	<i>105</i>
Sustainable Park Design	107
Funding Sources.....	123
Management, Operations, And Maintenance	134

Appendices

- A: Meeting Minutes and Materials
- B: Key Person Interviews
- C: Recreation Facility Construction Details
- D: Waterless Vault Restrooms Information

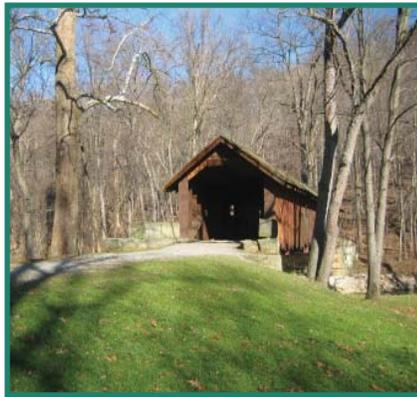


Chapter I

Background Data

PROJECT INTRODUCTION

Beaver County, through the Beaver County Planning Commission (BCPC), successfully applied to the Pennsylvania Department of Conservation and Natural Resources (DCNR) in 2006 for a grant to fund the preparation of Master Site Plans for Old Economy, Brush Creek, and Bradys Run Parks. These three existing County Parks are owned and operated by Beaver County. The grant was received and subsequently Beaver County hired Pashek Associates to prepare the Master Site Plans.



This Master Site Plan will provide Beaver County with a framework for making decisions regarding the further development or improvement of recreation facilities and their ability to meet the recreational needs of county residents.

The process of master planning includes analyzing natural features such as topography, hydrology, soils, and vegetation, as well as working with interested citizens to develop policies for development. This multi-layered approach, involving the surrounding community, stakeholders of the parks, and representatives of Beaver County, yields both short- and long-term strategies for facility development. It is important to note the Master Plan developed as a part of this study is meant to be a flexible tool for planning. Specific details of the park improvements and the final locations of facilities may be adjusted through subsequent design.

A carefully-developed master plan identifies ways to maximize recreational opportunities with the most efficient use of resources. For example, existing facilities are improved wherever possible to reduce new development costs and prevent unnecessary disturbance of land. In addition, thoughtful planning can reduce operating and maintenance expenses. Efforts are made throughout the plan to identify improvements and strategies that are feasible and affordable to Beaver County in the short, medium, and long term.

STUDY FORMAT

The master planning process involves a number of steps, including:

- Analyzing community- and recreation-related background information;
- Establishing goals and objectives for park development;
- Encouraging public participation through a variety of meetings and other methods;
- Preparing an inventory of existing site facilities and conditions;
- Conducting a site analysis of natural and cultural resources;
- Determining the county's needs for recreational facilities;
- Preparing a master site development plan for the park;
- Estimating construction costs;
- Preparing a phased capital improvement plan; and
- Identifying strategies for implementing and funding the capital improvement plan.

STUDY GOAL

At the onset of the planning process, the project study committee developed a general goal for this master site plan. This goal is to support the vision statement for Beaver County's Parks:

"... Beaver County's residents and policy-makers pledge their commitment to continuing the tradition of providing high-quality public recreation. This commitment includes the establishment of an adequate capital improvement plan for the park system. Under this plan, funding resources will ensure that the parks are well-maintained, well-publicized, and continually improved to meet current and future recreation needs of County citizens."

BENEFITS OF PARKS AND RECREATION

Parks and recreation are a major part of the high quality of life provided in Beaver County. Parks and recreational open space can preserve wildlife habitat, protect native ecosystems, and reduce pollutants.

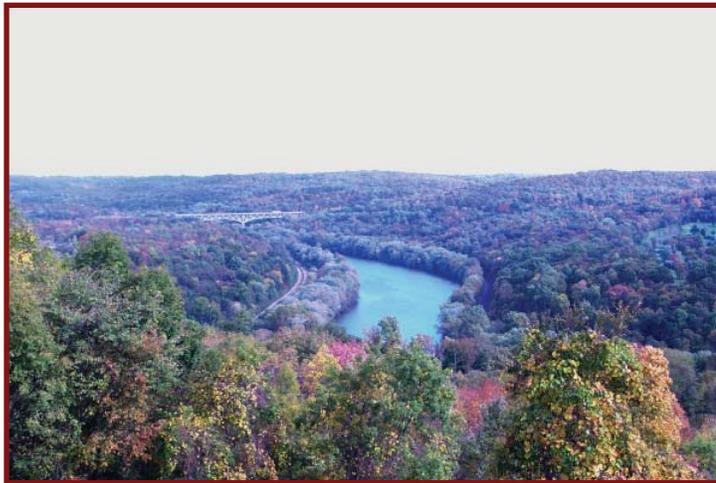


Parks may also provide residents a place to relax and engage in community gatherings and events. In addition, parks present opportunities to enjoy the natural environment. The local economy can also benefit from parks and recreation. Parks attract business and their employees to the surrounding area,

increase property values, and boost tourism.

INTRODUCTION TO BEAVER COUNTY

The 441-square mile tract of land that is today known as Beaver County saw its population grow rapidly with an influx of late 18th-century settlers attracted to the area's fish and wildlife, waterways transportation, fertile farmland, and abundant forests. Beaver County was officially recognized on March 12, 1800. At that time the county covered approximately 740 square miles and had a



population of 5,776. Despite the county's reduction in size due to the formation of Lawrence County in 1849, the total Beaver County population increased to over 56,000 by the turn of the 20th century.

Today Beaver County is a dynamic community of over 181,000 residents (2000 U.S. Census), most of which are still concentrated around the Beaver and Ohio Rivers. The county includes many historic river towns, post-war suburban communities, and a number of rural areas dominated by agriculture and forests.

The county is located 18 miles northwest of the City of Pittsburgh. It's neighboring communities include Lawrence County to the north, Butler County to the northeast, Allegheny County to the southeast, Washington County to the South, and portions of West Virginia and Ohio to the west. The County Seat is centrally-located within the County, in Beaver Borough. State Routes 60 (future I-376 corridor) and 65 bisect the county from north to south, and State Route 68 bisects the county from east to west. Routes 60 and 68 offer direct access to Beaver Borough. In addition to these roadways, the Pennsylvania Turnpike (Interstate 76) maintains a toll-free expressway that crosses the northeast portion of the county. Beaver County is also easily accessible to air travel, with Pittsburgh International Airport just 5 miles from the county's southern border.

DEMOGRAPHICS

Population Trends

According to the U.S. Census Bureau, the total Beaver County population decreased during the 1980's, with a slightly smaller decrease during the 1990's (see chart on the following page). Information from the 2000 U.S. Census shows the county's population at 181,412, down from 204,441 in 1980 and 186,093 in 1990. The county's population trends are comparable with several other nearby counties that saw populations decline with the collapse of the Western Pennsylvania steel industry in the 1980's.

Beaver County Population (per U.S. Census Data)

<i>Year</i>	<i>Population</i>	<i>Change (Persons)</i>	<i>Percent Change</i>
1980	204,441	--	--
1990	186,093	-18,348	-8.97%
2000	181,412	-4,681	-2.52%

At the time of this study, the most recent available population data (U.S. Census) was compiled in 2000. All population projections referenced herein based estimates on 2000 census data. Dates of some population projections have since passed, but their population estimates will remain relevant until the upcoming 2010 U.S. Census provides more recent actual census data.

Population projections obtained from the Pennsylvania State Data Center (<http://pasdc.hbg.psu.edu>) depict a continuation of the county's population decline in the future, with projected populations of 173,005 in 2005 and 164,649 in 2015. However, Southwestern Pennsylvania Commission (SPC) population projections released in 2002 are in stark contrast to the projections mentioned above. The SPC projected the population of Beaver County to be 192,435 in 2002 with a continued increase in population and a projected 2025 population of 214,104. This disparity in projected population trends creates difficulty in establishing a correct trend for future population. The most likely scenario is that the county's future population trends will fall somewhere between the two estimates.

Population Density

Beaver County's total area is 441 square miles, and the 2000 county population was 181,412. These numbers indicate a calculated population density of 411.4 persons per square mile. In comparison, Allegheny County (1755.7 persons / square mile) is the only one neighboring county with a higher population density. This number is much higher than other counties because Allegheny County includes the City of Pittsburgh. Lawrence County (262.9), Washington County (236.8), and Butler County (220.9) all have significantly lower population densities than Beaver County. Therefore, Beaver County has one of the highest population densities in the region.

Household Size

In 1990 the average household in Beaver County included 2.59 persons. In 2000 the average household size was 2.44, a 5.8% decrease. This is attributed to an increase in the number of single-person and non-family households.

Age Distribution

According to the 2000 Census, the county's population age characteristics show large proportions of

minors and senior citizens. In 2000, 22.6% of the county's population was under the age of 18 and 18.4% was 65 years of age or older. The total number of senior citizens rose significantly from 1980 to 2000 despite a 11% decline in the county's total population (see chart below).

Age Distribution of Beaver County Population, 1980-2000				
<i>Population Segment</i>	<i>1980</i>		<i>2000</i>	
	<i># Persons</i>	<i>%</i>	<i>#Persons</i>	<i>%</i>
Total Population	204,441	100.0	181,412	100.00
Under 5 years	13,209	6.5	9,860	5.4
5-24 years*	65,818*	32.2	44,716*	24.7
25-44 years	51,346	25.1	49,517	27.3
45-54 years	24,612	12.0	25,905	14.3
55-64 years	25,151	12.3	17,990	9.9
65 years & older	24,305	11.9	33,424	18.4

*Age segments used in 1980 Census data are 5-17 and 18-24; segments used in 2000 Census are 5-9, 10-14, 15-19, and 20-24. These segments, in each case, were combined to form a common 5-24 age group.

Income

The median family income in Beaver County was \$45,495 per the 2000 Census. This compares favorably to the Pennsylvania state-wide median family income of \$40,106.

Housing Characteristics

In 2000 the county contained 72,576 housing units, a 0.9% increase since 1990. The number of elderly single person households increased by 9.5%. The median value of owner-occupied units in Beaver County per the 2000 Census is \$85,000. This compares favorably with neighboring Lawrence (\$72,200) and Allegheny (\$84,200) Counties, but falls below median owner-occupied housing unit prices in Washington (\$87,500) and Butler (\$114,100) Counties. Of the 46,498 specified owner-occupied housing units in Beaver County in 2000, values were as follows:

<i>Housing Unit Value</i>	<i>Percentage of Total Units</i>
<\$50,000	18.1%
\$50,000 - \$99,999	47.3%
\$100,000 - \$149,999	22.5%
\$150,000 - \$199,999	7.9%
>\$200,000	4.1%

The number of vacant housing units in 2000 was 5,189. The number of renter-occupied units was 18,209 with a vacancy rate of 7.6% and a median rental of \$438 per month. The Lawrence (\$424) and Washington (\$423) County median monthly rental rates are lower than Beaver County rentals, while Butler (\$487) and Allegheny (\$516) rates are higher.

Conclusions from Demographic Data

(Source: 2000 U.S. Census Data)

- **Improve on Existing Open Spaces:** With a population that has steadily declined over the past two decades, the county has no need for additional recreation spaces. Therefore, efforts should be concentrated on improving the existing recreational opportunities.
- **Seniority Rules:** The age distribution of the population supports a surging demand for recreation opportunities for senior citizens. The number of senior citizens grew by 9,119 from 1980 to 2000, despite a 23,029-person drop in total population.
- **Active Population:** Income and educational characteristics of county residents indicate an active population, with 53.1% of all females in the labor force, and an increasing number of active retirees.
- **Home Ownership:** The slightly increasing percentage of owner-occupied units (73% in 1990 to 74% in 2000) indicates a need to maintain and/or enhance the quality of neighborhoods to attract new buyers and continue the increasing percentage trend.

EXISTING PARK SYSTEM

The recommendations of this study are intended to provide the optimal level of recreation facility services to the county's residents, whether by new development or improvement of existing facilities, given the opportunities and constraints of the existing park site. In order to determine the appropriate level of recreation facility service, one must understand which county recreational needs are met by the three County Parks in this study.

Parks are classified according to a hierarchy developed by the National Recreation and Parks Association (NRPA). The three County Parks share characteristics of the highest two of the classifications:

1) Regional Reserves

The regional reserve park is a facility designed more for the conservation of natural resources than recreational development. This type of park typically accommodates activities such as nature study, trail uses, camping, boating, and fishing. Regional reserve parks are considerably larger than regional metropolitan parks, but have the same forty- to fifty-mile service area.

The three County Parks being master planned all contain large tracts of land that have been set aside for conservation. All the parks accommodate trail uses, Bradys Run Park offers boating and fishing, and Brush Creek Park offers fishing opportunities.

2) Regional / Metropolitan Facilities

This type of facility generally serves communities within a one hour driving time service radius. These parks accommodate many types of outdoor activities, some of which may require large amounts of land, or special facilities. They may host special events and/or tournaments, swimming opportunities, hiking, camping, or bicycling.

The baseball / softball complex, horse arena, indoor recreation center, and ice arena at Bradys Run Park, the soccer fields at Brush Creek Park, and the public swimming pool at Old Economy Park are typical of regional / metropolitan parks. These facilities are used by residents from all corners of Beaver County and beyond. Furthermore, such facilities are often not available at smaller community or neighborhood parks.

EXISTING PLANNING EFFORTS

Beaver County Comprehensive Recreation and Parks Plan

The 2003 Beaver County Comprehensive Recreation and Parks Plan (Recreation Plan) inventoried and analyzed each of the county parks being master planned in this study. The inventory included detailed inspections of all park facilities including all structures, play equipment, sports fields and courts, restrooms, parking, signage, and open spaces.

Analysis of park facilities indicated a need for updated equipment and improvements to existing facilities. General recommendations made in the Recreation Plan include an aggressive public awareness campaign, development of regional recreation programming suitable for park visitors of all ages and abilities, and fostering inter-municipal cooperative efforts to support quality recreation in the county. These broad ideas, along with specific goals set forth in the Recreation Plan, were considered during this master planning study.

Horizons: Planning for the 21st Century, A Comprehensive Plan for Beaver County

The conservation of large portions of each of the county parks being studied is consistent with the County's Comprehensive Plan's (Comprehensive Plan's) general land use policy, which is to "encourage the adoption of sound use management practices throughout the county and promote awareness of environmentally-sensitive areas such as wetlands, flood plains, steep slopes, and soils." The Comprehensive Plan recommends parks, open space, and woodlands as uses for areas with significant natural resources including stream corridors, wetlands, groundwater recharge areas, steep slopes, and prime agricultural soils.

Improvements to existing facilities or development of new opportunities at the three parks will also comply with the Recreation and Open Space Action Plan section of the Comprehensive Plan. The goal of this plan is to maintain and improve the quality of life and environment for residents of Beaver County through the provision of parkland and recreation facilities. Improving the existing county parks will help the county provide and maintain high-quality facilities to meet the recreational needs of Beaver County Residents: another recommendation of the Recreation and Open Space Action Plan.

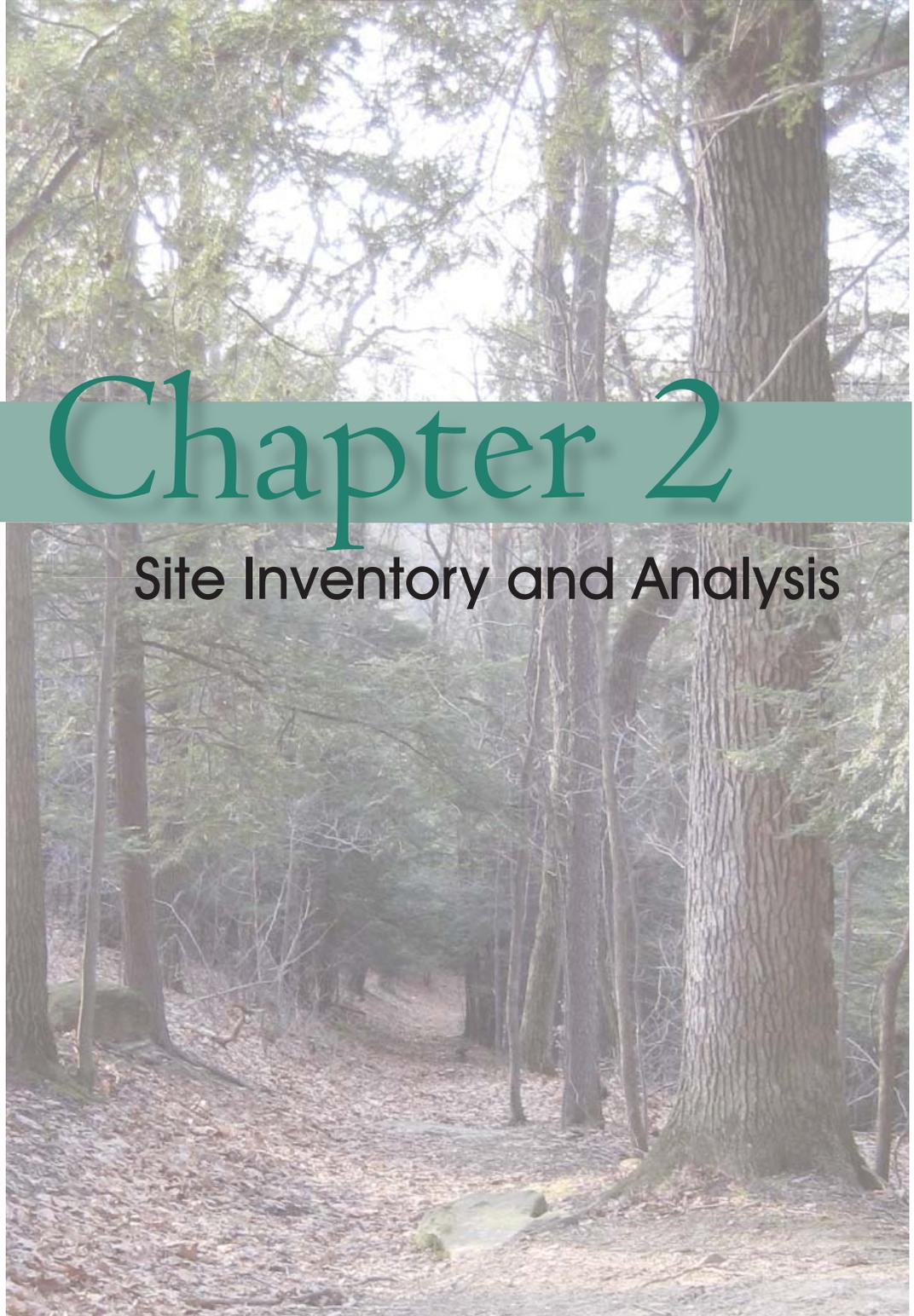
Beaver County Greenways and Trails Plan

The Beaver County Greenways and Trails Plan aims to enhance the quality of life in Beaver County by providing the County with a blueprint for the implementation of Greenways that will protect natural resources and provide recreation opportunities. The Greenways and Trails Plan sets forth the following objectives for Greenways implementation:

- 1) Establish conservation corridors that preserve and link high-priority habitats, sensitive environmental features, rural landscapes, and protected open space;
- 2) Build and interconnected network of diverse recreational trails connecting population centers to State and County parks, State Game Lands, and other significant recreational areas / amenities that promote active lifestyles and provide alternate means of transportation between the County's major destinations; and
- 3) Ensure that greenways and trails development works hand-in-hand with other economic development initiatives in Beaver County to foster growth, attract new businesses, and bring and retain young people by providing a high quality of life.

The goals of this Master Plan parallel the Greenways and Trails Plan's goals, and several of the Greenways recommendations relate directly to the County Parks studied in this report. Among those recommendations are:

- Establishment of conservation corridors along Brady's Run, Brush Creek, and Big Sewickley Creek (including an extension to Old Economy Park);
- Creation of a loop shared-use trail / "share the road" bike route loop in Brady's Run Park, along with several "share the road" bike routes connecting Brady's Run Park to other points in surrounding municipalities; and
- Establishment of "share the road" bike routes along State Route 989 and Legionville Road through and adjacent to Old Economy Park, as well as along State Route 588 adjacent to Brush Creek Park.

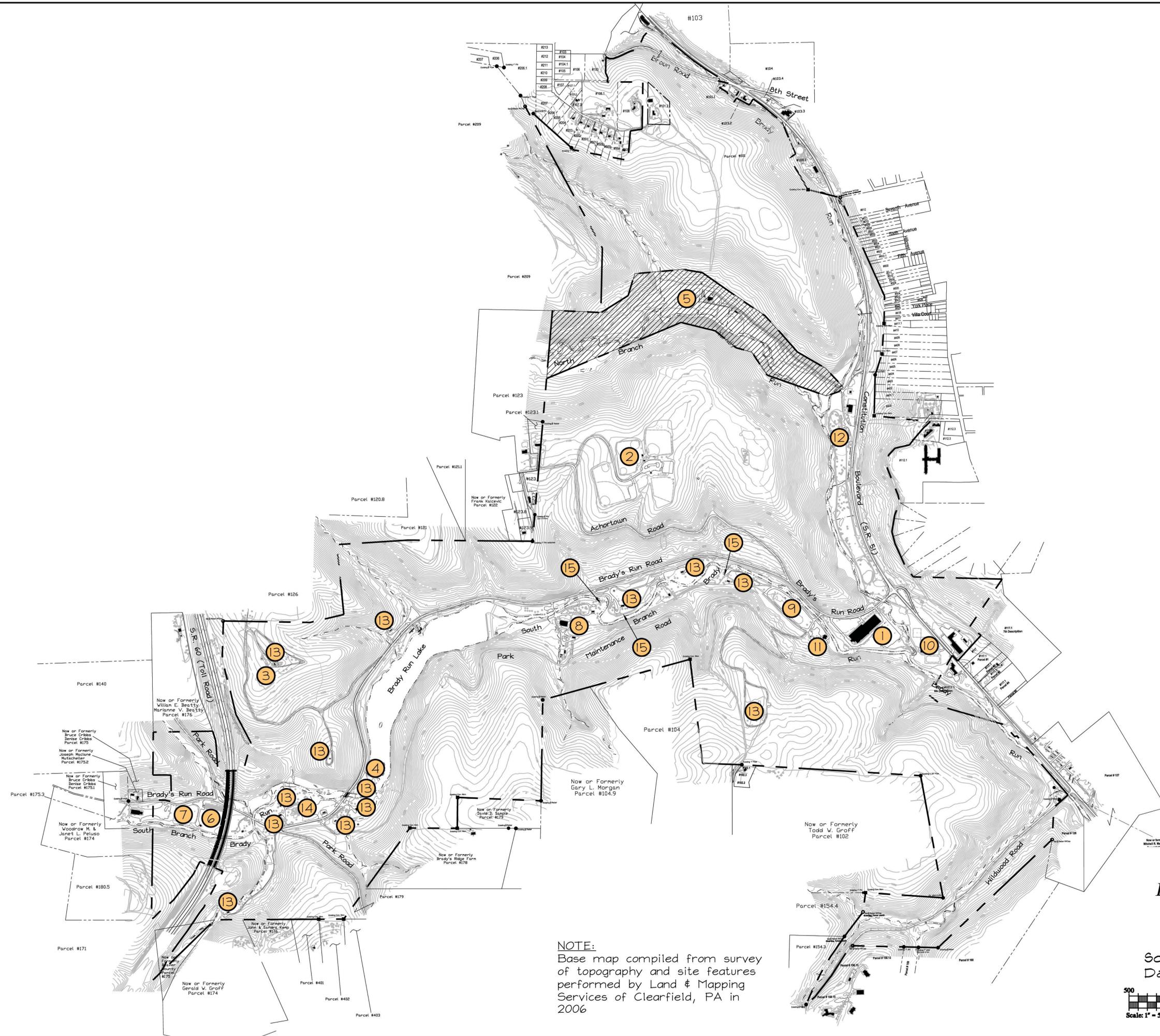


Chapter 2

Site Inventory and Analysis

LEGEND

- 1 Four Winds Indoor Recreation Center
- 2 Beaver County Softball / Baseball Complex
- 3 Calland Arboretum
- 4 Bradys Run Lake Boat Launch
- 5 Property of Beaver Valley Rifle & Pistol Club
- 6 Horseshoe Courts (Lighted)
- 7 Dog Park
- 8 Bradys Run Lodge
- 9 Horse Arena
- 10 Tennis Courts (4) and Skate Park
- 11 Beaver County Department of Waste Management & Recycling Recycling Center
- 12 Paved Walking Trail Entrance (and parking)
- 13 Picnic Grove (18 total pavilions)
- 14 Destination Playground
- 15 Paved Multi-purpose trail (through picnic groves)



NOTE:
 Base map compiled from survey of topography and site features performed by Land & Mapping Services of Clearfield, PA in 2006

Bradys Run Park
 Beaver County, Pennsylvania
 Existing Conditions Plan

Scale: As Noted
 Date: 1/8/07
 500 0 500 1000
 Scale: 1" = 500' Contour Interval: 10'-0"

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A thorough understanding of a recreational site and its surroundings are essential to successful recreation planning. Beaver County, history, culture, and demographics reviewed earlier in this plan have provided a solid base for development of the master site development plans for Bradys Run Park. To achieve the required knowledge of the park site, the park's physical elements were studied.



Physical site characteristics such as topography, soils, vegetation, and hydrology will be used to draw conclusions regarding the opportunities and constraints to recreational development presented by the park site. Inventories of each park property were compiled and site analyses were completed using various research sources. The findings from this process are documented in this section, and identified on the Bradys Run Park Site Analysis Plans, as appropriate.

BASE MAPPING

A base map of Bradys Run Park was prepared from a survey of topography and site features completed in 2006 by Land & Mapping Services of Clearfield, PA. This mapping was supplemented with field observations conducted in 2006 by Pashek Associates.

RIGHTS-OF-WAY AND EASEMENTS

A road right-of-way along Bradys Run Road (State Route 4012) traverses Bradys Run Park in an east-west orientation. In addition, other road rights-of-way along Achortown Road (State Route 4010) and Park Road (State Route 4018) also traverse portions of the Bradys Run Park Property.

LOCATION, SIZE, SITE ACCESS, AND LEGAL STATUS

At approximately 1,456 acres, Bradys Run Park is Beaver County's largest county-owned park. The park is located in Brighton, Chippewa, and Patterson Townships, two miles north of Beaver Borough. The park is accessible from Constitution Boulevard / State Route 51 via Bradys Run Road / State Route 4012, which is the main park entrance. Two other roads, Achortown (or Mile-Hill) Road and South Road, stem from Bradys Run Road within the park. Achortown Road / State Route 4010 traverses the northern portion of the site and continues to the northwest. South Road connects to Bradys Run Road on both the east and west sides of Bradys Run Lake, forming a loop. Bradys Run Road continues off of the park property, heading further west. The park is also accessible from Dutch Ridge Road / State Route 4020 via Park Road / State Route 4018, which traverses the extreme

southwestern corner of the park property, intersecting Bradys Run Road / State Route 4012.

ZONING AND ADJACENT LAND USE

The portion of Bradys Run Park in Brighton Township is located in a Special Conservation (SC-1) zoning district, in which recreational uses that minimize environmental impacts are a conditional use. Residential properties border the park to the south and west and are zoned Rural Residential (R-1) and Agricultural Residential (R-2). Small portions of the park's northeastern extremities, which lie in Patterson Township, are zoned for Preservation (P). This zoning permits municipal recreation limited to passive recreation such as hiking, nature study, and picnicking. Properties surrounding the park share a similar zoning, or are Highway Commercial (C-2) zoned properties along State Route 51. The northwestern portion of the park is located in Chippewa Township, and is mostly zoned Agricultural-Residential (AR-1). An area of land adjacent State Route 60 in the extreme western portion of the park is zoned Planned Commercial (PC) per the Chippewa Township Zoning Ordinance. This zoning permits publicly-owned parks. Residential properties border the park to the north and northwest share the same zoning designation.

EXISTING STRUCTURES AND ROADS

Because Bradys Run Park is by far the largest of the three parks being inventoried, it consequently has the largest vehicular circulation system. Bradys Run Road is the spine of the park's circulation systems, offering visitors access to the Ice Arena, Indoor Recreation Center, Bradys Run Lake, Bradys Run Lodge, and several other recreation facilities. Achortown Road and South Road also provide access to park facilities, such as baseball and softball fields and the park's various trails. Several minor park roads provide access to picnic areas and parking throughout the site.

Many structures are located in Bradys Run Park. They include the following:

- o 18 open-air picnic pavilions, ranging in size from 10'x16' to 30'x70';
- o 12 sets of restrooms;
- o a fishing dock;
- o two (2) concession stands;
- o the Hodge-Podge Lodge, Sugar Shack, and log cabin at the park's Maple Syrup Camp;



- o the large Bradys Run Lodge;
- o a boat house for Bradys Run Lake;
- o a bath house;
- o a locker room / storage building at the tennis court facility;
- o the Four Winds Recreation Center (indoor); which encloses the Ice Arena, walking track, and tennis courts along with Beaver County Department of Recreation and Tourism offices;
- o the indoor Ice Arena, which also houses the park’s offices; and
- o two other maintenance / storage buildings

UTILITIES

The following regulations require anyone who engages in any type of excavation or demolition (see the “Act” in below list for definition of excavation) to provide advanced notice of such activities:

- ➔ Underground Line / Facilities Damage Prevention Act of 1996 (the “Act”);
- ➔ OSHA Standard 1926.651 (revised 1990);
- ➔ Federal Pipeline Safety Act of 1968, as amended, protecting underground liquid (CFR 49, Part 195) and natural gas (CFR 49 Part 192.614) pipelines; and the
- ➔ National Electric Safety Code, ANSI C-2 (revised 1997).

In Pennsylvania, PA Act 287 as amended by Act 187 of 1996, 73P.S. section 176 et. seq., requires “notice in the design or planning phase of every work operation that involves the movement of earth with powered equipment.” the PA One-Call System, Inc. (PA One-Call) is a non-profit organization established to facilitate requests for utility information within the Commonwealth of Pennsylvania.

During the inventory of Bradys Run Park, PA One-Call (1-800-242-1776) was contacted for information regarding utilities in and around the park. Through their automated response service, PA One-Call responded to search serial numbers 2725308, 2725309, and 2725310. Three numbers were required to notify contacts at each municipality in which the park property is located. Utility providers then responded directly to Pashek Associates, with results shown below:

PA One-Call Responses - Bradys Run Park (Serial Numbers 2725308, 2725309, 2725310)

<i>Utility Company</i>	<i>Address</i>	<i>Response</i>	<i>Contact</i>
Beaver Falls Municipal Authority	1425 8th Avenue Beaver Falls, PA 15010	Facilities marked in field	Sam Alois
Beaver County Department of Public Works	469 Constitution Blvd. New Brighton, PA 15066	No Response	Gary Cable
Brighton Township Sewage / Municipal Authority	1300 Brighton Road, Beaver, PA 15009	Clear - No Facilities	Bryan DeHart

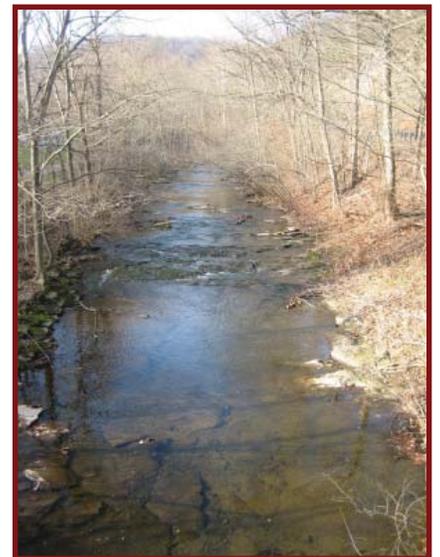
Chippewa Township	2811 Darlington Road Beaver Falls, PA 15010	No Response	Mark Taylor
Chippewa Township Sanitary Authority	701 Constitution Blvd. Beaver Falls, PA 15010	Facilities marked in field	Dennis Mike
Columbia Gas of PA, Inc.	501 Technology Drive Southpointe Industrial Park Canonsburg, PA 15317	Clear - No Facilities	U. Grant York
Columbia Gas of PA Design	501 Technology Drive Southpointe Industrial Park Canonsburg, PA 15317	Clear - No Facilities	U. Grant York
Comcast Cable Communications	2810 Darlington Road Beaver Falls, PA 15010	Clear - No Facilities	Dave Tatarek
Duquesne Light Company	New Beaver Ave. & Woods Run Pittsburgh, PA 15233	Clear - No Facilities	John Jascot jascot@duqlight.com
Patterson Township / Patterson Township Municipal Authority	1800 Dixon Way Beaver Falls, PA 15010	No Response	Paula Wagoner
Pennsylvania Power Company	First Energy Corp. P.O. Box 570 Youngstown, OH 44501-0570	No Response	Tim Kilmore
Verizon Pennsylvania, Inc.	201 Stanwix St., 4th Floor Pittsburgh, PA 15222	No Response	Ellen Moslander

WATER FEATURES AND WETLANDS

Bradys Run Park includes sections of three different streams: the North Branch of Bradys Run and South Branch of Bradys Run both flow eastward through the park into a separate stream known simply as Bradys Run. Several intermittent streams also feed these three main waterways during storm events. Bradys Run is classified as a Trout-stocked fishery (TSF) by the DEP Chapter 93 Water Quality Standards. The ability of trout to survive in a stream indicates good water quality.

The man-made Bradys Run Lake is the park's only other water body, and is maintained for recreational use.

Floodplains associated with Bradys Run, as well as the North and South Branches of Bradys Run, are located on the park property. These flood hazard areas are identified by FEMA flood insurance rate maps (#422311 and #422309). Base flood elevations and flood hazard factors have not been determined for the floodplain areas within the park.



National Wetlands Inventory (NWI) maps for the Bradys Run Park property revealed that the only wetlands located on the site are those associated with Bradys Run Lake.

SOILS

The U.S. Department of Agriculture’s Soil Conservation Service, in cooperation with the Penn State College of Agriculture and the PA Department of Environmental Resources’ (DER -- now Department of Environmental Protection, or DEP), issued a soil survey for Beaver and Lawrence Counties in 1982. This soil survey provides data on soil properties and determines site development constraints, if any, that site soils present.

In addition to the soil survey, Pashek Associates reviewed the list of hydric soils for Beaver and Lawrence Counties. Hydric soils are one of three criteria determining the presence of jurisdictional wetlands in the State of Pennsylvania. The following chart depicts site soil characteristics and potential limitations to site development.

<i>Soils Inventory - Bradys Run Park</i>			
<i>Soil Type (Map Symbol)</i>	<i>Drainage</i>	<i>Hydric Components</i>	<i>Limitations to Site Development</i>
Atkins Silt Loam (At)	Poor	Atkins (WV 0008)	High water table, flood hazard
Brinkerton Silt Loam, 3-8% slopes (BkB)	Poor	Brinkerton (PA 0090)	High water table, slow permeability
Cavode Silt Loam, 3-8% slopes (CeB)	Poor	Brinkerton	Seasonal high water table, slow permeability, erosion hazard
Culleoka Silt Loam, 3-8% slopes (CuB)	Good	None	Moderate depth to bedrock, erosion hazard
Ernest Silt Loam, 8-15% slopes (ErC)	Moderately Good	Brinkerton	Slope, slow permeability, seasonal high water table, erosion hazard
Gilpin Silt Loam, 3-8% slopes (GnB)	Good	None	Moderate depth to bedrock, erosion hazard
Gilpin Silt Loam, 8-15% slopes (GnC)	Good	None	Slope, moderate depth to bedrock, erosion hazard
Gilpin Silt Loam, 15-25% slopes (GnD)	Good	None	Slope, moderate depth to bedrock, erosion hazard
Gilpin Weikert Complex, 3-8% slopes (GsB)	Good	None	Depth to Bedrock
Gilpin Weikert Complex, 8-15% slopes (GsC)	Good	None	Slope, depth to bedrock
Gilpin Weikert Complex, 15-25% slopes (GsD)	Good	None	Slope, depth to bedrock

Gilpin Weikert Complex, 25-70% slopes (GsF)	Good	None	Slope, depth to bedrock
Gilpin-Upshur Complex, 3-8% slopes (GpB)	Good	None	Depth to bedrock, slow permeability, high shrink-swell potential, unstable soil material, erosion hazard
Guernsey Silt Loam, 3-8% slopes (GtB)	Moderately Good	Wet Spots	Slow permeability, seasonal high water table, clayey unstable soil
Guernsey-Vandergrift Complex, 8-15% slopes (GvC)	Moderate	Wet Spots	Slow permeability, seasonal high water table, clayey unstable soil material
Hazleton Channery Loam, 3-8% slopes (HaB)	Good	None	Erosion hazard, depth to bedrock (buildings)
Monongahela Silt Loam, 3-8% slopes (MoB)	Moderately Good	Purdy	Slow permeability, moderate erosion hazard, seasonal high water table
Philo Silt Loam (Ph)	Moderately Good	Atkins, Holly	Seasonal high water table, flood hazard
Pope Silt Loam (Po)	Good	Atkins, Holly	Flood hazard
Tilsit Silt Loam, 3-8% slopes (TsB)	Moderately Good	Wet Spots	Seasonal high water table, slow permeability
Tilsit Silt Loam, 8-15% slopes (TsC)	Moderately Good	Wet Spots	Slope, seasonal high water table, slow permeability
Urban Land - Arents Complex, (Ub)	Varies	Atkins, Holly, Brinkerton	Depth to bedrock, seasonal wetness, sloped areas may be unstable
Urban Land - Gilpin Complex, 8-25% slopes (UgD)	Good	None	Depth to bedrock, slope
Wharton Silt Loam, 3-8% slopes (WhB)	Moderately Good	None	Slow permeability, seasonal high water table, erosion hazard
Wharton Silt Loam, 8-15% slopes (WhC)	Moderately Good	None	Slope, slow permeability, seasonal high water table, erosion hazard
Wharton-Gilpin Silt Loam, 8-25% slopes (WnD)	Moderately Good	None	Slope, slow permeability, seasonal high water table, erosion hazard, depth to bedrock

After reviewing the soil inventory for Bradys Run Park, the following conclusions were made:

- Depth to bedrock and seasonal high water tables are the most common limitations to park development in most areas of the park. Slopes in most of the park are also a major limitation.
- Several of the site's soils contain hydric inclusions. This is expected on any site containing floodplain areas. The presence of hydric soils also further supports the identification of jurisdictional wetlands in and around Bradys Run Lake (recorded on National Wetland Inventory (NWI) mapping mentioned earlier in this section).
- The site contains a few soils comprised of unstable, clayey material. Caution should be used to avoid development of structures in these areas, and detailed investigations should be performed before development of any recreational facilities.

TOPOGRAPHY

Recreation facilities at Bradys Run Park are clustered in the nearly-level areas adjacent to the site's streams, as well as on a few broad ridge tops in the park's central and southern sections. The slopes in these areas are generally less than 10%. Small portions of the surrounding slopes are under 25%, but most are between 25% and 70%. Trails are the only facilities traversing this terrain. The largest gently-sloping areas of the site are located along the South Branch of Bradys Run, which flows across eastward across the southern part of the site, and at the confluence of the South Branch of Bradys Run with the main branch of Bradys Run. The Four Winds Recreation Center and associated parking are located here. A large nearly-level area houses several ball fields and parking on a broad ridge top in the central part of the park.

VEGETATION

Lists provided in this section represent potential plant species inventories for the various plant communities that exist on the three county park sites, as derived from the following sources in addition to direct field observation.

Soil Survey of Beaver and Lawrence Counties, Pennsylvania. United States Department of Agriculture's Soil Conservation Service, in cooperation with the Pennsylvania State University College of Agriculture and the Pennsylvania Department of Environmental Resources' State Conservation Commission: Issued April 1982.

Benyus, Janine M. The Field Guide to Wildlife Habitats of the Eastern United States. New York, NY: Simon & Schuster, Inc., 1989.



The hills of Bradys Run Park support an oak-hickory forest plant community, with remnants of a northern floodplain forest located in the low-lying areas near the park's streams. Oaks, hickories, and maples are the dominant canopy trees in these plant communities, and various other deciduous canopy trees, saplings, shrubs, wildflowers, and vines may also be present. According to the county's soil survey, the site's soils are well-suited to wild herbaceous plants, grasses, legumes, and hardwood trees.

The following list represents the potential plant species inventory for the habitat types at Bradys Run Park:

<i>Major (Canopy) Trees</i>	<i>Understory Trees, Shrubs and Vines</i>	<i>Herbaceous Plants</i>
American Basswood	American Black Currant (vine)	Asters (various)
American Elm	American Bladdernut	Black Snakeroot
Black Oak	American Holly	Bloodroot
Bur Oak	American Hornbeam	Common Cinquefoil
Black Willow	Beaked Hazel	Common Lespedeza
Black Cherry	Blackberry	Christmas Fern
Black Locust	Blueberry	Cinnamon Fern
Black Walnut	Box Elder	Cut-leaved Toothwort
Black Gum	Bur Cucumber (vine)	Dutchman's Breeches
Chestnut Oak	Buttonbush	False Solomon's Seal
Eastern Cottonwood	Climbing Bittersweet (vine)	Solomon's Seal
Eastern White Pine	Common Moonseed (vine)	Goldenrods (various)
Green Ash	Coralberry	Great Ragweed
Larch	Deerberry	Green Dragon
Northern Red Oak	Downy Serviceberry	Groundnut
Norway Spruce	Eastern Burningbush	Hog Peanut
Pin Oak	Eastern Hophornbeam	Indian Cucumber Root
Pumpkin Ash	Eastern Redbud	Jack-in-the-Pulpit
Red Maple	Elderberry	Jewelweed
Shingle Oak	Flowering Dogwood	Mayapple
Swamp White Oak	Greenbriers (vine)	Nannyberry
Shagbark Hickory	Hackberry	Ostrich Fern
Shellbark Hickory	Mapleleaf Viburnum	Winterberry
Sugar Maple	Mountain Laurel	Panic Grasses
Silver Maple	Poison Ivy (vine)	Partridgeberry
Sweetgum	Possumhaw	Pink Lady's Slipper
Sycamore	Red Mulberry	Royal Fern
Slippery Elm	Rhododendrons	Sedges
White Spruce	River Birch	Sessile Bellwort
White Ash	Spicebush	Stinging Nettle
White Oak	Sourwood	Sweetflag
Yellow Poplar	Sassafras	Tick Trefoils
	Speckled Alder	Tickclover
	Trumpet-Creeper (vine)	Trilliums
	Virgin's-Bower (vine)	Trout-Lily
	Virginia Creeper (vine)	Turtlehead
	Wild Grape (vine)	Violet Wood-Sorrel
	Wild Yam (vine)	Wild Ginger
	Winged Elm	Wild Sarsaparilla
	Witch Hazel	Wintergreen (Teaberry)
		Wood Nettle

WILDLIFE

To survive, animal species require food, cover, space, and water. All of these are provided on the park site, and thus the site is sufficient to support wildlife. The existence of wildlife on the park site may be of interest to local scholastic environmental educational programs or other environmental study groups.

A potential vegetation inventory was derived from reference sources. From this list of probable plant communities / habitats, Pashek Associates compiled a potential wildlife inventory using the following

sources:

Brittingham, Margaret C., and Colleen A. DeLong. "Management Practices for Enhancing Wildlife Habitat". Penn State College of Agricultural Sciences Cooperative Extension, 1998.

Benyus, Janine M. The Field Guide to Wildlife Habitats of Eastern United States. New York, NY: Simon & Schuster, Inc., 1989.

Bradys Run Park contains a mature oak-hickory forest that covers its slopes and ridges, and also several ribbons of northern floodplain forest cover the level floodplain near its streams. These habitats provide cover and abundant food for wildlife. Acorns and hickory nuts provide food for squirrels, wild turkeys, white-tailed deer, various mice, and chipmunks. Also, yellow poplar and white ash trees offer seeds that remain on the trees all winter, providing food for several bird species and other wildlife.



Shelter is also available in the forest habitat. Standing dead timber offers nesting cavities for raccoons, opossums, and wood ducks, and fallen logs and leaf litter provide ample shelter for small rodents, reptiles, and amphibians.

Potential Wildlife Inventory

The following list represents a potential inventory (not including insects and other invertebrates) of the wildlife that may utilize the habitat types within Bradys Run Park:

***POTENTIAL Wildlife Inventory:
Mature Oak / Hickory and Northern Floodplain Forests***

American Woodcock	Great Crested Flycatcher	Spotted Salamander
American Redstart	Gray Jay	Summer Tanager
Belted Kingfisher	Gray Squirrel	Scarlet Tanager
Blue Jay	Gray Fox	Silver-haired Bat
Blue-gray Gnatcatcher	Gray Treefrog	Spring Peeper
Broad-winged Hawk	Hooded Merganser	Timber Rattlesnake
Black Bear	Indiana Myotis (bird)	Tufted Titmouse
Black Rat Snake	Marbled Salamander	Veery (bird)
Cardinal	Massasauga Rattlesnake	Virginia Opossum
Central Newt	Mink	Wood Frog
Cooper's Hawk	Northern Bobwhite	Wood Duck
Common Goldeneye (bird)	Northern Flicker	Wood Turtle
Chickadees (various)	Northern Parula	Whip-poor-will (bird)
Dark-Eyed Junco	Northern Oriole	Woodpeckers (various)
Eastern-Wood Peewee	Northern Flying Squirrel	White-breasted Nuthatch
Eastern Ribbon Snake	Ovenbird	Warblers (various)
Eastern Bluebird	Pileated Woodpecker	Warbling Vireo
Eastern Box Turtle	Red-shouldered hawk	Wood Thrush
Eastern Harvest Mouse	Red-eyed Vireo	Wild Turkey
Fox Squirrel	Red Fox	White-footed Mouse
Four-toed Salamander	Raccoon	Woodland Vole
Five-lined Skink	Red-headed Woodpecker	Woodland Jumping Mouse
Green Egret	Red-bellied Woodpecker	White-tailed Deer
Green-backed Heron	Rufus-sided Towhee	Yellow-bellied Cuckoo
	Slimy Salamander	

Pennsylvania Natural Diversity Inventory Index Search

The Pennsylvania Department of Forestry maintains the Pennsylvania Natural Diversity Inventory (PNDI) Index. This is a database of known locations of Pennsylvania's rare, threatened, and endangered plant and animal species. The database and searches are now accessible online at the Pennsylvania Natural Heritage Program (www.naturalheritage.state.pa.us).

A search of the PNDI Database (Searches #20061012059771 and #20061012059773) indicated that park development should have no known impact on species federally protected under the Endangered Species Act, but have one (1) potential impact on a Pennsylvania special concern species. Exact species identification is not revealed for PNDI database searches to protect small populations of rare plants and animals from collection by humans.

Prior to the start of construction in any previously undisturbed areas of the site, the County should contact the Ecological Services Section of the Pennsylvania Department of Conservation and Natural Resources' (DCNR's) Bureau of Forestry at P.O. Box 8552, Harrisburg, PA 17105-8552, fax: (717) 772-0271 for instruction. The Ecological Services Section will require a copy of the PNDI Environmental Review (an Environmental Review Receipt is included in the appendices of this report), a cover letter with project narrative, and a description of the acreage to be impacted and

construction methods to be used.

Beaver County Natural Heritage Inventory

In 1993, the Western Pennsylvania Conservancy (WPC) worked with the Beaver County Planning Commission (BCPC) and the Pennsylvania Department of Community Affairs to develop the Beaver County Natural Heritage Inventory (NHI). The NHI identifies and ranks natural areas of importance to the biological diversity and ecological integrity of the County. These areas are known as “natural heritage areas.”

Bradys Run Park contains portions of two Bio-diversity areas, or BDA’s. BDA’s are natural heritage areas that include habitats harboring state or national animal or plant species of concern, possess a high diversity of species native to the County, or support a rare or exemplary natural community. The North Branch Valley BDA encompasses the North Branch Bradys Run stream valley between Routes 60 and 51, along with uplands and slopes between the two branches of Bradys Run. This BDA is home to a plant species of special concern, and exhibits two natural community types: mesic central forest and northern hardwood forest community. The South Branch Valley BDA includes the southern stream valley slopes and uplands along the South Branch of Bradys Run as well as the Wildwood Road stream valley, and represents one of the County’s best examples of a mesic central forest community.

In addition to identifying the BDA’s above, NHI designates Bradys Run Park as a “Managed Land”. These lands are included in the NHI because of their importance, or potential importance, to the overall maintenance and protection of ecological resources to the County. In addition to containing parts of three identified natural heritage areas, Bradys Run Park is very large and contains large areas of commonly-occurring natural habitats. The NHI suggests that attempts be made to protect the forested areas of the park as well as the identified natural heritage areas that pass within park boundaries.

Bradys Run Park and both BDA’s mentioned are encompassed by the Bradys Run Landscape Conservation Area, or LCA. An LCA is a large contiguous area important because of its size, open space and habitats; and retains much of its natural character due to a low level of disturbance. The Bradys Run LCA extends from Chippewa to Bridgewater, encompassing both branches of Bradys Run, and is designed to encourage protection of the stream and the accompanying BDA’s.

The Beaver County NHI is available online via the Pennsylvania Natural Heritage Program website listed on the previous page.

EXISTING RECREATIONAL FACILITIES

This section identifies issues related to the location, use, and relationship between existing facilities at Bradys Run Park. Analysis of the park property is visually represented in the Site Analysis Plan at the end of this chapter. A full inventory of the park’s existing facilities, including descriptions and analysis of individual facilities, is provided in the Appendices of this report.

Topography is the Major Limiting Factor to Park Development

The park's existing facilities are clustered on the more level ridge tops on the site, as well as the level lowlands around the park's streams. These are the only feasible areas for recreation facilities other than trails.



Trail Signage, Mapping, Markers Needed

The park's trail system receives considerable use and with improvement could further capitalize on one of the park's best outdoor recreation opportunities. Trail signage is needed at all trailheads. Proper signage identifies trails, and includes mapping, trail distance information, and trail use regulations so that user conflicts (i.e. mountain bikes, hikers) are minimized.

Trail markers along each trail are also needed to prevent accidental trespass onto properties neighboring the park. The Bradys Run South Trail, according to mapping completed from aerial photography, crosses the park's southern boundary and crosses private property. This trail needs to be re-routed, as do any others crossing park borders.

Markers along park trails will prevent users from following unauthorized trails and will also indicate distance traveled along each trail.

Softball / Baseball Field Complex Needs Re-organized

The existing Beaver County Softball / Baseball Complex contains large amounts of open space that may be better utilized if the orientation and/or location of the ball fields, roads, and parking areas were changed.

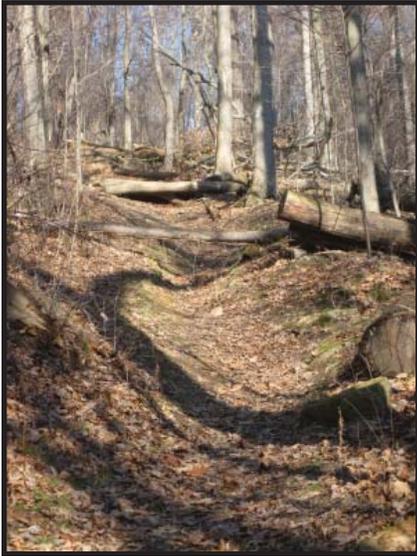
Ridge Top East of Ball Fields is Suitable for Development

One remaining undeveloped ridge top on the Bradys Run Park property is located just east of the Softball / Baseball Complex. This area is comprised of pole timber (3" to 8" diameter), with some brushy herbaceous clearings. The Bradys Run Trail North currently traverses this area, whose vegetation is unique to the northern portion of the park. The land here is flat and large enough for development of large recreation facilities such as additional ball fields, or for small facilities such as additional trails or small picnic areas. Vehicular access from the ball field complex is also possible.

Large Ridge Top Available with Alternate Access

A large, level ridge top in the extreme northern part of the park is available for development of recreation facilities, possibly athletic fields. Access is the main challenge to any use of this area. The only feasible access is from James Street in Chippewa Township. James Street is accessible from

State Route 51 via Braun Road.



Bradys Run North Trail, Logstown Trail Not Sustainable

The Bradys Run North Trail and Logstown Trail, located on the ridges north of Bradys Run Lake, need to be evaluated. Both trails provide fun, adventurous riding for mountain bikers but their designs cause unnecessary amounts of maintenance. In some spots, the Bradys Run North Trail has eroded up to 3 feet of the hillside away, creating a rocky channel that is nearly impassible. In one location near the trail's western end, the trail was placed directly adjacent to a small stream. No streambank protection of any kind was installed, and as a result half of the trail was completely eroded away during recent flooding. The trail appears to receive heavy use, and is 6' to 8' wide in most spots. Typical mountain bike trails and/or hiking trails do not need to be wider than 3'.

The Logstown Trail appears to have been recently re-graded, but no trail surface was provided. The mud surface now is suitable for adventurous riders, but excessive ponding may cause maintenance headaches in the future. Directional signage and other signage describing permitted trail uses is needed at trail intersections.

Bradys Run Trail South an Excellent Example of Single Track Trail

In contrast to some of the park's other trails, the Bradys Run Trail South is more sustainable. It is only as wide as needed for single track mountain bike use. In addition, it follows the contours of the hillsides on the southern portion of the site. With the exception of a few instances, the trail does not run up or down hills at constant grades. This situation WOULD result in erosion. Instead the trail dips and rolls along the hillsides, utilizing anchors such as large trees or boulders to keep riders interested.



Waste Characterization and Clean-Up Needed East of Calland Arboretum

A small area of ridge top just east of the Calland Arboretum was once used as an illegal trash dump, and may have been home to buildings in the distant past. Just east of the intersection of the Bradys Run North Trail and the Calland Arboretum Trail is a small area of flat ridgetop that is currently unused. Remnants of several stone foundations are located here, as is an illegal trash dump. Dumping appears to have been done in the distant past, as no vehicular access is currently provided. Clean-up of the illegal

trash dump will help beautify the park, and uncovering the old stone foundations may be of local archaeological interest.



Paved Walking Loop is a Great Community Resource

Many of the park's facilities are of exceptional quality. One example of this is the paved walking loop along Constitution Boulevard (State Route 51). This loop receives heavy use because of its easily accessible and visible location, and because of the excellent maintenance it receives. Clear, legible signage directs users coming to the walking trail from Route 51.



1 The Beaver County Softball / Baseball Complex contains large amounts of open space that may allow for reorganization of existing fields, or addition of new facilities. The wooded area in the background shown above is suitable for expansion of the ball field complex or park trail system.



2 Brady's Run Lake is one of the park's largest attractions, drawing swimmers, fishermen, and boaters from the surrounding area. Space is available for expansion of picnic areas adjacent to the lake.



4 This photo was taken near the west end of the Brady's Run Trail North. This section of the trail was placed too close to the adjacent stream, and as a result half of the trail has been totally eroded away during seasonal flooding.

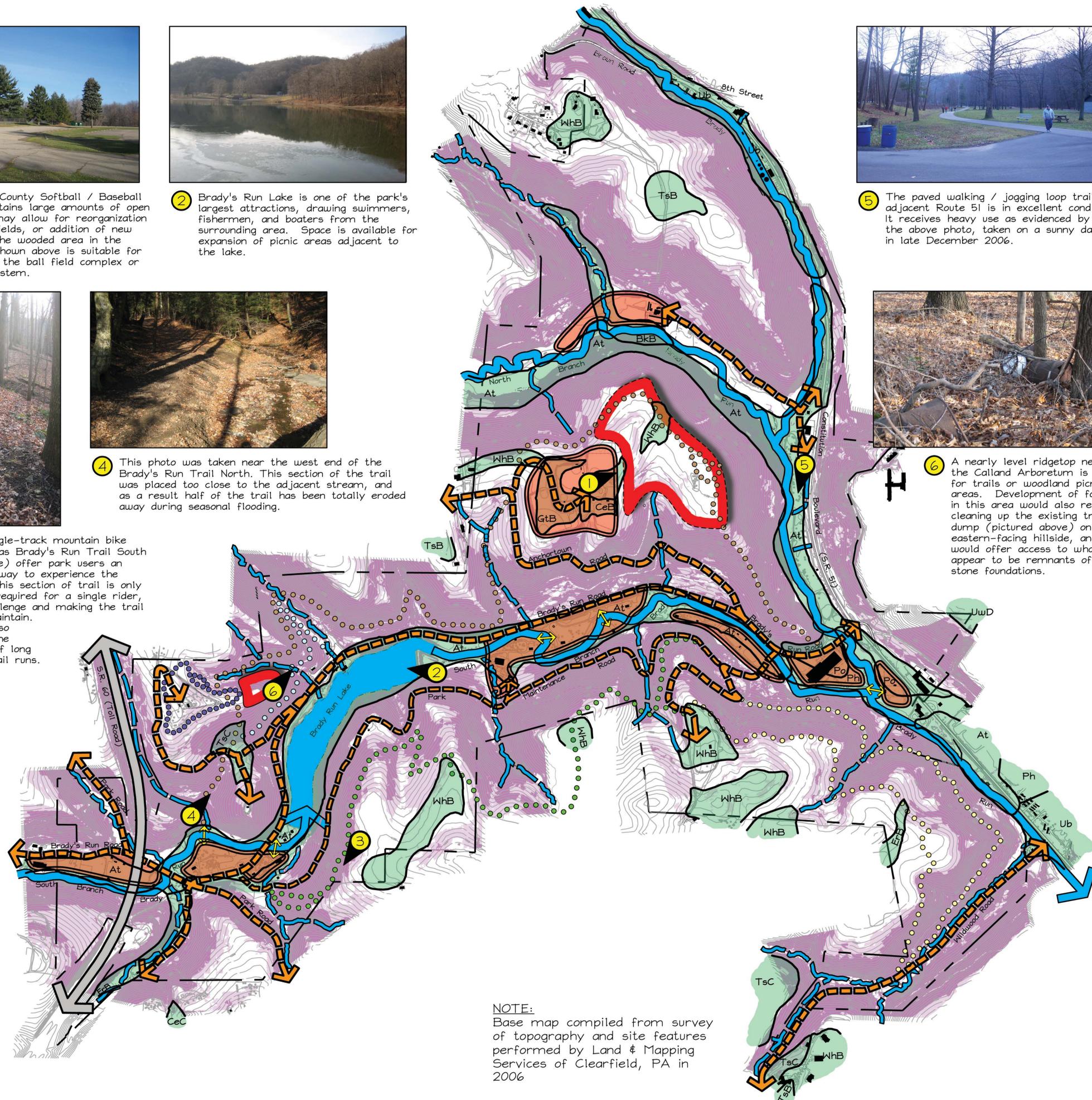
3 Excellent single-track mountain bike trails, such as Brady's Run Trail South (shown above) offer park users an adventurous way to experience the outdoors. This section of trail is only as wide as required for a single rider, creating challenge and making the trail easier to maintain. Erosion is also limited by the elimination of long down-hill trail runs.



5 The paved walking / jogging loop trail adjacent Route 51 is in excellent condition. It receives heavy use as evidenced by the above photo, taken on a sunny day in late December 2006.



6 A nearly level ridgetop near the Calland Arboretum is suitable for trails or woodland picnic areas. Development of facilities in this area would also require cleaning up the existing trash dump (pictured above) on the eastern-facing hillside, and would offer access to what appear to be remnants of old stone foundations.



LEGEND

Slopes 0-10%	
Slopes 10-25%	
Slopes 25%+	
Park Trails:	
Wildwood Loop Trail	
Brady's Run Trail South	
Brady's Run Trail North	
Logstown Trail	
Calland Arboretum Nature Trail	
Vehicular Circulation	
Major Off-site Vehicular Circulation Route	
Intermittent Drainage Way	
Perennial Stream	
Structure	
Park Maintenance Facility	
Recreational Activity Area	
Potential Recreational Developmental Areas	
Location of Site Photo (Arrow indicates direction of view)	
Pedestrian Connection (Footbridge)	
Hydic (Wetland Indicator) Soils	

Soil Symbol

At	= Atkins Silt Loam
BkB	= Brinkerton Silt Loam, 3-8% Slopes
CeB	= Cavade Silt Loam, 3-8% Slopes
CeC	= Cavade Silt Loam, 8-15% Slopes
ERB	= Ernest Silt Loam, 3-8% Slopes
GtB	= Guernsey Silt Loam, 3-8% Slopes
Ph	= Phil Silt Loam
Po	= Pope Silt Loam, 3-8% Slopes
TsB	= Tiltit Silt Loam, 3-8% Slopes
TAc	= Tiltit Silt Loam, 8-15% Slopes
UjD	= Urban Land-Arenta Complex
WhB	= Wharton Silt Loam, 3-8% Slopes
Ub	= Urban Land-Arenta Complex, 8-25% Slopes

NOTE:
Base map compiled from survey of topography and site features performed by Land & Mapping Services of Clearfield, PA in 2006

Brady's Run Park
Beaver County, Pennsylvania

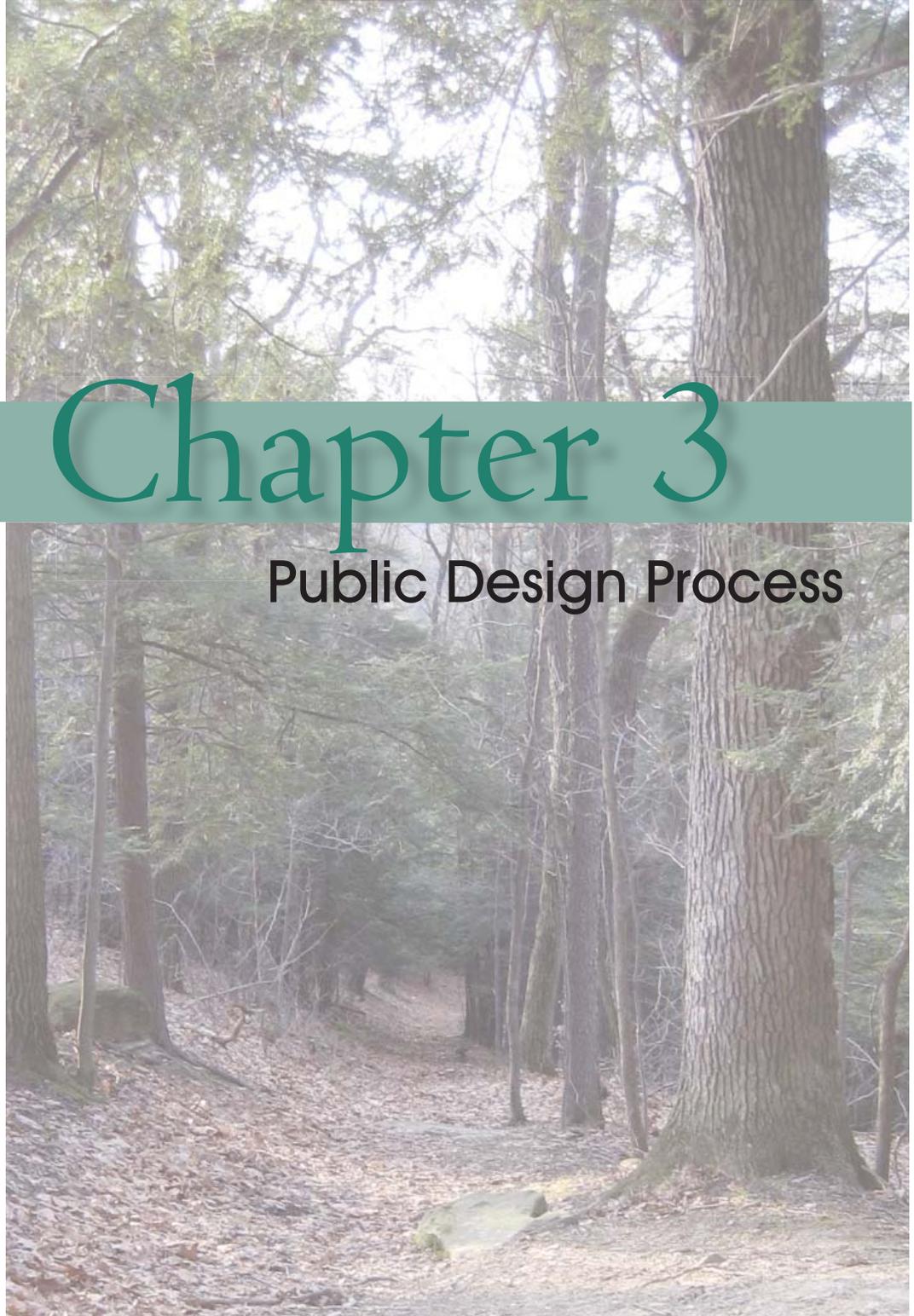
Site Analysis Plan

Scale: As Noted
Date: 12/21/06

Contour Interval: 10'-0"

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Chapter 3

Public Design Process

This chapter describes development of the park master plan. Together with the inventory and analysis, public participation played a key role in helping Pashek Associates develop the final master plan for each park.

A project study committee, comprised of local community officials and recreation group representatives, led the decision-making process with help from Pashek Associates. The committee offered specific information about the park site and helped guide the development of one concept plan for each park. Each concept plan was then revised according to further feedback from the committee. The subsequent revision to each concept plan resulted in a more detailed draft master plan for each park. These draft master plans were presented for comment at public meetings held at each park. With public comments in mind, Pashek Associates further revised the draft master plan, developed a cost estimate and phasing plan for park improvements, along with recommendations on park programs, maintenance, and operations. These items accompanied the final master plan and are described in detail later in this report. This chapter further details the design process mentioned above.

PUBLIC PARTICIPATION

The public participation process for this study included several forms of gathering data. The *project study committee*, which was formed to guide the master planning process, met three times throughout the course of the project. Six public input sessions were also held (two at each park), and the consultants also facilitated a meeting with the Beaver County Commissioners to obtain their support for the project through updates and subsequent feedback.

Pashek Associates conducted 12 key person interviews with citizens involved in recreation and / or conservation around the county. Key person interviewees were identified by the project study committee members. In addition to the efforts mentioned above, Pashek Associates maintained a project webpage accessible to all interested parties throughout the planning process.

This section describes the public input process and summarizes results from both the study committee and public input sessions. The input process culminates in the identification of proposed facilities and their relationship to each other, which the master plan reflects. Actual meeting minutes and results of the key person interviews are located in the appendices of this report.

Study Committee Meeting #1 (January 9, 2007)

At the first meeting of the Project Study Committee, Pashek Associates reviewed the master planning process and explained that the committee would establish a vision for the future of Bradys Run, Brush Creek, and Old Economy Parks, as well as provide input, and serve as a sounding board for plan recommendations as they are developed.

The committee then reviewed the project schedule, as well as the current “vision” for the park, and current park use. Committee members were then asked to comment on their feelings about the parks. They offered the following comments:

General (All Parks):

- Old Economy was a wonderful resource as I grew up. I spent a lot of time at the swimming pool.
- Its nice to have indoor and outdoor recreation opportunities available at Bradys Run. The park provides everyone with a place to recreate, even during bad weather.
- Brush Creek provides good bird watching opportunities.
- The Beaver County Senior News can serve as a venue to highlight the planning process, as well as solicit input from the County's seniors with regards to their recreation desires.
- Beaver County's park infrastructure and buildings are in poor shape. The capital budget for park improvements was eliminated several years ago and the maintenance budget is limited. Park roads are in very bad shape and need to be repaved.
- The County has developed a forest management plan. The plan recommends selective harvesting of timber in the parks, and returning the revenue generated back into the parks. I do not expect the plan to be implemented however.
- Bradys Run Handicap Fishing area has changed my father's life. It has allowed him to continue a hobby that he has always enjoyed.
- County parks are under funded. We need a mechanism to ensure improvements can be made. The County has made some strides in recent years. However, there are many more projects than need to be undertaken to maintain what we have.
- We are fortunate to have different types of parks to meet different recreation needs. Bradys Run meets the active recreation needs, Brush Creek meets passive recreation needs, and Old Economy meets the swimming needs of residents. We also have Raccoon Creek State Park in the County which is a wonderful asset to County residents.

Study Committee Meeting #2 (March 8, 2007)

The purpose of the second study committee meeting was to review the site analysis plans for each park. Pashek Associates presented a slide show explaining the process used to analyze each park site, including what characteristics of each park were analyzed and why. After an explanation of the site analysis process, attendees discussed ideas for improvements to the three parks. Comments made during this discussion are summarized below:

General (All Parks)

- All three parks have several areas maintained as lawn that could be better left non-mowed to revert to nature, or possibly mown once or twice annually, coinciding with events using those areas.
- Maintaining less areas as lawn may upset some park users who are thinking primarily in terms of safety.
- Some areas could be planted with wildflowers and/or native warm-season grasses for aesthetic purposes.
- Park users need to be educated on the environmental, aesthetic, and financial advantages of maintaining less manicured lawn areas.

Brush Creek Park

- (especially at Brush Creek Park), An 8-foot to 10-foot wide lawn strip should be maintained along park roads for walkers.
- Many of these lawn areas are maintained simply because they have always been maintained and no one questioned it.
- Less mowing would mean significant savings by not having to pay workers overtime to mow in spring.
- The tennis courts in Brush Creek could be removed as they have not been maintained (or used) for quite some time.
- There is potential to use some of the excess mowed areas in Brush Creek for a dog park. One spot may be where the unused tennis courts are now.
- Wetlands at Brush Creek are another example of areas that could be allowed to revert back to nature. Lawns immediately adjacent to small wetlands do not need to be maintained as lawn.
- An important note for all parks is that there are no restrictions for uses (it was previously thought that uses were restricted because the parks were built with Project 70 money years ago). Project 70 was a conservation-based initiative, but its funds carried no limitations in terms of what could / couldn't be built.

Bradys Run Park

- There is room for expansion of either the softball/baseball complex or the trail system in Bradys Run Park, just east of the existing ball field complex. It was stated that expansion has been an idea discussed for years. Ideally all the fields would be re-organized, but some of them would have to be kept open or they would lose all their users for an entire season.
- One idea is to have a 4-plex (4 fields in a radiating pattern) plus two more fields.
- DCNR frowns upon fields with incorrect orientation because the sun becomes a hazard for batters.
- We have some hills in the park, as well as tall tree lines that may prevent the sun from being a problem. Scheduling games at certain times of day may also help.
- The ball field complex at Bradys Run could become the best in the area, especially since it is accessible from two directions (from Route 51, from Achortown Road in Chippewa Township).

Old Economy Park

- The maintenance facility on the existing conditions plan is shown as not being on county property. We should double-check the survey for that park.
- The large flat area in the southwestern portion of the park is remote, and is suitable for expansion of the hiking / horse trails in the park, or possibly for construction of mountain bike trails. This area is inaccessible by vehicle, barring major earthwork.

After this discussion, Pashek Associates explained the importance of interviewing key people with interest in recreation and/or conservation in the County about improvements to each of the 3 parks being master planned. The study committee then listed possible key persons to be contacted for each park.

Study Committee Meeting #3 (July 9, 2007)

The third study committee meeting began with Pashek Associates describing the questions asked to key person interviewees and their responses. Key issues mentioned by interviewees included the following:

Bradys Run

- ~ Horseshoe Courts would benefit from relocation
- ~ Staff and funding are spread very thin
- ~ Directional signage, trail maps, and trail rules are needed
- ~ An 8-mile bike loop is possible within the park, with only approximately 1/2 mile of trail yet to be built, and a very short distance of on-road bike lane (several hundred feet).
- ~ Reorganization / Expansion of the ball field area is a good idea, but raises concerns about closing fields and losing participants for an entire year.

Brush Creek

- ~ Divots from horseback riders in the ball field outfields are hazardous to sports players on all teams
- ~ Parking for horse trailers would be great for horseback riders
- ~ Trails need signage to denote park trails vs. unauthorized trails
- ~ Better maintenance is needed on the ball field infields -- there is a drainage problem in the southern ball field's infield
- ~ Trails in the park need surface improvements (to stop erosion) and signage
- ~ Illegal ATV access at the park is worst in the northern end of the park (in the reclaimed strip mine area) and on the western edge of the park on the hillside above the maintenance building.

Old Economy

- ~ The park entrance is hard to find. Visitors need signage on Route 65 directing them to the park, and the park entrance should be more visible.
- ~ The play equipment in the park is outdated and the pavilions are in need of repair.
- ~ More attention needs to be given to the park -- all attention and funding goes to Bradys Run Park.

Committee members then discussed the issues raised for each park as they were reiterated during presentations of the respective concept plan for each park. Comments made during the discussion are summarized as follows:

Bradys Run

- ◇ The proposed bike loop could be extended through the area near the boat launch because everyone parks across Bradys Run Road anyway, the bike lane would not be in their way. (Pashek Associates explained that general access to the boat launch would not be a problem, but handicapped access may be an issue if the bike loop is constructed there)

- ◊ The County will soon apply for grant funding to pave the old park maintenance road (referred to as the “fire road”) for use as a bike trail -- while maintenance vehicles would still be allowed on it.
- ◊ Volunteer labor or public works labor could be used to obliterate unsustainable trail segments within the park.
- ◊ Eliminating the small parking area / turnaround across Bradys Run Road from the ice arena is a good idea (the proposed elimination of this lot coupled with extension of the park trail to the main ice arena parking lot would force trail and walking track users to park in the main lot)
- ◊ Who should run the concession stand at the ball field facility? Pashek Associates explained that in a similar situation on another project, a municipality had decided to staff the concession stand themselves and devote all proceeds to township-funded improvements to the adjacent ball fields.
- ◊ Attendees agreed that fees should be paid by baseball and/or softball leagues to use the fields, despite the fact that fees have not been charged for the use of the Bradys Run fields in the past.
- ◊ Fees are especially needed if the fields are to be lit -- the leagues should pay the lighting bill, not the County.

Brush Creek

- ◊ The original intent of the Brush Creek master plan should be kept in mind - a rustic natural setting. The proposed fences on the ball fields would confine that space rather than leave it open as it is now.
- ◊ The horseback riders have trails in the park that they can use - the recreation fields are not part of that trail system
- ◊ Divots in ball field outfields are being caused by horseback riders
- ◊ Obliterating unauthorized trails and posting more signage will curb illegal ATV access. Eliminating authorized trail access to the park will also help (i.e. a park trail extends directly to route 588 east of the park entrance)
- ◊ In the original winter recreation area master plan for Brush Creek Park, use of the creek water for snow-making was proposed, but was ruled out due to difficulty with permitting. A portion of the proposed water line for this area extends from Route 588 onto the park property past the existing rental house in the park’s southwestern corner.
- ◊ The proposed pavilions are a good idea. A lot of people go to the park to picnic, and to have no picnic space under roof is foolish.
- ◊ The County has a choice to make regarding designating use areas within the park. Although the original park was rustic and very open, the current uses of the park (i.e. softball) may merit designated spaces such as those that would be created if the fields were fenced.
- ◊ Picnickers could still gain access to the fields on certain days of the week. That is a matter of proper scheduling. Leagues might only be allowed to have the field during the week in the summer.

Old Economy

- ◊ The County should consider acquiring property or reaching an agreement with landowners at the corner of Route 989 and Forcey Drive to make a more visible entrance to the park.

Bradys Run Park Public Input Session #1 (August 21, 2007)

The first public input session at Bradys Run Park was held so that Beaver County residents using the park could learn about the master plan project for the park, and why it was being undertaken. Pashek Associates explained that the main reasons for completing a master plan are A) to give further development at the park and B) to attract future grant funding for construction of improvements proposed in the master plan.

Pashek Associates further explained that the master plan creates a long-term “vision” looking 10 to 15 years into the future. At that time an update of the master plan would be needed to re-assess current recreation needs.

During a review of the existing conditions plan and site analysis plan for the park, Pashek Associates explained the inventory and analysis process as part of master planning. After this review, attendees were asked to state what they would like to see improved at the park. Responses are summarized below:

- We have an opportunity to create a continuous bike loop path around the park
- Mountain bike paths in the park are already a regional destination that we should build on
- We should capitalize on the bike path opportunities within the park - we especially need a relatively flat, recreational bike path that can be used by all ages and abilities
- A shared use path for walking and biking is another idea
- We need an additional baseball field - the one (legion) field at the ball field complex is overused, and there is a need for an additional softball field
- Another possibility is a multi-use field for soccer / football / baseball practices
- The ball field complex needs city water - the fields are too high up on a hill for a well to provide adequate water for the fields
- fields should be lighted to expand their use
- Roads and parking for the ball fields need improved
- There are 85 acres of flat land in the northernmost part of the park property, accessible from James St. in Chippewa Township - this would be perfect for the soccer fields everyone has been asking for.
- Use of the existing tennis courts is increasing and we have room for additional courts near the existing outdoor courts.
- Enhancements need to be made to the tennis court area - a shaded shelter or gathering area just for players to rest would keep people there. Right now there is nowhere to sit and rest, no nice landscaped area to gather in, so people leave right away.
- The Lodge needs a new entrance bridge and also a second exit - right now those at the lodge during floods must use the old maintenance road to leave because the creek floods over the bridge
- Horse stables should be considered as they have been requested in the past, and possibly more parking for those with horse trailers
- A campground would be well-used

- ☛ Restrooms around the park need to be upgraded, whether with plumbing, or with waterless composting restrooms
- ☛ A mountain bike park (not just trails) would bring in revenue - Seven Springs has opened one and people drive hours to use and pay \$25 a day to do so.
- ☛ It will take a lot of money, but we should fix one of the mainstays of the park - the lake - along with the stream and bath houses
- ☛ A catch-and-release trout area was mentioned, created by using the bottom release on the existing dam (water would exit the lake from the bottom, creating colder water downstream environment). But the fish commission evaluated the situation and stated that the lake is too shallow for that idea to work. The entire water column is warmed by the sun during summer months.
- ☛ The state roads in the park are a disgrace - PennDOT needs to fix them badly.
- ☛ We need to respect our park better - keep it free from litter, prohibit camping out / drinking before the first day of trout season
- ☛ We lack the manpower to enforce rules concerning camping / littering, security, etc.
- ☛ Geese are becoming a major problem around the lake - we need to find some solution. No matter what we do to fix the problem we need to be ready to take criticism because somebody won't like it.
- ☛ An indoor soccer / multi-use facility would be a regional draw.
- ☛ The lodge needs upgrades such as better insulation, heat, and parking.
- ☛ Several residents have requested a sled-riding hill for children.
- ☛ Trails should be established to connect the park to adjacent neighborhoods and communities, Brighton and Patterson.

Bradys Run Park Public Input Session #2 (May 19, 2008)

A second public input session was held on May 19, 2008 at the maintenance garage in Bradys Run Park.. The purpose of this meeting was to present and receive feedback on the draft recommendations developed during the course of this master planning process. Those recommendations are further described in Chapter 4 – Recommendations and Implementation. In addition to the Consultant, County Planning, and Public Works staff three people attended the meeting.

After reviewing the proposed recommendations for Bradys Run Park, the following input was provided by the meeting attendees:

1. Members of the Beaver Area Bicycle Enthusiasts (BABE) indicated that the recommended mountain bike trails are desirable as some of the current trails are experiencing serious erosion problems. BABE members have attended IMBA training sessions, and are currently in the process of re-routing various trail segments at no cost to the County.
2. Where the existing mountain bike trails go off the park property, the cost of re-aligning the trail versus securing an easement from the property owners needs to be evaluated as it may be more economical to obtain easements than relocate the trails.

3. The proposed shared use path along the fire road, on the southern side of the lake should be a priority for development within the park as it provides the opportunity to create an eight mile shared use path loop through the park.
4. Attendees suggested the proposed improvements for the ballfield complex be reviewed and confirmed with Doug Berg, who represents the softball leagues who utilize the fields, and Jack Hilfinger, who coordinates the baseball leagues' use of the fields. The current proposal may not be accommodating the needs of softball and baseball.

The consultant indicated that the input received at this meeting would be considered as the Master Plan for the park is finalized.

Key Person Interviews

The study committee identified several key persons during the public participation process. These individuals had interest in the park or represented organizations with interest in the park. During key person interviews, Pashek Associates briefly explained their involvement in the Bradys Run Park Master Plan to each interviewee. During ensuing discussions about the park, several general questions were posed. These questions differed for each interview. A list of interviewees and their affiliations or interests in the park are listed below. A complete summary of actual interviews and responses is included in the Appendices of this report.

- **Bill Wiggins**, Horseshoe Association (organizes a horseshoe league that uses the park's horseshoe facility)
- **Jack Hilfinger**, Beaver County Assistant Recreation Director
- **Marlin Erin**, Owner of Snitger's Bicycle Shop (avid cyclist and mountain biker that uses and organizes repairs on trails within the park)
- **Doug Berg**, Beaver County Recreation Advisory Board, Softball / Baseball Representative (involved with softball / baseball leagues using the ball field complex in the park)

FACILITY DESIGN GUIDELINES

It is important to provide properly located, safe recreation facilities that are accessible to all park visitors. Safety issues include: sports field orientation, safe play settings, age-appropriate play equipment, safety zones, barriers to park and neighborhood traffic, and properly-designed trails.



ADA Accessibility

Designing for accessibility means ensuring that facilities meet the needs of the physically- and mentally-challenged; as well as individuals experiencing temporary disabilities. This accommodates not only those with disabilities, but also makes it easier for the general public to use the facilities. It is imperative that the County take steps necessary to provide facilities accessible to all park users.

Accessibility, in design terms, is described by the Americans with Disabilities Act (ADA), which guarantees equal opportunity for individuals with disabilities to participate in the mainstream of public life. To do so, the ADA sets requirements for facilities to prevent physical barriers that prevent the disabled from using those facilities. When recreational facilities are built or improved, they must comply with ADA standards by providing an accessible route to the area of use and spectator areas.

Standards / Guidelines include:

- *Consumer Product Safety Commission's "Handbook for Public Playground Safety"* - establishes equipment, use zone, and protective safety surfacing requirements.
- *National Recreation and Park Association's "Facility Development Standards"* - establishes facility dimensions, orientation, and slope requirements.
- *American Society of Testing Materials "Standard Consumer Safety Performance Specification for Public Playground Safety" (ASTM F 1487)* - establishes access route, equipment, use zone, and protective safety surfacing requirements.
- *American Society of Testing Materials "Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment" (ASTM F 1951)* - defines minimum requirements for accessible protective surfacing materials.
- *American Society of Testing Materials "Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment" (ASTM F 1292)* - defines minimum requirements for impact attenuation of protective surfacing materials.
- *Americans with Disabilities Accessibility Guidelines for Buildings and Facilities, Play Areas, Finale Rule*, www.access-board.gov - establishes requirements for playground equipment accessibility.
- *Universal Trail Assessment Process (UTAP)*, www.beneficialdesigns.com/trails/utap.html - Based on the promise that trails should be universally designed to serve all users, UTAP

encourages land managers to provide users with specific information regarding the trail so users can make an informed decision as to whether they have the ability to use the trail.

- *Architectural and Transportation Barriers Compliance Board's "Regulatory Negotiation Committee on Accessibility Guidelines for Outdoor Developed Areas"*, September 1999, www.access-board.gov - sets minimum requirements for accessible trails, access routes, resting opportunities, benches, utility connections, and trash receptacles.
- *American Association of State Highway Transportation Officials "Guide for the Development Of Bicycle Facilities"*.
- *Americans with Disabilities Act (ADA), Title II Requirement for Public Facilities*, www.access-board.gov
- *"Trail Planning, Design, and Development Guidelines"*, Minnesota Department of Natural Resources, Trails and Waterways
- *"Trail Solutions: IMBA's Guide to Building Sweet Singletrack"*, International Mountain Bicycling Association
- *"Natural Surface Trails by Design: Physical and Human Design Essentials of Sustainable, Enjoyable Trails"*, Troy Scot Parker

Sports Facility Standard Sources

Additionally, many facilities must comply with specific standards established for their respective activity. Sports facility standards, which must be understood in order to properly locate the facilities being considered in this study, include:

- *National Federation of State High School Association's "Court and Field Diagram Guide"*.
- *National Horseshoe Pitchers Association of America*, www.horseshoepitching.com - establishes court dimensions and requirements.
- *USA Volleyball*, www.volleyball.org - establishes court dimensions and requirements.
- *International Mountain Biking Association*, www.imba.com - establishes standards for sustainable multi-use trails
- *International Horse Show Association*, www.ihsa.com - establishes standards for facilities such as the horse arena

Park Program Facility Guidelines

Taking into consideration the aforementioned standards and guidelines, in combination with Pashek Associates' prior experience, the following facility development guidelines were created for Bradys Run Park:

Picnic Shelters

- Size varies
- Maximum 5% slope for accessibility
- Concrete pad beneath shelter
- Electrical service and charcoal grills at all shelters
- Picnic tables, drinking fountain, and trash receptacles at all shelters
- Handicapped access ramps, as needed
- Adequate landscaping for shade, especially on southern and western sides



Hiking Trails

- 5' width, compacted earth surface
- Maximum 20% slope, located and graded in such a manner as to minimize disturbance and erosion

Mountain Bike Trails

- 2' width, compacted earth surface (single track)
- Maximum 10% slope, except for short hill climbs (20%) less than 50 feet, located and graded in such a manner as to minimize disturbance and erosion



Paved Loop Bike Trail

- 8' width in wooded areas, 5' width along Bradys Run Road (on road shoulder)
- Bituminous surfacing along Bradys Run Road; compacted aggregate surfacing elsewhere
- 1/4 mile markers

Accessible Walkways

- 5' minimum width
- Maximum 5% slope
- Firm and Stable surface (meeting ADA requirements)

Softball/Baseball Fields

- Various sizes
- Grade away from home plate at maximum 2% slope
- To minimize sun glare, a line running from home plate to 2nd base should point East-Northeast if possible; Southeast is also acceptable

Volleyball Courts

- Size: 30' x 60' court surrounded by a 15-foot clear zone
- Long axis oriented north to south if possible
- Sand surfacing
- Maximum slope 1%, minimum 0.8%, for drainage



Horseshoe Courts

- 20' x 70' use area, 10' x 50' play area
- Long axis oriented north to south if possible
- Turf infield with pits comprised of potter's or blue clay
- Two end pegs must have same elevation



Restrooms

- Size varies
- Maximum 5% slope for accessibility
- Concrete pad and/or concrete block wall foundation
- Drinking Fountain

Concession Stands

- Size varies
- Maximum 5% slope for accessibility
- Concrete pad foundation

Roadways

- 20' cartway
- 10% maximum slope; 1% minimum slope for drainage
- Asphalt or gravel surfacing without curbs
- Security lights - security lighting needed for all sections of all park roads

Parking

- 9' x 20' parking stalls
- 20' access aisles
- Terminal islands (width varies) at both ends of each row of parking
- Internal landscape islands
- 8' wide accessible stalls with 5' wide accessible aisle (maximum 2% slope)
- 8' wide accessible van stalls with 8' wide accessible aisle (maximum 2% slope)
- Asphalt or gravel surfacing without curbs

Adjacencies and Density of Facilities

In addition to the above requirements, thought must be given to the appropriate adjacency of

facilities to one another, and to overall density of facilities in the park. Ideally, it is most desirable to locate facilities adjacent to one another only when they have a minimal impact on each other. For example, a pre-school playground should not be placed adjacent to a basketball court. An example of appropriate adjacency is the placement of a basketball court near a skate park. Each facility serves similar age groups, and both are active use facilities. During the preparation of the alternative design concepts and the final master plan, Pashek Associates located the proposed facilities while considering issues of adjacency. Density of facilities across the park was also considered throughout the master planning process. Bradys Run Park contains many existing facilities, and space for proposed facilities was located carefully to avoid overcrowding in the park's feasible development areas.

Parking Standards

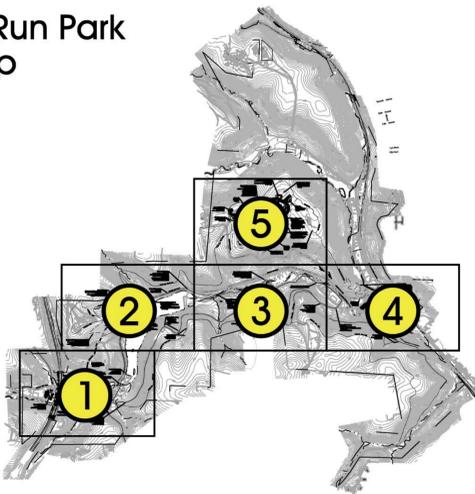
Parking must be considered for almost every park and recreation facility. It would not be feasible to provide parking required for peak use events, such as July 4th festivities, the Maple Syrup Festival, or other large public gatherings. Beaver County would be investing substantial funds in capital improvements that would only be utilized a few times each year. Beaver County currently directs event parking for the Maple Syrup Festival, 4th of July activities, and other gatherings toward the Four Winds Recreation Center parking lot and provides shuttle service to other event destinations within the park.

Constructing excess parking facilities solely for events would occupy space that could have been available for the development of other recreational facilities. "Proper sizing" of parking also minimizes impervious surface and reduces storm run-off.

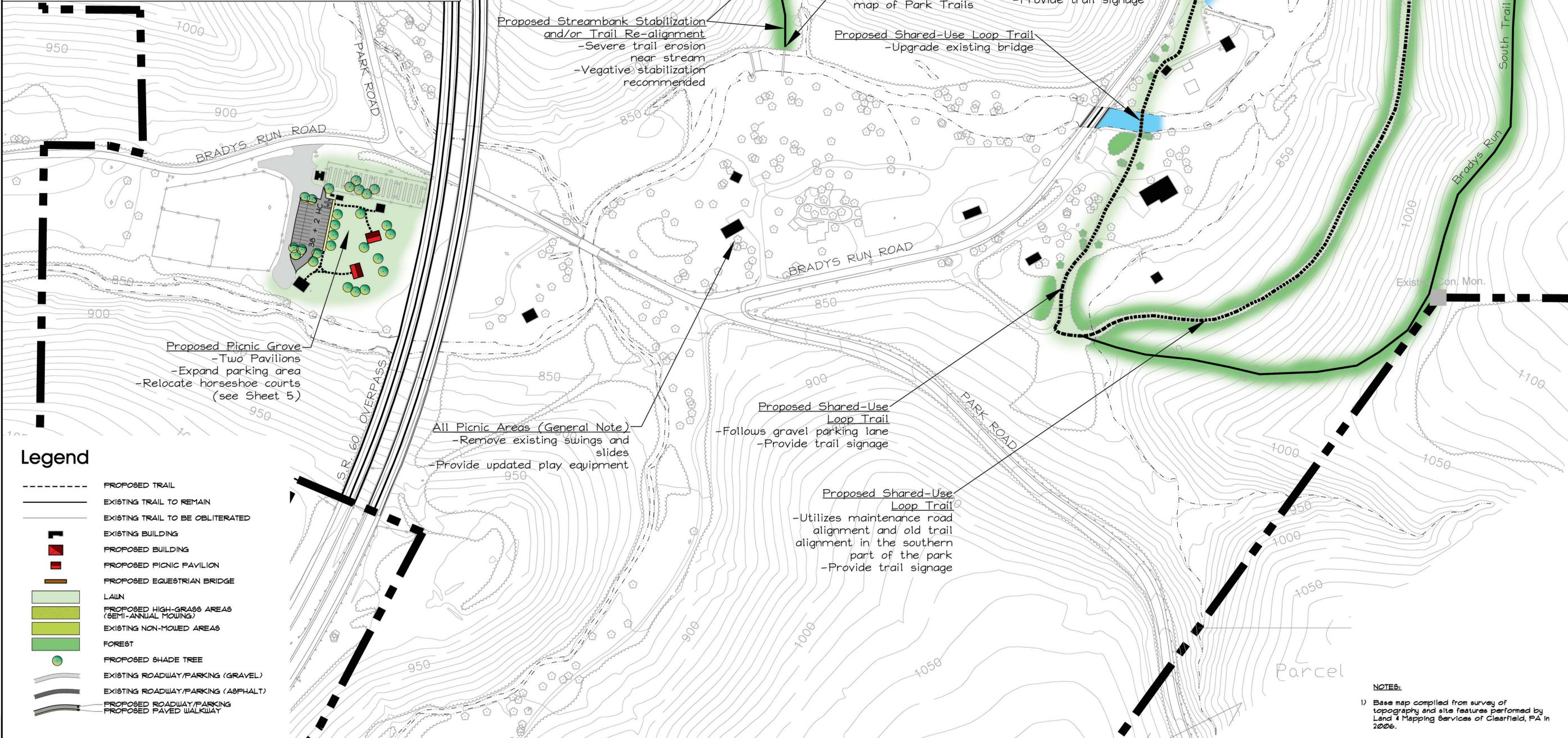
Parking Standards for this study were estimated using standards from Pashek Associates' prior experience with similar projects. The highest possible use rate by players and spectators at any facility is its *peak use*. A facility's *daily use* is 60% of its peak use. Parking should accommodate average daily use while providing opportunity for overflow parking to meet peak use event needs. Parking standards for this study were figured from the daily use rate assuming 2.5 persons per car. Parking for some facilities may vary from this formula, as users may arrive with a higher frequency. Parking for multi-use fields was estimated using the individual activity requiring the highest amount of parking.

<i>Facility</i>	<i>Number of Each Facility in Final Master Plan</i>	<i>Recommended Number of Parking Spaces per facility</i>	<i>Total Recommended Number of Parking Spaces</i>
Picnic Shelter (not including Lodge)	26 (7 proposed, 19 existing)	10	260
Bradys Run Lodge	1 (existing)	75	75
Four Winds Recreation Center	1 (existing)	100	100
Bradys Run Lake	1 (existing)	100	100
Arboretum	1 (existing)	20	20
Playground	3 (1 existing, 2 proposed)	5	15
Hiking / Mountain Bike Trail	5 (expansion of existing trail system)	5	25
Proposed Loop Bike Trail	1 (existing)	10	10
Existing Paved Walking Track	1 (existing)	15	15
Baseball/Softball Field	8 (2 existing, 6 proposed)	35	280
Tennis Court (outdoor)	4 (existing)	4	16
Volleyball Court	2 (proposed)	6	12
Horseshoe Court	16 (proposed)	2	32
Skate Park	1 (existing)	10	10
Multi-purpose Field	1 (existing)	30	30
Dek Hockey	1 (existing)	20	20
Basketball Court	1 (existing)	10	10
TOTAL PARKING NEEDS			1,030

Bradys Run Park Key Map



SHEET 2
SHEET 1



General Trail Note
-Provide Entrance and Directional Signage on all park trails

Proposed Streambank Stabilization and/or Trail Re-alignment
-Severe trail erosion near stream
-Vegetative stabilization recommended

Trail Entrance
-Provide Kiosk with map of Park Trails

Proposed Shared-Use Loop Trail
-Follows existing gravel access drive
-Provide trail signage

Proposed Shared-Use Loop Trail
-Upgrade existing bridge

Proposed Picnic Grove
-Two Pavilions
-Expand parking area
-Relocate horseshoe courts (see Sheet 5)

All Picnic Areas (General Note)
-Remove existing swings and slides
-Provide updated play equipment

Proposed Shared-Use Loop Trail
-Follows gravel parking lane
-Provide trail signage

Proposed Shared-Use Loop Trail
-Utilizes maintenance road alignment and old trail alignment in the southern part of the park
-Provide trail signage

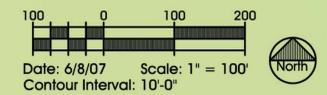
- Legend**
- PROPOSED TRAIL
 - EXISTING TRAIL TO REMAIN
 - - - EXISTING TRAIL TO BE OBLITERATED
 - EXISTING BUILDING
 - PROPOSED BUILDING
 - PROPOSED PICNIC PAVILION
 - PROPOSED EQUESTRIAN BRIDGE
 - LAWN
 - PROPOSED HIGH-GRASS AREAS (SEMI-ANNUAL MOWING)
 - EXISTING NON-MOWED AREAS
 - FOREST
 - PROPOSED SHADE TREE
 - EXISTING ROADWAY/PARKING (GRAVEL)
 - EXISTING ROADWAY/PARKING (ASPHALT)
 - PROPOSED ROADWAY/PARKING
 - PROPOSED PAVED WALKWAY

NOTES:
1) Base map compiled from survey of topography and site features performed by Land & Mapping Services of Clearfield, PA in 2006.

Bradys Run Park

Beaver County, Pennsylvania

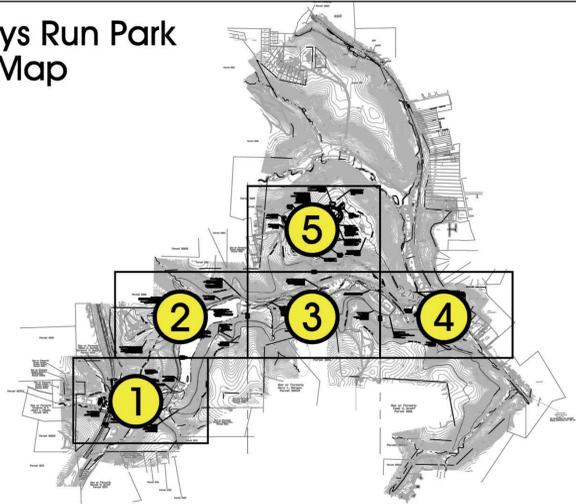
CONCEPT PLAN
SHEET 1 of 5



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Bradys Run Park Key Map



Legend

- PROPOSED TRAIL
- EXISTING TRAIL TO REMAIN
- EXISTING TRAIL TO BE OBLITERATED
- EXISTING BUILDING
- PROPOSED BUILDING
- PROPOSED PICNIC PAVILION
- PROPOSED EQUESTRIAN BRIDGE
- LAWN
- PROPOSED HIGH-GRASS AREAS (SEMI-ANNUAL MOWING)
- EXISTING NON-MOWED AREAS
- FOREST
- PROPOSED SHADE TREE
- EXISTING ROADWAY/PARKING (GRAVEL)
- EXISTING ROADWAY/PARKING (ASPHALT)
- PROPOSED ROADWAY/PARKING
- PROPOSED PAVED WALKWAY

Proposed Lookout
 -Extend a trail from the eastern tip of the Arboretum loop trail to the end of the existing ridgetop.
 -Clear vegetation to create views of Bradys Run Lake and beyond.

Proposed Shared-use Loop Trail
 -Trail exits Bradys Run Road
 -Create new trail connection along slope between park road and lake spillway.
 -Provide removable bollards to prevent vehicular access while allowing maintenance access

Proposed Shared-use Loop Trail
 -On-road bike lane length: ±1500 feet

Improve Boat House Access
 -Widen entrance drive
 -Provide concrete walkway from Bradys Run Road
 -Provide accessible parking spaces
 -Maintain vehicular building access for loading

Proposed Shared-use Loop Trail
 -Trail enters Bradys Run Road
 -Widen Road to create paved bike lane with minimum 5' width and pavement markings
 -Provide removable bollards to prevent vehicular access while allowing maintenance access.

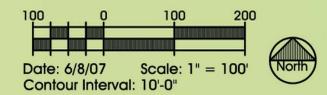
Proposed Shared-use Loop Trail
 -Follows existing maintenance road alignment
 -Repave maintenance road

Reroute Bradys Run South Trail
 to keep entire trail on park property

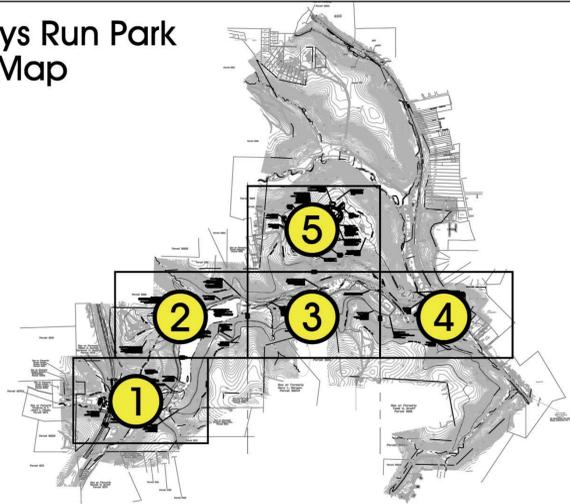
Re-align Existing Bradys Run North Trail
 -Create a switchback trail that gently climbs across the slope to provide a sustainable trail surface.
 -Obliterate eroded section of trail that climbs straight up the hillside.

Obliterate this section

NOTES:
 1) Base map compiled from survey of topography and site features performed by Land & Mapping Services of Clearfield, PA in 2006.



**Bradys Run Park
Key Map**



SHEET 5
SHEET 3

Proposed Shared-use Loop Trail
-Follows existing paved path and gravel drives through picnic areas
-Provide removable bollards at all intersections with vehicular drives and parking

Proposed Shared-use Loop Trail
-Crosses existing bridge

Proposed Shared-use Loop Trail
-Construct new trail segment from lodge access drive to Bradys Run Road near lake spillway.
-Provide removable bollards at intersection with lodge access drive

Proposed Shared-use Loop Trail
-Continues to follow maintenance road alignment

Proposed Shared-use Loop Trail
-Follows horse arena access drive

Proposed Shared-use Loop Trail
-Exits maintenance road alignment
-Maintain existing gate and provide bicycle bypass for trail access

Reroute Bradys Run South Trail to keep entire trail on park property

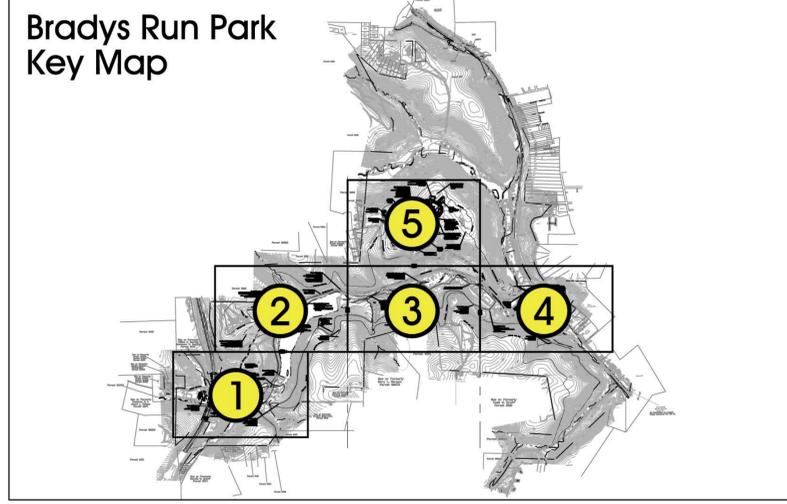
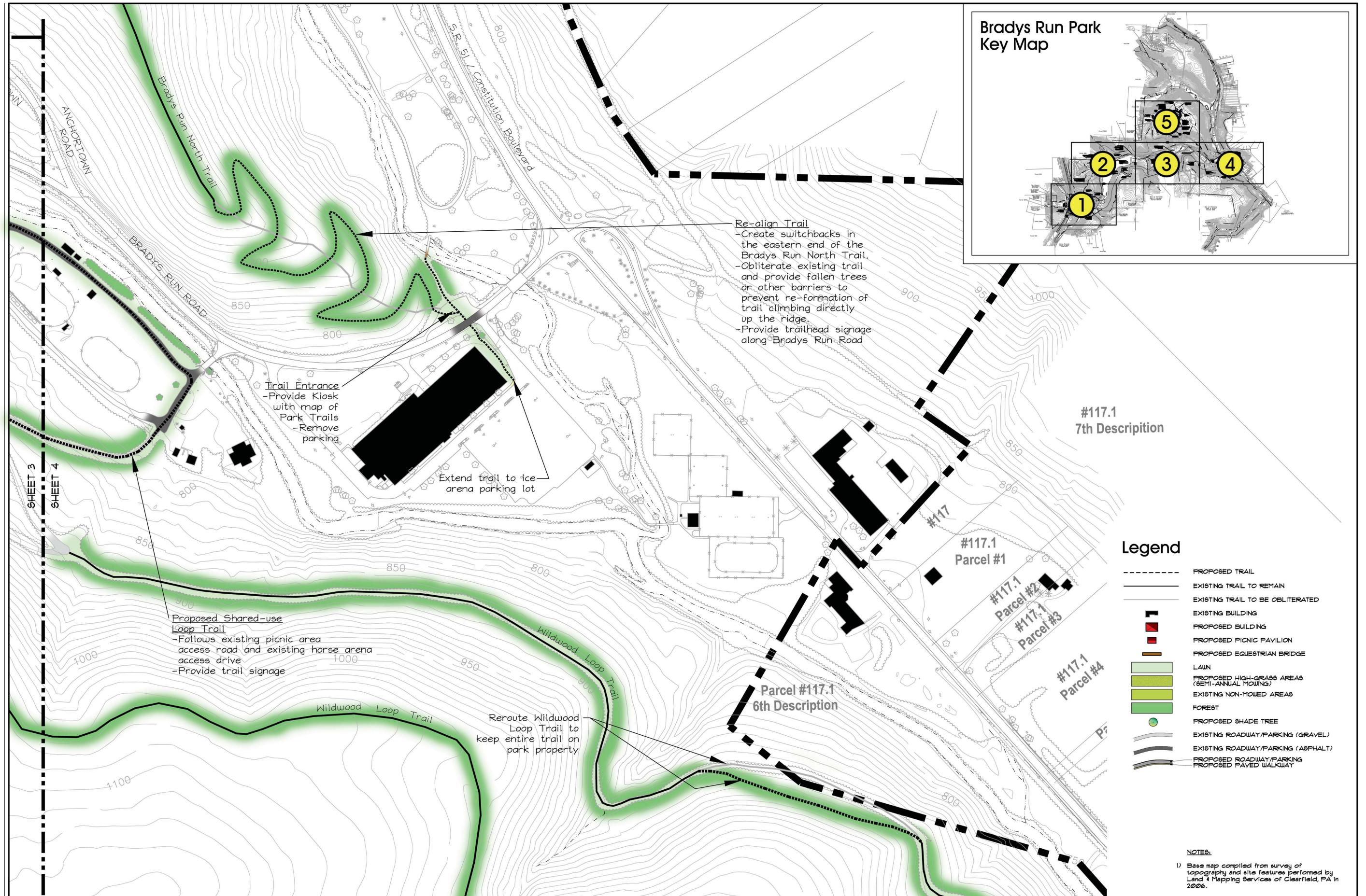
Legend

- PROPOSED TRAIL
- EXISTING TRAIL TO REMAIN
- EXISTING TRAIL TO BE OBLITERATED
- EXISTING BUILDING
- PROPOSED BUILDING
- PROPOSED PICNIC PAVILION
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- EXISTING ROADWAY/PARKING (ASPHALT)
- PROPOSED ROADWAY/PARKING
- PROPOSED PAVED WALKWAY

NOTES:
1) Base map compiled from survey of topography and site features performed by Land & Mapping Services of Clearfield, PA in 2006.

Parcel #104





Re-align Trail
 -Create switchbacks in the eastern end of the Bradys Run North Trail.
 -Obliterate existing trail and provide fallen trees or other barriers to prevent re-formation of trail climbing directly up the ridge.
 -Provide trailhead signage along Bradys Run Road

Trail Entrance
 -Provide Kiosk with map of Park Trails
 -Remove parking

Extend trail to ice arena parking lot

Proposed Shared-use Loop Trail
 -Follows existing picnic area access road and existing horse arena access drive
 -Provide trail signage

Reroute Wildwood Loop Trail to keep entire trail on park property

#117.1
 7th Description

#117.1
 Parcel #1

#117.1
 Parcel #2

#117.1
 Parcel #3

#117.1
 Parcel #4

Parcel #117.1
 6th Description

Legend

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- EXISTING NON-MOWED AREAS
- FOREST
- PROPOSED SHADE TREE
- EXISTING ROADWAY/PARKING (GRAVEL)
- EXISTING ROADWAY/PARKING (ASPHALT)
- PROPOSED ROADWAY/PARKING
- PROPOSED PAVED WALKWAY

NOTES:
 1) Base map compiled from survey of topography and site features performed by Land & Mapping Services of Clearfield, PA in 2006.

DESCRIPTION OF CONCEPT PLAN

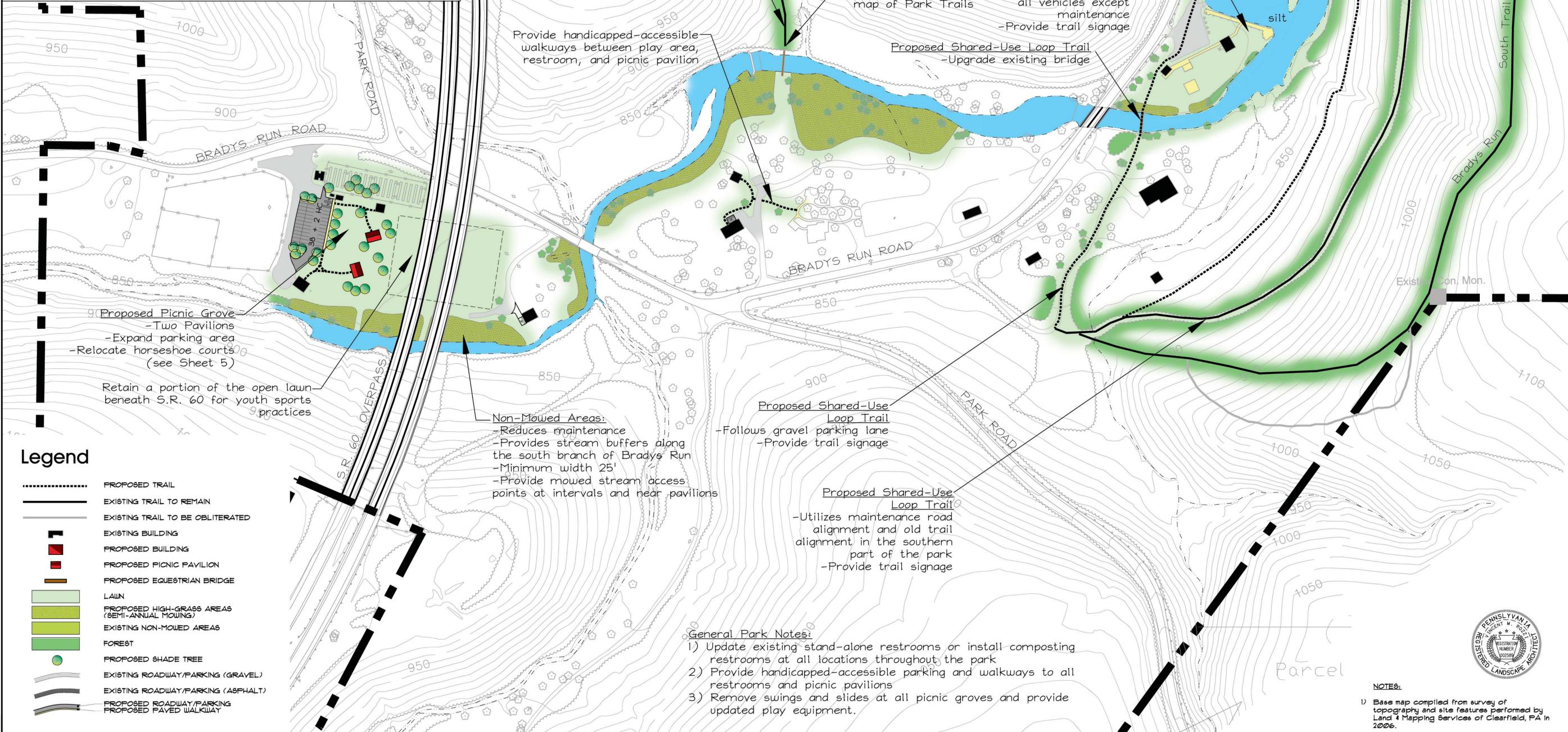
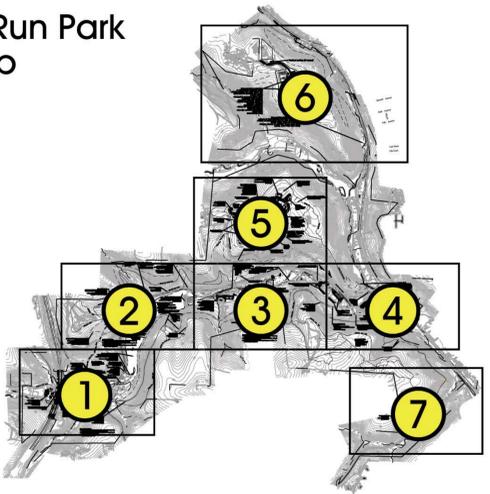
The Concept Plan for Bradys Run Park identifies *potential* design ideas generated by the project study committee, along with others developed by Pashek Associates. These ideas include vehicular and pedestrian circulation patterns, removal / replacement of existing recreation facilities, placement of proposed facilities, and other proposed improvements. The purpose of the concept plan is to expose the committee to several design ideas in an attempt to identify those to be included in the Draft Master Plan.

Because Bradys Run Park is such a large regional facility, the Concept Plan explored several opportunities for both improvements to existing facilities and introduction to new facilities in several different areas of the park. Improvements shown in the Concept Plan included the following:

- ❖ relocation of the existing horseshoe court facility to land adjacent to the existing ball field complex;
- ❖ re-organization of the ball field complex (including re-aligned vehicular and pedestrian circulation, parking, rotation of multiple existing fields, construction of proposed fields, and addition of three picnic groves);
- ❖ compacted aggregate access paths to all facilities;
- ❖ trail improvements including realignment of unsustainable trail sections and general trail resurfacing where needed;
- ❖ trail signage (including trail rules and mapping) at all trailheads, along with directional signage along all trails;
- ❖ expansion of the trail system to include a loop trail around the ball field complex a several-mile shared-use trail encircling Bradys Run Lake and the picnic areas and horse arena along the South Branch of Bradys Run, and a short trail leading to an overlook on the ridge top just east of the Calland Arboretum;
- ❖ two proposed picnic pavilions (each 25' x 35') near the existing dog park;
- ❖ paved parking areas for several existing and proposed facilities including handicapped-accessible spaces; and
- ❖ improved pedestrian and vehicular access to the existing boathouse.

The study committee's reaction to the concept plan was mostly positive. Most comments centered around parking situations at various places throughout the park, on management of the concession stand at the ball field complex, or on the possibility of lighting the existing ball fields. Comments were also fielded regarding trail rules, especially limiting the uses of certain trails to exclude equestrians for the safety of other trail users.

Bradys Run Park Key Map

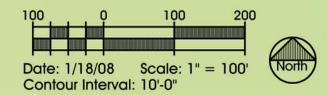


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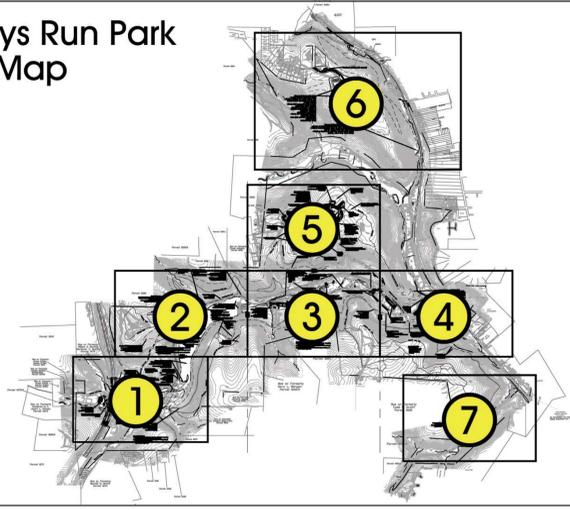
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- PROPOSED PAVED WALKWAY



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Bradys Run Park Key Map



Legend

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- PROPOSED ROADWAY/PARKING
- PROPOSED PAVED WALKWAY

Proposed Lookout
 -Extend a trail from the eastern tip of the Arboretum loop trail to the end of the existing ridgetop.
 -Clear vegetation to create views of Bradys Run Lake and beyond.

Proposed shared-use secondary loop trail along Bradys Run North Trail

Formalize parking area to maximize capacity:
 -Provide precast concrete wheelstops
 -Remove stone stockpile
 -Re-pave lot with gravel

Proposed Shared-use Loop Trail
 -Trail exits Bradys Run Road
 -Create new trail connection along slope between park road and lake spillway.
 -Provide removable bollards to prevent vehicular access while allowing maintenance access

Proposed Shared-use Loop Trail
 -On-road bike lane length: ±1500 feet

Stream / Lake Improvements
 -Research Fish Habitat Improvements
 -Implement Geese deterrent actions
 -Enforce no camping / no littering rules around the lake

Improve Boat House Access
 -Widen entrance drive
 -Provide concrete walkway from Bradys Run Road
 -Provide accessible parking spaces
 -Maintain vehicular building access for loading
 -Apply to PA Fish and Boat Commission for funds to improved boat launches and access walkways

Proposed Shared-use Loop Trail
 -Trail enters Bradys Run Road
 -Widen Road to create paved bike lane with minimum 5' width and pavement markings
 -Provide removable bollards to prevent vehicular access while allowing maintenance access.
 -Provide handicapped-accessible parking

Proposed Shared-use Loop Trail
 -Follows existing maintenance road alignment
 -Repave maintenance road

Reroute Bradys Run South Trail
 to keep entire trail on park property

Re-align Existing Bradys Run North Trail
 -Create a switchback trail that gently climbs across the slope to provide a sustainable trail surface.
 -Obliterate eroded section of trail that climbs straight up the hillside.

General Park Notes:
 1) Update existing stand-alone restrooms or install composting restrooms at all locations throughout the park
 2) Provide handicapped-accessible parking and walkways to all restrooms and picnic pavilions
 3) Remove swings and slides at all picnic groves and provide updated play equipment.

SHEET 2
 SHEET 1



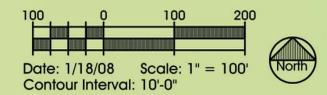
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Bradys Run Park

Beaver County, Pennsylvania

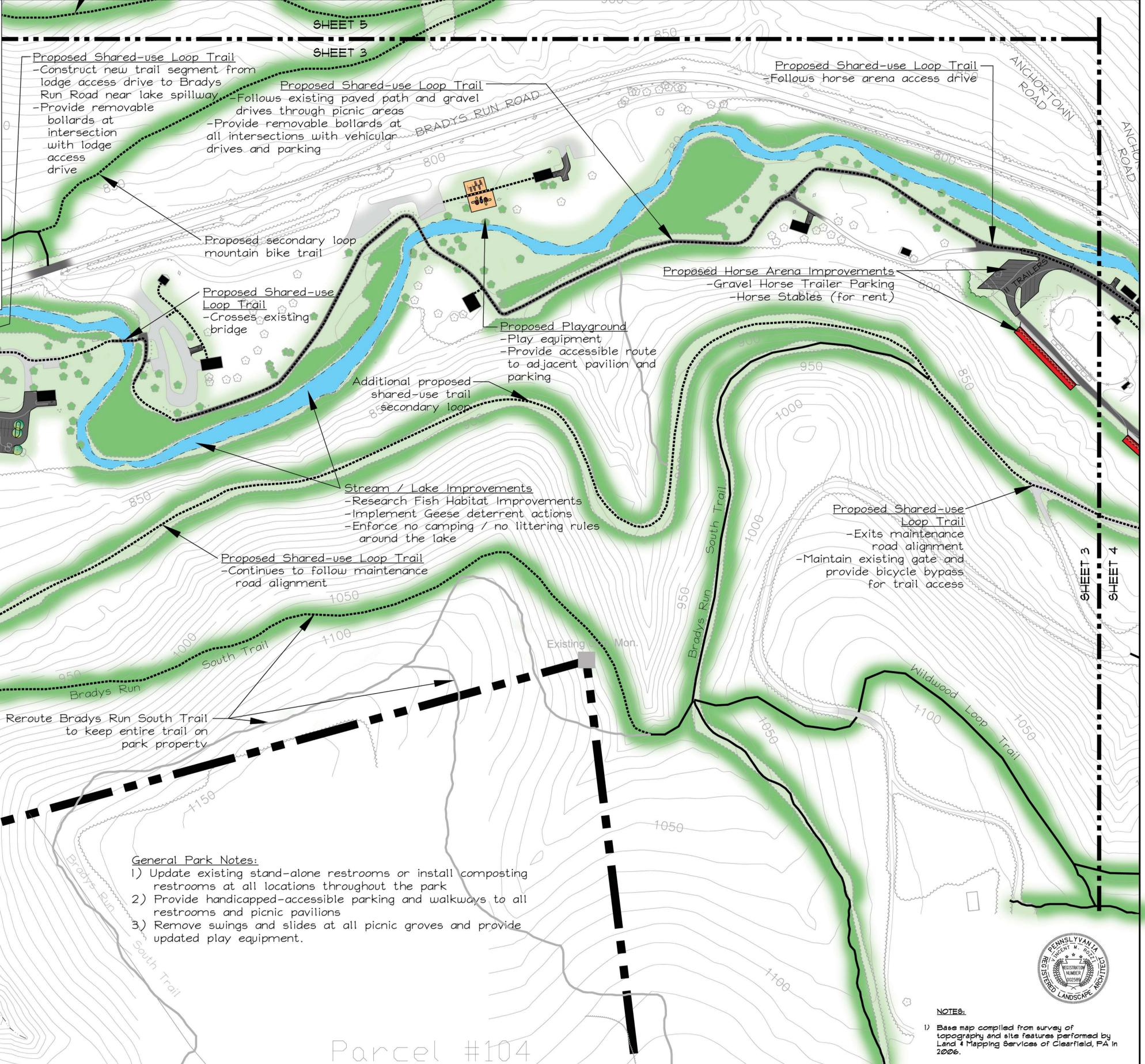
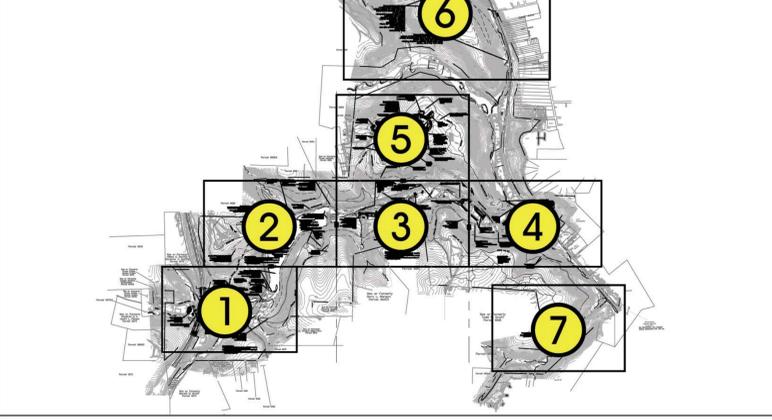
DRAFT MASTER PLAN

SHEET 2 of 7



PASHEK ASSOCIATES
 A Pennsylvania Corporation
 412.721.4262
 FAX 412.721.4902
 info@pasheka.com
 619 East Ohio Street
 Pittsburgh, PA 15212

Bradys Run Park Key Map



Proposed Shared-use Loop Trail
 -Construct new trail segment from lodge access drive to Bradys Run Road near lake spillway
 -Provide removable bollards at intersection with lodge access drive

Proposed Shared-use Loop Trail
 -Follows existing paved path and gravel drives through picnic areas
 -Provide removable bollards at all intersections with vehicular drives and parking

Proposed Shared-use Loop Trail
 -Follows horse arena access drive

Proposed secondary loop mountain bike trail

Proposed Shared-use Loop Trail
 -Crosses existing bridge

Proposed Playground
 -Play equipment
 -Provide accessible route to adjacent pavilion and parking

Proposed Horse Arena Improvements
 -Gravel Horse Trailer Parking
 -Horse Stables (for rent)

Lodge Improvements:
 -Replace entrance bridge with higher arched bridge to minimize flood damage
 -Reorganize parking area to maximize capacity
 -Complete architectural feasibility study to determine structural improvements needed

Stream / Lake Improvements
 -Research Fish Habitat Improvements
 -Implement Geese deterrent actions
 -Enforce no camping / no littering rules around the lake

Proposed Shared-use Loop Trail
 -Continues to follow maintenance road alignment

Proposed Shared-use Loop Trail
 -Exits maintenance road alignment
 -Maintain existing gate and provide bicycle bypass for trail access

Reroute Bradys Run South Trail
 to keep entire trail on park property

- General Park Notes:**
- 1) Update existing stand-alone restrooms or install composting restrooms at all locations throughout the park
 - 2) Provide handicapped-accessible parking and walkways to all restrooms and picnic pavilions
 - 3) Remove swings and slides at all picnic groves and provide updated play equipment.

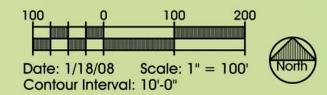
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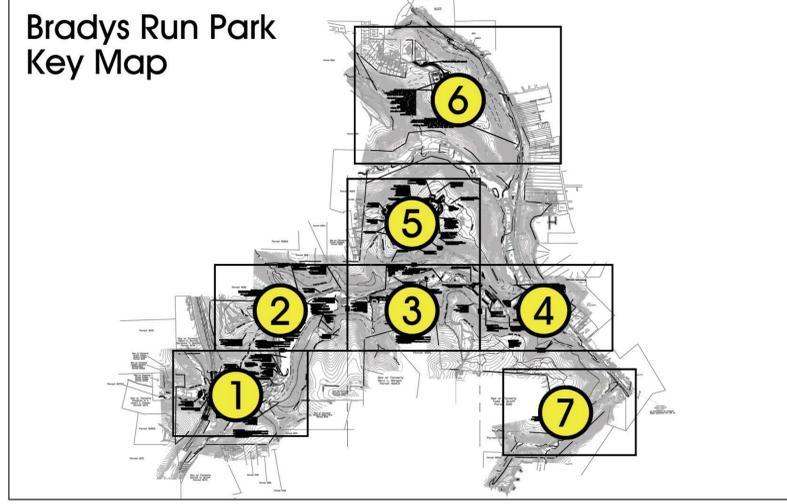
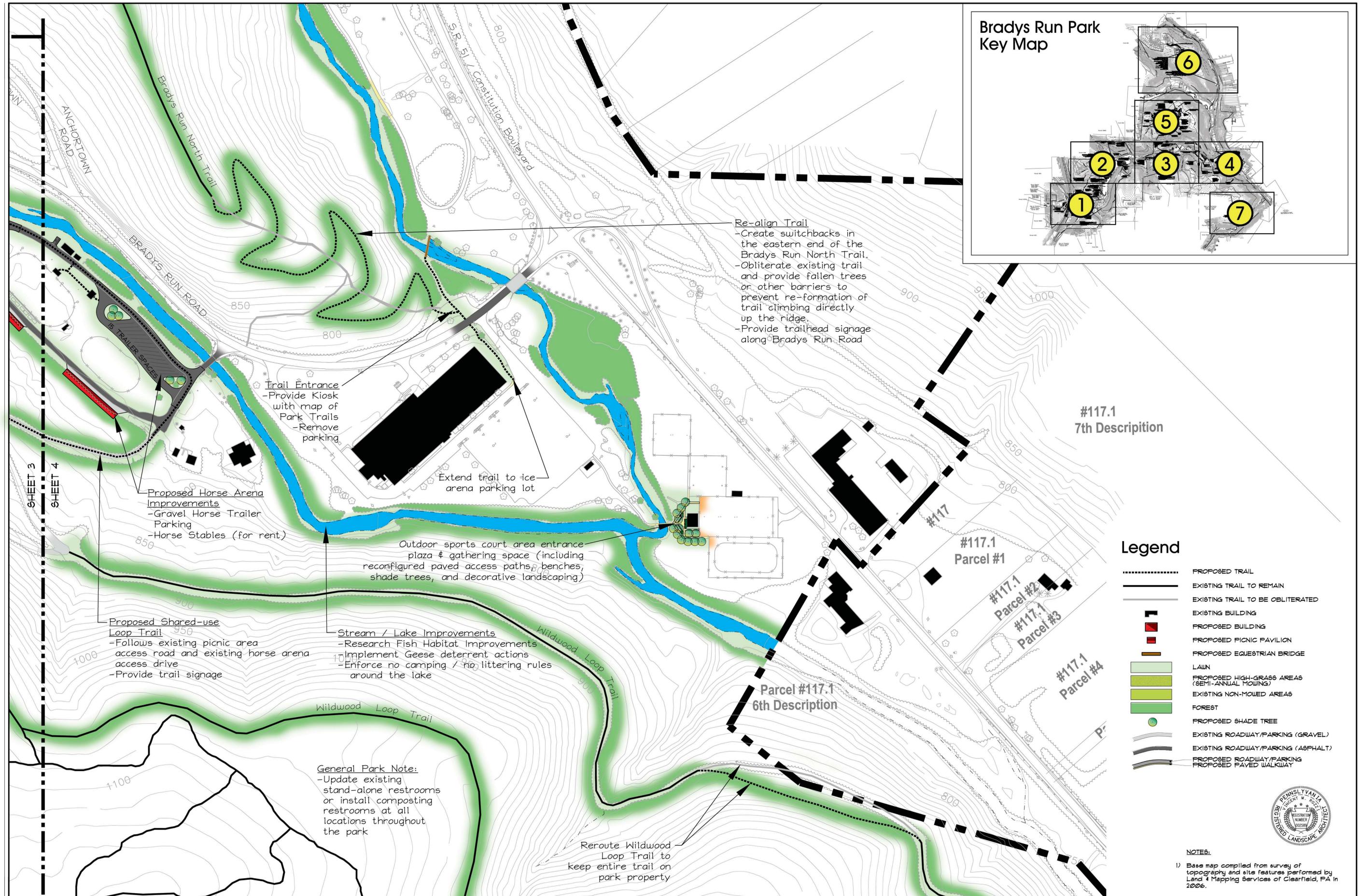
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Parcel #104





Re-align Trail
 -Create switchbacks in the eastern end of the Bradys Run North Trail.
 -Obliterate existing trail and provide fallen trees or other barriers to prevent re-formation of trail climbing directly up the ridge.
 -Provide trailhead signage along Bradys Run Road

Trail Entrance
 -Provide Kiosk with map of Park Trails
 -Remove parking

Proposed Horse Arena Improvements
 -Gravel Horse Trailer Parking
 -Horse Stables (for rent)

Outdoor sports court area entrance plaza & gathering space (including reconfigured paved access paths, benches, shade trees, and decorative landscaping)

Proposed Shared-use Loop Trail
 -Follows existing picnic area access road and existing horse arena access drive
 -Provide trail signage

Stream / Lake Improvements
 -Research Fish Habitat Improvements
 -Implement Geese deterrent actions
 -Enforce no camping / no littering rules around the lake

General Park Note:
 -Update existing stand-alone restrooms or install composting restrooms at all locations throughout the park

Reroute Wildwood Loop Trail to keep entire trail on park property

#117.1 7th Description

#117.1 Parcel #1

#117.1 Parcel #2

#117.1 Parcel #3

#117.1 Parcel #4

Parcel #117.1 6th Description

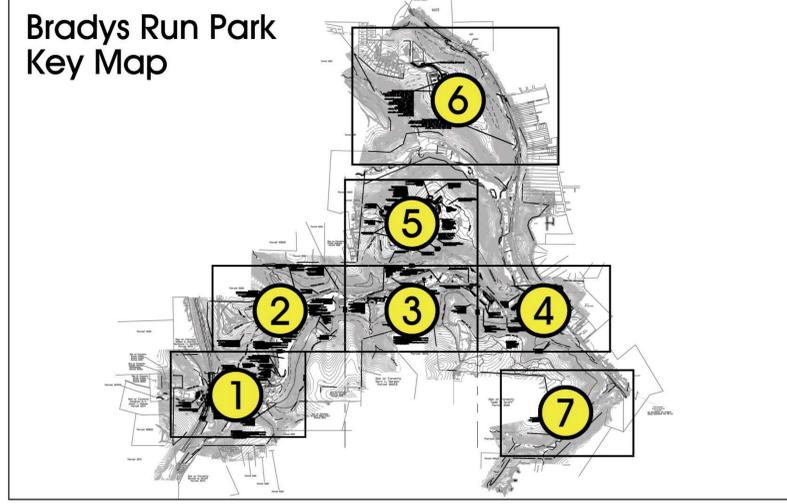
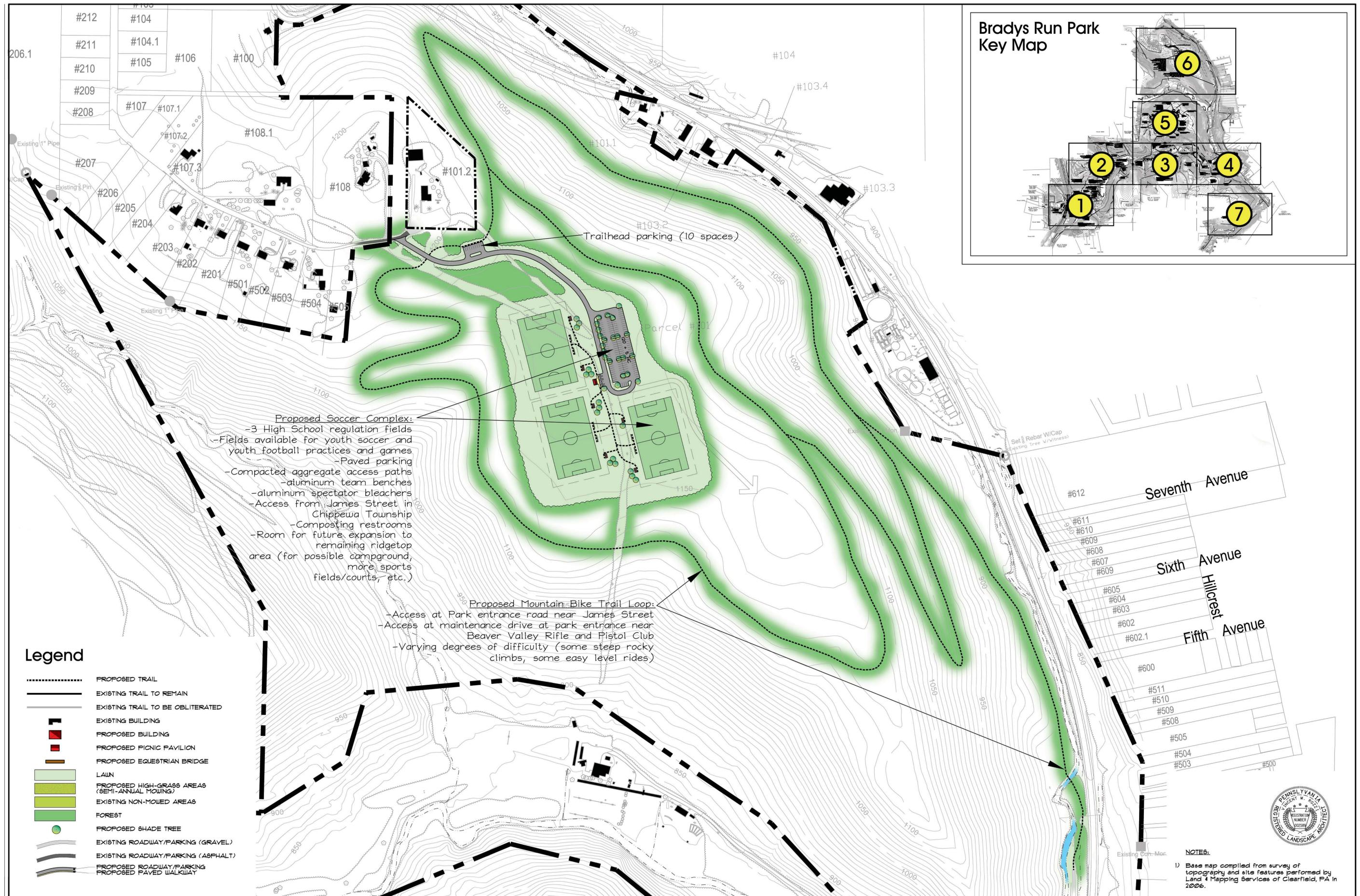
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Proposed Soccer Complex:

- 3 High School regulation fields
- Fields available for youth soccer and youth football practices and games
- Paved parking
- Compacted aggregate access paths
- aluminum team benches
- aluminum spectator bleachers
- Access from James Street in Chippewa Township
- Composting restrooms
- Room for future expansion to remaining ridgetop area (for possible campground, more sports fields/courts, etc.)

Proposed Mountain-Bike Trail Loop:

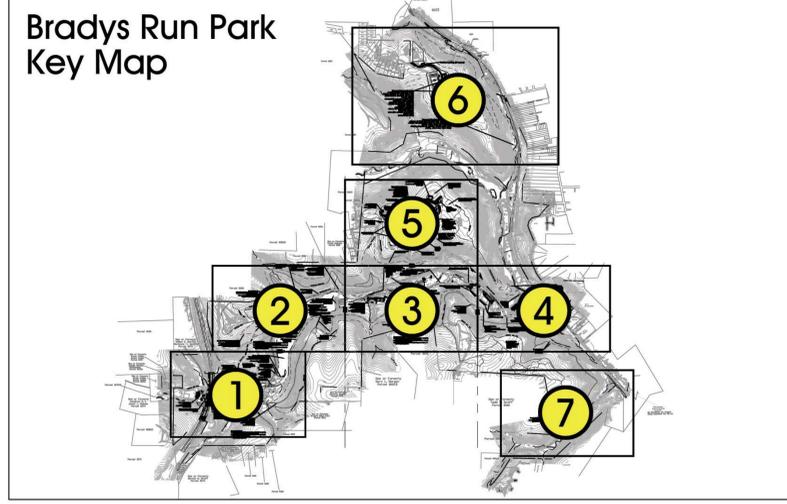
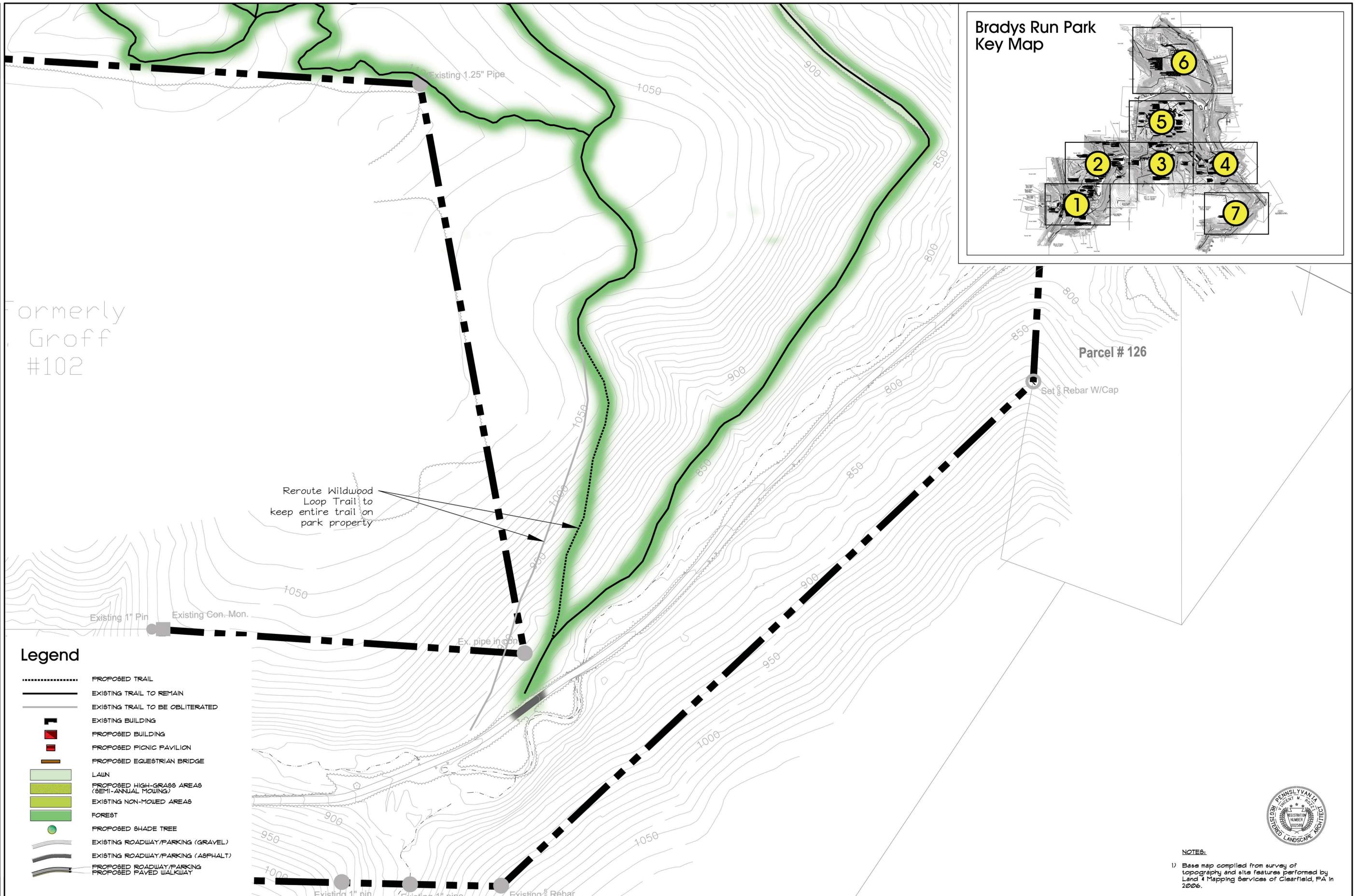
- Access at Park entrance road near James Street
- Access at maintenance drive at park entrance near Beaver Valley Rifle and Pistol Club
- Varying degrees of difficulty (some steep rocky climbs, some easy level rides)

- Legend**
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DRAFT MASTER PLAN DESCRIPTION

The Draft Master Plan incorporates favorable elements from the Concept Plan and addresses general recreation comments given at public input sessions. By addressing further public input, the Draft Master Plan strives to meet recreation needs of the community. Facilities and improvements included in the Draft Master Plan are as follows:

- 🌲 Improvements to Bradys Run Lake and the park's streams - including researching fish habitat improvements, dredging the lake, implementing geese control, and enforcing no camping / no littering rules within the park;
- 🌲 Relocation of the existing horseshoe court facility to land adjacent to the existing ball field complex;
- 🌲 Re-organization of the ball field complex (including re-aligned vehicular and pedestrian circulation, parking, rotation of multiple existing fields, construction of proposed fields and trail connections, and addition of three picnic groves);
- 🌲 Compacted aggregate access paths to all facilities;
- 🌲 Trail improvements including realignment of unsustainable trail sections and general trail resurfacing where needed;
- 🌲 Trail signage (including trail rules and mapping) at all trailheads, along with directional signage along all trails;
- 🌲 Expansion of the trail system to include a loop trail around the ball field complex; loop trail around the proposed soccer complex; a several-mile shared-use trail encircling Bradys Run Lake, picnic areas, and horse arena along the South Branch of Bradys Run and extending to Wildwood Road; and a short trail leading to an overlook on the ridge top just east of the Calland Arboretum;
- 🌲 Construction of formal paved parking and replacement of the bridge over Bradys Run at the existing Lodge;
- 🌲 Recommendations to conduct a feasibility study to determine needed structural and other architectural improvements needed for the Lodge;
- 🌲 Expanded gravel parking for horse trailers at the existing horse arena;
- 🌲 Construction of horse stables (available for rentals) at the horse arena;
- 🌲 Two proposed picnic pavilions (each 25' x 35') near the existing dog park;
- 🌲 Paved parking areas for several existing and proposed facilities including handicapped-accessible spaces;
- 🌲 Improved pedestrian and vehicular access to the existing boathouse;
- 🌲 Elimination of the existing small trailhead parking area across Bradys Run Road from the Ice Arena;
- 🌲 Re-paving the parking lot at the Ice Arena;
- 🌲 Development of a new entrance plaza and walkways at the tennis court / skate park area; and
- 🌲 Construction of three full-sized soccer fields, along with associated parking, spectator bleachers, access paths, and restrooms, in the northernmost part of the park. These facilities would be accessed via St. James Street in Chippewa Township.

It is important to note that opportunities also exist near the proposed soccer fields for development

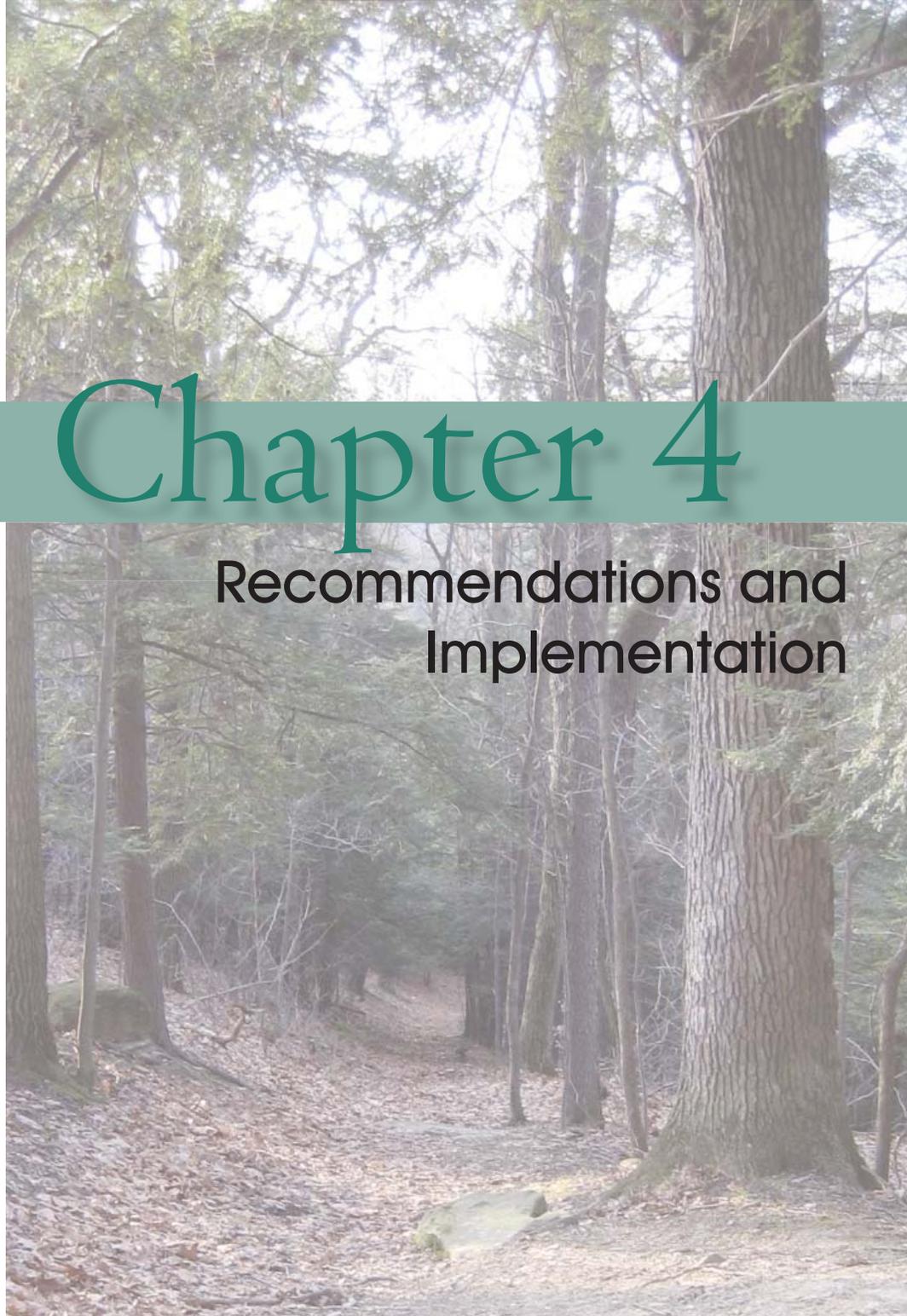
of facilities such as a campground or additional sports fields / courts. This expansion could take place in the distant future. A campground and additional tennis courts were two facilities favored in comments received during public input, but that also require space currently not available in other parts of the park. Other facilities considered included shared-use paths connecting the park to surrounding communities. Several comments were also fielded concerning the condition of state roads traversing the park, urging the master plan to address the roads.

PARK PROGRAM

After consideration of facilities proposed in the Draft Master Plan, further public input, and existing facilities to remain, the following list of facilities was developed for inclusion in the Final Master Plan. Proposed park improvements are discussed in more detail in the next chapter:

- Improvements to Bradys Run Lake and the park's streams - including researching fish habitat improvements, dredging the lake, implementing geese control, and enforcing no camping / no littering rules within the park;
- Relocation of the existing horseshoe court facility to land adjacent to the existing ball field complex, and construction of a shelter covering 3 courts;
- Re-organization of the ball field complex (including re-aligned vehicular and pedestrian circulation, parking, rotation of multiple existing fields, construction of proposed fields and trail connections, and addition of three picnic groves);
- Compacted aggregate access paths to all facilities;
- Trail improvements including realignment of unsustainable trail sections and general trail resurfacing where needed;
- Trail signage (including trail rules and mapping) at all trailheads, along with directional signage along all trails;
- Expansion of the trail system to include a loop trail around the ball field complex; loop trail around the proposed soccer complex; a several-mile shared-use trail encircling Bradys Run Lake, picnic areas, and horse arena along the South Branch of Bradys Run and extending to Wildwood Road; and a short trail leading to an overlook on the ridge top just east of the Calland Arboretum;
- Construction of formal paved parking and replacement of the bridge over Bradys Run at the existing Lodge;
- Recommendations to conduct a feasibility study to determine needed structural and other architectural improvements needed for the Lodge;
- Expanded gravel parking for horse trailers at the existing horse arena;
- Construction of horse stables (available for rentals) at the horse arena;
- Two proposed picnic pavilions (each 25' x 35') near the existing dog park;
- Cosmetic and structural improvements to existing picnic pavilions where necessary;
- Paved parking areas for several existing and proposed facilities including handicapped-accessible spaces;
- Improved pedestrian and vehicular access to the existing boathouse;
- Elimination of the existing small trailhead parking area across Bradys Run Road from the Ice Arena;

- Re-paving the parking lot at the Ice Arena;
- Development of a new entrance plaza and walkways at the tennis court / skate park area; and
- Construction of three full-sized soccer fields, along with associated parking, spectator bleachers, access paths, and restrooms, in the northernmost part of the park. These facilities would be accessed via St. James Street in Chippewa Township.



Chapter 4

**Recommendations and
Implementation**

Early in the Master Plan process, the project study committee developed a general goal of supporting the vision statement for Beaver County Parks:

“. . . Beaver County’s residents and policy-makers pledge their commitment to continuing the tradition of high-quality public recreation. This commitment includes the establishment of an adequate capital improvement plan for the park system. Under this plan, funding resources will ensure that the parks are well-maintained, well-publicized, and continually improved to meet current and future recreation needs of County citizens.”

This goal, along with public input and site inventory and analysis, guided the Master Plan recommendations. This chapter describes those recommendations, explains cost estimates and phasing, discusses possible funding sources, describes the operation and maintenance costs, and lists potential revenues for Bradys Run Park.

PROPOSED RECREATIONAL FACILITIES

Based on the inventory and analysis of the site, public input received throughout the park master planning process, basic design principles, and the goals mentioned above, the Study Committee recommends the development of the following recreational opportunities in Bradys Run Park:

Trail System

- ☛ Re-alignment of unsustainable trail sections
- ☛ Trail resurfacing where necessary
- ☛ Trail signage including maps, trail rules, directional signs, and trail markers
- ☛ Loop shared-use trail around the ball field complex (with five proposed access points)
- ☛ Loop mountain bike trail around the proposed soccer complex
- ☛ Shared-use trail encircling Bradys Run Lake, picnic areas, and horse arena while utilizing existing pathways, the shoulder of Bradys Run Road, and the existing maintenance road on the hillside south of the Lake This loop would also extend to Wildwood Road
- ☛ Overlook trail just east of Calland Arboretum
- ☛ Elimination of the existing small trailhead parking area across Bradys Run Road from the Ice Arena
- ☛ Trail connection from Ice Arena parking lot and existing paved oval track to eastern terminus of Bradys Run North Trail
- ☛ Geocaches, or small containers containing information or items hidden as part of a treasure-hunting game, accessible from existing and proposed trails (with use governed by park geocaching policies)

Bradys Run Lake and Park Streams

- ☛ Water Quality Testing and improvement measures as recommended by the 2003 Bradys Run Lake Watershed Assessment and Restoration Plan
- ☛ Erosion Control measures on select portions of the Park’s Streams
- ☛ Implementing goose population control
- ☛ Enforcing no camping / no littering rules within the park

- ☛ Improved pedestrian and vehicular access to the existing boathouse
- ☛ Improvements to the existing boat launch
- ☛ Formalized parking serving the boat house and beach
- ☛ Handicapped accessible parking and fishing area

Ball Field Complex

- ☛ Re-organization of vehicular and pedestrian circulation and parking
- ☛ Rotation of multiple existing fields to minimize sun glare
- ☛ Construction of one proposed adult ball field
- ☛ Spectator bleachers and dugouts (all fields)
- ☛ Trail loop surrounding ball field complex, with trailhead parking and five proposed access points, as well as connection to Bradys Run North Trail
- ☛ Three proposed picnic groves (with a total of four pavilions)
- ☛ Addition of restrooms to the existing concession stand
- ☛ Playground suitable for children ages 2-5
- ☛ One proposed pavilion near concession stand (plus continued use of existing pavilion)
- ☛ Pick-up / drop-off area
- ☛ Parking
- ☛ Maintenance / delivery access to concession stand
- ☛ Storage units for sports league equipment
- ☛ Warm-up Area including batting cages and practice pitching mounds
- ☛ Relocated horseshoe court facility (16 courts, with 3 under pavilion) including courts and league storage building
- ☛ Maintenance storage yard
- ☛ Scoreboards with public announcement system
- ☛ Satellite weather warning station

Soccer Field Complex

- ☛ Three full-sized soccer fields with players benches and spectator bleachers
- ☛ Restrooms
- ☛ Parking
- ☛ Mountain Bike loop trail accessible from proposed trailhead parking and from existing parking near entrance gate to Beaver Valley Rifle and Pistol Club property
- ☛ Soccer field complex access from St. James Street in Chippewa Township

Picnic Groves

- ☛ Consult a qualified architect to assess structural, cosmetic, utility-related deficiencies (including those identified in the 2003 Beaver County Comprehensive Recreation and Park Plan)
- ☛ Replace existing wooden separate-sex pit restrooms (3 sets) with new restroom facilities
- ☛ Implement needed improvements as identified by architectural assessment
- ☛ Replacement of outdated play equipment (swings, slides, see-saws, etc.) with updated equipment complying with current safety standards
- ☛ Construction of a picnic grove including two 25' x 35' pavilions near the existing dog park

Bradys Run Lodge

- ☛ Conduct a feasibility study to determine structural, utility, and other improvements necessary to make the Lodge an energy-efficient year-round facility
- ☛ Construction of formal parking at Bradys Run Lodge and the adjacent picnic grove (includes paved handicapped-accessible parking)
- ☛ Replace the existing bridge with a higher bridge or large culvert (designed by a qualified engineer) to increase flood volume

Ice Arena

- ☛ Re-paving the parking lot at the Ice Arena;

Tennis Courts and Skate Park

- ☛ Development of a new entrance plaza and walkways

Horse Arena

- ☛ Expanded gravel parking for horse trailers
- ☛ Construction of horse stables (available for rentals)

Dog Park

- ☛ Construct gravel entranceway to minimize mud
- ☛ Fill low spots to prevent standing water

General Improvements

- ☛ Compacted aggregate access paths to all facilities
- ☛ Paved parking areas for several existing and proposed facilities including handicapped-accessible spaces

MASTER PLAN DESCRIPTION

Trail System Improvements

During the Master Plan process, much public input focused on improvements to and marketing of the Bradys Run Park trail system. The proposed trail system features just over 14 miles of trails, including approximately 7 miles of new or completely re-built trails, and 7 miles of existing trails to remain. The plan also proposes the obliteration of approximately 3.9 miles of unsustainable trails and other existing trails that encroach onto neighboring properties.

Trail Design for Sustainability

The trail alignments shown on the Master Plan mapping are a general layout only. Trail design shapes trail users experience, and site-specific trail design in the field is the difference between an average trail and an extraordinary one. The Master Plan recommends that Beaver County strive to construct a sustainable trail system designed to accommodate the ongoing forces of trail

use, weathering, and erosion in order to minimize trail maintenance. Unsustainable sections of existing trail, some of which are identified in this plan, should be removed and re-routed for better sustainability.

Sustainable trails are often planned like small-scale rollercoasters that continually change grade, forcing water to fall off the trail in several locations rather than flow down the trail to a single outlet. Such trails should traverse hillsides gradually, creating a safe, enjoyable riding experience. Trails should make the best possible use of the existing topography on the park site. Large amounts of grading or clearing for trail construction are expensive and unnecessary.

All proposed trails and existing trails to be repaired should be designed and built for sustainability. Detailed information on sustainable trail layout, including grade reversals or “dips” as well as trail grades, is given later in this chapter.

Trail Surface is Important

The Master Plan proposes two types of new trails: shared-use paths (for walking and biking), and hiking / mountain biking / equestrian trails in the park’s forested areas.

Proposed shared use paths should be constructed of compacted aggregate except where steeper grade necessitates bituminous paving. Such trails should generally be a minimum of ten feet wide to accommodate two-way bike and/or pedestrian traffic.

Proposed hiking / mountain biking / equestrian trails should have natural earth surfaces, and should be approximately 3 feet wide. Narrow trails reduce the amount of exposed soil surface, minimize earthwork, and can help create a sense of anticipation among trail users when distant trails are not easily visible. In addition, narrow trails minimize or eliminate the need for clearing of forest canopy, which protects trails from erosion.

Further guidelines for trail surfaces, as well as related reference materials, are identified later in this chapter. Proposed trails as well as re-built existing trails should adhere to the guidelines offered herein.

Consider Trail Difficulty

Bradys Run Park is a large park with sufficient space for a complex trail system offering varying degrees of difficulty. In addition to standing alone as a trail system, the trails at Bradys Run Park should function as part of a larger trail system included in all three of the parks being studied for this Master Plan. For example, Bradys Run Park is the largest of the three parks, contains the most rugged topography, and has the most trails. Thus, it can offer trails requiring varying skill levels (easy, intermediate, difficult). Old Economy Park has a limited area for trails, and is most suitable for easier and intermediate trails. Brush Creek Park’s trails are confined to two wooded hillsides which do not offer sufficient space for varying degrees of difficulty. This Master Plan recommends that the trail systems at Brush Creek Park and Old Economy Park focus on easy and intermediate trails only.

More difficult trails can and should be offered at Bradys Run Park.

Improve Trail Signage to Include Maps, Rules, and Trail Markers

Clear, concise signage including trail markers, mapping, and rules will make the proposed trail system much more safe and user-friendly. Trail maps and rules should be posted at all trailheads, and trail markers and directional signage should be located at all trail intersections.

Degrees of trail segment difficulty, as well as distance between trailheads and intersections, should be noted on trail mapping. Interval distances (half-mile intervals at minimum) should be marked where desired. Detailed information on trail marker materials and construction is found later in this chapter.

Signage is even more important on Bradys Run Park's trails because they will be used by hikers, mountain bikers, and equestrians alike. Multi-use trail situations usually require rules for interactions between different modes of travel. Trail user safety is dependent on such rules. In this case, signs similar to that used by the International Mountain Biking Association (IMBA) should be used (see photo).



Another issue on multi-use trails is waste from horses. Horse waste on the trail is a hazard to other trail users and can ruin the trail experience for hikers and mountain bikers. Park trail rules should include a "bag rule" asking equestrians to remove their horse's waste from the trail using bags provided at trailheads. Although such rules are almost impossible to enforce, posting them often results in compliance by many trail users.

Create New Trail Opportunities

Seven-Mile Bike Loop

The Master Plan proposes a variety of new trail opportunities and connections in Bradys Run Park. Among these is a 7-mile loop bike trail utilizing the former maintenance road on the hillside south of Bradys Run Lake, portions of existing access drives to the west and north of the lake, a 1,500-foot portion of the Bradys Run Road shoulder (to be designated as an on-road bike lane), portions of the existing paved walking trail in the picnic area east of Bradys Run Lodge, and the picnic area access road just east / southeast of the horse arena.

The proposed loop trail would require less than one-half mile of newly-constructed off-road trail in addition to paving of the road shoulder (by PennDOT) along 1,500 feet of Bradys Run Road, and resurfacing and re-grading of the existing maintenance road south of Bradys Run Lake.

Ball Field Trail Loop

A loop trail encircling the re-organized ball field complex will offer an alternative route along the Bradys Run North Trail. The plan proposes five access points from the ball field complex, including a trailhead parking area near the ball field complex entrance.

Other new trails proposed by the Master Plan include re-routes of sections of the Bradys Run South Trail, Bradys Run North Trail, and Wildwood Loop Trail. Such re-routes were necessary to eliminate unsustainable trail segments or other trail segments encroaching onto neighboring properties.

Overlook Trail

The plan also proposes a short overlook trail extending eastward from the existing Calland Arboretum loop trail to the eastern end of an existing ridge top. With clearing of vegetation, this ridge top will offer excellent views of Bradys Run Lake and beyond.

Secondary Loops

In addition, the plan proposes a new trail along the hillside just south of Bradys Run Lake, at a lower elevation than the existing maintenance road (proposed as part of the aforementioned loop trail). This new trail will offer filtered views of the lake through the forest canopy. This secondary loop trail will be accessible from the existing maintenance road in two locations.

The plan also proposes a secondary loop from the Bradys Run North Trail. The secondary loop traverses the same south-facing hillside as the main Bradys Run North Trail, but is located a higher elevation.

Mountain Bike Loop

Another new trail proposed in the Master Plan is the loop mountain bike trail encircling the proposed soccer field complex in the extreme northern portion of the park property. This trail, approximately 3 miles in length, includes two loops: one following the gentle topography surrounding the proposed soccer field complex, and one traversing the hillside facing northeast toward State Route 51 / Constitution Boulevard. The plan proposes trailhead parking near the soccer field complex entrance from James Street in Chippewa Township, as well as an access trail ascending the hillside northward from the existing parking area near the gated entrance to the Beaver Valley Rifle and Pistol Club property.

Removal of Trailhead Parking

The plan recommends removal of the existing trailhead parking area across Bradys Run Road from

the Ice Arena. Trail users will instead park in the existing Ice Arena parking lot and use a proposed walkway to access the trailhead. The proposed walkway will also extend further north, providing pedestrian access to the existing paved walking /jogging track.

Work with Adjacent Landowners

Considering the scale and continual use of the trail system at Bradys Run Park, encroachment onto neighboring properties by user-created trails is always a possibility. The Master Plan recommends that the County: A) re-route sections of trail on neighboring properties to ensure that they are completely on park property; and B) approach landowners adjacent to the southern portion of the park property to discuss agreements that will protect those landowners from liability in the event of trail encroachment onto their land. The Beaver County Law Department may be a valuable partner in such discussions.

Of special note, the existing trail access at the northern terminus of Beacom Drive (a Brighton Township road) offers access to several of the park's trails. The Master Plan recommends that Beaver County work with Brighton Township, as well as owner of the adjacent property to develop trailhead parking and signage. Special care should be taken to preserve the adjacent landowner's privacy.

Partner With PennDOT and the Southwestern Pennsylvania Commission

This plan recommends that Beaver County begin a discussion with PennDOT regarding the addition of a bike lane segment (as shown on Master Plan) to Bradys Run Road (State Route 4012) during road resurfacing. In addition, the County should testify at Public Participation Panel (PPP) hearings administered by the Southwestern Pennsylvania Commission (SPC). PPP hearings will be held as part of 2007-2010 Transportation Improvement Program (TIP) efforts, which identify highway and transit improvements to be advanced during specified calendar years. Recommending Bradys Run Road resurfacing and bike lane paving as a TIP project may slate proposed improvements for development before 2010.

Connect with Brighton Township Bike Routes

In 2001, Brighton Township completed a Bicycle / Pedestrian Network Feasibility Study. The study proposed share-the-road bicycle routes and designated bike lanes throughout the Township, some of which pass through Bradys Run Park. A share-the-road bicycle route is proposed on Beacom Drive (extending into the park from the south), and designated bike lanes are proposed on Park Road and Bradys Run Road (entering the park from the south and west).

Beaver County should work with both Brighton Township and PennDOT to promote the development of the aforementioned bike route and lanes and to market them as non-vehicular access routes into the park. Directional signage to the park should accompany these routes, and signage within the park should direct bicyclists to these routes.

Share Maintenance Responsibility and Continue Communication with Trail Use Groups

Because the Bradys Run Park maintenance staff has their hands full caring for other areas of the park, the County should begin or continue trail maintenance agreements with trail use groups such as Beaver Area Biking Enthusiasts (BABE), Pittsburgh Trail Advocacy Group (PTAG), equestrians using the park's horse arena, and local volunteers. These organizations regularly use the trails in the park, repair portions of the trail, clear fallen trees, and repair or build small footbridges when necessary. They may be willing to perform maintenance on select trails or during select parts of the season, under agreement with the County.



Educate Trail Users

Hikers, mountain bikers, and equestrians have very different trail needs, yet use the same trails in Bradys Run, Brush Creek, and Old Economy Parks. In most cases, conflicts do not arise between different trail users. However, trail use groups sometimes misunderstand the needs of others using the same trail. For instance, hikers performing volunteer trail maintenance may not know that low branches (to a minimum height of 8 feet) overhanging the trail should be cleared for safe equestrian use. Equestrian groups may mistakenly remove stumps or logs intentionally placed on the trail as challenge obstacles for mountain bikers.

Beaver County, through its Greenways Coordinator, should hold an education session (or series of sessions) for trail use groups as well as casual trail users. This session should be focused on educating trail use groups on the needs of all trail users (mountain bikers, hikers, equestrians, etc.) so that maintenance efforts can be coordinated and trail conflicts minimized.

Permit and Develop Policies for Geocaching

Geocaching is a high-tech form of treasure-hunting in which thrill seekers use GPS units to place and locate containers hidden in natural settings. Upon finding these containers, or geocaches, one can add or remove items to / from the geocache and share their experiences online. According to online mapping at www.geocaching.com, 17 active geocaches are located on the Bradys Run Park property.

Geocaching can attract park users from the surrounding region, other counties, states, or even countries. It is a recommendation of this plan that Beaver County permit geocaching in the park, and develop an official geocache permit process, application form, and guidelines on geocache content and access. It is of concern to this Master Plan that geocaching in the park rely mainly on existing trails for access. Formation of geocaching user-created trails could cause erosion problems on the park's steep slopes and should be kept to a minimum. Examples of Geocache placement permits and guidelines are found in the appendices of this report.

Market Trails to the Surrounding Region

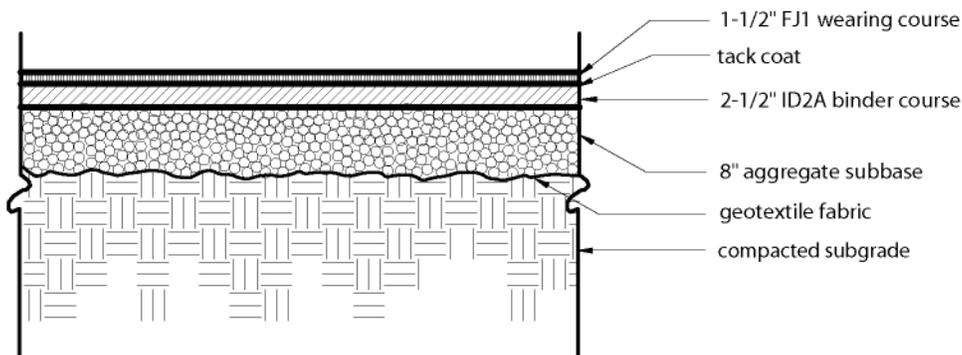
The variety and quality of trails at Bradys Run Park are found in very few places in the surrounding region. To increase use and awareness of the trails at Bradys Run Park, the County should begin a marketing effort in the entire southwestern Pennsylvania region to attract hikers, mountain bikers, and equestrians alike to the park. Efforts to promote the trails might include:

- holding regional races or other events on the park trails
- coordinating with other similar trail facilities to designate the park as a stop on a tour of races/events covering the state or larger region;
- distributing flyers similar to those developed and distributed to promote the opening of the Bradys Run Action Park;
- providing detailed park trails information on the County website and recreation group websites;
- adding detailed information on scheduled events in the park (i.e. event dates, individual racer times for each race, geocache information, etc.) to the Bradys Run Park website accessible via www.co.beaver.pa.us;
- partnering with neighboring Counties in regional tourism marketing efforts in Western Pennsylvania and Eastern Ohio; and
- working with local or regional recreation groups to create and host events unique to the region (adventure races -- trail running/mountain biking/canoeing, geocaching tournaments, etc.).

Improve Roadways, Parking, and Pedestrian Circulation

Repave the Park Road

Repaving of Bradys Run Road (State Route 4012) is one of the most apparent needs at Bradys Run Park. The Master Plan proposes re-paving the park road. A cross section of a typical asphalt roadway is shown below:



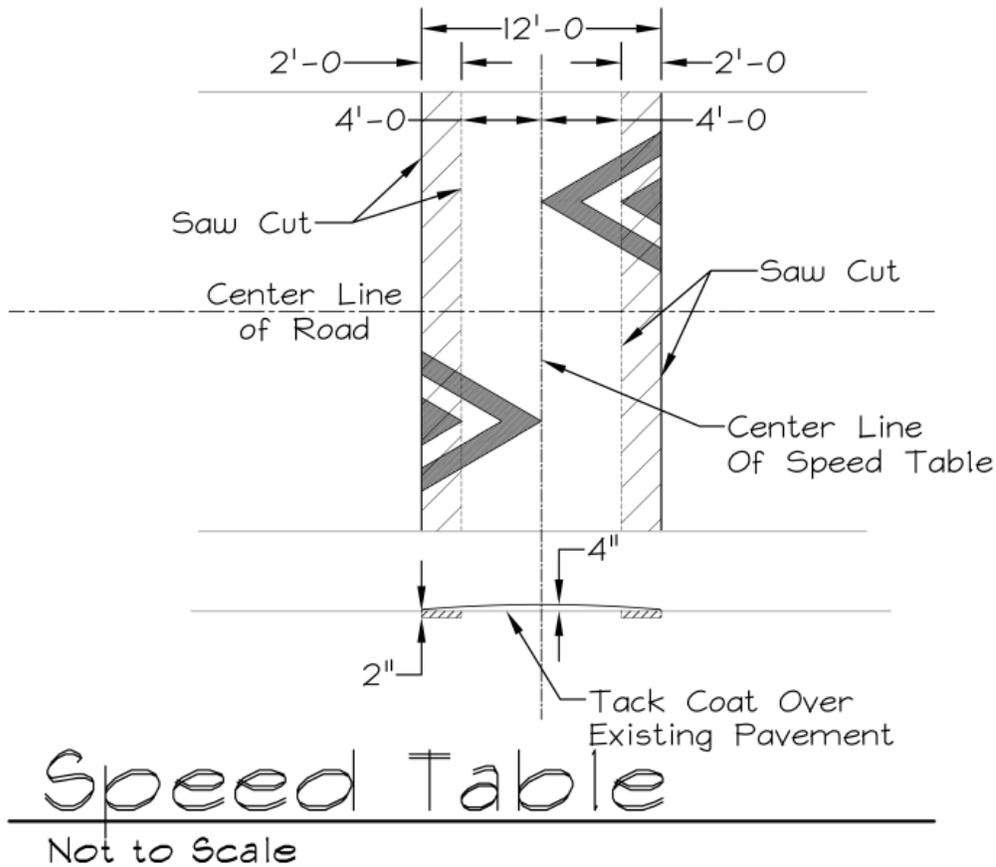
roadway is shown below:

Because Bradys Run Road is a State Route, it must meet PennDOT standards, which will determine required roadway width. The repaved park road should include speed tables at 1000-foot intervals (if

Bituminous Paving

Not to Scale

permitted by PennDOT regulations) to calm traffic and create a safer environment for bicyclists. Speed tables (see detail below) are elongated rectangular mounds of asphalt, approximately 12 feet in length, that are a more durable alternative to smaller speed bumps such as those found in the park today.



Share-the-Road Bike Route

In addition to re-paving Bradys Run Road, the Master Plan proposes adding signage denoting a share-the-road bike route. In addition, a portion of paved bike lane should be installed along the southern side of Bradys Run Road adjacent to the existing boat house. This bike lane is part of a larger loop trail described later in this section. Signage for a bike lane and for a share-the-road bike route has been installed on Brighton Road in Brighton Township (see photo).



All bike lanes, routes, and signage should comply with regulations set forth in the following resources:

- ❖ PennDOT Publication 13M: Design Manual, Part 2: Highway Design, latest edition (see Chapter 16);
- ❖ PennDOT Publication 408: Specifications, latest edition.
- ❖ U.S. Department of Transportation, Federal Highway Administration Manual of Uniform Traffic Control Devices, latest edition.



As mentioned earlier in this chapter, Beaver County should strive to connect the park's roadways with bike routes proposed in Brighton Township's Bicycle / Pedestrian Network Feasibility Study. A bike route on Bradys Run Road will help to achieve that goal.

Keep Parking Areas Permeable

Proposed parking areas in Bradys Run Park should be gravel-paved to limit the amount of impervious surface in the park. Proposed gravel parking areas are located adjacent to several existing and proposed facilities. Other existing gravel parking areas will remain, and should be re-paved with gravel as necessary.

Handicapped parking spaces are proposed in all parking areas adjacent to facilities. These spaces should be paved with asphalt to comply with Americans with Disabilities Act (ADA) guidelines.

Pave Walkways Only Where Needed

The Final Master Plan proposes access walks to nearly all park facilities. In order to minimize impervious surfaces in the park, only paths in areas receiving heavy pedestrian traffic (adjacent to parking areas) should be paved. These paths should maintain a 6-foot width to accommodate more frequent pedestrian movement. All other access paths in open, developed areas of the park should be constructed of compacted aggregate, and should be 5 feet wide except near restrooms or other recreation facilities where greater width is needed.

Improvements to Bradys Run Lake and the Park's Streams

The Master Plan proposes several improvements to Bradys Run Lake, related recreation facilities, and the streams in the park. Those improvements are described below.

Water Quality and Fish Habitat Improvements

To improve the water quality and fish habitat in Bradys Run Lake and the South Branch of Bradys Run, Beaver County should follow the recommendations set forth in the 2003 Bradys Run Lake

Watershed Assessment and Restoration Plan. These recommendations focus on reducing water quality-related impacts to contact recreation (swimming), protecting the health of resident fish, and increase overall water quality. The aforementioned recommendations are listed below (in order of priority):

- 1) Investigate coliform source area (s) -- Fecal coliform levels were found to be higher than acceptable standards in Bradys Run Lake. The County should investigate the source of fecal input into the South of Bradys Run upstream from the lake.
- 2) Sediment trap cleanout and rock revetment installation -- Clean three sediment traps on the South Branch of Bradys Run, and install a rock revetment along eroded stream bank near the State Route 60 overpass.
- 3) Encourage adequate erosion controls -- Nutrient forms and suspended solids (silt) have been the source of problems in the Lake in the past, and controls are needed to reduce the deposition in the Lake.
- 4) Egg addling / culling of goose population -- The County should secure permits necessary for goose population control from the U.S. Fish & Wildlife Service before retraining a commercial goose control service to perform egg addling in the spring and culling in the summer
- 5) Further evaluation of phosphorus loadings -- excessive phosphorus loads originating from a fecal coliform source upstream from the lake are causing eutrophication. Re-examine phosphorus loading after cleaning of sediment traps, investigating fecal coliform source, and performing goose population controls
- 6) Ongoing water quality monitoring program -- monitor water in the lake and stream for suspended solids and nutrients
- 7) Planning and permitting for sediment removal program in the lake -- Dredging the lake may be a necessary activity in the near future to improve fish habitat, improve fishing opportunities, and increase overall water quality. Applying for necessary permitting is a first step toward dredging.

This Watershed Assessment and Restoration Plan also recommends that the County proceed with lake dredging after permits and proper planning are complete.

Improve Access to the Boat House and Boat Launch

To improve access to the existing boat house, the Master Plan recommends the construction of accessible parking, paved loading space, and a paved walkway from Bradys Run Road (for use by pedestrians parked at the proposed improved parking lot across Bradys Run Road from the boat house).

In addition to these improvements, installation of a concrete boat ramp and sufficient trailer turn-around space is needed. This plan recommends that the County apply to the PA Fish & Boat Commission for funds to improve the boat launch and access drive.

The proposed improved parking lot on the northern side of Bradys Run Lake should include gravel

paving with pre-cast concrete wheelstops used to define parking spaces. Improving this lot and removing existing stone and concrete piles will maximize parking capacity for the boat house, beach, adjacent shelter, boat fishing, and shore fishing areas.

Provide Accessible Parking for Shore Fishing

The Master Plan proposes a small parking lot consisting of four (4) handicapped-accessible parking spaces, along with gated access to the proposed bike loop trail for maintenance vehicles. Bikes on the proposed trail must share a portion of the trail with vehicles entering the accessible parking area. Compacted aggregate paths provide access to the lake shore from the parking area.

Enforce “No Littering” and “No Camping” Policies

Among existing park rules and regulations are policies against littering in the park and overnight camping. Enforcement of these rules is needed around Bradys Run Lake, especially during the evening before the first day of trout season each April. Provision of heavy-duty metal trash receptacles and the use of public works and/or Sheriff’s Department employees, as appropriate, for enforcement of park policies may be needed during such events.

Re-Organize the Ball Field Complex

Part of the vision for Bradys Run Park is the development of a first-class baseball and softball facility rivaling the best such facilities in Western Pennsylvania. To help achieve this goal, the Master Plan proposes a re-organization of the existing ball field complex and the addition of new recreation facilities.

Rotate Fields to Reduce Sun Glare

The Master Plan proposes rotation of two existing fast-pitch softball fields and one adult ball field to reduce sun glare during games. DCNR recommends that a field be ideally oriented with Centerfield to the northeast, with other acceptable orientations facing southeasterly, easterly, or northerly directions.

Rotation of said fields will require removal of existing fencing, backstop, dugouts, and infields. The plan proposes that new fencing, backstops, dugouts, and infields be constructed at these rotated fields to match facilities at proposed fields.

Adult Baseball and Softball Need Fields

The one existing adult baseball field at the Bradys Run Ball Field Complex currently hosts 8 to 10 games per week (weather permitting) during warm months. This over-use can be relieved by the addition of another adult ball field. The desired size for use by adult baseball leagues is 320’ home run distances on the left and right field lines, 370’ in right-center and left-center fields, and 400’ in center field. The large field size is needed to allow longer hits from the metal bats used in the adult

baseball league.

The Master Plan also proposes an additional adult softball field to accommodate the increase in the number of leagues within the past year at Bradys Run Park. This additional field will also relieve stress from overuse on existing fields.

Field Amenities

This plan suggests that each proposed field and rotated existing field include concrete block dugouts or open-air chain-link fence dugout enclosures, 6' chain-link perimeter fencing, chain-link backstop with minimum 25' height, a clay infield, and aluminum spectator bleachers (at least one set 5 rows x 20').

The Master Plan also recommends that the County replace the existing backstop and re-grade / repair the infield on the existing adult baseball field.

Other amenities serving the entire ball field complex are electronic scoreboards, a public announcement system, and an automated early-warning weather station programmed to activate a siren at the first sign of severe weather as detected via Doppler radar frequencies. Research Additional Info....

Field Lighting

Lighting ball fields extends their use, and will allow significantly more play on the existing fields at Bradys Run Park. Lighting is proposed for the existing adult ball field in the southwestern corner of the ball field complex, the rotated adult ball field just to the northwest of the existing concession stand, and the rotated fast-pitch softball field in the southeastern corner of the complex.

More detailed information on field lighting is available in the Park Design Guidelines found later in this chapter.

Create a Central Congregation Area

Many park users will visit the ball field complex, and the need for a gathering place for the families and friends of baseball and softball teams is needed. Responding to this need, the Master Plan proposes a central congregation area. Facilities included in this central area include the following:

- Restrooms (added to the existing concession stand);
- Playground for children ages 2-5;
- Proposed picnic pavilion (plus continued use of existing pavilion);
- Pick-up / Drop-off area with maintenance / delivery access to concession stand;
- Storage units for sports league equipment;
- Warm-up area including batting cages and practice pitcher's mounds;

Re-organize Roadways, Walkways, and Trails

The proposed vehicular circulation system for the ball field complex includes an asphalt loop road 20' in width and 0.75 miles long, 422 gravel parking spaces plus 20 asphalt handicapped-accessible spaces (10 separate parking lots), and a pick-up / drop-off area adjacent to the existing concession stand. The pick-up / drop-off area is a loop with a 72' inside diameter sufficient to accommodate emergency vehicles.

Proposed six-foot-wide paved walkways line parking lots, while five-foot-wide compacted aggregated paths provide access to recreation facilities throughout the complex. Proposed access trails leading to the loop trail are 3' wide with natural earth surface (matching other proposed trails).

The proposed loop trail encircles the entire Ball Field Complex and offers five access points including one proposed trailhead parking near the entrance to the ball field complex. The loop includes a portion of the existing Bradys Run North Trail, as well as nearly 0.7 miles of new trail.

Other Recreation Facilities

Other facilities proposed in the re-organized ball field complex focus on park visiting not using the ball fields. Such facilities include:

- 3 proposed picnic groves with a total of 4 pavilions (one 25' x 35', three 15' x 25');
- 2 sand volleyball courts;
- A proposed 16-court horseshoe court facility (open to the public) with chain-link fence enclosure, 3 courts covered beneath a pavilion, and a league equipment storage building;
- Loop trail accessed at five different locations around the perimeter of the ball field complex.

Maintenance Yard

To provide proper maintenance to the existing and proposed fields, a maintenance area and outdoor materials storage yard must be located within the ball field complex. The plan proposes a maintenance yard on the eastern side of the complex, just south of the proposed picnic grove.

The maintenance yard should be roughly 115' x 80' to allow turn-around space for trucks and other machinery, should be surfaced in gravel except if paving is needed for materials storage bins, should be buffered from recreation facility by existing and/or proposed vegetation, and should be gated to prevent unauthorized vehicular access.

Soccer Field Complex

To meet the demand for soccer fields in Bradys Run Park, the Master Plan proposes three High School regulation - size (330' x 195') soccer fields atop a large level ridge top in the extreme northern part of the park. The fields are accompanied by proposed composting restrooms, compacted

aggregate access paths, 5 row x 20' aluminum spectator bleachers (2 per field), 30' team benches (2 per field), gravel parking for approximately 120 vehicles, and asphalt handicapped accessible parking. Gently-sloping land is available on the ridge top for future expansion of the complex to include additional soccer fields or other recreation facilities (i.e. camping, etc.).

Mountain Bike Loop

Also proposed as part of the soccer field complex is a mountain bike trail comprised of two loops of varying difficulty. One loop traverses the gentle topography at the edge of the ridge top, encircling the soccer field complex. The other loop traverses the much steeper grades on the hillside facing northeast toward State Route 51 / Constitution Boulevard.

The proposed mountain bike trail is accessible from the existing parking area near the gated entrance to Beaver Valley Rifle and Pistol Club property and the existing paved walking track. In addition, trailhead parking is proposed adjacent to the soccer field complex entrance on James Street in Chippewa Township. James Street can be reached from State Route 51 via Braun Road.

Utility Line Relocation

In addition to clearing and grading necessary for development of the soccer field complex, relocation of approximately 1,100 feet of existing overhead utility lines and four associated utility poles will be required. If possible, re-route utility lines and poles should be located in a manner that does not hinder future development of other recreation facilities on the ridge top to the south and southeast of the proposed fields.

Picnic Grove and Restroom Enhancements

Improvements are needed to the park's picnic groves and restrooms to enhance the picnicking experience at the park and attract continued use from residents of the surrounding area.

Perform an Architectural Analysis

This plan proposes that the County retain an architectural consultant to complete an analysis of all restroom buildings and picnic pavilions. Such an analysis should identify needed structural, utility, and cosmetic repairs, along with feasibility of replacement of individual structures. The needed picnic pavilion and restroom updates identified in the 2003 Beaver County Comprehensive Recreation and Parks Plan (2003 Recreation and Parks Plan) that have not yet been undertaken should be completed in the short-term.

In the event that repairs to existing restroom facilities are not feasible, this plan recommends that composting restrooms be installed. This report recommends that all wooden separate-sex pit restrooms (3 sets) be replaced with composting restrooms.

Replace Outdated Play Equipment

As stated in the 2003 Recreation and Parks Plan, play equipment at the park's existing picnic groves should be removed and replaced with updated equipment meeting current safety standards. Existing equipment to be removed includes swings, slides, see-saws, and other individual play structures. Replacement play equipment should include individual rides and climbing equipment, underlain by rubberized or shredded bark mulch safety surface. If space for updated equipment and manufacturer-recommended safety zones is not available at specific picnic groves, no equipment should be installed.

New Picnic Opportunities

The Master Plan proposes two new 25' x 35' picnic pavilions in a picnic grove just west of the Route 60 overpass. This grove includes:

- ~ gravel parking for approximately 38 vehicles;
- ~ 2 paved handicapped-accessible parking spaces;
- ~ pedestrian access to the existing adjacent restrooms and storage building, as well as proposed pavilions, via compacted aggregate walkways;
- ~ paved walkway along proposed parking;

In addition, this picnic grove retains a portion of the open lawn beneath State Route 60 for youth sports practices, and retains access to the South Branch of Bradys Run.

Bradys Run Lodge Improvements

Make the Lodge an Energy-Efficient Year-round Facility

This Master Plan recommends that a feasibility study be undertaken to determine need structural, utility, cosmetic, and other repairs necessary to improve the energy efficiency and general functionality of the Bradys Run Lodge.

Improve Lodge Access

The existing bridge at the Bradys Run Lodge includes multiple culvert openings that can clog with debris during floods and cause stream flow to rise over the road surface atop the bridge. This study recommends that the existing bridge be replaced by a higher bridge or culvert permitting greater flood volume. The proposed bridge should be designed by a qualified engineer, with attention to both structural stability and aesthetics.

To further improve access to the lodge, this plan proposes formal gravel parking for approximately 70 vehicles in the existing lawn areas north and northeast of the lodge. Included with this parking are 4 handicapped-accessible parking spaces located just east of the lodge, at an elevation nearly equal to the lodge's floor elevation. Proposed parking also includes one handicapped-accessible parking

space accommodating the existing picnic pavilion northeast of the lodge.

Other Facility Improvements

Re-pave the Four Winds Recreation Center Parking Lot

The Master Plan proposes that the County re-pave the existing parking lot at the Four Winds Recreation Center with asphalt and re-paint parking lines and handicapped access symbols.

Develop a New Entrance to the Tennis Courts and Skate Park

To enhance the entranceway to the existing tennis courts and skate park, the Master Plan proposes a re-organized entrance plaza featuring bench seating, decorative plant beds, deciduous shade tree plantings, and paved access paths.

Improve Dog Park Entranceway

The entranceway at the existing dog park has received heavy use, which has worn away the lawn and created mud during and after rainy weather. In addition, low spots within the dog park fill with water during rain storms and attract dogs during regular dog park hours.

The Master Plan recommends that the County fill low spots within the dog park and pave the entranceway with gravel or compacted aggregate to eliminate mud and provide a more stable surface able to withstand heavy foot traffic.

In addition, the County should relocate trash receptacles currently kept near the dog park entrance. These trash receptacles are often the source of odors because they are often filled with trash thrown over the dog park fence from outside the dog park. The odors are an unpleasant welcome for dog park visitors. The trash receptacles should be kept away from the entrance to the dog park, possibly in another corner of the dog park or in a central location within the dog park.

Horse Arena Upgrades

The Master Plan proposes the construction of 26 gravel parking spaces for horse trailers in two separate lots adjacent to the existing horse arena. Each space should be 10 feet wide and a minimum of 45 feet long, and should be oriented at approximately a 45-degree angle to the proposed drive aisle to allow for trailer maneuverability. Compacted aggregate access paths should be provided from parking areas and the adjacent picnic grove to the existing restrooms. This plan also recommends the addition of handicapped-accessible parking and viewing area adjacent to the existing spectator bleachers.

These proposed trailer parking spots will be most effective if a one-way traffic pattern (counter-clockwise in map view) is implemented on the access drive encircling the horse arena. The one-way direction would apply only to vehicles towing trailers, and would not be in effect on the access road

just east of the Horse Arena. A two-way traffic pattern should be maintained on that road to allow ingress and egress to / from the recycling center and the existing picnic grove atop the hill south of the horse arena.

Another proposed amenity for the horse arena is two horse stable buildings (each 20' x 200') with stalls available for rent during events. The two proposed buildings are located on the southwestern side of the horse arena, between the existing access road and treeline.

Reduced Maintenance via Non-mowed Areas

Mowing is one of the major components of maintenance in all three of the County Parks being studied for the Master Plan project. Pashek Associates analyzed the amount of lawn that is currently mowed in Bradys Run Park, as well as sizes of mowers used and frequency of mowing. With these numbers, Pashek Associates calculated potential cost savings of allowing some lawn areas to revert to a more natural state. These naturalized areas, referred to as “non-mowed” areas, would only require biannual mowing.

The following chart indicates potential labor time/cost saved each week (Bradys Run Park is mowed weekly) and total time/cost saved each mowing season. A seven-month period from April 1st to October 31st was used as the typical mowing season.

Potential Labor Time/Cost Savings for Non-mowed Areas vs. Lawn	
<i>Bradys Run Park</i>	
Mower Size	Mowing Speed
6-ft. Riding	0.35 hrs. / acre*
7-ft. Riding	0.35 hrs. / acre*
<i>Avg. mowing speed = 0.35 hrs/acre</i>	
Total area currently mowed	87.6 acres
Total labor time per weekly mowing	30.68 hours
Potential Maintenance Savings from Natural Areas	
Proposed naturalized areas	4.4 acres
Potential time weekly savings	1.5 hours
Seasonal time savings (30 weeks from April to October)	45 hours
--- Minus time spent mowing natural areas with brush hog (mowing speed 1.25 hrs/acre) twice / year	- 11 hours
Total hours saved	34 hours
Hourly Rate for staff (M3)	\$17.83
TOTAL ANNUAL SAVINGS	\$ 606.22

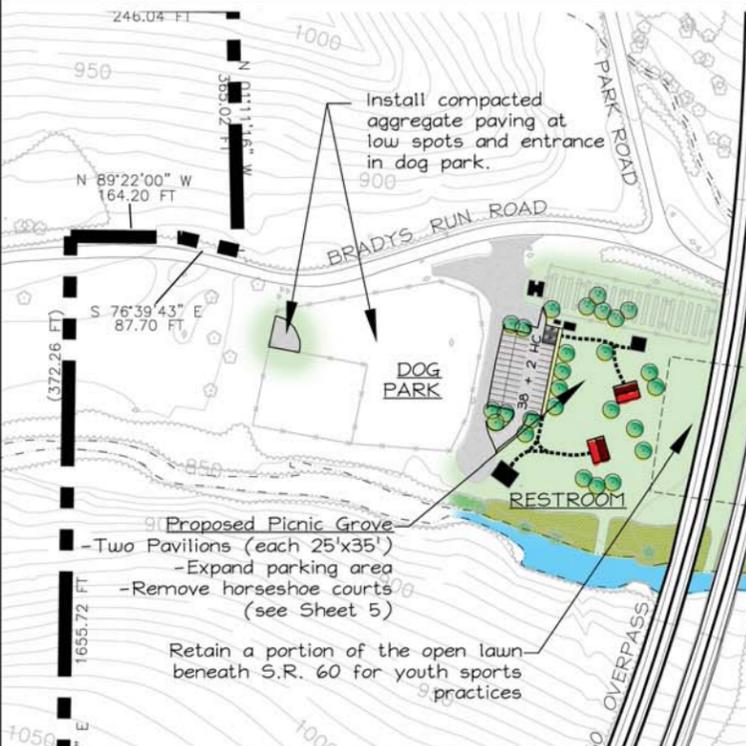
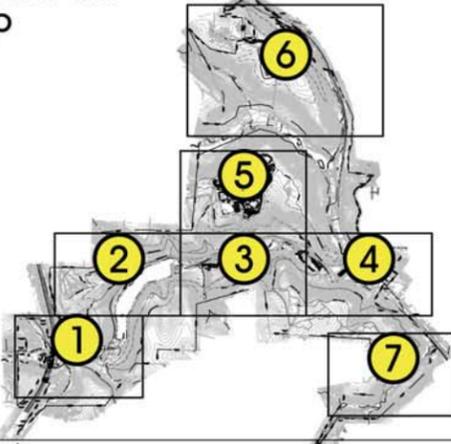
* Productivity standards taken from Park Maintenance Standards, published by the National Recreation and Park Association, 1986.

The annual cost savings outlined above may be compiled toward future improvements or to other maintenance needs for the park.

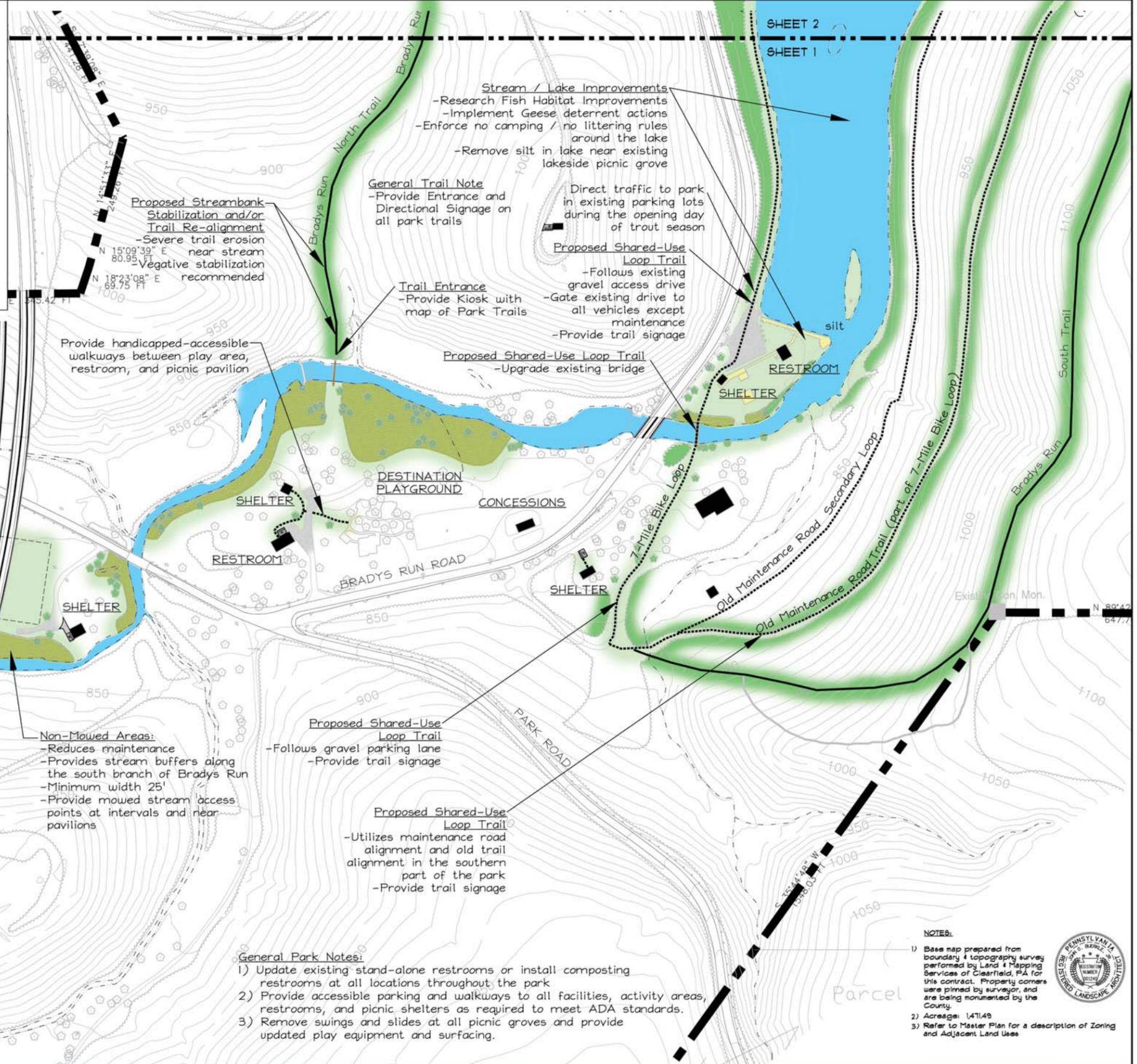
Time Needed to Move Equipment

Total acres mowed and time spent mowing lawn areas are approximate. Actual time may vary due to time traveled between each mowed area. Maintenance staff may need significant time to move equipment from area to area during mowing. This time should be minimal at Bradys Run Park, as it contains several large contiguous areas of lawn that can be mowed without loading / unloading equipment several times, or using several mowers at once.

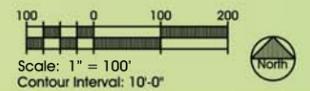
Bradys Run Park Key Map



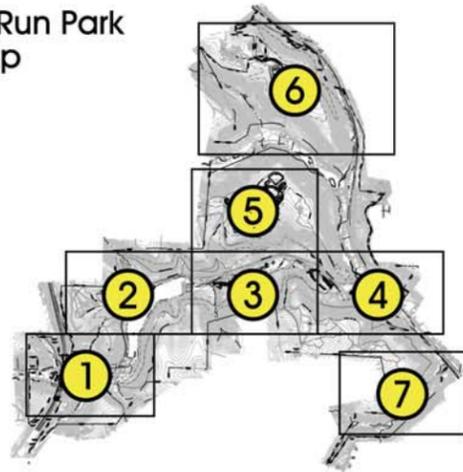
- ### Legend
- PROPOSED TRAIL
 - EXISTING TRAIL TO REMAIN
 - - - EXISTING TRAIL TO BE OBLITERATED
 - █ EXISTING BUILDING
 - █ PROPOSED BUILDING
 - █ PROPOSED PICNIC PAVILION
 - █ PROPOSED EQUESTRIAN BRIDGE
 - LAWN
 - PROPOSED HIGH-GRASS AREAS (SEMI-ANNUAL MOWING)
 - EXISTING NON-MOWED AREAS
 - FOREST
 - PROPOSED SHADE TREE
 - EXISTING ROADWAY/PARKING (GRAVEL)
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 - PROPOSED ROADWAY/PARKING
 - PROPOSED PAVED WALKWAY



- ### NOTES:
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 - 2) Acreage: 147.48
 - 3) Refer to Master Plan for a description of Zoning and Adjacent Land Uses



Bradys Run Park Key Map



Legend

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Proposed Overlook
 -Extend a trail from the eastern tip of the Arboretum loop trail to the end of the existing ridgetop.
 -Clear vegetation to create views of Bradys Run Lake and beyond.

Formalize parking area to maximize capacity:
 -Remove stone stockpile
 -Re-pave lot with gravel

Proposed 7-Mile Bike Loop
 -Trail exits Bradys Run Road
 -Create new trail connection along slope between park road and lake spillway.
 -Provide removable bollards to prevent vehicular access while allowing maintenance access

Proposed 7-Mile Bike Loop
 -On-road bike lane length: ±850 feet

Stream / Lake Improvements
 -Research Fish Habitat Improvements
 -Implement Geese deterrent actions
 -Enforce no camping / no littering rules around the lake

Improve Boat House Access
 -Widen entrance drive and pave with gravel
 -Provide paved walkway from road
 -Provide accessible parking spaces
 -Maintain vehicular building access for loading
 -Apply to PA Fish and Boat Commission for funds to improve boat launch (concrete) and access walkways

Proposed 7-Mile Bike Loop
 -Trail enters Bradys Run Road
 -Widen Road to create paved bike lane with minimum 5' width and pavement markings

Accessible Parking
 -Provide removable bollards to prevent vehicular access while allowing maintenance access to trail.
 -Provide handicapped-accessible fishing area

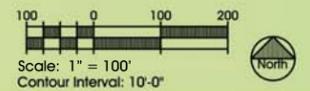
Proposed 7-Mile Bike Loop
 -Follows existing maintenance road alignment
 -Repair maintenance road

Reroute Bradys Run South Trail
 to keep entire trail on park property

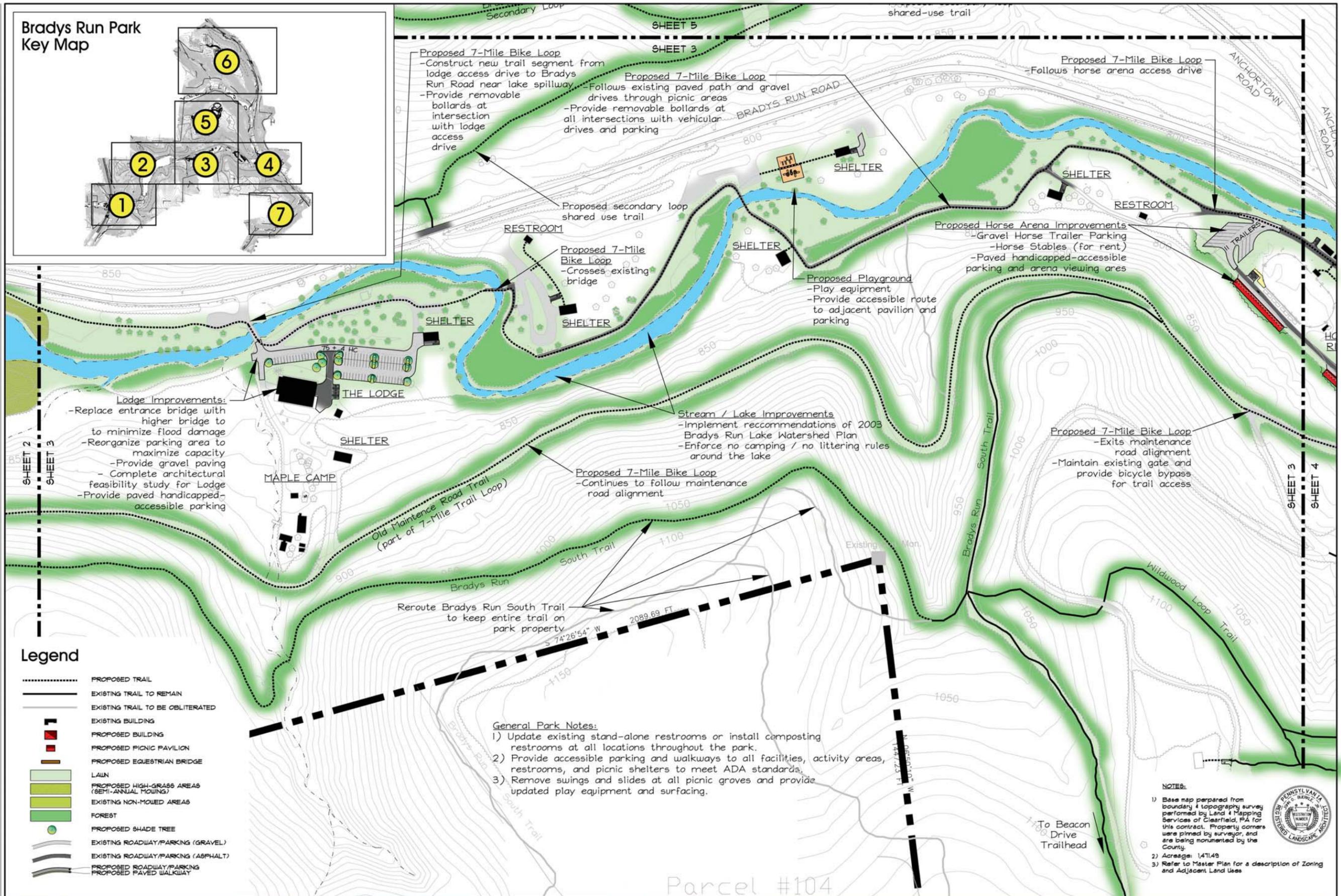
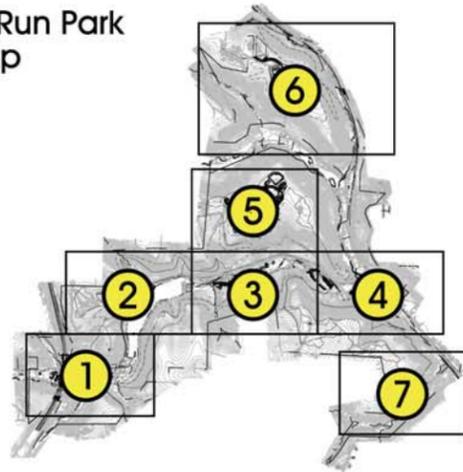
Re-align Existing Bradys Run North Trail
 -Create a switchback trail that gently climbs across the slope to provide a sustainable trail surface.
 -Obliterate eroded section of trail that climbs straight up the hillside.

- General Park Notes:**
- 1) Update existing stand-alone restrooms or install composting restrooms at all locations throughout the park
 - 2) Provide accessible parking and walkways to all facilities, activity areas, restrooms and picnic shelters to meet ADA stds.
 - 3) Remove swings and slides at all picnic groves and provide updated play equipment and surfacing.

- NOTES:**
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 - 2) Acreage: 1,471.49
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Bradys Run Park Key Map



Lodge Improvements:
 - Replace entrance bridge with higher bridge to minimize flood damage
 - Reorganize parking area to maximize capacity
 - Provide gravel paving
 - Complete architectural feasibility study for Lodge
 - Provide paved handicapped-accessible parking

Proposed 7-Mile Bike Loop
 - Construct new trail segment from lodge access drive to Bradys Run Road near lake spillway
 - Provide removable bollards at intersection with lodge access drive

Proposed 7-Mile Bike Loop
 - Follows existing paved path and gravel drives through picnic areas
 - Provide removable bollards at all intersections with vehicular drives and parking

Proposed 7-Mile Bike Loop
 - Follows horse arena access drive

Proposed Horse Arena Improvements
 - Gravel Horse Trailer Parking
 - Horse Stables (for rent)
 - Paved handicapped-accessible parking and arena viewing areas

Proposed Playground
 - Play equipment
 - Provide accessible route to adjacent pavilion and parking

Stream / Lake Improvements
 - Implement recommendations of 2003 Bradys Run Lake Watershed Plan
 - Enforce no camping / no littering rules around the lake

Proposed 7-Mile Bike Loop
 - Exits maintenance road alignment
 - Maintain existing gate and provide bicycle bypass for trail access

Proposed 7-Mile Bike Loop
 - Continues to follow maintenance road alignment

Reroute Bradys Run South Trail to keep entire trail on park property

General Park Notes:

- 1) Update existing stand-alone restrooms or install composting restrooms at all locations throughout the park.
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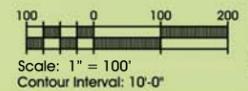
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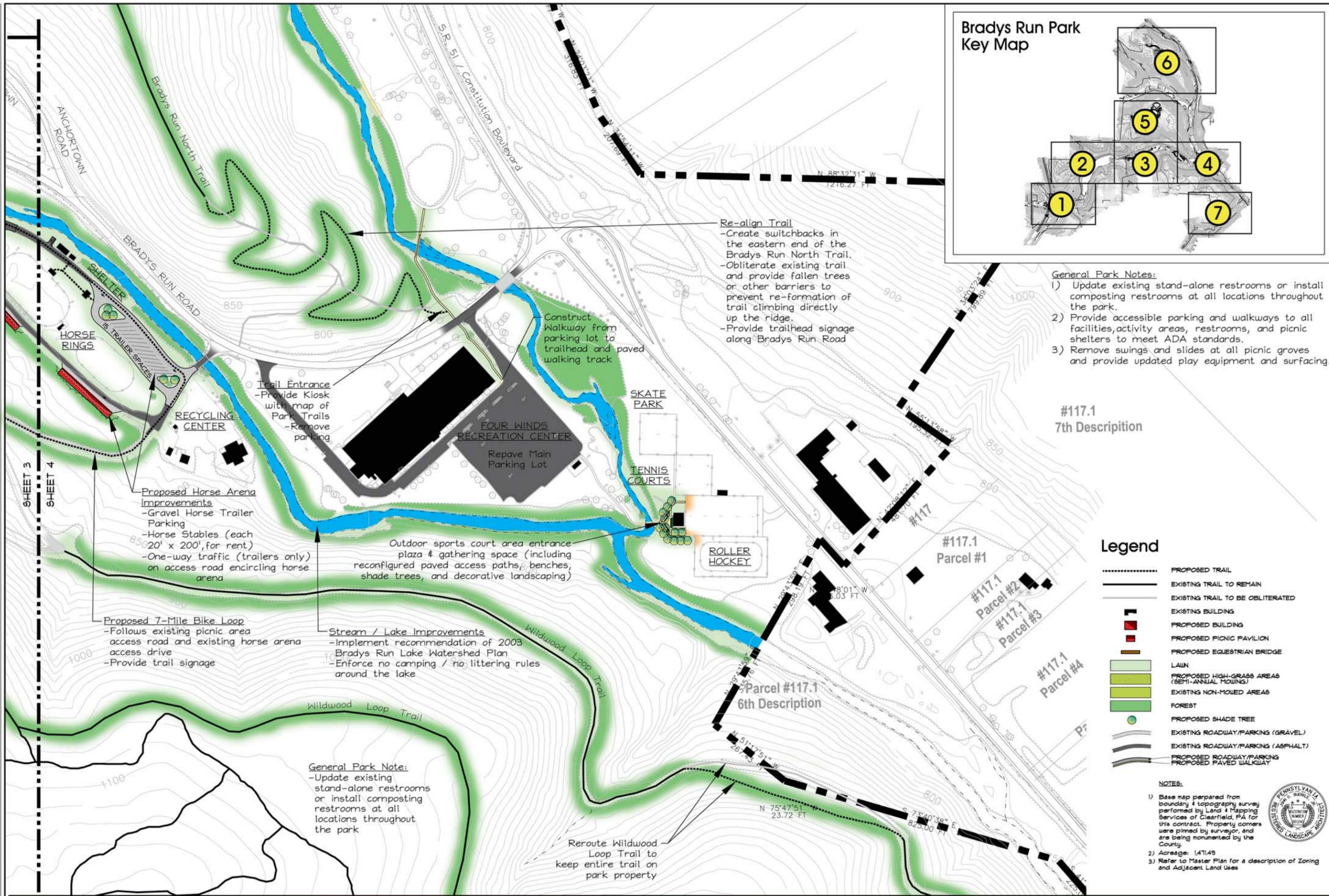
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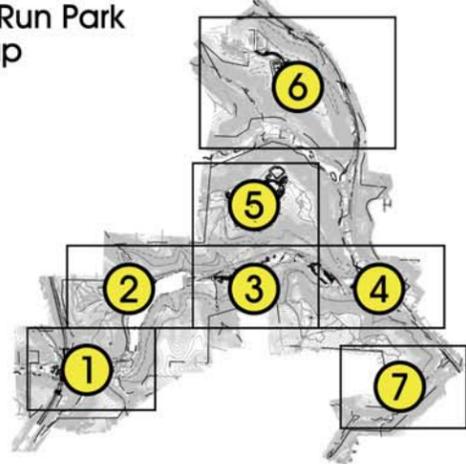
Legend

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Bradys Run Park Key Map



- General Park Notes:**
- 1) Update existing stand-alone restrooms or install composting restrooms at all locations throughout the park.
 - 2) Provide accessible parking and walkways to all facilities, activity areas, restrooms, and picnic shelters to meet ADA standards.
 - 3) Remove swings and slides at all picnic groves and provide updated play equipment and surfacing.

Re-align Trail
 -Create switchbacks in the eastern end of the Bradys Run North Trail.
 -Obliterate existing trail and provide fallen trees or other barriers to prevent re-formation of trail climbing directly up the ridge.
 -Provide trailhead signage along Bradys Run Road

Trail Entrance
 -Provide Kiosk with map of Park Trails
 -Remove parking

Proposed Horse Arena Improvements
 -Gravel Horse Trailer Parking
 -Horse Stables (each 20' x 200', for rent)
 -One-way traffic (trailers only) on access road encircling horse arena

Proposed 7-Mile Bike Loop
 -Follows existing picnic area access road and existing horse arena access drive
 -Provide trail signage

Stream / Lake Improvements
 -Implement recommendation of 2003 Bradys Run Lake Watershed Plan
 -Enforce no camping / no littering rules around the lake

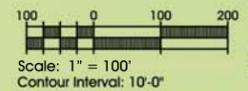
General Park Note:
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Reroute Wildwood Loop Trail to keep entire trail on park property

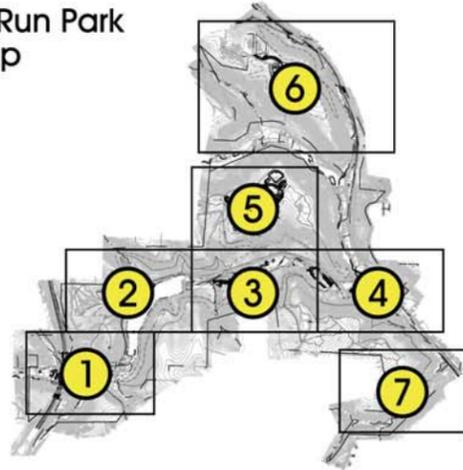
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Bradys Run Park Key Map



General Park Notes:

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- 3) Remove swings and slides at all picnic groves and provide updated play equipment and surfacing.

Proposed Congregation Area
 -Utilize existing concessions stand, add restrooms
 -Utilize existing restroom building
 -Walkways to buildings
 -Proposed Picnic Pavilion
 -Retain Existing Pavilion
 -Playground (Ages 2-5)
 -Pick-up/Drop-off Area
 -Maintenance Access Drive
 -Warm-Up Area included batting cages and practice pitcher's mound
 Self-storage unit for league equipment

Proposed Maintenance Area
 -Outdoor materials storage yard
 -Gated entrance
 -Provide tree plantings or other visual buffer

Remove existing mountain bike trails in area of proposed ball field complex improvements.

Proposed Picnic Grove
 -15' x 25' Pavilion
 -Sand Volleyball Court

Proposed Horseshoe Court Facility
 -Provide 16 courts with clay pits, lawn infield, paved access walks, and chain link backstops
 -3 covered courts under pavilion (45' x 50')
 -Open to the public
 -Provide small storage/maintenance building for league use Trail

Proposed Ball Field Loop Trail
 -Provide loop trail encircling ballfield complex and offering several access points
 -Proposed trail connects to Bradys Run North Trail

Remove existing mountain bike trails in area of proposed ball field complex improvements.

Proposed Loop Road
 -20' wide
 -Asphalt

Proposed Picnic Grove
 -15' x 25' Pavilion
 -Sand Volleyball Court

Proposed secondary loop shared-use trail

Proposed 7-Mile Bike Loop
 -Construct new trail segment from

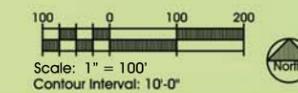
Proposed 7-Mile Follow base area

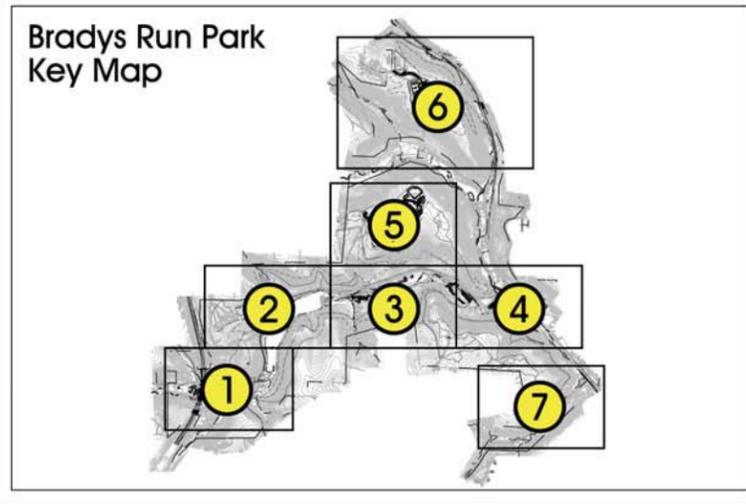
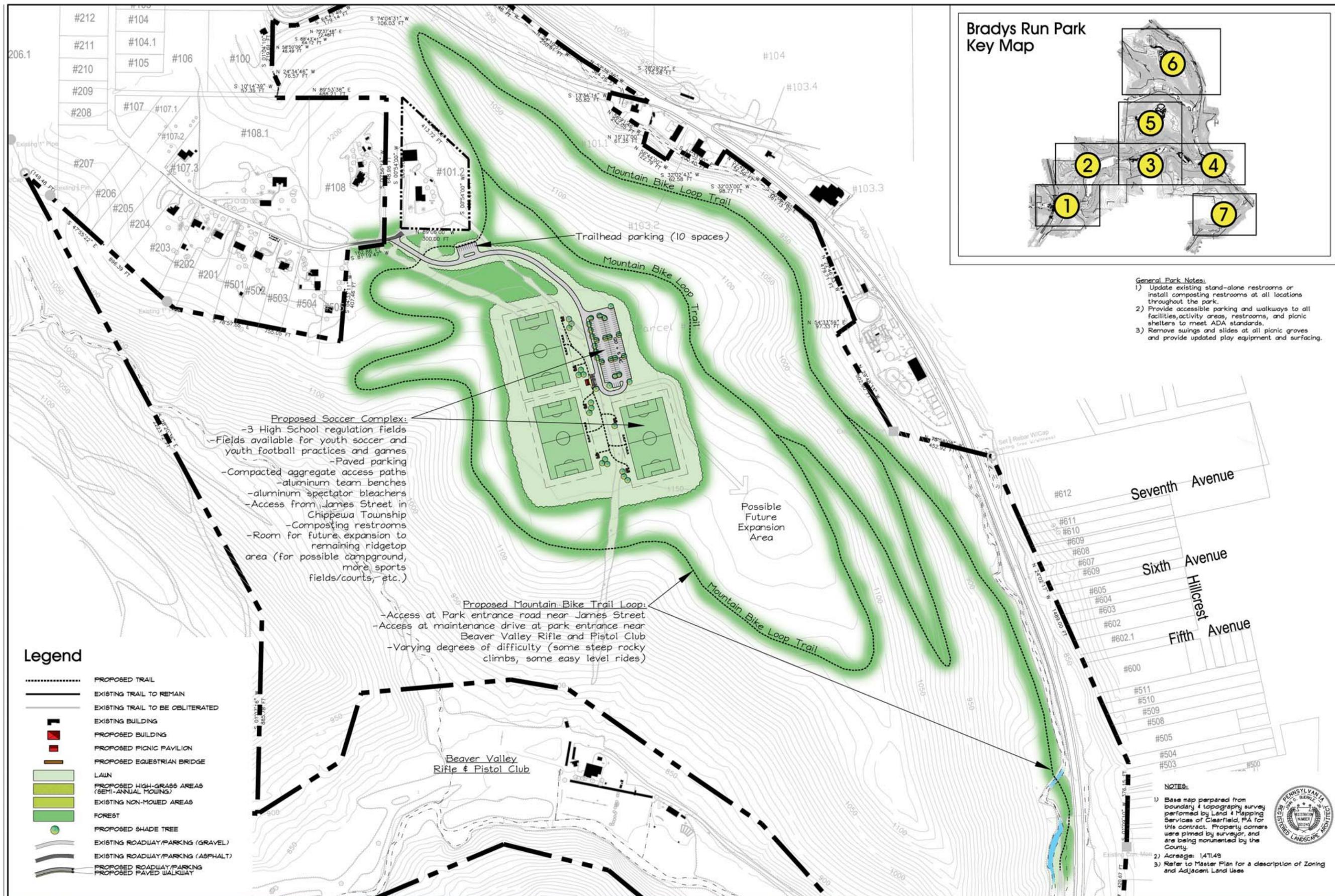
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 - 3) Remove swings and slides at all picnic groves and provide updated play equipment and surfacing.

Proposed Soccer Complex:

- 3 High School regulation fields
- Fields available for youth soccer and youth football practices and games
- Paved parking
- Compacted aggregate access paths
- aluminum team benches
- aluminum spectator bleachers
- Access from James Street in Chippewa Township
- Composting restrooms
- Room for future expansion to remaining ridgetop area (for possible campground, more sports fields/courts, etc.)

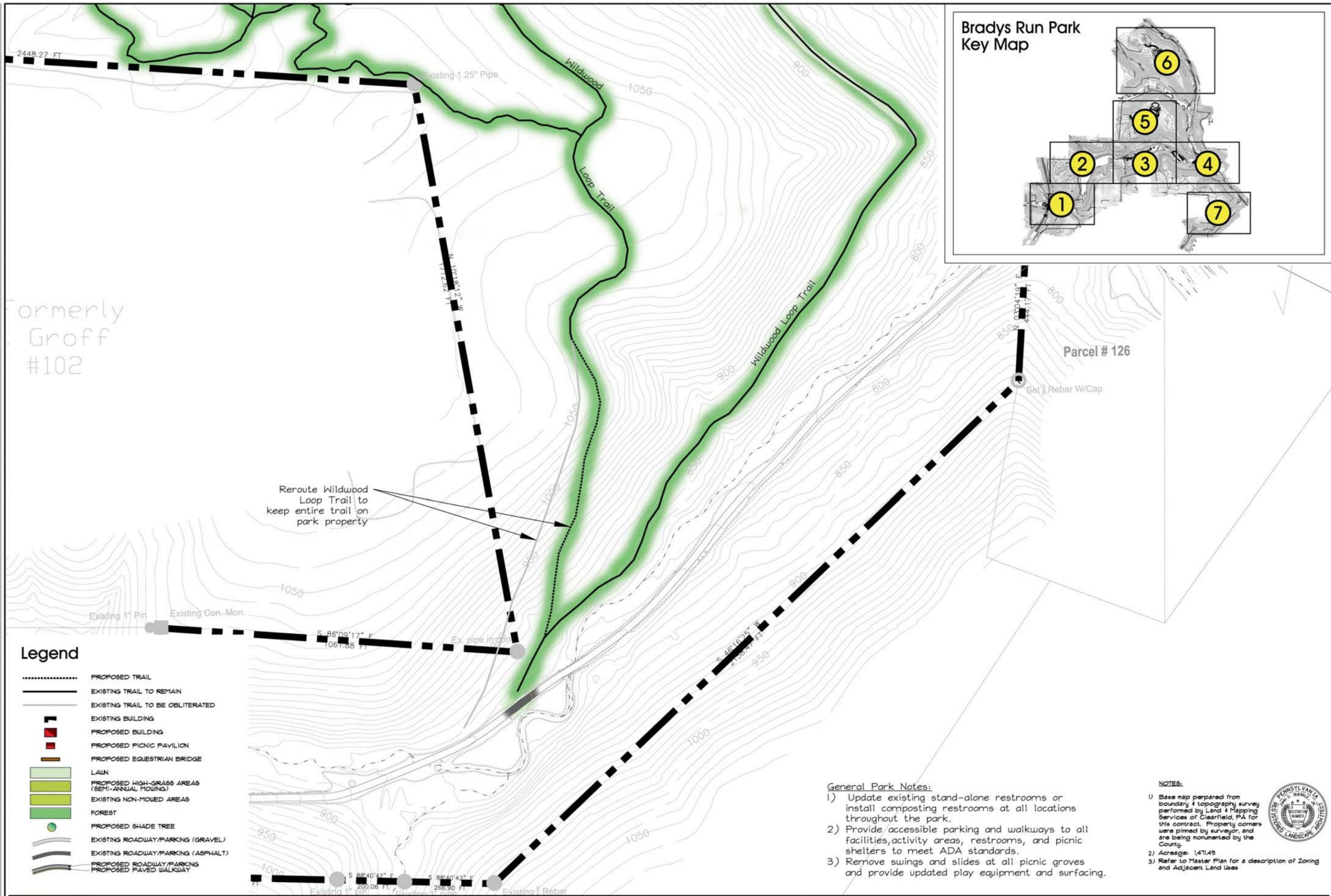
Proposed Mountain-Bike Trail Loop:

- Access at Park entrance road near James Street
- Access at maintenance drive at park entrance near Beaver Valley Rifle and Pistol Club
- Varying degrees of difficulty (some steep rocky climbs, some easy level rides)

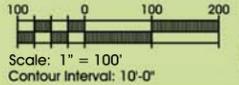
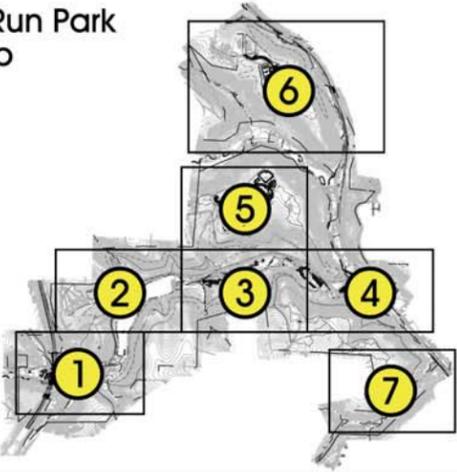
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Bradys Run Park Key Map



COST OPINION AND PHASING

Pashek Associates developed an opinion of probable construction costs for the proposed site improvements, based on the assumption that the implementation of the facilities will occur through a public bidding process, utilizing the Commonwealth of Pennsylvania's 2008 Prevailing Wage Rates. To budget for inflation of costs for future improvements, we recommend a four percent (4%) annual increase be budgeted for all work occurring after 2008.

In Pennsylvania, all projects over \$25,000 are required to use the State's Prevailing Wage Rates for Construction. However, volunteer labor, as well as donated equipment and materials, may reduce construction costs. The County may choose to construct some of the facilities utilizing volunteer and/or donated labor or materials. It is anticipated that this would also reduce the projected construction costs. Additionally, alternate sources of funding, including grant opportunities identified herein, may help to offset the expense to the County.

Based on these requirements, the opinion of probable construction cost to implement all of the improvements being proposed at Bradys Run Park is summarized as follows:

- **Park Trail System Improvements:** Obliteration of unsustainable sections of trails and trails encroaching on neighboring properties; clearing and grubbing; construction of earth surface and compacted aggregate trails; construction of asphalt on-road bike lane; various signage; regional marketing efforts

Subtotal: \$ 683,427

- **Bradys Run Lake and Stream Improvements:** Water-Quality monitoring and other recommendations from 2003 Bradys Run Lake Watershed Assessment & Restoration Plan, goose population control; earthwork; access improvements to the existing boat house, beach, boat launch; and shore fishing area; lake dredging; and gravel parking.

Subtotal: \$ 1,413,711

- **Picnic Grove Improvements:** Architectural Assessment of picnic pavilions and restrooms; replacement of outdated play equipment; construction of 2 pavilions and a playground; installation of gravel parking; paved handicapped parking and signage; compacted aggregate access walks; shade tree plantings; and lawn seeding.

Subtotal: \$ 715,672

- **Bradys Run Lodge Improvements:** Architectural feasibility study for use as an energy-efficient year-round facility; replacement of the existing vehicular bridge over the South Branch of Bradys Run; construction of gravel parking and paved handicapped-accessible parking; shade tree plantings; and lawn seeding.

Subtotal: \$ 196,142

- Ball Field Complex Improvements: Rotation of fields to minimize sun glare; proposed fields; improvements to existing fields; picnic pavilions (with water and electric service), sand volleyball courts; plumbed restrooms, re-organization of vehicular circulation; gravel parking; paved handicapped-accessible parking; proposed warm-up area (batting cages, practice pitchers mounds); storage units for league equipment; early-warning satellite weather system; multi-use trail loop; shade tree plantings; lawn seeding; and area lighting along the proposed road.

Subtotal: \$ 4,745,233

- Horse Shoe Court Facility: 16 clay-pit horseshoe courts (3 covered by pavilion); chain-link fence enclosure, storage building for league supplies; and asphalt access walks.

Subtotal: \$ 133,050

- Soccer Field Complex: 3 high-school regulation sized soccer fields; earthwork; clearing and grubbing; gravel parking; paved handicapped-accessible parking; trailhead parking for mountain bike trail; aluminum bleachers and team benches; shade tree plantings; re-routing overhead utility lines; and lawn seeding.

Subtotal: \$ 1,625,356

- Entrance Plaza at Tennis Courts / Skate Park / Roller Hockey Rink: Earthwork, asphalt walkways, benches, decorative shrub and groundcover plantings; shade tree plantings; and lawn seeding.

Subtotal: \$ 28,258

- Horse Arena Improvements: Earthwork; clearing and grubbing; gravel parking for trailers; traffic signage; paved handicapped-accessible parking and horse arena viewing area; two horse stables (with electric service); compacted aggregate access paths; shade tree plantings; and lawn seeding.

Subtotal: \$ 652,250

- Four Winds Recreation Center Improvements: Removal of existing asphalt paving; re-paving of parking lot (asphalt); linestriping; and installation asphalt walkway to trailhead across Bradys Run Road.

Subtotal: \$ 308,474

- Dog Park Improvements: Placement of compacted aggregate paving at the dog park

entranceway and at low spots within the dog park.

Subtotal: \$ 6,600

- Additional Costs: Permits, erosion and sediment control, stake-out, mobilization..

Subtotal: \$ 625,534

- Construction Contingency: To allow unknown field conditions to be addressed during the course of construction (cost based on a percentage of park construction costs).

Subtotal: \$ 525,534

- Professional Services: Design, construction document preparation, and construction observation (Fee based on a percentage of park construction costs, including contingency).

Subtotal: \$ 840,854

Total estimate of probable construction costs for Bradys Run Park, in 2008 dollars, is ***\$12,502,594***. Utilizing volunteer labor, donations of materials, and acquisition of grants, cost savings might be realized. We recommend that the County use Public Works Employees to construct various improvements at Bradys Run Park whenever feasible.

Bradys Run Park Master Plan

Opinion of Probable Construction Costs

Item No.	Item	Quantity	Unit	Unit Cost	Total Item Cost
1	Park Trail System Improvements (* denotes part of 7-mile loop trail)				\$683,428
	Obliterate existing trails (re-grade, place logs as barriers, etc.)	3.90	Mile	\$1,320	\$5,148
	Remove existing gravel paving (small parking lot north of Ice Arena)	1451	SY	\$2	\$2,902
	Remove existing asphalt paving (old maintenance road)	9686	SY	\$3	\$29,058
					* \$479,830
	Old Maintenance Road Trail* (compacted aggregate surface, 6-inch depth, 10' width)	9686	SY	\$22	\$213,092
	Additional Bicycle Trail Segments* (compacted aggregate surface, 6-inch depth, 10' width)	4261	SY	\$22	\$93,742
	On-road Bike Lane* (830' length, 5' width, heavy-duty asphalt surfacing, on shoulder of Bradys Run Road)	4611	SY	\$36	\$165,996
	Bike Lane Linestriping* (including lane stripes and bike lane symbols)	1	LS	\$2,000	\$2,000
	7-Mile Trail Loop Signage* (Directional Signs and Distance Markers)	1	LS	\$5,000	\$5,000
					\$166,490
	Bradys Run North Trail - Trail Re-routes and Secondary Loop (earth Surface, 3' width)	11348	LF	\$1.75	\$19,859
	Bradys Run South Trail - Re-routes (earth Surface, 3' width)	3975	LF	\$1.75	\$6,956
	Old Maintenance Road Trail - Secondary Loop (earth Surface, 3' width)	3596	LF	\$1.75	\$6,293
	Wildwood Loop Trail Re-Routes (earth Surface, 3' width)	1622	LF	\$1.75	\$2,839
	Ball Field Complex Trail Loop (earth Surface, 3' width)	4290	LF	\$1.75	\$7,508
	Mountain Biking only Trail Loop (earth surface, 3' width, in forested areas adjacent to soccer complex)	16200	LF	\$1.75	\$28,350
	Calland Abroretum Overlook Trail (earth Surface, 3' width)	572	LF	\$1.75	\$1,001

	Gravel Paving (Mountain bike trailhead access road and parking area)	1430	SY	\$22	\$31,460
	Clearing and Grubbing - forest canopy trees (for mountain bike trailhead parking)	0.7	AC	\$4,000	\$2,800
	Clearing and Grubbing - forest canopy trees (for Overlook)	0.2	AC	\$4,000	\$800
	Compacted Aggregate Paving (6" depth, 5' width - access walks)	392	SY	\$22	\$8,624
	Rustic Timber footbridges (assumes 15' length, 3' width)	5	EA	\$2,000	\$10,000
	Trail Signage (Entrance and Directional Signs and Distance Markers)	1	LS	\$15,000	\$15,000
	Share-the-Road Bike Routes Signage (Bradys Run Road)	1	LS	\$5,000	\$5,000
	Regional Trail Marketing Efforts (annual cost)	1	LS	\$20,000	\$20,000
2	Bradys Run Lake and Stream Improvements (*denotes a recommendation from 2003 Bradys Run Lake Watershed Assessment and Restoration Plan -- costs calculated using identified costs + 4% inflation / year since 2003)				\$1,413,711
	Investigate Coliform source area*	1	LS	\$9,730	\$9,730
	Sediment trap cleanout and rock revetment installation*	1	LS	\$54,750	\$54,750
	Encourage adequate erosion controls*				No labor and materials cost
	Egg addling / culling of goose population*	1	LS	\$14,600	\$14,600
	Further evaluation of phosphorus loading*	1	LS	\$17,030	\$17,030
	Ongoing water quality monitoring program* (annual cost)	1	LS	\$21,900	\$21,900
	Planning and permitting for sediment removal from Bradys Run Lake*	1	LS	\$34,067	\$34,067
	Address erosion issue beneath State Route 60 bridges	1	LS	\$10,000	\$10,000
	Dredge Bradys Run Lake	1	LS	\$1,000,000	\$1,000,000
	Remove existing stone blocks and concrete pipe (at parking lot on north side of Bradys Run Road near opposite the existing boat house)	1	LS	\$5,000	\$5,000
	Earthwork	800	CY	\$10	\$8,000
	Gravel Paving (Parking area)	4131	SY	\$36	\$148,716
	Asphalt Paving (Heavy Duty - accessible parking areas)	1058	SY	\$36	\$38,088
	Asphalt Paving (Standard Duty - Walks)	52	SY	\$32	\$1,664

	Compacted Aggregate Paving (6" depth - access walks)	108	SY	\$22	\$2,376
	Concrete Paving (Boat Ramp)	134	SY	\$60	\$8,040
	Accessibility Improvements to Beach	1	LS	\$20,000	\$20,000
	Accessible Parking Signs (includes footing)	7	EA	\$250	\$1,750
	Linestriping at accessible parking lots	1	LS	\$1,000	\$1,000
	Storm Drainage Sytem (inlets, pipes - for parking lot)	1	LS	\$15,000	\$15,000
	Vehicular Swinging Gate (4" steel tube, includes posts and concrete footing -- at lake access parking)	1	EA	\$2,000	\$2,000
3	Picnic Groves				\$715,672
	Remove existing Play Equipment at all shelters	1	LS	\$5,000	\$5,000
	Remove existing Horseshoe Court Facility (fence, concrete, lighting, wiring, buildings, etc.)	1	LS	\$10,000	\$10,000
	Architectural Assessment for Picnic Pavilions and Restrooms	1	LS	\$15,000	\$15,000
	Playground (Ages 2-12 play structure, 3-bay swingset, rubberized safety surface with underdrains)	1	LS	\$200,000	\$200,000
	Large Picnic Pavilions (35' x 25')	2	EA	\$40,000	\$80,000
	Install Composting Toilets at existing stand-alone restrooms (unisex)	3	LS	\$100,000	\$300,000
	Concrete Pads (for large pavilions)	195	SY	\$110	\$21,450
	Gravel Paving (parking areas)	1421	SY	\$22	\$31,262
	Asphalt Paving (Heavy Duty - accessible parking areas)	453	SY	\$36	\$16,308
	Asphalt Paving (Standard Duty - Walks)	89	SY	\$32	\$2,848
	Compacted Aggregate Paving (6" depth - access walks)	682	SY	\$22	\$15,004
	Accessible Parking Signs (includes footing)	12	EA	\$250	\$3,000
	Linestriping (all lots)	1	LS	\$2,000	\$2,000
	Trash Receptacles (2 per proposed pavilion)	4	EA	\$350	\$1,400
	Standing Charcoal Grills (1 per proposed pavilion -- approx. size 6' x 3')	2	EA	\$400	\$800
	Deciduous Shade Trees (2" caliper)	26	EA	\$400	\$10,400
	Seeding (lawn areas)	15.0	MSF	\$80	\$1,200
4	Bradys Run Lodge				\$196,142
	Remove existing concrete bridge / culvert at Bradys Run Lodge	1	LS	\$10,000	\$10,000
	Vehicular Bridge (as designed by qualified engineer)	1	LS	\$50,000	\$50,000

	Architectural Feasibility Study For Bradys Run Lodge (to explore improvements for energy efficiency and year-round use)	1	LS	\$20,000	\$20,000
	Gravel Paving (parking areas)	3713	SY	\$22	\$81,686
	Asphalt Paving (Heavy Duty - accessible parking areas)	746	SY	\$36	\$26,856
	Accessible Parking Signs (includes footing)	4	EA	\$250	\$1,000
	Linestriping (all lots)	1	LS	\$1,000	\$1,000
	Deciduous Shade Trees (2" caliper)	13	EA	\$400	\$5,200
	Seeding (lawn areas)	5.0	MSF	\$80	\$400
5	Ball Field Complex Improvements				\$4,745,233
	Remove existing asphalt paving (walkways, parking)	7153	SY	\$3	\$21,459
	Remove existing dugouts (4) and announcers' booth (1) at Ball Field complex (on fields to be rotated)	1	LS	\$10,000	\$10,000
	Remove existing players benches from one field to be rotated	1	LS	\$1,000	\$1,000
	Remove existing shade trees (ball field complex)	10	EA	\$200	\$2,000
	Remove existing chain link fence (ball field complex)	2767	LF	\$10	\$27,670
	Earthwork	170000	CY	\$10	\$1,700,000
	Clearing and Grubbing (Forest Vegetation)	19.0	AC	\$4,000	\$76,000
	Gravel Paving (parking areas)	28476	SY	\$22	\$626,472
	Asphalt Paving (Heavy Duty - road)	8280	SY	\$36	\$298,080
	Asphalt Paving (Heavy Duty - accessible parking areas)	681	SY	\$36	\$24,516
	Asphalt Paving (Standard Duty - Walks)	1679	SY	\$32	\$53,728
	Gravel Paving (maintenance yard)	1120	SY	\$22	\$24,640
	Compacted Aggregate Paving (6" depth - access walks)	3379	SY	\$22	\$74,338
	Accessible Parking Signs (includes footing)	18	EA	\$250	\$4,500
	Linestriping (all lots)	1	LS	\$3,500	\$3,500
	Storm Drainage Sytem (inlets, pipes - for parking lot)	1	LS	\$50,000	\$50,000
	Large Picnic Pavilions (35' x 25')	2	EA	\$40,000	\$80,000
	Small Picnic Pavilions (25' x 15')	3	EA	\$30,000	\$90,000
	Concrete Pads (for large pavilions)	195	SY	\$110	\$21,450
	Concrete Pads (for small pavilions)	126	SY	\$110	\$13,860
	Dugouts (8' x 20', concrete block)	12	LS	\$10,000	\$120,000
	Infield Repair (re-surfacing, re-grading and underdrainage - existing adult baseball field)	1	LS	\$15,000	\$15,000

6' Chain Link Fence with yellow PVC safety top (Proposed Tee Ball Field)	370	LF	\$40	\$14,800
6' Chain Link Fence with yellow PVC safety top (Rotated Fast-pitch Softball Field #1)	730	LF	\$40	\$29,200
6' Chain Link Fence with yellow PVC safety top (Rotated Fast-pitch Softball Field #2)	730	LF	\$40	\$29,200
6' Chain Link Fence with yellow PVC safety top (Rotated Adult Softball Field)	970	LF	\$40	\$38,800
6' Chain Link Fence with yellow PVC safety top (Proposed Adult Baseball Field)	1212	LF	\$40	\$48,480
6' Chain Link Fence with yellow PVC safety top (Proposed Adult Softball Field)	970	LF	\$40	\$38,800
Chain Link Fence Backstops (25' height)	6	EA	\$10,000	\$60,000
Metal foul poles with yellow net banner (12' height)	6	Pair	\$1,500	\$9,000
Aluminum Bleachers (5 rows x 15' length)	16	EA	\$3,500	\$56,000
Concrete Pads (for bleachers)	234	SY	\$110	\$25,740
Field Lighting (1 Existing adult field, 1 rotated adult field, 1 fast-ptich softball field)	3	LS	\$120,000	\$360,000
Playground (Ages 2-12 play structure, rubberized safety surface w/ underdrains)	1	LS	\$125,000	\$125,000
Sand Volleyball Court (incl. sand, poles, net, etc.)	2	LS	\$15,000	\$30,000
Warm-up Facility (4 Batting cages, 4 practice pitchers mounds)	1	LS	\$100,000	\$100,000
Storage Units (6 - for sports league equipment)	1	LS	\$10,000	\$10,000
Early-warning weather station	1	LS	\$10,000	\$10,000
Deciduous Shade Trees (2" caliper)	205	EA	\$400	\$82,000
Seeding (lawn areas)	500.0	MSF	\$80	\$40,000
Area lighting along proposed road (includes conduit, wiring, transformers, etc., and light poles)	1	LS	\$200,000	\$200,000
Water service wells for picnic pavilions	3	LS	\$25,000	\$75,000
Septic system for proposed restrooms	1	LS	\$25,000	\$25,000
6 Horseshoe Court Facility				\$133,050
10' Chain Link Fence	413	LF	\$50	\$20,650
Horseshoe Courts (Clay pits, backstops, grass infield)	16	EA	\$2,000	\$32,000
Asphalt Paving (Standard Duty - Walks)	325	SY	\$32	\$10,400
Horseshoe Court Facility Storage Building (15' x 15')	1	LS	\$20,000	\$20,000
Horseshoe Court Pavilion (3 courts - 45' x 50')	1	LS	\$50,000	\$50,000
7 Soccer Field Complex				\$1,625,356
Earthwork	105000	CY	\$10	\$1,050,000

	Clearing and Grubbing	15.8	AC	\$4,000	\$63,200
	Asphalt Paving (Heavy Duty - Parking areas)	8155	SY	\$36	\$293,580
	Asphalt Paving (Standard Duty - Walks)	53	SY	\$32	\$1,696
	Compacted Aggregate Paving (6" depth - access walks)	865	SY	\$22	\$19,030
	Accessible Parking Signs (includes footing)	5	EA	\$250	\$1,250
	Linestriping at parking lot	1	LS	\$1,500	\$1,500
	Storm Drainage Sytem (inlets, pipes - for parking lot)	1	LS	\$40,000	\$40,000
	Restroom Facility (25' x 15') at proposed soccer complex	1	EA	\$37,500	\$37,500
	Deciduous Shade Trees (2" caliper)	38	EA	\$400	\$15,200
	Seeding (lawn areas)	530.0	MSF	\$80	\$42,400
	Re-route existing overhead utility lines (approx. 1700')	1	LS	\$50,000	\$50,000
	Extend electric service to proposed restroom	1	LS	\$10,000	\$10,000
8	Entrance Plaza for Tennis Courts, Roller Hockey Rink, Skate Park				\$28,258
	Remove existing asphalt paving (walkways, parking)	214	SY	\$3	\$642
	Remove small structure (sign kiosk)	1	LS	\$2,000	\$2,000
	Earthwork	224	CY	\$10	\$2,240
	Asphalt Paving (Standard Duty - Walks)	248	SY	\$32	\$7,936
	Benches (8' length, with backrests)	7	EA	\$1,000	\$7,000
	Deciduous Shade Trees (2" caliper)	13	EA	\$400	\$5,200
	Decorative Shrubs / groundcover	1	LS	\$3,000	\$3,000
	Seeding (lawn areas)	3.0	MSF	\$80	\$240
9	Horse Arena Improvements				\$652,250
	Earthwork	2805	CY	\$10	\$28,050
	Clearing and Grubbing	0.3	AC	\$4,000	\$1,200
	Horse Stall Buildings (2 - each 200' x 20')	8000	SF	\$60	\$480,000
	Compacted Aggregate Paving (6" depth - access walks)	93	SY	\$22	\$2,046
	Gravel Paving (parking areas)	5053	SY	\$22	\$111,166
	Asphalt Paving (Heavy Duty - Parking areas)	54	SY	\$36	\$1,944
	Asphalt Paving (Standard Duty - accessible viewing area)	74	SY	\$32	\$2,368
	Accessible Parking Signs (includes footing)	2	EA	\$250	\$500
	"One-way"(2) and "Do Not Enter" (2) Signage for Trailer traffic only	4	EA	\$200	\$800
	Linestriping at parking lot	1	LS	\$1,000	\$1,000

	Gravel Paving (8" thickness)	498	SY	\$22	\$10,956
	Deciduous Shade Trees (2" caliper)	5	EA	\$300	\$1,500
	Seeding (lawn areas)	9.0	MSF	\$80	\$720
	Electric Service extension to horse stables	1	LS	\$10,000	\$10,000
10	Four Winds Recreation Center Improvements				\$310,974
	Remove existing asphalt paving (parking lot)	13078	SY	\$3	\$39,234
	Asphalt Paving (Heavy Duty Asphalt ONLY - retain aggregate base course)	13078	SY	\$20	\$261,560
	Linestriping at parking lot	1	LS	\$2,500	\$2,500
	Asphalt Paving (Standard Duty - Walks)	240	SY	\$32	\$7,680
11	Dog Park Improvements				\$6,600
	Compacted Aggregate Paving (6" depth - entranceway and estimated amount of low spots)	300	SY	\$22	\$6,600
<i>SUBTOTALS</i>					<i>\$10,510,673</i>
	Permitting	1	LS	\$25,000	\$25,000
	Mobilization	1	%	\$10,510,673	\$105,407
	Stake-Out	1	LS	\$75,000	\$75,000
	Erosion & Sedimentation Control Measures	4	%	\$10,510,673	\$420,427
	Professional Services (Design and Engineering Fees)	8	%	\$10,510,673	\$840,854
	Construction Contingency	5	%	\$10,510,673	\$525,534
<i>TOTAL</i>					<i>\$12,502,994</i>

Phasing

Ideally, the County would construct all park improvements in one phase, minimizing construction activities, disruptions, and realizing “economies of scale” construction savings. However, few Counties, municipalities, or organizations can afford to proceed in this manner and find it more appropriate to phase construction over a period of time.

Pashek Associates recommends that the improvements to Bradys Run Park be constructed in a series of logical phases. Depending on the County’s financial situation and the success of grant writing efforts, this phasing plan may be expedited or lengthened.

Recognizing the County’s desire to construct improvements as quickly and efficiently as possible, we recommend that construction begin with the phases described in this section. Improvements not included in the initial phases are considered lower priorities that should be revisited upon completion of work described herein.

Some Improvements Not Listed

Acquiring grants or other funding for the improvements listed below (in phases 1A-5) may take several years. Those improvements included in earlier phases are higher priorities. Upon completion of the phases described below, lower priority improvements not included in listed phases should be analyzed and re-prioritized.

Phasing Plan total cost opinions are summarized in this section, and are included in their entirety as part of this plan, along with the overall opinion of probable cost for proposed improvements to Bradys Run Park.

Phase #1A - \$ 816,444

Phase 1A construction at Bradys Run Park should focus on improvements to the park’s trail system, including: trailhead parking; trail re-routes; obliteration of specified trail segments; construction of new trails; trail signage and markers; and trail marketing efforts.

Phase #1B - \$ 1,692,316

Phase 1B includes access improvements to the existing boat house, beach, boat launch, and shore fishing area; as well as implementation of recommendations from the 2003 Bradys Run Lake Watershed Assessment and Restoration Plan; and addressing the erosion issue beneath the Route 60 overpass. This phase carries a large price tag but assumes use of Beaver County’s Environmental Initiative Funds (distributed to the County through DCNR) as well as other County matching funds.

Phase #2 - \$ 1,748,656

Phase 2 construction will focus on the beginning of development at the ball field complex. Work

will include: removal of a portion of the existing road; removal of shade trees; construction of the proposed loop road at the ball field complex; the development of proposed picnic groves near the entrance of the complex and on the southern end of the loop road; construction of the main parking area and smaller parking areas at picnic groves; paved handicapped-accessible parking; asphalt walkways; compacted aggregate paths; shade tree plantings; lawn seeding; area lighting along the proposed road; and utility services to proposed picnic pavilions and restrooms in the ballfield complex.

Phase #3 - \$ 1,271,106

Phase 3 will concentrate on further development at the ball field complex. Construction should include: earthwork; clearing and grubbing; installation of the proposed adult baseball field (fencing, infield, back stop, dugouts, bleacher); development of a picnic grove with pavilion and sand volleyball court in the northeastern part of the ball field complex; gravel parking; paved handicapped-accessible parking; asphalt walks; compacted aggregate access paths; shade tree plantings; and lawn seeding.

Phase #4 - \$ 854,493

Phase 4 construction will focus on enhancements to the park's picnic groves. Work will include the following: removal of the existing horseshoe court facility; replacement of outdated play equipment; an architectural assessment of picnic pavilions and restrooms to determine needs and feasibility of repairs; removal of wooden separate-sex restrooms; installation of composting restrooms; a playground; gravel parking areas; paved handicapped-accessible parking; asphalt walkways; compacted aggregate paving; shade tree plantings; and lawn seeding.

Phase #5 - \$ 1,168,102

The sixth phase of construction should concentrate on improvements to Bradys Run Lodge and the Horse Arena, as well as development of the new horseshoe court facility. Work will include: replacement of the vehicular bridge to Bradys Run Lodge; gravel parking areas; paved handicapped-accessible parking areas; an architectural feasibility study for year-round use and energy efficiency of the lodge; trailer parking, handicapped-accessible parking, accessible viewing area, rental stables, and signage at the horse arena; and construction of a 16-court horseshoe facility with chain-link fence enclosure, 3 covered courts under pavilion, and a horseshoe league equipment storage building.

Opinion of Probable Construction Costs - Phasing Plan Summary

AREA	Phase 1A	Phase 1B	Phase 2	Phase 3	Phase 4	Phase 5
Demolition and Removals	\$37,108	\$5,000	\$23,459	\$0	\$15,000	\$10,000
Clearing and Grubbing	\$0	\$0	\$28,000	\$28,000	\$0	\$1,200
Earthwork	\$0	\$8,000	\$400,000	\$700,000	\$0	\$28,500
Various Recreation Facilities and Improvements	\$646,319	\$1,400,711	\$1,021,978	\$340,734	\$700,672	\$941,742
Additional Costs	\$44,171	\$94,823	\$83,672	\$63,437	\$45,784	\$59,072
Construction Contingency	\$34,171	\$70,686	\$73,672	\$53,437	\$35,784	\$49,072
Professional Services	\$54,674	\$113,097	\$117,875	\$85,499	\$57,254	\$78,515
<i>Total</i>	<i>\$816,444</i>	<i>\$1,692,316</i>	<i>\$1,748,656</i>	<i>\$1,271,106</i>	<i>\$854,493</i>	<i>\$1,168,102</i>

Bradys Run Park Master Plan - Phase 1A

Opinion of Probable Construction Costs

Item No.	Item	Quantity	Unit	Unit Cost	Total Item Cost
1	Park Trail System Improvements (* denotes part of 7-mile loop trail)				\$683,427
	Obliterate existing trails (re-grade, place logs as barriers, etc.)	3.90	Mile	\$1,320	\$5,148
	Remove existing gravel paving (small parking lot north of Ice Arena)	1451	SY	\$2	\$2,902
	Remove existing asphalt paving (old maintenance road)	9686	SY	\$3	\$29,058
					\$479,830
	<i>Old Maintenance Road Trail*</i> (compacted aggregate surface, 6-inch depth, 10' width)	9686	SY	\$22	\$213,092
	<i>Additional Bicycle Trail Segments*</i> (compacted aggregate surface, 6-inch depth, 10' width)	4261	SY	\$22	\$93,742
	<i>On-road Bike Lane*</i> (830' length, 5' width, heavy-duty asphalt surfacing, on shoulder of Bradys Run Road)	4611	SY	\$36	\$165,996
	Bike Lane Linestriping* (including lane stripes and bike lane symbols)	1	LS	\$2,000	\$2,000
	7-Mile Trail Loop Signage* (Directional Signs and Distance Markers)	1	LS	\$5,000	\$5,000
					\$166,490
	<i>Bradys Run North Trail - Trail Re-routes and Secondary Loop</i> (earth Surface, 3' width)	11348	LF	\$1.75	\$19,859
	<i>Bradys Run South Trail - Re-routes</i> (earth Surface, 3' width)	3975	LF	\$1.75	\$6,956
	<i>Old Maintenance Road Trail - Secondary Loop</i> (earth Surface, 3' width)	3596	LF	\$1.75	\$6,293
	<i>Wildwood Loop Trail Re-Routes</i> (earth Surface, 3' width)	1622	LF	\$1.75	\$2,839
	<i>Ball Field Complex Trail Loop</i> (earth Surface, 3' width)	4290	LF	\$1.75	\$7,508
	<i>Mountain Biking only Trail Loop</i> (earth surface, 3' width, in forested areas adjacent to soccer complex)	16200	LF	\$1.75	\$28,350
	<u>Calland Abroretum Overlook Trail</u> (earth Surface, 3' width)	572	LF	\$1.75	\$1,001

Gravel Paving (Mountain bike trailhead access road and parking area)	1430	SY	\$22	\$31,460
Clearing and Grubbing - forest canopy trees (for mountain bike trailhead parking)	0.7	AC	\$4,000	\$2,800
Clearing and Grubbing - forest canopy trees (for Overlook)	0.2	AC	\$4,000	\$800
Compacted Aggregate Paving (6" depth, 5' width - access walks)	392	SY	\$22	\$8,624
Rustic Timber footbridges (assumes 15' length, 3' width)	5	EA	\$2,000	\$10,000
Trail Signage (Entrance and Directional Signs and Distance Markers)	1	LS	\$15,000	\$15,000
Share-the-Road Bike Routes Signage (Bradys Run Road)	1	LS	\$5,000	\$5,000
Regional Trail Marketing Efforts (annual cost)	1	LS	\$20,000	\$20,000
<i>SUBTOTALS</i>				<i>\$683,427</i>
Permitting	1	LS	\$2,500	\$2,500
Mobilization	1	%	\$683,427	\$6,834
Stake-Out	1	LS	\$7,500	\$7,500
Erosion & Sedimentation Control Measures	4	%	\$683,427	\$27,337
Professional Services (Design and Engineering Fees)	8	%	\$683,427	\$54,674
Construction Contingency	5	%	\$683,427	\$34,171
<i>TOTAL</i>				<i>\$816,444</i>

Bradys Run Park Master Plan - Phase 1B

Opinion of Probable Construction Costs

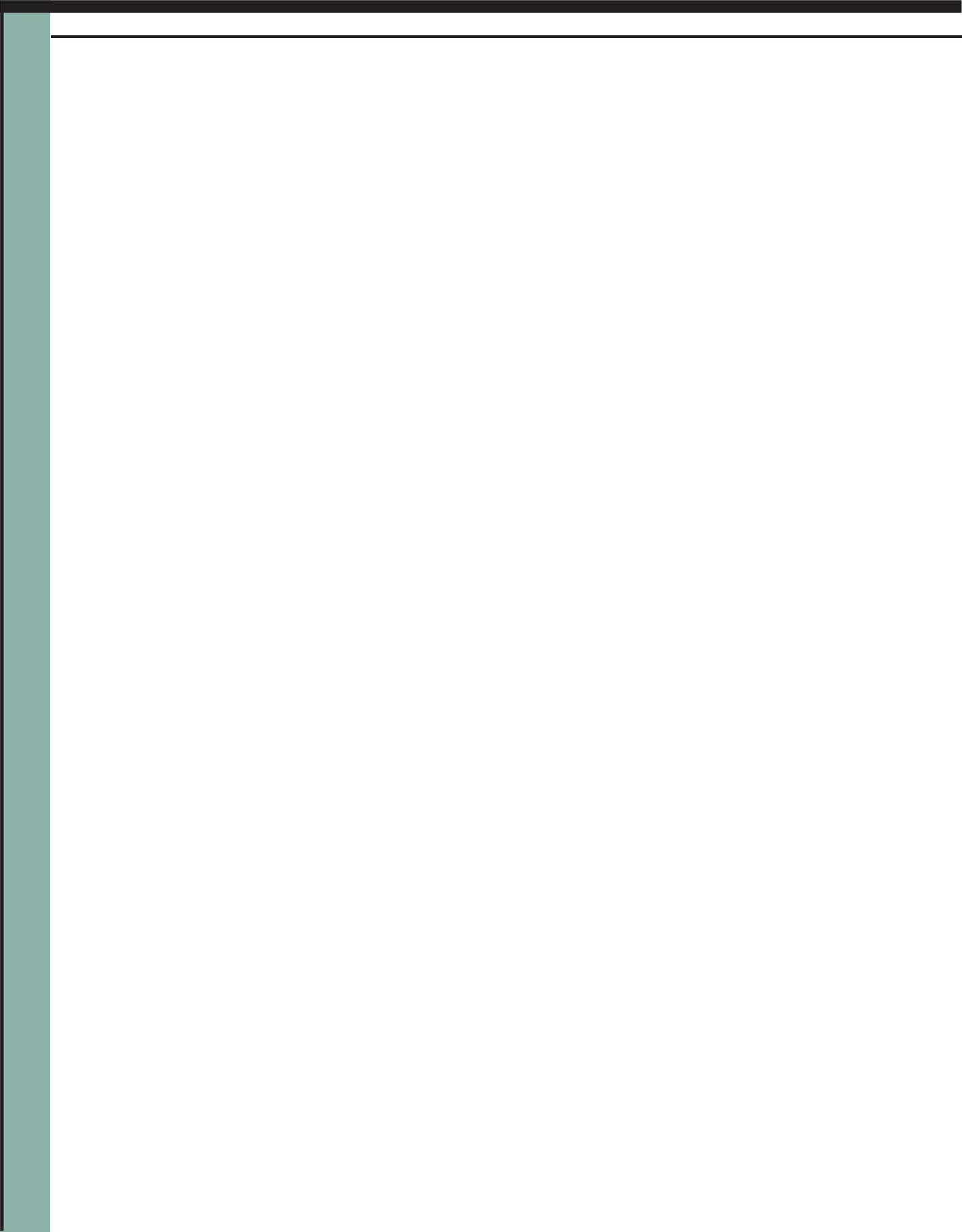
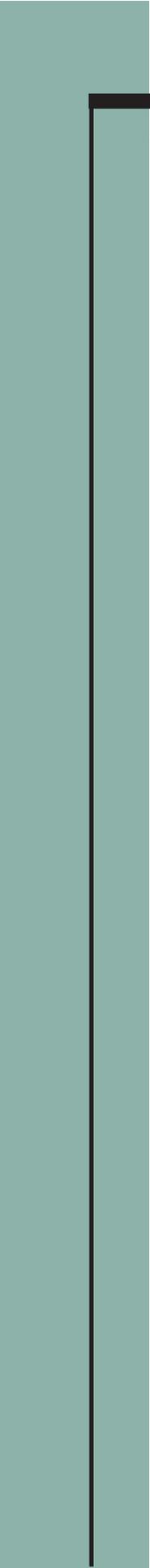
Item No.	Item	Quantity	Unit	Unit Cost	Total Item Cost
1	Bradys Run Lake and Stream Improvements (*denotes a recommendation from 2003 Bradys Run Lake Watershed Assessment and Restoration Plan -- costs calculated using identified costs + 4% inflation / year since 2003)				\$1,413,711
	Investigate Coliform source area*	1	LS	\$9,730	\$9,730
	Sediment trap cleanout and rock revetment installation*	1	LS	\$54,750	\$54,750
	Encourage adequate erosion controls*				No labor and materials cost
	Egg addling / culling of goose population*	1	LS	\$14,600	\$14,600
	Further evaluation of phosphorus loading*	1	LS	\$17,030	\$17,030
	Ongoing water quality monitoring program* (annual cost)	1	LS	\$21,900	\$21,900
	Planning and permitting for sediment removal from Bradys Run Lake*	1	LS	\$34,067	\$34,067
	Address erosion issue beneath State Route 60 bridges	1	LS	\$10,000	\$10,000
	Dredge Bradys Run Lake	1	LS	\$1,000,000	\$1,000,000
	Remove existing stone blocks and concrete pipe (at parking lot on north side of Bradys Run Road near opposite the existing boat house)	1	LS	\$5,000	\$5,000
	Earthwork	800	CY	\$10	\$8,000
	Gravel Paving (Parking area)	4131	SY	\$36	\$148,716
	Asphalt Paving (Heavy Duty - accessible parking areas)	1058	SY	\$36	\$38,088
	Asphalt Paving (Standard Duty - Walks)	52	SY	\$32	\$1,664
	Compacted Aggregate Paving (6" depth - access walks)	108	SY	\$22	\$2,376
	Concrete Paving (Boat Ramp)	134	SY	\$60	\$8,040
	Accessibility Improvements to Beach	1	LS	\$20,000	\$20,000
	Accessible Parking Signs (includes footing)	7	EA	\$250	\$1,750
	Linestriping at accessible parking lots	1	LS	\$1,000	\$1,000
	Storm Drainage Sytem (inlets, pipes - for parking lot)	1	LS	\$15,000	\$15,000
	Vehicular Swinging Gate (4" steel tube, includes posts and concrete footing -- at lake access parking)	1	EA	\$2,000	\$2,000

<i>SUBTOTALS</i>					<i>\$1,413,711</i>
	Permitting	1	LS	\$2,500	\$2,500
	Mobilization	1	%	\$1,413,711	\$14,137
	Stake-Out	1	LS	\$7,500	\$7,500
	Erosion & Sedimentation Control Measures	4	%	\$1,413,711	\$56,548
	Professional Services (Design and Engineering Fees)	8	%	\$1,413,711	\$113,097
	Construction Contingency	5	%	\$1,413,711	\$70,686
<i>TOTAL</i>					<i>\$1,692,316</i>

Bradys Run Park Master Plan - Phase 2

Opinion of Probable Construction Costs

Item No.	Item	Quantity	Unit	Unit Cost	Total Item Cost
1	Ball Field Complex Improvements				\$1,473,437
	Remove existing asphalt paving (walkways, parking)	7153	SY	\$3	\$21,459
	Remove existing shade trees (ball field complex)	10	EA	\$200	\$2,000
	Earthwork	40000	CY	\$10	\$400,000
	Clearing and Grubbing (Forest Vegetation)	7.0	AC	\$4,000	\$28,000
	Gravel Paving (parking areas and pick-up / drop-off)	9088	SY	\$22	\$199,936
	Asphalt Paving (Heavy Duty - road)	8280	SY	\$36	\$298,080
	Asphalt Paving (Heavy Duty - accessible parking areas)	164	SY	\$36	\$5,904
	Asphalt Paving (Standard Duty - Walks)	718	SY	\$32	\$22,976
	Compacted Aggregate Paving (6" depth - access walks)	96	SY	\$22	\$2,112
	Accessible Parking Signs (includes footing)	9	EA	\$250	\$2,250
	Linestriping (all lots)	1	LS	\$1,500	\$1,500
	Large Picnic Pavilions (35' x 25')	1	EA	\$40,000	\$40,000
	Small Picnic Pavilions (25' x 15')	2	EA	\$30,000	\$60,000
	Concrete Pads (for large pavilions)	98	SY	\$110	\$10,780
	Concrete Pads (for small pavilions)	84	SY	\$110	\$9,240
	Infield Repair (re-surfacing, re-grading and underdrainage - existing adult baseball field)	1	LS	\$15,000	\$15,000
	Sand Volleyball Court (incl. sand, poles, net, etc.)	1	LS	\$15,000	\$15,000
	Deciduous Shade Trees (2" caliper)	68	EA	\$400	\$27,200
	Seeding (lawn areas)	150.0	MSF	\$80	\$12,000
	Area lighting along proposed road (includes conduit, wiring, transformers, etc., and light poles)	1	LS	\$200,000	\$200,000
	Water service wells for picnic pavilions	3	LS	\$25,000	\$75,000
	Septic system for proposed restrooms	1	LS	\$25,000	\$25,000
SUBTOTALS					\$1,473,437
	Permitting	1	LS	\$2,500	\$2,500
	Mobilization	1	%	\$1,473,437	\$14,734
	Stake-Out	1	LS	\$7,500	\$7,500
	Erosion & Sedimentation Control Measures	4	%	\$1,473,437	\$58,937
	Professional Services (Design and Engineering Fees)	8	%	\$1,473,437	\$117,875
	Construction Contingency	5	%	\$1,473,437	\$73,672
TOTAL					\$1,748,656



Bradys Run Park Master Plan - Phase 3

Opinion of Probable Construction Costs

Item No.	Item	Quantity	Unit	Unit Cost	Total Item Cost
1	Ball Field Complex Improvements				\$1,068,734
	Earthwork	70000	CY	\$10	\$700,000
	Clearing and Grubbing (Forest Vegetation)	7.0	AC	\$4,000	\$28,000
	Gravel Paving (parking areas)	3342	SY	\$22	\$73,524
	Asphalt Paving (Heavy Duty - accessible parking areas)	134	SY	\$36	\$4,824
	Asphalt Paving (Standard Duty - Walks)	311	SY	\$32	\$9,952
	Gravel Paving (maintenance yard)	1120	SY	\$22	\$24,640
	Compacted Aggregate Paving (6" depth - access walks)	242	SY	\$22	\$5,324
	Accessible Parking Signs (includes footing)	5	EA	\$250	\$1,250
	Linestriping (all lots)	1	LS	\$1,000	\$1,000
	Large Picnic Pavilions (35' x 25')	1	EA	\$40,000	\$40,000
	Small Picnic Pavilions (25' x 15')	1	EA	\$30,000	\$30,000
	Concrete Pads (for large pavilions)	97	SY	\$110	\$10,670
	Concrete Pads (for small pavilions)	42	SY	\$110	\$4,620
	Dugouts (8' x 20', concrete block)	2	LS	\$10,000	\$20,000
	6' Chain Link Fence with yellow PVC safety top (Proposed Adult Baseball Field)	1212	LF	\$40	\$48,480
	Chain Link Fence Backstops (25' height)	1	EA	\$10,000	\$10,000
	Metal foul poles with yellow net banner (12' height)	1	Pair	\$1,500	\$1,500
	Aluminum Bleachers (5 rows x 15' length)	2	EA	\$3,500	\$7,000
	Concrete Pads (for bleachers)	45	SY	\$110	\$4,950
	Sand Volleyball Court (incl. sand, poles, net, etc.)	1	LS	\$15,000	\$15,000
	Deciduous Shade Trees (2" caliper)	30	EA	\$400	\$12,000
	Seeding (lawn areas)	200.0	MSF	\$80	\$16,000
SUBTOTALS					\$1,068,734
	Permitting	1	LS	\$2,500	\$2,500
	Mobilization	1	%	\$1,068,734	\$10,687
	Stake-Out	1	LS	\$7,500	\$7,500
	Erosion & Sedimentation Control Measures	4	%	\$1,068,734	\$42,749
	Professional Services (Design and Engineering Fees)	8	%	\$1,068,734	\$85,499
	Construction Contingency	5	%	\$1,068,734	\$53,437
TOTAL					\$1,271,106

Bradys Run Park Master Plan - Phase 4

Opinion of Probable Construction Costs

Item No.	Item	Quantity	Unit	Unit Cost	Total Item Cost
1	Picnic Groves				\$715,672
	Remove existing Play Equipment at all shelters	1	LS	\$5,000	\$5,000
	Remove existing Horseshoe Court Facility (fence, concrete, lighting, wiring, buildings, etc.)	1	LS	\$10,000	\$10,000
	Architectural Assessment for Picnic Pavilions and Restrooms	1	LS	\$15,000	\$15,000
	Playground (Ages 2-12 play structure, 3-bay swingset, rubberized safety surface with underdrains)	1	LS	\$200,000	\$200,000
	Large Picnic Pavilions (35' x 25')	2	EA	\$40,000	\$80,000
	Install Composting Toilets at existing wooden stand-alone restrooms (separate-sex)	3	LS	\$100,000	\$300,000
	Concrete Pads (for large pavilions)	195	SY	\$110	\$21,450
	Gravel Paving (parking areas)	1421	SY	\$22	\$31,262
	Asphalt Paving (Heavy Duty - accessible parking areas)	453	SY	\$36	\$16,308
	Asphalt Paving (Standard Duty - Walks)	89	SY	\$32	\$2,848
	Compacted Aggregate Paving (6" depth - access walks)	682	SY	\$22	\$15,004
	Accessible Parking Signs (includes footing)	12	EA	\$250	\$3,000
	Linestriping (all lots)	1	LS	\$2,000	\$2,000
	Trash Receptacles (2 per proposed pavilion)	4	EA	\$350	\$1,400
	Standing Charcoal Grills (1 per proposed pavilion -- approx. size 6' x 3')	2	EA	\$400	\$800
	Deciduous Shade Trees (2" caliper)	26	EA	\$400	\$10,400
	Seeding (lawn areas)	15.0	MSF	\$80	\$1,200
SUBTOTALS					\$715,672
	Permitting	1	LS	\$2,500	\$2,500
	Mobilization	1	%	\$715,672	\$7,157
	Stake-Out	1	LS	\$7,500	\$7,500
	Erosion & Sedimentation Control Measures	4	%	\$715,672	\$28,627
	Professional Services (Design and Engineering Fees)	8	%	\$715,672	\$57,254
	Construction Contingency	5	%	\$715,672	\$35,784
TOTAL					\$854,493

Bradys Run Park Master Plan - Phase 5

Opinion of Probable Construction Costs

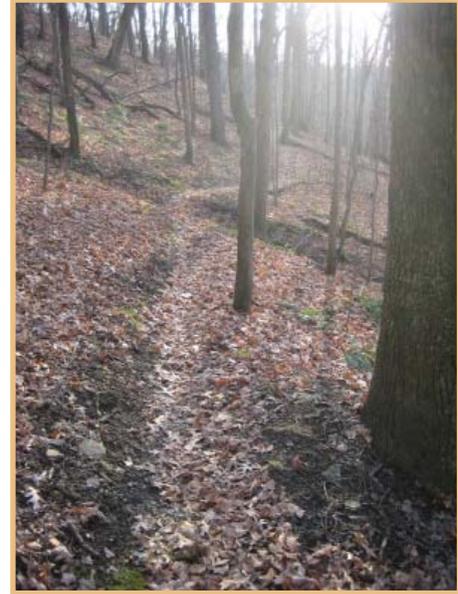
Item No.	Item	Quantity	Unit	Unit Cost	Total Item Cost
1	Bradys Run Lodge				\$196,142
	Remove existing concrete bridge / culvert at Bradys Run Lodge	1	LS	\$10,000	\$10,000
	Vehicular Bridge (as designed by qualified engineer)	1	LS	\$50,000	\$50,000
	Architectural Feasibility Study For Bradys Run Lodge (to explore improvements for energy efficiency and year-round use)	1	LS	\$20,000	\$20,000
	Gravel Paving (parking areas)	3713	SY	\$22	\$81,686
	Asphalt Paving (Heavy Duty - accessible parking areas)	746	SY	\$36	\$26,856
	Accessible Parking Signs (includes footing)	4	EA	\$250	\$1,000
	Linestriping (all lots)	1	LS	\$1,000	\$1,000
	Deciduous Shade Trees (2" caliper)	13	EA	\$400	\$5,200
	Seeding (lawn areas)	5.0	MSF	\$80	\$400
2	Horseshoe Court Facility				\$133,050
	10' Chain Link Fence	413	LF	\$50	\$20,650
	Horseshoe Courts (Clay pits, backstops, grass infield)	16	EA	\$2,000	\$32,000
	Asphalt Paving (Standard Duty - Walks)	325	SY	\$32	\$10,400
	Horseshoe Court Facility Storage Building (15' x 15')	1	LS	\$20,000	\$20,000
	Horseshoe Court Pavilion (3 courts - 45' x 50')	1	LS	\$50,000	\$50,000
3	Horse Arena Improvements				\$652,250
	Earthwork	2805	CY	\$10	\$28,050
	Clearing and Grubbing	0.3	AC	\$4,000	\$1,200
	Horse Stall Buildings (2 - each 200' x 20')	8000	SF	\$60	\$480,000
	Compacted Aggregate Paving (6" depth - access walks)	93	SY	\$22	\$2,046
	Gravel Paving (parking areas)	5053	SY	\$22	\$111,166
	Asphalt Paving (Heavy Duty - Parking areas)	54	SY	\$36	\$1,944
	Asphalt Paving (Standard Duty - accessible viewing area)	74	SY	\$32	\$2,368
	Accessible Parking Signs (includes footing)	2	EA	\$250	\$500
	"One-way"(2) and "Do Not Enter" (2) Signage for Trailer traffic only	4	EA	\$200	\$800

Linestriping at parking lot	1	LS	\$1,000	\$1,000
Gravel Paving (8" thickness)	498	SY	\$22	\$10,956
Deciduous Shade Trees (2" caliper)	5	EA	\$300	\$1,500
Seeding (lawn areas)	9.0	MSF	\$80	\$720
Electric Service extension to horse stables	1	LS	\$10,000	\$10,000
<i>SUBTOTALS</i>				<i>\$981,442</i>
Permitting	1	LS	\$2,500	\$2,500
Mobilization	1	%	\$981,442	\$9,814
Stake-Out	1	LS	\$7,500	\$7,500
Erosion & Sedimentation Control Measures	4	%	\$981,442	\$39,258
Professional Services (Design and Engineering Fees)	8	%	\$981,442	\$78,515
Construction Contingency	5	%	\$981,442	\$49,072
<i>TOTAL</i>				<i>\$1,168,102</i>

SUSTAINABLE PARK DESIGN

A sustainable park is one where the natural resources are protected, where wildlife habitat is improved, and when human recreation uses and maintenance practices do not conflict with the environment, but instead enhance them. Benefits of sustainable parks include:

- *Economic:* Natural vegetation and streamside plantings provide stormwater and flood control by absorbing and storing precipitation and pollutants. By absorbing and storing water runoff is reduced. Increased runoff can lead to flooding, property damage, erosion, and habitat loss.
- *Environmental:* Integrating parks with streamside corridors, wetlands, and other open spaces will increase the ecological value over time. According to the U.S. Forest Service one tree can generate \$31,250 worth of oxygen, provide \$62,000 worth of pollution control, recycle \$37,500 worth of water, and control \$31,250 worth of soil erosion over a fifty year lifespan.
- *Health and Safety:* Researchers from the University of Illinois have discovered time spent in nature relieves mental fatigue and the feelings of violence and aggression that can spring from it. They have found the more diverse and rich an environment is in natural resources, the higher the learning opportunities are for children.



Principals of Sustainable Park Design

“Creating Sustainable Community Parks, A Guide to Improving Quality of Life by Protecting Natural Resources”, published by the Pennsylvania Department of Conservation and Natural Resources provides valuable recommendations regarding how to implement sustainable practices into park design, maintenance, and operations. The guide can be obtained from www.dcnr.state.pa.us/brc/GreeningPennsylvania.pdf

These practices are based on the following principals:

1. Retain as much of the pre-existing landscape as possible during new construction, including the soil, rocks, native vegetation, wetlands, and contours. This will minimize disturbances, which can open up an area to invasive species. It can also keep costs down, as fewer new plants, soil amendments, and habitat enhancements will be needed.
2. Maintain high quality soils that will hold water and supply plants with proper nutrients. During construction, leave as much existing topsoil as possible. When new soil is brought in, ensure that it is certified weed free, in order to prevent the spread of new invasive species. Using compost and other natural products for mulch and fertilizer will help enhance the soil and feed the native plants. Good quality soil will reduce the need for fertilizers and supplemental watering.

3. Connect new landscape components with the surrounding native vegetation to create larger contiguous areas of habitat. Many wildlife species need large ranges to find adequate food, mates, and shelter. By reducing the amount of roads, parking lots, and turf areas, or by placing these together, habitat quality will be enhanced.
4. Create natural storm water management systems and other green infrastructure, such as rain gardens and swales of native grasses. These systems help to minimize downstream flooding, recharge and filter groundwater, and are more cost-effective and environmentally-sound than man-made systems of pipes and storage tanks.
5. Protect wetlands from disturbance and fill. Avoid placing construction projects, day-use areas, and roads/parking lots near or in wetlands. Natural wetlands provide many benefits to the environment that cannot easily be duplicated with man-made ones.
6. Use integrated pest management (IPM) strategies to minimize the use of chemical pesticides to control plant and insect pests. IPM is an ecologically-based approach to pest control that helps maintain strong and healthy plants. IPM can include the use of traps, sterile male pests, and quarantines.
7. Minimize impermeable surfaces like roads, parking lots, and paved trails. Consider replacing asphalt and concrete with permeable pavement, mulch paths, gravel lots, and native vegetation. Permeable surfaces help to recharge ground water, reduce erosion, lessen flooding events, and filter out pollutants. When impermeable surfaces must be used, arrange them in an area where they will not fragment habitat, make them as small in area as possible, and keep them away from water bodies.
8. Reduce turf to only those areas essential for recreational and other human use activities. Turf offers little habitat benefit and is not as effective as many native plants in pollution filtration, flood prevention, and erosion control. In addition, turf maintenance can have negative impacts on the surrounding environment and can require lots of mowing, watering, and fertilizing. Replace non-native turf grasses with native warm season grasses, which, once they are established, have lower maintenance needs.
9. Use native plants in riparian buffers around any surface water body, including wetlands. Riparian buffers help to filter pollutants before they reach water bodies, and the vegetation discourages nuisance geese from staying in the area. Roots from riparian vegetation also prevent erosion of soils into the water body and minimize flooding events. Shade from these buffers acts as a temperature control for the water body, which enhances habitat value for aquatic organisms. The food and shelter values of these buffers also enhances habitat. In addition, by selecting the right kinds of plants, the scenic views of the water bodies can be enhanced.
10. Identify and remove invasive plant species whenever possible. Invasive plants have a number of detrimental effects on natural habitats. Most invasive plants grow so densely and spread so rapidly that native vegetation is choked out.

Park Design Guidelines

This study recognizes the Park will be rehabilitated in a series of logical phases, and, a portion of the improvements may be constructed by volunteers, civic organizations, and others. Therefore, we recommend the County adopt design guidelines for all three parks that will ensure a consistent “look” as well as aesthetically pleasing structures compatible with the overall vision for the parks as established by the County.

We recommend guidelines be adopted for the following park elements:

- Park and Wayfinding Signage
- Landscaping
- Picnic Shelters
- Restrooms
- Benches, Picnic Tables, and Recycling Containers
- Roadway and Parking Area Development
- Trail Design, Layout, and Construction
- Athletic Field and Court Design and Construction
- Park, Athletic Field, and Court Lighting
- Stormwater Management
- Habitat Improvement
- Forest Management

In addition to the descriptions provided herein, the Appendix contains typical details, descriptions, and articles which provide valuable information on each aspect discussed herein.

Forestry Management Plan

We recommend a that the County follow recommendations set forth in the 1997 Forest Resource Evaluation for Bradys Run Park and Old Economy Park. The DCNR Bureau of Forestry completed the evaluation, and can offer further assistance regarding planning for stewardship, conservation, and wise use of forests and other related natural resources. The Bureau employs experts in forestland conservation practices that will provide sound, impartial advice to communities wishing to conserve and enhance their natural resources and maximize the myriad benefits they provide. The Bureau also provides advice to municipalities on various forms of green space and green infrastructure, including the planting and care of trees in developed or developing areas.

If the County desires to update the Forest Resource Evaluation, it should do so through the DCNR Bureau of Forestry’s Forest Stewardship Program. This program is a federal and state partnership that assists landowners in the completion of plans focusing on sustainable management of the forest and its related natural resources. The intention of the program is to provide sound management and continuing care for Pennsylvania’s private forest resources into the future. Limited cost share funding is currently available to offset the cost of preparing a Forest Stewardship Plan. Plans must be written

by approved plan writers. Information on this opportunity can be obtained at the Bureau of Forestry Field Office - District Eight, Gary L. Frank, District Forester, 158 South Second Avenue, Clarion, PA 16214, 814-226-1901, 814-226-1704 fax, gfrank@state.pa.us.

Habitat Improvement

During the course of this study several key observations were made with respect to the existing habitat of the three park properties:

1. Uniformity of the existing forest limits diversity in wildlife.
2. Water quality and stream habitat can be improved by addressing stream bank erosion and siltation of the water.
3. Because of the proximity of existing facilities to water bodies there is a desire to manage the mosquito population.

Water, shelter, and food are the three primary components that are required to sustain wildlife. Different species require these elements in different locations. Several basic principals should be followed when preparing a habitat management plan for a park:

- Do not assume no management is the best management. Active management is generally required to adjust imbalances created in the natural ecosystem by man, or by nature.
- Manage the forest for vertical diversity. Each layer of the forest offers a unique set of habitat features. Therefore, a good management plan will plan for a balance of subterranean, understory, middlestory, and canopy layers in the forest.
- Maintain corridors between habitats.
- Selectively removing large trees can improve the forest understory by reducing shade to help increase growth.

Vegetative Diversity

We recommend a forest management plan be prepared. The goal of the plan should be manage the health of the forest tracts within the park to encourage and promote wildlife diversity, and to manage the forest to maintain viable woodlots for future generations of County residents. This plan should be reviewed with the Pennsylvania Commission to ensure it is consistent with habitat management recommendations.

The Penn State Cooperative Extension can provide the County with technical assistance in preparing a forest management plan for the park.

Streambank Stabilization and Water Quality Improvements

We recommend streambank stabilization efforts be coordinated with the overall water quality improvements throughout the park.

Wildlife Habitat

We recommend the natural areas of the park be maintained and improved to encourage wildlife to utilize the park. The Appendix contains fact and data sheets specifying what improvements can be made for the following wildlife:

- Owls
- Ruffed Grouse
- Squirrels
- Ring-necked Pheasant
- Whitetail Deer
- Woodcock
- Woodchuck
- Wild Turkey
- Woodpeckers
- Chipmunks
- Bobwhite
- Cottontail Rabbit
- Red and Gray Fox
- Birds



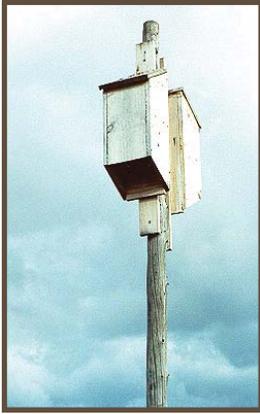
These sheets have been prepared by the Pennsylvania Game Commission and provide recommendation for habitat improvements for the corresponding species. This study recommends the County work with interested organizations in developing a systematic approach towards improving wildlife habitat within the park. Most importantly the County should establish a policy to retain brush and understory plants, elements essential to wildlife. The removal of vegetation should only be completed to address safety issues, and to satisfy the recommendations of the forest management plan.

Furthermore we have included in the Appendix xx publication titled “Nesting Boxes, Feeding Stations, Bird Houses, Wildlife Shelters, and How to Build Them.

Avian Species

We recommend the County recruit volunteers, work with local scouting organizations, and high school environmental clubs to improve the park for birds. This can be done by erecting bird houses throughout the park. Each species of bird has certain shelter requirements that must be met to successfully roost in a birdhouse. The PA Game Commission’s publication titled “Nesting Boxes, Feeding Stations, Bird Houses, Wildlife Shelters, and How to Build Them” provides specifics on these requirements.





Managing Mosquito Populations

With wetlands and other water features existing within two of the parks, many attending the public meetings for this project have indicated the mosquito population is an undesirable nuisance to those visiting the park during the summer months.

Herbicides exist to eliminate undesirable plants and chemical means exist to reduce and eliminate mosquito populations. However, we recommend a more environmentally friendly approach be taken to reducing the mosquito population. Bats will eat up to their full body weight in insects each night. These winged animals are a natural predator of the mosquito and can assist in managing their populations.

Bat houses can be strategically placed throughout the park to encourage them to use the park as a roosting site. Bat house should be mounted approximately fifteen to twenty feet above the ground and be located at least twenty-five feet from trees to reduce obstructions and predation. Bat houses should be placed facing various directions, to provide them the opportunity to select the best location based on climatic conditions of the site. Bats require warm areas to roost. Therefore, bat houses should be painted black in areas where the average high temperature is eighty to eighty-five degrees Fahrenheit, and brown grey, or green in areas where the average high temperature is eight-five to ninety-five degrees. Houses should be tilted ten degrees or so to help young bats stay in the box.

It may take up to two years for bats to find and begin to use artificial roosts. Bat houses should be inspected annually, and any vegetation that interferes with entry into the house should be removed. If predators such as house cats, raccoons, and snakes are noted in the vicinity of the boxes, predator guards should be installed. Attach predator guards made from roofing tin on the mounting post at a height of three feet to protect roosting bats.

Athletic Field Design and Construction

Final design and construction of athletic fields and athletic field improvements play an important role in their success and the amount of maintenance required to properly maintain them. We recommend the fields be designed by a Landscape Architect with extensive experience in the design of athletic fields, and that the construction of the fields be completed by a qualified contractor. This ensures the fields are properly designed and constructed. The infield area should be graded with a one percent slope, no more or no less, sloping from the edge of the mound towards the base paths. Surface water from the infield can be removed by installing a field drain around the outer edge of the skinned infield. These drains should drain away from the playing area to daylight, in accordance with local regulations. The outfield should be graded to a one percent slope, from the center in all directions, with water carried off the edges by field drains in necessary.

Rectangular fields, such as soccer, lacrosse and rugby, should be crowned down the center of the field and slope away from the centerline at one percent towards the edges of the field.

Sizes and other athletic field requirements vary depending on the regulating body. Therefore, when planning for new fields one must first select which regulating body's rules will be followed at the new field.

The appendix contains layout details and dimensions for a variety of athletic field types, sizes, and regulating bodies.

We recommend a fertilization program be established for existing and proposed fields. We recommend organic fertilizers of the chemical varieties. The chemical fertilizers can have a negative impact to the soil structure and content over time. Fields that are "left to fend for themselves" without an annual fertilization program can deteriorate rapidly.

Signage

We recommend that entrance signs into the park reflect the character and permanence of County Parks. These signs should be a signature that the parks become known by. Although we don't recommend the signs be the same for each of the County Parks, we do recommend they be similar in style, character, and constructed from similar materials.

Landscaping

To maintain the passive atmosphere of the County Parks, and to reduce maintenance costs, we have recommended that many of the areas which are currently mowed, but for no apparent reason, be returned to tall field grass representative of a meadow. The remaining areas can continue to be maintained as turf, appropriate for the given use area. Active recreation areas, as well as road shoulders, parking lot perimeters, and areas immediately adjacent to picnic shelters, should be maintained in a rye and fescue grass mix which can withstand heavy foot traffic and is generally drought tolerant.

Native species are typically more tolerant of local conditions and require less maintenance and care. Native plants help create landscapes that provide wildlife habitat and reduce maintenance costs. Their greatest benefit, though, may be the increased awareness about which plants are native and which are not, and the protection of remaining native plant communities. "Landscaping with Native Plants in Native Pennsylvania", www.dcnr.state.pa.us/Forestry/wildplant/native.aspx, a website of the Pennsylvania Department of Conservation and Natural Resources, provides an inventory of native plants to consider.

Unless the County is willing, or has agreements with other organizations that are willing, to maintain plantings on a regular basis, we recommend the County limit the planting of shrubs, annuals, and perennials to key areas where there is desire to place emphasis, such as at the entrances into the park. Additionally, we recommend the County explore the possibility of obtaining commitments from local garden clubs, the Penn State Master Gardeners, high school service groups, and others who may be willing to volunteer time and effort to maintain these plantings.

Picnic Shelters

We recommend a laminated wood beam style of picnic shelter be adopted as the standard for the park. The laminated wood beam shelters are an economical choice, and because they are delivered as a pre-fabricated and engineered package the shelter can be erected quickly.

The laminated arch beams are a desirable component from an functional, as well as aesthetic, basis. The arch beams do not have any horizontal surfaces therefore eliminating opportunities for birds to nest as they would in a traditional roof truss. Further, it eliminates the traditional roof truss which is also an attractive nuisance for that children like to swing from.

The floor of the shelter should be a four inch thick poured reinforced concrete slab and should extend two feet beyond the drip line of the shelter to reduce erosion and ponding of water which is commonly associated with this area. The floor should have a slight crown or pitch to provide positive drainage away from the center of the shelter.

The County should ensure that all shelters have the ability to accommodate existing and / or future electrical services. Should wood posts be selected for the shelter they must be specified with electrical raceways.

All shelters that are accessible to electrical service should have convenience outlets, lighting, and water service. We recommend against providing free standing charcoal grills adjacent to each shelter. By providing electricity to the shelters to serve food warmers and other appliances, and with the advent of portable charcoal and gas grills we feel permanent, free standing grills are obsolete and that they will present more maintenance than they will address in terms of convenience to the park users.

Each picnic shelter should be accessible by an Americans with Disabilities Act compliant stable, firm, and slip resistant walkway.

The shelter's appearance can be further enhanced by enclosing a portion or all of the column with a concrete masonry unit pier with a stone veneer.

Benches, Picnic Tables, and Trash / Recycling Containers

The Architectural and Transportation Barriers Compliance Board's Regulatory Negotiation Committee has published its "Accessibility Guidelines for Outdoor Developed Areas". This guideline recommends at least fifty percent, but never less than one, of the fixed benches and fixed picnic tables be accessible, and that forty percent, but never less than two, of the required fixed picnic tables be located adjacent to an accessible walkway. Further, with respect to benches, the guidelines recommend fifty percent of the accessible benches to have arm rests, and all accessible benches to have back support extending the entire length of the bench. All trash receptacles and recycling containers must be accessible and comply with dimensional requirements established ADAAG 4.27.

For the benches, trash and recycling containers we recommend the County select a simple, durable style. In addition, we recommend the County specify products that are use recyclable lumber in their construction. The trash and recycling containers should be specified with dome lids to limit water accumulation and to discourage animals from entering the containers.

Roadways and Parking

We recommend all parking areas be maintained and / or constructed as stable, firm, and slip resistant surfaces as required by the Americans with Disabilities Act. Therefore, roadways should be constructed from bituminous paving, and parking lots can be constructed with an aggregate surface. Accessible spaces can be provided within aggregate lots by compacting aggregate fines into the cross section, in the accessible parking spaces.

We recommend the parking areas not be paved with asphalt unless absolutely necessary because of intense use, such as the Four Winds Recreation Center in Bradys Run Park. Asphalt paving provides an impervious surface and creates a significant amount of stormwater runoff that must be addressed. Aggregate paving allows some of the stormwater to infiltrate into the soils below, and therefore reduces the volume of stormwater than will need to be managed.

Accessible Walkways

The Americans with Disabilities Act requires accessible routes from accessible parking spaces to recreation facilities, fields, and courts, and between all facilities, fields, and courts. Every effort must be made by the County to ensure compliance with the Americans with Disabilities Act.

Stormwater Management

The Pennsylvania Department of Environmental Protection regulates the management of stormwater volumes and water quality, through Chapters 105, 102, and 93 of the Pennsylvania Code, and the U.S. Environmental Protection Agency's Phase II National Pollutant Discharge Elimination System permitting requirements. These regulations require any land development to limit post construction increases in stormwater runoff to pre-development rates, to implement best management practices to temporarily control erosion and sedimentation and protect water quality during construction, and to permanently control and protect water quality during the life of the constructed project.

Stormwater runoff is dramatically accelerated when non-porous surfaces are constructed as part of park development activities. It is increased when wooded areas are converted to law. And, it is also increased when earth is moved and slopes are increased to provide level space for athletic fields, and courts.

Not only do we recommend the final design of all future park facilities meet these requirements, but that areas with current erosion and sedimentation problems be evaluated and addressed.

All stormwater, erosion and sedimentation, and water quality controls should strive to accomplish

their functions in an environmentally sensitive manner and respect the aesthetics of the park. This means limiting, where possible, the collection and piping of stormwater in an underground network of inlets, manholes, and piping that daylight into a permanent stormwater management detention pond. Instead, environmentally friendly alternatives such as infiltration beds, vegetative buffers, and bio-swales should be utilized. Where inlets are required, water quality inlets should be used.

The Pennsylvania Department of Environmental Protection’s “Best Management Practices Manual” is an excellent resource that documents many practices that can be implemented to address stormwater in a sustainable manner. The Manual can be viewed at <http://164.156.71.80/WXOD.aspx?fs=2087d8407c0e00008000071900000719&ft=1>.

The County is required to obtain permits for projects that have earth disturbances greater than one acre in size, and to construct, re-construct, or rehabilitate bridges across perennial waterways.

Athletic Field, and Court Lighting

Where night use of athletic fields and courts is and /or will occur, lighting should meet The Illuminating Engineering Society of North America’s (IESNA) “Recommended Practice for Sports and Recreational Area Lighting”. Their document provides guidelines for the lighting of sports and recreation facilities of all types and level of play.

First, their recommendations are based on defining the class of play for a particular facility. The following chart provides a summary of the IESNA’s recommendations for determining class:

Facility	Class			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Professional	X			
College	X	X		
Semi-Professional	X	X		
Sport Clubs	X	X	X	
Amateur Leagues		X	X	X
High Schools		X	X	X
Training Facilities			X	X
Elementary Schools				X
Recreational Events				X
Social Events				X
Class I: Facilities with spectator capacity of over 5,000				
Class II: Facilities with spectator capacity under 5,000				
Class III: Facilities with some provision for spectators				
Class IV: Facilities with no provision for spectators				

Once a facilities class is determine, then the IESNA guidelines provide specific illumination requirements based on the class of the facility. The following table summarizes the lighting

recommendations associated with existing and proposed facilities and courts located within the park:

Sport	Lighted Area	Class of Play	Horizontal in Footcandles	Uniformity
Baseball	Infield	I	150	1.2:1 or Less
	Outfield		100	1.7:1 or Less
	Infield	II	100	1.5:1 or Less
	Outfield		70	2:1 or Less
	Infield	III	50	2:1 or Less
	Outfield		30	2.5:1 or Less
	Infield	IV	30	2.5:1 or Less
	Outfield		20	3:1 or Less
Softball	Infield	I	150	1.2:1 or Less
	Outfield		100	1.7:1 or Less
	Infield	II	100	1.5:1 or Less
	Outfield		70	2:1 or Less
	Infield	III	50	2:1 or Less
	Outfield		30	2.5:1 or Less
	Infield	IV	30	2.5:1 or Less
	Outfield		20	3:1 or Less
Basketball		III	30	3:1 or Less
		IV	20	4:1 or Less
Field Hockey		II	50	2.5:1 or Less
		III	30	3:1 or Less
		IV	20	4:1 or Less
Football		I	100	1.7:1 or Less
		II	50	2.5:1 or Less
		III	30	3:1 or Less
		IV	20	4:1 or Less
Ice / Roller Hockey		II	50	2.5:1 or Less
		III	30	3:1 or Less
		IV	20	4:1 or Less
Lacrosse		II	50	2.5:1 or Less
		III	30	3:1 or Less
		IV	20	4:1 or Less
Horse Arena		II	50	2.5:1 or Less
		III	30	3:1 or Less
Horseshoes			5	4:1 or Less

Soccer		I	75	1.7:1 or Less
		II	50	2.5:1 or Less
		III	30	3:1 or Less
		IV	20	4:1 or Less
Softball	Infield	I	150	1.2:1 or Less
	Outfield		100	1.7:1 or Less
	Infield	II	100	1.5:1 or Less
	Outfield		70	2:1 or Less
	Infield	III	50	2:1 or Less
	Outfield		30	2.5:1 or Less
	Infield	IV	30	2.5:1 or Less
	Outfield		20	3:1 or Less
Tennis		I	125	1.7:1 or Less
		II	75	2.5:1 or Less
		III	50	3:1 or Less
		IV	30	4:1 or Less
Volleyball		III	30	3:1 or Less
		IV	20	4:1 or Less

Trail Design, Layout, and Construction

Trail design is dependant on the trail type, location, and use it will receive. For the three parks in this study we will discuss the guidelines associated with two types of trails, 1.) Shared Use Paths, and 2.) Mountain Biking / Hiking / Equestrian Trails.

Shared Use Paths

A shared use path is a facility that is typically removed from the vehicular transportation network, within it's own right-of-way, not the vehicular right-of-way. As it's name suggests many different types of users may be present on a shared use path. Users generally include walkers, joggers, bicyclists, and in-line skaters.

Shared Use Path Width and Clearance Requirements

The American Association of State Highway Transportation Official's (AASHTO) publication titled "Guidelines for the Development of Bicycle Facilities" recommends that two directional shared use paths be constructed with a minimum width of ten feet. Additionally, the guidelines state a minimum of a two foot wide graded area with a maximum slope of 1:6 should be maintained adjacent to both sides of the path. Where lateral obstructions; such as guide rails, utility poles, trees and walls; are present three feet of clearance from the object is recommended. When slopes greater than 1:3 are present it is recommended that a minimum of five feet be maintained between the edge of the path pavement and top of slope.

The minimum recommended vertical clearance to an obstruction is eight feet. However, the vertical clearance may need to be greater to accommodate maintenance and emergency vehicles.

Shared Use Path Materials

The path must be placed on stable, compacted soils to achieve structural stability. The final surface is dependent on the running slope of the trail. Ideally, a shared use path will have gentle grades of two to five percent. In these cases the path can be constructed as a compacted aggregate trail.

The Pennsylvania State Conservation Commission's Center Dirt and Gravel Road Studies has conducted research on trail surfaces. Based on this research the Commission have prepared a trail mix specification that results in a stable, firm, and slip resistant trail surface. This compacted aggregate surface is considered to be an environmentally friendly alternative to an asphalt trail cross section for the following reasons:

1. The compacted aggregate path has a higher rate of permeability than asphalt.
2. The compacted aggregate path has greater texture, and therefore, reduces the velocity of water run off to a higher degree than asphalt.

In addition to these environmental incentives, a compacted aggregate path is less expensive to install than its asphalt counterpart; and, a compacted aggregate path is more forgiving to the user due to its resiliency under foot.

However, paths with steeper slopes cannot sustain the compacted aggregate surfacing as runoff will erode the surface over time. In this case the path should be constructed with a bituminous cross section.

Details for the Compacted Aggregate Path and the Bituminous Path can be found in the appendix.

Mountain Biking / Hiking / Equestrian Trails

As with other elements of the parks, mountain biking, hiking, and equestrian trails should be designed and constructed in a sustainable manner. During the master planning process the existing trails in the park were evaluated and unsustainable sections of trail were noted and recommended for re-design.

To be sustainable, all trails should be located in areas and on soils that can support them. We recommend trails not be developed on hydric soils, or in those areas of soils with hydric inclusions that are determined to be "wet areas" during a field review.

The International Mountain Bike Association (IMBA) has published "Trail Solutions – IMBA's Guide to Building Sweet Single Track", as mentioned earlier in this chapter. The book provides practical recommendations for developing sustainable trails. In their publication, IMBA outlines five essential elements of sustainable trails, as follows:

1. The Half Rule: A trail's grade should not exceed half of the grade of the hillside or sideslope that it traverses. If the grade does exceed half it is considered a fall line trail. Water will flow down the fall line rather than run across and off of it.
2. The Ten Percent Average Guideline: Generally an average trail grade of ten percent or less is more sustainable. This does not mean that all trail grades must be kept under ten percent.

Many trails will have short sections that exceed ten percent.

3. **Maximum Sustainable Trail Grades:** The maximum grade is the steepest section of the trail that is more than ten feet in length. When designing a trail it is necessary to determine early in the process the precise maximum trail grades the trail will be able to sustain. The target figure that applies to most situations is between fifteen and twenty-five percent. However, soil types, rock, rainfall amounts, and types and numbers of users can affect the maximum sustainable grade.
4. **Grade Reversals (Dips):** A grade reversal is just what it sounds like. A spot a which a climbing trail levels out and then changes direction, dropping subtly and rising again. The change in grade provides a dip (low point) in the trail which forces water off the trail. Grade reversals are located at the frequency required to limit volume, momentum, and erosive power of the water flowing along the trail.

Frequent spacing of grade reversals are required to ensure water is removed from the trail before it becomes erosive. The spacing of grade reversals is dependent on the length and running slope of the trail above of the reversal and on the amount of water generated by the watershed above the reversal. The following table provides a general recommendation on how often grade reversals should occur along a trail:

Grade Reversal Spacing Guidelines

<i>Slope</i>	<i>Spacing</i>
<2%	300'
2-3%	230'
3-4%	200'
4-10%	140'
10-20%	120'
20-40%	110'
40-60%	100'

In “Natural Surface Trails by Design” author Troy Scott Parker takes sustainable trail design one step further by recommending that the trail designer not only think about the sustainability of the trail, but also the experience that is being created through its layout.

Sense of Exploration

Twisting, narrow, occasionally rough trails with limited sightlines create a sense of exploration. Most trails traverse side slopes that make it difficult to leave the trail, creating the rustic feel of freedom yet confinement trail users riders enjoy.

Sharpened Experience of the Natural World

Transitions from one environment to another are often abrupt, and trails take advantage of

environmental anchors and edges to sharpen our experience of the natural world. In particular, trails draw our attention to individual trees and rocks by wrapping around them and incorporating them into the fabric of the trail. Trails in general, exhibit a strong reaction to the site and take complex natural shapes rather than simple road-like shapes. Occasional rocks in the trail tread are left there to enhance the trail experience.

A Varied, Enjoyable, and Safe Trail Experience

Long gentle slopes, the mix of vegetation and forests, narrow trails, and sustainable trail design combine to form an extensive trail system with a relaxed, slow, rustic and yet cared-for feel.

Continuous Small-Scale Enjoyment and Flow

By continually tying the trail to the details of the site, and by continually varying trail grade and direction, trails create continuous small-scale enjoyment. Grades may become steep for short stretches, and quick short climbs and drops will be fairly common on some trails. As much as feasible, trails will be optimized for their “flow”—their satisfying sense of movement and rhythm of climbing, dropping, and turning. Flow does not usually just happen. It needs to be designed into the shape of the trail from the outset, and it is made on a foot-by-foot scale in precise response to the immediate site.

Sustainability and Enjoyment From The Same Physical Features

The trail system should be designed such that what makes it physically sustainable for trail use and for limiting erosion. This also creates a primary source of enjoyment for trail users. The common root for both sustainability and enjoyment is rolling grade.

Take The Site As It Comes

Generally, trails and trail system features use the existing site with little modification. In other words, instead of building trail experiences and facilities from scratch—or trying to make something into something else—we try to make the most of what is already there. This creates an informal quality in the general plan, which is consistent with the “take it as it comes” nature of mountain biking. It also helps reduce design and construction costs.

Anchors and Edges

An anchor is any distinct vertical feature in a visible area. An anchor gives reason for being here, instead of there. Native rocks, large trees, and other existing items in the landscape make good anchors which can be used in laying out a trail. Edges are extended anchors. Common edges in the landscape are the edges between vegetative communities such as that found between meadow and forest. We find this sharp contrast interesting and intriguing.

By tying a trail to landscape by routing it around anchors, and along and through edges we create an experience that trail users will enjoy.

Loops and Choices

There should be no dead end trails in the entire system.

Avoid Tempting Poor Trail Behavior

As much as possible, trail design can avoid tempting trail users to behave poorly. Trails should be located where people want trails, direct connections are made to likely destinations, aquatic resources are protected by distance or other means, switchbacks are minimized and difficult trails should have shortcuts present.

Minimal Trail Maintenance

Trails must be designed to accommodate the ongoing forces of trail use, weathering, and erosion in order to minimize trail maintenance. In particular, proper trail design can continually limit erosion, by limiting the amount of water that can be on any given point of a trail in any conceivable rain or runoff event. Even major downpours should produce little trail damage. If detailed onsite trail design and construction are done appropriately, future trail hardening, reconstruction, or relocation will not be necessary.

Sense of Stewardship

The trail system itself must respect the land and natural resources. This can be done during design by ensuring the trail's naturalistic shape and how it closely relates to the land. Because of this, the trail system will help instill a sense of visitor stewardship that will encourage them to behave responsibly (as opposed to creating an atmosphere of "anything goes" that implicitly invites poor behavior). Fully maximizing the sense of stewardship requires harmony of site, planning, design, construction, maintenance, and management.

Another excellent resource on sustainable trail design is the Minnesota Department of Natural Resources, Bureau of Trails and Waterways "Trail Planning, Design, and Development Guidelines". It is available for purchase at www.minnesotasbookstore.com, Stock No. 9-66.

Trail Markers

Trails should be marked first and foremost for safety. Should an accident occur, a trail user should be able to provide their location to emergency responders. We recommend mountain biking and hiking trails be marked, at a minimum, every one-half mile. Trails should also be marked to allow trail users to navigate the trail system. Therefore trail markers should be placed at trail intersections.

Trail marker designs range from the inexpensive to more costly solutions. We recommend the temptation to mark existing trees be avoided. This practice is in direct conflict with promoting sustainability and a respect for our environmental resources. A low cost solution that is utilized in many park systems are the carsonite trail markers. carsonite dual sided trail markers are difficult to vandalize, and are an economical choice for marking trails. The standard trail marker is designed to be 5'-6" in height by 3-1/2" wide. This is sufficient to place decals on to note trail direction, and distance, but small enough to deter vandalism on the signs. The carsonite marker is preferable to routed wooden posts, which can be prone to vandalism, and are more difficult and costly to install.

A typical trail marker detail is located in the appendix. More information of the carsonite dual sided trail markers can be found at www.carsonite.com.

FUNDING SOURCES

Several agencies provide grants to assist in providing financial resources to implement design and construction of facilities similar to those proposed for Brush Creek Park. Some offer grants to implement educational or recreational programs in concert with these facilities. Still others support the planning and implementation of projects with preservation of wildlife habitat. Assistance can also be acquired in the form of technical help, information exchange, and training.

Given the competition for grant funding, submission of a thorough application is required. Strategies for improving the chances of receiving a grant include:

- ⇒ Being well-prepared by knowing the funding agency (contact persons, addresses, phone numbers); ensuring your organization or municipality and the project are eligible; and submitting a complete and accurate application ahead of the specified deadline.
- ⇒ Clearly indicating the funding agency's vision and plans in the application, to portray how your project furthers their goals. Describe how matching funds such as private contributions and other grants will leverage the available funding. Describe how maintenance of the site will be accomplished to help justify the request for a grant award. Show past successes such as how past recreation or planning projects were funded and built, and how this project will follow those successes.
- ⇒ Contacting the funding agencies by personally meeting with them to show your commitment to the project.

Potential Funding Opportunities

Based on the potential funding sources for this project, Pashek Associates recommends that Beaver County pursue, at a minimum, the following funding opportunities:

<i>Facility</i>	<i>Potential Funding Sources</i>
Picnic Pavilions	Pennsylvania Conservation Corps, donated materials, donated / volunteer labor
Trails	Donated materials, donated / volunteer labor, National Recreational Trails Fund Act (NRTFA), Transportation Equity Act for the 21st Century (TEA21)
Landscaping	National Tree Trust, donated / volunteer labor
Roadways and Bridges	PA DCED Single Application Grant

Parking Areas	PA DCED Single Application Grant, DCNR Community Conservation Partnership Program (C2P2) Grants
Dog Park	DCNR Community Conservation Partnership Program (C2P2) Grants
Tennis Courts, Ball Fields, Soccer Fields, and Horseshoe Courts	Donated materials, donated / volunteer labor, DCNR C2P2 Grants, Major League Baseball's Baseball Tomorrow Fund

Beaver County should explore all potential funding sources and apply for funding as often as possible. An application that is rejected one year may still be accepted in future years.

The following is a list of known potential funding sources as previously listed, along with descriptions and program requirements, and contact information:

❖ ***21st Century Community Learning Centers Program:***

Agency: U.S. Department of Agriculture

Program Goals: This program was authorized by Congress to award grants to rural and inner-city public schools, or consortia of such schools, to plan, implement, or expand projects that address the education, health, social services, cultural, and recreational needs of the community.

Program Restrictions: School Districts must collaborate with an outside entity, such as another public agency or non-profit organization

Use of Funds or Support: Applications must address four of the following program activities: literacy education programs; senior citizen programs; children's day care services; integrated education; health, social service, recreational or cultural programs; summer and weekend school programs in conjunction with recreation programs; nutrition and health programs; expanded library service hours to serve community needs; telecommunications and technology education programs for individuals of all ages; parenting skills education programs; support and training for child day care providers; employment counseling, training, and placement; services for individuals who leave before graduating from secondary school, regardless of age of such individual; services for individuals with disabilities.

Contact: 21st Century Community Learning Centers, Attn: CFDA 84.287, U.S. Department of Education Application Control Center, Regional Office Building 3, Room 36337th & D Streets, SW, Washington, DC 20202-4725

Phone: 1-800-USA-LEARN

Website: www.ed.gov/21stcclc



❖ ***America's Treeways***

Agency: *National Tree Trust*

Program Goals: This program provides tree seedlings for planting on roadsides, highways, or land under the jurisdiction of any federal, state, municipal, or transportation authority.

Program Restrictions: Limitations include a minimum of 100 trees to a maximum of 10,000 trees. All trees delivered must be planted, and only volunteers may do the planting. The trees must be planted on public property.

Use of Funds or Support: Monetary grants are provided to local tree-planting organizations that support volunteer planting and education efforts throughout the United States.

Address: Todd Nelson, 1120 G Street, Suite 770, Washington, DC 20005

Phone: 1-800-846-8733

Website: <http://www.nationaltreetrust.org>



PLANTING AMERICA'S FUTURE

❖ ***Community Conservation Partnerships Programs (C2P2)***

Agency: Department of Conservation and Natural Resources (DCNR)

Program Goals: To develop and sustain partnerships with communities, non-profits and other organizations for recreation and conservation projects and purposes. The Bureau of Recreation and Conservation is responsible for fostering, facilitating and nurturing the great majority of these partnerships through technical assistance and grant funding from the Community Conservation Partnerships Programs.

Program Restrictions: See DCNR grant application manual for the Community Conservation Partnerships Program, as program restrictions vary by type.

Use of Funds:

- 1) Planning and Technical Assistance: Comprehensive Recreation, Park, and Open Space Plans; County Natural Area Inventories; Feasibility Studies; Greenways and Trails Plans; Rails-to-Trails Plans; Master Site Plans; River Conservation Plans; Education and Training; Peer-to-Peer Consultation and Circuit Riders (temporary employment of a full-time Park and Recreation Practitioner);
- 2) Acquisition Projects: Park and Recreation Areas; Greenways, Trails, and Rivers Conservation; Rails-to-Trails; Natural and Critical Habitat Areas;
- 3) Development Projects: Park and Recreation Areas; Park Rehabilitation and Development; Small Community Development; Greenways and Trails; Rails-to-Trails; Rivers Conservation; Federally Funded Projects; Lands and Water Conservation Fund (LWCF) Projects; Pennsylvania Recreational Trails

Contact: Kathy Frankel, PA DCNR, Southwest Field Office, 1405 State Office Building, 300 Liberty Avenue, Pittsburgh, PA 15222

Phone: (412) 565-7803

Website: <http://www.dcnr.state.pa.us>



❖ ***Community Development Block Grants (CDBG)***

Agency: U.S. Department of Housing and Urban Development

Program Goals: To provide a flexible source of annual grant funds for local governments nationwide: funds that they, with the participation of local citizens, can devote to the activities

that best serve their own particular development priorities, provided that these projects either 1) benefit low and moderate income persons; 2) prevent or eliminate slums or blight; or 3) meet other urgent community development needs.

Program Restrictions: Low and moderate income persons (generally defined as members of a family earning no more than 80% of the area's median income) benefit most directly and most often from CDBG funds for activities that principally benefit low and moderate income persons.

Use of Funds or Support: Building public facilities and improvements, such as streets, sidewalks, sewers, water systems, community and senior citizen centers, and recreational facilities. There are other possible uses of funds that do not relate to parks and recreation.

Contact: Westmoreland County, Department of Planning and Development, 2 North Main Street, Suite 601, Greensburg, PA 15601

Phone: (724) 830-3614 (William E. Mitchell II) or (724) 830-3650 (Bert Getto)

❖ ***Community Improvement Grants***

Agency: Pennsylvania Urban and Community Forestry Department

Program Goals: Focus is to support “greening” partnerships linking grassroots organizations, local community groups, and natural resource experts in support of community resource and natural resource management.

Use of Funds or Support: Encourages partnerships with and between diverse organizations and groups. Supports local improvement projects, tree planting projects in parks, greenbelts, schools, and community public spaces.

Contact: Penn State College of Agricultural Sciences, Cooperative Extension in Westmoreland County Donohoe Center, R.R. 12, Box 202E, Donohoe Road, Greensburg, PA 15601

Phone: (724) 837-1402

Fax: (724) 837-7613

Email: WestmorelandExt@psu.edu

Website: <http://westmoreland.extension.psu.edu>

❖ ***Conservation Reserve Program (CRP)***

Agency: Natural Resources Conservation Service

Program Goals: Designed to reduce erosion on sensitive lands, CRP also improves soil and water, and provides significant wildlife habitat.

Program Restrictions: Applications are for 10 and 15 year contracts.

Use of Funds or Support: The CRP offers annual rental payments, incentive payments for certain activities, and cost-share assistance to establish approved groundcover on eligible cropland.

Contact Info.: RR#12, Box 202 C, Greensburg, PA 15601-9271

Phone: (724) 834-9063 ext. 3 Fax: (724) 837-4127

Website: www.pa.nrcs.usda.gov/programs/



❖ ***Kodak American Greenways Awards Program***

Agency: The Conservation Fund and Eastman Kodak Company
Program Goals: Provide seed money to stimulate greenway planning and design. Supports pioneering work in linking the nation's natural areas, historic sites, parks, and open space.

Program Restrictions: Grant recipients are selected according to criteria that include: importance of the project to local greenway development efforts; demonstrated community support for the project; extent to which the grant will result in matching funds or other support from public or private sources; likelihood of tangible results; capacity of the organization to complete the project.

Use of Funds or Support: Planning, Implementation

Contact: Leigh Anne McDonald, American Greenways Coordinator, The Conservation Fund, 1800 North Kent Street, Suite 1120, Arlington, VA 22209

Phone: (703) 525-6300

Email: lmcdonald@conservationfund.org



❖ ***Land and Water Conservation Fund (LWCF) Grants***

Agency: LWCF

Program Goals: To provide park and recreation opportunities to residents throughout the United States, to allow communities to acquire and build a variety of park and recreation facilities, including trails. Funds are annually distributed by the National Park Service through the Pennsylvania Department of Conservation and Natural Resources (DCNR).

Program Restrictions: Communities must match LWCF grants with 50% of the local project costs through in-kind services or cash. All projects funded by the LWCF grants must be exclusively for recreation purposes, into perpetuity. Grants are administered through the DCNR Community Conservation Partnerships Program (C2P2).

Use of Funds or Support: Planning and investment in an existing park system.

Contact Info.: U.S. Department of the Interior, National Park Service, Recreation Programs Room, MIB-MS 3622, 1849 C Street NW, Washington, DC 20240

Phone: (202) 565-1200

Website: <http://www.ncrc.nps.gov/lwcf/>



❖ ***National Recreational Trails Fund Act (NRTFA)***

Agency: PA Department of Conservation and Natural Resources (DCNR) - administered through the Community Conservation Partnerships Program (C2P2)

Program Goals: The recreational trails program provides funds to develop and maintain recreational trails for motorized and non-motorized recreational trail use. The program funding represents a portion of the revenue received by the Federal Highway Trust Fund from the federal motor fuel excise tax paid by users of off-road recreational vehicles.



Program Restrictions: A component of TEA21, matching requirements for the Pennsylvania Recreational Trails Program Grants are 80% federal money, up to a maximum of \$150,000, and 20% non-federal money. However, acquisition projects will require a 50/50 match. “Soft match” is permitted from any project sponsor, whether private or public money. (“Soft match” includes credit for donations of funds, materials, services, or new right-of-way).

Use of Funds or Support: The department must distribute funding among motorized, non-motorized, and diverse trail use as follows: 40% minimum for diverse trail use, 30% minimum for non-motorized recreation, and 30% minimum for motorized recreation. The Commonwealth may also use up to 5% of its funds for the operation of educational programs to promote safety and environmental protection related to the use of recreational trails. The department will also consider projects that provide for the redesign, reconstruction, non-routine maintenance, or relocation of recreational trails to benefit the natural environment.

Contact: Kathy Frankel, PA DCNR, Southwest Regional Field Office, 1405 State Office Building, 300 Liberty Avenue, Pittsburgh, PA 15222

Phone: (412) 565-7803

Website: <http://www.dcnr.state.pa.us>

❖ ***Pennsylvania Conservation Corps***

Agency: Pennsylvania Department of Labor and Industry

Program Goals: This program provides work experience, job training, and educational opportunities to young adults while accomplishing conservation, recreation, historic preservation, and urban revitalization work on public lands.

Program Restrictions: The project sponsors receive the services of a Pennsylvania Conservation Corps crew, fully paid, for one year. Sponsors can also receive up to \$20,000 for needed materials and contracted services. Sponsors must provide a 25% cash match on material and contracted services costs.

Use of Funds or Support: Funds may be used for materials and contracted services needed to complete approved projects.

Contact: Lou Scott, Director, 1304 Labor and Industry Building, 7th and Forester Streets, Harrisburg, PA 17120

Phone: (717) 783-6385

Website: <http://www.dli.state.pa.us>



❖ ***Surface Transportation Program (STP) Funds***

Agency: Department of Transportation (PennDOT), Federal Highway Administration (FHWA)

Program Goals: These funds can be used for bicycle and pedestrian facility construction or non-construction projects such as brochures, public service announcements, and route maps. The projects related to bicycle and pedestrian transportation must be a part of the long-range transportation plan. These funds are controlled by the Metropolitan Planning Organization (MPO) in the Transportation Improvement Program.



Program Restrictions: Expands STP eligibilities to specifically include the following [1108(a)]: sodium acetate / formate, or other environmentally-acceptable, minimally corrosive anti-icing and de-icing compositions; programs to reduce extreme cold starts; environmental restoration and pollution abatement projects; including retrofit or construction of stormwater treatment facilities (limited to 20% of total cost of 3R-type transportation projects); natural habitat mitigation, but specifies that if wetland or natural habitat mitigation is within the service area of a mitigation bank, preference will be given to use the bank; privately owned vehicles and facilities that are used to provide inter-city passenger service by bus; modifications of existing public sidewalks (regardless of whether the sidewalk is on a Federal-aid highway right-of-way), to comply with the requirements of the Americans with Disabilities Act; infrastructure based intelligent transportation system capital improvements.

Use of Funds or Support: Transportation, planning, railroad crossing improvements.

Contact Information: 825 North Gallatin Avenue Extension, Uniontown, PA 15401-210545

Phone: (724) 439-7315

Website: www.dot.state.pa.us

❖ ***Transportation Equity Act for the 21st Century (TEA21)***

Agency: TEA21 / ISTE A

Program Goals: The primary source of federal funding for greenways and trails is through the Transportation Equity Act of 1998 (TEA21), formerly the Intermodal Surface Transportation Efficiency Act (ISTEA). ISTEA provided millions of dollars in funding for bicycle and pedestrian transportation projects across the country and will provide millions more as TEA21. There are many sections of TEA21 that support the development of bicycle and pedestrian corridors. The Pennsylvania Department of Transportation (PennDOT) can utilize funding from any of these subsets of TEA21 and should be contacted for further details.

Use of Funds or Support: Safety and Transportation Enhancements

Contact: Southwestern Pennsylvania Commission

Phone: (412) 391-5590

Website: (Federal Highway Administration) <http://www.fhwa.dot.gov/tea21/>

❖ ***Wal-Mart - Good Works***

Agency: Wal-Mart Foundation

Program Goals: Allows local non-profit organizations to hold fund raisers at their local Wal-Mart or Sam's Club. Wal-Mart and Sam's Club can elect to match a portion of the funds collected, up to \$1,000. Events held on the premises are eligible for funding when a Wal-Mart or Sam's Club Associate is actively involved in the event. Additionally, once the Wal-Mart or Sam's Club Associate has met certain criteria in the Matching Grant Program each year, a second source of funding is awarded to the store / club to use in the community. These funds do not require a fund raiser to be held; instead the funds can be awarded directly to a deserving organization.

Program Restrictions: Organizations that may qualify to receive funding through the Matching Grant Program are 501(c)(3) non-profit organizations or organizations that are exempt from needing 501(c)(3) status, such as public schools, faith-based institutions such as churches (must be conducting a project that benefits the community at large), and government

agencies.

Use of Funds or Support: Community Improvement Projects.

Contact: Community Involvement Coordinator at your local Wal-Mart or Sam's Club store.

Website: www.walmartfoundation.org/wmstore/goodworks

❖ ***Lowe's Charitable and Educational Foundation***

Program Goals: Education. Community improvement projects such as projects at parks and other public areas, housing for underprivileged citizens, and innovative environmental issues.

Program Restrictions: Organizations that may qualify to receive funding through the Matching Grant Program are 501(c)(3) non-profit organizations.

Contact: The Foundation only accepts grant applications submitted online through the website.

Website: <http://www.easy2.com/cm/lowe/foundation/intro.asp>

❖ ***Baseball Tomorrow Fund***

Agency: Major League Baseball and Major League Baseball Players Association

Program Goals: To promote and enhance the growth of baseball in the US, Canada and throughout the world by funding programs, fields, and equipment purchases, designed to encourage and maintain youth participation in the game.

Program Restrictions:

- To finance administrative staff salaries, office overhead and other recurring operating costs (office supplies, office equipment, and computer equipment purchase or repair)
- To fund construction of permanent structures and/or capital investments other than baseball construction or refurbishing
- To pay for membership dues, bank charges or audit expenses
- To cover other third part overhead costs

Use of Funds or Support: Grants from the Baseball Tomorrow Fund are designed to be sufficiently flexible to enable applicants to address needs unique their communities. The funds may be used to finance a new program, expand or improve an existing program, undertake a new collaborative effort, or obtain facilities or equipment necessary for youth baseball or softball programs.

Contact: Baseball Tomorrow Fund, 245 Park Avenue, New York, NY 10167

Phone: 212-931-7991 or email BTF@majorleaguebaseball.com

Website: www.majorleaguebaseball.sportsline.com/u/baseball/mlbcom/headquarters/btf.html

❖ ***Pennsylvania Urban and Community Forestry Program***

Agency: Pennsylvania Department of Conservation and Natural Resources (DCNR)

Program Goals: The three grant programs -- the Municipal Challenge Grant Program, the Community Improvement Grant Program, and the Tree Maintenance Grant Program -- are designed to foster community improvement through the planting and maintenance of trees.

Program Restrictions: These matching grant programs carry funding restrictions based on population. Municipalities may receive between \$1,000



and \$5,000 per season. Volunteer and community groups may receive between \$1,000 and \$3,000 per season. The trees must be planted on public or school property. Applicants must reapply for these funds

Use of Funds or Support: The funds may be used for planting and maintaining trees

Contact: Karli Suders, Urban Forestry Coordinator, DCNR, Forestry, Rural and Community Forestry, P.O. Box 8552, Harrisburg PA 17105-8552

Phone: 717-705-2825

Website: <http://www.dcnr.state.pa.us>

❖ ***Resource Conservation and Development Councils (RC&Ds)***

Agency: Natural Resources Conservation Service

Program Goals: Improve the local economy and environments.

Program Restrictions: RC&Ds are local representatives of citizens, county and local government, and other interested organizations who work together to improve and sustain the natural and economic resources of rural communities through plans which are facilitated by coordinators.

Use of Funds or Support: Businesses are developed, recreation areas are improved or developed, markets are developed, for local products, value is added to existing products, and resources management is accomplished through efforts to improve the local economy and environments.

Contact: RR#12, Box 202 C, Greensburg, PA 15601-9271

Phone: 724-834-9063 ext. 3

Website: www.pa.nrcs.usda.gov/programshom.htm



❖ ***Single Application Grants***

Agency: Pennsylvania Center for Local Government Services, Department of Community and Economic Development

Program Goals: Through one application form, applicants can apply for financial assistance from the Department's various funding sources.

Program Restrictions: Applications can be submitted to request 100% of funding for the proposed project. However, applications that can show some match in the form of dollars or services are more likely to be successfully awarded. Funds are allocated to this program annually and are distributed quarterly. Applications can be submitted at any time.

Use of Funds or Support: This program funds a wide variety of municipal projects, including recreational facility improvements and development.

Contact: Commonwealth of Pennsylvania, 325 Forum Building, Harrisburg, PA 17120

Phone: 717-787-8169 or 1-888-223-6837

Website: <http://www.inventpa.com>





❖ ***Pennsylvania Heritage Areas Program (PHAP):***

Agency: Department of Conservation and Natural Resources (DCNR)

Program Goals: There are five primary goals of the PHAP - economic development, partnerships, cultural conservation, recreation and open space, and education and interpretation.

Use of Funds: PHAP funds can be used for six types of projects.

A Feasibility Study, the initial step of the heritage area planning process, provides the information for DCNR and the Commonwealth Partners to determine if a region has the resources, public and private support, intergovernmental interagency cooperation, and the local commitment and leadership capability to develop and maintain a heritage area initiative for the area.

A Management Action Plan is a comprehensive study and process that will define a long-range (10 year) plan of action to organize, implement, manage and market the heritage area concept in the region.

A Special Purpose Study is a more concentrated study or plan necessary to implement one or more of the recommendations of an approved Management Action Plan or which support the Heritage Area.

Implementation Projects are non-planning projects that implement recommendations of the Management Action Plan and Special Purpose Studies.

Early Implementation Projects are implementation-type projects that are undertaken within State Heritage Area Planning Areas in conjunction with the Management Action Plan process. Management Grants fund those eligible expenses related to the administration and management of officially designated state heritage areas.

Contact: DCNR Regional Recreation and Parks Adviser

Website: www.dcnr.state.pa.us

❖ ***Pennsylvania Safe Routes to Schools Program (SRTS)***

Agency: SRTS is a Federal program administered in Pennsylvania through the Pennsylvania Department of Transportation (PennDOT)

Program Goals: This program seeks to enable and encourage children in kindergarten through eighth grades (K-8) to walk or bicycle to school, thereby promoting increased physical activity.

Program Requirements:

- This is not a grant program
- This is a federal cost reimbursement program; no funding is provided upfront
- Projects are 100% federally-funded and do not require a local match
- All projects phases are eligible for funding, but only after the project has been approved by PennDOT and the Federal Highways Administration (FHWA)
- All Federal Aid Highway (NEPA, competitive bidding, Davis Bacon prevailing wage rates, etc.) requirements must be followed

Use of Funds: Eligible projects generally include physical improvements that enhance student safety and/or promote walking and bicycling to school. Eligible projects would include (but

are not limited to) sidewalks, crossing improvements, traffic calming measures, signs, signals, bike storage facilities, and other similar features.

Contact: PA Safe Routes to School Coordinator, PennDOT Program Center

Phone: 717-787-8065

Website: www.dot.state.pa.us

MANAGEMENT, OPERATIONS, AND MAINTENANCE

Management Plan

Bradys Run Park is managed by the Beaver County Recreation Department. To improve ongoing park management, this plan recommends that the County develop a detailed management plan. This management plan should include the following components:

Rules and Regulations

The County should revisit rules and regulations at each park. With the development of new facilities at each park and improvements to existing facilities, new rules and regulations may apply. Some such rules are mentioned earlier in this chapter.

Habitat Management Plan

A habitat management plan should address habitat restoration and monitoring, wetland and water quality monitoring, and annual habitat evaluation. Information on habitat management and parks sustainability is included earlier in this chapter. In addition, this report recommends that the County comply with recommendations set forth in the DCNR Bureau of Forestry's Forest Resource Evaluation for Bradys Run and Old Economy County Parks (1997), as well as the Bradys Run Lake Watershed Assessment and Restoration Plan (2003).

Risk Management Plan

Assessing risk management for the parks should involve establish routine inspections of facilities to identify and address potential hazards that may be present within the park.

Maintenance Plan

The County should develop a plan that outlines procedures necessary to effectively and efficiently maintain all park facilities while considering public health and safety first and foremost. The maintenance plan should include sending maintenance personnel to proper training and educational seminars that address the various skills required to maintain park and athletic field facilities. An example of such a maintenance plan is the Program Identification and Prioritization as set forth by DCNR, applying to maintenance for Pennsylvania's State Parks.

The County should coordinate the preparation of these plans with organizations who provide technical assistance in these areas, including DCNR, DEP, PA Fish & Boat Commission, PA Game Commission, Penn State Cooperative Extension, the Beaver County Conservation District, etc.

Parks Management Structure

The Department of Public Works provides routine maintenance of the county parks. This centralized maintenance program appears to be effective in that the parks grounds look maintained and well groomed, trash and litter are generally under control, and facilities appear to be fairly clean. However, many of the buildings and other structures are in need of repair, renovation, or replacement. Maintenance activities are supervised by a Park Foreman who controls work

assignments and schedules, work orders, supply distribution, and other routine functions. Trade work is performed by Public Works personnel when they are available and can be assigned to a particular project. This doesn't always occur as quickly as desired. Consideration should be given to outsourcing services such as plumbing, electricians, and certain other building maintenance functions that experience a backlog of work orders. The purpose of this policy would be to supplement existing building maintenance positions and to allow necessary repairs to be made in a timely manner. Maintenance levels and standards should be established and the manpower balanced based on these requirements.

In 2003, the Beaver County Comprehensive Recreation and Parks Master Plan was adopted by the County. This plan contained recommendations related to restructuring the management of the County's parks to raise the priority and care of the parks to a higher level. The recommendation made in the 2003 plan was to remove park operations and maintenance responsibilities from the Public Works Department, and place them under the direct control of the County's Department of Parks, Recreation, and Tourism. To date the County has not begun the transition to this management structure. This recommendation is not designed to reduce the cost of maintenance of the parks, but rather a return to a management focus of providing park and recreation services and meeting the needs of the users. Park maintenance and operation functions involve much more direct and intimate involvement with the public, and require the skills of professionals who are educated and experienced in parks and recreation functions. A review of top urban park systems in the country, identified common characteristics of these highly ranked systems. A key characteristic was dedication to a focused parks and recreation mission.

In the current organizational structure that exists in Beaver County, this dedication and focus are missing. Their absence is not due to the people involved, because the motivation and intentions of Public Works staff covering parks and recreation is commendable. Their absence reflects an organizational structure which, by definition, has tried to bring together agencies with two distinct purposes.

In view of the above, we continue to recommend the County adopt the management structure proposed in Beaver County Comprehensive Recreation and Parks Master Plan. All positions within this structure should be filled with staff and professionals capable of coordinating overall services and activities and stewardship responsibilities, both at the individual park and countywide levels. Maintenance staff must be trained in proper park maintenance procedures and techniques.

Parks and Recreation services are in need of using a "team" approach to the daily management and operations of the park system and communications. Currently the separate functions within the park system focus on their own areas of responsibility: maintenance on maintenance, recreation on recreation, etc. While it is apparent that many individuals work very hard to do their jobs and have a certain amount of pride in their accomplishments, a team approach for the operation of the parks appears to be missing.

Observations in this area substantiate the need for professionally educated and trained managers. Many positions are filled by whoever happens to be available as opposed to an employee with

specific education and training for a certain type position.

There is a need for ongoing training and professional development. Specific areas in maintenance and safety, swimming pool operations, and overall management training need routine updating. Employees should be involved in developing and meeting overall agency goals and objective. Employees also need to be involved in developing standard operating procedures that outline how to deliver a high quality of customer service and address stewardship issues.

Unionization of park personnel does not have a material impact on getting things done. Park Foremen and staff work well together, and everyone appreciates the public orientation of parks and recreation work. Unionization does impact staffing for individual positions in that vacancies are filled by seniority rather than by strict qualification, sometimes working against the idea of putting the right person in the right job. During the public participation, meeting attendees expressed concern over the lack of cooperation with the Unions to allow various work projects to be completed in the park by volunteers. A closer look at this issue revealed that the Unions only ask that a formal request be made, indicating the project's scope, time frame, and estimated manpower proposed to complete the task. Typically, such requests are reviewed and approved without question.

Expenditures for county parks are not recorded at the facility / activity level. Therefore, analysis of profitability at the facility / activity level cannot be completed. We recommend an accounting system be implemented that tracks expenditures at the facility / activity level so that the County can better understand and manage expenses within the park system.

An equipment replacement fund is needed to replace worn out equipment in a timely and cost effective manner. Much of the existing equipment is simply worn out and beyond reasonable repair. Standardization of equipment should be evaluated as this would lead to overall efficiencies in procurement and operation/maintenance/repair of equipment. In addition, a critical element of fleet and equipment operation is a good service management program whereby all vehicles and equipment are regularly serviced at specific, predetermined intervals. This could be part of the overall maintenance management system or privatized.

Operations

Establishing expectation for facility users assists in providing smooth operations procedures. Written agreements between the County and non-profits, recreation groups, municipalities, or other entities wishing to use the park should be developed and executed. In addition, the County should continue existing agreements with such groups. These agreements establish the County's expectations of the partner organization, as well as what assistance the partner organization can expect from the County.

Agreements with athletic organizations are of special importance. Members of athletic organizations often volunteer many hours of physical labor to improve the facilities they use (i.e. baseball / softball fields). Over time their efforts give their organization a sense of pride / ownership in the facility. In addition, dispute can often be resolved quickly when an executed agreement is in place. Beaver

County should continue to work with athletic organizations using facilities in Bradys Run, Brush Creek, and Old Economy Parks.

Operations and Maintenance Priority Identification and Prioritization

We recommend the County adopt guidelines to assist in identifying and prioritizing operations and maintenance activities in the park. The Pennsylvania State Park system has developed the following as a guide that they use in the state park system.

1. Visitor/Employee Health and Safety and Facility Security (Hazards) – Ensure visitor/employee safety and security of the infrastructure and natural resources. Identifying and correcting visitor and employee hazards. Protecting the Commonwealth’s investment in natural resources and physical plant from damage or loss. Ensuring public/employee health by providing safe food, water and waste disposal facilities.
2. Sanitation/Cleanliness – To promote the attractiveness of the facility by ensuring that sanitation standards are met and maintained in all public buildings and facilities.
3. Natural Resources – To insure the long-term survival of the natural environmental resources of the park system, by managing human impact. The natural environment comprising the park includes air, land, water, timber, wildlife, flora, and minerals.
4. Preventive/Routine Maintenance – Maintenance that is necessary to ensure the continued operation of equipment or facilities on a daily basis and prolong its useful life.
5. Visibility/Appearance/Quality – To provide an overall general neat, clean, orderly appearance of the park that presents a well kept and properly maintained look.
6. Public Contact – To provide information to and direction for park visitors to ensure a safe enjoyable outdoor recreation experience.
7. Finances – To provide funds necessary to operate the park in a safe and efficient manner to assure quality public service.
8. Employee Training – To provide the employee with the proper “tools,” i.e., training necessary to better perform his/her job.
9. Monitor and Provide for Visitor Needs – The review of visitor requests and complaints on a continuing basis. Assess validity of requests and complaints on a continuing basis. Assess validity of requests and effect changes when warranted and feasible. To evaluate the impacts of use of Bureau resources to see if Bureau goals have been achieved. To plan and implement changes in Bureau goals and objectives so as to improve efficiency and quality services to the park users.

10. Administration – To plan, allocate, direct, and supervise the overall operation and maintenance activities in the State Park System.
11. Education – To provide visitors with information on their inter-relationship with their natural environment; stewardship of resources; current and emerging environmental issues in their environment.
12. Marketing – To make the public aware of the attractions and facilities available in state parks and appealing to visitor interests in order to promote increased park usage, visitor appreciation, and revenues.
13. Long-Term Viability – To develop and administer park activities to benefit the majority of park uses over the longest period of time. To ensure the availability of the park resources for future generations.
14. Programming – To direct the operation of visitor services to meet the needs of park visitors through the development and presentation of specific programs.
15. Regulation/Law Enforcement – To enforce Bureau rules and regulations and Commonwealth Laws to ensure visitor safety and protection of park resources in a manner that allows visitor enjoyment of recreational opportunities.
16. Life Cycle Planning - To determine the optimum cost versus benefit of a program/facility to determine its useful life in light of the services provided. To evaluate the phased replacement of programs/facilities in consideration of optimum cost to benefit, changing recreational needs and quality visitor services.

We recommend these guidelines be adopted for Beaver County’s park system.

Maintenance

Planning for maintenance and operations is a very important consideration when planning the development of park facilities. Consideration must be given to ongoing staffing and maintenance costs, as well as major equipment needs. The projections provided in this section estimate maintenance costs based on implementation of the Master Plan’s recommendations for Bradys Run Park in phases proposed earlier in this chapter.

In 1986, the National Recreation and Park Association (NRPA) developed a standard for classifying maintenance programs to allow for the forecasting of maintenance expenses related to park and recreation facilities. This standard was published by the NRPA in its publication *Park Maintenance Standards*. The following analysis utilizes this approach to determine the annual cost of maintaining the park after development of Master Plan recommendations.

The NRPA classification system identifies five levels (modes) of care that a park facility may receive.

Each mode is further defined by the level of care for each of fourteen maintenance items. For the three County Parks being master planned as part of this study, Mode II (High-level maintenance) was selected as the mode of care for park facilities. Mode II is described in detail as follows:

- 1) Turf Care: Grass cut every five working days. Aeration as required but not less than twice annually. Reseeding / sodding when bare spots are present. Weed control practiced when weeds present visible problems or represent 5 % of turf surface (in areas proposed as lawn). Some pre-emergent products may be used at this level (with special care near waterways).
- 2) Fertilizer: Adequate fertilizer level to ensure that all plant materials are healthy and growing vigorously. Amounts depend on species, length of growing season, soils, and rainfall. Rates should correspond to the lowest recommended rates shown on the chart on page 14. Distribution should ensure an even supply of nutrients for the entire year. Nitrogen, phosphorous, and potassium percentage should follow local recommendations from the County Extension Service (Penn State Cooperative Extension). Trees, shrubs, and flowers should receive fertilizer levels to ensure optimum growth.
- 3) Irrigation: Not required
- 4) Litter Control: Minimum of once per day, five days a week. Off-site movement of trash dependent on size of containers and use by the public. High use may dictate once per day cleaning or more. Containers are serviced.
- 5) Pruning: Usually done at least once per season unless species planted dictate more frequent attention. Sculptured hedges or high growth species may dictate a more frequent requirement than most trees and shrubs in natural growth style plantings.
- 6) Disease Control: Usually done when disease or insects are inflicting noticeable damage, reducing vigor of plant materials or could be considered a bother to the public. Some preventive measures may be utilized such as systematic chemical treatments. Cultural prevention of disease problems can reduce time spent in this category. Some minor problems may be tolerated at this level.
- 7) Snow Removal: Snow removed by noon the day following snowfall. Gravel or snow melt may be utilized to reduce ice accumulation.
- 8) Lighting: Text....Replacement or repair of fixtures when observed or reported as not working.
- 9) Surfaces: Should be cleaned, repaired, repainted, or replaced when appearance has noticeably deteriorated.
- 10) Repairs: Should be done whenever safety, function, or bad appearance is in question.
- 11) Inspection: Inspection by some staff member at least once a day when regular staff is

scheduled.

- 12) Floral Plantings: Some sort of floral plantings present. Normally no more complex than two rotations of bloom per year. Care cycle usually at least once per week except watering may be more frequent. Health and vigor dictate cycle of fertilization and disease control. Beds essentially kept weed free.
- 13) Restrooms: Should be maintained at least once per day as long as they are open to the public. High use may dictate service twice a day or more. Servicing period should ensure an adequate supply of paper and that rest rooms are reasonably clean and free from bad odors.
- 14) Special Features: Should be maintained for safety, function, and high-quality appearance as per established design.

A Note on Restrooms

Clean sanitary facilities are important because they are often the standard by which a park, its maintenance staff, and its managing organization are judged by visitors. Restrooms should be well lit, well ventilated, and cool at all times; and, they should be remodeled as needed to have the built in “improved cleanability” features described in the PA DCNR Bureau of State Parks *Cleaning and Custodial Maintenance Manual for Restroom and Shower Facilities* (1994). In addition to meeting a basic function, these facilities need to be modified to meet current legislated requirements for health, safety, and disability needs.

The Master Plan recommends that the County Recreation Department follow guidelines set forth in the Cleaning and Custodial Maintenance Manual mentioned above, including the establishment of a custodial maintenance plan. Such a plan should include three elements:

- 1) Procedure (HOW?): Develop a cleaning and first-level maintenance procedure;
- 2) Frequency (HOW OFTEN?): Apply the procedure at the right time intervals; and
- 3) Intensity (HOW MUCH?): Determine the amount of detail used in the cleaning and maintenance.

Detailed information on the elements of a custodial management plan can be found in the Cleaning and Custodial Maintenance Manual mentioned above.

Odorless Restrooms

Restrooms should be designed to maximize the flow of fresh air through vents into the restroom and mulching vault, while exhausting air from the vault outside the restroom structure. Information on one waterless vault restroom design that maximizes air flow is offered the U.S. Forest Service’s *In Depth Design and Maintenance Manual for Vault Toilets*, which is included in the appendices of this report.



The Master Plan recommends that, when feasible, Beaver County retrofit existing restrooms with air circulation technology as described and utilized by the U.S. Forest Service. If repairs to existing restrooms are not feasible, existing restrooms should be replaced with new waterless vault restrooms.

Park-Specific Maintenance

The Master Plan made the following assumptions to project maintenance costs for Bradys Run Park:

- the Beaver County Public Works Department (Park Foreman and staff) will perform all general park maintenance;
- the Beaver County Public Works Department will provide all manpower and equipment for general park maintenance tasks;
- Recreation organizations will perform partial maintenance on specific facilities (i.e. trail groups baseball / softball associations, etc.) and provide equipment for such maintenance;
- maintenance will be completed to meet the National Recreation and Park Society’s definition of a “high standard of care”;
- little winter maintenance will be required; and
- periodic maintenance for Bradys Run Road (State Route 4012) will be performed by PennDOT.

Maintenance Personnel

The following table projects the number of hours required to maintain all proposed facilities, along with existing facilities to remain, in the park. The table also establishes the associated costs for performing the respective activities.

<i>Bradys Run Park Maintenance Analysis</i>									
<i>Task</i>		<i>Quantity</i>	<i>Unit</i>	<i>Work hours per Unit</i>	<i>Times per Week</i>	<i>Weeks per Season</i>	<i>Total Hours</i>	<i>Cost per Hour</i>	<i>Cost per Task</i>
1	Bradys Run Lodge cleaning (interior and exterior)	1	EA	2	2	32	128	\$20	\$2,560
2	Ice Arena / Indoor Tennis Building Maintenance	1	EA	2	3	32	192	\$20	\$3,840
3	Other Buildings Maintenance	14	EA	0.25	1	32	112	\$20	\$2,240
4	Pavilion (and associated picnic table) cleaning	26	EA	0.5	3	32	1248	\$20	\$24,960
5	Restroom cleaning (self-mulching restrooms)	9	EA	1	7	32	2016	\$20	\$40,320
6	Skate Park check / maintenance	1	EA	0.5	5	32	80	\$20	\$1,600

7	Deck Hockey Rink check / maintenance	1	EA	0.5	3	32	48	\$20	\$960
8	Playground check / maintenance	3	EA	0.5	5	40	300	\$20	\$6,000
9	Horseshoe Court check / maintenance	16	EA	0.25	2	32	256	\$20	\$5,120
10	Tennis Court check / maintenance	4	EA	0.5	3	32	192	\$20	\$3,840
11	Ball Field Maintenance	8	EA	1	5	24	960	\$20	\$19,200
12	Parking lot sweeping / line striping (Ice Arena parking lot)	1	EA	16	1	4	64	\$20	\$1,280
13	Parking lot sweeping / line striping (handicapped-accessible spaces in other lots)	44	EA	0.5	1	4	88	\$20	\$1,760
14	Parking lot leveling / re-grading / weeding (gravel lots)	15	EA	4	1	1	60	\$20	\$1,200
15	Paved Walking Track sweeping / maintenance	1	Mile	4	1	8	32	\$20	\$640
16	Earth Surface Trail Maintenance	14	Mile	0.5	1	8	56	\$20	\$1,120
17	Bradys Run Lake / Shore Cleanup	1	EA	2	1	32	64	\$20	\$1,280
18	Boat House Maintenance (Interior and Exterior)	1	EA	1	5	32	160	\$20	\$3,200
19	Charcoal Grills / Water spigots maintenance (1 of each per picnic pavilion)	26	EA	0.25	2	32	416	\$20	\$8,320
20	Entrance Sign trimming / maintenance	1	EA	0.5	1	32	16	\$20	\$320
21	Dog Park Maintenance	1	EA	1	5	32	160	\$20	\$3,200
22	Turf Maintenance	83.2	AC	0.35	1	30	873.6	\$20	\$17,472
23	Trash Collection	1	LS	2	1	52	104	\$20	\$2,080
24	Miscellaneous Maintenance	1	EA	40	1	1	40	\$20	\$800
Totals (Total Annual Hours and Total Annual Manintenance Cost)							7665.6		\$153,312

Based on this analysis, approximately 7,600 hours are required to properly maintain the park upon implementation of the Master Plan. Taking into consideration benefits such as vacation and sick time, we estimate a staff of five full-time positions and 6 seasonal positions, all supervised by a Park Foreman, are required on an annual basis.

Currently there are fifteen full-time public works employees, in addition to the Park Foreman, who

currently perform maintenance activities at Bradys Run Park. However, it is estimated they only spend about 25% of their time performing park activities, with the remainder of their time being spent on other County priorities such as bridge and road work. Therefore, the equivalent of 3.75 full time positions are being dedicated to park operations and maintenance activities, leaving a shortage of 1.25 persons. When interviewed for this project, the park foreman often indicated that lack of manpower limits their ability to spend the time required maintaining the park's facilities.

As discussed earlier, we recommend the restructuring of the park's management as recommended in the 2003 Comprehensive Recreation and Parks Plan. That plan proposed a dedicated staff of one park foreman, five full time staff, and six seasonal staff. We concur with that recommendation based on the analysis conducted during this study.

Maintenance Equipment

In order to properly maintain the park's facilities, a large variety of equipment will be required. A list of equipment currently used by the Beaver County Department of Public Works is shown below. Much of this equipment is used for park maintenance.

<i>Beaver County Department of Public Works - Equipment List</i>			
<i>Vehicles</i>			
Truck No.	Use / Condition	Description	Mileage
1	Director's vehicle	1997 Ford 1/2-Ton (Pickup Truck)	128,400
4	Economy Park	1993 Ford 1/2 Ton	173,100
6	Economy Park - Water Truck	1993 Ford 3/4-Ton	150,200
7	Brady's Run - Snow	1993 Ford 3/4-Ton	87,500
8	Economy Park Roads & Bridges	1997 Ford 1/2-Ton	122,500
11	Brady's Run	1996 GMC 1/2-Ton	112,300
16	Brady's Run - Water Truck	1997 Ford 3/4-Ton	77,500
18	Brush Creek Park Foreman's vehicle	1996 Ford 1/2-Ton	136,500
30	Rodent Control	1995 Ford 1/2-Ton	130,500
34	General Maintenance	1998 Chevy 1/2-Ton	58,300
38	Brady's Run / Rust	1994 Ford 1/2-Ton	132,400
50	Brady's Run / Transmission	2000 Ford 1-Ton	43,200
51	Mechanic's vehicle	2000 Chevy 3/4-Ton	67,800
52	General Maintenance	1998 Chevy 1/2-Ton	122,600
53	General Maintenance	1997 Ford 3/4-Ton	79,200
54	General Maintenance	2000 Chevy 1/2-Ton	150,100
55	Brush Creek - Snow	2000 Chevy 3/4-Ton	64,700
56	General Maintenance	1998 Ford Van	107,300
57	General Maintenance	1990 Ford Van	204,700
59	General Maintenance	1989 Ford 3/4-Ton	69,000

Utility Use Only			
2	Brush Creek / Rust	1979 Ford 5-Ton	57,000
13	Brush Creek - Snow / Bad	1979 Chevy 1/2-Ton	88,686
14	Brady's Run / Rust	1995 Ford 1-Ton	36,000
25	Brady's Run - Bucket Truck	1997 Ford 1-Ton	56,000
35	Brady's Run - Box Van	1998 GMC	75,500
41	Brady's Run / Needs Clutch	1987 Ford 5-Ton	87,000
Out of Service			
9	Brady's Run	1997 1/2-Ton	117,100
40	Brady's Run	1988 Ford Van	210,000
47	Brady's Run	1987 Chevy 1/2-Ton	89,500
59	Brady's Run	1987 Ford 3/4-Ton	114,200

Beaver County Department of Public Works - Equipment List			
Maintenance Machinery			
Item / Description	Identification	Purchase Price / Value	Year
Caterpillar 416G Backhoe		\$52,000	1995
Fiat Allis FG75 Motor Grader	#61A-00262	\$55,325	1983
John Deere 410 Backhoe	#48499IT	\$25,610	1979
John Deere 450 Loader	\$450BA1772916T	\$45,000	1973
Rogers Tandem Trailer	#D5282	\$5,000	1984
#8200-9 Auger Attachment	#786	\$2,500	
Huber Maintainer		\$2,500	
Lincoln Arc Welder	#A1028413	\$2,500	
McCormick 140 Tractor	#54602-J	\$9,225	
International 140 Tractor	#53202J	\$8,685	
International 140 Tractor	#46821J	\$8,685	
White Tractor with Brush Hog	#235046019	\$7,895	1976
Woods Duel-blade Mower	#L308	\$2,500	
Meyers Water Pump	#1622W	\$3,525	
Meyers Water Pump	#2286W	\$3,525	

International Farmall 140	#49199J	\$8,685	
International Harvester 140	#659025	\$8,685	
International 140 Tractor	#65782J	\$9,000	
International 140 Tractor	#57218J	\$9,000	
Farmall 140	#6578222J	\$8,786	
John Deere 1070 Tractor	#MO1070A00262	\$12,000	1988
John Deere 1070 Tractor	#MO1070A003282	\$12,000	1989
Gill Pulverizer SU 400	#675	\$2,500	1989
Davey 290 Compressor	#28634	\$8,650	1980
Rosco Vibrastat Roller	#21608	\$11,700	1980
Meyers Water Pump	#36180	\$3,650	
Meyers 8-ft. Plow	(TRUCK #14)	\$1,500	1995
Meyers 9-ft. Plow	(TRUCK #15)	\$1,500	1995
Meyers 8-ft. Plow	(TRUCK #43)	\$1,500	1988
Meyers 10-ft. Plow	(TRUCK #36)	\$1,500	1991

The Master Plan re-iterates the general maintenance equipment observation and recommendation made in the 2003 Beaver County Comprehensive Recreation and Parks Plan: Much of the maintenance equipment has outlived its useful life and requires extensive repair for continued operation. When equipment reaches the end of its useful life, monies that are being invested in equipment repairs could be better used to purchase new equipment. We recommend the County establish an Equipment Replacement Fund. The purpose of this fund is to provide monies to systematically replace equipment when they reach the end of their useful life.

The following are rules of thumb that should be used when projecting the useful life of park maintenance equipment:

- Vehicles, such as cars, pick-up trucks, dump trucks, generally have a life expectancy of eight to ten years
- Construction vehicles, such as dozers, graders, backhoes, generally have a life expectancy of twelve to fifteen years
- Mowers, tillers, and the like generally have a life expectancy of five to ten years
- Large tools, such as welders, log splitters, generally have a life expectancy of fifteen years

Based on these guidelines, equipment currently in service for operations and maintenance of the County Parks should be retired upon fulfilling their life expectancy as listed above. After that time, equipment should be replaced as soon as funding is allocated for their replacement. Feasibility of repair of out-of-service equipment should be determined on a case-by-case basis.

Recreation Fees

Communities are always searching for ways to help offset the cost of maintaining and operating parks. One common source of revenue is recreation facility admission or use fees. As part of this study, Pashek Associates reviewed a list of recreation fees for facilities in Bradys Run and Old Economy Park, and compared them to fees charged for the use of similar facilities in the surrounding region. This section discusses recommendations that resulted from said research, as relating to recreation user fees for facilities in Bradys Run Park.

Facility Rentals

The park's existing picnic pavilions and Bradys Run Lodge are available for rental by the general public and proposed pavilions should also be available for rent. The County should continue to offer rental options for the Ice Arena, indoor tennis courts, horse arena, and outdoor courts and fields. The park's other facilities should be offered as a community service. Agreements should be made with recreation organizations whenever possible to possibly contributing toward maintenance (i.e. trail groups help with trail maintenance).

The park's pavilions can be rented by the day for gatherings. Fees for all pavilions are currently \$40 per weekday and \$60 per Saturday, Sunday, or Holiday (source: Beaver County Recreation Department User Fees - July 1, 2006). With the proposed addition of pavilions and improvements to picnic groves, the County should increase the rental fees slightly at Bradys Run Park. The Master Plan recommends rates of \$45 per weekday and \$65 per Saturday, Sunday, or Holiday. Ideally, these fees could be raised to \$50 (weekday) and \$75 (Saturday, Sunday, or Holiday), which are common rates charged elsewhere in the region. However, this plan recommends that price increases be implemented in small increments over the next 3-5 years.

The existing Bradys Run Lodge daily rental rates should remain at \$400 per day plus \$100 damage deposit. These rates should be revisited if major repairs are made to the Lodge per the architectural assessment proposed by the Master Plan.

The County's current rental fees for the horse arena, tennis courts (indoor and outdoor), horseshoe courts should remain the same. However, rental rates for tournaments on the ball fields at Bradys Run Park (\$250 per tournament) are slightly lower than fees at similar facilities in the surrounding region. The Master Plan recommends a ball field user fee of \$275 (a 10% increase). This fee should be re-assessed upon completion of the proposed improvements to the ball field complex. Average fees charged at similar ball field complexes in the surrounding region range from \$300 to \$500. Long-term increases should be implemented incrementally to bring the user fees at Bradys Run Park Ball Field Complex within this range in the next 3-5 years. The short-term rate increase mentioned above is the first step toward the recommended fee level.

Soccer Facility Fees

Recreation fees should be charged for use of the proposed soccer complex upon development. This plan proposes initial fees of \$275 per tournament (Friday night, Saturday, Sunday) and \$500 annual league fee for games and practices.

Ice Arena Fees

The daily admission and skate rental fees (per Beaver County Recreation Department User Fees - July 1, 2006) for the Ice Arena are slightly lower than similar fees at ice rinks in the surrounding region. The Master Plan recommends that a daily adult admission fee be raised from \$4.00 to \$5.00 while the child and senior citizen admission fees remain at \$4.00. In addition, this plan recommends an increase in skate rental fees. All other admission and rental fees for the Ice Arena should remain at their current level.

Programming

An additional source of revenue is the provision of programming that utilizes park facilities. The County Recreation Department coordinates programming within the park, and should work with local recreation organizations, communities, and non-profit groups to add both annual and periodic / series programs (weekly, monthly, etc.) throughout the year at Bradys Run Park. In addition, the County Recreation Department should also strive to continue events currently using the park.

Many annual or periodic events are currently held in Bradys Run Park. Descriptions of a few of these events are available online at <http://www.co.beaver.pa.us/recreation/brady.htm>. Examples of possible programs to be added at the park may include the following:

- Trail and Park Road Runs / Races
- Mountain Bike Races
- Sprint-Distance Triathlons / Adventure Races
- Skateboard Competitions
- In-line Skate Hockey Tournaments
- Community Days / Festivals
- One - Time Event Archery Hunts (pending approval by County Commissioners)
- Periodic Fishing Competitions
- Geocaching Tournaments
- Auctions (live or silent)
- Flea Markets

Larger fundraisers such as those above may raise hundreds or even thousands of dollars at a single event. Smaller fundraisers may include offering small recreation classes / programs, holding raffles, bake sales, etc. These fundraisers may raise several hundred dollars each. It should be noted that most fundraising events rely on significant volunteer participation for their success.

Potential Revenue Production

Through a proposed increase in the number and rental rates for picnic shelters and ball fields, implementation of soccer field user fees, and proposed rate increases adult admission to the ice arena and ice skate rental, Bradys Run Park has potential to increase its yearly revenue. The chart below compares 2007 revenue amounts for Bradys Run Park facilities to estimated potential revenues after construction of all proposed improvements. All figures assume immediate construction (during 2008) of all proposed park improvements, and are shown in 2008 dollars.

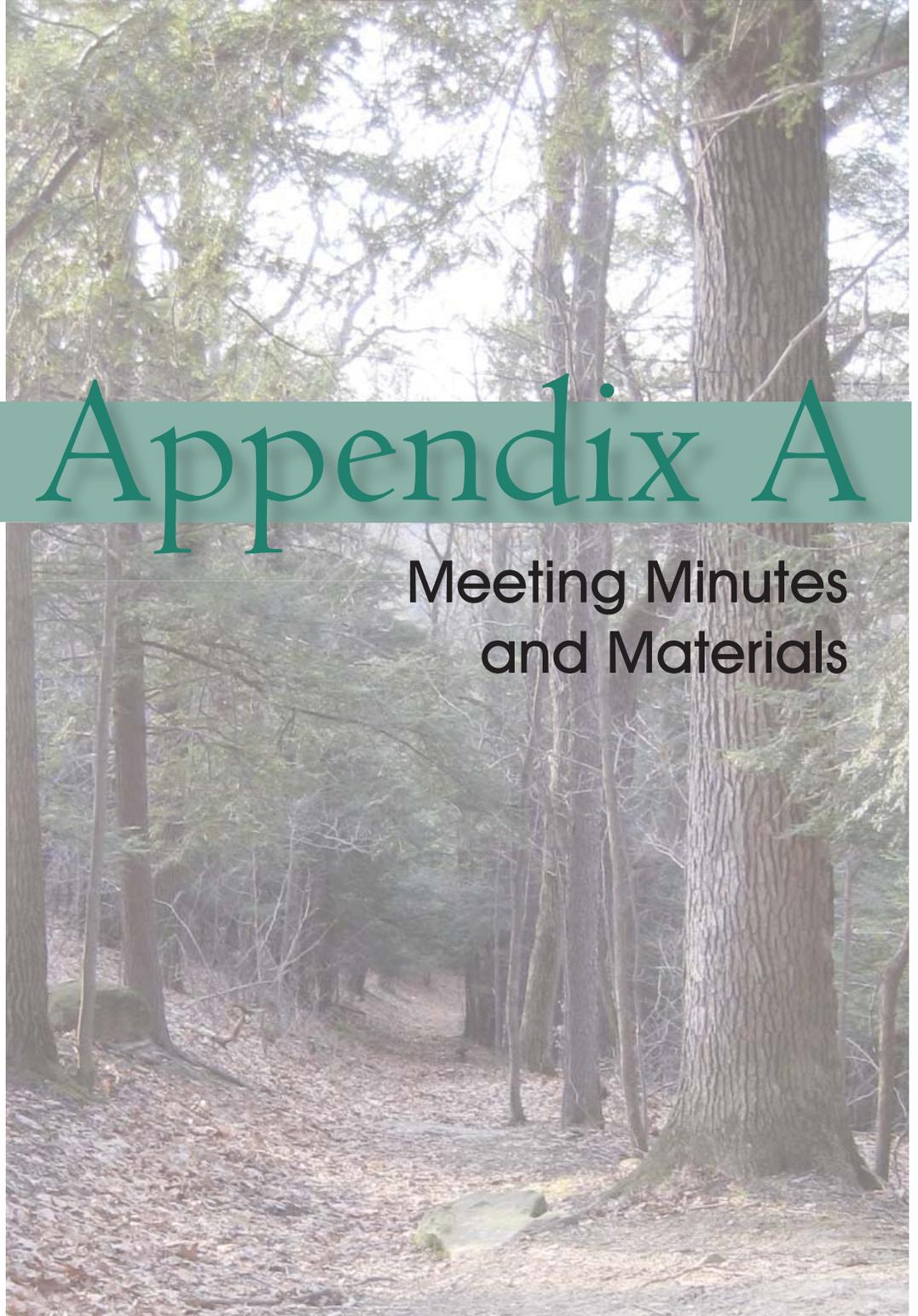
<i>Bradys Run Park 2007 Facility Revenue vs. Potential Revenue</i>				
<i>Existing Revenue 2007</i>		<i>Short-Term Potential Revenue</i>		<i>% Increase (Decrease)</i>
Facility / Income	Revenue	Facility	Revenue	--
Shelters, Ball Fields, Outdoor Recreation Facility, Boat Launch Permits	\$48,986* (estimated)	Shelters, Ball Fields, Outdoor Recreation Facility, Boat Launch Permits	\$62,475* (estimated)	+27.5%
Indoor Tennis Courts	\$78,570	Indoor Tennis Courts	\$78,570	-
Ice Arena, Silver Sneakers, Fitness Classes	\$130,108**	Ice Arena, Silver Sneakers, Fitness Classes	\$138,441** (estimated)	+6.4%
Skate Rental, Skate Sharpening, Totera Vending	\$44,631***	Skate Rental, Skate Sharpening, Totera Vending	\$52,131*** (estimated)	+16.8%
Ice Users	\$208,397	Ice Users	\$208,397	-
Ice Pro Lessons	\$1,274	Ice Pro Lessons	\$1,274	-
Pepsi Contract	\$8,000	Pepsi Contract	\$8,000	-
Sales Tax	\$131	Sales Tax	\$131	-
--	--	Soccer Fields	\$9,125****	-
TOTALS	\$520,097		\$558,544	+7.4%

* Estimated amount after subtraction of revenue for picnic shelters at Bradys Run Park

** Assumes Ice Arena revenues account for \$100,000 of 2007 facility revenue

*** Assumes Skate Rental revenues account for \$30,000 of 2007 facility revenue

**** Assumes 15 tournaments per year and 10 leagues utilizing the proposed soccer field complex



Appendix A

Meeting Minutes
and Materials

AGENDA

BEAVER COUNTY PARK MASTER PLANS STEERING COMMITTEE MEETING ONE Tuesday, January 9, 2007

1. Introductions – Five minutes
 2. What is a Master Plan – Five minutes
 3. Review of the Scope of Work – Five minutes
 4. County Vision – Ten minutes
 - a. What is / the role of Beaver County in providing park and recreation services?
 - b. What is the Vision for Beaver County's Parks for the next 10 to twenty years?
 5. Current Park Use – Ten minutes
 - a. Who currently uses the parks and why?
 - b. Who isn't using the parks? Why.
 6. Key Persons to Contact – Five minutes
 - a. Ten per park
 7. Next Meeting – tentative March 8th, 1:30 pm
-

Project Contact:

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Pashek Associates
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412-321-6362
jbuerkle@pashekla.com

Website Access for project information:
www.pashekla.com

Click: Client Workspace
Username: BC
Password: Parks



SCOPE OF WORK

Brady's Run County Park, Brush Creek County Park, and Old Economy County Park

A. Public Input

1. Study Group Meetings (up to 7)

Our unique facilitation skills result in active, positive and productive meetings. We collect information about the community from Study Group members. We will meet with the project study group up to seven times throughout the planning process. We will work with the Study Group to brainstorm ideas and issues, develop design concepts and review draft recommendations. Our meeting attendance includes preparation for the meeting, meeting attendance and recording of minutes.

2. Public Meetings (up to 6)

By using the Nominal Group Technique, we have conducted hundreds of quality public meetings, building consensus and support for the plan. We will work with Study Group members to identify the best public process. One possible strategy would be to have a general county-wide public information meeting followed by meeting in each park after concepts have been developed. Subsequent meeting would describe draft and final master plans.

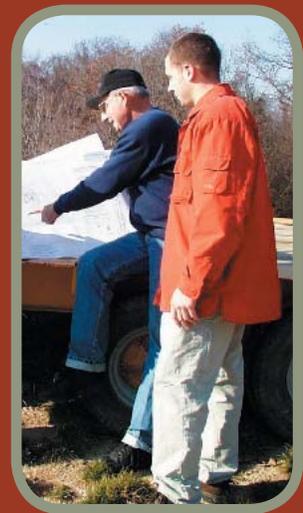
3. Key Person Interviews (up to 25)

We will conduct up to twenty-five key person interviews with stakeholders identified by the project study group.

4. Beaver County Commissioners' meeting (up to 2)

It is important for the successful implementation of this project, to obtain support for this plan from elected officials. We will provide updates and opportunities for County Commissioners to provide feedback. These presentations will be part of normally scheduled meetings.

5. We will summarize the results to the public participation process.



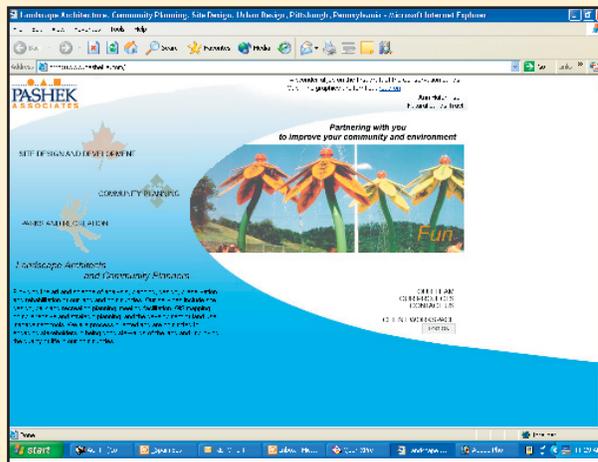
Brady's Run County Park, Brush Creek County Park, and Old Economy County Park

6. Web Page - www.pashekla.com

During the course of the project we will host a web site for the project. On this site we will post work completed for this project so that Officials, Staff, the Study Group, and residents can follow the study's progress.

To access an example of how this web site works:

- a. Go to www.pashekla.com



- b. select client workspace in the lower left hand corner



Brady's Run County Park, Brush Creek County Park, and Old Economy County Park

- c. then type in Farmington (for the Username) and Township (for the password).



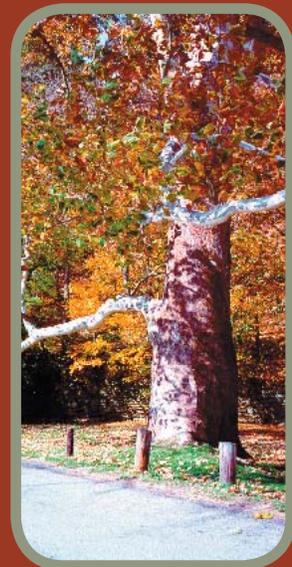
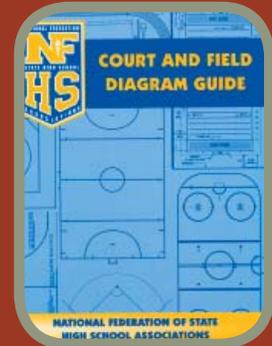
- d. You are there!

B. Background Data

1. Prepare introduction to the County based on the Comprehensive Recreation, Parks, and Open Space Plan.
2. Describe the existing park system, including number and size of parks.
3. Provide a brief description of how the parks fit into the recreational needs of the County.
4. Describe existing planning efforts and how they apply to the site.

C. Site Analysis and Design

1. We will briefly review the following items as they pertain to the site:
 - Location
 - Acreage
 - Topographic features
 - Surrounding land uses



- Historic features on site, if any
- Known environmental features
- Soil types from county soil survey
- Vegetation
- Wetlands (this is not a jurisdictional determination but a field view to determine if there are wetlands that will impact future development)
- Floodplains
- Riparian buffers
- Site access
- Zoning
- Deed restrictions
- Easements that limit use

2. Analysis of how the physical features impact on potential uses.
 - a. The advantages/disadvantages of the site for certain uses.
 - b. Areas that may not be suitable for public use and/or need special environmental protection or irrigation.
 - c. other use limiting aspects of the site.
 - d. Neighborhood compatibility

D. Activities and Facilities Analysis

1. Describe the areas and facilities to be developed and the recreation activities to be offered at each park, based on public participation, previous planning work, and needs assessments.
2. For each area / facility to be developed and activity to be offered:
 - a. Describe the level of activity for:
 1. entry level participation and introduction of users to basic skills.
 2. skill improvement
 3. unstructured / non-program use
 4. competition play
 5. level of use by spectators.



Brady's Run County Park, Brush Creek County Park, and Old Economy County Park

- b. Project by area, facility, and activity the basic standards and requirements such as:
 - 1. size
 - 2. dimensions
 - 3. orientation
 - 4. maximum percent slope permissible
 - 5. need for undisturbed area.
- c. Describe by area / facility / activity, the required and desired support facilities such as:
 - 1. roads
 - 2. parking
 - 3. maintenance facilities
 - 4. utilities
 - 5. shelters / buildings
 - 6. park furniture

E. Design Considerations

16. Design Considerations

- a. Describe the proposed facilities in response to the study group, public meetings, public input venues, and prior planning studies.
- b. Provide an analysis of the site's compatibility with the proposed recreation areas and facilities. The site's positive attributes as well as its limitations will be considered as well as various standards related to the development of the proposed recreation facilities and activities.
- c. Accepted good design practices, along with accepted national state and professional association area, facility and activity standards will be utilized.
- d. Applicable laws and regulations relating to health and safety shall be considered and complied with in the final master plan design.
- e. The master plan will conserve existing forest riparian forest buffers and develop new riparian buffers in a manner consistent with state-wide objectives and priorities.

“On several occasions, I felt Pashek Associates went the extra mile”

**- Andy Baechle, Director
Allegheny County
Parks
and Recreation
Department**



"Their design, strategy, and implementation for the park development were of high level quality. Their work was professional, organized and detailed for a successful improvement to Pine Community Park. As Landscape Architects, we highly recommend Pashek Associates for any new revitalization program."

- Joni Patsko
Parks and Recreation
Director
Township of Pine

- f. Review PNDI and the Historic Review Commission requirements and incorporate into the master plan.

F. Design Process

1. Develop preliminary alternatives plans and present them for input. Relationships between areas and facilities, along with circulation patterns, will be shown.
2. Written evaluations of preliminary alternatives will be completed. These evaluations will highlight both positive and negative aspects, and through community discussion and public participation determine which solution, or combination of ideas from the alternatives, offers the best compromise. Consideration will not only be given to the community's desires, but also to site limitations, applicable laws and regulations and accepted good design practices and standards.
3. A pre-final master plan will be developed for each park site and presented to obtain input. This master plan to scale, graphic rendering will show the final solution. All proposed areas and support facilities, along with existing facilities will be shown on the plan in final orientation and size.
4. A final draft plan will be developed after receiving public input.
5. The final master plan will be prepared after the final public meeting and receipt of DCNR review comments.

G. Cost Estimates

1. The study would identify development costs, by area and facility, including an estimate of probable development costs and identify the total cost for implementing the plan. Costs will include construction costs, project administration costs, and a contingency of a 10%.
2. A fiscally responsible phased and prioritized capital improvement plan would be identified. This plan would identify which areas and



Brady's Run County Park, Brush Creek County Park, and Old Economy County Park

facilities are to be developed in which years, and the costs associated with each phase. Implementation strategies to finance the capital improvement plan will be addressed. Future years will be adjusted for inflation.

H. Plan Narrative Report

All of the Scope of Work tasks described in this proposal will be produced in an attractive, easy-to-read report.

I. Mapping and Plan Drawings

A survey will be prepared, under this contract; a base map and site plan, with the following elements:

- Park Name
- Name of municipality/owner
- Scale, Graphic Scale, North Arrow, Date, Legend
- Seal of designing landscape architect registered in the Commonwealth of Pennsylvania.
- Acreage of site
- Site boundaries with bearings and distances
- Site zoning and zoning of surrounding properties
- Boundary lines of adjacent property parcels where they intersect with the planning site. These lines should be shown to the extent that they provide information regarding density of surrounding lands, points of change in use of adjacent properties, and points of access to the site.
- Existing uses of surrounding property (Example: single family residential, multi-family residential, commercial, industrial, undeveloped natural areas)
- General location and type of easements on the site
- Deed restriction on the site
- Topography (two foot contour preferable)
- Existing structures and facilities including utilities installations and storm water facilities.
- Circulation patterns (existing access roads / service drives / parking / trails / walks / ramps / paths and natural bridges)
- Natural and man-made barriers.



Brady's Run County Park, Brush Creek County Park, and Old Economy County Park

- Wetlands
- Drainage structures (culverts / catch basins / inlets / ditches / under drains)
- Site control structures (fences / dikes / walls)
- Rights-of-way
- Vegetation (existing trees and forested areas / meadow areas / farmland)
- Soils and limiting subsurface conditions
- Boundaries of existing riparian buffers
- Other site features that may have and impact

A Site Plan showing the existing and proposed improvements will be developed.

1. One colored rendering of proposed site plan (to same scale as base maps) with associated digital file will be provided.
2. The following will be shown on the plan.
 - Park Name
 - Name of municipality/owner
 - Scale / North Arrow / Date / Legend
 - Seal of designing landscape architect registered in Commonwealth Pennsylvania
 - Acreage of site
 - Site boundaries lines
 - All uses, facilities and structures proposed for the site.
 - Existing structures and facilities that are proposed to remain on the site.
 - Proposed site topography to accommodate proposed development of the site (minimum of three foot contour interval, two foot contour preferable)
 - Circulation patterns (proposed access roads / service drives / parking / trails / walks / ramps / paths and bridges)
 - Natural and man-made barriers
 - Water features (streams / rivers / ponds / lakes)
 - Wetland areas
 - Floodplains (delineate floodway and 100 year flood level)
 - Major drainage structures (culverts / catch basins / inlets / ditches / under drains)



Brady's Run County Park, Brush Creek County Park, and Old Economy County Park

- Site control structures (fences / dikes / walls)
- Rights-of-way
- Vegetation (trees and forested areas / meadow areas, farmland)
- Boundaries of existing riparian buffers
- Notations and legends necessary to fully explain the size, type and location of any proposed use, feature, or facility.

J. Draft Product

A cd of the draft report will be provided to the Study Group. A second round of draft cd's will be provided to BCPC before proceeding to completion of the master plan. 75 digital copies and 4 hard copies will be provided to BCPC for distribution to adjacent municipalities.

K. Final Products

1. The final reports shall consist of a coil bound master plan report beginning with an executive summary followed by clearly labeled sections for each plan component, along with the final version of the master plan. The final master site plan will cover all scope of work tasks in a logical order.
2. Deliverables shall include:
 - 33 black and white copies (one unbound for duplication) (11 for each park)
 - 6 sets of full-size plans (existing and proposed) (for each park)
 - 9 digital copies of both narrative and maps provided (3 for each park)



- Historic features on site, if any
- Known environmental features
- Soil types from county soil survey
- Vegetation
- Wetlands (this is not a jurisdictional determination but a field view to determine if there are wetlands that will impact future development)
- Floodplains
- Riparian buffers
- Site access
- Zoning
- Deed restrictions
- Easements that limit use

2. Analysis of how the physical features impact on potential uses.

- a. The advantages/disadvantages of the site for certain uses.
- b. Areas that may not be suitable for public use and/or need special environmental protection or irrigation.
- c. other use limiting aspects of the site.
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1. Describe the areas and facilities to be developed and the recreation activities to be offered at each park, based on public participation, previous planning work, and needs assessments.
2. For each area / facility to be developed and activity to be offered:
 - a. Describe the level of activity for:
 1. entry level participation and introduction of users to basic skills.
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 4. competition play
 5. level of use by spectators.





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Meeting Minutes

Beaver County Parks Master Plans

Community Advisory Committee Meeting One

Meeting Date and Time:

1:00 pm, January 9, 2007

Meeting Location:

Beaver County Office on Aging Conference Room
1020 Eighth Avenue, Beaver Falls, PA 15010

Attendees:

- | | |
|---------------------|--------------------------|
| Mr. Doug Berg | Ms. Laura Rubino |
| Mr. Jim Camp | Mr. John Scherfel |
| Mr. Patrick Geho | Mr. Dick Smith |
| Mr. Brian Hayden | Ms. Charlotte Somerville |
| Mr. Jack Hilfinger | Ms. Beverly Sullivan |
| Mr. Frank Mancini | Reverend Bernard Tench |
| Ms. Suzanne Modrack | Mr. Joe West |
| Mr. Mike Romigh | Dr. Dan Woods |

The following represents a brief review of discussions held during the above meeting:

- 1.1 The meeting began with Buerkle thanking everyone for agreeing to participate on this steering committee. Buerkle noted it is an important role as members will establish a vision for the future of Bradys Run, Brush Creek and Old Economy Parks, as well as provide input, and serve as a sounding board for the plans' recommendations as they are developed.
- 1.2 Buerkle reviewed the following agenda for the meeting:
 - 1. Introductions
 - 2. What is a Master Plan
 - 3. Review of the Scope of Work
 - 4. County Vision for the Park System
 - 5. Current Park Use
 - a. Who currently uses the parks and why?
 - b. Who isn't using the parks? Why.
 - 6. Next Meeting



- 1.3 Buerkle asked each attendee to introduce themselves and to note what organization they are affiliated with, if any, and to offer comments on how they feel about the parks. The following comments on the parks were offered:
- a. Old Economy was a wonderful resource as I grew up. I spent a lot of time at the swimming pool.
 - b. Its nice to have indoor and outdoor recreation opportunities available at Bradys Run. The park provides everyone with a place to recreate, even during bad weather.
 - c. Brush Creek provides good bird watching opportunities.
 - d. The Beaver County Senior News can serve as a venue to highlight the planning process, as well as solicit input from the County's seniors with regards to their recreation desires.
 - e. Beaver County's park infrastructure and buildings are in poor shape. The capital budget for park improvements was eliminated several years ago and the maintenance budget is limited. Park roads are in very bad shape and need to be repaved.
 - f. The County has developed a forest management plan. The plan recommends selective harvesting of timber in the parks, and returning the revenue generated back into the parks. I do not expect the plan to be implemented however.
 - g. Bradys Run Handicap Fishing area has changed my father's life. It has allowed him to continue a hobby that he has always enjoyed.
 - h. County parks are under funded. We need a mechanism to ensure improvements can be made. The County has made some strides in recent years. However, there are many more projects than need to be undertaken to maintain what we have.
 - i. We are fortunate to have different types of parks to meet different recreation needs. Bradys Run meets the active recreation needs, Brush Creek meets passive recreation needs, and Old Economy meets the swimming needs of residents. We also have Raccoon Creek State Park in the County which is a wonderful asset to County residents.
- 1.13 The date for the next steering committee meeting was set for 11:30 am, March 8, 2007, at the Beaver County Office on Aging Conference Room, at the Beaver County Human Services Building, 1020 Eighth Avenue, Beaver Falls, PA 15010.

In an effort to be conscious of our impact on the environment, Pashek Associates has chosen to deliver this document in a digital format. If you are unable to retrieve the attached file, or desire a hard copy of this file and the referenced attachment(s), please email me your request at jbuerkle@pashekla.com.

The information contained in these minutes was recorded by Pashek Associates and represents our interpretation and understanding of the discussions that occurred during the meeting.

Prepared by:

John O. Buerkle, Jr., RLA, AICP
Tuesday, February 27, 2007

Distribution: Attendees
Study Committee Members

AGENDA

BEAVER COUNTY PARK MASTER PLANS STEERING COMMITTEE MEETING TWO Thursday, March 8, 2007

1. Introductions – 5 minutes
2. Review Site Analysis for Each Park – 45 minutes
 - a. Condition of Existing Facilities
 - b. Potential Improvements and Opportunities
3. Discussion – 15 minutes
4. Key Persons to Contact – 10 minutes
 - a. Ten per park
5. Next Meeting

Project Contact:

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Username: BC

Password: Parks



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SITE DESIGN,
RECREATION PLANNING,
LANDSCAPE ARCHITECTURE,
COMMUNITY PLANNING,
ZONING



Meeting Minutes

Beaver County Parks Master Plans

Community Advisory Committee Meeting Two

Meeting Date and Time:

11:30 am, March 8, 2007

Meeting Location:

Beaver County Office on Aging Conference Room
1020 Eighth Avenue, Beaver Falls, PA 15010

Attendees:

- | | |
|---------------------|------------------|
| Mr. Doug Berg | Ms. Laura Rubino |
| Mr. Brian Hayden | Mr. Dick Smith |
| Mr. Jack Hilfinger | Mr. Joe West |
| Mr. Tom King | John Buerkle |
| Mr. Frank Mancini | Vince Rozzi |
| Ms. Suzanne Modrack | |

The following represents a brief review of discussions held during the above meeting:

- 1.1 The meeting began with Buerkle introducing Vince Rozzi, and explaining that the final surveys for Brush Creek and Bradys Run Parks were received and were available for review at this meeting. Buerkle then explained that this meeting would focus on the site analysis process for each park, and explaining the symbology found on the site analysis plans.
- 1.2 Rozzi then presented a slideshow (attached) explaining the process used to analyze each park site, including what characteristics of each park were analyzed and why. Buerkle and Rozzi explained that the site analysis plans represented broad ideas, and that a detailed list of conditions of individual existing facilities would be completed later in the project process.

After an explanation of the site analysis process, attendees discussed ideas for improvements to the three parks. Comments made during this discussion are summarized below:

- All three parks have several areas maintained as lawn that could be better left non-mowed to revert to nature, or possibly mown once or twice annually, coinciding with events using those areas.
- Maintaining less areas as lawn may upset some park users who are thinking primarily in terms of safety.
- Some areas could be planted with wildflowers and/or native warm-season grasses for aesthetic purposes.

- Park users need to be educated on the environmental, aesthetic, and financial advantages of maintaining less manicured lawn areas.

Brush Creek Park

- (especially at Brush Creek Park), An 8-foot to 10-foot wide lawn strip should be maintained along park roads for walkers.
- Many of these lawn areas are maintained simply because they have always been maintained and no one questioned it.
- Less mowing would mean significant savings by not having to pay workers overtime to mow in spring.
- The tennis courts in Brush Creek could be removed as they haven't been maintained (or used) for quite some time.
- There is potential to use some of the excess mowed areas in Brush Creek for a dog park. One spot may be where the unused tennis courts are now.
- Wetlands at Brush Creek are another example of areas that could be allowed to revert back to nature. Lawns immediately adjacent to small wetlands do not need to be maintained as lawn.
- An important note for all parks is that there are no restrictions for uses (it was previously thought that uses were restricted because the parks were built with Project 70 money years ago). Project 70 was a conservation-based initiative, but its funds carried no limitations in terms of what could / couldn't be built.

Bradys Run Park

- There is room for expansion of either the softball/baseball complex or the trail system in Bradys Run Park, just east of the existing ball field complex. Doug Berg stated that expansion has been an idea discussed for years. Ideally all the fields would be re-organized, but some of them would have to be kept open or they would lose all their users for an entire season.
- One idea is to have a 4-plex (4 fields in a radiating pattern) plus two more fields.
- Rozzi stated that DCNR frowns upon fields with incorrect orientation because the sun becomes a hazard for batters.
- We have some hills in the park, as well as tall tree lines that may prevent the sun from being a problem. Scheduling games at certain times of day may also help.

- The ball field complex at Brays Run could become the best in the area, especially since it is accessible from two directions (from Route 51, from Anchortown Road in Chippewa Township).

Old Economy Park

- The maintenance facility on the existing conditions plan is shown as not being on county property. We should double-check the survey for that park.
- The large flat area in the southwestern portion of the park is remote, and is suitable for expansion of the hiking / horse trails in the park, or possibly for construction of mountain bike trails.
- This area is inaccessible by vehicle, barring major earthwork.

1.3 Buerkle and Rozzi then asked the committee to help identify possible individuals and/or organizations that could be contacted as key persons for each park. Although the target number was 10 key persons per park, Buerkle explained that in some cases we make a larger list due to difficulty in contacting some individuals. The following list was given for each park:

Bradys Run Park

- Dave Hansen
- Doug Berg (Softball Association)
- Conservation District
- Beaver County Christian School (uses park for X-country running)
- St. Johns School (uses park for X-country running)
- Tom King to provide a list of non-profits using the park for fundraiser walks
- Local Officials
- Tennis Association
- Trout Unlimited (Pittsburgh Chapter) wanted to improve the fishery at Bradys Run Lake, some ideas for making the dam a bottom-release dam (whitewater habitat at base of dam is good for trout)
- Horseshoe Group
- Boy Scouts
- Bike Clubs - Bike Trails
- Master Gardeners
- Audubon?

Brush Creek Park

- Bonnie - Equestrian Horse Trails
- Conservation District
- Master Gardeners
- Local Officials

- Ted (superintendent in charge of park maintenance)
- Riverside School District - Football, Cross-country, Soccer Association
- Radio-controlled flying (in reclaimed mine area at north end of park) - no formal group but many individuals

Old Economy Park

- Bill Marvin
- Girl Scouts
- Master Gardeners
- Local Officials - Old Economy sponsors a 5K run their annually

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The information contained in these minutes was recorded by Pashek Associates and represents our interpretation and understanding of the discussions that occurred during the meeting.

Prepared by:

John O. Buerkle, Jr., RLA, AICP

Thursday, July 17, 2008

Distribution: Attendees
Study Committee Members

AGENDA

BEAVER COUNTY PARK MASTER PLANS STEERING COMMITTEE MEETING THREE Monday, July 9, 2007

1. Summary of Key Person Interviews - 10 minutes
2. Present Alternative Concept Plans for Each Park – 45 minutes
3. Discussion - 45 minutes
4. Next Steps:
 - a. Public Input Sessions – Tentative dates

Old Economy - August 20
Bradys Run – August 21
Brush Creek – August 22
 - b. Development of draft master plans
 - c. Study Committee Meeting Four

Project Contact:

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SITE DESIGN,
RECREATION PLANNING,
LANDSCAPE ARCHITECTURE,
COMMUNITY PLANNING,
ZONING



Meeting Minutes

Beaver County Parks Master Plans

Community Advisory Committee Meeting Three

Meeting Date and Time:

10:00 am, July 9, 2007

Meeting Location:

Beaver County Office on Aging Conference Room
1020 Eighth Avenue, Beaver Falls, PA 15010

Attendees:

- | | |
|----------------------|------------------|
| Mr. Dan Dishler | Ms. Laura Rubino |
| Mr. James Camp | Mr. Patrick Geho |
| Ms. Beverly Sullivan | Mr. Joe West |
| Mr. Frank Mancini | Mr. Dan Woodske |
| John Buerkle | Vince Rozzi |

The following represents a brief review of discussions held during the above meeting:

- 1.1 The meeting began with Buerkle reviewing the meeting agenda (attached).
- 1.2 Rozzi then summarized the key person interviews for each park, briefly describing the questions asked to each interviewee, and their responses. Key issues mentioned by interviewees included the following:

Bradys Run

- Horseshoe Courts would benefit from relocation
- Our staff and funding are spread very thin
- Directional signage, trail maps, and trail rules are needed
- An 8-mile bike loop is possible within the park, with only approximately 1/2 mile of trail yet to be built, and a very short distance of on-road bike lane (several hundred feet).
- Reorganization / Expansion of the ball field area is a good idea, but raises concerns about closing fields and losing participants for an entire year.

Brush Creek

- Divots from horseback riders in the ball field outfields are hazardous to sports players on all teams
- Parking for horse trailers would be great for horseback riders
- Trails need signage to denote park trails vs. unauthorized trails

- Better maintenance is needed on the ball field infields -- there is a drainage problem in the southern ball field's infield
- Trails in the park need surface improvements (to stop erosion) and signage
- Illegal ATV access at the park is worst in the northern end of the park (in the reclaimed strip mine area) and on the western edge of the park on the hillside above the maintenance building.

Old Economy

- The park entrance is hard to find. Visitors need signage on Route 65 directing them to the park, and the park entrance should be more visible.
- The play equipment in the park is outdated and the pavilions are in need of repair.
- More attention needs to be given to the park -- all attention and funding goes to Bradys Run Park.

1.3 Attendees then discussed the issues raised for each park as they were reiterated during presentations of the respective concept plan for each park. Comments made during the discussion are summarized as follows:

Bradys Run

- The proposed bike loop could be extended through the area near the boat launch because everyone parks across Bradys Run Road anyway, the bike lane would not be in their way. (Buerkle explained that general access to the boat launch would not be a problem, but handicapped access may be an issue if the bike loop is constructed there)
- The County will soon apply for grant funding to pave the old park maintenance road (referred to as the "fire road") for use as a bike trail -- while maintenance vehicles would still be allowed on it.
- Volunteer labor or public works labor could be used to obliterate unsustainable trail segments within the park.
- Eliminating the small parking area / turnaround across Bradys Run Road from the ice arena is a good idea (the proposed elimination of this lot coupled with extension of the park trail to the main ice arena parking lot would force trail and walking track users to park in the main lot)
- Who should run the concession stand at the ball field facility? Rozzi explained that in a similar situation on another project, a municipality had decided to staff the

concession stand themselves and devote all proceeds to township-funded improvements to the adjacent ball fields.

- Attendees agreed that fees should be paid by baseball and/or softball leagues to use the fields, despite the fact that fees have not been charged for the use of the Bradys Run fields in the past.
- Fees are especially needed if the fields are to be lit -- the leagues should pay the lighting bill, not the County.

Brush Creek

- The original intent of the Brush Creek master plan should be kept in mind - a rustic natural setting. The proposed fences on the ball fields would confine that space rather than leave it open as it is now.
- The horseback riders have trails in the park that they can use - the fields are not part of that trail system are they? (referring to the complaints of divots in ball field outfields caused by horseback riders)
- All illegal ATV access is not going to be stopped, but obliterating unauthorized trails and posting more signage will curb it. Eliminating authorized trail access to the park will also help (i.e. a park trail extends directly to route 588 east of the park entrance)
- In the original winter recreation area master plan for Brush Creek Park, use of the creek water for snow-making was proposed, but was ruled out due to difficulty with permitting. A portion of the proposed water line for this area extends from Route 588 onto the park property past the existing rental house in the park's southwestern corner.
- The proposed pavilions are a good idea. A lot of people go to the park to picnic, and to have no picnic space under roof is foolish.
- The County has a choice to make regarding designating use areas within the park. Although the original park was rustic and very open, the current uses of the park (i.e. softball) may merit designated spaces such as those that would be created if the fields were fenced.
- Picnickers could still gain access to the fields on certain days of the week. That is a matter of proper scheduling. Leagues might only be allowed to have the field during the week in the summer.

Old Economy

- The County should consider acquiring property or reaching an agreement with landowners at the corner of Route 989 and Forcey Drive to make a more visible entrance to the park.

Buerkle then presented tentative dates for the public input sessions to be held at each park:

Old Economy Park - August 20th

Bradys Run Park - August 21st

Brush Creek park - August 22nd

Buerkle also explained that comments from today's meeting would be taken into account when revising the concept plans into draft master plans that would be presented at the public input sessions.

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The information contained in these minutes was recorded by Pashek Associates and represents our interpretation and understanding of the discussions that occurred during the meeting.

Prepared by:

Vincent M. Rozzi, RLA

July 9, 2007

Distribution: Attendees
Study Committee Members



Meeting Minutes

Beaver County Parks Master Plans

BRADYS RUN PARK - Public Meeting #1

Meeting Date and Time:

7:00 pm, August 21, 2007

Meeting Location:

Bradys Run Park Ice Arena

PITTSBURGH

619 East Ohio Street
Pittsburgh, PA 15212



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MERCER COUNTY

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Attendees:

Joe West
Tom King
Brian Hayden
Jim Camp
Greg Powell
Jim Shaner
Dan Rubino
Terri Miller
Vince Rozzi

Dave Hansen
Frank Mancini, Jr.
Jack Hilfinger
Marlin Erin
Danny Paraivik
Dick Smith
Laura Rubino
John Buerkle

The following represents a brief review of discussions held during the above meeting:

- 1.1 The meeting began with Rozzi introducing himself and John Buerkle, and explaining what a master plan is, and why it is being undertaken for the park. Rozzi explained that a master plan is NOT a set of construction documents, but rather a set of concepts or ideas of what recreation improvements need to be made at the park.

The master plan, said Rozzi, will prove to grant funding agencies that the County has done its homework to find out what recreation facilities its residents want and need, as well as what management, maintenance, and operations improvements are needed. The main reasons for doing a master plan are to give direction to further development at the park and to attract future grant funding for construction of improvements proposed in the master plan.

Rozzi explained further that the master plan creates a long-term "vision" for the park, and that while some projects the master plan proposes may take place in the next few years, the "vision" is looking 10 to 15 years down the road. At that time, an update of the master plan may be needed because recreation needs may have changed.



1.2 Rozzi then briefly reviewed the existing conditions and site analysis plans, explaining the inventory and analysis process undertaken as part of the master plan. Two open areas in the park, Rozzi explained, provide easily-recognizable opportunity for development of recreation facilities. Major limiting factors of the park site include topography, remoteness (safety), and ability to maintain such a large amount of facilities.

1.3 Rozzi and Buerkle then said that the purpose of tonight's meeting is to gather information on what attendees think is needed in the park. Input from those that regularly use the park very valuable to the master plan and will enable Pashek Associates to make more informed recommendations. Attendees were then asked to state what they would like to see improved in the park. Responses are summarized below:

- We have an opportunity to create a continuous bike loop path around the park
- Mountain bike paths in the park are already a regional destination that we should build on
- We should capitalize on the bike path opportunities within the park - we especially need a relatively flat, recreational bike path that can be used by all ages and abilities
- A shared use path for walking and biking is another idea
- We sorely need an additional baseball field - the one (legion) field at the ball field complex is overused
- Another possibility is a multi-use field for soccer / football / baseball practices
- The ball field complex needs city water - the fields are too high up on a hill for a well to provide adequate water for the fields
- We should light the fields to expand their use
- Roads and parking for the ball fields need improved
- There is 85 acres of flat land in the northernmost part of the park property, accessible from James St. in Chippewa Township - this would be perfect for the soccer fields everyone has been asking for.
- Use of the existing tennis courts is increasing and we have room for additional courts near the existing outdoor courts.
- Enhancements need to be made to the tennis court area - a shaded shelter or gathering area just for players to rest would keep people there. Right now there is nowhere to sit and rest, no nice landscaped area to gather in, so people leave right away.
- The Lodge needs a new entrance bridge and also a second exit - right now those at the lodge during floods must use the old maintenance road to leave because the creek floods over the bridge
- More horse stables are needed, and possibly more parking for those with horse trailers
- A campground would be well-used
- Restrooms around the park need to be upgraded, whether with plumbing, or with newer self-mulching restrooms
- A mountain bike park (not just trails) would bring in revenue - Seven Springs has opened one and people drive hours to use and pay \$25 a day to do so.

- It will take a lot of money, but we should fix one of the mainstays of the park - the lake - along with the stream and bath houses
- A catch-and-release trout area was mentioned, created by using the bottom release on the existing dam (water would exit the lake from the bottom, creating colder water downstream environment). But the fish commission evaluated the situation and stated that the lake is too shallow for that idea to work. The entire water column is warmed by the sun during summer months.
- The state roads in the park are a disgrace - PennDOT needs to fix them badly.
- We need to respect our park better - keep it free from litter, prohibit camping out / drinking before the first day of trout season
- We lack the manpower to enforce rules concerning camping / littering, security, etc.
- Geese are becoming a major problem around the lake - we need to find some solution. No matter what we do to fix the problem we need to be ready to take criticism because somebody won't like it.
- An indoor soccer / multi-use facility would be a regional draw.
- The lodge needs upgrades such as better insulation, heat, and parking.
- Several residents have requested a sled-riding hill for children.

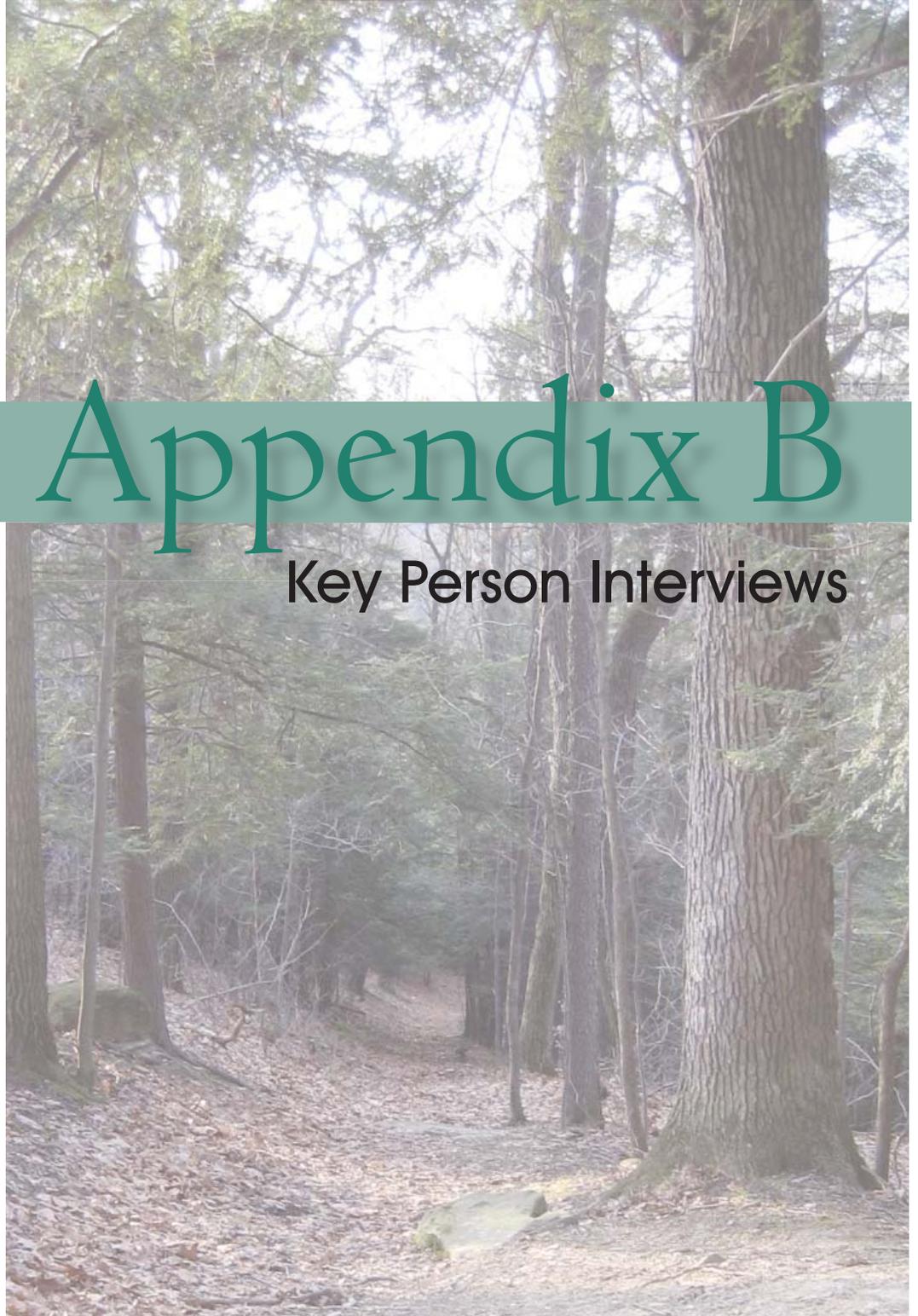
Buerkle and Rozzi then explained the next steps in the master planning process. Pashek Associates would use comments from tonight's meeting to develop a concept plan for the park. This concept plan would be shown to the project study committee, revised per their comments, and presented at the second public meeting, which would probably take place in November. The next public meeting will be held in the same room this one was held in, on the observation deck between the ice arena and indoor tennis courts.

Pashek Associates will also work to develop a cost estimate and phasing plan for the proposed park improvements, and will also prepare management and operations recommendations. The project will most likely be completed in December.

The information contained in these minutes was recorded by Pashek Associates and represents our interpretation and understanding of the discussions that occurred during the meeting.

Prepared by:

Vincent M. Rozzi, RLA
August 22, 2007



Appendix B

Key Person Interviews

BRADYS RUN PARK

Key Person Interview #1:

Bill Wiggins, Horseshoe Association

4/20/07

1) How many leagues use the horseshoe facility at Bradys Run Park? How many people (estimated) is that all together? How far away do people come from? Are there any other uses (rentals, etc.)?

We have one league, with 5 or 6 teams. Our league night is tuesday night, and all the teams come then. There's about 8 people per team, and most of the guys in the league are from nearby areas of Beaver County. We've had a few from distant areas like Canton, Ohio, but those people have to drive too far. They're not signed up this year. The courts (19 total) are open for public use during all times except tuesday night.

We've had a league since 1974 or 1975, and we still have some original members of that league. We start in the first week of May every year.

2) Is there any need to extend hours or expand the facility? Any need for more parking? What about for larger annual events?

The parking for the courts is fine. There's plenty. We have 4 or 5 tournaments a year and we have no problems then either. Our league usually uses 11 or 12 courts of the 19 courts, so no need for more courts. Even during the events we run tournaments over 2 days so we don't have to use all the courts. The public can still use a few.

Last year we held the state tournament and for that we had to use all the courts, but we don't host that every year.

We would like to enclose 4 or 5 courts so we could play in the winter. We don't have the money to keep leasing buildings to play in during the winter, and suitable buildings are few and far between.

3) I understand that you are experiencing some drainage problems at the horseshoe courts. Is this a recent problem or has it been occurring for a long period of time?

I've talked to the County Commissioners about this before, and they've promised to help us renovate the courts. If it rains during Tuesday before we play, it takes us an hour or an hour and a half to clean out the water just to play. So far we've seen no improvements made by the County. We would be open to moving the facility to a new, more high-profile place elsewhere in the park if renovations to the courts would cost too much. A more visible location might help us increase our membership.

BRADYS RUN PARK

Key Person Interview #2:

Jack Hilfinger, Assistant Park Foreman (Public Works)

Friday, 4/20/07

1) Describe the use at the indoor tennis courts. How many leagues use the courts? Do you hold any events / tournaments there?

We don't have a lot of leagues, but we have a lot of small groups reserve time. You can buy time at the courts either for a single use or periodic (i.e. each monday from 5-7 pm) sessions all season. We have lots of group and individual lessons, as well as high school matches and practices, and college matches. We've had Slippery Rock, Geneva, and even Clarion play home matches here.

In February we have two U.S. Tennis Association (USTA) tournaments, one for ages 12 & under and 14 & under, and one for 16 & under and 18 & under. We draw people from as far east as Philadelphia and as far south as Morgantown.

2) Describe the use of the Ice Rink. What types of groups use the rink? Are any events / tournaments held there? Is the parking adequate for event use?

We have all ages of people playing hockey, from 4-year olds to some over 50. We have youth leagues, JV and High School games and practices, and adult leagues. We also hold high school playoff games, and we have a hockey tournament in March for kids ages 10-17. A lot of our adult league players are active in coaching the young kids. From November through March we have two high school games (in one night) twice a week.

Figure skating and public skates are also big parts of the rink's use. We coordinate our events so that tennis and ice rink events aren't going on at the same time. This way there's no problem with the parking. It's more than enough.

3) I understand that there's many programs that use the park on occasion throughout the year. I've heard about the wildflower walks (is that Geneva College?) and the nature talks at Pavilion #12. Can you tell me a little bit about those programs or some others that use the park?

The Conservation District runs the nature programs at Pavilion #12, as well as the nature walks. They also run the Maple Syrup Festival in early April. This year we sold over 7,000 servings of maple syrup in 2 days, so it's quite an event.

Events like this happen in the park almost every weekend. We have baseball/softball tournaments. A cancer walk is held here annually. If it's dry, they use the outdoor 1-mile track. If it rains they use the track inside the tennis building. A motorcycle group holds a fundraiser for a police officer who was killed in the line of duty a few years ago in Aliquippa.

4) If you could improve anything about the park, what would it be?

Two things: Money and Manpower. More funding and more staff would make us able to offer more and better programs. As with most places, we're spread pretty thin.

BRADYS RUN PARK

Key Person Interview #3:

Marlin Erin, Bicyclist, Owner of Snitger's Bicycle Shop in Beaver, PA

Friday, 4/20/07

1) Do you or any of your customer's use the trails in Bradys Run Park? Who built the trails?

I ride the trails often, and also help maintain them. Many of the park trails were neglected hiking trails that were made by the boy scouts in the 1950's. In the 1990's, when mountain biking became more popular, a group of citizens spearheaded the effort to re-open these trails for mountain bike use. That group is the Beaver County Mountain Biking Club. Segments of the trails have been built by several different individuals since then.

Also, some of the trails are old road beds left from the time the park was built.

2) Upon site visits to the park, one opportunity we saw was the possibility of re-routing a few of the park's hiking / biking trails to make them more sustainable. In your opinion, would there be enough interest among local trail use groups to organize volunteer efforts to reroute trails and educate riders about sustainability?

Some of the bike groups maintaining the trail try to use International Mountain Biking Association (IMBA --- www.imba.com) standards to create sustainable trails for multiple users. Right now, a lot of park neighbors ride horses into the park from their barns on all sorts of days, including very muddy ones. This absolutely destroys the trail tread.

3) Another visible need along the trails is directional signage, distance markers, and possibly warning signage in challenging trail areas. Has this improvement been discussed among the biking community?

Yes. IMBA has signage for trails that tells users who should yield to who on the trails. For example, hikers yield to bikers, bikers and hikers yield to horses, etc. Snitgers Bicycle shop is prepared to donate the signs to the park to ensure safer riding.

4) Do other bicyclists use the park's roads? If so, have you heard of any improvements needed from an on-road cyclists standpoint?

Many bicyclists use the park roads. The roads are in terrible need of improvement. Malek Francis, the regional PennDOT bicycle and pedestrian coordinator, has toured the park with me to see the roads. Those are PennDOT-maintained roads. There are no shoulders anywhere along the park road and people often travel far above posted speed limits through the park. Once outside the park, traffic becomes much less of a problem.

I use North Park as an example of a well-designed state-maintained road. They have a 6-foot shoulder along their road so that people can ride their bikes or walk. Because of that, it has become a major destination for cyclists.

Also there is nowhere in the park that you can walk along the road with a stroller. That's a pretty bad situation for a park, and it needs to be addressed.

5) What improvements need to be made to the trails and/or roads in the park to make it better for bicyclists and mountain-bikers?

I've been asking the County Commissioners to make an 8-mile bike loop in the park. 7.5 miles of it is existing. It would take a half mile of new trail, and cleaning up of the existing trails to complete the loop. I think that loop would challenge the Moraine State Park bike trail for users. We already draw mountain-bikers from all over Beaver County and Northeastern Ohio to use the trails at the park.

The biggest improvement that is needed is advertisement. The county hasn't capitalized on the draw that the bike trails create. The county recently published a brochure mentioning all the recreation opportunities in the entire county, and the mountain bike trails weren't even mentioned. Because the Commissioners aren't tuned in to the user groups for trails, the economic opportunity presented by the trails flies under their radar. They don't understand the economic development that could occur if the trails were improved. It would be a tremendous regional draw.

We should be looking at what the Trail Towns along the Great Allegheny Passage trails are doing. They are realizing the opportunity that the trail brings to help their local economies. If we could get a trail from Beaver County down to Coraopolis, we could join up to the Allegheny Passage and be part of that network. That would take some serious effort at acquiring land along the rivers. There's no straight line rail alignment there for us to follow the entire route, but it is possible.

BRADYS RUN PARK

Key Person Interview #4:

Doug Berg, Beaver County Recreation Advisory Board, Softball / Baseball Representative

Wednesday, 5/23/07

1) Does one organization run all the leagues at the Bradys Run Softball/Baseball Complex?

The Beaver County Recreation Department acts as central liaison and coordinator of all organizational leagues at the complex. Each league has an appointed representative that coordinates directly with the Recreation Department.

2) How many leagues use the facility? Can you estimate how many people play?

Approximately 6-8 leagues, 10-20 teams per league, 20-25 players per team. Including spectators, fans, families, and support staff between 2,250-4,000 people weekly. Our league alone has 20 teams with 25 people contained on each roster for the summer season, we also have a separate fall season with 15 to 20 teams. Our league has members comprised mostly of County residents, however we have players that come from as far away as Pittsburgh, Butler, Ohio, and WV

3) Has expansion or reorganization of the ball field facility been discussed? (Regarding fields and access/parking). If expansion were to occur, what age group is in the most need of another field?

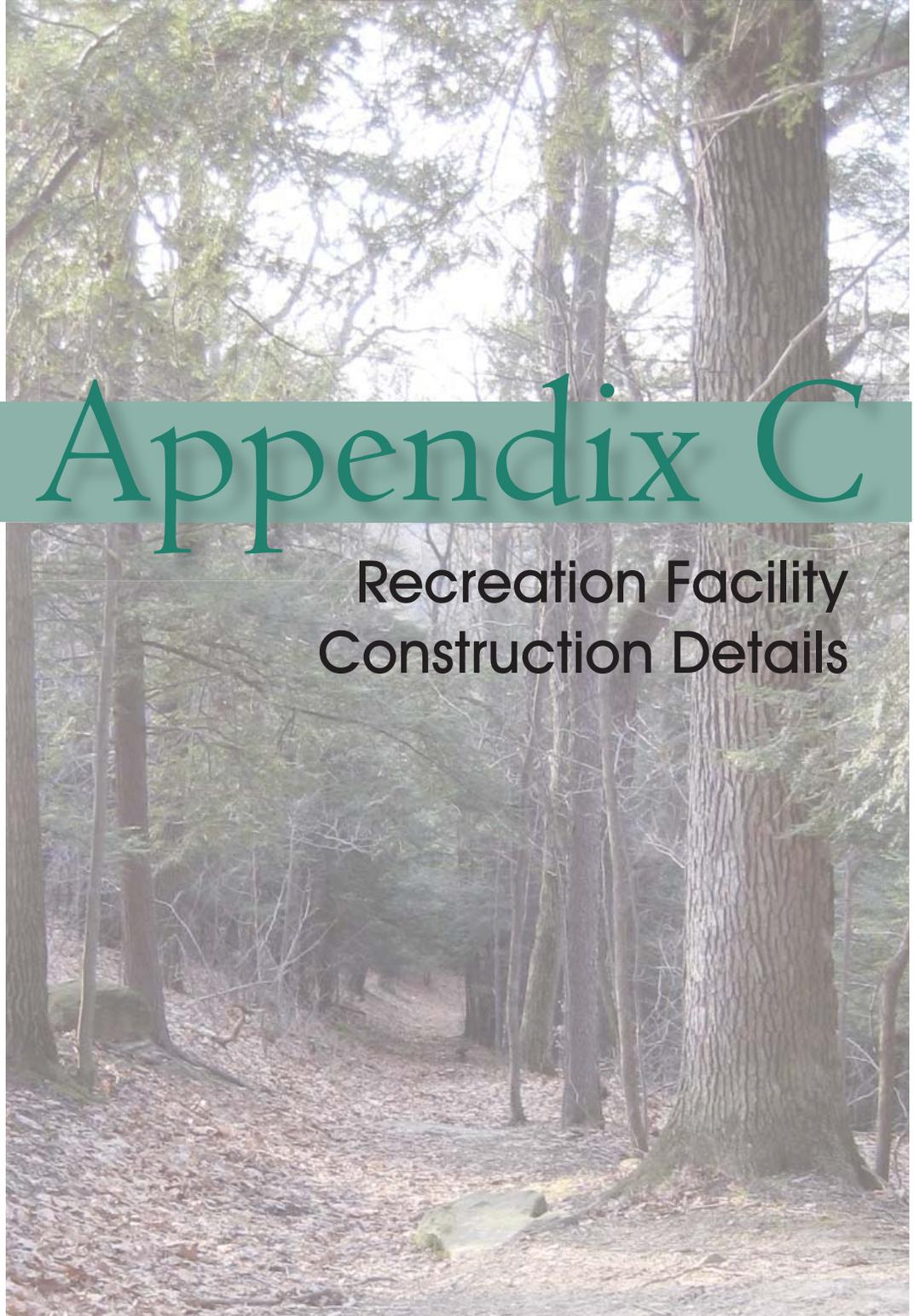
Yes, expansion and reorganization of the facility have both been discussed. The problem with reorganization is twofold, one being the most likely scenario would be to close the facility during construction. How many participants would we lose due to the construction? How long will the facility be closed? Two, the best use of space in reorganization would be to reconfigure the fields in a traditional wagon wheel ball field complex configuration. With a wagon wheel alignment our ball fields would lose most of the shaded areas that make our complex unique.

4) Bradys Run is considered a regional facility. What improvements would need to be made to ensure that the Bradys Run Complex is the premier facility in the region? What could be done to set it apart from other facilities in the area?

- We are in desperate need of another adult softball field, currently there are (3) fields suitable for competitive play, (4) are needed.
- Playground, with so many ball players and teams dedicated to Beaver County families, while games are being played there is no where for the children to congregate.
- Increased parking.
- Another baseball field.
- A youth field.
- At least one additional pavilion, possibly two.
- An improved central hub, concession stand, maintenance facility, storage, offices.
- Scoreboards, water lines to each field.
- Two major components that would set our facility apart from others, lighted fields, a walking, biking loop around entire facility.

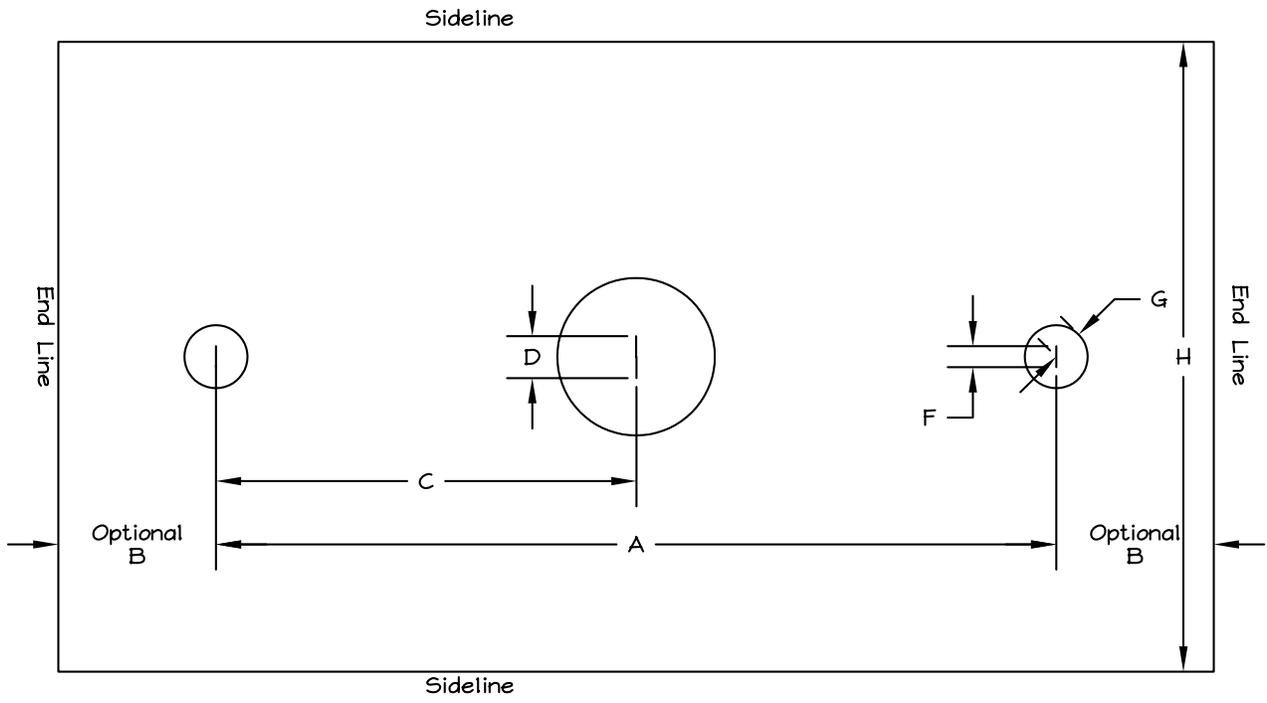
5) If you could make only one major improvement to the ball field complex (A- reorganization of fields, B-add a field, C-improve parking situation to plan for expansion) what would it be?

Completion of an additional adult competitive regulation softball field.



Appendix C

Recreation Facility
Construction Details



Lacrosse Layout

Not to Scale

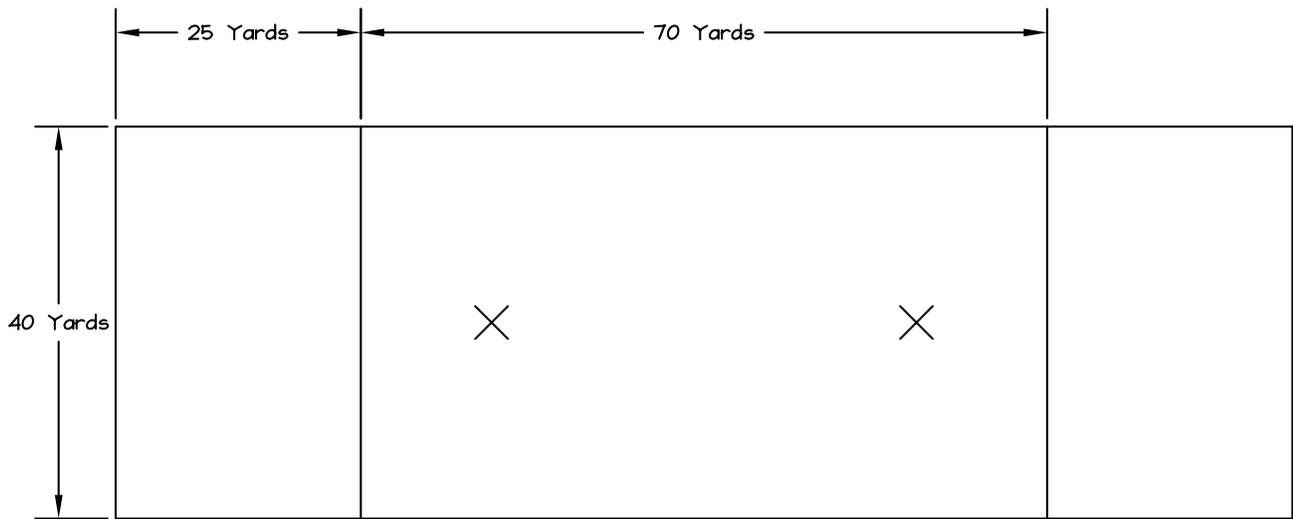
Women's and Girls Lacrosse		A	B	C	D	E	F	G	H
		Recommended							
Type of Field	Ages	Field Length	Field Width	Restraining Line	Goal Circles	Distance Behind Goal Lines	12 Meter Fan	8 Meter Fan	Center Field Circle
Women's (NCAA & US Lacrosse)		100yds	70yds	30yds	8.5' r	10yds	47' 9"	34' 9"	10yds
Girls (US Lacrosse)									
<i>Under 9</i>	6-8 (level C rules)	50yds	25yds		2m r	10yds		34' 9"	
<i>Under 11</i>	9-10 (level C rules)	50yds	25yds		2m r	10yds		34' 9"	
<i>Under 13</i>	11-12 (level B rules)	90yds	50yds	30yds	8.5' r	10yds	47' 9"	34' 9"	10yds
<i>Under 15</i>	13-14 (level A rules)	100yds	70yds	30yds	8.5' r	10yds	47' 9"	34' 9"	10yds

= Required Measurements

Women's Lacrosse Standards

Community Park Standards



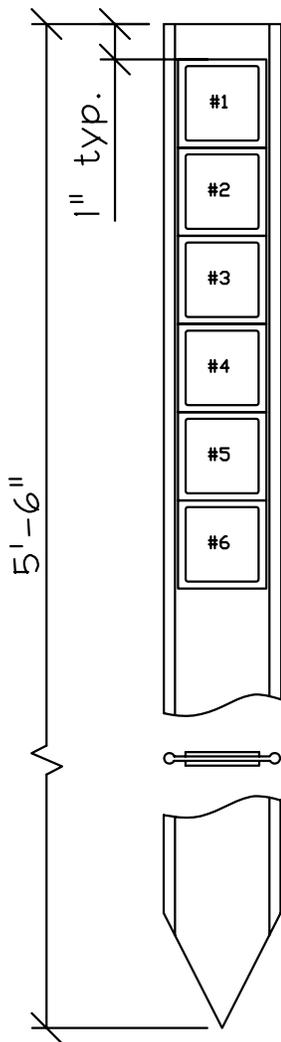


Ultimate Frisbee Field Layout

Not to Scale

Ultimate Frisbee Standards

Community Park Standards

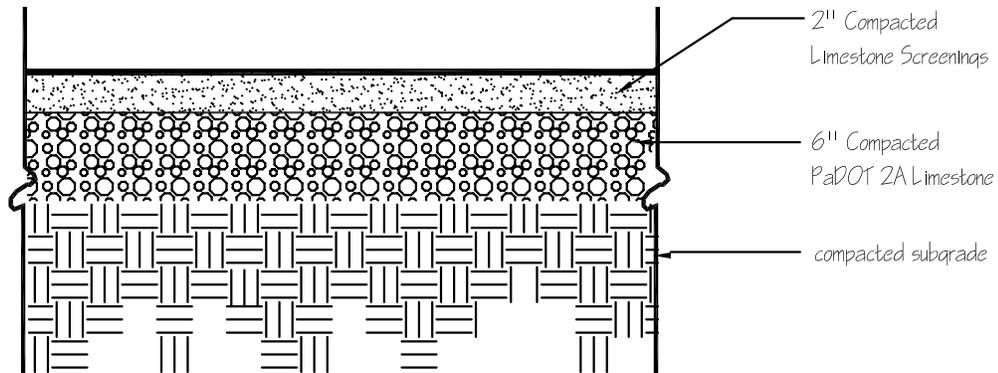


Carsonite #
 CIB-306603
 Dual Sided
 Trail Marker
 w/Decals
 @ 3" o.c. on
 both sides

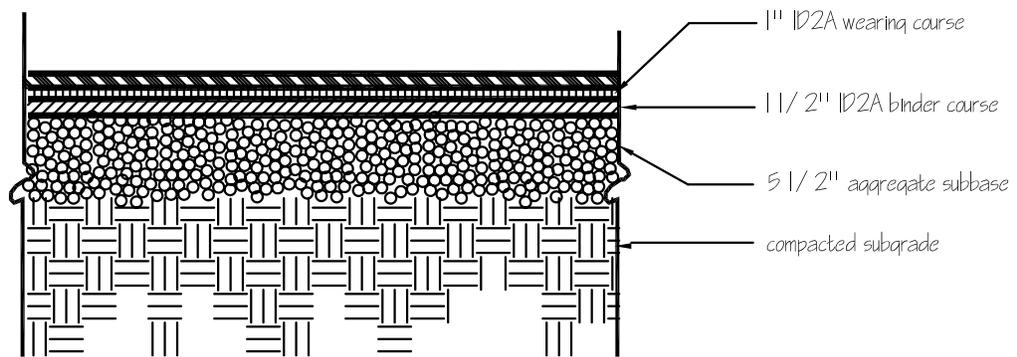
TRAIL MARKER
 SECTION
 (rotated 90 deg°)
 w/ decals both
 sides

Trail Mark Detail

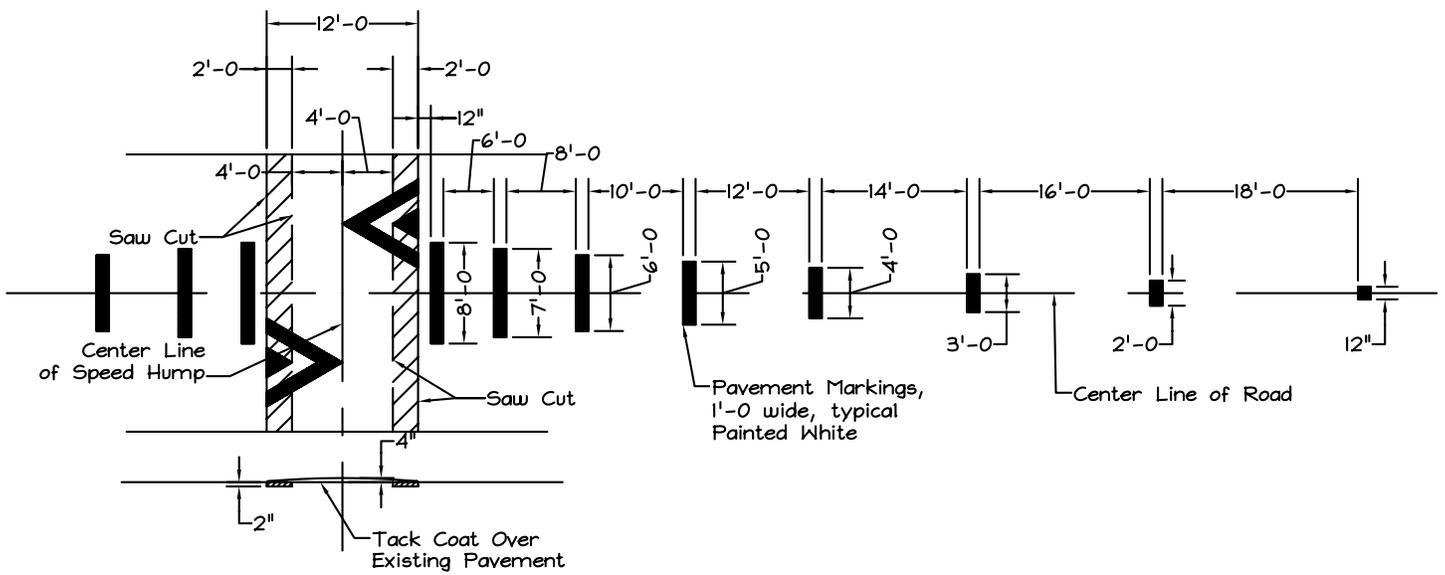
Not to Scale



Compacted Limestone Trail

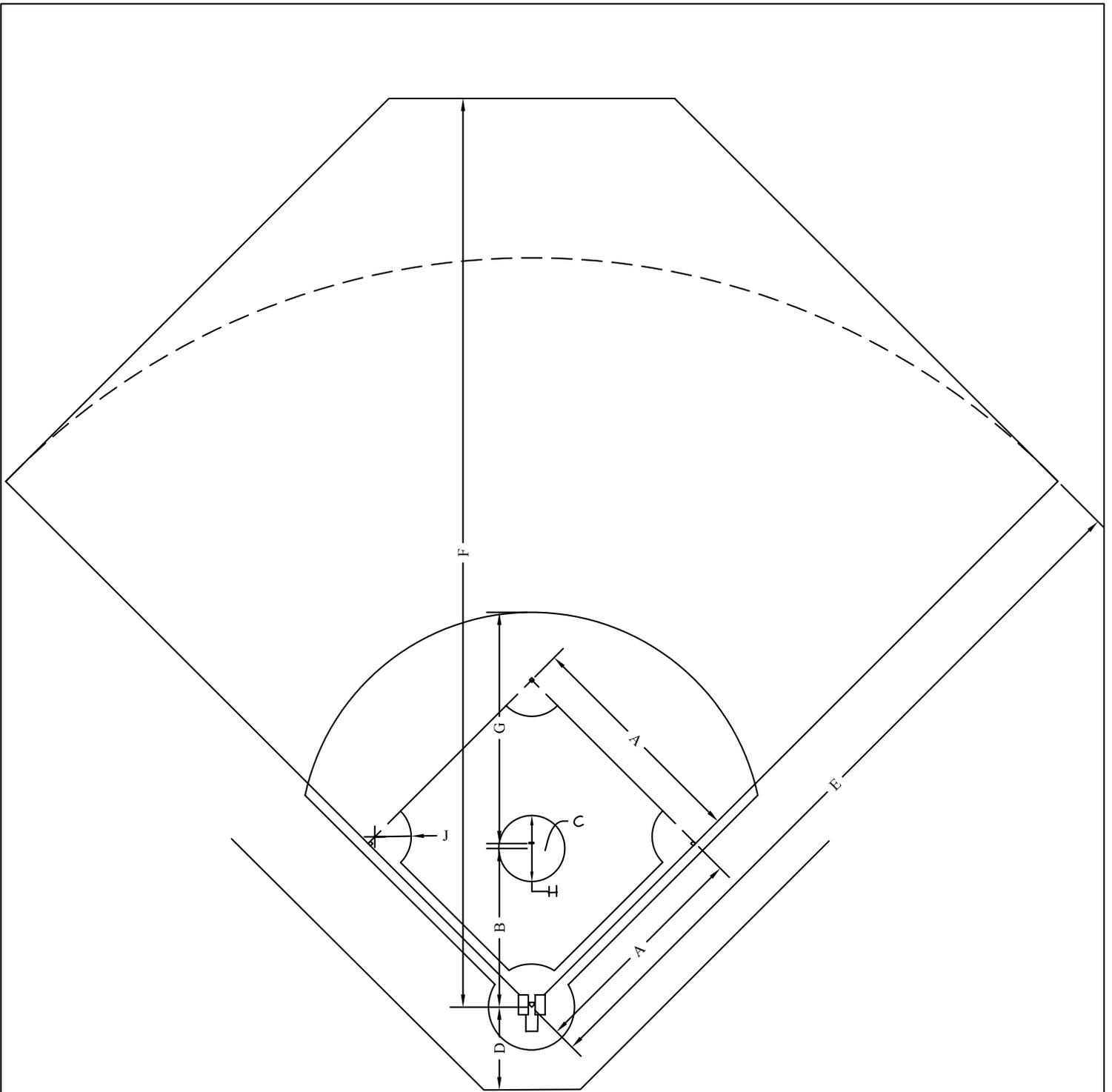


Bituminous Trail Paving Section



Speed Table & Approach Markings

Community Park Standards



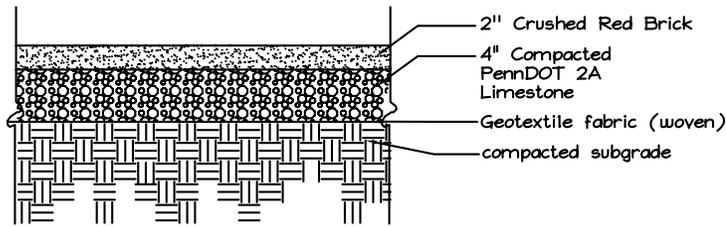
Softball Layout

Not to Scale

Softball Field Standards - Sheet One

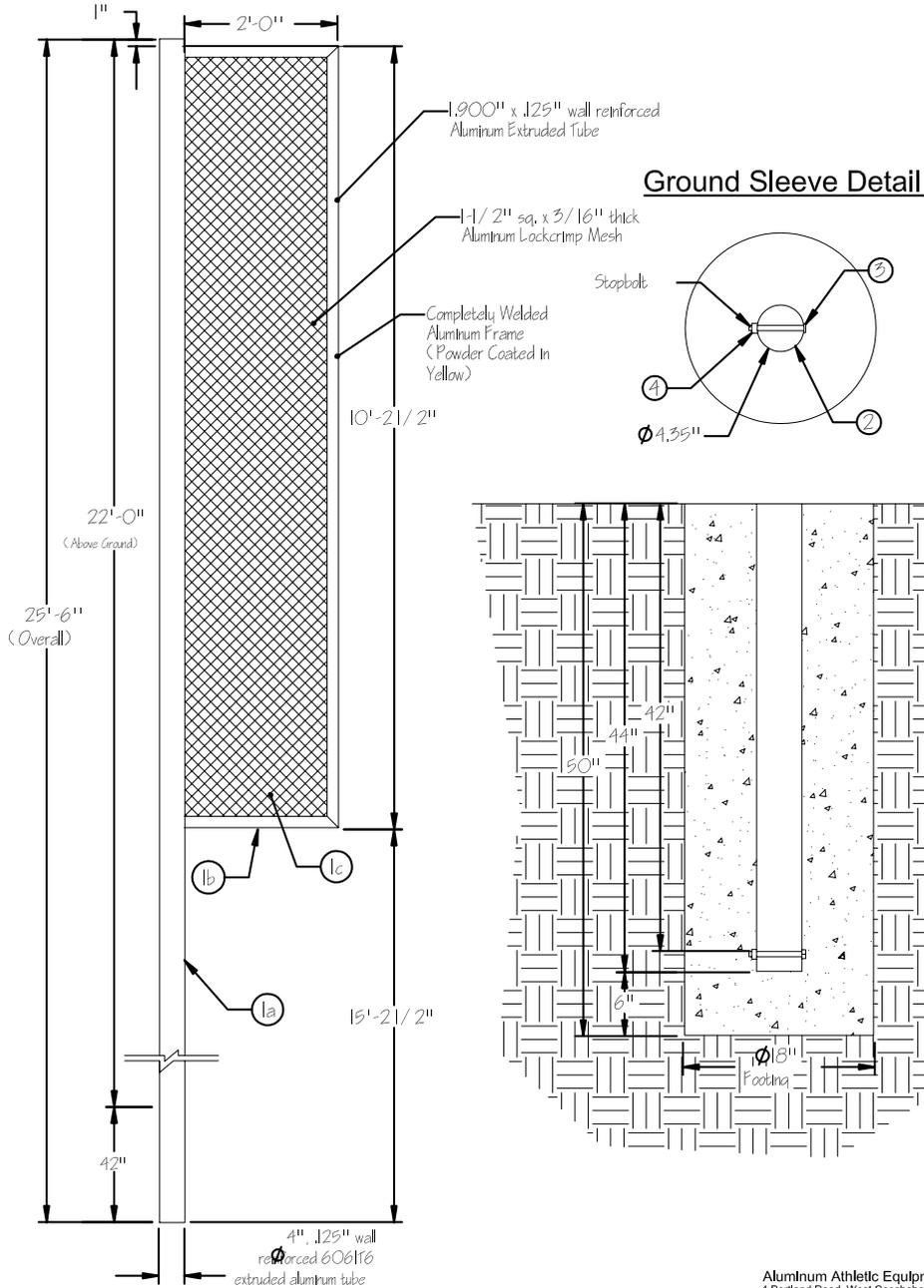
Community Park Standards





Warning Track

Not to Scale



Aluminum Foul Pole

Not to Scale

Aluminum Athletic Equipment
 4 Portland Road, West Conshohocken, PA 19428
 Phone: (610) 825-6565 Toll Free: (800) 523-6471
 AFP-22 - All-Aluminum Foul Pole

Ballfield Details - Sheet One

Community Park Standards

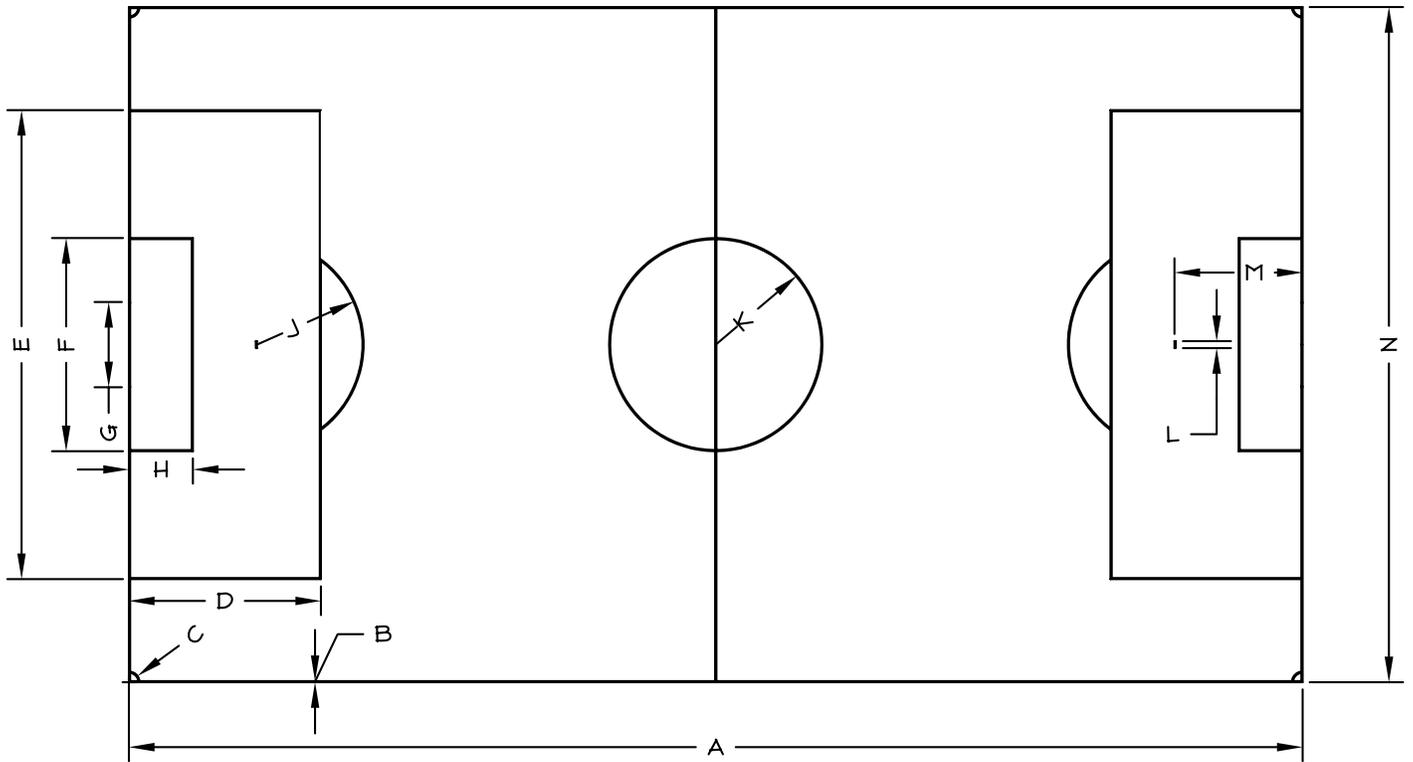
.....●▲■.....
PASHEK
 ASSOCIATES
 A Pennsylvania Corporation

League	Division	Bases	Pitching	Min. Fence	Max. Fence
American Softball Association Fast Pitch	Girls - 10 and under	60'	35'	150'	175'
	Girls - 12 and under	60'	35'	175'	200'
	Girls - 14 and under	60'	40'	175'	200'
	Girls - 16 and under	60'	40'	200'	225'
	Girls - 18 and under	60'	40'	200'	225'
	Boys - 10 and under	55'	35'	150'	175'
	Boys - 12 and under	60'	40'	175'	200'
	Boys - 14 and under	60'	46'	175'	200'
	Boys - 16 and under	60'	46'	200'	225'
	Boys - 18 and under	60'	46'	200'	225'
	Women	60'	40'	200'	250'
	Men	60'	46'	225'	250'
Jr. Men	60'	46'	225'	250'	
American Softball Association Slow Pitch	Girls - 10 and under	55'	35'	150'	175'
	Girls - 12 and under	60'	40'	175'	200'
	Girls - 14 and under	65'	50'	225'	250'
	Girls - 16 and under	65'	50'	225'	250'
	Girls - 18 and under	65'	50'	225'	250'
	Boys - 10 and under	55'	40'	150'	175'
	Boys - 12 and under	60'	40'	175'	200'
	Boys - 14 and under	65'	50'	250'	275'
	Boys - 16 and under	65'	50'	275'	300'
	Boys - 18 and under	65'	50'	275'	300'
	Women	65'	50'	265'	275'
	Men	65'	50'	275'	315'
	Major	70'	50'	275'	315'
	Coed	65'	50'	275'	300'
Super	70'	50'	325'		
American Softball Association Modified Pitch	Women	60'	40'	200'	200'
	Men	60'	46'	265'	265'
American Softball Association 16 In. Pitch	Women	55'	38'	200'	200'
	Men	55'	38'	250'	250'
American Fastpitch Association	10 & Under	35 ft.	60 ft.	150 ft.	175 ft.
	12 & Under	38 ft.	60 ft.	175 ft.	200 ft.
	14 & Under	40 ft.	60 ft.	175 ft.	200 ft.
	16 & Under	40 ft.	60 ft.	200 ft.	200 ft.
	18 & Under	40 ft.	60 ft.	200 ft.	200 ft.
American Fast Pitch Association Slo-Pitch	12" Men		50 ft.	65 ft.	300 ft.
	16" Men		50 ft.	65 ft.	225 ft.
	16" Women's		50 ft.	65 ft.	235 ft.
	Women's Class 'A'		50 ft.	65 ft.	275 - 325 ft.
	Women's Class 'B'		50 ft.	65 ft.	275 - 325 ft.
	Women's Class 'C'		50 ft.	65 ft.	250 - 325 ft.
United States Specialty Sports Fast Pitch	8 & Under	34 ft.	40 ft.	60 ft.	200 ft.
	9 & Under	34 ft.	40 ft.	60 ft.	200 ft.
	10 & Under	34 ft.	40 ft.	60 ft.	200 ft.
	11 & Under	37 ft.	40 ft.	60 ft.	200 ft.
	12 & Under	37 ft.	40 ft.	60 ft.	200 ft.
	13 & Under	40 ft.	46 ft.	60 ft.	200 ft.
	14 & Under	40 ft.	46 ft.	60 ft.	200 ft.
	15 & Under	40 ft.	46 ft.	60 ft.	200-225 ft.
	16 & Under	40 ft.	46 ft.	60 ft.	200-225 ft.
18 & Under	40 ft.	46 ft.	60 ft.	200-225 ft.	
United States Specialty Sports Fast Pitch	23 & Under	43 ft.	46 ft.	60 ft.	200-225 ft.
	Women	40 ft.		60 ft.	200-250 ft.
	Men		46 ft.	60 ft.	225-265 ft.

Softball Field Standards - Sheet Two

Community Park Standards





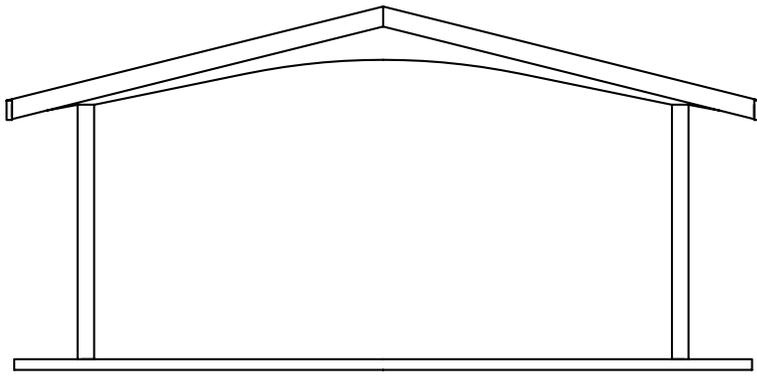
Soccer Layout

Not to Scale

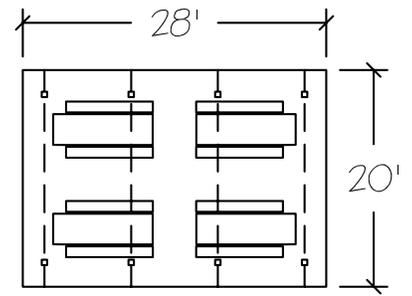
Soccer Field										
Type of Field	A	A	B	B	C	D	E	F	G	Notes
	Length, min.	Length, max.	Width, min.	Width, max.	Center Circle	Corner Arcs	Goal Area	Goal	Penalty Area	
<i>Federation Internationale de Football Association</i>	110 yards	120 yards	70 yards	80 yards	10 yds.	1 yd.	20 x 6 yds.	8 yds.	18 x 44 yds.	
<i>National Federation of State High School</i>	110 yards	120 yards	55 yards	75 yards	10 yds.	1 yd.	20 x 6 yds.	8 yds.	18 x 44 yds.	
<i>National Collegiate Athletic Association (NCAA)</i>	110 yards	120 yards	65 yards	80 yards	10 yds.	1 yd.	20 x 6 yds.	8 yds.	18 x 44 yds.	
U.S. Youth Soccer										
<i>6 and under</i>		25 yards		20 yards	3 yds.	2 yds.	n/a	4 x 6 ft.	n/a	3 on 3
<i>8 and under</i>		50 yards		30 yards	5 yds.	2 yds.	3 x 3 yds from goal posts	6 x 12 ft.	n/a	4 on 4
<i>10 and under</i>		50 yards		40 yards	8 yds.	2 ft.	6 x 6 yds from goal posts	7 x 21 ft.	n/a	5 on 5
<i>12 and under</i>		50 yards		40 yards	8 yds.	2 ft.	6 x 6 yds from goal posts	7 x 21 ft.	n/a	6 on 6
<i>14 and under</i>		60 yards		40 yards	8 yds.	2 ft.	6 x 6 yds from goal posts	7 x 21 ft.	n/a	7 on 7
<i>16 and under</i>		70 yards		50 yards	8 yds.	2 ft.	6 x 6 yds from goal posts	7 x 21 ft.	n/a	8 on 8
American Youth Soccer Organization										
<i>6 and under</i>		30 yards		15 yards						3 on 3
<i>8 and under</i>		50 yards		25 yards						5 on 5
<i>10 and under</i>		80 yards		40 yards						7 on 7
<i>12 and under</i>		90 yards		45 yards						9 on 9
<i>14 and under</i>	100 yards	120 yards	50 yards	80 yards	10 yds.	1 yd.	20 x 6 yds.	8 yds.	18 x 24 yds.	
<i>16 and under</i>	100 yards	120 yards	50 yards	80 yards	10 yds.	1 yd.	20 x 6 yds.	8 yds.	18 x 24 yds.	
<i>18 and under</i>	100 yards	120 yards	50 yards	80 yards	10 yds.	1 yd.	20 x 6 yds.	8 yds.	18 x 24 yds.	
Amateur Athletic Union Soccer Handbook										
<i>8 and under</i>		90 yards		60 yards						
<i>10 and under</i>		90 yards		60 yards						
<i>12 and under</i>		110 yards		60 yards						
<i>14 and under</i>		110 yards		65 yards						
<i>16 and under</i>		120 yards		75 yards						

Soccer Field Standards - Sheet Two

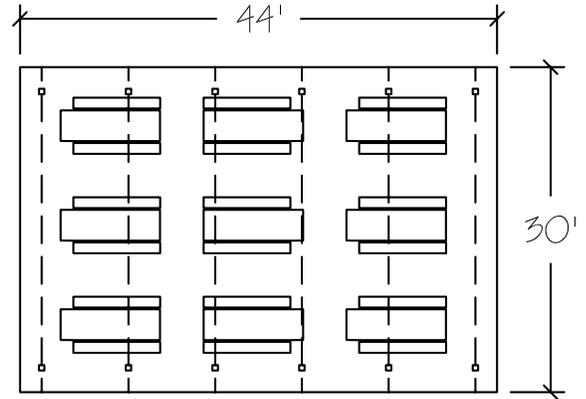
Community Park Standards



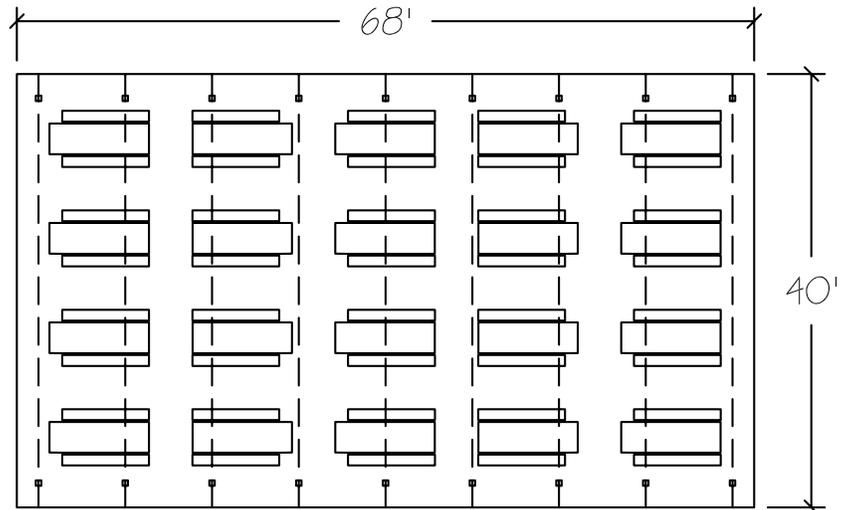
Elevation



Small Shelter
(capacity - 32 persons)
requires 11 parking spaces

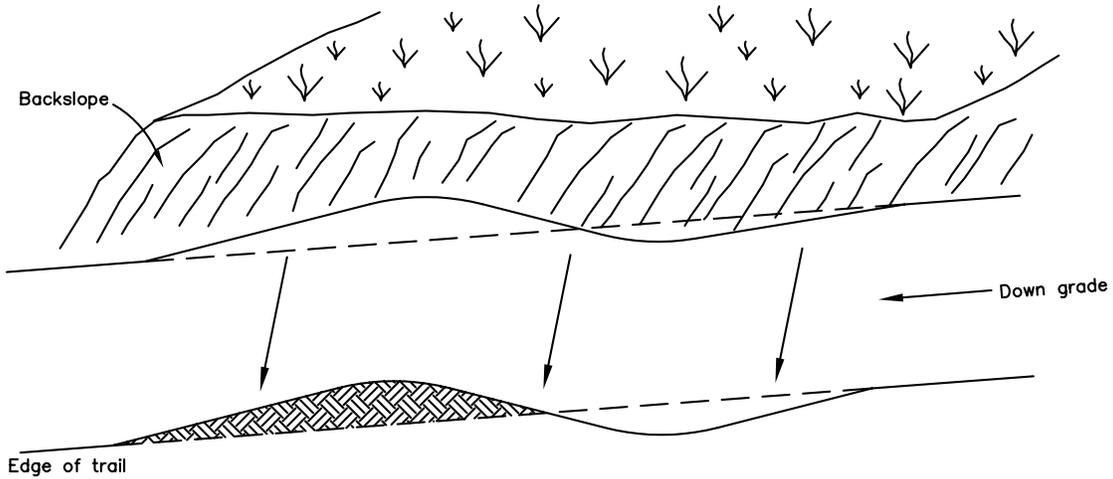


Medium Shelter
(capacity - 72 persons)
requires 24 parking spaces



Large Shelter
(capacity 160 persons)
requires 55 parking spaces

TRAIL SLOPE	AVERAGE DIP SPACING
2%	300'
3%	230'
4%	200'
5% to 10%	140'
11% to 20%	120'
21% to 40%	110'
40% to 60%	100'



PLAN VIEW

On sideslopes 15% or less use R-2 Rip Rap at dip bottom, 6" deep as shown in grade dip detail.



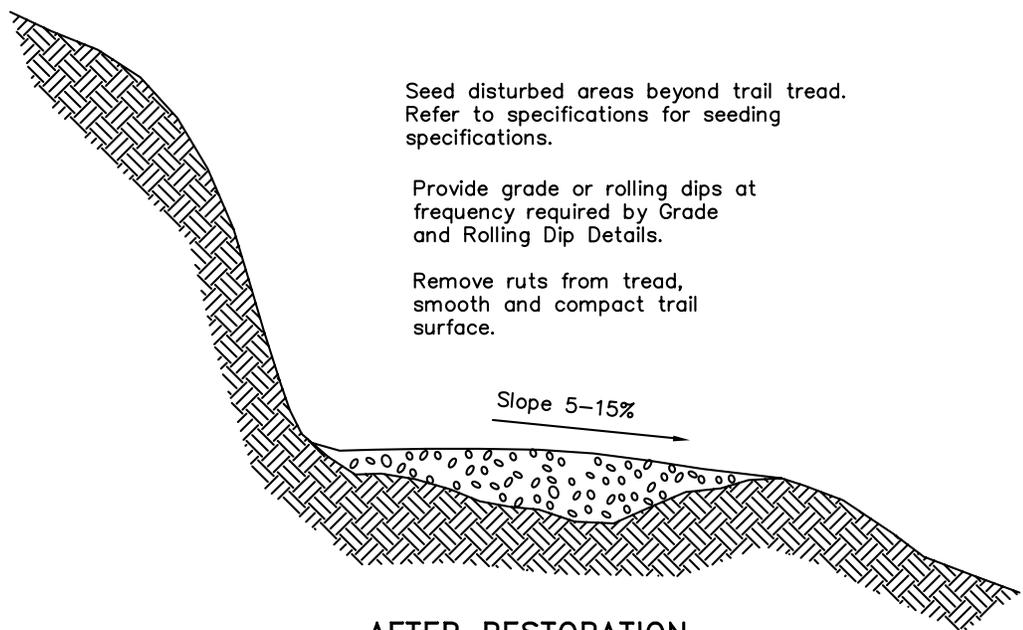
PROFILE

- Maintenance Notes:
1. Inspect and clean sediment trap within 24 hours of a run-off event.

Mountain Bike Trail Rolling Dip NOT TO SCALE

Mountain Bike Rolling Dip

Community Park Standards



Seed disturbed areas beyond trail tread.
Refer to specifications for seeding specifications.

Provide grade or rolling dips at frequency required by Grade and Rolling Dip Details.

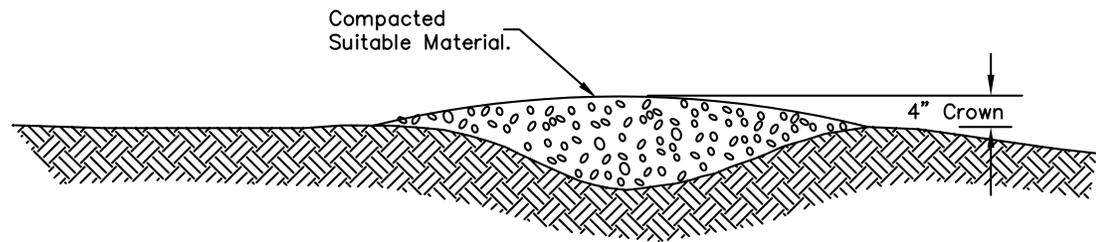
Remove ruts from tread, smooth and compact trail surface.

Slope 5-15%

AFTER RESTORATION

Provide grade or rolling dips at frequency required by Grade and Rolling Dip Details.

Remove ruts from tread, smooth and compact trail surface.



Compacted Suitable Material.

4" Crown

FLAT SLOPES

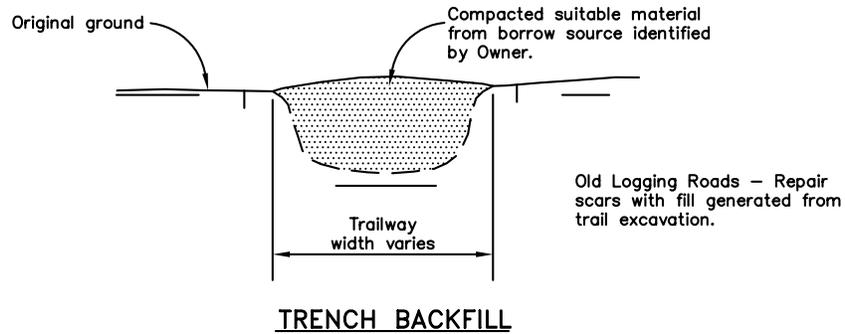
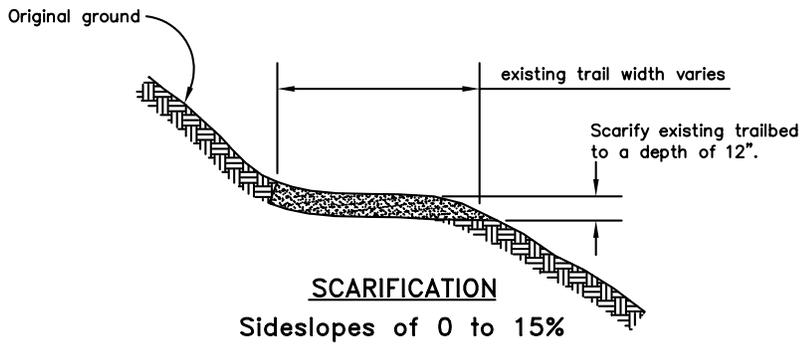
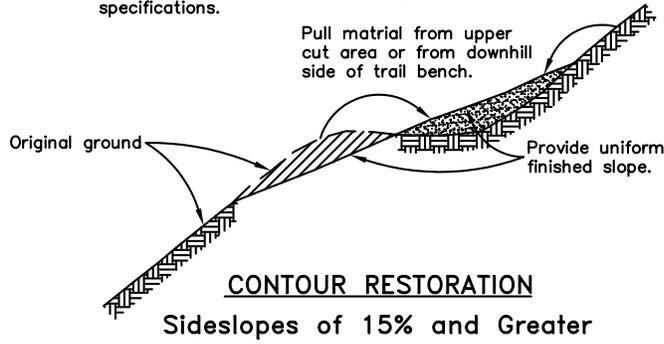
Existing Trail Restoration

NOT TO SCALE

Notes:

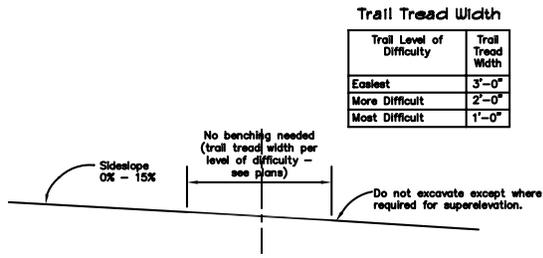
Where shown on the drawings obliterate trail, for a distance of 100' in each direction, from each side of new trail. Seed disturbed area as specified in the project manual.

Seed disturbed areas beyond trail tread.
Refer to specifications for seeding specifications.

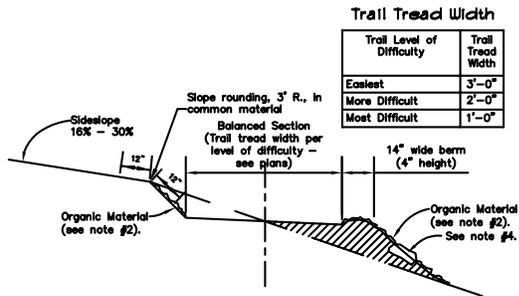


Trail Obliteration

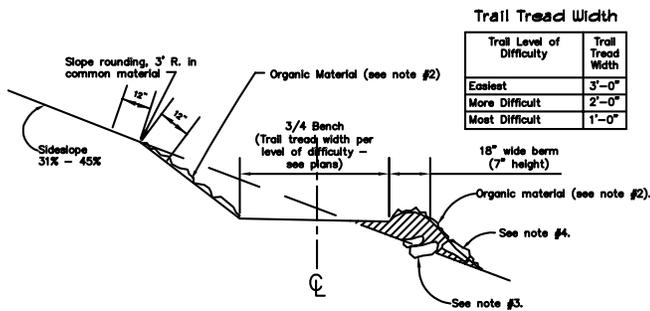
NOT TO SCALE



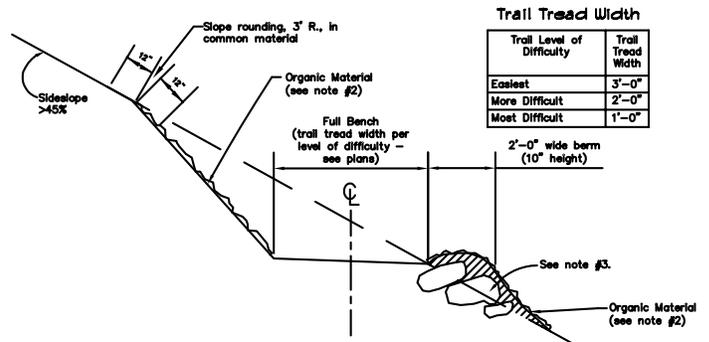
Trail Type 'A' - side slopes between 0% and 15%



Trail Type 'B' - side slopes between 16% and 30%



Trail Type 'C' - side slopes between 31% and 45%



Trail Type 'D' - side slopes Greater than 45%

Mountain Bike Trail Cross Sections

Not to Scale

GENERAL NOTES:

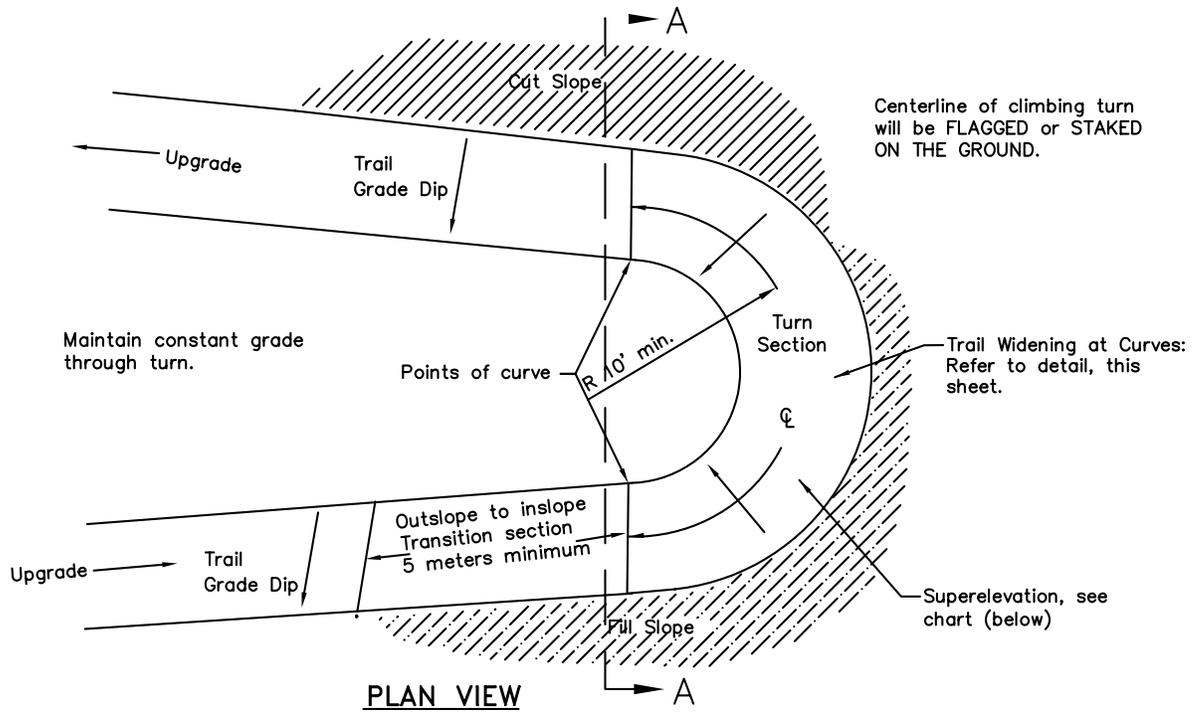
- 1) When proposed trail is located on existing road or trail refer to Trail Restoration Detail for construction requirements.
- 2) Provide rough surface to all fill slopes and cut slopes to promote natural revegetation.
- 3) Add 1" to 2" inches of organic matter (leaves, dead branches, etc.) to exposed fill slopes and cut slopes.
- 4) Key elongated rocks (excavated from cut above trail) into existing slope to reinforce bench.
- 5) Place several excavated rocks on surface of fill slope for natural appearance.
- 6) Remove any existing organic material before placing fill, and replace organic material atop fill.
- 7) For Superelevation:

Trail Level of Difficulty	Normal Trail Tread Width	Curve Radius			
		10'-0" or less	10'-0" to 20'-0"	20'-0" to 40'-0"	40'-0" or more
Easiest	3'-0"	5'-0"	4'-0"	3'-0"	3'-0"
More Difficult	2'-0"	3'-0"	2'-6"	2'-0"	2'-0"
Most Difficult	1'-0"	2'-0"	1'-6"	1'-0"	1'-0"
Superelevation (inches of superelevation per foot of trail width)		3"	2-1/2"	2"	1-1/2"

- 7) Remove all roots over 2" diameter that protrude from the cut slope
- 8) Maximum cut slopes shall be the lesser of a) 1:1 or b) twice the existing side slope.
- 9) Maximum fill slopes shall be the lesser of a) 50% or b) 1.5 X the existing side slope.
- 10) Provide Grade Dips or Rolling Dips as detailed on construction detail sheets at the specified intervals along the trails.
- 11) Seed disturbed areas beyond trail tread.
Refer to specifications for seeding specifications.

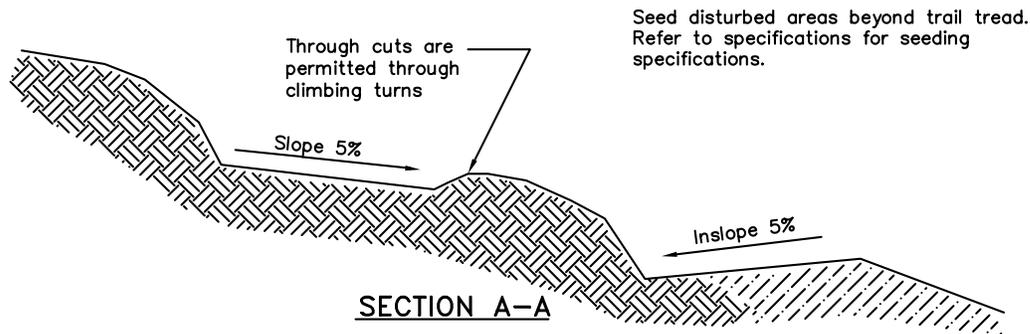
TRAIL TREAD NOTES:

- 1) On Easiest and More Difficult trails, Contractor shall remove all loose stones from top 3" of trail tread surface, along with fixed stones that protrude more than 3" from tread surface.
- 2) On Most Difficult trails, Contractor shall remove all loose stones from top 3" of trail tread surface, along with fixed stones that protrude more than 6" from tread surface.
- 3) No stones smaller than 9 s.f. shall protrude more than 3" from trail tread surface (except in existing boulder fields). If rock greater than 9 s.f. is encountered, provide fill for transition from compacted trail tread to rock surface.



Superelevation on curves:

Trail Level of Difficulty	Normal Trail Tread Width	Curve Radius			
		10'-0" or less	10'-0" to 20'-0"	20'-0" to 40'-0"	40'-0" or more
Easiest	3'-0"	5'-0"	4'-0"	3'-0"	3'-0"
More Difficult	2'-0"	3'-0"	2'-6"	2'-0"	2'-0"
Most Difficult	1'-0"	2'-0"	1'-6"	1'-0"	1'-0"
Superelevation (inches of superelevation per foot of trail width)		3"	2-1/2"	2"	1-1/2"



Insloped Climbing Turn

NOT TO SCALE

Mountain Bike Trail Climbing Turn

Community Park Standards

NOTES:

- 1) Work with natural vegetation patterns to feather or meander edges of clearing work to avoid severe clearing appearance.
- 2) Cut limbs that intrude into clearing limits flush with tree trunk rather than stubbing limb at clearing limit.
- 3) Cut vegetation that intrudes into clearing limits back to plant base rather than in midair at clearing limit.
- 4) Toss stems and branches beyond clearing limits so cut ends lie away from the trail.
- 5) Do not wind row debris unless debris is being used for trail obliteration.
- 6) If fifty percent or more of a tree is to be pruned remove the entire tree.

Clearing Limits

Side slopes	Uphill from tread edge	Downhill of tread edge	Height
0-15%	0-2' unless required to open sight lines		8'
15-30%	12-30"	0-24"	8'
>30%	24-48"	0-24"	8'

Do not remove trees over 3" dbh if they are over 9" from edge of tread.

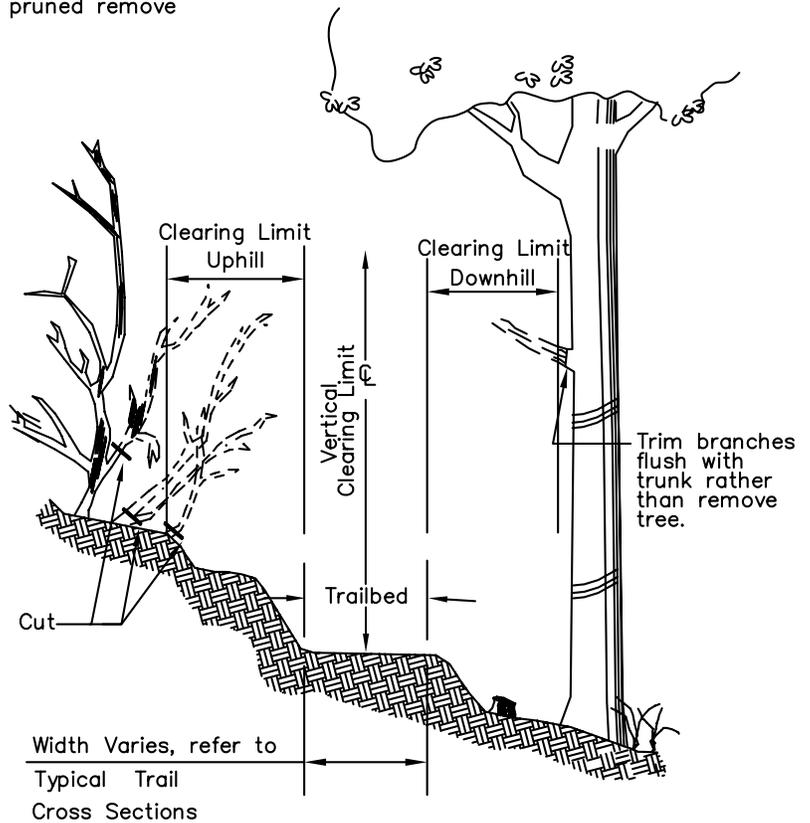
Remove all trees less than or equal to 1/2" DBH within 12" of tread.

If possible, keep trees 6" DBH or greater. Do not remove trees over 6" DBH if within 0" of tread.

If in doubt, do not remove tree.

Remove all stumps to within an average of 1", 2" max. of ground.

Rub soil into cut stumps.

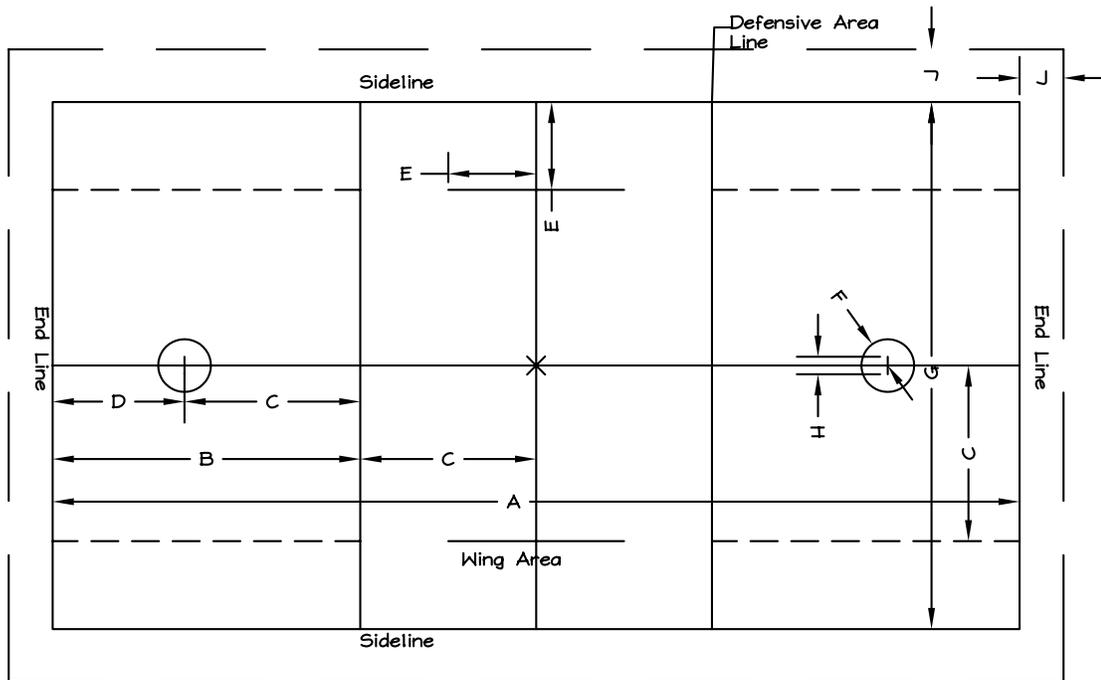


Mountain Bike Trail Clearing Limits NOT TO SCALE

Mountain Bike Trail Clearing Limits

Community Park Standards





Lacrosse Layout

Not to Scale

Men's and Boys Lacrosse Field Dimensions		A	B	C	D	E	F	G	H
Type of Field	Ages	Field Length	Field Width	Defensive Area Line	Wing Area Line	Attack Area	Distance Behind Goal Lines	Goal Crease	Wing Area
Men's		110yds	60yds	35yds from EL	10yds from SL, 20yds long	20yds from DAL	15yds	9' r	20 yds.
Boys									
<i>Bantam Division</i>	under 9	<i>All Boys' Divisions recommended playing field dimensions same as Men's.</i>							
<i>Lightning Division</i>	under 11								
<i>Junior Division</i>	under 13								
<i>Senior Division</i>	under 15								

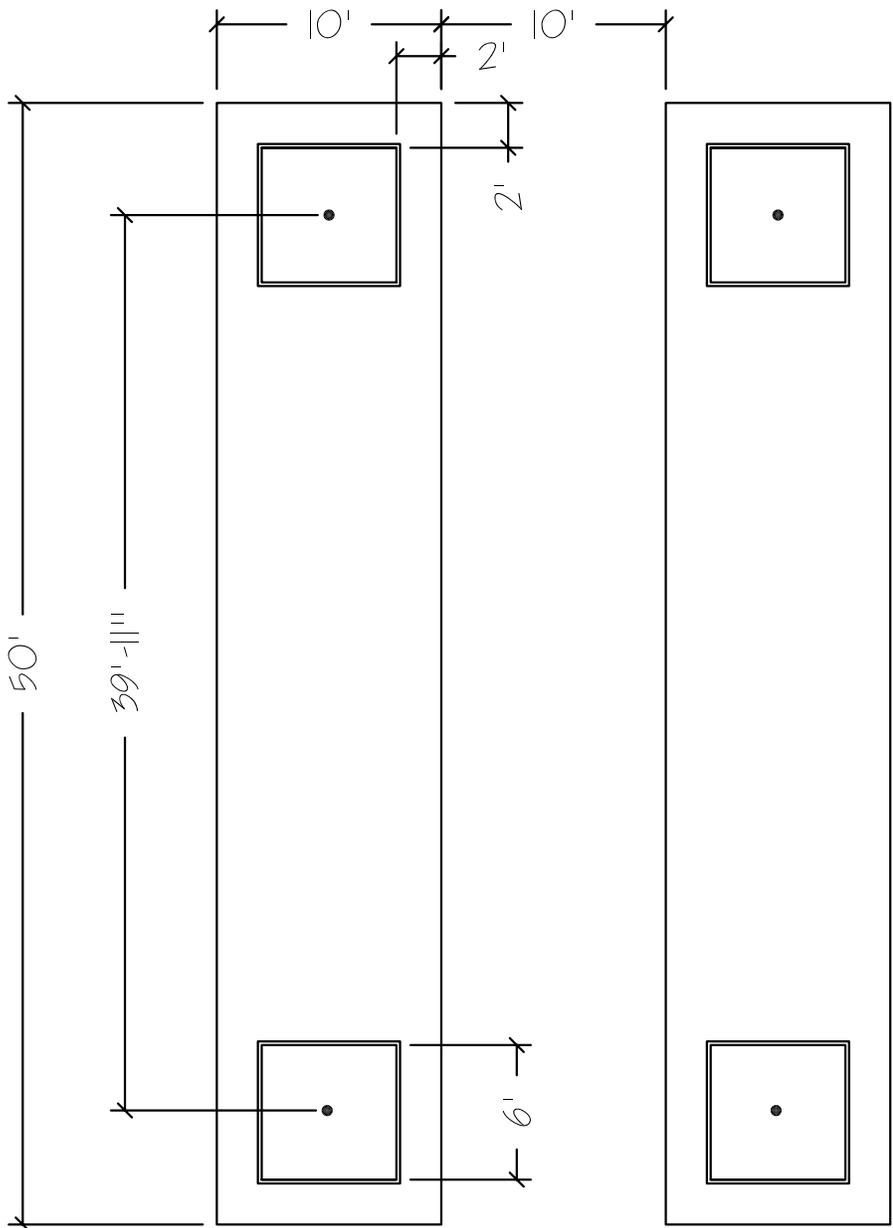
EL=End Line
SL=Sideline

DAL=Defensive Area Line

= May be competitive

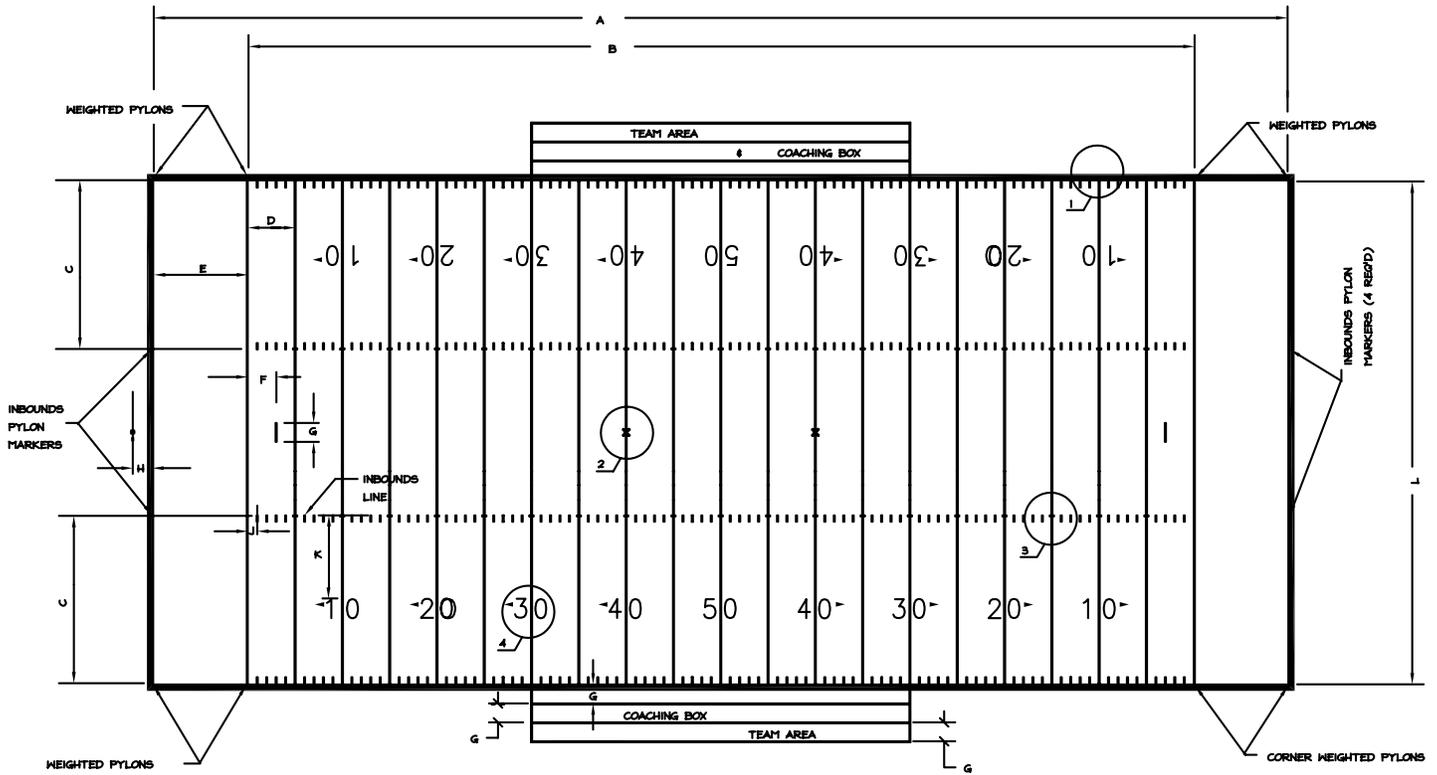
Men's Lacrosse Standards

Community Park Standards



Horseshoe Court Layout

Community Park Standards

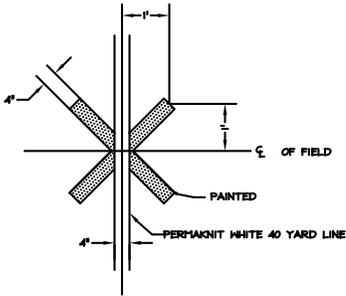


Football Layout

Not to Scale

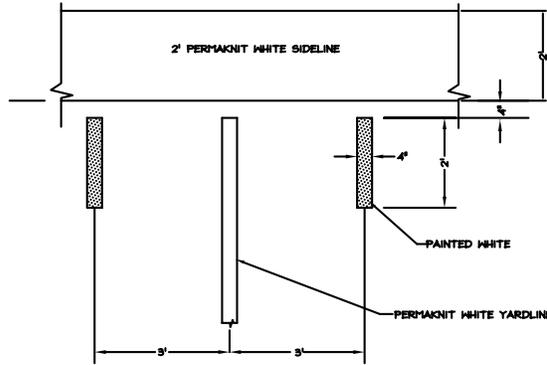
Football Field Standards - Sheet One

Community Park Standards



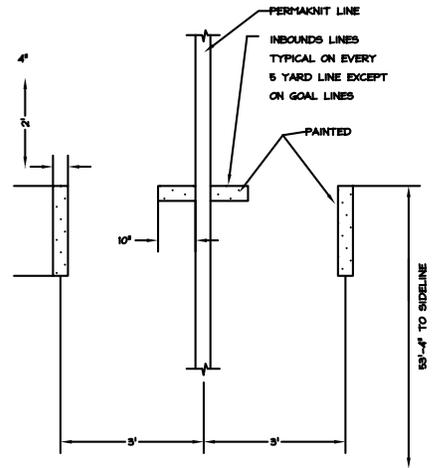
2 Kick-Off Marker

Not to Scale



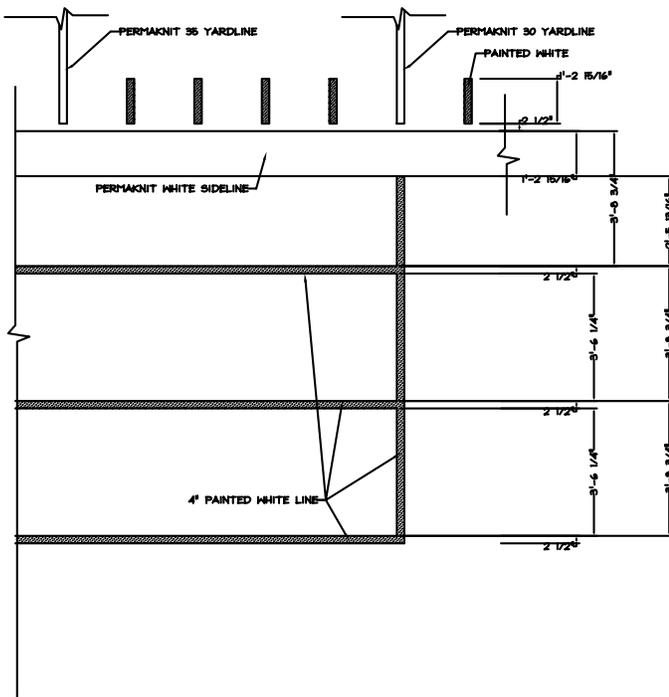
1 Sideline Detail

Not to Scale



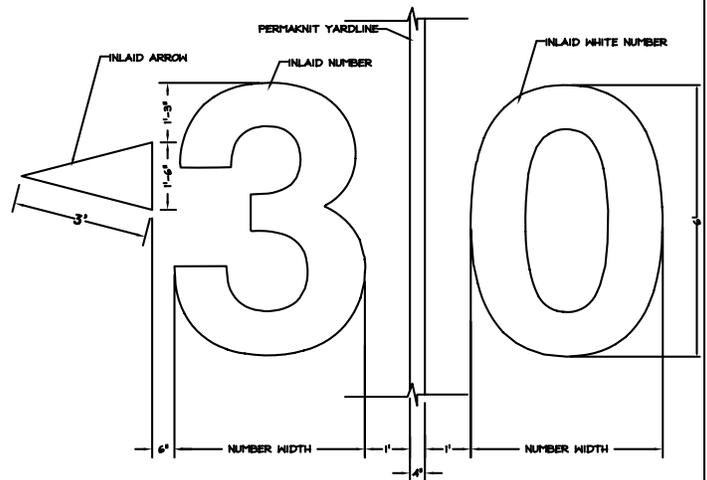
3 Inbound Line Detail

Not to Scale



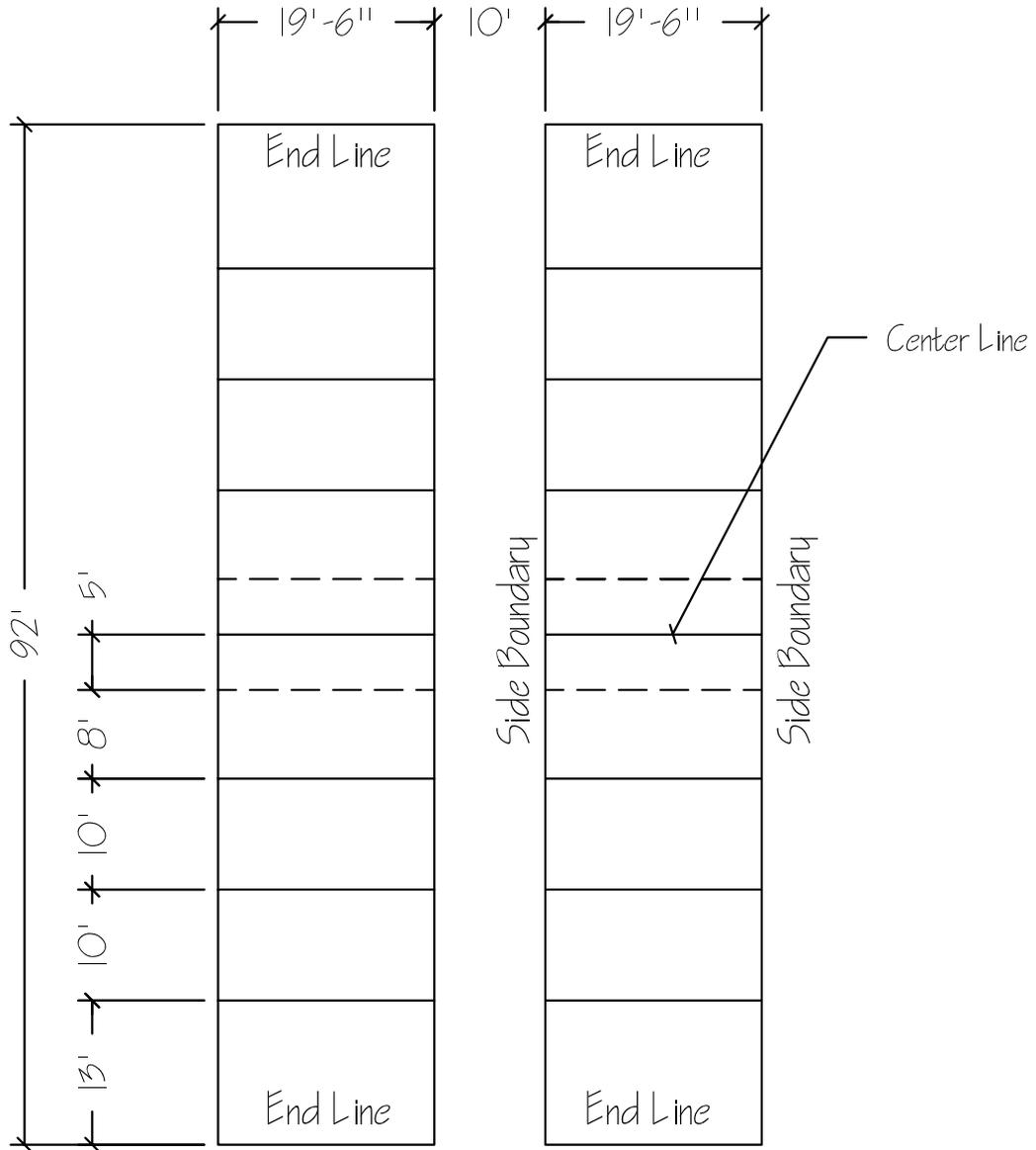
Coaches Box Detail

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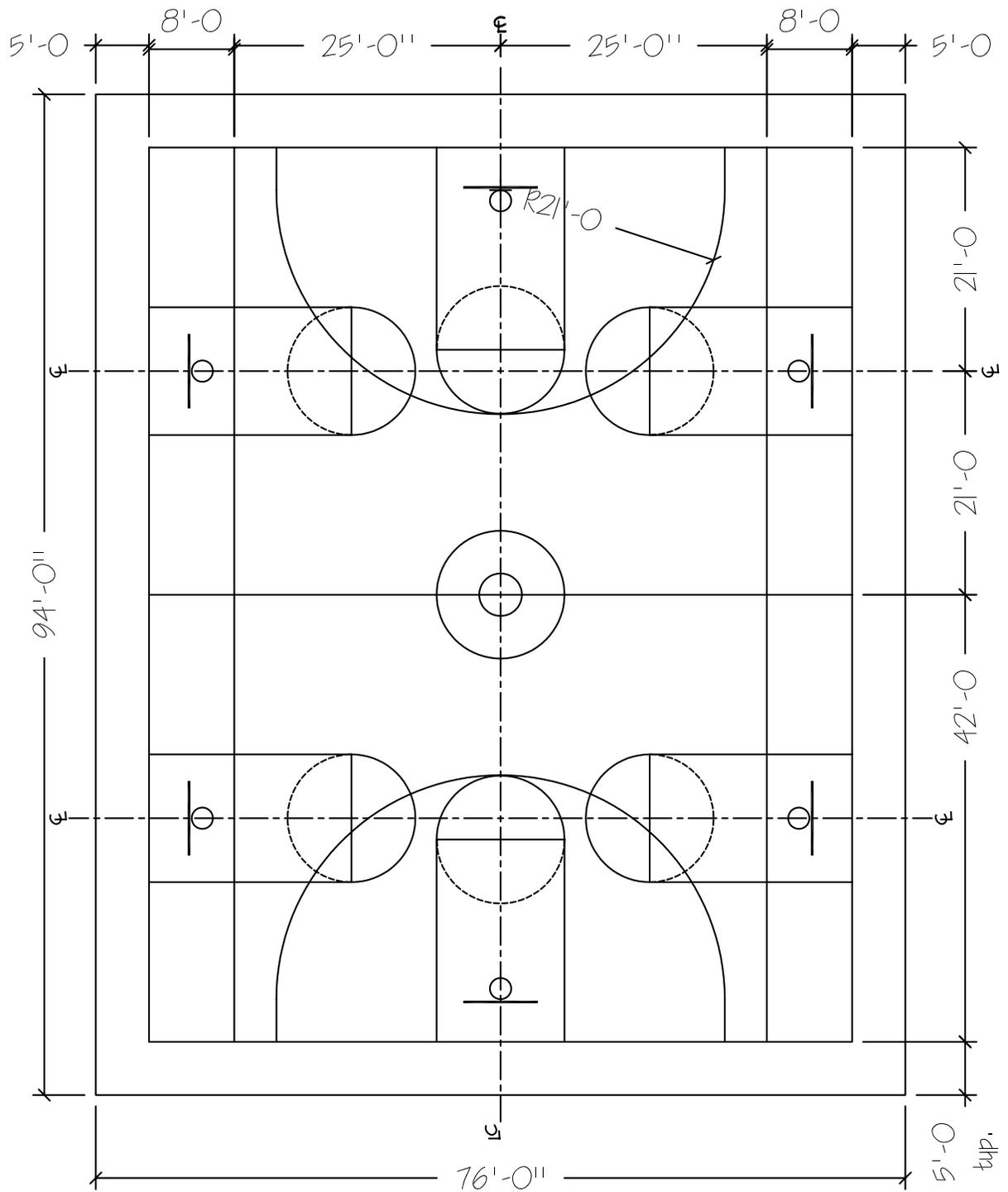
4 Yardline Numbers

Not to Scale



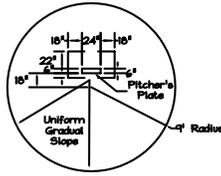
Bocci Court Layout

Community Park Standards

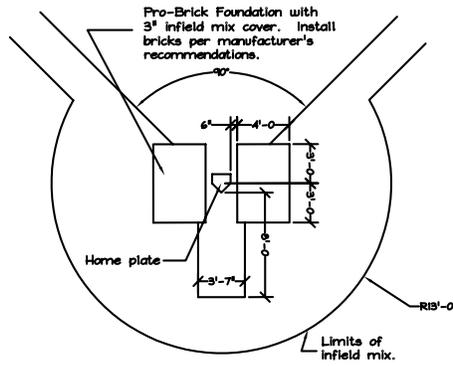


Basketball Court Layout

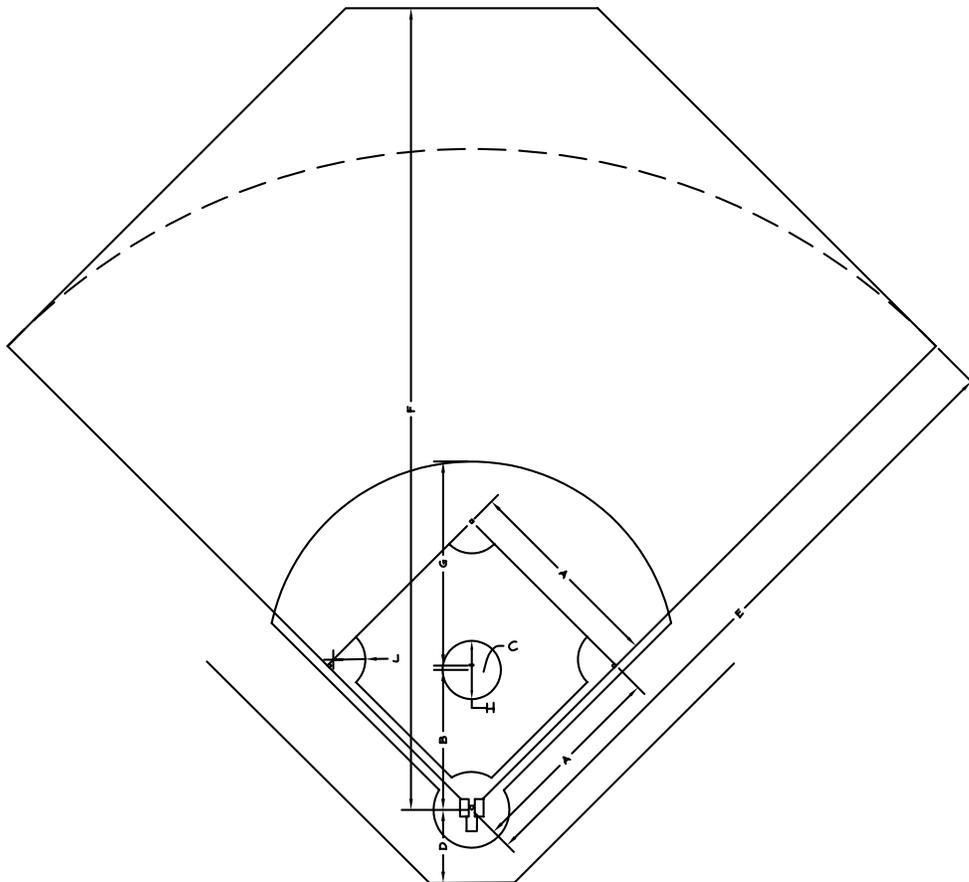
Community Park Standards



Pitcher's Mound Detail
Not to Scale



Batter's Box
Not to Scale



Baseball Layout
Not to Scale

Baseball Field Standards - Sheet One

Community Park Standards

Baseball Dimensions		Required			Recommended			
Type of Field	Ages	A	B	C	D	E	F	G
		Base Lines	Pitching Distance	Pitching Height	Backstop from Home Plate	Foul Lines	Center Field	Infield Arc from Pitchers Plate
Major League Baseball (MLB)		90'	60.5'	10"	60'	325'	400'	95'
National Collegiate Athletic Association (NCAA)		90'	60.5'	10"	60'	330'	400'	95'
National Federation of State High School Associations		90'	60.5'	10"	60'	300' min	350' min	95'
Pony Baseball, Inc.								
<i>Shetland Division</i>	5&6	50'	38'	n/a	25'	125'	200'	
<i>Pinto</i>	7&8	50'	38'	4"	25'	150'	200'	
<i>Mustang</i>	9&10	60'	44'	4"	30'	175'	225'	
<i>Bronco</i>	11&12	70'	48'	6"	30'	225'	275'	
<i>Pony</i>	13&14	80'	54'	8"	40'	275'	315'	80'
<i>Colt</i>	15&16	90'	60.5'	10"	50'	300'	350'	95'
<i>Palomino</i>	17&18	90'	60.5'	10"	50'	300'	350'	95'
Babe Ruth Baseball, Inc.								
<i>Bambino Division</i>	5 to 12	60'	46'	6"	25'	200' min	200' min	50'
<i>Babe Ruth League</i>	13-15	90'	60.5'	10"	60'	250' min	250' min	95'
<i>16-18 League</i>	16-18	90'	60.5'	10"	60'	300' min	350' min	95'
American Legion Baseball	18&under	90'	60.5'	10"	45' r	300'	375'	95'
Little League Baseball, Inc.								
<i>Tee Ball</i>	5 to 8	60'	46'		25' min.	200'	200'	50'
<i>Minor League</i>	7 to 8	60'	46'		25' min.	200'	200'	50'
<i>Little League</i>	9 to 12	60'	46'		25' min.	205'	215'	50'
<i>Junior League</i>	13-14	90'	60' -6"		25' min.	300'	300'	95'
<i>Senior League</i>	14-16	90'	60' -6"		25' min.	300'	300'	95'
<i>Big League</i>	16-18	90'	60' -6"		25' min.	300'	300'	95'
T-Ball USA								
<i>Tee Ball</i>	4 to 8	50'	38'		25' min.	125' max.	125' max.	

 = unofficial recommendation

Baseball Field Standards - Sheet Two

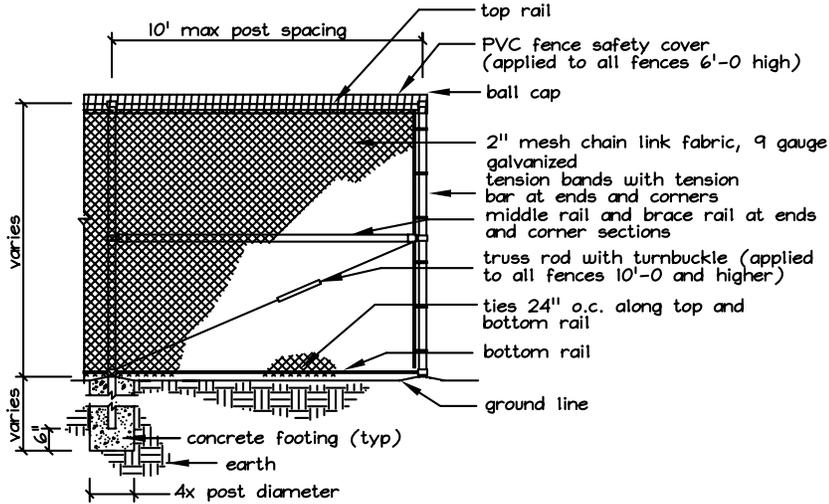
Community Park Standards



PIPE SIZES FOR VARIOUS FENCE MEMBERS

Height	Gate Post	Corner Post	Line Post	Top Rail	Middle Rail	Brace Rail	Bottom Rail	Footing Depth
6'	2 1/2"	2 1/2"	2"	1 5/8"	1 5/8"	1 5/8"	1 5/8"	36"
10'	3"	3"	2 1/2"	1 5/8"	1 5/8"	1 5/8"	1 5/8"	36"
20'	4"	4"	2 7/8"	1 5/8"	1 5/8"	1 5/8"	1 5/8"	60"

all pipe sizes are outside diameter

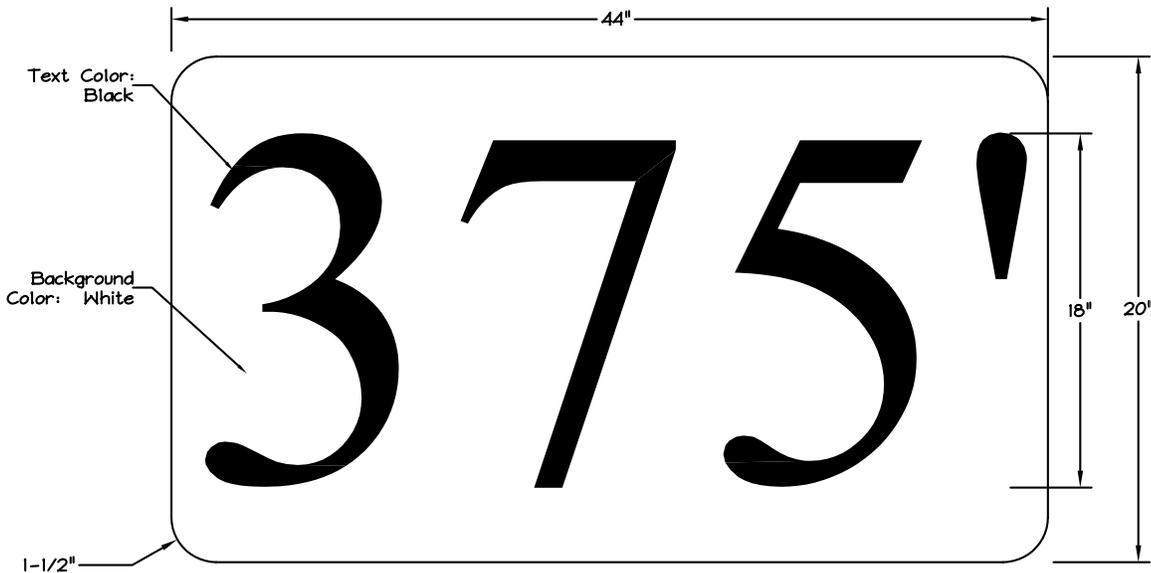


Chain Link Fence with Safety Cover

Not to Scale

Notes:

1. Submit shop drawing of each sign to the Owner's representative prior to ordering.
2. Submit shop drawing indicating method of attaching sign to fence to the Owner's Representative for review.
3. Sign shall be flat sheet aluminum complying with PennDOT Section 1103, Traffic Signing and Marking.
4. Border and lettering shall be Class II reflective sheeting in accordance with PennDOT Section 1103, Traffic Signing and Marking.



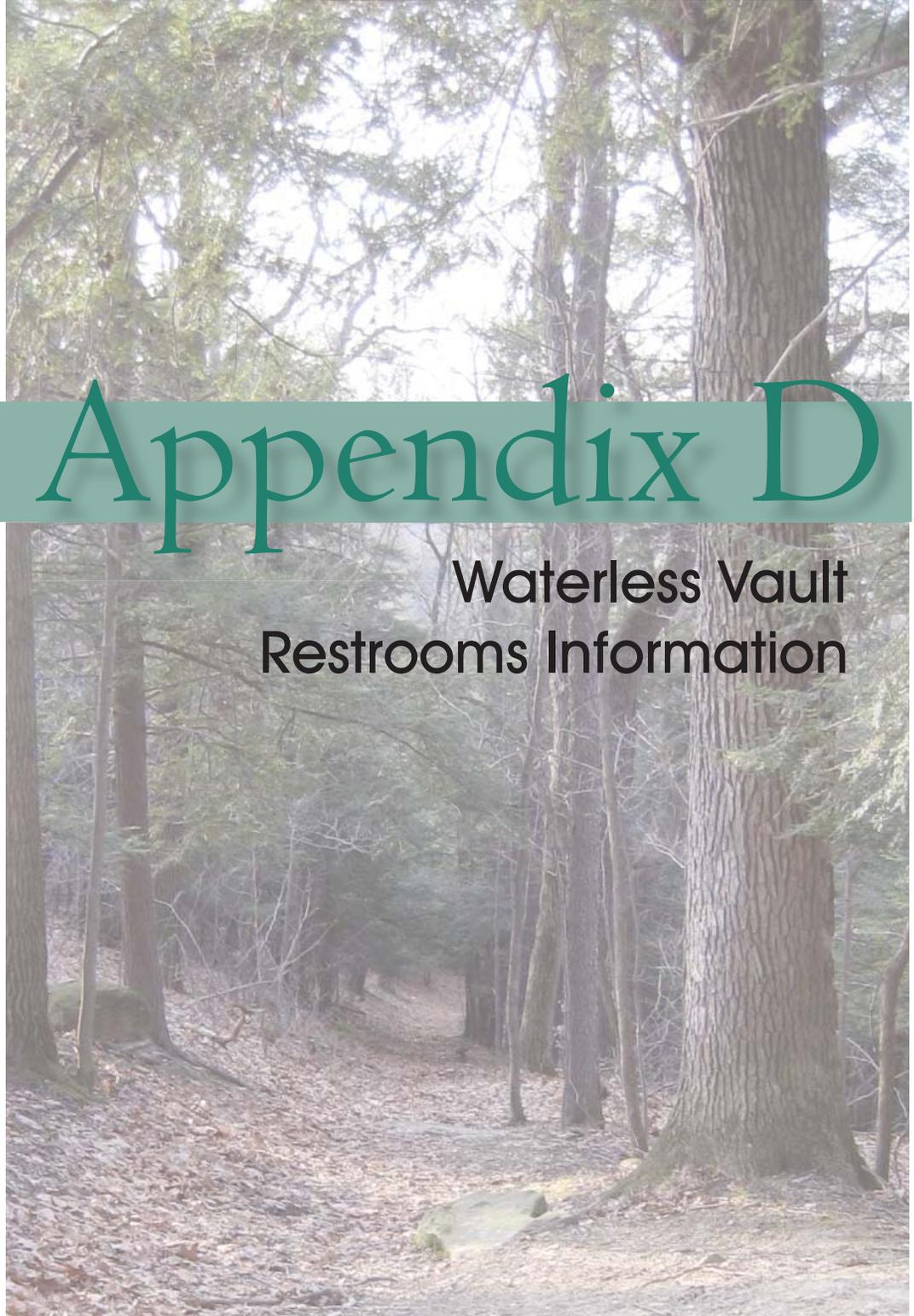
Sign Enlargement

Outfield Distance Marker

Not to Scale

Ballfield Details - Sheet Two

Community Park Standards



Appendix D

Waterless Vault
Restrooms Information

In-Depth Design and Maintenance Manual for Vault Toilets

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TE01A35
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CONTENTS

INTRODUCTION	1
SECTION 1 CONDENSED DESIGN CRITERIA	3
THE VAULT	4
BUILDING INTERIOR FLOOR SURFACE	4
INTERIOR BUILDING WALLS AND CEILING.....	4
TOILET RISER	5
TOILET PAPER DISPENSER	5
LIGHTING	5
AIR VENT FOR THE BUILDING.....	5
THE VENT TO ASPIRATE ODORS OUT OF THE VAULT	5
PLACING THE BUILDING ON THE SITE (EXTREMELY IMPORTANT)	6
SECTION 2 IN-DEPTH EXPLANATION OF THE DESIGN CRITERIA	7
THE VAULT	8
Rationale to Support Using an Outside Cleanout	10
Materials for Vault Construction.....	11
BUILDING INTERIOR FLOOR SURFACE	14
INTERIOR BUILDING WALLS AND CEILING.....	15
TOILET RISER	15
TOILET PAPER DISPENSER	16
LIGHTING	17
VENTING INTRODUCTION	18
AIR VENT FOR THE BUILDING	22
THE VENT TO ASPIRATE ODORS OUT OF THE VAULT	23
PLACING THE BUILDING ON THE SITE (EXTREMELY IMPORTANT)	25
SECTION 3 GUIDELINES FOR THE MAINTENANCE AND OPERATION OF VAULT TOILETS	29
INTRODUCTION	30
STARTING UP AND MAINTAINING THE VAULT	30
PUMPING THE VAULT	31
CLEANING THE INTERIOR BUILDING FLOOR.....	32
CLEANING THE TOILET RISER.....	32
CLEANING THE BUILDING INTERIOR	32
MAINTAINING THE EXTERIOR.....	32
MAINTAINING THE VENT PIPE	33
BIOLOGICAL AND CHEMICAL ADDITIVES	33
SECTION 4 GUIDELINES FOR THE DESIGN OF A TWO UNIT TOILET	35
SECTION 5 GUIDELINES FOR THE DESIGN OF A FOUR UNIT TOILET	41
SECTION 6 MANUFACTURERS' NAMES AND ADDRESSES	45
SECTION 7 WHY EXISTING VAULT AND PIT TOILETS HAVE ODOR PROBLEMS	51
SECTION 8 AN INVENTORY OF TYPICAL VAULT TOILET CONTENTS	57

ILLUSTRATIONS

FIGURE NO.

1. DESIGN OF A TYPICAL VAULT	8
2. INSTALLATION OF A VAULT LINER	12
3. INSTALLATION OF THE BUILDING VENT	18
4. PLACING THE BUILDING VENT FOR UP-CANYON AND DOWN-CANYON WIND	20
5. SUN'S ENERGY CAUSING CONVECTION ON A SHROUD ENCASED PIPE	21
6. PLACING A COVER OVER A VENT PIPE	24
7. PREMANUFACTURED VAULT TOILET SYSTEM WITH CORRECT DESIGN FEATURES	27
8. PRECHARGING A VAULT WITH FRESH WATER AFTER PUMPING	30
9. FLOOR PLAN OF A TYPICAL TWO UNIT TOILET BUILDING	36
10. PLACING THE BUILDING VENTS IN A TWO UNIT TOILET BUILDING; BOTH DOORS ON THE SAME SIDE OF THE BUILDING	37
11. PLACING THE BUILDING VENTS IN A TWO UNIT TOILET BUILDING; DOORS ON OPPOSITE ENDS OF THE BUILDING	38
12. PLACING THE BUILDING VENTS IN A TWO UNIT TOILET BUILDING; BOTH DOORS ON SAME SIDE AND WIND AGAINST ONE SIDE	39
13. HOW TO FORCE THE WIND INTO THE DOWNWIND COMPARTMENT OF A TWO UNIT TOILET	40
14. PLACING THE BUILDING VENTS IN A FOUR UNIT TOILET BUILDING; ALL DOORS ON THE SAME SIDE OF THE BUILDING	42
15. FOUR UNIT TOILET BUILDING IN A SQUARE FORMAT (DO NOT BUILD)	43
16. SINGLE UNIT TOILET VENTING PROBLEMS WITH NO WIND	53
17. SINGLE UNIT TOILET VENTING PROBLEMS AS A RESULT OF WIND	54
18. TWO UNIT TOILET VENTING PROBLEMS WITH NO WIND	55
19. FOUR UNIT TOILET VENTING PROBLEMS AS A RESULT OF WIND	56

INTRODUCTION

No longer is it necessary to tolerate the obnoxious odors associated with previously designed vault and pit-type toilets. This manual will explain how to design, locate, and maintain the complete vault or pit toilet system so that the building interior (use area) is odor free and the entire system, from the bottom of the vault to the top of the vent, is acceptable to the visitor and easy to operate and maintain.

There are many names synonymous with this type of toilet system (as shown on the front cover). This design manual will refer only to vault and pit toilets.

A pit toilet simply has a hole in the ground with a building over it. All liquid waste drains down through the soil and all solid waste remains until the hole fills up.

A vault toilet has a sealed container buried in the ground with a building over it. All waste is contained until the waste is removed by pumping.

The design of both vault and pit toilet buildings are the same for odor control, maintenance, and service to the public.

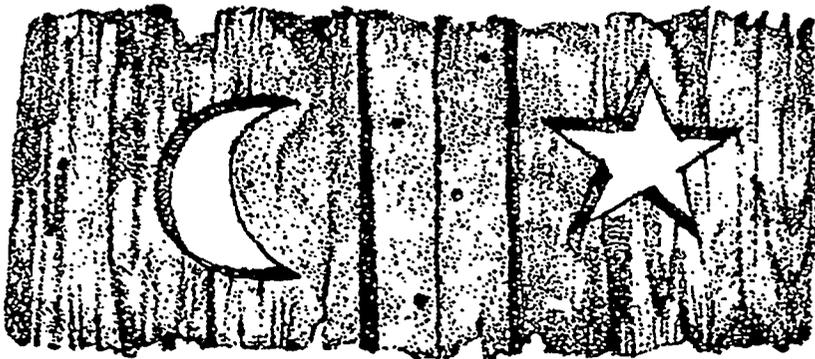
IT IS IMPORTANT THAT ODORS ARE ATTACKED ON ALL FRONTS! This manual will show how to eliminate all sources of odors associated with vault and pit-type toilets.

This manual is divided into eight sections. Section 1 contains the condensed design criteria for those already familiar with vault and pit toilet design. Section 2 contains an in-depth explanation of the design criteria in conjunction with illustrations. Section 3 contains guidelines for the maintenance and operation of vault toilets. Section 4 contains guidelines for the design of a two unit toilet. Section 5 contains guidelines for the design of a four unit toilet. Section 6 contains manufacturers' names and addresses for the more common items used in vault and pit-type toilets. Section 7 contains an explanation of why the existing toilet building designs have an odor problem. Section 8 contains an inventory of typical vault toilet contents.

ALL BUILDINGS SHALL BE DESIGNED FOR PEOPLE WITH DISABILITIES.

THE PRINCIPLES SHOWN IN THIS MANUAL ALSO APPLY TO RETROFITTING ANY EXISTING VAULT OR PIT TOILET BUILDING.

American privies were the only toilets with a moon or star above the door. We have been told the moon meant it was for the ladies and a star would be for the gents. That way, anyone could stay out of trouble even if unable to read.



SECTION 1

CONDENSED DESIGN CRITERIA

THE VAULT

1. There shall be one vault for each toilet riser.
2. All interior vault surfaces shall be sealed to prevent leaking and absorption of odors into the material used to construct the vault. If the building floor slab is the top of the vault, then the underneath side of the floor slab (top interior of the vault) shall be sealed to prevent odor absorption.
3. The vault shall have a black interior to help prevent the visitor from seeing the waste when looking down the toilet riser. Do not use bituminous materials for coating the vault because that material is food for the bacteria.
4. The vault shall have a bottom slope of 1 inch per ft from under the toilet riser out to the outside cleanout area so that the waste can be more thoroughly removed.
5. The vault shall have a 24-inch diameter (minimum) lightweight manhole cover installed to the rear or side of the building. The manhole cover must be sealed to prevent air and water from entering the vault. The manhole cover should be raised, with the surrounding concrete sloped away using a minimum slope of 1/2 inch per ft. (Manhole covers are only for vault toilets, not pit toilets.)
6. The size of the vault is determined by the amount of use at each site. The size is usually 750 to 1,000 gal. For estimating purposes, 1,500 uses equals approximately 100 gal.
7. The depth of the vault shall be no deeper than 4-1/2 to 5 ft.
8. The vault toilet pumping contractor should never be allowed to remove the contents of the vault through the toilet riser, inside the building. Old vault toilets that have no outside cleanout are obviously excluded.

BUILDING INTERIOR FLOOR SURFACE

1. The floor shall be sloped 1/2 inch per ft from the back to the front door so that water will not "pocket" and cleaning will be easier.
2. The floor shall be completely sealed to prevent any staining or odor absorption.
3. The floor shall have a non-slip surface only in the walkway area.
4. The wall to floor surfaces shall have a large radius coving (4 to 6 inches) and all 90° corners shall be rounded.
5. The floor shall evenly join the outside concrete so that there is no lip at the doorway to hinder the people with disabilities from entering.

INTERIOR BUILDING WALLS AND CEILING

1. The walls shall be nonporous.
2. The walls shall be light in color to assist in reflecting available light.
3. The walls shall be difficult to write on or designed to be easily cleaned.
4. The walls shall be free from ledges, angles, and shelves so that less dirt accumulates and cleaning is easier.
5. Each building shall have an insulated ceiling so that the interior of the building is not heated by the sun shining on the roof.

6. The building walls should be reinforced to allow firm attachment of any type of toilet paper holder/dispenser and grab bars for people with disabilities.

TOILET RISER

1. The riser shall have no cracks and crevices on the outside for potentially odorous materials to collect in.
2. The riser shall have a heavy-duty open front seat and cover assembly that does not seal the air out.
3. The riser shall be easy to clean and impervious to oxidizing cleaning agents.
4. The riser shall be vandal resistant.

TOILET PAPER DISPENSER

1. If the vault or pit toilet building is located where there will be no people with disabilities, then use either the three-roll lock-bar dispenser or the mile-long (continuous roll) dispenser.
2. If the building is located for people with disabilities, then consider using the mile-long (or continuous roll) dispenser.

LIGHTING

1. Lighting within the building shall be adequate for the visitor to comfortably function, but not directed in such a way that the visitor can see the waste in the vault. Do not use overhead skylights.
2. Polycarbonate (LEXAN) windows shall be used in place of glass or thin plastics to help prevent breakage as a result of vandalism. Fiberglass is not recommended because when damaged, the resulting splintering fibers could be a hazard.
3. To maintain privacy, LEXAN shall be translucent or covered with translucent louvers.

AIR VENT FOR THE BUILDING

1. The vent in the building, necessary to supply replacement air for the air drawn out of the vault, shall be around 120 sq inches of free area for a single unit toilet.
2. There shall be only one vent opening in the building. The opening shall be placed only on one side of the building (the side that the prevailing wind blows against). The "side" can be either side, or the front or back of the building.
3. The vent shall be located "head-high" on the building if there is a constant prevailing wind hitting that side. For shifting winds, the vent shall be placed as low to the ground as possible and on the side that the wind is most predominant during the use period. If there is an up-canyon wind in the morning and a down-canyon wind during the afternoon, then the vent shall be placed on an adjacent wall surface as low to the ground as possible so that the wind has the least effect of aspirating air out of the building.
4. The vent shall be constructed of a heavy-duty material, such as expanded metal, in order to prevent vandalism.
5. There shall be no screen in the vent opening unless the size is 1/4-inch mesh (least dimension).

VENT TO ASPIRATE ODORS OUT OF THE VAULT

1. The vault vent shall be a minimum of 12 inches in diameter. Each vault shall have its own vent. The 12-inch size is for single unit toilets only.

2. The top of the vent pipe shall be a minimum height of 3 ft above the highest point of the roof.
3. The 12-inch diameter pipe above the roof shall be painted a dark color to take advantage of potential convection resulting from the sun's energy as the sun heats the pipe. This effect is minimal, but everything helps.
4. The top of the 12-inch pipe shall remain uncovered and unscreened. If a top is absolutely necessary, it should be a flat plate placed 12 inches above the top of the pipe and supported by three thin metal rods so as not to interfere with the aspiration aspects of the wind flowing over the open top pipe.

PLACING THE BUILDING ON THE SITE

NOTE: A BUILDING THAT IS CORRECTLY DESIGNED, IN ALL ASPECTS, WILL NOT FUNCTION PROPERLY UNLESS IT IS LOCATED PROPERLY IN THE FIELD!

1. The building shall be placed to take advantage of the wind flow or the sun's energy, preferably both.
2. The building shall not be placed in a hollow, beneath an overhang, on the lee side of a ridge, immediately adjacent to a dense tree line, or in dense brush and/or trees. Both the building location and orientation are important.
3. Place the building so that odors emitted from the vent stack will not affect campground spurs, group use areas, boat launch areas, etc.
4. Do not place two single unit or two two-unit toilet buildings close together and in line with the wind.

SECTION 2

*IN-DEPTH EXPLANATION
OF THE DESIGN CRITERIA*

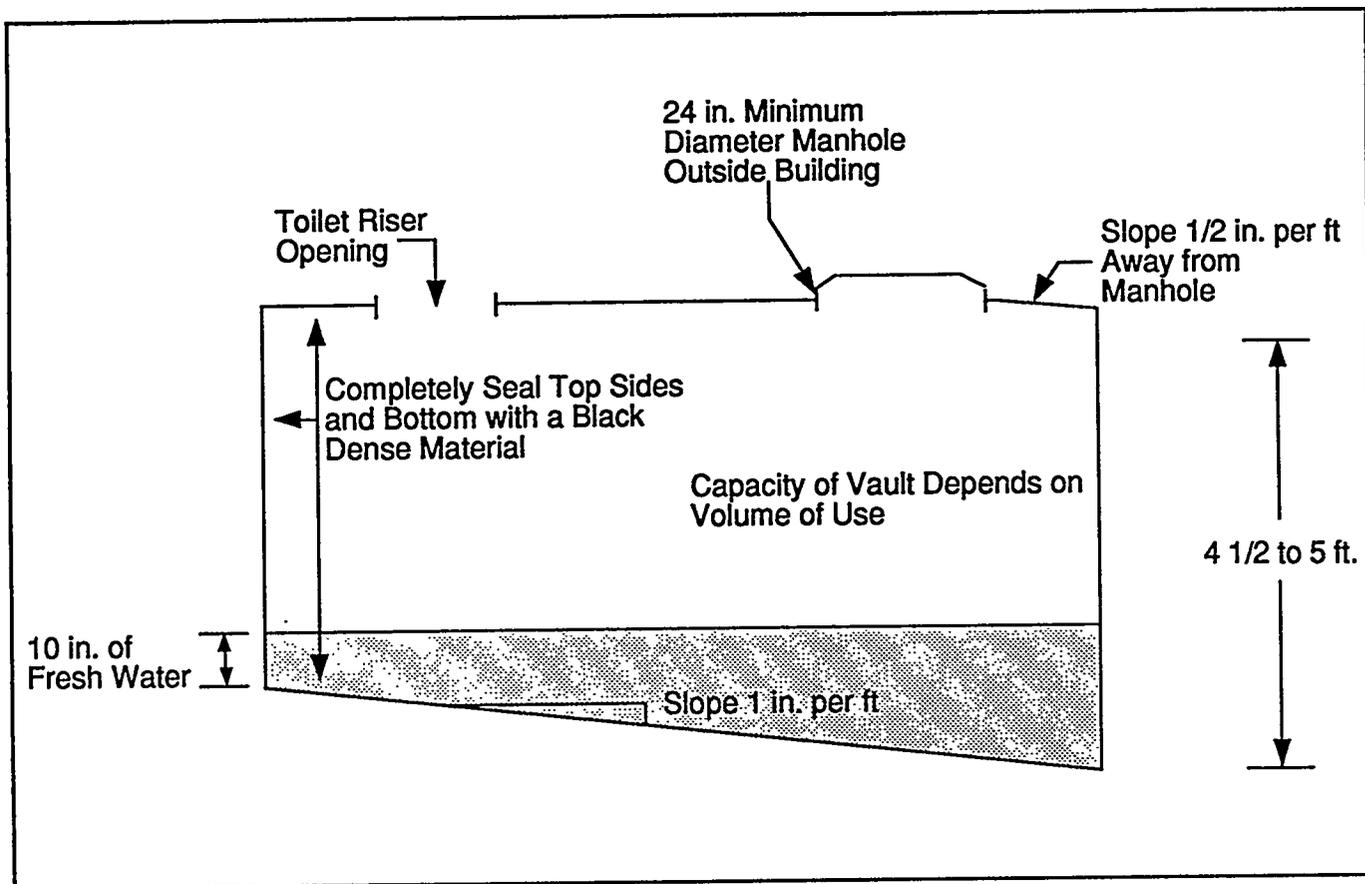


Figure 1

THE VAULT

The following is a discussion of the vault design criteria.

1. There shall be one vault for each toilet riser.

The objective of properly venting a toilet is to have the air inside the building go down the toilet riser into the vault and then go out through the 12-inch diameter vault vent. If there are two toilet risers over one vault, then a cross flow of air can occur and odor can be forced up into the building use compartment. (See venting for further details.)

2. All interior vault surfaces shall be sealed, to prevent leaking and absorption of odors into the material used to construct the vault.

If the vault leaks then there is a potential of contaminating the surrounding water table or nearby lake or stream.

Any loss of liquid allows the solid waste to be exposed on the surface of the vault contents. When solids are exposed, the odors increase, and more importantly, flies begin their breeding cycle.

If the vault is constructed out of concrete and not completely sealed, odors will absorb into the concrete. When the vault is pumped, cleaned out, walls washed down, and precharged with fresh water, there will be no change in odor problem because of the odors being emitted from the walls of the vault. This is a major source of odor! Odors should be eliminated from all sources so that the overall use of the toilet is enhanced. The bottom (underneath side) of the building floor should also be sealed to prevent odor absorption.

3. The vault shall have a black interior to help prevent the visitor from seeing the waste when looking down the toilet riser.

This is an aesthetic consideration and parallels the saying "out of sight, out of mind." Vault toilet waste can be very offensive to the eye and everything should be done to prevent the visual impact. If there is no odor in the toilet use compartment and the visitor cannot see the toilet contents, then the experience is considerably more tolerable.

Bituminous coatings should not be used because they remain semi-soft and waste will cling to the sides of the vault as the waste is being pumped. This semi-soft material makes it difficult to remove the waste by hosing or scrubbing the walls. These coatings are also food for the sewage bacteria.

- 4. The vault shall have a bottom slope of 1 inch per ft from under the toilet riser out to the outside cleanout area so that the waste can be more thoroughly removed.**

When the sewage pumper removes the waste from a flat bottomed vault, the hose will begin sucking air (vortexing) when there is about 2 to 3 inches of waste left. If there is not a sufficient amount of liquid to get the level down to 3 inches, then the hose will suck air long before that.

The objective of pumping any vault is to remove all of the contents (including cans, bottles, rocks, etc.).

By sloping the bottom of the vault and requiring that the pumper have a pressure water supply, virtually all of the contents can be removed because they will gravity flow down to the low end of the vault directly under the manhole. After pumping, the vault should then be recharged with 10 inches of fresh water (depth at shallow end). This precharged water will help to prevent the solid waste from mounding above the water level. Flies will not be able to breed and odors will be significantly reduced if a water level is retained.

- 5. The vault shall have a 24-inch diameter (minimum) lightweight sealed manhole cover installed to the rear of the building. The manhole cover must be sealed to prevent air and water from entering the vault. The manhole cover should be raised, with surrounding concrete sloped away using a minimum slope of 1/2 inch per ft. (Manholes are only for vault toilets.)**

The 24-inch diameter will allow sufficient access for removing anything thrown down the toilet riser by the public and sufficient access for pumping the waste.

It is imperative that the manhole cover be completely sealed so that no air or water can enter the vault in order for the venting to work properly and prevent odors in the use compartment. The only air that should be allowed to enter the vault must be through the toilet riser. Another benefit to a sealed manhole is to prevent the obnoxious odors in the vault from escaping at ground level.

The manhole cover should be raised so that the concrete surrounding the cover can be sloped away with a minimum slope of 1/2 inch per ft. This will help prevent heavy rainfall from depositing dirt on top of the cover and leaking in excess water into the vault. Maintenance personnel dislike having to clean around the cover. If dirt accumulates, there is a good chance that when the cover is replaced it will not seal the air out.

- 6. The size of the vault is determined by the amount of use at each site. The size is usually 750 to 1,000 gal.**

Each site has a different use pattern. The capacity of the vault should be designed so that the vault is pumped at least once at the end of the season. If the season happens to be all year long, then the capacity should be designed so that pumping occurs a minimum of three times each year.

Remember that we are trying to reduce odors at every place we can. Frequent pumping, thorough cleaning, precharging with fresh water, and using a vault that is completely sealed to prevent leaking and odor absorption will help greatly to alleviate odors.

As a design rule, it takes approximately 1,500 normal average uses to fill a 100-gal capacity. Generally the 750 or 1,000-gal size will be adequate for most recreation sites.

- 7. The depth of the vault shall be no deeper than 4-1/2 to 5 ft.**

Normally the depth would be 4-1/2 ft under the toilet riser and 5 ft under the outside manhole. All the debris (cans, bottles, rocks, rags, etc.) has to be removed from the outside manhole. In order to make this obnoxious displeasing task as easy as possible, the depth of the vault should be as shallow as possible. However, too shallow brings the waste up too close to the toilet riser, so a compromise is necessary.

The 4-1/2 to 5-ft depth also makes it easier in case the pumper, after removing the sewage waste contents, has to go into the vault to remove the occasional large rock that cannot be removed by a clam rake. If the persons can lower themselves into the vault and stand in the vault with their head and shoulders out in the fresh air, then they will not be as reluctant to remove the rock or rocks. After pumping, they simply lower themselves into the vault, take a deep breath, lean over and get the rock, and then stand up and breathe fresh air.

This shallow depth also allows the pumper to more effectively control the end of the heavy suction hose resulting in a more thorough removal of the waste. By frequently repositioning the hose around the interior of the vault, more of the heavier sludge can be removed before all of the liquid is removed.

- 8. The vault toilet pumping contractor should never be allowed to remove the contents of the vault through the toilet riser opening, inside the building. Old vault toilets that have no outside cleanout are obviously excluded.**

Rationale To Support Using An Outside Cleanout:

- a. When the pumper (pumping through the riser opening on the inside of the building) removes the waste from a vault toilet, the suction hose gets clogged often. The hose is then removed to unclog the waste unless there is a reverse air flow on the suction hose allowing the pumper to force air out to unclog the hose. When the hose is removed and unclogged, the waste is usually spilled all over the floor and the waste adhering to the outside of the hose rubs on the floor and walls. This waste can soak into the floor and be a sanitary problem to our barefoot visitors, especially children, and can also cause lingering odor problems.
- b. When debris such as cans, bottles, underwear, pinecones, etc., is removed from the riser opening, a few drops of stinky waste usually drips on the floor. After removing many pieces of debris, the floor is again saturated, causing the same sanitary and odor problem as above. Even if the floor is washed down after pumping, most of the waste (spilled during pumping) is washed out the front door. This waste is now at the edge of the concrete where it will attract flies and other insects. This is not a good way to greet our visitors!
- c. When the vault floor is flat, the pumper cannot get all of the waste out of the vault because the hose will begin to suck air when it gets to about three inches deep. This odorous waste (odor is increased when the vault contents are stirred up and pumped) will stink for three days. Even if water is added the smell will still be bad. That is why the vault floor should be sloped 1 inch per ft from under the riser to the outside manhole so virtually all of the waste can then be removed.
- d. Pumping through the riser opening is difficult. The pumper cannot control the end of the suction hose in the riser as well as through a 24-inch diameter manhole on the outside of the building. The riser opening is only 16 by 20 inches. When pumping through the riser, the hose has to be lifted and moved over as much of the bottom as possible in order to get the heavier sludge before all the liquid is gone. The larger the opening, the easier it is to reposition the hose.
- e. The walls of the vault should be washed down during every pumping. This is very difficult to do through the riser opening because of the size of the hole and the closeness of the building walls.
- f. If a large rock has to be removed, there are not many pumpers that will go down the small riser hole to remove it. However, lowering one's self down through the 24-inch diameter manhole is much easier and because it is located outside, the lighting and abundance of fresh air is much better.
- g. When pumping occurs, the resulting increase in odor is obnoxious! When pumpers have to pump down through the riser opening inside the building, they are exposed to this intense odor without

any possible relief. Even in a properly vented system there will be odor associated with the pumping process and the pumper should not be exposed to this obnoxious smell.

There are those pumpers who will say that the odor goes along with the job and it does not bother them (typical macho image). When that particular pumper is no longer available, the new ones will probably not tolerate the smell on the inside when they know the pumping could be conducted from the outside. We should not expose any personnel, contract or our own, to such an adverse condition that we can control.

Let's look at some of the reasons why pumpers complain about the outside manholes. One of the reasons is because of our previous manhole design. Remember that the pumper is pumping our vaults to make money and time is money. If the pumper has to unscrew rusted bolts that are covered with dirt or mud and then wrestle a 100-lb cover and then clean out the dirt from the rim and the bolt holes before replacing the cover, the pumper would rather go down through the riser opening.

However, if we design the outside manhole properly, you will find the pumper will be more receptive to using the outside manhole for pumping. A proper manhole cover:

- a. Should be hinged, or be round plastic which is easy to remove.
- b. Should open against the back of the building (so that the cover is not in the way of pumping).
- c. Should have the concrete surrounding the cover sloped away at a minimum slope of 1/2 inch per ft (so the rain will keep the cover clean and dirt will not be blown over the cover).
- d. And, should be made out of lightweight aluminum or plastic.

The pumpers will also tell you that the majority of the solids lay directly below the riser (the impact zone) and they need to get the end of the suction hose into this concentration so that they do not pump out the liquids before getting most of the solids. However, if they are told that they need a large hoe to pull the impact zone out to the outside manhole and a clam rake (with 4 to 6 tines approximately 6 inches long and dulled on the ends) to remove the cans, bottles, etc., then they will be better equipped to do the job and more willing to pump from the outside. (More discussion on Page 31.)

A side benefit to the pumper is that by moving the impact zone, the concentration of waste is broken up and the chances of clogging the suction hose is reduced.

For all of the reasons given above, the pumping contract should clearly state that the pumper SHALL NOT USE THE TOILET RISER OPENING TO REMOVE THE WASTE.

Vertical access doors on the rear of the building are not as good for removing the waste as an outside manhole and are not recommended.

Materials For Vault Construction

There are a number of materials that the vault can be constructed with: cross-linked polyethylene; reinforced concrete block or concrete with a Hypalon liner; poured in place concrete; and pre-poured concrete. The use of steel and fiberglass should be discouraged.

A discussion of each follows:

1. Cross-linked polyethylene. This is the best material currently available for the vault. It will not crack, chip, or peel in the harshest of weather conditions. There are currently two sizes available for burial; 750 and 1,000 gal. They are both specifically constructed to meet all of the correct design criteria (impervious, black, slope of 1 inch per ft on the bottom, a 24-inch diameter manhole and a depth of 4-1/2 to 5-ft deep).
2. Reinforced concrete block or concrete with a Hypalon liner. Concrete block, poured in place concrete,

or prepreoured concrete can be lined with Hypalon or other equivalent synthetic rubber or plastic material. Using the Hypalon or other similar material (black only) will completely seal the concrete interior walls and floor.

REMEMBER TO SEPARATELY SEAL THE UNDERSIDE OF THE BUILDING FLOOR SURFACE TO PREVENT ODOR ABSORPTION. THE HYPALON MUST BE A MINIMUM OF 45 MIL, 3-PLY, POLYESTER-REINFORCED. ANY SIMILAR MATERIAL SHOULD BE EVALUATED FOR ITS STRENGTH AND RESISTANCE TO THE NORMAL WASTE MATERIALS.

During installation the liner should be cushioned on the bottom of the vault by placing 2 inches of sand between the concrete and the liner. (See Figure 2.) The liner should then be protected from damage (caused by bottles, followed by rocks and/or the end of the waste pumper's hose) by pouring a minimum of 4 inches of concrete over the liner. This concrete (type 5) does not have to be sealed on top to prevent odor absorption because it is always submerged, although sealing will certainly help to prevent deterioration.

NOTE: The 4 inches of concrete poured over the liner is not for preventing uplift pressures due to a high water table. Consult with engineering for that solution.

Hypalon can be ordered for any size vault. Simply measure the vault and send the dimensions to the manufacturer. If similar materials are used, you will have to check with that manufacturer for methods of application.

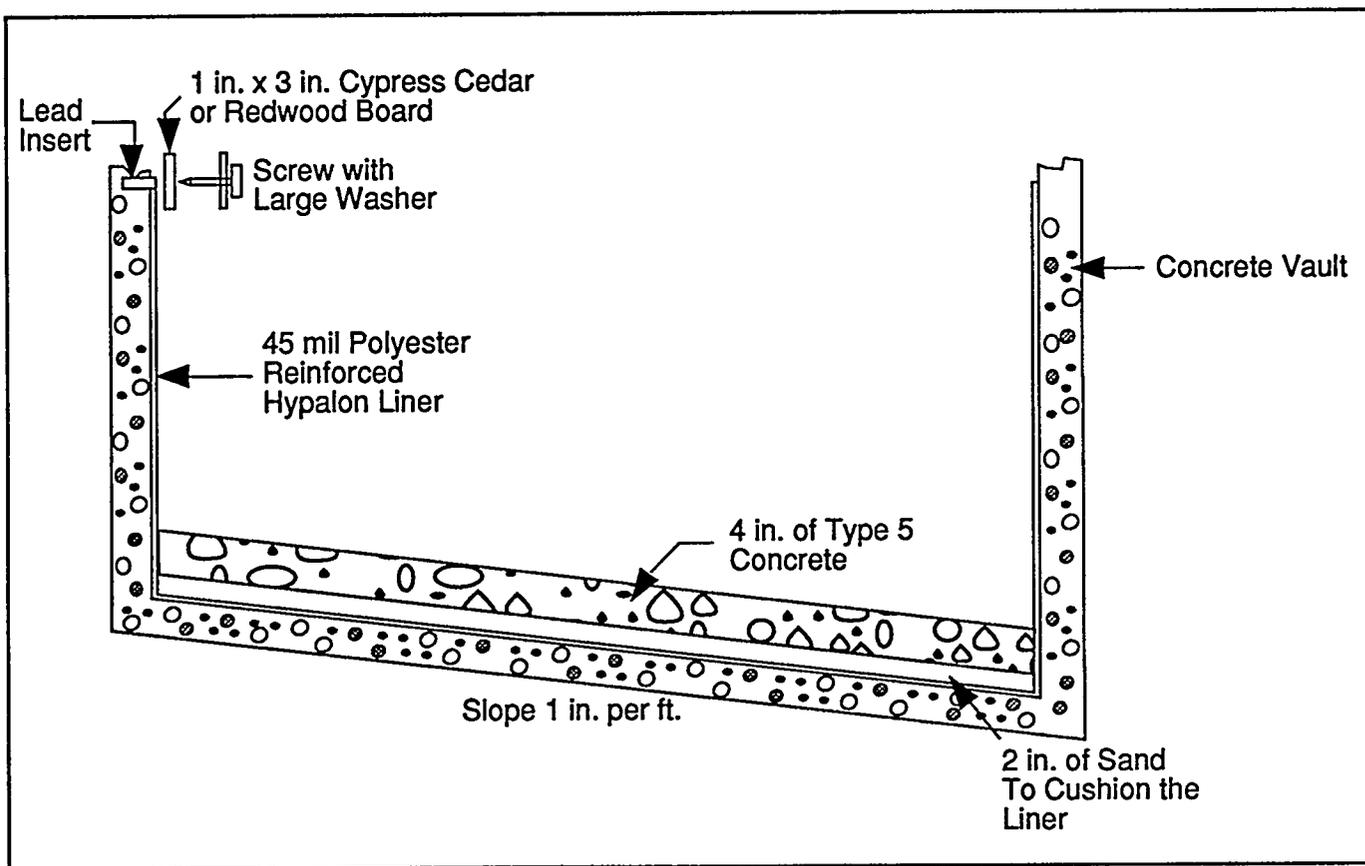


Figure 2

THE WASTE PUMPER SHOULD BE CAUTIONED TO BE CAREFUL OF TEARING THE LINER SIDEWALLS WITH HIS RAKES AND HOSES.

The only disadvantage of using a synthetic liner is if a rip or puncture does occur, it is very difficult to get someone to fix it.

3. **Poured in place concrete.** Poured in place concrete has been frequently used in the past. If this method is chosen please be alerted to the following concerns:
 - a. Be certain that Type 5 concrete is used to prevent deterioration by alkali attack.
 - b. Be certain that special caution is taken when placing the water seal system between the floor slab and the walls in order to prevent any possible leakage.
 - c. Use a dense Type 5 concrete with reinforcing to prevent future cracking of the concrete.
 - d. Thoroughly seal the concrete with a black material that the normal sewage bacteria will not eat and a material that is very hard and smooth for easy cleaning. Do not use an asphalt or bitumastic coating.
 - e. Check with the manufacturer to be certain the coating will last for the lifetime of the toilet because it is difficult to find someone that will recoat the vault after it has been used.
4. **Prepoured or precast concrete.** This has been the most commonly used vault. There are some major difficulties with using prepoured or precast vaults.
 - a. Normally, Type 5 concrete is not used.
 - b. Normally, the purchaser does not inspect the quality of the concrete or the method in which it is poured.
 - c. These vaults are hardly ever sealed with a long lasting quality sealant.
 - d. They are heavy and difficult to install.
 - e. Rarely does the vault have a 1 inch per ft slope in the bottom. I have never seen one. However, a sloped bottom can be added.
 - f. Most are not designed for a 24-inch manhole to be placed to the rear of the building.

Unless all of the correct design features can be adhered to, do not use prepoured or precast concrete vaults.

5. **Steel.** Very few steel vaults have been used. Most of them are steel culvert pipes with concrete bottoms. Because of the difficulty of corrosion from the soil and from the sewage, steel vaults should not be used.

Lining a steel vault with a synthetic rubber or plastic material or coating will protect the interior from corrosion by the sewage, but will not protect the exterior from corrosion by the soil.

The exterior can also be coated, but it is too difficult to protect the coating from damage during backfilling operations. Coating both the inside and outside is also too expensive. The interior coating is also subject to damage from rocks dropped in the vault and from the steel end of the pumper's suction hose. Stainless steel vaults are simply too expensive and rarely come with a sloped bottom.

6. **Fiberglass.** Fiberglass vaults are fairly common and can be found all across the country. **FIBERGLASS VAULTS ARE NOT RECOMMENDED.** Some of the major concerns are as follows:
 - a. There are a number of resins used to make fiberglass. Be certain that you specify an orthothalic resin. The other resins are more susceptible to being eaten by the normal bacteria found in sewage.
 - b. If a large rock or the steel end of the sewage pumper's hose is dropped into the vault (this happens quite often) the bottom can be cracked or punctured and again, it is difficult to get someone to repair it.

- c. Fiberglass is subject to stress cracking due to vibration during shipment and is subject to damage during handling, installation, future earth shifts, and extreme temperature differentials.
- d. Generally fiberglass vaults are the most expensive.

BUILDING INTERIOR FLOOR SURFACE

1. **The floor shall be sloped 1/2 Inch per ft from the back to the front door so that water will not "pocket" and cleaning will be easier.**

This is one of the most important design criteria in any vault or pit-type building! How many toilet buildings (of all kinds) have you been in, only to find liquid (origin unknown) standing on the floor? This is not an experience that we want our visitors to have to tolerate when the solution is simple.

The Uniform Federal Accessibility Standards, The California Accessibility Standards, and the Interagency Interim Design Guide for Accessible Outdoor Recreation agree that most floor surfaces should have a slope of 1:50 (2%) and ramps should not exceed 1:20 (5%). Cross slopes should also not exceed 1:50 (2%).

The suggestion of using a slope of 1/2 inch per ft (4.2%) on the floor of the building interior appears to be excessive until the alternatives are examined. Unless the floor is adequately sloped, liquid will be left standing on the floor. This liquid (of unknown origin) is very offensive to a wheelchair person because the wheels of the chair must go through it and can then be a potential contaminant to the person as they propel the wheelchair. Consequently, adequately sloping the floor is extremely important.

Due to normal construction practices a 1/4 inch per ft slope (2%) will not work to drain water effectively and it hasn't worked in the past. Remember that after you design the slope, someone else uses a trowel to finish the concrete and a 1/4 inch per ft slope is difficult to produce. There are thousands of toilet buildings that will verify this statement. **ADEQUATE SLOPING IS CRITICAL!**

2. **The floor shall be completely sealed to prevent any staining or odor absorption.**

This is also an important design criteria! As soon as the door is opened and the visitor sees stains on the floor, the toilet facility is perceived to be unsanitary. Any sealant that is used should be carefully evaluated and coordinated with the manufacturer to assure that it is relatively easy to apply and will withstand heavy traffic for a long period of time.

3. **The floor shall have a non-slip surface only in the walkway area.**

Cleaning any floor surface that has a non-slip surface is more difficult due to the roughness. To make cleaning the floor easier, do not put the non-slip surface at the rear of the toilet riser and keep it about one foot from the walls. The visitors do not walk in these areas, so a non-slip surface is not necessary. All broom finishes should be in the same direction as the floor slope so the water will drain better.

4. **The wall to floor surfaces shall have a large radius coving (4 to 6 inches) and all 90° corners shall be rounded.**

By coving the wall to floor surface and rounding all the 90° corners, there will be no areas for dirt and odorous materials to accumulate, thus making the floor surface easy to clean. When the interior is clean the perception is that the toilet is sanitary.

Caution - If the floor to wall surface is poured 90 degrees and the coving and rounded corners are then added, you will have many cracks (where the two surfaces meet). Odor causing materials will collect in these cracks.

5. **The floor shall evenly join the outside concrete so that there is no lip at the doorway to hinder the people with disabilities from entering. This design criteria is self-explanatory.**

INTERIOR BUILDING WALLS AND CEILING

- 1. The walls shall be nonporous.**

It is important that the walls be nonporous so that over an extended period of time, odors do not absorb into the material.

- 2. The walls shall be light in color to assist in reflecting available light.**

Lighting within the building should be sufficient for the visitors to properly function but not placed in such a way that they can see the contents of the vault. However, when the wall surfaces are light in color, the interior is perceived to be clean.

- 3. The walls shall be difficult to write on or designed to be easily cleaned.**

In order to maintain an aesthetic interior, the walls should be difficult to write on. By reducing the writing you will also reduce the maintenance time. If the wall surfaces are similar to fiberglass reinforced plastic (FRP) or well painted, then they should be easily cleaned.

- 4. The walls shall be free from ledges, angles, shelves, etc., so that less dirt accumulates and cleaning is easier.**

It is important to reduce the amount of time it takes to clean a toilet building. Each shelf, ledge, etc., that has to be cleaned takes valuable time.

- 5. Each building shall have an insulated ceiling so that the interior of the building is not heated by the sun shining on the roof.**

There will be a certain amount of solar energy transfer through the walls of the building, but by far the largest amount of heat in a building comes from the sun shining on the roof. By installing an insulated ceiling, this additional heat buildup in the building is kept to a minimum.

When the interior of the building gets very warm, designers and field personnel are inclined to place vents in the upper walls to let this hot air escape. This is a mistake! In order to create proper venting there should be only one vent on only one side of the building. (See venting section.) So the best solution is not to allow heat to build up within the building.

- 6. The building walls should be reinforced to allow the firm attachment of any type of toilet paper holder/dispenser and grab bars for people with disabilities.**

It takes very little time, and costs very little, to thoroughly reinforce the wall or walls that items will be attached to. Use 2-by 6-inch or 2-by 8-inch lumber to reinforce the wall. Reinforce a good portion of the wall so the installers will not have to guess where the reinforcing is.

TOILET RISER

- 1. The riser shall have no cracks and crevices on the outside for potentially odorous materials to collect in.**

The objective of any toilet building interior is to maintain a clean, odor free environment. Toilet risers manufactured with cracks and crevices on the outside promote the collection of odor causing substances. Rarely do maintenance people take a small brush and disinfect these areas.

Because of this and other problems, the white (now commonly used) cross-linked polyethylene riser was developed. There are no cracks and crevices on the outside. The white color was chosen to simulate the color of the normal flush toilet found in most homes. The thought behind this was that the more familiar a person is with something, the less likely vandalism will occur. Also, white denotes cleanliness.

2. The riser shall have a heavy-duty, open front seat and cover assembly that does not seal out the air flow.

The open front seat allows a dynamic air flow (created by the wind entering the building and the 12-inch vent pipe aspirating it out of the vault) to continuously function. This assures that fresh air will be entering the building at all times. The open front seat is also easier to use for most people, particularly people with disabilities, and it is more sanitary.

If the original seat assembly is a heavy-duty, open-front seat as supplied with the cross-linked polyethylene riser and is vandalized or removed because of normal wear and tear, do not go to the local hardware store and replace it with a thin, flat, closed-front, inexpensive plastic assembly. This is not only a disservice to the visitor it is unsanitary, difficult to use and will prevent the dynamic air flow that we have fought so hard to create.

3. The riser shall be easy to clean and impervious to oxidizing cleaning agents.

Thoroughly cleaning the toilet riser is essential and the easier it is, the more often it will be done. If the material is impervious to oxidizing cleaning agents then stronger caustic materials can be used and less time is spent cleaning. Cleaning agents should always be reviewed so that the maintenance personnel and the vault contents will not be adversely affected.

A new 5-ft long brush has been specifically designed and manufactured for cleaning toilet risers of all types. It is listed with the other products in SECTION 6.

4. The riser shall be vandal resistant.

The public has a tendency to vandalize those things that they dislike. Vault and pit toilets have been major targets in the past. The initial development of the cross-linked polyethylene riser resulted partly from reviewing hundreds of dented stainless steel risers. The cross-linked riser cannot be dented.

Caution - A green cross-linked polyethylene riser does exist that has no seat and a lid that seals off the air flow. This riser is not recommended.

NOTE: Do not pour concrete around the riser so that the riser cannot be removed. Periodically the risers have to be replaced due to normal wear and tear and due to occasional vandalism. When designing for people with disabilities, be certain to use the taller 18-inch riser.

TOILET PAPER DISPENSER

- 1. If the vault or pit toilet building is located where there will be no people with disabilities, then use either the three-roll lock-bar dispenser or the mile-long (continuous roll) dispenser.**

Most people prefer a free rolling toilet paper dispenser because it is easy to get the paper. However, a free rolling toilet paper dispenser attributes to the following:

- People will physiologically use more paper than they physically need.
- Some visitors, having nothing else better to do while using the facility, will see how much paper they can spin off with a rapid pull. Maintenance personnel or visitors will gather up this excess paper and throw it into the vault.

The excess paper, resulting from the above two methods of over use, causes the following problems:

- The cost of providing more toilet paper is increased.
- The chances of using all the supplied paper before the next scheduled maintenance period increases. Visitors get very angry when there is no toilet paper.
- The excess paper sandwiches with the waste and various forms of debris and causes the

pumper's hose to clog up (unless the vault contents are well mixed before pumping and no one wants to do that).

- d. The excess paper aids the waste in mounding above the liquid level by creating a floating bed. This mounded waste becomes a breeding area for flies and increases odors.
- e. The final problem of using excess paper is that when the waste is pumped and taken to a treatment plant, the hardest part of the waste to digest is the cellulose (toilet paper).

So, it becomes imperative to carefully examine the type of toilet paper dispenser that we use. The lock-bar dispenser was developed to solve all of the above problems but does not meet the requirements for people with disabilities.

Note. When placing the rolls on the lock-bar dispenser be sure to place them so the paper hangs on the outside. If it hangs on the inside it is very difficult to get off. **ALSO, DO NOT MODIFY THE DISPENSER BAR SO THAT THE PAPER ROLLS FREELY.**

2. If the building is located for people with disabilities then consider using the mile-long (or continuous roll) dispenser.

The single ply rolls can be up to one mile long. The two ply rolls are somewhat shorter but still very long. Rubber "O-rings" can be placed on the spindle of one manufacturer's product in order to control the pull off speed of the paper so the roll cannot spin freely. This dispenser gives the visitor all they want, but with the rubber O-rings on the spindle a person cannot easily spin the paper off the roll.

Another continuous roll dispenser uses friction pads on the spindle to control the pull off rate of the paper.

The larger roll replaces approximately 14 regular rolls. During maintenance, partially filled rolls are replaced with new rolls. Since the mile-long dispenser replaces 14 regular rolls, further savings of paper are achieved by not throwing away the 14 partially filled rolls.

Be certain that there are serrated edges on both bottom ends of the mile-long dispenser so that mischievous visitors cannot run out the door and through the recreation facility with that long string of paper.

NOTE: The continuous roll dispenser refills are sold as a system. The industry has not standardized the toilet paper refills so some rolls are not interchangeable with other brands of dispensers. Be certain that you have a source for refills before purchasing the dispenser.

LIGHTING

1. **Lighting within the building shall be adequate for the visitor to comfortably function but not directed in such a way that the visitor can see the waste in the vault. DO NOT USE OVERHEAD SKYLIGHTS.**

This criteria is more of an aesthetic consideration. The visitor will feel better about using a vault or pit-type toilet if there is no odor and the contents of the vault or pit cannot be seen. Overhead skylights illuminate the contents and consequently should not be used.

2. **Polycarbonate (LEXAN) windows shall be used in place of glass or thin plastic, to help prevent breakage by vandalism. Fiberglass is not recommended because when damaged, the resulting splintering fibers could be a hazard.**

Polycarbonate windows are considerably more expensive than glass but rarely are they broken.

3. **To maintain privacy, the LEXAN shall be translucent or covered with translucent louvers.** When selecting the type of windows and locating the windows, be careful not to place them in such a way that someone on the outside can see silhouettes on the inside.

VENTING INTRODUCTION

Before expanding on the venting design criteria, let's first discuss what causes a vault or pit-type toilet system to be odorless.

In order for proper venting to occur there must be some form of energy. This energy can be either wind, sun, or electric (ac or dc) powered fans. The method of achieving an odor free toilet is very simple. If the air inside the toilet building is forced to flow down the toilet riser into the vault and then out through the 12-inch diameter vent pipe, the building use compartment will have no odor.

Remember that the odor has not been eliminated, it has simply been removed from inside the building and forced to the outside. This outside odor problem will be discussed later when the building location is discussed.

How do we get this air in the building compartment to flow down the toilet riser into the vault and out through the vent pipe? See Figure 3.

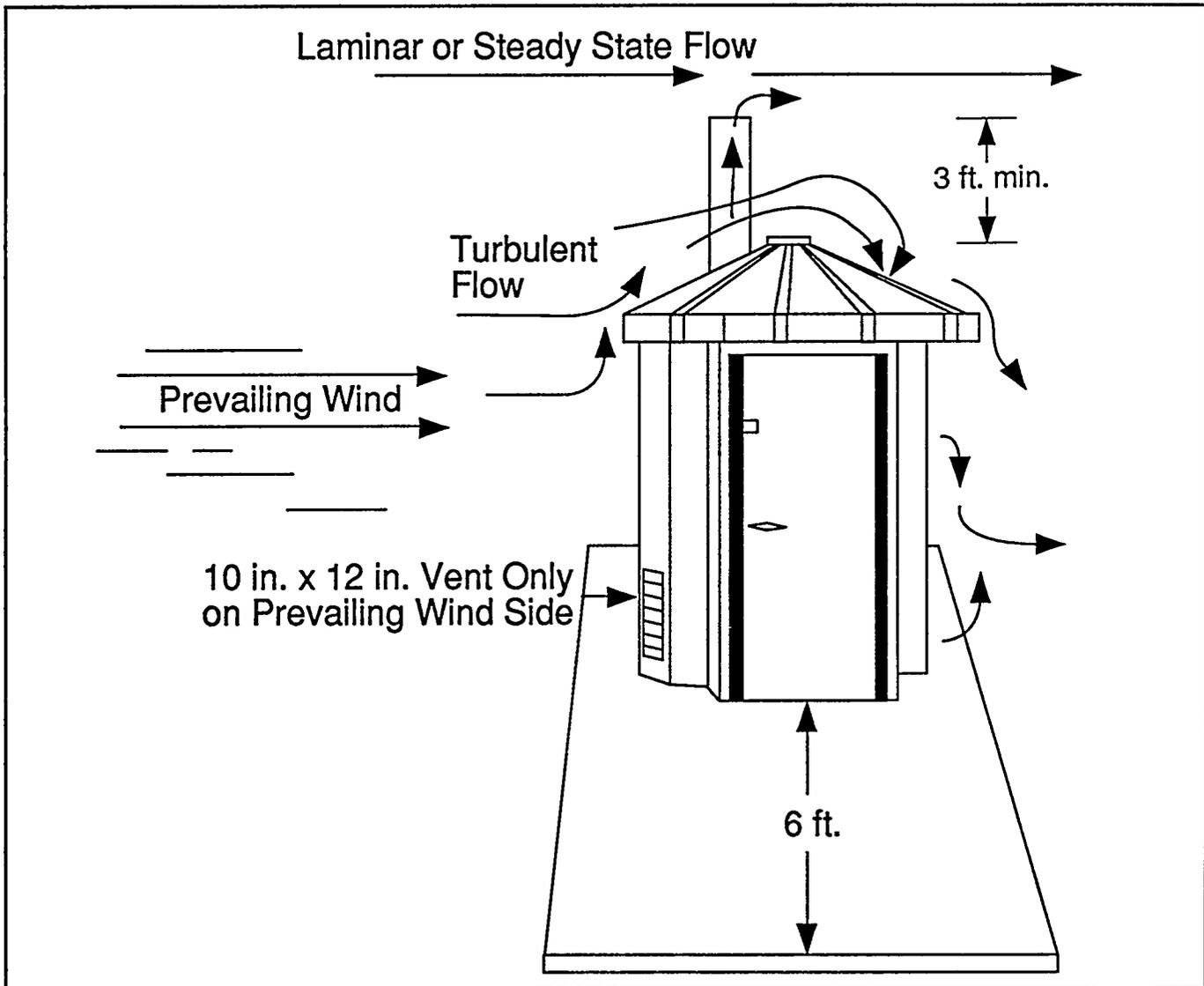


Figure 3

THE FOLLOWING ADDRESSES ONLY A SINGLE UNIT TOILET. For the design of a two unit toilet see SECTION 4, but read SECTION 2 first because a two unit toilet is simply two single toilets under one roof. For the design of a four unit toilet, follow the same reading instructions because a four unit toilet is simply four single unit toilets (in line with each other) under one roof. See SECTION 5 for the four unit design.

Place one 10-by 12-inch vent only on one side (either side, front or back) of the building. The correct side to place this vent is the side that the prevailing wind blows against. Install a 12-inch diameter round pipe to vent the vault and raise the pipe a minimum of three feet above the highest point of the roof. All vent pipes should be straight up from the vault. **AVOID ANY BENDS IN THE VENT STACK BECAUSE THIS WILL CREATE A RESISTANCE TO AIR FLOW.**

Two things will happen: First, by having the top of the vent pipe a minimum of three feet above the highest point of the roof, the wind will blow across the top of the pipe in a laminar or steady state flow and will not be affected by the turbulence associated with the wind flowing over and around the building. With just a two mile per hour (mph) wind flow the 12-inch pipe will aspirate approximately 60 cubic feet per minute (cfm) from the vault.

Second, the prevailing wind will blow air into the 10-by 12-inch building vent and, because there are no other openings in the building for the air to escape, this air will slightly pressurize the building compartment. This slight pressure begins to force the air down the toilet riser into the vault.

So, we have two forces at work: One is pulling the air out of the vault by aspiration and one is pushing the air down into the vault by pressure. This synergistic action results in an odorless toilet because the odor in the vault cannot go against the air flow and enter the building compartment.

CAUTION: Visitors have learned over the years that propping the toilet doors open is sometimes a way to reduce the odors in the building compartment. With the new design concepts shown in this manual, this past practice must be avoided. The doors must remain closed at all times!

The 10-by 12-inch vent in the building may be located midway or head high on the building wall **if the wind is prevailing in one direction all the time.** The objective of the building vent is to help pressurize the building compartment and the higher the vent is placed the greater the wind velocity to assist the process.

CAUTION: If the prevailing wind is blowing against the rear of the building (opposite the door), then place the 10-by 12-in building vent on this side, but be certain that the wind does not enter the building vent and blow the door open. This will short circuit the venting system. Door closures may be necessary.

If the wind is consistently very strong against the back of the building and you cannot keep the door closed with a door closure designed for people with disabilities, then reduce the size of the building vent.

Now let's look at continuously shifting winds. This condition must be addressed differently.

With continuously shifting winds, the 10-by 12-inch building vent must be placed as low to the ground as possible and on the side where the wind is the most common during the use period at the site. (Consult with the maintenance folks or campground host to assist in defining wind directions.) By placing the vent as low as possible, any negative effect of the wind on the building vent when changing to the opposite side of the building will be significantly reduced and the positive effect of the wind in a laminar flow across the open top of the 12-inch diameter vent pipe will prevail and draw the air in through the building vent, down the toilet riser and out through the vent stack.

Suppose there is a known up-canyon wind in the morning and a down-canyon wind in the late afternoon and evening. (See Figure 4.) When this wind condition exists (and it often does) **DO NOT PLACE THE VENT ON EITHER OF THOSE SIDES!** Place the vent on an adjacent side as low to the ground as possible.

There will be a small amount of aspiration caused by the wind blowing past this vent but, because the vent is low to the ground, the effect will be small. Again, the positive effect of the wind aspirating the air out of the 12-inch vent stack will prevail and this force will draw the air in through the building vent.

There is a side benefit of placing the vent in the door. When the door is opened, a suction within the building occurs and at that moment odors can be drawn up out of the vault. By placing the vent in the door this suction effect is reduced because air can flow in through the vent as the door is being opened.

Some people will say that without additional vents at the top of the building compartment the building interior will get hot and the visitors will complain.

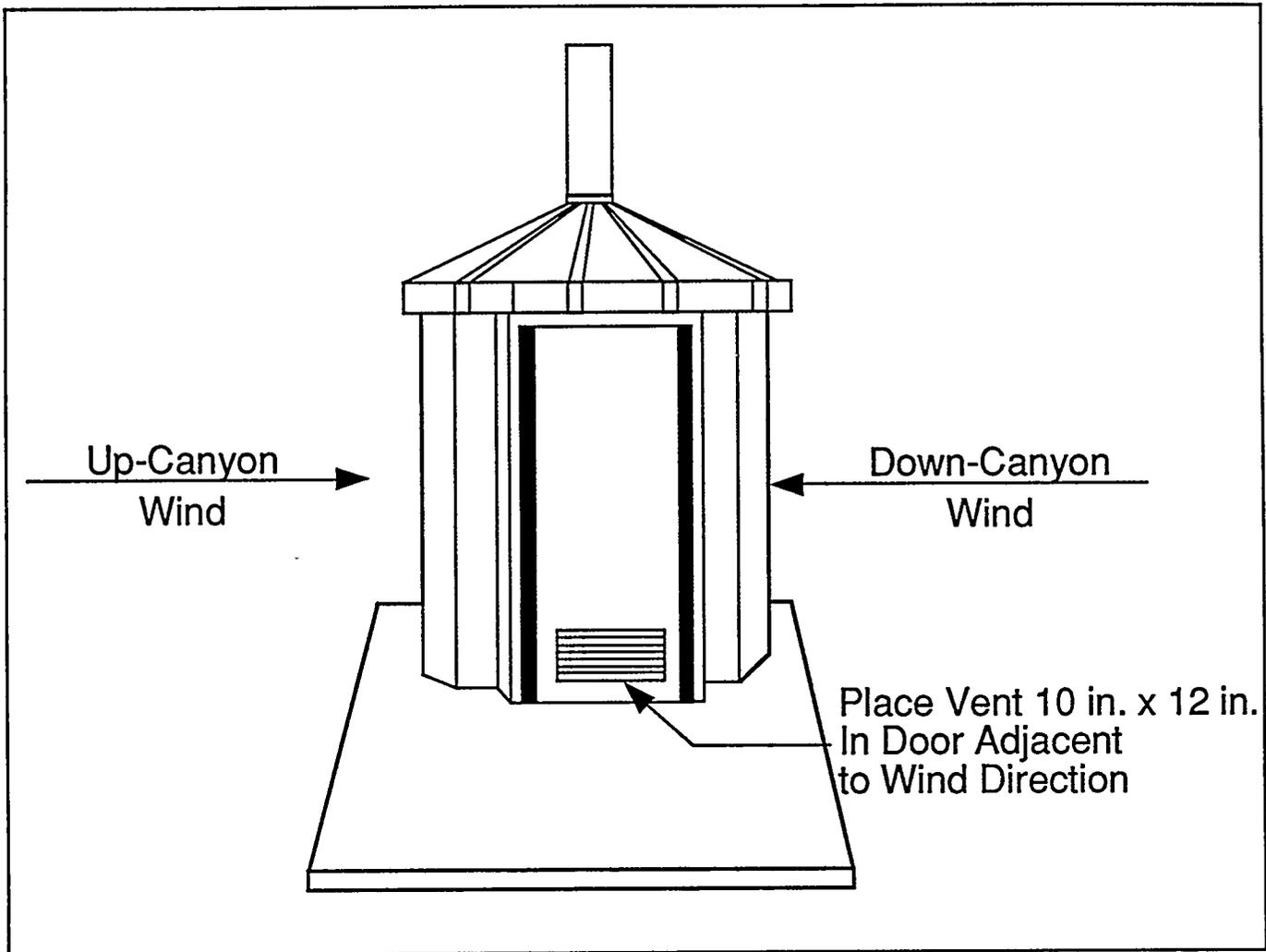


Figure 4.

DO NOT PLACE ANY ADDITIONAL VENTS ANYWHERE IN THE BUILDING.

Any additional vents in the building, or even a loosely fitting door, will allow the air flow to be short circuited. Nothing must interfere with the air in the building compartment from flowing down the toilet riser into the vault and up the vent stack.

This constant flow of air will assist in keeping the building cool. Remember, even if the building compartment becomes a little warm there will be no odors. The visitor dislikes warm stinky buildings, not warm odor-free buildings. Installing an insulated ceiling to keep the heat out (as previously discussed) is an important design criteria.

PROPER VENTING WHEN THERE IS NO WIND

When there is no wind, then the sun or electricity (ac or dc) must provide the energy.

USING A POWERED FAN. First consider ac or dc electricity. By placing a fan in the vent stack (run by ac power or by photovoltaics) and venting the building exactly the same as previously discussed, the building compartment will be odorless. The fan should be capable of moving air at a rate of 75 cfm. If you use an ac powered fan or use photovoltaics with a battery, consider using a timer so that the fan can be shut off around 9:00 p.m. and then started again when the use period begins (6:00, 7:00, or 8:00 a.m.). There is no reason to exhaust the stinky air all night long when the building only receives occasional use.

Generally, at night, the wind becomes still and dampness sets in. The stinky air from the vault, being forced out by the fan, can in some cases result in the entire recreation area being obnoxious in odors. If photovoltaics are used to drive a fan in a day use area, no timer is needed because when the sun goes down the fan will stop.

USING THE SUN FOR ENERGY (WITHOUT A FAN) (WITHOUT A FAN)

By placing the 12-inch diameter vent pipe in an enclosed and sealed metal shroud and facing the shroud in the south direction, the sun will heat the air between the shroud and the pipe evenly, all around the pipe. The pipe will then get considerably hotter than the outside ambient temperature and create a convection process that will draw the air out of the vault. (See Figure 5.)

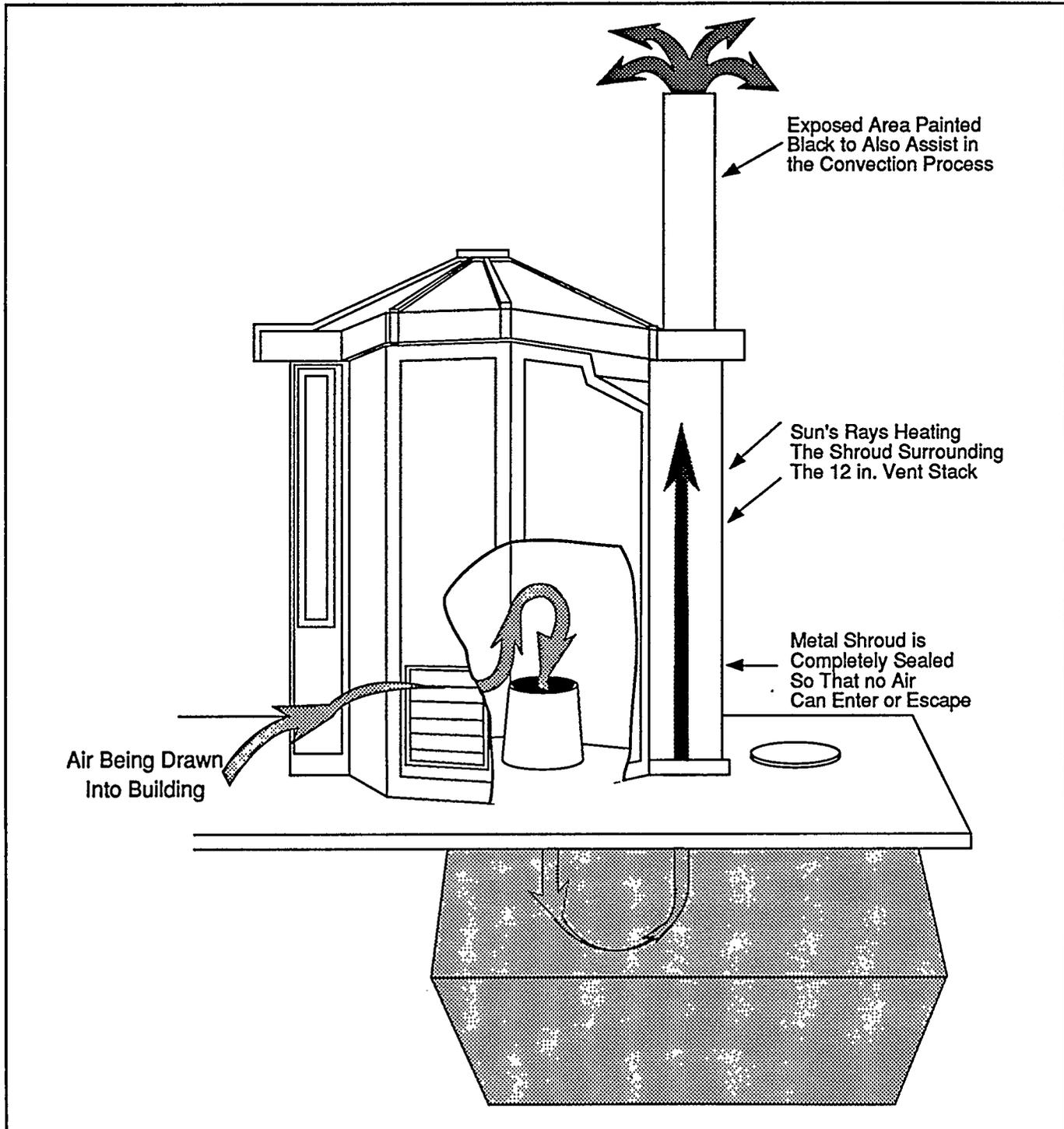


Figure 5

To further assist this process, the 12-inch pipe within the shroud should be galvanized metal. It can be relatively thin because the outer shroud will protect it from vandalism. Metal is far better for conducting heat than PVC, ABS, etc.

This method of venting is dependent on the sun hitting the shroud. Do not place the building in a bushy or wooded area that will prevent the sun from shining on the shroud. Do not orient the building so that the shroud is on the north side!

If only the vent pipe (without a sealed shroud) is exposed to the sun, the convection process will not be nearly as effective. The sun will only shine on one-half of the pipe at any one time and because of the various angles that the sun hits the pipe, the sun will effectively heat only about one-third of the outer surface of the pipe. The rest of the pipe is not being heated and any wind blowing will cool the entire pipe. The resulting convection process will be very limited.

The 12-inch vent pipe can also be placed within the building or in a wall space. However, the effect of the sun for convection will be reduced even further unless the wall space is designed to absorb heat.

EXPLANATION OF VENTING DESIGN CRITERIA

FIRST, THE AIR VENT FOR THE BUILDING

- 1. The vent in the building, necessary to supply replacement air for the air drawn out of the vault, shall be around 120 sq in of free area for a single hole toilet.**

This building vent should closely match the opening of the toilet riser and the vent stack for the vault. If the building vent is much larger, then negative effects on the building vent caused by changing winds could draw odors up out of the vault and into the building compartment. If the building vent is too small, the 12-inch diameter vault vent will pull air into the building through a smaller opening and be working against a slight vacuum. So keep the building vent, the toilet riser opening, and the vault vent all about the same size.

- 2. There shall be only one vent opening in the building and it shall be placed only on one side of the building (the side that the wind blows against).** The previous discussion illustrated where to place the vent if there were changing winds.

If there are two vents on opposite or adjacent sides of the building, the outside air can enter the building through one vent and exit the building through the other vent. Remember, nothing must short circuit the ability of the air entering the building use compartment from flowing down the toilet riser, into the vault and up the vent stack. The outside air entering the building compartment should slightly pressurize the compartment. If there is more than one vent then there is no chance of pressurizing the compartment because the air will flow in on one side and out the other side. Consequently, place only one vent on one side of the building. "Side" can mean either side or the front or back.

- 3. The vent shall be located "head-high" on the building if there is a constant prevailing wind hitting that side. For shifting winds, the vent shall be placed as low to the ground as possible and on the side that the wind is most predominant during the use period. If there is an up-canyon wind in the morning, and a down-canyon wind during the afternoon, then the vent shall be placed on an adjacent wall surface as low to the ground as possible so that the wind has the least effect of aspirating air out of the building.**

The above has been discussed in the previous text. (Pages 19 and 20.)

- 4. The vent shall be constructed of a heavy-duty material, such as expanded metal, in order to prevent vandalism.**

When the building vent is located close to the ground there is more of a chance for vandalism. By constructing the vent out of a heavy-duty material, vandalism will be reduced. Remember, the free open space must be approximately 120 sq inches. The size of the actual vent may have to be bigger than the 10 by 12 inches if expanded metal or designer block is used.

Normally, louvers are used to prevent people from seeing inside the building. These louvers should also be vandal resistant.

5. There shall be no screen in the vent opening unless the size is 1/4-inch mesh (least dimension).

Maintenance on vault toilets is never perfect and periodically waste will mound up above the liquid level. This exposed waste becomes a breeding area for flies. If we install screens in the building vent area, the flies that are generated within the vault cannot get out. The second biggest complaint of vault toilets, other than the obnoxious odors, is the flies in the building. The 1/4-inch mesh size will allow the flies to leave.

The 1/4-inch mesh screen takes up space, so be sure to increase the 10-by 12-inch vent size so that you end up with a free space of 120 sq inches.

SECOND, THE VENT TO ASPIRATE ODORS OUT OF THE VAULT

1. The vault vent shall be a minimum of 12 inches in diameter. Each vault shall have its own vent. This 12-inch vent size is for single unit toilets only.

In order for a vault or pit-type toilet to vent correctly and eliminate odors from coming up into the building use compartment, a steady flow of air needs to go from the building compartment, down the toilet riser, into the vault, and out of the 12-inch vent stack.

There are many of nature's influences that interfere with this venting process. Shifting winds, cloudy days, rainy days, and windless days are some of these changing influences. So, in order to insure that the venting will be effective most of the time, it is necessary for the air flow out of the vault to be between 60 and 100 cfm.

After evaluating 4, 6, 8, 10, and 12-in pipes, 10-ft long, in a calibrated wind tunnel at wind speeds of 2, 5, and 7 mph, the results clearly showed that the size had to be a minimum of 12 inches in diameter. (A 12-inch pipe will aspirate approximately 60 cfm when the wind speed is 2 mph.)

Square ducts and rectangular ducts (the rectangle was on a ratio of 3 to 1) were also evaluated. Both square and rectangular openings work better than the round (the wind must, however, be perpendicular to the short side of the rectangle and perpendicular to either side of the square) until the wind changes slightly and blows across the diagonal of either duct. The ability of the duct to aspirate was then significantly reduced. Therefore, the round pipe, which is independent of any wind direction, is the recommended top of any venting system. A square or a rectangle can be brought up from the vault to just above the roof (if the designer finds it necessary) but the last foot should be round.

Also studied in the wind tunnel were 29 different tops that are sometimes placed on vent pipes to increase aspiration (turbines, rotating siphons, stationary ventilators, pipe size increasers, and tops designed as round venturies).

The simple open top pipe aspirated more air than any of the 29 tops at a 2 mph wind speed. Some of the tops aspirated more air than the open top pipe at wind speeds above 2 mph, but why spend a lot of money for the top and then have to maintain it when the open top 12-inch pipe aspirates more air than is necessary above a 2 mph wind speed. In order to have the toilet odor free for the majority of the time, the 2 mph wind speed was considered critical. It is easy to make the venting system work at greater wind speeds.

2. The 12-inch vent pipe shall be a minimum height of 3-ft above the highest point of the roof.

The only way the 12-inch pipe will effectively aspirate the air out of the vault is to have the wind flow go over the top of the pipe in a laminar flow or steady state condition. In order to guarantee a laminar flow condition, the pipe must be high enough above the highest point of the roof to escape the turbulence of the wind going around and over the building.

In many cases the vent must be considerably higher, depending on the surrounding vegetation. After using smoke bombs to evaluate the flow of air over and around buildings, it was easily determined that the absolute minimum height of the 12-in vent stack must be three feet above the highest point of the roof. If the building

is located incorrectly and odors emitted from the vent stack are causing problems in the immediate recreation area, the vent pipe may have to be raised to keep the odors from reaching the ground.

- 3. The 12-Inch diameter pipe above the roof shall be painted a dark color (or shall be black ABS) to take advantage of potential convection from the sun's energy as the sun heats the pipe.

Even though, as previously explained, the sun is only effectively heating approximately one-third of the pipe, this minor assistance is still a positive effect. Everything must be done to aspirate the air out of the vault to assure an odor free building in as many climatic conditions as possible.

- 4. The top of the 12-Inch pipe shall remain uncovered and unscreened.

If a screen is used for some reason (such as preventing birds from building a nest or preventing rocks from being thrown in) then use a thin wire 1-inch mesh. This will not significantly reduce the aspiration effect of the wind blowing over the pipe. The screen must be placed parallel to the ground. CAUTION: Be certain to keep the screen clear of leaves, cobwebs, etc., so the aspiration effects of the wind blowing across the top of the pipe will not be reduced.

Screens of any size are not recommended!

If for some reason it is absolutely necessary to put a protective cover over the top of the pipe (perhaps to help reduce the noon-time sun light from illuminating the vault contents) be certain that it is no more than a flat plate raised 12 inches (one pipe diameter) above the top of the pipe. (See Figure 6.)

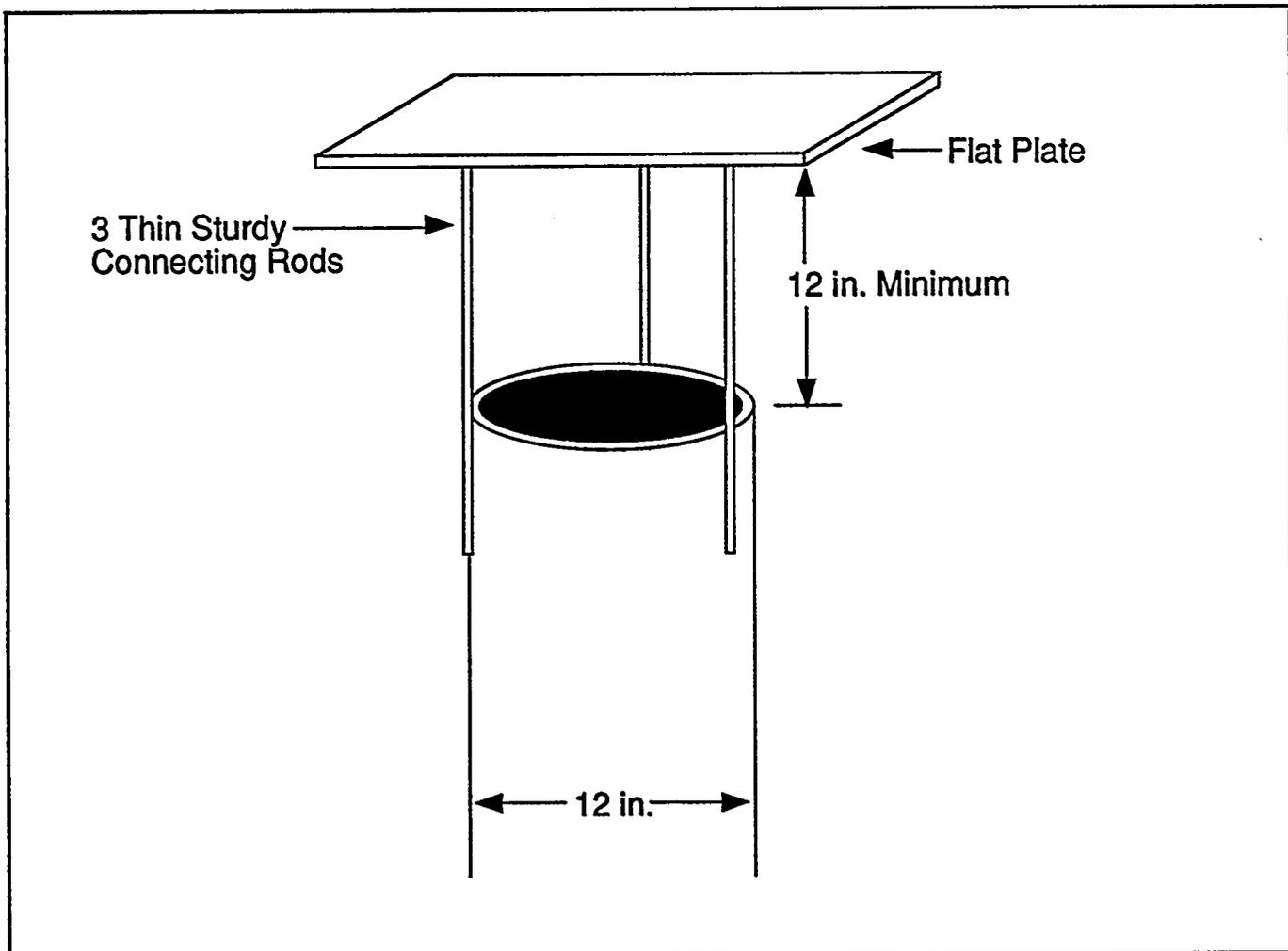


Figure 6

Do not use a cone or other shaped top because of the turbulence caused by the wind over and around the top.

Rain entering the pipe is not a problem except, perhaps, in Alaska. Almost all vaults are deficient in water, so any water added by rainfall can only help.

The problem of how high to raise the flat plate was validated in a calibrated wind tunnel. The plate was raised until the reading of the aspiration (air flow through the pipe) was the same as when there was no top on the pipe.

NOTE: Use no more than three thin round rods to hold up the flat plate so that the wind is not restricted (anymore than it has to be) when flowing over the top of the pipe and through the rods.

Also, if a particular top is used, be certain to alert the maintenance folks that this top must be maintained. All cobwebs need to be removed and the original function of the top needs to be maintained. The air flow through the vent pipe must not be reduced! TOPS OTHER THAN A FLAT PLATE ARE NOT RECOMMENDED.

PLACING THE BUILDING ON THE SITE

NOTE: A BUILDING THAT IS CORRECTLY DESIGNED, IN ALL ASPECTS, WILL NOT FUNCTION PROPERLY UNLESS IT IS LOCATED PROPERLY IN THE FIELD!

1. The building shall be placed to take advantage of the wind flow or the sun's energy (preferably both).

In order for proper venting to occur, an unobstructed flow of wind must be directed past the building. Buildings should be placed closer to open areas and roadways in order to take advantage of the wind.

CAUTION: Placing a vault or pit-type toilet building immediately adjacent to a roadway may result in owners of motor homes, etc., dumping their recreational vehicle waste into the vault or pit.

If a given area has very little wind, then the building should be located to take advantage of the sun's energy. By placing a shroud around the vent stack and sealing the air space between the pipe and the shroud and by facing the vent stack and shroud toward the sun (true south), the resulting heat convection process will assist in the aspiration of the air from the vault. Selective clearing of vegetation may have to be done to allow the sun's rays to hit the pipe shroud or to create a path for the wind.

2. The building shall not be placed in a hollow, beneath an overhang, on the lee side of a ridge, immediately adjacent to a dense tree line, or in dense brush and/or trees. Both the building location and orientation are important.

The building should be placed to prevent surrounding earth formations from causing down pressures on the building. This will result in poor venting. Do not place the building close to dense tree or brush cover or immediately adjacent to any building (pumphouse, picnic pavilion, assembly building, etc.) that will interfere with the normal flow of air past the building. Buildings placed on the lee side of a ridge are subject to down pressures by the wind as the wind blows over the ridge and down onto the building.

3. Place the building so that odors emitted from the vent stack will not affect the visitors during their use of any of the recreation facilities (campgrounds, picnic areas, boat launch areas, scenic overlooks, etc.)

The design of vault and pit-type toilets as outlined in this manual will virtually eliminate the odors within the building. However, the odors from the vault have not been eliminated. They have just been moved to the outside of the building. Consequently, it is important to locate the building so that the odors leaving the building do not affect the visitor use areas. This will require some early planning and close coordination with the maintenance personnel on the site to verify prevailing wind directions.

4. Do not place two single unit (or two unit) toilet buildings close together and in line with the wind.

If two buildings are close together and in line with the wind, the downwind building will receive the turbulent flow of air from the first building. This is not conducive to good venting.

It is acceptable to have the buildings close together if they are located so that the prevailing wind strikes both buildings equally. Normally, there will be no problem if the buildings are offset enough to receive equal wind force.

As a summation of the previous design criteria, the following *Figure 7* shows a new, correctly designed, premanufactured vault toilet system (from Romtec, Inc.) that comes complete with a 750 gal vault, disabled access building, cross-linked polyethylene toilet riser, lightweight manhole cover, and a correct venting system.

**EXISTING TOILET SYSTEM
MANUFACTURED BY ROMTEC, INC.**

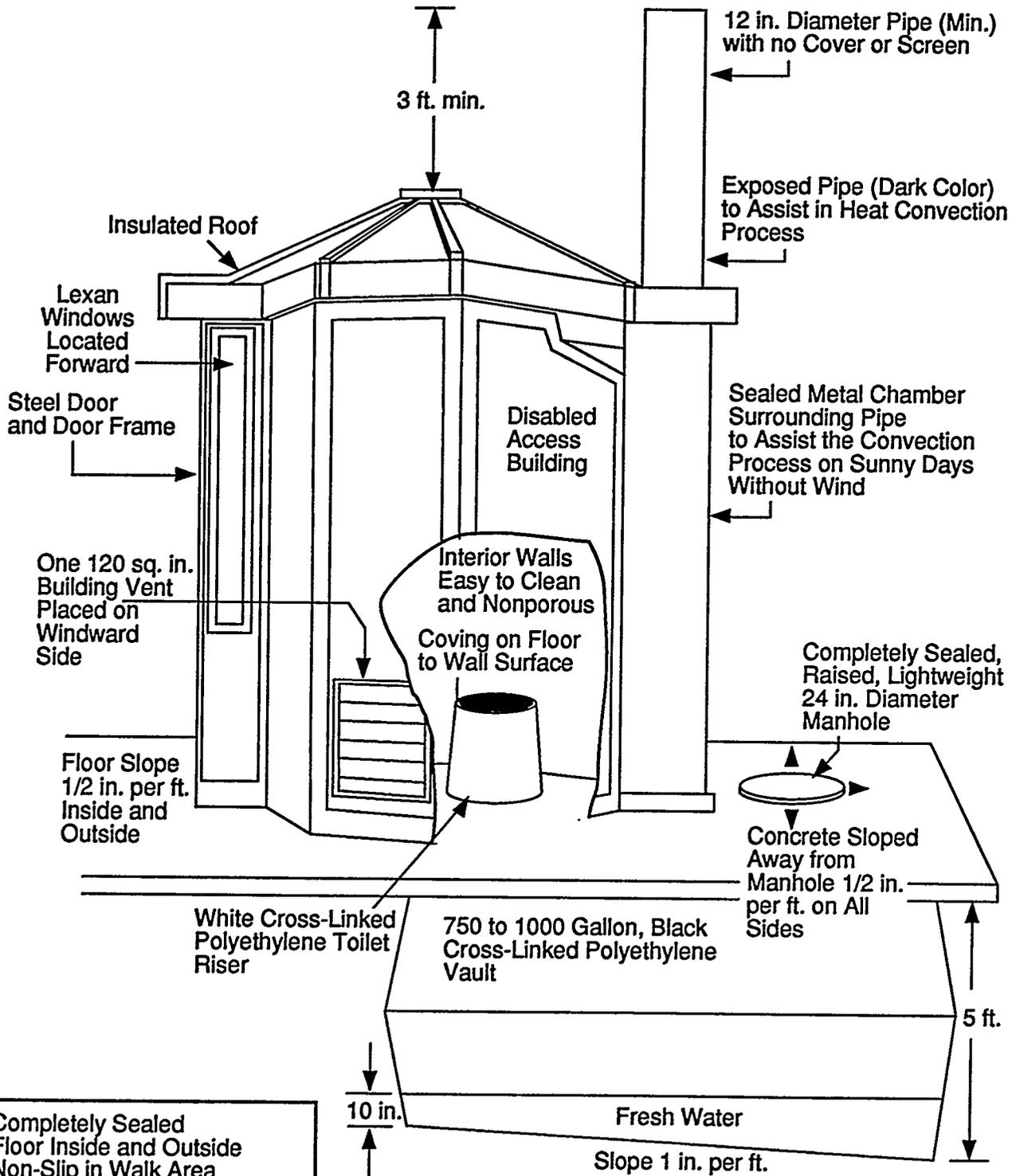


Figure 7

SECTION 3

GUIDELINES FOR THE MAINTENANCE AND OPERATION OF VAULT TOILETS

INTRODUCTION

In the past and up to the present, vault toilets were considered to require very little maintenance. The building interior was swept out and occasionally washed, the toilet riser was infrequently cleaned on the inside, a few cobwebs in the building compartment were occasionally knocked down, and the vault was pumped when it filled up.

It is necessary to reduce odors everywhere they occur. It is also necessary to offer the cleanest toilet possible to our visitors. If the toilet facilities are clean, odor free, and maintained, then you will rarely hear any complaints about the remainder of the recreation facility.

This portion of the manual will discuss the general maintenance requirements that should be adhered to.

STARTING UP AND MAINTAINING THE VAULT

Assuming we are starting with a new vault, there should be approximately 10 inches of water in the vault, under the toilet riser (See Figures 1 or 8). Assuming the vault has a 1 inch per ft slope, there will be approximately 16 inches of water in the vault under the outside manhole cleanout cover. This precharged water will help to delay the forming of the cone of waste that forms under the toilet riser. When the waste rises above the water, the flies will begin to breed and additional flies will then be in and around the toilet.

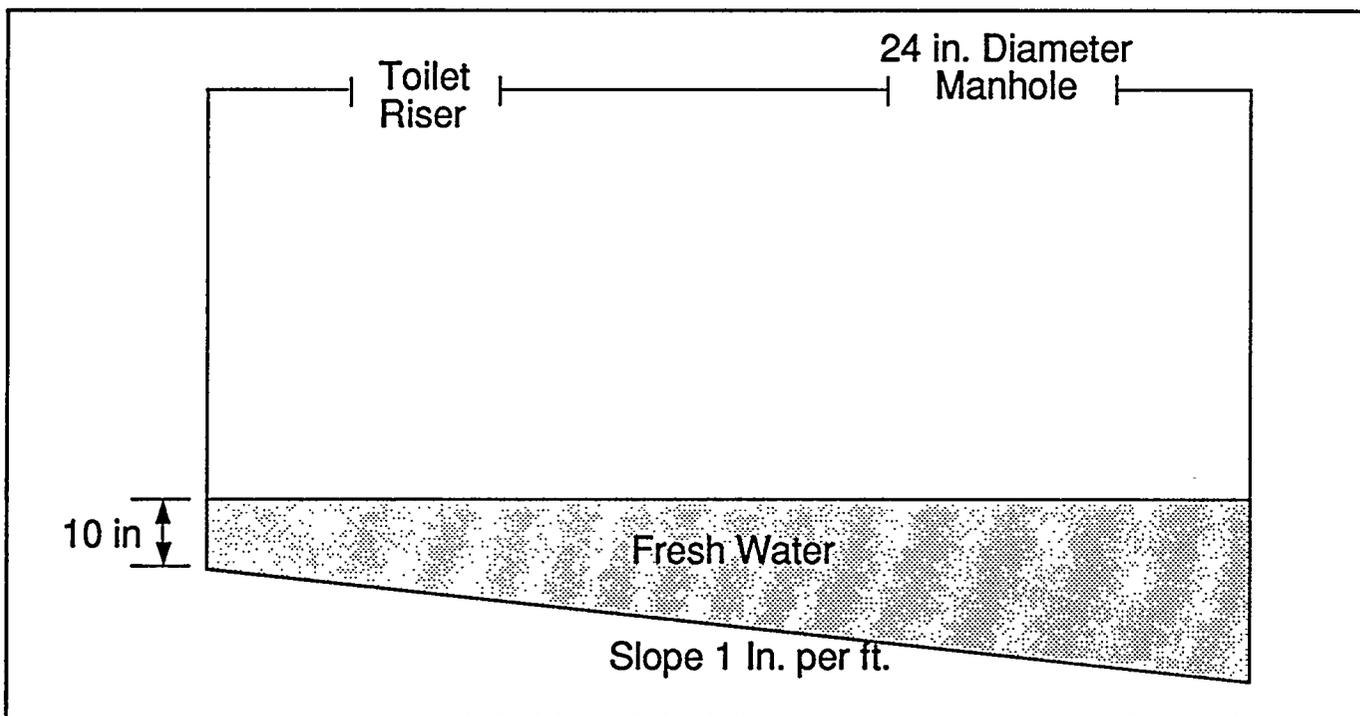


Figure 8

Another benefit of maintaining a water level is that the odor emanating out of the vault will be reduced by about 30 percent.

A water layer is also more aesthetically pleasing to the visitor than a mound of waste.

During the use period the waste will eventually begin to cone below the impact zone. Periodically it is necessary to move the cone over. Do not mix the vault contents because this will release obnoxious gases and the facility will have increased odors for three or more days. When there is an outside manhole to pump the vault, the task of moving the cone is easier. Simply take a large hoe and lower the hoe on the far side of the cone area and pull the cone from under the impact zone. If you have to move the cone from inside the building compartment, down the toilet riser hole, then use a long handled flat shovel and push the cone away from the impact zone. This is more difficult! Either way, do it slowly!

By periodically moving and submersing the cone, fly production will be much less and odors will be significantly reduced. During this procedure there is also an opportunity to remove the more obvious floating debris such as cans, bottles, pine cones, etc. Use a 4 or 6 tine clam rake for this work and dull the ends of the tines to prevent injury to any person or damage to any synthetic liners.

PUMPING THE VAULT

This is the most obnoxious task in any recreation complex. Extreme courtesy and patience should be extended to anyone associated with this task.

The pumper (who contracts to remove the waste) should be called into the office at the beginning of the recreation season (especially new contractors who have not pumped vault toilets) and thoroughly instructed as to procedure, what the pumper can expect to find, (see inventory in Section 8) what equipment is needed, and what the requirements are to dispose of the waste. The pumper will be required to remove the entire contents of the vault.

The pumper will need heavy duty plastic bags for holding all the debris that is removed. The pumper will need two 5-to 6-ft long clam rakes, with between 4 and 6 tines (rounded on the ends) approximately 6 inches long. There is some debris that is more easily removed by two rakes than one and sometimes two people need to work together to remove heavy rocks.

Once the more obvious debris on top is removed, the clam rakes are necessary to plunge down through the waste to locate the debris hidden from view.

The pumper might want to have a two prong grabber (5-ft long handle) to assist him in removing the top floating cans and bottles. The grabber is faster and more dependable than trying to balance the debris on the clam rake tines.

The pumper will need a pressure water system to clean the vault walls and dilute the final remaining waste so that more waste can be removed. This pressure water system is also useful in cleaning up the mess that the pumper will make above ground during the pump out process (especially if the pumper is required to pump through the toilet riser because of not having an outside cleanout). **No new vaults should be built without an outside 24-inch diameter cleanout!**

For the pumper's safety they may want to have rubber gloves, safety glasses, and a face mask around the mouth (for obvious reasons). They should also keep up with various shots recommended by a local physician (hepatitis, tetanus, typhoid, etc.).

The pumper should be required to remove as much debris as possible BEFORE PUMPING BEGINS. Once the pumping begins, the vacuum system will quickly remove the liquid contents. If during this initial pumping, the hose continually gets clogged with debris and has to be removed from the vault, the liquid in the vault will be gone long before the waste solids are removed because, as the hose is withdrawn, it continues to remove the top liquid while partially clogged with a can or bottle, etc. So, remove as much debris as possible before pumping begins.

When the pumper gets to the bottom, the suction hose will begin to suck air when there is about 3 inches of waste remaining. At this point, more water should be added. This is a good time to wash the vault side walls down and accomplish two things at once. Then the remaining waste should be removed. The hoe may again be needed to pull some remaining sludge out from under the impact zone and down the slope.

CAUTION: If the pumper's truck is parked lower than the vault and the truck fills up before the entire contents of the vault are emptied, the pumper's only recourse is to let the contents of the hose spill out on the ground. This is an unacceptable practice and should be avoided.

After the pumping is completed, 10 inches of water should cover the shallow end of the vault (assuming there is a 1 inch per ft slope) or over the entire flat bottom of previously existing vaults that have no slope. At this time the addition of a quart of clorox bleach is a good idea because it will disinfect the remaining waste and result in a good odor reduction. The chlorine will soon oxidize off as waste is introduced.

The pumper should be required to disinfect all topside concrete surfaces that were contaminated with waste. If the pumper was required to pump through the toilet riser (only because there was no outside cleanout) then the adjacent walls and the entry way may also have to be disinfected. The pumper should be required to dispose of all contents removed from the vault into a Forest Service or State approved disposal site.

The pumper should be accompanied by an authorized inspector to see that the above tasks are accomplished.

The above procedure and equipment suggested for a contract pumper are also applicable to Agency personnel performing this task.

CLEANING THE INTERIOR BUILDING FLOOR.

The most important criteria here is consistently removing all forms of odor causing material. This means a continuous cleaning and disinfecting of all cracks and 90° corners. Because most toilets have an improperly sloping floor, cleaning personnel should use a squeegee to remove the excess water. Standing water should never be left on the floor!

The floors should be thoroughly sealed to prevent any staining. If stains already exist, do not use a clear sealer over the stain. The final floor surface should be light in color and stain free.

CLEANING THE TOILET RISER.

The toilet riser is the most important item in the toilet building to keep thoroughly clean and disinfected. Unfortunately, it is often the most overlooked because one's face is just above the opening of the riser when cleaning with the normally supplied 18-inch long brush. There is now a 5-ft long brush with foam rubber grips so that you can now stand fully upright and comfortably put your body weight into cleaning the inside of the riser. Brush is listed in SECTION 6.

About once a month, as a minimum, the entire riser should be removed and thoroughly cleaned on the outside with soap and a disinfectant. Odor causing materials can collect on the outside flange area and need to be removed.

During each visit, inspect the toilet seat and tighten as needed. When the original seat assembly is vandalized or removed because of normal wear and tear, do not go to the local hardware store and replace it with a thin, flat, closed-front, inexpensive seat assembly. This is not only a disservice to the visitor, it is unsanitary, difficult to use and will prevent the dynamic air flow down the riser and up the vault vent.

Be certain that the seat cover has a back stop that will not mar the finish of the seat and is located to hold both the seat lid and seat comfortably open.

CLEANING THE BUILDING INTERIOR

When cobwebs are hanging in the corners and dead flies or rodent nests are on various flat surfaces, the visitor does not get the feeling of cleanliness. Window louvers often present this problem.

Keep the walls, window ledges, joists, etc., free of dust and cobwebs and particularly free from spiders and dead flies.

If the present wall surfaces are porous, then seal them so they will be easy to clean and odors will not be further absorbed. It goes without saying that all writing and other defacing marks should be removed or covered over.

The use of pleasant smelling deodorants placed in a container on the wall is optional and acceptable.

MAINTAINING THE EXTERIOR

The exterior has a lot to do with the visitors' perception of cleanliness.

Keep the exterior free from mud and/or water stains on the walls, damaged boards or broken block, and keep the paint/stain presentable. Also be certain that all door fixtures (knobs, latches, slider bolts, hinges, etc.) are in proper working order.

MAINTAINING THE VENT PIPE

All tops and screens should be removed from the vent pipes. The small amount of rain that enters the pipe can only be a benefit because most vaults are deficient in water anyway. The only reason, in most cases, for a flat top to be placed over a vent pipe is to keep the noon day sun from illuminating the vault contents. Remember we are trying to prevent the visitor from seeing the vault contents.

After removing the tops and screens from the vent pipe, be certain that the vent stacks are clear of cobwebs, etc. For a single unit toilet the vent pipe should be 12 inches in diameter and raised to a minimum of 3 ft above the vent stack.

Repair bullet holes or other damage to the vent pipe as soon as it occurs. This will assure that no cross connections of air flow occur in the venting system.

If galvanized pipe sections are used for the vault vent, then be certain that each connection is completely sealed so that no outside air can enter the vent pipe and interfere with the ability of the vent system from drawing air out of the vault.

BIOLOGICAL AND CHEMICAL ADDITIVES

Many producers of biological and chemical additives contact the managers of recreation areas and the maintenance personnel trying to sell their products, claiming that odors will be either reduced or eliminated and the waste will be liquefied and easier to pump.

A study of 27 such products were evaluated, in depth, in 1990. The report is available from the Technology and Development Center at 444 East Bonita Avenue, San Dimas, CA 91773.

None of the products eliminated the odor nor did they reduce the odor to an acceptable level.

When a manufacturer claims that their product will break down the waste and make it easier to pump, remember that fecal matter, toilet paper, and urine are not difficult to pump. It is the cans, rocks, bottles, etc., that cause pumping problems.

Also think about the process of adding the product. Ninety-five percent of the vaults have a cone of waste or floating mat on top (sometimes thick enough to walk on). So, when you mix up the biological or chemical product and pour it into the vault, the product will only effect the area it lands in. You certainly do not want to stir the product into the vault mass because of the resulting odors.

New waste is being added (sometimes immediately) after you finish adding the product. If there is a floating mat or a cone then this newly added waste is not affected by the product.

Many products are corrosive and require special handling.

Certain pH's have to be maintained in order for some products to work.

The recreation visitors throw all kinds of products into the vault toilets and many times these products are caustic and will nullify any bacterial effect.

All in all, adding biological or chemical products for odor control is not practical or economical. Let the burden of proof be on the manufacturer. If they wish to prove their product, let them do so at their expense over a season. Be careful if they require you to completely pump out the toilet and precharge it with water and then add their product. This practice will reduce odors approximately 30% without the additive.

Spend your time and money on changing the venting (see venting section), keeping the vent stack clear of cobwebs and debris, sealing the vault, maintaining a water layer over the waste, and keeping the building interior (especially the toilet riser) clean and disinfected.

SECTION 4

DESIGN OF A TWO UNIT TOILET

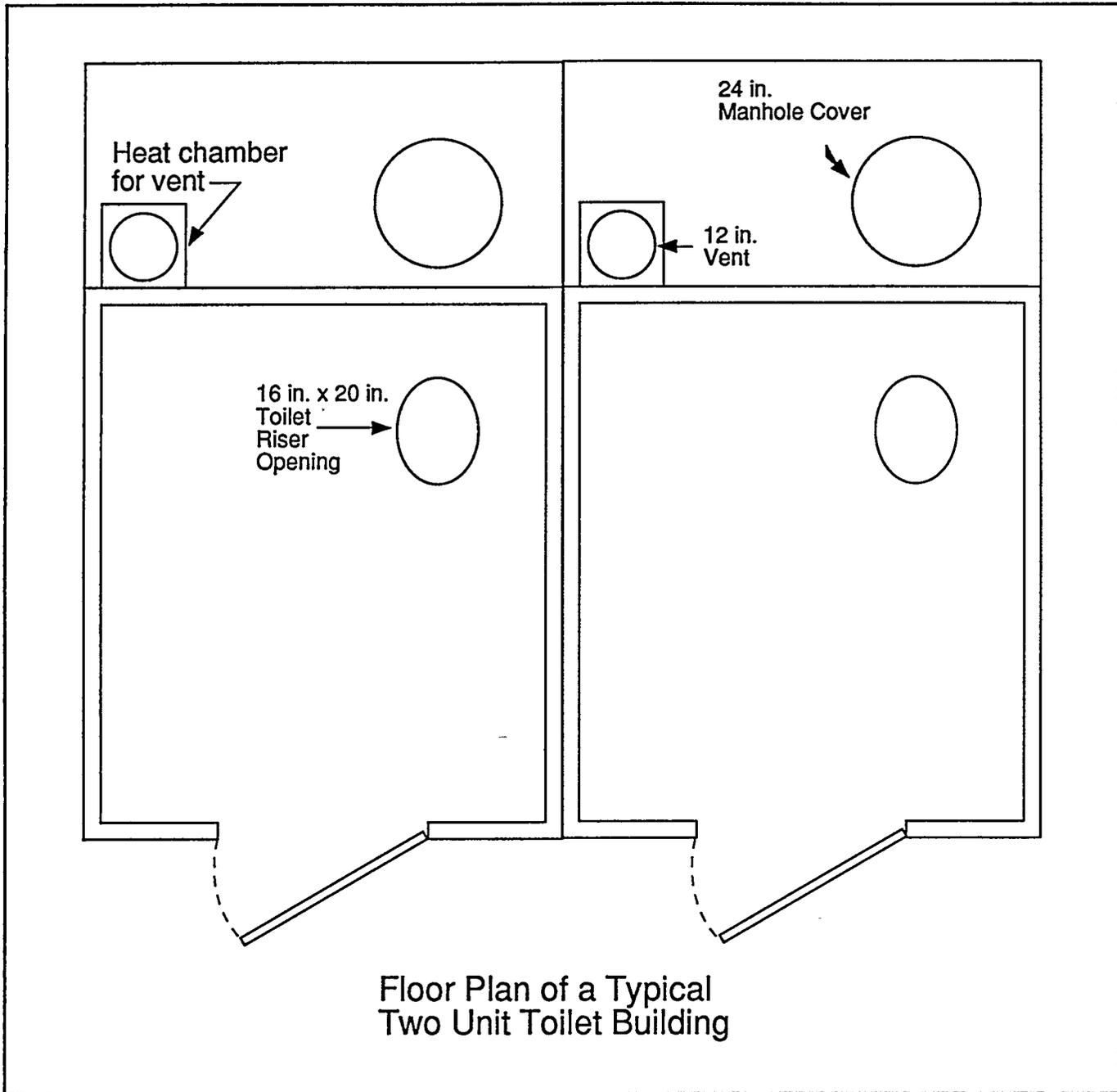


Figure 9

A two unit toilet is simply two single unit toilets under one roof. Each compartment must have its own vault toilet riser, vault and venting system.

All design features are the same for a two unit as they are for a single unit. (See Figure 9.) Read SECTION 2 for the correct design. The location of the building on the site in relation to the prevailing wind is, however, more critical.

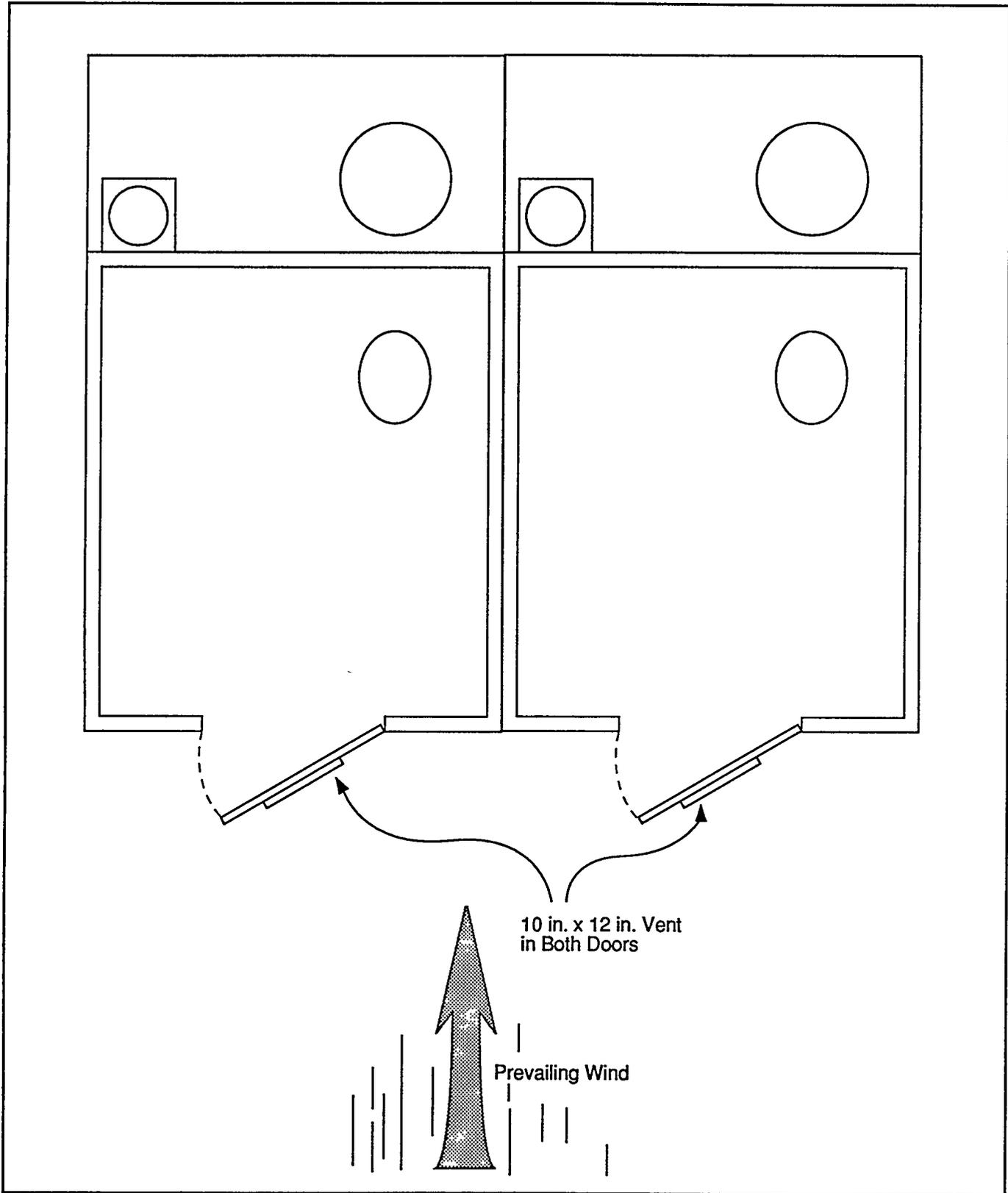


Figure 10

The building should be located so that the prevailing wind blows against the front doors if both doors are on the same side or against both backs of the building. (See Figure 10.) With the prevailing wind blowing against both doors, place the 10-by 12-inch vent in each door down low to the ground or if the wind blows against the backs of the building, place the vents on that wall. (Be sure the wind does not blow through and open the door.)

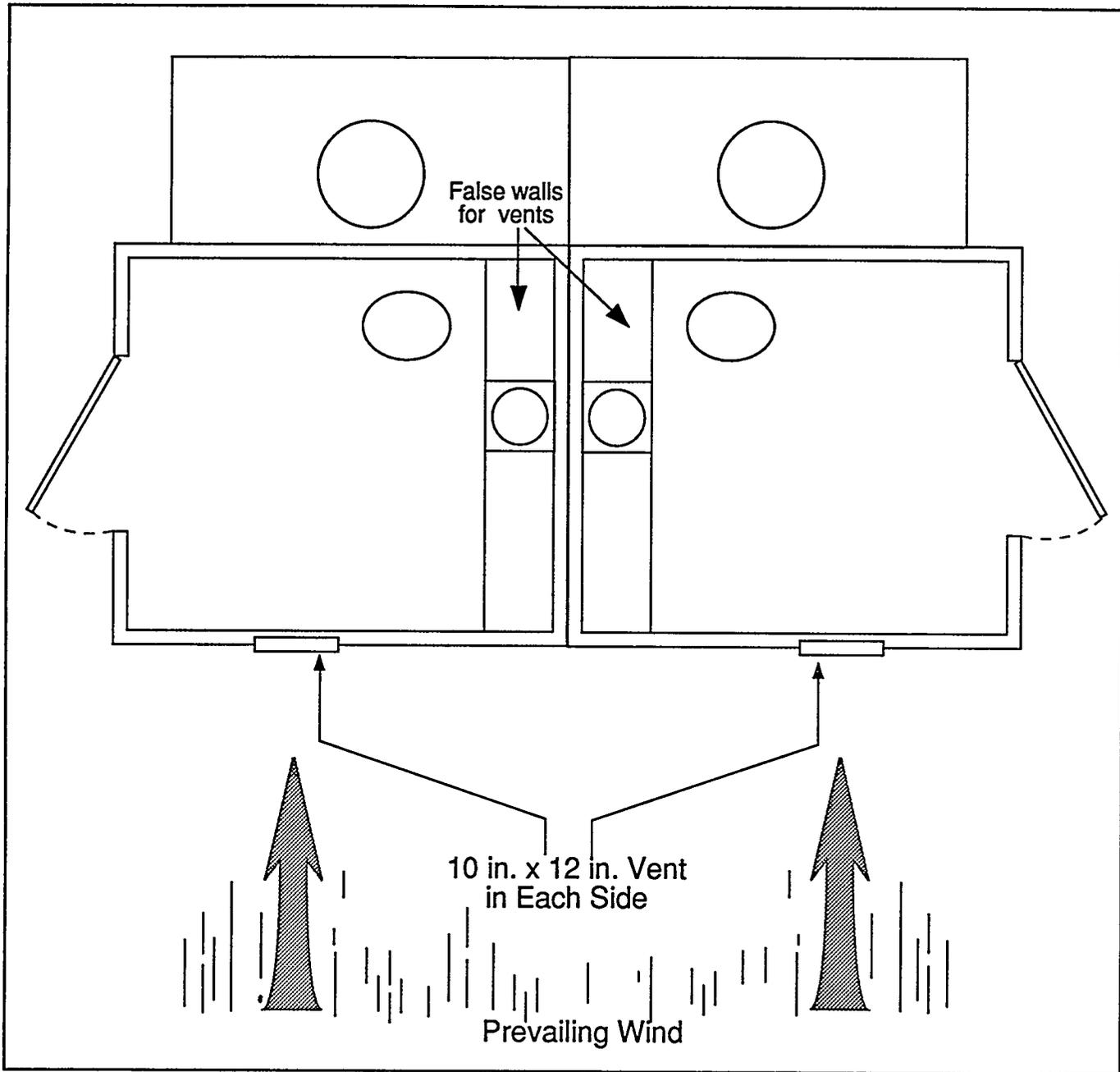


Figure 11

If the door entrances are on opposite ends of the building, then locate the building so the prevailing wind blows against the side, equally hitting both compartments. With the prevailing wind blowing against both compartments on one side of the building, place the 10-by 12-inch vent low to the ground and on each compartment side. (See Figure 11.)

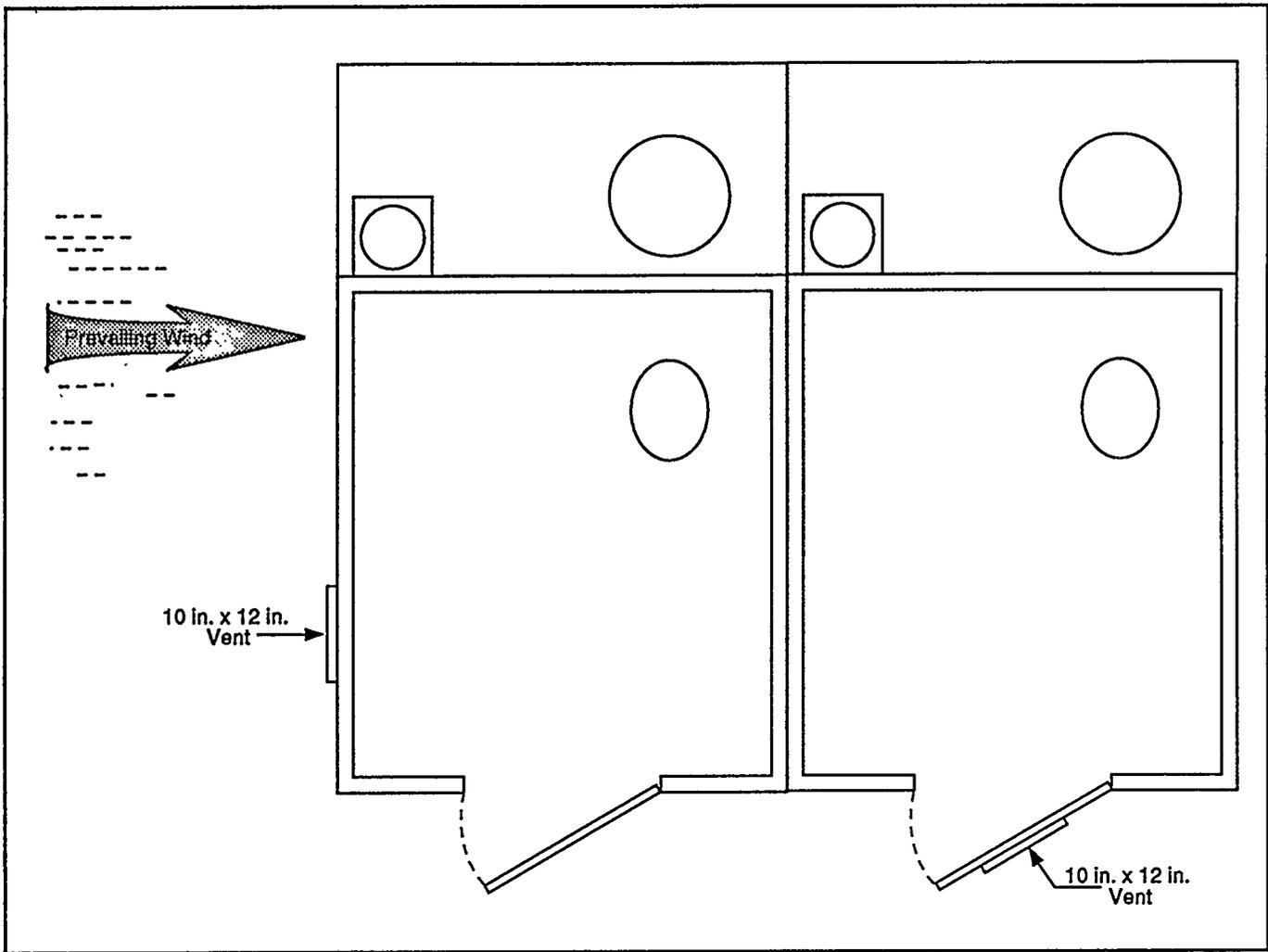


Figure 12

Now let's assume, for site location reasons, that the two unit building cannot be located so that the wind prevails against both compartments. (See Figure 12.)

Remember that both compartments are completely separate from each other. So, on the side that the prevailing wind blows against, take advantage of the wind and place the vent on that side (shown in above diagram).

The other compartment is now on the negative side of the building (negative effect of the wind) so place the 10-by 12-inch vent in the door as low to the ground as possible. The wind will still have a tendency to aspirate air out of the building compartment but the effect will be minimal because the least effect of the wind is at ground level. The aspiration of the air out of the vault by the 12-inch diameter vent stack, raised three feet above the highest point of the roof (13 to 14 ft off the ground), will have a much greater effect and will actually draw the air in through the lower vent in the door.

A more effective way to enhance the downwind compartment, when the wind is guaranteed to be prevailing against one side of the two unit building, is to place the downwind compartment vent over the door and put a scoop on it to funnel the air into the building. (Figure 13.) By placing the scoop over the door it will not be a potential injury causing item for the visitor. If the scoop is located on the lower part of the building, a person could hit their leg on it as they walked past the scoop.

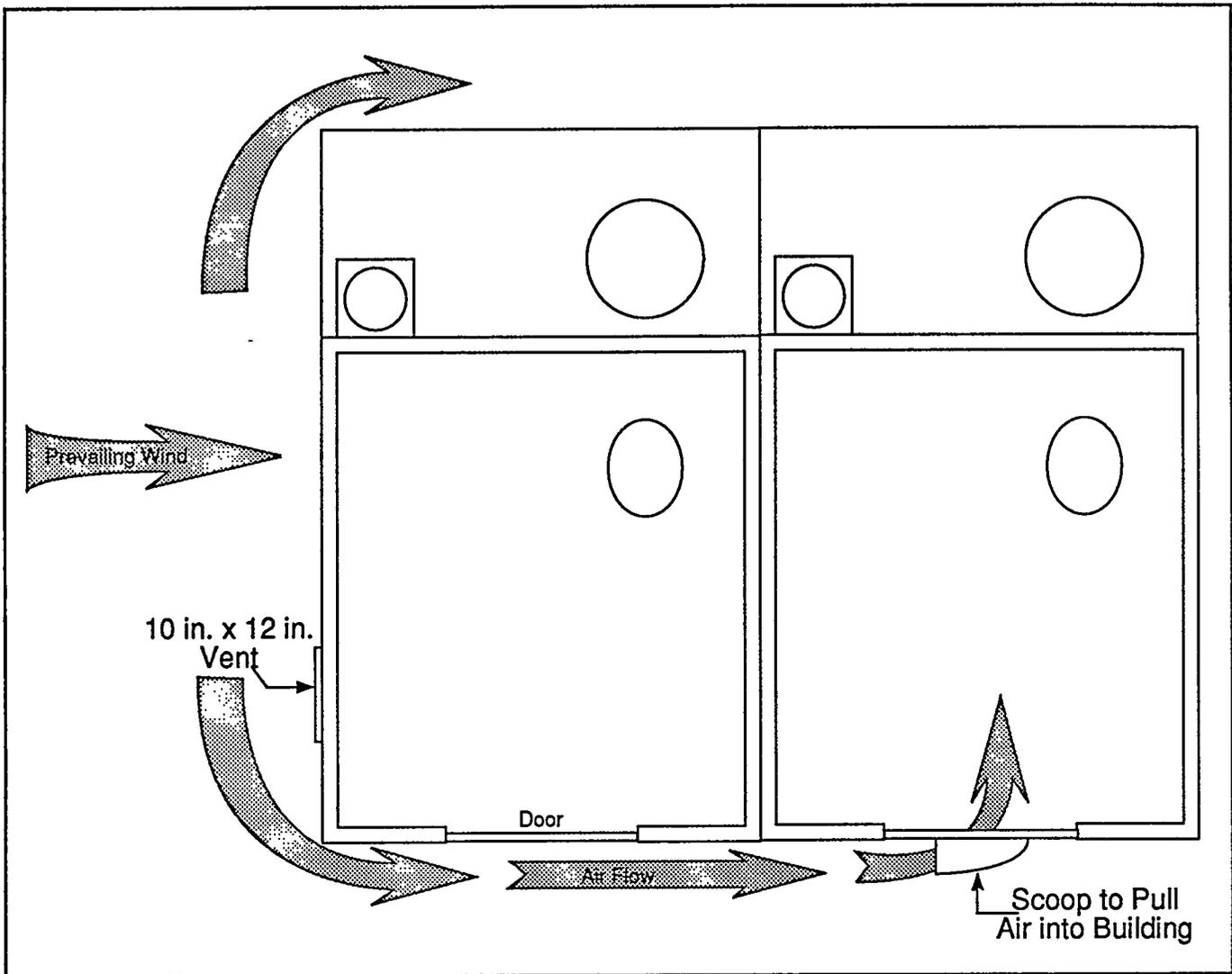


Figure 13

Always be thinking about how to get the wind to cause a slight pressure in each compartment. All building plans should incorporate a statement like: **All building vents shall be located by the Inspector or Contracting Officer's Representative (COR) once the building is located in the field.** At this time the inspector or COR can better determine where the prevailing wind is coming from and what the best way is to get the wind to blow into each compartment.

If the building was designed with similar openings on each side, then the COR could instruct the contractor to put a vent in one opening and a window in the other without having to do a field modification.

Assume that the wind is constantly changing and there is no prevailing wind that you can count on. The best location for the vents is low to the ground on the side that the wind is considered to be the most common during the major use period at the site. This is the best that can be accomplished but may not always result in an odor free building. The design of the building (both doors on one side vs. doors at each end of the building) should be taken into account when designing for each site. The location of the building in relation to the site (considering the prevailing or non-prevailing wind) may help dictate the style of building.

SECTION 5

DESIGN OF A FOUR UNIT TOILET

A four unit toilet is simply four single unit toilets, in line, under one roof. Each compartment must have its own vault toilet riser, vault, and venting system. All design features are the same for a four unit as they are for a single unit. Read SECTION 2. As with the two unit, the location of the four unit on the site, in relation to the prevailing wind, is critical. The building should be located so that the prevailing wind blows against all four front doors or all four backs of the building. The 10-by 12-inch building vents should then be placed in each door or on each back wall, depending on the wind direction, and low to the ground. (See Figure 14.)

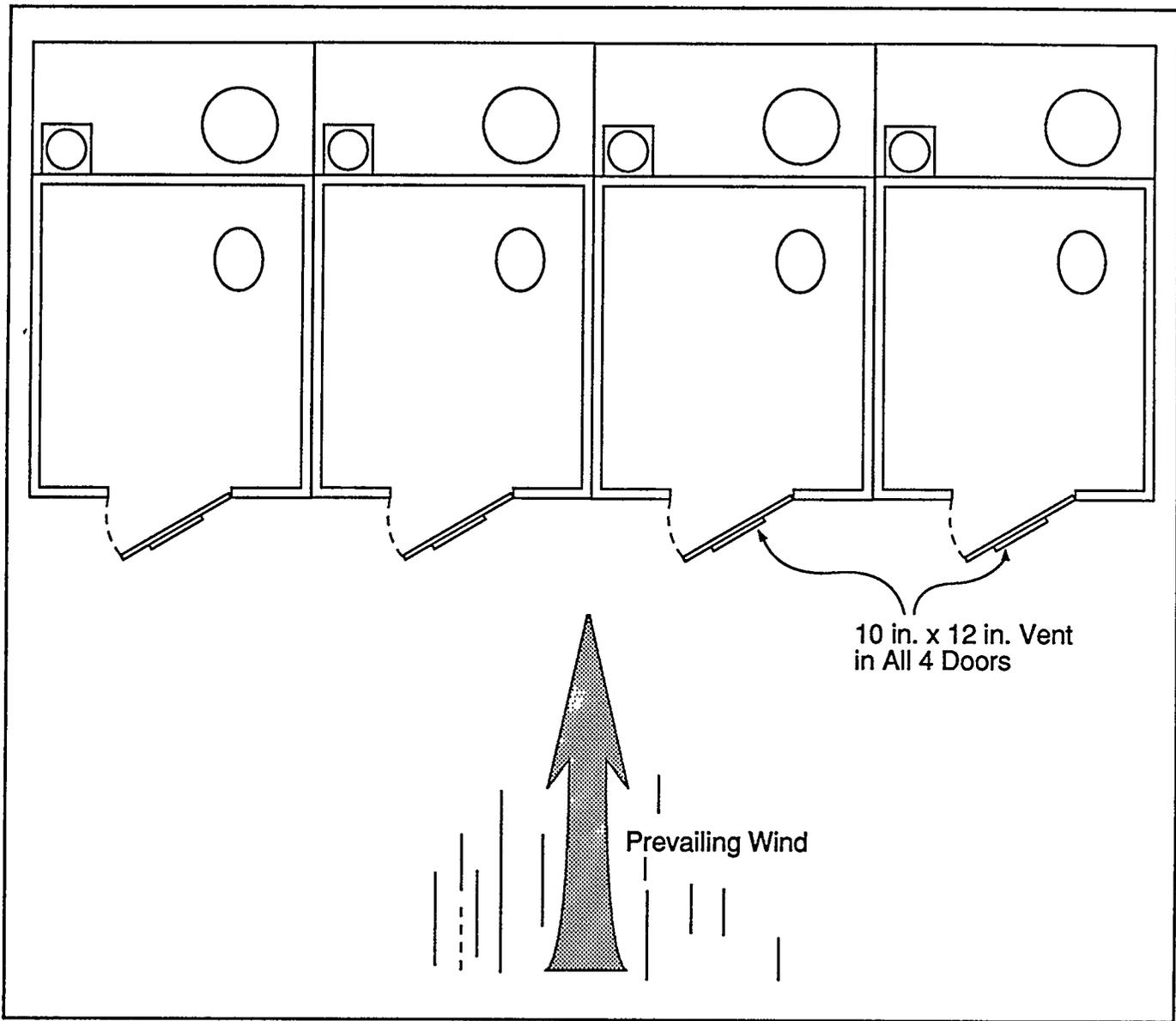


Figure 14

If the wind ends up blowing against one side so that three compartments are on the negative side of the wind, then the location of the building vents for these three can be enhanced by using the same scoop system as shown for the two unit toilet. This is only effective if the prevailing wind is guaranteed to be constant in one direction. However, this arrangement should be avoided.

A four unit toilet in a square format should not be built. (See Figure 15.) The reason is, that no matter what the wind direction, two of the compartments will be on the negative side of the wind force, resulting in the wind aspirating air out of those two building compartments. If powered fans are used in each vent stack, then the negative side aspiration problems can be overcome.

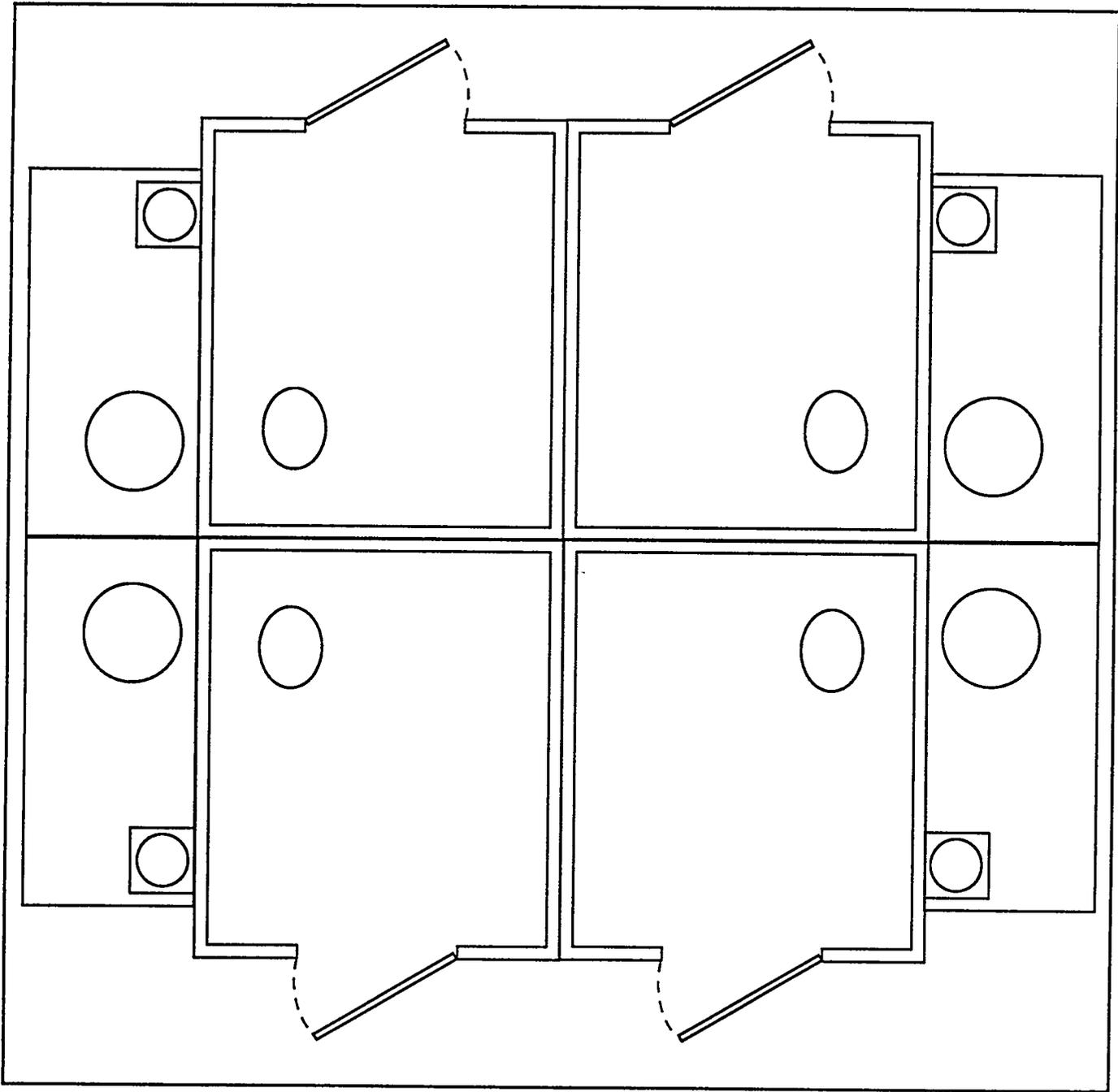


Figure 15

SECTION 6

**MANUFACTURERS, NAMES
AND ADDRESSES FOR THE
MOST COMMON ITEMS**

The following list of manufacturers are offered as a guide for items normally associated with vault and pit-type toilets. This list is not complete because there are many manufacturers across the country that can supply similar items to some of the items listed. If you do not already have a source for a certain item, this list may help get you started. The best way to select a product is to write to each manufacturer and tell them what you plan to use their product for and let them recommend their best product for that purpose. After evaluating the various products you then decide on the product, based on your particular parameters.

NOTE: FOR THOSE ITEMS THAT COSTS ARE GIVEN, THE COSTS ARE AS OF JULY 1991.

PREMANUFACTURED VAULTS

ROMTEC, INC.
15587 NORTH BANK RD.
ROSEBURG, OR 97470
PHONE (503) 496-3541
FAX (503) 496-0803

VAULTS ARE BLACK CROSS-LINKED POLYETHYLENE
1,000 GALLON SIZE COSTS = \$1,650 FOB PORTLAND, OR
750 GALLON SIZE COSTS = \$1,450 FOB ROSEBURG, OR

COATINGS FOR CONCRETE VAULTS AND BUILDING FLOOR SURFACES

NOTE: MOST COATINGS MUST BE APPLIED AFTER THE CONCRETE HAS CURED 30 DAYS.

ALSO NOTE THAT COATINGS PLACED ON THE INSIDE OF THE VAULT MAY NOT BE ABLE TO WITHSTAND OUTSIDE HYDROSTATIC PRESSURES DUE TO HIGH WATER TABLES.

RAINGUARD PRODUCTS, INC.
821 WEST HYDE PARK BLVD.
INGLEWOOD, CA 90302
PHONE 213-670-2953

FOR VAULTS USE THEIR PRODUCT BG-500
USE A BLACK COLOR. FOR BUILDING FLOOR
SURFACES USE SATIN LOK (clear and gray).

DEVCON, A DIVISION OF ILLINOIS TOOL WORKS, INC.
30 ENDICOTT ST.
DANVERS, MA 01923
PHONE 508-777-1100

FOR BUILDING FLOOR SURFACES USE EPOXY
COAT 7000 (multicolors). NO BLACK COATINGS
FOR VAULTS

PORTER INTERNATIONAL
CORPORATE OFFICE
400 SOUTH 13TH ST.
LOUISVILLE, KY 40203-1714
PHONE 502-588-9200

FOR VAULTS - FIRST, SAND BLAST AND THEN
APPLY "TAR SET STANDARD" WHICH IS A THERMAL
SETTING COAL TAR EPOXY RESIN. COLOR IS
BLACK. FOR BUILDING FLOOR SURFACES USE
7500 SERIES MAGNA COAT (multicolors).

GARON PRODUCTS, INC.
1924 HIGHWAY 35, CN20
WALL, NJ 07719
PHONE 800-631-5380

FOR VAULTS USE DECORPOXY (black).
FOR FLOOR SURFACES USE TIGER BOND 221
(multicolors).

GARLAND FLOOR CO.
4500 WILLOW PARKWAY
CLEVELAND, OH 44125
PHONE 800-321-2395

FOR BUILDING FLOOR SURFACES ONLY
USE CHEMI-COTE SR-VOC.
THEY HAVE NO COATINGS FOR VAULTS.

ATLAS MINERALS AND CHEMICALS, INC.
FARMINGTON ROAD
MERTZTOWN, PA 19539
PHONE 215-682-7171

FOR VAULTS USE CHEM-PROOF 2400 TOP COAT A VINYL ESTER COATING (black). FOR BUILDING FLOOR SURFACES USE REZKLED 110 SL (multi-colored).

COATINGS COMPOSITES
10105 DOTY AVE.
INGLEWOOD, CA 90303
PHONE 800-421-5418

FOR VAULTS AND BUILDING FLOOR SURFACES USE FIBRECRETE, TOP COATED WITH CONOGLAZE TYPE CF (dark charcoal for vaults and multicolors for building floors).

ADDITIONAL BUILDING FLOOR MATERIALS

OMNITECH INDUSTRIES, INC.
3747 SO. INCA STREET
ENGLEWOOD, CO 80110
PHONE 303-430-7300

"OMNITUFF"

PETERSON CHEMICAL CORP.
710 FOREST AVE.
SHEBOYGAN FALLS, WI 53085
PHONE 414-467-2471

"TORGINOL"

GARON PRODUCTS, INC.
1924 HIGHWAY 35 CN20
WALL, NJ 07719
PHONE 800-631-5380

"CONCORD"

THORO SYSTEMS PRODUCTS
7800 N.W. 38TH STREET
MIAMI, FL 33166
PHONE 305-592-2081

"THOROCLEAR"

WALL SURFACING MATERIALS FOR BUILDING INTERIORS

KEMPLITE COMPANY
104 NO. CHICAGO STREET
JOLIET, IL 60434
PHONE 815-727-5000

"KEMPLY"

ALLIANCE WALL CORP.
P.O. BOX 920488
NORCROSS, GA 30092
PHONE 404-447-5043

"PORCELAIN ENAMEL STEEL PANEL"

OMNITECH INDUSTRIES, INC.
3747 SO. INCA STREET
ENGLEWOOD, CO 80110
PHONE 303-430-7300

"EPOXY WALL TILE COATING"

BURNS AND RUSSEL COMPANY
506 SO. CENTRAL
BALTIMORE, MD 21231
PHONE 800-638-3188

"SPECTRA GLAZE"

SANTANA PRODUCTS COMPANY
301-11 CLIFF STREET
SCRANTON, PA 18503
PHONE 800-386-5002

"PLASTIC PANELS"

THORO SYSTEMS PRODUCTS
7800 N.W. 38TH STREET
MIAMI, FL 33166
PHONE 305-592-2081

"THOROLASTIC"

THERMO MATERIALS, INC.
P.O. BOX 9454
SAN DIEGO, CA 92109
PHONE 800-882-7007

"THERMO LIQUID TILE"

GARON PRODUCTS, INC.
1924 HIGHWAY 35 CN20
WALL, NJ 07719
PHONE 800-631-5380

"DURAPOXY"

SYNTHETIC LINERS FOR VAULTS

BURKE RUBBER COMPANY
2250 SOUTH TENTH ST.
SAN JOSE, CA 95112
PHONE 800-669-7010

C.W. NEAL CORP.
8404 MAGNOLIA AVE SUITE B
SANTEE, CA 92071
PHONE 619-562-6438

COST FOR 5 PLY, 8 BY 8 BY 250 DENIER 45 MIL,
POLYESTER REINFORCED HYPALON WITH A
3-INCH ROPE HEM USING A 3/8 DIA. POLYPROPYLENE
LENE ROPE, INDUSTRIAL GRADE MATERIAL.
COST = \$543

FRED B. REVES CO.
P.O. BOX 67
TUCKERTON, NJ 08087
PHONE 800-233-7176

COST FOR 3-PLY, 45 MIL HYPALON WITH A
10 X 10 X 1,000 DENIER POLYESTER SCRIM WITH A
4-INCH TOP HEM AND GROMMETS ON 18-INCH
CENTERS FOR A 1,000 GAL CAPACITY (6X6X4 Ft.)
COST = \$500

MANHOLE COVERS

DEXOL PLASTICS, INC.
P.O. BOX DRAWER R
TUSCALOOSA, AL 35404
PHONE 205-556-1777

ABS, WATERTIGHT, AND ALREADY ASSEMBLED.
TOTAL WEIGHT OF 34 LBS
COST = \$69.80

THE BILCO COMPANY
P.O. BOX 1203
NEW HAVEN CT 06505
PHONE 203-934-6363
FAX 203-933-8478

MODEL J1AL MODIFIED WITH STAINLESS STEEL
HARDWARE. INTERIOR DIMENSIONS ARE 2 FT.
BY 2 FT. REQUEST A GASKET. CONSTRUCTED OF
1/4-INCH ALUMINUM. WEIGHT = 60 LBS - HINGED
COVER. COST = \$503 FOB NEW HAVEN, CT

DUR-RED PRODUCTS
4900 CECELIA STREET
CUDAHY, CA 90201
PHONE 213-771-9000
FAX 213-771-9009

MODEL SEA, HINGED COVER, 1/4-INCH ALUMINUM,
SPECIFY A RUBBER GASKET. DIMENSIONS ARE
2 FT BY 2 FT. COST = \$379 FOB CUDAHY, CA

TOILET RISERS

ROMTEC, INC.
15587 NORTH BANK ROAD
ROSEBURG, OR 97470
PHONE 503-496-3541
FAX 503-496-0803

WHITE CROSS-LINKED POLYETHYLENE
COST FOR STANDARD RISER 1-9 = \$132
10-19 = \$109
20-39 = \$107

COST FOR DISABLED ACCESS RISER 1-9 = \$132
10-19 = \$129
20-39 = \$127

COST FOR THE REPLACEMENT SEAT AND LID = \$30

REHCO CORPORATION
550 PATRICE PLACE, UNIT D
GARDENA, CA 90248
PHONE 213-719-1033

STAINLESS STEEL (REQUEST A HEAVY DUTY
OPEN-FRONT SEAT)

COST FOR STANDARD SIZE RISER 1-9 = \$113
(INCLUDES OPEN FRONT, HEAVY-
DUTY SEAT AND COVER) 10-19 = \$110
20-39 = \$107

COST FOR EXTENSION FLANGE 1-9 = \$29
TO CREATE A DISABLED ACCESS
TOILET RISER 10-19 = \$27
20-39 = \$25

COST TO REPLACE THE SEAT 1-9 = \$47
AND COVER ASSEMBLY 10-19 = \$44
20-39 = \$41

BRUSH FOR CLEANING ALL TOILET RISERS

ROMTEC, INC.
15587 NORTH BANK ROAD
ROSEBURG, OR 97470
PHONE 503-496-3541
FAX 503-496-0803

HANDLE IS 5-FT LONG WITH FOAM RUBBER
CUSHIONS. BRUSH IS 7 INCHES LONG BY 2
INCHES WIDE WITH 1-1/8-INCH BRISTLES. BRUSH
IS CONNECTED TO HANDLE BY A 3/8-INCH STAIN-
LESS STEEL PIN, WHICH ALLOWS THE BRUSH
TO PIVOT ON THE END OF THE HANDLE.

COST FOR BRUSH = \$35

TOILET PAPER HOLDERS

JIM ASLIN-ASLIN INDUSTRIES
P.O. BOX 294
NORTH BEND, OR 97459
PHONE 503-269-1903

TWO AND THREE ROLL LOCK BAR DISPENSER

COST FOR TWO ROLL LOCK BAR DISPENSER 2-9 = \$19.95
(INCLUDING FREIGHT) 10-19 = \$18.10
THIS DISPENSER IS DESIGNED FOR WALLS 20-99 = \$16.25
THAT HAVE GOOD SUPPORT BUILT IN 100 + = \$14.25
BECAUSE THE SPACING OF THE BOLT
HOLES ARE TOO SHORT FOR CONNECTING
TO EXISTING STUDS.

COST FOR THE THREE ROLL LOCK BAR DISPENSER(INCLUDING FREIGHT) 2-9 = \$21.95
THIS DISPENSER IS DESIGNED SO THE DISTANCE BETWEEN THE BOLT 10-19 = \$19.65
HOLES (16 inches) WILL MATCH THE STUDS IN THE WALLS OF OLD TOILETS. 20-99 = \$17.85
100 + = \$15.25

ENVIRONMENTAL CARE PRODUCTS
300 RANGER ST.
BREA, CA 92621
PHONE 714-528-8142

KATRIN MILE-LONG DISPENSER - STAINLESS STEEL

COST FOR THE LARGE KATRIN DISPENSER = \$19.00

DISPENSER HOLDS 5,280 FT OF SINGLE PLY PAPER

DISPENSER HOLDS 2,640 FT OF TWO PLY PAPER

COST FOR SMALL KATRIN DISPENSER = \$12.50

DISPENSER HOLDS 2,250 FT OF SINGLE PLY PAPER

DISPENSER HOLDS 1,125 FT OF TWO PLY PAPER

SCOTT JUMBLE ROLL TISSUE (JRT)

GSA CONTRACT NO. GS-02F-53388 -COST FOR THE SCOTT DISPENSER PLASTIC = \$21 TO \$22
BAKED ENAMEL = \$28

GRAB BARS (HAND RAILS) FOR PEOPLE WITH DISABILITIES

ROMTEC, INC.
15587 NORTH BANK ROAD
ROSEBURG OR 97470
PHONE 503-496-3541

COST OF GRAB BARS 24-INCHES LONG = \$40
36-INCHES LONG = \$45
42-INCHES LONG = \$50

GRAB BARS ARE STAINLESS STEEL
AND MOUNTING HARDWARE IS INCLUDED.

MCKINNEY
1591 INDIANA STREET
SAN FRANCISCO, CA 94107
PHONE 415-282-7800
FAX 415-282-1121

BOBRICK WASHROOM EQUIPMENT, INC
11611 HART STREET
NORTH HOLLYWOOD, CA 91605-5882
PHONE 818-982-9600
FAX 213-875-1104

COST OF GRAB BARS 24-INCHES LONG = \$23.64
STAINLESS STEEL 36-INCHES LONG = \$26.94
42-INCHES LONG = \$28.58
48-INCHES LONG = \$30.23

12-INCH DIAMETER ABS PLASTIC PIPE

ROMTEC, INC.
15587 NORTH BANK ROAD
ROSEBURG, OR 97470
PHONE 503-496-3541

COST OF 12-INCH DIAMETER ABS PIPE = \$15 PER FT

COMPLETE PREMANUFACTURED VAULT TOILET SYSTEM

ROMTEC, INC.
15587 NORTH BANK ROAD
ROSEBURG, OR 97470
PHONE 503-496-3541

COST INCLUDES A 750 GAL VAULT, MANHOLE
COVER, DISABLED ACCESS TOILET RISER,
COMPLETE BUILDING AND VENTING SYSTEM.

COST = \$4,985

SECTION 7

**WHY EXISTING VAULT
AND PIT TOILETS
HAVE ODOR PROBLEMS**

History shows that the building, surrounding the hole in the ground, evolved slowly. First, there was simply a hole in the ground with two small logs (spaced appropriately) over the top. As the population came closer together, walls were erected for privacy. The walls were quickly followed by a roof and in time a door was added to complete the enclosure.

During this evolution there were no vent stacks anywhere. Only in recent history did the vent stack appear. In very recent times, designers sized the vents by aesthetics rather than functional considerations. Now let's look at what causes the odor problems in existing vault toilet buildings (other than the obvious).

1. The most prevalent and main cause is when the air flow within the building is flowing up from the vault, into the use compartment, bringing with it the foul smelling waste odors.
2. The waste odors that are absorbed by the concrete or concrete block walls within the vault are another major source. These absorbed odors (very sour), combined with the contained waste odors flowing with the air flow up out of the vault into the use compartment, make the compartment obnoxious.
3. The odors absorbed by the concrete floor in the use compartment and by porous interior wall materials also contribute to the odor problem.
4. Waste particles, that collect in cracks and crevices due to 90° floor to wall surfaces and 90° corners, help to cause odors and attract flies.
5. Cracks and crevices in some of the toilet risers can collect odor causing urine and fecal particles and are rarely cleaned thoroughly.

Items 2 through 5 are simple to solve and would be less of a problem if the air flow were reversed (as it should be) and forced to flow down the toilet riser into the vault and up out of the vent stack. Remember, it is still necessary to eliminate the causes of odor shown in items 2 through 5 because, when the venting is correct, we want the least amount of odor to leave the building because of the detrimental downwind effects.

Item No. 1 needs further clarification so that the reader can see why the air flow comes up from the vault into the use compartment.

Since odors were now a problem, due to the complete enclosure, openings were placed in the walls to allow fresh air into the building (attempting to dilute the odor).

During this evolution there were no vent stacks anywhere.

Only recently (in history) did the vent stack appear.

In very recent times, designers sized the vents by aesthetic rather than functional considerations.

Consequently, because of all of the above reasons, the designs that now exist have a variety of errors which result in odor problems within the vault and pit toilet buildings.

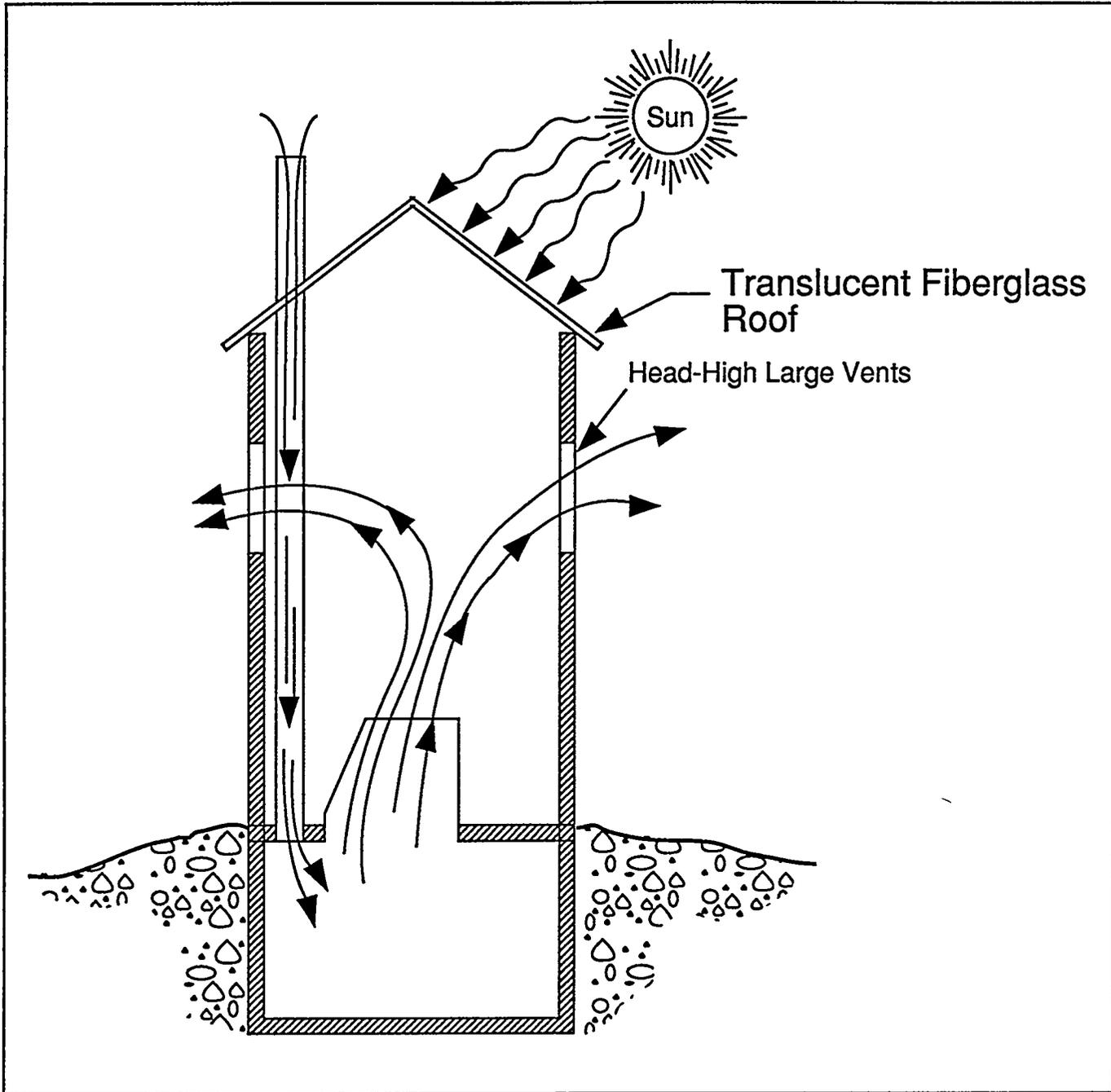


Figure 16

Figure 16 illustrates how the sun, shining through the translucent fiberglass roof (with no wind blowing), creates heat within the building. This hot air rises and escapes through the large screened vents on both sides of the compartment. The replacement air (to resupply the hot air leaving the building) comes up from the vault or pit and the replacement air for the vault or pit comes down the small vent stack. The obvious result is odors are brought up into the building compartment.

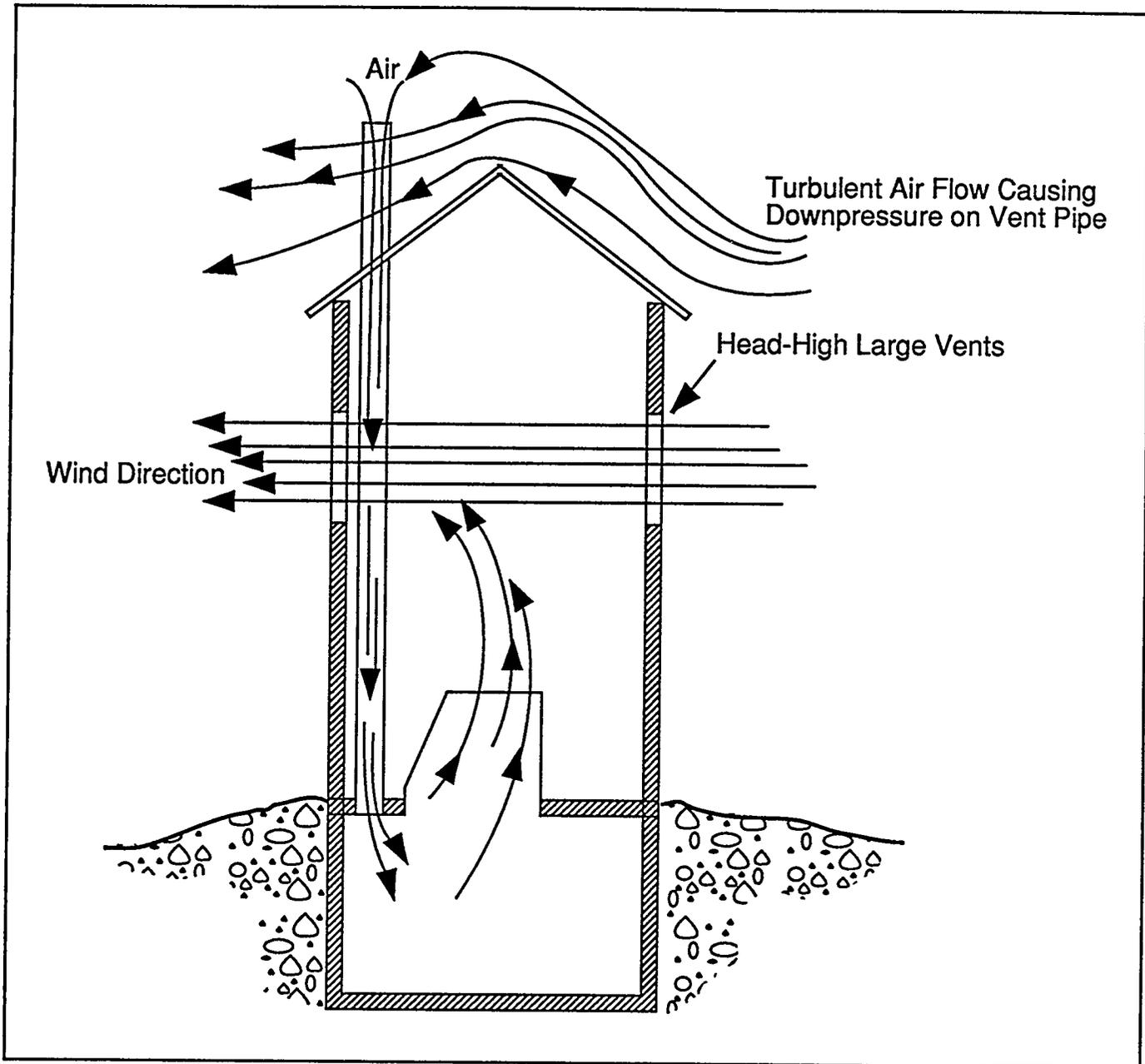


Figure 17

Figure 17 clearly illustrates what happens when the wind blows through a typical single unit toilet building. The building vent openings generally exceed 400 sq inches on each side and the 4-inch vent stack has only a 12-sq inch opening.

There are two negative forces at work here. The first is due to the amount of air blowing through the building causing a negative pressure in the building and drawing air out of the vault. The small 4-inch diameter pipe cannot compete with the large openings in the building. The only way the air in the vault can be drawn up the vent stack is by an aspiration effect caused by the wind blowing across the top of the pipe.

Even if the vent pipe were placed higher up so that the top of the pipe is in the steady state (laminar) flow of the wind blowing across the top of the pipe, the pipe is still too small. A two mph wind can only aspirate approximately eight cfm in a wind tunnel, which represents the best of conditions.

This brings us to the second negative force at work. In conjunction with the vent pipe being too small, the pipe is not high enough above the roof. By being placed so close to the roof top (and in some cases, not even

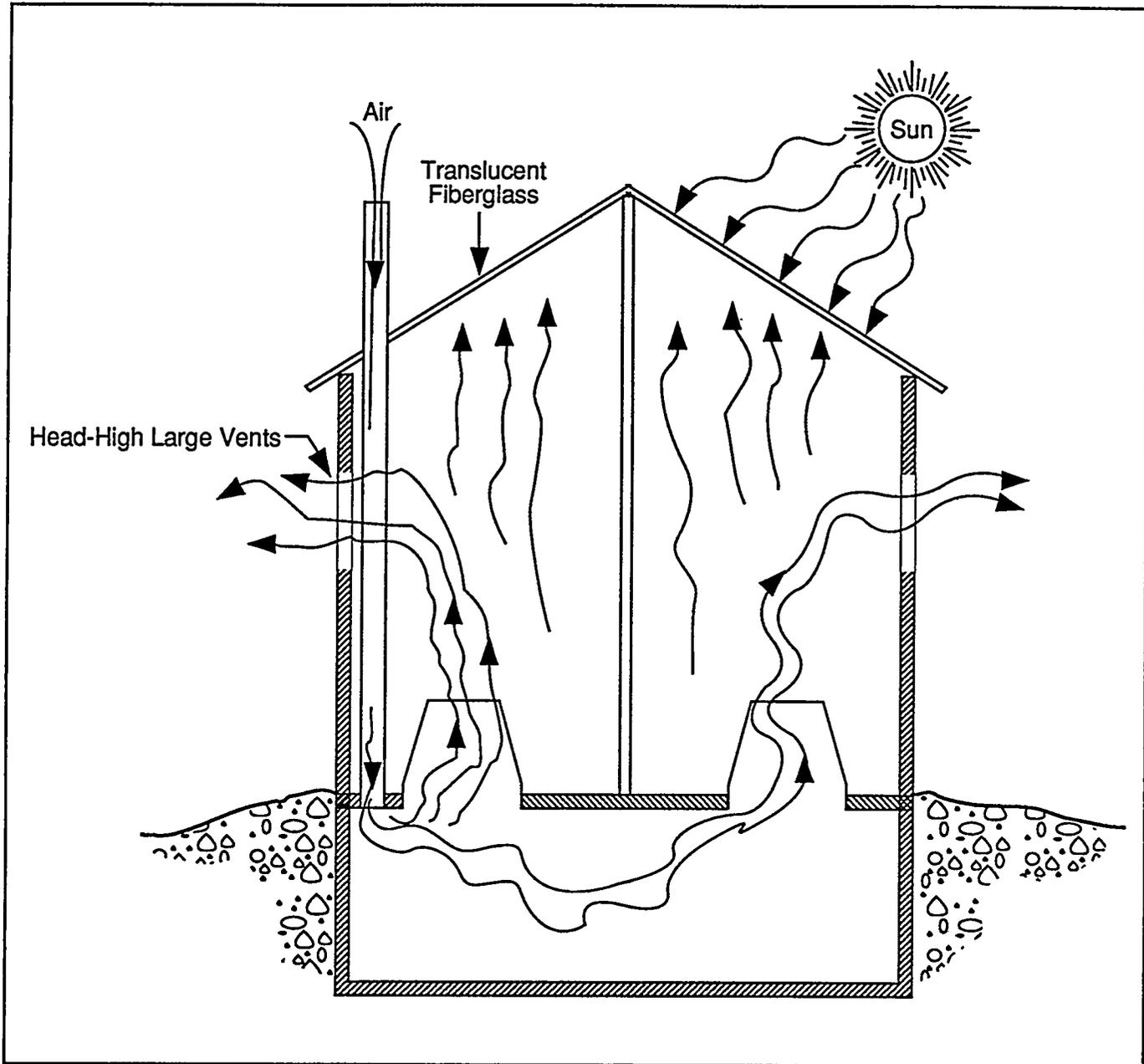


Figure 18

protruding above the ridge of the roof) the turbulent air flow over the roof causes a down pressure on the vent and forces air down into the vault (as shown in Figure 17) and subsequently up into the building compartment. This is a complete reversal of what is supposed to happen.

Figure 18, above, illustrates a two unit toilet design causing the same problem as the single unit design shown in Figure 16.

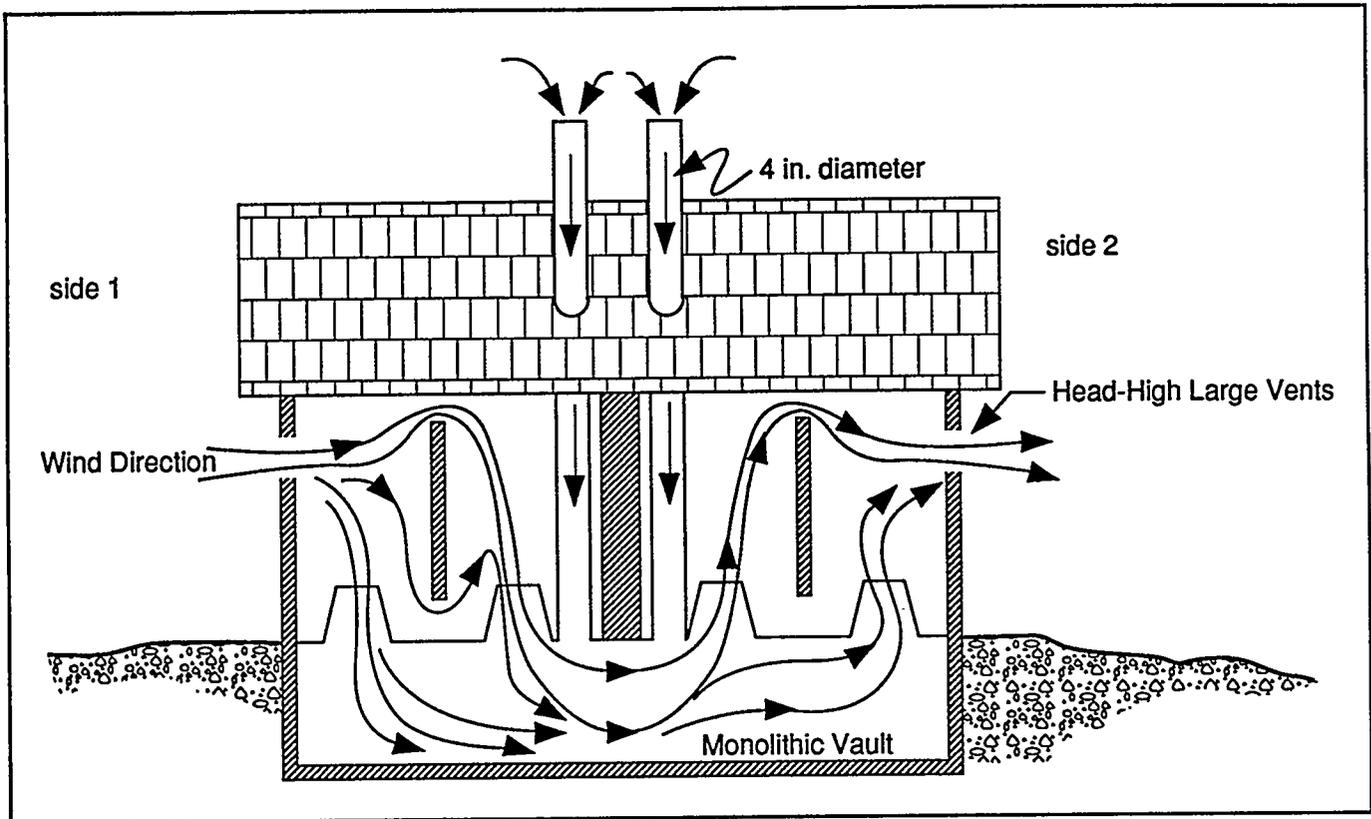


Figure 19

Figure 19 illustrates a four unit toilet with the wind blowing. NOTE: A two unit toilet with a single vault beneath two toilet risers in separate compartments would result in the same air flow condition.

The wind enters one compartment and slightly pressurizes that compartment. The pressurized air has only one place to go and that is down through the toilet openings.

At the same time, the wind blowing around and past the building causes a negative pressure to develop in the down wind compartment, resulting in the air in the compartment being drawn out of the compartment (through the building side vent).

The small vent pipes for the vault cannot aspirate enough air out of the vault to even begin competing with the flow of air through the building. The building vents are way too large and the little vault vent pipe is way too small.

All of the above reverse venting situations can be compounded by placing vertical screens around the top of the vent pipe or by placing screens across the top of the pipe that are too fine. The screens offer resistance to air flow and reduce or eliminate the ability of the wind to cause an aspiration effect out of the pipe. Screens also get clogged due to cobwebs, leaves, pine needles, and dust and they are rarely cleaned.

There are, of course, hundreds of design configurations and certainly too many to cover in this section. The above designs are representative of what the typical problems are that result in odorous conditions existing in the buildings.

SECTION 8

**AN INVENTORY OF TYPICAL
VAULT TOILET CONTENTS**

The following debris is from a men's two unit vault toilet before pumping began:

68 cans	59 plastic bags 3-1/2 gal capacity	26 full rolls of toilet paper
21 styrofoam cups	11 bottles	8 empty plastic wrappers
7 sticks	6 ponderosa pine cones	4 wads of aluminum foil
4 mens' boxer shorts	3 plastic cups	3 small rags
3 mens' jockey shorts	3 boys' jockey shorts	2 boy scout caps
2 wires (4-ft long)	2 bent wires (2-ft long)	1 cloth dinner napkin
1 T-shirt	1 apple	1 large bag of 8 diapers
1 strip of rubber (1 by 20 inches)	1 section of cardboard	1 large rag
1 tube of antiseptic (3/4 full)	1 small cardboard donut container	1 large plastic bowl
1 toilet paper holder in good condition	1 sanitary napkin	1 contraceptive
1 plastic fork	1 paper towel	1 long piece of string
1 plastic camera strap (2-1/2 ft long)	1 hypodermic syringe	1 plastic straw
1 large piece of plastic toy (4"by 10")	1 wire container for solid deodorant block	1 paper bag
1 cap from spray can	1 cubic yard of rocks	

The remaining debris is from the same men's two unit vault toilet after screening the pumped contents.

28 paper towels approx 1-gal capacity	10 plastic bags	8 aluminum can pull tabs
7 wads of aluminum foil	3 wads of bubblegum	3 jockey shorts
3 ice cream bar sticks	2 combs	2 plastic caps
2 10-qt buckets of paper plus numerous cigarette packs, gum wrappers and lots of small rocks	1 whittling stick	1 orange
1 name plate from toilet	1 squirrel eaten pinecone	1 large weed
1 18-in long rope	1 small piece of wood	1 contraceptive
1 small weiner package	1 wine bottle cork	1 flash bulb

1 styrofoam cup

1 wool mitten

1 peach pit

1 small plastic tube

1 1/2 pint drink container

1 Copenhagen snuff cap

1 chicken bone

1 plastic spoon

Introducing... The Next Generation of Odor-Free Waterless Restrooms



T H E N A T I O N ' S R E S T R O O M R E S O U R C E



**RESTROOM
FACILITIES LTD™**

ARCHITECTURAL FLEXIBILITY



Restroom Facilities Limited designed and built this composting restroom for Yosemite National Park. Part of the architectural requirement was that the facility have a rugged hand crafted look, so we hand hewed every log. We can match most site-specific architecture, build it off-site and install it almost anywhere nationwide. The Yosemite mountain top location was so remote, that we flew the final facility in by helicopter.

Most Vault Restrooms are Designed Using Outdated Technology

Developed by the U.S. Forest Research Center, the “Sweet Smelling Toilet” concept, was a significant advance in the attempt to develop waterless toilets that did not smell. Now, over 10 years later, it is a seriously outdated concept yet one that most restrooms still use.

We’ve Developed the Next Generation™ Sweet Smelling Toilet™

The Original “Sweet Smelling Toilet” Principle

The “Sweet Smelling Toilet” system principally relies on solar gain to warm the air within a 12” black vault flue pipe, creating positive air pressure in the pipe, and thus a draft is pulled from the negative air pressure within the vault (tank). The goal is to cause the air in the restroom to go down the riser (toilet), through the vault, and exit up the flue pipe, keeping odor out of the restroom. However, fresh air is allowed to enter the vault only through a small 12” x 14” vent in a wall. Upper gable vents are closed off because their research stated that if the gables were left open, odors from the tanks would come up the riser and bring foul air from the vault, into the restroom.

The problem with this design is that it doesn’t allow enough fresh air into the building to make the system work. Often the restroom heats up to the point where it is unbearable to use, and worse, the heat affects the air flow system so that when the door is opened, the rush of air going out causes foul air in the tank to come up through the riser, counteracting the draft created by the flue pipes, and filling the restroom with odor from the vault (tank).

Improved Air-Flow Dynamics Leave the Original System Behind

Restroom Facilities Limited believed we could do better, and we did. After extensive research, our designers re-engineered the air flow mechanics of our buildings. We opened up the gable vents, using stainless steel wire mesh, and made other proprietary structural changes that countered,

what the “Sweet Smelling Toilet” research stated was the problem with open gables. We also understand the importance of positioning these gable vents so that they work with prevailing winds for maximum ventilation and heat dispersion. The result is the “Next Generation” vault toilet design. With our proprietary air flow design, there is never a build up of heat, or positive air pressure, in the restroom. Therefore, the draft created by the flue pipes which draws the odor from the tanks to the outside is never compromised as it often is with the original system.



New Technology: Open wire mesh gables (stainless steel), utilizing fresh air currents is just one part of our redesigned air flow system.

VAULT RESTROOMS ARE A NATURAL FOR FLOOD PLAINS

Our engineers are experienced in designing vault restrooms for flood prone areas. First, our restrooms can be elevated to a flood safe level, complete with wheel chair access ramps. Our raised exterior walls allow flood waters to flow through the building should levels reach that high.



Our Next Generation System Works in Any Location or Climate

An important element to the "Next Generation" system is the flue design. Our flue pipes are always completely outside the structure, unlike some designs where only the tops are exposed. This ensures that enough of the surface area of the pipe is exposed to the sun, creating a draft that draws odor out of the vault, and up the flue pipe. The "Next Generation" air flow design is so effective, that it will function properly, and always out perform the original system, even when the ability of the flue pipes to generate heat is compromised due to climate or location.



Another Odorless Solution...Moisture-Resistant Concrete

We are the only restroom manufacturer to seriously address the issue of odor, and damage caused by urine soaked concrete. Most restroom manufacturers, or site contractors, apply a surface coating to the concrete. Surface coatings wear off, and usually the damage is done before it is re-applied.



Typical concrete will absorb moisture and urine causing odor and disintegration of the concrete.

Urine not only causes odor, but it compromises the integrity of the concrete. Our moisture-resistant concrete floor is achieved with additives mixed into the concrete, so it doesn't wear off with time.



Our concrete floor repels liquids, so our restrooms won't smell and the concrete keeps its integrity.

Rugged Construction that's Easy to Maintain

For over 15 years we have specialized in building restrooms that can take abuse, and are easy to maintain. A couple of our unique components are: 24,000 hour, vandal-resistant, high-pressure sodium light fixtures and, door closers that are the most durable available. We also utilize a continuous door hinge that requires no maintenance and makes pulling the door off almost impossible. Interior options include 8" wall tile with epoxy grout, or continuous FRP. Either option creates an easy-to-clean shower stall-like environment. Slightly raised exterior walls provide easy hose-down cleaning. We even offer an optional anti-graffiti finish, graffiti just rinses off.

Minimal Site Disruption

Your Restroom Facilities vault restroom is built off-site in our 1.5 acre temperature controlled plant, shipped anywhere nationwide, and installed by our experienced crew in 2-5 days. That means an absolute minimum of site disruption, and none of the mess or safety issues created with on-site construction.



So call us today and learn more about Restroom Facilities Limited

SPECIAL FEATURES

- Over 15 Years of Unmatched Specialized Restroom Experience.
- Complete Architectural Plans and Civil Engineering Calc's provided to Comply with local Permitting... No Architect Required.
- Full ADA Compliance.
- Building is Fully Relocatable to a New Site...Anytime.
- Water/Urine-Resistant Concrete Floor.
- Optional Anti-Graffiti Finish on Exterior and Interior Walls
- Minimal Site Disruption as Turnkey Installation is Completed in Days, Not Months Like On-Site Construction.
- Drill-Resistant Concrete Toilet Partitions Available.
- Custom Designed and Fabricated Components that Reduce Maintenance.
- Single-Source Responsibility from Design to Completion.
- No Hidden Costs.

GENERAL SPECIFICATIONS

Foundation/Floor – Precast, 8" Concrete, Moisture/Urine-Resistant Slab.

Interior Choices – Precision Block, 8" x 8", Stone-Based Floor Tile with Epoxy Grout, or Continuous Corner-to-Corner, 3/32", Class "A" FRP (Creates a Shower Stall Effect).

Exterior Choices – Brick, Stone, T1-11, Masonry Wainscot, Precision (Smooth) Block, Split-Faced Block, Stucco, Horizontal Clapboard, Board and Batten, Tudor, or Custom.

Gables/Ventilation – Glue Laminated or Steel Posts, with 1/8" #304 Stainless Steel Vent Screen.

Ceiling – Structural Plank and Beam, or Structural Steel Frame with Wood Grain Fiber/Cement Painted Ceiling.

Roof Finish – Standing Seam Metal, California Clay or Steel Roof Tiles, Concrete, 40-Year Composition Shingles.

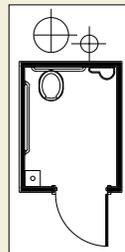
Doors – 14,16, or 18 gauge Steel, or Custom Stainless Steel Gates.

Available Accessories – Stainless Steel Toilet Paper Holders, Waste Disposal Containers, Grab Bars, AntiBacterial Handi-Wipes. Toilet Partitions are Custom Fabricated Polyethylene with Stainless Steel Tubing/Channels, or 1 1/4" Concrete.

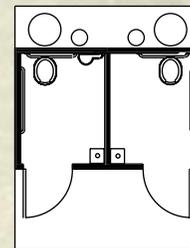
Electrical – Optional 100 AMP Service (or more if required), Vandal Resistant, 24,000 Hour Light Fixtures, Concealed Switches and Outlets.

Waterless Component – Up to 1200 Gal. Pre-Cast, 32,000 Use Capacity, Concrete Tank, Polyethylene Toilet Riser and Urinal.

We Design and Build Vault Restrooms for Single, and Multiple Users

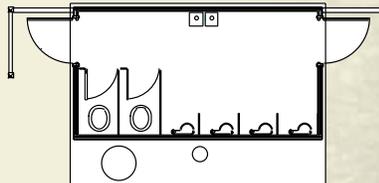


Single User Unisex



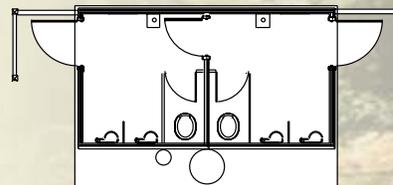
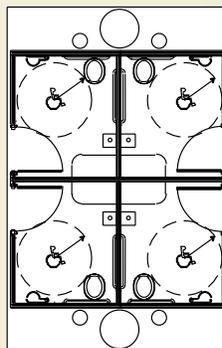
**Single User Mens
and Women's**

Multi User

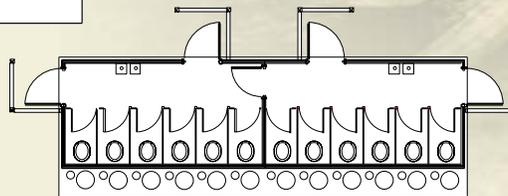


Multi User

**Four Family
Style Restrooms**



**Multi User Men's and
Women's Restroom**



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FACILITIES LTD™**

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Fax 775.327-6066
E-Mail: sales@restroomfacilities.com

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