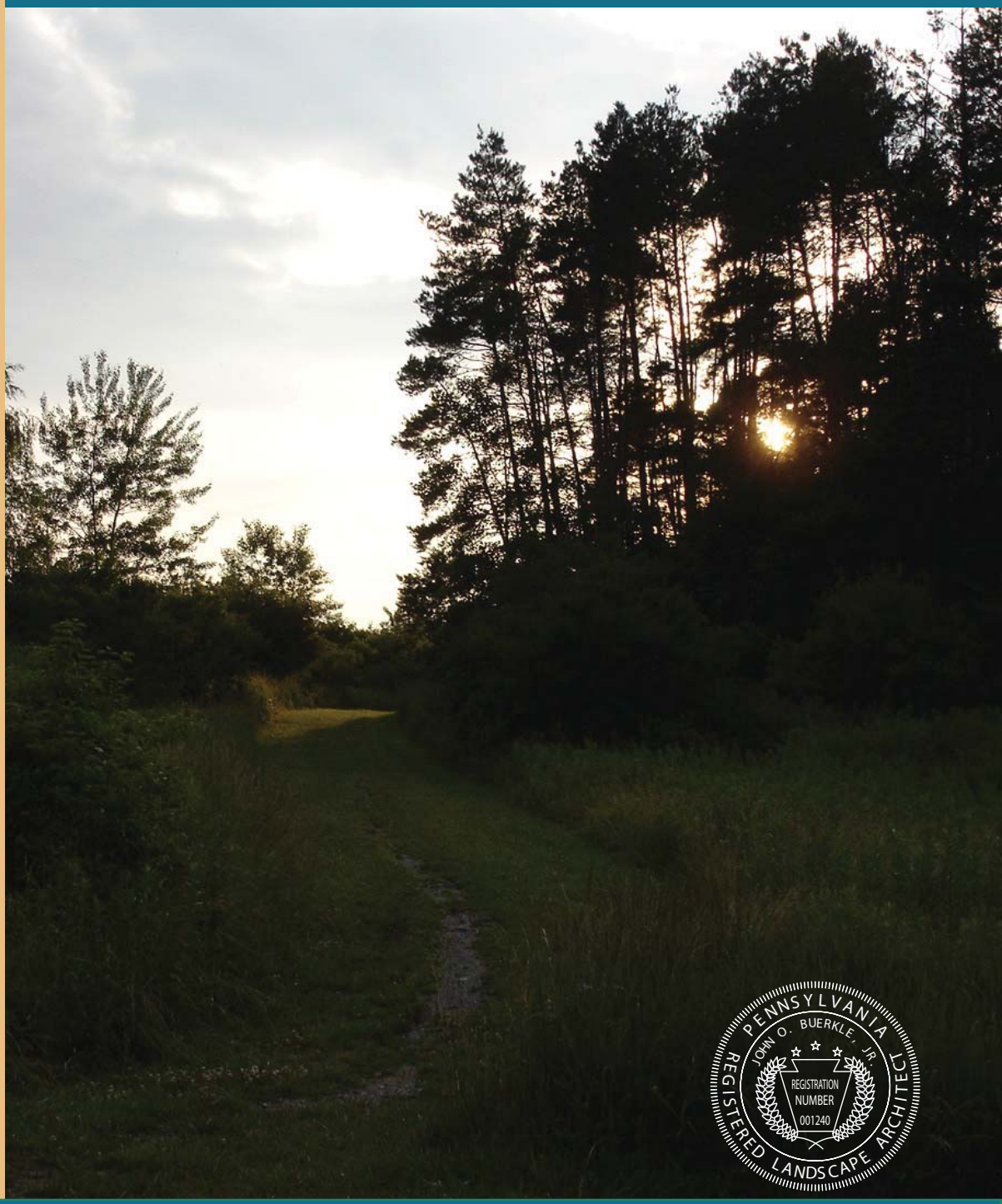
# Brush Creek Park

# 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.

Pashek Associates

Fall 2008

# 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
***Brian Hayden*** - Director of Communications, Beaver County Board of Commissioners
***Tom King*** - Director, Beaver County Department of Recreation and Tourism
***Frank Mancini, Jr.*** - Director of Planning and Economic Development, Beaver County Planning Commission; Executive Director, Beaver County Redevelopment Authority
***Suzanne Modrak*** - Project Manager, Community Development Program of Beaver County
***Laura Rubino*** - Project Manager, Beaver County Corporation for Economic Development
***John Scherfel*** - Manager, Beaver County Conservation District
***Richard Smith*** - Vice Chairman, Beaver County Recreation Advisory Board
***Charlotte Somerville*** - Chairperson, Beaver County Planning Commission
***Beverly Sullivan*** - Director, Beaver County Office on Aging
***Reverend Bernard Tench, Jr.*** - Pastor, Second Baptist Church of Beaver Falls
***Joseph West*** - Department Manager of Planning, Beaver County Planning Commission
***Dan Woodske*** - Marketing Director, Beaver Initiative for Growth

## Key Person Interviewees

***Jeff Langer*** - Riverside (School District) Football
***George / Cheryl Hall*** - Owners, Skyline Stables
***Terry Smith*** - Beaver County Christian Church Softball League
***Ed Sheppard*** - Freedom High School Teacher and Cross-Country Coach
***Matt Reichart*** - Pine Valley Bible Camp (Youth Group)
***Ted Krzemienski*** - Park Superintendent

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

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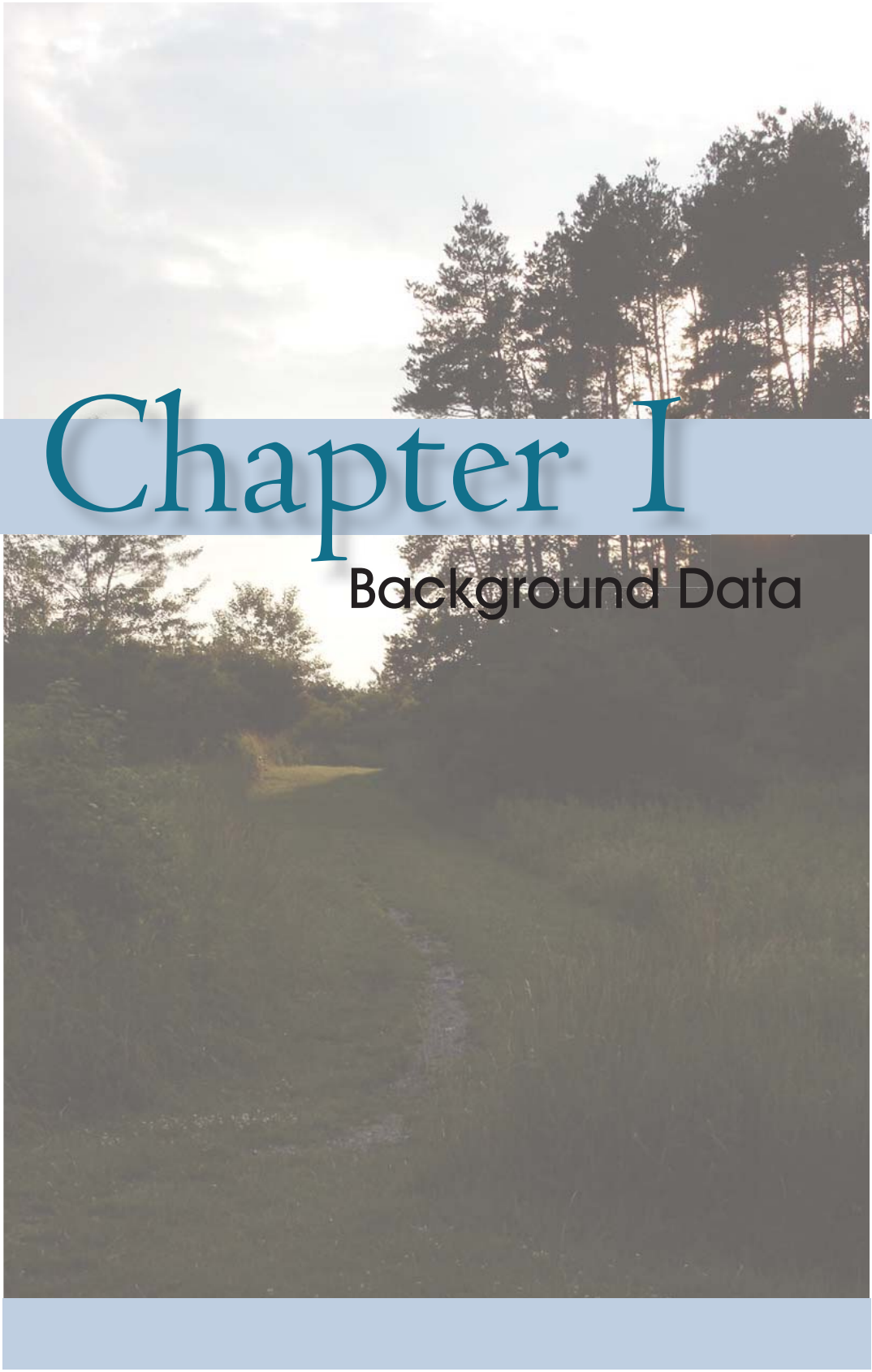
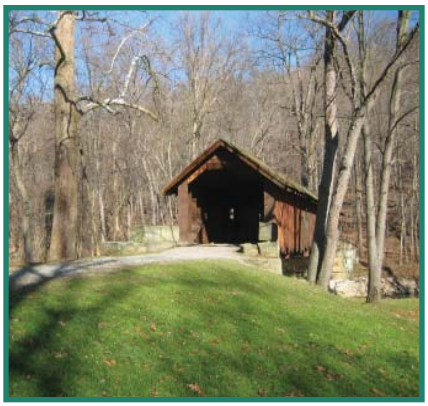


# Chapter 1

## 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

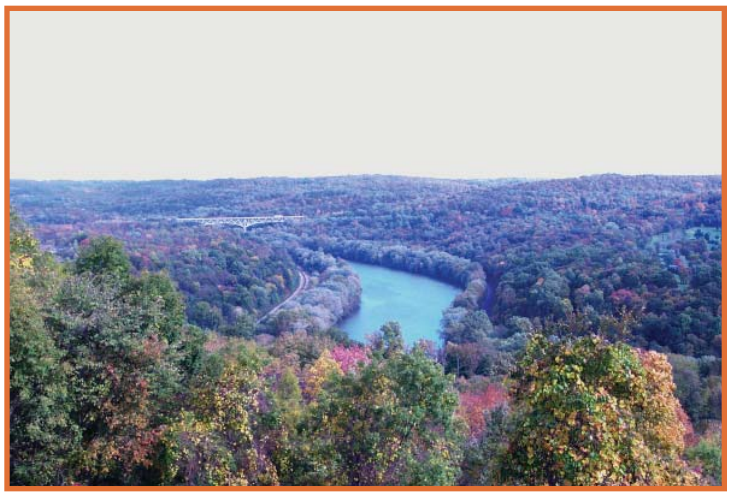
Parks and recreation are a major part of the high quality of life provided in Beaver County. Parks and recreational open space can preserve wildlife habitat, protect native ecosystems, and reduce pollutants.

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) | | | |
|---|---|---|---|
| *Year* | *Population* | *Change (Persons)* | *Percent Change* |
| 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 | | | | |
|---|---|---|---|---|
| *Population Segment* | *1980* | | *2000* | |
| | *# Persons* | *%* | *#Persons* | *%* |
| 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:

| *Housing Unit Value* | *Percentage of Total Units* |
|---|---|
| <$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:

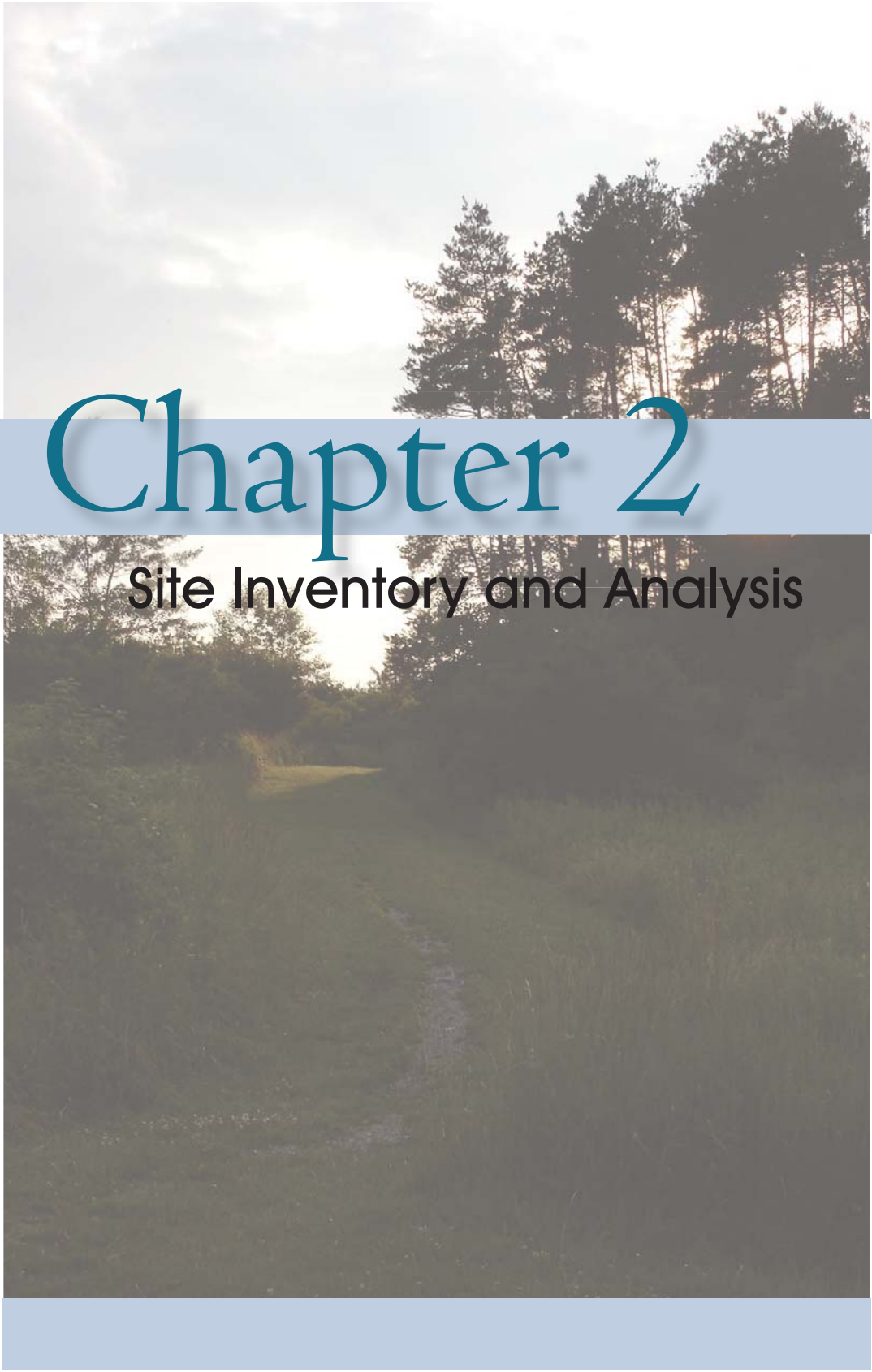
1) Establish conservation corridors that preserve and link high-priority habitats, sensitive environmental features, rural landscapes, and protected open space;

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.

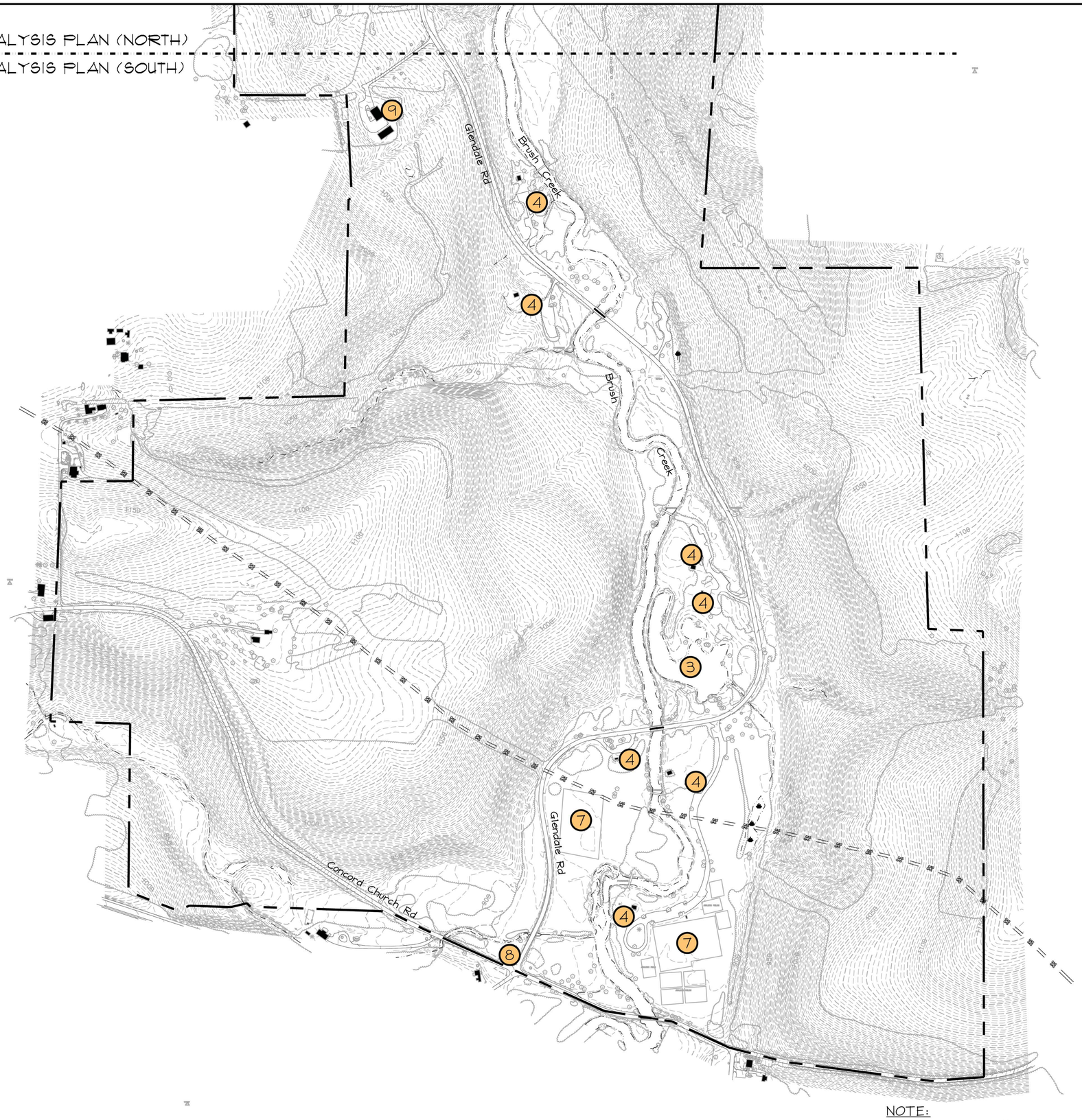


# Chapter 2

## Site Inventory and Analysis

MATCHLINE: SITE ANALYSIS PLAN (NORTH)

MATCHLINE: SITE ANALYSIS PLAN (SOUTH)




LEGEND

1. Baseball / Softball Field
2. Tennis Courts (2 sand / outdoor carpet, 2 asphalt)
3. Fishing / Canoeing Lake
4. Picnic Grove
5. Covered Bridge
6. Trailhead
7. Soccer / Multi-Use Field
8. Main Park Entrance
9. Maintenance Facility

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

# *Brush Creek Park*

*Beaver County, Pennsylvania*

## Existing Conditions Plan (South)

Sheet 1 of 2
Scale: As Noted
Date: 11/24/06

200 0 200 400
Scale: 1" = 200' Contour Interval: 2'-0
North

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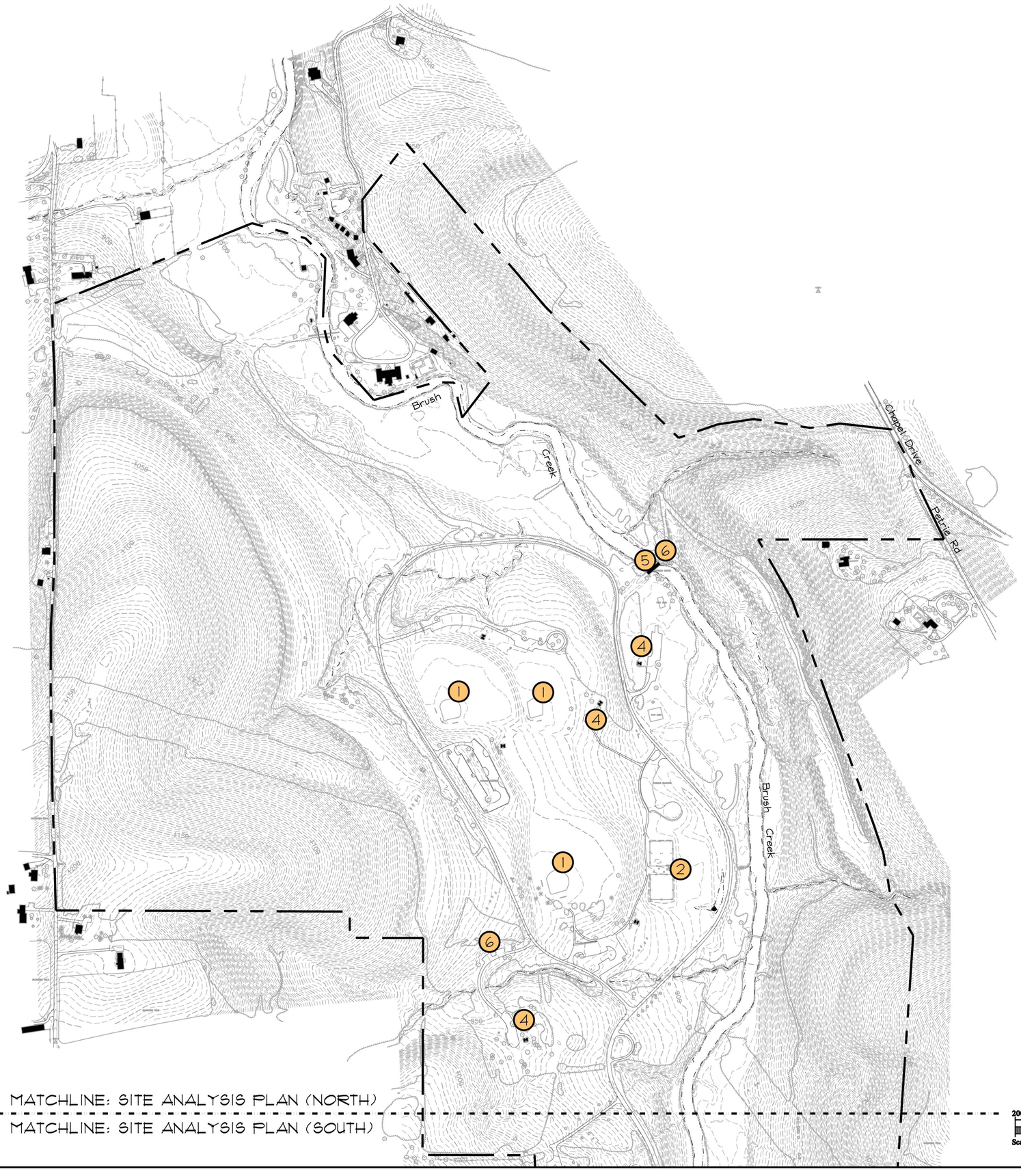


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MATCHLINE: SITE ANALYSIS PLAN (NORTH)

MATCHLINE: SITE ANALYSIS PLAN (SOUTH)

# *Brush Creek Park*

*Beaver County, Pennsylvania*

Existing Conditions Plan (North)

Sheet 2 of 2
Scale: As Noted
Date: 11/24/06

200 0 200 400
Scale: 1" = 200' Contour Interval: 2'-0
North

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Thoughtful recreational planning is only undertaken with an extensive knowledge of the individual recreational site, as well as its role in the surrounding community. Beaver County's cultural, historical, and demographic characteristics are discussed in this plan's introduction and provided context for development of the master site development plans for Brush Creek Park. Each park site's physical characteristics were also studied to further the master planning process.

Conclusions regarding opportunities and constraints with respect to development were drawn from the site's physical characteristics such as topography, soils, vegetation, and hydrology. Using various resources, inventories of each park property were compiled and site analyses were completed. The findings from this process are documented in this section and identified on the Brush Creek Park Site Analysis Plans, as appropriate.

## BASE MAPPING

Base maps of the existing conditions and property boundaries for Brush Creek Park were 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

The surveyor did not identify any rights-of-way or easements on the Brush Creek Park site. A large overhead power line traverses the site, but no right-of-way was designated on the survey.

## LOCATION, SIZE, SITE ACCESS, AND LEGAL STATUS

**Brush Creek Park** is located in the northeastern part of Beaver County, north of Concord Church Road / State Route 588. Portions of the park are in Marion and North Sewickley Townships. This park consists of approximately 400 acres, and is accessible from State Route 588 via Glendale Road, which is the main park drive. Brush Creek Park is owned by Beaver County.

## ZONING AND ADJACENT LAND USE

Brush Creek Park is located in Marion and North Sewickley Townships. North Sewickley Township has not adopted a municipal zoning ordinance. The portion of the park in Marion Township is zoned Agricultural (A-1) per the Marion Township Zoning Ordinance. Land use on the adjacent properties is primarily single-family residential, with some nearby agricultural properties.

## EXISTING STRUCTURES AND ROADS

Brush Creek Park is accessible by vehicular traffic only from Concord Church Road / State Route 588 via Glendale Road, which is main park road. This road extends from the southern portion of the site, twice crossing Brush Creek, and forms a large loop in the northern part of the park. Eleven (11) picnic groves are available on the site, all accessible via paved drives from the main park road. Parking areas are asphalt or gravel. Several narrow, compacted-earth walking trails and equestrian trails traverse both the wooded and open portions of the park property, some extending onto other properties. These trails provide no legal vehicular access to the park.

Existing structures at Brush Creek Park include the following:

- Beaver County's only covered bridge, which spans Brush Creek in the northern part of the park.
- eight (10) small restroom buildings located in or near the park's picnic groves and other activity areas;
- one large restroom facility in picnic grove #8;
- two (2) vehicular bridges along the main park road;
- six (6) footbridges near the various picnic groves and trails;
- a park maintenance facility; and

## 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

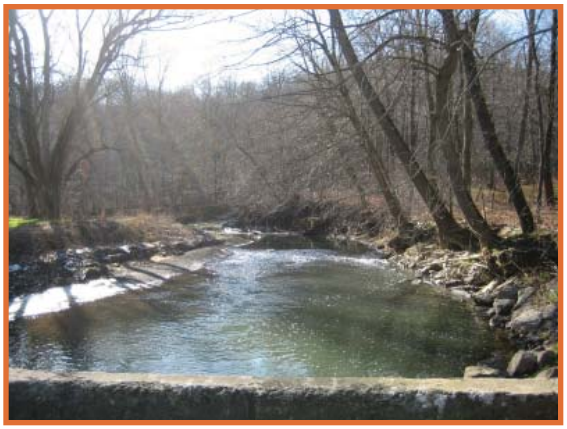
with powered equipment." the PA One-Call System, Inc. (PA One-Call) is a non-profit organization established to facilitate requests for utility information within the Commonwealth of Pennsylvania.

Thus, PA One-Call (1-800-242-1776) was contacted during the inventory of Brush Creek Park for information regarding utilities in the vicinity of the park. Through their automated response service, PA One-Call responded to search serial numbers 2725247 and 2725248. Utility providers then responded directly to Pashek Associates, with results shown below:

| *PA One-Call Responses - Brush Creek Park (Serial #'s 2725247 and 2725248)* | | | |
|---|---|---|---|
| ***Utility Company*** | ***Address*** | ***Response*** | ***Contact*** |
| Columbia Gas of PA, Inc. | 501 Technology Drive<br>Southpointe Industrial Park<br>Canonsburg, PA 15317 | Clear - No Facilities | U. Grant York |
| Columbia Gas of PA Design | 501 Technology Drive<br>Southpointe Industrial Park<br>Canonsburg, PA 15317 | Clear - No Facilities | U. Grant York |
| Dominion Transmission, Inc. - Beaver Station | P.O. Box 2450<br>Clarksburg, WV 26302 | Facilities are Marked | Roger D. Brown<br>roger_d_brown@dom.com |
| Eastvale Borough | 820 Walnut Street<br>Rochester, PA 15074 | None | Harold, Sonny, Harvey<br>harr12h@peoplepc.com |
| National Fuel Gas Supply Corporation - Henderson | 1100 State Street<br>Erie, PA 16501 | Clear - No Facilities | Daniel Krahe |
| North Sewickley Township | 893 Mercer Road<br>Beaver Falls, PA 15010 | Clear - No Facilities | Cindy Anderegg |
| North Sewickley Township Municipal Authority | 590 Mercer Road<br>Beaver Falls, PA 15010 | Clear - No Facilities | Office Personnel |
| North Sewickley Township Sewage Authority | 893 Mercer Road<br>Beaver Falls, PA 15010 | Clear - No Facilities | Office Personnel |
| Pennsylvania American Water Co. - Western Division | 2736 Ellwood Road<br>New Castle, PA 16101 | Clear - No Facilities | Karen Smith |
| Pennsylvania Power Company | FirstEnergy Corp.<br>P.O. Box 570<br>Youngstown, OH 44501-0570 | Clear - No Facilities | Tim Kilmore |
| Verizon Pennsylvania, Inc. | 201 Stanwix St., 4th Floor<br>Pittsburgh, PA 15222 | None | Ellen Moslander |

## WATER FEATURES AND WETLANDS

Several intermittent tributaries feed Brush Creek as it meanders northward through the Brush Creek Park property. Brush Creek is classified as a warm-water fishery (WWF) by the DEP Chapter 93 Water Quality Standards. In addition to the stream, the park site contains a 1.93-acre pond maintained for recreational use.



FEMA flood insurance rate maps (#4211610005B, #4222490001A, #4222490003A) indicate the presence of flood plains along the portion of Brush Creek traversing the park property. A small floodplain area is also identified along one of the creek's small tributaries in the southwestern corner of the park, near the park entrance. Most of these flood-prone areas are inundated with water during 100-year flood events, but base flood elevations and flood hazard factors are undetermined. Small portions of the park's floodplains are between the 100-year and 500-year flood elevations. These zones experience flooding of less than 1 foot during 100-year flood events and/or have a contributing drainage area of less than 1 square mile. Such flood zones are located in the extreme northern portion of the park property, on the western side of Brush Creek.

A review of National Wetland Inventory (NWI) mapping available online via the U.S. Fish & Wildlife Service, indicates the presence of riverine (stream-based) wetlands in the northern part of the park property, and the previously-mentioned freshwater pond. A survey of the park's topography and site features supports this data, and identifies three additional small marsh areas. Two of these marshes are located along the eastern edge of the Brush Creek floodplain in the southern portion of the park, the remaining marsh is just west of the park road, adjacent to the existing tennis courts.

## 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 Pennsylvania 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 Commonwealth of Pennsylvania. The following chart depicts site soil characteristics and potential limitations to site development.

| ***Soils Inventory - Brush Creek Park*** | | | |
|---|---|---|---|
| ***Soil Type (Map Symbol)*** | ***Drainage*** | ***Hydric Components*** | ***Limitations to Site Development*** |
| Atkins Silt Loam (At) | Poor | Atkins (WV 0008) | High water table, flood hazard |
| Cavode Silt Loam, 8-15% Slopes (CeC) | Poor | Brinkerton | Seasonal high water table, slow permeability, slope, erosion hazard |

| | | | |
|---|---|---|---|
| Clymer Loam, 3-8% Slopes (CmB) | Good | None | Depth to bedrock |
| Clymer Loam, 8-15% Slopes (CmC) | Good | None | Slope, depth to bedrock |
| Culleoka Silt Loam, 15-25% Slopes (CuD) | Good | None | Slope, moderate depth to bedrock, erosion hazard |
| Ernest Silt Loam, 8-15% Slopes (ErC) | Moderately Good | Brinkerton | Slow permeability, seasonal high water table, 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, 15-25% Slopes (GsD) | Good | None | Slope, depth to bedrock |
| Gilpin-Weikert Complex, 25-70% Slopes (GsF) | Good | None | Slope, depth to bedrock |
| Guernsey Silt Loam, 3-8% Slopes (GtB) | Moderately Good | Wet Spots | Slow permeability, seasonal high water table, clayey unstable soil |
| Guernsey Silt Loam, 8-15% Slopes (GtC) | Moderately Good | Wet Spots | Slow permeability, seasonal high water table, clayey unstable soil |
| Monongahela Silt Loam, 0-3% Slopes, (MoB) | Moderately Good | Purdy | Slow permeability, 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 |
| Purdy Silt Loam (Pu) | Poor | None | Slow permeability, seasonal high water table, clayey soil |
| Tyler Silt Loam, 0-3% Slopes (TyA) | Moderately Poor | Purdy, Brinkerton | Slow permeability, seasonal high water table |
| Udorthents, Strip Mine, gently sloping (UAB) | Varies | Wet Spots | Severe erosion hazard, other limitations must be determined by on-site investigation (soils vary greatly), may be used for recreation or open space |
| Udorthents, Strip Mine, moderately steep (UAD) | Varies | Wet Spots | Severe erosion hazard, other limitations must be determined by on-site investigation (soils vary greatly), may be used for recreation or open space |
| Udorthents, Strip Mine, steep (UAE) | Varies | None | Severe erosion hazard, other limitations must be determined by on-site investigation (soils vary greatly), may be used for recreation or open space |
| 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, 8-15% Slopes (WhC) | Moderately Good | None | Slow permeability, seasonal high water table, slope, erosion hazard |
| Wharton-Gilpin Silt Loam, 15-25% Slopes (WnD) | Moderately Good | None | Slow permeability, seasonal high water table, erosion hazard, slope, Depth to bedrock |

The following conclusions were drawn from a review of the soil inventory for Brush Creek Park:

- Depth to bedrock and seasonal high water tables are the most common limitations to park development in most areas of the park. Slopes in some parts of the park are also a 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 during the survey of the park site.
- The site contains strip-mined areas and urban land soils, which vary highly in stability and soil material. Caution should be used in these areas, and detailed investigations should be performed before development of any recreational facilities - especially structures.

## TOPOGRAPHY

Brush Creek Park consists of a stream valley with a broad, nearly-level plain (0-10% slopes) along Brush Creek, surrounded by mostly-wooded slopes ranging from 10% nearly 60%. Most of the park's recreation facilities are located in the nearly-level areas of the site, with the exception of a few parking areas and trails. The gently-sloping plain surrounding Brush Creek is widest in the southern end of the park. Ball fields are located in the northern part of the site, but are constructed on large terraces above the level plain around Brush Creek.

The property's high point is at an elevation of 1208 (feet above sea level), atop a hill on the property's western boundary. The park's low point, in the center of Brush Creek in the extreme southern portion of the park, is at approximate elevation of 890.

## 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 majority of Brush Creek Park is an Oak-Hickory Forest, and remnants of a Northern Floodplain Forest are evident on the park site. While oaks and hickories are the dominant canopy trees in this plant community, other deciduous canopy trees, saplings, shrubs, wildflowers, and vines may also be present. Maples appear to be particularly dominant in areas of past strip-mining. According to the county's soil survey, the site's soils are well-suited to wild herbaceous plants, grasses, legumes, and hardwood trees. Site soils are also somewhat suitable for coniferous / evergreen trees.

A *potential* plant species site inventory, including species from both the oak-hickory forests and northern floodplain forests on the Brush Creek Park site, is depicted in the chart below:

| *Major (Canopy) Trees* | *Understory Trees, Shrubs and Vines* | *Herbaceous Plants* |
|---|---|---|
| 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 | Rhodendrons | 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) | Trillums |
| | 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

Animal species require food, cover, space, and water for survival. These elements are available on the Brush Creek 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.

The Brush Creek Park property contains a mature oak-hickory forest that covers its slopes and ridges, and also several areas of northern floodplain forest cover the level floodplain near Brush Creek. These habitats provide abundant food and cover for a variety of 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 two forest habitats. 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 list on the following page represents a *potential* inventory (not including insects and other invertebrates) of the various wildlife that may utilize the habitat types on the Brush Creek Park site:

| *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 Box Turtle | Pileated Woodpecker | Warbling Vireo |
| Eastern Bluebird | 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 (Search #20061012059767) indicated that park development should have no known impact on species federally protected under the Endangered Species Act, and no known impact on Pennsylvania special concern species.

## 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."

The NHI designates Brush Creek 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. Brush Creek Park does not include any identified natural heritage

areas, but is very large and contains large areas of commonly-occurring natural habitats. Thus, Brush Creek Park is ecologically important in a general sense. The NHI suggests that attempts be made to expand and recover the qualities of the more natural areas of the park (floodplain, forested slopes, etc.). These areas provide habitat for wildlife and native plants, as well as a buffer for Brush Creek, which is recovering from pollution caused by acid mine drainage.

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

## EXISTING RECREATION FACILITIES

This section lists and analyzes existing recreation and support facilities at the park, and identifies issues related to the location, use, and relationship between existing facilities at Brush Creek Park. Analysis of the park property is visually represented in the Site Analysis Plan at the end of this chapter. Parking for existing facilities is analyzed in the next chapter along with needed parking for proposed facilities.

## Existing Facilities at a Glance

| *Facility* | *Quantity* | *Size* | *ADA Accessible?* | *Analysis Notes* |
|---|---|---|---|---|
| Soccer / Football Fields | 10 | (2) 300' x 190'<br>(4) 100' x 70'<br>(4) 80' x 60' | No | Fields used by multiple sports, and are well-drained. Insects and divots made by horseback riders are biggest problems. |
| Restrooms | 10 sets | Sizes vary | No | Pit toilets; good condition. |
| Roads | 2.4 miles | Width varies | N/A | Road in poor condition: crumbling due to lack of proper compacted aggregate base |
| Road Bridges | 2 | 61' long x 25' wide | N/A | Southernmost bridge moved by recent flood waters. Bridges do not allow space for flood waters to flow beneath. Need replaced. |
| Parking | Approx. 515 spaces | No parking space lines visible | No | Gravel Parking, functions well and is in fair condition. No handicapped parking spaces. |
| Playgrounds | 2 | 1 small; 1 large | No | Large playground (equipment for ages 5-12) and Small playground (ages 2-5) in good condition, have shredded bark safety surface. |
| Tennis Courts | 4 | Courts are regulation size | Yes | Sand/outdoor carpet surface courts (2) need re-surfaced, asphalt courts (2) are unused and need removed. 10' high fence enclosure needs minor repairs. |
| Picnic Groves | 11 | Sizes vary | No | Most groves have stand-alone picnic tables (92) in good condition, standing charcoal grills (22) in fair condition, water pumps (13 total) in good condition. No shelters. |
| Ball Fields | 3 | (1) 350' LF/RF, 380' CF;<br>(1) 335' RF, 350' LF/CF;<br>(1) 200' LF/RF, 250' CF | No | Soil infields, players benches, chain-link backstops, no outfield fences. Fields severely rutted and divoted by illegal ATV use, horseback riders. Infields need maintenance. |
| Trails | Approx. 6 miles | Widths and surfaces vary | No | 0.79-mile grass trail in mine reclamation area; 2-mile trail in eastern part of park; all other trails cannot be identified as park trails. Signage is inadequate. Trails surfaces eroded in several areas. |
| Lake | 1 | 1.93 acres | No | Near picnic grove, picturesque |
| Maintenance Facility | 1 | -- | Yes | Electric, water, sewer, telephone service. Run efficiently with minimal staff. |
| Model Airplane Field | 1 | Approx. 4 acres | No | Large open lawn area |
| Northern Field | 1 | Approx. 6 acres | No | Large open lawn area and miner's cabin used only by neighboring bible camp. Maintenance road and storage area abut field. |

## Hydric Soils are a Limiting Factor

Nearly all of the park's recreation facilities are located on the level lowlands near Brush Creek. These areas are underlain by hydric (potential wetland indicator) soils, which are often poorly drained, resulting in a high water table and seasonal ponding. This condition may limit the development of large structures with extensive foundation systems, or other facilities that may require large amounts of earthwork.

## Less Lawn Equals Less Maintenance

An excessive amount of space in the park is maintained as open, unprogrammed lawn. These spaces are not used for any organized activity, and in some cases aren't used at all. Letting these areas revert to herbaceous fields and mowing them once or twice yearly will decrease runoff from the park area, attract wildlife such as birds, provide habitat for wildflowers, and greatly decrease the effort required for park maintenance. Nowhere is this more prevalent than the broad sweeping lawn around the existing ball fields and tennis courts. Mowing only wide paths for access would be sufficient to maintain visibility (and thus safety) in these areas.

## Trail System is Unorganized

Several trails exist on the Brush Creek Park property. However, only a few are recognizable as park trails. Recognizable trails include: a 0.79-mile lawn surface trail in the mine reclamation area at the northern end of the park; and a 2.00-mile earth surface trail along the eastern Brush Creek Valley slope from the covered bridge to Route 588. A lack of signage and trail maintenance makes it nearly impossible to determine how much of the remaining 3.15 miles of trails are official park trails and which are not. Many trails appear to have been created by hikers, mountain bikers, ATV riders, or park neighbors (some neighbors, such as the Pine Valley Bible Club, have created access trails connecting their facilities to the park). Only trails very near the creek are discernable as park trails. Directional signage and trail distance signage is needed.

## ATV Access is a Problem

ATV riders access the park from several of the surrounding properties, as is evidenced by the numerous trails leading into the park. These trails may be simply for recreational riding, or for hunting access. In any case, illegal ATV access presents a threat to park security because riders can enter the park at any time. In addition, the trails created by these riders often destroy vegetation and

cause erosion, especially in areas of the park that have been strip-mined.

## Developing Recreational Facilities near the Park Entrance may Improve Visitors' First Impression of the Park

Just east of Glendale Road, the park's main access, is a flat open lawn near Brush Creek and one of its un-named tributaries. Development of an attractive facility such as a playground, small picnic grove, or possibly a loop trail through this high-profile area would provide visitors with an immediate impression of the quality of the park's facilities.

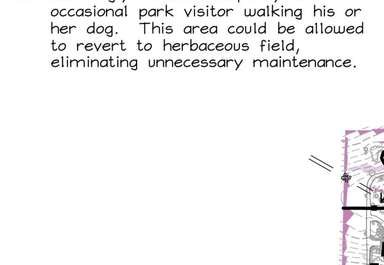
## Access is Well-Organized, Picnic Areas are Excellent

The park's main road and secondary drives for separate activity areas makes good use of the space in the park, which is sometimes divided by the creek. Excellent use of some of the park's small "pockets" of space is made by the picnic areas. They provide a feeling of seclusion or privacy in woodland settings, while at the same time being close enough to the park road or other facilities to be safe. Picnic groves also cater to a variety of users: some picnic groves include large numbers of picnic tables and are suitable for large gatherings, while others contain small numbers of picnic tables for casual picnics.

MATCHLINE: SITE ANALYSIS PLAN (NORTH)

MATCHLINE: SITE ANALYSIS PLAN (SOUTH)

5 Yet another open mowed area seemingly unused except by an occasional park visitor walking his or her dog. This area could be allowed to revert to herbaceous field, eliminating unnecessary maintenance.



6 The open lawn area near the park entrance is a suitable spot for an extension of the park's trail system or other passive recreational facility. This addition would improve the park's image to the first-time visitor.

7 Ample room near the park entrance exists for casual recreation or stream access for environmental education or other passive nature-related recreation.

LEGEND

- Slopes 0-10%
- Slopes 10-25%
- Slopes 25%+
- Park Trails
- Vehicular Circulation
- 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) — 4
- Pedestrian Connection (Footbridge)
- Hydric (Wetland Indicator) Soils — GVD

Soil Symbol
- At = Atkins Silt Loam
- CeC = Cavode Silt Loam, 8-15% Slopes
- ErC = Ernest Silt Loam, 8-15% Slopes
- MoB = Monongahela Silt Loam 3-8% Slopes
- Ph = Phil Silt Loam
- Po = Pope Silt Loam
- Pu = Purdy Silt Loam
- TyA = Tyler Silt Loam, 0-3% Slopes
- TyB = Tyler Silt Loam, 3-8% Slopes
- UAB = Udorthents (strip mine, gently sloping)
- UAD = Udorthents (strip mine, moderately steep)
- WhB = Wharton Silt Loam, 3-8% Slopes

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

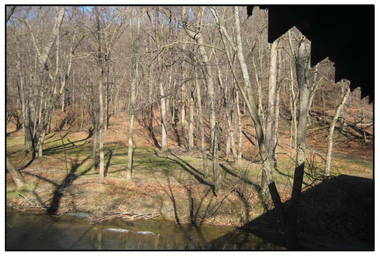
# *Brush Creek Park*
## *Beaver County, Pennsylvania*

Site Analysis Plan (South)

Sheet 1 of 2
Scale: As Noted
Date: 11/24/06

200 0 200 400
Scale: 1" = 200' Contour Interval: 2'-0
North

PASHEK ASSOCIATES
A Pennsylvania Corporation
412/321-6362
FAX 412/321-9202
info@pashek.com
619 East Ohio Street
Pittsburgh, PA 15212

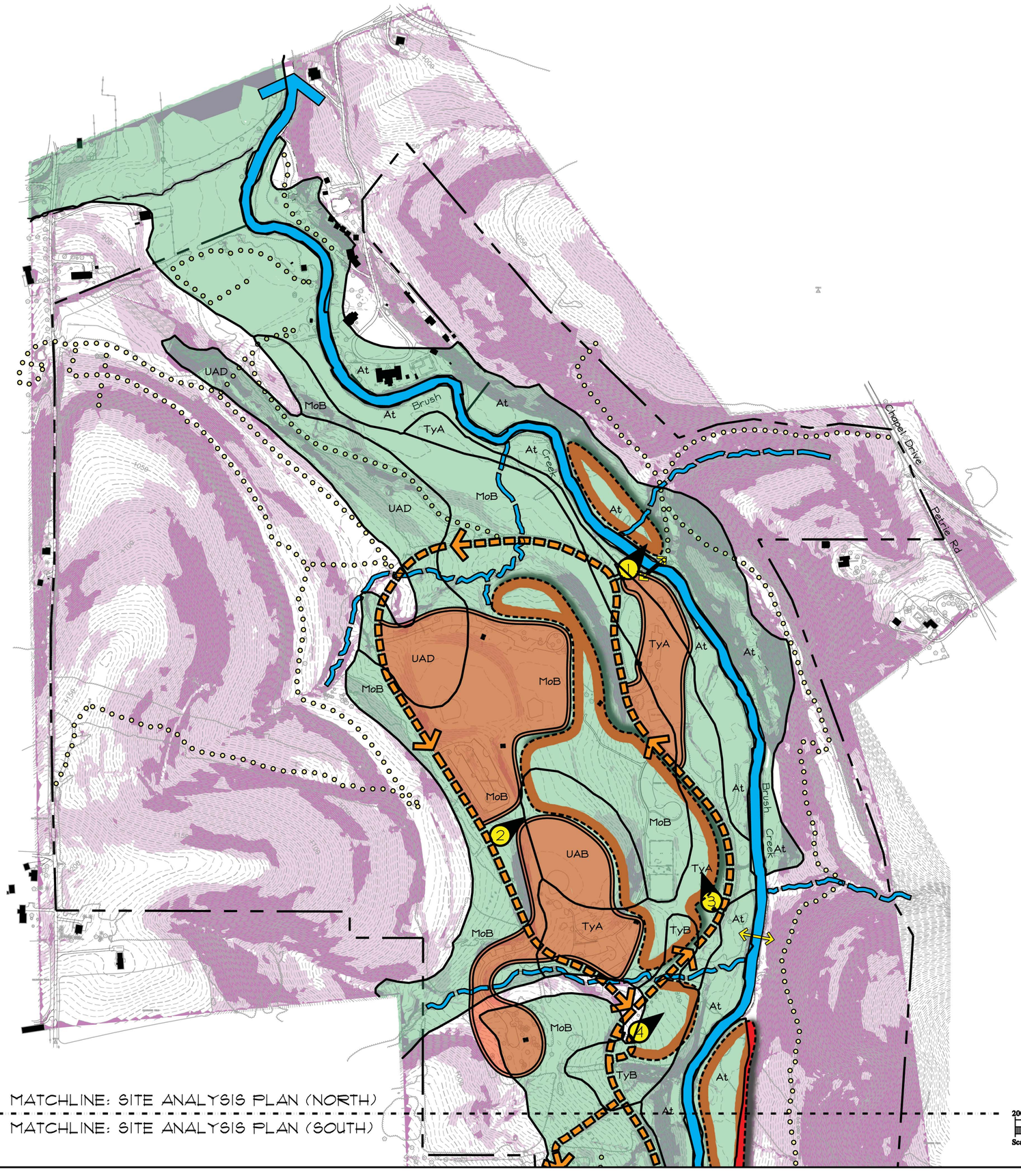


1 A small area of floodplain is currently maintained as lawn and accessible via the covered bridge and trails. This could potentially be used as a casual picnic ground.

2 An excessive amount of lawn is maintained within the loop road. Most of this area could be allowed to revert to herbaceous fields with mowed access paths between ball fields and other activities.

3 A small wetland is located just east of the existing tennis courts. Maintaining less lawn around the wetland would help to filter runoff into it, and would also create a more natural look for the park.

4 This small (±1 acre) area of lawn appears to be unused for any recreational purpose. If this area is indeed unused, it need not be mowed more than twice each year.




MATCHLINE: SITE ANALYSIS PLAN (NORTH)

MATCHLINE: SITE ANALYSIS PLAN (SOUTH)

## LEGEND

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- Potential Recreational Developmental Areas
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- UAD = Udorthents (strip mine, moderately steep)
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# *Brush Creek Park*

*Beaver County, Pennsylvania*

## Site Analysis Plan (North)

Sheet 2 of 2
Scale: As Noted
Date: 11/24/06

200 0 200 400
Scale: 1" = 200' Contour Interval: 2'-0
North

PASHEK ASSOCIATES
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412/321-8362
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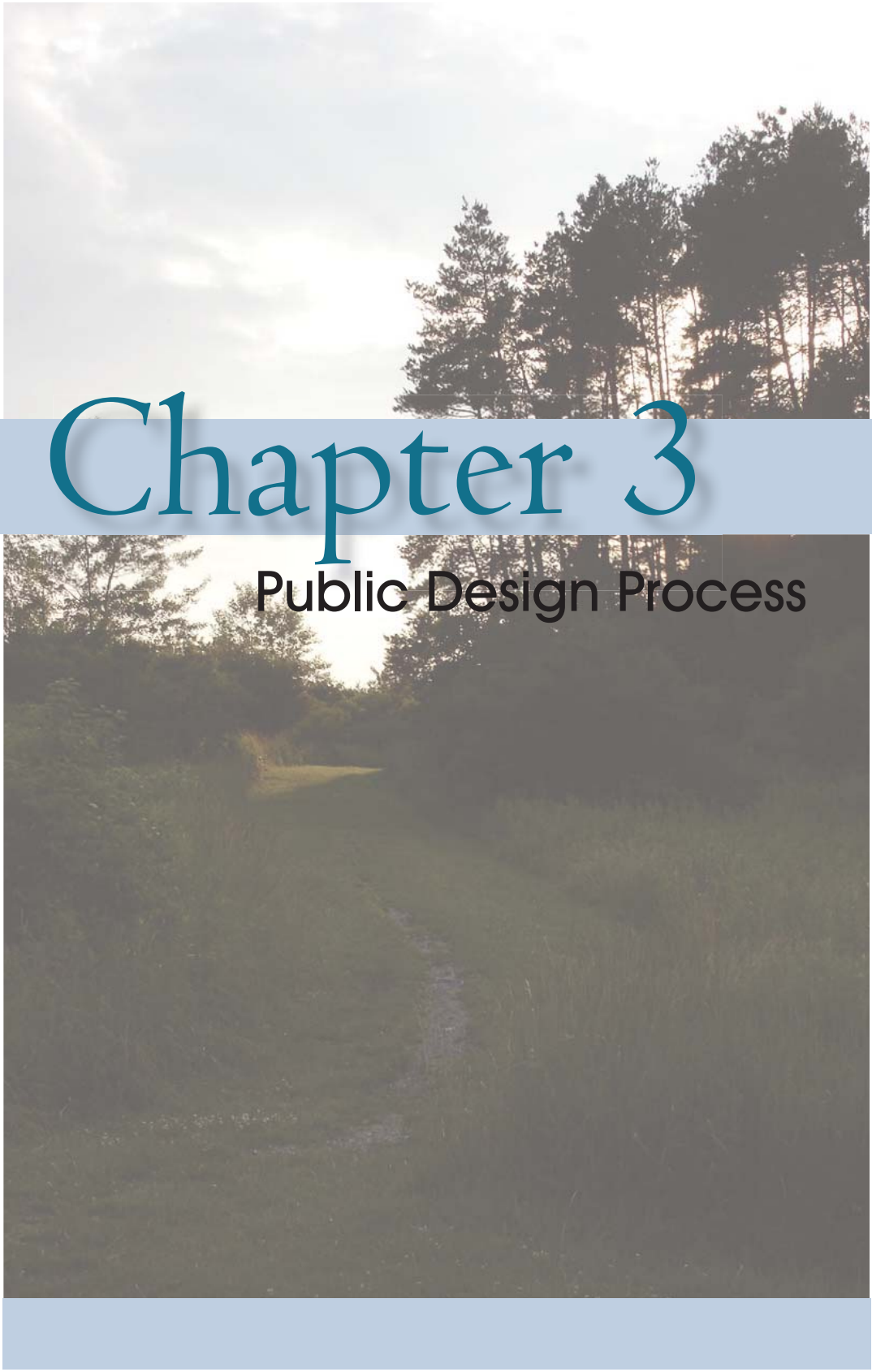


# Chapter 3

## 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 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.

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 sill 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.

## Brush Creek Park Public Input Session #1 (August 22, 2007)

The first public input session at Brush Creek 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:

- I'd like to see shelters in the park - to bring in revenue and give a variety of picnic opportunities.
- The tennis courts need re-furbished. More people would use them if they were redone.
- A basketball court would be highly used
- The road is in severe need of repair - one of the park's bridges has been sliding and has been sectioned off with construction cones for months. The bridges in place now also don't allow enough water to flow beneath them during floods - they should be higher arched bridges. The road base is basically non-existent underneath the original asphalt, so tar-and-chip resurfacing goes bad in a matter of months. A good road needs to be re-built from scratch.
- I don't think the ski / tube slope is a good idea for this park. People will just get in their cars and drive to Seven Springs to do the same thing at a bigger facility. Making snow will be too expensive.
- The trails in the park are our biggest concern - they badly need resurfaced and in certain spots need totally redone.
- A shared-use trail for walking and bike riding as part of the road throughout the park would be very nice.
- I don't think the snow tube hill should be ruled out as a long term idea. This park was originally slated to be the County's winter recreation park
- Even if we don't make snow, a large open hill for simple sled riding is something we need. Right now there are utility rights-of-way running up and down the hills in the park, but with sled riding there are liability concerns.
- Trail rules need to be looked at - right now, horseback riders drop their waste all over the trails and roads in the park. It stinks, and is also a hazard for infection for a hiker or mountain bike rider with an open cut on their leg.
- We should create and enforce a bag rule: horseback riders must clean up their horse's waste in a bag (similar to dog users). We have a better chance of getting them to do this than to ride on

separate trails from hikers / bikers.

- We don't have any security patrol so vandalism happens a lot in the park. Even periodic patrols would prevent a lot of it.
- Speeding cars in the park are a problem.
- Cross-country running and skiing could be done on the trails year-round if the surface is improved.
- Rozzi explained that trail sustainability and signage were the two biggest issues he noticed when walking the park's trails. It's quite easy to walk down one of the "unauthorized" trails that leads to someone's garage.
- There are several big trees down across the trails in the park - trees big enough that the maintenance staff can't remove them. Trail groups need to contact someone that removes stumps / cuts trees for a living to come and get them.
- Because the maintenance staff is already stretched thin taking care of the more developed park areas, trail users should approach the County Union to develop an agreement to work on the trails in the park on a regular basis.
- Trail bridges also need repaired. One is completely collapsed and a few others are almost that bad.
- We should try to attract grant funding to re-plant the reclaimed mine area with trees.
- All planning documents, including the old master plan (a model on the maintenance building wall) should be considered during the new master plan
- The covered bridge needs a new roof
- The trails and the road are our top priorities in this park - they should be short-term priorities ahead of everything else.

## Brush Creek Park Public Input Session #2 (May 13, 2008)

A second public input session was held on May 13, 2008 at the maintenance garage in Brush Creek 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 approximately six people attended the meeting.

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

1. Although it is important to maintain the park's original focus on passive recreation and the environment, it is also important to respond to today's recreation needs of Beaver County's residents. Therefore, we concur with the recommendation of providing picnic shelters in the park, and to improve the ball fields to make them more desirable for play.

2. Concern was expressed over the County's past proposal for a skiing and snow tubing facility as it is not consistent with the intent of the park, requires a substantial investment in infrastructure, and other examples in the region show that it may not be financially feasible to

sustain its operations. The consultant indicated that a sledding hill is being recommended in lieu of a larger facility. That said, the area could be expanded in the future if desired. An attendee questions whether there might be a more appropriate location for the area in the northern portion of the park.

3. The park foreman reinforced his concerns with the existing bridges in the park over Brush Creek. He said this spring the park road has to be closed on approximately six occasions due to high water that flooded the park road. He indicated that replacement of the bridges, at a higher elevation to accommodate seasonal high waters, must be a priority.

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 Brush Creek 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.

- ***Jeff Langer***, Riverside Youth Football Coach (utilize park fields)
- ***George & Cheryl Hall***, Skyline Stables (organizes a horseback ride through the park)
- ***Terry Smith***, Beaver County Christian Church Softball League (utilize park fields)
- ***Ed Sheppard***, Freedom High School Teacher and Cross County Coach (utilizes the park for cross country meet)
- ***Matt Reichart***, Pine Valley Bible Camp (utilize park for overnight group camping)
- ***Ted Krzemienski***, Brush Creek Park Foreman

## 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" , I*nternational 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".

- International Mountain Biking Association, www.imba.com - establishes standards for sustainable multi-use trails

## 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 Brush Creek 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 / Mountain Biking / Equestrian Trails***

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

***Mountain Bike (only) 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

***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

***Restrooms***

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

***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. Brush Creek Park was originally planned as a rustic facility containing large amounts of green space, and retaining the current density of facilities was recommended contains many existing facilities, and space for proposed facilities was located carefully to avoid overcrowding in the park's feasible development areas.

## Parking Standards

Existing parking at Brush Creek Park was studied to determine if a need existed to increase parking for existing recreation facilities. The number of existing parking spaces (approximately 515) indicates that existing parking is adequate for existing recreation facilities. Thus, additional parking is proposed only where existing facilities are improved or where new recreation facilities are proposed.

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 annual Skyline Saddle-up (horseback ride) fund raiser, 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. Excess parking facilities occupies 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 (shown in the chart on the following page) 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.

| *Facility* | *Number of Each Facility in Final Master Plan* | *Recommended Number of Parking Spaces per facility* | *Total Recommended Number of Parking Spaces* |
|---|---|---|---|
| Existing Lake | 1 | 5 | 5 |
| Existing Picnic Groves (without shelters) | 5 | 8 | 40 |
| Existing Youth Soccer / Football Field | 8 | 15 | 120 |
| Existing Adult Soccer Field | 2 | 30 | 60 |
| Existing Playgrounds | 2 | 10 | 20 |
| **TOTAL EXISTING FACILITY (to remain) PARKING NEEDS** | | | **245** |
| ***ACTUAL EXISTING PARKING TO REMAIN*** | | | ***350*** |
| Picnic Shelter | 3 (proposed) | 10 | 30 |
| Sled-riding Hill | 1 (proposed) | 20 | 20 |
| Hiking / Mountain Bike / Equestrian Trail | 1 (existing trail system, plus expansion) | 30 | 30 |
| Baseball/Softball Field | 3 (existing) | 40 | 120 |
| Tennis Court (outdoor) | 2 (existing) | 4 | 8 |
| Dog Park | 1 (proposed) | 15 | 15 |
| **TOTAL IMPROVED / PROPOSED FACILITY PARKING NEEDS** | | | **268** |
| ***ACTUAL PROPOSED PARKING FOR IMPROVED / PROPOSED FACILITIES*** | | | ***306*** |
| **TOTAL PARKING SPACES NEEDED / PROPOSED** | | | **513 / 656** |

# DESCRIPTION OF CONCEPT PLAN

The Concept Plan for Brush Creek 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.

The focus of the Concept Plan is two-fold: 1) improved safety, parking, and access for existing facilities; and 2) introduction of new facilities previously unseen in the park. Improvements shown in the Concept Plan included the following:

- compacted aggregate access paths to all facilities;
- trail improvements including obliteration of unauthorized ATV trails, realignment of unsustainable trail sections, and general trail resurfacing;
- trail signage (including trail rules and mapping) at all trailheads;
- three proposed picnic pavilions (each 25' x 35');
- paved parking areas including handicapped-accessible spaces;
- re-grading of outfield areas, installation of fences, and construction of dugouts at the park's ball fields;
- annual mowing (as opposed to weekly, etc.) in large lawn areas of the park - resulting in natural look and less maintenance;
- construction of a fenced off-leash dog park (requires removal of the existing tennis courts);
- development of a snow-tube / sledding hill along with associated snack bar, snow tube / sled / cross-country ski rental, magic carpet (tube lift), restroom, snow-making equipment, and small-flow sanitary sewage treatment plant;
- paved horse-trailer parking just west of Brush Creek near the park entrance; and
- updated park mapping and information at the existing information kiosk.

The study committee's reaction to the concept plan included some positive and some negative comments. Most committee members were concerned that sport fields/courts and pavilions did not fit the original "rustic" nature of the park. Some argued that enclosing (fencing) a ball field simply helps define its use per activity. Proper scheduling would be needed to ensure that fields are available to both leagues and to casual play by picnickers. Still another comment emphasized the fact that ball field fencing would prevent the fields unnecessary, destructive use by horse-back riders.

Other committee members thought the addition of pavilions to the park would be a positive, as they would provide a much-needed under-roof picnic setting.

The general consensus for the snow-tubing hill was that a snow-making operation would be pose difficulties in permitting and would be very costly. Instead, the committee supported construction of a simple sledding hill with the idea that snow making equipment and other support facilities could be added in the future.

SHEET 2

SHEET 1

Improve hiking trail surface and provide trail markers (all park trails)

Improve hiking trail surface and provide trail markers (all park trails)

Brush Creek

Extend existing picnic area drive to provide access road to proposed maintenance building for snow tube run

Water line for artificial snow-making at snow tube run

hiking trail connects existing trail to picnic area

Obliterate all trails that provide unauthorized access to park property (Typical of all park boundaries)

Snow Tube Area:
-Snow tube runs (varying slopes)
-Slow-down area at base of hill
-magic carpet conveyor carries snow tubers to top of hill
- snow tube rentals

Parking Area Improvements:
-25' x 35' Picnic Pavilion
-Organized parking including handicap-accessible spaces
-concrete walkway along western side of parking lot
-precast concrete wheelstops
-compacted aggregate walkway connections to snow tube run
-shade tree plantings
-turnaround suitable for busses and emergency vehicles

Water line for artificial snow-making at snow tube run

Snack Bar and cross-country ski rental

Small-flow sewage treatment plant

Provide plumbing to existing restroom

CONCORD CHURCH ROAD (S.R. 588)

Provide updated park map at existing kiosk

GLENDALE ROAD

Brush Creek

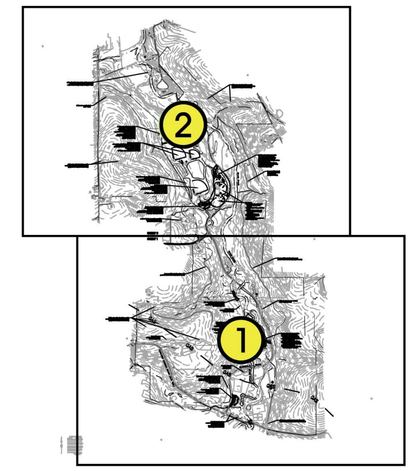
High-Grass Areas (throughout park):
-allow grass to grow to mature height (24 to 36 inches)
-mow once per year at 8" height
-these areas will save maintenance time

Parking Area:
-organized parking, including horse-trailer parking
-easy access to park trail system via main park road

Park Trail Extension:
-trail location is high-profile and easily accessible
-provide signage including trail map and trail rules

Obliterate existing park trail access to State Route 588 (Concord Church Road)

## Brush Creek 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

NOTES:

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

# Brush Creek Park

Beaver County, Pennsylvania

CONCEPT PLAN
SHEET 1 of 2

200 0 200 400

Date: 6/22/07 Scale: 1" = 200'
Contour Interval: 10'-0"

North

PASHEK ASSOCIATES
A Pennsylvania Corporation
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619 East Ohio Street
Pittsburgh, PA 15212

Cabin (used by Pine Valley Bible Camp):
-Stabilize stream crossing near cabin
-Allow Pine Valley Camp to repair cabin

Obliterate unauthorized ATV Trails

Obliterate all trails that provide unauthorized access to park property (Typical of all park boundaries)

Brush Creek

Parking Area Improvements:
-25' x 35' Picnic Pavilion
-Organized parking including handicap-accessible spaces
-concrete walkway along southern side of parking lot
-precast concrete wheelstops
-compacted aggregate walkway connections to Fields
-shade tree plantings

Provide trail map and signage at all trailheads

Field Improvements:
-re-grade outfield to eliminate ruts, divots
-compacted aggregate access walkways (maximum 5% slope for handicap access)
-concrete block dugouts
-spectator bleachers
-6' high chain-link perimeter fence

Parking Area Improvements:
-25' x 35' Picnic Pavilion
-Organized parking including handicap-accessible spaces
-concrete walkway along western side of parking lot
-precast concrete wheelstops
-compacted aggregate walkway connections to dog park
-shade tree plantings

Improve hiking trail surface and provide trail markers (all park trails)

Obliterate all trails that provide unauthorized access to park property (Typical of all park boundaries)

High-Grass Areas (throughout park):
-allow grass to grow to mature height (24 to 36 inches)
-mow once per year at 8" height
-these areas will save maintenance time

Field Improvements:
-Install infield underdrains
-compacted aggregate access walkways (maximum 5% slope for handicap access)
-concrete block dugouts
-spectator bleachers
-6' high chain-link perimeter fence

Dog Park:
-remove tennis courts and associated paving and fencing
-6' high chain-link perimeter fence
-fence-enclosed entrance/exit areas for leashing/unleashing
-shade tree plantings
-compacted aggregate access walks
-access to existing restroom
-waste receptacles

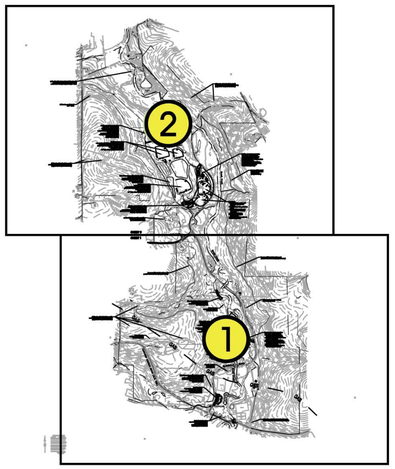
Parking Area Improvements:
-Organize parking spaces, add handicap accessible spots
-compacted aggregate access walkways (maximum 5% slope for handicap access)
-remove existing walkway

proposed trail connection provides access from picnic area, park maintenance drive

SHEET 2

SHEET 1

## Brush Creek 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

NOTES:

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

# Brush Creek Park
Beaver County, Pennsylvania

CONCEPT PLAN
SHEET 2 of 2

200 0 200 400

Date: 6/22/07 Scale: 1" = 200'
Contour Interval: 10'-0"

North

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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:

- Removal of the existing park road and re-installation of a new road base and surface to avoid recurrence of settling and cracking problems;
- Replacement of the park road bridges over Brush Creek with higher arching bridges that provide higher flood volume beneath;
- A compacted aggregate shared-use path following the entire park road (shoulder);
- Compacted aggregate access paths to all facilities;
- Trail improvements including obliteration of unauthorized ATV trails, realignment of unsustainable trail sections, and general trail resurfacing;
- Trail signage (including rules and mapping) at all trailheads;
- Institution and enforcement of a waste bag rule for horseback riders (bags to be provided by the County at trailheads);
- Three proposed picnic pavilions (each 25' x 35');
- Paved parking areas including handicapped-accessible spaces;
- Re-grading of outfield areas, installation of fences, and construction of dugouts at the park's ball fields;
- Construction of an asphalt basketball court;
- Annual mowing (as opposed to weekly, etc.) in large lawn areas of the park - resulting in natural look and less maintenance;
- Construction of a fenced off-leash dog park (requires removal of two of the existing tennis courts);
- Rehabilitation of the 2 existing sand / outdoor carpet mat surface tennis courts;
- Development of a rustic sledding hill (for possible future upgrade into a snow-tube / sled / ski hill with snow making capability);
- Paved horse-trailer parking just west of Brush Creek near the park entrance; and
- Updated park mapping and information at the existing information kiosk.

Further public comment emphasized that the road and trails in the park should be the highest priorities for redevelopment, and that the park's original designation as a rustic recreation park be considered in all decisions.

SHEET 2

SHEET 1

Brush Creek

Trail Improvements:
- Improve hiking trail surface
- Provide trail route and distance markers (all park trails)
- Re-build trail where severe erosion has occurred
- Re-route unsustainable section of trails
- Provide trail signage (at trailheads) including trail maps and rules
- Institute a "bag rule" requiring horseback riders to pick up horse waste from the trail surface. Provide bags at trailheads
- Approach County Union to develop a trail maintenance agreement

Trail Improvements:
- Improve hiking trail surface
- Provide trail route and distance markers (all park trails)
- Re-build trail where severe erosion has occurred
- Re-route unsustainable section of trails
- Provide trail signage (at trailheads) including trail maps and rules
- Institute a "bag rule" requiring horseback riders to pick up horse waste from the trail surface. Provide bags at trailheads
- Approach County Union to develop a trail maintenance agreement

Replace road bridges on main park road

hiking trail connects existing trail to picnic area

Obliterate all trails that provide unauthorized access to park property (Typical of all park boundaries)

Sledding Hill:
-Several sled runs (varying slopes)
-Slow-down area at base of hill
-Constructing this sled hill will allow for future upgrade into snow-tubing facility

Parking Area Improvements:
-25' x 35' Picnic Pavilion
-Organized parking including handicap-accessible spaces
-concrete walkway along western side of parking lot
-precast concrete wheelstops
-compacted aggregate walkway connections to sled-riding hill
-shade tree plantings
-turnaround suitable for busses and emergency vehicles

Provide plumbing to existing restroom

CONCORD CHURCH ROAD (S.R. 568)

GLENDALE ROAD

Brush Creek

Provide updated park map at existing kiosk

High-Grass Areas (throughout park):
-allow grass to grow to mature height (24 to 36 inches)
-mow once per year at 8" height
-these areas will save maintenance time

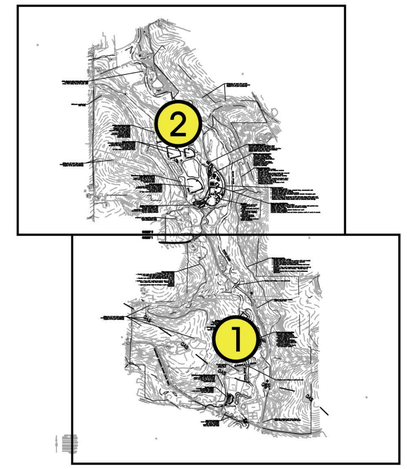
Parking Area:
-organized parking, including horse-trailer parking
-easy access to park trail system via main park road

Replace road bridges on main park road

Park Trail Extension:
-trail location is high-profile and easily accessible
-provide signage including trail map and trail rules

Obliterate existing park trail access to State Route 588 (Concord Church Road)

## Brush Creek Park Key Map




## Legend

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- 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.

# Brush Creek Park

Beaver County, Pennsylvania

DRAFT MASTER PLAN
SHEET 1 of 2

200 0 200 400

Date: 1/24/08 Scale: 1" = 200'
Contour Interval: 10'-0"

North

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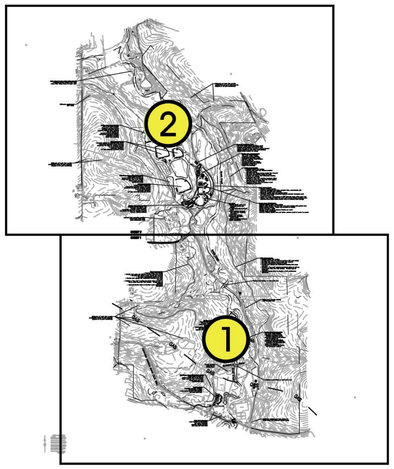
Pittsburgh, PA 15212

# Brush Creek Park
## Key Map

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Cabin (used by Pine Valley Bible Camp):
-Stabilize stream crossing near cabin
-Allow Pine Valley Camp to repair cabin

Obliterate unauthorized ATV Trails

Obliterate all trails that provide unauthorized access to park property (Typical of all park boundaries)

Parking Area Improvements:
-25' x 35' Picnic Pavilion
-Organized parking including handicap-accessible spaces
-concrete walkway along southern side of parking lot
-precast concrete wheelstops
-compacted aggregate walkway connections to Fields
-shade tree plantings

Field Improvements:
-re-grade outfield to eliminate ruts, divots
-compacted aggregate access walkways (maximum 5% slope for handicap access)
-concrete block dugouts
-spectator bleachers
-6' high chain-link perimeter fence

Obliterate all trails that provide unauthorized access to park property (Typical of all park boundaries)

High-Grass Areas (throughout park):
-allow grass to grow to mature height (24 to 36 inches)
-mow once per year at 8" height
-these areas will have maintenance time

Field Improvements:
-install infield underdrains
-compacted aggregate access walkways (maximum 5% slope for handicap access)
-concrete block dugouts
-spectator bleachers
-6' high chain-link perimeter fence

Parking Area Improvements:
-Organize parking spaces, add handicap accessible spots
-compacted aggregate access walkways (maximum 5% slope for handicap access)
-remove existing walkway

proposed trail connection provides access from picnic area, park maintenance drive

Brush Creek

Proposed Basketball Court:
-84' x 50' (High School regulations size)
-Asphalt court surface with painted lines
-Install two (2) 10-foot aluminum players benches
-Shares parking lot with other park facilities
-Highly visible location for safety

Parking Area Improvements:
-25' x 35' Picnic Pavilion
-Organized parking including handicapped-accessible spaces
-concrete walkway along western side of parking lot
-precast concrete wheelstops
-compacted aggregate walkway connections to dog park
-shade tree plantings

Trail Improvements:
- Improve hiking trail surface
- Provide trail route and distance markers (all park trails)
- Re-build trail where severe erosion has occurred
- Re-route unsustainable section of trails
- Provide trail signage (at trailheads) including trail maps and rules
- Institute a "bag rule" requiring horseback riders to pick up horse waste from the trail surface. (Provide bags at trailheads)
- Approach County Union to develop a trail maintenance agreement

Road Improvements:
- Remove existing asphalt
- Construct aggregate road base, compact base, overexcavate soft spots and fill with base material
- Construct asphalt base and wearing course
- Construct 5-foot-wide compacted aggegate shoulder throughout park as a shared-use trail
- Install new larger speed bumps at 500' intervals along entire park road
- Replace road bridges within the park with arched bridges providing more clearance from Brush Creek stream level to minimize flood damage

Dog Park:
-remove tennis courts and associated paving and fencing
-6' high chain-link perimeter fence
-fence-enclosed entrance/exit areas for leashing/unleashing
-shade tree plantings
-compacted aggregate access walks
-access to existing restroom
-waste receptacles

Tennis Court Rehabilitation:
-Remove existing sand / mat surface
-Replace with asphalt base and color coat court surface with painted lines
-Utilize existing fencing. Repair and re-paint as needed.
-Install new nets / posts
-Provide 6-foot aluminum players benches per court
-Provide trash receptacles
-Remove existing asphalt area and timber planters south of courts to remain

SHEET 2

SHEET 1

NOTES:

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

# Brush Creek Park
Beaver County, Pennsylvania

DRAFT MASTER PLAN
SHEET 2 of 2

200 0 200 400

Date: 1/24/08 Scale: 1" = 200'
Contour Interval: 10'-0"

North

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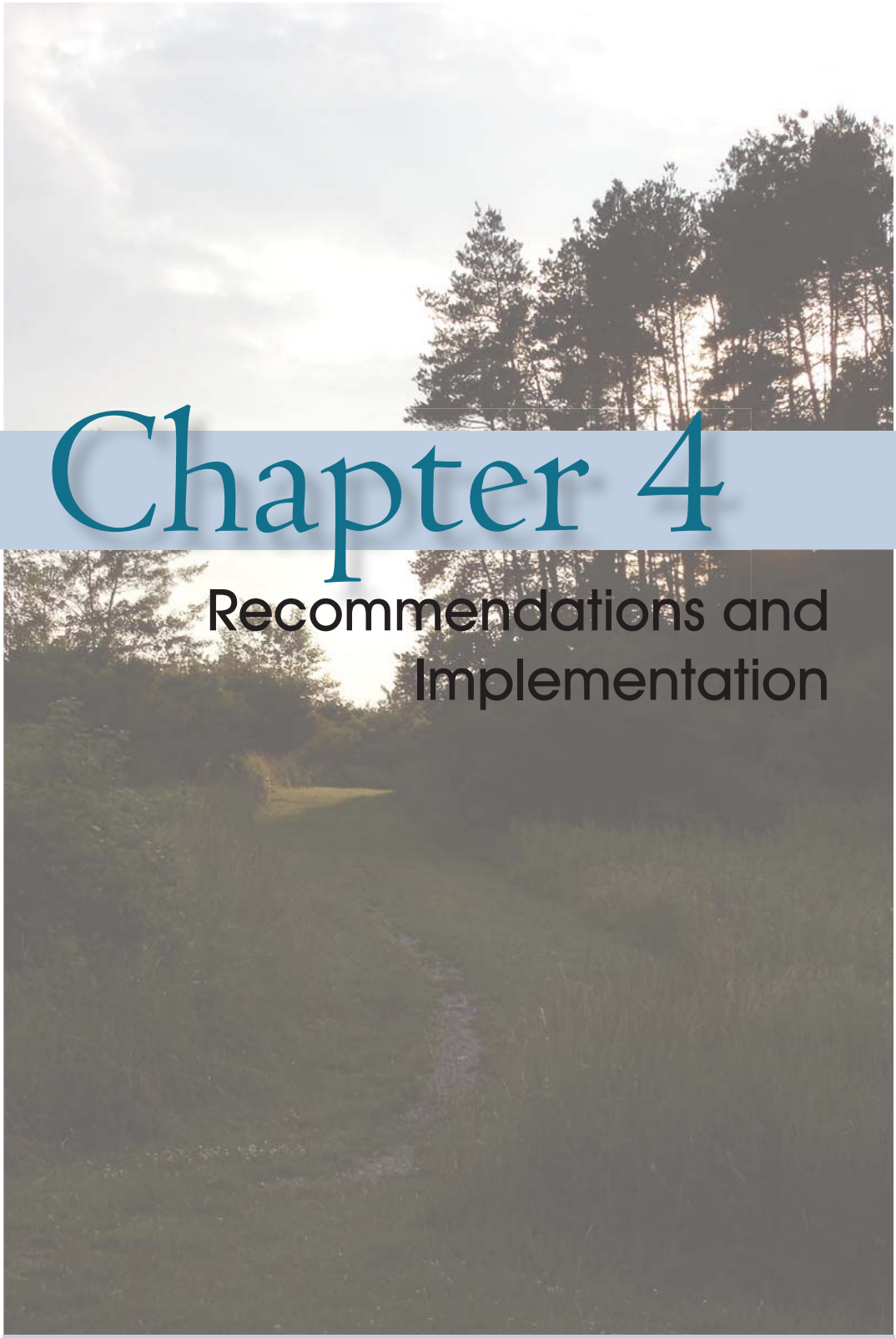
Pittsburgh, PA 15212

# 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:

- 5.7 miles of well-marked park trails (multi-use, including both improved existing trails and proposed trails)
- 3 proposed picnic pavilions (25' x 35')
- Existing picnic groves
- Improvements to 3 existing ball fields
- Rehabilitation of 2 existing tennis courts, removal of 2 existing tennis courts
- Proposed Dog Park
- Improved existing parking areas and proposed parking throughout the park (270 spaces, 13 horse trailer spaces, and 24 handicapped-accessible spaces)
- Approximately 350 additional existing parking spaces (gravel)
- Re-paved park road (including compacted base for asphalt surfacing)
- Replacement of road bridges within the park
- Proposed sledding hill
- Provision of plumbing to the existing restroom adjacent to the proposed sledding hill
- Updated park mapping and rules at existing information kiosk



# 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 Brush Creek 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 Brush Creek Park:

- 5.7 miles of well-marked park trails (multi-use, including both improved existing trails and proposed trails)
- 3 proposed picnic pavilions (25' x 35')
- Existing picnic groves
- Improvements to 3 existing ball fields
- Rehabilitation of 2 existing tennis courts, removal of 2 existing tennis courts
- Proposed Dog Park
- Improved existing parking areas and proposed parking throughout the park (270 spaces, 13 horse trailer spaces, and 24 handicapped-accessible spaces)
- Approximately 350 additional existing parking spaces (gravel)
- Re-paved park road (including compacted base for asphalt surfacing)
- Replacement of road bridges within the park
- Proposed sledding hill
- Provision of plumbing to the existing restroom adjacent to the proposed sledding hill
- Updated park mapping and rules at existing information kiosk

# MASTER PLAN DESCRIPTION

## Trail System Improvements

Public input during the Master Plan process overwhelmingly pointed to the need for improvements to the existing trail system at Brush Creek Park. The proposed 5.7 miles of trails includes several miles of new trail and a basic rebuilding of many of the park's existing trails. Further, it proposes

obliteration of many of the unauthorized trails entering the park.

With new earth trail surface and a trail alignment designed to minimize erosion, the trails within the park will be suitable for use by hikers, cross-country runners, mountain bike riders, and equestrians. A high-quality trail system could be the primary reason for people to visit the park.

***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***

Larger parks with more complex trail systems often offer trails of varying degrees of difficulty. At Brush Creek, the trail system is not complex, and 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.

The area available for trails at Brush Creek Park is confined to two wooded hillsides which do not offer sufficient space for multiple trail options (easy trail routes vs. difficult trail routes). In addition, the trails at Brush Creek traverse relatively similar terrain. Thus, this Master Plan recommends that the trail system at Brush Creek Park focus on easy and intermediate trails only. More difficult trails will be offered at Bradys Run Park.

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

Clear, concise trail 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 or directional signage should be located at all trail intersections.

Degrees of trail segment difficulty, as well as distances 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 Brush Creek 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 mentioned during public input was waste from horses on the park's trails. Horse waste on the trail is a hazard to other trail users and can ruin the trail experience for hikers and mountain bikers. Park users stated the need for 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.

***Share Maintenance Responsibility***

Because the Brush Creek Park maintenance staff has their hands full caring for other areas of the park, the County should discuss trail maintenance agreements with trail use groups such as Beaver Area Biking Enthusiasts (BABE) and the Pittsburgh Trails Advocacy Group (PTAG), equestrians from nearby Skyline Stables, and local high school cross-country teams. These organizations regularly use the trails in the park, repair portions of the trail, clear fallen trees, repair or build small footbridges when necessary, and place their own signage on the trails for events. They may be willing to perform maintenance on select trails or during select parts of the season, under agreement with the County.

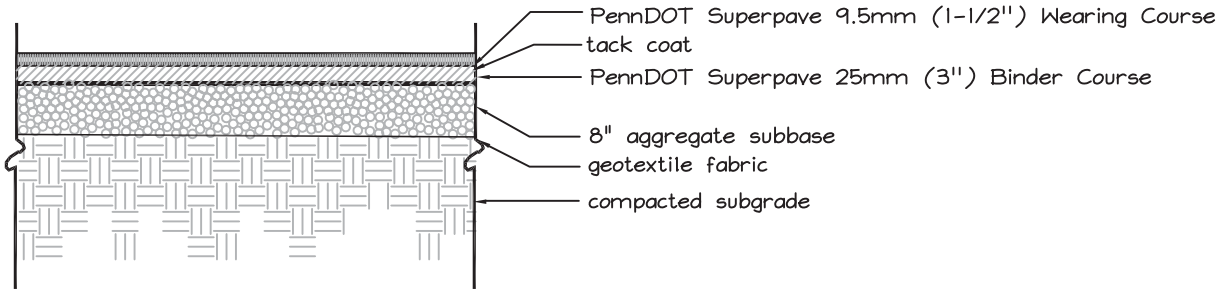
## Improve Roadways, Parking, and Pedestrian Circulation

***Replace Vehicular Bridges***

Because frequent annual flooding requires those portions of the park that are accessible by bridge only to be closed 6-12 times during the course of a year, we recommend replacing the existing road bridges in the park. This is the most apparent need at Brush Creek Park, and is the foremost proposed improvement. Bridges should be of sufficient elevation to provide ample volume for floodwater to pass beneath them. This plan recommends that the County retain a qualified consultant to design the proposed road bridges so that future problems with flooding can be avoided.

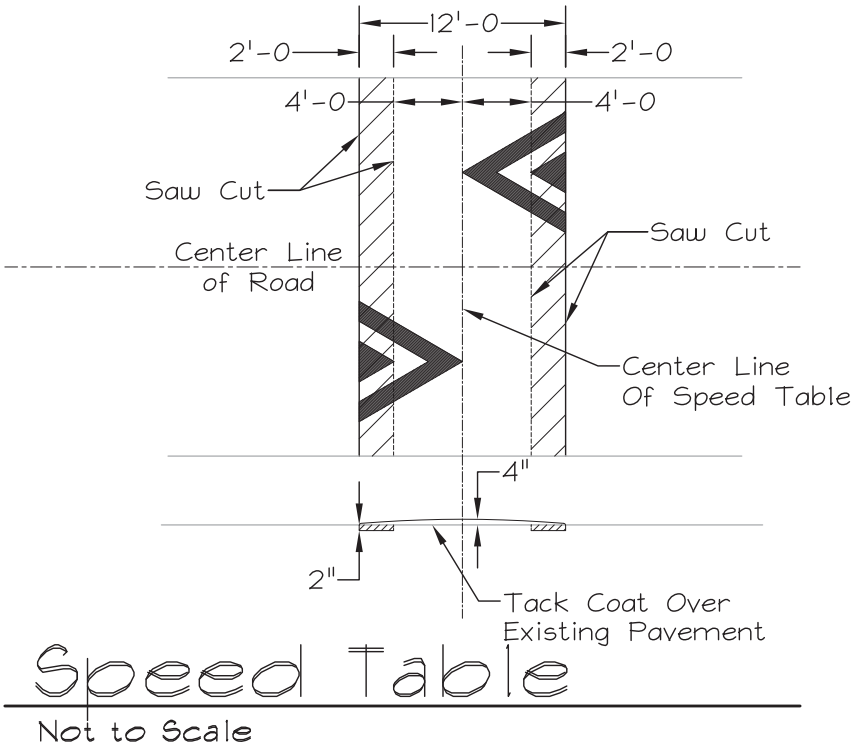
***Rebuild the Park Road***

Repair of the park road is also a very apparent need at Brush Creek Park. The Master Plan proposes re-paving the park road with a sufficient compacted aggregate base to support heavy-duty asphalt paving, automobile traffic, and occasional use by utility trucks or other large maintenance vehicles or machinery. A cross section of a typical asphalt roadway is shown:




Bituminous Paving (Standard)

Not to Scale




The proposed park road width is 20', and the road should include speed tables at 1000-foot intervals. Speed tables (see detail at left) 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.

***Keep Parking Areas Permeable***

Proposed parking areas in Brush Creek Park should be gravel-paved to limit the amount of impervious surface in the park. This idea parallels the original rustic design for Brush Creek Park. Proposed gravel parking areas are located adjacent to the proposed improved tennis courts and dog park, north of the existing ball fields, north of the existing lake, and near the park entrance. Other existing gravel parking areas will remain, and should be repaved with gravel as necessary.

Handicapped parking spaces are proposed in all parking areas adjacent to handicapped-accessible 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. Further information on paving materials is found later in this chapter.

## Improve Ball Fields to Prevent Unauthorized Uses

Six-foot chain-link perimeter fences are proposed at each of the three existing ball fields. These

fences will include vehicular gates for maintenance access and pedestrian gates for player access near dugouts. The fences will prevent unauthorized uses such as horseback riding and unauthorized ATV use, both of which have caused damage to the existing fields.

Other proposed improvements aim to make the ball fields more suitable for league play or more constant casual use. Proposed improvements include:

- perimeter infield underdrains (4" perforated PVC piping -- all fields);
- re-grading outfield areas to eliminate ruts and divots (2 northernmost fields);
- two sets of spectator bleachers per field (aluminum, each bleacher 5 rows x 15' long);
- signage prohibiting equestrians and ATV's;
- open-air dugout enclosures (chain-link fence, steel or timber posts, and steel roof); and
- handicapped-accessible compacted aggregate access paths.
- metal foul poles with yellow net banners

## Reduce 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 Brush Creek 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 (Brush Creek 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* | |
|---|---|
| **Mower Size** | **Mowing Speed** |
| 6-ft. pull-behind attachment | 0.35 hours / acre |
| 5-ft. riding | 0.5 hours / acre |
| *Average Mowing Speed = 0.425 hours. / acre* | |
| Total area currently mowed | 99.2 acres |
| Total labor time per weekly mowing | 42.2 hours |
| **Potential Maintenance Savings from Natural Areas** | |
| Proposed naturalized areas | 15.1 acres |
| Potential weekly time savings | 6.4 hours |
| Seasonal time savings (30 weeks from April to October) | 192 hours |

| | |
|---|---|
| --- Minus time spent mowing natural areas with brush hog (mowing speed 1.25 hrs/ acre) twice / year | - 37.8 hours |
| **Total hours saved** | **154.2 hours** |
| Hourly Rate for staff (M3) | $17.83 |
| **TOTAL ANNUAL SAVINGS** | **$2.749.39** |

* 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 Brush Creek 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.

## Add Variety to Picnic Groves

This plan recommends the addition of three 35' x 25' foot picnic pavilions at three different picnic groves throughout the park. These pavilions will accommodate groups of approximately 50 persons or less (assuming 6 picnic tables per pavilion), and will generate revenue via rentals. In addition, the pavilions will add to the variety of picnic settings offered at Brush Creek Park.

## Consider Developing a Sledding Hill

The 2002 Engineering Feasibility Study for the Brush Creek Park Winter Recreation Area examined the feasibility of a snow tubing and/or skiing area in Brush Creek Park. Due to the expense of equipment needed for a ski / snow-tube hill, the difficulty for necessary utility access for snow-making, and concern that revenues from the ski / snow tube hill would not meet the County's expectations, this Master Plan does not recommend that such a facility be developed.

However, the County should consider development of a sledding hill. This is an activity undertaken much more often in the County, and better fits the rustic design intent of Brush Creek Park. The proposed sled hill is located north of the existing lake, on the

western side of Brush Creek. The slope faces northwest, and is accessible only by footbridge from a proposed parking area.

## Rehabilitate Tennis Courts to Increase Use

To draw more use of the two actively-used tennis courts at Brush Creek Park, the Master Plan recommends removal of the existing outdoor mat / sand surface, and placement of an asphalt surface with color coat and painted court lines. The existing fence enclosure should be repaired and painted as necessary. Each court should also be equipped with new nets and posts, one six-foot aluminum players bench, and a trash receptacle.

This plan also recommends removal of the asphalt entrance plaza and existing planters just south of the courts that are to remain. The southernmost courts are currently not used and should be removed in their entirety.

## Add an Off-leash Dog Park

A 2.5-acre off-leash dog park is another part of the proposed improvements in the Master Plan. The dog park facilities will be relatively simple, including: a 6-foot-high chain link perimeter fence; gated fence enclosures for leashing / unleashing dogs; small clusters of shade tree plantings throughout the dog park; and waste receptacles.

Other design elements should respond to needs expressed by users of the dog park at Bradys Run Park, which should serve as an example for that proposed in Brush Creek Park.

## Form an Agreement with Pine Valley Bible Camp

The Pine Valley Bible Camp (PVBC), which owns property adjacent to Brush Creek Park, currently uses a field in the northernmost part of the park, just east of the reclaimed mine area. This open field also contains a “miner’s cabin” at the northern end of one of the park’s maintenance road. The PVBC has permission to use this area, and is currently the only park visitor group to do so.

This Plan recommends that Beaver County form an agreement with the PVBC that permits use of the entire open field at the northernmost end of the park. This field is accessible from park property only via a gated maintenance road. In addition, the agreement should permit the PVBC to renovate the miner’s cabin, at their own

expense, for youth group activities. The cabin is currently unused by Brush Creek Park, and is in disrepair.

## Continue Partnerships for Events

This plan recommends that Beaver County continue ongoing partnerships and keep open dialogs with organizations that hold events in the park. Organizations such as the Pine Valley Bible Camp, Riverside School District (youth football), Freedom School District (cross country), Skyline Stables, Beaver Area Bike Enthusiasts (BABE), and others schedule events in the park. These groups can provide valuable input regarding the park's condition, and may be willing to implement improvements to the park that are beneficial to their uses or events.

park maintenance drive

SHEET 2

SHEET 1

-access to existing restroom
-waste receptacles

Trail Improvements:
- Improve hiking trail surface
- Provide trail route and distance markers (all park trails)
- Re-build trail where severe erosion has occurred
- Re-route unsustainable section of trails
- Provide trail signage (at trailheads) including trail maps and rules
- Institute a "bag rule" requiring horseback riders to pick up horse waste from the trail surface. Provide bags at trailheads
- Approach County Union to develop a trail maintenance agreement

Brush Creek

Trail Improvements:
- Improve hiking trail surface
- Provide trail route and distance markers (all park trails)
- Re-build trail where severe erosion has occurred
- Re-route unsustainable section of trails
- Provide trail signage (at trailheads) including trail maps and rules
- Institute a "bag rule" requiring horseback riders to pick up horse waste from the trail surface. Provide bags at trailheads
- Approach County Union to develop a trail maintenance agreement

Replace road bridges on main park road

hiking trail connects existing trail to picnic area

Sledding Hill:
-Several sled runs (varying slopes)
-Slow-down area at base of hill
-Constructing this sled hillwill allow for future upgrade into snow-tubing facility

Obliterate all trails that provide unauthorized access to park property (Typical of all park boundaries)

Provide plumbing to existing restroom

Construct one accessible parking space.

Picnic Area Improvements:
-25' x 35' Picnic Pavilion
-Horseshoe Court
-Organized parking including accessible spaces
-paved walkway along western side of parking lot
-compacted aggregate walkways to recreation facilities
-shade tree plantings
-turnaround suitable for buses and emergency vehicles
-wheelstops foraccessible spaces

CONCORD CHURCH ROAD (S.R. 588)

GLENDALE ROAD

Brush Creek

High-Grass Areas (throughout park):
-allow grass to grow to mature height (24 to 36 inches)
-mow once per year at 8" height
-these areas will save maintenance time

Parking Area:
-organized parking, including horse-trailer parking
-easy access to park trail system via main park road

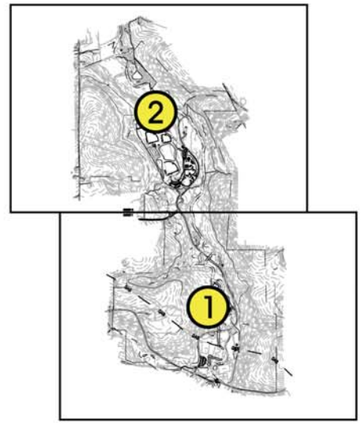
Provide updated park map at existing kiosk

Replace road bridges on main park road

Park Trail Extension:
-trail location is high-profile and easily accessible
-provide signage including trail map and trail rules

Obliterate existing park trail access to State Route 588 (Concord Church Road)

## Brush Creek 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

**Accessibility Notes**

1. Provide number of accessible parking spaces as required by the Americans with Disabilities Act.

2. When possible, all trails shall meet Americans with Disabilities Act standards, maximum 5% grade without handrail and no maximum distance, up to 8% grade with handrail(s) maximum 30' before required landing.

**Minimum No. Accessible Parking Spaces per Parking Area**

ADA Standards for Accessible Design 4.1.2 (5)

| Total No. of Parking Spaces | Total Minimum No. of Accessible Spaces | Van Accessible Parking Spaces (96" min. access isle) | Accessible Parking Spaces (60" min. isle) |
|---|---|---|---|
| 1 to 25 | 1 | 1 | 0 |
| 26 to 50 | 2 | 1 | 1 |
| 51 to 75 | 3 | 1 | 2 |
| 76 to 100 | 4 | 1 | 3 |
| 101 to 150 | 5 | 1 | 4 |
| 151 to 200 | 6 | 1 | 5 |
| 201 to 300 | 7 | 1 | 6 |

COMMONWEALTH OF PENNSYLVANIA REGISTERED LANDSCAPE ARCHITECT

NOTES:

1) Base map prepared from a boundary & topographic survey preformed by Land & Mapping Services of Clearfield, PA as part of this contract. Property corners were pinned by the surveyor and are being monumented by the County. A copy of the meets and bounds, and the final boundary and topographic survey are one file in the Beaver County Planning Commission offices.

2) Park Acreage: 632.21 Acres

3) Zoning and Adjacent Land Uses: The park is located in Marion and North Sewickley Townships. The portion of the park in Marion Township is zoned Agricultural. North Sewickley Township does not have a zoning ordinance. Current surrounding land uses are primarily single family residential with some nearby agricultural properties.

# Brush Creek Park

Beaver County, Pennsylvania

FINAL MASTER PLAN
SHEET 1 of 2

200 0 200 400
Scale: 1" = 200'
Contour Interval: 10'-0"

North

PASHEK ASSOCIATES
A Pennsylvania Corporation
412/331-4260
FAX 412/331-9160
info@pashek.com
619 East Ohio Street
Pittsburgh, PA 15212

**Accessibility Notes**

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| 201 to 300 | 7 | 1 | 6 |

Obliterate all trails that provide unauthorized access to park property (Typical of all park boundaries)

Construct accessible parking spaces adjacent to two existing playgrounds and to existing restrooms.

Cabin (used by Pine Valley Bible Camp):
-Stabilize stream crossing near cabin
-Allow Pine Valley Camp to repair cabin

Obliterate unauthorized ATV Trails

Picnic Area Improvements:
-25' x 35' Picnic Pavilion
-Horseshoe Court
-Organized parking including handicap-accessible spaces
-paved walkway along southern side of parking lot
-compacted aggregate walkway connections to recreation facilities
-shade tree plantings
-wheelstops for accessible spaces

Field Improvements:
-re-grade outfield to eliminate ruts, divots & install infield underdrains
-compacted aggregate access walkways (maximum 5% slope for access)
-open-air dugout enclosures
-spectator bleachers
-6' high chain-link perimeter fence

Obliterate all trails that provide unauthorized access to park property (Typical of all park boundaries)

High-Grass Areas (throughout park):
-allow grass to grow to mature height (24 to 36 inches)
-mow once per year at 8" height
-these areas will save maintenance time

Field Improvements:
-install infield underdrains
-compacted aggregate access walkways (maximum 5% slope for handicap access)
-open-air dugout enclosures
-spectator bleachers
-6' high chain-link perimeter fence

Parking Area Improvements:
-Organize parking spaces, add handicap accessible spots
-paved walkway along northern side of lot
-compacted aggregate access walkways to recreation facilities (maximum 5% slope for handicap access)
-remove existing walkway
-wheelstops for accessible spaces

proposed trail connection provides access from picnic area, park maintenance drive

Brush Creek

Proposed Basketball Court:
-84' x 50' color coated surface
-Shares parking with other park facilities
-Highly visible location

Picnic Area Improvements:
-25' x 35' Picnic Pavilion
-horseshoe court
-organized parking including accessible spaces
-paved walkway along western side of parking lot
-wheelstops for accessible spaces
-compacted aggregate walkway connections to recreation facilities
-shade tree plantings

Trail Improvements:
- Improve hiking trail surface
- Provide trail route and distance markers (all park trails)
- Re-build trail where severe erosion has occurred
- Re-route unsustainable section of trails
- Provide trail signage (at trailheads) including trail maps and rules
- Institute a "bag rule" requiring horseback riders to pick up horse waste from the trail surface. (Provide bags at trailheads)
- Approach County Union to develop a trail maintenance agreement

Road Improvements:
- Re-construct road base, & overexcavate soft spots and fill with base material
- Pave asphalt base and wearing course
- Construct 5-foot-wide compacted aggegate shoulder throughout park as a shared-use trail
- Replace speed bumps with speed tables, 500' intervals along park road
- Replace vehicular bridges with arched bridges to provide required clearance for high water in Brush Creek and to minimize flood damage

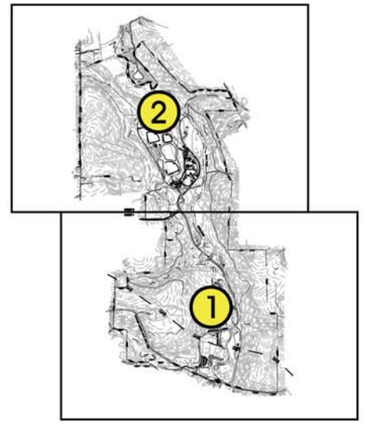
Tennis Court Rehabilitation

Dog Park:
-6' high chain-link perimeter fence
-shade tree plantings
-compacted aggregate access walks
-access to existing restroom
-waste receptacles

SHEET 2

SHEET 1

## Brush Creek Park Key Map




## Legend

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PENNSYLVANIA REGISTERED LANDSCAPE ARCHITECT

# Brush Creek Park

Beaver County, Pennsylvania

FINAL MASTER PLAN
SHEET 2 of 2

200 0 200 400
Scale: 1" = 200'
Contour Interval: 10'-0"

North

PASHEK ASSOCIATES
A Pennsylvania Corporation

# 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 Brush Creek Park is summarized as follows:

- Demolition and Removals: Removal of existing tennis courts, areas of park road paving, existing gravel parking, and existing road bridges

  Subtotal: $ 113,883

- Clearing and Grubbing: Removal of forest and brush areas (for proposed sledding hill), including grubbing of stumps.

  Subtotal: $ 24,000

- Site Structures: Picnic Pavilions, arching road bridges

  Subtotal: $ 1,080,000

- Site Paving and Signage: Earthwork, heavy-duty bituminous paving (roads, handicapped parking), line striping, bituminous walkways, compacted aggregate pathways, gravel parking areas, wheel stops, accessible parking signage, directional and entrance signage, and trash receptacles.

  Subtotal: $ 1,233,166

- Recreational Facilities: Multi-use trail system, ball fields, tennis courts, dog park, basketball court, sledding hill, horseshoe courts

  Subtotal: $ 1,053,430

- Landscaping: Deciduous and evergreen shade trees and lawn seeding.

  Subtotal: $ 78,400

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

  Subtotal: $ 234,144

- 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: $ 179,144

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

  Subtotal: $ 286,630

Total estimate of probable construction costs for Brush Creek Park, in 2008 dollars, is ***$4,258,047***. 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 Brush Creek Park whenever feasible.

# Brush Creek Park Master Plan

Overall Opinion of Probable Construction Costs

| Item No. | Item | Quantity | Unit | Unit Cost | Total Item Cost |
|---|---|---|---|---|---|
| **1** | **Removals and Demolition** | | | | **$113,883** |
| | Remove existing asphalt paving (park road - assumes removal of 25% of road) | 5207 | SY | $3 | $15,621 |
| | Remove existing asphalt wearing course (park road - assumes removal of wearing course only on 75% of road) | 15622 | SY | $1.50 | $23,433 |
| | Remove existing gravel paving (parking / walkways) | 2135 | SY | $3 | $6,405 |
| | Remove existing road bridges | 2 | LS | $25,000 | $50,000 |
| | Remove existing asphalt paving (2 tennis courts and adjacent entrance) | 2018 | SY | $3 | $6,054 |
| | Remove existing chain link fence (2 tennis courts) | 456 | LF | $10 | $4,560 |
| | Remove existing nets / posts (2 tennis courts) | 2 | LS | $500 | $1,000 |
| | Remove existing sand / mat surface (2 tennis courts) | 1 | LS | $2,500 | $2,500 |
| | Remove existing planters at tennis courts | 1 | LS | $2,000 | $2,000 |
| | Obliterate existing trails (re-grade, place logs as barriers, etc.) | 1.75 | Mile | $1,320 | $2,310 |
| **2** | **Clearing and Grubbing** | | | | **$24,000** |
| | Clearing and Grubbing | 6.0 | AC | $4,000 | $24,000 |
| **3** | **Site Structures** | | | | **$1,080,000** |
| | Picnic Pavilions (Timber frame, 35’ x 25’) | 3 | EA | $40,000 | $120,000 |
| | Arching road bridges with heavy-duty metal grate surface | 2 | LS | $480,000 | $960,000 |
| **4** | **Site Paving and Signage** | | | | **$1,233,166** |
| | Earthwork (Parking Areas) | 19040 | CY | $10 | $190,400 |
| | Earthwork (Park Road) (Assumes replacement of 25% of road) | 3470 | CY | $10 | $34,700 |
| | Earthwork (Access Paths) | 1520 | CY | $10 | $15,200 |
| | Concrete Pads (for pavilions) | 292 | SY | $110 | $32,120 |
| | Asphalt Paving (Heavy Duty - Main Park Road) (Assumes replacement of 25% of road) | 5207 | SY | $36 | $187,452 |
| | Asphalt Wearing Course (Assumes resurfacing on remaining 75% of road) | 15622 | SY | $15 | $234,330 |

| | | | | | |
|---|---|---|---|---|---|
| | Asphalt Speed Tables (4-inch height, 12-ft. length, 20-ft width, with painted on-road warning striping, at 1000-ft intervals along park road) | 13 | EA | $6,000 | $78,000 |
| | Asphalt Paving (Heavy Duty - Handicapped Parking Spaces) | 729 | SY | $36 | $26,244 |
| | Gravel Paving (Parking Areas) | 14127 | SY | $22 | $310,794 |
| | Asphalt Paving (Standard Duty - Sidewalks in high-traffic pedestrian areas) | 871 | SY | $32 | $27,872 |
| | Compacted Aggregate Paving (6” depth - access walks) | 3832 | SY | $22 | $84,304 |
| | Accessible Parking Signs (includes footing) | 26 | EA | $250 | $6,500 |
| | Linestriping (all lots) | 1 | LS | $2,000 | $2,000 |
| | Precast Concrete wheelstops | 26 | EA | $125 | $3,250 |
| **5** | **Trail System** | | | | **$190,870** |
| | Earthwork (Proposed and existing trails - assumes total regrading of existing trails) | 6650 | CY | $10.00 | $66,500 |
| | Earth Surface Trails (3’ width, in forested areas) | 9640 | LF | $1.75 | $16,870 |
| | Trail Signage (Entrance Signs and Distance Markers) | 1 | LS | $7,500 | $7,500 |
| | Metal Footbridge over Brush Creek near front of park (approximate 80-foot span) | 1 | LS | $100,000 | $100,000 |
| **6** | **Ball Fields Improvements (3 Fields)** | | | | **$206,060** |
| | Aluminum Bleachers (5 rows x 15’ length) | 6 | EA | $3,500 | $21,000 |
| | Infield Underdrains (4” perforated PVC, includes trenching) | 1500 | LF | $12 | $18,000 |
| | Open-air Dugout Enclosures (8’ x 20’, chain-link fence, steel/timber posts, steel roof) | 6 | LS | $10,000 | $60,000 |
| | 6’ Chain Link Fence with yellow PVC safety top (South Ball Field) | 873 | LF | $40 | $34,920 |
| | 6’ Chain Link Fence with yellow PVC safety top (Northwest Ball Field) | 982 | LF | $40 | $39,280 |
| | 6’ Chain Link Fence with yellow PVC safety top (Northeast Field) | 709 | LF | $40 | $28,360 |
| | Metal foul poles with yellow net banner (12’ height) | 3 | Pair | $1,500 | $4,500 |
| **7** | **Tennis Court Improvements (2 Courts)** | | | | **$70,480** |
| | Asphalt court paving | 1444 | SY | $30 | $43,320 |
| | Asphalt color coat | 1444 | SY | $15 | $21,660 |
| | Court Line Striping (2 courts) | 1 | LS | $1,500 | $1,500 |
| | Repaint net posts | 1 | LS | $500 | $500 |
| | Tennis Nets | 2 | EA | $1,000 | $2,000 |

| | | | | | |
|---|---|---|---|---|---|
| | Aluminum Players benches (8' length, no backrest) | 2 | EA | $750 | $1,500 |
| **8** | **Basketball Court** | | | | **$34,215** |
| | Earthwork | 520 | CY | $10 | $5,200 |
| | Asphalt court paving | 467 | SY | $30 | $14,010 |
| | Asphalt color coat | 467 | SY | $15 | $7,005 |
| | Court Line Striping | 1 | LS | $1,500 | $1,500 |
| | Basketball Rims, backboards, and supports | 2 | EA | $2,500 | $5,000 |
| | Aluminum Players benches (8' length, no backrest) | 2 | EA | $750 | $1,500 |
| **9** | **Sledding / Snow Tube Hill** | | | | **$479,100** |
| | Earthwork | 47910 | CY | $10 | $479,100 |
| **10** | **Dog Park** | | | | **$61,305** |
| | 6' Chain Link Fence | 1523 | LF | $35 | $53,305 |
| | 5'-wide Chain link gate (6' ht.) | 6 | EA | $1,000 | $6,000 |
| | 10'-wide Double-gate (6' ht., for vehicular access) | 1 | EA | $2,000 | $2,000 |
| **11** | **Other Improvements** | | | | **$11,400** |
| | Horseshoe Courts (Clay Pits, backstops, grass infield) | 3 | EA | $2,000 | $6,000 |
| | Standing Charcoal Grills (approx. size 6' x 3') | 3 | EA | $300 | $900 |
| | Trash Receptacles (2 per pavilion) | 6 | EA | $750 | $4,500 |
| **12** | **Landscaping** | | | | **$78,400** |
| | Seeding (lawn areas) | 290.0 | MSF | $80 | $23,200 |
| | Deciduous Shade Trees (2" caliper) | 138 | EA | $400 | $55,200 |
| *SUBTOTAL* | | | | | *$3,582,879* |
| | Permitting | 1 | LS | $25,000 | $25,000 |
| | Mobilization | 1 | % | $3,582,879 | $35,829 |
| | Stake-Out | 1 | LS | $30,000 | $30,000 |
| | Erosion & Sedimentation Control Measures | 4 | % | $3,582,879 | $143,315 |
| | Professional Services (Design and Engineering Fees) | 8 | % | $3,582,879 | $286,630 |
| | Construction Contingency | 5 | % | $3,582,879 | $179,144 |
| ***TOTAL*** | | | | | ***$4,258,047*** |

## 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 Brush Creek 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 1-4) 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 Brush Creek Park.

***Phase #1- $ 1,197,300***

Phase 1 construction at Brush Creek Park should include only the replacement of the two road bridges. This improvement is the top priority, and problems during floods each year will persist if the bridges are not replaced.

***Phase #2 - $ 514,025***

Phase 2 includes repairing the most deteriorated sections of the park road, assuming that 25% of the park road needs total replacement of asphalt and placement of aggregate base. Also included in this phase are the improvements to the park's trail system.

***Phase #3 - $ 450,965***

Phase 3 construction will focus on construction of proposed picnic pavilions and amenities (including horseshoe courts), gravel horse-trailer parking area, paved handicapped parking, paved walkways, compacted aggregate access paths, associated earthwork, and landscaping.

***Phase #4 - $405,324***

Phase 4 will concentrate on removal of the existing tennis courts, rehabilitation of two tennis courts, construction of parking near the tennis courts, paved walkways, compacted aggregate walking paths, associated earthwork, and landscaping. Also included in this phase are improvements to the southernmost ball field, as well as compacted aggregate access paths to all existing ball fields, and the restrooms to the south and to the east of the ball fields.

| *Opinion of Probable Construction Costs - Phasing Plan Summary* | | | | |
|---|---|---|---|---|
| **AREA** | **PHASE I** | **PHASE II** | **PHASE III** | **PHASE IV** |
| Demolition and Removals | $50,000 | $15,621 | $1,638 | $17,896 |
| Clearing and Grubbing | $0 | $0 | $0 | $0 |
| Site Structures | $960,000 | $0 | $120,000 | $0 |
| Site Paving and Signage | $0 | $222,152 | $220,075 | $163,038 |
| Recreation Facilities | $0 | $190,870 | $11,400 | $139,900 |
| Landscaping | $0 | $0 | $24,400 | $18,000 |
| Additional Costs | $56,000 | $27,048 | $24,376 | $22,442 |
| Construction Contingency | $50,500 | $21,548 | $18,876 | $16,942 |
| Professional Services | $80,800 | $34,476 | $30,201 | $27,107 |
| ***Total*** | ***$1,197,300*** | ***$514,025*** | ***$450,965*** | ***$405,324*** |

# Brush Creek Park Master Plan - Phase 1

Opinion of Probable Construction Costs

| Item No. | Item | Quantity | Unit | Unit Cost | Total Item Cost |
|---|---|---|---|---|---|
| **1** | **Removals and Demolition** | | | | **$50,000** |
| | Remove existing road bridges | 2 | LS | $25,000 | $50,000 |
| **2** | **Site Structures** | | | | **$960,000** |
| | Arching road bridges with heavy-duty metal grate surface | 2 | LS | $480,000 | $960,000 |
| *SUBTOTALS* | | | | | *$1,010,000* |
| | Permitting | 1 | LS | $2,500 | $2,500 |
| | Mobilization | 1 | % | $1,010,000 | $10,100 |
| | Stake-Out | 1 | LS | $3,000 | $3,000 |
| | Erosion & Sedimentation Control Measures | 4 | % | $1,010,000 | $40,400 |
| | Professional Services (Design and Engineering Fees) | 8 | % | $1,010,000 | $80,800 |
| | Construction Contingency | 5 | % | $1,010,000 | $50,500 |
| ***TOTAL*** | | | | | ***$1,197,300*** |

# Brush Creek Park Master Plan - Phase 2

Opinion of Probable Construction Costs

| Item No. | Item | Quantity | Unit | Unit Cost | Total Item Cost |
|---|---|---|---|---|---|
| **1** | **Removals and Demolition** | | | | **$17,931** |
| | Remove existing asphalt paving (park road - assumes removal of 25% of road) | 5207 | SY | $3 | $15,621 |
| | Obliterate existing trails (re-grade, place logs as barriers, etc.) | 1.75 | Mile | $1,320 | $2,310 |
| **2** | **Site Paving and Signage** | | | | **$222,152** |
| | Earthwork (Park Road) (Assumes replacement of 25% of road) | 3470 | CY | $10 | $34,700 |
| | Asphalt Paving (Heavy Duty - Main Park Road) (Assumes replacement of 25% of road) | 5207 | SY | $36 | $187,452 |
| **3** | **Trail System** | | | | **$190,870** |
| | Earthwork (Proposed and existing trails - assumes total regrading of existing trails) | 6650 | CY | $10.00 | $66,500 |
| | Earth Surface Trails (3' width, in forested areas) | 9640 | LF | $1.75 | $16,870 |
| | Trail Signage (Entrance Signs and Distance Markers) | 1 | LS | $7,500 | $7,500 |
| | Metal Footbridge over Brush Creek near front of park (approximate 80-foot span) | 1 | LS | $100,000 | $100,000 |
| *SUBTOTALS* | | | | | *$430,953* |
| | Permitting | 1 | LS | $2,500 | $2,500 |
| | Mobilization | 1 | LS | $10,000 | $10,000 |
| | Stake-Out | 1 | LS | $3,000 | $3,000 |
| | Erosion & Sedimentation Control Measures | 4 | % | $430,953 | $17,238 |
| | Professional Services (Design and Engineering Fees) | 8 | % | $430,953 | $34,476 |
| | Construction Contingency | 5 | % | $430,953 | $21,548 |
| ***TOTAL*** | | | | | ***$514,025*** |

# Brush Creek Park Master Plan - Phase 3

Opinion of Probable Construction Costs

| Item No. | Item | Quantity | Unit | Unit Cost | Total Item Cost |
|---|---|---|---|---|---|
| **1** | **Removals and Demolition** | | | | **$1,638** |
| | Remove existing gravel paving (parking / walkways) | 546 | SY | $3 | $1,638 |
| **2** | **Site Structures** | | | | **$120,000** |
| | Picnic Pavilions (Timber frame, 35’ x 25’, no utilities) | 3 | EA | $40,000 | $120,000 |
| **3** | **Site Paving and Signage** | | | | **$220,075** |
| | Earthwork (Parking Areas) | 3770 | CY | $10 | $37,700 |
| | Earthwork (Access Paths) | 1520 | CY | $10 | $15,200 |
| | Concrete Pads (for pavilions) | 292 | SY | $110 | $32,120 |
| | Asphalt Paving (Heavy Duty - Handicapped Parking Spaces) | 699 | SY | $36 | $25,164 |
| | Gravel Paving (Parking Areas) | 3041 | SY | $22 | $66,902 |
| | Asphalt Paving (Standard Duty - Sidewalks in high-traffic pedestrian areas) | 328 | SY | $32 | $10,496 |
| | Compacted Aggregate Paving (6” depth - access walks) | 969 | SY | $22 | $21,318 |
| | Accessible Parking Signs (includes footing) | 25 | EA | $250 | $6,250 |
| | Linestriping (all lots) | 1 | LS | $1,800 | $1,800 |
| | Precast Concrete wheelstops | 25 | EA | $125 | $3,125 |
| **4** | **Other Improvements** | | | | **$11,400** |
| | Horseshoe Courts (Clay Pits, backstops, grass infield) | 3 | EA | $2,000 | $6,000 |
| | Standing Charcoal Grills (approx. size 6’ x 3’) | 3 | EA | $300 | $900 |
| | Trash Receptacles (2 per pavilion) | 6 | EA | $750 | $4,500 |
| **5** | **Landscaping** | | | | **$24,400** |
| | Seeding (lawn areas) | 40.0 | MSF | $80 | $3,200 |
| | Deciduous Shade Trees (2” caliper) | 53 | EA | $400 | $21,200 |
| *SUBTOTALS* | | | | | *$377,513* |
| | Permitting | 1 | LS | $2,500 | $2,500 |
| | Mobilization | 1 | % | $377,513 | $37,751 |
| | Stake-Out | 1 | LS | $3,000 | $3,000 |
| | Erosion & Sedimentation Control Measures | 4 | % | $377,513 | $15,101 |
| | Professional Services (Design and Engineering Fees) | 8 | % | $377,513 | $30,201 |
| | Construction Contingency | 5 | % | $377,513 | $18,876 |
| ***TOTAL*** | | | | | ***$450,965*** |

# Brush Creek Park Master Plan - Phase 4

Opinion of Probable Construction Costs

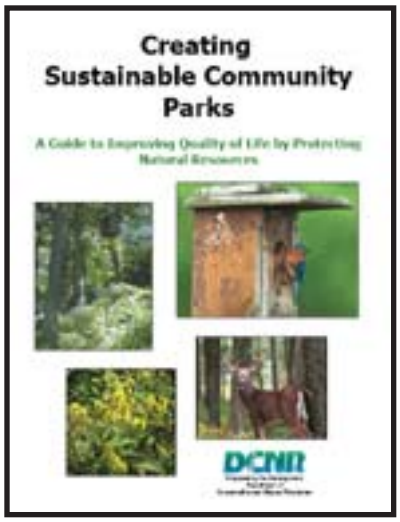
| Item No. | Item | Quantity | Unit | Unit Cost | Total Item Cost |
|---|---|---|---|---|---|
| **1** | **Removals and Demolition** | | | | **$17,896** |
| | Remove existing gravel paving (parking / walkways) | 594 | SY | $3 | $1,782 |
| | Remove existing asphalt paving (2 tennis courts and adjacent entrance) | 2018 | SY | $3 | $6,054 |
| | Remove existing chain link fence (2 tennis courts) | 456 | LF | $10 | $4,560 |
| | Remove existing nets / posts (2 tennis courts) | 2 | LS | $500 | $1,000 |
| | Remove existing sand / mat surface (2 tennis courts) | 1 | LS | $2,500 | $2,500 |
| | Remove existing planters at tennis courts | 1 | LS | $2,000 | $2,000 |
| **4** | **Site Paving and Signage** | | | | **$163,038** |
| | Earthwork (Parking Areas) | 2556 | CY | $10 | $25,560 |
| | Earthwork (Access Paths) | 924 | CY | $10 | $9,240 |
| | Asphalt Paving (Heavy Duty - Handicapped Parking Spaces) | 30 | SY | $36 | $1,080 |
| | Gravel Paving (Parking Areas) | 2180 | SY | $22 | $47,960 |
| | Asphalt Paving (Standard Duty - Sidewalks in high-traffic pedestrian areas) | 871 | SY | $32 | $27,872 |
| | Compacted Aggregate Paving (6” depth - access walks) | 2333 | SY | $22 | $51,326 |
| **6** | **Ball Fields Improvements (3 Fields)** | | | | **$69,420** |
| | Aluminum Bleachers (5 rows x 15’ length) | 2 | EA | $3,500 | $7,000 |
| | Infield Underdrains (4” perforated PVC, includes trenching) | 500 | LF | $12 | $6,000 |
| | Open-air Dugout Enclosures (8’ x 20’, chain-link fence, steel/timber posts, steel roof) | 2 | LS | $10,000 | $20,000 |
| | 6’ Chain Link Fence with yellow PVC safety top (South Ball Field) | 873 | LF | $40 | $34,920 |
| | Metal foul poles with yellow net banner (12’ height) | 1 | Pair | $1,500 | $1,500 |
| **7** | **Tennis Court Improvements (2 Courts)** | | | | **$70,480** |
| | Asphalt court paving | 1444 | SY | $30 | $43,320 |
| | Asphalt color coat | 1444 | SY | $15 | $21,660 |

| | | | | | |
|---|---|---|---|---|---|
| | Court Line Striping (2 courts) | 1 | LS | $1,500 | $1,500 |
| | Repaint net posts | 1 | LS | $500 | $500 |
| | Tennis Nets | 2 | EA | $1,000 | $2,000 |
| | Aluminum Players benches (8’ length, no backrest) | 2 | EA | $750 | $1,500 |
| **12** | **Landscaping** | | | | **$18,000** |
| | Seeding (lawn areas) | 70.0 | MSF | $80 | $5,600 |
| | Deciduous Shade Trees (2” caliper) | 31 | EA | $400 | $12,400 |
| *SUBTOTALS* | | | | | *$338,834* |
| | Permitting | 1 | LS | $2,500 | $2,500 |
| | Mobilization | 1 | % | $338,834 | $3,388 |
| | Stake-Out | 1 | LS | $3,000 | $3,000 |
| | Erosion & Sedimentation Control Measures | 4 | % | $338,834 | $13,553 |
| | Professional Services (Design and Engineering Fees) | 8 | % | $338,834 | $27,107 |
| | Construction Contingency | 5 | % | $338,834 | $16,942 |
| ***TOTAL*** | | | | | ***$405,324*** |

# SUSTAINABLE PARK DESIGN

A sustainable park is one where the natural resources are protected, where wildlife habitat is improvements, 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 Forestry Management Plan be developed for the park. The DCNR Bureau of Forestry offers 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.

The Forest Stewardship 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 places 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 of 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 is 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 tolerate 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=2087d8407c0e000080000719000007 19&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* | *II* | *III* | *IV* |
| 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 |

| Sport | Lighted Area | Class of Play | Horizontal in Footcandles | Uniformity |
|---|---|---|---|---|
| ***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**

| *Slope* | *Spacing* |
|---|---|
| <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 limits 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 be 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 n 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:

| *Facility* | *Potential Funding Sources* |
|---|---|
| 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, Sledding Hill, Tennis Courts, Ball 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

NATIONAL TREE TRUST
PLANTING AMERICA'S FUTURE

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

DCNR

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 tails. 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 / ISTEA
  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 of 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

Brush Creek 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.

***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 by the Union 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, disputes can often be resolved quickly when an executed agreement is in place. Beaver County should continue to work with athletic organizations using facilities in Brush Creek, 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 Brush Creek 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: 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 Brush Creek 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 Brush Creek 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.

***Brush Creek Park Maintenance Analysis***

| | *Task* | *Quantity* | *Unit* | *Work hours per Unit* | *Times per Week* | *Weeks per Season* | *Total Hours* | *Cost per Hour* | *Cost per Task* |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Pavilion (and associated picnic table) cleaning | 3 | EA | *0.5* | *3* | *32* | *144* | *$20* | *$2,880* |
| 2 | Restroom cleaning (self-mulching restrooms) | 10 | EA | 1 | 7 | 32 | *2240* | *$20* | *$44,800* |
| 3 | Ball Field Maintenance | 3 | EA | 1 | 5 | 24 | *360* | *$20* | *$7,200* |
| 4 | Horseshoe Court check / maintenance | 3 | EA | 0.25 | 2 | 32 | *48* | *$20* | *$960* |
| 5 | Playground check / maintenance | 2 | EA | 0.5 | 5 | 32 | *160* | *$20* | *$3,200* |
| 6 | Lake Cleaning / Maintenance | 1 | EA | 1 | 1 | 32 | *32* | *$20* | *$640* |
| 7 | Sledding Hill Maintenance | 1 | EA | 1 | 3 | 16 | *48* | *$20* | *$960* |
| 8 | Dog Park Maintenance | 1 | EA | 1 | 5 | 32 | *160* | *$20* | *$3,200* |
| 9 | Parking lot sweeping / linestriping (handicapped-accessible spaces) | 25 | EA | 0.5 | 1 | 4 | *50* | *$20* | *$1,000* |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 10 | Parking lot leveling / re-grading / weeding (gravel lots) | 14 | EA | 4 | 1 | 1 | *56* | *$20* | *$1,120* |
| 11 | Park Road Maintenance | 1 | EA | 4 | 1 | 52 | *208* | *$20* | *$4,160* |
| 12 | Earth Surface Trail Maintenance | 5.7 | Mile | 0.5 | 1 | 8 | *22.8* | *$20* | *$456* |
| 13 | Charcoal Grills / Water spigots maintenance (1 of each per picnic pavilion) | 26 | EA | 0.25 | 2 | 32 | *416* | *$20* | *$8,320* |
| 14 | Entrance Sign trimming / maintenance | 1 | EA | 0.5 | 1 | 32 | *16* | *$20* | *$320* |
| 15 | Turf Maintenance | 84.1 | AC | 0.35 | 1 | 30 | *883.05* | *$20* | *$17,661* |
| 16 | Trash Collection | 1 | LS | 2 | 1 | 52 | *104* | *$20* | *$2,080* |
| 17 | Miscellaneous Maintenance | 1 | EA | 40 | 1 | 1 | *40* | *$20* | *$800* |
| **Totals (Total Hours, Total Annual Maintenance Cost)** | | | | | | | 4987.85 hours | | $99,757 |

Based on this analysis, approximately 5,000 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 two full-time positions and three seasonal positions, all supervised by a Park Foreman, are required on an annual basis.

Currently there are two full-time public works employees, in addition to the Park Foreman, who currently perform maintenance activities at Brush Creek 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 one half full time position is being dedicated to park operations and maintenance activities, leaving a shortage of 1.75 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, two full time staff, and three 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.

| Beaver County Department of Public Works - Equipment List | | | |
|---|---|---|---|
| ***Vehicles*** | | | |
| 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.

## Potential Revenue Production

Communities are always searching for ways to help offset the cost of maintaining and operating parks. Three common sources of revenue are facility rentals, recreational programming, and fundraising events. Below is a brief description of the revenue potential of each.

***Rentals***

The park's proposed picnic pavilions should be available for rental by the general public. The park's other facilities should be offered as a community service, with recreation organizations possibly contributing toward maintenance (i.e. trail groups help with trail maintenance).

The park's pavilions should be available for rental by the day for gatherings. Fees should equal fees charged for pavilions in other County Parks. Pavilions are currently $40 per weekday and $60 per Saturday, Sunday, or Holiday. With the addition of the proposed pavilions at all three parks, the County should increase the rental fees slightly. The Master Plan recommends rates of $45 per weekday and $65 per Saturday, Sunday, or Holiday. These rates should apply to proposed pavilions at Brush Creek Park.

Ideally, pavilion rental rates at all the County Parks should be raised to $50 per weekday and $75 per Saturday, Sunday, or Holiday. Because a sharp increase in rental rates would likely cause a drop

in the number of rentals, this plan recommends that pavilion rates be increased incrementally over the next 3-5 years. The rate increase mentioned above (to $45 and $65) is the first recommended incremental increase.

***Programming***

A possible additional source of revenue is the provision of programming that utilizes park facilities. The County Recreation Department currently coordinates programming within the park and charges no use fees for events and programs. The Master Plan recommends that the County 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 Brush Creek Park.

The County should strive to continue communications with user groups currently using the park for events, and charge user fees for any event for which the group holding the event does not provide at least partial maintenance. Agreements between the County and user groups should include clauses that provide a waiver of user fees when partial maintenance is performed by the user group and confirmed by park maintenance staff.

Examples of possible programs to be added at the park may include the following:

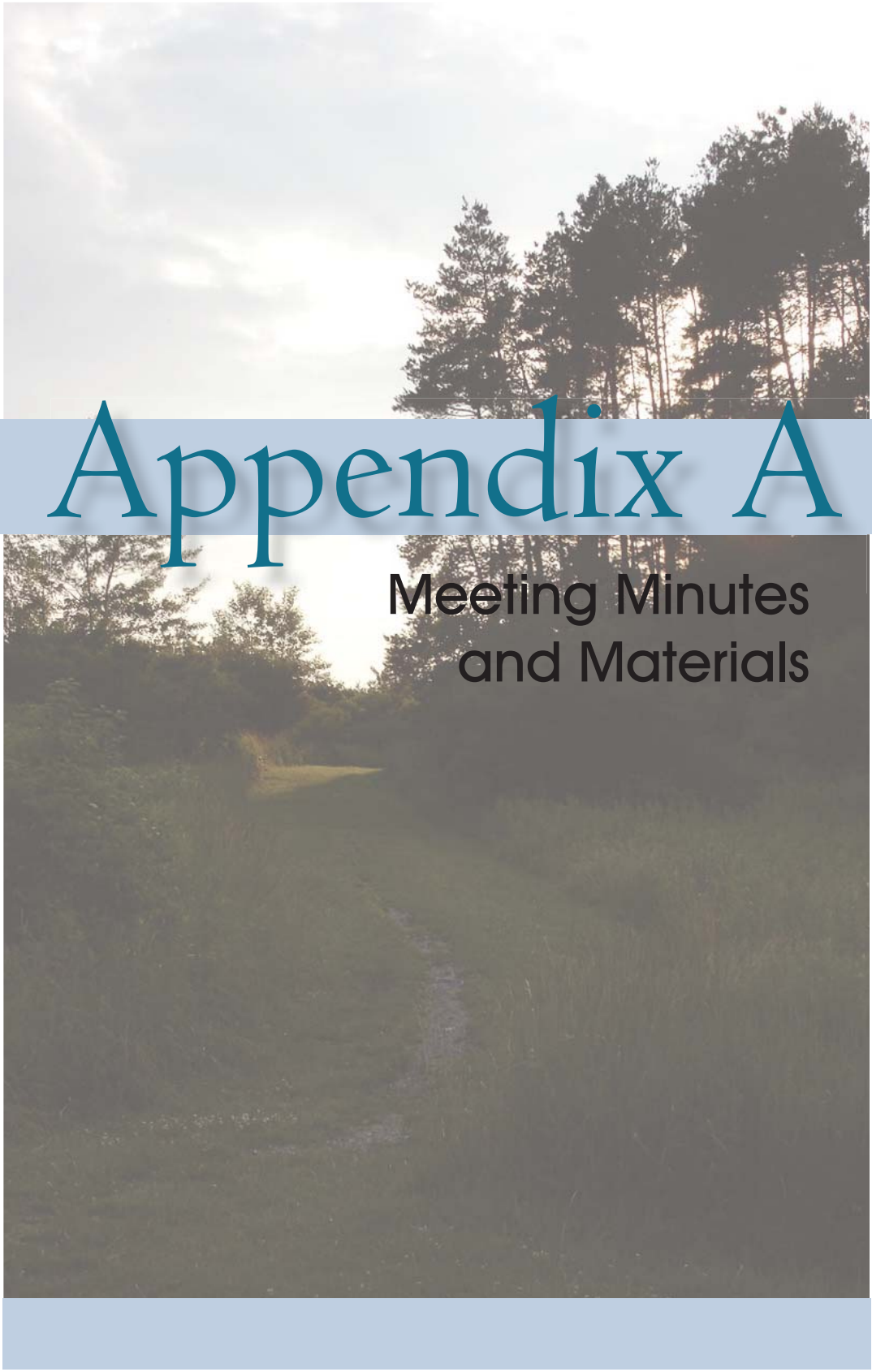
- Trail and Park Road Runs / Races
- Mountain Bike Races
- Tennis Tournaments
- Baseball / Softball Tournaments
- Soccer Tournaments
- Community Days / Festivals
- One - Time Event Archery Hunts (pending approval by County Commissioners)
- Auctions (live or silent)
- Flea Markets

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.

***Revenue Potential Summary***

Through proposed construction and increased rental rates for picnic shelters, along with a proposed increase in the number of events held at the park (thus more recreation fees), Brush Creek Park has potential to produce yearly revenue. The chart below estimates short-term potential revenues assuming immediate construction (in 2008) of all proposed improvements. All figures are in 2008 dollars.

| *Brush Creek Park Short-Term Potential Revenue* | |
|---|---|
| **Facility** | **Potential Annual Revenue** |
| *Picnic Shelters (3)*<br>@ $45/weekday, $65/Saturday,Sunday.or Holiday<br>(Assumes weekend rentals full between Memorial Day and Labor Day -- approx. 13 weekends) | $5,070<br>($1,690 per shelter) |
| *Park Events*<br>(assumes 4 new events @ $100 per event -- existing events do not pay fees pending help with facility maintenance) | $400 |
| **TOTALS** | **$5,470** |



# Appendix A

## Meeting Minutes and Materials

# AGENDA

## BEAVER COUNTY PARK MASTER PLANS
### BRUSH CREEK PARK PUBLIC INPUT SESSION
### Wednesday, August 22, 2007

1. What is a Master Plan?

    a. Creates a Vision for the Park for the next 10 to 20 years
    b. Framework to Guide Decision Making and Re-Investment in the Park
    c. Covers All Aspects: Facilities, Programs, Operations, Maintenance

2. What are the Opportunities and Constraints of the Park Property?

3. What is Your Vision for Brush Creek Park?

4. What are the Next Steps:

    a. Develop Draft Master Plan
    b. Prepare Opinions of Probable Construction Costs
    c. Prepare Phasing Plan
    d. Prepare Operations and Management Recommendations
    e. Public Meeting to Present and Receive Feedback on Draft Plan and Recommendations – Early Winter

Project Contact:

Vince Rozzi
Pashek Associates
619 East Ohio Street
Pittsburgh, PA 15212
412-321-6362
vrozzi@pashekla.com

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# 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:

John Buerkle
Pashek Associates
619 East Ohio Street
Pittsburgh, PA 15212
412-321-6362
jbuerkle@pashekla.com

Website Access for project information:
www.pashekla.com

Click: Client Workspace
Username: BC
Password: Parks

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# Scope of Work

## 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.

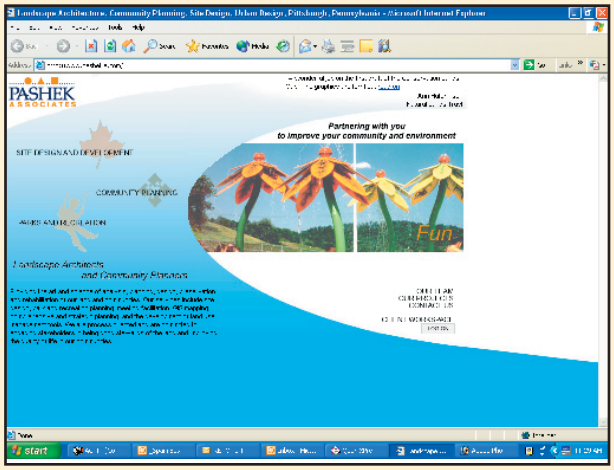
5. We will summarize the results to the public participation process.

6. Web Page - **www.pashekla.com**

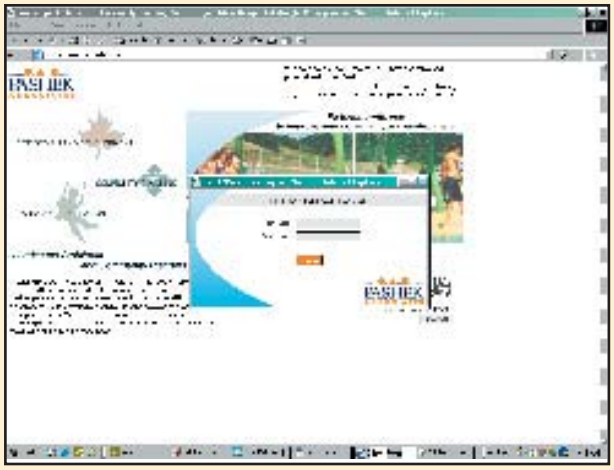
   During the course of the project we will host a web site for the project. On this site we will post work completed for this project so that Officials, Staff, the Study Group, and residents can follow the study's progress.

To access an example of how this web site works:

a. Go to www.pashekla.com



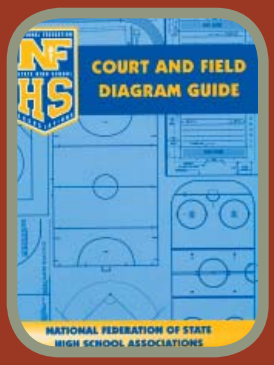

b. select client workspace in the lower left hand corner

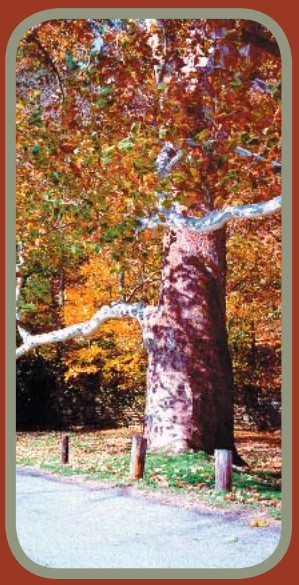




c. then type in Farmington (for the Username) and Township (for the password).


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.



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**




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

**"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**



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.

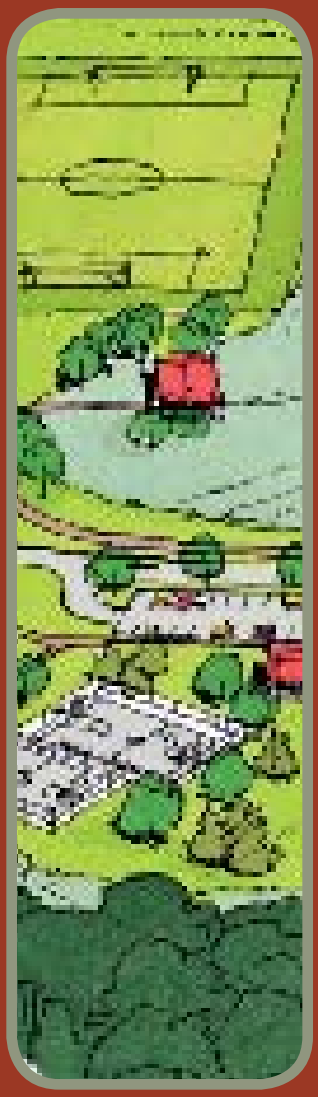
## H. Plan Narrative Report

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.



- 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 / trials / 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)



- 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.
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   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.
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      3. unstructured / non-program use
      4. competition play
      5. level of use by spectators.



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SITE DESIGN,
RECREATION PLANNING,
LANDSCAPE ARCHITECTURE,
COMMUNITY PLANNING,
ZONING

# *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:

John Buerkle
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619 East Ohio Street
Pittsburgh, PA 15212
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jbuerkle@pashekla.com

Website Access for project information:
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LANDSCAPE ARCHITECTURE,
COMMUNITY PLANNING,
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# *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
Mr. Brian Hayden
Mr. Jack Hilfinger
Mr. Tom King
Mr. Frank Mancini
Ms. Suzanne Modrack
Ms. Laura Rubino
Mr. Dick Smith
Mr. Joe West
John Buerkle
Vince Rozzi

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 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 allow 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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# *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 sill 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.

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 your request to 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:

Vincent M. Rozzi, RLA
July 9, 2007

Distribution: Attendees
Study Committee Members

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# *Meeting Minutes*

**Beaver County Parks Master Plans**
*BRUSH CREEK PARK - Public Meeting #1*
*Meeting Date and Time:* *7:00 pm, August 22, 2007*
*Meeting Location:* *Brush Creek Park Maintenance Building*

*Attendees:*

| | |
|---|---|
| Ted Krzemienski | Jim Shaner |
| Will Childs | Ray Walser |
| Mary Louise Phillips | Chris Sowinski |
| Daleen Patsiga | Ed Sheppard |
| Alan S. Ware | Joe West |
| Frank Mancini, Jr. | Dave Florentine |
| Bryan Hayden | Vince Rozzi |

The following represents a brief review of discussions held during the above meeting:

1.1 The meeting began with Rozzi introducing himself, 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. Several 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 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:

- I'd like to see shelters in the park - to bring in revenue and give a variety of picnic opportunities.
- The tennis courts need re-furbished. More people would use them if they were redone.
- A basketball court would be highly used
- The road is in severe need of repair - one of the park's bridges has been sliding and has been sectioned off with construction cones for months. The bridges in place now also don't allow enough water to flow beneath them during floods - they should be higher arched bridges. The road base is basically non-existant underneath the orginal asphalt, so tar-and-chip resurfacing goes bad in a matter of months. A good road needs to be re-built from scratch.
- I don't think the ski / tube slope is a good idea for this park. People will just get in their cars and drive to 7 springs to do the same thing at a bigger facility. Making snow will be too expensive.
- The trails in the park are our biggest concern - they badly need resurfaced and in certain spots need totally redone.
- A shared-use trail for walking and bike riding as part of the road throughout the park would be very nice.
- I don't think the snow tube hill should be ruled out as a long term idea. This park was originally slated to be the County's winter recreation park
- Even if we don't make snow, a large open hill for simple sled riding is something we need. Right now there are utility rights-of-way running up and down the hills in the park, but sled riding there is a liability concern.
- Trail rules need to be looked at - right now, horseback riders drop their waste all over the trails and roads in the park. It stinks, and is also a hazard for infection for a hiker or mountain bike rider with an open cut on their leg.
- We should create and enforce a bag rule: horseback riders must clean up their horse's waste in a bag (similar to dog users). We have a better chance of getting them to do this than to ride on separate trails from hikers / bikers.
- We don't have any security patrol so vandalism happens a lot in the park. Even periodic patrols would prevent a lot of it.
- Speeding cars in the park are a problem.
- Cross-country running and skiing could be done on the trails year-round if the surface is improved.
- Rozzi explained that trail sustainability and signage were the two biggest issues he noticed when walking the park's trails. It's quite easy to walk down one of the "unauthorized" trails that leads to someone's garage.

- There are several big trees down across the trails in the park - trees big enough that the maintenance staff can't remove them. Trail groups need to contact someone that removes stumps / cuts trees for a living to come and get them.
- Because the maintenance staff is already stretched thin taking care of the more developed park areas, trail users should approach the County Union to develop an agreement to work on the trails in the park on a regular basis.
- Trail bridges also need repaired. One is completely collapsed and a few others are almost that bad.
- We should try to attract grant funding to re-plant the reclaimed mine area with trees.
- All planning documents, including the old master plan (a model on the maintenance building wall) should be considered during the new master plan
- The covered bridge needs a new roof
- The trails and the road are our top priorities in this park - they should be short-term priorities ahead of everything else.

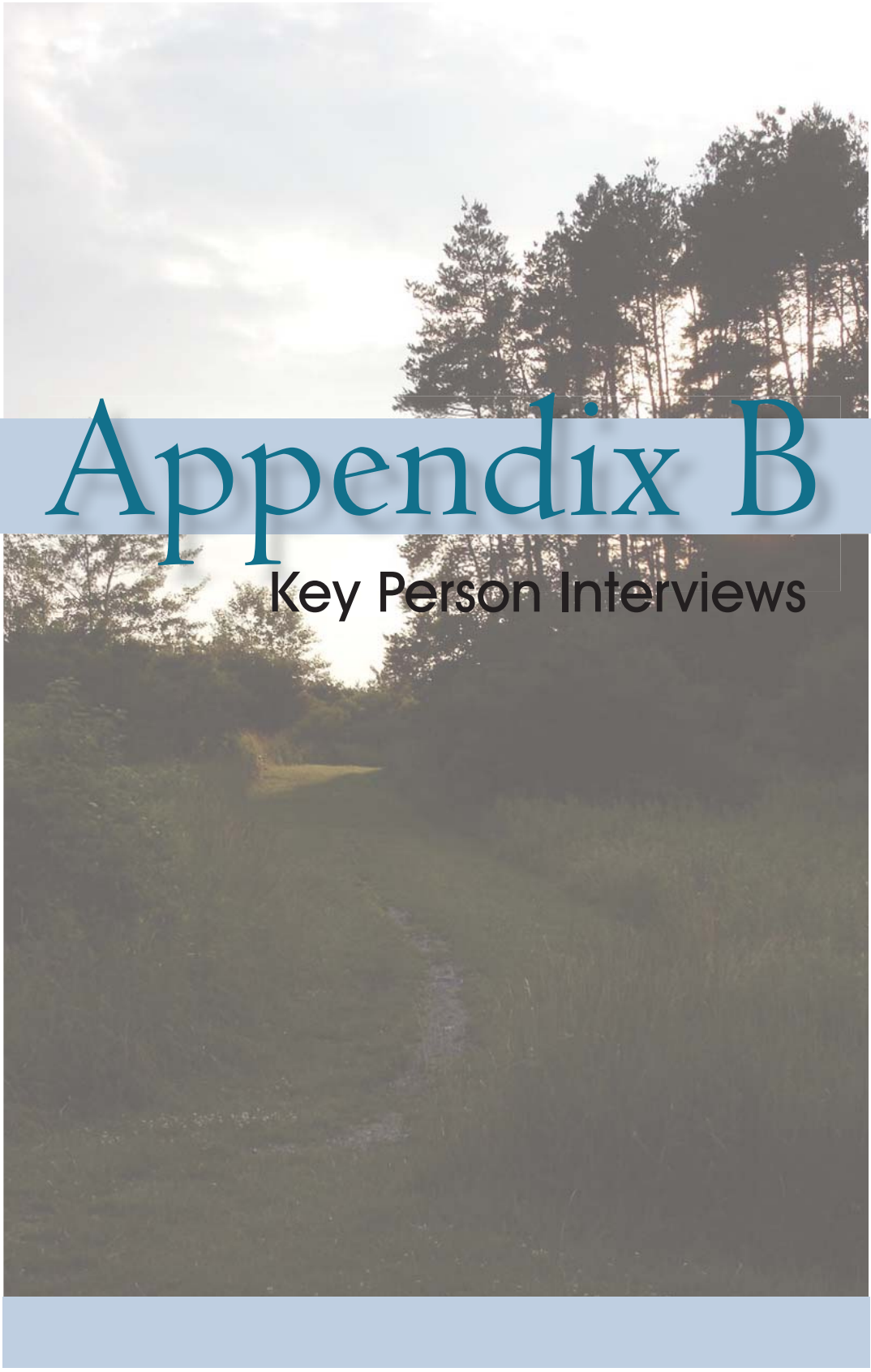
Rozzi then explained the next steps in the master planning process. Pashek Associates would use comments from tonight's meeting to develop a concept plan for the park. This concept plan would be shown to the project study committee, revised per their comments, and presented at the second public meeting, which would probably take place in November. The next public meeting will again be held in the maintenance building.

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 23, 2007



# Appendix B

## Key Person Interviews

# *BRUSH CREEK PARK*
# *Key Person Interview #1:*

**Jeff Langer,** Riverside Football
Wednesday, 4/18/07

***1) Describe your use of the park for football (what ages, practices, camp, games?)***

We use the park for practices and scrimmages with other area schools. Our kids are ages 5-14, and last year we had 136 players organized into 4 teams.

***2) Are the fields of adequate size, drainage for football use? What improvements are needed?***

The fields drain fine. They are usually dry. The main problems we have are divots from horseback riders who ride through the areas we use for fields. We use the ball field outfields on top of the hill in the north part of the park, and the flat lawn area near the restroom building.

Bugs are also a big problem. The kids, parents, and coaches are constantly swatting bugs during games, and parents have voiced concerns over West Nile Virus. I have spoken with the park staff about something that can be done, but I'm not sure what the answer is. We don't want to come out and spray ourselves because it may cause people to get sick, etc. I'm not if anything can be done to eliminate some of the bugs.

***3) During games, do you see large crowds attend? How are the park facilities at accommodating them in terms of parking?***

Usually we have 1 parent per player. During scrimmages sometimes both parents. Parking hasn't been a problem usually. Once we did have problems with people parking on the grass where there were signs asking them not to do so, but every other time we use the fields it's not a problem.

# *BRUSH CREEK PARK*
# *Key Person Interview #2:*

**George / Cheryl Hall,** Skyline Stables (organize a horseback ride in the park as a St. Jude Hospital Fundraiser)
Thursday, 4/19/07

***1) Where in the park do you have the fundraiser? On the trails? On lawn? Roads?***

The ride starts at the ranch (1-1/4 mile from the park along Glendale Road) and we ride into the park on the park road, but enter one of the trails on the left about 1 block into the park. That trail brings us away from the park facilities across the hillside, then re-enters the park road near the softball fields. We ride around the back (north) end of the park road loop to the covered bridge, which we cross to gain access to other trails that we ride out of the park before going back to the ranch. Riders sometimes stop at the restrooms near the softball fields and near the playground by the covered bridge.

***2) How many participants do you normally have?***

We usually have about 200 horses, and raise $23,000 to $25,000 each year. This is our 15th year, and the saddle-up raises more money per-horse than any other such event in the U.S. Participants bring their own horses. Our stable enters 10 horses in the event. Most riders get per-mile sponsors for the ride, and we give away a golden saddle with the St. Jude hospital logo burnt into one side and the sponsor company's logo on the other.

***3) Are there any spectators? Where does everyone park?***

We usually have about 3 people per horse. Participants park their horse trailers at the ranch. Even late comers park on the road outside the park. Very rarely someone will park in the parking area near the park soccer fields. Having a pull-off or designated parking area for trailers in the park would be great.

***4) Are the trails in the park adequately marked for riding? During site visits, we saw a lot of illegal access trails (both footpaths and ATV trails). Does this ever cause confusion?***

The park trails are in great need of signage. Each spring before the event (which is the first Saturday in May), we clear the trails of fallen logs and put up our own signage for the ride so riders who aren't familiar with the park's trails don't get confused. Many of the trails leading into the park are from neighboring houses. We don't want people riding accidentally into someone's yard.

Years ago, the trails in the park had signs and trails were named, but signs have deteriorated. If you ever need to see which trails are "official" park trails, don't hesitate to call and I can show you. There are 2 trails on each side of the park, one at the bottom of each hillside, and one at the top of each hillside. Pictures of the ride are available on our website, www.skylinesaddleup.tripod.com.

# *BRUSH CREEK PARK*
# *Key Person Interview #3:*

**Terry Smith,** Beaver County Christian Church Softball League
Thursday, 4/19/07

***1) How big is the Church Softball League? How many churches? How many teams? How wide of an area do people travel from (where are the churches)?***

We have 12 teams, from churches mostly in the northern part of Beaver County. The only team from the southern valley is from Ambridge, and they just joined the league recently.

***2) Does the league use both larger fields? How many days a week / how many games per day?***

In the past we used only one field at Brush Creek and we tried to only use that field for make-up games. This year we'll be using the park a lot more, probably using both fields at once. Our games are at 6:00 in the evenings, and we run double-headers between the same two teams on each field (2 games per field, back-to-back). Four teams is the most we'll have there at one time. Each team plays 1 night / week.

***3) Are there any improvements that need to be made to the field or the associated facilities at the park? (restrooms, concessions, parking, etc.)?***

The fields at Brush Creek Park used to be the best in the county years ago. It's sad but there has been a real lack of maintenance at the fields. The infields are rarely dragged, and when they are, the maintenance staff drags them so deep that it's too soft for a ball to bounce well. Ground balls just die in the dirt. When we drag the field ourselves or fill in puddles that have formed, the maintenance staff gets upset.

On the northernmost softball field, the outfield is uneven, and there are so many divots and small ruts that it is almost dangerous. The infield is fine on that field. The southernmost field has serious drainage problems in the infield, but the outfield is okay. What the fields need most is consistent maintenance. Someone to chalk the foul lines, drag the field, fill in puddles, etc. Also there are no fences and team benches are a little older but these are not nearly as big a problem as the field surfaces.

# *BRUSH CREEK PARK*
# *Key Person Interview #4:*

**Ed Sheppard,** Freedom H.S. Teacher and Cross Country Coach, organizes Freedom Invitational, MAC Cross Country Meet
Friday, 4/20/07

***1) What is your role in the organization of the larger cross country meets held at Brush Creek Park (MAC, Freedom Invitational)?***

I'm the Freedom Cross Country team coach, and we host both the MAC meet, which is our conference meet, and the Freedom Invitational.

***2) How many teams usually run in these meets? How many people attend?***

The MAC meet usually has 20 or 22 teams, and the Freedom Invitational usually draws between 25 and 30 teams. That's about 500 runners, and we run 4 to 5 separate races. In terms of spectators, we usually have a few hundred. The meets are held in the week so it somewhat limits the number of parents that can attend.

***3) Are the facilities at Brush Creek adequate to handle these events? What improvements could be made to help accommodate large groups of people? Parking improvements? Bus parking?***

The park has plenty of parking to handle everyone. Usually people don't try to park on the grass, they'll just park in a lot that's farther away. We have the buses drop off the kids, then park in one of the furthest parking lots so they're not in anyone's way. We don't have any problem finding room for them to park.

***4) What about the cross country course itself? Where do the teams run? Do you ever use the trail system in the park?***

We start and end near the ball fields in the northern part of the park. We usually run one lap around the inside loop of the park road, then northward into the reclaimed strip mine area, along the top of hill (upper terrace) on the way out and along the bottom of hill on the way back, then run another lap inside the loop made by the park road.

We used to have our own marked course on the trails in the park. Part of the course was the official park trail, and part of the course we made our own trail. The trails soon became eroded and were no longer safe to run, especially in meets.

***5) One of the needs we see in Brush Creek is the need for signage on the trail system to avoid confusion between park trails and illegal access trails from neighboring properties. Would the trails be more suitable for practice or meet use should signage improve?***

What the trails need is to be redone so that erosion is reduced. It is easy, however, to run outside the park. The boundary is not clearly defined when you are on the trail. The trail could also use a new surface. Schenley Park in Pittsburgh uses cinders on their trail, and people love to run on it.

# *BRUSH CREEK PARK*
# *Key Person Interview #5:*

**Matt Reichart,** Pine Valley Bible Camp (Youth Group) that uses park for overnight camping in summer
Thursday, May 31, 2007

***1) How many people do you usually have for the campouts? Do you bring everyone over by bus or use cars? Is the parking situation okay?***

We usually have anywhere from 80 to 100 kids, plus about 50 or 55 staff. We don't need to drive to the park because we're directly adjacent to the park property. We walk to the northern end of the park via a footpath along Brush Creek.

***2) Do your camps utilize different areas of the park for each outing, or do you always use the same area? Do you organize other activities for camp participants while they are in the park? (hiking / games, etc.) If so, what facilities do you use? (fields, playground, etc.)***

We use the northernmost part of the park near the reclaimed mine area. We use a side portion of the open field for soccer, and we use the old miner's cabin at the end of the service road as a base from which to lead short loop horseback rides. We also take the kids on hikes along the park trails into the center of the park. The girls at our overnight camps stay near the playground near the covered bridge, and we have the boys in a separate location.

***3) What types of improvements could be made to make the park easier to use for camp groups? Describe the perfect overnight camping area for your camps.***

I'd love to see plumbed restrooms instead of the pit toilets. Picnic shelters would also be great for us to use during camps. We'd also love to be able to use the trails for horseback rides.

We have a winterized lodge that we could market to all youth groups using the park. Our lodge currently holds about 100 to 130 people, and we will be renovating it to increase that number in the next 3 to 5 years.

A few things I'd like to mention... We'd be willing to renovate the old miner's cabin for our use because no one else seems to use it and it's deteriorating rapidly. I'd hate to see it lost. Also, we very much appreciate the permission to use the northernmost field in the park. It seems that we have almost exclusive use of it, and I'd like to see that situation remain unchanged.

Also, we may have a donor that would help us (if the county is interested) purchase the northernmost "finger" of the park property, just east of our camp. It's a thin stretch of woods between us and the top of the hill. The park can't really do much with it other than trails, but we would be able to develop more facilities there if we owned the land.

# *BRUSH CREEK PARK*
# *Key Person Interview #6:*

**Ted Krzemienski,** Brush Creek Park Foreman
Thursday, 6/28/07

***1) There is a house on top of the hill, just west of the main park entrance on State Route 588. Is this house on the park property?***

Yes. That house is a rental property owned by the County, and it's currently occupied.

***2) Looking at some of the plans for a proposed snow tube run, I see a proposed waterline to be placed near that house. Have you heard anything about this?***

The waterline was started a few years ago. The County extended it from Route 588 onto the park property before running out of grant money. I believe it extends eastward from 588 past the driveway and house to the back of the lawn.

***3) Does anybody use the field in the extreme northern part of the park at the end of the old maintenance road?***

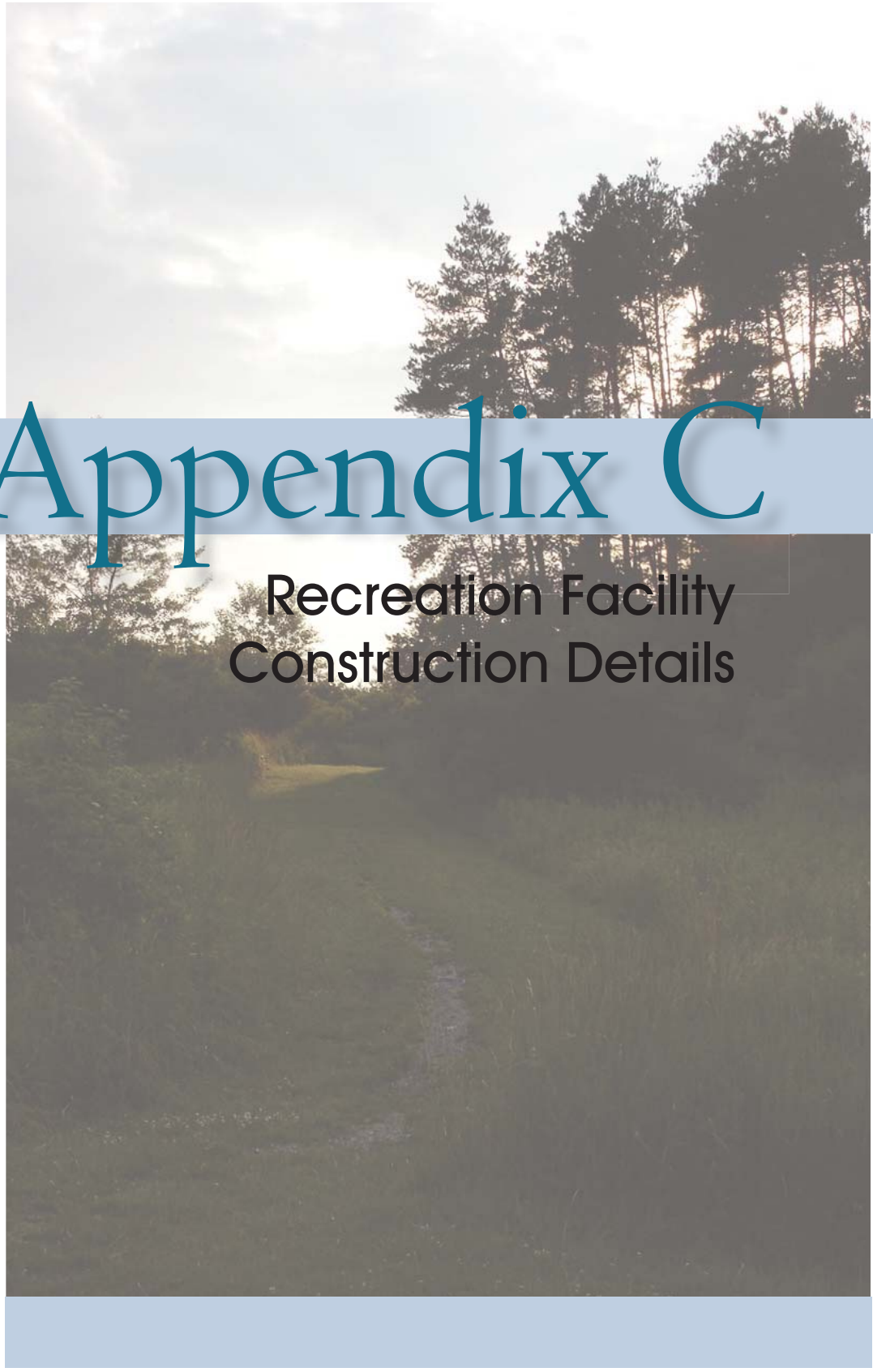
The Pine Valley Church Group uses the field to house animals and conduct group activities. They have an agreement with the County to use the field as long as they maintain it. No one else uses that field. We use the maintenance road for access to storage space next to the field. We have some stone, railroad ties, and at times soil stored there. Our maintenance road is the only vehicular access to the storage area.

***4) Upon visiting the northern part of the park, I noticed several ATV tracks. Where is your biggest problem with ATV's trespassing in the park?***

The northern end -- in the reclaimed strip mine and on the old maintenance road -- is the worst. We also catch some kids up the hill from our maintenance building. I know people come into the park at night on dirt bikes or ATV's. We often find their tracks on the ball fields during the day.

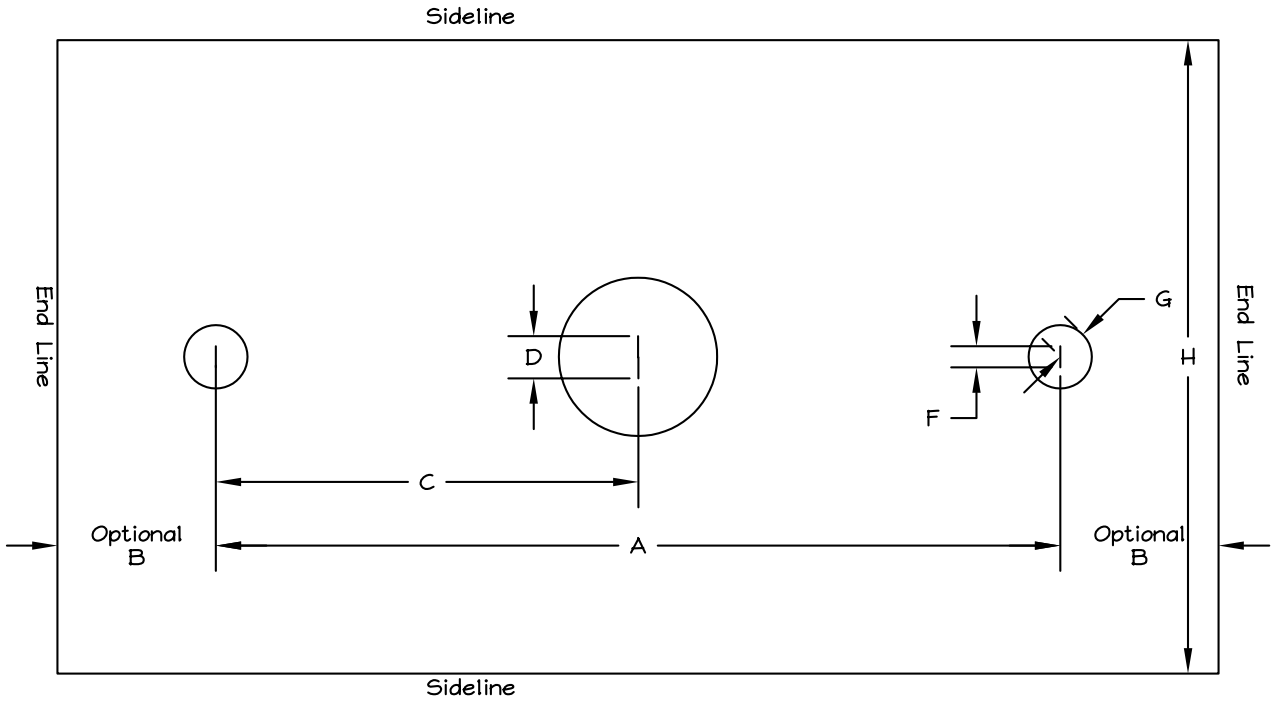
***5) Speaking of the ball fields, has there been any talk of upgrading them for heavier league use?***

The fields are already used to their maximum. The church softball league uses each field twice a week, a travelling baseball league uses it once a week, and other groups use it quite often.



# 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) | | | | | | | | | |
| *Under 9* | 6-8 (level C rules) | 50yds | 25yds | | 2m r | 10yds | | 34' 9" | |
| *Under 11* | 9-10 (level C rules) | 50yds | 25yds | | 2m r | 10yds | | 34' 9" | |
| *Under 13* | 11-12 (level B rules) | 90yds | 50yds | 30yds | 8.5' r | 10yds | 47' 9" | 34' 9" | 10yds |
| *Under 15* | 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

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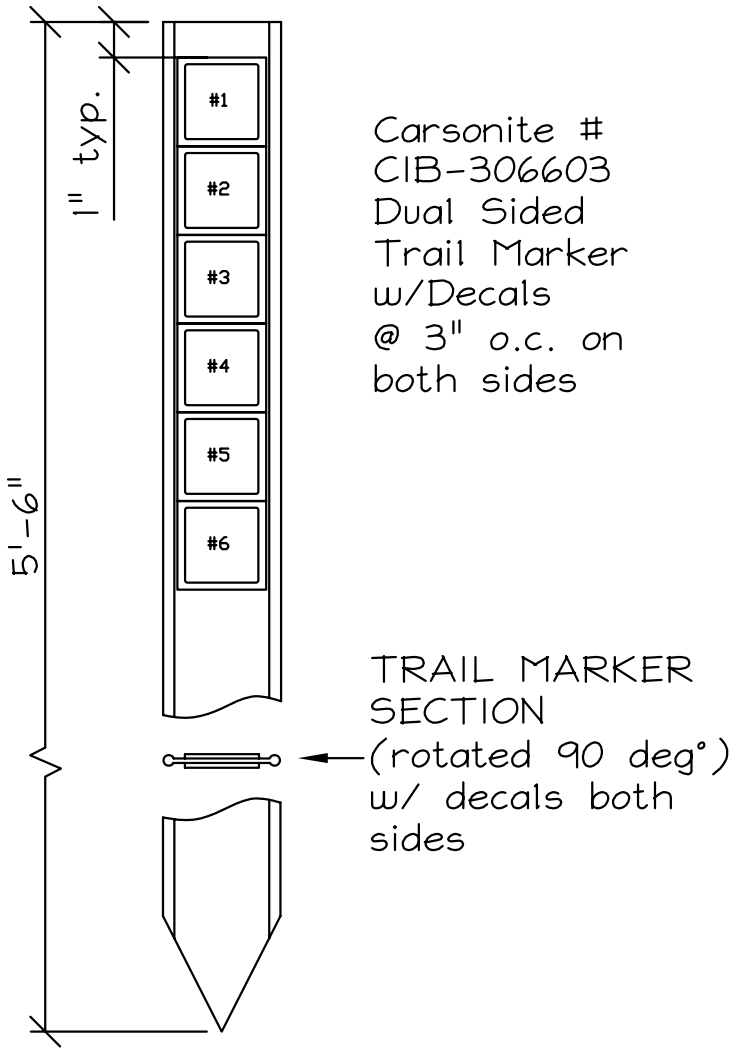
A Pennsylvania Corporation



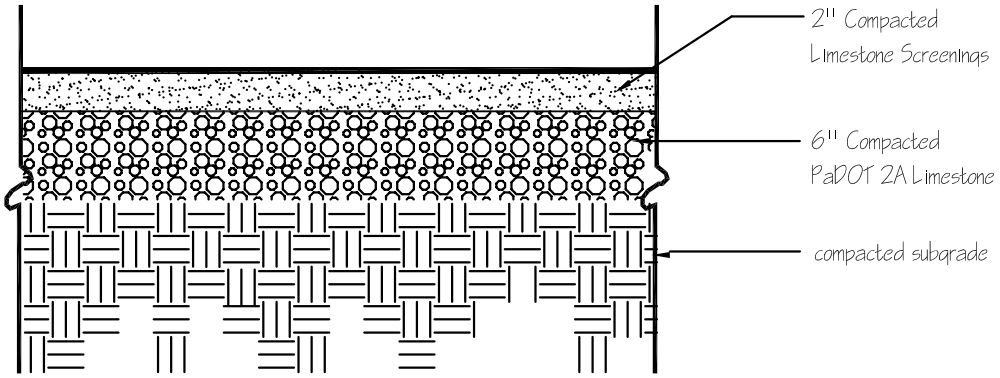

# Trail Mark Detail

Not to Scale

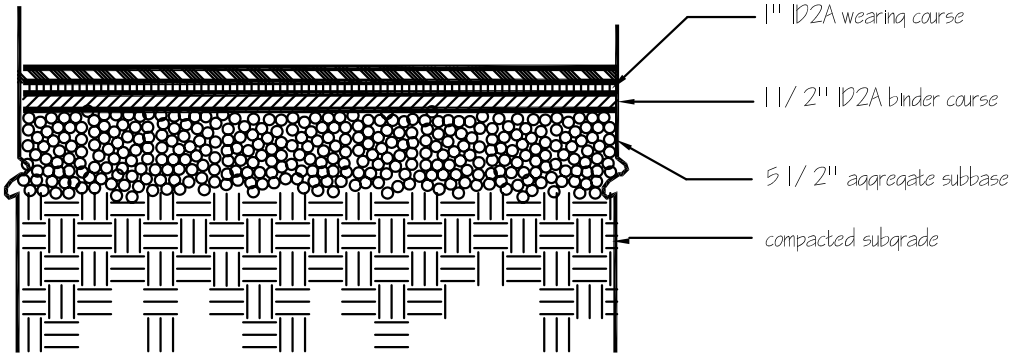
## Trail Markers

Community Park Standards

PASHEK ASSOCIATES
A Pennsylvania Corporation




Compacted Limestone Trail

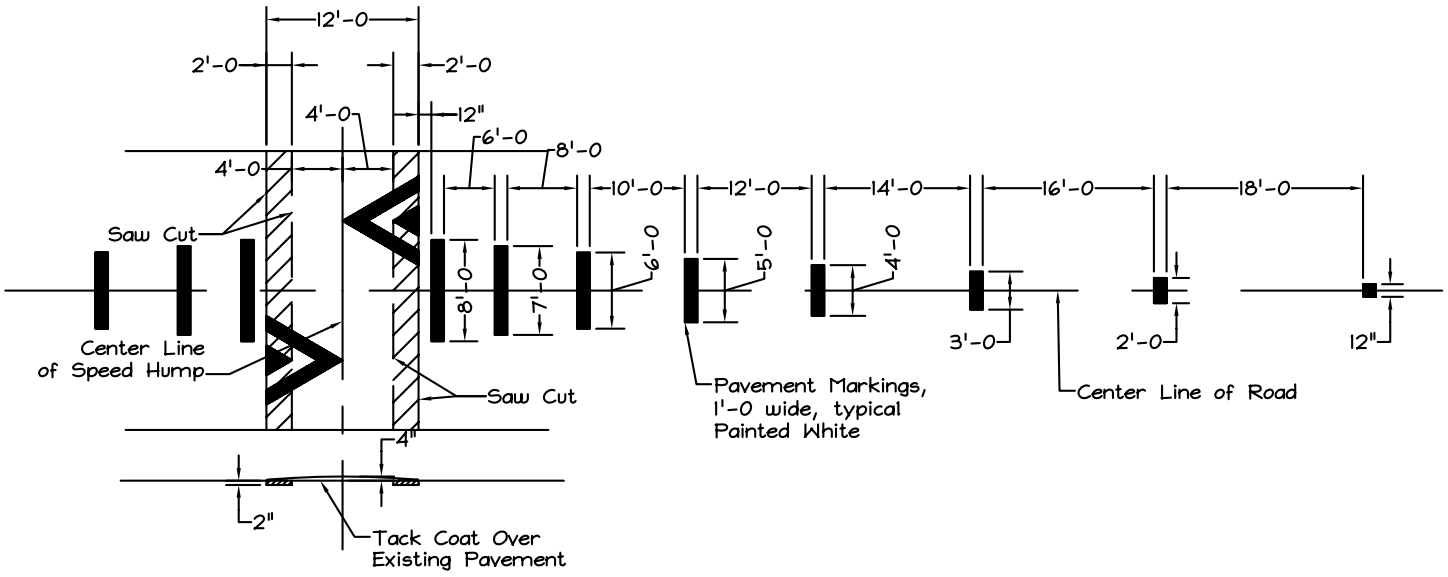



Bituminous Trail Paving Section

# Trail Cross Sections

## Community Park Standards

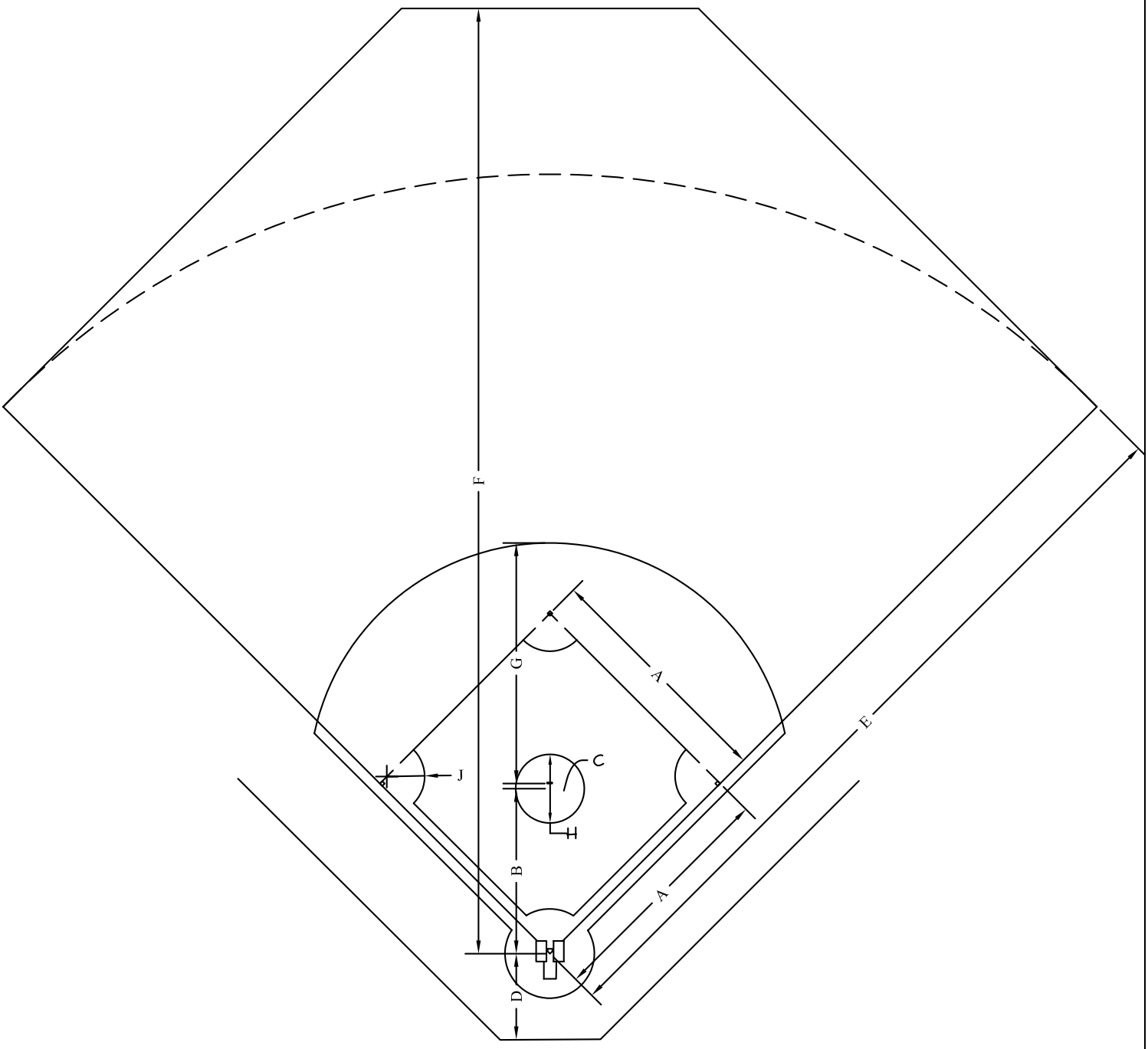
PASHEK ASSOCIATES
A Pennsylvania Corporation




# Speed Table & Approach Markings

## Community Park Standards

PASHEK ASSOCIATES
A Pennsylvania Corporation



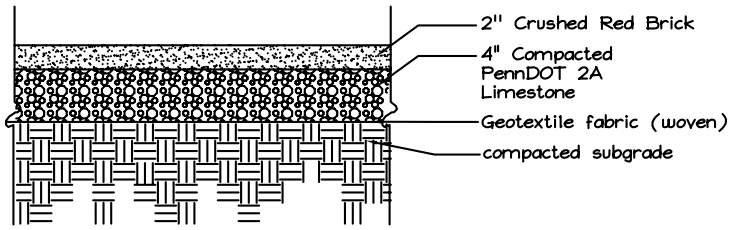

Softball Layout

Not to Scale

# Softball Field Standards - Sheet One

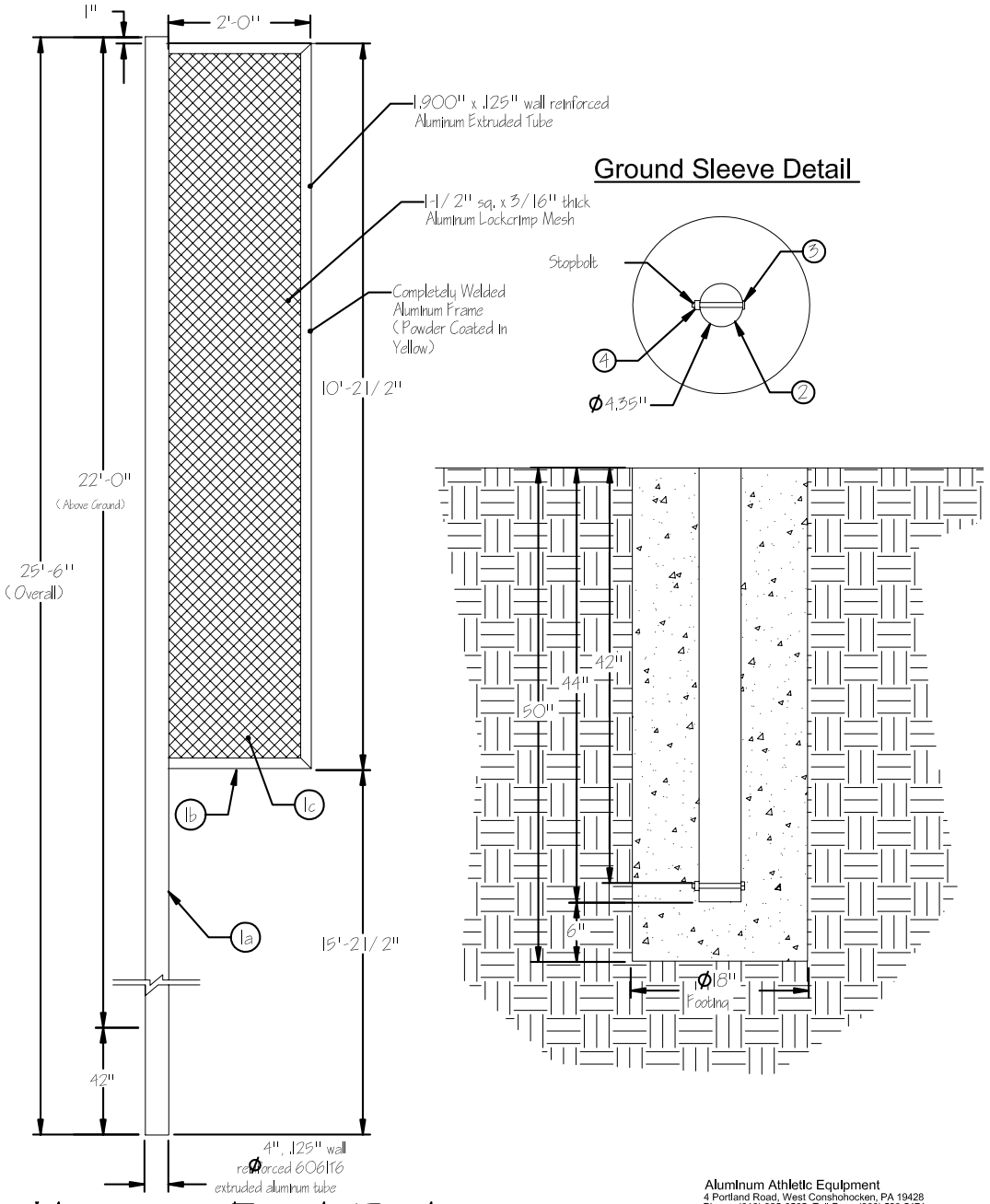
Community Park Standards

PASHEK ASSOCIATES
A Pennsylvania Corporation




## 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) 523-5471
AFP-22 - All-Aluminum Foul Pole

# Ballfield Details - Sheet One

## Community Park Standards

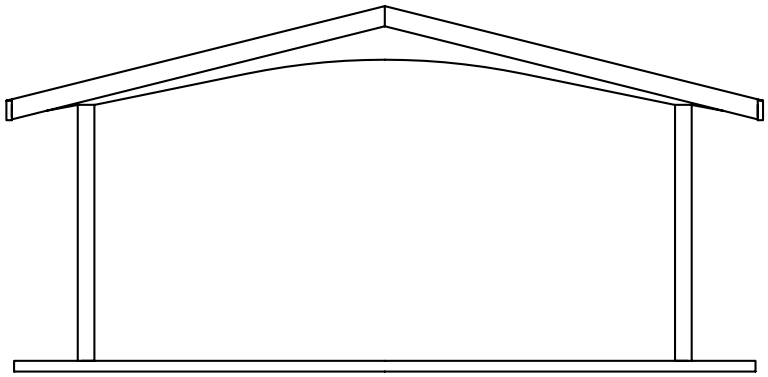
PASHEK ASSOCIATES
A Pennsylvania Corporation

| 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. |
| | Women's Class 'D' | | 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. |

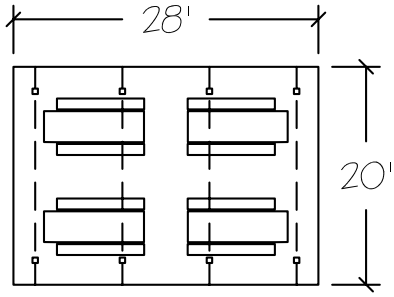
# Softball Field Standards - Sheet Two

## Community Park Standards

PASHEK ASSOCIATES
A Pennsylvania Corporation



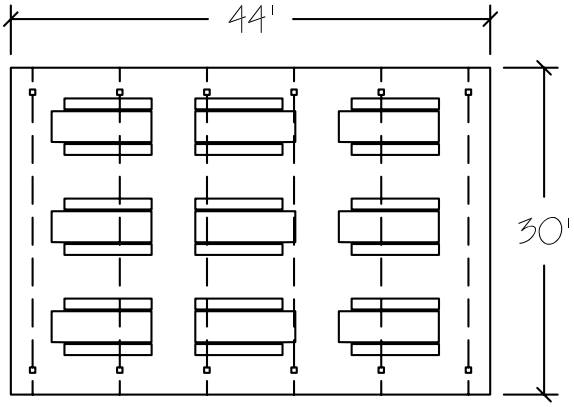
Elevation




## Small Shelter

( capacity - 32 persons)

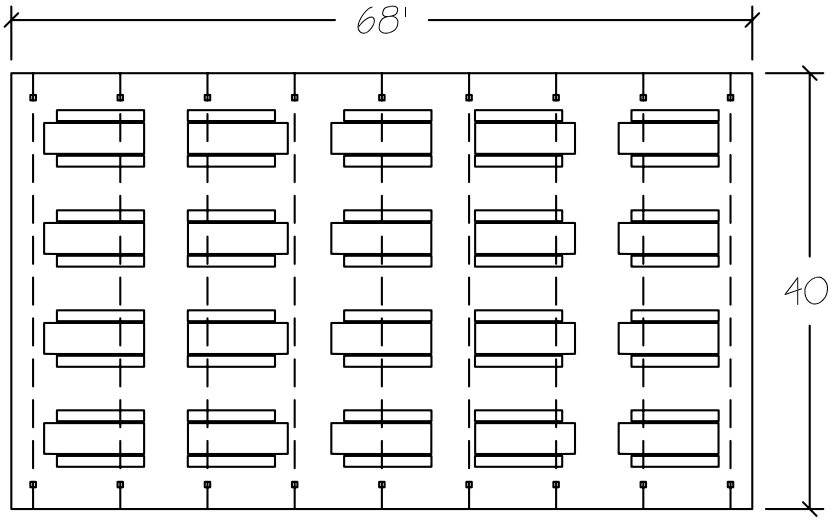
requires 11 parking spaces




## Medium Shelter

( capacity - 72 persons)

requires 24 parking spaces




## Large Shelter

( capacity 160 persons)

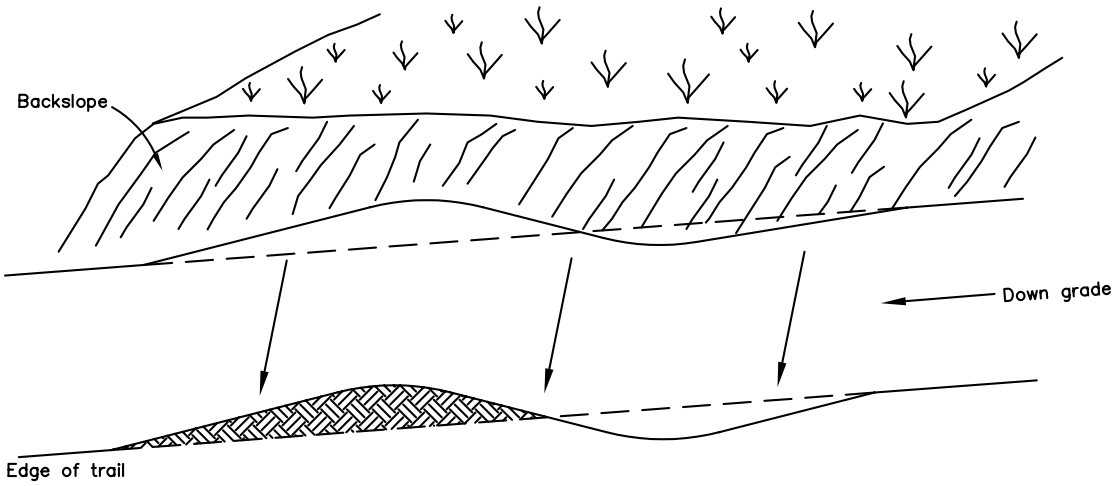
requires 55 parking spaces

# Laminated Beam Wood Picnic Shelters

Park Standards

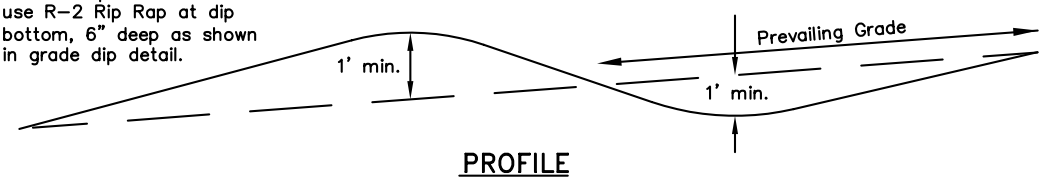
PASHEK ASSOCIATES
A Pennsylvania Corporation

| 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.

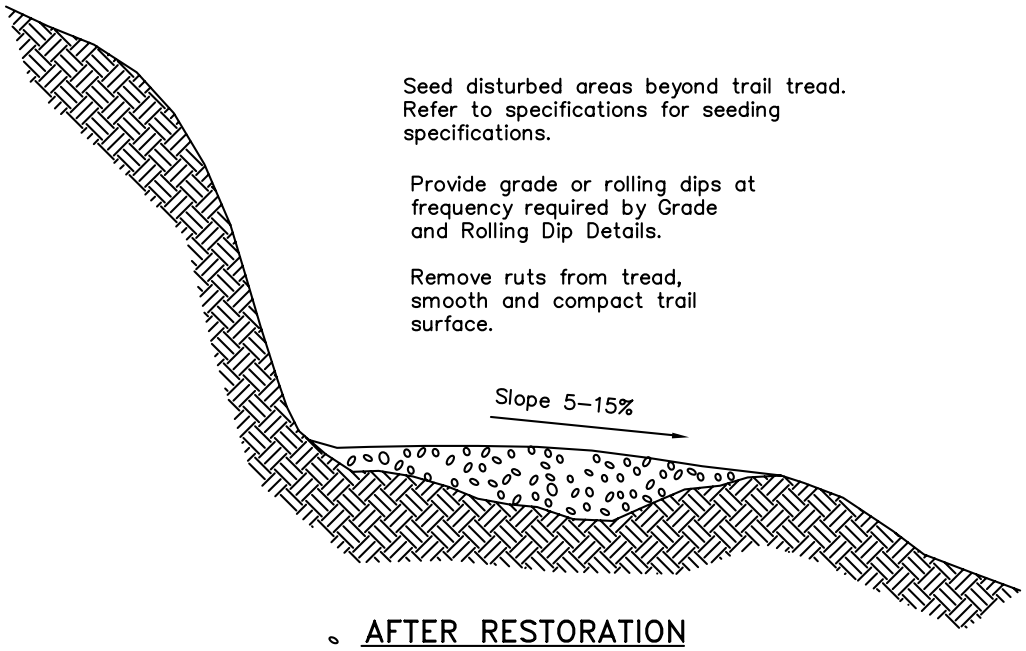
## Mountain Bike Trail Rolling Dip

NOT TO SCALE

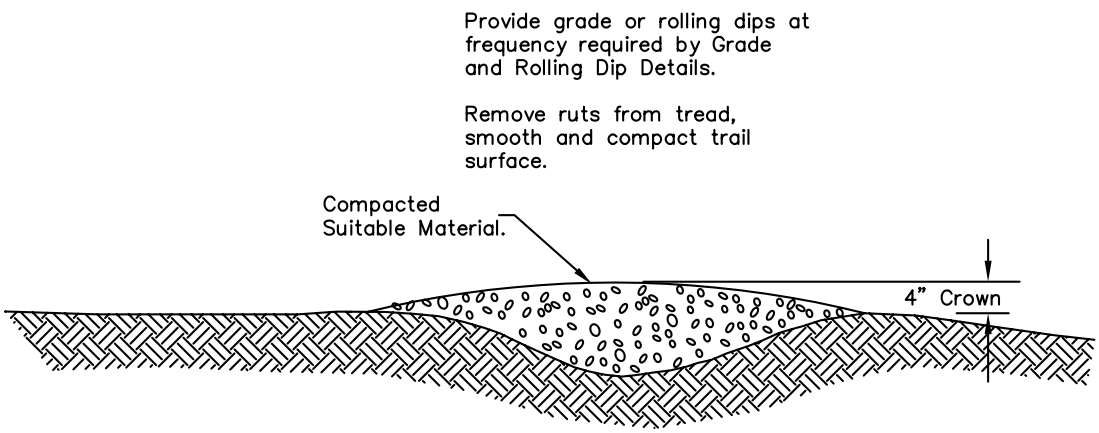
# Mountain Bike Rolling Dip

Community Park Standards

PASHEK ASSOCIATES
A Pennsylvania Corporation




AFTER RESTORATION




FLAT SLOPES

# Existing Trail Restoration

NOT TO SCALE

## Mountain Bike Trail Restoration

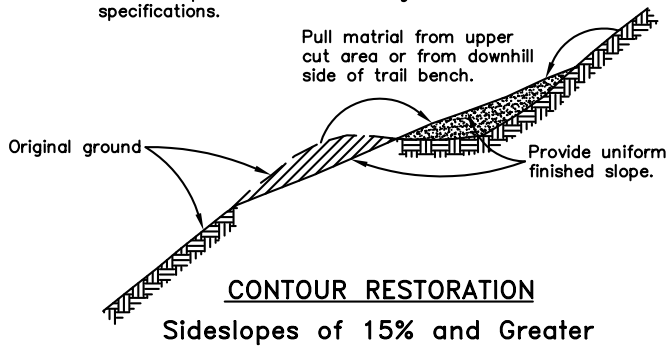
Community Park Standards

PASHEK ASSOCIATES
A Pennsylvania Corporation

Notes:

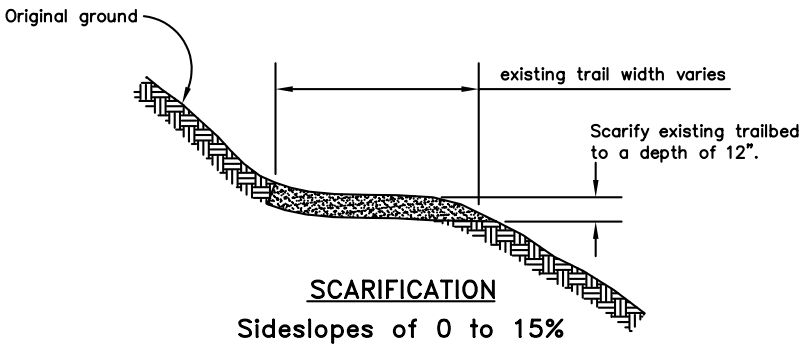
Where shown on the drawings obliterate trail, for a distance of 100' in each direction, from each side of new trail. Seed disturbed area as specified in the project manual.

Seed disturbed areas beyond trail tread. Refer to specifications for seeding specifications.



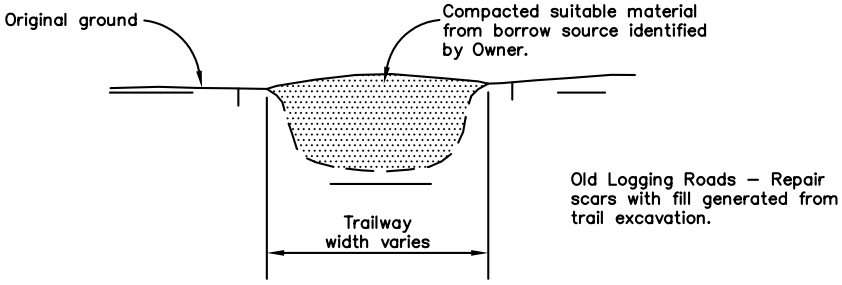

CONTOUR RESTORATION

Sideslopes of 15% and Greater




SCARIFICATION

Sideslopes of 0 to 15%




TRENCH BACKFILL

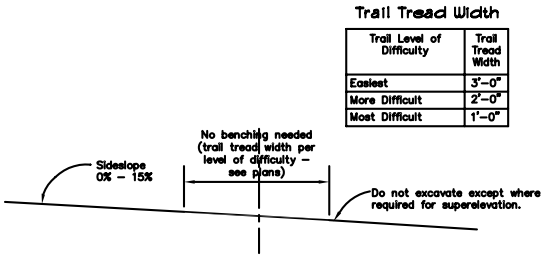
Trail Obliteration

NOT TO SCALE

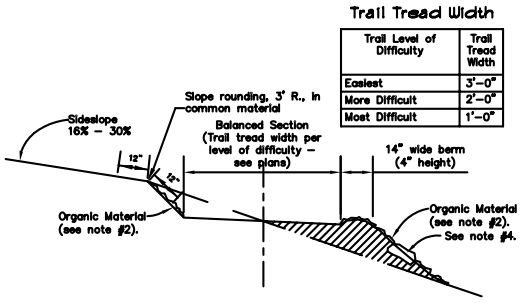
# Mountain Bike Trail Obliteration

## Community Park Standards

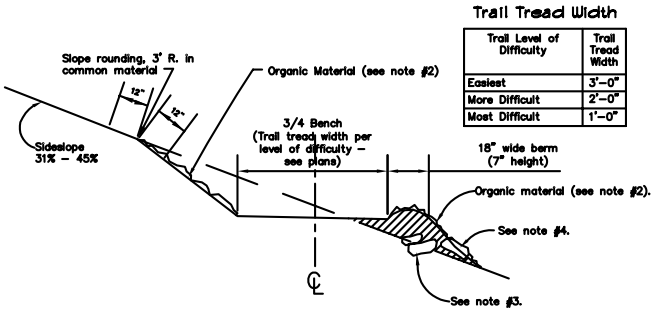
PASHEK ASSOCIATES
A Pennsylvania Corporation



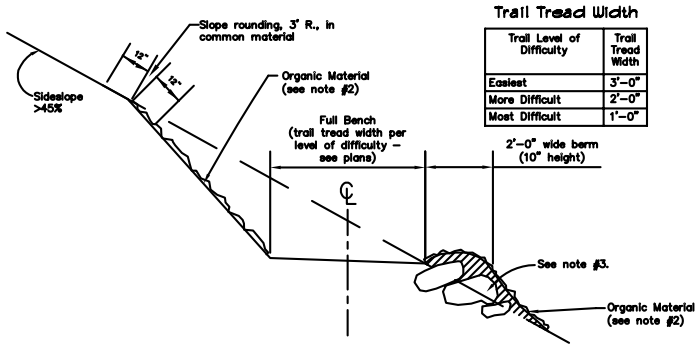

Trail Type 'A' - side slopes between 0% and 15%




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

## Mountain Bike Trail Details - Sheet 1

Community Park Standards

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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" |

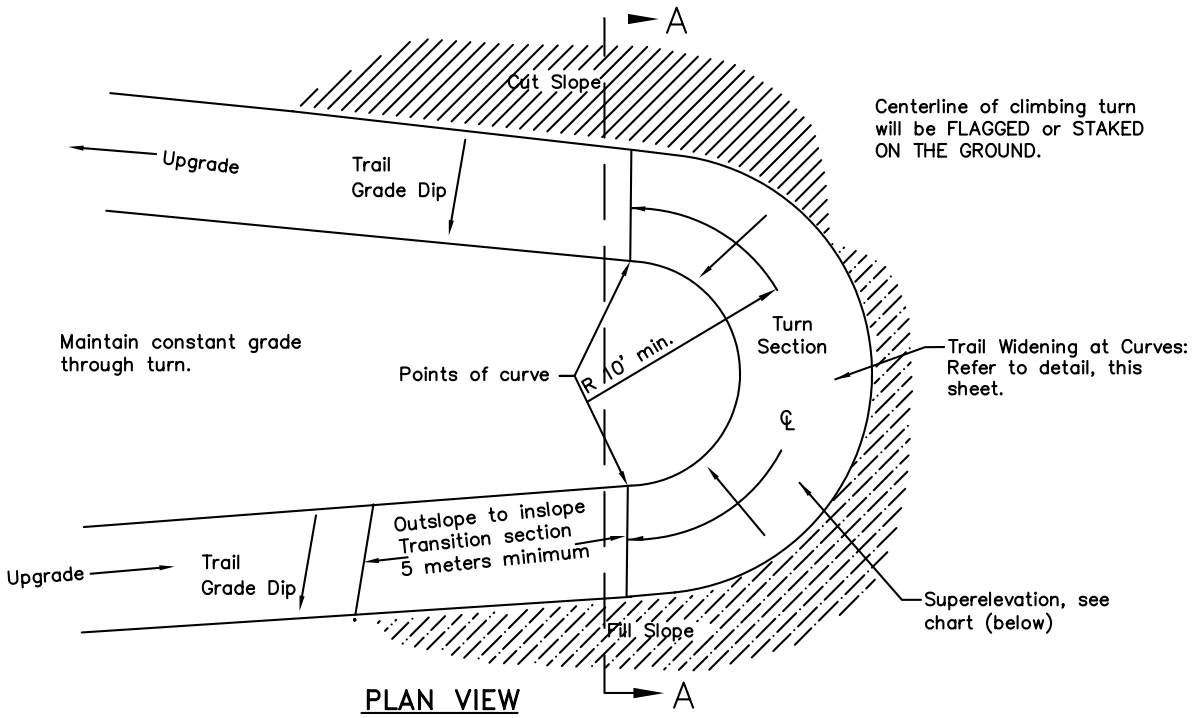
7) Remove all roots over 2" diameter that protrude from the cut slope
8) Maximum cut slopes shall be the lesser of a) 1:1 or b) twice the existing side slope.
9) Maximum fill slopes shall be the lesser of a) 50% or b) 1.5 X the existing side slope.
10) Provide Grade Dips or Rolling Dips as detailed on contruction 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.

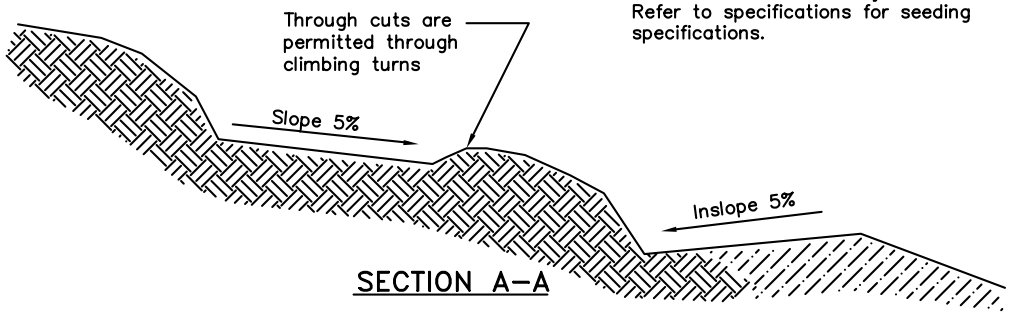



PLAN VIEW

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" |

Seed disturbed areas beyond trail tread. Refer to specifications for seeding specifications.




SECTION A–A

Insloped Climbing Turn

NOT TO SCALE

# Mountain Bike Trail Climbing Turn

## Community Park Standards

PASHEK ASSOCIATES
A Pennsylvania Corporation

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.

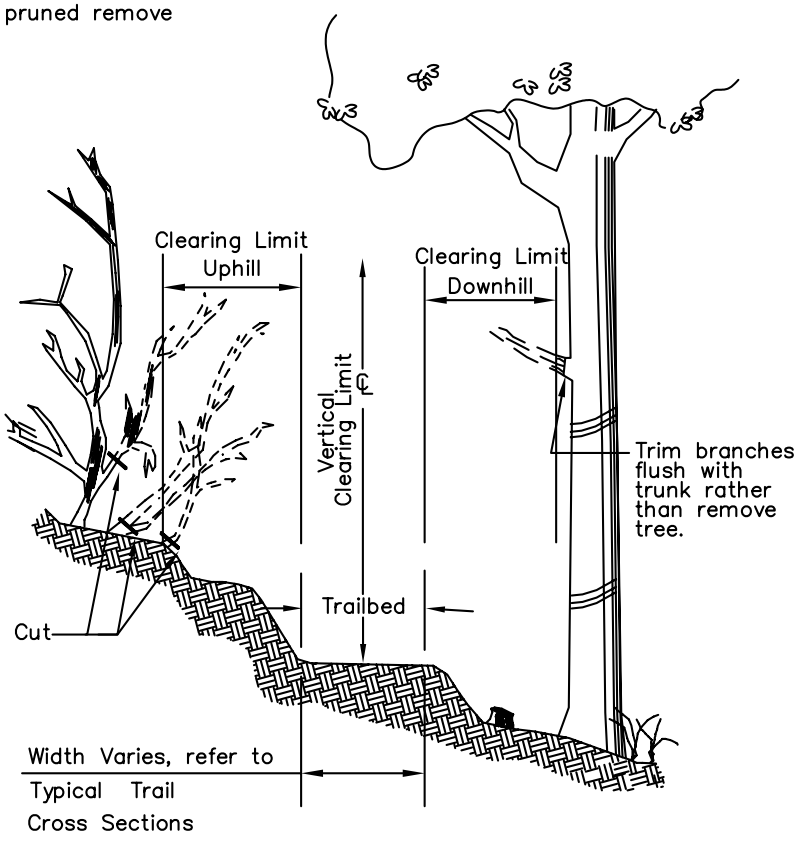
Remove all trees less than or equal to 1/2" DBH within 12" of tread.

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.

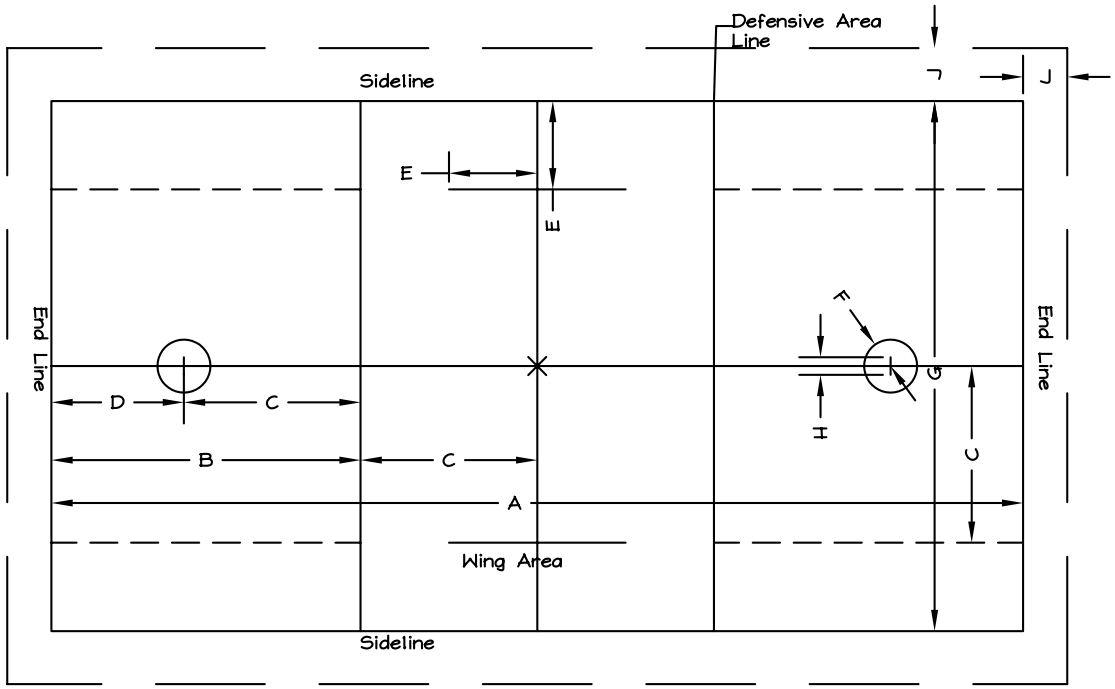
Remove all stumps to within an average of 1", 2" max. of ground.

Rub soil into cut stumps.




# Mountain Bike Trail Clearing Limits

NOT TO SCALE




## Lacrosse Layout

Not to Scale

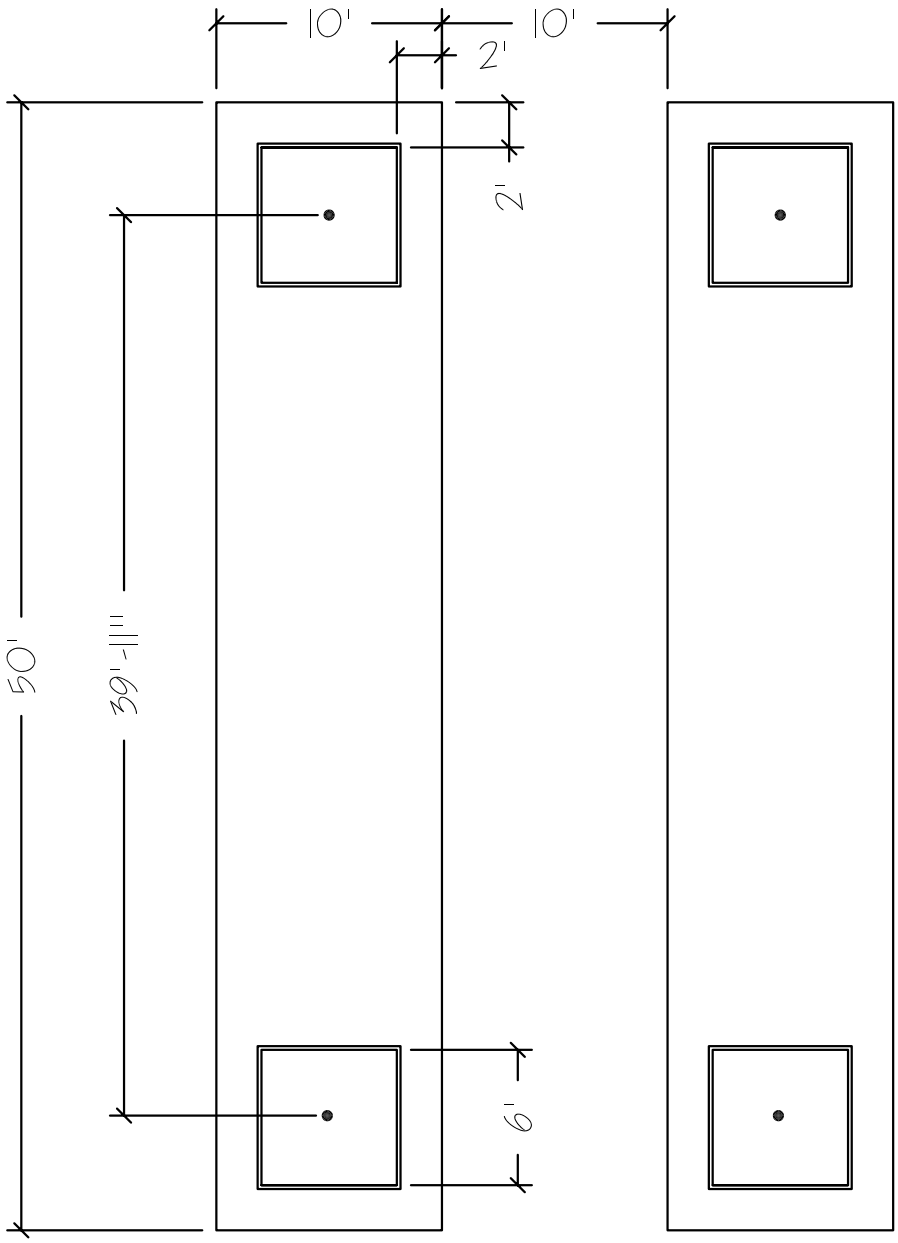
| Men's and Boys Lacrosse Field Dimensions | | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|---|
| **Type of Field** | **Ages** | **Field Length** | **Field Width** | **Defensive Area Line** | **Wing Area Line** | **Attack Area** | **Distance Behind Goal Lines** | **Goal Crease** | **Wing Area** |
| Men's | | 110yds | 60yds | 35yds from EL | 10yds from SL, 20yds long | 20yds from DAL | 15yds | 9' r | 20 yds. |
| Boys | | | | | | | | | |
| *Bantam Divison* | under 9 | *All Boys' Divisions* ***recommended*** *playing field dimensions same as Men's.* | | | | | | | |
| *Lightning Division* | under 11 | | | | | | | | |
| *Junior Division* | under 13 | | | | | | | | |
| *Senior Division* | under 15 | | | | | | | | |

EL=End Line
SL=Sideline
DAL=Defensive Area Line
= May be competitive

# Men's Lacrosse Standards

## Community Park Standards

PASHEK ASSOCIATES
A Pennsylvania Corporation




# Horseshoe Court Layout

## Community Park Standards

PASHEK ASSOCIATES
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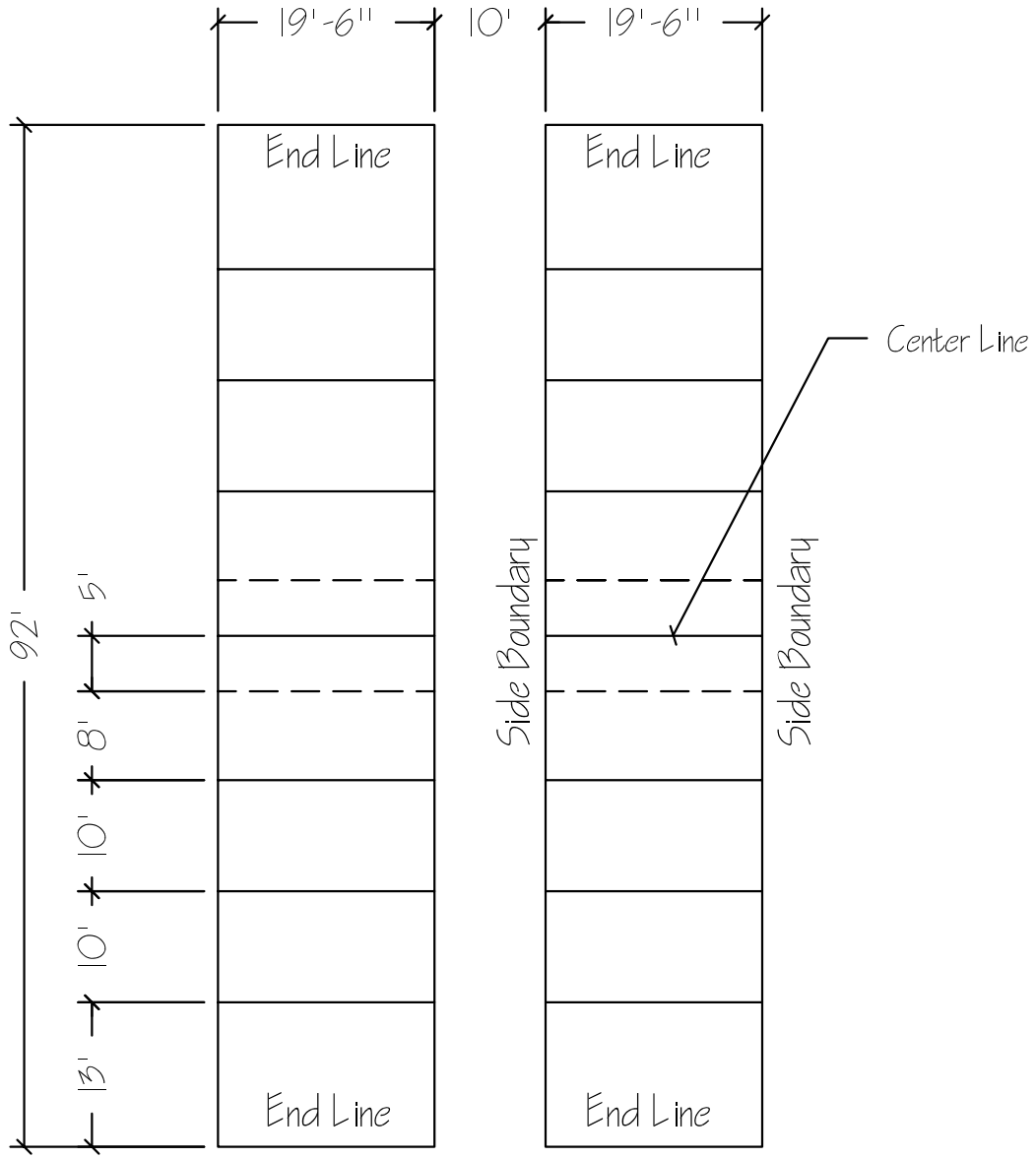
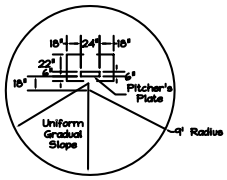



# Bocci Court Layout

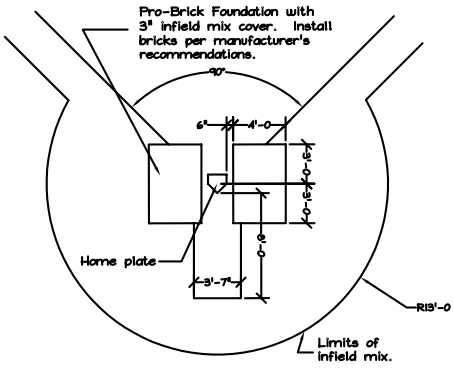
## Community Park Standards

PASHEK ASSOCIATES
A Pennsylvania Corporation




Pitcher's Mound Detail

Not to Scale




Batter's Box

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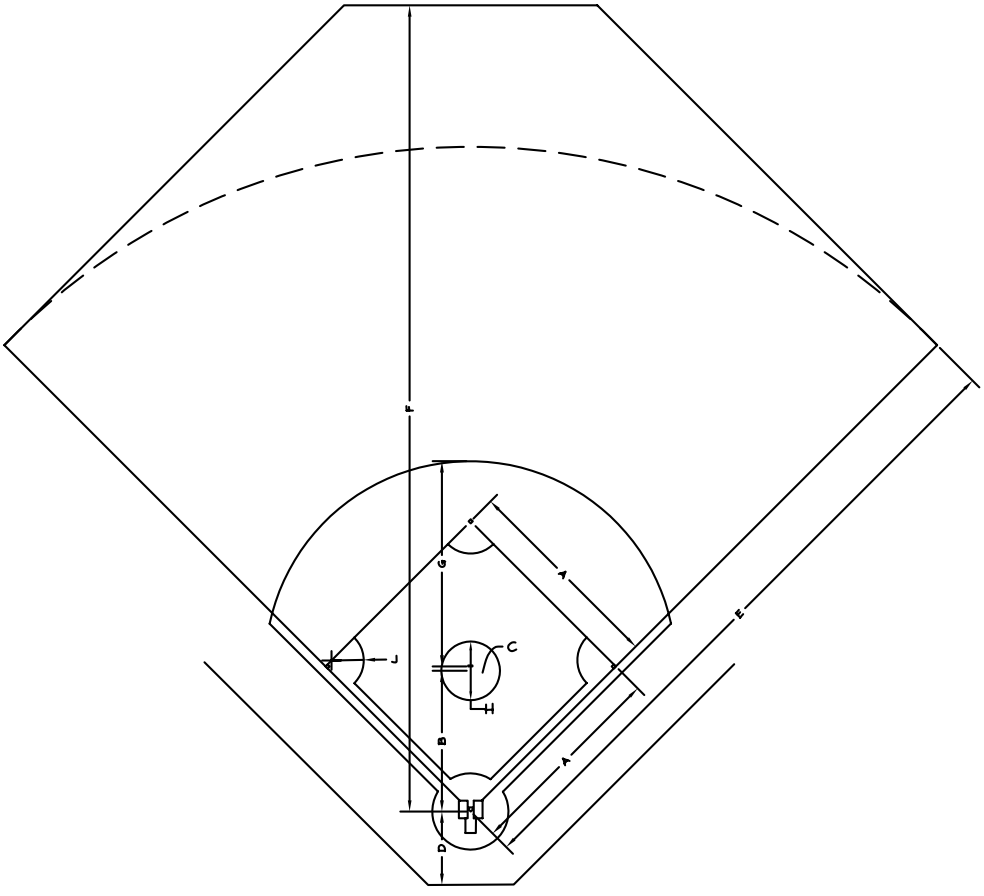



Baseball Layout

Not to Scale

# Baseball Field Standards - Sheet One

## Community Park Standards

PASHEK ASSOCIATES
A Pennsylvania Corporation

| Baseball Dimensions | | Required | | | Recommended | | | |
|---|---|---|---|---|---|---|---|---|
| Type of Field | Ages | A<br>Base Lines | B<br>Pitching Distance | C<br>Pitching Height | D<br>Backstop from Home Plate | E<br>Foul Lines | F<br>Center Field | G<br>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. | | | | | | | | |
| *Shetland Division* | 5&6 | 50' | 38' | n/a | 25' | 125' | 200' | |
| *Pinto* | 7&8 | 50' | 38' | 4" | 25' | 150' | 200' | |
| *Mustang* | 9&10 | 60' | 44' | 4" | 30' | 175' | 225' | |
| *Bronco* | 11&12 | 70' | 48' | 6" | 30' | 225' | 275' | |
| *Pony* | 13&14 | 80' | 54' | 8" | 40' | 275' | 315' | 80' |
| *Colt* | 15&16 | 90' | 60.5' | 10" | 50' | 300' | 350' | 95' |
| *Palomino* | 17&18 | 90' | 60.5' | 10" | 50' | 300' | 350' | 95' |
| Babe Ruth Baseball, Inc. | | | | | | | | |
| *Bambino Division* | 5 to 12 | 60' | 46' | 6" | 25' | 200' min | 200' min | 50' |
| *Babe Ruth League* | 13-15 | 90' | 60.5' | 10" | 60' | 250' min | 250' min | 95' |
| *16-18 League* | 16-18 | 90' | 60.5' | 10" | 60' | 300' | 350' | 95' |
| American Legion Baseball | 18&under | 90' | 60.5' | 10" | 45' r | 300' | 375' | 95' |
| Little League Baseball, Inc. | | | | | | | | |
| *Tee Ball* | 5 to 8 | 60' | 46' | | 25' min. | 200' | 200' | 50' |
| *Minor League* | 7 to 8 | 60' | 46' | | 25' min. | 200' | 200' | 50' |
| *Little League* | 9 to 12 | 60' | 46' | | 25' min. | 205' | 215' | 50' |
| *Junior League* | 13-14 | 90' | 60' -6" | | 25' min. | 300' | 300' | 95' |
| *Senior League* | 14-16 | 90' | 60' -6" | | 25' min. | 300' | 300' | 95' |
| *Big League* | 16-18 | 90' | 60' -6" | | 25' min. | 300' | 300' | 95' |
| T-Ball USA | | | | | | | | |
| *Tee Ball* | 4 to 8 | 50' | 38' | | 25' min. | 125' max. | 125' max. | |

= unofficial recommendation

# Baseball Field Standards - Sheet Two

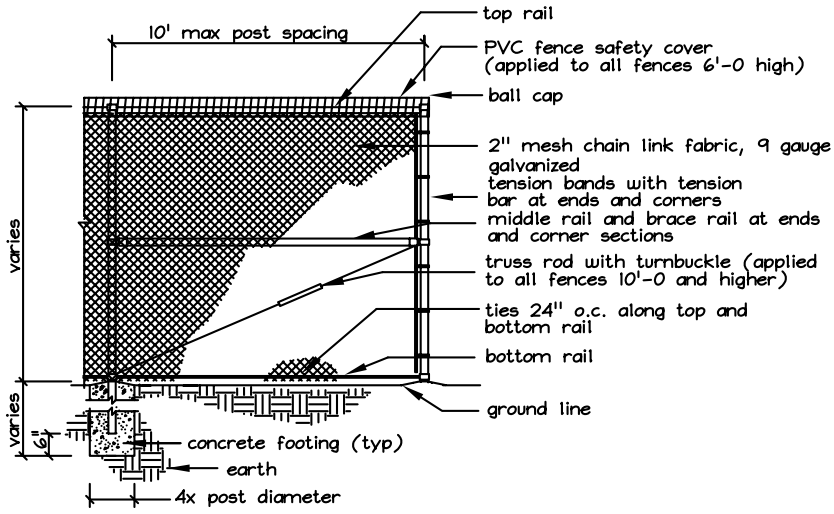
Community Park Standards

PASHEK ASSOCIATES
A Pennsylvania Corporation

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

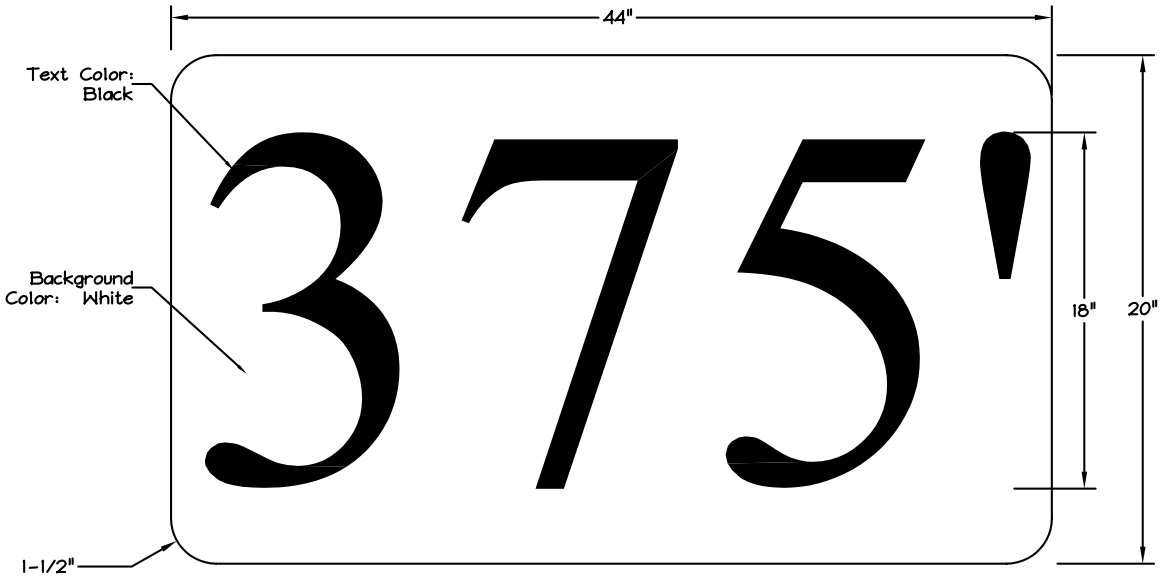



## Chain Link Fence with Safety Cover

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

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# Ballfield Details - Sheet Two

## Community Park Standards

PASHEK ASSOCIATES
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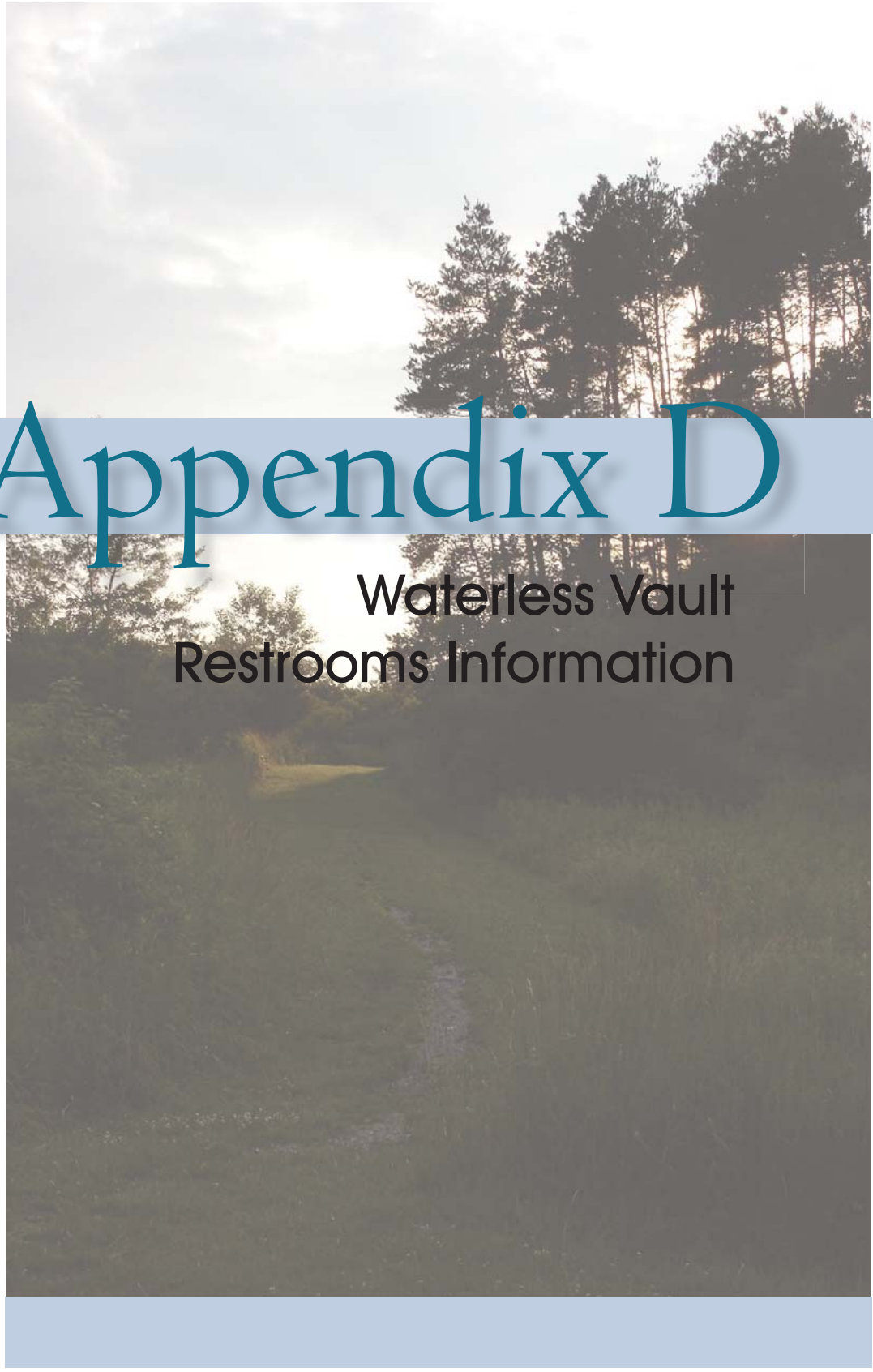

# Appendix D

## Waterless Vault Restrooms Information

# In-Depth Design and Maintenance Manual for Vault Toilets

Briar Cook, Civil Engineer
*Program Leader, Recreation*

Technology & Development Center
San Dimas, California

TE01A35
Technical Services, Recreation

## CONTENTS

## ILLUSTRATIONS

FIGURE NO.

## 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.

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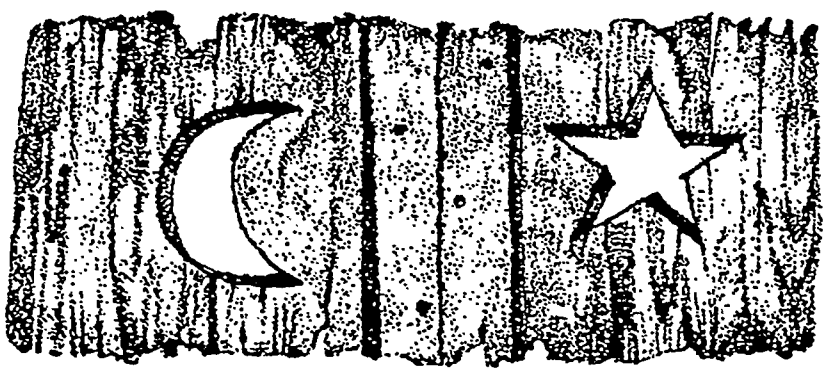
*American privies were the only toilets with a moon or star above the door. We have been told the moon meant it was for the ladies and a star would be for the gents. That way, anyone could stay out of trouble even if unable to read.*



# 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 <u>only</u> 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 <u>only one</u> 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*

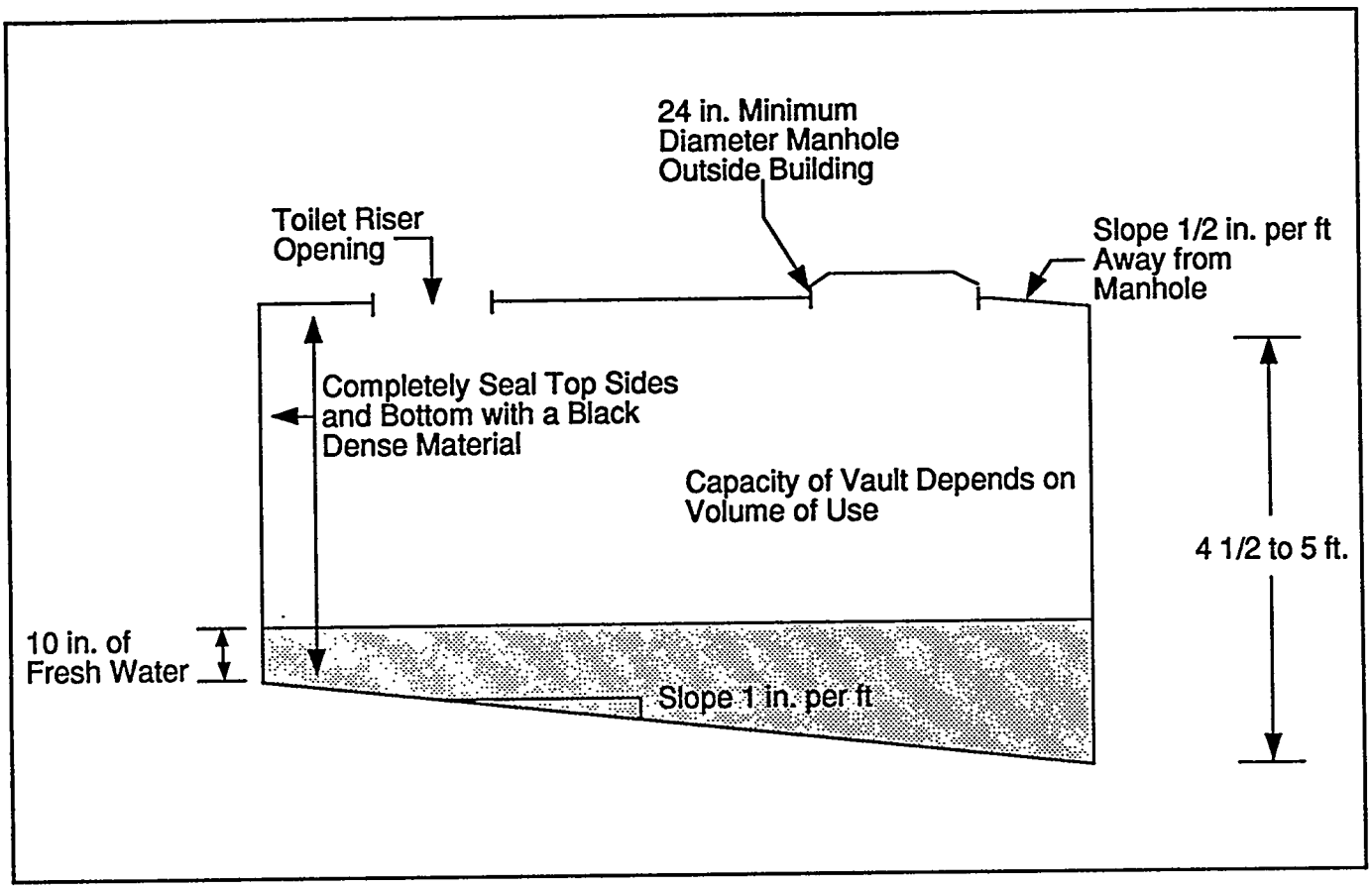



*Figure 1*

## 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 prepoured 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 <u>all</u> 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 prepoured 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.

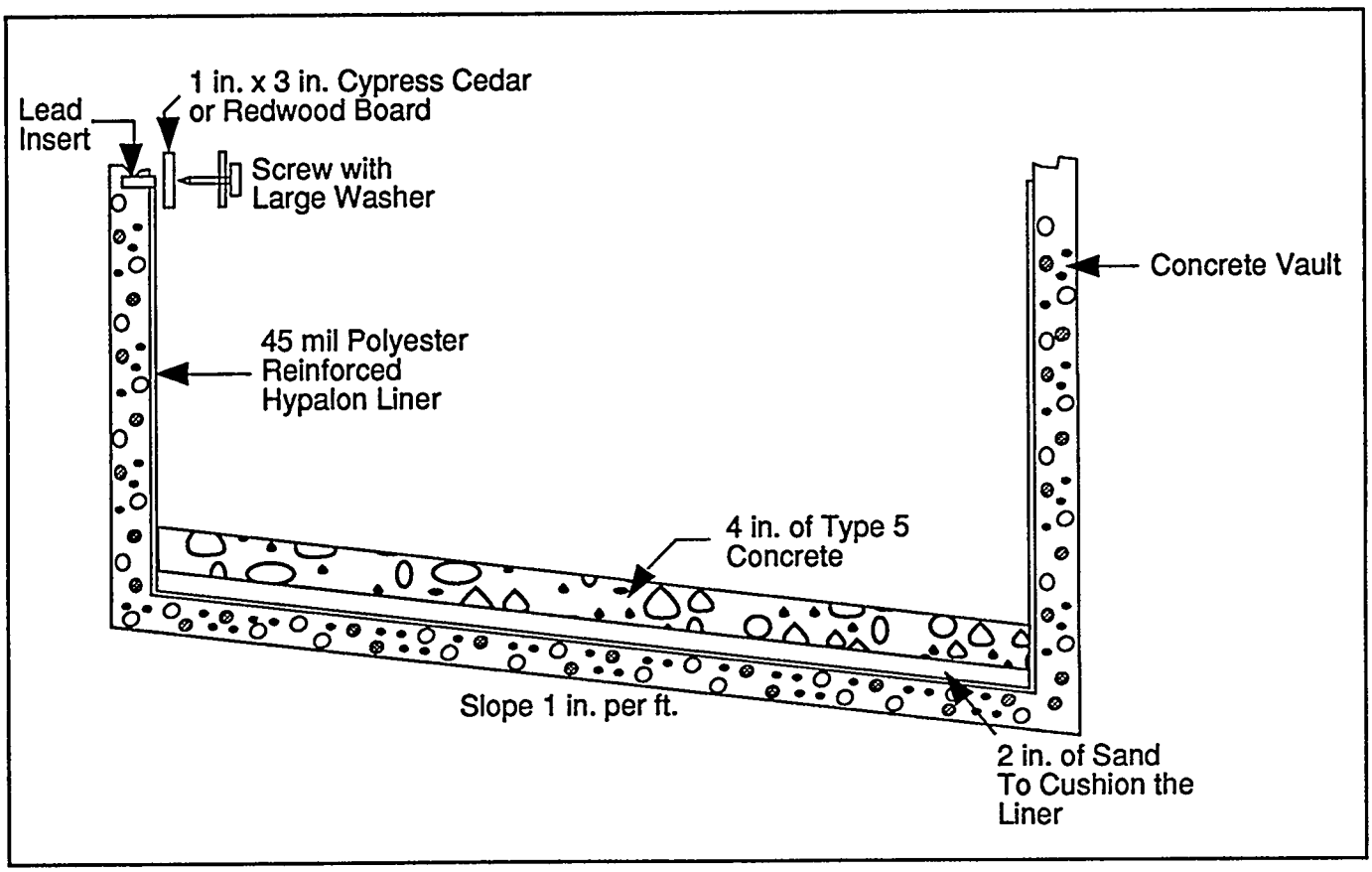



*Figure 2*

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 susceptable 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:

a. People will physiologically use more paper than they physically need.

b. 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:

a. The cost of providing more toilet paper is increased.

b. 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.

c. 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.*

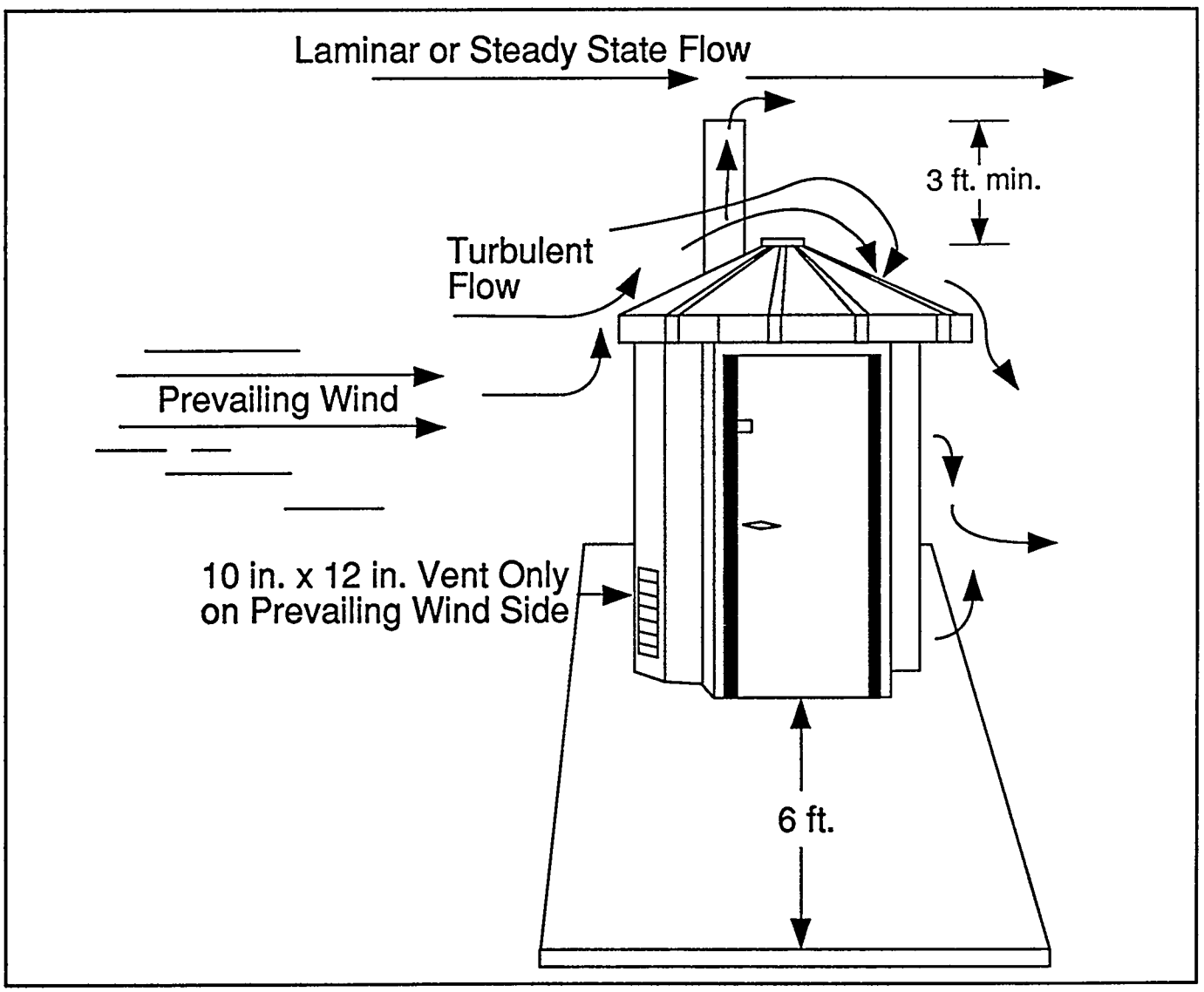



*Figure 3*

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.

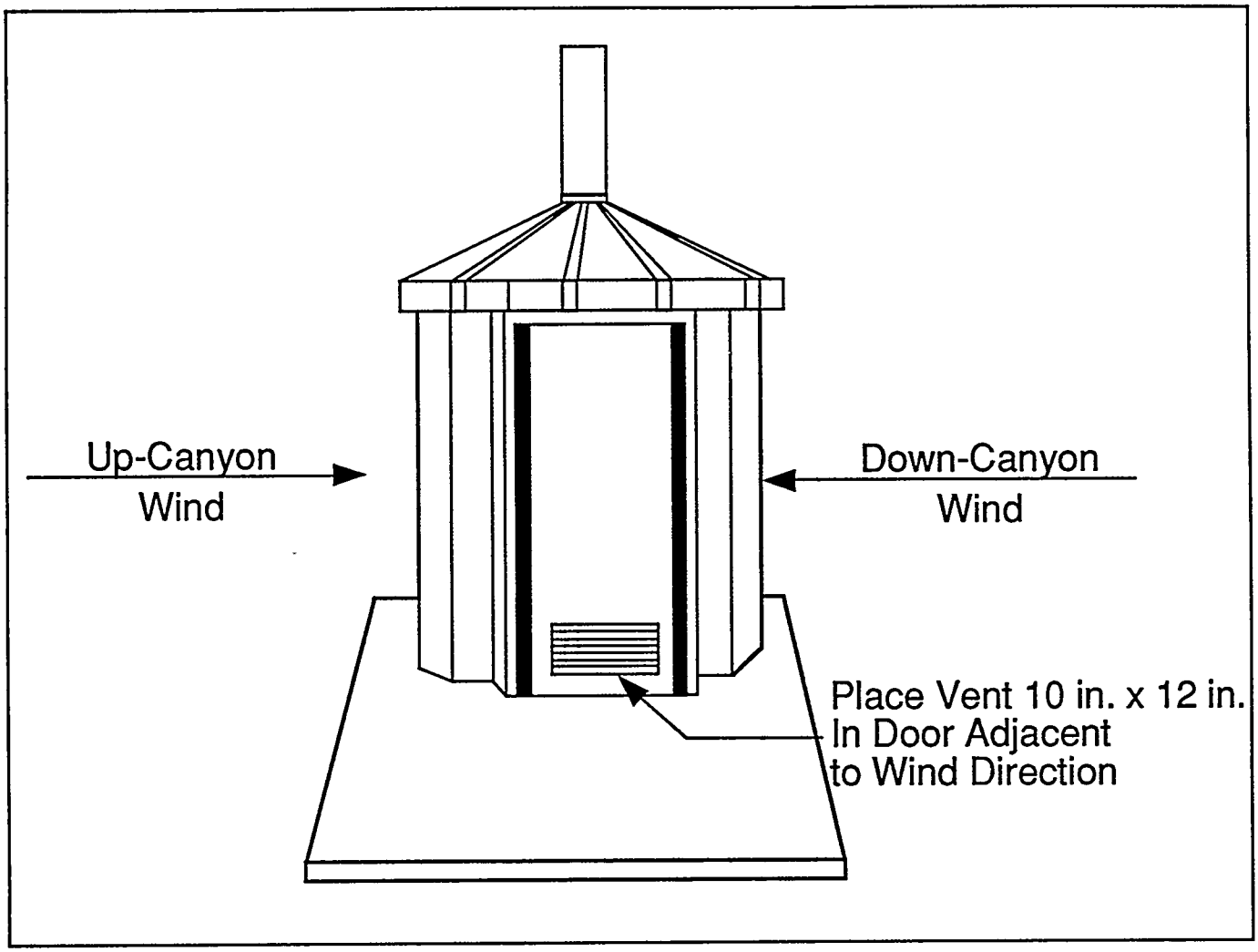



*Figure 4.*

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)

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.*)

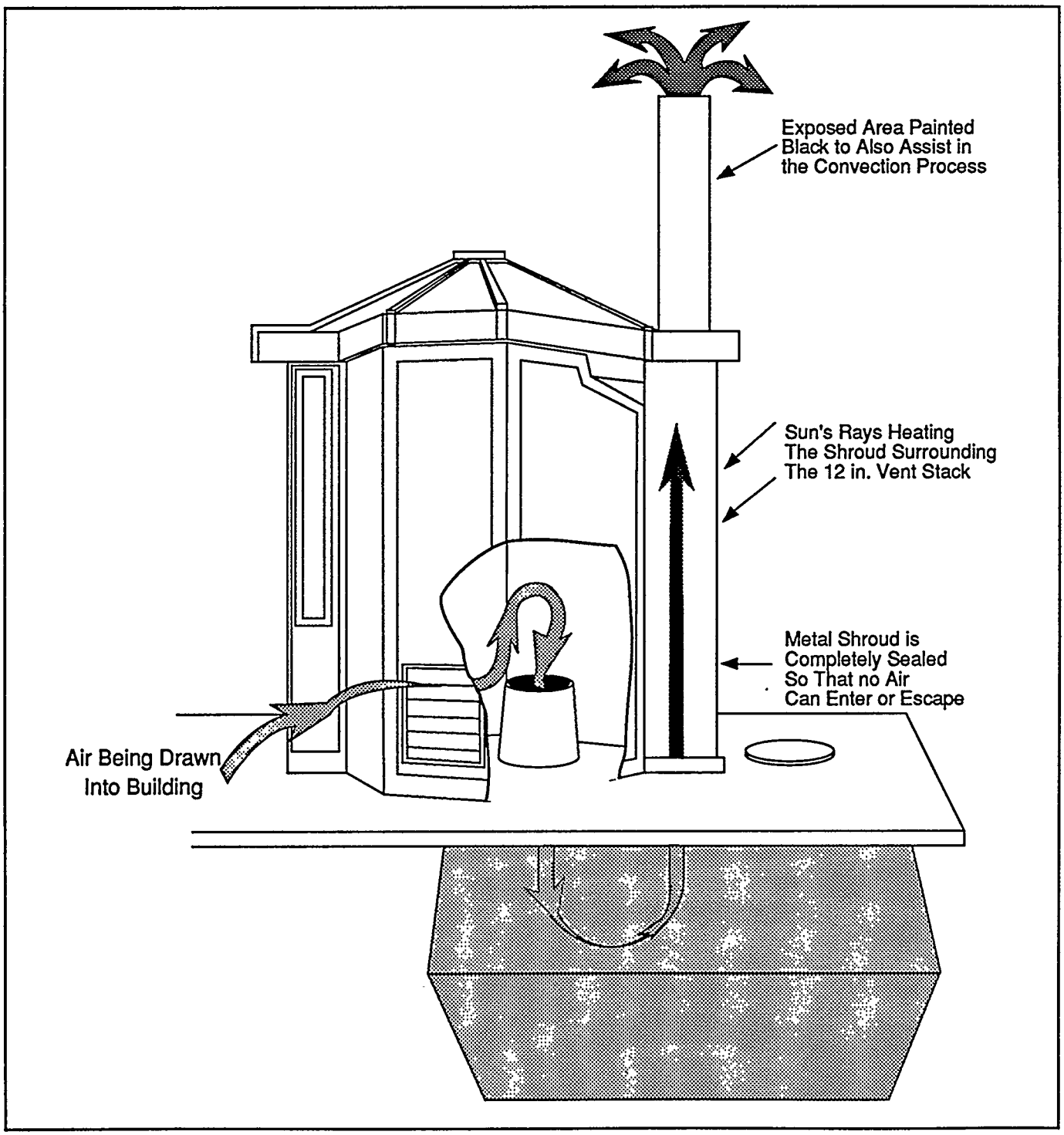



*Figure 5*

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.*)

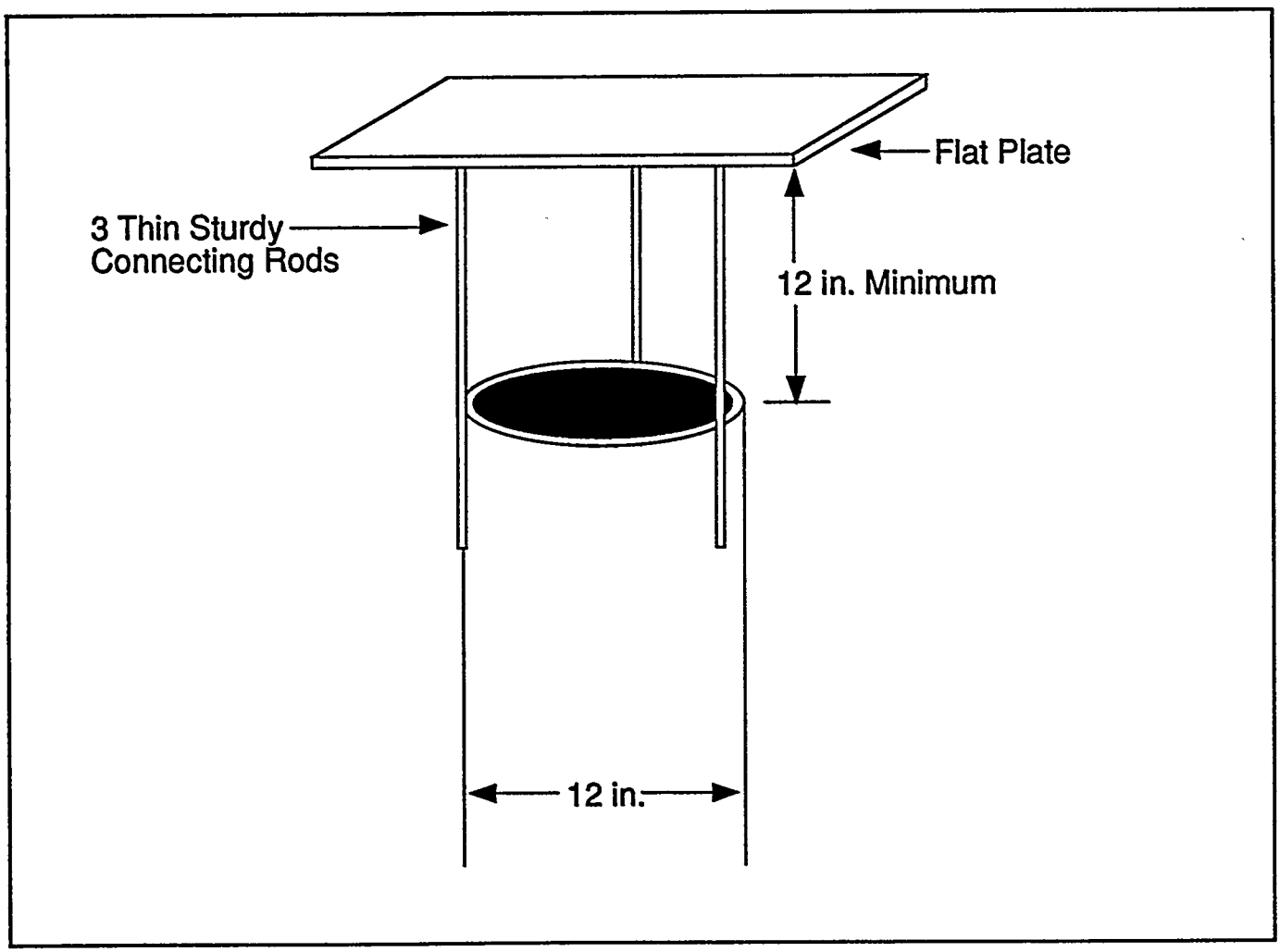



*Figure 6*

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.

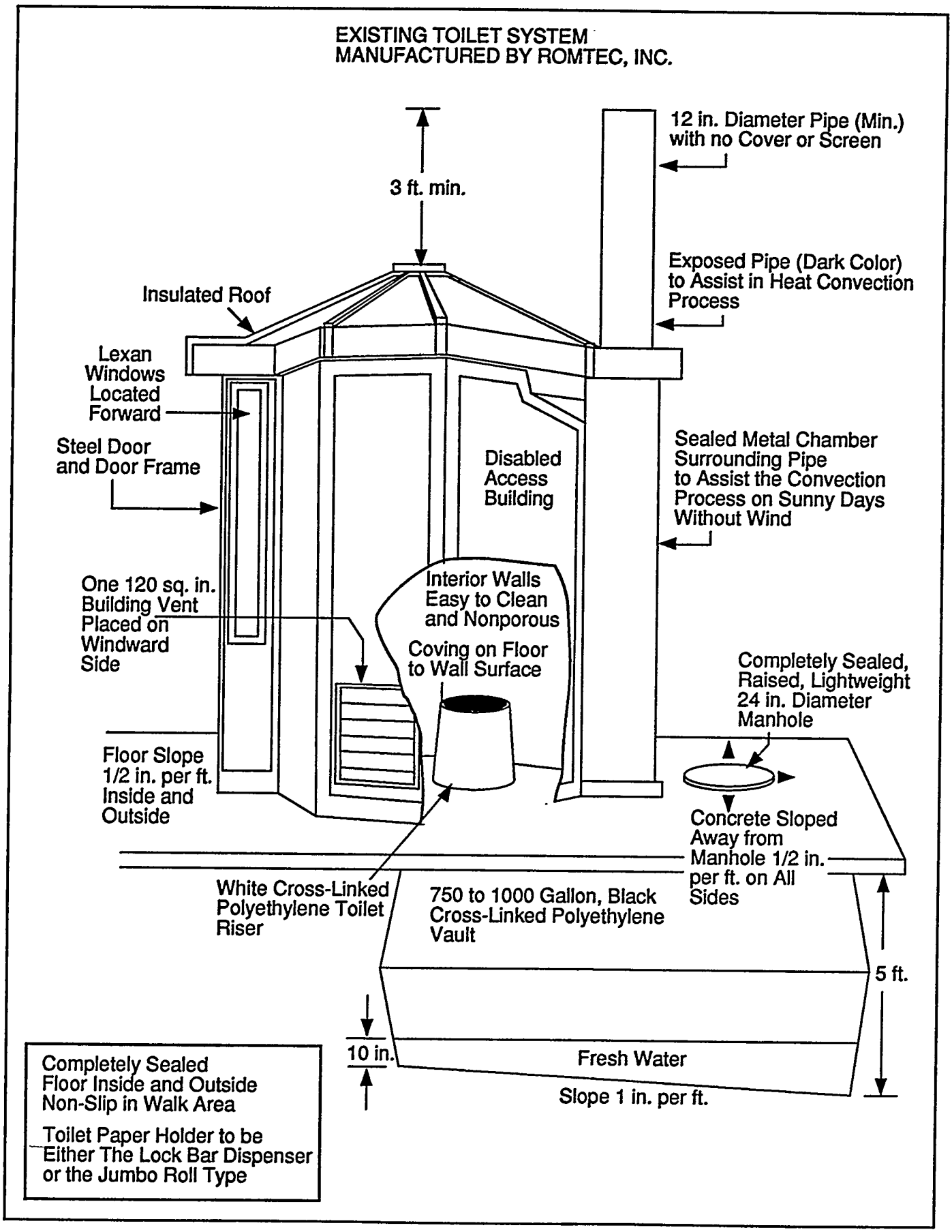

EXISTING TOILET SYSTEM
MANUFACTURED BY ROMTEC, INC.
12 in. Diameter Pipe (Min.) with no Cover or Screen
3 ft. min.
Exposed Pipe (Dark Color) to Assist in Heat Convection Process
Insulated Roof
Lexan Windows Located Forward
Steel Door and Door Frame
Disabled Access Building
Sealed Metal Chamber Surrounding Pipe to Assist the Convection Process on Sunny Days Without Wind
One 120 sq. in. Building Vent Placed on Windward Side
Interior Walls Easy to Clean and Nonporous
Coving on Floor to Wall Surface
Completely Sealed, Raised, Lightweight 24 in. Diameter Manhole
Floor Slope 1/2 in. per ft. Inside and Outside
Concrete Sloped Away from Manhole 1/2 in. per ft. on All Sides
White Cross-Linked Polyethylene Toilet Riser
750 to 1000 Gallon, Black Cross-Linked Polyethylene Vault
5 ft.
10 in.
Fresh Water
Slope 1 in. per ft.
Completely Sealed Floor Inside and Outside Non-Slip in Walk Area
Toilet Paper Holder to be Either The Lock Bar Dispenser or the Jumbo Roll Type

*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.

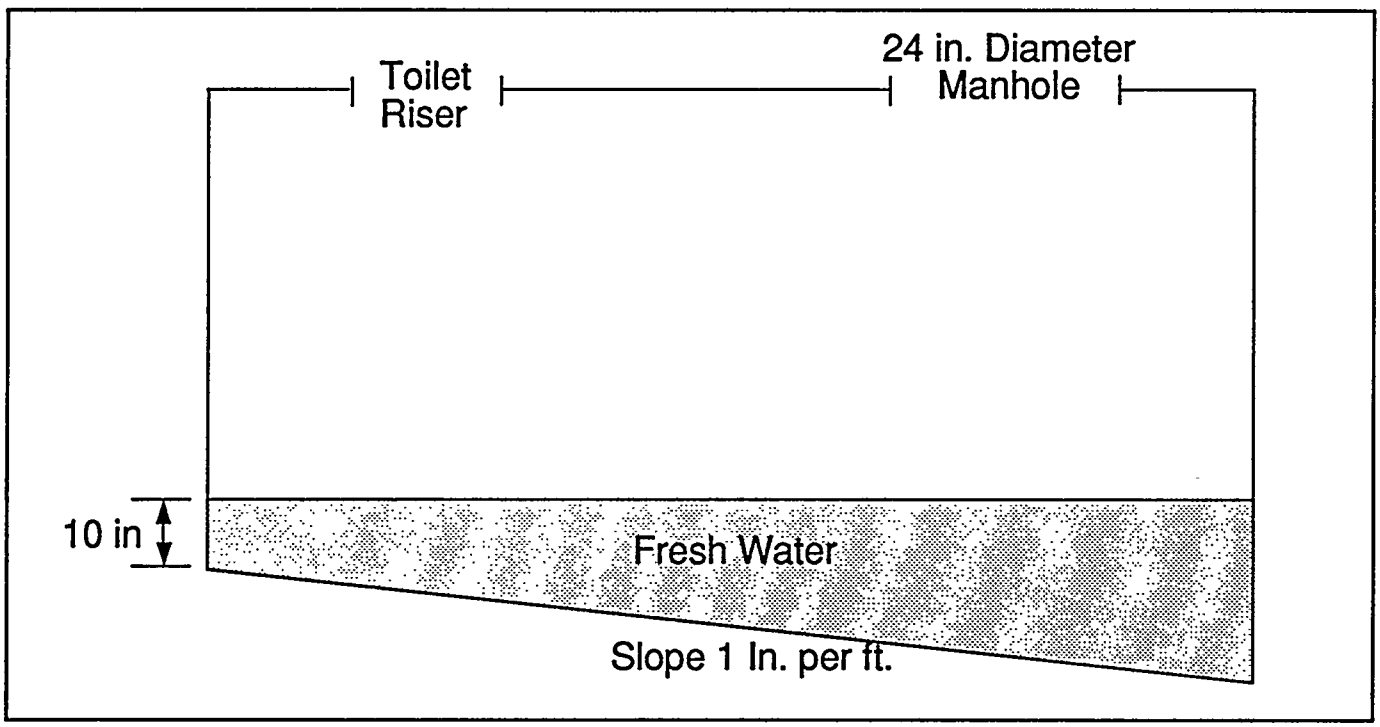



*Figure 8*

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*

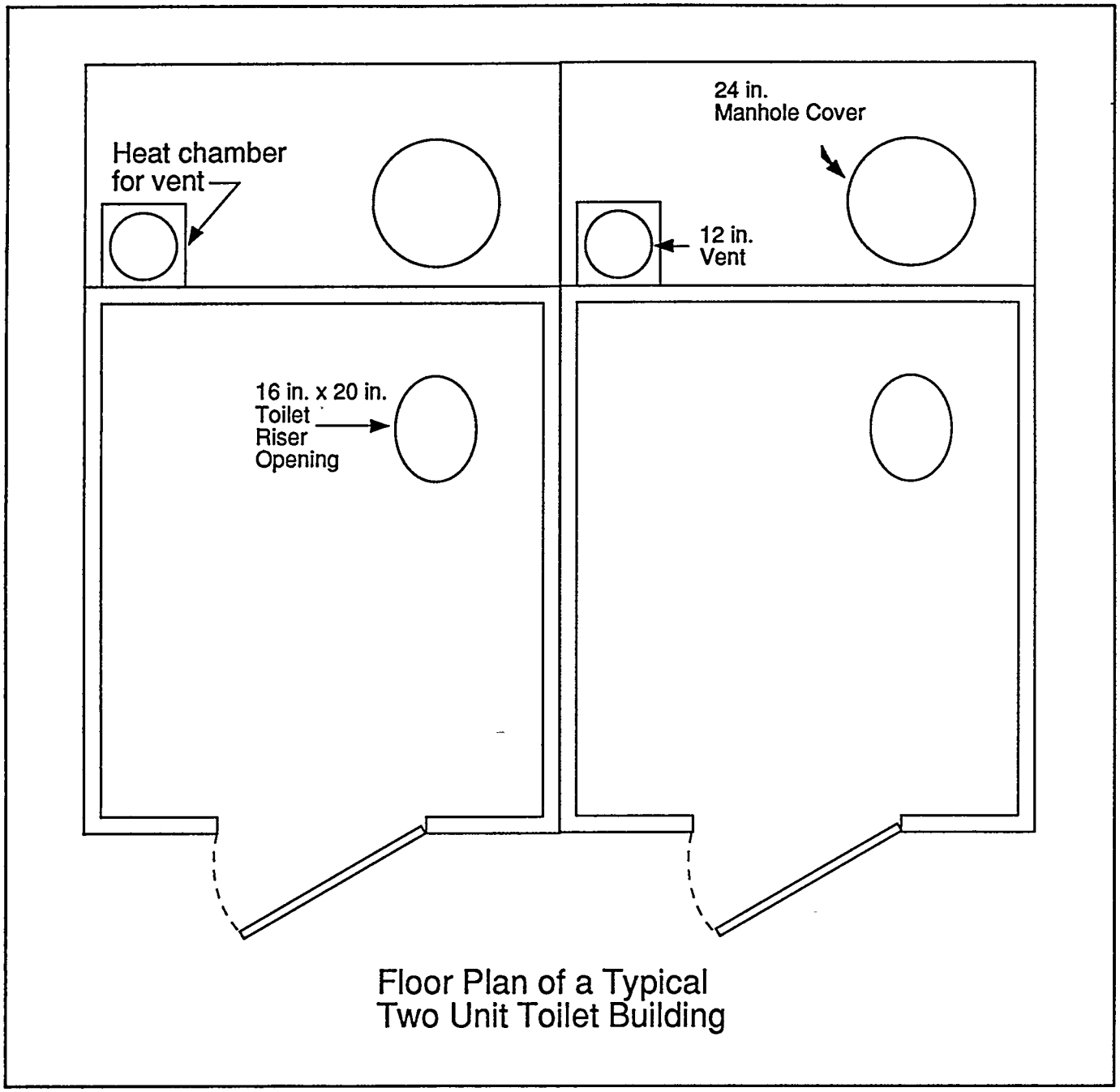



*Figure 9*

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.

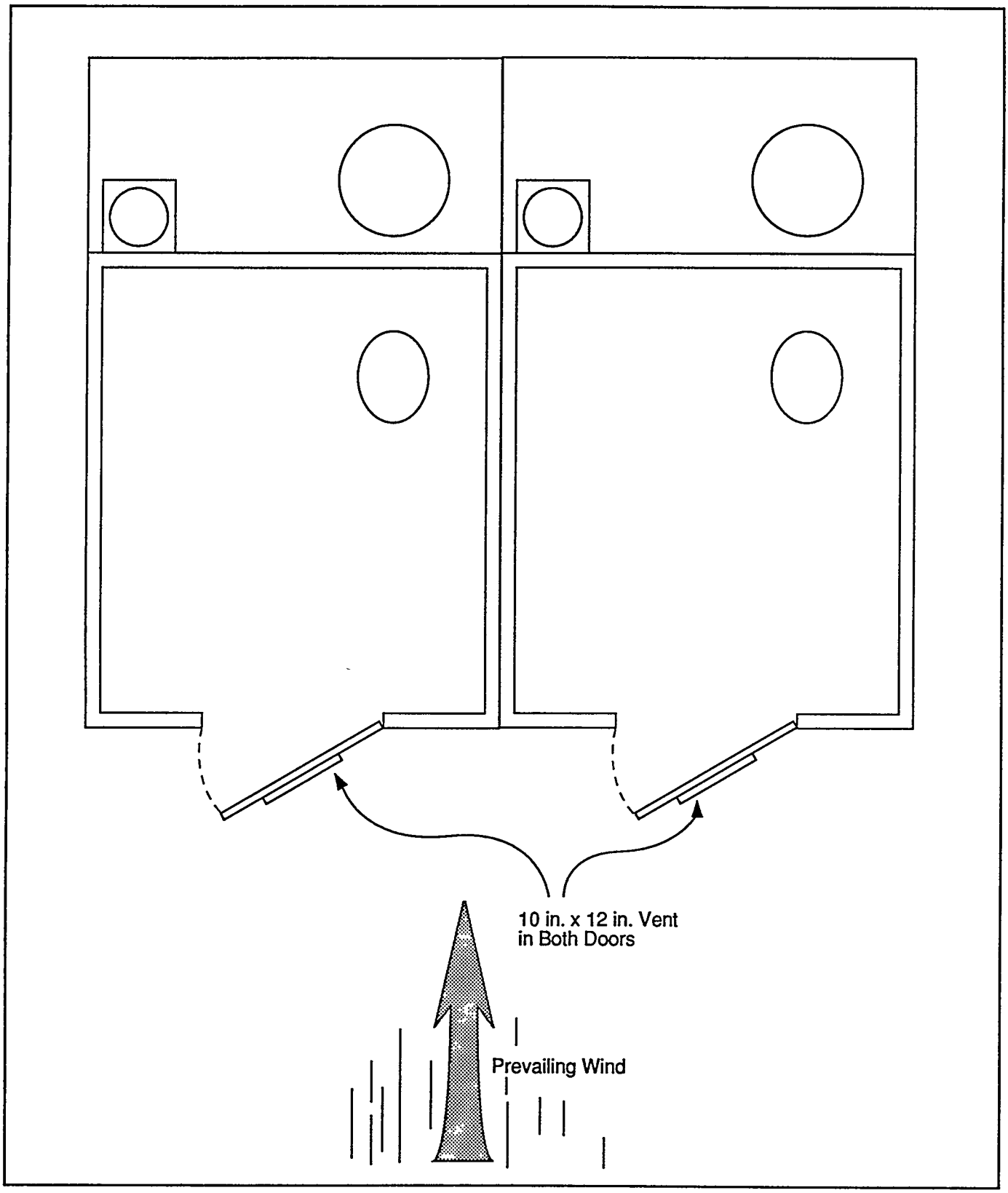



*Figure 10*

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.)

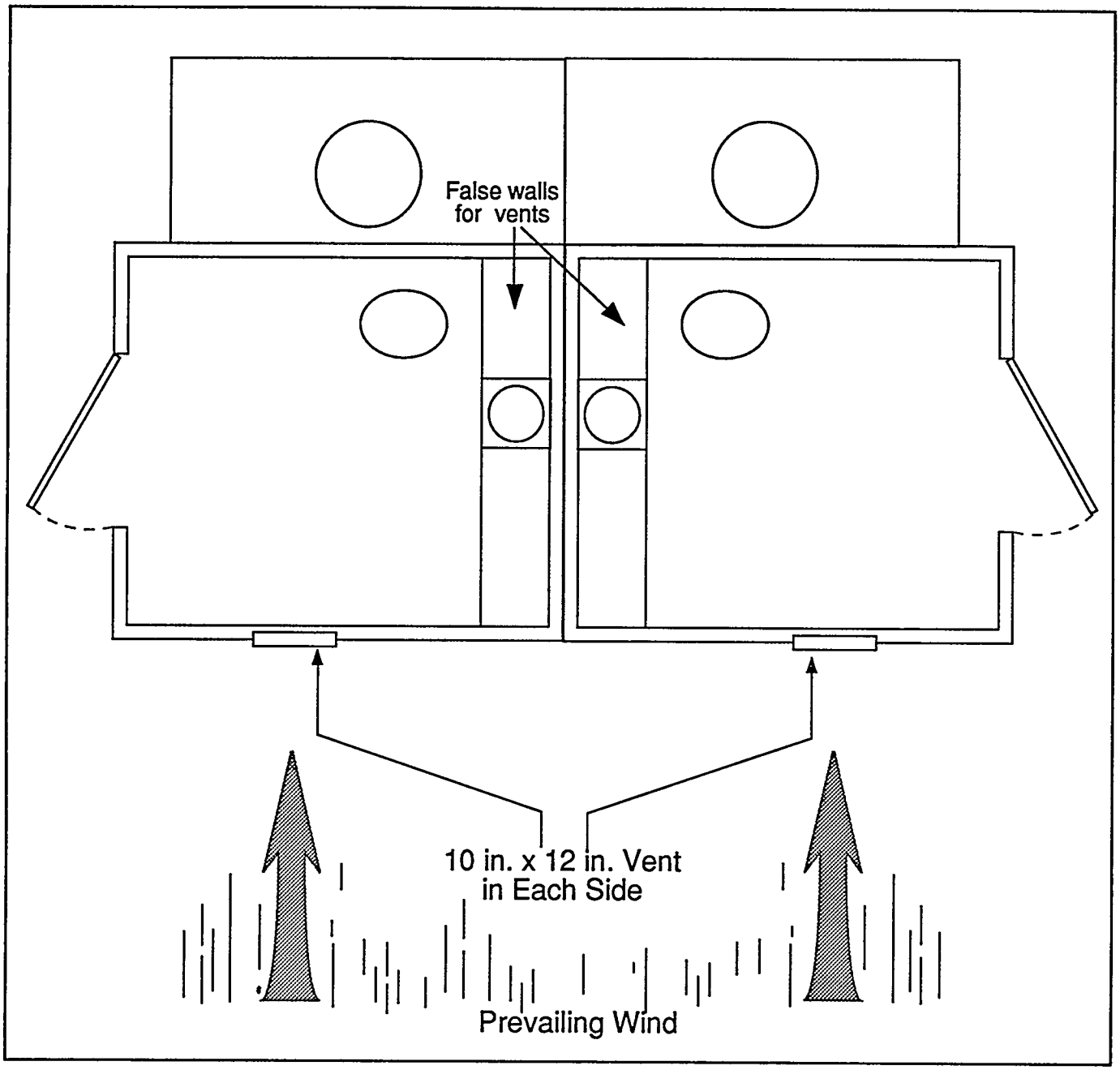



*Figure 11*

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.*)

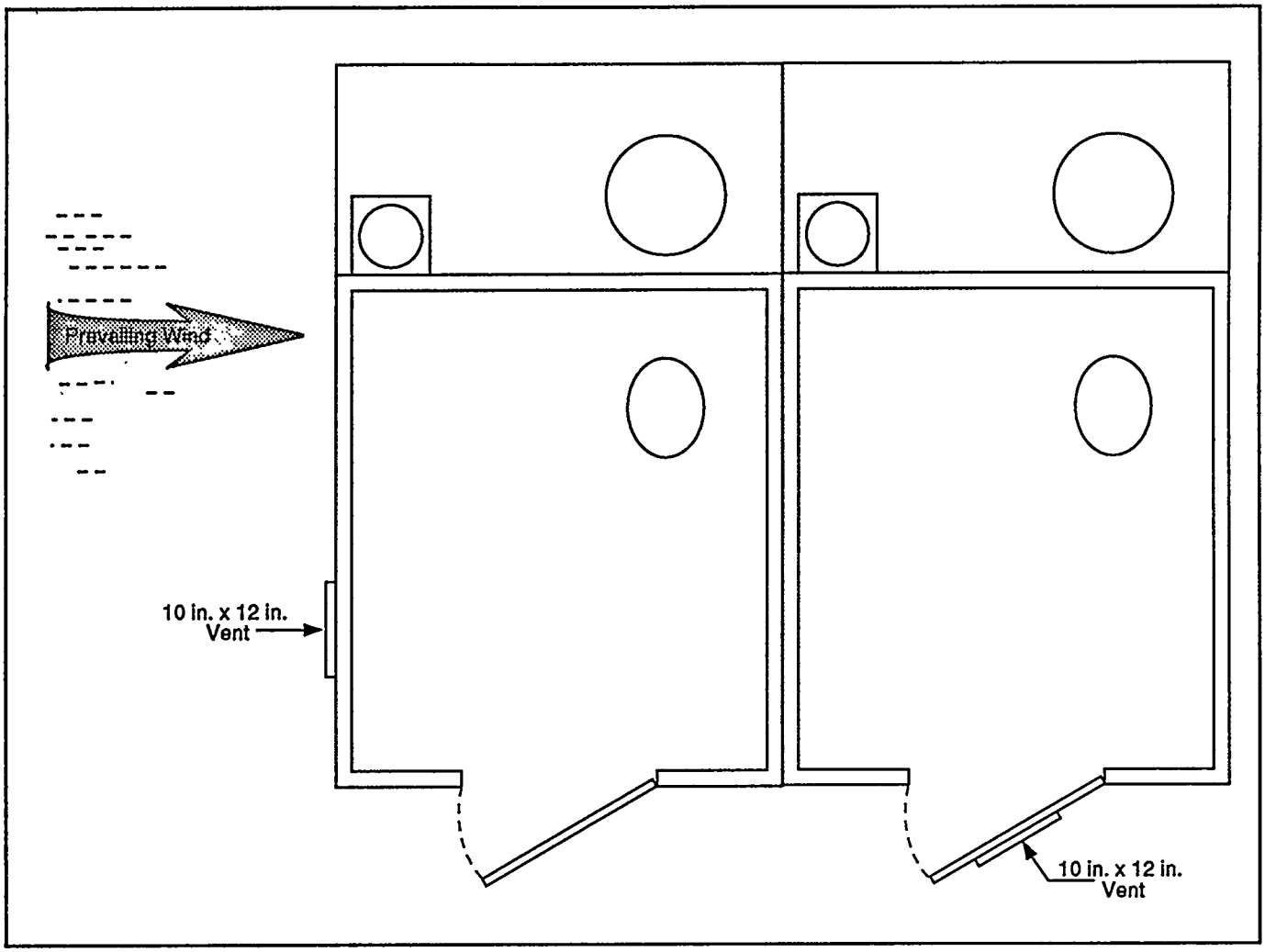



*Figure 12*

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.

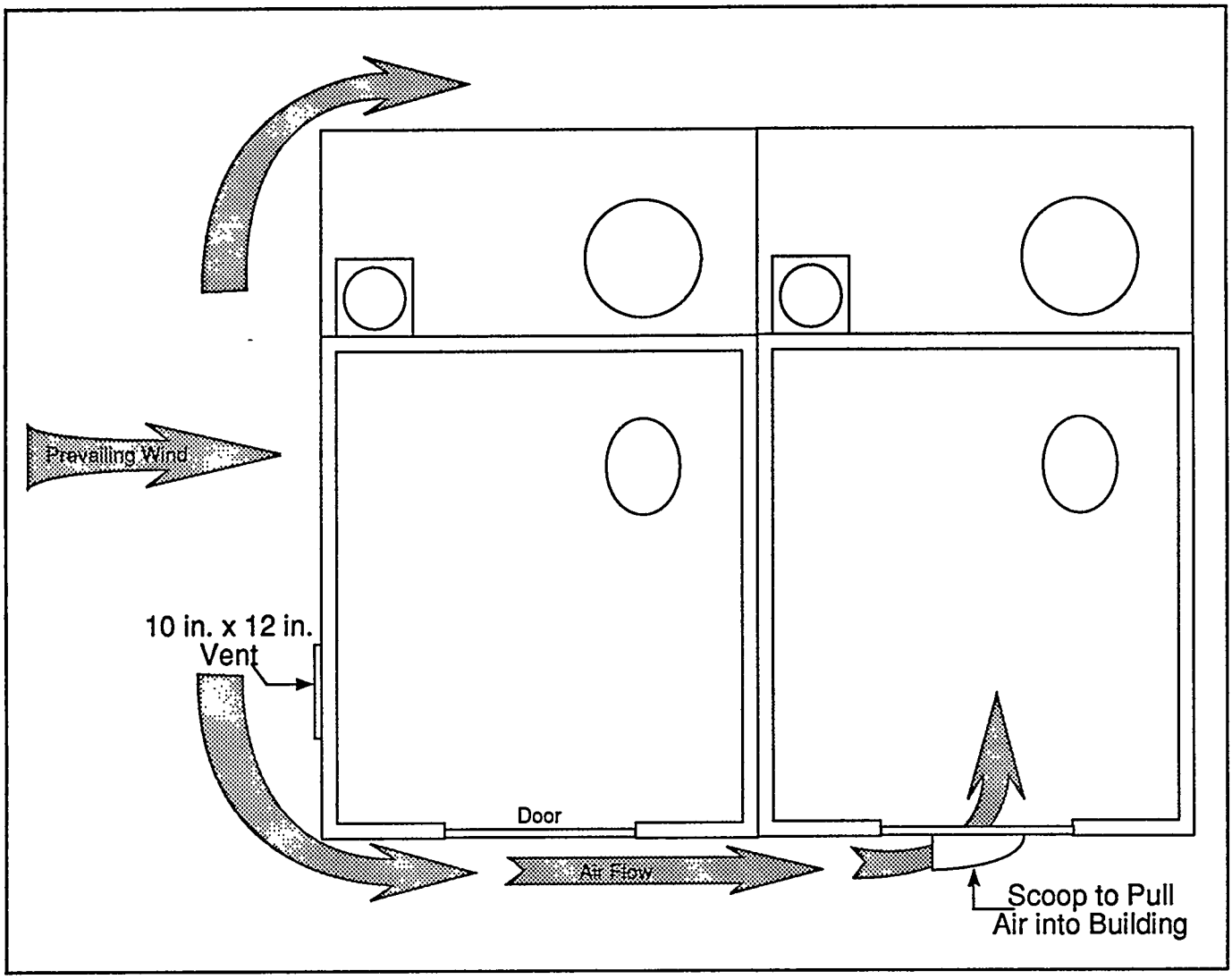



*Figure 13*

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.)*

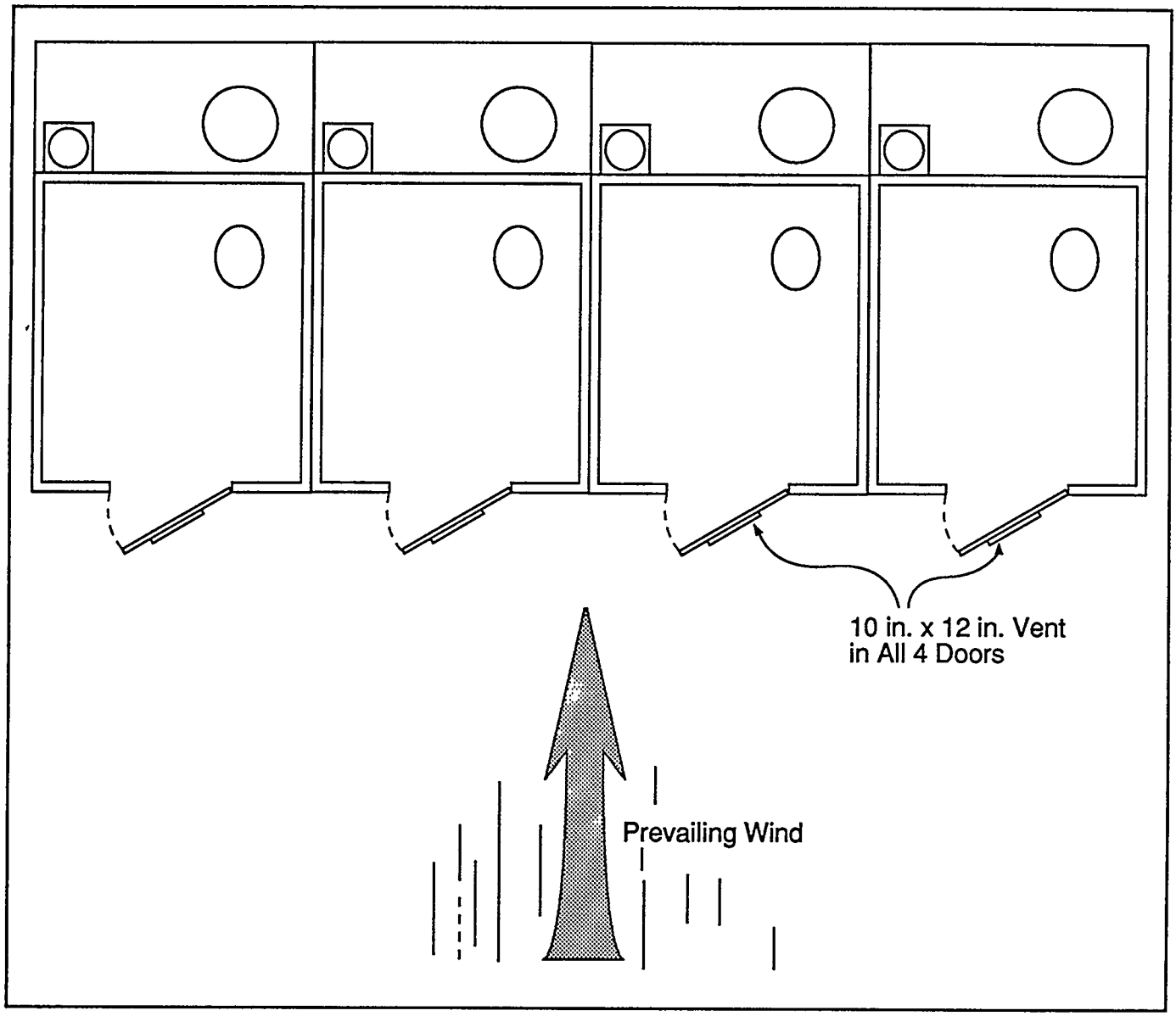



*Figure 14*

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.

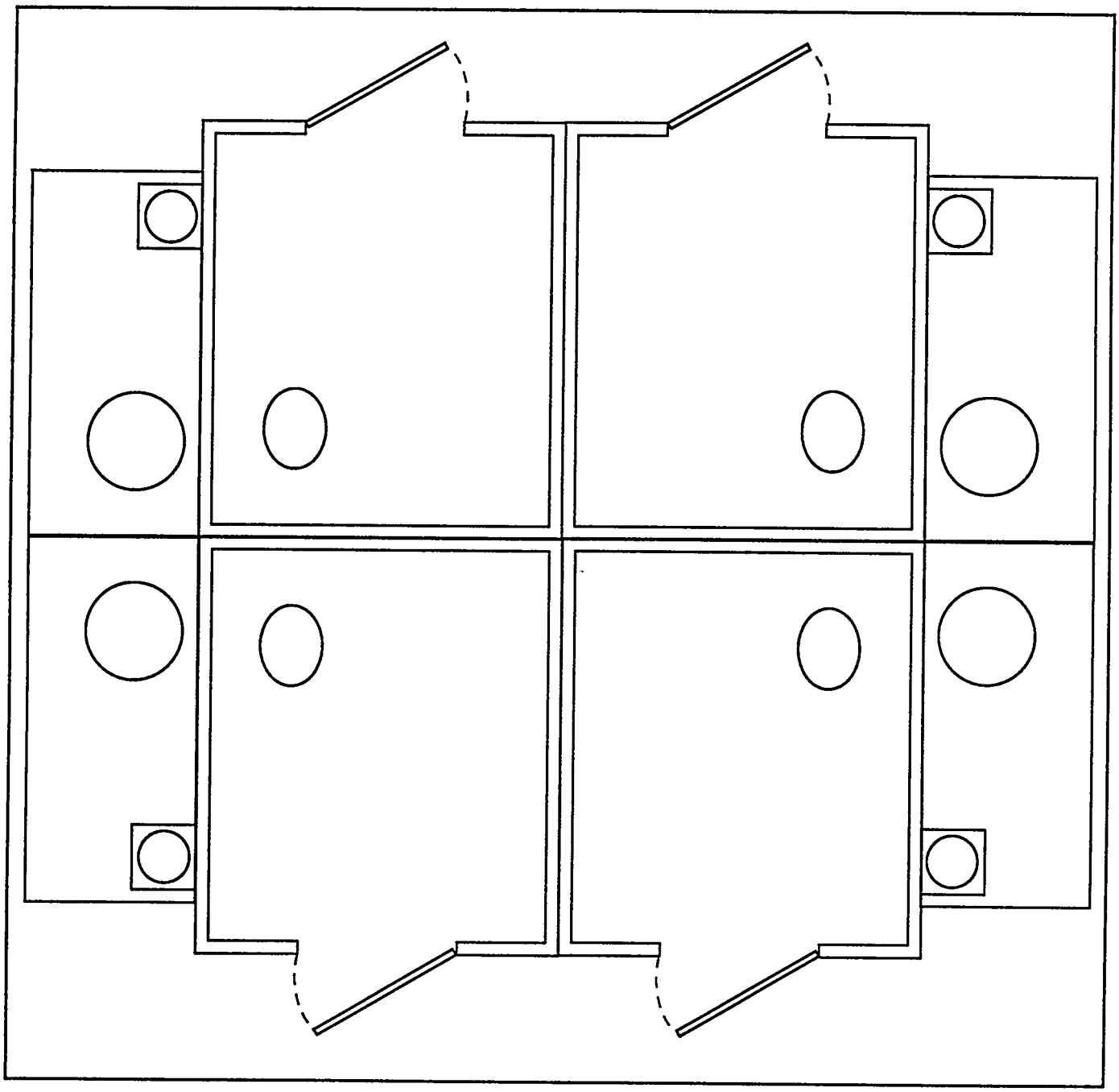


*Figure 15*

# 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

I,OOO 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.
45OO 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.<br>FARMINGTON ROAD<br>MERTZTOWN, PA 19539<br>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<br>10105 DOTY AVE.<br>INGLEWOOD, CA 90303<br>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.<br>3747 SO. INCA STREET<br>ENGLEWOOD, CO 80110<br>PHONE 303-430-7300 | "OMNITUFF" |
| PETERSON CHEMICAL CORP.<br>710 FOREST AVE.<br>SHEBOYGAN FALLS, WI 53085<br>PHONE 414-467-2471 | "TORGINOL" |
| GARON PRODUCTS, INC.<br>1924 HIGHWAY 35 CN20<br>WALL, NJ 07719<br>PHONE 800-631-5380 | "CONCORD" |
| THORO SYSTEMS PRODUCTS<br>7800 N.W. 38TH STREET<br>MIAMI, FL 33166<br>PHONE 305-592-2081 | "THOROCLEAR" |

**WALL SURFACING MATERIALS FOR BUILDING INTERIORS**

| | |
|---|---|
| KEMLITE COMPANY<br>104 NO. CHICAGO STREET<br>JOLIET, IL 60434<br>PHONE 815-727-5000 | "KEMPLY" |
| ALLIANCE WALL CORP.<br>P.O. BOX 920488<br>NORCROSS, GA 30092<br>PHONE 404-447-5043 | "PORCELAIN ENAMEL STEEL PANEL" |
| OMNITECH INDUSTRIES, INC.<br>3747 SO. INCA STREET<br>ENGLEWOOD, CO 80110<br>PHONE 303-430-7300 | "EPOXY WALL TILE COATING" |
| BURNS AND RUSSEL COMPANY<br>506 SO. CENTRAL<br>BALTIMORE, MD 21231<br>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 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 (INCLUDES OPEN FRONT, HEAVY-DUTY SEAT AND COVER) 1-9 = $113
10-19 = $110
20-39 = $107

COST FOR EXTENSION FLANGE TO CREATE A DISABLED ACCESS TOILET RISER 1-9 = $29
10-19 = $27
20-39 = $25

COST TO REPLACE THE SEAT AND COVER ASSEMBLY 1-9 = $47
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 STAINLESS 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 (INCLUDING FREIGHT) 2-9 = $19.95
10-19 = $18.10
20-99 = $16.25
100 + = $14.25

THIS DISPENSER IS DESIGNED FOR WALLS THAT HAVE GOOD SUPPORT BUILT IN 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
10-19 = $19.65
20-99 = $17.85
100 + = $15.25

THIS DISPENSER IS DESIGNED SO THE DISTANCE BETWEEN THE BOLT HOLES (16 inches) WILL MATCH THE STUDS IN THE WALLS OF OLD TOILETS.

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 STAINLESS STEEL
24-INCHES LONG = $23.64
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 porus 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 <u>why</u> 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 aesthètic 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.

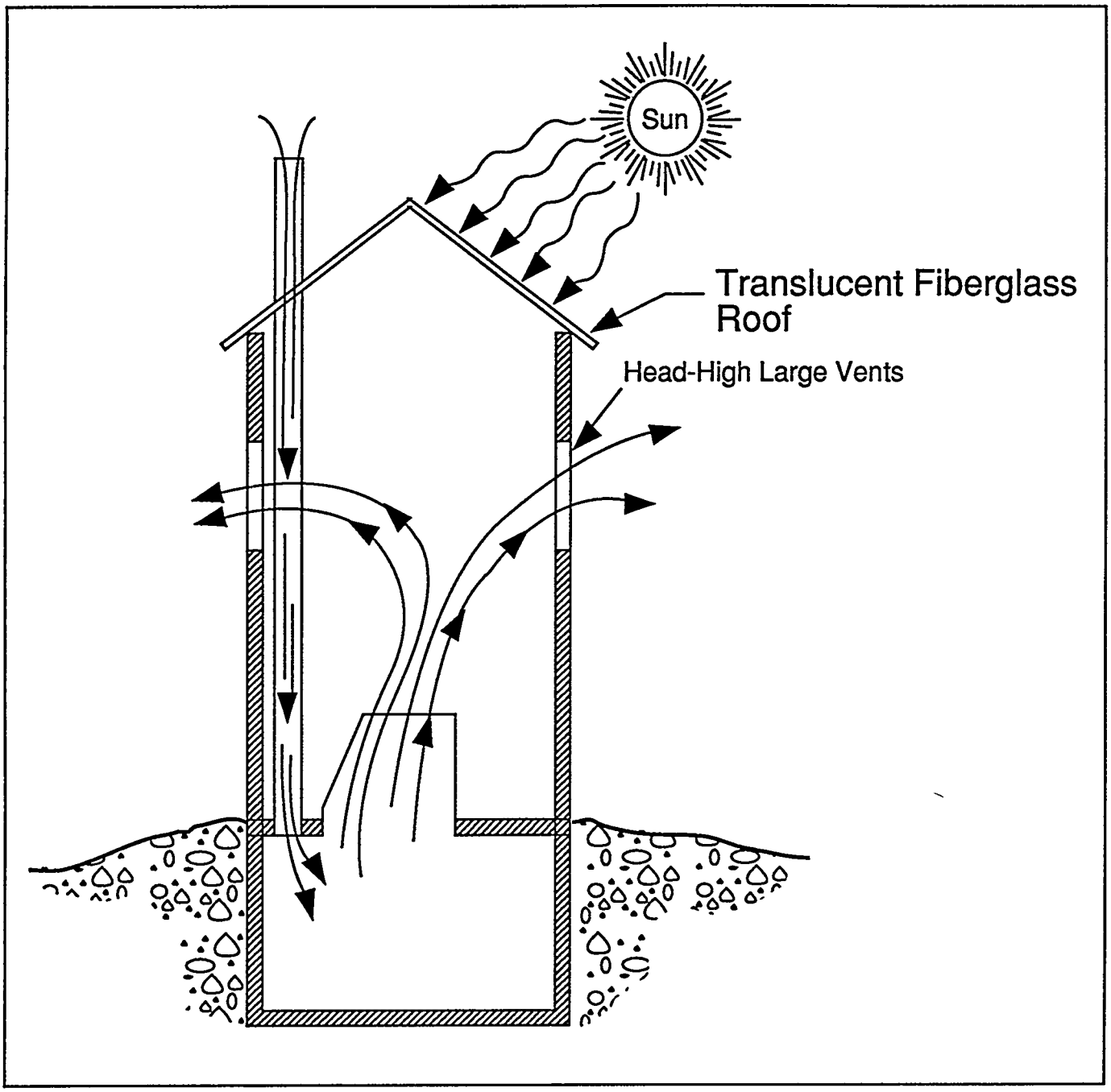



*Figure 16*

*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.

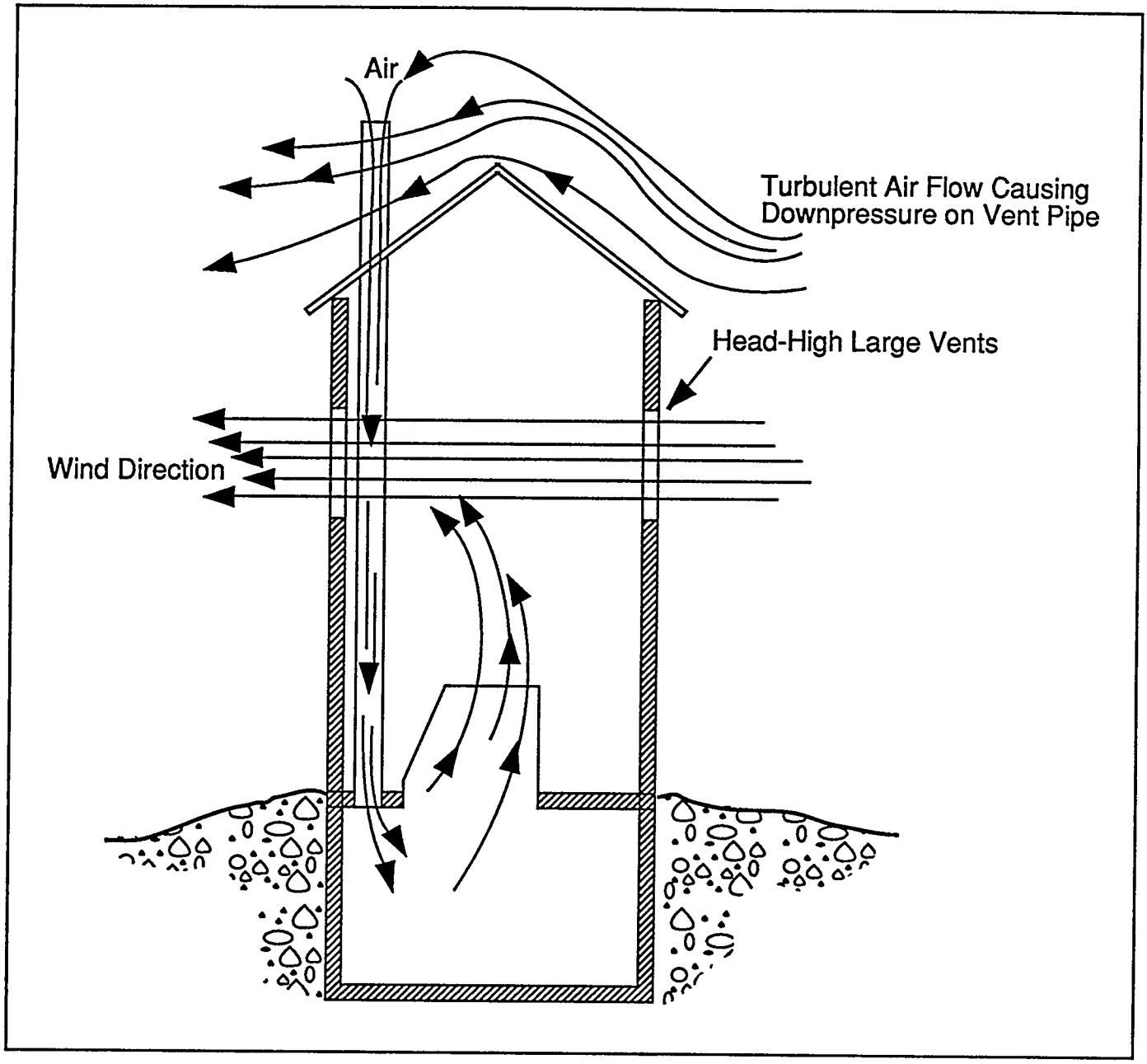



*Figure 17*

*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

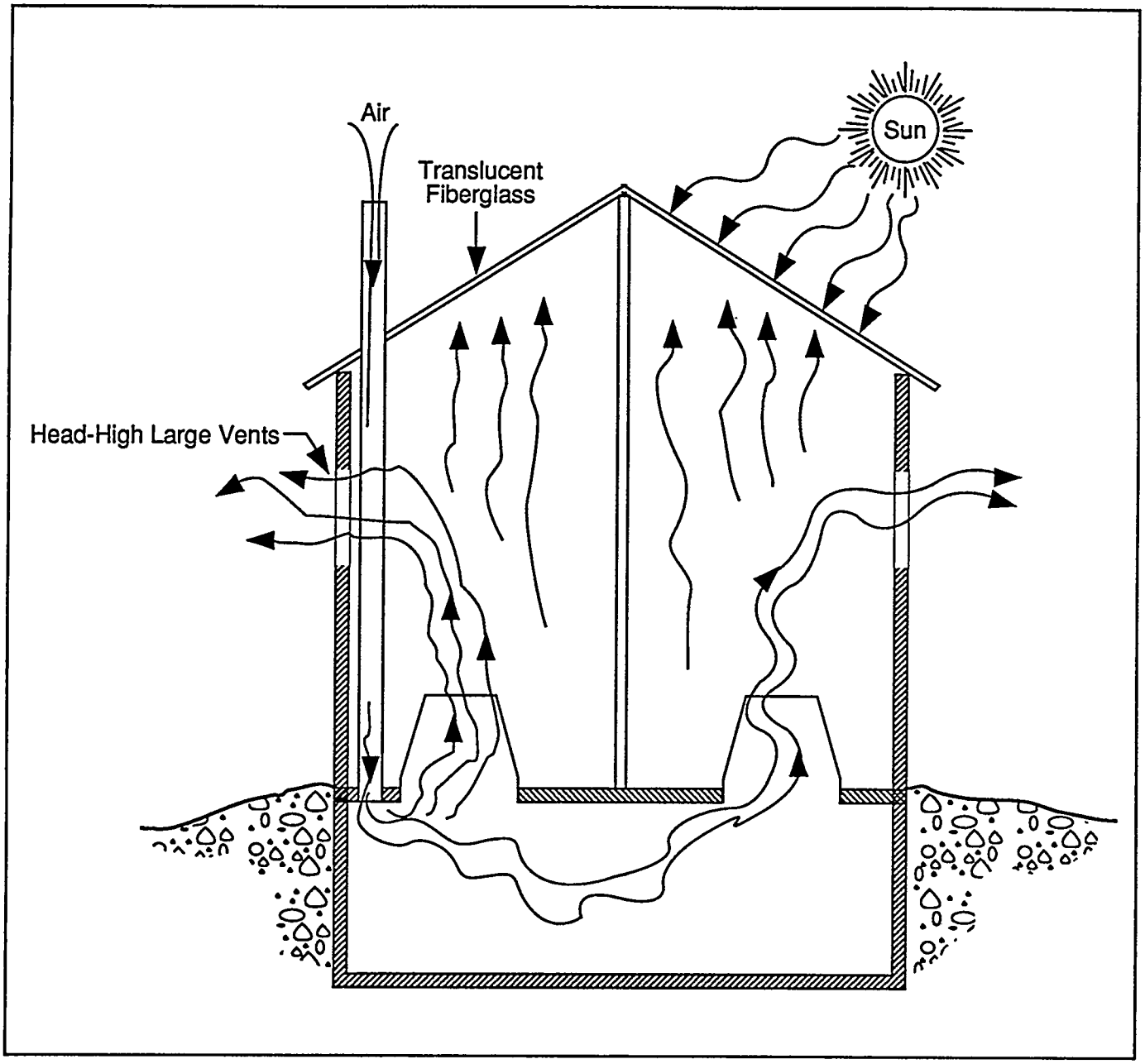



*Figure 18*

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.*

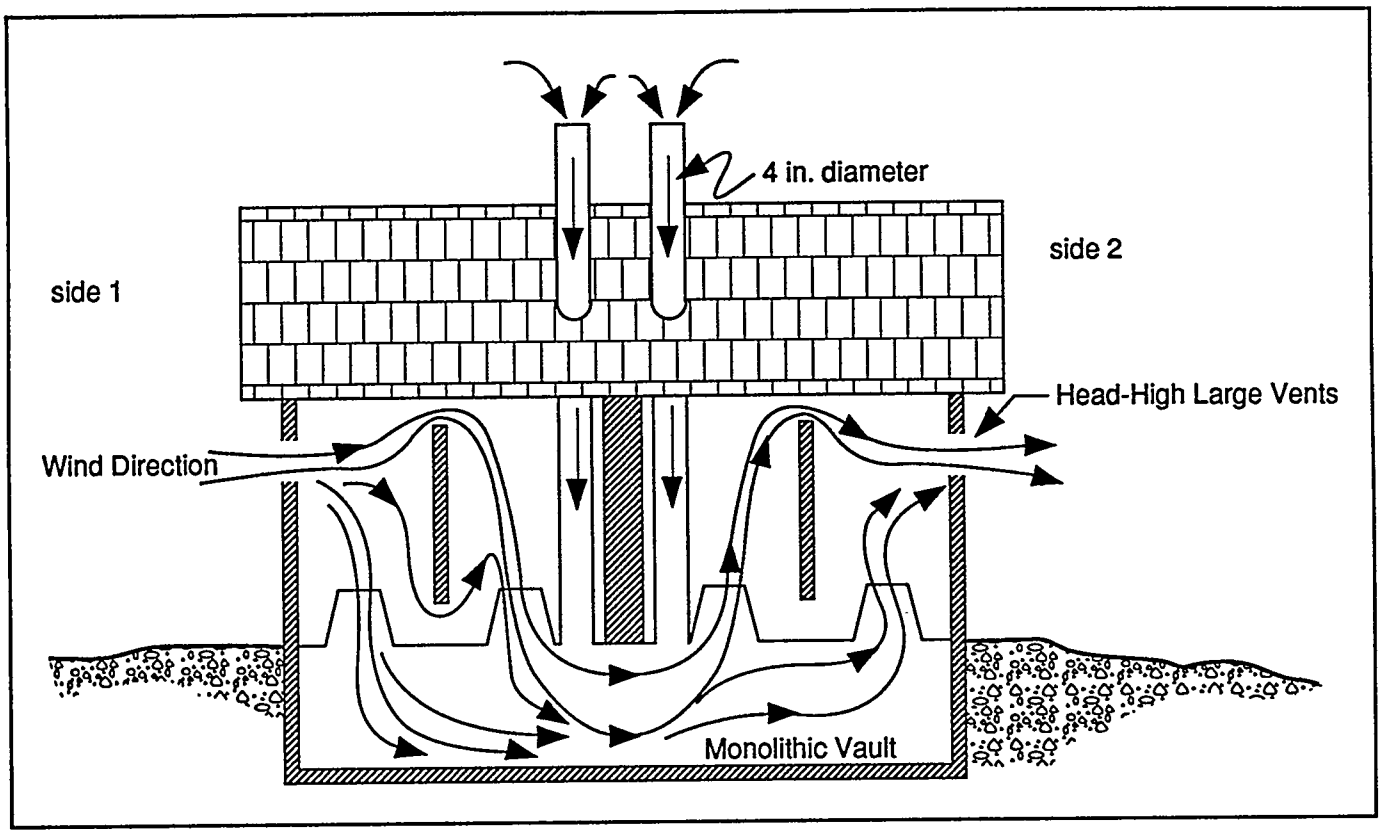



*Figure 19*

*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 riser 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, or 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



☆U.S. GOVERNMENT PRINTING OFFICE: 1991- 588-259/59310

# Introducing...
# The Next Generation
# of Odor-Free
# Waterless Restrooms

THE NATION'S RESTROOM RESOURCE

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

***New Technology:*** *Open wire mesh gables (stainless steel), utilizing fresh air currents is just one part of our redesigned air flow system.*

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.

## Vault Restrooms are a Natural for Flood Plains

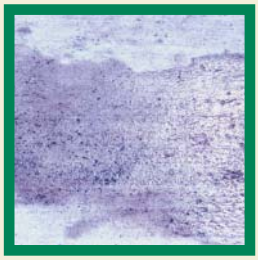
Our engineers are experienced in designing vault restrooms for flood prone areas. First, our restrooms can be elevated to a flood safe level, complete with wheel chair access ramps. Our raised exterior walls allow flood waters to flow through the building should levels reach that high.

### 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. 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.



*Typical concrete will absorb moisture and urine causing odor and disintegration of the concrete.*

*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.

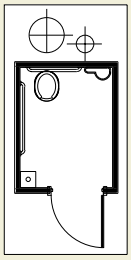
**Doors** – 14,16, or 18 gauge Steel, or Custom Stainless Steel Gates.

**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.

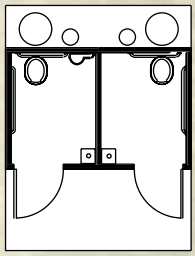
**Electrical** – Optional 100 AMP Service (or more if required), Vandal Resistant, 24,000 Hour Light Fixtures, Concealed Switches and Outlets.

**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*

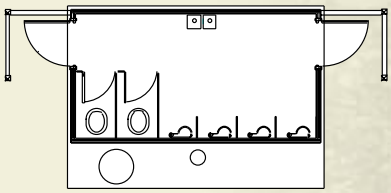


***Single User Unisex***



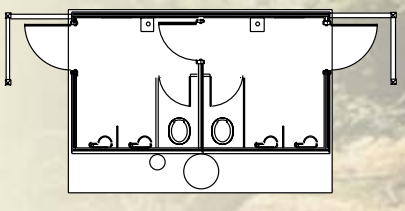
***Single User Mens and Women's***

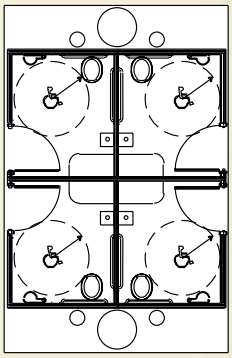
***Multi User***

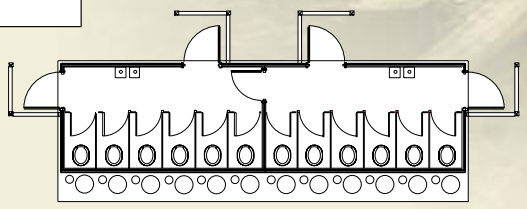


***Multi User***

***Four Family Style Restrooms***







***Multi User Men's and Women's Restroom***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