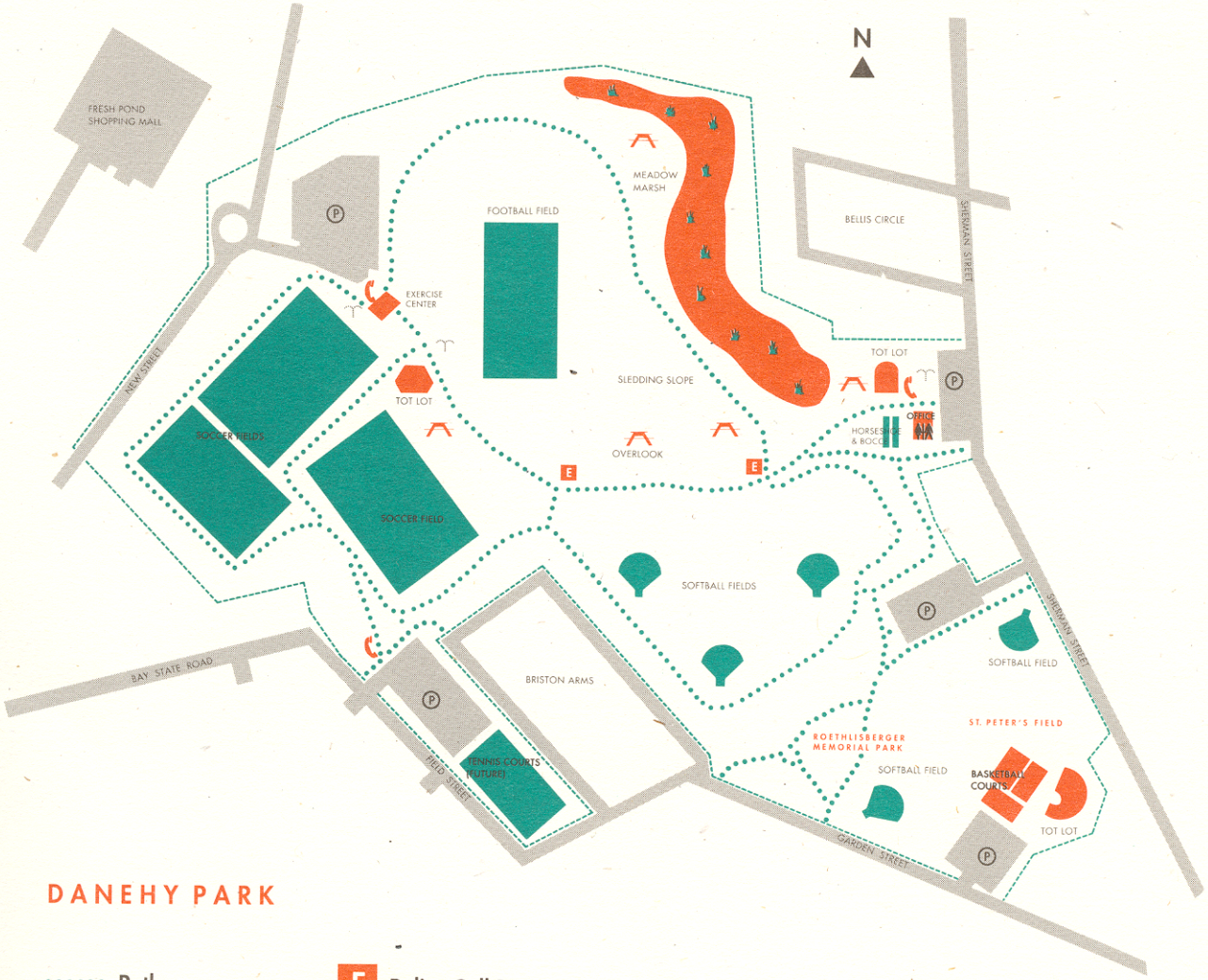
MAY0R THOMAS W. DANEHY PARK

DANEHY PARK IS A 50-ACRE RECREATIONAL FACILITY BUILT ON THE SITE OF THE FORMER CITY LANDFILL

THE LANDFILL WAS CLOSED TO ACTIVE DUMPING IN THE EARLY 1970S. THE CITY SUBSE-QUENTLY RECLAIMED WHAT WOULD HAVE BEEN A W ASTE LAND, AND TURNED IT INTO A COMMUNITY RESOURCE. AT DANEHY PARK, CITY RESIDENTS CAN ENJOY VARIOUS ACTIVITIES SUCH AS SOFTBALL, SOCCER, BIKING, JOGGING AND NATURE STUDY.



DANEHY PARK

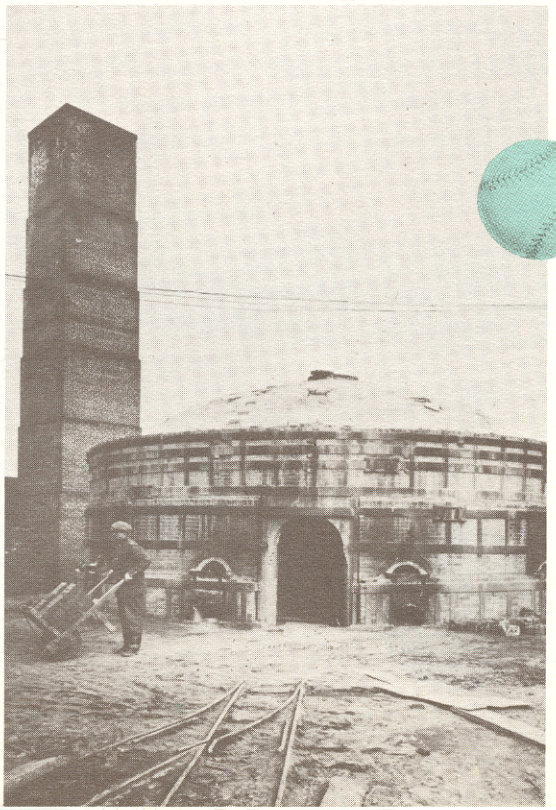
- Path
- Pay Telephone
- Picnic Area
- Police Call Box
- Drinking Fountain
- Parking

OPEN SPACE IN AN URBAN SETTING

Danehy Park, one of Cambridge's most valuable resources, offers its residents the opportunity to enjoy a variety of recreational activities in the midst of a busy urban setting. With a population of approximately 95,800 persons residing in a 6.26 square mile area, Cambridge is one of the most densely populated cities in the United States.

Residents of cities often have limited access to recreational opportunities outside of the immediate neighborhood. City parks provide the only close-to-home urban open recreation space available to city neighborhoods. Open space is valuable in an urban setting quite simply because it is scenic and helps create a pleasant surrounding for residents and visitors, and also because of its recreational uses such as walking or bike riding, picnicking or playing softball or soccer.

Prior to the development of Danehy Park, Cambridge had 67 parks and 248 acres of open space. The development of the former landfill has increased the city's open space by 20%. As a result, recreational programs and opportunities have significantly expanded.



THE LAND

Danehy Park is built on the site of the former City landfill. Originally, the land was predominately clay, and beginning in 1847, the clay was extracted to manufacture bricks. New England Brick Company used this site until 1952. The result was a deep clay pit into which the City dumped its trash.

September 1990
Grand Opening

1988 - 1990
Development of the park

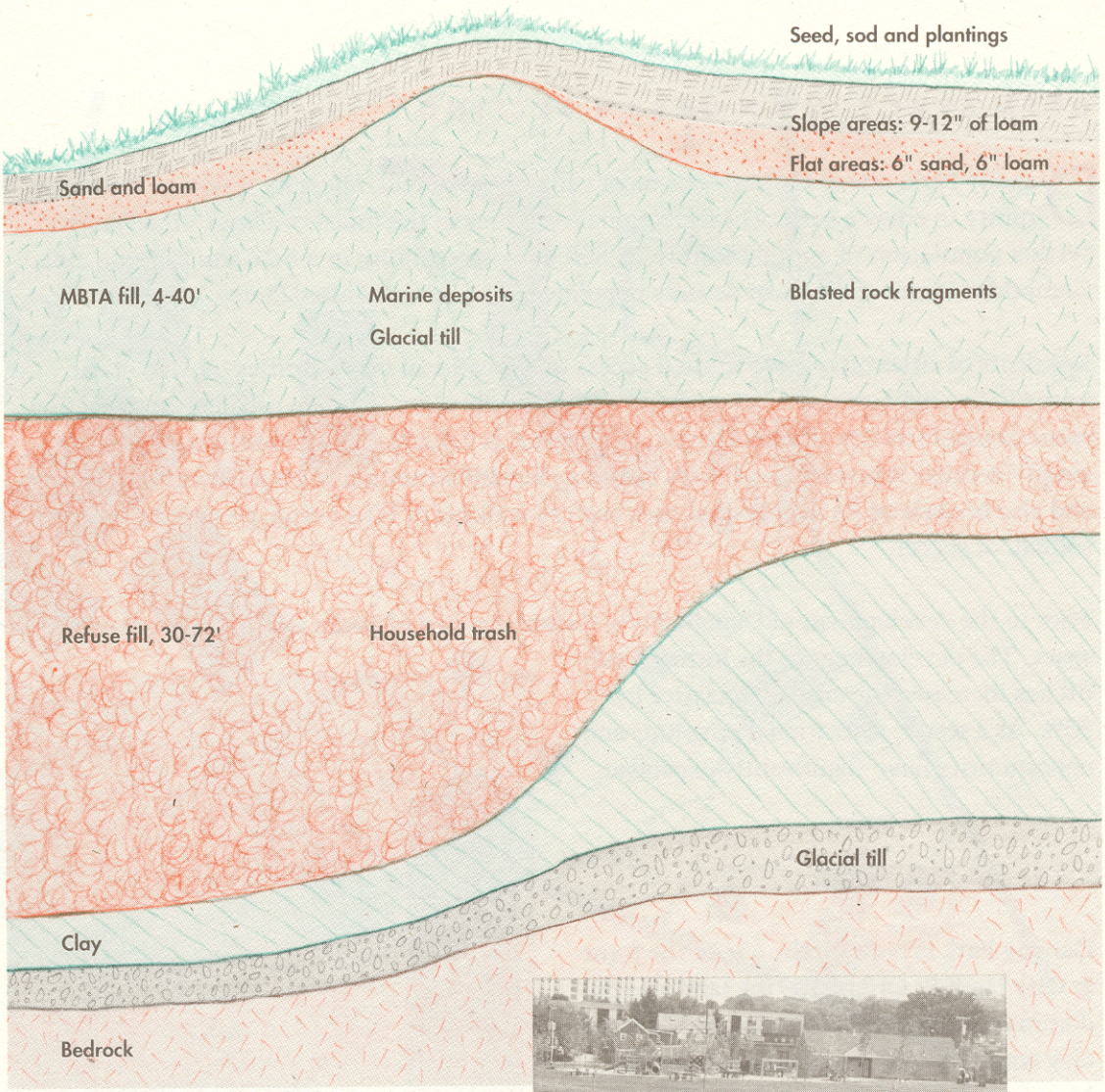
1978 - 1983
Used by MBTA during Red Line extension

1971
Closed to active dumping

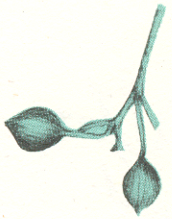
1952 - 1971
Used as the Municipal landfill

1847 - 1952
Excavated by NE Brick Co.

Continental Glaciation (the Wisconsinan)



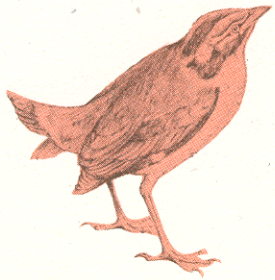
Dumping at this site began in the early 1950s. It is fortunate that the Cambridge dump site was a clay pit, since clay is an impervious substance that acts as a liner, minimizing the movement of contaminants beyond the dumpsite.



There is one major difficulty involved in building a structure on top of a landfill. A landfill settles (or sinks) over time as weight is added to the top of the trash and as the trash decomposes. The magnitude of the settlement depends on two factors: the thickness of the layer of trash, as trash is highly compressible; and the thickness of the added fill or load on top. The rate of the initial short-term settlement is rapid and largely controlled by the rate of filling. The rate of long-term settlement is relatively constant and predominately affected by the thickness of the trash. Settlement conditions delay the construction of hard-surfaced courts and pavements until a future time when settlement is diminished.

In the late 1970s and early 1980s, the City entered into an agreement with the Massachusetts Bay Transportation Authority (MBTA) to use this area as a construction staging area when it was extending the Red Line rapid transit system through Cambridge. Materials from the tunnel excavation were deposited on top of the trash layer. This resulted in the placement of 4-40 feet of fill over the entire 50 acre landfill. In total, over 2 million cubic yards of material was added to the top of the site. An additional 1 to 2 feet of sand and loam was added during the development of the park. The MBTA filling operations quickly compressed the trash layer and hastened the settlement of the site.

At Danehy Park, some areas settled over 14 feet during MBTA filling operations. At present, the site is experiencing long-term settlement. The settlement is being monitored and, at this point, should be minimal due to the extensive filling activities, and due to the site preparation activities that took place during the final construction of the park.



THE WETLAND

Wetlands are vegetated aquatic ecosystems that include such areas as bogs, marshes and swamps. Wetlands frequently perform important functions in the environment. These spaces store water to help prevent flooding in low areas and also provide food and shelter for migratory birds and other animals.

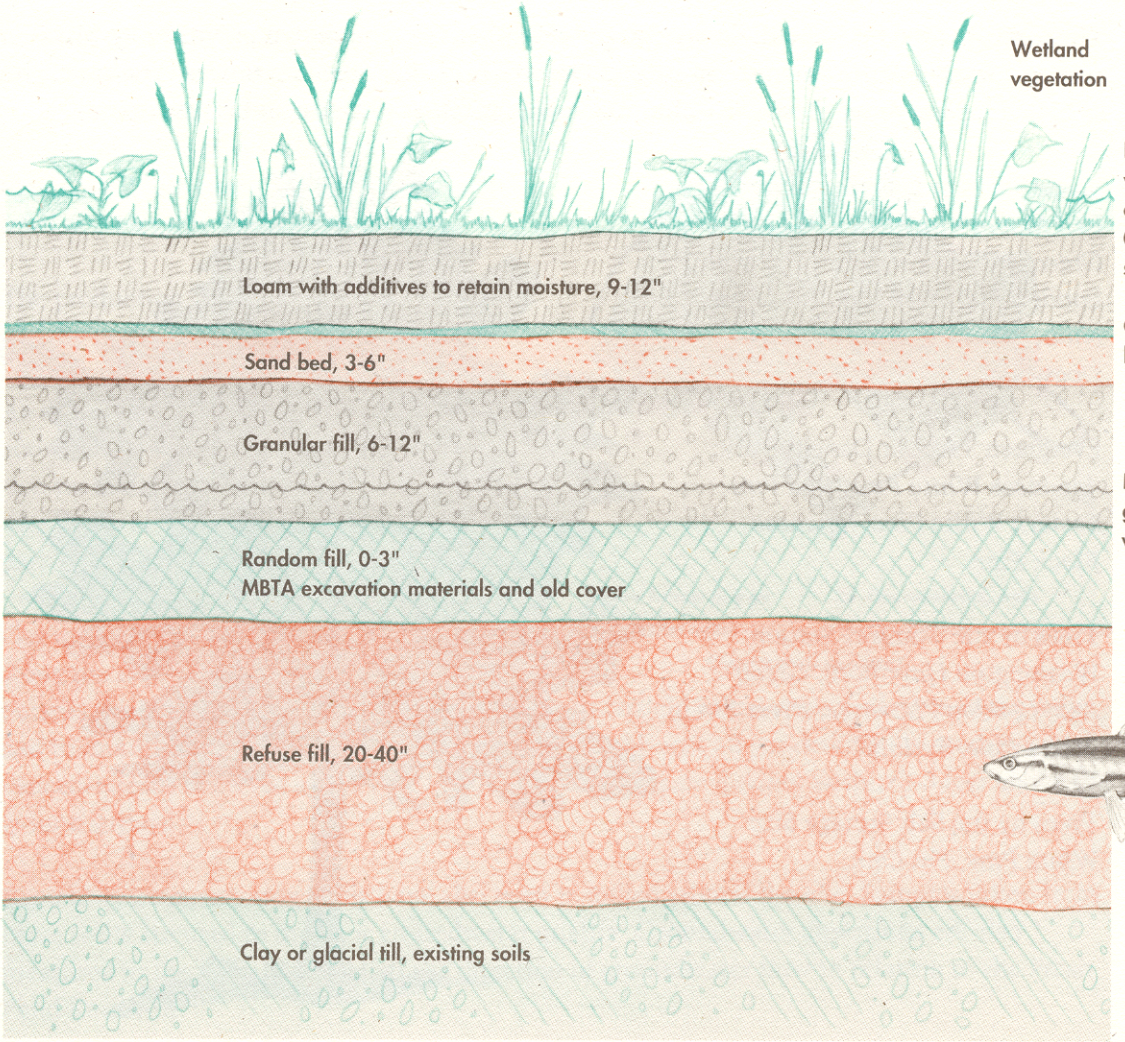
The wetland at Danehy Park is a valuble educational resource for the City of Cambridge. It is also a particularly important factor in controlling flooding. The land in the area of the wetland is only 1 - 2 feet above the groundwater, consequently in the past, streets and yards would easily flood. So during a storm, this area serves as a detention area for storm water.

When the area was a landfill, there was a existing wetland on top of a 40 foot layer of trash which was a potential pathway for contaminants to human exposure at the surface. During the construction of the park, the wetland was filled with sand and gravel, and a new wetland was created on top of it, with the approval of the Cambridge Conservation Commission. The new, current wetland is almost 2 acres in size. It is lined with an impervious liner made of clay and placed 1 foot above the high groundwater level which prevents the transport of contaminants from the trash layer. The current wetland addresses concerns of safety, and creates a buffer for the adjacent neighborhood and a pleasant habitat for birds and other wildlife.

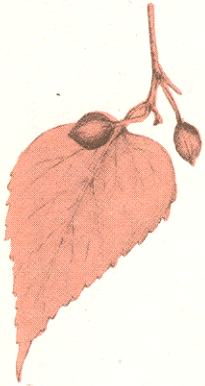
Through 1994 the wetland will be enhanced with a variety of plants and animals to create a balanced and healthy ecosystem. Island and brush habitats provide shelter and breeding grounds for fish and smaller aquatic life. They are also used for perches and nesting sites for birds.

Special wetland plantings in this area include Cattails in tuber and seed form, and water lilies in the open water and sheltered areas to create habitats and add color. Hornwort, and Water Moss are oxygenators in the water and provide food and shelter under-water. There also are additional plants, in concentrated areas of planting. Each add their own flowers, food stock and habitat to the ecosystem. These plants include: Pickerel Weed, Arrow Head, Cinnamon Fern and Blueflag Iris.

Animals have also been introduced to this wetland. Fish, specifically Golden Shiner and Northern Redbelly Dace, are the foragers of the wetland, eating algae and insect larvae distributed throughout. Pond snails are the algae eaters. Eastern Crayfish are nocturnal plant eaters, and hide under rocks and in debris. Bullfrogs and Pickerel Frogs, established in the sheltered areas, are the pond carnivores, eating insects, worms and small animals. Ducks, Canadian geese and birds have found the site and have taken up residence.



TREES AND PLANTINGS



The creation of the park used 1.5 tons of grass and wildflower seed (with over 20 wildflower varieties) and 18 acres of sod. Over 1,000 plants were planted including approximately 30 different varieties of trees, shrubs and wetland species. The trees at the park are maintained by the City Arborist.

The mixture used for the wildflowers on the slopes was a combination of Northeast Mixture, Aggressive Amendment Mixture and Dry Mixture; these contain flower varieties such as New England Aster, Cosmos, California Poppy, Black-eyed Susan and Daisy.

Shade Trees at Danehy Park:
Red Maple, Hackberry, White Ash, Green Ash, Sweetgum, Crabapple, London Planetree, Bradford Pear, Niobe Weeping Willow, Silky Dogwood.

Evergreen Trees at Danehy Park:
Japanese White Pine, Red Pine, Eastern White Pine, Japanese Black Pine.

Trees by the Comfort Station:
Washington Hawthorn, Green Ash, London Planetree, River Birch, White Pine, Redbud.

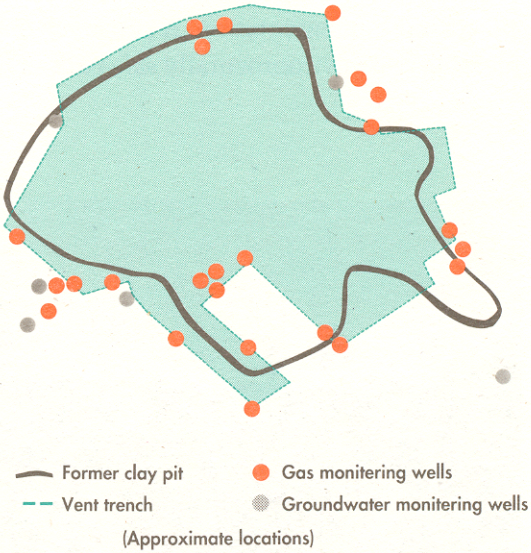
Trees by the Salt Storage Site:
White Pine, Pin Oak.

ENVIRONMENTAL MONITORING

Over time, bacteria digest and break down trash, and produce a blend of gases — mostly methane. Methane is a combustible gas and needs to get vented to prevent the gas from building up. Methane naturally moves vertically, but when the landfill was capped, the methane was blocked and forced to move laterally through the trash layer.

In the early 1980s, a crushed stone vent trench was constructed around the entire park to prevent the lateral movement of methane beyond the property line as a result of the capping and compression of the trash during filling operations. This stone-filled trench extends to at least 2 feet below the groundwater level or 2 feet into the natural clay.

The production of methane gas in landfills usually peaks approximately 7 to 10 years after dumping at the landfill has stopped. As the landfill at Danehy Park was closed to active dumping in 1971, methane production reached its peak between 1979-1982. The levels of methane gas detected at the park now are low and continue to decrease.



Gas monitoring wells have been installed along the edge of the park both within and outside the property line; on both sides of the vent trench, to measure gas levels in the area and to monitor the effectiveness of the vent trench. Almost all gas detected is methane, and concentrations observed are at very low levels and dissipate quickly within 2-3 feet above the ground surface.

Groundwater monitoring wells have also been installed around the site. Samples taken from these wells are used to monitor groundwater quality. Groundwater elevations are also measured in the wells to establish the direction of groundwater flow in relation to the Fresh Pond Reservoir.

THE FUTURE

The future of Danehy Park includes tennis courts, a 400-meter running track, spectator stands, sports lighting and a changing facility. The City's goal is to construct these within the next decade, depending on settlement conditions at the park.

Mayor Thomas W. Danehy Park demonstrates an innovative reuse of a former landfill. It also demonstrates the technical feasibility of developing a multi-purpose recreational facility which addresses environmental constraints. The City is excited about the opportunities this project provides and believes other communities can profit from Cambridge's approach and successful implementation. A perceived liability has been transformed into an aesthetically pleasing and environmentally safe park to be enjoyed by all.

Robert W. Healy
City Manager

Richard C. Rossi
Deputy City Manager & Project Manager

Camp, Dresser & McKee Inc.
Environmental Engineers and Landscape Architects

Moriece & Gary, Inc.
Landscape Architects

Haley & Aldrich, Inc.
Geotechnical Engineers

For information on soccer, softball and special event use permits, call the Recreation Department at 349-6230.
Danehy Park is maintained by City staff and private contract.

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Illustration: Kathy Bray
Children in photos: front cover, left to right, Antoinette Brothers, Leanne O'Loughlin, Grace Gorospe. Back cover, Elyse Williams.
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