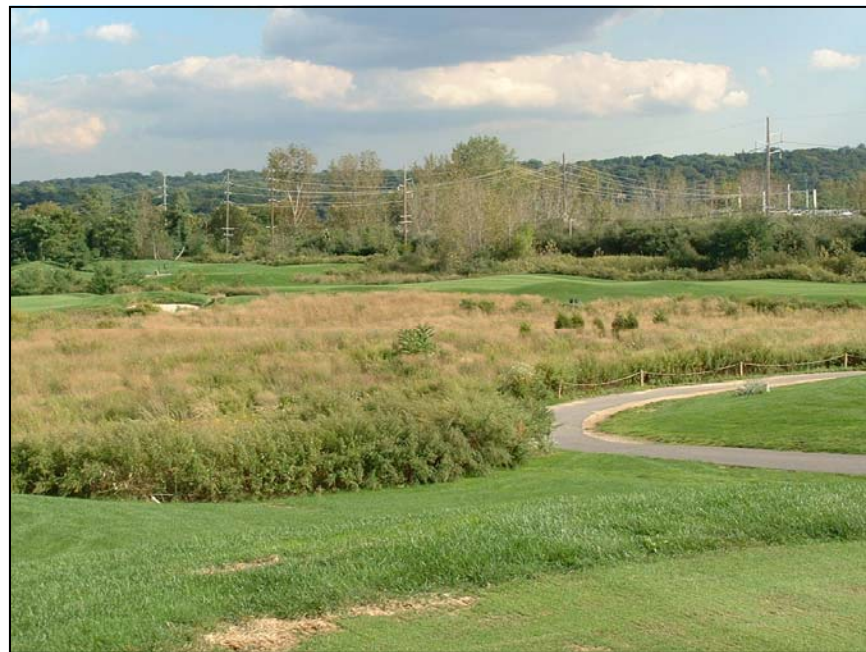




TOWN OF NORTH HEMPSTEAD HARBOR LINKS



Harbor Links at North Hempstead is an 18-hole golf course, with a 9-hole executive course, practice range, miniature golf facility, and athletic fields designed as part of a municipal recreational facility. The project is located on the site of a sand mining operation abandoned during the late 1980's in Nassau County, New York. Water features on the site are a by-product of the mining operation while two types of habitats were preserved: bluffs and wetlands. Three to six inches of compost was added to each tee and fairway to amend the poor quality soil. The goal of the project is to provide recreation to the community, while restoring native Long Island habitats, to reuse stormwater runoff, and to provide a method of disposal of treated effluent from the adjacent landfill remediation project. On July 25, 2001, Harbor Links became an Audubon International Certified Signature Sanctuary.



*For more information
Please call:*

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230 Second St., Ste 311
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WILDLIFE CONSERVATION AND HABITAT ENHANCEMENT

New York state listed threatened species the osprey, nested nearby Hempstead Harbor and flies over the project site. They have put up an osprey nesting pole. Partners in Flight watch list species are Eastern wood pewee, catbird, and field sparrow.

Nesting on site: Blue heron, American black duck, red-tailed hawk, killdeer, flicker, downy woodpecker, bank swallow, blue jay, mockingbird, catbird, yellow warbler, yellowthroat, field sparrow, and song sparrow.

Restore this highly degraded site to an assemblage of Long Island Habitats. This restoration has a dual purpose to allow the site's wildlife to continue to coexist with the purposed land use changes and to facilitate the organization and/or use of the site species currently found.

Hope to attract the eastern meadowlark and eastern bluebirds.

Preserved two types of habitats: bluffs and wetlands

Stabilization of bluffs with terracing hydrologic intervention geotextiles and extensive soil stabilization plants. This will also create high water grassland habitat.

Bird activity early on near the athletic fields (#3) revealed a presence of a Bank swallow colony near the margin of the former sand mine settling basin which is now open space preserve. The slopes were not disturbed until the chicks had fledged and the colony abandoned the site for the season in 1998. The area was regularly reviewed as construction of the athletic fields continued. The colony was very active. With 100 holes with 80% occupancy, which for Long Island represents a significant sized bank swallow colony. To avoid disturbing the birds for the season, the colony was to be protected to mid Audubon and a method of closing off the mouth of the gully with a dike and trying to preserve the bluff face which houses the colony was explored. A berm and storm water collection area with outlet pipe was installed as part of the drainage system. The separation of the area from the active use area will allow the colony to remain for a number of years.



This new naturalized area helps to provide a corridor between the holes on the golf course.



On # 14 tee the sand dune was left as a historic reminder of the how the land was used prior to construction.

INTEGRATED PEST MANAGEMENT (IPM)

Exotic controlled Phragmites but Purple loosestrife not a problem

All tees are constructed of suitable on-site soils and have been amended with three to six inches of recycled compost. All fairways and some roughs have also been constructed of amended three to 6-inch recycled compost since the soil quality is so poor.

The goal was to reduce water use fertilizer, pesticides and fossil fuel by 25%.
Grow-in began in late August 1997 and was completed in the following spring.

Town of North Hempstead was willing to make the tremendous investment required to reclaim the site and make the golf course more environmentally friendly by adding the compost. To achieve a porosity, but density exchange and moisture holding ability reserve for only putting greens because of the high costs.

Greens are sand green system consisting of a uniformly graded sand growing medium with a perforated pipe and stone under drain system.

Grasses: putting greens used L-93 bentgrass which were developed within 50 miles of the site. Fairways and primary roughs are a blend of bluegrass and chewing creeping red fescue. Both fine fescues were high in endophytes. They are also low disease pressure.

Revegetated slopes with coastal panic grass, switchgrass, big bluestem, little bluestem, and sand lovegrass.

WATER QUALITY

Slope failure occurred just above the cart path at the middle of 15th tee. The failure was crescent shaped slough of about 60 ft. X 100 feet deep. It occurred due to build up of perched water. The repair recommended incorporates back-filling the sloughed materials in lifts with geo-gri sheets in between each lift as well as place French drains at the back of the lift to relieve sub-surface water.

The pump-and-treat, after being treated, had extremely high salt levels as well as high chloride levels. After researching this issue, it was determined that a Gypsum System should be installed and injected directly into the irrigation system.

WATER CONSERVATION

The irrigation system is a Rainbird Nimbus computer control system.

Weather station is Campbell Scientific and market by Rain Bird, Model WS-100.

Low flow faucet and low volume toilets.

Additional natural plant communities between fairways, along wetlands on slopes and at edge areas they can extend and complement the depauperate plant community that existed.

Cart paths are continuous on the 18-hole course and partial integrated into the nine hole executive course. The paths are constructed of a 2-inch asphalt wearing surface on 4 inches of recycled crushed concrete base.

The use of pump and treat effluent from the adjacent landfill remediation project to supply irrigation to the site. This provides a method of disposal of treated effluent water while alleviating the need to rely solely on community water supplied or to construct an on site groundwater well.



Three sources of irrigation water: pump and treat, Stormwater captured by capped landfill surface drainage system to landfill retention pond and then recharge basin. Water district back up system. This system can only be activated when the supply pond is below a determined elevation and only when the pumps are running. This ensures use only as needed and minimized filling the pond unduly and the subsequent evaporation losses.

Over the years as sand and gravel were removed from the site, fine silts and clays washed to isolated low areas and developed into impermeable liners. Thus, wetlands were developed. increased total wetlands by 2 acres.

These wetlands rely almost exclusively on overland runoff to maintain their hydrology. The project has been designated to maintain patterns of surface runoff to the greatest feasible.

Two acres of wetlands were filled and three and one-half were created for replacement. Wetlands were now seasonal water and dry up in the summer so there are no fish.

The pond reconstruction near the clubhouse has a water fall and ozone system is used for aeration. Wetland species were included in this pond for demonstration purposes. It has proved to be a very good area for bird activity.

The course drainage system provides the water supply. Wetland plants have been included to provide emergent edge and wood vegetation with the goal of the plants to increase vegetative diversity and improve the habitat and filtering qualities of the wetlands

The two primary water features on the site which usually contain year round water. Wetlands SC-11 and wetlands # 6 less than one acre in size each.

Available storage capacity of the irrigation pond is 6,340.631 gallons which will provide 12.7 days of irrigation for 27 holes which represent an average daily drawdown of 9.12 inches.

The landfill reclamation system (pump and treat) will provide make up water and is capable of providing approximately 200 gpm 288,000 gallons per day to the pond. In addition, stormwater runoff from the landfill is available to supply the pond. If additional supply is needed, it will come from the Port Washington water district.

Main efforts to use recycled water is associated with the adjacent landfill site where the pump and treat system and the topography of the capped portion of the landfill allow for the conveyance of water from these sources to the irrigation supply pond.

Water from the executive course will discharge into the recharge basin adjacent to the supply pond and can be pumped to augment supply if necessary.

ENERGY EFFICIENCY

All parking lot lighting, waterfalls, and mini golf lighting are on timers.

Local power company installed an energy efficient step transformer in the irrigation pump house.

WASTE REDUCTION AND MANAGEMENT

Used some stones on the walkway to the 17th green and used stones to build an ornamental wall in front of the executive course clubhouse. The rock walkway was replaced by brick.

Recycled railroad ties were used throughout the golf course as retaining walls to control erosion.

We used recycled asphalt grindings for maintenance roads.

Recycled Belgium Block was used as curbing around greens and tees.

A retention wall was created from recycled railroad ties on the thirteenth tee complex to hold back sand from the eroding mounds of tailings.

NATURAL RESOURCE MANAGEMENT CENTER (NRMC)

Fuel Island - Spill containment water of approximately 100 gallons was planned for. The requirements for a roof at the island were mainly developed for situations where tanks were above ground with exposed dike areas and where they would be a need to shade the tanks. In this situation, the Fire Marshall required that the tanks be a below ground double walled system with alarms. Any potential fuel spill will be contained as follows: the pavement is pitched to the southwest corner of the compound and this corner will be contained by a 6-inch curb. A solid concrete catch basin will be installed in the corner with a debris/oil separator hood. The basin will accommodate a 100-gallon spill as well as be able to handle storm drain flow.

Each piece of equipment has a specially marked area where it is parked each night. It is parked in the same place each day so a leak, etc., is easily detected if there is an oil leak, etc.



OUTREACH AND EDUCATION

In an effort to education the new residents in the mid-rise apartment complex located adjacent to the 17th and 18th hole, Harbor Links sent out letters inviting them to the course to explain the Audubon International Signature Program to them and what part they can play in it. They toured parts of the course discussing the environmental issues.

Harbor Links hosted the Long Island Mentoring Partnership A Kids on Course program, which along with the National Golf Course Owners Association, provides a mentoring program which targets promoting an interest in golf among underprivileged youths.



Local eagle scouts built bird houses and installed them as 150 yard markers on every hole.

The Town of North Hempstead was the recipient of A Sand Mine Reclamation Award presented by the New York State Department of Environmental Conservation in 2002.

Under privileged kids who normally would never be exposed to the game of golf were brought to Harbor Links through a program called APrivate Public Partnership which is sponsored by the Met PGA. This program is designed to bring children to both a private and public course to introduce them to the game of golf and the beautiful environment of a golf course. It is a week long seminar and then the kids are given passes to use the driving range for free and discounted green fees for the entire season.

The certification of Harbor Links as an Audubon International Signature Sanctuary is a significant achievement for the Town of North Hempstead.

The Town of North Hempstead has been environmentally aware for many decades and this meritorious recognition is more than an appropriate merger of two entities with worthwhile goals, it is a combination of those who step forward to meet environmental challenges.

Thank you Audubon International for your program, it is a help to all of us who know the importance of a quality life and to those of us who wish to ensure environmental quality for all communities.

Gerard R. Olsen
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Department of Parks & Recreation

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