

ARLINGTON RESERVOIR DAM REHABILITATION

town of arlington, massachusetts



The Arlington Reservoir Dam is a 1,600-foot long by 12-foot high earth embankment dam built in the 1870s. The reservoir originally served as a drinking water supply for the Town of Arlington, but is currently used for recreational purposes. As with many dams built during the industrial revolution, the embankments are overgrown with trees / vegetation, there are areas where seepage through the embankments is evident. In addition, the hydraulic capacity of the dam is significantly undersized by current standards.

The Town of Arlington selected Weston & Sampson to inspect the dam, conduct engineering analyses (static and seismic slope stability and hydraulic capacity analyses) to assess the structural and hydraulic conditions of the dam, design repairs to bring the dam into compliance with current dam safety regulations, and prepare an emergency action plan for the structure and downstream area.

The conceptual design included standard repairs such as removing woody vegetation from the embankment surfaces, correcting the vertical and horizontal alignment of the dam crest, re-grading and installing riprap on upstream embankment slopes, re-grading and improving drainage on downstream slopes, making structural and operational improvements to existing spillways, and constructing a new emergency spillway to improve hydraulic capacity.

The conceptual design met significant opposition from local residents who use the dam extensively for walking, jogging, bird watching, etc. (i.e., the planned tree removal was unacceptable). The project was at an impasse until Weston & Sampson identified a unique solution based on a dam repair project designed by the US Army Corps of Engineers in Minnesota. A vertical interlocking steel sheetpile wall with a reinforced concrete cap was designed for installation along the dam crest. This "I-Wall" allowed the majority of trees to remain on the dam while providing protection from dam breach and control of seepage through the embankments.

This project was the first of its kind using this approach in Massachusetts. Despite the premium cost of the I-Wall, reducing tree removal and riprap slope protection on the upstream side of the dam far outweighed the cost in this case.

- **2006 American Council of Engineering Companies Gold Award for Engineering Excellence**
- **2006 American Public Works Association National Project of the Year**

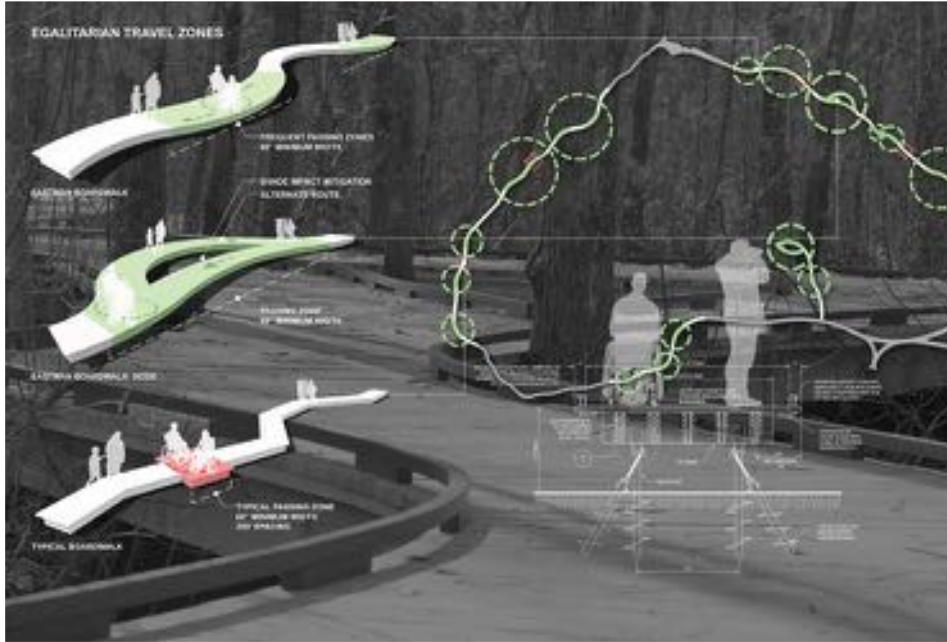
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Weston & Sampson®

NEWMAN ELEMENTARY SCHOOL ATHLETIC FIELDS – EASTMAN CONSERVATION AREA IMPROVEMENTS

town of needham, massachusetts



Weston & Sampson was retained by the Town of Needham to design sports field upgrades and improvements to the Eastman Conservation Area. The Eastman Conservation Area serves as an outdoor learning laboratory for the elementary school and the Needham Science Center, which is located at the school. The conservation area possesses an amazingly varied landscape within a relatively small footprint that includes wetlands, meadows and streams, open bodies of water, uplands, and rock outcroppings.

Weston & Sampson is working closely with teaching professionals to develop compelling interpretive and interactive signage that will enhance teaching at various “learning pods” located throughout the site. Specific work has included the design of boardwalks, at-grade trails, overlooks, piers, and a wide range of other site amenities that help to support the storytelling about wildlife and wetlands and woodlands and other environmental features that are unique to this rich and varied conservation landscape. Boardwalks and outdoor classroom spaces have been designed to be minimally invasive and unobtrusive; they were constructed in a way that allows users to experience the unique ambiance of the wetland resources from within the environment and not just from the outside looking in.

- conservation area improvements
- outdoor learning laboratory
- boardwalks, trails, overlooks, and piers
- sports field upgrades
- construction administration

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CHEESECAKE BROOK SOUTHERN CORRIDOR MASTER PLAN & PHASE 1 CONSTRUCTION

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Weston & Sampson worked closely with the City of Newton, Massachusetts Planning and Development Department on a Master Plan for the southern portion of Cheesecake Brook between Eddy Street and Watertown Street.

Weston & Sampson's design team, through a series of community meetings, garnered many divergent opinions regarding the potential passive recreational use of this historic corridor. Graphics were developed and presented by Weston & Sampson for discussions. During the course of these meetings we developed an enhancement program to satisfy all interested parties.

Critical to the planning and conceptual design effort was the need to flush out the full range of potential enhancements to the Cheesecake Brook corridor, which might include the development of some or most of the following:

- A safe and attractive amenity for the use and enjoyment of neighborhood residents and visitors, including designating the extent of the corridor that is accessible to non-residents and the extent of the corridor that may be left off limits to residential abutters. Channel depth, channel slope, and maintenance requirements of the new public access amenities are important considerations.
- A manageable amenity in regard to the performance of regular stormwater maintenance efforts by the public works department.
- An open space resource that is more environmentally friendly and includes a series of potential stormwater management improvements.

Potential implementation of a series aesthetic improvements to enhance the overall visual qualities of the Cheesecake



Brook greenway that potentially include: Replacement of an existing chain link fence with a more attractive fence system; management of vegetation along the corridor to include removal of invasive species, damaged or diseased vegetation, and improved visibility; management of the corridor to include a mix of open lawn, meadow, shrub, ornamental, evergreen and deciduous plantings; and introduction of pedestrian crossings and points of public access and use.



Public access route - before

The Master Plan for a portion of the corridor was finalized in August of 2007. After finalizing the Master Plan, Weston & Sampson prepared documents for the construction of a Phase 1 program for the corridor. The construction of the Phase 1 program was completed in June of 2008. Weston & Sampson is currently refining the Master Plan for the remainder of the corridor.



Improvements to public access route



Public access pathway design

ENGINEERING & DESIGN SERVICES AT ROSEMARY POOL

town of needham, massachusetts



Weston & Sampson, along with our Aquatics Group, was selected by the Town of Needham to conduct a thorough assessment of the Rosemary Pool and subsequent feasibility study of potential renovations/new pool and poolhouse configurations for the facility. The project is unique because of its location immediately adjacent to Rosemary Lake.

The design process included a review of the existing conditions, visioning sessions, and public meetings; a study of several alternatives from removal of the pool, to repairs and replacement, to constructing a year-round enclosed facility; an outline of the permitting requirements; identification of the operating budget considerations and noted potential timelines and phasing issues.

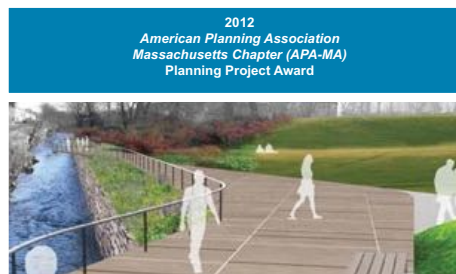
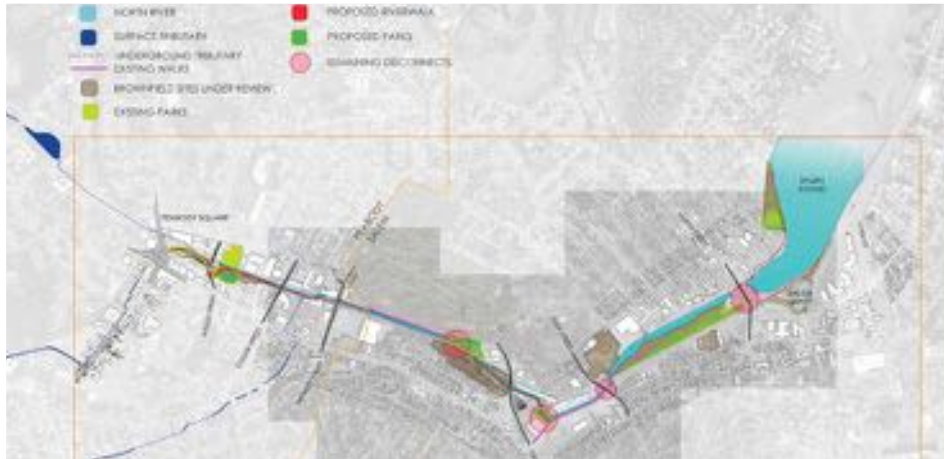
We prepared a detailed report outlining the history of the property and facility, but focused on highlighting issues with the existing facility and putting forward potential solutions for replacement/renovation. Our report also included excerpts from prior reports in 1998, 2001, 2002; a summary of the “Blue Sky Meeting” we conducted in 2013; results of a Public Comparable Pool Survey; a cost summary; the 1971 Pool Designs; and information about the current pool codes.

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PEABODY | SALEM RIVERWALK

metropolitan area planning council & cities of peabody and salem, ma



Weston & Sampson was selected by the Metropolitan Area Planning Council (MAPC) to manage and administer their EPA Coalition Brownfields Grant with the cities of Peabody and Salem, Massachusetts. Weston & Sampson assisted MAPC and the two cities to:

- Identify potential Brownfields sites
- Develop an inventory and GIS-based mapping
- Prioritize sites for assessment
- Engage the community
- Comply with the Massachusetts Contingency Plan (MCP)
- Provide Licensed Site Professional (LSP) services
- Conduct reuse planning and visioning
- Coordinate with other contractors

- EPA brownfields coalition grant
- riverwalk planning
- boardwalk design
- site assessment / LSP services
- reuse planning
- community outreach
- visioning
- leverage of funding
- corridor project

The project's primary focus is the corridor between Peabody Center and the North River in Salem, which is an area of extensive flooding. The Brownfields assessments focus on properties that will be impacted by a major flood mitigation project the cities are conducting to alleviate periodic flooding in the area. By assessing properties prior to construction, environmental issues that can affect the flood mitigation project can be identified, and the planning for construction can include those elements.

Weston & Sampson conducted a number of community outreach and public information meetings to present the program and, working with MAPC, EPA, and the planning departments of Peabody and Salem, prioritized sites and allocated resources to assess the various parcels. Weston & Sampson led the community process, which yielded a rich and diverse strategy for reuse of this important corridor. Boardwalk segments put in place now would have to be relocated when the Army Corps of Engineers widened the river as part of their flood mitigation efforts. This informed a temporary / permanent strategy for boardwalk construction. In addition, we crafted extensive illustrative graphics and text to support this effort and create a viable roadmap for future development by identifying actionable outcomes, goals, and objectives.

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COES RESERVOIR DAM REHABILITATION

city of worcester, massachusetts



The City of Worcester selected Weston & Sampson to inspect, evaluate the condition of and design improvements to the Coes Reservoir Dam. This approximately 700 ft. long, 20 ft. high earthen dam was constructed after the Civil War to provide a power source for a factory complex used for wrench and knife manufacturing into the 1990s. The dam was in poor structural condition, was overgrown with trees and brush, and the existing spillway was severely undersized.

An iron intake pipe passed through the embankment and provided flow to a water turbine which powered factory equipment until the 1930s. Discharge from the turbine pit was directed toward the main spillway through a tailrace channel along the downstream toe of earth embankment. The primary spillway had an approximately 38 ft. long concrete fixed weir near the north end of the dam.

Dam repairs also included remediation of PCB-impacted materials identified by Weston & Sampson during building demolition activities in the late 1990.

Dam repair and environmental remediation began during the 2005/2006 winter season and were completed by the end of summer 2006. The repair design included removing the existing intake pipe and installing a low-level outlet in the intake pipe and tailrace alignments. The low-level outlet was operated during the remainder of construction to allow PCB-impacted material excavation and disposal, spillway enlargement, and embankment improvements to be conducted in-the-dry. Wetland replication was also conducted on the Coes Reservoir shoreline north of the dam.

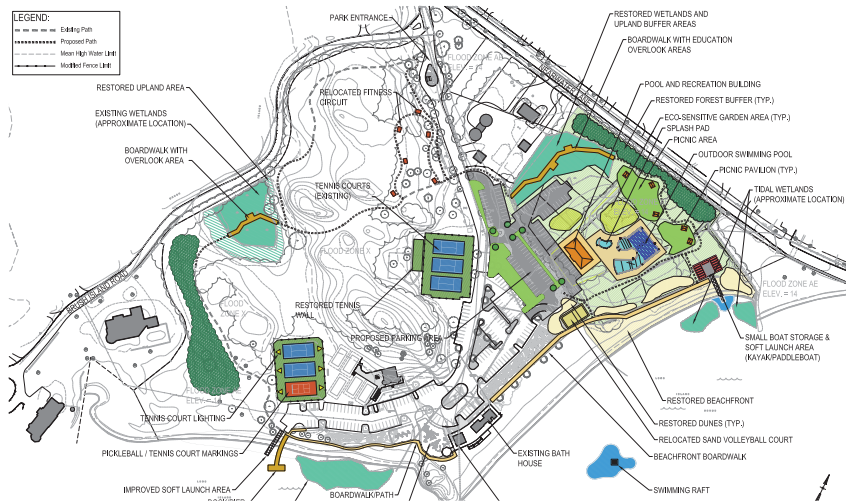
Weston & Sampson completed inundation mapping and compiled an Emergency Action Plan (EAP) for distribution to the City of Worcester, DCR Office of Dam Safety (ODS), and the Massachusetts Emergency Management Agency (MEMA).

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WEED BEACH PARK MASTER PLAN

town of darien, connecticut



Weston & Sampson is currently working with the Town of Darien, Connecticut to develop a Master Plan for the expansion of Weed Beach Park. Located along the Long Island Sound, the park is currently home to tennis courts, paddle courts, paddle hut, walking trails, outdoor fitness stations, Weed Beach and a beach house. Weston & Sampson was hired by the Town to help plan the development of a recently purchased parcel adjacent to the existing park.

The park's high-profile status and proximity to neighboring homes allowed the design team to work closely with both the Town and the neighboring citizens to ensure the expansion would meet the needs and desires of the residents. Several public outreach meetings were conducted to gather as much public involvement as possible, including the development of an on-line survey that was taken by over 2,100 of the Town's residents.

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MASTER PLAN FOR NEWTON UPPER FALLS PLAYGROUND AND NEWTON HIGHLANDS PLAYGROUND

city of newton, massachusetts



Weston & Sampson was selected by the Newton Parks & Recreation Department during the fall of 2006 to complete a comprehensive master planning process for the Newton Highlands Playground and Newton Upper Falls Playground. The purpose of this master plan is to provide a preferred site improvements plan that reflects the needs of these two diverse communities. This plan will serve as a guide for all future development of this park, as well as a tool to secure funding from various private, city, state, and federal sources.

Weston & Sampson collaborated with the Newton Parks & Recreation Department to develop conceptual and final "Preferred" master plans for both properties. These were generated in response to the needs of the city as expressed by various community representatives at a series of public hearings and through the issuance of a comprehensive Park User Survey.

During our research on these properties we discovered historic photographs and images of old plans that informed our approach to the planning for Newton Upper Falls Playground.

The images (below left) have been excerpted from a book entitled "The Makers of the Mold," by Kenneth W. Newcomb and include a group of ball players from Upper Falls and a canoe paddler along the banks of the Charles near Upper Falls Playground.

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CUSHING MEMORIAL PARK MASTER PLAN AND DEVELOPMENT

town of framingham parks and recreation department



Weston & Sampson was retained to develop an Open Space Master Plan for the 65-acre former Cushing State Hospital property near Farm Pond in Framingham. Nearly a dozen public forums were held to establish and prioritize the scope of planned improvements for this scenic property. The finished master planning document presented a “vision statement,” analyzed existing conditions, identified general and specific improvement programs, funding sources, budgets, phases, and also included an operations and maintenance narrative.

The largely passive, \$2.5 million improvement program has been widely supported by the Framingham community with early phase improvements currently being designed or constructed. The full range of improvements will ultimately include landscape restoration and enhancement of a historic chapel, installation of an elaborate walking/biking/jogging trail system, extensive tree, shrub, perennial and meadow plantings, site furnishings, and signage. Work also includes the establishment of access and service drives with perimeter parking amenities.

To implement the actual improvements, Weston & Sampson has assisted town representatives in securing both private and public funding through a variety of grant programs and initiatives.

- applied for land from GSA
- former VA hospital-asbestos clean-up
- PARC grants and other state grants awarded
- extensive community participation process
- multi-use trail system
- historic “chapel” restoration
- 9/11 memorials
- veterans memorials-all wars

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MAYOR THOMAS M. MENINO PARK ENGINEERING AND DESIGN SERVICES

boston redevelopment authority



When Mayor Menino visited Spaulding Hospital's brand-new state-of-the-art rehabilitation facility at Charlestown Navy Yard in early 2013, he saw potential in the vacant waterfront land that lay next door. No less, he hoped that a fully accessible playground and park would be in place by the end of his term in November. In order to meet the challenge of designing and constructing a park within just three short months, the Boston Redevelopment Authority enlisted the support of Spurr, Weston & Sampson's design studio. Boston's newest waterfront park is a dramatic open space resource designed as a place of recovery from health challenges and respite from the daily rigor of urban life. Much of the design inspiration drew from the park's history as the Navy Yard's first shipbuilding dry dock built during World War II. Demand for ships was so great that shipbuilding began at Pier 11 even before construction of the facility was complete.

At the time, the dry dock's construction required that the Navy Yard expand beyond the existing pier and bulkhead line. Granite blocks that once held back seawater now form the battened walls of Mayor Thomas M. Menino Park's playground, which not only provides seating, but creates elevated lawns and viewing decks oriented to capture the splendor of Boston's working waterfront and stunning downtown skyline. Most importantly, innumerable opportunities for active play, physical therapy and exercise for all generations are incorporated into the park.

The finished park is intended to honor those focused on perseverance, renewal, recovery, awakening and revival. Phase I of Mayor Thomas M. Menino Park opened to the public on November 4, 2013.

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Weston & Sampson

BOSTON COMMON – VARIOUS PROJECTS

city of boston, massachusetts



At the Boston Common, Weston & Sampson provided complete design and construction administration services to the City of Boston for the restoration of the historic Parkman Bandstand brick pathways, which were originally designed by the Olmsted Brothers (Ca. 1911), and surrounding lawn areas. In addition to our landscape architects, Weston & Sampson's team also included both an arborist and an archeologist who provided critical observation and preservation services throughout the project. We developed contemporary construction detailing practices to restore the site to its original grandeur and increase the longevity of the work.

Weston & Sampson also recently completed design and construction administration services for the reconstruction of Oliver Wendell Holmes Mall, which links the Boylston Street Massachusetts Bay Transportation Authority (MBTA) Station to the Guild Stairs at Beacon Street (near the Statehouse).

Work included the pulverizing of all existing pavements, new full depth pavements, granite bench pads and benches, extensive storm drainage improvements, and tree plantings along this major 4,000 linear foot pedestrian corridor.

- **parkman bandstand pathway project received preservation achievement award, boston preservation alliance**
- **extensive research; matching bricks found and purchased for reuse**
- **coordinated pathway construction with bandstand rehabilitation**
- **achieved handicapped accessibility in all areas**
- **reconstruction of oliver wendell holmes mall resolved historic drainage problems at the frog pond**

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Weston&Sampson®

PATHWAYS & ENTRANCE IMPROVEMENTS: BOSTON COMMON, PUBLIC GARDEN, & COMMONWEALTH AVENUE MALL

city of boston, massachusetts



The Boston Parks and Recreation Department selected Weston & Sampson to improve the pathways and entrances to the Boston Common, the Public Garden, and Commonwealth Avenue Mall.

This multi-site project included a thorough assessment of existing entrance and pathway conditions throughout all three sites followed by an analysis and ranking in order to prioritize an improvement program. Weston & Sampson then developed the proposed improvements into drawings and details and prepared them for submission to the Boston Landmarks Commission, who then subsequently approved them without condition. The project team then assembled estimates for all three sites and adjusted the scopes of work, as appropriate, to leverage the funding available.

The public process included meetings directly with the Friends of the Public Garden as well as public forums held at Emerson College that drew about 15 residents. Based on the presentation graphics, those in attendance were able to understand the proposed improvements and provide meaningful feedback on the project.

During the course of construction, several unforeseen conditions arose. Weston & Sampson's downtown Boston office location enabled us to provide responsive construction oversight and coordination with the contractor. When potentially unsuitable soils were discovered, our in-house environmental professionals were able to provide advice to BPRD that facilitated a timely and risk-appropriate solution.

Weston & Sampson's team also included both an arborist and an archeologist who provided critical observation and preservation services throughout the project.

- **coordinated public process**
- **maintained historical preservation**
- **managed environmental response to unforeseen soil conditions**

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SITE ASSESSMENT, RISK CHARACTERIZATION, REMEDIATION & SITE DEVELOPMENT

city of worcester, massachusetts

The Coes Reservoir Dam was constructed after the Civil War to provide power to the Coes Wrench Factory, where the first adjustable wrenches in U.S. History were produced. This earthen dam, approximately 700 feet long and 20 feet high, is a high hazard dam, which was in poor structural condition with hydraulically inadequate spillway and polychlorinated biphenyl (PCB) contamination. The City of Worcester selected Weston & Sampson to evaluate the condition of and design improvements to the dam. The city sought a safe, economical solution for dam rehabilitation while addressing elevated concentrations of PCBs in soil.

Site Assessment and PCB Remediation

During a site investigation, several contaminants including polycyclic aromatic hydrocarbons (PAHs), heavy metals, and elevated concentrations of PCBs were identified on the dam. The detection of elevated PCBs triggered a 2-hour notification to the Department of Environmental Protection (DEP) and required additional site assessment and imminent hazard evaluation under the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000.

The elevated PCBs also required site characterization and cleanup in accordance with the Environmental Protection Agency's (EPA's) Toxic Substance Control Act (TSCA), 40 CFR 761. The site was pre-characterized in accordance with the self-implementing cleanup provision of TSCA and was cleaned up during dam rehabilitation, which required excavation and off-site disposal of 1,200 cubic yards of soil to a TSCA-certified landfill and sampling and analysis of more than 500 samples for cleanup verification. Currently, site remediation in accordance with the risk characterization under the MCP and the risk-based cleanup provision of TSCA, as well as the Phase II remedy implementation for the property are being performed.

The Phase IV RIP and risk-based cleanup plan for the property include the capping of residual PCB impacts in soil containing <10 parts per million (ppm). The cap consists of bituminous asphalt concrete and flexible membrane liners finished as a paved parking area for the park. EPA's Washington headquarters reviewed and approved the risk-based plan for the site and park. Construction of the cap is complete.

Future Visioning

Weston & Sampson assisted the city with site reuse planning and design of a park and greenway corridor along the reservoir. The plan envisions open space properties connected through a boardwalk or pathway, creating new and enhanced opportunities for recreation to residents of all ages and abilities.



- **pcb, pah and metals contamination**
- **imminent hazard evaluation**
- **phase II-comprehensive site assessment**
- **phase III-remedial action plan**
- **risk characterization**
- **self implementing and risk-based cleanups**
- **remediation**
- **regulated under mcp and tsc**
- **active public park at the property**

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