

PROJECT APPROACH

PROJECT UNDERSTANDING

The historic Roger Williams Park (RWP) is located in the southern part of the city of Providence, Rhode Island, and contains approximately 435 acres of landscaped areas, including the Roger Williams Park Zoo. The park also contains a seven-lake complex which comprise approximately 100 acres. The park was designed by Horace Cleveland in 1878, and was constructed in the 1880s. Many of the roads, bridges and sidewalks were built by the Works Progress Administration from 1935 to 1940.

We understand that the City of Providence (City) has received funding from the U.S Environmental Protection Agency (EPA), Region 1, for a restoration project to improve the water quality and biodiversity conditions of the Park's ponds. While the existing pond complex was clearly modified from a natural stream-pond system, they provide important ecological and environmental benefits as they drain to Narragansett Bay making their ability to assimilate pollutants important. The contributing watershed to the ponds includes significant urban areas northwest of I-95, including drainage from Reservoir Avenue (Route 2), which impacts the ponds' water quality. Over the years, significant sediment deposition has accumulated in the ponds that contribute to water quality impairment. In addition, there are a range of direct sources of pollutants including localized erosion, and a Canada Geese population that are impacting the ponds.

We understand the overarching goals for the long term project include:

- Water Quality Improvement within the Ponds;
- Restoration of Biodiversity within the Ponds;
- Improvements to Public Health associated with fish consumption; and
- Promotion of Outreach, Public Engagement and Stewardship.



Geese along the eroded shoreline

This request for proposals is the first phase of the RWP Ponds Restoration Project that includes the development of an overall "Master Plan" to meet the above goals (Task 1) as well as an early implementation action plan to design, permit, and provide pre-construction services for up to five of the highest priority sites (Task 2). We offer the following scope of work developed in accordance with the City's RFP.

PROPOSED SCOPE OF WORK

Task 1: Water Quality Management Plan

The HW team will work closely with the City, Rhode Island Department of Environmental Management (DEM), Narragansett Bay Estuary Program (NBEP) and the Steering Committee to develop a master plan for the restoration of the RWP ponds. This plan will incorporate short and long-term measures to improve water quality, aesthetics, habitat and public use of the pond. The master plan will be derived from GIS and CAD files (base mapping provided by the City of Providence) and will include conceptual designs for a set of stormwater best management practices (BMPs), designed in accordance with the new Rhode Island Stormwater Design and Installation Standards Manual (Stormwater Manual), and other measures such as buffer enhancement. The primary focus of the plan will include the Park ponds, Park grounds, and the secondary focus will be the nearby neighborhood watersheds, in the context of the Mashapaug Pond subwatershed of the Pawtuxet River. The HW team will also set up a project website for inclusion and dissemination of project information as interim deliverables are created and to solicit public feedback. The HW team will undertake the following specific subtasks:

Subtask 1.1 Description of Existing Park Ponds

Using existing data from the DEM, City of Providence Parks Department and the Providence Department of Public Works (DPW) as well as the University of Rhode Island Watershed Watch (URIWW), a description of the Park ponds will be completed. The description will focus on the physical aspects of the ponds and will include text, table, and mapping deliverables.

At a minimum the following information will be presented:

- Hydrology of the ponds including flows, surface area, elevations, and bathymetry;
- Watersheds for each pond;
- Watershed land use and impervious surfaces;
- Location of existing wetland features;
- Location of existing storm drainage outfalls and catch basin areas including size and elevation information; and
- Existing park infrastructure including park roads, parking lots, catch basins, curbing and drainage channels, major park features, and attractions.



The Bandstand overlooking the pond

With the permission of the City and its project partners, the information collected as part of this task will be made available to the public using free on-line data viewers. It could be included as part of the new Rhode Island Community Resource Inventory which presents basic physical and environmental information for the state of Rhode Island in an easy to use interactive format. Links to the mapping viewer could then be placed in appropriate City and State websites, providing a method to further public outreach.

Deliverables:

1. GIS database of existing information.
2. Hard copies of maps for discussion and reporting.
3. On-line interactive map.

Subtask 1.2 Description of Existing Water Quality Conditions and Concerns

Based on DEM, University of Rhode Island (URI) Watershed Watch data and any other identified data sources, data tables and graphs depicting water quality data will be prepared. Data will be provided in a manner to provide observation of any seasonal trends. Once a description of current water quality conditions is completed the data will be compared to DEM water quality and TMDL requirements to characterize the trophic conditions of the ponds and water quality impairments.

Deliverable:

1. Text, tables, and graphs of existing water quality conditions.

Subtask 1.3 Characterize the Major Phosphorus Sources

Phosphorus loading will be assessed on a watershed basis for each of the Park ponds and Mashapaug Pond. Loading estimates will include sources both in-pond (eg: internal loading, waterfowl, erosion) and within the pond watershed (loading from upstream ponds, stormwater discharges, land use, impervious surfaces). Using the sources identified in the loading analysis, a matrix will be prepared to prioritize the major sources of phosphorus loading to each pond based on technical feasibility to remove/remediate the source, anticipated level of benefit and cost. A discussion will be provided summarizing the results of the loading analysis with special attention to phosphorus loads associated with in-park land uses and landscape.

Deliverable:

1. Text, tables, and graphs characterizing major phosphorus sources.

Subtask 1.4 Develop Short and Long Term Water Quality Goals for the Park Ponds

The HW team will coordinate with the City, DEM, NBEP, and the Steering Committee to develop a set of short-term and long-term water quality goals for the Park ponds. Specifically, HW will convene one working session with the City, DEM, NBEP and the Steering Committee to provide specific draft goals (such as target phosphorus reduction levels, increased reforested buffer width, decreased chlorophyll a concentrations, etc.) for the following topics:

- Water quality parameters;
- Aquatic Habitat;
- Algae concentrations; and
- Pond/shoreline aesthetics.

The HW team will utilize the project website to collect and disseminate input on goal setting and refinement.

Deliverables:

1. Development of outreach/engagement materials for Steering Committee, and project website.
2. Draft and final document of specific goals for Park ponds.

Subtask 1.5 Develop and Evaluate Water Quality Management Options

The HW team will develop a comprehensive assessment of water quality improvement options appropriate for the Park ponds. The HW team, as the lead author of the recently updated Stormwater Manual, and as a consultant to EPA Region 1 on a range of stormwater technical issues, is intimately familiar with the latest stormwater requirements and practices for water quality control.



A potential retrofit area

The HW team will undertake this assessment work for three distinct management areas: upstream of the Park in the urban neighborhoods within the contributory watershed to the Park, within the Park itself, (with an emphasis on these areas directly contributory to the ponds), and within the Ponds themselves. In addition, as outlined in the RFP, this portion of the project is anticipated to be the “heart of the consultant’s work” and it is “anticipated that considerable time will need to be spent in presenting and reviewing the water quality options to the project technical committee, to DEM, and to the public.” We have therefore budgeted for up to two technical meetings with the Steering Committee.

For both the upstream areas of the Park and the areas within the Park, the HW team will conduct the following assessments:

Field Assessment of Restoration Opportunities

Using mapping information derived during previous subtasks, and in consultation with the City, DEM, NBEP and the Steering Committee, HW staff will spend up to two days in the field to visit up to 20 candidate stormwater retrofit sites and will evaluate upland and hotspot pollution sources using basic methodologies developed by the Center for Watershed Protection (CWP). More information on these methodologies can be obtained directly by downloading free copies of the above mentioned protocols of at the following link: <http://www.cwp.org/PublicationStore/USRM.htm>.

Retrofit Inventory

HW will utilize the basic retrofit inventory methodology outlined in the publication “Urban Stormwater Retrofit Practices” (Schueler *et al.*, 2007) to identify potential stormwater retrofit practices (HW staff contributed to the publication and approaches described in this publication). At each candidate location, HW will evaluate drainage conditions, identify site constraints, and develop retrofit options that have the best reported pollutant removal capability for the pollutants of concern and have the highest runoff reduction potential. Examples include but are not limited to: bioretention (or rain gardens, where applicable), sand filters, impervious cover reduction, permeable pavers, dry swales (linear practices that contain amended soils), wet vegetative treatment systems (WVTS), and infiltration systems. These practices can be adapted as necessary to several different drainage configurations including larger open areas (such as adjacent to ball fields), roadside drainage, parking lots, storm drain outfalls, and upstream of road culverts, for example. Our methodology will focus on screening for a range of opportunities as a function of available open space or within publically owned properties.

Each of the evaluated retrofit opportunities will be subject to a ranking procedure in order to help prioritize locations for further evaluation. We will assign a relative weight to each screening factor, based the water quality priorities of the watershed, which include meeting the goals outlined in Subtask 1.4.

After compiling and weighting the screening criteria, we will draw pertinent information from the retrofit inventory and score individual projects. Project scores will be entered into a spreadsheet and ranked from highest to lowest to establish the retrofit priority list. Highest scoring projects will be double-checked to look for hidden “project killers,” wherein a project with a high total score has a low or zero score for one or more parameters, suggesting that it may not be feasible. We will prioritize individual sites based on runoff reduction, phosphorus load reduction, other environmental benefits and impacts, educational opportunity, and cost. We will recommend the highest scoring sites for implementation. In consultation with the project partners, the project ranking will be a major factor in selecting particular projects to be advanced to the design and permitting phase (Task 2).

Upland Pollutant Source Control Survey

HW will conduct a modified Upland Subwatershed and Site Reconnaissance (USSR) (Wright et al., 2004) to provide a rapid, but thorough, characterization of upland areas in order to inventory problem sites and/or behaviors of contributing pollutants, and to identify potential restoration projects such as natural drainage/Low Impact Development (LID) retrofits, source control, pervious area management, and improved municipal maintenance. The USSR was developed by the CWP to help watershed groups, municipal staff, and consultants efficiently assess subwatershed restoration potential. HW staff assisted in the development of the USSR and have extensive experience conducting the protocol.

The survey is rapid, inexpensive, and has four main components: residential source assessment, hotspot source inventories, pervious area assessments, and streets and storm drains. The HW team will conduct a general assessment of the contributing neighborhood and Park areas for behaviors or existing practices that may be influencing water quality. We will identify other upland watershed management opportunities based on observable conditions, such as water quality education and stewardship efforts, pet waste management, lawn care practices, illicit discharges, catchbasin cleaning and stenciling, etc. Commercial operations will be evaluated for their potential to be stormwater pollution hotspots based on observations outdoor material storage: waste management; landscaping and construction practices; fueling and maintenance procedures; and other factors indicative of high risk of pollutants coming into contact with stormwater.

The USSR assessment will be used in addition to the retrofit inventory to:

- Evaluate neighborhood pollution potential and identify specific behaviors (e.g., pet waste management, car washing) to target watershed education and outreach;
- Assess conditions of the street and drainage network to determine street sweeping and catchbasin cleanout needs;
- Evaluate potential stormwater hotspots (i.e. gas stations, car washes, restaurants) and identify waste management, outdoor material storage, and behaviors contributing to stormwater contamination;
- Identify municipal operations and practices (i.e. deicing, snow disposal, nuisance bird exclusions, street sweeping, good housekeeping) for enhancing pollution prevention efforts; and
- Develop targeted source control strategies for priority neighborhood and stormwater hotspots in the watershed to include implementation targets, cost estimates, and delivery mechanism.

The initial findings, site photos, and preliminary recommendations from this survey will be summarized in Subtask 1.6 Water Quality Management Plan. Implementation factors such as areas to target, audience, delivery approach, costs, and funding options will be included in the Plan.

HW's subconsultant, Kenneth Wagner, a Certified Lake Manager, will develop and evaluate water quality management options focused on in-pond options (alum, wetland creation, targeted dredging, herbicides, aeration, etc.). Options would include: magnitude of costs and cost ranges, estimate of effectiveness, and implementation feasibility issues.

Deliverables:

1. Maps, photographs, cost estimates, and ranking assessment documenting retrofit opportunities and a summary source control opportunities identified in the field.
2. In-pond assessment summary including cost and effectiveness of a range of options.
3. Preparation for and attendance at up to three meetings with the City, DEM, NBEP and the Steering Committee to review initial findings.

Subtask 1.6 Develop Roger Williams Park Ponds Draft Water Quality Management Plan

A draft Water Quality Management Plan will be provided to the project partners electronically for review. As indicated in the RFP, and as a result of Subtask 1.5, the draft plan will present both short and long-term recommendations and implementation costs, and institutional arrangements, where necessary. A final Water Quality Management Plan will be provided following the receipt of comments, and upon the completion of implementation of pilot projects under Task 2.

This Plan will compile the results of the previous tasks and will include at least the following measures:

- GIS-derived maps of watershed boundaries, soils, land use, water resources, and any identified site-specific sources of impairment to summarize the results of Subtasks 1.1 and 1.2;
- Maps depicting public and private retrofit opportunity locations, upland management/ restoration locations, and confirmed hotspot locations;
- Tables summarizing retrofit, source control, and other restoration opportunities;
- Ranking of stormwater retrofits for short and long term implementation and recommended sites for design/permitting under Task 2, other environmental benefits and impacts, educational opportunity, and relative cost;
- Recommendations for priority source control activities;
- Site photos and copies of retrofit inventory and other applicable field sheets;
- Concept designs for up to five of the highest ranked retrofit opportunities;
- Feasibility analysis for meeting phosphorus reduction targets based on available restoration opportunities; and
- Evaluation of the potential for non-structural behavioral management practices to affect cost-savings on structural stormwater improvements.

Copies of the draft report will be provided electronically to the City, DEM, NBEP and the Steering Committee as a PDF. A total of three final hard copies and a CD with electronic files (WORD, PDF) of the draft report and associated materials will be provided..

Deliverable:

1. Draft Water Quality Management Plan and supporting materials.

Task 2 Engineering Services for Best Management Practices

The HW team, in consultation with the City, DEM, NBEP, and the Steering Committee will select up to five of the highest priority sites identified in Task 1 Management Plan. The HW team assumes that these sites will be chosen in association with the project partners and within the context of the proposed design

budget provided here-in. Projects that involve significant utility relocations, traffic management, structural foundation considerations, etc., are not likely to fall within this category. Projects such as rain gardens, bioretention, dry swales that are relative small in scale and do not involve complex design/construction issues will likely fall within this category. The HW team will undertake the following services for these project locations.

Subtask 2.1 Design, Engineering, Permitting, and Preconstruction

Subtask 2.1a: Survey, Resource Area Delineation, and Test Pits

HW will complete the final field work to create final designs for the selected sites. This will include up to five soil test pits, and topographic surveys of the necessary areas to finalize the designs. The survey scope is difficult to estimate at this time, three days of field time and associated data processing is assumed. Survey work and soil test pits will be conducted by Narragansett Engineering.

Based on initial investigations, it is believed that the project will likely involve construction activity within the 50-foot perimeter wetland buffer or 200-foot riverbank wetland and will require resource area delineation. HW will identify and delineate jurisdictional wetlands and jurisdictional buffers within the vicinity of the project. All resource areas will be flagged and wetland data sheets completed as necessary in accordance with the provisions of DEM.

Subtask 2.1b: Permit Ready Design Plans

HW will provide the following items for completion of a permit ready design package:

- Produce construction design plans, profiles, and details for small-scale surface stormwater treatment measures;
- Coordinate with applicable utility companies that may be affected by the design;
- Produce an erosion and sediment control plan and details;
- Produce a planting plan;
- Produce a recommended general construction sequence;
- Produce a set of technical specifications; and
- Develop quantity takeoffs, and an engineer's construction cost estimate.

This planset will be reviewed and stamped by both a Rhode Island Registered Professional Engineer and a Rhode Island Registered Landscape Architect, both employed by HW. As part of the development of construction plans, HW will prepare detailed engineering calculations depicting how each component was sized for stormwater treatment and conveyance. HW will also prepare a comprehensive Operations and Maintenance Plan for each component of the project for both during and post construction, describing the inspection and maintenance requirements and frequency. HW will meet with the project partners prior to finalizing the plans and revise the plans as necessary following review and comment.

Subtask 2.1c: Permitting Services

Under this task, HW will provide services to support the City with permit acquisition. This will include measuring resource area disturbance, transcribing resource limits to project plans, developing a project narrative, and completing the permit application forms for submission to DEM to secure a Freshwater Wetlands Permit. HW will correspond with DEM staff as necessary to answer questions and respond to written requests for additional information.

Subtask 2.1d: Specifications Manual and Final Cost and Quantity Estimate

Based on the final permit conditions from DEM and input from the project partners, HW will complete final construction bid-ready plans, bid cost estimate tabulation for construction, and construction specifications to support the City in bidding the project in accordance with the Construction Specifications Institute (CSI) 2004 Master Format, or the City's general specification format. HW will supply Division 1, General Requirements, and applicable Divisions for Facility Construction Subgroups for site and infrastructure construction. We assume the City will provide Division 0 boilerplate language outlining the City's procurement and contracting requirements. HW will coordinate with the City staff to coordinate the specification package.

HW will meet with City staff to discuss the final plans and any final comments and make one revision to the plans and produce a final set of construction bid-ready plans. HW will provide one set of approved plans and one set of digital plans (in AutoCAD v. 2011, or compatible) to the City as a final deliverable of this task.

Task 2 Deliverables:

1. Topographic survey, resource delineation and test pit summary of proposed sites;
2. Stamped permit ready design plans (one hard copy and one electronic copy), and drainage report narrative (two hard copies, one digital copy);
3. DEM Freshwater Wetland Permit Application;
4. Final construction bid package and construction estimates (two hard copies, one digital copy); and
5. Final construction bid-ready plans (one hard copy, one digital copy in AutoCAD v 2011), and attendance at of two meetings with City staff.

Subtask 2.2 Construction Oversight

Consistent with designs finalized under Task 2.1, HW will oversee the installation of BMPs, and provide a certificate/letter stating the BMPs have been installed according to design specifications. HW will provide up to six site inspections under this task. We assume an As-Built plan will also be prepared by the contractor, for HW review and comment, that illustrates the specifications of the BMP construction and any alterations from the design plans for use in presentation, technology transfer, and education. HW will then prepare and file certifications of completion to DEM with the Record Drawing.

Deliverables:

1. Inspection reports, including photographic record for up to six site inspections;
2. Review of final As-Built drawings of the BMPs (provide by the City and/or construction contractor); and
3. Certificate/letter stating the BMPs have been installed according to design specifications.

Task 3: Final Water Quality Management Plan

A final Water Quality Management Plan will be provided to the project partners electronically that incorporates final comments from the Steering Committee and well as reflects those project that were designed and constructed as part of Task 2. The final plan will present both short and long-term recommendations and implementation costs, and institutional arrangements, where necessary.

Deliverables:

1. Maps, photographs, cost estimates, and revised ranking documenting retrofit opportunities and a summary source control opportunities identified in the field.

2. In-pond assessment summary including cost and effectiveness of a range of options.

ASSUMPTIONS

We offer the following assumptions as the basis for our accompanying cost estimate to provide the above services.

1. The scope of work and budget for public outreach and education for Virtual Marketing Associates will be authorized under a separate agreement and/or authorization.
2. We assume that up to five project locations will be carried to final design and will be selected by HW and the project partners within the budget assumptions contained herein.
3. We assume that no property boundary survey work will be required for project. If these services are requested, the HW team has fully capable staff to provide the City with these services and can do so as part of a contract amendment.
4. HW will not be responsible for the location of underground utilities not visible or identified in the field on the survey. We will include appropriate caveats on the plans to require the contractor to verify subsurface conditions, prior to construction.
5. We assume the City will provide a backhoe and operator for conducting the test pits. If one is not available, HW can procure these services as a contract modification.
6. We assume a police detail or other traffic management will not be required for any fieldwork. If such a detail is required, we assume the City will cover these expenses or issue an appropriate amendment to our contract.
7. We have assumed that the project area may contain wetland areas and/or jurisdictional buffers and will require a DEM Freshwater Wetlands Permit. We assume that our services will not be required to assist the City in filing any other local, state or federal agencies (i.e., no endangered species filing, no 404/401 Water Quality Certification or Army Corps of Engineers wetland permits, no filing with the Rhode Island Historical Preservation & Heritage Commission). If such permits are required, HW has fully qualified staff to assist the City and would be pleased to offer any services necessary as a negotiated contract amendment to this scope of services.
8. We assume that the project site is not in the vicinity of a hazardous waste site. If any site assessment and remediation services are required, HW has fully qualified staff to assist the City and would be pleased to offer any services necessary as a negotiated contract amendment to this scope of services.
9. We assume "Division 0" Bid Specifications will be provided by the City. It is also assumed the City will be responsible for advertising the bid, distributing plans and specifications, printing, and ultimately selecting the contractor and issuing a notice of award.
10. Construction site layout and construction staking prior to construction under Task 2.2 will be conducted by the City's contractor responsible for construction services.
11. This estimate does not include services for shop drawing review during the construction process.
12. This estimate does not include services for sampling and testing of materials during the construction process that may be required.
13. HW's construction observation work is inspectional in nature and will not include supervision or direction of the actual work of the contractor, the contractor's employees, agents or subcontractors. The contractor shall be informed by the owner that neither the presence of HW's field personnel nor the observation and/or testing by HW shall excuse the contractor for defects discovered in the contractor's work.
14. In no event will HW be responsible or liable for the contractor's use or administration of personnel, machinery, staging, or other temporary or precautionary construction, safety precautions or procedures, or for compliance by the contractor with the provisions, terms, or

specifications of the contract. Observation services provided by HW are solely for the benefit of the owner.

15. In no event will HW be responsible or liable for the security of construction material stockpiled on site.
16. Any meetings, additional work items, extension of the duration of work items, or additional materials not specifically outlined in this proposal will be undertaken following the execution of a mutually acceptable contract amendment.