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September 19, 2018

CONDITION ASSESSMENT

GEORGE HOBART BAKER MEMORIAL FOUNTAIN
J.W. Fiske Iron Works, New York, 1914
Painted cast iron fountain

PROJECT NO. 18019

LOCATION: Owego, New York

Image 01: Fountain before treatment

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INSPECTION

The fountain (Image 01) was inspected June 20 through 21, 2018 by Jim Gwinner, Public Art Conservator of McKay Lodge Fine Arts Conservation Laboratory Inc. Images were taken of the fountain as well as measurements of the fountain components. In addition, local stakeholders were interviewed for a more complete understanding of the history of the fountain and the project goals. After the inspection, the fountain was disassembled for restoration of the cast iron and zinc fountain elements by Robinson Iron of Birmingham, Alabama.

The resulting report is an assessment of the fountain and its components. It includes recommendations for demolition as well as construction of a new fountain pool, wall, plumbing and pump system. It also reviews projected water usage and costs to operate and maintain the fountain on an annual basis.

FOUNTAIN DIMENSIONS

Pool:	14 feet in diameter
Wall height:	18 inches
Central concrete pedestal:	5 feet diameter, 14 inches (height)
Bowl support column:	66 inches
Bowl:	78 inches in diameter, 26 feet ¾ inches (height)
Fireman:	75 inches (height), 25 inches base in diameter
Fireman pedestal:	28 inches in diameter, 26 inches (height)

(See Figure 01: includes a dimension elevation drawing, electrical section of pool floor with chase for wire, and plumbing section with supply and drain).

PROCEDURE

The goal of the new fountain installation is to construct a simple, but robust concrete pool which incorporates the original cast iron outer pool walls as well as a cast concrete central pedestal to support the cast iron base and bowl of the fountain. The new installation shall incorporate a submersible pump in a pump pit within the pool floor.

Image 02: Kearny Park Fountain initial reassembly

The treatment will be completed by Robinson Iron. The cast iron fountain and zinc fireman figure will be first disassembled into their separate components as needed. Old paint coatings and corrosion will be removed, the elements repainted. The fountain will then be returned to Owego, New York.

An example of the reassembly process is illustrated for another project, the Kearny Park Fountain in Muskegon, Michigan by McKay Lodge Conservation Laboratory, Inc. (Image 2).

DEMOLITION

The site for the fountain should be prepared while the fountain is being restored at Robinson Iron facilities. Old concrete and plumbing must be removed so that a new water supply can be laid into the fountain location and a new sanitary sewer connection for the draining of the fountain can be installed. The supply line through the concrete slab should be 1-inch copper tubing with water stop flange (Figure 02: PEM 63730, Georgia Fountain Company).

The drain should be in the bottom of the pump pit and connected to the sanitary sewer. Provisions should be made to access and snake the drain as needed; this drain will also perform as the overflow for the pool as it is also a standpipe (Figure 03: 62203 #610430 PEM, Georgia Fountain Company). The standpipe must be custom fitted with a stainless-steel chain welded to the standpipe, and then attached to a stainless-steel eye set into the concrete with a lock making it difficult for vandals to remove.

FORMING AND POURING NEW FOOTER POOL BASIN FLOOR

The pool floor with integral footer is intended to be a monolithic installation. It should float on its gravel sub-base.

CONCRETE

POOL FLOOR	16 feet diameter (see Figure 04 for dimensional drawing)

The new pool floor should be 16 feet in diameter. Set grades on site so all water drains away from fountain. Excavate 14 inches below grade for a 6-inch sub base and 8-inch pool slab. Trench for 3-inch drain and 1-inch supply. Excavate and form for pump pit, trench for 4-inch chase sleeve from pump pit to interior of fountain element. Install perforated drain tile below around perimeter of pool floor.

SUB-BASE	6-inch sub base compacted #57 limestone
FLOOR REINFORCEMENT	½ inch epoxy coated rebar, 1 foot on center

CONCRETE SPECIFICATION

Floor and footer to be integrally poured at the same time.

- Floor: 8 inches thick, 4000 p.s.i., air entrained, 4-6 inch slump, with macrofiber 6-1/2 lbs. per cubic yard, plasticizer, low chert. Hydrotite waterstop (Sika Corp.). (Figure 05)

- Footer: 4 X 4 X 4 feet deep (or local frost depth)

- Concrete Pedestal: 4000 p.s.i., air entrained, 4-6 inch slump, with macrofiber 6-1/2 lbs. per cubic yard, plasticizer, low chert. Form pre-made and poured on site the same day as the floor/footer.

- Walls: Hand-pack, 4000p.s.i., air entrained, 2-4 inch slump, with macrofiber 6-1/2 lbs. per cubic yard, low chert.

Images of this process are depicted below and on the following page for the Root Park Fountain, Muskegon, Michigan (Images 03-05).

Image 03: Root Park Fountain, Muskegon, Michigan

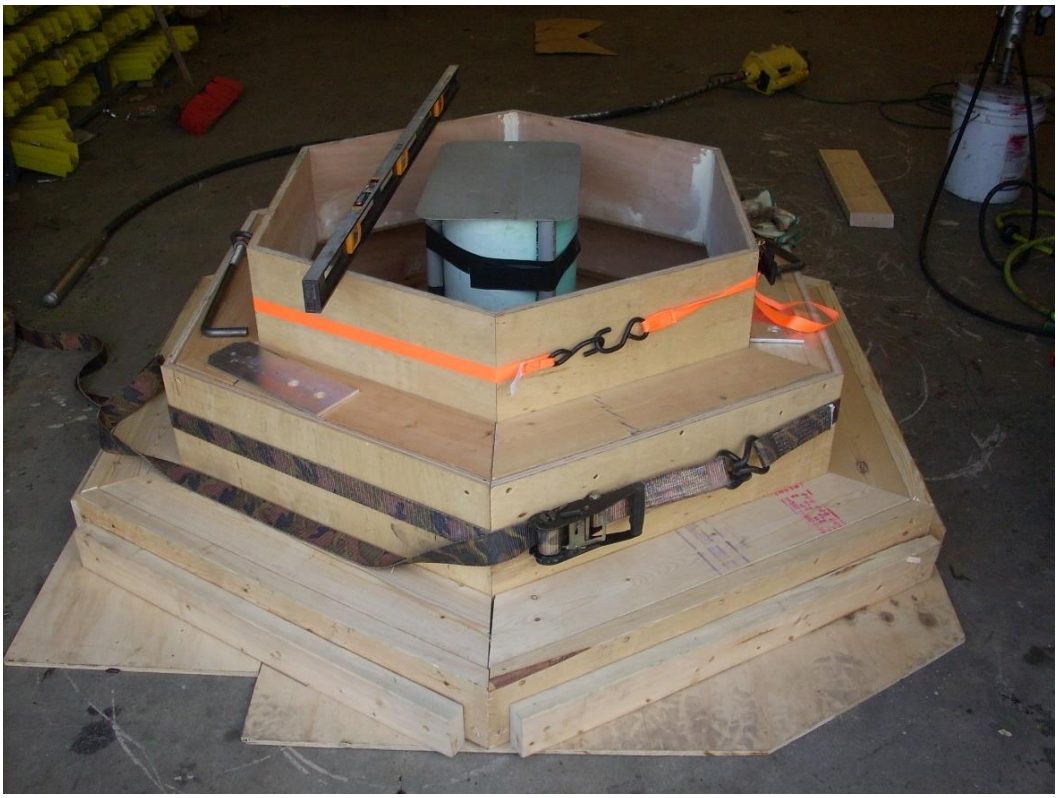

Image 04: Fabrication of a hexagonal wood form to pour a concrete base pedestal, Root Park Fountain, Muskegon, Michigan

Image 05: Concrete pedestal with lifting eyes, tabs to bolt the bottom of the cast iron base to, hole through center to allow for water supply, Root Park Fountain, Muskegon, Michigan

PLUMBING

SUPPLY

The supply line shall run from the City water source and routed through a curb stop valve box set below the frost line. If the water is to be metered, the meter can be removed for the winter and placed in a box between the curb stop and the fountain pool. From the meter box, the water line should be composed of copper and have a hose bib in the meter box; this is for a hook-up to wash down the fountain. The copper line must be set in elevation to run beneath the pool floor and be attached to the water stop slab penetration (PEM 63730, Georgia Fountain Company, see Figure 02). All lines must be installed in such manner that they can be cleared (blown out) for winter shutdown.

DRAIN

The drain for the fountain shall be a removable standpipe with its mount flange set flush with the floor in the pump pit (62203 #610430 PEM, Georgia Fountain Company, see Figure 03). When cut at the correct height, any water above the top of the standpipe will run down the drain. The pool will drain down the sanitary sewer when the standpipe is lifted, and the fountain and pool can be washed before replacing the standpipe and refilling the pool.

PUMP

The pump to supply the four water jets shall be a submersible bronze and stainless-steel pump with a 12-foot power cord (Figure 06: PowerFlo PFU31). The cord shall run through a 2-inch PVC SCH 40 DWV chase sleeve, which should be installed to get the power cord fed within the pump pit into a waterproof connection box which will be set into the interior pool wall.

WATER DISPLAY

The water display for this fountain is a simple arrangement of four outlets equally spaced around the rim of the bowl which houses the fireman statue. In the past, the bowl filled with water to the level of the outlets on the sides of the bowl then exited the bowl as four streams. This gravity fed configuration can be easily blocked with leaves and debris causing the bowl to overflow. Outlets should be plumbed with flexible hose in the manner described below.

A 4-inch PVC sch 40 DWV chase sleeve shall be placed to travel from the pump pit to the center of the fountain and up through the base. This chase shall carry a 2-inch PVC spa hose (Tigerflex Spa Hose FMCR, source typical brand) to carry the water from the pump to the bowl area. The spa hose uses stainless-steel hose clamps and barbed fittings for assembly. The pump should be attached to the spa hose with a 2-inch polypropylene cam lock hose coupling (McMaster-Carr, source typical brand). A manifold should be fabricated from copper pipe and fittings with four (4) ½ inch ball valves. Each ½ inch ball valve shall feed a ½ inch soft copper water supply line

one to each water outlet on the rim of the bowl. By feeding each one with a valve operated supply line, the outlets can be independently adjusted, and therefore, have less chance of clogging with debris like the older gravity fed installation previously described. The plumbing of the pump, spa hose supply, copper manifold, valves and copper supply tubing to the outlets will need to be custom designed and installed when the fountain is assembled.

ELECTRIC

Electric (20A 115V) should be supplied from a weathertight above ground panel box, through a buried wire fed to a waterproof junction box set into the concrete of the interior wall. The submersible pump 12-foot wire shall be fitted to this waterproof box also and the connection for the pump shall be made within the box. An on-off timeclock should be installed into the above ground panel box to control the display operation of the fountain.

INSTALLATION

Images and descriptions included regarding the Kearny Park and Root Park Fountains installations in Muskegon, Michigan which illustrate a similar, but not identical, process for the upcoming treatment of the George Hobart Baker Memorial Fountain (Images 06-10).

For the Baker Memorial Fountain, assembly of the cast iron elements can begin once the concrete footer/floor is installed and cured. The wall elements should be placed and adjusted before they are bolted to the floor. Bolt locations must be marked, drilled 3 to 4 inches deep, and stainless-steel threaded studs should be bonded to the concrete with a quick-setting epoxy or appropriate acrylic adhesive. Walls must be bolted to the floor with stainless-steel nuts and washers. The diameter of the stainless-steel stud should be ½ inch NC.

The interior of the cast iron walls must be lined with a polypropylene drainage mat product such as Enkadrain (Enkadrain 9120, Bonar Inc.). This lining will be between the interior of the cast iron wall, acting as a drainage space between the cast iron and the hand laid interior concrete pool wall. The dry-pack concrete should not be placed directly touching the interior of the cast iron walls (See Images 06-10).

The interior concrete wall shall be hand-laid and finished. Since the concrete mix is stiff, several laborers are required to quickly install and finish it. The interior can be coated with a waterproof coating once the concrete has cured. Cast iron elements must then be made plumb and level adjusting with stainless steel washers used as shims if necessary for a complete installation (See Image 10).

Kearny Park Fountain was treated by McKay Lodge Conservation staff only with assistance from City Maintenance for logistics. For the Root Park Fountain, City Maintenance decided to assume most of the project based on what it had learned through observation of the Kearny Park Fountain project.

Image 06: Example of walls being laid out for Root Park Fountain

Image 07: Example of Walls in place and pedestal in place for Root Park Fountain

Image 08: Example of the walls in place for Kearny Park Fountain

Image 09: Laying up dry-pack concrete walls within the interior of the cast iron walls for Kearny Park Fountain

Image 10: Final install of the cast iron, waiting for application of the interior waterproof coating for Kearny Park Fountain

For the Baker memorial fountain, it is not possible to predict each step and result of the treatment, and the project might involve further discussion as it progresses.

BAKER FOUNTAIN WATER USAGE AND COSTS

The final section of this report reviews the necessary water usage and projected water maintenance costs. In addition to water usage and labor, evaporation from the pool itself should also be considered when developing a long-term maintenance plan for the fountain. Important figures are highlighted below, and some figures are rounded for greater clarity.

VOLUME

- 14-foot diameter pool with a 1-foot water depth ($V = \pi r^2 h$) =153.9 cubic feet of total water volume. This figure is rounded to 155 cubic feet.

- 155 cubic feet =1,159 gallons of total water volume. This figure is rounded to 1,160 gallons.

ANTICIPATED USAGE (OWEGO, NY)

- Operating season: April-October or 30 weeks
- Fountain should be drained and washed out weekly

Monthly Maintenance (4 drain/wash per month):

- 155 cubic feet X 4 drain/wash = 620 cubic feet of total water volume

Operating Season (28 drain/wash per season):

- 155 cubic feet X 28 drain/wash = 4,340 cubic feet of total water volume

EVAPORATION LOSS

- 0.25 to 0.5 inches per 24-hour day loss rate.
- 155 cubic feet X 0.25 inches = (38.25) 39 cubic feet of loss per day. This figure has been rounded to 40 cubic feet loss of water per day.
- 40 cubic feet x 7 = 280 cubic feet of water loss per week
- 280 cubic feet X 4 weeks = 1120 cubic feet of water loss per month

  OR, at the highest evaporation rate of 0.5 inches per 24 hour period

- 155 X 0.5 = 80 cubic feet per day
  2240 cubic feet per month of water loss (see above for details)

Minimum to Maximum Seasonal (7 month) Evaporation Rates : 7,840 to 15,680 cubic feet

LOWEST ONE MONTH USAGE WITH EVAPORATION AND MAINTENANCE CHANGES:

These figures assume that due to cool weather and low algae growth, the fountain may only require two drain/wash maintenance cycles per month.

- 2 drain, wash and refill — 2 X 155 = 310 cubic feet
- Evaporation — 1 X 1120 = 1120 cubic feet

1430 cubic feet per month total water usage

HIGHEST ONE MONTH USAGE WITH EVAPORATION AND MAINTENANCE CHANGES:

- 4 drain, wash and refill 4 X 155 = 620 cubic feet
- Evaporation 1 X 2240 = 2240 cubic feet

2860 cubic feet per month total water usage

TOTAL USAGE SEASONAL

- LOW: 7 months X 1430 cubic feet per month = 10,010 cubic feet per season
- HIGH: 7 months X 2860 cubic feet per month = 20,020 cubic feet per season

ANNUAL COSTS:

Note: these costs are based on what information could be found online for Owego Municipal water costs.

- Water: 1-1/2" meter @ 2000cu.ft. per month $80.00
- Sewer: EDU3 146 per month $146.00
- $226.00 X 7 months (approximately) $1,582.00 per season.