



report

Enos Cook Memorial Fountain Assessment Report

Town of Amherst
Sweetser Park
Amherst, MA 01002

November 2018

Weston & SampsonSM

ENGINEER'S REPORT

The Enos Cook Memorial Fountain (the Cook Fountain/the fountain) is located in the Town of Amherst, Massachusetts (the Town). The Town is approximately 27.72 square miles, with a population of 40,079 (2016 US Census). The Town was settled in 1703, not officially becoming a Town until 1759 when it was established as part of the Town of Hadley. The Town later separated into its own and was named after Jeffery Amherst.

The Cook Fountain is the centerpiece of Sweetser Park which is located between Lessey Street and Main Street in the Town center (See **Figure A**). The Park was established in the mid-1800s by Edward



Figure A – Study Location

Dickinson, Luke Sweetser and two well to do friends. In 1910, Enos Foster Cook, donated funds for a fountain in the park. The Olmstead Brothers were hired to design the fountain, which was constructed in 1914. The design of the fountain included a circular basin with four pointed corners, a fountain basin with a reinforced concrete floor and marble veneer, Tennessee marble coping and a vertical Tennessee marble stone column at the center of the fountain basin supporting a Tennessee marble stone fountain bowl (See **Figure B**).

The Cook Fountain went through a major renovation funded by the Amherst Rotary that ended in 1995. In the 20+ years since this work, the fountain has been annually maintained by cleaning out

debris and washing the stones. However, the Town staff has noticed increased spalling and erosion of the Tennessee marble stones, particularly in the fountain bowl and support column and shifting of the stones that has caused offset loose joints.

Weston & Sampson Engineers has been retained by the Town to assess the existing condition of the fountain and to provide recommendations for repairing/renovating it. Our scope of services includes the following:

- Review of existing information, including design drawings, record drawings, project manuals, O&M manuals, maintenance records and photographs.
- Meet with applicable Town personnel to discuss operations and maintenance of the facility.
- Observe and monitor current operations.
- Perform an assessment of the fountain and the mechanical equipment's existing condition.
- Provide recommendations and a cost estimate to repair/renovate the fountain.



Figure B – Cook Enos Memorial

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1.0 BACKGROUND, GENERAL INFORMATION, AND EXISTING USE OF THE FOUNTAIN

The Enos Cook Memorial Fountain is located in the Town of Amherst, Massachusetts in Sweetser Park, between Lessey Street and Main Street (See **Figure A**). The fountain is the centerpiece of the park and is visited by residents (especially families with young kids), tourists and visitors. It is in a highly visible location in the Town Center en route to the Emily Dickinson Museum making it a popular Town attraction. The fountain is typically used from late April/early May until the first frost. During the colder months the fountain is winterized.

The fountain was constructed in 1914 and was shut down in 1975 due to a water supply issue in the Town. The fountain wasn't turned back on for 20-years due cracked marble and faulty plumbing. In 1995 the fountain underwent a major renovation allowing for it to be turned back on. Renovations included installing a new water circulation system, repairing the electrical systems and repairing the stone walls. In 2013 the fountain was shut down again to protect the Town's water supply from a potential cross contamination with the fountains water supply. During the Winter of 2013-2014 the Town Department of Public Works (DPW) made repairs to the fountain and it was reopened in May of 2014. In August of 2015 the fountain pump stopped working and was replaced with a new one.

The following assessment of the fountain's existing condition was performed with the intent of restoring the fountain using its original design by Olmsted Brothers.

1.10 Description of the Existing Fountain

1.11 1995 Renovation

In 1995 the Enos Cook Memorial Fountain was renovated after being shut down for 20 years. Renovations were done by Garrity & Tripp and included restoring the Tennessee pink marble units on the fountain, repairing the concrete base, replacing the concrete deck panels, and replacing existing landscape planting. Additionally, the work included a new precast concrete manhole to house the circulation equipment, installing a new water circulation system, repairing the electrical systems and installing an irrigation system.

1.20 Current Challenges

A current challenge for the Town is scouring and cracking of the fountain structure. Additionally, the existing winterization process is labor intensive and needs to be reevaluated.

2.0 – Evaluation of Existing Fountain

A field reconnaissance was performed on September 14, 2018 to inspect the fountain. The fountain was not in operation during the time of inspection. The reinforced concrete floor of the fountain basin is approximately 10-feet (ft) in diameter and 1-ft 1-inches (in) deep. The marble veneer of the fountain basin is 10-in wide by 1-ft 8-in high. The marble coping blocks of the basin are 6-in high by 10-in wide. At the time of the investigation the fountain basin had a water depth of 4-in along the edge and 6¹/₂-in in the center. The center Tennessee marble column of the fountain is 1-ft 6¹/₄-in in diameter at the base and 1-ft 4³/₄-in in diameter at the top and is 5-ft 6-in tall. The marble column is set on a 1-ft high concrete base that has 4 3/4-in inlets. The center column supports the fountain bowl which is also Tennessee marble.

2.10 – Existing Conditions

The existing condition of the fountain is poor. As previously mentioned, the fountain has not seen any significant renovations since 1995. There is significant cracking along the basin floor, veneer, coping and along the centerpiece column. The cement caulking along the basin veneer and coping has become detached, creating large openings along the basin (See **Figure C** and **Figure D**). It was noted by the Town that water depths in the fountain are kept low to avoid seepage through the cracks and openings.



Figure C– Cracking along Basin Siding



Figure D – Dethatched Cement Caulking

The fountain bowl contains four spouts that are connected to a 1-1/2-inch brass water supply connection. The spouts are set up to discharge water out of four holes situated along the top of the fountain bowl. It is intended for the water to project out of the holes into the basin. Based on scouring on the exterior of the fountain bowl and staining along

the column it is evident that the water does not always properly project away from the centerpiece (See **Figure E**).

The fountain is currently protected in the winter with wood panels (See **Figure F**). The Town noted that this form of winterization is not ideal. Not only is it labor intensive for the Town to construct and deconstruct each year, but it is also not an effective method in preserving the fountain. Being many pieces, the wood paneling does not create a tight seal around the fountain. Early on cracking can most likely be attributed to this current method of winterization. This form of winterization is also not cost effective as the paneling corrodes easily and needs to be replaced frequently.

2.11 – Structural

The cracks and openings along the fountain basin and fountain centerpiece are significant. Water is most likely seeping into these cracks and openings impacting the structural integrity of the fountain. The cement caulking holding pieces of the fountain together has loosened. If this binding continues to loosen it could pose a hazard to people visiting the fountain by pieces falling off creating a trip hazard or water leaking from the fountain creating a slip hazard.



Figure E – Scouring & Staining on Fountain Centerpiece



Figure F – Current Fountain Winterization Method

2.12 – Finishes

As previously noted, the fountain bowl has significant scouring due to improper projection of water discharging out of the spouts. This has also resulted in staining along the centerpiece column. The fountain water is currently treated with chlorine which is most likely contributing to the corrosion of the fountain bowl as well. The exterior finish of the fountain basin is in fair condition with minor cracks and some discoloration.

2.20 – Recommendations

The existing condition of the fountain is poor. Repairing the fountain to bring it back to “like new” conditions does not seem to be a feasible solution. It is recommended that the fountain be replaced. Per the Town’s instruction, the design of the fountain cannot deter from the original Olmstead Brothers’ design. Since the fountain design is unique the Town would need to work with a manufacturing company to create a custom fountain.

Additionally, it is recommended that the method of winterization for the fountain be updated to avoid cracking of the new structure during the freeze-thaw cycle. For winter protect, a possible solution could be a panelized system on a light weight aluminum with a fabric roof.

3.0 – Evaluation of Existing Fountain Patio

3.10 – Existing Conditions

The fountain is bordered by a concrete patio with red pavestones, shaped to outline the fountain (See **Figure G**). The outside border of the patio has a 1-ft 2-in wide by 9-in high concrete curbing. The patio has four openings, one to the North, South, West, and East of the fountain. At the East opening there are stairs extending into green space and to the North, South, and West openings are ADA compliant walkways. The northern walkway extends approximately 345-ft towards Lessey Street and is made up of grey brick pavers set on a concrete deck with a granite border. The southern walkway extends approximately 50-ft towards Main Street and is constructed of cement concrete. The western walkway extends approximately 85-ft towards Boltwood Walk and is made up of red brick pavers.



Figure G – Fountain Patio Looking East

Along the walkway is a mix of blank and engraved brick pavers. It was noted by the Town that the sidewalk south of the fountain along Main Street is being replaced and will extend up to the concrete curbing of the fountain patio. This will replace part of the southern walkway.

There are no drainage structures within the patio area. The patio is sloped towards the roadway to direct drainage through the Northern and Southern patio openings and towards the greenspace through the eastern patio opening. The Town did not report any drainage concerns related to the fountain area.

The outside perimeter of the patio is surrounded by trees and shrubs. There is no existing lighting surrounding the fountain although the fountain does run overnight. There are two benches at the Northwest and Southwest edge of the patio. A wastebasket is placed at the Southeast edge of the patio.

3.11 – Structural

The structural condition of the fountain patio is good. The cement grouting between the concrete pavers has diminished allowing for dirt and weeds to accumulate (See **Figure H**). The finish on the eastern stairs has deteriorated, exposing the concrete (See **Figure I**).

3.12 – Finishes

The red pavers that make up the patio have faded significantly over the years. There is also significant discoloration on the pavers and the curbing due to dirt build up over the years. The finishes on the walkway are in good condition. The finish on the eastern stairs has worn and is in need of repair.



Figure H – Fountain Patio Finishes



Figure I – Eastern Stairs

3.20 – Recommendations

The fountain patio overall is in good condition and therefore replacement of the patio is not needed. It is recommended that the stairs on the east side of the patio are replaced. The patio should be power washed regularly to remove buildup dirt and weed growth on and between the pavers. This will help improve the appearance of the patio. It could be beneficial to install lighting around the fountain since the fountain runs overnight.

Since the color of the pavers has significantly faded the Town should consider replacing the pavers as part of the fountain replacement. This will improve the overall appearance of the fountain.

4.0 – Evaluation of Existing Vault

4.10 – Existing Conditions

The filtration system for the fountain is located northeast of the fountain in the planter area. The filtration system consists of a 6-ft by 4-ft by 6-ft precast concrete vault with a 42-in by 42-in cover. The vault houses the collector tank, the filtration pump, controls, and autofill sensor. Water from the fountain basin enters through the southside wall of the vault into the collector tank. The collector tank is 4-ft by 2-ft 4-in by 3-ft. The collector tank is located directly beneath the vault cover and has a grated top for standing within the vault.

Next to the vault is the water meter system that is protected by a white LokBox structure. The LokBox contain the autofill system to feed domestic water into the vault. Next to the Lok Box is the electrical service and distribution panel. This powers the pump and controls.

4.11 – Recirculation System

The Fountain was designed to have water enter the filtration system from the fountain basin through the four 3/4-in inlets in the base of the center column. Due to cracks and openings within the fountain coping and veneer the water level has been kept low below these inlets. To accommodate the low water depths the fountain was reconfigured to utilize the existing drain for filtration.

As shown in **Figure J** the drain is currently a 4-in PVC pipe installed in the basin floor. Water collected through this pipe is typically gravity fed to the collector tank. When the fountain basin needs to be drained the water is redirected to the Town's sanitary system through the opening and closing of valves.

The Town currently treats the water by manually mixing chlorine tablets into the holding tank daily. The Town presently does not have any issues with this practice as the Department of Public Works (DPW) already has to visit the park daily for other maintenance responsibilities. However, chlorine in the water is most likely contributing to the corrosion of the fountain bowl.



Figure J – 3/4-in PVC Inlet

Treated water from the collector tank is recirculated through the system through a pump at the bottom of the collector tank within the vault. The pump is a Little Giant Submersible Pump, Model No. 3E-12NRY, 1/15 HP, 230V, 12 GPM. This pump was installed as part of the 1995 restoration work. Before entering the pump, sediment is filtered out of the water using a Campbell High Flow Sediment Pre-Filter system.

Water level within the vault is monitored with a W. W. Grainger float valve that is connected to a 1/2-in water supply connection.

The water meter system is currently being held up by a brick block stacked on top of a cylindrical block.

4.12 – Structural

The recirculation equipment was recently updated and structurally is in good condition. The piping is buried and therefore could not be visually inspected. It is recommended that the piping be replaced as part of the fountain restoration.

The interior wall of the vault has some staining indicating that it is not epoxy coated.

4.20 – Recommendations

The equipment for the recirculation system was recently updated and appears to be in good condition. No pressure testing was performed on the piping and therefore the piping should be replaced as part of the fountain restoration. It is recommended that the fountain and fountain patio be replaced in conjunction with replacing the piping. As mentioned in Section 3.0 Evaluation of Existing Fountain Patio, the concrete panels of the patio have faded significantly, and therefore new concrete panels would improve the aesthetics of the fountain.

It is recommended that the chlorine disinfectant is replaced with an Ultra Violet (UV) to improve disinfection of the filtered water and reduce corrosion of the marble. UV systems allow for the

disinfection of circulated water by sending water through ultra violet light rays killing most pathogens and contaminates. This in turn lowers the amount of chemicals required to treat the water.

It is recommended that the vault is epoxy coated to avoid further staining/infiltration of the concrete walls.

5.0 – Conclusion

In conclusion it is recommended that the Enos Cook Memorial Fountain in Amherst, MA is replaced. The fountain has not seen any major renovations since 1995. Over the years it has experienced significant cracking staining and scouring. The following is recommended to restore the fountain:

- Replace concrete base of the fountain and the column
- Replace Tennessee pink marble pieces, including the fountain coping, veneer, column and bowl.
- Install a new pump.
- Replace the existing disinfection system with a UV system.
- Remove and replace fountain piping.
- Install a stainless steel above ground electrical and fill cabinet to house the pump, filter and UV system.
- Upgrade the method of winterization.
- Renovate the patio area, including replacing the concrete panels, existing plants and concrete steps.

It is estimated that it will cost \$585,299 to restore the fountain. A detailed cost estimate is included in **Appendix A**.

Appendix A – Opinion of Probable Cost

Enos Cook Memorial Fountain Rehabilitation Cost Estimate

Town of Amherst, Massachusetts

Division 13 - Special Construction						
Monument Piece	\$25,000	EA	1	\$25,000	\$6,500	\$31,500
Total						\$31,500
Division 22 - Mechanical						
Filter Pump	\$2,300	EA	1	\$2,300	\$2,400	\$4,700
VFD	\$5,000	EA	1	\$5,000	\$1,200	\$6,200
Filter	\$2,300	EA	1	\$2,300	\$1,920	\$4,220
Hangers	\$600	LS	1	\$600	\$960	\$1,560
Nozzles	\$2,000	LS	1	\$2,000	\$960	\$2,960
Mechanical Piping	\$10	LF	50	\$500	\$1,360	\$1,860
Water Level Control	\$2,000	EA	1	\$2,000	\$960	\$2,960
Autofill System	\$2,500	EA	1	\$2,500	\$1,920	\$4,420
1 1/2-in PVC Pipe	\$8	LF	200	\$1,600	\$0	\$1,600
New Domestic Water Service	\$3,500	LS	1	\$3,500	\$0	\$3,500
2-in PVC Pipe	\$11	LF	100	\$1,100	\$0	\$1,100
Total						\$35,080
Division 23 - Heating, Ventilating and Air Conditioning (HVAC)						
Ventillation System	\$1,500	LS	1	\$1,500	\$960	\$2,460
UV System	\$3,000	EA	1	\$3,000	\$1,920	\$4,920
Total						\$7,380
Division 26 - Electrical						
Electrical Wiring	\$1,000	LS	1	\$1,000	\$4,480	\$5,480
Devices & Boxes	\$5,000	LS	1	\$5,000	\$4,480	\$9,480
Instrumentation	\$7,500	LS	1	\$7,500	\$0	\$7,500
Bonding	\$1,500	LS	1	\$1,500	\$2,240	\$3,740
Total						\$26,200
Division 31 - Earthwork & Landscaping						
Excavation	\$40	CY	23	\$920	\$0	\$920
Crushed Stone	\$45	CY	9	\$383	\$0	\$383
Backfill	\$45	CY	17	\$767	\$0	\$767
Loam & Seeding	\$10	SY	100	\$1,000	\$0	\$1,000
Pine Bark Mulch (3" Depth)	\$12	SY	56	\$667	\$0	\$667
Plantings	\$10,000	LS	1	\$10,000	\$960	\$10,960
Irrigation System	\$5,000	LS	1	\$5,000	\$3,840	\$8,840
Lighting	\$10,000	LS	1	\$10,000	\$5,760	\$15,760
Total						\$39,297
Division 33 - Utilities						
Utilities	\$7,000	LS	1	\$7,000	\$0	\$7,000
Total						\$7,000
Project Summary						
Total						\$412,377
15% OH & Profit						\$61,857
Bond/Insurance @ 2%						\$9,485
Engineering @ 10%						\$48,372
10% Contingency						\$53,209
Total						\$585,299