Public Works Memorandum
NO. 2009-42

DATE: **June 4, 2009**

TO: **Honorable Mayor Carrigan and City Council**

FROM: **Ryan P. McCrady, City Manager**
Richard G. Marley, P.E., Director of Public Works

SUBJECT: **Second Amendment to Engineering Agreement with Hanson Professional Services for the Lake Decatur Dam Repairs Project, City Project 09-02**

SUMMARY RECOMMENDATION: It is recommended by staff that the City Council approve the attached resolution authorizing the second Amendment to the Agreement with Hanson Professional Services, Inc., (Hanson), for engineering services to develop designs and construction documents for repairs to the Lake Decatur Dam for a fee not to exceed $129,282. The second Amendment to the Agreement authorizes an increase in the fee of $129,282, therefore increasing the not to exceed fee of $110,100 to $239,382.

BACKGROUND:

Prior Council Action

November 6, 2000 – Council approved Resolution R2000-220 approving an agreement with Harza Engineering Company for the design of Lake Decatur Dam Phase II Improvements, City Project 2000-41, in the amount of $48,900.

September 17, 2001 – Council approved Resolution R2001-176 awarding a contract to OCCI, Inc. to perform the Lake Decatur Dam Rehabilitation, City Project 2000-28A in the amount of $542,370.

September 20, 2004 – Council approved Resolution R2004-140 authorizing an agreement with Hanson Professional Services for design of the Lake Decatur Dam Rehabilitation Project 2004 Upstream Face of Spillway, City Project 04-20, in the amount of $40,000.

May 16, 2005 – Council approved Resolution R2005-60 awarding an amendment to the agreement with Hanson Professional Services for the design of the Lake Decatur Dam Rehabilitation Project 2004 Upstream Face of Spillway in the amount of $27,300 bringing the total agreement amount to $67,300.

May 16, 2005 – Council approved Resolution R2005-61 awarding a contract to J. F. Brennan to perform the Lake Decatur Dam Rehabilitation Project 2004 Upstream Face of Spillway in the amount of $167,675.

January 20, 2009 – Council approved Resolution R2009-04 authorizing an agreement with Hanson Professional Services to design Lake Decatur Dam spillway structure repairs. The agreement was for a fee not to exceed $83,400.

April 20, 2009 – Council approved Resolution R2009-52 authorizing Amendment 1 to the Hanson Professional Services agreement. The work added by Amendment 1 includes the rehabilitation of the mechanical systems that raise and lower the sluice gates on the north side of the dam, replacing the seals for the Bascule Gates and Sluice Gates, and the removal of non-functioning heating units along the Bascule Gates. Amendment 1 was for a fee not to exceed $26,700 for a total fee of $110,100.

Summary of the Major Construction History of Lake Decatur Dam
Appendix A provides a brief summary of past improvements to the Lake Decatur Dam.

Current Project Status
The 2009 Dam Repair Project is currently out for bid. The bid opening is scheduled for June 19, 2009 and will be brought before the City Council on July 6. The estimate for the construction project is $1,410,000. A budget amendment may be sought at the time of construction contract approval depending upon the actual bids received.

Current Design Services Agreement
The Lake Decatur Dam is a Class 1 structure, as classified by the Illinois Department of Natural Resources. This classification indicates that failure of the dam would have a high probability of causing loss of life and/or substantial economic loss. As a condition of the Operating Permit, the City is required to undertake annual inspections. The annual inspections typically identify maintenance issues that need to be addressed in future capital projects.

On January 20, 2009, the City Council authorized a design services agreement with Hanson Professional Services (of Springfield, IL) to develop detailed design drawings and prepare construction documents for a rehabilitation project to address the recommendations contained in the annual inspection reports for the past five years. The original scope of work for this agreement identified four general groups of improvements that were needed:

1. Repairs to the training wall between gated outlet works and spillway
2. Repairs to north and south sections of the spillway
3. Repairs to south abutment and training walls
4. Repairs to the gated outlet structure.

On April 20, 2009, the City Council authorized Amendment 1 to the design services agreement to add work addressing concerns identified in a detailed inspection of the dam. The work added by Amendment 1 includes the rehabilitation of the mechanical systems that raise and lower the sluice gates on the north side of the dam, replacing the seals for the bascule gates and sluice gates, and the removal of non-functioning heating units.

Staff recommends authorizing Amendment 2, which provides the following assistance during the bidding process and the construction phase:

1. Respond to requests for information by contractors as they review the bid documents.
2. Review the contractor's bids and determine the qualifications of the low bids.
3. Provide a written recommendation to the City of Decatur of the apparent lowest, responsible bidder.
4. Attend the pre-construction meeting to discuss the project with the contractor.
5. Assist the City in providing construction observation which will include visiting the site approximately three (3) times per week, for a duration of 22 weeks.

6. Review Contractor submittals for conformance with the project specifications.
7. Review requests for payment by the Contractor for agreement with observed progress of the work.
8. Evaluate the condition of the downstream apron slab surface. This information will be used to prepare construction documents for the for the anticipated 2010 construction contract.
9. Conduct an Apron Slab Void Detection Survey using Ground Penetrating Radar (GPR) to determine the presence of voids under the downstream apron.
10. Conduct south embankment seepage monitoring. Continued seepage around the south side of the dam may warrant additional work in a future repair contract.
11. Provide record drawings detailing changes to the plans and specifications and provide electronic and hard copies for the City's records.

Future Work

The Lake Decatur Dam rehabilitation work is a three year, three phase project that is expected to approach a total cost of $4 million. The work will include the following:

Phase 1, 2009

The Phase 1 dam rehabilitation project is to begin construction in July, 2009, with Council approval planned for July 6. This work will include:

1. Repairs to the upstream face of the dam.
2. Rehabilitation of the mechanical systems that raise and lower the sluice gates on the north side of the dam.
3. Replacing the seal systems for the bascule gates and sluice gates.
4. Removal of gate heaters along the bascule gates.
5. Installation of a concrete patch on the downstream spillway of the dam.

The estimated construction cost is $1.4 million.

Phase 2, 2010

The Phase 2 dam rehabilitation project is to be constructed summer of 2010. This work will include:

1. Evaluation of the 2009 test patch and patching the full downstream spillway.
2. Replace 4 hydraulic cylinders on the north bascule gate. The cylinders will be pre-purchased in the fall of 2009 to assure a summer 2010 delivery.
3. Grout crack injection of the dam to reduce water infiltration through the dam.

The estimated total project cost is 1.4 million.

Phase 3, 2011

The Phase 3 dam rehabilitation project is to be constructed summer of 2011. This work will include:

1. Repair of downstream scour damage below the dam.
2. Replace 4 hydraulic cylinders on the south bascule gate. The cylinders will be pre-purchased in the fall of 2010 to assure a summer 2011 delivery.

The estimated total project cost is 1.1 million.

Several amendments to the Hanson Design Services Agreement will be recommended over the course of the 3 year dam rehabilitation work. While it may be possible to authorize engineering services for the full 3 years initially, experience has shown that it is better to approve amendments to the Agreement as the project progresses and more information is obtained.

POTENTIAL OBJECTION:

New Dam vs. Existing Dam
Concerns have been raised in the past regarding the options of rehabilitating the existing dam or building a new dam. As recently as 2002, as part of adding water capacity, options were reviewed to add dams north of Rea's Bridge Road or on Friends Creek. The estimates for these options indicated dam construction costs ranging from $30 - $35 million. Even if funding were allocated for this work, the likelihood of gaining the approval and permits necessary to build a new dam, even to replace our current dam, is very low. Dams cause significant environmental impacts that can only be addressed over the course of years through numerous studies and court rulings.

Maintaining the function and operation of the existing dam through planned rehabilitation is the most cost effective means to continue the impoundment of Lake Decatur. It is important that the City focus its efforts toward maintaining the current dam.

INPUT FROM OTHER SOURCES: Hanson Professional Services, HDR Engineering, Department of Water Management

STAFF REFERENCE: Keith Alexander, Director of Water Management, Richard Marley, Public Works Director, Matt Newell, City Engineer, and Curt Cassidy, Civil Engineer II. Keith Alexander and Richard Marley will be in attendance at the City Council meeting to answer any questions of the Council on this item.

BUDGET/TIME IMPLICATIONS:

Budget Impact: Funding for this project is budgeted in the Water Operating Fund. The amount of Amendment 2 is $129,282 for a total Design Services Agreement fee of $239,382.

Staffing Impact: Staffing is in place to oversee this work.

This memorandum was prepared by Curtis Cassidy, P.E., Civil Engineer II and reviewed by Matthew C. Newell, P.E., City Engineer.

Attach: 3

cc: John Smith, Assistant City Manager for Public Services
Keith Alexander, Director of Water Management
Jeffrey J. Tatarek, P.E., S.E., Hanson Professional Services, Inc.

APPENDIX A
A Summary of the Major Construction History of Lake Decatur Dam

The City owns and operates the Lake Decatur Dam located on the Sangamon River just west of Business Route U.S. 51. Built in 1922, the dam provides an impoundment for the City's source of drinking water. In 1955 bascule gates were added to the concrete spillway to increase the lake level from elevation 610 to 614.5. The following table summarizes the history of major construction projects for the Lake Decatur Dam:

Year	Activity
1922	Original Construction
1950's	Fish ladder removed
1954-55	Flashboards removed and bascule gate installed Sluice gate replacement and trash racks installed
1955-1996	Sluice gates reconditioned
1955-1996	Resurfaced downstream face of spillway access platform
1995	Overlay placed on downstream face of spillway
1996	Shotcrete applied to left and right abutment walls
1998	North bascule gate hydraulic cylinders refurbished (Cylinders 1 thru 4)
2000	South bascule gate hydraulic cylinders refurbished (Cylinders 5 thru 8)
2000	Approximately 30 concrete panels on upstream slope of right embankment replaced
2000	Pile cap and all concrete panels along the downstream right riverbank training wall replaced.
2001	New joints saw cut into spillway overlay to match original dam joints
2001	Spalling along upstream face of outlet works and downstream face of spillway patched
2001	New riprap placed downstream of stilling basin and along the left river bank
2004	New sluice gate lift mechanism at the lower tail water dam
2005	Spalling along upstream face of outlet works structure patched

RESOLUTION NO. _____

RESOLUTION AUTHORIZING SECOND AMENDMENT TO AGREEMENT WITH HANSON PROFESSIONAL SERVICES, INC. FOR LAKE DECATUR DAM REPAIRS, CITY PROJECT 09-02

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF DECATUR, ILLINOIS:

Section 1. That the Second Amendment to the Agreement authorizing the engineering services for the design of repairs and construction documents to the spillway structure of Lake Decatur Dam, presented to the Council herewith between the City of Decatur and Hanson Professional Services, Inc., be, and the same is hereby, received, placed on file and approved.

Section 2. That the Mayor and the City Clerk be, and they are hereby, authorized and directed to execute said amendment to agreement on behalf of the City, in the amount of $129,282 for a total not to exceed $239,382.

PRESENTED and ADOPTED this 15th day of June, 2009.

_____
Michael T. McElroy, Mayor

ATTEST:

_____
Celeste F. Harris, City Clerk

Amendment No. 2 to
Agreement C08L0198

Whereas, the City of Decatur, subsequently referred to as "Client," and Hanson Professional Services Inc., subsequently referred to as "Hanson," have previously entered into a Professional Services Agreement dated December 29, 2008 in connection with the Lake Decatur Dam Repairs subsequently referred to as "Project," and

Whereas, the Client has ordered certain changes to the services being provided by Hanson for the Project.

Now, therefore, this Amendment to the Agreement (Amendment No. 2) is made this 19th day of May, 2009 to revise the Scope of Services and Cost of Services as provided herein. All other terms and conditions of the Agreement remain unchanged.

The Scope of Services is modified as follows to provide construction related services in 2009:

1. Bid Evaluation:

    a. Respond to contractor's request for information (RFI) during the bidding period; prepare written responses to RFI's for distribution by the City to all bidders; prepare written addenda, as required by RFI's, for distribution by the City to all bidders.
    b. Review contractor's bids for work described in the plans and specifications.
    c. Provide a written recommendation to the City of Decatur of the apparent lowest, responsible bidder.

2. Pre-Construction Meeting: Attend on-site pre-construction meeting to discuss project scope with the selected contractor. HDR will participate via teleconference to discuss the scope of work prepared by their firm.

3. Construction Observation:

    a. Hanson and HDR will visit the site periodically, as directed by the City's on-site representative to assist with observation of the work for compliance with the contract documents.
    b. Assume Hanson's on-site representative(s) will visit the site an average of three (3) times per week for a duration of 22 weeks, plus expenses for travel to the site.
    c. Assume three on-site visits by HDR representatives to observe the work for the bascule and sluice gate work.

4. Contractor Submittals: Review submittals prepared by the Contractor for items specified to be included in the work for conformance with the project specifications.

5. Contractor Pay Requests: Review requests for payment by the Contractor for agreement with observed progress of the work.

6. Apron Slab Condition Survey: In order to evaluate the condition of the surface of the downstream apron slab, the project specifications require the Contractor to dewater and clean the surface. Hanson will observe and document areas of the apron slab which require repairs and use this information to prepare construction documents for the anticipated 2010 construction contract.

7. Apron Slab Void Detection Survey: Previous repair projects at the Lake Decatur Dam have included work to investigate the presence of voids under the apron slab and to fill the voids with flowable grout. In order to evaluate the presence of any additional voids under the slab, Hanson will engage the services of AECOM Technical Services, Inc. (ATS) to use Ground Penetrating Radar (GPR) to investigate the area under the slab for voids. Services to be provided by ATS for the Project are as follows:

   a. GROUND PENETRATING RADAR SURVEY

      ATS will provide 2 trained non-destructive testing specialists and suitable GPR equipment to achieve the project objectives. The project will be divided into two phases, a Trial Phase and a Production Phase.

      Trial Phase

      The Trial Phase includes a site mobilization/demobilization from ATS's Milwaukee office and adequate time to test various GPR antennae at the site. The purpose of the Trial Phase will be to calibrate the GPR equipment to site conditions and determine the useful extent of radar energy penetration. Following initial data collection in the Trial Phase, the GPR crew will consult with Hanson Professional Services, Inc. staff on site to decide if the GPR data provides the information required. If insufficient value is derived from the GPR data, the project will terminate and ATS will demobilize and invoice for this phase only, without any equipment charges.

      Production Phase

      The Production Phase will include a GPR survey of selected transects (survey lines) parallel to the dam face. Full-length data lines will be conducted at about two (2)-foot intervals with exact locations to be determined on site. This will result in approximately twenty (20) 500-foot passes. In areas where potential anomalies are located at the concrete/sub-base interface transects will be made perpendicular to the previous transects to determine the extent of the anomaly. The Production Phase will begin immediately upon completion of the Trial Phase.

      ATS will return the GPR data to the office where it will be analyzed for anomalies and trends. Five copies of a final report will be prepared. The report will discuss the equipment and procedures used during the survey and will present the results in a plan view of the apron slab. The plan view will include the position along each transect of each anomaly imaged to the nearest foot. The size of each anomaly will be estimated and reported.

      ATS will mark selected locations on the apron slab for the purpose of ground truthing/calibrating the GPR data. A total of approximately 2-3 cores will be marked.

   b. SERVICES PROVIDED BY CONTRACTOR

      Provide a clean, unobstructed access to the apron slab for the data collection vehicle (van).

      Provide a dry and clean surface of the apron slab for the data collection.

Provide approximately 2-3 cores at the marked locations along with a core log indicating the depth of concrete and the depth of void (if present).

8. South Embankment Seepage Monitoring: It is suspected that seepage through the embankment behind the south abutment is due to the deteriorated condition of the upstream face of the dam and training walls. It is anticipated that the proposed repairs to the upstream face of the dam and training walls may cause the seepage to stop. After the repairs are completed, Hanson will visit the site periodically to observe the south embankment for signs of seepage. Continued seepage may warrant additional work in future repair contract to investigate and repair the source of the seepage.

9. Record Drawings: Contract specifications require the Contractor to provide a red-lined set of marked contract documents to the City as a record to illustrate the final as-built condition of the proposed repairs. Hanson and HDR will record any changes to the electronic version of the project plans and specifications and provide electronic and hard copies for the City's records.

The Cost of Services is modified as follows:

Cost of Services in Agreement	$ 83,400
Total of Previous Amendments	$ 26,700
Increase this Amendment ($129,282) as follows:	
• Bid Evaluation	$ 2,540
• Pre-Construction Meeting	$ 1,897
• Construction Observation	$ 81,485
• Contractor Submittal Review	$ 11,519
• Contractor Pay Request Review	$ 1,897
• Apron Slab Condition Survey	$ 8,440
• Apron Slab Void Detection Survey	$ 16,271
• South Abutment Embankment Monitoring	$ 1,657
• Record Drawings	$ 3,576
Cost of Services with all Amendments	$239,382

Client and Hanson hereby agree to and accept the terms as stated herein.

Hanson Professional Services Inc. **City of Decatur**

By: _____ By: _____

Jeffery T. Ball, P.E.

Title: Senior Vice President Title: _____

Date: _____ Date: _____