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September 28, 2010

Mr. Karl D. Stave, P.E.
RCM Site Development Section
Milwaukee, County Department of Public Works
City Campus – Room 216
2711 West Wells Street
Milwaukee, WI 53208

RE: Structural Engineering Evaluation of the Estabrook Park Dam Located on the Milwaukee River, Milwaukee, Wisconsin – AECOM Project No. 60159452

Dear Mr. Stave:

We have completed our structural evaluation of the current physical condition of Estabrook Dam on the Milwaukee River. The attached report details the results of the condition evaluation, both gated spillway and overflow spillway stability analyses, and provides repair recommendations identified as a result of our evaluation. We also discuss structural maintenance of the facility and provide our opinion of probable costs of recommendations to bring the facility back to good structural condition. Once rehabilitation is completed, we expect the facility to function for 20 more years, with annual operations and maintenance.

Our scope of work consisted of performing a visual inspection, non-destructive testing and material testing of the gated spillway structure, as well as a visual inspection of the serpentine overflow section and the tooth-like icebreakers upstream of the gated spillway. Our main directive was to update STS Consultant's 2006 structural evaluation report (STS project No. 5-87996) dated September 8, 2006. Of primary concern is the structural stability of the dam components with an estimate of costs to bring the dam structures back to structurally stable condition.

Per the Wisconsin DNR Order to Repair or Abandon the Dam, you may also consider demolishing the dam structures and restoring the river to open flow conditions. We have not evaluated that option in this scope of services, but could assist you, should you desire to investigate that option.

If you have questions regarding the attached report, please call Steve Elver at 847-279-2476.

Respectfully,

Charles D. Dean, P.E.
Project Engineer

Steven A. Elver, S.E., P.E.
Principal Engineer

cc: Don Pirrung – AECOM

Certification Page

I, Steven A. Elver, hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of ch. A-E4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in Chapters 31 and NR333 Wis. Adm. Code.

Steven A. Elver, P.E.
Registration No. E-24485-6

WISCONSIN
STEVEN A. ELVER
E-24485
LAKE VILLA, ILLINOIS
PROFESSIONAL ENGINEER

Sept. 28, 2010
Date

State of Wisconsin
Department of Regulation and Licensing

PROFESSIONAL ENGINEER

No. 24485-6 Expires: 07/31/2012

STEVEN A ELVER
445 RAE AVENUE
LAKE VILLA IL 60046

The person whose name appears on this document has complied with the provisions of the Wisconsin Statutes and holds the credential specified on the front of this card. To verify the current status of this credential, use "Lookup a License" at www.drl.wi.gov.

Ch 440.11, Wis Statutes, requires you to notify the Department of a name or address change within 30 days. Please submit corrected information via the web at www.drl.wi.gov or by mail to DRL at PO Box 8935, Madison WI 53708-8935.

AECOM Cost Estimate - Estabrook Park Dam
Structural Repair Option - $1,500,000 Budget

9/28/2010 *Note: This estimate does not include sediment removal, which is covered in a separate, environmental cost estimate.*

Opinion of Probable Structural Project Costs

Client: Milwaukee County DPW
Address: 2711 West Wells St, Milwaukee, WI

	Description	Units	Unit Cost	Quantity	Total Cost	Comments
1.00	General					
1.1	Mobilization / Demobilization	ls	$35,000.00	1	$35,000	segmental barge, small crane, incidental equipment
1.2	Erosion Control	ls	$4,000.00	1	$4,000	silt fence and turbidity barriers
1.3	Site Restoration	ls	$15,000.00	1	$15,000	repair pavements, grading, seeding and mulching
1.4	Diversion of water	ls	$25,000.00	1	$25,000	Porta-dam installation during pier repairs, with stoplogs removed on overflow spillway
2.00	Gated Spillway - Concrete Repairs					
2.01	Concrete surface repairs - abutments and stairs	sf	$75.00	700	$52,500	reconstruct stairs, complete abutment surface reconstruction
2.02	Concrete surface repairs - bridge deck and walls	sf	$75.00	500	$37,500	partial depth repair of deck, partial to full depth repair of walls, sawcut closed expansion joints and replace joint material
2.03	Pier reconstruction - below el. 37.75	sf	$90.00	2800	$252,000	complete surface reconstruction below el. 37.75', all 11 piers
2.04	Concrete surface repairs - pier above el. 37.75	sf	$75.00	800	$60,000	partial depth repair above el. 37.75 as needed, all 11 piers
2.05	Install grouted tie down anchors in upstream piers, for stability with ice loading at full pool	ls	$300,000.00	1	$300,000	includes 11 tie down anchors into bedrock, with mobilization
3.00	Gated Spillway - Gate Repairs					
3.01	Prepare and paint slide gates	ea	$3,500.00	10	$35,000	sandblast, prime and paint all 10 slide gates in place
3.02	Misc. repairs to gates, guides and seals	ls	$10,000.00	1	$10,000	as needed based upon inspection after cleaning
4.00	Ice Breakers - Concrete Repairs					
4.01	Concrete surface repairs	ea	$3,500.00	24	$84,000	chip, install anchors, polymer modified concrete, incl. replacing 1 and 1/3 ice breakers
5.00	Overflow Spillway					
5.01	New flashboards	ls	$1,000.00	1	$1,000	4"x8"x7'4" timber, recently replaced with new ones - budget for stockpile of new ones
5.02	Repair / replace bent supports	ls	$2,000.00	1	$2,000	assume 4 to be repaired
5.03	Concrete surface repairs	sf	$75.00	500	$37,500	chipping, anchors, and polymer modified concrete repair of crest
6.00	Slope Protection					
6.01	Riprap	cy	$70.00	600	$42,000	24" layer of riprap, left and right banks u/s
6.02	Geotextile	sy	$3.00	1,600	$4,800	and d/s of gated spillway
7.00	Debris Removal	ls	$25,000.00	1	$25,000	upstream of gated spillway and ice breakers, not incl. environmental cleanup area
8.00	Miscellaneous					
8.01	Repair / replace handrails, fences, gates, etc.	ls	$5,000.00	1	$5,000	
8.02	Misc. Site Electrical Work	ls	$15,000.00	1	$15,000	Per Milwaukee County recommendation

	Construction Sub-Total:		$1,042,300
	Construction Contingency:	20%	$208,460
	Construction Estimate:		$1,250,760
9.00	Engineering		
9.01	Engineering design		$115,000
9.02	Resident engineering and contract administration		$80,000
9.03	Prepare EAP and IOM plans		$15,000
	Engineering Subtotal:		$210,000
	Engineering Contingency:	15%	$31,500
	Engineering Estimate:		$241,500
	Total Project Cost Estimate:		**$1,492,260**

Information presented on this sheet represents our opinion of probable costs in 2010 dollars, based upon previous unit rates and quantities updated from the 2006 STS Cost Estimate. Unit and lump-sum prices are based on costs for similar projects, our engineering judgment, and/or published cost data. Actual bids and total project costs may vary based on contractor's perceived risk, site access, season, market conditions, etc. No warranties concerning the accuracy of costs presented herein are expressed or implied.

Note: This rehabilitation estimate is to extend the life of the dam structures for 20 years, with some regular maintenance. This estimate is for repairs of existing structural components only, not including the nearby transformer building. Costs for replacement or remodeling of structures is not included.