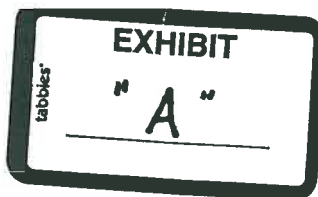


Fuller  
Mossbarger  
Scott &  
May



10018  
International Boulevard  
Cincinnati, Ohio  
45246-4839

513-860-1070  
513-860-1073 FAX

November 25, 2003

O.1.8.4.CN1042003

Kathy Dorman  
Storm Water Engineer  
City of Mason  
Engineering and Building Department  
6000 Mason-Montgomery Road  
Mason, Ohio 45040

RE: Proposal  
Fairway Drive Improvement Design  
Mason, Warren County, Ohio

Dear Kathy:

As requested, we are pleased to submit this proposal for the referenced project. We have assembled a project team that is highly qualified, experienced in the City, and dedicated to helping the City of Mason with this project. All of the work for this project will be completed out of our Cincinnati office. Our team member, Kleingers & Associates, has assisted FMSM in the City of Mason with previous projects.

Thank you for the opportunity to submit this proposal. We understand the importance of this project to the City of Mason and are dedicated to making it a success.

Respectfully submitted,

FULLER, MOSSBARGER, SCOTT AND MAY  
ENGINEERS, INC.

A handwritten signature in black ink, appearing to read "Stan A. Harris".

Stan A. Harris, P.E.  
Associate

SAH/lfb

## **6. Project Understanding**

FMSM has reviewed the Request for Proposal (RFP) and performed preliminary reconnaissance of the proposed project area. We understand that as a result of the July 17, 2001 storm, several homes were flooded in the Fairway Drive Watershed. FMSM performed a hydrologic and hydraulic study for the Fairway Drive Watershed that identified a combination of solutions.

A detention basin and channel realignment were proposed for the Van Buren and Washington Way areas. The channel realignment will primarily increase channel efficiency and eliminate ponding. The detention basin will offset the detrimental downstream effects of the channel improvement and reduce some common flooding problems for downstream residents.

An enlargement of the existing detention basin above Bunker Lane was proposed to mitigate the flooding problems in that area. This improvement will reduce backwater elevations and flooding upstream of the culverts that are located at Bunker Lane and Fairway Drive.

FMSM understands that these improvements will need to be integrated into the current drainage system and be complementary to the existing home sites. In addition, FMSM understands that it is of paramount importance that the Fairway Drive Watershed residents and the Golf Course Management have input to the designs where appropriate and that their concerns are addressed as much as possible. As in the initial study described above, FMSM will make local contact phone numbers available to the residents to facilitate the exchange of project information.

## **7. Project Approach**

Based on our understanding of project elements and requirements outlined in the RFP, FMSM proposes the following approach.

### **7.1. Project Kickoff Meeting**

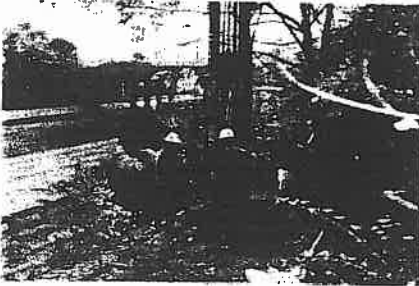
FMSM will meet with City of Mason to review project goals and constraints. Intermediate milestones for the project components (i.e. review of models, geotechnical investigation, etc.) will also be confirmed at the project kickoff meeting.

### **7.2. Data Collection and Review**

During this task, FMSM will briefly review the results of the Fairway Drive Watershed Study and Design and other support documents. FMSM will

also contact the appropriate utilities and other agencies that may be affected by the project to obtain copies pertinent information.

### **7.3. Geotechnical Investigation**



*FMSM will perform a geotechnical investigation to determine foundation conditions as well as the suitability of soil in the basin area for use as engineered embankment.*

FMSM will perform a subsurface investigation at the detention basin areas site to determine soil strata, engineering properties, and make recommendations regarding the suitability of soil in the basin area for use as embankment material. Three borings will be advanced along the proposed centerline of the dam near Walnut Lane and one each at the upstream and downstream toes. These borings will be advanced to the top of bedrock, or a maximum depth of 30 feet, whichever occurs first. Two borings will be advanced along the proposed channel centerline near Van Buren and Washington Way. Six additional borings will be advanced within the proposed basin near Walnut Lane to determine the depths and types of soil that will be excavated. Three borings will also be advanced around the perimeter of the existing basin on the golf course. These borings will be advanced to a depth of 15 feet or auger refusal. Standard Penetration Test (SPT), undisturbed Shelby Tube or bag samples will be obtained from the borings. All borings will be backfilled with soil cuttings after they are completed.

All field work will be performed under the supervision of a geotechnical engineer or geologist. Laboratory testing will be performed by FMSM's in-house laboratory and in accordance with ASTM standards. Natural moisture contents will be performed on all samples. Samples of the predominant horizons encountered will be subjected to engineering classification testing. Unconfined compressive strength tests will be performed on undisturbed Shelby Tube samples.

At the conclusion of the geotechnical investigation, a report will be prepared with graphic boring logs and the results of all soil tests. Bore hole locations will be identified on project drawings. The report will address the adequacy of the site to support an earth dam, parameters for design of the embankments, and suitability of the soil in the basin area for use as embankment material.

### **7.4. Develop Design Alternatives**

Upon completion of tasks 6.1 through 6.5, FMSM will develop design alternatives for the two project components. The following components will be addressed:

Van Buren And Washington Way

- Channel Realignment
- New Detention Basin

## Bunker Lane

- Enlarge existing upstream basin

Design criteria will include controlling the 100-year storm event and reducing the peak flow. The ability to control smaller events will also be considered. Other criteria to be considered include limiting increases in the 100-year water surface elevation upstream, energy dissipation, water quality, downstream erosion control, and protection of the downstream side of the dam.

FMSM will prepare a report summarizing project findings and proposed preliminary design alternatives. Design alternatives will reflect the findings of the geotechnical investigation, as well as the hydrologic and hydraulic analysis. Conceptual sketches and budgetary construction cost estimates will be provided for each alternative. At the conclusion of this task FMSM will meet with the City of Mason to present the report, discuss preliminary design alternatives, and provide a recommendation.

### **7.5. Permitting**

FMSM will assist the City of Mason in obtaining state and federal permits for the proposed detention basin project. For the purpose of the cost estimate provided with this proposal, it is assumed that required permits will be limited to a 401 Water Quality Certification and NPDES permit from OEPA, a Corps of Engineers 404 Dredge and Fill Permit, and a ODNR Dam Safety Permit.

### **7.6. CLOMR and LOMR**



*FMSM will assist the City in preparing a LOMC application to update FEMA flood mapping of the study reach.*

FMSM will prepare, submit and assist the City of Mason in obtaining approval of a Federal Emergency Management Agency (FEMA) Letter of Map Change (LOMC) either a CLOMR or LOMR, based on the models developed for the Fairway Drive Watershed Study and Design. Discharge estimates for the floodplain analysis will be determined using either SWMM RUNOFF or HEC-HMS. Values for the 10-, 50-, and 500-year storm events will be generated. The 100-year discharge data will be taken from the preliminary analysis performed earlier. Flood profiles for the 10-, 50-, 100-, and 500-year storms and the floodway associated with the 100-year water surface elevation will be estimated using a HEC-RAS model. The floodway will be computed assuming equal conveyance reduction in the channel overbank areas. Encroachment of the floodplain during the floodway computations will not be permitted within the stream channel banks or if it results in greater than a 0.1-foot rise in the computed water surface elevation. Additionally, floodplain boundaries for the 100-, and 500-year storms will be developed. FMSM will use automated mapping software in

conjunction with HEC-GeoRAS to transfer hydraulic model output to flood inundation maps.

The LOMC documentation will include: a narrative of methodology used to develop the LOMC; profile plots for the 10-, 50-, 100-, and 500-year floods; and an annotated FIRM showing the updated 100-year and 500-year flood boundaries, floodway limits, base flood elevations, and cross section locations. Application fees will be the responsibility of the City of Mason.

### **7.7. Final Design**

Based upon City and regulatory agency feedback, FMSM will prepare final construction documents, suitable for bidding and constructing the project, for the selected improvement alternative. A final opinion of probable construction cost will also be prepared. Ten (10) paper copies and one mylar set of engineering plans will be provided to the City, along with an electronic copy in AutoCAD 2000 format.

### **7.8. Construction Services**

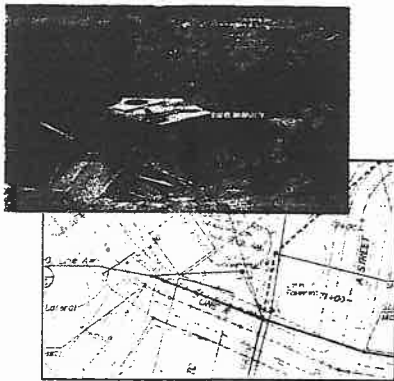
FMSM will assist the City with construction administration services including bid review, shop drawing review, construction monitoring and invoice review. Full time observation will be required during construction of the dam. Periodic visits will be performed during other phases of work (clearing, excavation of basin soil, etc.)

### **7.9. Easement Services**

FMSM will assist Mason in the procurement of appropriate 100-year floodplain easements. FMSM will supply a list of appraisers to Mason for consideration. The appraiser will submit an estimate of the fair market value for the easement. FMSM will supply support data to the appraiser and property owners. FMSM will also notify affected property owners upon the completion and approval of the final design. It is anticipated that there will be three meetings with each property owner during the acquisition process. Appraiser fees and payments to land owners for the actual easements will be the responsibility of the City of Mason.

### **7.10. Project Management and Coordination**

FMSM will have monthly progress meetings and submit reports to the City's Project Manager, to keep them aware of the status of the project. Three public meetings will be held to educate and inform residents of the design alternatives and the final design.



*FMSM will develop final construction drawings and documents suitable for bidding and constructing the proposed improvements.*

## **8. Estimated Cost of Service and Schedule**

### **8.1. Estimated Cost**

Based on our project understanding and approach, FMSM has broken the project into the tasks outlined in Table 1. A breakdown of the project costs by design element is presented in Table 2.

**Table 1. Preliminary Estimate of Engineering Costs**

	<b>Work Task</b>	<b>Fee</b>
7.1	Project Kickoff Meeting	\$ 900.00
7.2	Data Collection & Review	\$ 11,000.00
7.3	Geotechnical Investigation	\$ 13,000.00
7.4	Develop Design Alternatives	\$ 7,500.00
7.5	Permitting	\$ 4,000.00
7.6	CLOMR and LOMR	\$ 4,000.00
7.7	Preliminary Final Design	\$ 37,615.00
7.8	Construction Services	\$ --
7.9	Easement Services	\$ 7,500.00
7.10	Project Management & Coordination	\$ 8,200.00
	<b>Totals:</b>	<b>\$ 93,715.00</b>

This estimate of fees is based on the following assumptions:

- Scope is limited to that outlined in the RFP and in this proposal
- Borings locations for the geotechnical investigation will be accessible with a truck-mounted drill rig
- Permit fees will be paid by the City
- Fees for construction services to be submitted at later date

**Table 2. Engineering Costs by Design Element**

<b>Element</b>	<b>Fee</b>
Channel Realignment	\$ 18,743.00
New Basin with Three Concepts	\$ 37,486.00
Enlarging Existing Basin	\$ 37,486.00
Public Meetings (each)	\$ 1,000.00

## **8.2. Schedule**

The City has identified a design completion deadline for this project by July 30, 2004. Assuming Notice to Proceed no later than December 15, FMSM is confident that design work can be completed by July 30, 2004. Table 3 identifies target milestones for the individual work tasks.

**Table 3. Project Schedule**

<b>Work Task</b>	<b>Completion Date</b>
1. Kickoff Meeting	December 15, 2003
2. Data Collection and Review	December 31, 2003
3. Geotechnical Investigation	February 29, 2004
4. Develop Design Alternatives	April 30, 2004
5. Permitting	May 31, 2004
6. CLOMR and LOMR	June 30, 2004
7. Final Design	July 30, 2004
8. Easement Services	
9. Project Management	

<sup>1</sup> Completion dates for permitting and CLOMR/LOMR applications will be dependent on timely reviews by USACE, OEPA, ODNR and FEMA.