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May 20, 2002

O.1.8.4.CN0452002

Kathy Dorman
Stormwater Engineer
City of Mason
214 W. Main Street
Mason, Ohio 45040

RE: Proposal
Fairway Drive Watershed Study and Design
Mason, Ohio

Dear Kathy:

This is in response to your Request for Proposals dated May 2, 2002 for the Fairway Drive Watershed Study and Design.

As outlined in our proposal, we can provide Mason with extensive experience in:

- Hydrologic studies;
- hydraulic analysis;
- floodplain mapping;
- flood damage reduction alternatives analysis;
- GIS mapping, and;
- LOMR application preparation.

Our Project Manager, Jim Latchaw, is located in our West Chester office and will be readily accessible to you during the project. He will be supported by a team of highly trained specialists. We have enjoyed our previous work with the City of Mason and look forward to continuing our relationship.

Thank you for the opportunity to submit this proposal.

Respectfully submitted,

FULLER, MOSSBARGER, SCOTT AND MAY
ENGINEERS, INC.

Stan A. Harris, P.E.
Associate

SAH/lfb

FMSM analyzed several alternatives to bring the dam into compliance with the regulations.

existing spillway system does not meet current regulatory standards. We have explored several alternatives including increasing spillway capacity, armoring the top of the dam, lowering the hazard classification of the dam, and performing a critical storm analysis. **FMSM has worked closely with the City to help it protect the health and welfare of its citizens and natural resources in a fiscally responsible manner.** This project is ongoing and should be completed this year within budget.

In summary, FMSM has enjoyed a professional and cordial working relationship with City of Mason staff.

6.0 Project Scope

The FMSM Team will perform the following tasks in order to complete the Fairway Drive Watershed Project.

6.1. Preliminary Investigations and Data Collection

6.1.1. Review Available Information

FMSM Team members will obtain and review existing information relevant to the project including, but not necessarily limited to:

- Existing FIS floodplain mapping and supporting model (if a model exists)
- Topographic mapping from Warren County
- Aerial photographs from Warren County
- City GIS data showing storm, sanitary and water system data in watershed
- As-built construction plans relevant to storm water
- SCS soils map for Warren County
- Property ownership and right-of-way data (County and City records)
- Bulletin 71, Rainfall Frequency Atlas of the Midwest
- Any available rain gauge data
- City of Mason Geodetic Control Manual
- Any available past studies, plans and reports relevant to this study

6.1.2. Staff and Community Interviews

FMSM will meet with city staff to learn as much as possible about the history of flooding problems in the area. Historical high water information will be obtained if available.

Next, a residential inquiry form will be prepared. The purpose of this form will be to record information from key landowners in the area concerning historical flooding. A draft of the form will be prepared and submitted to the City for review. After suggested revisions have been

made, a list of owners to interview will be developed by FMSM and City staff. FMSM will contact these individuals and interview them. Completed interview forms will be forwarded to the City on a regular basis.

FMSM will contact the City prior to contacting any property owners or performing field work.

FMSM is aware that this is a very sensitive project and will contact the City Engineer prior to contacting any property owners. Likewise, property owners will be contacted prior to performing any field work (surveying, etc.) in their area.

6.1.3. Watershed Delineation

Topographic contours available from Warren County will be used to determine the approximate watershed boundary. The watershed boundary will be refined by performing a field reconnaissance.

6.1.4. Field Surveying

Kleingers and Associates will survey all culverts and bridges along the main drainage course, establishing location, size and invert elevations. They will also obtain a sufficient number of representative cross sections to support the HEC-RAS analysis. The surveyors will also locate utilities within the approximate floodplain area. Finally, floor elevations of structures within the approximate floodplain will be determined. The City of Mason's Geodetic database will be used to establish control. Survey data will be certified to acceptable FEMA benchmarks (NGVD 1929).

FMSM Personnel: Project Manager, Senior Project Engineer, Project Engineer, GIS Specialist (126 Man-Hours)

6.2. Floodplain Delineation

HEC-HMS and HEC-RAS will be used to analyze the watershed.

The HEC-HMS model will be used to predict runoff for various storm events including the 1-, 2-, 5-, 10-, 25-, 50-, 100-, and 500-year storms. Discharge will be predicted for at least two points in the watershed. Runoff curve numbers will be determined by overlaying SCS soil types and land use. Time of concentration will be calculate using standard equations for overland and channel flow. Rainfall values will be obtained from Bulletin 71. Rainfall for the July 17-18 event will be based on the study our firm performed for the Butler County Department of Environmental Services last year.

Discharges from the HEC-HMS analysis will be input to a HEC-RAS model of the system. The HEC-RAS model will use field surveyed cross sections and structure data. FMSM's modeler's will select the appropriate hydraulic parameters based on field reconnaissance of the watershed. FMSM will use an automated mapping process that we have used successfully on other projects and for FEMA in the development of flood studies. The process integrates digital

topographic mapping with hydraulic model output to create flood inundation maps.

FMSM Personnel: Project Manager, Senior Water Resources Engineer, Senior Project Engineer, GIS Specialist (172 Man-Hours)

6.3 Alternative Solutions

FMSM will work with City Staff to identify and analyze at least three cost effective solutions to reduce or eliminate structural flooding within the watershed without adversely affecting downstream or upstream property owners. Possible solutions may include:

- Increased drainage structure (culvert) size
- Detention within watershed
- Floodproofing of individual structures
- Buyouts

The hydraulic model will be re-run to demonstrate the effectiveness of proposed structural solutions. After the three most viable alternatives have been identified, FMSM will prepare cost estimates. Assistance will be required from the City to evaluate the cost of any buyouts.

FMSM Personnel: Project Manager, Senior Water Resources Engineer, Senior Project Engineer, CADD Technician (170 Man-Hours)

6.4 Report

A report will be prepared which will summarize the methodology and results of the study. A key component of the report will be a map that shows which properties and structures are within the 100-year floodplain. Maps will also be prepared demonstrating the revised 100-year flood plain for the various alternatives analyzed.

The report will contain a number of figures to help explain the methodology and results. At a minimum, the report will contain maps that depict sub-basin boundaries, land use, soil type, curve numbers, overland flow paths, channel centerlines, and hydrologic model schematics showing sub-basin routing. Floodplain work maps will be prepared which show the 100-year and 500-year flood boundaries, the floodway boundaries, and the cross section locations. All maps will be prepared in ArcView.

Upon completion of the report, FMSM will present the findings to City Council.

FMSM Personnel: Project Manager, Senior Project Engineer, Project Engineer, GIS Specialist, Clerical (120 Man-Hours)

Maps will be prepared showing which structures are in the 100-year floodplain.

6.5 LOMR Documentation

When requested by the City (either before or after implementation of flood damage reduction alternatives), FMSM will prepare documentation for a LOMR application. The documentation will include the report outlined above along with profile plots for the 10-, 50-, 100-, and 500-year floods for the study reach in FEMA format and an annotated FIRM showing the 100-year and 500-year flood boundaries, base flood elevations, and cross section locations.

FMSM Personnel: Project Manager, Senior Project Engineer, Project Engineer, GIS Specialist (66 Man-Hours)

6.6 Project Management and Progress Meetings

Monthly progress meetings will be held to update the City Engineer and staff on the project. A written progress report will also be submitted. We will also communicate on a more frequent basis via phone and email as conditions warrant. The following is a listing of major milestones that will be met, assuming that notice to proceed is given by July 1, 2002

Table 2. Project Milestones

<u>Activity</u>	<u>Completion Date</u>
Review Existing Data	July 19, 2002
Delineate Watershed	August 30, 2002
Hydrologic Study	August 30, 2002
Draft Report	October 18, 2002
Hydraulic Study	November 29, 2002
Final Report/Present to City Council	December 15, 2002
LOMR Package	To be determined

FMSM Personnel: Project Manager, Senior Project Engineer, Clerical (88 Man-Hours)

7.0 Project Budget

The project budget for the tasks outlined in Section 6 is as follows:

Table 3. Project Costs

<u>Task No.</u>	<u>Description</u>	<u>Man-Hours</u>	<u>Cost</u>
1	Preliminary Investigations/Data Collection	126	\$14,870.00
2	Floodplain Delineation	172	\$12,380.00
3	Alternative Solutions	170	\$11,350.00
4	Report	120	\$ 8,340.00
5	LOMR Doc.	66	\$ 4,430.00
6	Project Management and Progress Mtgs.	88	\$ 8,460.00
TOTAL PROJECT COST.....			\$ 59,830.00