

**Request for Statement of Qualifications
for Professional Services**

FY 2016 & FY 2017 Drainage Masterplan Program



City of Memphis, Tennessee

Qualifications to be received by November 23, 2015 at 2:00 p.m., CST

Submit Qualifications to:
City of Memphis
Attn: James A. Simpson, Jr., PE, CPESC
Division of Engineering
125 N. Main St., Room 644
Memphis, TN 38103



Prepared by City of Memphis
Division of Engineering
901.636.6700

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Professional Services**

FY 2016 & FY 2017 Drainage Masterplan Program

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FY 2016 & FY 2017 Drainage Masterplan Program

I. Statement of Intent

The City of Memphis is issuing this Request for Statements of Qualifications (RFSOQ) to qualified firm(s) or team(s) to study the hydrologic and hydraulic characteristics of selected drainage basins and to develop a series of recommendations to improve drainage conditions throughout the study areas. The projects described herein represent the studies planned for the 2016 and 2017 fiscal year (FY 2016 & FY 2017), and represent several phases in a multi-year project to study, map, and improve the drainage infrastructure across the City of Memphis. The responses to this RFSOQ will be utilized for a 24-month period (FY 2016 and FY 2017) to select qualified consultants to participate in the drainage study efforts.

II. Planned Project Schedule

The following project schedule presents a timeline for the submission of the Statements of Qualifications (SOQ) from interested and qualified firms and the selection process by City staff. Project conditions or legislative constraints may cause portions of this schedule to change. However, it should be noted the deadline for the submission of the Statement of Qualifications cannot be changed except through a written addendum to this document published by the City of Memphis Division of Engineering.

Request for Statements of Qualifications Issued	November 2, 2015
Final Date to Submit <u>RFSOQ</u> Questions in Writing	November 16, 2015
Statement of Qualifications Due	November 23, 2015
Evaluation of Responses and Interviews	November 23, 2015-December 14, 2015
Final Selections / Begin Contract Development	December 14, 2015

III. Project Background

The City of Memphis was originally founded in 1819 on the Fourth Chickasaw Bluff along the Mississippi River. During its history, the City of Memphis has long been a hub for commerce and transportation of goods. During the late 1800's, several yellow fever epidemics decimated much of the City. Those epidemics, although ultimately costing Memphis its City Charter for 14 years, were the impetus behind city-wide infrastructure improvements in the early 20th Century including separate sanitary sewage collection and drainage systems. Since that time, Memphis has continued to grow in an eastward manner from the original riverside developments to its current boundaries.

Since the 1800's, several drainage criteria have been used to develop or improve infrastructure. Although well-intended, the drainage criteria implemented throughout many areas of the City were inadequate to properly characterize the stormwater runoff and flooding potential in Memphis. The result is numerous areas of the City with repetitive flooding problems affecting roadways and structures, particularly in older areas of the City. The drainage design standards have been continuously improved over the years, most recently in 2006, but much of the infrastructure has not been improved.

Acting on a recommendation from the City's Storm Water Advisory Board, the City of Memphis established a stormwater utility fee in 2006 to be assessed to households and businesses throughout the City. The intent of the fee is to provide a reliable funding source for the maintenance and improvement of the City's stormwater drainage infrastructure and streams. Maintenance activities are largely managed through the Division of Public Works, while drainage studies and capital improvement projects are managed through the Division of Engineering.

A 2012 review of the stormwater program identified 7 major study districts, largely corresponding to City Council Districts, which have been subdivided into numerous smaller study areas. The intent and goal of the Division of Engineering is to complete one drainage study in each of the study districts each year, starting in FY 2014. The smaller study areas will be systematically analyzed, at an anticipated rate of one per year per study area based on priority. Exhibit C1, found in Attachment C, illustrates the overall study areas. The eventual goal is to study each drainage basin in the City and undertake projects in each basin as needed to mitigate the impacts of future storm events on the public infrastructure and private property.

In 2013, the initial two rounds of drainage masterplan studies were initiated under the title "Stormwater Modeling, Mapping, & Analysis." The two rounds of studies consisted of 14 study areas awarded to 13 firms/teams and are in progress as of the release of this RFSOQ. The efforts and lessons learned from those initial studies have been used to modify the efforts in subsequent years.

IV. General Conditions

To the extent permitted by law, all materials included in the Statements of Qualifications shall be kept confidential until the qualifications evaluation is complete. No information about any qualifications or submitting entities shall be released until the process is complete, except to pertinent City staff and the Selection Committee. All information provided shall be considered by the Selection committee in making recommendations to pursue agreements with the selected submitted entities.

The City of Memphis has the right to (a) reject any and/or all submissions of qualifications; (b) waive irregularities and technicalities; (c) accept any alternative submission of qualifications which may, as determined by City staff, better serve the needs of the City of Memphis; (d) give full and proper evaluation of the firm or team presenting the qualifications. The City, and its appointed Selection Committee, shall be the sole judge of the qualifications, and the decision reached shall be final.

The City reserves the right to make any such investigation it deems necessary to determine the ability or qualifications of a submitting entity to perform the work requested.

Information the City deems necessary to make this determination shall be provided, upon request, by the submitting entries. Such information may include, but is not limited to, current financial statement verified by an independent CPA, verification of availability of equipment and personnel, past performance records, and additional references.

All expenses related to preparing the Statement of Qualifications shall be borne by the submitting entities.

V. SOQ Submission Instructions and Requirements

All submitted Statements of Qualifications shall comply with the following instructions. These instructions are intended to ensure the prospective consultant firm(s) or team(s) are providing the City with the pertinent information in a relatively uniform format to assist the Evaluation Committee in making expedited and informed decisions.

A. General

Published RFSOQ information is available in PDF format on the City of Memphis website at <http://www.cityofmemphis.org/Government/EngineeringDivision.aspx>, where it can be viewed, downloaded, and/or printed. It is the responsibility of the interested parties to verify their responses are based on the most current version of the RFSOQ.

B. Questions

All inquiries, suggestions, or requests concerning interpretation, clarification, or additional information pertaining to the RFSOQ shall be made via e-mail to james.simpson@memphistn.gov no later than 5:00 PM on November 16, 2015. All questions should pertain to the RFSOQ submission and selection process. *All questions pertaining to the scope of work or specific projects will not be addressed during this time.* No oral interpretations of the RFSOQ shall be used, nor shall the City of Memphis be responsible for any such interpretations. All clarifications of or modifications to this document shall be issued as written addenda and be made available on the City's website. All addenda shall be considered a permanent part of the RFSOQ. No addenda shall be released within 48 hours of the SOQ submission deadline. It shall be the responsibility of each submitting entity to verify, through the City of Memphis Division of Engineering, they have all issued addenda and to incorporate the addenda into their SOQ's.

C. Submission Requirements

All submissions shall be received before 2:00 PM on November 23, 2015.

Electronic submission via USB drive and/or e-mail is preferred. SOQ's shall be sent via e-mail to engineering@memphistn.gov **AND** james.simpson@memphistn.gov. NOTE: The City of Memphis mailbox limit is 15MB per e-mail. It is recommended, and the responsibility of the submitting entity, to send a test e-mail with an attachment of similar size prior to the submission date. Any such e-mails and associated attachments will be deleted. If more than one e-mail is necessary, you

must label each e-mail accordingly, "Part __ of __". Please note that only PDF documents will be accepted for electronic submissions.

If you choose to not submit electronically, you must submit six (6) copies of the SOQ to:

City of Memphis
Attn: James A. Simpson, Jr., PE, CPESC
Division of Engineering
125 N. Main St., Room 644
Memphis, TN 38103

Printed submissions shall be enclosed in a sealed envelope and shall have the name of the submitting entity and "Statement of Qualification for Professional Services for FY 2016 & FY 2017 Drainage Masterplan Program" plainly marked on the outside.

Responses shall clearly indicate the legal name, address, and telephone number of the submitting entity (company, firm, partnership, individual). The qualifications shall bear an original signature, being signed above the typed or printed name and title of the signer. All qualifications must be signed by a duly authorized office of the company with the authority to bind the firm to a contract.

SOQ's will not be returned. SOQ's not conforming to the required format shall be rejected. SOQ's received after the specified time shall not be considered. It is the sole responsibility of the submitting entity to ensure the SOQ has been submitted before the deadline stated above. Late submissions arising from the use of a separate courier or delivery service shall not be accepted and will not be considered. Any such late submissions will remain unopened.

D. Format

Qualifications must be typed or printed on 8-1/2" x 11" paper. Pages must be consecutively numbered. A table of contents must be included in the statement of qualifications. The maximum permissible length of the submission is 35 pages (single-sided).

The statement of qualifications should be structured as follows:

1. Cover Sheet
2. Letter from submitting entity to selection committee. (included in total page count)
3. Table of Contents
4. Firm Profile including pertinent information and a general overview of the submitting entity. If submission includes multiple firms, each firm should be represented in this section. M/WBE firms should be clearly identified, along with the anticipated percentage of work they will be responsible for.
5. Organizational Chart and Resumes for key employees who will manage the project and final product.

6. Summary of Relevant Experience for selected projects the submitting entity believes will demonstrate applicable experience(s) and aid the selection committee in evaluating the entity.
7. Project Approach, including any novel approaches and experiences that may help distinguish the submitting entity in the selection process.
8. References from previous clients for whom similar work was performed.
9. List of Active City of Memphis Projects for the prime engineering consultant only, including City project number, contract number, contract value, and expected completion date. Do not include projects that have been completed. Any completed projects that warrant highlighting should be included in other section of the submission.

VI. SOQ Evaluation Procedure and Criteria

All qualified submissions received before the deadline shall be evaluated and scored by the Evaluation Committee according to the criteria contained herein. Deviations from the requested SOQ format may result in scoring deductions or outright ineligibility for evaluation.

The criteria to be used by the Evaluation Committee are listed below, and are based on a 100-point scale:

1. The expertise of the submitting entity with projects of this general nature and scope, to be evaluated as follows (60 points total):
 - a. Experience of firm(s) with projects of similar scope and nature **(25 points)**, and
 - b. Experience of submitted staff with projects of similar scope and nature **(25 points)**, and
 - c. Experience with City of Memphis projects. **(10 points)**
2. Commitment to a minimum of 25% M/WBE participation on the project team. M/WBE firms used to meet this minimum requirement must be listed on the Certified EBO Registry maintained by the City of Memphis Office of Contract Compliance. Alternate registrations, including those maintained for State of Tennessee projects **will not** be considered. **(10 points)**
3. Local availability of staff / team members. **(13 points)**
4. Extent to which the **prime** consultant will perform the work. **(10 points)**
5. The amount of work the prime consultant has under contract with the City of Memphis at the due date of the Statement of Qualifications. **(7 points)**

Submitting entities shall be available for interviews by the Evaluation Committee following the initial scoring if requested. Discussions may be conducted with responsible submitting entities for the purposes of clarification to assure full understanding of and conformance to the RFSOQ requirements. After qualifications have been opened, any selected entity should be prepared to meet with the Evaluation Committee at a time and date determined by the City of Memphis. Selection shall be based on the firms' qualifications applicable to the scope and nature of the services to be performed per this RFSOQ. Determination of firms' qualifications shall be based on their written responses to the RFSOQ and information presented to the Evaluation Committee during oral interviews, if any.

In addition to materials provided in the written responses to this RFSOQ, the Committee may request additional material, information, or references from the submitting entity.

The firm(s) or team(s) determined to be the most qualified for the projects, based on the Statements of Qualifications, will be selected to begin contract negotiations to provide engineering services on one, or more, of the planned drainage studies. The firm(s) or team(s) selected will be notified at the earliest practical date and invited to submit more comprehensive information, if necessary.

In the event a satisfactory agreement cannot be reached with a selected entity, the City may choose to negotiate with other qualified firm(s) or team(s).

Attachment A: Standard Survey Codes

The survey data and associated CAD file provided to the City of Memphis as part of these projects shall conform to the following survey codes. The decision is left to the selected entity to decide whether to utilize these codes during field survey work or to “find and replace” codes using a computer and the survey log file. However, if different codes are used during the field work, a list of original and modified survey codes shall be provided in addition to the other requirements.

ID	CODE	DESCRIPTION
1	INL3X3	3x3 Inlet (Shoot 4 Corners on Top)
2	INL4X4	4x4 Inlet (Shoot 4 Corners on Top)
3	6-72L	6-72 inlet Left Corner @ Face of Curb
4	6-72R	6-72 inlet Right Corner @ Face of Curb
5	ANGPT	Angle Point
6	ABUT	Bridge Abutment
7	ACPAD	Air Conditioner (Shoot 4 Corners)
8	AHEADW	Word, Ahead (Shoot 4 Corners) Word written on Asphalt
9	APPSLAB	Bridge Approach Slab
10	ARROWL	Left Turn Arrow (3 Shots, 2 at the bottom, 1 at the point)
11	ARROWR	Right Turn Arrow
12	ARROWS	Straight Ahead Arrow
13	ASP	Asphalt Surface
14	ASPCURB	Top of Asphalt Curb
15	AWNING	Awning
16	AXLEFND	Axle Fnd
17	BC	Back of Curb
18	BSW	Back of Sidewalk
19	BSWMP	Back Walk @ Mid Point
20	BARR	Barricade
21	BBGOAL	Basketball Goal
22	BBP(*)	Billboard Pier (#= Pole Diameter in Feet)
23	BENCH(*)	Bench (*= Wood, Metal, etc)
24	BIRDHSE	Bird House

ID	CODE	DESCRIPTION
25	BL	Base Line
26	BLDGCOR	Building Corner
27	BLDGFACE	Building Face
28	BM	Bench Mark
29	BOTTOM	Creek or River Bottom
30	BOXELEC	Electrical, not defined by code list
31	BOXTS	Traffic Signal, mounted flush in s/w with cover (Shoot 4 Corners)
32	BOXMLGW	Traffic Signal, mounted flush in s/w with MLGW cover (Shoot 4 Corners)
33	BRIDGEEND	Bridge End
34	BRIDGERAIL	Bridge Railing
35	BFFE	Basement Finish Floor Elevation
36	BUSSHELT	Bus Shelter
37	BUSH	Bush
38	CARM	Control Arm (access to parking lot)
39	CFT(*)	Crow Foot (*= FND or SET)
40	CARPORT	Carport
41	CONCSLAB	Concrete Slab
42	CONCSPILL	Concrete Spillway
43	CPS(*)	Cotton Picker Spindle (*= FND or SET)
44	CSPLIT	Curb Split
45	CONCSWALE	Concrete Swale
46	CTVPED	Cable TV Pedestal
47	CCL(*)	Concrete Channel Lining (*= TOP, TOE, FL, etc.)
48	CHIMNEY	Chimney (describe material in a note)
49	CL	Center Line
50	CLPOST	Clothes Line Post
51	CLSTRC	Centerline of Structure
52	COLUM(*)	Column (*= Wood, Brick, CONCRete etc.)

ID	CODE	DESCRIPTION
53	CONCCOR	Concrete Corner
54	CONCENC	Concrete Encasement
55	COPWALL	Coping Wall
56	CUL(*)	Culvert (*= TOP,TOE, INVert, FL, etc.)
57	DBYL	Double Broken Yellow Line
58	DMH	Drain Man Hole
59	(*)DOCK	(* = Loading, Boat, Etc.) Dock
60	DOGHSE	Dog House
61	DOGRUN	Dog Run
62	DSBYL	Double Solid & Broken Yellow Line
63	DSYL	Double Solid Yellow Line
64	DW(*)	Driveway (*= ASPhalt, CONCrete, GRVL)
65	DWLB	Driveway apron (left back corner, facing street)
66	DWLF	Driveway apron (left front corner, facing street)
67	DWRB	Driveway apron (right back corner, facing street)
68	DWRF	Driveway apron (right front corner, facing street)
69	ELECLINE	Electric Line
70	ELECVALUT	Electric Vault
71	EM	Electrical Meter
72	EMH	Electrical Man Hole
73	E(*)	Edge of (*= Pavement, Water, GRVL, Brick)
74	ER	End Radius
75	FH	Fire Hydrant
76	FPUMP	Fuel Pump, at Service Stations
77	FSW	Front of Side Walk
78	FB	Flower Bed
79	FC	Face of Curb
80	FCAPT	Face Curb Angle Pt

ID	CODE	DESCRIPTION
81	FCER	Face of Curb @ End Radius
82	FFE	Finished Floor Elevation
83	FIRECB	Fire Call Box
84	FLDI	Flow Line Ditch
85	FLGUT	Flow Line Gutter
86	FLP(*)	Flowline Pipe (*= Pipe Dia. in Inches)
87	FLAGP	Flag Pole
88	FNC(*)	Fence (*= Height in Feet)
89	FNCCOR	Fence Corner
90	FNCEND	Fence Terminates
91	FOC	Fiber Optic Cable
92	FOLL	Following
93	FTBRIDGE	Foot Bridge
94	GLINE	Gas Line
95	GM	Gas Meter
96	GRAIL	Guard Rail
97	GARAGE	Garage
98	GARDEN	Garden
99	GATE(*)	Fence Gate (*= Metal, Wood, etc.)
100	GMH	Gas Manhole
101	GND	Ground
102	GRATE	Grate That Does Not Have Abbreviation (Give Corner Shots)
103	GRDSTK	Guard Stake
104	GRVL	Gravel
105	GUYP	Guy Pole
106	GUYW	Guy Wire
107	GV	Gas Valve
108	HWL	Head Wall (Left End Face)

ID	CODE	DESCRIPTION
109	HWR	Head Wall (Right End Face)
110	HROW	Hedgerow (Shoot at Face or Corners)
111	HSTONE	Headstone (Grave)
112	HUB (*)	Point Location (*= FND or SET)
113	INL10	No. 10 Inlet (Shoot 4 Corners)
114	INL11	No. 11 Inlet (Shoot 4 Corners)
115	INL12	No. 12 Inlet (Shoot 4 Corners)
116	IP(*)	Iron Pin (*= FND or SET)
117	JCTBOX	Junction Box
118	LIFTSTA	Lift Station
119	LIP(*)	Man Hole Lip (*= Sewer, Drain, Electrical, Etc.)
120	LP(*)	Light Pole (*= Metal, Wood, etc.)
121	LS	Last Shot
122	MCOVER	Metal Cover for unknown utilities
123	MAILBOX	Mailbox
124	MED	Median
125	METP(*)	Metal Pole (*= Pole Diameter in Inches)
126	MHCOR	Mobile Home Corner
127	MON(*)	Monument (*= FND OR SET)
128	NAIL	Nail (other than P-K)
129	NS	Next Shot
130	ONLYW	Word, Only (Shoot 4 Corners) Word written on Asphalt
131	PROPSMH	Proposed Sewer Man Hole
132	PARWALL	Parapet Wall
133	CTVPB	Pull Box - Cable TV
134	ELECPB	Pull Box - Electrical
135	TSPB	Pull Box - Traffic Signal
136	PC	Point of Curvature

ID	CODE	DESCRIPTION
137	PCC	Point of Compound Curvature
138	PEDBUT	Pedestrian Push Button Control
139	PEDLGT	Pedestrian Head Signal (Walk, Don't Walk)
140	PHONEB	Phone Booth (Shoot 4 Corners)
141	PHONEP	Phone, Pay (Shoot on O/S)
142	PI	Point of Intersection
143	PIER(*)	Pier (*= Diameter in Ft.)
144	PILE	Piling
145	PILECAP	Pile Cap
146	PK(*)	PK Nail (*=FND or SET)
147	PLAYEQP	Playground Equipment
148	PM	Parking Meter
149	PMT	Pad Mounted Transformer (Shoot 4 Corners)
150	POC	Point on Curve
151	POOLHSE	Pool House
152	PORCH(*)	Porch (*= Wood, Brick, CONCrete etc.)
153	POT	Point on Tangent
154	PP(*)	Power Pole (*= CONCrete, Wood, Metal, Diameter in inches)
155	PRC	Point of Reverse Curvature
156	PSL	Parking Stall Line
157	PT	Point of Tangency
158	PROTANK	Propane Tank (Shoot 4 Corners)
159	PUMP	Pump
160	RETWALL	Retaining Wall
161	RIPRAP	Rip Rap / Revetment
162	ROW	Right of Way
163	RRCL	Center Line of RR Tracks
164	RRMM	RR Mile Marker

ID	CODE	DESCRIPTION
165	RRTRK	Rail Road Track
166	RRSPIKE	Rail Road Spike
167	RRTRW	Rail Road Tie Retaining Wall
168	RWM	Rectangular Water Meter (Shoot 4 Corners)
169	INLS11	S-11 Inlet (With Side Openings Shoot 4 Corners)
170	SBWL	Single Broken White Line
171	SCDRAIN	Scupper Drain (On Bridges)
172	SCO	Sewer Clean Out
173	SDWL	Single Dotted White Line
174	SHRUB	Shrub
175	SLIDE(*)	Slide (*= Wood, Metal, etc)
176	SMH	Sewer Man Hole
177	SPOILBK	Spoil Bank
178	SPRINK	Sprinkler Head
179	SSPILE	Steel Sheet Piling
180	SSWL	Single Solid White Line
181	SSYL	Single Solid Yellow Line
182	STSIGN	Street Sign
183	STANCH	Stanchion
184	STEP	Step (Shoot 2 Front Corners on Top of Step)
185	STOPBAR	Traffic Stop Bar
186	STOPW	Word, Stop (Shoot 4 Corners) Word written on Asphalt
187	STOSHED	Storage Shed
188	SWDRAIN	Sidewalk Drain (Shoot 4 Corners)
189	SWIMPOOL	Swimming Pool
190	SWNGSET	Swingset
191	SWRLINE	Sewer Line
192	TP(*)	Telephone Pole(* = Wood, Metal, ETC..)

ID	CODE	DESCRIPTION
193	TPED	Telephone Pedestal
194	TTB	Telephone Terminal Box
195	TLINE	Telephone Line
196	TB	Top of Bank
197	TBM	Temporary Bench Mark
198	TC(*)	Top of Curb (*= ER, MP, END Etc.)
199	TCSIGN	Traffic Control Sign
200	THRT	Throat of Inlet
201	TMH	Telephone Man Hole
202	TOEGUT	Toe of Gutter (Shot on Concrete)
203	TOE	Toe of Slope / Toe of Fill
204	TREE(*)	Tree (*= Diameter in Inches)
205	TREED(*)	Double, 2 trees from common root (* =Dia. In Inches)
206	TREEL	Tree Line
207	TREEQ(*)	Quad, 4 trees from common root (* =Dia. In Inches)
208	TREET(*)	Triple, 3 trees from common root (* = Dia. In Inches)
209	TS	Traffic Signal Light
210	TSAW	Traffic Signal Anchor Wire (Shoot Where Attached to Pole)
211	TSCAB	Traffic Signal Control Cabinet
212	TSL	Traffic Signal Loop (Cut in Asphalt)
213	TSP(*)	Traffic Signal Pole (*= Metal, Wood)
214	TVAP(*)	TVA Post, Metal (* = Dia.In Ft.)
215	TVATWR	TVA Tower (Enter # in note)
216	VAULT	VAULT
217	VENTP(*)	Vent Pipe over underground pipes (*= Sewer, etc)
218	WSPIG	Water Spigot
219	WALL(*)	Wall (*= Brick, CONCrete., Wood, etc.)
220	WCR	Wheel Chair Ramp (Shoot 4 Corners)

ID	CODE	DESCRIPTION
221	TESTWELL	Test Well
222	WLINE	Water Line
223	WM	Water Meter
224	WV	Water Valve
225	WW	Wing Wall
226	XWALK	Pedestrian Crosswalk
227	XCUT(*)	X-CUT (*= FND or SET)

Attachment B: File Structure for Final Submission

The following folder structure and naming convention shall be used to organize all files to be included in the final deliverables to the City. All files within the folders should be well-organized and include, at a minimum, the City Project Number. Please refer to Attachment D: Minimum Project Requirements and Sample Project Scope for further details on deliverables.

→[Basin ID]-[Basin Name]-[FY]-[City Contract No.]

→Final Report

→Complete Report (PDF format with all Exhibits)

→Exhibits (individual PDF files for each exhibit)

→Tables (MS Excel files containing tabular data)

→GIS Mapping (all GIS to be ESRI-compatible formats)

→Base Files (original files provided by the City to consultant)

→Flooded Area Maps (model results illustrated as floodplains)

→Updated Base Files (survey-adjusted GIS data sets)

→Georeferenced Photos

→Modeling

→Base Model

→Final Recommendation

→Alternatives (note: all alternatives can be stored in one model file, or in sub folders that are appropriately labeled)

→Survey

→ASCII Files (PNEZID Format)

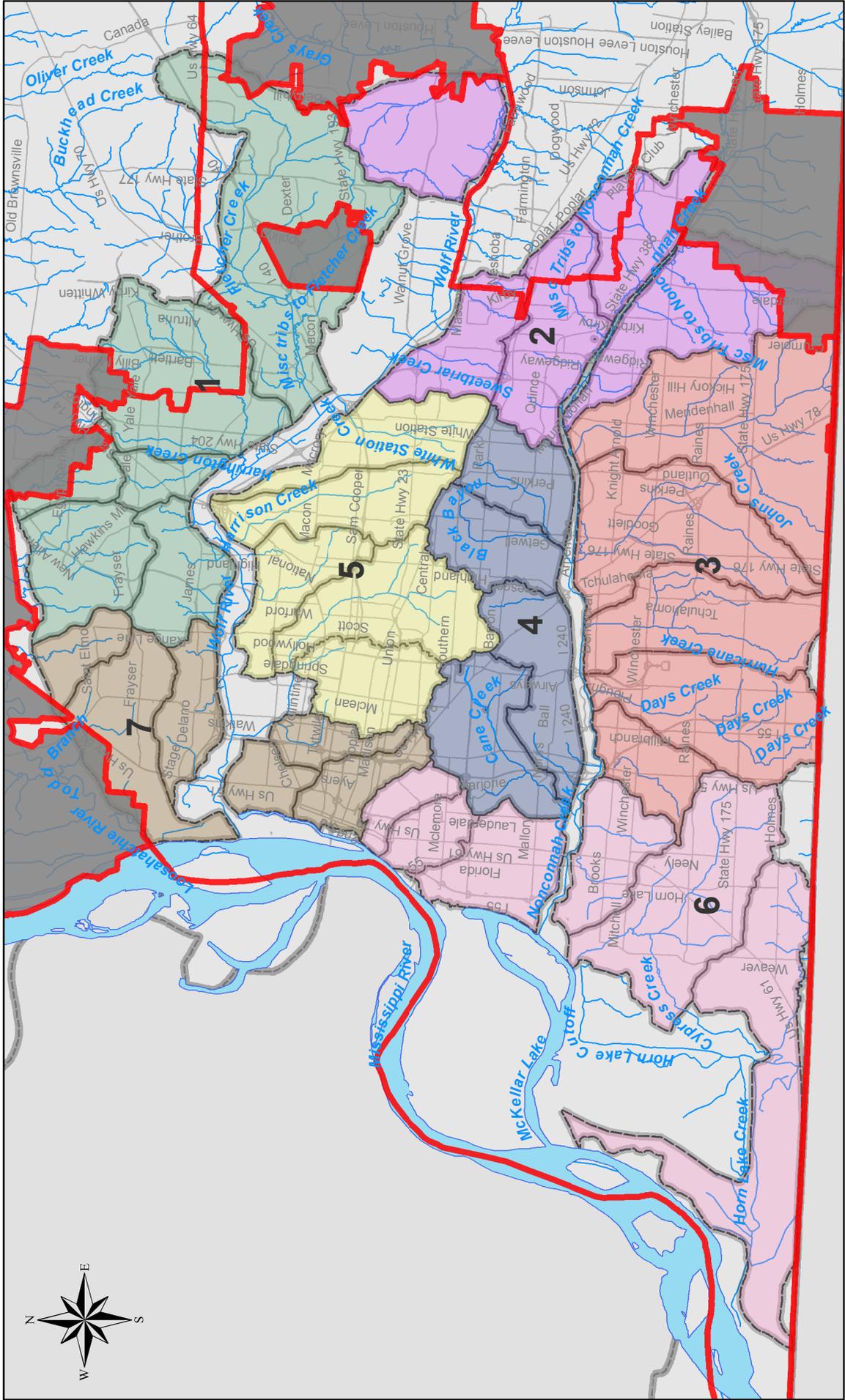
→CAD Files (AutoCAD 2013, following National CAD Standard)

→PDF Scans of field books

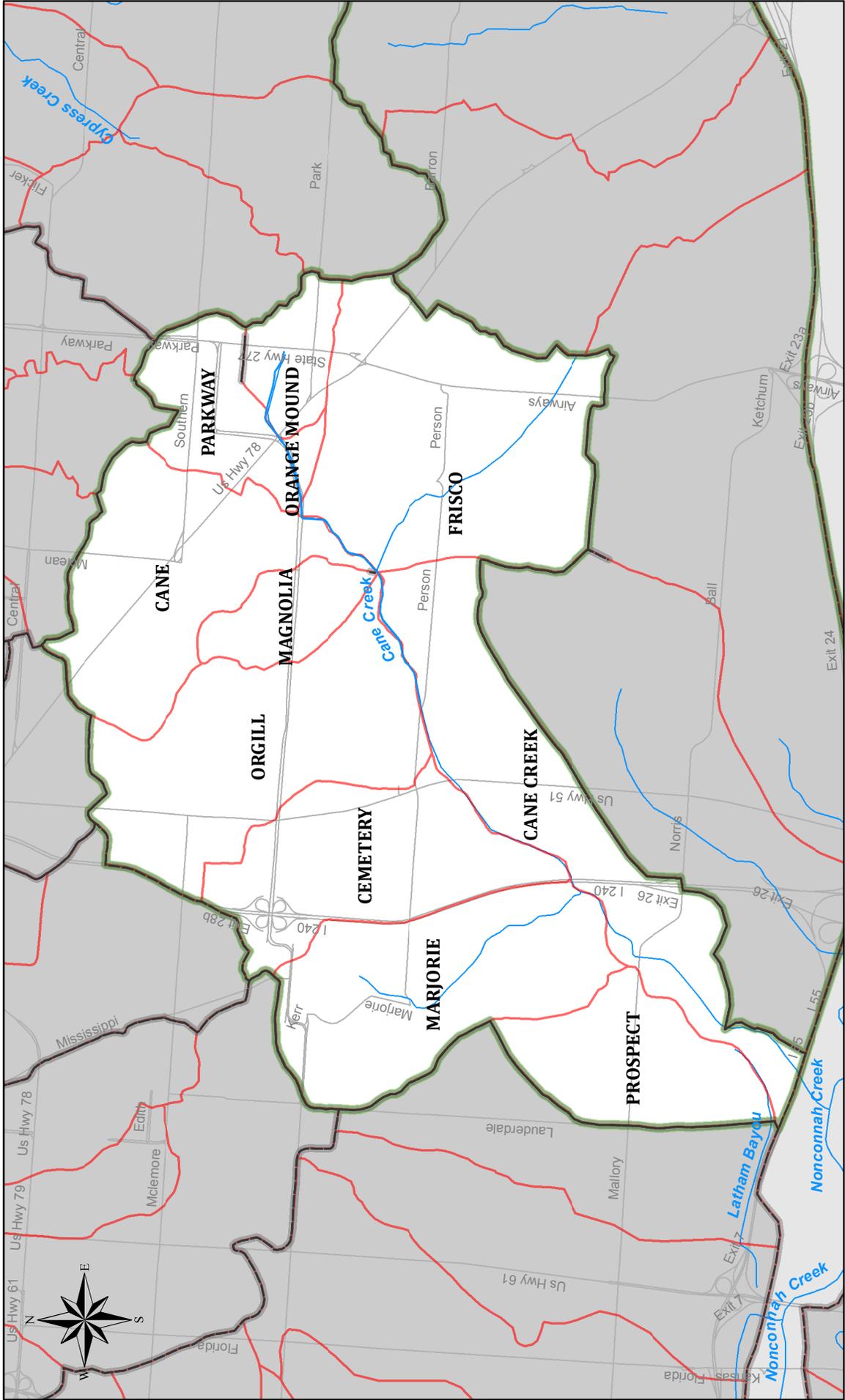
→Photography

Attachment C: Study Area Maps and Information

The following exhibits illustrate how the City has been organized for this master planning effort. Exhibit C1 illustrates the entire City, and its subdivision into the seven Study Districts. Exhibit C2 illustrates Study District 4 and the various Study Areas that comprise that particular Study District. Exhibit C3 illustrates the Cane Creek Study Area, located in Study District 4.



**FY 2016 & FY 2017 Drainage Masterplan Program
C1: Overall Study District Map**



FY 2016 & FY 2017 Drainage Masterplan Program
C3: Cane Creek Study Area

Attachment D: Minimum Project Requirements and Sample Project Scope

The following scope presents a generalized version of what is expected to be included in the project scope of any signed contracts resulting from the RFSOQ. It, however, may not include all potential scope items or cover every topic. Therefore, each entity selected to perform a project related to this RFSOQ will be responsible for making a “good faith” effort towards developing a practical scope of work tailored to their specific study and approved by City staff. The term “consultant” as used below, is intended to imply an individual company, or group of companies working together to complete the scope of services for each project resulting from this RFSOQ and selection process. The term “project team” as used below, is intended to imply the collective group containing the consultant and pertinent City staff.

A. Project Kick-Off

- The consultant shall attend a project kick-off meeting with City staff to discuss the project schedule, administrative issues, and known issues throughout the Study Area(s).
- The consultant shall provide the City with a list of contacts responsible for the project effort. The list of contacts shall indicate a primary and secondary point of contact.
- The consultant shall prepare and manage 2 initial public meetings intended to allow residents an opportunity to discuss observed problem areas with the project team. This task includes the organization and scheduling of the meeting space, notification of meeting to the public, preparation of exhibits, collection of pertinent information from residents, and preparation of meeting minutes.
- The consultant shall conduct field visits of the subject drainage system prior to land surveying efforts to develop a better understanding of the existing conditions throughout the system and site features to include in the surveying effort.
- The consultant shall present and maintain an anticipated project schedule. This schedule is to be updated and presented to the City staff on a regular basis.

B. Data Collection and Survey

- Available data (GIS, record drawings, etc.) shall be made available from the City. The consultant shall be responsible for reviewing the available data.
- GIS-based topographic information shall be allowed as the main source of topographic information beyond the top of banks. All channel and pipe sections shall be surveyed, including discrete points to define the top and invert elevations of each drainage structure (inlet, headwall, manhole, etc.). All channel sections shall be surveyed from top of bank to top of bank, at a minimum.
- The land surveying efforts shall meet or exceed the requirements defined below:
 - The horizontal datum for survey work shall be NAD83, TN Zone 4100, as derived from the NGS National Spatial Reference System (NSRS). Horizontal survey data collection shall comply with “SECOND ORDER” standard, as defined in Table A-4 of the current TDOT Survey Manual.
 - The vertical datum for all survey work shall be based on the City of Memphis Benchmark Network. All control points be referenced to the City’s Benchmark Network, without exception. Vertical survey data

collection shall comply with “THIRD ORDER” standard, as defined in table A-5 of the current TDOT Survey Manual.

- The distance between channel cross sections will be variable, depending on channel geography and transitions. However, the maximum allowable cross-section spacing along prismatic sections is 500 feet.
- Surveyed cross-sections shall be required at each significant change in channel geometry, at all points of concentrated stormwater discharge, and immediately up- and downstream of structure crossings.
- All field survey work shall utilize the field survey codes included in Attachment A. In the event the provided list does not cover all the necessary survey codes, a list of additional codes used, and their accompanying descriptions, shall be provided to the City.
- All survey data collected for structures shall be consistent with standards to be provided by the City.
- The following features shall be included in the land surveying effort, at a minimum:
 - All open channels;
 - All pipes 24” and larger in the tributary drainage network;
 - All pipes downstream from an identified flooding concern;
 - All structures (headwalls, bridges, inlets, etc.) along drainage features meeting the above criteria.
- All surveyed structures shall be photographed. All such photographs shall be georeferenced. Structures crossing an open channel shall have photographs from the upstream and downstream vantage points. Structures discharging into channel shall be photographed from the channel. Photographs shall be provided as a GIS layer.
- The consultant shall coordinate the survey data with existing information, including plans and GIS data, to develop a more accurate depiction of the drainage basin and network to be studied.
- Each individual project scope will include a specific number of structures and cross-sections to be included in the base contract. Any additional survey collection efforts will be handled as additional work, subject to the consent of the Division of Engineering.
- It is the responsibility of the engineering consultant to manage the survey effort to minimize the collection of data unnecessary for the development of the model.

C. Hydrologic and Hydraulic Modeling

- All hydrologic and hydraulic modeling shall be consistent with Volume 2 of the City of Memphis / Shelby County Stormwater Management Manual. Modeling shall be based on the 24-hour, SCS Type II storm with statistical recurrence intervals of 2, 5, 10, 25, 50, and 100 years. Particular focus will be paid to the 10-year and 100-year storm events.
- The hydrologic and hydraulic model(s) shall be validated, to the extent practicable, based on available information and/or observations.
- All hydrologic and hydraulic modeling efforts shall be completed in the InfoSWMM modeling software package using sound engineering judgment and modeling practices.

- Provision and maintenance of all software packages necessary for the performance of these projects is the sole responsibility of the consultant.
- All files shall be maintained and named according to the structure outlined in Attachment B.
- The projects shall be modeled using a combination 1D/1D hydrologic and hydraulic model; which relies on traditional 1D model mechanics to characterize flow throughout the underground drainage network, channels, and overland flow areas.
- The preliminary modeling results and recommended improvements shall be presented to selected City staff for input prior to fully analyzing potential improvements.
- Based on input from City staff, the consultant shall study the impacts of potential capital improvement projects on the modeled flooded areas. The consultant will develop a final recommendation for capital improvement projects to pursue in subsequent years. Recommendations shall include cost estimates and a Benefit Cost Analysis compliant with FEMA requirements.

D. Final Report

The final report shall be written in two volumes. The first volume is intended to be more concise and intended for senior-level staff to review and familiarize themselves with the overall effort, problem areas, and recommended solutions.

The second volume is intended to be a more detailed chronicle of the modeling effort that will facilitate the continued use and evaluation of the model and future capital improvement or development projects that may take place in the study area. This volume will need to include all assumptions and parameters used in developing the model, a description of the model calibration efforts, a more detailed breakdown of the alternative analyses, and a breakdown of the associated cost estimates.

E. Model Transfer Services

The Consultant is expected to transfer ownership and operation of the project models to the City staff prior to completion of the project. This service shall include, at a minimum, the following:

- Provision of completed models on write-protected digital media for installation on the City servers. The folder/file naming convention and organizational structure shall be as shown in Attachment B; and
- A presentation to selected City staff to review the completed model, including all non-standard aspects.
- The consultant's lead modeling engineer shall attend two separate 4-hour sessions at City Hall to ensure the model is running correctly on City computers and the results are consistent with those presented in the Final Report.

F. Anticipated Meetings

The following meetings are to be included in the project schedule and proposed fees. Unless noted otherwise, the meetings indicated are single instances.

Additional meetings requested by, and for the benefit of the consultant team will be at the expense of the consultant team.

- Project kick-off meeting;
- Initial public meetings (2) to hear resident concerns;
- Monthly progress meetings (to be regularly scheduled at a consultant's office, if local);
- 50% project review meeting;
- Review of preliminary solutions;
- Review of final solutions;
- 95% project review meeting;
- Presentation to senior City staff;
- Final public meetings to present results (2); and
- Unplanned, unscheduled meetings at the request of the City (up to 3)

G. Deliverables and Expected Schedules

The final items, as a minimum, will be submitted to the City upon completion of the final report.

- Four (4) printed, full-color copies of the Final Report;
- A portable, USB-compatible external hard drive containing the following:
 - Modeling files, including base conditions and all modeled alternatives;
 - Final Report
 - Entire document in single PDF format and
 - Individual exhibits in PDF format,
 - GIS Feature Classes
 - Georeferenced photos of the following:
 - All major structures,
 - Open/Closed system transitions,
 - Stream crossings,
 - Point discharges to modeled streams, and
 - Other features that could impact modeling efforts and results,
 - Hydrologic basins for modeling,
 - Land use polygons for modeling,
 - Soil type polygons for modeling,
 - Construction of model, including:
 - Channel centerlines (line),
 - Pipe networks (line),
 - Nodes (inlets, manholes, etc.), and
 - Defined overland flow paths (line),
 - Inundation coverage for modeled alternatives,
 - Sketches of recommended solutions,
 - Surveyed structures (FFE), with indications of whether they are in or out of the floodplain, and
 - Updated topography.

- Survey data
 - Field survey, in AutoCAD 2013 format including modeling triangulated irregular network (TIN);
 - Field survey data, in a comma-separated file (PNEZID);
 - Scans of survey field books in PDF format