

SERVICES AUTHORIZATION #5 CONSULTANT SERVICES AGREEMENT

THIS SERVICES AUTHORIZATION is made and entered into this _____ day of _____, 20____, by and between the **City of Orlando, Florida**, a municipal corporation existing under the laws of the State of Florida (CITY), and **Southeastern Surveying and Mapping Corporation**, doing business locally at 6500 All American Boulevard, Orlando, Florida 32810 (CONSULTANT).

WHEREAS, the CITY and the CONSULTANT have previously entered into an agreement for the CONSULTANT's professional services (Agreement) on May 5, 2009 concerning the Stormwater Inventory and Asset Management Project (Project); and

WHEREAS, the Agreement was approved and authorized by the City Council and signed by the Mayor Pro Tem and City Clerk, as Documentary #090504I02; and

WHEREAS, the Agreement was amended by Services Authorization #1 dated February 1, 2010, to add Phase 2 to the Project; and

WHEREAS, the Agreement was amended by Services Authorization #2 dated January 27, 2011, to add Phase 3 to the Project; and

WHEREAS, the Agreement was amended by Services Authorization #3 dated April 10, 2012, to add Phase 4 to the Project; and

WHEREAS, the Agreement was amended by Services Authorization #4 dated January 31, 2013 to add Phase 5 to the Project; and

WHEREAS, the CITY and the CONSULTANT wish to amend the Agreement as set forth herein; and

WHEREAS, the CITY and the CONSULTANT now wish to memorialize their understanding for the CONSULTANT's additional professional services for Phase 6 of the Project.

NOW, THEREFORE, in consideration of the mutual promises and covenants contained herein and given one to the other, the sufficiency of which is hereby acknowledged, the parties agree as follows:

I. SCOPE OF SERVICES

The scope of services has been agreed to by the parties, and is attached hereto and incorporated herein, by reference, as EXHIBIT I.

II. FEE

The not-to-exceed fee of \$999,143.29 has been agreed to by the parties, and is attached hereto and incorporated herein, by reference, as EXHIBIT I.

III. TERM

The term of the Services Authorization shall be completed by the end of business thirty-eight (38) weeks from the issuance of a Notice to Proceed by the CITY. It is also agreed that the CITY shall have an option for extension of this Services Authorization as necessary to complete the present scope of Services (Exhibit I) or to provide additional services.

IV. ENTIRE AGREEMENT

This Services Authorization supersedes all previous services authorizations, amendments, agreements, or representations, either verbal or written, heretofore in effect between the CITY and the CONSULTANT that may have concerned the matters covered herein, except that this Services Authorization shall in no way supersede or amend the Agreement or other services authorizations or amendments except as specifically provided herein. No additions, alterations, or variations to the terms of this Services Authorization shall be valid, nor can the provisions of this Services Authorization be waived by either party, unless such additions, alterations, or waivers are expressly set forth in writing in a document duly executed by the parties. CONSULTANT acknowledges and agrees that any proposals or proposed agreements from subconsultants attached to this SERVICES AUTHORIZATION are attached solely to reflect the scopes of work to be performed and the fees to be charged by such subconsultants. By executing this SERVICES AUTHORIZATION, the CITY does not become a party thereto or bound by the terms thereof.

IN WITNESS WHEREOF, the parties hereto have executed this Services Authorization on the day and year first written above.

City of Orlando, Florida

MAYOR or Mayor Pro Tempore (Print Name)

MAYOR or Mayor Pro Tempore (Sign Name)

ATTEST:

Amy T. Iennaco, Interim City Clerk

(SEAL)

APPROVED AS TO FORM AND LEGALITY
for the use and reliance of the
City of Orlando, Florida, only.

_____, 20____

Michael S. O'Dowd
Assistant City Attorney
Orlando, Florida

Southeastern Surveying and Mapping Corporation

By: _____

(Print Name)

Title: _____

STATE OF FLORIDA }

COUNTY OF _____ }

PERSONALLY APPEARED before me, the undersigned authority,
_____, [] well known to me or [] who has produced
_____ as identification, and known by me to be the _____ of the
corporation named above, and acknowledged before me that he/she executed the foregoing
instrument on behalf of said corporation as its true act and deed, and that he/she was duly
authorized to do so.

WITNESS my hand and official seal this ____ day of _____, 20__.

NOTARY PUBLIC

Print Name: _____

My Commission Expires: _____

Steven L. Anderson, Jr., PSM, PLS
 Charles M. Arnett, PSM
 Michael L. Dougherty, PSM
 Bruce C. Ducker, PSM
 James M. Dunn, II, PSM
 Thomas F. Ferguson, PSM
 Ronnie A. Figueroa, PSM, GISP
 Tate B. Flowers, PLS
 Robert W. Gardner, PSM
 Brian R. Garvey, PE, GISP
 Daniel J. Henry, PSM, PLS
 Matthew G. Jennings, RLS
 Gary B. Krick, PSM
 Brad J. Lashley, PSM, PLS
 Myron F. Lucas, PSM
 Bruce M. Mason PSM
 James E. Mazurak, PSM
 Thomas K. Mead, PSM, PLS



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Serving the Southeast Since 1972
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Timothy O. Mosby, PSM
 James L. Petersen, PSM
 William C. Rowe, PSM
 Tony G. Syfrett, PSM, PLS
 John S. Thomas, PSM
 Edward W. Wackerman, PSM
 Thomas P. Young, Jr., PSM, GISP
 Kirk R. Hall, EI, GISP
 Brad A. Stoppel, EI, GISP
 Cheryl A. Isenberg, GISP
 Brian E. Latchaw, GISP
 Patrick J. Phillips, GISP
 Donna L. Hendrix, CST IV
 Frank B. Henry, CST IV
 Mark W. Klaers, CST IV
 David M. Rentfrow, CST IV
 Steve D. Smith, CST IV
 Celeste B. van Gelder, CST IV

Land Surveying & Mapping Services • Sub-Surface Utility Designation & Location Services • Geographic Information Systems • GPS Asset Inventories

November 11, 2016

Mr. Richard Allen, P.S.M., C.F.M.
 City Surveyor
 Survey Services / Engineering Division
 City of Orlando
 400 South Orange Avenue
 Orlando, Florida 32801

RE: City of Orlando Stormwater Facilities Inventory Maintenance Update – FY 2016-2017

Southeastern Surveying and Mapping Corporation (SSMC) is pleased to present this proposal to perform a maintenance update of the City of Orlando's comprehensive Stormwater Inventory and Condition Assessment of all City maintained stormwater facilities. This Maintenance Update is required to keep the City's Stormwater Facilities Asset Management System up to date due to the construction of new stormwater facilities that the City is responsible for maintaining and inspecting.

The inventory update will identify, locate, photograph and inspect stormwater inlets, manholes, outlets, open channels and ponds conveying stormwater runoff from all publicly maintained and named private roadways within and adjacent to the incorporated Orlando City limits including roadways maintained by the City of Orlando, Orange County, the Florida Department of Transportation and the Orange County Expressway Authority. As directed by City personnel, this maintenance update will collect new and updated stormwater facilities which were constructed or modified, after the initial inventory was performed by SSMC between 2009 and 2015.

SCOPE OF SERVICES

The Project Approach is subdivided into the following five categories of tasks:

- A. Project Mobilization and Setup
- B. Local Roadway Field Inventory
- C. Collector and Arterial Roadway Field Inventory
- D. Quality Assurance Review
- E. Data Integration and Training

Each of the tasks in the Project are discussed in more detail in the enclosed Scope of Services.

DELIVERABLES

Final Map Deliverables shall consist of an ESRI ArcView Version 10 Geodatabase compatible with the City's GIS system along with maps and summary reports. All features will be linked to digital photos of all collected

6500 All American Blvd Orlando, FL 32810 407.292.8580 407.292.0141 Fax	1130 Highway 90 ChIPLEY, FL 32428 850.638.0790 850.638.8069 Fax	Cypress Business Center 8301 Cypress Plaza Drive, Suite 104 Jacksonville, FL 32256 904.737.5990 904.737.5995 Fax	119 West Main Street TAVARES, FL 32778 352.343.4880 352.343.4914 Fax	10 East Lake Street Kissimmee, FL 34744 407.944.4880 407.944.0424 Fax	University Corporate Park 10770 North 46th Street Suite C-300 Tampa, FL 33617 813.898.2711 813.898.2712 Fax
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*Licenses: PSM: Florida Professional Surveyor & Mapper • PLS: Alabama Professional Land Surveyor • RLS: Georgia Registered Land Surveyor • PE: Professional Engineer
 Certifications: EI: Engineering Intern • GISP: Geographic Information Systems Professional • CST: Certified Survey Technician*

stormwater features. All stormwater data for these basins will also be migrated into the City's current asset management system.

SCHEDULE

The proposed duration of the project will be thirty-eight (38) weeks from receipt of a notice to proceed. Preliminary GIS progress submittals will be delivered to the City to review on a monthly basis. Final Data for all basins and migration of all collected data into the City's current asset management system will be completed within thirty-eight (38) weeks from receipt of a notice to proceed from the City.

PROJECT FEE

The total not to exceed fee for this Project will be Nine Hundred Ninety Nine Thousand One Hundred Forty Three and 29/100 dollars (\$999,143.29) as described in the Project Fees section on page 13 of the attached Scope of Services. The City will be invoiced in two parts against this "Not to Exceed" Fee. For this project, SSMC will be assisted by a combination of M/WBE sub-consultants including L&S Diversified, LLC (MWBE), PES, LLC (MBE) and Horizon Geo Services, Inc. (WBE).

For inventory of stormwater structures receiving runoff from the collector and arterial roadways listed in Task C.1, invoicing will be based upon a unit cost of \$262.04 per drainage structure inventoried.

For inventory of stormwater structures receiving runoff from the remaining local roadways, invoicing will be based upon a unit cost of \$136.72 per drainage structure inventoried.

These per structure rates are based upon our previous proposal dated January 10, 2013 and SSMC proposes no increase to our 2013 contracted labor rates and fees as a cost containment measure for the City.

If you have any questions about this proposal, please feel free to contact me at (407) 292-8580.

Sincerely,



Gary B. Krick, P.S.M.
President / Project Manager
GBK:brg

Attachment: Scope of Services



Scope of Services

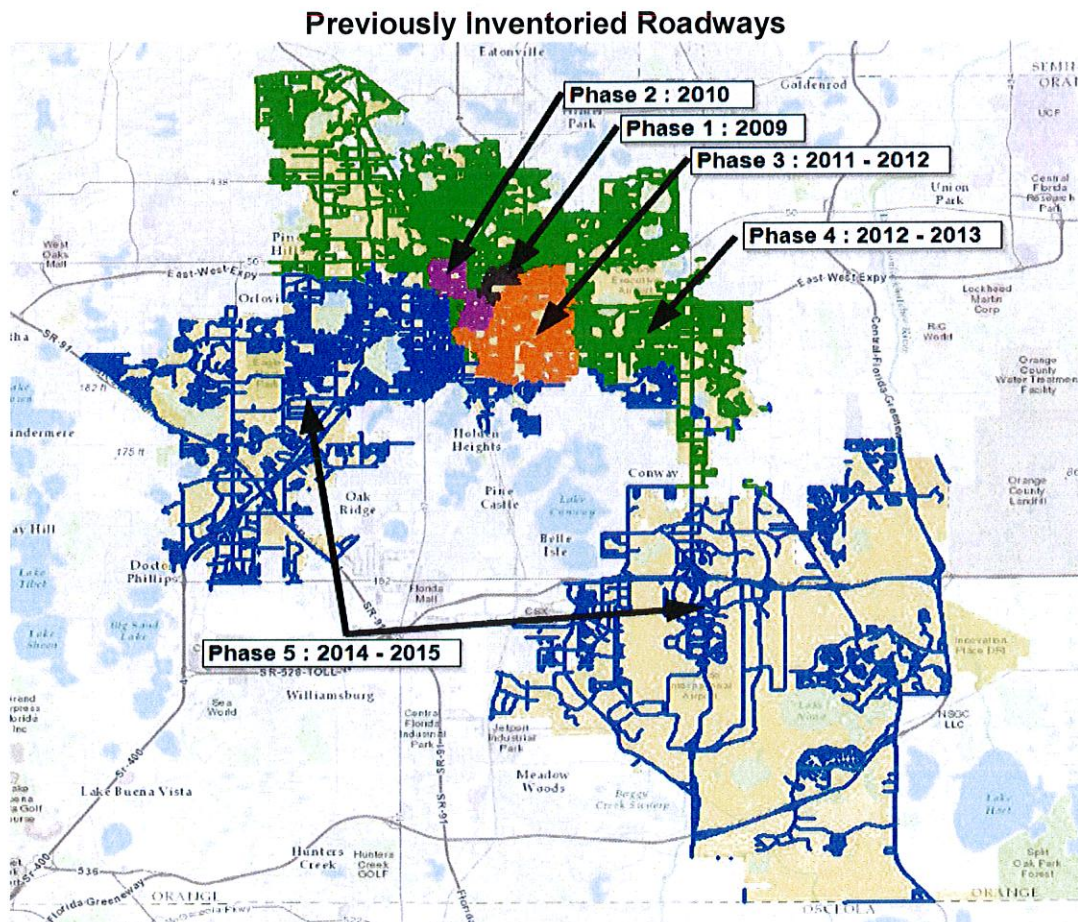
City of Orlando Stormwater Facilities Inventory

Maintenance Update – FY 2016-2017

November 11, 2016

Southeastern Surveying and Mapping Corporation (SSMC) is pleased to present this proposal to perform a maintenance update of the City of Orlando's comprehensive Stormwater Inventory and Condition Assessment of all City maintained stormwater facilities. This Maintenance Update is required to keep the City's Stormwater Facilities Asset Management System up to date due to the construction of new stormwater facilities that the City is responsible for maintaining and inspecting.

The inventory update will identify, locate, photograph and inspect stormwater inlets, manholes, outlets, open channels and ponds conveying stormwater runoff from all publicly maintained and named private roadways within and adjacent to the incorporated Orlando City limits including roadways maintained by the City of Orlando, Orange County, the Florida Department of Transportation and the Orange County Expressway Authority. As directed by City personnel, this maintenance update will collect new and updated stormwater facilities which were constructed or modified, after the initial inventory was performed by SSMC between 2009 and 2015.



Project Approach

The project approach is sub-divided into five categories of tasks:

A. Project Mobilization and Setup – City staff will identify areas where additional stormwater facilities have been constructed, and direct SSMC to perform a maintenance update within those areas. At this point, the preparation for field work begins. The project work area is divided up into smaller work assignments for SSMC Field staff and our M/WBE sub-contractors.

B. Local Roadway Field Inventory – A horizontal and vertical inventory is performed for all stormwater structures along the local roadways within the project areas. Field Inventory along the local roadways will be performed by multiple two-person field crews which will include field personnel from SSMC, and support from our M/WBE partners: PES, LLC, L & S Diversified, and Horizon Geo Services, Inc...

C. Collector and Arterial Roadway Field Inventory – A horizontal and vertical inventory is performed for all stormwater structures along the Collector and Arterial roadways within the project areas. Because of the more complicated requirements of performing maintenance of traffic and confined space entry within the larger drainage structures along the collector and arterial roadway network, all inventory along these roadways will be performed by Southeastern Surveying managed field crews which will include field personnel from Southeastern Surveying and support from our M/WBE partners: PES, LLC and L & S Diversified, and Horizon Geo Services, Inc..

D. Quality Assurance Review - A detailed review of the collected field data and consultation with the City to verify the completeness and accuracy of the inventory. All quality control assurance reviews will be performed by Southeastern Surveying & Mapping staff.

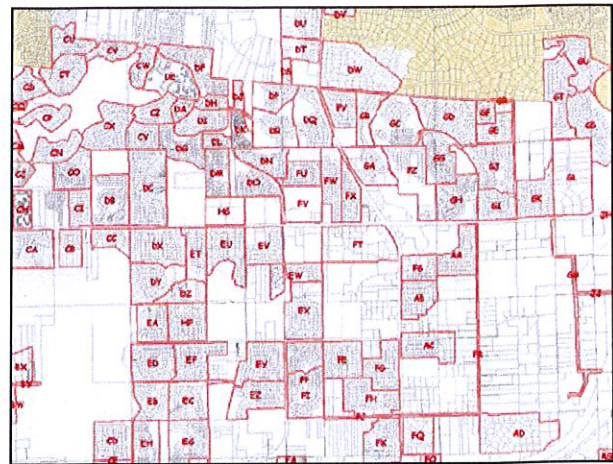
E. Data Integration - Maps and data are delivered, loaded onto the City of Orlando Geographic Information Systems (GIS) servers, and the new data is loaded into the City's current Asset Management System. Southeastern Surveying and mapping corporation will coordinate all deliveries and installation activities with the City's staff.

Each of these categories is described in more detail on the following pages.

A. Project Mobilization & Setup

A.1 Delineate Limits of Individual Work Modules

A single large inventory project such as this is managed as a series of many smaller projects which are referred to as Work Modules. Each work module will contain approximately 1 to 3 miles of roadway. For example, if the City assigns multiple residential subdivisions to be updated, then each of those subdivisions will become a separate work module. The raw GIS data files and all associated field photographs and notes are tied to an individual work module. Each work module stands alone as its own smaller project. A module is assigned to an individual field team who is responsible for completing the inventory within the work module. A project database will track the status of the work module, identifying when the module is created, when the Field Inventory is completed, when GPS QC/QA has been completed, when Final QC/QA is completed, and when the module is delivered to the City. Work module maps for the entire inventory area will be prepared showing the limits of each module and the ID numbers of the adjacent module areas. Ideally, these maps will contain the roadway network, road names, parcel boundaries and addresses and will utilize the digital orthophotos as a base. The work module maps will be used by the field teams to navigate while performing the inventory within the work module.



Prepare Work Modules for Field Crews

Each field team performing field data collection on the stormwater maintenance project will receive a work packet based upon the module being inventoried.



The work packet shall consist of a 2015 aerial photograph covering the extent of the work module, an 11"x17" map of the module used for navigation by the field personnel containing roadway centerlines and street names of the roadways to be inventoried within the module.

A.3 Georeference Existing Plans and As-built record drawings

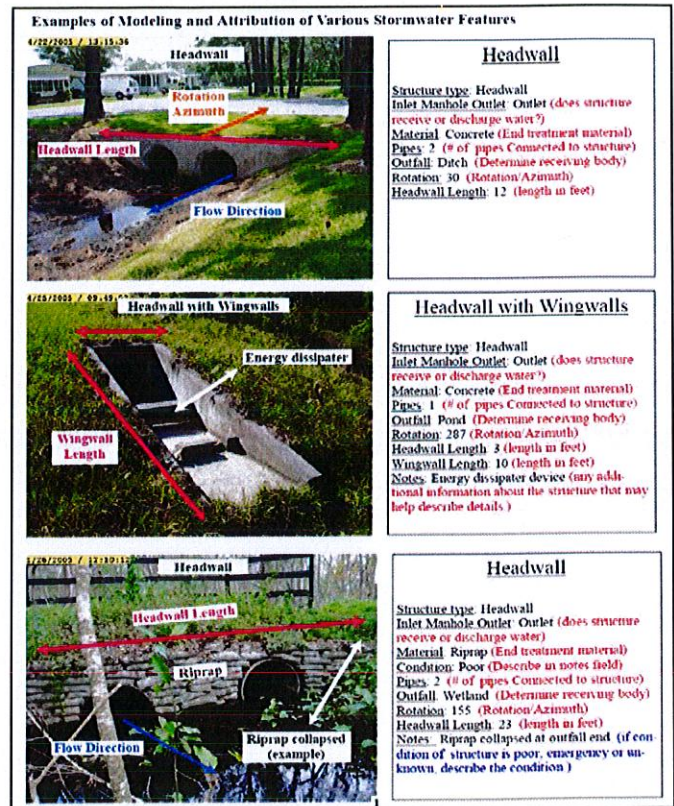
Any existing as-built records of the newly constructed stormwater facilities being updated will be obtained from the City. The maps will be geo-referenced in order to be used in the GIS system. These maps will be used as a reference to verify that all constructed infrastructure was located and may also be used as a reference when an area is inaccessible.

A.4 Update Field and Office Process Documentation

All field procedures revised since the previous phase of the project will be documented so that the inventory shall remain consistent between sub-consultant firms performing the inventory. Field documentation will provide specifications and examples of how information should be collected and classified by the field personnel. Office documentation will standardize all processing and data entry procedures so that all data products are consistent.

A.5 Train Sub-Consultant Field Personnel

Multiple training classes will be held in the field at the project site for all sub-consultant personnel who will be collecting field data in order to insure that collected data is consistent and accurate and that the production follows the established specifications and guidelines.



B. Local Roadway Field Inventory

B.1 Assign Module to Field Team

Each field team will be responsible for the updating the inventory within a collection of adjacent work modules. When a module is assigned to a field team, all associated maps and record drawings for that module will be delivered to the sub-consultant so that the work may proceed.

B.2 Perform Horizontal / Vertical Location and Structure Detailing

Drainage structures will be located utilizing the most appropriate measurement technique for the environment where the structure is located. If the structure is located in clear sky, then RTK GPS can be used to establish the structure's position and elevation. If the structure is located under tree canopy and an RTK position cannot be obtained, the position and elevation will be established by conventional traversing from a pair of control points at known locations and elevations. If there are no nearby control points, then a pair of temporary control points will be set in a nearby area that has clear sky and the location and elevation of these temporary pair points will be established using the RTK GPS.

When using RTK GPS, the SSMC field personnel will locate the structures and culverts with redundant GPS measurements and enter the required attributes into the data collector's data dictionary. Horizontal locations of the drainage structures shall be to an accuracy of one foot. Vertical elevations of the structures will be to an accuracy of 0.2 foot. Interior structure dimensions such as the measurement from the top of the structure to inverts of the interior pipe culverts will be to an accuracy of 0.1 foot.



Each structure will be located and opened so that field personnel can count the number of pipes connected to the structure, verifying the sizes and materials of the culverts within the structure, and measuring the depth from the top of the structure to each of the pipe inverts and the structure bottom. The field technician will mark the location where the elevation measurement will be taken later with a paint spot to mark the reference location where the depth was measured from. Whenever pipes and culverts are obscured by obstructions, debris, silt, or water, the fields personnel will default to the attribute values obtained from any available source documents or make a best guess estimate based on probing into the structure and mark this structure for further investigation.

Using either direct GPS measurement, triangulation from local control, or differential leveling from nearby control elevations, the top elevation of the drainage structure will be measured. If there is no structure at the end of the culvert (for example, the culvert end is a pipe end or a mitered end), then the invert elevation of the culvert will be measured.

B.3 Office Data Entry and AutoCAD Drafting

Using field notes, sketches and GPS derived coordinate locations, GIS technicians will plot the locations of the drainage structures using ESRI's ArcGIS software. Descriptive attributes for each of the structures will be entered into the GIS database. Pipes and culverts will be captured as linear features. Each end of the linear features will be digitized in the field connecting two GPS collected structure positions defining the beginning and end of the culvert. Pipes will be digitized in a downstream flow direction.

B.4 Field Revisits / Rework

After plotting the collected field data, the office technician will identify and additional information that will need to be collected with an additional field revisit. These field revisits may be for the collection of missing information, the verification of inconsistent measurements, or the collection of additional stormwater facilities based upon filed information collected on an adjacent roadway of work module.

B.5 Prepare Surveyor's Report

A surveyors report will be prepared for each work module delivered to SSMC and the City. The surveyors report will contain a certification of the accuracy of the collected data along with a statement listing the horizontal and vertical control that was utilized for the delivered work module.

B.6 Automated QC/QA of Module

Southeastern Surveying & Mapping Corp. has developed and implemented an Automated Structure Validation Tool and an Automated Culvert Validation Tool which will be used to review the data submitted collected by each of the field teams. These tools consists of two ArcGIS Applications which analyze each drainage structure and culvert collected, and checks the structure and culvert attributes against a set of structure and culvert validation rules. If a rule has been broken, then the structure or culvert is flagged with a warning to the GIS technician to investigate whether the issue is an allowable exception to the rule or an error that needs to be corrected in the submitted database. These automated validation tools allow for the efficient review and approval of delivered data from the sub-consultants.

B.7 Inventory Local Roadway Structures Requiring Maintenance of Traffic and/or Confined Space Entry on Local Roadways

If a field team is unable to inventory a drainage structure due to its location within a heavily traveled roadway, or if the size of the drainage structure requires confined space entry procedures and equipment, the field team will schedule that structure for a revisit by a three-person field team equipped for performing Maintenance of Traffic or Confined Space Entry.

B.8 Inventory Local Roadway Open Channels, Canals & Ditches

Applicable open channels, canals, ditches stormwater conveyance channels perpendicular to the local roadways will be collected as linear features. Open channel attributes and a digital photograph of the open channel will also be collected. Using either direct GPS measurement, triangulation from local control, or differential leveling from nearby control elevations, the bottom elevations of the beginning and ending of all open channels will be measured.



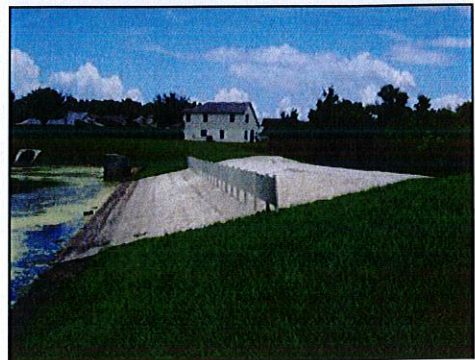
B.9 Inventory Local Roadway Retention Ponds

Retention ponds and other unnamed receiving water bodies which receive stormwater runoff from the local roadway network will be located as polygon features. Field personnel will walk the perimeter of the pond along the approximate top of bank for dry and wet ponds. Pond attributes and a digital photograph will also be collected.



B.10 Inventory Local Roadway Control Structures

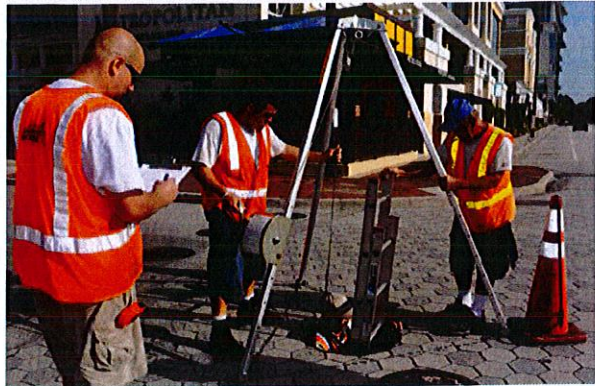
Stormwater control structures located within and adjacent to stormwater retention ponds will be inventoried, located and photographed. Weir lengths measured and weir elevations will be calculated.



C. Collector and Arterial Roadway Field Inventory

C.1 Perform Horizontal/Vertical Location and Structure Detailing

Horizontal and vertical location and structure detailing along the collector and arterial roadway network will follow the same processes as used in the local roadways, however stormwater inventory tasks along the collector and arterial roadway network will typically require the additional manpower afforded by a three or four man field crew and confined space entry safety equipment due to the typically large size of the drainage structures and that fact that the larger traffic volumes and faster roadway speed limits necessitate more formal configurations for maintenance of traffic including the use of off-duty law enforcement personnel for lane closures and traffic direction.



C.2 Office GIS Processing / Field Coordination

At the conclusion of each day, the data collected in the field is uploaded to the servers in SSMC's offices. This provides a daily back up of all collected data. If necessary the data can be post processed to differentially correct any points which were not corrected in real time. During this initial download process, the field technician is responsible for placing the GPS receiver data on the server, transferring the digital photographs from the camera to the server, and coordinating digital photo file names to avoid duplicate names from other field teams. Daily downloads of field data provides secure backups of the data in order to avoid loss or corruption of the data.

Digital Photographs taken that day are reviewed by the office GIS technician to make sure that the number of photos taken matches the number of assets located. Each photo is reviewed for clarity and focus and the photo is compared to the feature that it is assigned to in order to identify errors in the classification of the features. The attributes of each feature are reviewed by the office GIS technician for completeness and accuracy. This is performed on the same day that the features were collected while the features are fresh in the mind of the field technician.

Once the photo and attribute review is completed, the office GIS technician will load that day's data into the project geodatabase using SSMC's custom "Data Loader" application. If any information is missing or incomplete, the office GIS technician will prepare a revisit map for the field crew so that they can return to the structure the following day to collect and missing data, or resolve issues identified by the office GIS technician.

C.3 Field Revisits / Rework

After loading the collected field data into the project geodatabase, the office GIS technician will identify and additional information that will need to be collected with an additional field revisit. These field revisits may be for the collection of missing information, the verification of inconsistent measurements, or the collection of additional stormwater facilities based upon filed information collected on an adjacent roadway of work module.

C.4 Inventory Collector & Arterial Open Channels, Canals & Ditches

Applicable open channels, canals, ditches and roadside swales along the collector and arterial roadway will be collected as linear features. Open channel attributes and a digital photograph of the open channel will also be collected. Using either direct GPS measurement, triangulation from local control, or differential leveling from nearby control elevations, the bottom elevations of the beginning and ending of all open channels will be measured.

C.5 Inventory Collector & Arterial Retention Ponds

Retention ponds and other unnamed receiving water bodies which receive stormwater runoff from the collector and arterial roadway network will be located as polygon features. Field personnel will collect the perimeter of the pond along the approximate top of bank for dry and wet ponds. Pond attributes and a digital photograph will also be collected.



D. Quality Assurance Review

D.1 Identify Data Gaps and Overlaps

Collected field data is compared to adjacent areas to make sure that there is no missing data or duplicate data that may have been collected at the intersection between two adjacent work modules.

D.2 Review Spatial Accuracy

In order to verify the spatial (positional) accuracy of the collected data, the XY coordinate value representing the position of each asset will be checked for 100% of the assets in the office, and 10% of the assets in the field.

In the office, the collected positions of the assets will be checked against the City's roadway centerline, parcel base map and aerial photography. The positions of the assets will be checked to verify that they are located on the correct side of the street and in the correct corner of the intersection. As a secondary check, the asset locations visible in the digital photograph can also be compared against the City's digital orthophotos. The quality of the GPS derived position will also be reviewed. Any positions derived from questionable GPS solutions will be re-observed in the field.

D.3 Review Attribute Accuracy

It is important to verify that all assets have a complete set of attributes and that the attributes are correct. SSMC personnel in the office will verify attribute completeness. 100% of the assets will be reviewed and checked to verify that each feature has the requisite number of attributes.

The primary focus of the attribute quality assurance review is to compare the attributes to the Photo, identify incomplete attributes, check for inconsistent attributes, and resolve problems due to incorrect or inconsistent attribution. For example any attributes, which require the addition of a comment in the database, will be checked to verify that a comment exists. The attribute values for each structure and culvert will be reviewed for consistency making sure that culvert sizes are consistent and structure type match the digital photo.

D.4 Perform Random Field Checks and Re-Visits of Field Collected Data

For a random portion of the field collected features, a two man field crew will return to the work module in the field to verify the spatial accuracy and connectivity of the collected data. This re-check will verify that the assets are shown in their proper locations and the pipe network reflects the proper connectivity between the structures.

D.5 Perform Topology and Network Connectivity Review

The linear features for the pipe culverts will be reviewed and edited to insure that each linear feature contains only two vertices. Any additional collected vertices on the linear feature will be deleted. The polygon features for the pond perimeter will be reviewed and edited to insure that the polygon perimeter is represented by a smooth path with no spikes or irregularities. Any additional collected vertices on the polygon feature will be deleted. Topology checks will be performed to validate the connectivity between the structures, culverts, and open channels.

D.6 Perform Digital Photograph Review

Each asset located in the field is also photographed. The photograph is composed to show the asset in its surroundings. This makes the photo useful in verifying the position of the asset on the map. The GPS derived position of the asset, overlaid on an aerial photograph, is compared to the position seen in the asset's digital photograph. The asset's photograph is also used to verify the accuracy of the assets recorded. For example, the photograph may allow the reviewer to verify the material for a pipe culvert, or the bottom material for an open channel.



Because of the importance of the photography, a second photograph review is performed by an office GIS technician. This technician will compare photo name in GIS attributes to the photo image, document missing, blurry, or incorrectly composed photos for photo retakes, and track down incorrectly matched photos.

One of the ways that SSMC continuously works to improve the quality and efficiency of the digital photography is by investing in new technologies such as GPS enabled digital cameras. Having the camera's GPS position embedded into the photographs header allows us to quickly automate the process of verifying that the photo taken matches the asset that the photo is attached to.

E. Data Integration and Training

E.1 Prepare Final Maps and Reports

After the quality assurance review and final attribution is completed, a final deliverable geodatabase will be prepared. Features in the data model will be symbolized and labeled by setting up rules within an ArcGIS Map Document. Reports identifying any specific infrastructure damage or problems identified will be generated as well.

E.2 Prepare Metadata

The data model, field procedures manual, and office procedures manual will be reformatted into metadata which will be incorporated into the deliverable geodatabase.

E.3 Deliver and Install GIS Data and Photographs

Final GIS data, map documents, reports and digital photographs will be delivered to the City of Orlando on DVD and installed on the City's server. Final Map Deliverables shall consist of an ESRI ArcView Version 10 Geodatabase compatible with the City's GIS system along with maps and summary reports. All features will be linked to digital photos of all collected Stormwater features.

E.4 Load Geodatabase Feature Classes into City's Current Asset Management System

Feature classes in the delivered stormwater geodatabase will be migrated into the City's current Asset Management System and linked to the GIS database.

Project Fees

The Project Fees will be based upon the existing contracted fees on a unit cost (per drainage structure) basis described in the Phase 5 – Boggy Creek, Shingle Creek, Wekiva River and Lake Hart Basins dated January 10, 2013.

In the proposal dated January 10, 2013 in Exhibit II, Page 1 it states:

“For inventory of stormwater structures receiving runoff from the collector and arterial roadways and additional structures requiring confined space entry, invoicing will be based upon a unit cost of \$261.61 per drainage structure inventoried as calculated in Exhibit II.

For inventory of stormwater structures receiving runoff from the remaining local roadways, invoicing will be based upon a unit cost of \$136.54 per drainage structure inventoried as calculated in Exhibit II. “

Details of the of the man-hours, and labor rates used to establish these “per drainage structure” costs can be found in the “Project Summary Table” in Exhibit II, on Page 3 of the January 10, 2013 proposal.

Based on guidance from City staff, it is estimated that the City wishes for budget for an approximate 10% growth since the original inventory began in 2009. The City’s existing inventory consists of 55,029 drainage structures. Estimating a 10% growth rate would imply that there would be:

$$55,029 \times 10\% = \mathbf{5,503 \text{ new stormwater drainage structures within the City}}$$

In the City’s existing inventory, 36% of the drainage structures are located along collector and arterial roadways and 64% of the drainage structures are on local roadways Based on these values, it can be estimated that there will be:

Collector and Arterial Roadways: $5,503 \text{ new structures} \times 36\% = \mathbf{1,981 \text{ structures}}$

Local Roadways: $5,503 \text{ new structures} \times 64\% = \mathbf{3,522 \text{ structures}}$

Using the unit cost rates from the January 10, 2013 proposal described above the estimated total project fee can be calculated as:

Collector and Arterial Roadways: $1,981 \text{ structures} \times \$261.61 \text{ per structure} = \mathbf{\$518,249.41}$

Local Roadways: $3,522 \text{ structures} \times \$136.54 \text{ per structure} = \mathbf{\$480,893.88}$

Total Estimated Budget $\mathbf{\$999,143.29}$

The total “Not to Exceed” fee for this Project will be Nine Hundred Ninety Nine Thousand One Hundred Forty Three and 29/100 dollars (\$999,143.29). The City will be invoiced in two parts against this "Not to Exceed" Fee based upon the actual number of drainage structures along local roadways and along the collector and arterial roadways. The City will only be invoiced to the actual number of structures inventoried so the actual maintenance update cost could be significantly less than this budget amount based upon actual infrastructure encountered in the field.

All fees will be invoiced against the total "Not to Exceed" fee for this Project. If the fee for the number of drainage structures identified in this inventory exceeds this amount, Southeastern Surveying & Mapping Corp. will not perform any mapping of these additional structures without prior written authorization from the City.

For this project, Southeastern Surveying and Mapping Corporation will be assisted by a combination of M/WBE sub-consultants including L&S Diversified, LLC (MWBE), PES, LLC (MBE) and Horizon Geo Services, Inc. (WBE). SSMC anticipates the following M/WBE participation goals for this project:

Firm Name	Firm Certification	Anticipated M/WBE Participation Goal
PES, LLC	MBE	11%
L & S Diversified, LLC	MWBE	11%
Horizon Geo Services, Inc.	WBE	2%

Bi-weekly status reports will be provided to the City of Orlando tabulating the status of the mapping project and the estimated fees for the facilities mapped. This will allow City staff to monitor the progress of the mapping project and its budget status. Invoices will be sent monthly.