

CITY OF DELRAY BEACH
CONSULTING SERVICE AUTHORIZATION

DATE: 9/29/17

SERVICE AUTHORIZATION NO. 17-01 FOR ENGINEERING CONSULTING SERVICES

CITY P.O. NO. _____ CITY EXPENSE CODE _____

CITY PROJECT NO. 16-049 ADA ENGINEERING PROJECT NO. C272-0117-01

This Service Authorization, when executed, shall be incorporated in and shall become an integral part of, the "Agreement for General Consulting Services".

Title: City of Delray Beach Stormwater Management Master Plan Update

I. PROJECT DESCRIPTION

This Service Authorization is for engineering services associated with the updating the City of Delray Beach's Stormwater Master Plan. The City's Master Plan was originally created in 1993 by Mock, Roos & Associates, Inc. A revision was completed in 2000 by Kimley Horn & Associates, Inc. The last update included 11 recommendations for improvements needed in the City's drainage system, which were only partially completed. The updated Plan needs to address the current and future needs of the City based on growth and climatological changes that have and will continue to, impacted the City's drainage system.

The goal of the Update of the Stormwater Master Plan is to create a plan to address water resource issues and problems within the City of Delray Beach. These issues include drainage problems, street flooding, tidal flooding, inadequate infrastructure, stormwater quality and recharge as well as other stormwater related issues or problems.

The Scope of Services will include a review of the City's drainage infrastructure, evaluating the adequacy and condition of the drainage facilities, determining of the Level of Service (LOS) for flood protection for the city's sub watersheds, identifying water resource and drainage issues/problems, and identifying and defining solutions.

Included in this effort will be a review of the City's Stormwater Utility Ordinance and Fee structure. Recommend revisions to the fee structure to address the fairness and the fee distribution. Additionally, review of the City's NPDES permit and requirements and development of an automated GIS system to collect inspection, sampling and other applicable data gathered by city staff to meet permit requirements.

II. SCOPE OF SERVICES FOR THIS SERVICE AUTHORIZATION INCLUDE

Task 1 – Kickoff Meeting

A kickoff meeting will be held with the City to discuss the project goals, tasks and schedule. Coordination will begin for the transfer of information such as GIS datasets and previous reports that will be needed for the project. ADA will develop a meeting agenda and prepare meeting minutes for distribution.

Task 2 – Data Acquisition and Site Visits

ADA will collect, review and evaluate data provided by the City as needed to perform the flooding, Level of Service (LOS), Sea Level Rise (SLR) and water quality analyses as well as assessments of the stormwater ordinance and utility rate structure. Information to be provided by the City shall include:

1. 1991 Stormwater Master Plan
2. 2000 Stormwater Master Plan Update
3. GIS data including:
 - a) Sub watersheds delineations
 - b) Drainage inventory of infrastructure including pipes, inlets and manholes with attributes for pipe size, type and invert elevations and inlet grate elevations. (Note: Conversion of the Drainage Atlas is currently underway and should be completed prior to this contract. If data convert is not completed in time for this contract, portions of the Atlas may be provided in Auto-Cad format. Convert remaining data into GIS format as necessary.)
 - c) Inspection information of condition of stormwater infrastructure.
 - d) Soil Maps and land use maps.
 - e) Land Use of the City provided in GIS format by ESD staff.
 - f) Locations of swale and water conveyance features.
 - g) Parcel data
4. MS4 NPDES permit and submittals to Countywide permitting coordinator
5. Stormwater ordinances
6. Utility rate structure studies
7. Other relevant studies and flooding reports

Other information to be obtained by ADA includes the following:

1. County LiDAR information
2. Existing aerial images
3. SFWMD permit data
4. SFWMD/USGS Well and water level data

The data will be reviewed and modified as needed to represent the existing conditions. Up to three site visits will also be performed to verify conditions in locations where clarification is needed. This project, however, does not include surveying services to verify the drainage inventory. ADA will prepare an inventory of the information collected including descriptions, sources and comments.

Task 3 – Hydrologic/Hydraulic Model Setup

An ICPR 4 model will be developed to simulate existing conditions based on information obtained and reviewed in Task 2. Model data input will include:

1. Sub-basin areas
2. Stage-area relationships
3. Times of concentration

4. Runoff curve numbers
5. Direct connected impervious areas
6. Hydraulic nodes and links (stormwater infrastructure)
7. Boundary conditions

The model will consist of hydrology and 1-D hydraulics, which will include simplified hydraulic links between subbasins based on equivalent pipe sizes and overland flow connections between the subbasins and the Intracoastal Waterway. It is understood that the GIS infrastructure database is incomplete and that some pipe information needed for the subbasin connections may not be available. In the course of developing the model connections, a list of missing information necessary for the model will be prepared. The City will be contacted and will decide whether they will obtain the information or whether ADA will arrange for the information to be obtained through a surveying subconsultant.

When the model input is complete, the model will be tested and a limited calibration will be performed in consideration that there is very little, if any, available recorded flow and stage information. Model adjustments will be made to the model if deemed warranted to better match eye-witness accounts of flooding. A Technical Memorandum will be prepared describing the task and presenting the results of the existing conditions model with maps, graphs and tables. Comments and revisions from the City will be incorporated into the final Master Plan document (Task 11).

Task 4 – Level of Service (LOS)

The LOS will be established using documented procedures and requirements. The existing LOS will be determined for the minor, secondary and primary road systems as well as for buildings based on assumed finished floor elevations. Different storms will be established for each of these features based on common practices and coordination with the City. The results will be quantified in linear feet of roadway meeting or not meeting LOS and number buildings meeting or not meeting LOS. Maps will be produced showing the locations of areas of non-compliance. A Technical Memorandum will be prepared describing the task and presenting the results of the LOS model runs. Comments and revisions from the City will be incorporated into the final Master Plan document (Task 11).

Task 5 – Sea Level Rise (SLR)

A SLR scenario will be established based on an agreed upon source of anticipated ocean rise estimations. The scenario will reflect a timeframe as directed by the City such as 30 or 50 years into the future. A version of the model will be created to reflect the changes associated with the higher sea level including the boundary conditions and soil storage. The model will be run to assess the impacts of SLR by comparing the flooding depths and spatial extents to the results of the existing conditions model. In addition, backflow prevention devices will be researched to determine the most suitable type of device based on environment, head loss and maintenance. A Technical Memorandum will be prepared describing the task and presenting the results of the SLR model run. Comments and revisions from the City will be incorporated into the final Master Plan document (Task 11).

Task 6 – Water Quality Assessment

The extent of existing water quality treatment in the City will be reviewed based on the existing infrastructure (swales and exfiltration trenches) and SFWMD ERP permits. Areas will be identified where additional water quality is recommended. Water quality features to be considered include swales, exfiltration trenches, ponds and stormwater filters and will depend on the characteristics and suitability of each location. A Technical Memorandum will be

prepared describing the task and presenting the results of the analysis including maps of water quality coverage. Comments and revisions from the City will be incorporated into the final Master Plan document (Task 11).

Task 7 – Capital Improvement Projects

The assessments performed in Task 4, 5 and 6 will be used to determine problem areas and develop alternatives for improvements. The problem areas will be compared to areas identified on previous master plans. It is assumed that up to ten problem areas will be analyzed to determine appropriate stormwater solutions. Regulatory requirements for flood stages and allowable discharge rates will be observed in the development of alternatives. Engineer's estimate of probable construction costs will be prepared based recently completed projects of similar type and scale. A Technical Memorandum will be prepared describing the steps taken to identify problem areas, develop alternative improvements, model the systems and select effective solutions. The memorandum will also include illustrations of the proposed projects and the probable construction cost estimates. Comments and revisions from the City will be incorporated into the final Master Plan document (Task 11).

Task 8 – Stormwater Ordinance Review

The existing City stormwater ordinance will be reviewed and recommendations will be made for any changes that are determined to benefit the City. Rules for new or modified homes and businesses will be reviewed in regard to flood control and water quality to determine appropriate stormwater treatment and storage requirements based on reviews of other Florida municipalities and state requirements. ADA will identify any changes needed in stormwater ordinances for the city due to the revised FEMA flood stages and the construction impacts to the surrounding properties due to significantly higher finished floors required for new construction. ADA will attend a stakeholder meeting arranged by the City with developers, engineers and architects. ADA will prepare a Powerpoint presentation demonstrating the current requirements and potential changes. ADA will prepare minutes for the meeting.

Task 9 – Utility Rate Structure Review Assistance (Optional Task as Needed)

ADA will provide assistance to the City's consultant that will be hired to re-evaluate the City's Storm Water Utility billing methodology. Methodologies to be considered could include:

- Flat Fee
- Runoff Coefficient
- Residential Flat Fee
- Equivalent Residential Unit (ERU)
- Single Family Unit (SFU)
- Tiered Residential Fee
- Level-of-Service / Geography Base
- Area Measurements (all parcels)

ADA will provide information, as needed and if available from the hydrologic analyses performed in Task 3. ADA will also perform analyses of spatial options associated with the methodologies.

Task 10 – NPDES Review

ADA will review the NPDES requirements for the City, develop protocol that will satisfy the City's requirements for the existing MS4 - NPDES permit. This permit requires that the City implement programs to protect waterbodies from pollutant loading and illicit discharges. ADA will assess the requirements for inspection and maintenance of drainage facilities and review

the current stormwater maintenance and inspection system with recommendations for implementing GIS based facility management software. A Technical Memorandum will be prepared describing the task and recommendations. Comments and revisions from the City will be incorporated into the final Master Plan document (Task 11).

Task 11 – Master Plan Documentation

A report for the Stormwater Master Plan Update will be prepared that will document the procedures, findings and recommendations of the assessments performed. The report will include maps, figures and tables. It is anticipated to include the following sections:

- Introduction
- Data Collection and Evaluation
- Hydrologic/Hydraulic Modeling
- Level of Service
- Sea Level Rise
- Water Quality Assessment
- Capital Improvement Projects
- Stormwater Ordinance Review
- Utility Rate Structure Review
- NPDES Review

A draft copy of the Master Plan will be submitted for the City's review. Comments and revisions from the City will be incorporated into the final Master Plan document. Five (5) hard copies of the final document, including appendices for model input and output, will be delivered to the City along with a PDF version and ICPR4 modeling files.

III. COMPENSATION

The compensation for services provided shall be billed on a Lump Sum basis, plus reimbursable expenses for each task of work, in accordance with Article VII, Method II, up to the following not-to-exceed cost for each phase.

Engineering Services – (City Project Nos. 16-049)

Task 1 – Kickoff Meeting	\$ 2,617.20
Task 2 – Data Acquisition and Site Visits	\$ 13,835.28
Task 3 – Hydrologic/Hydraulic Modeling	\$ 37,835.28
Task 4 – Level of Service	\$ 17,603.16
Task 5 – Sea Level Rise	\$ 15,516.24
Task 6 – Water Quality Assessment	\$ 14,642.28
Task 7 – Capital Improvement Projects	\$ 32,969.04
Task 8 – Stormwater Ordinance Review	\$ 11,668.98

Task 9 – Utility Rate Structure Review (Optional Task if Requested by City)	\$ 6,493.32
Task 10 – NPDES Review	\$ 13,744.14
Task 11 – Master Plan Documentation	\$ 17,839.44

Total Compensation – \$ 184,497.36

IV. COMPLETION DATE

The Tasks outlined will be completed within 365 calendar days of issuance of Notice to Proceed (NTP).

This service authorization is approved contingent upon the City's acceptance of and satisfaction with the completion of the services rendered in the previous phase or as encompassed by the previous service authorization. If the City in its sole discretion is unsatisfied with the services provided in the previous phase or service authorization, the City may terminate the contract without incurring any further liability. WGI shall commence work on any service authorization approved by the City to be included as part of the contract without a further notice to proceed.

Approved by:

CITY OF DELRAY BEACH:

Date _____

By: _____
Cary D. Glickstein
Mayor

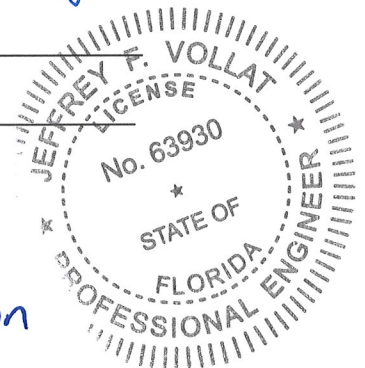
CONSULTANT: ABA Engineering

Date 9/29/17

By: [Signature]
(Seal)

Witness (Signature)

Ricardo Brown
Witness (Printed)



Attest: _____

Approved as to Legal Sufficiency

R. Max Lohman City Attorney

Katerri Johnson, City Clerk

BEFORE ME, the foregoing instrument, this ____ day of _____, 201____, was acknowledged by _____ on behalf of the Corporation _____, and said person executed the same free and voluntarily for the purpose there-in expressed.

Witness my hand and seal in the County and State aforesaid this ____ day of _____, 201____.

Notary Public
State of Florida
My Commission Expires:

TABLE 1

**City of Delray Beach
Stormwater Management Master Plan Update**

Date: 9/26/2017

Man-hour and Fee Estimate

Task /Subtask	Task Description	ADA Engineering, Inc.			TOTALS			
		Principal Engineer	Project Manager	Senior Engineer	Total Labor Hours	Total Labor Costs	Other Direct Expenses**	Total
	Rate	\$160.26	\$99.18	\$102.03				
1	Kick-off Meeting	10	2	8	20	\$2,617.20	\$ -	\$2,617.20
1.1	Prepare for and attend kick-off meeting	6		4	10	\$1,369.68	\$ -	\$1,369.68
1.2	Prepare meeting minutes	4	2	4	10	\$1,247.52	\$ -	\$1,247.52
2	Data Acquisition and Site Visits	47	8	54	109	\$13,835.28	\$ -	\$13,835.28
2.1	Review Previous Master Plans and Studies	12	2	8	22	\$2,937.72	\$ -	\$2,937.72
2.2	Obtain and Review GIS Datasets from City	10	2	12	24	\$3,025.32	\$ -	\$3,025.32
2.3	Obtain other GIS sources (soils, topography, etc.)	6	2	12	20	\$2,384.28	\$ -	\$2,384.28
2.4	Obtain Recorded Monitoring Data	4		5	9	\$1,151.19	\$ -	\$1,151.19
2.5	Site Visits	9		9	18	\$2,360.61	\$ -	\$2,360.61
2.6	Create inventory of Collected Information with Description/Comments	6	2	8	16	\$1,976.16	\$ -	\$1,976.16
3	Hydraulic/Hydrologic Model Setup	122	15	162	299	\$37,568.28	\$ -	\$37,568.28
3.1	Subbasin Characteristics							
3.1.1	Stage-Area Relationships	18	2	20	40	\$5,123.64	\$ -	\$5,123.64
3.1.2	Times of Concentration	12	2	18	32	\$3,958.02	\$ -	\$3,958.02
3.1.3	Runoff Curve Numbers	8	1	12	21	\$2,605.62	\$ -	\$2,605.62
3.1.4	Direct Connected Impervious Areas	12	1	16	29	\$3,654.78	\$ -	\$3,654.78
3.2	Determine Missing Pipe Data Requirements	8		12	20	\$2,506.44	\$ -	\$2,506.44
3.3	Hydraulic Node and Link Input	32	3	40	75	\$9,507.06	\$ -	\$9,507.06
3.4	Boundary Conditions	4		4	8	\$1,049.16	\$ -	\$1,049.16
3.5	Model Testing and Calibration	8	2	8	18	\$2,296.68	\$ -	\$2,296.68
3.6	Existing Conditions Technical Memorandum	20	4	32	56	\$6,866.88	\$ -	\$6,866.88
4	Level of Service (LOS)	68	10	56	134	\$17,603.16	\$ -	\$17,603.16
4.1	Develop Methodology	12	2	8	22	\$2,937.72	\$ -	\$2,937.72
4.2	Model Existing LOS							
4.2.1	Minor Roadways	6	1	6	13	\$1,672.92	\$ -	\$1,672.92
4.2.2	Secondary Roadways	6	1	6	13	\$1,672.92	\$ -	\$1,672.92
4.2.3	Primary Roadways	6	1	6	13	\$1,672.92	\$ -	\$1,672.92
4.2.4	Buildings	6	1	6	13	\$1,672.92	\$ -	\$1,672.92
4.2.5	Map Results	12	2	12	26	\$3,345.84	\$ -	\$3,345.84
4.3	LOS Technical Memorandum	20	2	12	34	\$4,627.92	\$ -	\$4,627.92
5	Sea Level Rise (SLR)	60	6	52	118	\$15,516.24	\$ -	\$15,516.24
5.1	Establish SLR Scenario	12	2	6	20	\$2,733.66	\$ -	\$2,733.66
5.2	Modify and Model Boundary and Soil Conditions	20	1	18	39	\$5,140.92	\$ -	\$5,140.92
5.3	Identify and Map Areas of SLR Impacts	8	1	8	17	\$2,197.50	\$ -	\$2,197.50
5.4	Research and Recommend Backflow Prevention Devices	8		8	16	\$2,098.32	\$ -	\$2,098.32
5.5	SLR Technical Memorandum	12	2	12	26	\$3,345.84	\$ -	\$3,345.84
6	Water Quality Assessment	52	6	56	114	\$14,642.28	\$ -	\$14,642.28
6.1	Quantify Locations with Permitted BMPs	12	1	12	25	\$3,246.66	\$ -	\$3,246.66
6.2	Quantify Locations with Other BMPs	10	1	12	23	\$2,926.14	\$ -	\$2,926.14
6.3	Identify and Map Areas of Deficiency	12	2	14	28	\$3,549.90	\$ -	\$3,549.90
6.4	Water Quality Technical Memorandum	18	2	18	38	\$4,919.58	\$ -	\$4,919.58
7	Capital Improvement Projects (CIP)	104	8	152	264	\$32,969.04	\$ -	\$32,969.04
7.1	Identify 10 (approx.) Problem Areas	16	2	16	34	\$4,395.00	\$ -	\$4,395.00
7.2	Develop Proposed Improvement Plans	24	2	24	50	\$6,493.32	\$ -	\$6,493.32
7.3	Model Improvements and Assess Benefits	16		24	40	\$5,012.88	\$ -	\$5,012.88
7.4	Revise Improvements and Re-assess	16		24	40	\$5,012.88	\$ -	\$5,012.88
7.5	Probable Construction Cost Estimates	8	2	32	42	\$4,745.40	\$ -	\$4,745.40
7.6	CIP Technical Memorandum	24	2	32	58	\$7,309.56	\$ -	\$7,309.56
8	Stormwater Ordinance Review	50	6	30	86	\$11,668.98	\$ -	\$11,668.98
8.1	Review City Ordinance	6		4	10	\$1,369.68	\$ -	\$1,369.68
8.2	Develop Recommendations for Revisions	16	2	8	26	\$3,578.76	\$ -	\$3,578.76
8.3	Attend and Prepare Presentation for Stakeholder Meeting	12		8	20	\$2,739.36	\$ -	\$2,739.36
8.4	Prepare Draft Ordinance	12	2	8	22	\$2,937.72	\$ -	\$2,937.72
8.5	Stakeholder Meeting Minutes	4	2	2	8	\$1,043.46	\$ -	\$1,043.46
9	Utility Rate Structure Review Assistance	24	2	24	50	\$6,493.32	\$ -	\$6,493.32
9.1	Provide Data and Coordination with City's Consultant	8		8	16	\$2,098.32	\$ -	\$2,098.32
9.2	Assist in Assessing Alternative Approaches	16	2	16	34	\$4,395.00	\$ -	\$4,395.00
10	NPDES Review	54	4	46	104	\$13,744.14	\$ -	\$13,744.14
10.1	Review Current and Upcoming NPDES Requirements	8		6	14	\$1,894.26	\$ -	\$1,894.26
10.2	Review City Submittals to Countywide Permit Coordinator	8		6	14	\$1,894.26	\$ -	\$1,894.26
10.3	Assess Current Inspection Practices	6	1	8	15	\$1,876.98	\$ -	\$1,876.98
10.4	Review and recommend GIS Facility Management Software	20	1	16	37	\$4,936.86	\$ -	\$4,936.86
10.5	NPDES Technical Memorandum	12	2	10	24	\$3,141.78	\$ -	\$3,141.78
11	Master Plan Documentation	65	9	64	138	\$17,839.44	\$ -	\$17,839.44
11.1	Introduction	4		4	8	\$1,049.16	\$ -	\$1,049.16
11.2	Data Collection and Evaluation	5		4	9	\$1,209.42	\$ -	\$1,209.42
11.3	Hydrologic/Hydraulic Modeling	8	2	10	20	\$2,500.74	\$ -	\$2,500.74
11.4	Level of Service	6	1	8	15	\$1,876.98	\$ -	\$1,876.98
11.5	Sea Level Rise	6	1	8	15	\$1,876.98	\$ -	\$1,876.98
11.6	Water Quality Assessment	6	1	8	15	\$1,876.98	\$ -	\$1,876.98
11.7	Capital Improvement Projects	16	2	12	30	\$3,986.88	\$ -	\$3,986.88
11.8	Stormwater Ordinance Review	8	1	4	13	\$1,789.38	\$ -	\$1,789.38
11.9	NPDES Review	6	1	6	13	\$1,672.92	\$ -	\$1,672.92
Total Hours		656	76	704				
Total \$ Per Individuals		\$105,131	\$7,538	\$71,829				
TASK ORDER TOTAL					1436	\$184,497.36	\$ -	\$184,497.36

** Other direct expenses are presented in the Expenses Tab.