



621 NW 53rd Street, Suite 265
Boca Raton, FL 33487
tel: 561 571-3800

April 12, 2021

Aqeel Abdool-Ghany, P.E.
Assistant City Engineer
City of Hallandale Beach
400 S Federal Hwy
Hallandale Beach, FL 33009

In accordance with Resolution No. 2020-054, RFP #FY 2018-2019-012 Continuing Professional Architectural and Engineering Services and Other Services, the following scope of services is provided by CDM Smith Inc. (CONSULTANT) as requested by the CITY to provide Engineering Services.

Subject: Work Authorization No. 01 - GIS Plans Mapping
Proposal Transmittal for Engineering Services

Dear Aqeel:

CDM Smith Inc. is pleased to submit the attached scope of services and fee as Work Authorization No. 1 (WA#01) to assist the City in enhancing its existing GIS. We look forward to commencing this important project with you.

Sincerely,

A handwritten signature in blue ink, appearing to read 'JZ', is shown within a light blue rectangular box.

Jonathan Z. Goldman P.E., PMP, BCEE
Associate
CDM Smith Inc.

cc: Suzanne Mechler, P.E.



**CITY OF HALLANDALE BEACH, FL
FY 2018-2019-012 CONSULTANT COMPETITIVE NEGOTIATION ACT (CCNA)
CONTINUING PROFESSIONAL ARCHITECTURAL AND ENGINEERING SERVICES
AND OTHER SERVICES**

CDM SMITH INC.

WORK AUTHORIZATION NO. 01

CITYWIDE GIS ENHANCEMENT - UTILITY INFRASTRUCTURE GIS MAPPING

April 12, 2021

In accordance with Resolution No. 2020-054, the following scope of services is provided by CDM Smith Inc. (CONSULTANT) as requested by the City of Hallandale Beach (CITY).

The CITY intends to conduct GIS Mapping of Utility Infrastructure, Work Authorization (WA) No. 1, herein after referred to as “the Project”.

PROJECT BACKGROUND

The City of Hallandale Beach encompasses approximately 4.5 square miles in southeast Broward County and its Public Works Department serves approximately 40,000 people. The CITY is in the process of enhancing its existing GIS database of the water, wastewater, and stormwater systems so that the infrastructure data is compiled in a single, accessible location for use by the CITY to aid in routine and emergency maintenance procedures and with system information for design purposes. Currently there are many digital record drawings in various locations that the City desires to be catalogued and entered into the GIS in the correct geospatial locations so that these plans can be accessed and viewed rapidly using point and click technology directly on a map both in the office and in the field via a mobile device developed application. This Scope of Work presents the services the CONSULTANT shall provide to the CITY for the inclusion of the digital map information and database population into the CITY’s GIS.

SCOPE OF SERVICES

The following is a detailed description of the CONSULTANT services:

TASK 1 – PROJECT KICKOFF WORKSHOP, WORK PLAN DEVELOPMENT, AND PROJECT MANAGEMENT

Within two weeks after the project start the CONSULTANT will prepare for and facilitate a half day project kickoff workshop with CITY stakeholders. The objective of this meeting is to confirm the project objectives, review the scope of the work and the schedule, establish the lines of communication for data sharing, review lists of available data and reports, perform a physical inspection of the CITY’s current GIS, system data, plans repository, data systems, and clarify project

requirements. The CONSULTANT will prepare meeting information including the workshop agenda and materials/handouts and provide a workshop summary memo upon completion.

Note: At the time of developing the proposal for this project, workshops are anticipated to be held face to face under social distancing guidelines and other CITY- or CONSULTANT-mandated precautions, as allowable under CITY rules and CONSULTANT's Health and Safety policy in effect at the time of the actual meetings. Virtual options for the meetings and attendees will be made available.

TASK 2 – REVIEW OF EXISTING GIS, DATA, AND FRAMEWORK

Subtask 2.1 – Review of Data Sources

The CONSULTANT will obtain and assess the types, format, quality, and quantity of utilities system data available from the CITY. The CONSULTANT shall also assess publicly available data, aerial imagery, pictometry, and “street-view” imagery that could be utilized to assist in developing the GIS plans mapping.

Subtask 2.2 – Database Design Review

The CONSULTANT will review the current geodatabase design and system architecture that will provide the foundation for CITY's GIS mapping environment and will consider requirements for compatibility with linked data plans repositories and field viewing and observations.

TASK 3 - GIS MAPPING OF SCANNED DIGITAL PLANS

Subtask 3.1 – Geolocation and Mapping of Digital Plan Sets

The CONSULTANT will import and geographically reference scanned plans provided by the CITY into the GIS database. Up to 1,550 sheets contained within standard scanned record drawing electronic plan sets will be mapped. Points will be georeferenced by matching points between the base data and the plans, and the plan area limit of each plan sheet will be entered into a polygon layer within the GIS database. Each plan area limit polygon will be attributed with plan name, plan date, and plan type, as applicable and related to an intersection or fixed points. This process will result in a polygon layer of plan area limits and the layer will be linked to scanned images of each plan to allow the CITY to access historical plans via the GIS environment.

The mapping process involves:

- Plans logging
- Cataloging and notation of the plan sets
- Review of the plans to locate and determine the applicable plan sheets with features applicable to the geodatabase
- Conversion of the scanned pdf files into image files (jpg/tif)
- Creation of the spatial reference of the sheet limits within the GIS
- Placement of control points on the map
- Performing non-distortional georeferencing of the sheets into the map
- Creation of the bounding polygons for each referenced sheet
- Attachment of the image files to each polygon
- Entering the sheet attributes into the database
- Linking of the plan set filename and directory archive within the attributes of the data for one click access to the plans.

The deliverable will be a Esri geodatabase format .gdb file containing the mapped plan sets and their associated attribute data - location, file name, utility type, plan name, plan type, year, street, and datum. Population of the data contained within the mapped sheets into the GIS is not included as part of this subtask.

TASK 4 – DATA LOCATION REVIEW AND ATTRIBUTE UPDATE FOR WASTEWATER SYSTEM

Subtask 4.1 – Data Location Review and Attribute Update

The CONSULTANT will update and populate the existing GIS data fields where applicable from record data in the mapped plan sheets performed under Task 3 for up to 96 miles of sanitary sewer and force main. CONSULTANT will transcribe utility features and attribute information from the plans to populate the existing GIS database fields with new or missing information. Feature locations not visible on base maps will be placed or updated based on available information. As each structure point is placed, available information for existing GIS fields provided on the source documents will be entered into the geodatabase. Conveyance structures will be snapped to associated structure points, digitized in the direction of flow if discernable, and be coded with pipe size and other information noted on plans. Attribute information not available on source documents will be coded as “null” in the GIS database. Areas of conflicting information will be noted for required field survey by others. Completion of a quality review process in which a combination of automated tools (developed using Esri’s “data reviewer” and “map automation” technology) and manual checks will be used to review data developed. Datum and elevations will be adjusted to NAVD88.

TASK 5 – OPTIONAL SERVICES

The CONSULTANT will update the existing GIS data where applicable from record data in the mapped plan sheets in Task 3 for other utilities as authorized. CONSULTANT will transcribe utility features and attribute information from the plans to populate the existing GIS database with new or missing information. Feature locations not visible on base maps will be placed based on available information. As each structure point is placed, available information for existing GIS fields provided on the source documents will be entered into the geodatabase. Conveyance structures will be snapped to associated structure points, digitized in the direction of flow if discernable, and be coded with pipe size and other information noted on plans. Attribute information not available on source documents will be coded as “null” in the GIS database. Areas of conflicting information will be noted for required field survey by others. Completion of a quality review process in which a combination of automated tools (developed using Esri’s “data reviewer” and “map automation” technology) and manual checks will be used to review data developed. Datum and elevations will be adjusted to NAVD88. The scope, fee, and schedule for each task will be developed individually for each assignment on a task by task basis.

DATA OR ASSISTANCE TO BE PROVIDED BY THE COUNTY

- Provide requested data gathering of existing system information as necessary.
- Attend meetings and assist with meeting coordination as requested.
- Timely review of deliverables.

TIME OF PERFORMANCE

CONSULTANT will begin providing the services as outlined in the above tasks within two weeks of receipt of an executed contract and a written notice to proceed with purchase order from the CITY.

Tasks 1-4 of the project is estimated to have an 18-month duration as shown in Table 1. The CONSULTANT will prepare a more detailed baseline schedule within 30 calendar days after notice to proceed and refined after the kickoff meeting or other project milestones.

The time of performance for each task assigned under the Optional Services Task 4 will depend on the work assigned and will be provided separately with each authorization.

Project management activities will be performed and consist of those general functions required to maintain the project on schedule, within budget, and that the quality of the work products defined within this authorization are consistent with CONSULTANT's standards and CITY's requirements. CONSULTANT's project manager (PM) will be the main point of contact for this project.

CONSULTANT will prepare a monthly invoice for the work performed with an accompanying written progress report submitted to the CITY's representative. These reports will include updated project schedule, a 4-week look-ahead summary, the project budget summary, and a summary of completed activities and work remaining. The CONSULTANT will maintain a Quality Management System (QMS) on this project. An internal project planning and scope review session will be conducted at the start of the project. This action is required by the CONSULTANT's QMS guidelines. Ongoing project quality management and team coordination among CITY, CONSULTANT, and Subconsultants will be provided throughout project duration.

Table 1 Estimated Time of Performance

Task	Major Activity/Deliverable	Days From Project Start	Project Month	Anticipated Duration
1	Project Kickoff Workshop and Work Plan Development	14	1	1 week
2	Review Existing GIS, Data, and Framework	30	2	1 month
3	GIS Mapping of Digital Plans	45	3	7 months
4	Data Location Review and Attribute Update for San S and FM	120	4	8 months
5	Optional Services	As Assigned	As Assigned	TBD

COMPENSATION AND PAYMENT

For the services performed under Tasks 1 through 4 of this Scope of Services, CITY agrees to pay a Lump Sum fee of \$162,270 for labor and reimbursables. The labor breakdown for Task 1-4 is provided in Table 2. CONSULTANT will submit monthly invoices for partial payments to be made in

proportion to the estimated percentage of work completed for Tasks 1 through 4. **Table 3** provides the value by task for invoicing purposes.

Optional Services will be compensated as negotiated on a task-by-task basis from the allocated Upper Limit Task 5, on a Lump Sum basis as authorized.

Table 3- Task Budgets for Invoice Purposes Only

Task No.	Description	Value
	BASIC SERVICES	
1.0	Project Kickoff Workshop and Work Plan Development	\$10,090
2.0	Review Existing GIS, Data, and Framework	\$8,910
3.0	GIS Mapping of Digital Plans	\$57,780
4.0	Data Location Review and Attribute Update San S and FM	\$83,390
	Reimbursables	\$2,000
	Total (Tasks 1-4) Lump Sum	\$162,270
5.0	OPTIONAL SERVICES (Upper Limit)	
5.1	GIS Database Population of Other Utility Mapped Plan Sets - Data Location and Attribute Update	\$206,000
	TOTAL WORK AUTHORIZATION No.1 (Upper Limit)	\$368,270

TABLE 2

**CITY OF HALLANDALE BEACH
CITYWIDE GIS ENHANCEMENT - UTILITY INFRASTRUCTURE GIS MAPPING
FEE ESTIMATE**

Tasks	Associate, Engineering	Director, Engineering	Project Manager	Project Engineer	Engineer	Jr. Engineer	Senior Tech Manager	CADD Technician	Administrator	Total Hours	Total Labor Fee
<i>Contract Billing Rate</i>	\$275	\$250	\$240	\$160	\$140	\$120	\$160	\$120	\$100		
Task 1 - Project Kickoff Workshop and Work Plan Development	2	0	32	0	0	0	8	4	2	48	\$ 10,190.00
Task 2 - Review Existing GIS, Data, and Framework	2	0	24	0	0	0	12	4	2	44	\$ 8,910.00
Task 3 - GIS Mapping of Digital Plans and QA QC	4	0	16	0	0	0	44	380	2	446	\$ 57,780.00
Task 4 - Data Location Review and Attribute Update San S and FM	2	8	36	0	0	0	60	520	2	628	\$ 83,390.00
<i>Total Hours</i>	10	8	108	0	0	0	124	908	8	1166	
<i>Total Fee</i>	\$2,750	\$2,000	\$25,920	\$0	\$0	\$0	\$19,840	\$108,960	\$800		\$ 160,270.00

CDM Smith Labor	\$160,270.00
Subconsultant Labor	\$0.00
Reimbursables	\$2,000.00
Total Lump Sum Fee	\$162,270.00