

TASK ORDER No. 3 - DESIGN SERVICES – PHASE I
DENNIS STREET STORMWATER IMPROVEMENTS
PUMP STATION AND DRAINAGE WELL
CITY OF KEY WEST

BACKGROUND

The City of Key West (CITY) has decided to improve their existing storm water system by constructing a new pump station, stormwater drainage well and associated supporting infrastructure. Currently, the stormwater system consists of approximately 63 permitted outfalls and associated stormwater collection systems, 54 vertical exfiltration drains, 5 pressurized wells, approximately 121 storm water gravity recharge wells, and associated collection and treatment systems.

The stormwater improvements are required in sub-basin 3340 near the Key West High School, which currently has consistent standing water issues. There is an existing gravity well at Dennis Street that is too low to be effective. This new project will achieve the goal of lifting water to a new pressurized drainage well in order to reduce the duration of standing water in the area surrounding the High School.

INTRODUCTION

Black & Veatch (CONSULTANT) has been requested by the CITY to provide detailed design services for the new stormwater pump station and drainage well including a diversion structure and vortex separator upstream of the pump station and backup power for the pumping units. It is anticipated that the new pump station will be located mid-block on Dennis Street between Venetia Street and Blanche Street, but this will be further defined during the conceptual design. The diesel generator will be elevated for flood protection purposes. During the initial design stage, coordination will be required with the High School and nearby properties to determine the feasible location for the generator. The capacity of the drainage system (pump station peak flow) will be determined with the results in the existing storm water model to be provided by the CITY. CONSULTANT will be using the conceptual sizing developed in the model to finalize the design. The stormwater drainage well will be of the standard size used in the existing system, which includes a 24" casing and a depth of 120 feet.

SCOPE OF SERVICES

TASK SERIES 100 - PRELIMINARY INVESTIGATION AND CONCEPTUAL DESIGN REPORT

Task 101 - Stormwater System Design Criteria and Site Selection Memorandum

A. Evaluation of Existing Data. CONSULTANT will evaluate the existing data through:

- (1) Site visit and kick off meeting with CITY staff.

- (2) Reviewing existing stormwater master plan and other pertinent information from the CITY's files. A data request will be prepared and submitted to the CITY to obtain existing data.
 - (3) Reviewing stormwater records to determine history of flows regarding volume and characteristics. Review of hydrogeologic data to include nearby existing wells testing results and geologic information.
- B. Design Criteria. CONSULTANT will establish the stormwater system design criteria in a letter memorandum including the following components:
- (1) Diversion structure
 - (2) Vortex separator
 - (3) Bar screen
 - (4) Pump station - Identify type, number, capacity, speed ranges, drive types, horsepower, and type of control for the pumps.
 - (5) Backup generator
 - (6) Drainage well
- C. Site Selection. CONSULTANT will investigate suitability of the location of the improvements. The investigation will include:
- (1) A review of available topographic, property, and utility maps within the existing area to identify the most feasible location.
 - (2) Obtaining and reviewing available topographic, property, and utility maps and subsurface records for the site.
 - (3) Reviewing existing geologic information, subsurface records and geotechnical investigation reports for the possible construction area.
- CONSULTANT will prepare a memorandum summarizing all the findings and evaluation results (A through C above) and submit two (2) hard copies and one (1) electronic copy to the CITY for review. CONSULTANT will conduct a project review workshop with the CITY to review the memorandum.
- D. Based on the discussions during the workshop, CONSULTANT will incorporate comments from the CITY as necessary into the next design submittal (Basis of Design Memorandum).

Task Series 100 Deliverables

The following deliverables are included in Task Series 100:

- Workshop meeting minutes.
- Stormwater System Design Criteria and Site Selection Memorandum

TASK SERIES 200 – DESIGN SERVICES

Task 201 – Project Coordination

Project coordination will encompass efforts required for project set-up, resource management, scheduling, invoicing, trend management, and other requirements needed to effectively and efficiently complete the tasks described in this scope of services.

Task 202 - Preliminary Design – Basis of Design

A. CONSULTANT will commence this phase only after the CITY has accepted the Conceptual Design memorandum and all design criteria developed under TASK 100. As part of TASK 200, CONSULTANT will complete the following design criteria deliverables:

- (1) Basis of Design Memorandum
- (2) Layouts of piping and major equipment.
- (3) Power distribution functional diagram
- (4) Site plan
- (5) Internal quality control review and refinement before submitting to the CITY
- (6) Quality assurance and quality control plan update.
- (7) Project schedule update
- (8) Project trend register update.

B. The basis of design memorandum is the most important deliverable from this phase. It is the means to communicate scope, objectives, and details of the project to the CITY, regulatory agencies, and the design team. Information in the basis of design memorandum includes:

- (1) Summary report with engineering design parameters.
- (2) Site plan drawings.
- (3) Preliminary structural and mechanical drawings.
- (4) Specification list.

- C. CONSULTANT will submit two (2) hard copies and one (1) electronic copy of the preliminary drawings and final Basis of Design Memorandum to the CITY for review.
- D. CONSULTANT will conduct a project review workshop with the CITY to review the preliminary drawings and final Basis of Design Memorandum. Based on discussions during the workshop, CONSULTANT will refine the drawings by incorporating the applicable comments into the next design submittal (Level 2).

Task Series 200 Deliverables

The following deliverables are included in Task Series 200:

- Basis of Design Memorandum (including preliminary drawings and specification list).
- BODM workshop meeting minutes.

TASK SERIES 300 - SURVEYING SERVICES

Task 301 – Project Survey

- A. The proposed area(s) to be surveyed is bounded by Venetia Street, Dennis Street, and Key West High School as shown in Attachment A. CONSULTANT will engage Avirom & Associates Inc. (SURVEY SUB-CONSULTANT) to execute the project survey outlined below.
- B. SURVEY SUB-CONSULTANT shall prepare a separate set of survey drawings for each location to be surveyed. CONSULTANT shall perform the tasks and furnish the information described below within the Area of Survey for the Project:
 - (1) Establish horizontal and vertical controls and ties as required to properly establish and verify the existing section lines, property lines, platted lot lines, easements, rights-of-way, topographic data, and elevations.
 - (2) Research and identify all visible utilities, including utility types, sizes, materials, locations, direction, and elevations from utility records, visible observations, utility field locations, and other information available, particularly the utilities that are visible and that are accessible from manholes (sanitary and storm sewer lines, culverts, electrical lines and ducts, etc.). Provide record of all utility contacts, including company name, person contacted, address, telephone number, date, and a copy of all information obtained or recorded. Utility research and documentation shall meet or exceed ASCE 38.02 Quality Level C.
 - (3) Conduct topographic survey and identify, including type of materials where applicable, all visible improvements, natural and artificial site topography, contours, utilities, drainage courses, rock outcroppings, banks or slope lines, highways, streets, curb and gutters, signs, traffic control signs, fencing, gates, culverts, driveways, landscaping, structures, ponds, septic fields, and railroads on drawings. Locate and identify the type

and size of all trees in landscaped, developed, and generally clear areas, and all trees 12 inches in diameter and larger in wooded areas.

- (4) Research and identify the 100-year flood elevation within and immediately adjacent to the Area of Survey for the Project.
- (5) Conduct research at CITY and county offices for local survey control and street centerline information.

C. General Information for Surveying Services. Provide all labor, materials, equipment, transportation, and appurtenant work for performing the surveying services.

- (1) The existing section lines, property lines, platted lot lines, easements, and rights-of-way; baseline survey; horizontal and vertical controls and ties; contours; utility information; topographic information; labeling and legends; any supplemental information; and date of survey shall be provided as a strip map on electronic drawing files and plotted on bond ANSI D (22"x34") and submitted to the CITY. All drawing file updates or changes shall be submitted on a separate layer to easily identify the changes from the previous submittal. Vertical ground profiles are also to be provided in tabular form with a hard copy. The electronic strip map shall be one continuous file without borders and grid. All notes and callouts shall be positioned on the drawing files so that they are read from the same orientation and so as not to be superimposed on any other notes or critical features. The plots and drawing files shall be oriented so that north is toward the top, right or left of the sheet as appropriate for the increasing station plotted left to right on the strip base map.
- (2) CAD requirements for preparation of the base map in AutoCAD shall comply with the drafting standards and requirements provided by the CITY.
- (3) The horizontal and vertical controls and ties shall be located on the drawing files at their respective locations. Elevations shall be based upon NAVD 88.
- (4) Surveys and legal easement descriptions shall be performed by and the plots and electronic drawing files prepared under the direction of a professional land surveyor registered in the State of Florida.
- (5) Obtain required permits, insurance and pay all fees, including flagmen fees, for working within highway, street, and railroad rights-of-way. CONSULTANT shall perform all work in conformity with the requirements of the authority owning, or having jurisdiction over and control of, the right-of-way in each case.
- (6) Attend a project initiation meeting with the CITY prior to performing Services to discuss, review and clarify coordination of work, schedule, understanding of Scope of Services, and deliverables.

Task 302 – Easements and Property Owner Information.

- A. Provide a list of the parcel identification numbers and property owner names and addresses for the tracts affected by the proposed project. Add the property owner names and site address to the survey base map.
- (1) Prepare initial title report, including encumbrances, for the property information on the survey map and easement documents, and an updated title report shall be obtained to determine if any changes from the initial report prior to the CITY recording and acquiring the easements. A copy of the reports shall be provided for the CITY's use.
 - (2) Prepare legal temporary and permanent easement descriptions on each parcel or property on which easements are required for use in acquiring the easements. The legal description of each easement shall include a figure identifying and dimensioning the easement to correspond with the written descriptions, and include the area in square feet and acres for each easement.

Task Series 300 Schedule

Time is an essential condition of the Agreement. The CONSULTANT's work will consist of two components. The first component relates to the initial survey work and includes the scope listed above in Task 301. This work shall be completed and submitted to the CITY within three weeks of Notice to Proceed. The second component shall consist of the preparation of easement descriptions for temporary and permanent easements at the pump station and well site(s). The scope for this second component described in Task 302 above shall be completed and submitted within eight weeks of Notice to Proceed.

Task Series 300 Deliverables

The following deliverables are included in Task Series 300:

- Signed and sealed reproducible AutoCAD drawing(s) of survey no larger than ANSI D (22"x34") on bond.
- Electronic drawing files in AutoCAD ".DWG" file format. See the attached "Standards for Preparation of Electronic AutoCAD Drawings" for electronic file information.
- ASCII text files of site survey data. Points shall be comma delimited and shall include point number, northing, easting, and description code. Consultant shall provide a list of all point codes used and a full description.
- Copy of survey field book, including detailed hand sketches, describing the area of survey and information collected.
- Title reports, including encumbrances, on each parcel or property on which easements are required.

- Signed and sealed legal easement descriptions, including figures, on each parcel or property on which easements are required.

TASK SERIES 400 - GEOTECHNICAL SERVICES

- A. CONSULTANT will provide geotechnical engineering services including exploratory work and laboratory and field testing based on preliminary drawings and designs, and including professional interpretations of exploratory and test data. Exploratory work, field testing and laboratory testing services shall be provided through a subcontract with GEOSOL, Inc. to this agreement. Initial services will include:
- (1) Initial geotechnical exploratory work, such as soil borings, penetration tests, soundings, laboratory tests of soils and rock samples that are required to provide information for design, and other field and laboratory tests and analyses that are required to provide design information.
 - a) One (1) boring at the location of the new pump station will be drilled.
 - (2) An initial geotechnical report by Engineer interpreting the data collected from the exploratory work and testing and making assessments of the site conditions that can be anticipated from this initial exploratory work. Two (2) hard copies of the report will be provided to the CITY.
- B. CONSULTANT will provide a final geotechnical report evaluating the initial geotechnical investigation, field and laboratory test results, and the initial geotechnical report once the design has progressed to a level that such an evaluation is possible. The final evaluation shall be based on the actual design, including sizes, locations, and loadings of structures; types, and extent of excavations; and shall consider both design parameters and constructability. If, in the opinion of the reviewing professional or Engineer, additional geotechnical data are required for the preparation of the final report, these data shall be provided under an amendment to the Agreement and the subcontract. The final report shall indicate the anticipated performance of the subsurface material to be encountered on the project both during and after construction, under the loading conditions, use, and types of excavations anticipated. Two (2) hard copies of the report will be provided to the CITY.

Task Series 400 Deliverables

The following deliverables are included in Task Series 400:

- Initial geotechnical report interpreting the data collected from the exploratory work and testing and making assessments of the site conditions that can be anticipated from this initial exploratory work.
- Final geotechnical report evaluating the initial geotechnical investigation, field and laboratory test results and the initial geotechnical report.

ASSUMPTIONS

1. It is anticipated that the results from the City of Key West Stormwater Master Plan by CH2M Hill dated April 2012 can be used to determine the capacity of the pump station. Additional modeling efforts will be addressed as supplemental services.
2. It is anticipated that existing hydrogeological data for existing wells in Key West is available to design the new well. If that is not the case, a pilot hole may be necessary.
3. It is understood that the well will be considered a drainage well and it will need to be assisted by a pump with sufficient head pressure to lift the water to the well location and cause positive injection into the ground.
4. Total number of trips for Phase I is three.

BUDGET

Tasks 100 thru 400 as described in this scope of work document would have the following lump sum fees:

TASK SERIES	LUMP SUM FEES
Task 100 – Preliminary Investigation and Conceptual Design Report	\$13,800
Task 200 – Design Services	\$75,527
Task 300 – Surveying Services	\$11,372
Task 400 – Geotechnical Services	\$6,195
Direct Costs	\$7,140
LUMP SUM TOTAL	\$114,034