May 14, 2019

Michael G Jenkins, PH.D., P.E.
Coastal Engineering Principle
Applied Technology & Management, Inc.
2047 Vista Parkway, Suite 201
West Palm Beach, FL 33411

Via email to: mjenkins@appliedtm.com

Subject: **Town of Palm Beach Topographic, Hydrographic, and Aerial Imagery Monitoring Survey**
WGI: 3447.00

Dear Dr. Jenkins,

Wantman Group, Inc. (WGI) is pleased to provide this proposal to Applied Technology & Management, Inc. (CLIENT) for additional survey services. Our scope of services and corresponding fees are detailed below. In addition, it is agreed that WGI's services will be performed pursuant to WGI's Agreement Provisions, associated with the original contract between WGI and CLIENT, executed July 27, 2018.

SCOPE OF SERVICES

Project Understanding

WGI plans to perform 93 onshore/offshore beach profile surveys and obtain aerial imagery of beach shoreline approximately 3000' in width, beginning just north of the Palm Beach Inlet, and continuing south approximately 12 miles to the town southern limit. Profiles will extend from FDEP Range Monuments R-68 to R-135, and include intermediate profiles at the following locations:

- R-73.5, R-74.5, R-76.5, R-77.5, R-110.5, R-111.5, R-112.5, R-113.5, R-114.5, R-115.5, R-116.5, R-117.5, R-118.5, R-119.5, R-120.5, R-121.5
- R-93+601.6, R-94+406.5, R-94+708.7, R-94+1008.4, R-94+1308.0, R-95+316.2, R-95+412.7, R-96+224.7, R-96+429.7

WGI will also perform 3 shore parallel profiles at the following locations:

- 3 shore parallel profiles between R-93 and R-97.

Horizontal and Vertical Control Plan

WGI plans to utilize RTK GPS for both hydrographic and topographic data collection. NGS monuments will be utilized for base station occupations and daily rover checks. Physical FDEP monuments will not be utilized for control. Static data on GPS base stations will be recorded throughout the entire data acquisition time period.

Topographic and Hydrographic Beach Profile Survey — Lump Sum……$60,750.00

WGI will recover and record spot elevations on all monuments that are recovered in good condition and

provide in tabular format to the client. We will provide the collection of hydrographic and topographic beach profile data for each location listed above, and profile lines will extend from the established monuments to the limits of the beach, and it will include all land features encountered along the profile. (ie. seawalls, roads, walls, protected vegetation). Elevations will be taken at a 10' intervals on the landward side.

For the seaward profile lines, each line will extend seaward on the prescribed azimuth for a distance of no less than 3,000 or to a depth of 40', whichever is greatest. Soundings will be obtained at 12.5' ranges along the profile. RTK positioning will be utilized for all horizontal and vertical positioning of all onshore and offshore acquisition along with motion sensing equipment (heave, pitch, and roll compensation).

No data will be collected when the seas are greater than 3' and onshore and offshore data collection will be conducted concurrently to insure uniformity of data. Bathymetric survey equipment calibration including bar checks, latency tests, tide gage checks and velocity measurements will be submitted in a report format for review. All topographic and hydrographic data acquisition and reporting will be in compliance with the FDEP monitoring standards for Beach Erosion Control Projects.

Aerial Imagery

Event 1 Lump Sum……$17,500.00
Event 2 Lump Sum……$17,500.00

WGI will acquire and process aerial imagery of an approximate 8000 acres along the shore of the Town of Palm Beach, spanning approximately 16 miles in length. Acquisition will occur (weather permitting) during the month of August 2019 (Event 1), and again in the Spring 2020 (Event 2). Acquisition will occur as close as possible to low tide to help delineate features under water, and with sun angle between 10-35 degrees to minimize sun reflectance over the project area. Imagery will be orthorectified and stitched into a seamless mosaic as the primary deliverable. WGI will provide a Meta data file with tide and sun angle information during acquisition as part of the deliverable.

- **Conventional Aircraft with photogrammetric mapping camera system**

  WGI will acquire imagery using a medium format aerial mapping camera. Imagery will be suitable for a 3" GSD orthomosaic deliverable. Aerial Triangulation methods will be utilized to geo-reference the imagery. Final delivery will be tiled in Geotiff format, Florida State Plane Coordinate System, East Zone, NAD 1983.

Emergency Before and After Beach Profile Survey's **Daily Rate……$3,800.00/day**

WGI will perform before and/or after Beach Profile Survey's as requested by the client, per the Topographic and Hydrographic Beach Profile Survey scope listed above. The survey areas to be collected and estimates are as follow:

- Mid-Town – R-89 to R-102 (14 profiles) **estimated 3 days - $11,400.00**
- Phipps Park – R-117 to R-127 (11 profiles) **estimated 2 days - $7,600.00**

Submittals

Beach Profile Surveys

- Raw data files including GPS data at the base stations and rovers (data logged to facilitate post-processing and a complete HYPACK project.
- FDEP formatted range line data files.
- ASCII files for each profile range line in FDEP distance depth format.
- ASCII (Hydro) file containing all bathymetric data sorted at a 3 foot interval in XYZ format.
- ASCII (Topo) file containing all topographic data collected in XYZ format.
- ASCII (DTM) containing final merged data of the Hydro, Topo data.
- Completed Metadata
- Copies of all field books
- Survey Quality Control Report including right-of-way entry, control monuments with designation of recovered, destroyed, or fixed, included in the control network, tide gauge location and monument used, dates of field data collection, types of equipment used, quality control checks and digital files.

Aerial Imagery

- Original RGB Imagery
- Tiled Orthomosaic in GeoTiff format of the entire site within project limits.
- Metadata report containing acquisition information, sun angle, and tidal position at the time of acquisition.

Any additional optional services requested by CLIENT will be provided in accordance with WGI's current hourly fee schedule in effect at the time of service, or a fixed fee to be negotiated once a scope of service is defined.

We appreciate the opportunity to be of service to Applied Technology & Management, Inc. Upon acceptance of this proposal, please sign and return an executed copy to this office. Please note that the Agreement Provisions are an integral part of this contract, are hereby incorporated by reference, and are controlling unless both parties expressly waive them in writing prior to commencement of work. By executing this Proposal, CLIENT expressly agrees to be bound by the Agreement Provisions and the enclosed Fee Schedule. Further, and whether this proposal is executed or not, the ordering of, acceptance of, or reliance on services performed by WGI constitutes acceptance of the attached Agreement Provisions.

Respectfully submitted,
WGI

Eric Matthews, PSM
Area Manager

Sam Hall, PSM
Vice President

CLIENT'S CORPORATE ATTESTATION: If signing this Proposal on behalf of a corporate entity, I hereby affirm that such entity is correctly identified above, and is legally valid, active, and duly licensed and authorized to conduct business in the State of Florida. I also affirm that I am duly authorized and have legal capacity to execute this Proposal and bind the corporate entity.

AUTHORIZATION FOR CREDIT CHECK: By signing this Proposal, I hereby authorize WGI to conduct a credit check or obtain a credit report with respect to CLIENT (as identified in this Proposal) for purposes of WGI providing services to CLIENT.

Corporate Representative:

_____
Name (Printed)

This Proposal accepted this ____ day of _____, 2019

By _____
Name (Signature)
Applied Technology & Management, Inc.