

PALM BEACH COUNTY
BOARD of COUNTY COMMISSIONERS
AGENDA ITEM SUMMARY

Meeting Date: December 4, 2012

Consent
 Public Hearing

Regular
 Workshop

Department

Submitted by: Information Systems Services
Submitted for: Information Systems Services

I. EXECUTIVE BRIEF

Motion and Title: Staff recommends motion to:

- A) approve Task Order No. 1 to Contract R2011-2052 with Surdex Corporation to complete the eastern digital orthophotography at a cost of \$156,180; and
- B) approve Task Order No. 1 to Contract R2011-2053 with BAE Systems to complete the western digital orthophotography at a cost of \$105,797; and
- C) approve Supplement No. 1 to Task Order No. 1 with Woolpert, Inc. (R2011-2054) to extend the term to November 21, 2013 at no additional cost; and
- D) receive and file Woolpert, Inc. Task Order No. 1.

Summary: Three firms were selected using the Consultant Competitive Negotiations Act (CCNA) process, contracted on December 20, 2011 to perform digital orthophotography and planimetric mapping for the County (R2011-2052, R2011-2053, and R2011-2054). Task Order No. 1 with Surdex Corporation is to complete .5 foot color digital orthophotography for the eastern areas at a cost of \$156,180, and Task Order No. 1 with BAE Systems is to complete mostly 1 foot color digital orthophotography for the western areas of Palm Beach County at a cost of \$105,797. Supplement No. 1 is to extend the term of Task Order No. 1 with Woolpert Inc. due to weather delays. Woolpert Task Order No. 1, which was under \$100,000 and previously executed is submitted for receive and file purposes. There are no costs associated with Supplement No. 1 with Woolpert. Countywide (PFK)

Background and Justification: In December 2011, contracts were established with three firms: Surdex Corporation; BAE Systems; and Woolpert, Inc., to provide mapping services. Planimetric mapping entails delineating a list of features, such as drainage, building outlines and edge of pavements, from aerial photos to within +/- 0.5 foot accuracy. Digital orthophotography provides aerial photos rectified to match the earth's surface location. All Task Orders in excess of \$100,000 require Board approval.

Attachments:

- 1. Surdex Corporation Task Order No. 1 (2 originals)
- 2. BAE Systems Task Order No. 1 (2 originals)
- 3. Map of project areas
- 4. Woolpert, Inc. Supplement No. 1 (2 originals)
- 5. Woolpert, Inc. Task Order No. 1 (1 original)
- 6. ERM Budget Availability Statement revised 11/2/12

Recommended by: Steve Bordelon 11/14/12
Department Director Date

Approved by: [Signature] 11/13/12
County Administrator Date

II. FISCAL IMPACT ANALYSIS

A. Five Year Summary of Fiscal Impact

Fiscal Years	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>
Capital Expenditures	\$261,977	0	0	0	0
Operating Costs	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
External Revenues	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Program Inc (County)	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
In-Kind Match (County)	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
NET FISCAL IMPACT	<u>\$261,977</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>
 # Additional FTE Positions (Cumulative)	 <u>0</u>	 <u>0</u>	 <u>0</u>	 <u>0</u>	 <u>0</u>

Is Item Included in Current Budget Yes No

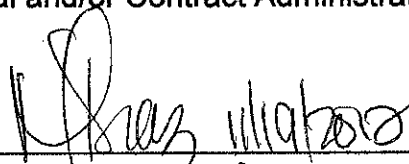

Budget Account Number(s): Fund: 3901 Dept: 491 Unit: M010 Obj: 3401
3652 / 381 / various units

B. Recommended Sources of Funds / Summary of Fiscal Impact

C. Department Fiscal Review: *Robert Paul* 11/15/12

III. REVIEW COMMENTS

A. OFMB Fiscal and/or Contract Administration Comments:

<p> <hr/> OFMB <i>sd 4/14/12</i> <i>al 11/16/12</i> <i>NR 11/14</i></p>	<p> <hr/> Contract Administration <i>11-30-12 B. Wheeler</i></p>
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B. Legal Sufficiency:



 Assistant County Attorney

C. Other Department Review:

 Department Director

TASK ORDER

TASK ORDER # 1

CONSULTANT **Surdex Corporation**

ACCOUNT #

CONTRACT **R2011-2052**

COUNTY PROJECT MANAGER **Kelly Ratchinsky** PHONE **233-5321**

PROJECT NAME **2012-13 Digital Orthophotos – Eastern Palm Beach County**

LOCATION **Palm Beach County East**

TASK DESCRIPTION

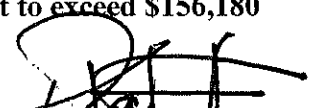
Color Digital Orthophotos .5 foot GSD per attached proposal.

DELIVERABLES +/- **See Attached** DUE DATE **September 30, 2013**

TASK ORDER TYPE **Lump Sum** RETAINAGE **10%**

TOTAL AMOUNT **Not to exceed \$156,180**

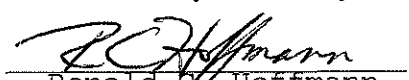
PROJECT MANAGER


Kelly Ratchinsky

DATE

11/13/12

CONSULTANT


Printed Name/Title: **Ronald Hoffmann**
President

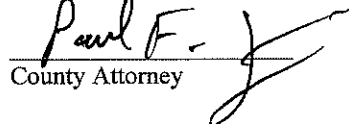
DATE

10/22/12

PALM BEACH COUNTY
BOARD OF COUNTY COMMISSIONERS

Chair

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY


County Attorney

APPROVED AS TO
TERMS AND CONDITIONS


ISS Department Director



Fee Schedule /Standard Project Specifications

Date: September 28, 2012
To: Kelly Ratchinsky
From: Brian Stinson
Project Name & Location: Palm Beach County 2012/13 Aerial Mapping Project Area Quote

Service	Price
■ Acquisition- Intergraph DMC- Project Area: .5'gsd	\$87,825.00
■ Image Processing	\$6,000.00
■ Survey by Prism Surveying Inc. – Delray, FL	\$8,900.00
■ Aerotriangulation	\$8,050.00
■ Ortho Production	\$48,000.00
TOTAL	\$156,180.00

- Project Specifications and Deliverables**
- All deliverables will meet Palm Beach County specifications & requirements.
 - Deliverables will also be formatted to Accommodate the Florida DOR requirements
 - Geotiff & Tfw, Mrsid formats on external hard drive
 - Metadata Tfw files
-
- Final Project Delivery Date: August 31, 2013

Customer is responsible for all applicable taxes – including Sales Tax.

TASK ORDER

TASK ORDER # 1 CONSULTANT BAE Systems

ACCOUNT # CONTRACT R2011-2053

COUNTY PROJECT MANAGER Kelly Ratchinsky PHONE 233-5321

PROJECT NAME 2012-13 Digital Orthophotos – Western Palm Beach County

LOCATION Palm Beach County West

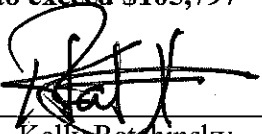
TASK DESCRIPTION

Color Digital Orthophotos 1" = 400' scale and 1" = 100' scale per attached proposal.

DELIVERABLES +/- See Attached DUE DATE September 30, 2013

TASK ORDER TYPE Lump Sum RETAINAGE 10%

TOTAL AMOUNT Not to exceed \$105,797

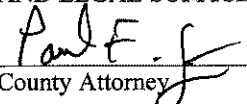
PROJECT MANAGER  DATE 11/13/12
Kelly Ratchinsky

CONSULTANT  DATE 10-25-2012
Printed Name/Title: Didi Rufer, Contracts Manager

PALM BEACH COUNTY
BOARD OF COUNTY COMMISSIONERS

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County Attorney

APPROVED AS TO
TERMS AND CONDITIONS


ISS Department Director

Palm Beach County

Florida

2013 Palm Beach County Orthophoto Project
(Western Half of County)

Scope of Work

September 26, 2012

Provided by BAE SYSTEMS

BAE SYSTEMS

September 26, 2012

Mr. Kelly Ratchinsky
Countywide GIS Coordinator
Palm Beach County
301 N. Olive Avenue, 8th Floor
West Palm Beach, FL 33401

Reference: 2013 Palm Beach County Orthophoto Project (Western Half of County)

Dear Mr. Ratchinsky,

BAE SYSTEMS is pleased to submit this proposal for providing Color Digital Orthophotography for the western half of Palm Beach County. This proposal is based on the mapping boundary sent by the County via e-mail.

All of the products and services described below will be completed under the direct supervision of our Florida PSM, certified photogrammetrists, GIS professionals and other geospatial professionals and will meet or exceed the standards and specifications for Palm Beach County.

SCOPE OF SERVICES

Project Management

Ms. Debra Taylor will be your overall project manager for this project. She will be BAE SYSTEMS primary point of contact and will have overall management responsibility. Ms. Taylor will produce and distribute all status reports and should be used as the central point for communication. Ms. Taylor will prepare Palm Beach County Contract Management a written report to track the status of production and to note milestones and/or issues that require resolution. BAE SYSTEMS will also prepare and submit monthly invoices based on percent complete.

Aerial Photography

BAE SYSTEMS will acquire new color aerial photography for this project only on days when conditions are considered optimal for collection of aerial photography. Flight will be done using digital cameras incorporating ABGPS receivers and an IMU as integrated components of the system. Other factors during aerial photography acquisition include:

- Photography parameters include 60% forward overlap and 30% sidelap; crab shall not exceed 5%; climatic conditions will be free of clouds and haze
- Aerial Photography will be acquired when the sun angle is at least 30% to minimize shadowing effects.
- Extend all photography two full exposures, beyond the project limits.

This new digital imagery will consist of (17) flight lines and (358) exposures for the .5' imagery and (19) lines and (1276) exposures for the 1' imagery.

Survey Control

BAE SYSTEMS will receive and utilize the existing geodetic control network that is already in place for the County and we understand that this control network will be suitable enough to meet the project specifications and accuracies. We also understand that all control is referenced horizontally to the Florida State Plane Coordinate System (East Zone) in NAD83/90, vertically to the NGVD29 datum, and was performed by a Florida Registered Professional Land Surveyor.

Analytical Triangulation

We will perform Softcopy analytical triangulation to extend and densify the ground control survey points, and establish orientation parameters for each image. Softcopy analytical triangulation is an entirely digital process. Our softcopy workstations support sub-pixel accuracy and will be utilized for both compilation and orientation measurement. The results will be checked to make certain that they conform to National Map Accuracy Standards with respect to scale and RMSE.

DEM

BAE SYSTEMS will receive and utilize the existing DEM that is already in place for the County. The DEM data is believed to be suitable to meet the required project specifications and accuracies. BAE Systems will provide DEM repair/updates as necessary.

Digital Orthophotography

Digital orthorectification will include a spatial and radiometric transformation from line / sample space into the specified ground coordinate system. Inputs into the orthorectification process are the digital image, the interior and exterior orientation parameters for each image, corrections for lens distortion, earth curvature & atmospheric refraction, camera calibration information, and the Digital Elevation Model (DEM). In the process, each pixel in the scanned image is geometrically transformed from a line/sample value to a geographic location. The interior and exterior orientation parameters are used to project each pixel into the ground coordinate system, while the DEM is used to correct for relief displacement.

Color and tone will be defined during the Pilot phase of this project. The final output will be at a 1" = 400' scale for the 1' pixel resolution and a 1" = 100' for the .5' pixel resolution.

Once the images are ortho-rectified, they are checked for geometric accuracy, image quality, and tone balancing.

The final 1' & .5' pixel color digital orthophotography will be a seamless database of imagery delivered in tile format to Palm Beach County. Achieving this goal requires that the tone of the imagery be matched for consistency, and that the individual overlapping orthophotos be mosaicked together. Imagery along adjacent tile edges will not be displaced by more than one pixel.

Project Accuracies

All photogrammetric mapping products are to meet National Map Accuracy Standards (NMAS).

The United States Army Corps of Engineers' interpretation is as follows:

"For NMAS orthophotos, 90 percent of all photographic details on the orthophotography shall be accurate to within at least 1/30 in. of true position, as determined by test surveys, and none of the photographic details shall be displaced by more than 1/15 in. from true coordinate position. Since

the orthophoto process rectifies images at the ground elevation of a DTM scan, accuracy standards must exclude objects above and below the scan elevation, such as tops of buildings, poles, trees, and other like objects.”

Therefore, for this project, 1/30 of an inch at publication scale equates to +/-13.33' for the 1"=400' maps and +/-3.33' for the 1" = 100' maps.

Quality Control

BAE SYSTEMS sought and achieved certification by the International Standards Organization (ISO) in 1998. ISO standards are a series of internationally recognized Quality System requirements that encompass all areas of corporate organization. BAE SYSTEMS Quality Program is an extensive set of processes and tested procedures that ensure our clients receive the highest quality products and services. The following statements summarize our Program:

- BAE SYSTEMS is committed to providing products and services that will meet or exceed the expectations of our customers.
- BAE SYSTEMS will achieve the goals of our Quality Program through our total and continuous dedication to world-class quality in all stages and phases of our production cycle, from beginning to end.
- BAE SYSTEMS will implement our Quality Program via thorough training of our employees to ensure that they understand our external and internal customers, as well as project requirements and deadlines, and can apply the proper procedures needed to meet those requirements on time and without error, each and every time.
- Providing quality products and services is the responsibility of everyone at BAE SYSTEMS.

Delivery Items

- Finalize the flight line layout maps and submit to the County for approval
- 1 set of raw digital photography images
- Prepare and submit the final flight line map in ArcInfo format
- All tiles will be delivered in World TIFF (for the 1" = 400' 1' pixel) and World geoTIFF (for the 1" = 100' .5' pixel) format and delivered on external hard drive.
- Provide MrSID files based on the County's existing layout at a 30x compression on external hard drive.
- Provide additional MrSID files based on the County's existing 8 tile layout at a 30x compression, tiles will be provided by the County (for the 1" = 100' .5' pixel)
- Metadata incorporated into each TIFF World file as per PBC Specification. An example .tfw will be provided.
- Submit imagery to FDOT per FDOT specifications as outlined in the following document: <ftp://sdrftp03.dor.state.fl.us/Map%20Data/00%20Mapping%20Data%20Information/AerialPhotographyContract.pdf>

Charles Russell, CFE
Property Tax Oversight
Room 2-3200
2450 Shumard Oak Blvd.
Tallahassee, Florida 32399-0126
Tel: (850) 617-8867
Fax: (850) 617-6113
russellic@dor.state.fl.us

We understand that the County will provide the tile layout with tile names in an ArcInfo format (.shp).



Project Schedule

Based on the timing of the Task Order approval, BAE Systems will work with Palm Beach County to develop a mutually agreeable project delivery schedule.

Total Project Costs

New Digital Photography	\$ 43,550
Project Management	\$ 10,617
Analytical Triangulation	\$ 19,384
Digital Orthophotography	\$ <u>32,246</u>
TOTAL	\$ 105,797

Payment Terms

We will utilize the payment terms that are already in place as per our existing open end contract with Palm Beach County.

Insurance Coverage

During the terms of any contract which might result from this proposal, BAE SYSTEMS will have in place the following types of insurance coverage: a) professional liability; b) statutory workman's compensation; c) valuable papers insurance; d) public liability protection; e) automobile insurance. BAE SYSTEMS liability of any future claims relating to the services performed as part of this contract will be strictly limited to the total dollar value of the services specified within this proposal.

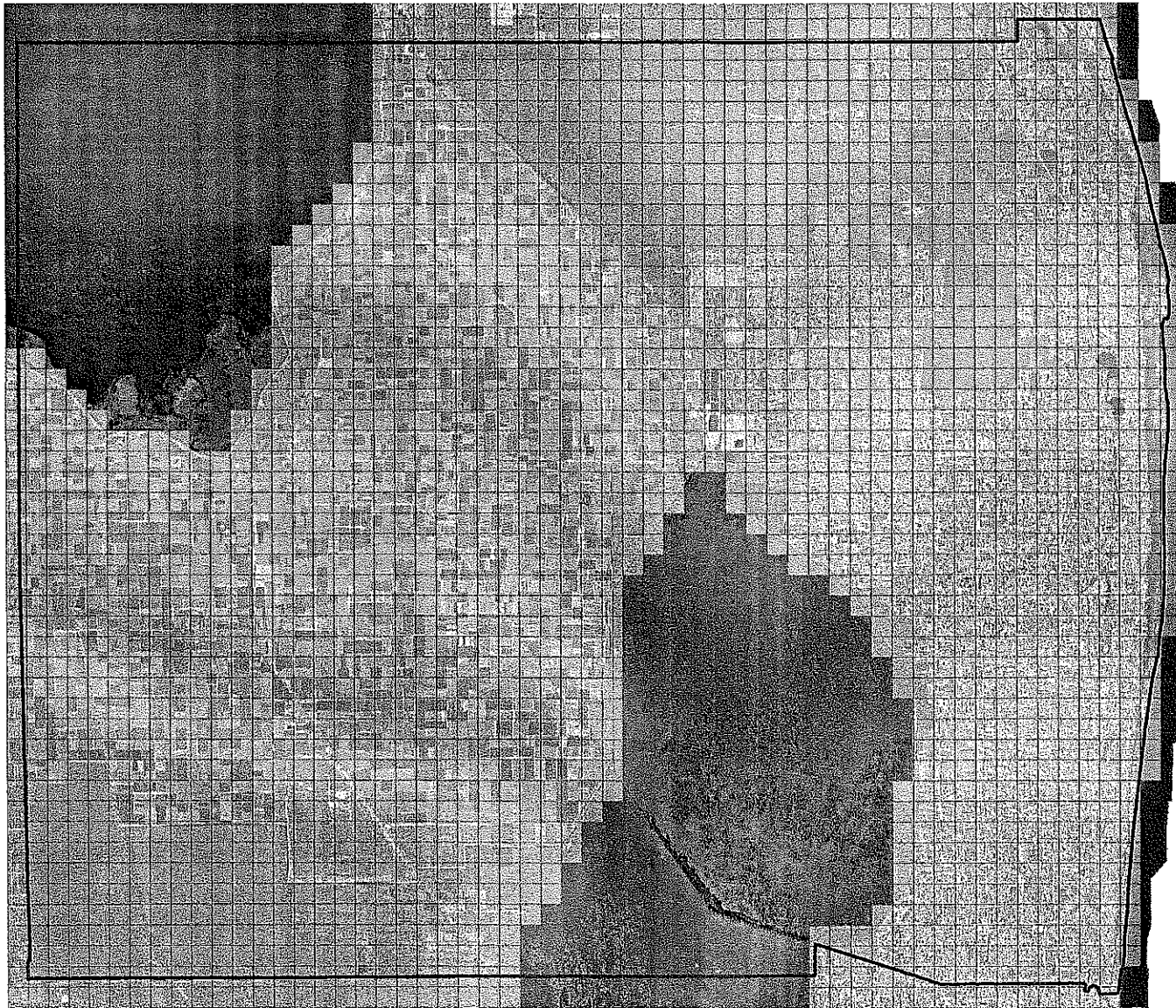
Thank you for the opportunity to submit this proposal. We look forward to working with you on this very important project. If you have any questions or comments concerning this proposal, please contact Andy Pickford at (856) 793-4316 (office), (215) 499-0983 (cell), or andrew.pickford@baesystems.com

Very Truly Yours,

BAE SYSTEMS

Andrew F. Pickford, CP, GISP
Regional Manager




2012/13 Aerial Mapping Project



Legend

Aerial Mapping Project Areas

Aerial Mapping

-  0.5 Foot, BAE
-  0.5 Foot, Surdex
-  1 Foot, BAE

SUPPLEMENT NO. 1 TO TASK ORDER NO. 1

SUPPLEMENT # 1

CONSULTANT Woolpert, Inc.

ACCOUNT # See BAS from ERM dated 5/2/12 CONTRACT R2011-2054

COUNTY PROJECT MANAGER Kelly Ratchinsky PHONE 233-5321

PROJECT NAME 2012 Countywide Coastal Aerial Photography

LOCATION Palm Beach County Coasts and Inlets

SUPPLEMENT DESCRIPTION

Extend Task Order No. 1 due date.

ORIGINAL DATE November 21, 2012 REVISED DUE DATE November 21, 2013

TASK ORDER TYPE Lump Sum RETAINAGE 10%

TOTAL AMOUNT Not to exceed \$77,733 to be funded by ERM

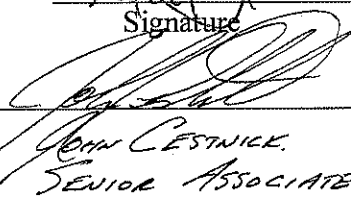
PROJECT MANAGER



Signature

DATE 11/15/12

CONSULTANT



Printed Name/Title:

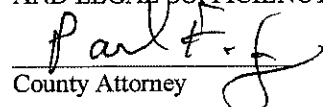
JOHN CESTNICK
SENIOR ASSOCIATE

DATE 2012-11-13

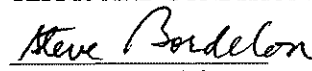
PALM BEACH COUNTY
BOARD OF COUNTY COMMISSIONERS

, Chair

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY


County Attorney

APPROVED AS TO
TERMS AND CONDITIONS


ISS Department Director

TASK ORDER

TASK ORDER # 1

CONSULTANT Woolpert, Inc.

ACCOUNT # See BAS from ERM dated 5/2/12 CONTRACT R2011-2054

COUNTY PROJECT MANAGER Kelly Ratchinsky PHONE 355-3958

PROJECT NAME 2012 Countywide Coastal Aerial Photography

LOCATION Palm Beach County Coasts and Inlets

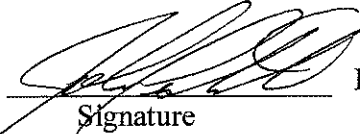
TASK DESCRIPTION

Color Digital Orthophotos 1"= 600' scale, 0.33 foot resolution per attached proposal.

DELIVERABLES +/- See Attached DUE DATE November 21, 2012

TASK ORDER TYPE Lump Sum RETAINAGE 10%

TOTAL AMOUNT Not to exceed \$77,733 to be funded by ERM

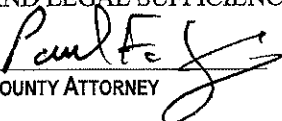
PROJECT MANAGER  DATE 2012-5-21
Signature

CONSULTANT JOHN CESTNICK DATE 2012-5-21
Printed Name/Title: SENIOR ASSOCIATE
WOOLPERT INC.

PALM BEACH COUNTY
BOARD OF COUNTY COMMISSIONERS


Steve Bordelon, Director of ISS

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY


COUNTY ATTORNEY



March 14, 2012

Kelly Ratchinsky
Countywide GIS Coordinator
Palm Beach County
Vista Center
2300 N. Jog Road, 4th Floor Office 4W-50
West Palm Beach, FL 33411-2743

RE: 2012 Coastal Orthophoto Estimate

Dear Kelly:

Thank you very much for the opportunity to once again propose on the coastal orthophoto development. The 2012 Technical Specifications were followed to develop our fee estimate, as well as the understanding that Palm Beach County wants to receive virtually the same service and deliverables as Woolpert provided in 2011. Some items to note with our work plan are as follows:

- 1) As in 2011, Woolpert proposes to acquire the RGB aerial imagery using a digital sensor - a Leica ADS80. This is a push-broom sensor, so it does not collect individual frames of imagery, but rather, collects imagery in continuous strips the length of the flight lines. Where the 2012 Technical Specifications define acquisition and delivery parameters in terms of a film or a frame camera, we'll fly and deliver as those criteria apply to the ADS80 sensor. More specifically:
 - a) Raw ground pixel resolution is specified to be 0.33 feet as captured with film at 1"=600' scale (3,600 feet above ground level). We are proposing the same option that was contracted in 2011, and that was to use Woolpert's ADS80 sensor and collect at the specified 0.33 feet raw ground pixel resolution (flown at 3,165 feet above ground level). **This option will result in imagery that meets the final 0.5-foot ground resolution and will meet 1"=100' NMAS horizontal accuracy.**
 - b) Specifications relating to 80% forward overlap don't apply because the push-broom sensor collects continuously. All orthophoto imagery is collected at nadir.
 - c) Raw digital orthorectified imagery will be provided in images strips as collected. We will break the strips down into multiple segments so the file sizes are no larger than approximately 1GB.

2012 Coastal Orthophoto Estimate
March 14, 2012
Page 2

- d) For the Photo Mosaic Index, we will provide MrSID format mosaics of the image strips as collected. We may wish to either increase the level of compression (1:100, for example) or break the area into multiple MrSID mosaics to keep file sizes manageable.
- e) As provided in 2011, Woolpert will include the Statistical Validation Report identified within the deliverables, within our Aerial Triangulation Report.

A couple more clarifications that don't necessarily apply to imagery acquisition:

- 1) As provided in 2011, for the Spot Index Map, we will provide a layout for each imagery product showing the outlines of each image file - an orthophoto index in both AutoCAD .dwg and ArcGIS .shp file formats.
- 2) For the Control & Targeting, we're not planning to re-target any points (there are five points within the vicinity from our 2009 orthophoto project), but can measure the locations of those targets as they show on the 2009 imagery and determine those locations on the new imagery. Also, we agree that we can determine photo control locations from the triangulated stereo imagery from our 2009 flights.

Woolpert's Fee Proposal Breakdown ~ (0.33 feet raw ground pixel resolution, flown at 3,165 feet AGL)

• Imagery Acquisition and Processing	\$ 39,682
• Film scanning	Not Applicable
• Ground control survey & targeting; Airborne GPS Survey	Not Applicable
• Aerial Triangulation	\$ 9,199
• Orthophoto Mapping	\$ <u>28,852</u>
TOTAL FEE	\$ 77,733

Publication scale: 1"=100' Pixel Resolution: 0.5-foot Photo type: Natural Color
Horizontal Accuracy: +/-3.33' at 90 Percent Imaging Sensor: ADS80 Digital Imaging Sensor.

Thank you once again for the opportunity to propose on this project. We look forward to your response and to working with you again. Should you have any questions at all, please never hesitate to call me at any time.

Sincerely,
Woolpert, Inc.


John Cestnick, PSM
Senior Associate

2012 TECHNICAL SPECIFICATIONS

ENVIRONMENTAL AERIAL PHOTOGRAPHY ACQUISITION FOR PALM BEACH COUNTY COASTS & INLETS

1. PURPOSE

Palm Beach County (PBC) intends to issue a contract to provide digital orthophotography in the coastal areas for the purposes of monitoring coastal erosion, performance of restoration projects, accretion in inlet shoals, and mapping and quantifying exposed rock and/or reef in nearshore waters. In order to ensure that the photographs meet the needs for these purposes, these technical specifications include criteria for physical conditions during the time of the photography (sun angle, tide stage, sea surface conditions, water clarity, and those conditions outlined in Paragraph 3 below), photographic equipment, horizontal and vertical control and aerotriangulation, orthorectification, and deliverables. The minimum acceptable criteria are as follows:

2. LOCATION AND COVERAGE

The area of coverage includes the entirety of the Palm Beach County coastline located in Palm Beach County, Florida, from the Martin County line to the Broward County Line. The coastal and nearshore coverage includes all inlets as follows:

- **Jupiter Inlet.** West to Alternate A1A
- **Lake Worth Inlet.** West to the Port of Palm Beach
- **South Lake Worth Inlet.** West to the Boynton boat ramp
- **Boca Raton Inlet.** West to Palmetto Park Road

The orthophotography deliverable for this project involves 92 tiles that cover 4,200' x 3,000' each at a map scale of 1"=100' (Exhibit A).

Coastal coverages, at a minimum, must match the imagery provided by prior contractors for 2008 and 2009 and will include no less than 2,000' from shore and land mass sufficient for aerial triangulation and orthorectification of the photographs. Relative to the flight conditions described in Paragraph 3 below, approximately 1/3 of the photo frame should be land mass and 2/3 ocean.

3. FLIGHT CONDITIONS

PBC requires that aerials be flown on a rising tide, at least 2 hours after low tide and no later than 1 hour after high tide to ensure clear water inside the inlets. Water clarity and sea state are the most important factors in obtaining the necessary image quality for evaluating the reefs in the nearshore waters. Calm seas and clear water are essential for acceptable images. Cloud cover, fog, smoke and other factors must be considered to ensure acceptance, and the sun angle must be between 15 degrees and 35 degrees.

The flight window of opportunity shall begin on May 1. The goal is to complete the flights before the rainy season, as once the rains begin it becomes increasingly difficult to schedule flights. The preferred months for flights are May through August when the seas are likely to be the calmest. Prior to flight, the contractor will provide PBC with a chart showing the calendar dates of flight opportunities that are favorable to the sun angle and tide constraints of the project (See Exhibit B). PBC and the contractor will then jointly monitor various Federal, State, and Local internet web sites for favorable weather, tide, and water clarity conditions

immediately preceding those dates of flight opportunity. **PBC will provide the final on site assessment of the sea conditions and, in consultation with the contractor who will be monitoring the sky conditions, will provide the final authorization for the flight 24 hours prior to the anticipated flight.**

PBC requires that photography capture will start on the north end of the County. The contractor will attempt to capture the entire coastline during each photo mission. Factors which may keep this from occurring would be acts of God, clouds below the aircraft, rain or high winds.

Logs shall be maintained and provided to PBC for the following:

- A. A flight log representing aircraft flight time shall be maintained on an hourly basis. The time of takeoff, start of photographs, end of photographs, and landing shall be recorded to the nearest of 0.1 of an hour.
- B. A daily weather log shall be maintained for each flight window to substantiate any delays due to inclement weather. The weather log shall include date, location, weather report, and weather forecast from the U.S. Weather Bureau. This information may be supplemented by direct observation.
- C. A tide log shall include the date, time, the location of the nearest NOAA tide station(s) being reported, and the tide elevation at the beginning, middle, and end of data collection as calculated for photo collection location (through interpolation between adjacent tide stations). All reported tide elevations shall be referenced to NAVD 1988.

4. SCOPE OF WORK

The contractor shall furnish all necessary materials, labor, supervision, equipment, and transportation necessary to execute and complete all work required by these specifications.

The scope of work includes new aerial photography and digital orthophotography. The contractor shall provide vertical color aerial photography, digital photo index maps, aerial triangulation, scanning, orthorectified digital images, and digital plot files. All requirements commonly included in comparable professional grade work are to be included in these specifications and all deliverables specified in Section 11 are required to complete the scope of work.

5. CONTROL & TARGETING

The contractor will incorporate the most recent aerotriangulation block, to be provided by PBC, in place of running its own control network. PBC will approve this method toward meeting the NMAS 1"=100' standards. The contractor will therefore repeat this process for this project.

Prior to the photography acquisition, the contractor may elect to repaint additional existing targets for additional statistical QC purposes.

No other control should be necessary to attain the specified accuracy requirements. Offshore control is not required.

6. AERIAL PHOTOGRAPHS

The images shall be furnished from new aerial photography flown specifically for this contract. Vertical aerial color photographs shall cover the areas specified in item 2 above. The aerial images shall be suitable for producing digital orthophotos at both 0.33-ft and 1.0-ft ground pixel resolution (GPR). The photography

shall be flown at 1"= 600' (1:7200) nominal camera scale (NCS). **PBC shall approve all photography prior to orthorectification. The contractor will provide within two (2) weeks from completion of aerial flights the digital raw scanned imagery to PBC for this purpose.**

A minimum of 80% forward overlap is required. The increase of forward overlap supports improved visibility through the water surface.

Tilt shall not exceed 5 degrees for any one photograph or 2 degrees for any 10 or more photographs in a line or one degree for the entire job. Crab shall not exceed 10 degrees as measured from the flight line, as indicated, by two or more consecutive photographs.

The contractor shall furnish aerial film of a quality that is equal or superior to Kodak color 2444 negative film. Only fresh, fine grain, dimensional, stable, and safety base aerial film shall be used. If digital photography is used in lieu of film, the same or better quality and resolution as the 2005 and 2007 aerial photographs must be provided.

The contractor shall scan the aerial photography at 14 microns (approximately 0.33-foot ground pixel resolution for the 1"=600' photography).

All images shall be clear and sharp in detail, fine-grained, uniform average density, average minimum contrast, free of clouds and cloud shadows, light streaks, smoke, static marks, fog, stains, or other blemishes which would render them unsuitable for their intended purpose. Light reflections from water areas shall be kept to the minimum when possible, consistent with wave action, use of filters, and time of photography and without extensive obscuration from ground shadow. If requested and if film is used, the negatives shall be uncut and furnished on spools and in suitable rigid containers or canisters. The outside of the containers shall be labeled with project name, date of photographic exposure numbers on the roll, and survey number.

Each exposure shall be numbered just within the exposed area, in consecutive order throughout the entire area, starting with exposure number one on roll number one and continuing the numbering in consecutive order through all rolls. The approximate time and scale of the photographs shall appear on the first and last exposure of each flight line, the month, day, and year shall appear on each exposure, just within the exposed area. The exposures shall show the date, scale of photography, project identification designator, survey number, roll number (R-1) and flight line number followed by the photo number as reading from left to right on each photograph.

A photo spot index map for the entire project will be provided to PBC. Each image position will be labeled with the image/sheet number and be provided in electronic format as ESRI shape files. In addition, the contractor will provide a digital photo mosaic index in MrSID format. This shall be delivered to PBC immediately upon completion of the aerotriangulation.

7. COORDINATE REFERENCE FRAME

Survey: Datum- NAD 83/90 (feet) - Horizontal
NAVD 88 - Vertical

8. AERIAL TRIANGULATION

The contractor will use the most recent aerotriangulation data to be provided by Palm Beach County. The purpose of this is to obtain as many tie points as possible to control the new photography to a block that already exceeds NMAS and thereby eliminate the need for new ground control.

PBC expects the aerial triangulation solution will support the required accuracy for this project (1"=100' NMAS). The contractor shall deliver a digital and bound copy of its aerial triangulation report to PBC.

9. DIGITAL ORTHOPHOTOGRAPHIC IMAGES (TIF and TFW)

The contractor shall prepare and deliver digital orthorectified color image files in TIF/TFW format.

- 9.1 Scanners.** The scanning of the aerial film shall be at 14 microns. PBC expects the imagery to be re-sampled up to the final output resolution (6" ground pixel resolution). Down sampling from the original scans to a finer resolution for output is not acceptable. The final file output for the images shall be TIF and TFW file format. (Sample TFW with metadata shown in Exhibit C).

Scanning will be performed at 12-bit resolution in order to enhance feature detail, with special emphasis on the subsurface areas.

- 9.2 Surface Model.** PBC will provide the surface model necessary for orthorectification. The contractor will be responsible for verifying the completeness and supplementing the collection, where required.

- 9.3 Image Processing.** In order to better reveal subsurface features, a gamma stretch shall be used. Color and tone will be defined and submitted to PBC for approval and that definition will be approved by PBC and used by the contractor for production of the remaining project. The final output will be at both a 0.33-ft GPR and 1.0-ft GPR.

- 9.4 Raw Orthorectified Imagery.** The contractor will provide the raw digital orthorectified imagery for each frame of photography. This will give PBC the opportunity to scrutinize image detail after it has been orthorectified, but before the images were mosaiced, cleaned up, color balanced, or feathered along cut lines. These will be at 0.33-ft GPR and delivered on DVDs or USB2 or firewire external hard drive with .tfw, .tif files. **This raw imagery is provided with a strict understanding that they will only be used for PBC's internal purposes and will not be made available to the general public.**

- 9.5 Image Mosaicing.** When two or more digital orthophoto chips are mosaiced, the chip judged by visual inspection to have the best contrast should be used as the reference image. The brightness value of the other chips shall be adjusted to match that of the reference chip. The join lines between the overlapping chips shall be chosen so as to minimize tonal variations. Localized adjustments of the brightness values shall be performed to minimize tonal differences between join areas. Sheets will end match precisely with adjacent sheets with no cover, a seamless mosaic digital image shall be created of the overall basin.

Every frame of the 80% forward overlap photography will be utilized for this project to ensure that most of the final orthophoto imagery will be as close as possible to nadir in the direction of

flight. This will result in less building lean, less subsurface displacement from water refraction, and less surface reflection from sunlight.

9.6 MrSID Imagery. The contractor shall produce three (3) MrSID files at 20x compression that match the tile layouts for the 1.0-ft GPR images.

10. QUALITY CONTROL

The contractor shall make every effort to minimize errors or defects in the final imagery. PBC will return comments to the contractor within fifteen (15) days of receipt of imagery. The contractor shall respond to PBC's comments or concerns within fifteen (15) days, either making necessary corrections or providing clarification.

11. DELIVERABLES

On completion of the service, all data required shall be delivered or mailed to PBC at the address shown in the contract and shall be accompanied by a properly numbered, dated and signed letter or shipping form listing the materials being transmitted. All costs of the deliverables shall be borne by the contractor. Items to be delivered include, but are not limited to, the following:

1. Original roll(s) of aerial film negatives, if film is used (To be stored by the contractor.)
2. One copy of the Aerial Triangulation Report in digital and hardcopy format. (Includes the current aerial camera calibration report.)
3. One copy of the Image Processing and Quality Control Report in digital and hardcopy format. (Includes the Flight and Film Inspection Report and Statistical Validation Report.)
4. One copy of the flight report signed by the pilot or the aerial photographer. The flight report shall contain the flight, tide, and weather logs as outlined in Section 3.
5. Raw digital orthorectified imagery provided on DVDs with .tfw, .tif files produced at 0.33-ft GPR before they were mosaiced, cleaned up, or color balanced. These are provided with a strict understanding that they will only be used for PBC's internal purposes and will not be made available to the general public.
6. 92 digital orthorectified tiles provided on DVDs or on an USB2 or firewire external hard drive with .tfw, .tif files produced at both 0.33-ft GPR and 1.0-ft GPR.
7. Digital imagery provided in MrSID format in 3 segments, and these 3 images will be created at 20x compression for the 1.0-ft GPR images.
8. Digital spot index map with all sheets numbered and referenced in .dwg and .shp format.
9. Digital photo mosaic index in MrSID format upon completion of the aerotriangulation.
10. Federally compliant metadata in electronic format for each deliverable in Item 6 above.
11. Updated DEM in uncompressed ArcINFO GENERATE if modified.

12. SCHEDULE

All deliverables will be sent to PBC ninety (90) days after completion of successful aerial photography. The contractor shall submit a schedule for this project in Microsoft Project format (Gantt Chart) within ten (10) days of receipt of the Task Order.

**Digital Orthophotography
2007 Coastal Tile Layout**

Palm Beach County
Department of Environmental
Resources Management

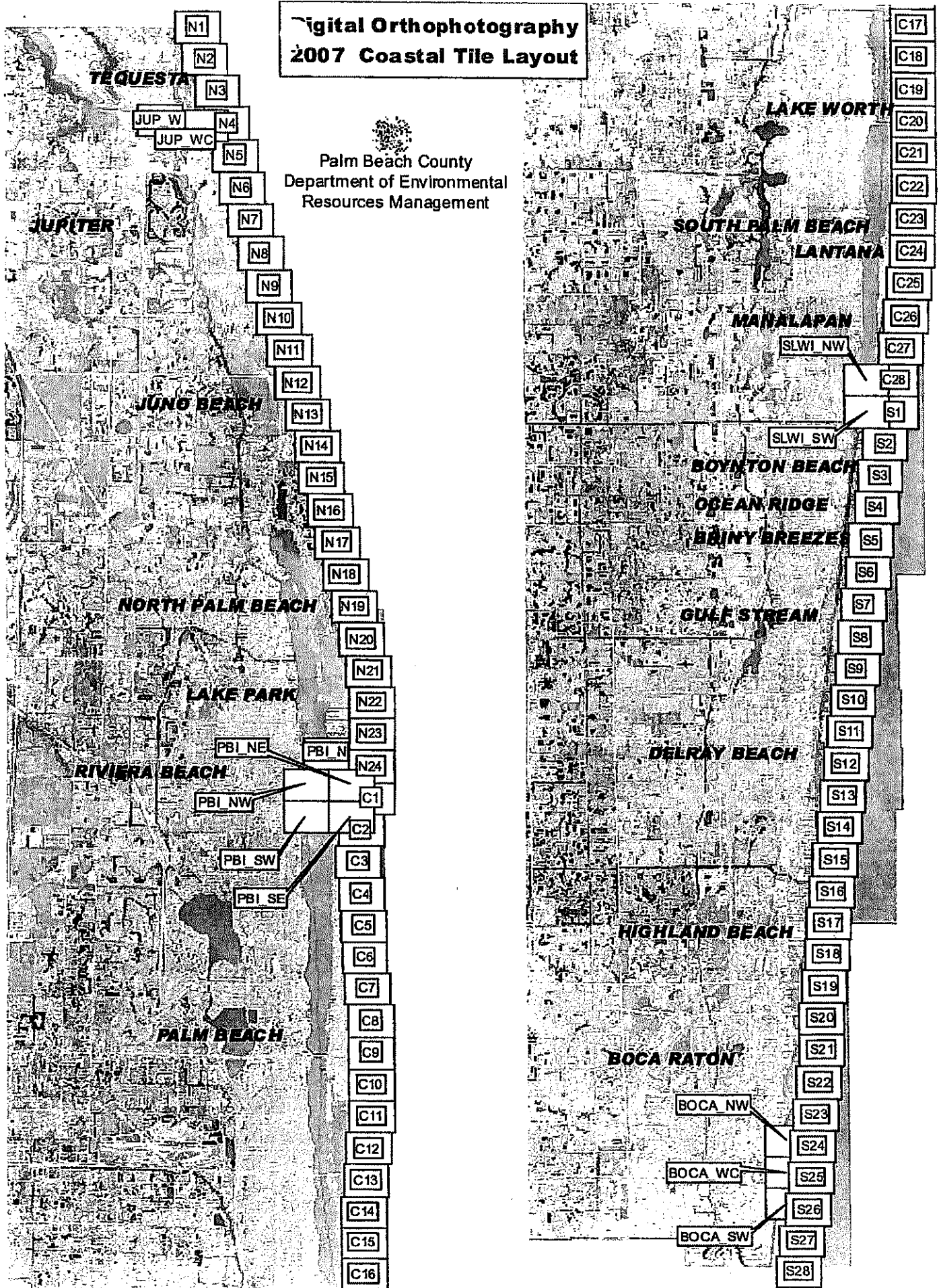


EXHIBIT A



EXHIBIT B

Palm Beach County, FL Coastal Mapping Project

MAY, 2006 - FLIGHT OPPORTUNITY WINDOW

Date	Tide Window				Sun Angle Window		Optimal Photography Window			Date
	Low Tide (EDT)	High Tide (EDT)	2 hrs after low tide (EDT)	1 hr after high tide (EDT)	Begin 15° (EDT)	End 35° (EDT)	open	close	hours:minutes	
01-May-06	5:53	11:40	7:53	12:40	7:55	9:25	7:55	9:25	1:30	01-May-06
02-May-06	6:44	12:30	8:44	13:30	7:55	9:25	8:44	9:25	0:41	02-May-06
03-May-06	7:39	13:26	9:39	14:26	7:55	9:25	XX	XX	XX	03-May-06
04-May-06	8:39	14:29	10:39	15:29	7:55	9:25	XX	XX	XX	04-May-06
05-May-06	9:41	15:36	11:41	16:36	7:50	9:20	XX	XX	XX	05-May-06
06-May-06	10:39	16:39	12:39	17:39	7:50	9:20	XX	XX	XX	06-May-06
07-May-06	11:30	17:34	13:30	18:34	7:50	9:20	XX	XX	XX	07-May-06
08-May-06	12:14	18:22	14:14	19:22	7:50	9:20	XX	XX	XX	08-May-06
09-May-06	0:37	6:30	2:37	7:30	7:50	9:20	XX	XX	XX	09-May-06
10-May-06	1:19	7:08	3:19	8:08	7:50	9:20	7:50	8:08	0:18	10-May-06
11-May-06	1:59	7:45	3:59	8:45	7:50	9:20	7:50	8:45	0:55	11-May-06
12-May-06	2:37	8:21	4:37	9:21	7:45	9:20	7:45	9:20	1:35	12-May-06
13-May-06	3:15	8:57	5:15	9:57	7:45	9:20	7:45	9:20	1:35	13-May-06
14-May-06	3:54	9:36	5:54	10:36	7:45	9:20	7:45	9:20	1:35	14-May-06
15-May-06	4:35	10:17	6:35	11:17	7:45	9:20	7:45	9:20	1:35	15-May-06
16-May-06	5:19	11:03	7:19	12:03	7:45	9:20	7:45	9:20	1:35	16-May-06
17-May-06	6:08	11:54	8:08	12:54	7:45	9:20	8:08	9:20	1:12	17-May-06
18-May-06	7:02	12:54	9:02	13:54	7:45	9:20	9:02	9:20	0:18	18-May-06
19-May-06	8:03	14:01	10:03	15:01	7:45	9:20	XX	XX	XX	19-May-06
20-May-06	9:08	15:12	11:08	16:12	7:45	9:20	XX	XX	XX	20-May-06
21-May-06	10:12	16:21	12:12	17:21	7:45	9:20	XX	XX	XX	21-May-06
22-May-06	11:13	17:26	13:13	18:26	7:45	9:20	XX	XX	XX	22-May-06
23-May-06	12:09	18:24	14:09	19:24	7:45	9:20	XX	XX	XX	23-May-06
24-May-06	0:42	6:34	2:42	7:34	7:45	9:20	XX	XX	XX	24-May-06
25-May-06	1:35	7:24	3:35	8:24	7:45	9:20	7:45	8:24	0:39	25-May-06
26-May-06	2:25	8:12	4:25	9:12	7:45	9:20	7:45	9:12	1:27	26-May-06
27-May-06	3:13	8:58	5:13	9:58	7:45	9:20	7:45	9:20	1:35	27-May-06
28-May-06	3:59	9:44	5:59	10:44	7:45	9:20	7:45	9:20	1:35	28-May-06
29-May-06	4:46	10:30	6:46	11:30	7:45	9:20	7:45	9:20	1:35	29-May-06
30-May-06	5:32	11:17	7:32	12:17	7:45	9:20	7:45	9:20	1:35	30-May-06
31-May-06	6:20	12:06	8:20	13:06	7:45	9:20	8:20	9:20	1:00	31-May-06

May has 22:15 available hours of photography for the beach areas

0.50000000000000
0.00000000000000
0.00000000000000
-0.50000000000000
880744.250000000000
911191.750000000000

Metadata

Image FileName: 404212
Coordinate System: Florida State Plane East
HDatum: NAD 1983 HARN 1990
Coordinate Units: US Foot
Accuracy Standards: NMAS
HAccuracy: +/- 3.3333
Photo Flight Date(s): 01/20/2005 to 01/25/2005
Original Photo Ratio Scale: 1:10080
DTM Used for Ortho: Client Provided DTM, Updated 2005
Image Resolution: 0.5

nrows: 11084
ncols: 12648
xmin: 880744
xmax: 887068
ymin: 905650
ymax: 911192
nbands: 3

Owner: Palm Beach Co.
Custodian: Palm Beach Co.
Contractor: Surdex Corporation

Copyright, Palm Beach Co. 2005



**Palm Beach County
Environmental Resources Management**

INTERDEPARTMENTAL BUDGET AVAILABILITY STATEMENT

REQUEST DATE: 05/02/2012 *11/2/12 JP*

REQUESTED BY: Janet Phipps

PHONE: 233-2513

PROJECT TITLE: Countywide Coastal Aerial Photography

PROJECT NO:

SITE: Countywide

ACTIVITY: Coastal Orthophoto

CONTRACTOR/CONSULTANT NAME: Woolpert, Inc

SCOPE OF SERVICES: Provide digital orthophotography in the coastal areas as describe on the attached specifications.

IG Fee Yes No

Total Amount: \$77,733

BUDGET ACCOUNT NUMBER(S):

Fund	Dept	Unit	Obj	SObj	Program	PPC	(Proj) Task	(Site) Sub Task	(Activity) Task Ord	Amount
3652	381	M040	3120		E040	CIP	S011	CCOC	14	\$3,238.88
3652	381	M045	3120		E045	CIP	S021	CJUC	14	\$2,386.54
3652	381	M028	3120		E028	CIP	S005	CJUB	14	\$4,432.14
3652	381	M037	3120		E037	CIP	S009	CSII	14	\$3,238.88
3652	381	M044	3120		E044	CIP	S013	CSPB	14	\$1,704.67
3652	381	M015	3120		E015	CIP	S001	COCR	14	\$4,432.14
3900	381	M700	3120		E700	CIP	S017	CSLW	14	\$4,261.68
3652	381	M041	3120		E041	CIP	S012	CDEB	14	\$5,284.48
3652	381	M039	3120		E039	CIP	S010	CBOR	14	\$2,727.47
3652	381	M051	3120		E051	CIP	S016	CBOR	14	\$2,386.54
3652	381	M016	3120		E016	CIP	S002	CBOR	14	\$2,045.61
3652	381	M034	3120		E034	CIP	S007	CPAB	14	\$21,478.86
3652	381	M100	3120		S102	M100	X007	CCTY	14	\$20,115.12

*93
19,195.0
22,398.0
JP*

BAS APPROVED BY: *Liz Plurin* DATE: *5/2/12*
Liz Plurin 11/2/12

ENCUMBRANCE NUMBER: KPO - _____