

# Letter Proposal

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Kelly Jo Hoffmann, P.E., S.E.  
Capital Programs, Engineer Planner  
University of Illinois Urbana-Champaign  
1501 S. Oak Street  
Champaign, IL 61820

**RE: Project #U15007, Request for Proposal**

**Illinois Height Modernization Program: Phase II, Processing of Airborne LiDAR Data for Bond, Clinton and Washington Counties in Illinois**

Dear Ms. Hoffman:

The following proposal to the request for retainer services from Suredex for the Illinois Height Modernization Program (ILHMP), which is managed by the Illinois State Geological Survey (ISGS), to process leaf-off, airborne LiDAR data for Bond, Clinton and Washington Counties in Illinois acquired in Phase I, late fall/early winter 2014. The total project area consists of 1,804 tiles sized 5,000' square which equals a total area of 1,618 square miles, including a nominal flight buffer around the outside perimeter. Suredex will bundle delivery data in stand-alone county datasets, including a full tile buffer between adjacent counties on this task order.

- 1. Data Processing:** Using aerial data captured and feedback of a pilot project completed during Phase I, Suredex will resume data processing to create contract deliverables including las classification, generation of data derivative products, creation of metadata and reports, and final delivery of all data.

This proposal includes a detailed scope of work for the services required to complete data processing, timeline for production through final delivery, and itemized fees for proposed services. Suredex will complete all of the proposed work in Phase II using our own personnel and equipment.

## **PHASE II LIDAR PROCESSING STATEMENT OF WORK**

### **PROJECT AREA DESCRIPTION**

#### **LIDAR PROCESSING SCOPE OF WORK**

LiDAR data will be compliant with *U.S. Geological Survey National Geospatial Program Lidar Base Specification, Version 1.0* (see <http://pubs.er.usgs.gov/publication/tm11B3>); as such, classified point cloud deliverables are required to be in fully compliant LAS file format, v1.2. The version selected must be used for all LAS deliverables in the project.

Nominal pulse spacing (NPS) and point density: the overall project area is to be collected at an NPS of 0.89 meters, which equates to 1.27 pulses per square meter.

### **DATA CLASSIFICATION**

TerraSolid/TerraScan software is used to run automated classification routines. Several macros (filter algorithms) will be employed on this project given the variances in terrain and scene morphology to obtain high-yielding results for this project and minimize the time and cost for manual terrain editing. The following list identifies the point classes to be used for this project:



### Classified Point Cloud

- Classified Point Cloud:

Code:	Description:
0	Created, never classified
1	Unclassified1
2	Ground
3	Low Vegetation [numeric cutoff values to be provided by INHS]
4	Medium Vegetation [numeric cutoff values to be provided by INHS]
5	High Vegetation [numeric cutoff values to be provided by INHS]
6	Building
7	Low Point (noise)
8	Model Key-point (mass point)

### BREAKLINES

Surdex has a wide variety of tools available for the compilation of breaklines required for the hydro-flattening services. Surdex's process, developed and refined through numerous projects, includes both manual and automated procedures. Our R&D staff has developed software to assist and improve efficiency in the hydro-enforcement process.

Several sets of data are available to assist the technicians in developing the hydro-enforcement breaklines. These include; LiDAR data, color hillshade maps derived from the LiDAR data, National Hydrographic Dataset and intensity images are all useful developing hydro breakline data.

All breaklines developed for use in hydro-flattening will be delivered as an ESRI feature class, PolylineZ or PolygonZ format, as appropriate to the type of feature represented. ESRI file geodatabase format will also be delivered. Breaklines will be as a continuous layer and will use the same horizontal and vertical coordinate reference system and units as the LiDAR point delivery. Hydrographic flattening will be in conformance with USGS version 1.0.

### METADATA

Project-level metadata will be delivered that fully complies with Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata (CSDGM) format standard in XML format. Metadata will describe the project, data acquisition methods, system calibration, processing methods, and statistical validation process and results. Project documentation will include control point and flight diagram information from the LiDAR acquisition flight.

### QA/QC REPORTING

Surdex has QA/QC steps built into each production step to ensure stated project specifications are met. A checklist of all project deliverables will be created for internal production usage and validation. Data review will include LAS versioning, file format, projection, datums, units, returns, intensity, point classifications, high/low points, metadata and reports. All final products are reviewed by our Quality Assurance team, led by QA Manager Brad Barker, prior to delivery.

### LIDAR MAPPING ACCURACY

LiDAR data delivered by Surdex will meet or exceed the following accuracies: Vertical accuracy will be less than or equal to 12.5cm RMSEz or less to meet USGS Quality Level 3 requirements for floodplain mapping and general topographic mapping. Final products will be checked using an independent software application, Topo Analyst created by Spatial Information Systems (SIS) based in Starkville, MS. This application provides comprehensive analysis of data throughout the project life cycle with a multitude of statistics, charts and graphs.



## **PROJECT TEAM**

The Surdex project team will consist of our key project personnel listed below.

Tim Donze – Business Development

Wade Williams – Project Manager

Tim Bohn – Director of Project Management

Steve Kasten – VP, Survey & Photogrammetry

Jim Peterson – Director of Survey & UAV Technology

John Boeing – VP Operations

Charles Meyers – LiDAR Manager

Brad Barker – Quality Assurance Manager

Paul Briggs – Chief Pilot

Kevin Eichelberger – Flight Operations Manager

## **PROJECT REPORTING & DELIVERY/FEE SCHEDULE**

### **SCHEDULE**

The intention is to resume LiDAR production acquired during Phase I during leaf-off vegetative conditions and incorporating feedback from ISGS regarding the pilot delivery. Surdex has included a 15-day window in Phase II for data quality assurance (QA) and quality control (QC) review by ISGS personnel.

### **PROJECT REPORTING**

Surdex will report project progress as milestones and percentage of each milestone completed to every 2 weeks.



## DELIVERY ITEMS

Each data format will be processed and delivered in the following Stateplane zones:

Bond, Clinton and Washington Counties: Geo-referenced to IL Stateplane NAD83, West Zone, NAVD88 US Survey feet.

1. **Unclassified LiDAR point cloud to ASPRS Standards.**
  - a. Calibrated in LAS v1.2 format.
2. **Classified LiDAR point cloud to ASPRS Standards.**
  - a. **Bond, Clinton and Washington** Counties, calibrated and geo-referenced to Illinois Stateplane NAD83, West Zone, NAVD88 US Survey feet in LAS v1.2, \*.dgn and \*.DAT formats.
3. **Hydrographic Breaklines**, Microstation .dgn.
4. **TIN surface in .TIN format**
5. **Hydro flattened .DEM format (if requested)**
6. **ESRI Geodatabase of all deliverables**
7. **SIS Topo Analyst LiDAR Vertical Accuracy Report**
8. **FGDC compliant metadata in .xml format.**



### MILESTONE DESCRIPTION AND COMPLETION DATE

Proposed schedule of Phase II begins after 15 day review by ISGS of pilot product completed in Phase I.

Approximate Schedule				
MILESTONE	START DATE	FINISH DATE	PERCENT OF PHASE	FEE
<b>Phase II LiDAR Processing</b>				
Notice to Proceed	1/30/2015	1/30/2015	0%	\$0
Full Data Classification	2/2/2015	4/30/2015	85%	\$157,150
Breakline Generation	3/2/2015	3/31/2015	5%	\$9,240
DEM Generation	4/1/2015	4/30/2015	7%	\$12,940
Final Deliverables	5/1/2015	5/15/2015	3%	\$5,550

### PRICING

The fee consists of data processing to create contract deliverables including .las classification, generation of data derivative products, creation of metadata and reports, and final delivery of all data for Bond, Clinton and Washington Counties. Neither additional fees nor reimbursable cost are expected. Fees are payable to contract terms and conditions.

**Phase II TOTAL FIXED FEE: \$184,880.00**

Sincerely,

**SURDEX CORPORATION**

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Business Development  
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