

AGREEMENT FOR PROFESSIONAL SERVICES

FOR

GEOSPATIAL SERVICES

THIS AGREEMENT is made by and between Sauk County, Wisconsin, (OWNER) and Ayres Associates Inc, 5201 East Terrace Drive, Suite 200, Madison, Wisconsin, 53718 (CONSULTANT).

WHEREAS, the OWNER intends to retain the CONSULTANT to provide geospatial services within the project areas delineated in Attachment A.

NOW, THEREFORE, the OWNER and CONSULTANT agree to the performance of professional services by CONSULTANT and payment for those services by OWNER as set forth below:

ARTICLE 1 – SCOPE OF SERVICES

1.1 BASIC SERVICES

After written authorization to proceed, CONSULTANT shall:

- 1.1.1 Acquire aerial LiDAR (Light Detection And Ranging) in the Spring of 2020 for the project area shown on Attachment A. LiDAR will be acquired for the project area shown on Attachment A with the following specifications:
 - a) Nominal pulse density for the LiDAR acquisition will be ≥ 2 pulses per square meter, single swath.
 - b) LiDAR acquisition will be conducted when the ground is free of snow, and when the atmospheric conditions between the aircraft and the ground are free of clouds and fog.
 - c) LiDAR acquisition will be flown with an average of 30% overlap between swaths.
- 1.1.2 Perform GPS survey for calibration ground control and for quality control.
 - a) Ground Control calibration points will be established to supplement the airborne GPS positional accuracy.
 - b) Ground Control Quality Check Points will be established for validation of positional accuracy.
 - c) 50 Check Points will be collected for assessment of Non-vegetated Vertical Accuracy (NVA). The NVA points will be collected in clear open terrain (bare earth) and urban land cover.
 - d) 40 Check Points will be collected for assessment of Vegetated Vertical Accuracy (VVA). The VVA points will be collected in representative land cover types across the project area.

- 1.1.3 Calibrate the LiDAR point cloud to support the development of a bare earth surface model (DEM) to meet the following vertical accuracy requirements:
- a) RMSEz (non-vegetated) ≤ 10 cm (Point Cloud and DEM)
 - b) NVA ≤ 19.6 cm at 95% confidence level (Point Cloud and DEM)
 - c) VVA ≤ 29.4 cm at 95th percentile level (DEM only)
- 1.1.4 Prepare LiDAR data and derivative products to conform to specifications defined in the USGS "National Geospatial Program LiDAR Base Specification Version 2.1". LiDAR data will meet the USGS definition of Quality Level 2 (QL2).
- 1.1.5 Compile hydro-flattened breaklines for ponded water that is 2 acres or greater and double lined streams with a minimum width of 30 meters. The streams will break at road crossings (culvert locations). The hydrographic features will be flattened as per the criteria outlined in "National Geospatial Program LiDAR Base Specification Version 2.1". The road fills will not be removed from the DEM, streams will not break at bridges, and when the identification of a feature as a bridge or culvert cannot be made reliably, the feature will be regarded as a culvert. Permanent islands 1 acre or larger shall be delineated within all waterbodies. The hydro breaklines will be delivered in ESRI polylineZ feature class.
- 1.1.6 Compile bridge breaklines to enforce logical terrain surface below bridges. The bare earth surface below the bridge shall be a continuous interpolation of the terrain lateral to the bridge deck. Streams and water bodies that meet the criteria for hydro-flattening shall be monotonically continuous where bridge decks have been removed.
- 1.1.7 Process and classify the calibrated LiDAR data to support bare earth surface model generation. The point cloud format will be LAS v1.4 format. The calibrated LiDAR point cloud will be classified to the following base classification scheme:
- Class 1: Processed, but unclassified
 - Class 2: Bare-earth ground
 - Class 7: Low Noise
 - Class 9: Water
 - Class 17: Bridge Decks
 - Class 18: High Noise
 - Class 20: Ignored ground (breakline proximity)
- 1.1.8 Generate a bare earth Digital Elevation Model (DEM) from classified bare earth points (Class 2) and breaklines. Water bodies and streams will be hydro-flattened within the DEM. The cell size will be 2.0 feet. The delivery format will be GeoTIFF tiles.
- 1.1.9 Prepare a Pilot Area consisting of nine contiguous tiles of classified point cloud (LAS) data, hydro breaklines, and Bare Earth DEM tiles, along with reporting of calibration control against the calibrated raw swath point cloud.
- 1.1.10 Tile the LiDAR deliverable products according to a 4,500-foot by 4,500-foot tile index across the project area. A tile schematic will be delivered in ESRI Shapefile format.
- 1.1.11 Prepare LiDAR deliverable products to full extent of the project area shown on Attachment A.

- 1.1.12 Reference the LiDAR deliverable products to WISCRS, Sauk County Coordinates, NAD 83 (11), NAVD 88 (Geoid 12B), US Survey Feet.
- 1.1.13 Prepare a report on the assessed vertical accuracy of the bare earth surface (NVA and VVA) using the GPS survey data collected for the quality control.
- 1.1.14 Calculate horizontal accuracy as produced to meet horizontal accuracy and report the results in the metadata.
- 1.1.15 Prepare reports for the LiDAR acquisition and processing phases of the project. Reports will include:
 - a) Data Collection report with flight logs
 - b) Polygons representing individual swath boundaries
 - c) Survey report detailing the collection of ground control for calibration
 - d) Processing report detailing classification and breakline methodology, product generation, and QC procedures
 - e) Vertical accuracy assessment of the point cloud and the DEM
 - f) Boundaries of product extents
- 1.1.16 Prepare FGDC compliant metadata in .xml format
- 1.1.17 Deliver the final products on external a USB hard drive
- 1.1.18 Deliver the following products to OWNER:
 - a) Classified Point Cloud, LAS v1.4 format
 - b) Hydro flattening breaklines, ESRI shapefile, polylineZ format
 - c) Bare Earth DEM, GeoTIFF format
 - d) Pilot Area, LAS and DEM format tiles
 - e) Tile Schematic, ESRI shapefile format
 - f) LiDAR acquisition and processing reports, including:
 - 1) Data Collection report with flight logs
 - 2) Polygons representing individual swath boundaries
 - 3) Survey report with calibration control points
 - 4) Processing report for generation of products
 - 5) Vertical Accuracy Report (NVA and VVA)
 - 6) FGDC metadata, XML format
- 1.1.19 CONSULTANT may render to the OWNER advice, consultation, and expertise with respect to the development, use, and technical application of the deliverables provided under this project.

ARTICLE 2 – CHANGES IN THE SCOPE OF SERVICES

2.1 Services Requiring Changes in the Scope of Services

The OWNER or the CONSULTANT may, from time to time, request changes in the scope of services to be performed hereunder. Such changes, while not anticipated, may include an increase or decrease in the amount of CONSULTANT'S compensation. Any such changes must be mutually agreed by and between OWNER and CONSULTANT and shall be incorporated in written amendments to this agreement. Such changes may include:

- 2.1.1 Services to investigate existing conditions or facilities or to verify the accuracy of information furnished by OWNER.
- 2.1.2 Services resulting from significant changes in the general scope, extent or character of the Project.
- 2.1.3 Furnishing services of independent professional associates and consultants for other than Basic Services.
- 2.1.4 Preparing to serve or serving as a consultant or witness for OWNER in any litigation, arbitration or other legal or administrative proceeding involving the Project.
- 2.1.5 Additional services in connection with the Project, including services, which are to be furnished by OWNER and services not otherwise, provided for in this Agreement.

ARTICLE 3 - OWNER'S RESPONSIBILITIES

OWNER shall do the following in a timely manner so as not to delay the services of CONSULTANT:

- 3.1 Place at CONSULTANT's disposal all reasonably available pertinent information, upon which the CONSULTANT can rely. This may include project boundaries in georeferenced vector format, existing digital terrain models, and existing ground control information.
- 3.2 Arrange for access to and make all provisions for CONSULTANT to enter upon public and private property as required for CONSULTANT to perform services under this Agreement.
- 3.3 Furnish approvals and permits from all governmental authorities having jurisdiction over the Project and such approvals and consents from others as may be necessary for completion of the Project.
- 3.4 Give prompt written notice to CONSULTANT whenever OWNER observes or otherwise becomes aware of any development that affects the scope or timing of CONSULTANT's services.

ARTICLE 4 - PERIODS OF SERVICE

- 4.1 The provisions of this Article 4 and the compensation for CONSULTANT's services have been agreed to in anticipation of the orderly and continuous progress of the Project. If completion dates are exceeded through no fault of CONSULTANT, compensation provided herein shall be subject to equitable adjustment.
- 4.2 The services called for in Article 1 will be completed and submitted by March 31, 2021. Specific tasks will be completed and delivered according to the following schedule:
- a) LiDAR data collection: March-May 2020 (as weather and ground conditions permit)
 - b) Pilot LiDAR tiles: delivered six months after data collection is complete
 - c) Countywide LiDAR datasets: delivered ten months after data collection is complete
 - d) The OWNER has 30 days after delivery of the countywide products to review the data and provide the CONSULTANT with written comments. The CONSULTANT shall make final delivery within 30 days of OWNER's review.
- 4.3 The expiration date of this Agreement is December 31, 2025.
- 4.4 CONSULTANT's services under this Agreement shall be considered complete when submissions have been accepted by the OWNER.
- 4.5 If OWNER has requested significant modifications or changes in the general scope, extent or character of the Project, as memorialized in a written change order executed by the Parties, the time of performance of CONSULTANT's services shall be adjusted equitably.
- 4.6 If CONSULTANT's services for the Project are delayed or suspended in whole or in part by OWNER for more than three months for reasons beyond CONSULTANT's control, CONSULTANT shall on written demand to OWNER (but without termination of this Agreement) be reimbursed for all charges and services rendered through the date of suspension, however such reimbursement shall not exceed the amount set forth in 5.1.1 and shall take into the consideration the costs and compensation to complete the Project.

ARTICLE 5 - PAYMENTS

5.1 Compensation for Services

- 5.1.1 OWNER shall compensate CONSULTANT on a lump sum basis for services included in Article 1 not to exceed the following amount:

5.1.1.1 Total fees for LiDAR acquisition, ground control, and data processing:
\$176,513.00

5.2 Times of Payments

- 5.2.1 CONSULTANT shall submit monthly invoices for Basic and Additional Services rendered. OWNER shall make prompt monthly payments in response to CONSULTANT's invoices.

5.3 Other Provisions Concerning Payments

- 5.3.1 If OWNER fails to make any payment due CONSULTANT for services and expenses within sixty days after receipt of Consultant's invoice, the amounts due CONSULTANT will be subject to equitable adjustment but in no event shall it be increased by more than a rate of 1-1/2% per month (18% A.P.R.) from said sixtieth day, and in addition, CONSULTANT may, after giving seven days' written notice to OWNER, suspend services under this Agreement until CONSULTANT has been paid in full all amounts due for services and expenses. If for some reason there is a dispute concerning an invoice and the dispute extends beyond one month, the owner will not be assessed a 1.5% penalty to that invoice.
- 5.3.2 In the event of termination by OWNER for reasons other than CONSULTANT'S breach of this agreement, CONSULTANT will be reimbursed for all charges and services rendered, however, in no event shall such reimbursement exceed the compensation set forth in 5.1.1.
- 5.3.3 Records pertinent to CONSULTANT's compensation will be kept in accordance with generally accepted accounting practices.
- 5.3.4 Factors determining compensation payable to CONSULTANT will be adjusted periodically and equitably to reflect changes in various elements that comprise such factors. Any changes must be mutually agreed by and between the OWNER and the CONSULTANT and shall be incorporated in written amendments to this agreement.

ARTICLE 6 - GENERAL CONSIDERATIONS

6.1 Reuse of Documents

Any reuse of the services and documents provided under this agreement for purposes not intended, will be at the OWNER'S sole risk.

6.2 Controlling Law

This Agreement is to be governed by the law of the State of Wisconsin.

6.3 Termination

The obligation to provide further services under this Agreement may be terminated by either party upon seven days' written notice in the event of substantial failure by either party to perform in accordance with the terms hereof through no fault of the terminating party.

6.4 Indemnification

The CONSULTANT hereby agrees to indemnify the OWNER for all claims arising solely from negligent acts, errors or omissions of the CONSULTANT in the performance of professional services under this agreement.

6.5 Data ownership Assignment

The CONSULTANT assigns ownership of the data to the OWNER and its project participants for all deliverable products produced under this contract. The CONSULTANT agrees that the deliverable products and documents shall not be made available to nor used to prepare additional products for any individual or organization at any time without prior written approval by the OWNER.

ARTICLE 7 - EXHIBITS AND SCHEDULES

7.1 The following Exhibits are attached to and made a part of this Agreement.

7.1.1 Attachment A – Project Area Map of Sauk County (consists of 1 page).

7.2 This Agreement (consisting of pages 1 to 8, inclusive), together with the Exhibits and Attachments identified above, constitute the entire agreement between OWNER and CONSULTANT and supersede all prior written or oral understandings. This Agreement and said Exhibits may only be amended, supplemented, modified or canceled by a duly executed written instrument.

IN WITNESS WHEREOF, the parties hereto have made and executed this Agreement as of the day and year first written above.

Sauk County, WI
OWNER

Ayres Associates Inc
CONSULTANT

_____	(Signature)	_____
_____	(Typed Name)	Jason Krueger
_____	(Title)	Manager
_____	(Date)	_____

Attachment A Map of Project Area

