

Public Input
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PROPOSAL FOR PHOTOGRAMMETRIC SERVICES CITY OF MANITOWOC

Date: April 2, 2014

To

Client Contact:	Dan Koski
Company:	City of Manitowoc
Business Address:	900 Quay St Manitowoc, WI 54220
Phone:	920-686-6910
Email:	dkoski@manitowoc.org

By

Name of Firm:	Surdex Corporation (SURDEX)
Business Address:	520 Spirit of St. Louis Blvd. Chesterfield, MO 63005
Website:	www.surdex.com
Phone / Fax:	636-368-4424 / 636-368-4401
Proposal Contact:	Tim Donze
Email:	timd@surdex.com
Type Ownership:	S-Corporation
FEIN:	43-0690641
Year Established:	Est. 1954

Dan:

Thank you for your recent request for photogrammetric services as part of the Northeast Wisconsin Ortho Imagery Consortium. The following documentation describes Surdex's understanding of the project and its proposed Scope of Services.

Your project will be executed in two main phases. The first phase will be aerial acquisition and post processing only during this flight season, Spring 2014. The second phase will be the production of the orthos, planimetrics and contours for delivery in early 2015.

PROJECT AREA

The project area includes ~47.4 sq miles. The exact area of interest (AOI) is shown on the boundary diagram later in this document. Prior to mobilization of acquisition assets and production, Surdex will require confirmation of the contractual project limits.



DIGITAL AERIAL PHOTOGRAPHY

Aerial photography will be captured of the area of interest using Surdex aircraft equipped with high precision direct digital aerial mapping sensors. The acquisition plan will be designed to achieve photogrammetric accuracies based on the known accuracy requirements requested by City of Manitowoc and generally accepted photogrammetric practice. The digital image sensors are equipped with digital forward motion compensation and gyro-mount sensor leveling technology. To supplement the required photogrammetric ground control, all aircraft and sensors are equipped with Global Positioning System (GPS) Navigation, Airborne Global Positioning System (ABGPS) survey and Inertial Measurement Unit (IMU) technology. Surdex's direct digital sensors capture Panchromatic (PAN), Red, Green, Blue (RGB) and near Infrared (IR) bands simultaneously. Processing and delivery of supplemental image bands is available upon request for an additional charge.

Conditions: Surdex will take vertical aerial photographs using a precision aerial mapping camera, free of clouds, cloud shadows and atmospheric haze, generally between 10:00 a.m. and 2:00 p.m., or when the sun angle is greater than 30 degrees.

GROUND CONTROL SURVEYS

Surdex will use Global Positioning System (GPS) survey technology to establish the ground control. The elevations shall be based upon ellipsoidal heights that have been modified by the latest geoidal model available. The accuracies shall be sufficient to support the mapping requirements.

Horizontal control will conform to Third Order Class II standards as stated in the publication "Standards and Specifications for Geodetic Control Networks," National Oceanic and Atmospheric Administration, Federal Geodetic Control Committee, September 1984 and will be local coordinates unless stated otherwise in the scope of work.

Vertical Control established by Surdex will conform to Third Order, Class II standards as stated in the publication "Standards and Specifications for Geodetic Control Networks," National Oceanic and Atmospheric Administration, Federal Geodetic Control Committee, September 1984.

If Surdex provides field control, all survey records, control descriptions, computations and related materials will remain the property of Surdex Corporation.

Field survey procedures are defined in the publication "Standards and Specifications for Geodetic Control Networks," National Oceanic and Atmospheric Administration, Federal Geodetic Control Committee, September 1984.

The coordinates shall be based on the County Coordinate System or as specified prior to the start of the project. The elevations shall be based on Mean Sea Level, North American Vertical Datum (NAVD) of 1988. All units shall be based in U.S. Survey feet. If alternate coordinate system or datum is required, Surdex requires notification and specifications prior to project initiation.

Aerotriangulation: Analytical aerotriangulation may be used to establish supplemental horizontal and vertical control for stereoscopic models.



DIGITAL MAPPING

PLANIMETRIC MAPPING

Surdex technicians will collect visible and identifiable features from the aerial photography that are generally shown on maps at 1"=50'. Surdex will digitize the planimetric features in the 3-D stereo environment following industry accepted practice. Field data collection of planimetric features is not included in this proposal.

Planimetric features to be shown include;

#50 scale mapping#			
Primary Roads	Unpaved Roads	Trails	Railroads- single line
Buildings	Foundations/Ruins	Concrete Pads	Under Construction Zones
Airports	Utility Substations	Parking Lots	Bridges/Abutments
Culverts (large)	Concrete Dams	Athletic Fields	Tennis Courts
Golf Course	Cemetery	Pipelines	Large Signs/Billboards
Antenna	Transmission Towers	Water Tanks	Walls-free/retaining/high
Treelines	Brushline	Major Fencelines	Swamps
Lakes/Ponds	Rivers/streams	Single Trees (35' crown)	
Alleys	Driveways	Shoulders	Public Sidewalks
Guardrails	Culverts (small)	Catch basins	In ground pools
Light Poles	Utility Poles	Traffic Light	Utility Pole w/light
Traffic light	Manholes	Single trees (25' crown)	Residential Fencelines
Curbs	Post	Small Signs	Railroads-double
Fire Hydrants	Bushes	Single Tree (>10' crown)	

Contours and Spot Elevations: Contours will be generated from a photogrammetrically compiled digital terrain model. Contours will be shown at 2 foot vertical interval and every fifth contour line will be an index contour. Contours will be shown as solid lines except in areas where the ground is obscured by vegetation. In such areas, the contours will be shown as dashed lines. Surdex does not warrant nor accept liability of the accuracy of contours in obscured areas. Spot elevations will be shown on the maps in proper position at water level on lakes, reservoirs and ponds, on hilltops, in saddles, at bottoms of depressions, at intersections of principal streets and highways and in flat areas not depicted by contours.

ORTHOPHOTO MAPPING

Digital Orthophotography: Surdex will produce orthorectified digital aerial image tiles consistent with the shapefile area of interest (AOI) and tile layout based on **one quarter of a U.S. Public Land Survey section** provided by the City of Manitowoc. **This tile layout based on the PLS sections will be overlapping to your specification (~300'-500') to aid in printing on 36" x 36" plots.** The orthoimage tiles will be provided at a horizontal scale of 1"=50' at a ground resolution of .25'. Unless specifically requested in writing, Surdex reserves the right to utilize, if available, any existing elevation model deemed suitable for orthorectification to meet the contractual accuracy requirements as stated. If suitable elevation data is not available, Surdex will generate a new elevation model using manual and automated photogrammetric techniques. If requested, Surdex will deliver the elevation model used in the orthorectification process. To improve efficiency of client acceptance, Surdex may provide, at its discretion, seamline data for reference. Standard image format shall be tiff and tiff world (.tif/.tiff) and will be delivered on external hard drive. Additional image formats are available. An additional charge may be required for additional formatting or processing.

Ortho imagery will be trimmed to the buffered boundary shown on the diagram below resulting in delivery partial image tiles with no data pixels outside the boundary.



MAPPING ACCURACY

Unless otherwise requested, the photogrammetric mapping provided under this proposal will meet or exceed American Society for Photogrammetry and Remote Sensing (ASPRS) Accuracy Standards for Large Scale Maps, **Class 1** horizontal and/or vertical accuracies as listed below. Photogrammetric mapping meeting alternate accuracies (Class 2 or 3) is available upon request. Table accuracy values below are RMSE in feet.

Map Scale	Class 1 Accuracy RMSE	Class 2 Accuracy RMSE	Class 3 Accuracy RMSE
1"=20'	0.2	0.4	0.6
1"=40'	0.4	0.8	1.2
1"=50'	0.5	1	1.5
1"=100'	1	2	3
1"=200'	2	4	6
1"=400'	4	8	12

Contour Interval	Class 1 Accuracy RMSE	Class 2 Accuracy RMSE	Class 3 Accuracy RMSE
0.5'	0.17	0.33	0.5
1'	0.33	0.66	1
2'	0.67	1.33	2
4'	1.33	2.67	4
5'	1.67	3.33	5

In areas where the ground is obscured on the photographs, such as areas of dense foliage or coniferous growth, contours may not meet the previously defined map accuracies and no warranty is expressed or implied concerning such areas. Wherever possible, however, spot elevations will be shown to provide the most complete and accurate vertical information available from the photography used for this project.

MAP TESTING PROCEDURES

Standard procedure requires that photogrammetric maps be field-checked prior to use. Obtaining field survey information for map check purposes will be the sole responsibility of the City of Manitowoc. Failure to perform field tests and notify Surdex of non-compliance with the map accuracy standards previously stated within 90 days of delivery shall be deemed an acceptance of the maps and any claims whatsoever as a result of such non-compliance are waived. In the event of timely notice of any deficiencies, Surdex's liability extends only to correcting Surdex related deficiencies and will in no case exceed the original fee or include any subsequent costs incurred by the client or others; said warranty does not extend to services, data, or control information provided by the client.

Surdex recommends map testing follow FGDC-STD-007.3-1998, Geospatial Positioning Accuracy Standards, Part 3: National Standard for Spatial Data Accuracy (NSSDA) guidelines.

<http://www.fgdc.gov/standards/projects/FGDC-standards-projects/accuracy/part3/chapter3>

SCHEDULE

The aerial photography will be scheduled immediately upon your authorization to proceed. A Project Manager will be assigned to coordinate the production and scheduling of this project. Services will be provided on a mutually agreeable schedule after receipt of the signed copy of this proposal / contract. Both seasonal and daily weather conditions dictate when acceptable data can be captured. Our Flight Control Manager will consider these factors when planning the schedule.



FEE SCHEDULE

Phase 1: Spring 2014

SERVICES	SCALE AND PRODUCT	PRICE
DIGITAL TOPOGRAPHIC MAPPING	Aerial Imagery Acquisition to support .25' Orthos, 50 scale Planimetrics and 2' contours	\$6,115

Phase 2: Early 2015

SERVICES	SCALE AND PRODUCT	PRICE
DIGITAL TOPOGRAPHIC MAPPING	Ortho Imagery Production 50 scale .25' resolution	\$12,229
	50 scale planimetric feature extraction	\$33,500
	2' contour generation	\$39,500
	Total:	\$85,229

DELIVERY ITEMS included in above fees:

- Plan, Contours, Break & Spot Point files in AutoCAD format (wgn & dgn)
- Digital data in .tif/tfw & MrSID

We look forward to working with you and your staff on this project.

Sincerely,

SURDEX CORPORATION

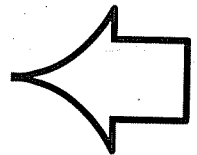
Tim Donze

Tim Donze

 Surdex Corporation Signature

ACCEPTANCE BY CLIENT

CITY OF MANITOWOC



 Client Signature


ACCEPTANCE BY CLIENT

CITY OF MANITOWOC

 Client Signature



0 3,850 7,700 15,400 23,100 30,800 Feet

 City of Manitowoc

City of Manitowoc, WI
2014 Mapping Project
Proposed Boundary Diagram

CAUTION: This diagram for estimating purposes only. Final number of points and positions may vary.



TERMS AND CONDITIONS

The following terms and conditions are incorporated in and become a part of the proposal between Client and Surdex Corporation ("Surdex"). Client and Surdex agree as follows:

ACCESS

Client shall arrange for access to and make all provisions for Surdex to enter upon all public and private lands as required for Surdex to perform its services.

INVOICES

Client shall be invoiced on a monthly or phased basis as set forth in the proposal. Payment shall be due within 30 days after Client's receipt of an invoice. Client is solely responsible for payment of services. Payment will in no way be conditional upon Client receipt of payment for Client accepted services provided by Surdex. Interest shall accrue on past due invoices at the rate of 1 ½ percent per month (18% per annum), or the maximum rate allowed by law, whichever is less, from the date that payment was first due. Payments shall be applied first to accrued interest and then to unpaid principal. Client agrees to pay Surdex's fees, costs, and other reasonable expenses, including attorney's fees, incurred in any efforts to enforce any provision of this Agreement, including efforts to compel payment of past due amounts. If a project is inactive for more than 45 days, Surdex may suspend the services and bill Client for all services performed to date. If Client does not provide evidence of tax exempt status prior to commencement of any services by Surdex then Client shall be responsible for all taxes in connection with such services.

SURDEX'S INSURANCE REQUIREMENTS

Surdex shall maintain in force throughout the term of this Agreement insurance of the types and in the minimum amounts set forth below.

- 1) WORKERS COMPENSATION: Statutory Coverage, including Employer's Liability with minimum limits of \$1,000,000.
- 2) COMMERCIAL GENERAL LIABILITY: \$1,000,000 Combined Single Limit per occurrence for Bodily Injury, Personal Injury, and Property Damages,

including Contractual Liability covering Surdex's indemnification obligations in this Agreement.

- 3) COMPREHENSIVE AUTOMOBILE LIABILITY: \$1,000,000 Combined Single Limit per accident including any auto, all owned autos, hired autos and non-owned autos.
- 4) PROFESSIONAL LIABILITY: \$2,000,000.00
- 5) AIRCRAFT LIABILITY: \$10,000,000.00
- 6) VALUABLE PAPERS: \$150,000.00

INDEMNITY

Surdex agrees to indemnify, defend and hold Client harmless from and against any and all claims, demands, suits, damages, and costs (including attorney' fees and cost of defense) due to bodily injury or property damages arising directly out of Surdex's negligence, but only to the extent that such indemnity is covered by Surdex's CGL or Professional Liability insurance.

As a material part of the consideration to Surdex, Surdex assumes all risk of damage to its property or injury to persons, including its agents, contractors and employees in performance of Services hereunder, and Surdex hereby waives all claims in respect thereof against Client, except for any claim arising out of Client's negligence or willful misconduct. As used in this Section, the term "Client" shall include Client's employees, agents and contractors, if applicable, and "Surdex" shall include Surdex's employees, agents and contractors, if applicable. Client agrees to indemnify, defend and hold Surdex harmless from and against any and all claims, demands, suits, damages, and costs (including attorney' fees and cost of defense) due to bodily injury or property damages arising directly out of Client's negligence.

TESTING

Client shall independently verify the accuracy of Surdex's services prior to using or relying on the same (or providing the same to others for any reason), and in an event no later than six (6) months after completion of the services (the "Claim Period"). If Client fails to take commercially reasonable efforts to verify the accuracy of Surdex's services as required herein then Client shall be deemed to have waived all claims and rights of recovery against Surdex, regardless of legal theory.



RIGHT TO CURE

If Client discovers errors in the services within the Claim Period, Client shall promptly notify Surdex and Surdex shall have the right for ninety (90) days after receipt of Client's notice (or such longer period if 90 days is insufficient) to correct such defects at Surdex's sole cost.

LIMITATION OF LIABILITY

To the fullest extent permitted by law, Surdex's total aggregate liability to the Client arising out of this Agreement, whether arising in contract, warranty, tort (including negligence), strict liability, or otherwise, is limited to the Total Price paid to Surdex.

NOTWITHSTANDING ANYTHING TO THE CONTRARY, NEITHER CLIENT NOR SURDEX SHALL BE LIABLE TO THE OTHER FOR, AND EACH EXPRESSLY WAIVES THE RIGHT TO RECOVER, CONSEQUENTIAL, INDIRECT, PUNITIVE, SPECIAL OR EXEMPLARY LOSSES OR DAMAGES, WHETHER ARISING IN CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY OR OTHERWISE, INCLUDING BUT NOT LIMITED TO LOSSES OF USE, PROFITS, BUSINESS, REPUTATION OR FINANCING.

OTHER

Any services being provided to Client by Surdex may be terminated by either party upon ten (10) days prior written notice, and in such event Surdex shall be paid by Client for all services performed up to and including the termination date, including reimbursable expenses.

Neither Client nor Surdex shall be liable to the other for damages or delay in performance caused by acts of God, strikes, labor disputes, accidents or any other event beyond the control of the other or its employee's and agents.

All disputes arising out of or relating to this Agreement shall be decided by arbitration, in accordance with the rules of the American Arbitration Association. The prevailing party shall be awarded attorneys' fees and costs.

Surdex agrees that all materials, reports, drawings, studies, specifications, estimates, maps, computer data tapes, computations and other materials prepared by or for Client under the terms of this Agreement shall upon proper payment by Client to Surdex be the property of the Client. However, any processes, procedures, programs, software, or

similar practices of Surdex, whether developed prior to or during the project, shall remain the property of Surdex until sold or licensed to Client for its use or use by others for separate compensation. Client shall not alter the same in any manner and shall waive any claim against Surdex and shall, to the fullest extent permitted by law, indemnify, defend, and hold Surdex harmless from any claim or liability for injury or loss arising from unauthorized alteration of Surdex's work product.

Surdex shall keep confidential all information obtained from and designated as confidential by Client and shall not divulge any confidential information concerning the Project to any person or entity (other than Surdex's subcontractors, employees or other persons or entities to the extent necessary to complete the services) unless written approval is granted by the Client or as ordered by a court of competent jurisdiction.

This Agreement shall be governed by and construed in accordance with the laws of the State of Missouri, without regard to its conflicts of laws rules. Should a conflict of terms arise from agreed to flow down provisions, the terms of this agreement shall prevail.

This Agreement shall be binding upon and inure to the benefit of the parties hereto, their successors and assigns.