

December 6, 2000

Ms. Patsy Horton
GIS Coordinator
City of Rapid City
300 Sixth Street
Rapid City, SD 57701

RE: Pennington County Photography and Rectified Imagery

Dear Ms. Horton:

We are pleased to present this proposal / contract for aerial photography and image rectification services for the areas outlined in your RFP dated November 10, 2000 (approximately 72 square miles of land).

Aerial Photography

We propose obtaining new black and white aerial imagery during the Spring of 2001, after all snow melt and during acquisition windows where the sun angle will be at 30 degrees or greater. We propose obtaining the photography in stereo at 5200' above the terrain with a 66% forward and 32% side overlap. The resulting photo scale will be 1:10400 or 1"=867' approximately. Flight lines will be designed along section centers or section boundaries and will cover a one square mile area approximately within the center 70% of each exposure. Every other exposure of photography (approximately) will be selected for scanning to provide full image coverage of the areas selected in your RFP. Additional images in each area will be available (but not scanned) to provide full stereo coverage and provide options for future mapping such as orthophotography, elevation models and topographic mapping.

We will ensure that aerial photography for a contiguous block area will be obtained on the same day of acquisition to ensure a good fit in imagery.

A complete flight diagram will be provided prior to flight operations. We have designed all flight lines at N/S or E/W orientations for ease in image processing and rectification operations. We have estimated 214 exposures of photography.

Control

There is currently no ground control or airborne photo control designated for this project. Georeferencing will be accomplished through fitting imagery to existing data.

Image Scans

We will utilize our Intergraph/Zeiss photogrammetric scanner and scan the original film at 28 microns (907 dpi). Approximately every other exposure will be scanned to provide complete coverage of the areas requested. Image resolution will be approximately 1' in ground sample distance (GSD).

Georeferencing of Images

We will warp the imagery to fit existing map data using a "best fit" approach. Final determination of the source of the map data to be used as the control will need to be finalized prior to project start. Options can include 7.5 minute quad maps, existing plat and or road coverage vector data, and DOQQ imagery. In the case of DOQQ and existing vector data we will warp the new imagery to fit the provided coordinate system and datum. In the case of 7.5 minute quad maps used as the control, we can project this data to various targeted coordinate systems and datums.

Adjacent imagery will be mosaiked for good continuity within each project area. Final image tiles will be cut from the mosaiks. We will need further discussions of image tiling and file name convention.

Our process for providing rectified imagery that meets the "best fit" approach to rectification involves the selection of a number of control locations that are photo identifiable and matching these to control locations within an existing map base. Typically twenty to fifty locations are identified within each exposure of photography to provide a framework for the program to "warp" the imagery to fit the existing mapping. This process works quite well in areas of little relief. Some of the areas selected in your project may have distortions in fit and image-to-image ties based upon the heavy relief.

All imagery will be provided on CD as GeoTiffs that also have a ".tfw" georeferencing file for compatibility with ESRI software such as ArcInfo and ArcView.

Adjacent images will be obtained on the same date of photography and they will be image processed to provide tonal balance. Digital images will be provided that have no pixel gaps between adjacent images and will edge match as well as the "best-fit" approach will allow.

File naming can be provided by legal description (section,township,range) or project area name or some other method determined by the City.

Deliverables

- One (1) set of 9" x 9" black and white contact prints of ALL exposures of photography.
- One (1) flight line index.
- One (1) Camera Calibration Report
- One (1) set of digital rectified imagery with a ground sample distance (GSD) of approximately one foot. Images will be delivered on CD with associated ".tfw" georeferencing files, compatible with ArcInfo.

Schedule

We propose the following schedule for this project:

April 1 through April 30	Flight Acquisition
April 15 through May 15	Photo Lab Operations
May 1 through May 20	Image Scan Operations
May 31, 2001	Delivery of contact prints, line index, report
May 20 through July 31	Image Rectification Operations
June 15, 2001	Delivery at 25% of Imagery
June 30, 2001	Delivery at 50% of Imagery
July 15, 2001	Delivery at 75% of Imagery
July 31, 2001	Final Delivery
	Progress Reporting Strategy

Horizons appoints Linda VanVlack as the project manager for this contract. She will provide ongoing communication during the project duration. We recommend the appointment of one person as the Project Manager from the City as well. All changes to scope of work and schedule would be directed by these two individuals.

This project is currently set-up with bi-weekly and monthly milestones. We recommend a reporting schedule of bi-weekly. The progress reports can be formatted to fit with City needs and requirements, email communication is our preferred method. In general these written reports will indicate our progress within our targeted schedule.

Pricing

Item	Description	Price
1.	Stereo B/W aerial photography and photo lab	\$ 10,000
2.	Image scans and digital rectification of the imagery.	\$ 21,000
	Total Price:	\$ 31,000

Payment of our invoice will be due within 30 days after delivery and invoicing.

We appreciate the opportunity of furnishing this proposal and look forward to being of service. We would appreciate your purchase order and/or signing and returning a copy of this proposal, which will serve as our contract and notice to proceed. If you have any further questions, please do not hesitate to contact me.

Respectfully submitted,
HORIZONS, INC.

Becky Morton
Technical Representative

Proposal accepted for City of Rapid City by:

Signature _____
Name Jim Shaw
Title Mayor
Date _____
Tax Exempt # or Resale # _____
Purchase Order or Client Job No. _____
Total Contract Amount \$ _____

Attest:

James F. Preston
Finance Officer

(seal)