

**KDHE - SURFACE MINING SECTION
Abandoned Mined Land Reclamation Program**

**SPECIFICATIONS FOR 2016 AERIAL PHOTOGRAPHY
and
DIGITAL CONTOUR MAPPING**

These are the Specifications for aerial photography and digital contour mapping of abandoned mined land which are to be reclaimed by KDHE to abate hazards which are the result of past mining. The sites are located in Crawford and Cherokee Counties, in Southeast Kansas.

The specific locations to be photographed and mapped under these Specifications will be shown on attached copies of portions of the USGS Quad maps for southeast Kansas.

SPECIFICATIONS FOR AERIAL PHOTOGRAPHY

The aerial photography shall conform to the National Map Accuracy Standards. The negative scale for the focal length of the camera used shall be capable of producing contour mapping at two foot contour intervals. However, mapping shall be performed at the two foot contour interval, with a 0.5 foot contour accuracy. The SMS anticipates the use of a negative scale of 1 inch equal to 200 feet to produce a two-foot contour vertical mapping accuracy of at least one-half (1/2) the contour interval, and a spot elevation accuracy within one-fourth (1/4) the contour interval.

The aerial photography portion of the contract shall include furnishing all labor, equipment, tools, materials, and supervision for the aerial photography. All aerial photographs shall be taken between January 15, 2014 and March 15, 2014, at a time when leaves are off the vegetation, and maximum ground visibility is possible. Establishment of ground control and subsequent contour mapping from the photographs will be by the KDHE prior to the date the photography is to take place. The contractor shall advise the KDHE at least two weeks before the photography is expected to be performed so the control point surveying can be coordinated accordingly. As part of the aerial photography portion of the Contract, the SMS shall receive the following:

- a. Diapositives of the photos of each area requested
- b. Black & white contact prints of the photos of each area requested
- c. Negatives of the photography for each area, including the "trailer" photos.

- d. Current Camera Calibration Documentation & Certification for the camera(s) used for the aerial photography.

All proposals, and invoices, for the aerial photography work shall include a breakdown of the prices for the above items, as well as for mobilization / demobilization, frame charges, flight mileage charges, Analytical Aero-Triangulation, Soft Copy Triangulation, & 3D Topographical DTM Mapping. All proposals shall also include an estimate of the number of frames/negatives expected for each site, as well as estimate of the number and location of control points needed for contour mapping each site.

SPECIFICATIONS FOR CONTOUR MAPPING

These are the Specifications for the Digital Contour Mapping services from aerial photography for the designated areas taken under the above specifications. Mapping shall not commence until the SMS has reviewed and accepted the aerial photography work.

For proposal purposes, the designated 1,067 acres of the estimated total area of 1,800 acres to be photographed is to be included in the mapping costs. The exact areas to be mapped shall be designated by the SMS after review and approval of the aerial photographs. Note the sites are in areas which have been strip mined for coal. Consequently, the terrain may be extremely rough, often heavily vegetated, and containing areas with considerable variations in elevation over short distances.

The mapping shall conform to the following specifications:

1. All text and contour annotation shall have the Z axis elevation set to zero, or it shall be on a different layer(s). All utilities, power poles, buildings, roads, streams, other reference lines, etc., shall have the Z axis elevations set to zero, unless they are at actual ground elevations.
2. Mapping shall include the .TIN (Triangular Irregular Network) file data. The .TIN file data shall be compiled using a grid of spot elevation “mass” points along with breaklines, and skeletal line strings of points, which represent breaks in grades, and/or surface features such as ridge tops, channels, etc.
3. The contour mapping and .TIN file data shall be provided in a format for use with AutoCad 2007, or later version. The contour data shall be batch, and manually edited, converted to a .DWG file, and furnished on a CD(s).

4. KDHE will provide the ground control information, and/or coordinate the details for establishment of the elevations and coordinates to be used for performing the mapping work, after the order is placed.
5. All contours shall be at 2 foot intervals and smoothed.
6. All contours shall be on their respective layers (i.e., 10' contours on one layer and 2' contours on another).
7. If any apparent discrepancies, anomalies, or errors are noted for the control point information furnished by KDHE, the Contractor shall cease mapping that site and contact KDHE immediately to have the matter resolved before mapping can commence.
8. All mapping shall be aligned to NAD 83, Kansas South, State Plane Coordinates.
9. A digital file, at 1" = 200', or larger scale, of the contour mapped area shall be furnished for SMS review and approval (via e-mail or CD) prior to the Contractor making final delivery of the items required in these specifications.
10. A list of all layers and other parameters used to prepare the contour map of the site shall be provided so that the SMS can duplicate the mapping from the raw data as needed.
11. All final submittal of required items shall be furnished to KDHE within two weeks after acceptance of the mapping by the KDHE (per Item 9. above)

All quotes and invoices for the contour mapping work shall be on a Unit Price basis. The Unit Prices shall include all labor, equipment tools, supervision, and materials required to perform the mapping per acre, and all costs for furnishing each unit of the other items noted in these specifications.

Besides the unit prices for each item, the SMS evaluation of the proposals will also consider the costs associated with the number of frames/diapositives proposed, and the number and location of the control points needed to be surveyed by the KDHE.