

# **Scott County GPS Corner Survey**



## **Request for Proposals**

**March 12, 2007**

**Revised March 22, 2007 – Project Scope of Services § 5.b., p. 3.**



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## Introduction and Background

### Project Introduction

Scott County, Iowa is requesting proposals to collect survey grade GPS positions on a number of section corners, ¼ corners or other PLSS corners within the county. The survey is intended to support the development of a countywide GIS parcel conversion effort and to enhance GPS control within the county. Corners will be collected in both incorporated and unincorporated Scott County. Some subdivision corners or other important cadastral corner features may also be requested but this is primarily a PLSS corner survey. We hope to actively involve local surveyors in the future maintenance and expansion of this control network as an ongoing public resource.

A parcel mapping project will run concurrently with the survey project. As a consequence, the company selected for the GPS survey control project will be required to work closely with the Scott County GIS parcel conversion consultant.

### Background

The Public Land Survey System (PLSS) in Scott County was originally surveyed more than 150 years ago. The Scott County Secondary Roads Department continues to perpetuate a number of these corners as road projects and other duties allow.

Since 1990, Scott County has required that corner certificates be filed with the Recorder's Office. Recently, the Recorder's Office began scanning and indexing all newly recorded documents and have imaged all previously recorded corner certificates dating back to 1990. The scanned certificates are available both online and in the Recorder's office via their document imaging and indexing system developed by COTT Systems of Worthington, Ohio.

In addition to the corner certificates filed with the Recorder's Office, the Secondary Roads Department keeps binders containing paper monument records for many other corners. Staff have recently scanned the Secondary Road's monument records and are in the process of referencing them in GIS. A consolidated corner database of all available corner monument records and certificates will be made available to the consultant of the GPS survey project during project planning and field data collection.

In 2004 Scott County, Iowa contracted with Dan Corbin of Dan Corbin, Inc. to assist the county in selecting a company to provide digital orthophotography. Dan Corbin also provided QA/QC for the aerial photo project and produced a high quality GPS control network. Documents and data related to the 2005 Scott County GPS Survey Control Network can be found on the Scott County website at the following URL: [http://www.scottcountyiowa.com/it/gis\\_control.php](http://www.scottcountyiowa.com/it/gis_control.php).

In February of 2007, Scott County will finalize a contract with a GIS firm to provide GIS and parcel conversion services. The parcel conversion process will involve creating a seamless countywide parcel database from (predominantly) original source materials such as surveys, plats and deeds. The parcel conversion consultant will use corner coordinates as a foundation layer of the GIS mapping effort.

More information about the GIS Parcel Conversion project can be found here: [http://www.scottcountyiowa.com/it/gis\\_docs.php](http://www.scottcountyiowa.com/it/gis_docs.php).

## Project Scope of Services

### Project Overview

The goal of the project is to acquire survey grade coordinates on selected section corners, ¼ corners and other significant property monuments as identified by Scott County. The Consultant will be required to occupy the corner (reestablished and tied-out as necessary using standard practices) and assign state plane coordinates and elevation values using rapid static methods. Corner certificates are to be drawn up and recorded using the corner certificate template provided by Scott County (see “Attachment A, Scott County Corner Certificate” and “Attachment B, Iowa Administrative Code, Chapter 12 – Minimum Standards for U.S. Public Land Survey Corner Certificates”).

The Scott County Recorder’s Office, Secondary Roads Department and GIS staff will be working to identify the corners to be surveyed. The intent of Scott County is not to capture all available corners, but rather to collect those deemed of particular use or importance to the cadastral conversion project and to densify the available control. While the final number of corners to be collected is not yet known, we expect it may be between 200-500 corners depending on final project budget and consultant fees.

The majority of the corners participating in the survey will be found, uncovered and pre-marked by Scott County Secondary Roads Department and City of Davenport staff prior to commencement of the survey. Those corners within the city limits of Bettendorf will not be pre-marked. Some corners may require monument ties or the monuments themselves to be reset. However, in the interest of making the most efficient use of time and resources we may omit certain difficult points from the project (lost corners for example). The cost estimates requested in this RFP are separated according to corner conditions and whether corners have been pre-marked or not.

The survey consultant will assign a Project Manager to serve as a single point of contact for the duration of the project. The Project Manager will facilitate communication and collaborate with Scott County and the GIS parcel conversion consultant as necessary. The Project Manager will attend meetings or teleconferences as necessary and provide monthly progress reports to aid in project and schedule monitoring.

Project Specifications are further detailed below:

### Project Specifications

1. Occupy section, quarter-section, and property corners identified.
2. Verify and tie-out corners using standard practices.
3. Repair or replace damaged iron pins and nails in accordance with standard practices. For instances where insufficient durable physical objects exist to provide a reference tie for PLSS corners, the Consultant shall place iron pins with witness posts whenever possible and practical.
4. Reestablish obliterated (see definition) corner markers in accordance with standard practices. Lost corners (see definition) will be evaluated by the county for inclusion in the project.
5. Establish coordinates (northing, easting and elevation) for all project corners.

- a. Horizontal coordinates to be delivered in U.S. State Plane, Iowa South Coordinates (1402) with units in survey feet and shall meet or exceed National Geodetic Survey (NGS) 1st-order accuracy standards using the 1996 HARN-adjusted North American Datum of 1983 (NAD83) (See table below).
- b. Vertical measurements will be referenced to the existing North American Vertical Datum of 1988 (NAVD88) GPS monuments in the Scott County Network. Vertical elevations shall be transferred from the existing network monuments utilizing GPS techniques and the Geoid 2003 model to produce NAVD88 orthometric elevations for each project corner. (§ Revised 3/22/2007).

Table 1. -- Geometric relative positioning accuracy standards for three-dimensional surveys using space system techniques.

Survey categories	Order	(95 percent confidence level)			
		Minimum geometric Accuracy standard			
		Base error e (cm)	Line-length Dependent error		
		p (ppm)	a (1:a)		
Global-regional geodynamics; deformation measurements .....	AA	0.3	0.01	1:100,000,000	
National Geodetic Reference System, "primary" networks; regional-local geodynamics; deformation measurements .....	A	0.5	0.1	1: 10,000,000	
National Geodetic Reference System, "secondary" networks; connections to the "primary" NGRS network; local geodynamics; deformation measurements; high-precision engineering surveys .....	B	0.8	1	1: 1,000,000	
National Geodetic Reference System (Terrestrial based); dependent control surveys to meet mapping, land information, property, and engineering requirements .....	(C)				
	1	1.0	10	1: 100,000	
	2-I	2.0	20	1: 50,000	
	2-II	3.0	50	1: 20,000	
	3	5.0	100	1: 10,000	

Note: For ease of computation and understanding, it is assumed that the accuracy for each component of a vector base line measurement is equal to the linear accuracy standard for a single-dimensional measurement at the 95 percent confidence level. Thus, the linear one-standard deviation (s) is computed by:

$$s = \pm[\sqrt{e^2 + (0.1d \cdot p)^2}]/1.96. \quad (\text{See appendix B.})$$

Where, d is the length of the baseline in kilometers. 5-26-68

- c. With some exceptions allowed as the result of technology advances in the field, the survey will follow the methodologies described in the "Geometric Accuracy Standards and Specifications for Using GPS Relative Positioning Techniques" published by the Federal Geodetic Control Committee reprinted with correction on August 1, 1989 ([http://www.ngs.noaa.gov/FGCS/tech\\_pub/GeomGeod.pdf](http://www.ngs.noaa.gov/FGCS/tech_pub/GeomGeod.pdf)). Notable exceptions include:
          - i. Excellent results are possible using a sampling rate of 5-10 seconds which can result in occupation times as little as 10 minutes as opposed to the 60-120 minute requirement when using triple differencing processing or the 20-30 minute minimum requirement stated in the standards. This results in substantial manpower savings.
          - ii. The recommendation that three receivers be observing simultaneously becomes irrelevant if all monuments are occupied at least twice and at least ten percent of all monuments will be occupied at least three times as stated in the standard.
6. A free adjustment will be made of the entire network to check for errors and/or substantial misclosures. A constrained adjustment will then be made based on the HARN points and existing 2005 Scott County Geodetic Control Network which would surround the county and the project site to assure geometric integrity.
7. In addition to Iowa State Plane Coordinates and elevation values for all points, data on each point shall also include:
  - a. Station identifier (name and/or survey point number).
  - b. Corner reference using standard county naming convention (see definitions).
  - c. Date collected.
  - d. Beginning and ending occupation times.
  - e. Name of surveyor.
  - f. Receiver identifier (make, model).
  - g. Description of monument and center mark if available.
  - h. Corner monument condition. The distance of the top of the corner monument above or below the ground (when available). Negative values indicate a recessed or buried monument, such as those set in road ways below the traveled surface. This attribute is expressed in whole inches.
8. Holes dug on the travel portion of the roadway to expose corners must be filled by end of day. Holes must be adequately marked while opened and unattended. Minor holes required to be chiseled from asphalt paved roads may be filled with existing material, followed by a notification to the County. County shall be notified if a noticeable depression is made on paved roads so the appropriate repairs can be made.
9. Consultant must provide their own safety equipment and appropriate signage while working on this project.
10. The Consultant will prepare an accuracy report in accordance with the reporting standards outlined in the Federal Geographic Data Committee's (FGDC) publication on "Geospatial Positioning Accuracy Standards – Part 2: Standards for Geodetic Networks" (See Attachment C).
11. The Consultant will coordinate with Scott County's selected parcel conversion vendor as the conversion schedule requires.

12. Any additional costs above and beyond the scope of the contract will be negotiable and will require a contract addendum approved by both parties.

## Project Deliverables

1. Final horizontal and vertical control point data in MS Excel, AutoCAD and ESRI GDB file format with sufficient precision and appropriate extents to support the surveyed accuracy of the data. (Current release version is 9.2)
2. A standard FGDC accuracy report on points collected including network adjustments, network diagrams, closure errors, etc. Report format shall include: Complete PDF document, MS Word or Excel files as appropriate, and one printed and bound report.
3. Digital photos for all land corners surveyed (minimum two photos per corner).
4. Paper and PDF file format copies of all Scott County Public Land Survey Section Corner Certificates (and any other tie sheets) created as part of the project. Corner Certificates must use the template shown in "*Attachment A, Scott County Corner Certificate*".

## Project Schedule

The project will progress in geographic increments so that the county is surveyed and mapped one portion at a time. During project planning sessions with Scott County staff, the GIS parcel conversion consultant and the GPS survey consultant, the project delivery areas will be determined. The project areas will most likely coincide with existing townships and municipal boundaries in the rural areas and smaller towns, and by municipal boundaries, sections or groups of sections in Davenport and Bettendorf.

Once the individual project areas are determined, the typical workflow will proceed as follows:

1. County Secondary Roads Department or City of Davenport staff recon corners to be included in the survey. They uncover corners, mark them with flags or paint and provide a mapping grade GPS coordinate for the point.
2. Survey consultant receives coordinates and occupies corner according to project specifications. Survey consultant provides coordinates and other deliverables to Scott County and the GIS parcel conversion consultant.
3. Coordinates are reviewed and any questions, errors or omissions conveyed back to the survey consultant.
4. Parcel conversion consultant proceeds to use control in the mapping project and survey consultant surveys the next mapping area.

The project schedule will mirror the mapping project schedule which will continue from approximately April, 2007 to October, 2008.



## RFP Submissions Requirements

### Response Component

The County requests that the Consultant organize their response according to the format below. This will support a more effective review of RFP responses by Scott County staff and provides the Consultant with a clear proposal template to follow.

- Cover Letter
- Table of Contents
- Firm History/Background
- Technical Approach Summary – Your assessment of the project including survey methods, best practices, discussion of pertinent technical issues and quality control procedures relating to the project.
- Project Management Approach – Please describe your project management process. This may include a project management structure diagram, frequency and methods of communication, resource planning, project metrics, sample project reports, etc.
- Completed RFP Worksheet – The included RFP Worksheet contains several standard questions which can be answered by filling in your responses directly on the worksheet. Four items in the RFP Worksheet require attachments/addendums. Please see “Attachment G, RFP Worksheet” for more information.
- Project Schedule. Please provide a Gantt chart or similar. Schedule should reflect the anticipated April, 2007 start date and extend to October, 2008. Identify project benchmarks, work breakdowns etc as necessary.
- Signed copy of “Attachment D, Scott County Standard Terms and Conditions”.
- Signed and completed Scott County Project Fee Schedule (see “Attachment E, Scott County Project Fee Schedule”). The price should reflect labor as well as all tools, supervision, travel time and materials required to perform the work requested.
- A signed copy of “Attachment E – Scott County Project Fee Schedule”.
- Completed copy of “Attachment F – Consultant Checklist”. Please initial each item as you verify that they have been included in your response.

### Proposal Format and Copies

The Consultant will supply three bound, printed copies of their RFP response and one complete digital copy in PDF format on CD. Please ensure that the PDF version of the response matches the printed version.

### RFP Submittal Schedule and Delivery Instructions

All questions regarding the RFP should be submitted in writing via mail or email to:

Scott County GIS  
Attn: Ray Weiser, GIS Coordinator  
Scott County Administrative Center  
600 W 4<sup>th</sup> St  
Davenport, IA 52801-1030  
Email: [gis@scottcountyjowa.com](mailto:gis@scottcountyjowa.com)

The deadline for presenting questions is Monday, March 26, 2007. Questions will be routinely summarized and answered as received. A final list of all questions and responses will be distributed to all Consultants on or before Wednesday, March 28, 2007.

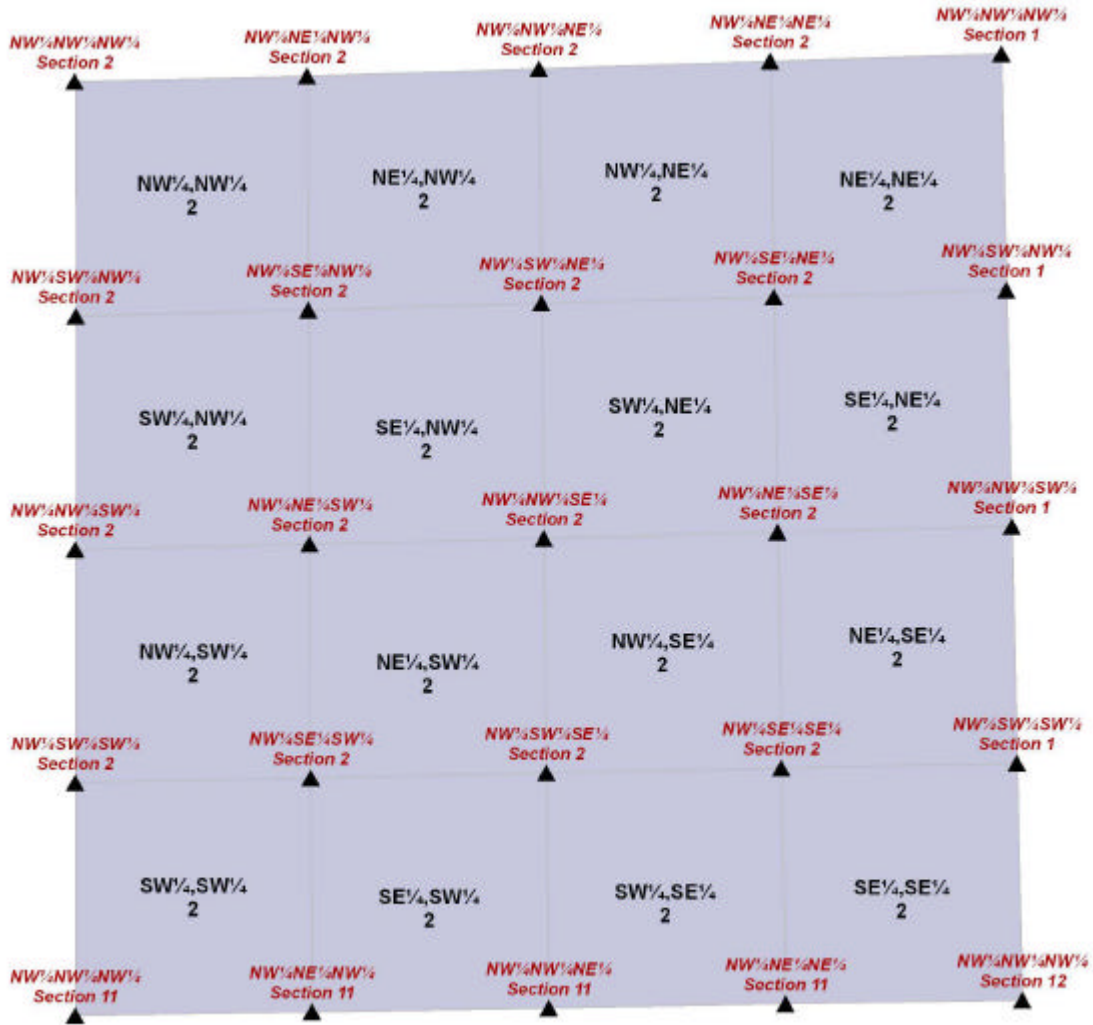
**RFP's should be placed in a sealed envelope, clearly marked as "Scott County GPS Corner Survey RFP" and mailed or delivered to:**

Scott County Purchasing Department  
Attn: Robert Holliday, CPPB Purchasing Specialist  
Scott County Administrative Center  
600 W 4<sup>th</sup> St  
Davenport, IA 52801-1030  
Email: [purchasing@scottcountyiowa.com](mailto:purchasing@scottcountyiowa.com)

**RFP responses must be received by the Scott County Purchasing Department no later than 4:30 PM on Monday, April 2, 2007. Late responses will not be considered.**

## Definitions

County naming convention: Priority is given to the south and east side of each section. The only change to this is along the south county line between Muscatine County. A sample section is annotated below.



Obliterated corner: A corner for which its monument/marker cannot be found after a diligent search, but ties and/or other evidence exist which indicate the proper position of the monument/marker.

Lost corner: A corner for which its monument/marker cannot be found after a diligent search, and no ties and/or evidence exist which indicate the proper position of the monument/marker.

# Attachments

## Attachment A Scott County Corner Certificate

SLSI 9-94

UNITED STATES PUBLIC LAND SURVEY CORNER CERTIFICATE

OF


Land Survey Monuments situated in Section \_\_\_\_\_, Township \_\_\_\_\_, Range \_\_\_\_\_, of the Fifth Principal Meridian, \_\_\_\_\_ County, Iowa. Previously recorded in \_\_\_\_\_ in County Recorder's Office.  
(book, page, document number, etc.)

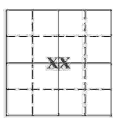
(Show reason for preparing this certificate, the evidence and detailed procedures used in establishing the corner positions and monumentation found or placed.)  
Monument Description and Remarks: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_


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**PLAN - VIEW**

(Show a minimum of three reference ties to durable physical objects, relevant monuments and physical conditions that will enable recovery of the corner.)







Iowa State Plane South Coordinates, NAD1983 (ft): <i>(If Determined):</i> X: _____ Y: _____	Elevation, NGVD1988 (ft): <i>(If Determined):</i> Elevation: _____
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List Corners to be Indexed			
Corners	Section	Twp	Range

**Attachment B**  
**Iowa Administrative Code, Chapter 12 – Minimum Standards for U.S. Public  
Land Survey Corner Certificates**

IAC 11/14/01

Engineering and Land Surveying

[193C] Ch 12, p.1

CHAPTER 12  
MINIMUM STANDARDS FOR U.S. PUBLIC LAND SURVEY  
CORNER CERTIFICATES  
[Prior to 11/14/01, see 193C—2.8(355)]

**193C—12.1(542B) General statement.** Each land surveyor shall comply with the minimum standards for preparing a U.S. Public Land Survey Corner Certificate as described by statute or administrative rule. The minimum standards in this chapter shall apply to every corner certificate prepared in this state.

**193C—12.2(355) U.S. Public Land Survey Corner Certificate.**

**12.2(1).** A corner is considered a part of the U.S. Public Land Survey System if it has the status of a corner of a:

- a) Quarter-quarter section or larger aliquot part of a section.
- b) Fractional quarter-quarter section or larger fractional part of a section.
- c) Government lot.

**12.2(2)** A U.S. Public Land Survey Corner Certificate shall be prepared by the surveyor as part of any land surveying which includes the use of a U.S. Public Land Survey System corner if one or more of the following conditions exist:

- a) There is no certificate for the corner on file with the recorder of the county in which the corner is located.
- b) The surveyor in responsible charge of the land surveying accepts a corner position which differs from that shown in the public records of the county in which the corner is located.
- c) The corner monument is replaced or modified in any way.
- d) The reference ties in an existing public record are incorrect or missing.

**12.2(3)** A U.S. Public Land Survey Corner Certificate shall comply with the following requirements:

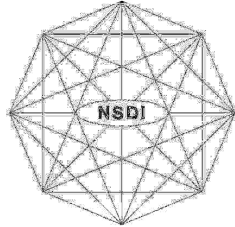
- a) The identity of the corner, with reference to the U.S. Public Land Survey System, shall be clearly indicated.
- b) The certificate shall contain a narrative explaining:
  - 1) The reason for preparing the certificate.
  - 2) The evidence and detailed procedure used in establishing or confirming the corner position whether found or placed.
  - 3) The monumentation found or placed perpetuating the corner position with an accurate description of each monument including but not limited to size, shape, material type, capped with license number, and color.
  - 4) The extent of the search for an existing monument when the corner is reset as obliterated or lost.
- c) The certificate shall contain a plan-view drawing depicting:

- 1) Relevant monuments including the reference monumentation and an accurate description thereof.
- 2) Physical surroundings including highway and street centerlines, fences, structures and other artificial or natural objects as applicable that would facilitate recovery of the corner.
- 3) Reference ties in sufficient detail to enable recovery of the corner. There shall be at least three reference ties from the corner to durable physical objects near the corner which are located so that the intersection of any two of the ties will yield a strong corner position recovery. All ties shall be measured to one-hundredth of a foot.
- d) The certificate shall bear the signature of the land surveyor, a statement certifying that the work was performed by the surveyor or under the surveyor's direct personal supervision, the date of signature, and the surveyor's Iowa license number and legible seal as provided in rule 193C—6.1(542B). Ch 12, p.2 Engineering and Land Surveying[193C] IAC 11/14/01

**12.2(4)** The surveyor shall record the required U.S. Public Land Survey Corner Certificate and forward a copy to the county engineer of the county in which the corner is located within 30 days after completion of the surveying. These rules are intended to implement Iowa Code sections 355.3, 355.11 and 542B.2. [Filed 10/24/01, Notice 8/8/01—published 11/14/01, effective 1/1/02]

**Attachment C**  
**Geospatial Positioning Accuracy Standards – Part 2: Standards for**  
**Geodetic Networks**

*(See Next Page)*



National Spatial Data Infrastructure

## Geospatial Positioning Accuracy Standards Part 2: Standards for Geodetic Networks

Federal Geodetic Control Subcommittee  
Federal Geographic Data Committee

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Federal Geographic Data Committee

Department of Agriculture • Department of Commerce • Department of Defense • Department of Energy  
Department of Housing and Urban Development • Department of the Interior • Department of State  
Department of Transportation • Environmental Protection Agency  
Federal Emergency Management Agency • Library of Congress  
National Aeronautics and Space Administration • National Archives and Records Administration  
Tennessee Valley Authority



## Federal Geographic Data Committee

Established by Office of Management and Budget Circular A-16, the Federal Geographic Data Committee (FGDC) promotes the coordinated development, use, sharing, and dissemination of geographic data.

The FGDC is composed of representatives from the Departments of Agriculture, Commerce, Defense, Energy, Housing and Urban Development, the Interior, State, and Transportation; the Environmental Protection Agency; the Federal Emergency Management Agency; the Library of Congress; the National Aeronautics and Space Administration; the National Archives and Records Administration; and the Tennessee Valley Authority. Additional Federal agencies participate on FGDC subcommittees and working groups. The Department of the Interior chairs the committee.

FGDC subcommittees work on issues related to data categories coordinated under the circular. Subcommittees establish and implement standards for data content, quality, and transfer; encourage the exchange of information and the transfer of data; and organize the collection of geographic data to reduce duplication of effort. Working groups are established for issues that transcend data categories.

For more information about the committee, or to be added to the committee's newsletter mailing list, please contact:

Federal Geographic Data Committee Secretariat  
c/o U.S. Geological Survey  
590 National Center  
Reston, Virginia 22092

Telephone: (703) 648-5514

Facsimile: (703) 648-5755

Internet (electronic mail): [gdc@usgs.gov](mailto:gdc@usgs.gov)

Anonymous FTP: <ftp://fgdc.er.usgs.gov/pub/gdc/>

World Wide Web: <http://fgdc.er.usgs.gov/fgdc.html>

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2.1 Introduction

2.1.1 Objective

This document provides a common methodology for determining and reporting the accuracy of horizontal coordinate values and vertical coordinate values for geodetic control points represented by survey monuments, such as brass disks and rod marks. It provides a means to directly compare the accuracy of coordinate values obtained by one method (e.g., a classical line-of-sight traverse) with the accuracy of coordinate values obtained by another method (e.g., a Global Positioning System (GPS) geodetic network survey) for the same point.

2.1.2 Scope

Geodetic control surveys are usually performed to establish a basic control network (framework) from which supplemental surveying and mapping work, covered in other parts of this document, is performed. Geodetic network surveys are distinguished by use of redundant, interconnected, permanently monumented control points that comprise the framework for the National Spatial Reference System (NSRS) or are often incorporated into the NSRS.

These surveys must be performed to far more rigorous accuracy and quality assurance standards than those for control surveys for general engineering, construction, or topographic mapping purposes. Geodetic network surveys included in NSRS must be performed to meet automated data recording, submittal, project review, and least squares adjustment requirements established by the Federal Geodetic Control Subcommittee (FGCS).

2.1.3 Applicability

Geodetic network surveys are often employed when large geopolitical area (e.g., county-level or larger) mapping control is required, and where seamless connection with adjacent political areas is critical. Accurate network control may also be required for controlling interstate transportation corridors (highways, pipelines, railroads, etc.); long-span bridge construction alignment; geophysical studies; structural deformation monitoring of dams, buildings, and similar facilities.

2.1.4 Related Standards

Part 6: Point Profile, The Spatial Data Transfer Standard (FGDC, 1998) defines the format to be used to transfer geodetic coordinate data, including the accuracy of the coordinate values, between geographic information systems.

Part 3, National Standard for Spatial Data Accuracy (NSSDA), Geospatial Positioning Accuracy Standards (FGDC, 1998) provides the statistical and testing methodology for estimating the accuracy of point coordinate values produced from maps and other digital geospatial data with respect to geo-referenced ground positions of higher accuracy.

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The public review draft of Part 4, Standards for A/E/C and Facility Management, Geospatial Positioning Accuracy standards, uses the NSSDA for accuracy testing and verification. The NSSDA may be used for fully geo-referenced maps for A/E/C and Facility Management applications such as preliminary site planning and reconnaissance mapping.

#### 2.1.5 Standards Development Procedures

Draft accuracy standards for geodetic networks were developed by the FGCS Methodology Work Group, Federal Geographic Data Committee. The draft accuracy standards were released for public review through the FGCS and evolved into the final form presented in Table 2.1 of this publication.

#### 2.1.6 Maintenance

The U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, National Geodetic Survey, maintains accuracy standards for geodetic networks for the Federal Geodetic Control Subcommittee, Federal Geographic Data Committee. Address questions concerning accuracy standards for geodetic networks to: Director, National Geodetic Survey, NOAA, N/NGS, 1315 East-West Highway, Silver Spring, Maryland 20910.

2.2 Testing Methodology And Reporting Requirements

2.2.1 Accuracy Standards

Note that the following accuracy standards supersede and replace the accuracy standards found in FGCC 1984 and FGCC 1988 (see Section 2.3). The classification standard for geodetic networks is based on accuracy. Accuracies are categorized separately according to Table 2.1 for horizontal, ellipsoid height, and orthometric height. Note: although the largest entry in Table 2.1 is 10 meters, the accuracy standards can be expanded to larger numbers if needed.

Table 2.1 -- Accuracy Standards  
 Horizontal, Ellipsoid Height, and Orthometric Height

Accuracy Classification	95-Percent Confidence
	Less Than or Equal to:
1-Millimeter	0.001 meters
2-Millimeter	0.002 "
5-Millimeter	0.005 "
1-Centimeter	0.010 "
2-Centimeter	0.020 "
5-Centimeter	0.050 "
1-Decimeter	0.100 "
2-Decimeter	0.200 "
5-Decimeter	0.500 "
1-Meter	1.000 "
2-Meter	2.000 "
5-Meter	5.000 "
10-Meter	10.000 "

When control points in a survey are classified, they have been verified as being consistent with all other points in the network, not merely those within that particular survey. It is not observation closures within a survey which are used to classify control points, but the ability of that survey to duplicate already established control values. This comparison takes into account models of crustal motion, refraction, and any other systematic effects known to influence survey measurements.

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### 2.2.2 Accuracy Determination

The classification standard for NSRS is based on Table 2.1.

The procedure leading to classification involves four steps:

1. The survey measurements, field records, sketches, and other documentation are examined to verify compliance with the specifications for the intended accuracy of the survey. This examination may lead to a modification of the intended accuracy.
2. Results of a minimally constrained, least squares adjustment of the survey measurements are examined to ensure correct weighting of the observations and freedom from blunders.
3. Local and network accuracy measures computed by random error propagation determine the provisional accuracy. In contrast to a constrained adjustment where coordinates are obtained by holding fixed the datum values of the existing network control, accuracy measures are computed by weighting datum values in accordance with the network accuracies of the existing network control.
4. The survey accuracy is checked by comparing minimally constrained adjustment results against established control. The result must meet a 95 percent confidence level. This comparison takes into account the network accuracy of the existing control, as well as systematic effects such as crustal motion or datum distortion. If the comparison fails, then both the survey and network measurements must be scrutinized to determine the source of the problem.

Users with specialized applications that require more exacting accuracy estimates at the CORS sites should contact NGS. It is not necessary to directly connect to a CORS to compute the network accuracy of a control point. However, it is necessary that the survey be properly connected to existing NSRS control points with established network accuracy values.

By supporting both local accuracy and network accuracy, the diverse requirements of NSRS users can be met. Local accuracy is best adapted to check relations between nearby control points. For example, a surveyor checking closure between two NSRS points is mostly interested in a local accuracy measure. On the other hand, someone constructing a Geographic or Land Information System (GIS/LIS) will often need some type of positional tolerance associated with a set of coordinates. Network accuracy measures how well coordinates approach an ideal, error-free datum.

Thus, for control points in the NSRS, both local accuracy and network accuracy will be reported for each geodetic component (horizontal control, ellipsoidal height, and orthometric height).

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2.2.3 Accuracy Reporting

When providing geodetic point coordinate data, a statement should be provided that the data meets a particular accuracy standard for both the *local accuracy* and the *network accuracy*. For example, these geodetic control data meet the 2-centimeter local accuracy standard for the horizontal coordinate values and the 5-centimeter local accuracy standard for the vertical coordinate values (heights) at the 95-percent confidence level. A similar statement should be provided for these same data reporting the network accuracy.

Note: In the above statement the data may comply with one accuracy value for the horizontal component and a different accuracy value for the vertical component. If a dataset does not contain elevation data, label it for horizontal accuracy only; conversely, when a dataset does not contain horizontal data, label it for vertical accuracy only.

It is preferred that accuracy value(s) be reported in metric units; however, feet shall be used when the dataset coordinates are in feet (i.e., State Plane Coordinates in feet). The number of significant digits for the accuracy value(s) shall be consistent with the number of significant digits for the dataset point coordinates. For most geodetic control network applications, centimeters should be used for reporting local accuracy and network accuracy values.

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2.3 References

- Federal Geodetic Control Committee, 1984, Standards and Specifications for Geodetic Control Networks: Silver Spring, Maryland, National Geodetic Survey, National Oceanic and Atmospheric Administration, 29 p.
- Federal Geodetic Control Committee, 1988, Geometric Geodetic Accuracy Standards and Specifications for Using GPS Relative Positioning Techniques, Version 5.0, reprinted with corrections, August 1, 1989: Silver Spring, Maryland, National Geodetic Survey, National Oceanic and Atmospheric Administration.
- Federal Geodetic Control Subcommittee, 1994, Input Formats and Specifications of the NGS Data Base, Vol. I, Horizontal: Silver Spring, Maryland, National Geodetic Survey, National Oceanic and Atmospheric Administration.
- Federal Geographic Data Committee, 1998, Part 1, Reporting Methodology, Geospatial Positioning Accuracy Standards, FGDC-STD-007.1-1998: Washington, D.C., Federal Geographic Data Committee, 10 p.
- Federal Geographic Data Committee, 1998, Part 3, National Standard for Spatial Data Accuracy, Geospatial Positioning Accuracy Standards, FGDC-STD-007.3-1998: Washington, D.C., Federal Geographic Data Committee, 28 p.
- Federal Geographic Data Committee, 1998, Part 6, Point Profile, Spatial Data Transfer Standard, FGDC-STD-002.6: Washington, D.C., Federal Geographic Data Committee.



**Attachment D**  
**Scott County Standard Terms and Conditions**

SCOTT COUNTY INSURANCE REQUIREMENTS:

The Contractor shall have in force during the period of this contract, insurance as listed below:

- A. Bodily Injury and Property Damage Insurance: The CONTRACTOR shall take out and maintain during this contract, bodily injury and property damage liability insurance under a comprehensive general form and automobile injury and property damage insurance under a comprehensive general form.

The required limits of this insurance shall not be less than:

General Liability:

Personal Injury - each person	\$1,000,000
Personal Injury - each occurrence	\$1,000,000
Personal Injury - Aggregate	\$1,000,000
Personal Damage - each occurrence including Broadform Liability Extension	\$1,000,000

Automobile Liability - Owner, Non-Owned and Hired  
Vehicles:

Personal Injury - each person	\$1,000,000
Personal Injury - each occurrence	\$1,000,000
Personal Damage - each occurrence	\$1,000,000

The above insurance shall cover the contractor's employees, the public and Scott County employees while in the buildings and on the grounds of Scott County.

- B. Certificates of Insurance: The CONTRACTOR shall deliver to Facility & Support Services, 428 Western Ave., Davenport, IA 52801, certificates of insurance covering all above insurance in duplicate before starting project. Such certificates shall provide ten days prior notice by registered mail of any material change in or cancellation of this insurance.
- C. Contractual Liability Insurance: The CONTRACTOR shall take out and maintain during this contract, liability insurance.
- D. Products and completed Operations Liability Insurance: The CONTRACTOR shall also take out Products and Completed Operations Liability Insurance of limits not less than any of the above limits specified in these qualifications.
- E. Workmen's Compensation and Employer's Liability:
- (1) The CONTRACTOR shall maintain during this contract, the statutory workmen's compensation and employer's liability insurance for all his employees to be engaged in the maintenance work under the contract.
  - (2) The amount of Employer's Liability Insurance shall not be less than One Million (\$1,000,000).

INDEMNIFICATION:

To the fullest extent permitted by law, the CONTRACTOR shall indemnify and hold harmless the Owner and their agents and employees from and against all claims, damages, losses and expenses, including but not limited to attorney's fees, arising out of or resulting from the performance of the WORK, provided that any such claim damage, loss or expense (1) is attributed to bodily injury, sickness, disease or death or to injury to or destruction of tangible property (other than the WORK itself) including the loss of use resulting therefrom, and (2) is caused in whole or in part by any negligent act or omission of the CONTRACTOR and subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or otherwise reduce and otherwise exist as to any party or person described in this paragraph.

OWNERSHIP OF DATA:

All data and other records supplied to the Consultant for this project shall remain the sole property of the County. The Consultant shall not, without written consent, copy or use such records, except to carry out contracted work, and will not transfer such records to any other party not involved in the performance of the Contract pursuant to this RFP.

LATE COMPLETION:

Should the Consultant selected as a result of this RFP fail to perform the work within the period of time stipulated in the contract, the Contractor shall pay to Scott County \$400.00 as liquidated damages per calendar day from the day of default, unless extensions of time granted by the County specifically provide for the waiving of late completion charges. The liquidated damages represent the amount estimated to be lost as a result of untimely completion.

Scott County shall have the right to deduct the late completion charges from any monies in its hands, otherwise due, or to become due, to the Consultant, or to sue for and recover compensation for damages for nonperformance of this contract within the time stipulated.

SUBCONTRACTOR:

The County reserves the right to approve any subcontractor utilized by the prime Consultant and inclusion of any subcontractor in your proposal shall not be misconstrued as implied consent by the county to use that subcontractor.

**If it is your firm's intent to abide by the Scott County project requirements as described, please have an authorized representative sign below.**

\_\_\_\_\_  
Consultant Company Name

\_\_\_\_\_  
Authorized Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

**Attachment E**  
**Scott County Project Fee Schedule**

**Corner Fee Breakdown (per corner)**

**Pre-Marked Section Corners**

Establish XYZ Iowa State Plane Coordinates<sup>1</sup>: \$ \_\_\_\_\_

**Unmarked Section Corners**

Establish XYZ Iowa State Plane Coordinates<sup>1</sup>: \$ \_\_\_\_\_

**Obliterated Corner**

Cost to re-establish obliterated corner from existing ties<sup>2</sup>: \$ \_\_\_\_\_

**Lost Corner**

Cost to re-establish a lost corner<sup>2</sup>: \$ \_\_\_\_\_

**Supporting Corner Data**

Two digital photos per corner: \$ \_\_\_\_\_

Preparation of corner certificate: \$ \_\_\_\_\_

<sup>1</sup> Cost of establishing coordinates should include all aspects of the process including travel time, reoccupying the monument, verifying/tying-out as required and data logging. Costs should also include project management and post processing.

<sup>2</sup> See pg. 8, Definitions.

**Project wide components**

**FGDC Accuracy Report** \$ \_\_\_\_\_

\_\_\_\_\_  
Consultant Company Name

\_\_\_\_\_  
Authorized Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

## **Attachment F Consultant Check List**

**Please make sure to include the following items in your RFP Response.**

*(Person preparing the RFP Response should initial as each item is verified.)*

- \_\_\_\_\_ Letter of Transmittal
- \_\_\_\_\_ Table of Contents
- \_\_\_\_\_ Firm History/Background
- \_\_\_\_\_ Technical Approach
- \_\_\_\_\_ Project Management Approach
- \_\_\_\_\_ Completed RFP Worksheet, *(and following attachments...)*
  - \_\_\_\_\_ Attachment A: Income Statement
  - \_\_\_\_\_ Attachment B: Resumes of Key Personnel
  - \_\_\_\_\_ Attachment C: Subcontractor Profile *(if applicable)*
  - \_\_\_\_\_ RFP Addendum *(if applicable)*
- \_\_\_\_\_ Project Schedule
- \_\_\_\_\_ Attachment D – Signed Scott County Standard Terms and Conditions
- \_\_\_\_\_ Attachment E – Signed Scott County Project Fee Schedule
- \_\_\_\_\_ Attachment F – Copy of this completed Consultant Checklist
- \_\_\_\_\_ Three printed copies and one PDF file on CD of your complete RFP response

# Scott County RFP Worksheet

## Company Overview

- 1) Firm Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
\_\_\_\_\_  
Phone: ( ) \_\_\_\_\_ Fax: ( ) \_\_\_\_\_  
Website: \_\_\_\_\_
- 2) Year Established: \_\_\_\_\_  
a) Number of years offering survey grade GPS services: \_\_\_\_\_
- 3) Type of Ownership: \_\_\_\_\_  
a) Parent Company if applicable: \_\_\_\_\_
- 4) Audited Income Statement (please include with your response and identify as "Attachment A: Income Statement").
- 5) Name of Project Manager: \_\_\_\_\_  
Email: \_\_\_\_\_

## Key Personnel and Capabilities

- 6) Resumes of key personnel (please include with your response and identify as "Attachment B: Resumes of Key Personnel").
- 7) Describe scope of subcontracted work if applicable (please include profiles of any subcontractors with your response and identify as "Attachment C: Subcontractor(s) Profile"): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

8) Location of office out of which majority of work will be performed: \_\_\_\_\_

9) Total number of persons assigned to work on project: \_\_\_\_\_  
*(Please list staff below)*

<b>Name</b>	<b>Title</b>	<b>Years with Firm / Total Years of Experience</b>

**Relevant Experience and Capabilities**

10) List three (3) relevant GPS or survey projects with contact information:

**Project 1**

Name: \_\_\_\_\_  
Year Completed: \_\_\_\_\_  
Duration: \_\_\_\_\_  
Cost: \_\_\_\_\_  
Contact Info: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Project 2**

Name: \_\_\_\_\_  
Year Completed: \_\_\_\_\_  
Duration: \_\_\_\_\_  
Cost: \_\_\_\_\_  
Contact Info: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Project 3**

Name: \_\_\_\_\_  
Year Completed: \_\_\_\_\_  
Duration: \_\_\_\_\_  
Cost: \_\_\_\_\_  
Contact Info: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- 11) Include a list of all related projects completed within the past three (3) years. If desired you may add additional pages. List most recent first by month/year:

<b>Mo/Yr</b>	<b>Name/Brief Description</b>



12) Inventory of relevant hardware/software/equipment that will be used to work on the project: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

*If you feel that any salient points about the project or your capabilities have not been adequately addressed elsewhere in this RFP, please incorporate your additional information in an addendum, labeled **“RFP Addendum”** and attach it to your response.*