



Cache  
County  
1857

**DEVELOPMENT SERVICES DEPARTMENT**

BUILDING | SURVEYING | ENGINEERING | GIS | PLANNING & ZONING | ROADS | WEEDS

# CACHE COUNTY SECTION CORNER PROJECT

**A GRANT PROPOSAL TO:** State of Utah Monument  
Replacement and Restoration Committee (MRRC)

**APPLICANT:** Cache County, Utah

**DATE:** June 12<sup>th</sup>, 2019

## CACHE COUNTY SECTION CORNER PROJECT



State of Utah  
Monument Replacement and  
Restoration Committee  
1 State Office Building, Room 5130  
Salt Lake City, UT 84114

For Committee Use Only

Application No. \_\_\_\_\_

Date Filed: \_\_\_\_\_

## GRANT APPLICATION

### Applicant Information

Applicant agency Cache County  
Street 179 N. Main St  
City Logan State UT Zip 84321  
Contact person Josh Runhaar  
Phone 435-755-1640 Fax 435-755-1987  
Email josh.runhaar@cachecounty.org  
Presiding official Craig W. Buttars  
Title Executive/ Surveyor  
Phone 435-755-1850  
Email craig.buttars@cachecounty.org

### Proposed Funding

Total project cost \$9,000.00  
Total MRRC funds requested \$7,000.00  
Other project funding (specify) \$560.00 in kind, \$1440.00 cash, misc. material cost unknown

### Attachment checklist

1. Description of the problem or situation to be addressed and how the proposed project will remedy the problem. A superior project description will thoroughly address each category of the Committee's Evaluation Criteria.
2. Map of the project area.
3. Cost estimate. Itemization of expenditures is encouraged. Include cost sharing if applicable.

### Presiding official signature

I, Craig W Buttars, the Executive/ Surveyor  
(typed name) (typed title)

of Cache County Corp.  
(typed name of applicant agency)

do hereby certify the information in this application is accurate and correct to the best of my knowledge and this application has been authorized by the applicant agency.

Craig W Buttars  
(signature)

6/12/19  
(date)

## **SUMMARY**

Cache County developed a monument preservation program where valley floor monuments are given the highest priority. The valley floor reflects where most of our growth is occurring. However after a few years of working on monument preservation, we soon realized there were other areas within the county that are in great need of monument preservation. These areas are within the private developable properties to the southeast of the dominant valley floor also known as “Priority 2A” or existing section corners in the mountainous areas. See attachment: *Image 1: Cache County Section Corner Summary Map*. Cache County has not been able to sufficiently perpetuate, monument or locate these valuable but in jeopardy corners. This is due to priority focus and budget constraints. With the help of monies from the Survey Monument Replacement and Restoration County Grant Program, Cache County would be able to accomplish significant monument preservation and locating in our priority 2A area.

## **THE PROBLEM**

Many section corners have not been preserved, monumented or located within the private land holdings of Priority 2A. Multiple surveys in the Priority 2A area call out stones and corner locations that have not been verified by the county. Our focus, with this grant, is within the Legacy Ranch at Monte Cristo, which is a development created in the late 90’s. The Legacy Ranch Survey Narrative states “Sam Churnos, the son of the original owner testified, to the surveyor, that the fences built around the perimeter were built on the section lines, specifically the fence corners at the section corners.” The survey narrative also states two stones were found disturbed and conflicted with the existing fence corners at the location. Locating and verifying these corners that were found and not found will allow us to properly monument and produce tie sheets with measured latitudes and longitudes preserving the corners in the long term. Capturing this valuable information provides clarity and reduces the risk of the stones or corners being disturbed in the future. See: *Image 2: Legacy Ranch at Monte Cristo Survey Narrative*

## **THE WORKFLOW**

Jeff Nielson P.L.S. of Foresight Surveying will turn in corner data, set forth in “*Attachment C Field Procedures*” of the *Public Land Survey System (PLSS) Grant Program* to the County’s GIS division. The GIS division will be responsible for creating the corner tie sheets See: *Image 3: Tie Sheet 574*. Corner tie sheets meet and will continue to meet tie sheet standards set forth in “*Attachment D*” of the *Public Land Survey System (PLSS) Grant Program*. Corner tie sheets are then published to the public via the County’s Section Corner & Survey Web Mapping Application (<http://66.232.67.238/websites/surveyviewer/>).

## OUR GOALS

Cache County has already made significant improvements on perpetuation and preservation within the valley floor. The challenge going forward will become locating corners with little to no information. Through the 2018-2019 year, Cache County has used its own funds to complete perpetuation of monuments already existing on the valley floor. Once existing corners have been perpetuated, the focus will shift to locating corners with limited to no data and/or tie sheet within our Priority Areas 1B and 2B.

1. Complete Priority 1A - Existing section corners on the valley floor in need of perpetuation
  - a. Perpetuation Completed = 795
  - b. Needs to be Perpetuated = 32
2. Priority 1B - General area of the valley floor where section corners have not as of yet been located and limited to no data exists. Unknown count of section corners that can be reasonably placed (limitations of data, accessibility and usefulness)
3. Priority 2A – Existing section corners in the mountainous areas in need of perpetuation
  - a. Perpetuation Completed = 117
  - b. Needs to be Perpetuated = 82
4. Priority 2B – General area of the mountainous areas where section corners have not been located and limited to no data exists. Unknown count of section corners that can be reasonably placed (limitations of data, accessibility, and usefulness)

## OUR GOAL FOR THE 2019/2020 GRANT

1. Priority 2A – Existing section corners in the mountainous areas in need of perpetuation
  - a. Perpetuation Completed = 117
  - b. Needs to be Perpetuated = 82
  - c. Perpetuate with 2019/2020 grant = 16 to 20

## **BUDGET**

It is estimated that 16 of the 82 section corners remaining in Priority 2A can be perpetuated. The County estimates this can be accomplished at a cost near \$7,000.00.

### **Priority 2A: Existing damaged/missing corners requiring additional repairs**

#### Materials

1. 4 Rebar Reference Points \$1.67 each (\$6.68)
2. 4 plastic caps \$0.26 each (\$1.04)
3. Aluminum survey caps \$9.80 each

Materials Total - \$17.52 per corner.

#### Labor

1. Surveying work and data compilation  $\approx 3 \frac{1}{2}$  hours each = \$474.48

Materials and Labor Total = \$492.00 per corner.

This project is scalable to the amount of funding made available (more section corners can be added with additional funding and/or less corners with less funding).

### **County Resources/Match**

The County is also putting financial and in kind effort into this project and request. While Cache County is seeking funds to finalize perpetuation of monuments in Priority 2A, the County has allocated funding to 1) pay unique material costs for Priority 2A (concrete, flowable fill, etc.) and 2) in kind staff time for tie sheet creation and 3) cash match.

1. Tie sheet preparation 16 @  $\approx 1$  hour each @ \$35.00 per hour = \$560.00 (in kind)
2. Cash contribution \$1440.00 + out of pocket expense for unique materials

Match Total = \$2,000.00

For this round of funding Cache County is hoping to repair/perpetuate 16 section corners (*See Image 4: Section Corner Project Area Map*)

The estimated total cost to complete repairs and/or perpetuation on these 16 section corners is  $\approx$  \$9,000.

## CONCLUSION

Cache County has made significant improvements to existing section corner data and tie sheets among the valley floor. The *Cache County Section Corner & Survey Web Mapping Application* is one of the County's most popular and useful tools to surveyors, realtors, title companies, cities, and the general public. As the County transitions into a more financially burdensome phase of the project the requested financial assistance will greatly improve the project's success. The County hopes to provide the PLSS with better quality section corner data as well as create an environment to receive higher quality land surveys and avoid property disputes.

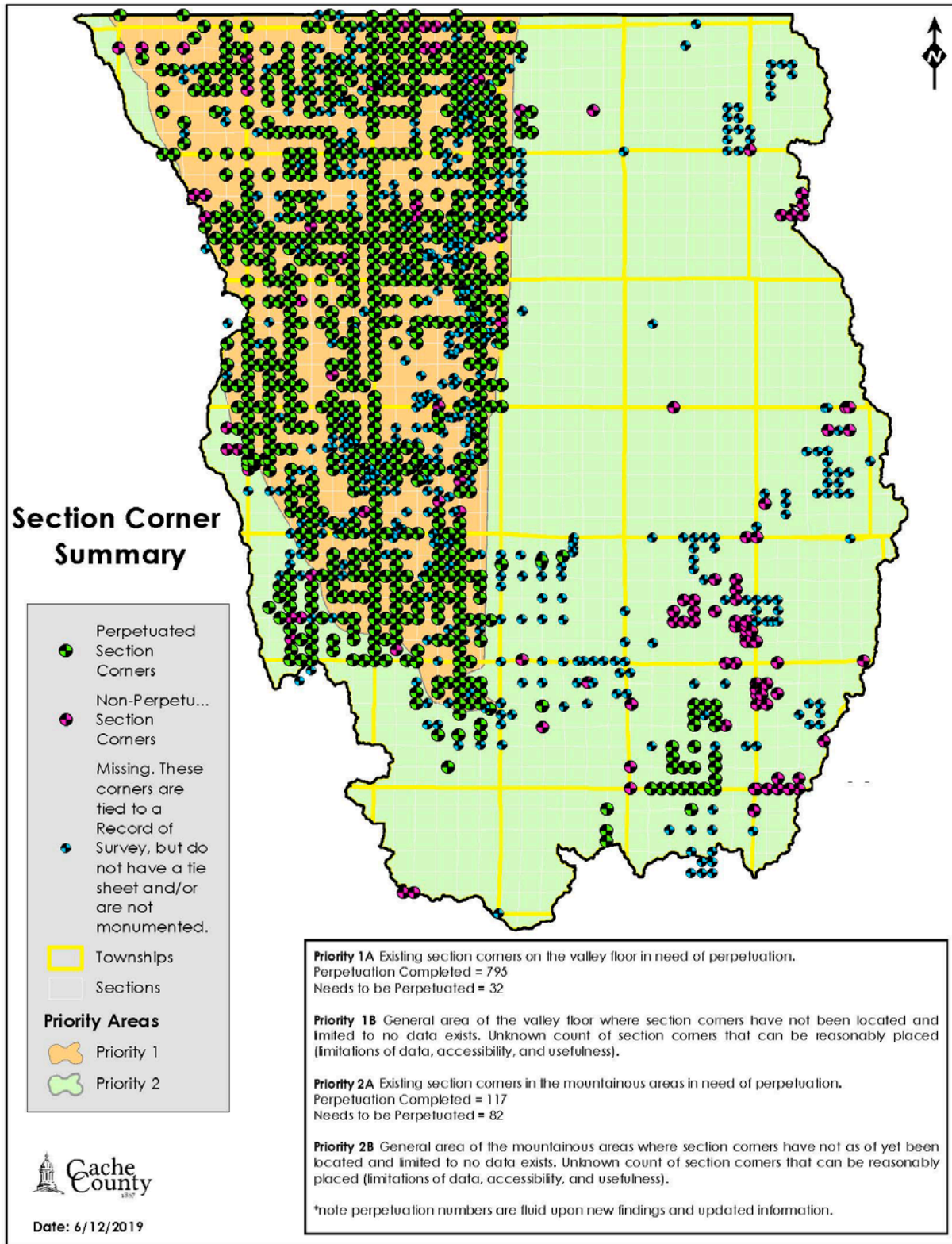
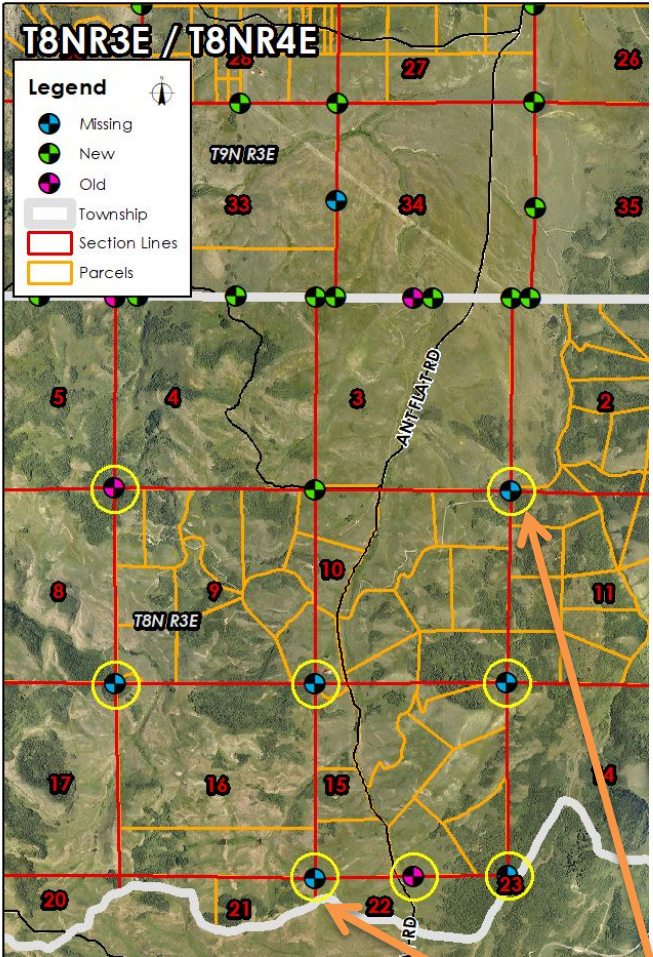


Image 1: Cache County Section Corner Summary Map



NARRATIVE

THE PURPOSE OF THIS SURVEY WAS TO ESTABLISH AND SET THE PROPERTY CORNERS OF THE PARCELS SHOWN AND DESCRIBED HEREON. THE CONTROL USED TO ESTABLISH THE PROPERTY LINES WAS THE EXISTING FENCE LINES AND SECTION CORNERS FOUND AROUND THE PERIMETER OF SECTIONS 1, 2, 9, 10, 11, 12, 15 AND 16, T8N, R3E, SLB&M. SAM CHURNOS, THE SON OF THE ORIGINAL OWNER TESTIFIED TO MYSELF THAT THE FENCES BUILT AROUND THE PERIMETER OF THE ABOVE MENTIONED SECTIONS WERE BUILT ON THE SECTION LINES, SPECIFICALLY THE FENCE CORNERS AT THE SECTION CORNERS. AS SHOWN ON THIS PLAT, TWO MARKED STONES THAT WE FOUND CONFLICTED WITH THE EXISTING FENCE CORNER AT THE LOCATION. THE STONE HAS BEEN DISTURBED AND THUS WE USED THE FENCE CORNER AS THE BEST AVAILABLE EVIDENCE OF THE SECTION CORNERS ACTUAL LOCATION. THE BASIS OF BEARING IS BASED ON WGS 1984 STATE PLANE DATUM.

2 disturbed stones

Image 2: Legacy Ranch at Monte Cristo Narrative





# Cache County Monument Record Sheet

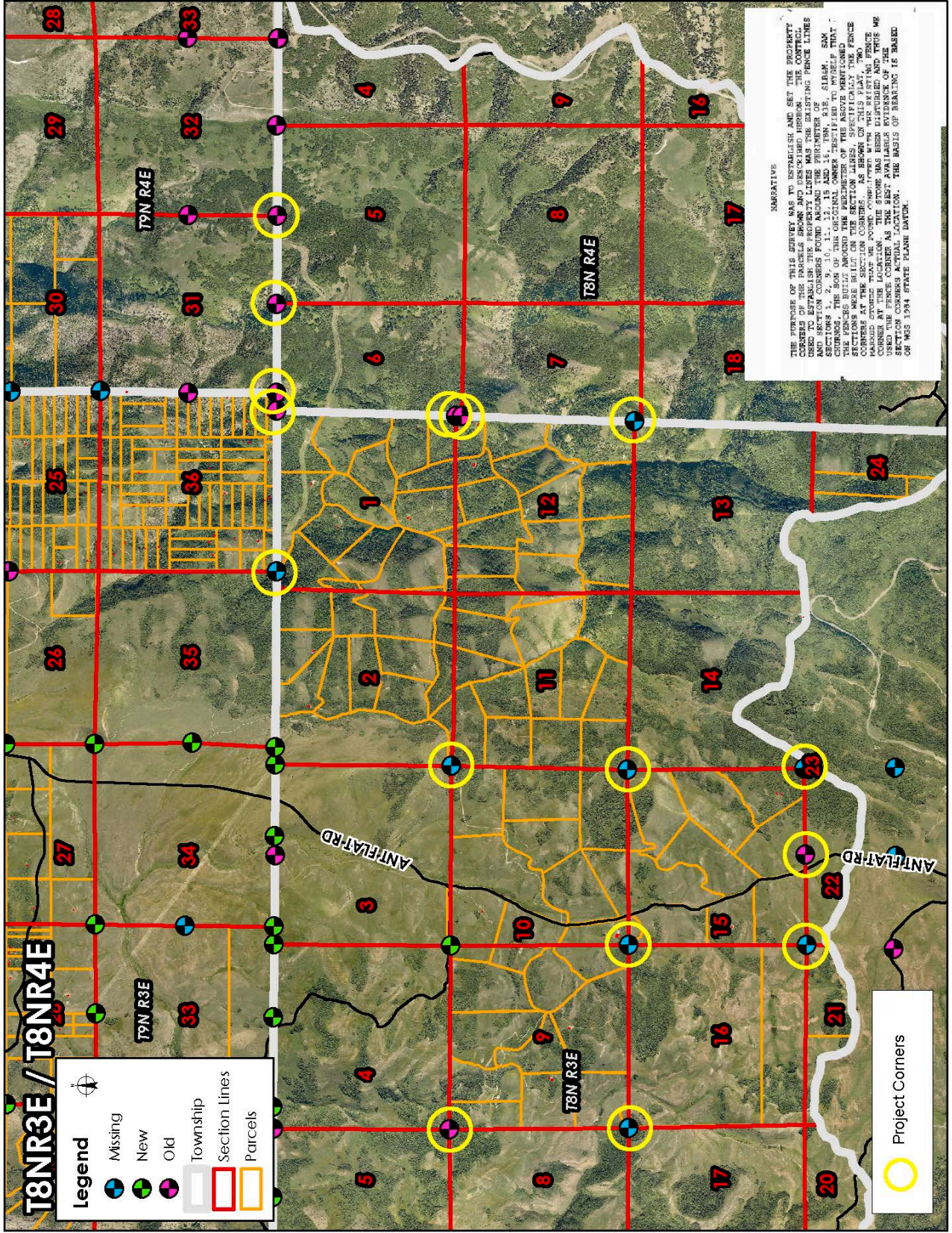
Cache County  
Corner ID # **574**

BLM Point Name		Contact Name	License Number	Date																																																																																								
UT260140N0010W0_300400		Jeff C. Nielsen	5152661	2/27/2015																																																																																								
Corner of Section		Map View Photo or Sketch																																																																																										
300400																																																																																												
Township and Range																																																																																												
T14N R1W																																																																																												
Base and Meridian																																																																																												
Salt Lake																																																																																												
State																																																																																												
UT																																																																																												
County																																																																																												
Cache County																																																																																												
Geographic Coordinates																																																																																												
Latitude (DMS)	41°56'47.4138"N																																																																																											
Longitude (DMS)	-111°58'23.5956"W																																																																																											
Ellipsoid Height																																																																																												
Grid Coordinates																																																																																												
Northing	3868950.9340																																																																																											
Easting	1511674.9840																																																																																											
Horizontal Units	feet																																																																																											
Ortho Elevation	4558.135																																																																																											
Coordinate System																																																																																												
Zone	UT North																																																																																											
Datum																																																																																												
WGS84																																																																																												
Vertical Units																																																																																												
12A																																																																																												
Vertical Datum																																																																																												
NAVD89																																																																																												
Monument Status																																																																																												
Existing																																																																																												
Section Corner Location																																																																																												
<table border="1"> <tr> <td>100700</td><td>200700</td><td>300700</td><td>400700</td><td>500700</td><td>600700</td><td>700700</td> </tr> <tr> <td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td></td> </tr> <tr> <td>100600</td><td>200600</td><td>300600</td><td>400600</td><td>500600</td><td>600600</td><td>700600</td> </tr> <tr> <td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td></td> </tr> <tr> <td>100500</td><td>200500</td><td>300500</td><td>400500</td><td>500500</td><td>600500</td><td>700500</td> </tr> <tr> <td>18</td><td>17</td><td>16</td><td>15</td><td>14</td><td>13</td><td></td> </tr> <tr> <td>100400</td><td>200400</td><td>300400</td><td>400400</td><td>500400</td><td>600400</td><td>700400</td> </tr> <tr> <td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td></td> </tr> <tr> <td>100300</td><td>200300</td><td>300300</td><td>400300</td><td>500300</td><td>600300</td><td>700300</td> </tr> <tr> <td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td></td> </tr> <tr> <td>100200</td><td>200200</td><td>300200</td><td>400200</td><td>500200</td><td>600200</td><td>700200</td> </tr> <tr> <td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td></td> </tr> <tr> <td>100100</td><td>200100</td><td>300100</td><td>400100</td><td>500100</td><td>600100</td><td>700100</td> </tr> </table>		100700	200700	300700	400700	500700	600700	700700	6	5	4	3	2	1		100600	200600	300600	400600	500600	600600	700600	7	8	9	10	11	12		100500	200500	300500	400500	500500	600500	700500	18	17	16	15	14	13		100400	200400	300400	400400	500400	600400	700400	19	20	21	22	23	24		100300	200300	300300	400300	500300	600300	700300	30	29	28	27	26	25		100200	200200	300200	400200	500200	600200	700200	31	32	33	34	35	36		100100	200100	300100	400100	500100	600100	700100
100700	200700	300700	400700	500700	600700	700700																																																																																						
6	5	4	3	2	1																																																																																							
100600	200600	300600	400600	500600	600600	700600																																																																																						
7	8	9	10	11	12																																																																																							
100500	200500	300500	400500	500500	600500	700500																																																																																						
18	17	16	15	14	13																																																																																							
100400	200400	300400	400400	500400	600400	700400																																																																																						
19	20	21	22	23	24																																																																																							
100300	200300	300300	400300	500300	600300	700300																																																																																						
30	29	28	27	26	25																																																																																							
100200	200200	300200	400200	500200	600200	700200																																																																																						
31	32	33	34	35	36																																																																																							
100100	200100	300100	400100	500100	600100	700100																																																																																						
Monument Area Photo		Monument Close-up Photo																																																																																										
Additional Notes																																																																																												
<p>Reference Points</p> <p>373 3868947.006 1511653.292 CACHE RBR CAP</p> <p>374 3869007.57 1511680.266 CACHE RBR CAP</p> <p>375 3868839.31 1511671.011 CACHE RBR CAP</p>																																																																																												
Monument Description																																																																																												
<p>Found cache county plastic cap on 5/8" rebar, 12" below grade, good condition, reset RPs 1,2&amp;3 with 5/8" x 24" rebar &amp; cache cap.</p>				<p>Cache County makes no guarantees, representations, or warranties of any kind, express or implied, as to the content, accuracy, timeliness, or completeness of any of the data. Cache County reserves the right to make changes to the data at anytime without notice.</p>																																																																																								



Image 3: Tie Sheet 574

Image 4: Section Corner Project Area Map





Contract # 200516

### STATE OF UTAH CONTRACT

1. **CONTRACTING PARTIES:** This agreement is between the State of Utah, Department of Technology Services, Automated Geographic Reference Center (AGRC), 1 State Office Building Fl 6, Salt Lake City, Utah 84114-1201, (Agency Code 110) referred to as STATE, and the following County, which is a Government Agency.

County Name: Cache County Vendor number: 44649BR  
Address: 179 North Main St.  
City, State, Zip: Logan, Utah 84321

2. **GENERAL PURPOSE OF CONTRACT:** The general purpose of this contract is for the County to receive Monument Replacement and Restoration Committee (MRRC) funding as outlined in the 2015 Senate Bill 264 for monument replacement, preservation and restoration of Public Land Survey System section corners.

3. **CONTRACT PERIOD:** Effective date 7/15/2019. Termination date 6/30/2020, unless terminated early or extended in accordance with the terms and conditions of this contract. The MRRC may conduct a mid-term contract review to assure the work is being done or scheduled for completion within the terms of this contract. If progress toward completion of the work cannot be documented, the COUNTY risks the possibility of contract termination. The deliverable for this contract is due May 15, 2020.

4. **GRANT VALUE:** County will be paid a maximum of \$ 7,000 for funds authorized by this contract.

5. **ATTACHMENTS INCLUDED AS PART OF THIS CONTRACT:**

- Attachment A: Standard Terms and Conditions
  - Attachment B: Scope of Work
  - Attachment C: Field Procedures
  - Attachment D: Deliverables
- Any conflicts between Attachment A and other Attachments will be resolved in favor of Attachment A.

6. **DOCUMENTS INCORPORATED INTO THIS CONTRACT BY REFERENCE BUT NOT ATTACHED HERETO:**

- A. All other governmental laws, regulations, or actions applicable to goods and/or services authorized by this contract.

IN WITNESS WHEREOF, the parties sign and cause this contract to be executed.

COUNTY

Craig W Butters  
Signature

7/30/19  
Date

CRAIG W BUTTERS, EXECUTIVE  
Name and Title of Signer (Type or Print)

STATE

[Signature] Date: 8/12/2019  
Sean A. Fernandez PLS, Cadastral Manager  
Automated Geographic Reference Center (AGRC)

[Signature] Date: 8/14/19  
Department of Technology Services

RECEIVED AND PROCESSED  
BY DIVISION OF FINANCE Date: 8/20/19  
Division of Finance

**“ATTACHMENT A”  
STATE OF UTAH – DEPARTMENT OF TECHNOLOGY SERVICES,  
AGRC STANDARD TERMS AND CONDITIONS**

1. **COUNTY:** The COUNTY shall have no authorization, express or implied, to bind the State of Utah or the above State Agency to any agreements, settlements, liability, or understanding whatsoever, unless herein expressly set forth. Persons employed by the STATE and acting under direction of the COUNTY shall not be deemed to be employees or agents of the STATE.
2. **AUTHORITY:** Provisions of this contract are pursuant to the authority set forth in Sections 107 of the State of Utah Accounting Policies and Procedures and any other relevant provisions of the STATE.
3. **RENEGOTIATIONS OR MODIFICATIONS:** This contract may be amended, modified, or supplemented only by written amendment to the contract, executed by the parties hereto, and attached to the original signed copy of this contract. AGRC has no obligation to perform any services not specified in the contract.
4. **TERMINATION:** This contract may be terminated, with or without cause, in advance of the specified expiration date by either party, upon 30 days prior written notice being given to the other party. On termination of this contract, COUNTY will make payment for all services rendered and/or costs obligated to date of termination.
5. **CONTRACT JURISDICTION:** The provisions of this contract shall be governed by the laws of the State of Utah.
6. **SEPARABILITY CLAUSE:** The declaration by any court or other binding legal source that any provision of this contract is illegal and void shall not affect the legality and enforceability of any other provision of this contract unless said provisions are mutually dependent.
7. **INDEMNITY CLAUSE:** The COUNTY agrees to indemnify, save harmless, and release the State of Utah and the State officers, agents, and employees from and against any and all loss, damages, injury, liability, suits, and proceedings arising out of the performance of this contract by the COUNTY, its officers, agents, volunteers, or employees. The STATE agrees to indemnify, save harmless, and release the Utah County and the County officers, agents, and employees from and against any and all loss, damages, injury, liability, suits, and proceedings arising out of the performance of this contract by the STATE, its officers, agents, volunteers, or employees.
8. **NONAPPROPRIATION OF FUNDS:** Contractual service obligations of the STATE to be fulfilled after the current fiscal year are contingent upon funds to maintain the servicing agency being appropriated, budgeted, or otherwise made available. If funds are not appropriated or otherwise available to maintain the servicing agency, this contract may be terminated without penalty by the STATE upon giving thirty (30) days written notice.
9. **DATA:** All data received or compiled by the STATE under this contract becomes the property of the State of Utah. Access to and confidentiality of said data will be governed by the rules and procedures of the agency with whom the data originated when such rules are specified as an amendment to this contract.
10. **DEADLINES:** AGRC's agreement to all deadlines and costs in this contract is contingent upon the COUNTY's performance of such actions as are instrumental to the completion of this contract. If the COUNTY fails to act in a timely manner, AGRC may opt to consider the contract terminated under the conditions of Paragraph 4.
11. **CONFLICTS:** Conflicts, if any, between Attachment A and any other attachments will be resolved in favor of Attachment A.

Rev 12/03/03

## **"ATTACHMENT B"**

### **SCOPE OF WORK COUNTY PLSS MONUMENT PRESERVATION PROTECTION AND REHABILITATION PROJECT**

The Monument Replacement and Rehabilitation Committee as created by SB264, enacted 2015, referred to as COMMITTEE, is distributing Legislative authorized grants to Utah counties, referred to as COUNTY, for work to preserve, protect and rehabilitate monuments of the Public Land Survey System.

**The work to be performed is surveying of the Public Land Survey System section corners in order to preserve, protect or rehabilitate the monuments of the PLSS.**

1. The grants are awarded based on Committee review of grant requests. Grant requests should outline a specific area of interest for the work to occur and the scope of work for each county. County must have an established Public Land Corner Preservation Fund (see Section 17-23-19 Utah Code Annotated) to be eligible for grant funds.
2. Projects having PLSS monuments that are in danger of being disturbed, destroyed or have severe deterioration shall be given the highest priority.
3. The grant request for PLSS work will include a map created by the County outlining areas of the PLSS in which section corner monuments are in need of preservation, protection or rehabilitation.
4. The grant request will include a total cost required for the project. Itemization of expenditures is encouraged.
  - Eligible costs include those associated with the protection, restoration, re-monumentation, rehabilitation, preservation and documentation as approved by the Committee.
5. Responsible stewardship of allocated grant monies is mandatory.
6. The survey work will be conducted by the County, or a contractor of the County, qualified by the State of Utah licensing requirements and following the work requirement as outlined in the contract and its attachments.
  - The Committee is available to any County upon request to provide oversight or assistance on contractor selection and/or project performance.
7. The purpose of this program is to preserve, protect or rehabilitate monuments of the Public Land Survey System. The quality of the work performed to find, perpetuate and document the true corner location is of paramount importance.
8. The preservation of original evidence including all accessories to the monuments is of paramount importance, and where there is an absence of accessories, accessories will be re-established.
9. The County will provide PLSS deliverables to the Committee according to the directions and requirements outlined in "Attachment D"

**“ATTACHMENT C”**  
**FIELD PROCEDURES**

**PURPOSE:**

The purpose of this document is to give direction, guidance and an understanding of what is expected in performing field surveys necessary for the maintenance, restoration and re-location of Corners of Cadastral surveys of the Public Land Survey System (PLSS) within the State of Utah.

**END RESULT OF THE FIELD SURVEY:**

Once the field survey is complete, the surveyor will have gathered, constructed, staked or completed a minimum of the following for each corner:

1. The corner will have been located.
2. The corner will have an acceptable monument.
3. The corner will be referenced.
4. Utah Grid and Geodetic coordinates will have been gathered for the corner.
5. A photo will have been taken of the corner monument (showing markings). A second photo will have been taken of the general corner vicinity.
6. Field notes will have been kept.

Information gathered during the field survey will later be transferred onto the Corner Monument Record (Corner File) and the Record of Survey (ROS) which become the official documents for locating and perpetuating the corner.

**1.1 The corner will have been located:**

**1.1.1 G.L.O. survey plats and field notes** are a unique resource of important information about original corner monuments and their accessories. They contain such information as:

- The type of monument set, its dimensions and markings.
- The type of corner (standard, witness, closing, meander, etc.).
- What accessories were established - a mound of stones and its dimensions, blazed bearing trees with their size, species and their course and distance from the corner.
- Relationship with other corners.
- Topography of the area.

The surveyor shall have copies of the G.L.O. plats and field notes while engaged in his survey.

#### **1.1.2 Research:**

In addition to G.L.O. plats and notes, the surveyor should perform appropriate research into the corner's history. This research could include but not necessarily be limited to:

- a. Records of survey as filed with the County Surveyor's office.
- b. Corner Monument Records (Corner Tie Sheets). These are usually found in the County Surveyor's office but may also be located in the County Recorder's office or with AGRC.
- c. Right-of-way maps for highways, canals, railroads, etc.
- d. Documents filed for record with the County Recorder's office.
- e. Aerial photos.
- f. NGS Data Sheets.
- g. Records and testimony of Professional Land Surveyors and their employees who are familiar with the area.
- h. Testimony of land owners or long-time residents of the area.

## **1.2 The corner will have an acceptable monument.**

### **1.2.1 Existent Monument, not required to be replaced:**

- a. Unless directed otherwise by the County surveyor or this Committee (if there is not a current county surveyor), an original stone monument in its originally set location does not need to be replaced if it is firmly set, readily identifiable and reasonably durable.
- b. County Surveyor, Private Licensed Surveyor, G.L.O. or B.L.M. brass or aluminum cap monuments on a pipe or minimum 5/8" rebar do not need to be replaced if they are firmly set, readily identifiable and reasonably durable.

### **1.2.2 Existent Monument, required to be replaced:**

The surveyor will be required to replace any monument not meeting criteria set forth in 1.2.1 a. or b.

### **1.2.3 Identification of Existent and Obliterated Corners:**

- a. Existent Corners are defined in 6-11 of the Manual of Surveying Instructions, 2009 edition (hereinafter referred to as Manual).
- b. Obliterated corners are defined in 6-17 of the Manual.
- c. The surveyor shall follow the process for determining the position of an Existent or Obliterated Corner as given in Chapter Six of the Manual.

### **1.2.4 Lost Corners:**

The decision that a corner is lost should not be made until every means has been exercised that might aid in identifying its original position. The courts have admonished surveyors for being too quick to turn to proportionate measurement. They tell us, to find all evidence, every shred of evidence, before we say that the corner point is lost. Determining a corner to be lost and then applying proportionate methods of restoring it is the surveyor's last resort.

U.S. v Doyle 468 F 2<sup>nd</sup> 633 (1972)

*"For corners to be lost, they must be so completely lost that they cannot be replaced by reference to any existing data or other sources of information, and before courses and distances can determine boundary. ALL MEANS for ascertaining location of the lost monuments must first be exhausted."*

If a corner is declared lost, its position shall be determined by proportionate measurement as outlined in chapter seven of the Manual.

### **1.2.5 Corner Monuments:**

- a. If a Corner Monument is set, it shall be a minimum 2" diameter durable metal disk on a pipe or rebar having a minimum diameter of ¾" and a length of 30".



- b. If the corner falls in a rock out-cropping, concrete or concrete post, a durable metal disk not less than 2" diameter, on a metallic stem not less than three inches long (drilled into the base) and fixed with epoxy cement, is acceptable as the monument.
- c. If the corner falls in a dirt or gravel road, the monument cap shall be buried 6" below the road surface.
- d. If the corner falls in a paved road, the monument shall be placed in a prefabricated monument well. Alternately, the monument may be driven or drilled into the road base with its disk recessed ¼" to ½ " below the pavement surface and any cavities created during the process, filled with epoxy, quikcrete, rockite, cement all, or other similar product.
- e. In the event a corner monument cannot practically be set because of steep terrain, water, marsh, existing structures, busy roads, etc. a minimum of two reference monuments shall be set. These monuments shall be placed as outlined in 4-17 of the Manual.
- f. Corner Monuments shall be marked (stamped) as shown in chapter four of the Manual and shall bear the license number of the surveyor in responsible charge. Reference monuments shall have the distance to the corner point stamped thereon.

### **1.3 The corner will be referenced: (See example sketch 1.6.5)**

- a. Whenever possible, section corners and quarter-section corners (including reference monuments to these corners) shall be witnessed by at least four references of durable quality. If possible these references should also be in different quadrants.
- b. Sixteenth section corners, monumented during original or subsequent cadastral surveys shall also be witnessed, as cited in item a. above.
- c. All references shall be carefully described, and their bearings and distances from the corner noted in the field notes.
- d. Acceptable reference monuments could be a nail in a utility pole or fence post, a scribe in a concrete structure or rock outcropping or a rebar driven into the ground. With exception of items such as concrete or rock scribes, a tag, washer or cap bearing the license number of the surveyor shall be affixed to the reference monument.

### **1.4 Utah Grid and Geodetic coordinates will have been gathered for the corner:**

#### **1.4.1 The surveyor shall obtain the following coordinates of the corner.**

- a. Utah Coordinate System – Northing and Easting (appropriate zone) 1983.
- b. NAD 83 Geographic Coordinates (North Latitude and West Longitude).
- c. NAVD 88 Elevation.
- d. Reporting Units are to be U.S. Survey Foot or Meter.

**1.4.2 The Surveyor shall state the Coordinate Source:**

- a. Acceptable sources are the Utah Reference Network Control System (VRS) and Opus Solution Reports.
- b. Sample Surveyor's Statement: "Coordinates are NAD 83 (2011) (EPOCH 2010) derived from the Utah Reference Network Control System.  
GEOID 12a, NAVD 88 Elevation = #,###.#."

**1.4.3 Acceptable Data Gathering Equipment:**

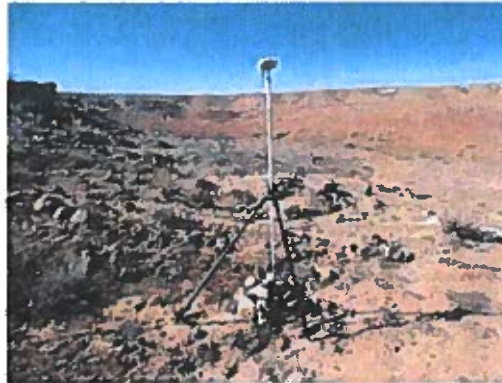
- a. Survey Grade G.P.S. List make and model (such as Trimble R6, TSC3 data collector).
- b. Total Station. List make and model. (A total station instrument may be used to traverse to a corner where a G.P.S. observation is not practicable, such as beneath a tree or structure).

**1.4.4 Measuring to the Corner:**

- a. G.P.S. receiver or mirrors shall be placed on a tripod or a rod with bipod supports and plumbed above the corner.
- b. Three minute observations shall be observed.
- c. Maintain a PDOP of 6 or less.
- d. Minimum horizon angle of 15°.
- e. Should be observed with low RMS values.

**1.5 A photo will have been taken of the corner monument (showing markings). A second photo will have been taken of the general corner vicinity.**

**SA  
MP  
LE  
S**



**1.6 Field notes will have been kept and contain:**

**1.6.1 Date of the field visit.**

**1.6.2 Names of those in the survey party.**

**1.6.3 Instrumentation used. See item 1.4.3.**

**1.6.4 A complete description of corner monument set or found with accessory evidence.**

**Examples:**

*In citing these examples, it is not the committee's intent to address every situation the surveyor will encounter, give specific language or specify which acceptable monument types are to be set.*

- a. **Existent Monument, not needing replacement** - At the corner we found the original monument stone measuring 12"x6"x10" out of ground, firmly set, with a ¼ mark, clearly visible, on west face and a mound of stones, 30" base, 12" high, 2.5' west of corner to

center of mound. As reference points to the corner, we set two 5/8" rebar with plastic caps (LS #) which bear S45°E 43.26' and S45°W 54.62' from the corner and set a guard stake, being a 5' metal "T" post 1.0' north of corner.

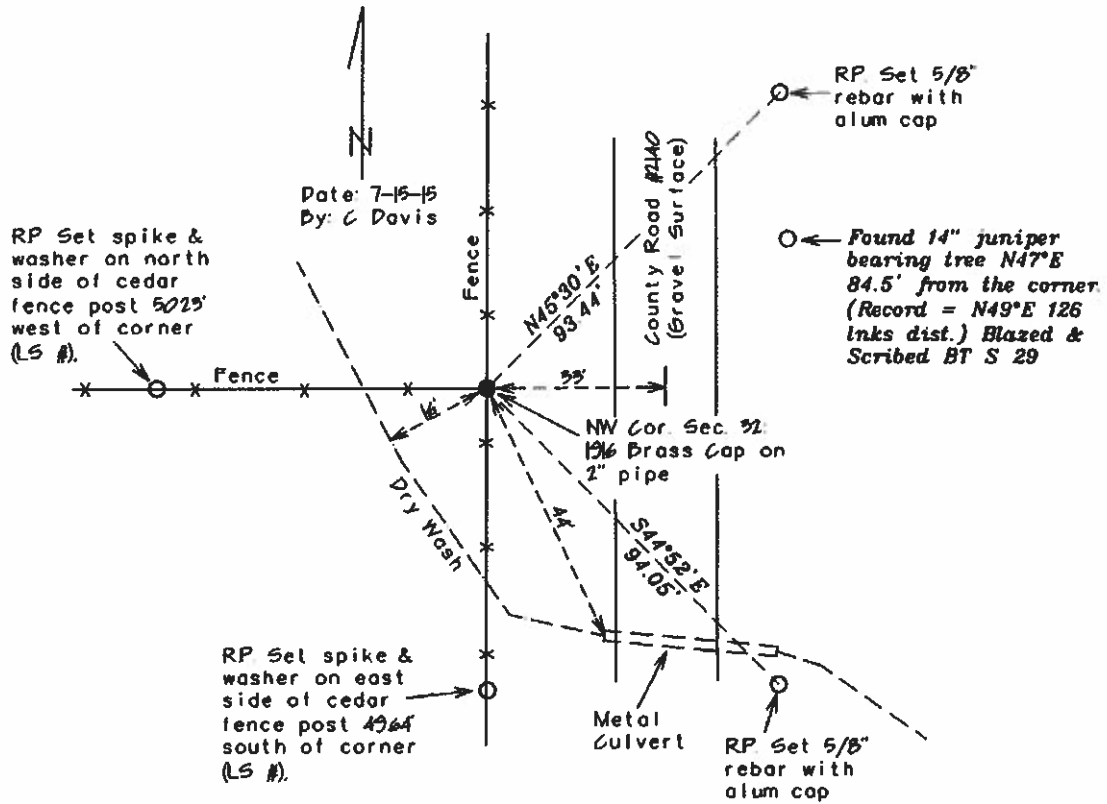
- b. **Existent Monument, needing Replacement** - At the corner we found the original monument stone measuring 12"x6"x14", loosely set, with ¼ mark, barely visible, on west face and a scattered mound of stones west of corner. We replaced the stone monument with a 3" aluminum cap on a ¾" x30" rebar protruding 0.5' above ground, buried the original monument stone along-side and re-constructed the mound of stones, 3' base, 1.5' high, 2' west of corner to center of mound. As reference points, we set ...
- c. **Existent Corner, needing re-monumentation** -The ¼ corner falls near the edge of cleared agricultural ground. We found the original 1911 brass cap monument pulled from and lying on the ground. We also found a blazed cedar bearing tree (scribe marks not discernible), as described in field notes of 1911 cadastral survey, S14°25'E 41 links. (27.06') distance from the ¼ corner. No other evidence of the corner was found. I determined the ¼ corner point at record bearing and distance from the bearing tree. At the ¼ corner we set a ¾" x 30" rebar with a 3" aluminum cap 24" in ground as the monument for the ¼ corner. We buried the original brass cap and pipe along-side the monument and constructed a mound of stones, 3' base, 1.5' high, 2' north of corner to center of mound. As reference points, we set ...
- d. **Obliterated Corner, position determined by direct evidence** - Found no remaining evidence of the corner monument nor its accessories. I determined the point for the corner, according to the best available evidence, latitudinally midway between east-west road right-of-way fences and longitudinally in line with an ancient fence extending north; the corner falls in a gravel road. At the corner we set a 2" x 30" aluminum pipe with a 3" aluminum cap (containing a magnet), buried 0.5' below the road surface and deposited a magnet at the base of the monument. As reference points, we set ...
- e. **Corner lost in one direction, Obliterated in the other, position determined by proportionate measurement and collateral evidence** – At the calculated position of the ¼ corner we found no remaining evidence of the original 1911 brass cap monument nor its accessories. I spoke with an elderly land owner, living in a house southwest of the ¼ corner road intersection, he pointed to an old post, east of the 3-way road intersection (road extends north, south and west) and told us, "when I was young, the corner cap was

straight out (west) from that post about 15 to 20 feet toward the road". He said, "when the county rebuilt the road, they covered the cap." Using a metal detector, we were unable to locate the original corner monument. I determined the  $\frac{1}{4}$  corner point, latitudinally, west of the fence post, and longitudinally on line between the SE and NE corners of the Section (1/4 corner measures 22' west of post). At the  $\frac{1}{4}$  corner, we set a  $\frac{3}{4}$ " x 30" rebar with a 3" aluminum cap, buried 0.8' below the gravel road surface. As reference points to the corner, we set ...

- f. **Lost Corner** – Corner of sections 25, 26, 35 and 36: Nearby ground has been cleared for agricultural purposes with trees uprooted and pushed into piles near the corner position. We found a portion of the original monument, being a broken stone with one visible notch, lying on the ground approximately 30' southwest of its calculated position. We found no remaining evidence of the original corner accessories (4 bearing trees) nor any other evidence suggesting the original corner position. I determined the corner point to be at proportionate distance; measuring from the south  $\frac{1}{4}$  corner and northwest corner of section 25, and the north and east  $\frac{1}{4}$  corners of section 35. At the corner, we set a  $\frac{3}{4}$ " x 30" rebar with a 3" aluminum cap, 28" in the ground and constructed a mound of stones, 3' base, 1.5' high, 1.6' west of corner to center of mound. As reference points, we set four  $\frac{5}{8}$ " rebar with 1" aluminum caps (LS #) which bear S45°10'E 43.26', S45°23'W 54.62', N43°24'W 64.33' and N46°12'E 44.67' from the corner and set a guard stake, being a 5' metal "T" post 0.5' north of corner.
- g. **Additional samples** may be found in the Manual, beginning at page 375.

#### 1.6.5 A sketch of the corner:

**SAMPLE:**



**1.6.6 Other pertinent information as needed.**

## **“ATTACHMENT D”**

### **THE DELIVERABLES**

IN ACCORDANCE WITH UTAH CODE 17-23-17 AND 17-23-17.5 THERE WILL BE TWO PRIMARY DELIVERABLES WITH THE POSSIBILITY OF A THIRD DELIVERABLE, DEPENDANT UPON EITHER THE REQUIREMENTS OF COUNTY SURVEYORS OR THE COMMITTEE. THE TWO PRIMARY DELIVERABLES ARE: (1) A GENERAL VICINITY MAP WITH ENOUGH DETAIL SHOWING THE AREA(S) WHERE CORNER MONUMENTS WILL BE PRESERVED, PROTECTED, OR REHABILITATED; AND (2) A CORNER FILE (SECTION TIE SHEET) FOR EACH CORNER MONUMENT REPLACED OR RESTORED; SAID CORNER FILE SHALL BE FILED IN THE COUNTY SURVEYOR'S OFFICE AND ELECTRONICALLY FILED WITH THE STATE AGRC. (3) *IF REQUIRED BY THE COUNTY SURVEYOR WHERE THE WORK WILL BE PERFORMED OR BY THE COMMITTEE*, A RECORD OF SURVEY (ROS) PLAT WILL ALSO BE COMPLETED.

IT WILL BE EXTREMELY IMPORTANT TO REVIEW ATTACHMENT “C” LABELED “THE MONUMENT REPLACEMENT AND RESTORATION COMMITTEE FIELD PROCEDURES (Field Procedures)” PRIOR TO ANY WORK BEING PERFORMED. THIS FIELD PROCEDURES ATTACHMENT WILL SERVE AS A GUIDE TO BOTH THE CONTRACTOR IN HIS WORK AND THE COMMITTEE IN THEIR REVIEW.

#### **GENERAL VICINITY MAP**

This can be any type of map (USGS, Aerial Image, GIS map furnished by the County, or anything else that is to such a scale that will clearly depict the corner monuments that will be located, tied, rehabilitated, etc.

#### **THE SECTION TIE SHEET (CORNER FILE)**

During the course of or near the end of the survey project the COMMITTEE may require preliminary versions of corner file reports (section tie sheets) to verify that critical levels of data are made part of said Corner Files. At the end of the project the COMMITTEE may require proof of filing those Corner File Reports with the applicable County Office prior to payment. Please keep in mind that much of the same information found on a section tie sheet will also be found on any required ROS. One of the primary differences will be the capability of putting a great amount of information and detail on a Record of Survey Plat that may not fit on a Corner File Report (tie sheet). The “minimum” amount of information required on the Section Tie Sheet would be the following:

- Monument Description, include a complete description of the corner monument (Field Procedures 1.6.4).

- Corner description specifics (section, township, range, base & meridian)
- Date of field work
- Name(s) of individuals involved in the field work
- A complete description of accessories (original and added) and their relationship to the corner, with bearing/distance ties (Field Procedures 1.3).
- A reference to the ROS filing\recording number if an ROS is required
- Horizontal Coordinate Values and units (feet\meters)---State Plane ( horizontal datum\projection) as well as Lat\Lon (Field Procedures 1.4.1 and 1.4.2).
- Elevation Values and units (feet\meters)---Vertical Datum (Field Procedures 1.4.1 and 1.4.2).
- Stamp\seal of the surveyor certifying the work
- Photo(s) of the corner monument (showing markings)
- A sketch or graphical representation of the general corner vicinity showing existing features near the corner with accessories found or set (Field Procedures 1.6.5).
- Any additional information that describes the corner monument location that may help a surveyor or property owner locate the monument.

## **THE RECORD OF SURVEY PLAT**

If required by either the County Surveyor in that county where the work is performed, or by the COMMITTEE, a Record of Survey Plat will need to be filed. During the course or near the end of the survey project the COMMITTEE may require a preliminary version of said ROS plat to verify that the critical levels of data are made part of said plat. At the end of the project and prior to payment, the COMMITTEE may require proof of filing the final plat with the respective county. The necessary data on the ROS plat will be the following:

- 1) A description, per corner, whether it was considered "existent", "obliterated", or "lost".
- 2) In the case of existent or obliterated corners a thorough narrative corner by corner as to what was found, what was not, and what evidence was used in the decisions made. It will also be important to note how those findings relate to the original record. It will be critical to include what accessories were identified as well as what led to the final decisions that were made (Field Procedures 1.6.4).
- 3) Justification to determine a corner is lost as outlined in the Manual of Instructions (Field Procedures 1.2,4). It will be assumed that prior to the classification of a corner being lost, that every shred of evidence has been carefully examined.
- 4) A detailed description of what was set. (Field Procedures 1.6.4).
- 5) The following details for each monument (Field Procedures 1.4.1 and 1.4.2):
  - Horizontal Datum\State Plane Projection



- Northing and Easting and Units (feet\meters)
  - Latitude\Longitude
  - Vertical Datum
  - Elevation and Units (feet\meters)
  - Height and Geoid Model
  - Collection Method (VRS, OPUS, Other Control). If other control is used, what do those control monuments represent and how do they tie back to the HARN
  - A list of the HARN, CORS, or other reference stations used in the survey.
- 6) The stamp\seal and signature of the surveyor certifying the plat as well as any additional information that is required according to U.C. 17-23-17 that may be applicable to this type of survey project.

**UPON ACCEPTANCE BY THE COMMITTEE, AND AS REQUIRED BY STATUTE, ANY REQUIRED CORNER FILE AND/OR RECORD OF SURVEY PLAT WILL BECOME PUBLIC RECORD AND THE RESPONSIBILITY OF THAT COUNTY WHERE THE WORK WAS PERFORMED. AN ELECTRONIC VERSION OF THE DATA SHALL BE SENT TO THE STATE OF UTAH AGRC TO COMPLETE THE REQUIREMENTS OF THE CONTRACT.**

### **How to Submit Electronic Corner Information**

1. In a Web Browser Go To: <http://mapserv.utah.gov/PLSS/>
2. Select Login. Register if you don't have an account or login with you username and password.
3. Zoom to a section corner by using the TRS tab (Township, Range, Section) or use the + and – buttons to zoom to the corner to be submitted.
4. Once the corner is viewable select the point with your cursor.
  - a. If the point is displayed purple the corner currently has a Monument Record Sheet submitted. The sheet can be viewed by selecting the View tie sheet in the lower left corner.
  - b. Monument Record Sheets can still be submitted for corners that currently have a sheet. The new sheets will be added to the existing record sheet and hopefully improve the accuracy of the point over time.
  - c. If it is displayed orange the corner does not have a Monument Record Sheet available.
5. Once a point is selected, 2 options show up at the bottom of the screen.
  - a. Submit Existing Sheet – will allow you to submit a sheet that is already created and on your computer
  - b. Submit Corner Data – will allow you to create a sheet by filling out an online form with the required field information and photos. The following information is needed to complete a form:

- i. **Collection Date**
- ii. **BLM Point Number (provided by web site when the point is selected)**
- iii. **County**
- iv. **Accuracy**
- v. **Meridian**
- vi. **Township**
- vii. **Range**
- viii. **Section**
- ix. **Section Corner**
- x. **Monument Status**
- xi. **Geographic Coordinates -**
  - 1. **Latitude**
  - 2. **Longitude**
  - 3. **Ellipsoid Height**
  - 4. **Vertical Units**
- xii. **Grid Coordinates -**
  - 1. **Northing**
  - 2. **Easting**
  - 3. **NAVD88 Elevation**
  - 4. **State Plane Zone**
  - 5. **Horizontal Units**
  - 6. **NGS Adjustment**
- xiii. **Monument Description - (Location information, terrain, general findings, monument condition, etc.)**
- xiv. **Monument Notes - (Narrative about the monument and field procedures used to determine its location and coordinates)**
- xv. **Photo 1 - Map view Photo or Sketch**
- xvi. **Photo 2 - Monument Area Photo (with tripod over monument)**
- xvii. **Photo 3 - Monument Close-up Photo**
- xviii. **Extra Pages - pages can be added to the form that will be created when submitted.**