TEXAS MILITARY FORCES
Joint Forces Headquarters
Adjutant General's Department
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Surveyor's Report on the Boundary Survey of Camp Mabry, City of Austin, Travis County, Texas November 2009-January 2010

File No. Sketch File 78
TRAVIS County

Date Filed: September 9, 2011

Jerry Patterson, Commissioner

By Douglas Howard

See Travis Co. State Real Property Sketch 16

90085

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Joint Forces Headquarters
Adjutant General's Department
Facilities Management Office
Austin, Texas 78763
ATTN: LTC Senecaut

4 February 2010

Subject: Surveyor's Report on the Boundary Survey of Camp Mabry, City of Austin, Travis County, Texas—November 2009 to January 2010

Dear LTC Senecaut:

A boundary survey of Camp Mabry Military Reservation was conducted by request from the Director, Facilities Management Office from 18 November 2009 to 25 January 2010 in order to locate the true title lines of Camp Mabry. Please find the enclosed Surveyor's Report and the survey plat.

During the retracement and reconstruction of the boundary of Camp Mabry, I accessed approximately 28 deeds and 19 plats currently on file in Building Number 1 referencing the Camp Mabry tracts and adjoining property. At the conclusion of this boundary survey, the Real Property Division is requesting an Abstract of Title on property within the present boundary of Camp Mabry in order to clear up any potential ambiguities of title ownership.

This boundary survey has 37 boundary calls to Camp Mabry corners and seven ties to witness monuments—one being an estimated 1,200-year-old 39-inch diameter live oak tree in the vicinity of the northeast corner of Camp Mabry. A total of 143 boundary monuments marking both Camp Mabry and adjoining property were found; eight monuments were set for corner—to include one inside the old State Arsenal (Building Number 41) along it's inside east wall—which marks the west Right-of-Way line of Loop Number 1 MOPAC Highway.

If you have any questions regarding the boundary survey of Camp Mabry, please contact me at 512-782-5796 (office) or by email at david.rolbiecki@us.army.mil.

Very Respectfully,

David A. Rolbiecki, R.P.L.S.

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Subject: Surveyor's Report on the Boundary Survey of Camp Mabry, City of Austin, Travis County, Texas—November 2009 to January 2010

1. Purpose: To document the background, facts, retracement, and professional conclusions leading to the reconstruction of the boundary of present day Camp Mabry.

2. Information used in this Boundary Survey.

A. General Land Office field notes and Travis County Abstracts used. Research of original land grants from the General Land Office (GLO) website and visits to Travis County Deed Records was essential in the reconstruction of the boundary of present day Camp Mabry, which is out of two Original Surveys from the Sovereign. Three fourths of the northwest portion of Camp Mabry comes out of a 1,467.13-acre grant from the Republic of Texas to Daniel J. Gilbert, which was surveyed on 28 February 1838; called the "No.8 Survey" (Travis County Abstract No. 313), patented on 5 February 1846 to Thomas H. Mays. The remainder of Camp Mabry (the southeast approximate one-fourth portion) comes out a 4,428.40-acre grant from the Republic of Texas to George W. Spear, which was surveyed on 23 April 1838; called the "No.7 Survey" (Travis County Abstract No. 697), patented on 31 March 1841 to Spears.

B. Deed record information used in boundary reconstruction.

(1) Camp Mabry tracts (Table 1). The Facilities Management Office Real Property Division provided the following deeds comprising Camp Mabry:

Table 1. State of Texas tracts comprising present day Camp Mabry

STATE TRACT	VOLUME	PAGE	ACRES
"PARCEL NUMBER 1A": State Of Texas (General Land Office "No. 6")	105	466	80
"PARCEL NUMBER 2": State Of Texas (General Land Office "No.4")	188	232	7.42
"PARCEL NUMBER 3A": "Option of Purchase" Citizens Encampment Committee of the City of Austin for and on Behalf of the State of Texas "1st. Tract"	234	544	39.28
"PARCEL NUMBER 4": State of Texas Camp Mabry Road Entry & Exit	304	494	Not specified
"PARCEL NUMBER 5" containing the following tracts: State of Texas (General Land Office "No.7"), State of Texas (General Land Office "No.8" and "No. 9"), State of Texas (General Land Office "No.10")	188 188 183	232 233 46	Multiple
"PARCEL NUMBER 6": State of Texas	520	615	0.6669
"PARCEL NUMBER 7": Frank Roll et ux. to State of Texas	251	71	0.55 acre out of 2 acres
"PARCEL NUMBER 8": State of Texas	530	66	3.02

"PARCEL NUMBER 9": State of Texas	1263	539	1.35
"PARCEL NUMBER 10": Eliza C.J. Deison to United States Of America (General Land Office "No.1")	239	82-84	200
• Later described in a quit claim deed from United States of America to the State of Texas	1653	152	189.11
• Later described in a plat to the State of Texas	Book 7	37	190.80
• From which a portion of this plat was later described in a Property Transfer to the Texas National Guard Armory Board	5096	817	16.687[1]

(2) Adjoining property tracts (Table 2). Deeds to the current property owners that adjoin Camp Mabry obtained from Travis County Deed Records:

Table 2. Camp Mabry adjoining property tracts

GRANTEE	VOLUME	PAGE	ACRES	SURVEY ABSTRACT
NORTHWEST BOUNDARY LINE OF CAMP MABRY				
Colorado Foothills Section One	5	58	Plat	A-313
Colorado Foothills Section Two	5	107	Plat	
Lot 1 & 2 Balcones Park Annex	6	101	Plat	
Block F Balcones Park Addition Section Two	6	90	Plat	
Block R Balcones Park Addition Section Six	7	77	Plat	A-708
Block K Balcones Park Addition Section Five	7	43	Plat	
NORTHEAST BOUNDARY LINE OF CAMP MABRY				
United States of America	232	82	10.89	A-313
Block A & C Highland Park West	4	299B	Plat	
EAST BOUNDARY LINE OF CAMP MABRY				
State of Texas Loop No. 1 Right-of-Way	6823	637	Right-of-Way	A-313 & 697
City of Austin to State of Texas for Right-of-Way purposes "Tract 1" (taken out of Camp Mabry 190.80 acre tract)	SCR No. 29	58th Legislature	0.617	A-313
City of Austin to State of Texas for Right-of-Way purposes "Tract A"	SCR No. 40	May 1969	4,601 Sq. Ft.	A-697
City of Austin to State of Texas for Right-of-Way purposes "Tract B"	SCR No. 40	May 1969	9,774 Sq. Ft.	
City Of Austin	2946	1164	2.427	
City Of Austin	2476	508	2.922	

[1] Acreage not to be added to the original 200 acres. This tract is out of 190.80 acre tract from the United States of America to the State of Texas.

SOUTHWEST BOUNDARY LINE OF CAMP MABRY				
GRANTEE	**VOLUME**	**PAGE**	**ACRES**	**SURVEY ABSTRACT**
City of Austin Right-of-Way map of West 35th Street from MOPAC to Hill View Road	Right-of-Way map		Right-of-Way	A-313 & 697
City of Austin map of Camp Mabry Golf Course and West 35th Street Right-of-Way from Hill View Road to Pecos Street	Map Sec. #177		Right-of-Way	A-313
MAR-GLEN	19	174	Plat	
Resubdivision Lot 6 Perlitz Subdivision	99	286	Plat	
Perlitz Townhouse Addition	77	89	Plat	
Woodmont Addition	81	298	Plat	
Lot 1 Acers-Rodriguez Addition	80	256	Plat	
MONT-DALE	4	18	Plat	
Woodstone Square	63	58	Plat	
Lot-A Pecos Square Subdivision	77	242	Plat	

C. Local and State Agency Assistance.

In addition to the physical evidence locating the boundary lines of Camp Mabry, I needed map information to locate the Right-of-Way lines of MOPAC and West 35th Street. I interviewed people from both the City of Austin and Texas Department of Transportation and they provided me with information intrinsic to reconstructing the boundary of Camp Mabry along the Right-of-Way lines of MOPAC and West 35th Street. I also want to mention here that several Adjutant General's Department employees were selfless in assisting me with real property records and Geographic Information Systems data (Table 3).

Table 3. List of local and state agency employees that provided information on Camp Mabry.

Name	Property/Organization
John Moore, RPLS	City of Austin Deeds and Rights-of-Way, phone 512-974-7177
Joe Campos	City of Austin Deeds and Rights-of-Way
Michael Murphy	City of Austin Geographic Information Systems, phone 512-974-2741
Roger Wheat	Texas Department of Transportation, Austin, Texas , phone 512-832-7095
Tina Burford	Adjutant General's Department Facilities Management Directorate Real Property Division
Cynthia White	Adjutant General's Department Facilities Management Directorate Real Property Division
Burhan Girgin	Adjutant General's Department Enterprise GIS Manager, Facilities Management Directorate
Mark Pane	Adjutant General's Department Facilities Management GIS Technician
Bob Burson	Adjutant General's Department Facilities Management Maintenance Branch
Mark Hinojosa	Adjutant General's Department Facilities Management Maintenance Branch

3. Methods used in the boundary survey of Camp Mabry.

The first field work I performed on Camp Mabry was a topographical survey of the Garrison Command rear parking area and the area where Buildings 10A & B are now located. With the topographical information, I was able to design and stake out a concrete driveway the Garrison Command building needed in the rear to allow delivery trucks to drive directly to the loading dock. Bob Burson Maintenance Branch Manager of the Facilities Management Directorate asked and assisted me in staking out building envelope corners for the temporary buildings now occupied by Human Resources.

A. Establishing a geodetic control network.

I established the first survey control on 18 March 2009 using a Trimble 5700 dual frequency GPS receiver and Zephyr Geodetic2 antenna with ground plane set up on the starting point. The baseline of the starting point was post-processed in WGS-84 from a TXDOT Continuously Operating reference Station (TXAU (CORS)) located across MOPAC Highway (Figure 1) that was held fixed in three dimensions on the International Terrestrial reference Frame (ITRF). I downloaded the TXAU (CORS) Receiver Independent Exchange (RINEX) file from the National Geodetic Survey (NGS) and used its Broadcast Ephemeris and navigation files to process the baseline vector to the starting point using the Weighted Ambiguity and Vector Estimator (WAVE) program in Trimble Geomatics Office, V1.63, yielding an Earth-Centered, Earth-Fixed (ECEF) position in WGS-84. The resultant 1,865 foot baseline vector yielded a variance ratio of 11.5 (< 3 = flag); 1-sigma RMS of 0.002 feet; azimuth error of 00°00'00.299"; horizontal precision of 0.005 feet and vertical precision of 0.013 feet.

Fig. 1. TXAU CORS station seen from across MOPAC on top of TXDOT building.

The legal coordinate system passed by legislation for Texas land surveying is the North American Datum of 1983 (NAD 83), U.S. State Plane Texas State Plane Coordinate System

(U.S. Survey Foot). Austin is located in central Texas, and the zone used was Texas Central Zone 4203. Due to the fact that this is a mapping projection, the state plane grid coordinates needed to be scaled "to ground" coordinates and this was performed in Trimble Geomatics Office (Figure 2).[2] The vertical datum for the control network is the North American Vertical Datum of 1988 (NAVD 88).

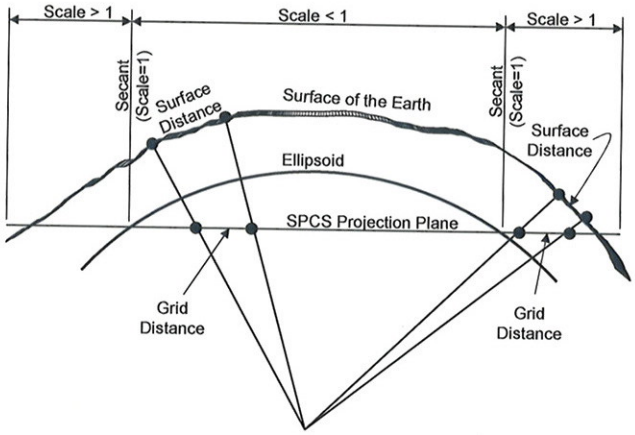


Fig. 2. Surface (ground) vs. grid distances. Scale factor is 1 when the SPCS projection plane intersects the ellipsoid at the secant. Distortion of distance on the projection plane occurs on either side of the secant.

Secondary control points for boundary and topographic work were relative-positioned from the starting point with Real Time Kinematic (RTK) GPS, using a Trimble R8 dual frequency GPS receiver attached to a fixed, 2-meter rod. Observation time was 181 epochs (*a priori* RTK times for secondary control points) whose baseline vectors from Station 500 typically yielded a 1-sigma RMS of 0.0006 feet, horizontal precisions of 0.007 feet, and vertical precisions of 0.011 feet.

Anticipating a full boundary survey of Camp Mabry, I established a geodetic control network on 30 September 2009 in order to densify the control to provide sufficient coverage using RTK. Station 500 was the base point for relative positioning of the new control. Eight additional control points (501 through 507, & 1000) were established by eight-minute fast-static observations using a Trimble R7 Global Navigation Satellite System (GNSS) dual frequency receiver and Zephyr Geodetic2 antenna with ground plane as the base station, and setting up a Trimble R6 GNSS dual-frequency receiver attached to a fixed, 2-meter rod over the unknown point. The new baseline vectors were processed using the WAVE program in Trimble Geomatics Office. Holding Station TXAU (CORS) fixed in three dimensions, the entire control

[2] Grid distances have a scale factor of < 1. Required distances for the survey must be "at ground" and a combined ground scale factor is performed using the reciprocal of the product of the grid scale factor and elevation factor. See: *Hybrid State Plane Coordinate System for Transforming a Citywide Survey Control Network to Surface Values: Case Study for Frisco, Texas*—Rolbiecki, D.A. and Lyle, S.D. ASCE Journal of Surveying Engineering; 134 (4), 105-14 (2008).

network underwent a minimally constrained least squares adjustment in WGS-84, passing the Chi-square test (the null hypothesis being expected frequency of errors estimated correctly) at the 95% Confidence Level, yielding 2-sigma errors at or below 0.04 feet horizontally, and 0.09 feet vertically (See Figure 3 and Appendix for network adjustment results).

Fig. 3. Geodetic control network established on Camp Mabry, 30 September 2009. Colored bars for the error ellipses over the points represent measured statistical horizontal and vertical errors in +/- 0.01-foot increments. Gray dotted lines represent a grid overlay of 1,000-foot squares.

Prior to beginning the boundary survey, I needed to perform a site calibration of the established GPS control network in order to localize to the existing control and transfer the calibration to subsequent job files each day I surveyed. The calibration used a least squares linear regression model in Trimble Geomatics Office, which showed the minimum and maximum residuals in both horizontal and vertical planes. Holding selected points with the minimal residuals in plane, a 7-parameter similarity transformation from the WGS-84 ECEF datum (in Cartesian X, Y & Z) to a "local datum" was performed. Transformation parameters used were:

- 3 parameters: Translation from the WGS-84 ellipsoid in ΔX, Y & Z to the local datum
- 3 parameters: Rotation about the Cartesian axes, X, Y & Z(ε = rotation about X axis; ψ = rotation about the Y axis; ω = rotation about Z axis)
- 1 parameter: Scale (In this case, a scale factor of 1 was used because I did not want to rescale the project coordinates during the calibration)

The Camp Mabry Site Calibration yielded extremely acceptable results (Table 4).

Table 4. Site Calibration Results		
Transformation from WGS-84 to Local Coordinate System†	**Residuals in Plane‡**	
ω = 00°00'01"	Max Horizontal	0.045 feet
ΔN = -0.012 feet	Max Vertical	0.018 feet
ΔE = 0.041 feet		
† ΔN/ ΔE represent differences in State Plane Northings and Eastings from the original N & E		
‡ Out of a total of 12 GPS control points spread across Camp Mabry and outside		

B. Deed Research.

In researching the Real Property Division at Camp Mabry, I was able to obtain the deeds for Parcels 1-10 from Table 1. Extensive deed research was done online using the Travis County Deed Records and Central Appraisal District websites. In addition, I used Texas File, a web-based company where I downloaded deeds and plats for a nominal fee. The City of Austin provided valuable maps of West 35th Street and deeds to easements on Camp Mabry needed for the boundary survey.

A working deed sketch was prepared in a Trimble Terra Model V10.6 project file and continuously updated as I obtained more deeds. This file later served as my base file for downloading field data. During the input of the "old" Camp Mabry tracts, there were apparent gaps and overlaps between these tracts. The interior tract lines in the survey are shown in an "approximate location" for information purposes only. It was not uncommon to find two tracts with contiguous lines with different distances (and sometimes bearings) called to the same corner. These tracts were surveyed in the late 19th and early 20th Century, and the instruments and methods used were crude by today's standards of surveying accuracy. Many of the original surveyors were exposed to the danger of hostile Indians and remote areas of undeveloped land, and low wages. For the most part, they were highly educated men, but the profession also attracted anyone willing to undertake dangers and hardship, and some of the Original Surveys were performed with questionable competence. Land was cheap, and efforts to produce accurate surveys could have exceeded the cost of the land itself. Furthermore, surveying was done with compass and most likely a Gunter's chain or other "chaining" device for distance measurement marked conveniently for measurement in varas, the standard linear unit of measure in Texas at the time, and used by the GLO today.[3] Local attractions from ferrous soils on the compass needle may have caused false readings to the magnetic meridian, and when extending

[3] Shine, D. and N. Foster. 2000. *Boundary Retracement.* Texas Society of Professional Surveyors seminar, 9 December 2000, Tyler, Texas. The Spanish word vara, translated into English, means "yard," vaguely defined as "three geometrical feet." The length of the vara is different in several Latin American countries. By statute, the Texas legislature adopted the vara as 33.33 inches in 1919.

long lines, drift to one side of the line or the other was common. Without having the actual field notes of the surveyors, it is difficult to know with any degree of certainty, how they surveyed the tracts and their propensity for drift or distance error. Knowing these variables can help us compensate for the error by proportion and applying magnetic declination. Most of the metes and bounds descriptions in these deeds give calls to witness trees and reference ties to creeks and streams, calling for stone corners, and setting stakes. This is pretty good evidence that an actual on-the-ground survey was made. There were many tracts giving no reference to natural or artificial monuments on the ground, leaving me to wonder if a survey was actually performed, or if they were "office surveys." Needless to say, putting these tracts together in hopes they would all fit together nicely was overly optimistic. The Camp Mabry tracts I did survey (with the exception of using the Rights-of-Way of MOPAC Highway and West 35th Street to control the present boundary) were tied directly to the boundary of Camp Mabry.

C. Fieldwork.

Actual boundary fieldwork commenced on 24 November 2009 on the present north line of Camp Mabry where it joins the United States of America 10.89 acre tract. I was asked by Facilities Management Directorate to prepare a survey for the Air Force Weather Flight site for a lease agreement. The east line of the Air Force lease property was established after locating the 16.687-acre property transfer tract (where HQ 36th Infantry Division sits) and projecting a line from the northeast line of the 16.687-care tract along an arc whose radius was called to be 740 feet. The arc is the apparent south line of Engineer (a.k.a. Division) Drive, and thus we have an 80-foot-wide Right-of-Way for Engineer Drive.

My next focus was to retrace the 190.80-acre tract that came out of the 200-acre tract formerly known as the "Old Deison Farm." At around this time, Mark Hinojosa, a State employee and former survey field instrument operator began assisting me for the duration of the project. I was looking for the called stone and concrete monuments with the inscription of "Camp Mabry" on them. In spite of all the development that sprang up around Camp Mabry, I was able to find most of the original Camp Mabry monuments, which would control the northwest and northeast line of Camp Mabry (Figure 4). I made every effort to recover all of the original Camp Mabry monuments; unfortunately, some were destroyed or could not be found. Justice Thomas M. Cooley once said:

> "*The general duty of a surveyor in such a case is plain enough. He is not to assume that a monument is lost until after he has thoroughly sifted the evidence and found himself unable to trace it.*"[4]

[4] Cooley, Thomas M. 1881. Chief Justice, Supreme Court of Michigan. *The Judicial Function of Surveyors*. 2nd Meeting of the Michigan Association of Surveyors and Engineers, Lansing, Michigan 11-13 January 1881.

Fig. 4. Original Camp Mabry monument—one of several found in good condition along the northwest and northeast lines.

The next phase was to follow the northwest line of Camp Mabry with the Colorado Foothills and Balcones Park subdivisions. The controlling monuments found were the original stone and concrete monuments called out in the 190.80-acre Camp Mabry tract and what was called out on the plats (Figure 5).

Fig. 5. Original stone monument found with nail on top (looking south). This marks the inner ell corner of the northwest of Camp Mabry at the northeast corner of Lot 10, Block 3, Balcones Park Addition Section Two. The same type monument was found at a Camp Mabry corner at the intersection of the northwest line of Block F, Balcones Park Section Two and the southeast line of Block R, Balcones Park Addition Section Six. The private property wood fence corner overlaps into Camp Mabry by 3.3 feet to the east.

I concentrated next on the northeast line again and tying in Block C of Highland Park West; this time running the line from the original Camp Mabry northeast line all the way east to the

west Right-of-Way line of MOPAC Highway. While searching for a called concrete monument stamped "Camp Mabry," we ran into the owner of Lot 8, Block C of Highland Park West that showed us a large live oak tree whose age was estimated by the City of Austin Arborist to be between 800 and 1,200 years old (Figure 6). We later measured the tree to be 39 inches in diameter at breast height, and used it as a witness tree to a Camp Mabry corner.

Fig. 6. 39-inch diameter-at-breast-height live oak tree believed to be 1,200 years old. The tree canopy rises up to about 60 feet. Mark Hinojosa poses on the east side of the tree for size comparison.

There were areas of Camp Mabry covered with thick tree canopy not suitable for GPS observation because of multipath error effects and high Position Dilution of Precision (PDOP).[5] When this occurred, we used a Trimble S6 total station robot to take terrestrial observations. The S6 can remotely track a prism rod ran by the operator, and can measure objects without the prism rod using Direct Reflectorless technology (Figure 7).

From the northeast corner of Camp Mabry in the west Right-of-Way line of MOPAC Highway, we ran the line south along the Right-of-Way line to the northeast line of West 35th Street. We found every monument at their called locations; mostly TXDOT Type-II monuments, which are bronze discs in concrete monuments that were set, flush to the ground.

[5] Dilution of Precision (DOP) is a unit-less value based on the quality of satellite geometry in the sky and includes Position, Geometrical, Time, and Vertical DOP. Good (low) PDOP means $\geq$ five satellites spread out widely in the sky, covering all quadrants of the compass. Poor (high) PDOP commonly occurs during a particular time of the day when satellites are clumped too closely together, and many are below the horizon mask angle of the GPS receiver.

Fig. 7. Trimble S6 total station robot locked on to a prism rod taking a back sight. The antenna on the robot receives commands from the data collector controlled by the operator (at the prism rod) and sends data back for logging. In this configuration, the robot tracks the prism rod's infrared beacon, and measures distances with infrared. The Direct Reflectorless mode uses a laser beam pointed at the object that is being measured and does not require use of the prism rod. This location is near the northwest corner of Camp Mabry. The chain link fence is the security fence constructed after 911.

We found three military buildings overlapping the Camp Mabry boundary line. The first one is the Reserve Center Maintenance Building located at the southeast line of the United States of America 10.89 acre tract. Its southeast side overlaps into Camp Mabry by as much as 28.5 feet. This is the reason for the 0.164-acre 101LE State of Texas Lease No. DACA 63-5-77-0005 to the United States. The second is the AAFEES building, which overlaps into the west Right-of-Way line of MOPAC Highway by 1.1 feet (see Detail "G" of this survey). The third building is the Old State Arsenal (Building Number 41), whose southeast corner overlaps into the west Right-of-Way line of MOPAC Highway by 2.7 feet (see Detail "H" of this survey). We had to set a boundary corner monument inside the building, and we coordinated with the building staff to reconnoiter the where the monument needed to be set and came back the next day and set the monument, which is now located in the Men's locker room (Figure 8).

Fig. 8. Above left: Traversing into the south side of Building 41. Above right: Location of the Camp Mabry boundary monument 2.4 feet inside the outer wall of Building 41. Below: 5/8" iron rod with aluminum cap stamped AGDTX-BOUNDARY set for corner.

There were other overlaps onto Camp Mabry as shown on the survey. The platted subdivisions along the northwest and northeast line of Camp Mabry had their lot corners in their

proper locations, and no conflicts seen. However, there are private fences and stone walls that overlap into Camp Mabry as shown in Details "B" through "E" on this survey. The most significant overlap is the green chain link fence along the northwest line of Camp Mabry from the lots of Block K of Balcones Park Section Five and Block R of Balcones Park Section Six subdivisions. The overlap begins 1.5 feet into Camp Mabry at Lot 14, Block R of Balcones Park Section Six subdivision (Figure 9), and widens as much as 25.3 feet into Camp Mabry at the common corner of Lots 16 & 17, Block K of Balcones Park Section Five subdivision. From there, the green chain link fence narrows back, overlapping the northwest corner of Camp Mabry by 14.9 feet. There is evidence of landscaping and cultivation by the lot owners all the way up to the fence overlap.

Fig. 9. Above left: Green chain link fence at Lots 13 & 14, Block R of Balcones Park Section subdivision that overlaps into Camp Mabry seen beyond the 911security fence. Above right: Green chain link fence and wooden fence at Lots 12 & 13, Block R of Balcones Park Section subdivision that overlaps into Camp Mabry seen beyond the 911security fence.

We ran the south line of Camp Mabry from the west Right-of-Way line of MOPAC Highway by locating Right-of-Way monumentation of West 35th Street. We located boundary corners to the Perlitz town house subdivisions, and those of the Woodmont Addition and Acers-Rodriguez Addition subdivisions (see Detail "J" of this survey).

From the northwest corner of Lot 1, Acers-Rodriguez Addition, we ran the south line of Camp Mabry along an existing (and surprisingly accurately laid) chain link fence (Figure 10).

Fig. 10. Mark Hinojosa drilling a hole in concrete at the base of a chain link fence corner post to set a 5/8" iron rod with aluminum cap stamped AGDTX-Boundary. This boundary corner is in the northwest Right-of-Way line of West 35th Street. View looking northwest.

The Right-of-Way of West 35th Street along this stretch was a bit challenging because the two City of Austin Right-of-Way maps that were supposed to have matched at Hill View Road had slightly different bearing systems, compounded by the fact that the map from MOPAC Highway to Hill View Road had approximately a 30-foot excess in length. I relied heavily upon City of Austin Map "Sec. #177" to reconstruct the boundary back to the Point of Beginning (Figure 11).

Fig. 11. Point of Beginning: A 5/8" iron rod with aluminum cap stamped AGDTX-BOUNDARY set for corner at the southwest base of a steel chain link fence corner post at the intersection of the present northeast Right-of-Way line of West 35th Street and the southeast line of Lot 1, Block 1, Colorado Foothills Section One. View is looking southeast.

We used City of Austin Map "Sec. #177" to locate the Camp Mabry Golf Course, which was surveyed by the city in the 1950s, and called for monuments set. These monuments turned out to be 1-inch square iron rods (Figure 12).

Fig. 12. 1-inch square iron rod found at a boundary corner of the Camp Mabry Golf Course.

In all, we spent a total of 31 days of fieldwork to complete the boundary, ending on 25 January 2010 (Figure 13 & 14).

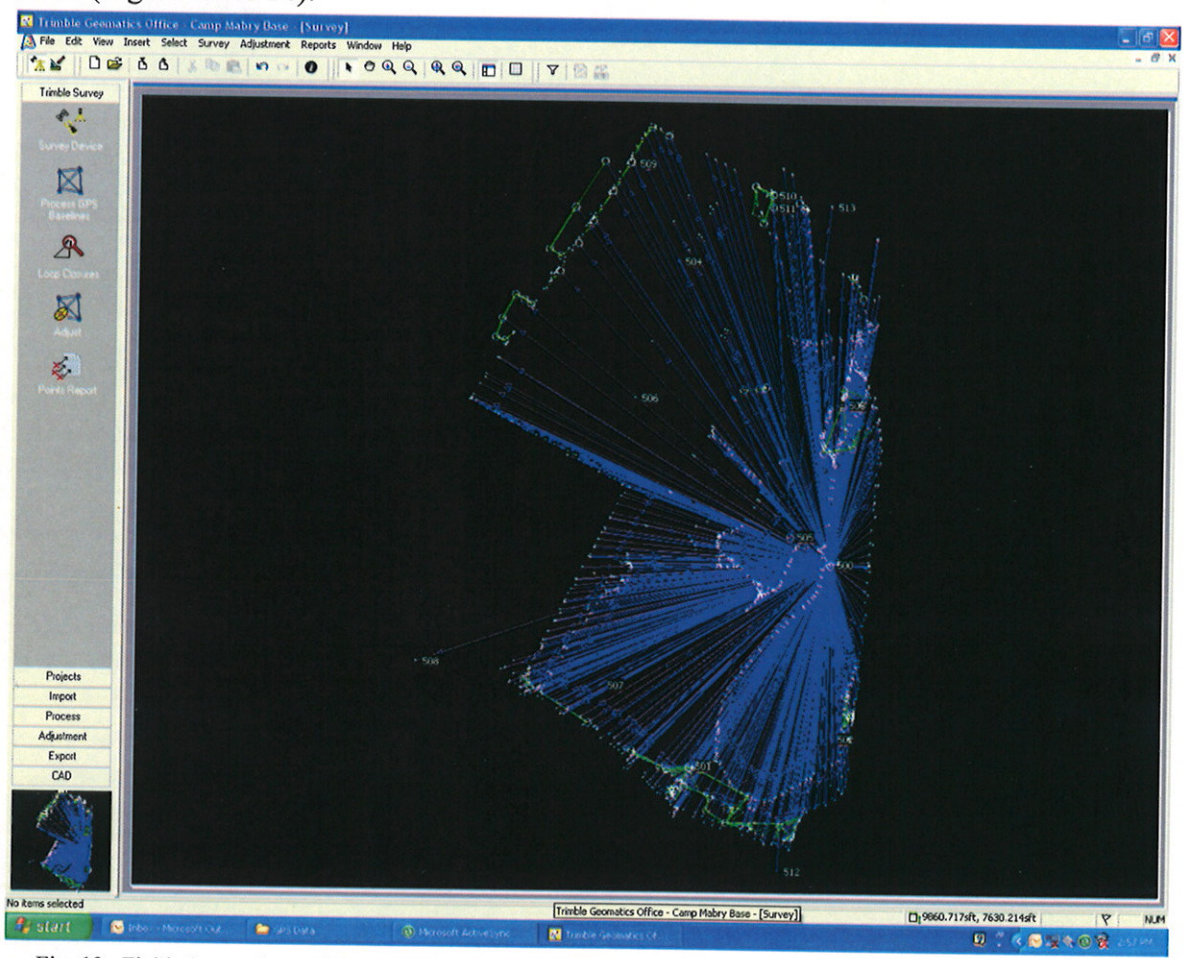


Fig. 13. Field observations of Camp Mabry shown in Trimble Geomatics Office. Blue vectors represent GPS baselines streaming out from Station 500. Green vectors represent terrestrial observations using the Trimble S6 robot.

Fig. 14. Workhorse of the Camp Mabry boundary survey was GPS and a truck. Left foreground: Trimble R7 GNSS dual frequency receiver and Zephyr Geodetic2 antenna with ground plane set up over Station 500, used as the Base. Right foreground: Trimble TRIMMARK-3 base station radio and antenna used as the VHF communication link to send relative-positioning corrections to the Rover receiver. Middle foreground: Trimble R6 GNSS dual frequency receiver on a 2-meter fixed composite rod with Trimble TSC2 Survey Controller data collector, used as the Rover. Mark Hinojosa poses in the background. View looking south at the Parade Field on Camp Mabry.

4. Results of the 2009-2010 Camp Mabry Boundary Survey.

Please refer to the Camp Mabry Boundary dated February 2010 and its accompanying detail sheet. Today, Camp Mabry encompasses an area of 368.14 acres, with a total perimeter of 18850.11 feet.

The following metes and bounds describe the boundary of present day Camp Mabry Military Reservation:

BEING *a tract or parcel of land situated in the City of Austin, Travis County, Texas, and being out of the Daniel J. Gilbert Number 8 Survey, Abstract Number 313 and the George W. Spear Survey, Abstract Number 697, and being the present day Camp Mabry Texas National Guard Military Reservation now or formerly making up the following parcels of land:*

> *"PARCEL NUMBER 1A": State Of Texas (General Land Office "No. 6") called 80 acres, Volume 105, Page 466; "PARCEL NUMBER 2": State Of Texas (General Land Office "No.4") called 7.42 acres, Volume 188, Page 232; "PARCEL NUMBER 3A": "Option of Purchase" Citizens Encampment Committee of the City of Austin for and on Behalf of the State of Texas "1st. Tract" called 39.28 acres, Volume 234, Page 544; "PARCEL NUMBER 4": State of Texas Camp Mabry Road Entry & Exit, Volume 304, Page 494; "PARCEL NUMBER 5" containing the following tracts: State of Texas (General Land Office "No.7"), Volume 188, Page 232, State of Texas (General Land Office "No.8" and "No. 9"), Volume 188, Page 233, State of Texas (General Land Office "No.10"), Volume 183, Page 46; "PARCEL NUMBER 6": State of Texas called 0.6669 acres, Volume 520, Page 615; "PARCEL NUMBER 7": Frank Roll et ux. to State of Texas called 0.55 acre out of 2 acres, Volume 251, Page 71; "PARCEL NUMBER 8": State of Texas called 3.02 acres, Volume 530, Page 66; "PARCEL NUMBER 9": State of Texas called 1.35 acres, Volume 1263, Page 539; "PARCEL NUMBER 10": Eliza C.J. Deison to United States Of America (General Land Office "No.1") called 200 acres, Volume 239, Pages 82-84, and later described in a quit claim deed from United States of America to the State of Texas called 189.11 acres, Volume 1653, Page 152, and later described in a plat to the State of Texas called 190.80 acres, Book 7, Page 37, from which a portion of this parcel called 16.687 acres was later described in a Property Transfer to the Texas National Guard Armory Board, Volume 5096, Page 817;*

All recorded in the Deed and Plat Records of Travis County, Texas and being more particularly described as follows:

BEGINNING *at a 5/8" iron rod with aluminum cap stamped AGDTX-BOUNDARY set in concrete (U.S. State Plane NAD83 Texas Central Zone 4203//10,087,193.298'N// 3,106,247.082'E) at the southwest base of a steel chain link fence corner post at the intersection of the present northeast Right-of-Way line of West 35th Street (variable width Right-of-Way) and the southeast line of Lot 1, Block 1, Colorado Foothills Section One, an addition to the City of Austin, Texas recorded in Book 5, Page 58, Plat Records, Travis County, Texas, from which a 1" diameter pipe found in a concrete monument at the southeast corner of said Lot 1, Block 1, Colorado Foothills Section One bears South 27°44'09" West a distance of 44.40 feet;*

THENCE *with the southeast line of said Colorado Foothills Section One, and the southeast line of Colorado Foothills Section Two, an addition to the City of Austin, Texas recorded in Book 5, Page 107, Plat Records, Travis County, Texas the following calls:*

North 27°44'09" East a distance of 2046.63 feet to a dome-shaped stone monument with nail on top found at the northeast corner of said Colorado Foothills Section Two;

North 61°17'25" West passing at 1252.57 feet a concrete monument with bronze cap stamped CAMP MABRY found in the northeast line of Block F, Balcones Park Addition Section Two, an addition to the City of Austin, Texas recorded in Book 6, Page 90 Plat Records, Travis County, Texas, and continuing for a total distance of 1713.28 feet to a dome-shaped stone monument with nail on top found at the southeast corner of Lot 14, Block R, Balcones Park Addition Section Six, an addition to the City of Austin, Texas recorded in Book 7, Page 77, Plat Records, Travis County, Texas;

***THENCE** North 32°50'56" East with the southeast line of said Block R, Balcones Park Addition Section Six passing at 1067.04 feet a concrete monument with bronze cap stamped CAMP MABRY found, and passing at 2578.80 feet a concrete monument with bronze cap stamped CAMP MABRY found, and continuing for a total distance of 2766.05 feet to an iron rod with red plastic cap found for corner in the southeast line of Block K, Balcones Park Addition Section Five, an addition to the City of Austin, Texas recorded in Book 7, Page 43, Plat Records, Travis County, Texas, said point also being the southwest corner of a called 10.89 acre tract of land described in a deed to the United States of America recorded in Volume 239, Page 82, Deed Records, Travis County, Texas;*

***THENCE** South 61°43'33" East with the southwest line of said United States of America 10.89 acres passing at passing at 362.65 feet a 1/2" iron rod found in concrete 0.85 feet northeast at right angles to said line, and passing at 725.83 a concrete monument with stamped CAMP MABRY found, and passing at 932.93 feet a 5/8" iron rod with aluminum cap marked AGDTX-BOUNDARY found, and continuing for a total distance of 1325.54 feet to a concrete monument with bronze cap stamped CAMP MABRY found at the southeast corner of said United States of America 10.89 acres, from which a 2" diameter iron pipe found at the southeast corner of a called 2.35 acre tract of land described as "100LE" in a lease agreement from the State of Texas to the United States of America, Lease No. DACA 41-443-ENG.6828 bears South 61°40'47" East a distance of 400.00 feet;*

***THENCE** North 28°18'06" East continuing with the southeast line of said United States of America 10.89 acres a distance of 360.79 feet to an iron rod with blue plastic cap found for corner in the southwest line of Block C, Highland Park West, an addition to the City of Austin, Texas recorded in Book 4, Page 299B, Plat Records, Travis County, Texas;*

***THENCE** with the southwest line of said Block C, Highland Park West the following calls:*

South 61°34'36" East passing at 200.02 feet a 2" diameter iron pipe found at the northeast corner of said 2.35 acre tract "100LE," and continuing for a total distance of 410.47 feet to a concrete monument with bronze cap stamped CAMP MABRY found for corner, from which a 39" diameter live oak tree bears South 82°30' East a distance of 57.0 feet;

South 03°01'49" East a distance of 411.49 feet to a 5/8" iron rod with aluminum cap stamped AGDTX-BOUNDARY set for corner in the hole of a 12" diameter old wooden fence corner post found lying on the ground next to the hole;

South 60°27'49" East a distance of 419.03 feet to a 1/2" iron rod found for corner in the present west Right-of-Way line of Loop Number 1 MOPAC Highway, as described in a deed to the State of Texas for the purposes of widening MOPAC Highway recorded in Volume 6823, Page 637, Deed Records, Travis County, Texas;

***THENCE** with the present west Right-of-Way line of said Loop Number 1 MOPAC Highway the following calls:*

South 11°05'11" East passing at 550.27 feet an X-Cut found on top of a concrete curb, and continuing for a total distance of 1244.24 feet to a 3/4" iron rod found for corner;

South 12°51'07" East a distance of 235.19 feet to a bronze TYPE-II Texas Department of Transportation monument found for corner;

South 04°20'51" East a distance of 205.06 feet to a bronze TYPE-II Texas Department of Transportation monument found for corner;

South 04°47'03" West a distance of 485.86 feet to a bronze TYPE-II Texas Department of Transportation monument found for corner;

South 04°04'18" West a distance of 599.02 feet to a bronze TYPE-II Texas Department of Transportation monument found for corner;

South 04°49'14" West a distance of 1209.35 feet to a bronze TYPE-II Texas Department of Transportation monument found for corner;

South 09°56'02" West a distance of 200.76 feet to a 5/8" iron rod with aluminum cap stamped AGDTX-BOUNDARY set for corner inside the Old State Arsenal Building Number 41, 2.4 feet west of the outside west wall;

South 04°55'02" West a distance of 238.51 feet to a 5/8" iron rod found for corner;

South 11°02'57" West a distance of 503.04 feet to a to a 1/2" iron rod found for corner in the northeast line of the remainder of a called 2.427 acre tract of land described in a deed to the City of Austin recorded in Volume 2946, Page 1164, Deed Records, Travis County, Texas;

***THENCE** North 65°27'00" West with the northeast line of said City of Austin's remaining 2.427 acres and a chain link fence a distance of 290.02 feet to a steel chain link fence corner post found at the northwest corner of the remainder of a called 2.922 acre tract of land described in a deed to the City of Austin recorded in Volume 2476, Page 508, Deed Records, Travis County, Texas;*

THENCE *South 12°20'54" West with the west line of said City of Austin's remaining 2.922 acres and a chain link fence a distance of 359.85 feet to a 1" diameter round-head bolt found for corner in the present west Right-of-Way line of said Loop Number 1 MOPAC Highway at the beginning of a non-tangent curve to the left whose chord bears South 31°25'01" West a distance of 73.87 feet;*

THENCE *with the present west Right-of-Way line of said Loop Number 1 MOPAC Highway the following calls:*

In a southwesterly direction with said non-tangent curve to the left having a central angle of 17°42'21", a radius of 240.00 feet and an arc distance of 74.17 feet to a bronze TYPE-II Texas Department of Transportation monument found for corner;

South 20°55'22" West a distance of 135.18 feet to a bronze TYPE-II Texas Department of Transportation monument found for corner at the beginning of a non-tangent curve to the right whose chord bears South 51°08'51" West a distance of 80.22 feet;

In a southwesterly direction with said non-tangent curve to the right having a central angle of 56°18'49", a radius of 85.00 feet, and an arc distance of 83.54 feet to a bronze TYPE-II Texas Department of Transportation monument found for corner;

South 79°20'35" West a distance of 35.19 feet to a 5/8" iron rod found in a concrete monument flush to the ground in the north Right-of-Way line of said West 35th Street;

THENCE *with the north Right-of-Way line of said West 35th Street the following calls:*

North 75°55'55" West a distance of 406.00 feet to an X-Cut found in the top of a concrete curb with "0+99" etched beside it;

North 75°22'32" West a distance of 188.72 feet to a 5/8" iron rod found for corner in the southeast line of Lot 4 of the Resubdivision of Lot 6, Perlitz Subdivision, an addition to the City of Austin, Texas recorded in Volume 99, Page 286, Plat Records, Travis County, Texas;

THENCE *departing the north Right-of-Way line of said West 35th Street and with the southeast and northeast line of said Resubdivision of Lot 6, Perlitz Subdivision the following calls:*

North 28°31'53" East a distance of 176.99 feet to a calculated point for corner 0.4 feet South 28°31'53" West from the corner of a wrought iron fence, and from said calculated point a 1-1/4" diameter iron pipe found on the west side of a stone wall bears South 62°46'23" East a distance of 11.62 feet;

North 62°46'23" West passing at 49.86 feet a 1/2" iron rod found, and passing at 58.77 feet an iron rod with yellow cap found at the northwest corner of Lot 4 of said Resubdivision of Lot 6, Perlitz Subdivision, and continuing for a total distance of 210.25 feet to a 1/2" iron rod found at

the northeast corner of Lot 9 of Perlitz Townhouse Addition, an addition to the City of Austin, Texas recorded in Volume 77, Page 89, Plat Records, Travis County, Texas;

***THENCE** with the northeast line of Lot 9 of said Perlitz Townhouse Addition the following calls:*

North 63°08'24" West a distance of 77.01 feet to a 1/2" iron rod found for corner;

North 62°37'35" West a distance of 215.22 feet to a 1/2" iron rod found at the northeast corner of said "Parcel Number 4" State of Texas Camp Mabry Road Entry and Exit tract;

***THENCE** with the southeast, southwest, and northwest lines of said "Parcel Number 4" State of Texas Camp Mabry Road Entry and Exit tract the following calls:*

South 27°01'02" West passing at 178.60 feet a 5/8" iron rod with aluminum cap stamped AGDTX-BOUNDARY set for reference in the present northeast Right-of-Way line of said West 35th Street, and continuing for a total distance of 201.41 feet to a point for corner;

North 54°43'54" West a distance of 80.75 feet to a point for corner;

North 27°01'06" East passing at 20.76 feet an X-Cut in the southwest edge of a concrete sidewalk set for reference in the present northeast Right-of-Way line of said West 35th Street, and continuing for a total distance of 190.96 feet to a 5/8" iron rod with aluminum cap stamped AGDTX-BOUNDARY set at the northeast corner of Woodmont Addition, an addition to the City of Austin, Texas recorded in Volume 81, Page 298, Plat Records, Travis County, Texas, from which a 5/8" iron rod found bears South 62°10'13" East a distance of 18.63 feet;

***THENCE** North 62°10'13" West a with the northeast line of said Woodmont Addition a distance of 206.63 feet to a 5/8" iron rod found for corner;*

***THENCE** North 62°11'12" West a distance of 279.39 feet to a 5/8" iron rod with aluminum cap stamped AGDTX-BOUNDARY set for corner in the north line of Lot 1, Acers-Rodriguez Addition, an addition to the City of Austin, Texas recorded in Volume 80, Page 256, Plat Records, Travis County, Texas, from which a 5/8" iron rod found in the original northeast Right-of-Way Line of said West 35th Street bears North 62°11'12" West a distance of 75.27 feet;*

***THENCE** with the present northeast Right-of-Way line of said West 35th Street and along a chain link fence the following calls:*

North 42°40'29" West a distance of 92.56 feet to a steel fence corner post found for corner, from which a 5/8" iron rod with aluminum cap stamped AGDTX-BOUNDARY set for reference in concrete at the east base of said corner post bears North 49°11'17" East a distance of 0.26 feet;

North 56°37'07" West a distance of 659.75 feet to a 1" square iron rod found for corner;

North 56°22'05" West a distance of 515.83 feet to the ***POINT OF BEGINNING*** *and containing 368.14 acres of land.*

Bearing system of this survey is U.S. State Plane 1983 (at ground), Texas Central Zone 4203, North American Datum of 1983(CONUS), with a ground scale factor of 1.00007446 computed from GPS Point #500 (10,088,298.352'N // 3,109,137.309'E). State plane coordinate values (U.S. Survey Feet) for point #500 derived from CORS Station TXDOT-AUSTIN (TXAU), NAD 83(CORS). Vertical Datum: NAVD 88, GEOID03 (CONUS), GPS-derived orthometric elevations.

5. Professional Conclusions.

A. Construction of the northwest boundary line of Camp Mabry from the northwest Right-of Way line of West 35th Street to the United States of America 10.89-acre tract.

Using the City of Austin Map "Sec. #177" and the Colorado Foothills Section One and Two plats, I found the called for concrete monument at the intersection of the northwest Right-of-Way line of West 35th Street and the southeast line of Colorado Foothills Section One. The monument was a 1-inch iron pipe in a concrete monument sticking approximately 1.5 feet above the ground next to a power pole. Finding a dome-shaped stone monument (a nail was found in its top center) in the called for southwest line of the 190.80-acre Camp Mabry plat, I constructed a line connecting the two monuments. Referring to City of Austin Map "Sec. #177," I set a 5/8" iron rod with aluminum cap stamped AGDTX-BOUNDARY at the called distance of 44.40 feet from the concrete monument along the constructed line. The monument was set at the southwest base of a steel chain link fence corner post. City of Austin Map "Sec. #177" called this corner a "Post." From this set monument, I ran the boundary line to the called stone monument at the northeast corner of Colorado Foothills Section Two.

From the stone monument at the northeast corner of Colorado Foothills Section two, I constructed a boundary line to another dome-shaped stone monument (a nail was found in its top center) at the called for west corner of the 190.80-acre Camp Mabry plat in the southeast line of Balcones Park Addition Section Six. I also found a concrete monument on line at 1252.57 feet stamped "CAMP MABRY" (the inscription was on a bronze cap on top of the monument, common to every "CAMP MABRY" monument I found) called for in the 190.80-acre Camp Mabry plat.

From the stone monument found at the west corner of the 190.80-acre Camp Mabry plat in the southeast line of Balcones Park Addition Section Six, I constructed a boundary line to an iron rod with red plastic cap found at the southeast corner of the United States of America 10.89-acre tract. Along this line, I found concrete monuments stamped "CAMP MABRY" called for in the 190.80-acre Camp Mabry plat at 1067.04 feet, and at 2578.80 feet, and continued for a total distance of 2766.05 feet to the capped iron rod found.

B. Construction of the northeast boundary line of Camp Mabry from the southwest corner to the northeast corner of the United States of America 10.89-acre tract.

From the iron rod with red plastic cap found at the southwest corner of the United States of America 10.89-acre tract, I constructed a boundary line to the concrete monument stamped "CAMP MABRY" called for in the 190.80-acre Camp Mabry plat at the southeast corner of the United States of America

10.89-acre tract. Along this line, I found a concrete monument stamped "CAMP MABRY" called for in the 190.80-acre Camp Mabry plat at 725.83 feet, and continued for a total distance of 1325.54 feet to the southeast corner of the United States of America 10.89-acre tract. From there, I constructed a boundary line to an iron rod with blue plastic cap found for corner in the southwest line of Block C of Highland Park West subdivision.

Next, I constructed a boundary line from the iron rod with blue plastic cap through a 2-inch iron pipe found on line at 200.02 feet called for at the northwest corner of the 2.35-acre "100LE" lease tract from the State of Texas to the United States of America, which ran for a total distance of 410.47 feet straight to a concrete monument stamped "CAMP MABRY" called for in the 190.80-acre Camp Mabry plat found in the southwest line of Block C of Highland Park West subdivision. I witnessed this corner to a 39-inch live oak tree bearing South 82°30' East distance of 57.0 feet.

I constructed the next two boundary lines by bearing-bearing intersect using the original plat bearings, setting a 5/8" iron rod with aluminum cap stamped AGDTX-BOUNDARY in the hole of a 12-inch diameter old wooden fence post once stood from the concrete monument stamped "CAMP MABRY" called for in the 190.80-acre Camp Mabry plat to the north; and from a 1/2" iron rod found for corner in the west Right-of-Way line of MOPAC Highway to the southeast. In that location, there was supposed to have been a concrete monument stamped "CAMP MABRY" called for in the northeast line of the 190.80-acre Camp Mabry plat. Austin Electric Power Company had recently done some work at that corner location and I believe they destroyed the original monument in order to set a down guy.

C. Construction of the east boundary line of Camp Mabry along the west Right-of-Way line of MOPAC Highway to the City of Austin 2.427 acre and 2.922 acre tracts.

From the 1/2" iron rod found at the northeast corner of Camp Mabry, I constructed the boundary line by finding monuments in their proper location at every corner, save for the one that needed to be set inside the Old State Arsenal (Building 41). I set a 5/8" iron rod with aluminum cap stamped AGDTX-BOUNDARY by bearing-bearing intersect from a Type-II TXDOT monument found for corner from the north; and from a 5/8" iron rod found for corner from the south; placing the monument 2.4 feet inside the building from its outer west wall.

From the 5/8" iron rod I used to set the monument inside Building 41, I found a 1/2" iron rod for corner in its proper location in a chain link fence in the northeast line of two City of Austin tracts, being the remainder of a called 2.427-acre tract and the remainder of a 2.922-acre tract, respectively.

D. Construction of the east boundary line of Camp Mabry from the City of Austin 2.427-acre and 2.922-acre tracts to the west Right-of-Way line of MOPAC Highway.

The two City of Austin tracts called for their northeast line to run with a chain link fence. Departing the west Right-of-Way line of MOPAC Highway, I constructed a boundary line from the 1/2" iron rod found at the northeast corner of the remainder of the City of Austin 2.427-acre tract, running with the chain link fence to a steel fence corner called for in the City of Austin 2.922-acre tract. I continued the boundary line with the chain link fence to a round-headed bolt found in the ground at the north corner of

"Tract B" City of Austin to the State of Texas called 9,774 Sq. Ft. tract in the west Right-of-Way line of MOPAC Highway.

E. Construction of the east boundary line of Camp Mabry from the west Right-of-Way line of MOPAC Highway to the northeast Right-of Way line of West 35th Street.

From the round-headed bolt found in the ground at the north corner of "Tract B" City of Austin to State of Texas tract, I constructed a boundary line along a curve to the left, holding the called-for radius of 240.00 feet for an arc distance of 74.17 feet to a Type-II TXDOT monument found for corner. I continued the boundary line a straight-line distance of 135.18 feet to another Type-II TXDOT monument found for corner at the beginning of a non-tangent curve to the right. Continuing with the non-tangent curve to the right, I held the called for radius of 85.00 feet for an arc distance of 83.54 feet to a Type-II TXDOT monument found for corner.

From the Type-II TXDOT monument found for corner, I constructed a boundary line passing at 9.52 feet through a round-headed bolt found in the ground at the southwest corner of "Tract B" City of Austin to State of Texas tract and continuing for a total distance of 35.19 feet to a 5/8" iron rod in a concrete monument found flush with the ground in the northeast Right-of Way line of West 35th Street.

F. Construction of the southwest boundary line of Camp Mabry from the northeast Right-of Way line of West 35th Street to the southeast corner of the Resubdivision of Lot 6 Perlitz Subdivision.

From the 5/8" iron rod in a concrete monument found flush with the ground, I constructed a boundary line with the northeast Right-of-Way line of West 35th Street 406.00 feet to an X-Cut with the inscription "0+99" found in the top of a concrete curb. From this corner, I constructed the boundary line to a 5/8" iron rod found at the southeast corner of the Resubdivision of Lot 6 Perlitz Subdivision. I believe the X-cut and 5/8" iron rod are the best evidence found that reconstructs the northeast Right-of-Way line of West 35th Street, which is the common boundary line with Camp Mabry. These two segments are supposed to be along a portion of West 35th Street that is a 60-foot Right-of-Way. The street has since paved over the original southwest lines of Camp Mabry Parcel Numbers 6, 8, and 9. I could not find monumentation along the south Right-of-Way line of West 35th Street at this location. The southeast corner of the Resubdivision of Lot 6 Perlitz Subdivision has a 15-foot Right-of-Way dedication to the north, but I was unable to find a monument.

G. Construction of the southwest boundary line of Camp Mabry from the southeast corner of the Resubdivision of Lot 6 Perlitz Subdivision to the northwest corner of Perlitz Townhouse Addition.

From the southeast corner of the Resubdivision of Lot 6 Perlitz Subdivision, I constructed a boundary line by plat bearing that intersected the northeast line of the subdivision. I was unable to find a boundary monument due to a wrought iron fence being in the calculated corner location. The corner intersected a line I constructed 210.25 feet from a 1/2" iron rod found at the northwest corner of the Resubdivision of Lot 6 Perlitz Subdivision through an iron rod with yellow cap found at the northwest corner of Lot 4 through a 1/2"iron rod found believed to be the original northeast corner of Jeff D. Thompson tracts

(Volume 575, Page 428 and Volume 1849, Page 315), to a 1.25" iron pipe found in the west side of a stone wall on Camp Mabry.

From the northwest corner of the Resubdivision of Lot 6 Perlitz Subdivision (same being the southeast corner of Perlitz Townhouse Addition, I constructed a boundary line 77.01 feet to a 1/2"iron rod found believed to be the original northeast corner of Jeff Thompson (Volume 450, Page 65). From the that point, I constructed a boundary line 215.22 feet to a 1/2"iron rod found at the northwest corner of Perlitz Townhome Addition, same being the northeast line of Camp Mabry Parcel Number 4, from which a 5/8" iron rod found at the northwest corner of Camp Mabry Parcel Number 4 bears North 62°10'13" West a distance of 79.92 feet.

H. Construction of the southwest boundary line of Camp Mabry from the northwest corner of Perlitz Townhouse Addition around Camp Mabry Parcel Number 4.

Following the deed calls of Camp Mabry parcel Number 4, I constructed a boundary line 201.41 feet to a calculated point in West 35th Street. I set a 5/8" iron rod with aluminum cap Stamped AGDTX-BOUNDARY at 178.60 feet for reference to the original northeast 60 foot Right-of-Way line of West 35th Street. By holding the southeast deed line of Camp Mabry Parcel Number 4, there is an apparent deed gap with the northwest line of Perlitz Townhome Addition. Continuing with the southwest line of Camp Mabry Parcel Number 4 a distance of 80.75 feet to a calculated point in West 35th Street on line with the southeast line of Woodmont Addition. From said point and with the deed line of Camp Mabry Parcel Number 4 and the southeast line of Woodmont Addition, setting an X-cut in the south edge of a concrete sidewalk at 20.76 feet and continuing for a total distance of 190.96 feet to the before mentioned 5/8" iron rod found at the northwest corner of Camp Mabry Parcel Number 4, same being the northeast corner of Woodmont Addition, from which a 1/2"iron rod found bears South 62°10'13" East a distance of 18.63 feet. According to City of Austin Right-of-Way map of West 35th Street from MOPAC to Hill View Road, there appears to be a 20-foot deed conflict with Camp Mabry Parcel Number 4 and Fred S. Boutall et ux. (Volume 388, Page 21). The 1/2" iron rod found at 18.63 feet may be Boutall's northeast corner. I honored the deed line of Camp Mabry Parcel Number 4 because it was recorded in Volume 304, Page 494—before Boutall's deed. This iron is also a corner monument for the Camp Mabry Golf Course according to City of Austin Map Sec. #177.

I. Construction of the southwest boundary line of Camp Mabry from the northwest corner of Camp Mabry Parcel Number 4 to the northeast Right-of-Way line of West 35th Street.

From the northwest corner of Camp Mabry Parcel Number 4, I constructed a boundary line 206.63 feet to a 5/8" iron rod found at the northeast corner of Lot 1 Acers-Rodriguez Addition. From there, I constructed a line to a 5/8" iron rod found in the original northeast 60 foot Right-of-Way of West 35th Street, same being the northeast corner of Lot 1 Acers-Rodriguez Addition, where I set a 5/8" iron rod with aluminum cap stamped AGDTX-BOUNDARY for corner in the present northeast Right-of-Way line of West 35th Street, 1 foot east of a chain link fence corner.

J. Construction of the southwest boundary line of Camp Mabry from the northeast Right-of-Way line of West 35th Street to the Point of Beginning.

Following the present northeast Right-of-Way line of West 35th Street according to City of Austin Map Sec. #177, I constructed a boundary line along a chain link fence 92.56 feet to a steel fence corner post, setting a 5/8" iron rod with aluminum camp stamped AGDTX-BOUNDARY in concrete for reference at the east base of the post that bears South 49°11'17" East a distance of 0.26 feet. Thence northwesterly along the chain link fence 659.75 feet to a 1" square iron rod found for corner. Thence northwesterly along the chain link fence 515.83 feet to the Point of Beginning.

6. Summary. This report is the result of three months of deed research, on-the-ground fieldwork, boundary analysis, and boundary reconstruction. I believe this report and boundary survey will be of great value to managing Camp Mabry real property for the Adjutant General's Department, and for the general public of the City of Austin and Travis County, Texas for many years to come.

Respectfully Submitted,

David A. Rolbiecki
Registered Professional Land Surveyor

APPENDIX

I. Camp Mabry Boundary Closure Report

Adjutant General's Department, FMO
2210 W. 35th Street
Camp Mabry, Austin, TX 78703
512-782-5226
Friday, January 29, 2010 10:44:11 AM

PROJECT: D:\Geospatial Survey Group\Camp Mabry\BDY CAMP MABRY.pro

CLOSURE REPORT

Coordinate values shown are computed based on the rounded bearing and distance, or chord bearing and chord lengths as indicated herein.

Boundary Name: BDY

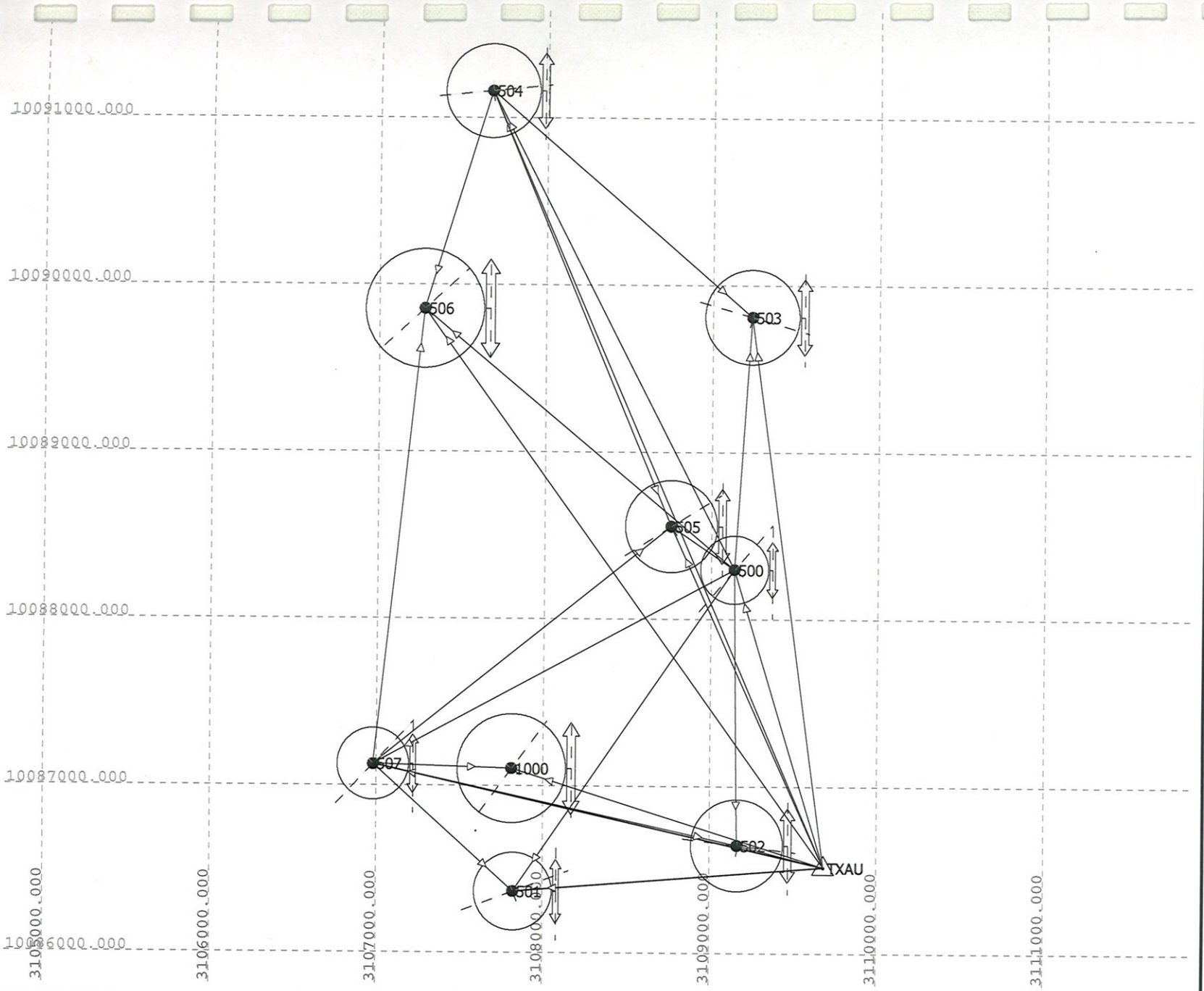
Point Number	Description	Sta	Northing	Easting	Elevation
2513	BDY-IRSC	0+00.00	10087193.2976	3106247.0825	
N27°44'09"E 2046.63 ft					
676	STONE MON W/	20+46.63	10089004.7754	3107199.5753	647.25
N61°17'25"W 1713.28 ft					
624	STONE MON W/	37+59.91	10089827.7877	3105696.9179	
N32°50'56"E 2766.05 ft					
602	IRFC-RED	65+25.96	10092151.5576	3107197.2933	715.57
S61°43'33"E 1325.54 ft					
611	CONC-MON-MAB	78+51.50	10091523.6610	3108364.6844	684.99
N28°18'06"E 360.79 ft					
630	IRFC-BLUE	82+12.29	10091841.3234	3108535.7400	679.66
S61°34'36"E 410.47 ft					
648	CONC-MON-MAB	86+22.76	10091645.9469	3108896.7298	664.26
S03°01'49"E 411.49 ft					
2141	BDY-IRSC	90+34.25	10091235.0323	3108918.4827	
S60°27'49"E 419.03 ft					
656	5/8"IRF	94+53.28	10091028.4605	3109283.0567	633.86
S11°05'11"E 1244.24 ft					
652	3/4"IRF	106+97.52	10089807.4400	3109522.3102	664.62
S12°51'07"E 235.19 ft					
640	TXDOT-MON	109+32.71	10089578.1420	3109574.6240	662.97
S04°20'51"E 205.06 ft					
642	TXDOT-MON	111+37.78	10089373.6720	3109590.1687	662.28
S04°47'03"W 485.86 ft					
641	TXDOT-MON	116+23.64	10088889.5048	3109549.6468	658.61
S04°04'18"W 599.02 ft					
643	TXDOT-MON	122+22.66	10088291.9967	3109507.1139	654.23
S04°49'14"W 1209.35 ft					
727	TXDOT-MON	134+32.02	10087086.9244	3109405.4857	638.99
S09°56'02"W 200.76 ft					
1305		136+32.78	10086889.1743	3109370.8523	

```
  S04°55'02"W     238.51 ft
649          5/8"IRF        138+71.29 10086651.5422  3109350.4080 633.40

  S11°02'57"W     503.04 ft
650          1/2"IRF        143+74.34 10086157.8270  3109253.9998 633.00

  N65°27'00"W     290.02 ft
1566         FENCEPOST SE   146+64.35 10086278.3266  3108990.1979

  S12°20'54"W     359.85 ft
691          ROUND-BOLT     150+24.21 10085926.8015  3108913.2423

       Center Point:             1683 10085771.6687  3109096.3647 RP
             Radius:           240.00 ft
              Delta:       17°42'21" Left
         Arc Length:            74.17 ft
      Chord Bearing:      S31°25'01"W
       Chord Length:            73.87 ft
    Middle Ordinate:             2.86 ft
           External:             2.89 ft
   Deg of Curvature:       23°52'24" Arc Definition
            Tangent:            37.38 ft
           Curve PI:                  10085898.2586  3108889.0661
651          TXDOT-MON      150+98.37 10085863.7611  3108874.7367 641.01

  S20°55'22"W     135.18 ft
645          TXDOT-MON      152+33.55 10085737.4945  3108826.4626 639.08

       Center Point:             2530 10085770.6938  3108748.2143 RP
             Radius:           85.00 ft
              Delta:       56°18'49" Right
         Arc Length:            83.54 ft
      Chord Bearing:      S51°08'51"W
       Chord Length:            80.22 ft
    Middle Ordinate:            10.06 ft
           External:            11.41 ft
   Deg of Curvature:       67°24'24" Arc Definition
            Tangent:            45.49 ft
           Curve PI:                  10085695.5954  3108808.6809
646          TXDOT-MON      153+17.09 10085687.1711  3108763.9902 637.61

  S79°20'35"W      35.19 ft
647          5/8"IRFC-CON   153+52.28 10085680.6635  3108729.4072 636.77

  N75°55'55"W     406.00 ft
659          X-CUT-0+99     157+58.27 10085779.3516  3108335.5841 633.96

  N75°22'32"W     188.72 ft
661          5/8"IRF        159+46.99 10085827.0000  3108152.9783 627.79

  N28°31'53"E     176.99 ft
1440         PLAT-IR        161+23.98 10085982.4956  3108237.5158

  N62°46'23"W     210.25 ft
663          1/2"IRF        163+34.23 10086078.6884  3108050.5613 638.64

  N63°08'24"W      77.01 ft
668          1/2"IRF        164+11.24 10086113.4824  3107981.8596 638.19

  N62°37'35"W     215.22 ft
664          1/2"IPF        166+26.45 10086212.4386  3107790.7384 635.15

  S27°01'02"W     201.41 ft
2612         BDY            168+27.87 10086033.0085  3107699.2462

  N54°43'54"W      80.75 ft
2613         BDY            169+08.62 10086079.6340  3107633.3173

  N27°01'06"E     190.96 ft
2512         BDY-IRSC       170+99.58 10086249.7529  3107720.0658
```

```
   N62°10'13"W     206.63 ft
 672          5/8"IRF        173+06.20 10086346.2172  3107537.3349 613.91

   N62°11'12"W     279.39 ft
2514          BDY-IRSC       175+85.59 10086476.5784  3107290.2221

   N42°40'29"W      92.56 ft
2508          BDY-IRSC       176+78.16 10086544.6298  3107227.4817

   N56°37'07"W     659.75 ft
 684          1"SQIRF        183+37.91 10086907.6306  3106676.5728 539.35

   N56°22'05"W     515.83 ft
2513          BDY-IRSC       188+53.74 10087193.3260  3106247.0863
```

```
Closing latitude                = 0.02842
Closing departure               = 0.00381
Closing bearing                 = S07°38'42"W
Closing distance                = 0.02867
Total traverse length           = 18850.11  (18853.74)
Total error of closure          = 1/657386
Error of closure in latitude    = 1/663282
Error of closure in departure   = 1/4941486

Area                            = 16036420.12 Sq. Ft.
Area                            = 368.1455 Acres
```

II. Camp Mabry GPS Baseline Processing and Network Adjustment Report



Field surveyor:
Rolbiecki
Computer operator:
Rolbiecki
Reference:
Camp Mabry GPS Control N

Scale 1" to 833 ft
0 1500 sft
US survey feet

Plot Scale: 1" to 833 ft
Printed on 10/1/2009, at 11:50:17 AM

Printed from Trimble Geomatics Office

Site: Not selected, System: US State Plane 1983
Zone: Texas Central 4203, Datum: NAD 1983 (Conus)

Project: Mabry Control Network
USFeet Template

Baseline Processing Report

Project : Mabry Control Network

User name	User	**Date & Time**	12:47:24 PM 10/1/2009
Coordinate System	US State Plane 1983(at ground)	**Zone**	Texas Central 4203
Project Datum	NAD 1983 (Conus)		
Vertical Datum	NAVD 88	**Geoid Model**	GEOID03 (Conus)
Coordinate Units	US survey feet		
Distance Units	US survey feet		
Height Units	US survey feet		

Processing Summary

ID	From	To	Baseline Length	Solution Type	Ratio	Reference Variance	RMS
B25	504	503	2068.098sft	L1 fixed	13.9	1.727	0.006m
B24	504	506	1363.561sft	L1 fixed	16.9	1.778	0.006m
B13	500	505	458.624sft	L1 fixed	24.4	1.028	0.004m
B11	500	503	1516.263sft	L1 fixed	20.2	1.209	0.005m
B19	507	1000	832.242sft	L1 fixed	14.5	6.119	0.012m
B15	500	507	2454.637sft	L1 fixed	20.9	5.783	0.008m
B22	507	505	2279.994sft	L1 fixed	16.2	3.687	0.009m
B23	507	506	2745.110sft	L1 fixed	29.8	5.495	0.010m
B14	500	506	2428.679sft	L1 fixed	9.3	6.752	0.008m
B26	504	505	2822.862sft	L1 fixed	12.3	2.599	0.007m
B12	500	504	3215.967sft	L1 fixed	21.4	1.461	0.005m
B3	TXAU	502	541.568sft	L1 fixed	15.3	1.115	0.005m
B17	TXAU	1000	1963.701sft	L1 fixed	11.2	8.878	0.015m
B6	TXAU	505	2240.837sft	L1 fixed	10.3	3.098	0.009m
B10	500	502	1650.331sft	L1 fixed	23.3	1.061	0.004m
B2	TXAU	501	1868.199sft	L1 fixed	12.4	1.710	0.006m
B18	TXAU	501	1868.185sft	L1 fixed	29.2	1.630	0.006m
B9	500	501	2335.981sft	L1 fixed	24.3	1.442	0.005m
B1	TXAU	500	1865.387sft	L1 fixed	19.8	1.745	0.006m
B20	507	501	1134.382sft	L1 fixed	24.9	2.795	0.006m
B21	507	502	2234.689sft	L1 fixed	18.3	2.712	0.007m
B8	TXAU	507	2773.097sft	L1 fixed	4.8	4.395	0.007m
B16	TXAU	507	2773.131sft	L1 fixed	12.9	5.782	0.011m
B7			4118.462sft	L1 fixed	4.2	16.168	0.013m
B4	TXAU	503	3326.074sft	L1 fixed	11.8	1.200	0.005m
B5	TXAU	504	5061.455sft	L1 fixed	15.7	1.497	0.006m

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Network Adjustment Report

Project : Mabry Control Network

User name	User	**Date & Time**	11:38:01 AM 10/1/2009
Coordinate System	US State Plane 1983	**Zone**	Texas Central 4203
Project Datum	NAD 1983 (Conus)		
Vertical Datum		**Geoid Model**	GEOID03 (Conus)
Coordinate Units	US survey feet		
Distance Units	US survey feet		
Height Units	US survey feet		

Adjustment Style Settings - 95% Confidence Limits

Residual Tolerances

To End Iterations : 0.000033sft
Final Convergence Cutoff : 0.016404sft

Covariance Display

Horizontal
Propagated Linear Error [E] : U.S.
Constant Term [C] : 0.00000000sft
Scale on Linear Error [S] : 1.96

Three-Dimensional
Propagated Linear Error [E] : U.S.
Constant Term [C] : 0.00000000sft
Scale on Linear Error [S] : 1.96
Elevation Errors were used in the calculations.

Adjustment Controls

Compute Correlations for Geoid : False
Horizontal and Vertical adjustment performed

Set-up Errors

GPS
Error in Height of Antenna : 0.040sft
Centering Error : 0.040sft

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Statistical Summary

Successful Adjustment in 1 iteration(s)

Network Reference Factor : 0.47
Chi Square Test (α=95%) : PASS
Degrees of Freedom : 39.00

GPS Observation Statistics

Reference Factor : 0.47
Redundancy Number (r) : 39.00

Individual GPS Observation Statistics

Observation ID	Reference Factor	Redundancy Number
B1	0.53	2.32
B2	0.23	2.11
B3	0.19	1.76
B4	0.25	1.70
B5	0.68	1.71
B6	0.21	1.78
B9	0.45	1.93
B10	0.34	1.75
B11	0.68	1.70
B12	0.25	1.70
B13	0.29	1.75
B14	0.28	1.32
B15	0.96	2.24
B16	0.30	2.25
B17	0.32	1.34
B18	0.24	2.14
B19	0.32	1.30
B20	0.48	1.91
B21	0.31	1.74
B22	0.45	1.74
B23	0.28	1.30
B25	0.99	1.50

Weighting Strategies

GPS Observations

User-defined Scalar Applied to All Observations

Scalar : 1.00

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Adjusted Coordinates

Adjustment performed in WGS-84

Number of Points : 10
Number of Constrained Points : 1
Horizontal and Height Only : 1

Adjusted Grid Coordinates

Errors are reported using 1.96σ.

Point Name	Northing	N error	Easting	E error	Elevation	e error	Fix
TXAU	10086515.880sft	0.000sft	3109682.495sft	0.000sft	N/A	N/A	N E h
500	10088298.352sft	0.025sft	3109137.309sft	0.025sft	N/A	N/A	
501	10086368.107sft	0.029sft	3107821.992sft	0.029sft	N/A	N/A	
502	10086648.390sft	0.034sft	3109163.528sft	0.034sft	N/A	N/A	
503	10089811.186sft	0.035sft	3109237.239sft	0.035sft	N/A	N/A	
504	10091159.213sft	0.035sft	3107669.334sft	0.035sft	N/A	N/A	
505	10088555.197sft	0.034sft	3108757.527sft	0.034sft	N/A	N/A	
506	10089855.131sft	0.043sft	3107273.420sft	0.043sft	N/A	N/A	
507	10087126.934sft	0.026sft	3106982.039sft	0.026sft	N/A	N/A	
1000	10087103.931sft	0.040sft	3107810.801sft	0.040sft	N/A	N/A	

Adjusted Geodetic Coordinates

Errors are reported using 1.96σ.

Point Name	Latitude	N error	Longitude	E error	Height	h error	Fix
TXAU	30° 18'42.08791"N	0.000sft	97° 45'22.71296"W	0.000sft	636.084sft	0.000sft	Lat Long h
500	30° 18'59.85207"N	0.025sft	97° 45'28.46043"W	0.025sft	567.378sft	0.025sft	

501	30° 18'41.05166"N	0.029sft	97° 45'43.97229"W	0.029sft	556.547sft	0.029sft
502	30° 18'43.51818"N	0.034sft	97° 45'28.59715"W	0.034sft	556.239sft	0.034sft
503	30° 19'14.80006"N	0.035sft	97° 45'26.92096"W	0.035sft	574.490sft	0.035sft
504	30° 19'28.49905"N	0.035sft	97° 45'44.45027"W	0.035sft	604.496sft	0.035sft
505	30° 19'02.48080"N	0.034sft	97° 45'32.72452"W	0.034sft	556.819sft	0.034sft
506	30° 19'15.68448"N	0.043sft	97° 45'49.31025"W	0.043sft	564.453sft	0.045sft
507	30° 18'48.75302"N	0.026sft	97° 45'53.35266"W	0.026sft	483.845sft	0.027sft
1000	30° 18'48.33589"N	0.040sft	97° 45'43.90592"W	0.040sft	555.606sft	0.042sft

Coordinate Deltas

Point Name	ΔNorthing	ΔEasting	ΔElevation	ΔHeight	ΔGeoid Separation
TXAU	0.000sft	0.000sft	N/A	0.000sft	N/A
500	0.000sft	0.000sft	N/A	0.000sft	N/A
501	0.000sft	0.000sft	N/A	0.000sft	N/A
502	0.000sft	0.000sft	N/A	0.000sft	N/A
503	0.000sft	0.000sft	N/A	0.000sft	N/A
504	0.000sft	0.000sft	N/A	0.000sft	N/A
505	0.000sft	0.000sft	N/A	0.000sft	N/A
506	0.000sft	0.000sft	N/A	0.000sft	N/A
507	0.000sft	0.000sft	N/A	0.000sft	N/A
1000	0.000sft	0.000sft	N/A	0.000sft	N/A

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Control Coordinate Comparisons

Values shown are control coord minus adjusted coord.

Point Name	ΔNorthing	ΔEasting	ΔElevation	ΔHeight

TXAU	N/A	N/A	N/A	N/A

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Adjusted Observations

Adjustment performed in WGS-84

GPS Observations

Number of Observations : 22
Number of Outliers : 2

Observation Adjustment (Critical Tau = 3.18). Any outliers are in red.

Obs. ID	From Pt.	To Pt.		Observation	A-posteriori Error (1.96σ)	Residual	Stand. Residual
B25	504	503	Az.	132° 00'43.1133"	0°00'03.7081"	-0° 00'00.6030"	-0.32
			ΔHt.	-30.005sft	0.038sft	-0.070sft	-3.61
			Dist.	2067.829sft	0.037sft	0.006sft	0.31
B15	500	507	Az.	242° 48'06.4821"	0°00'02.2546"	-0° 00'00.8919"	-0.46
			ΔHt.	-83.534sft	0.028sft	-0.086sft	-3.45
			Dist.	2453.156sft	0.027sft	-0.001sft	-0.03
B11	500	503	Az.	5°06'20.4034"	0°00'04.6978"	-0° 00'00.4611"	-0.17
			ΔHt.	7.112sft	0.035sft	0.050sft	2.48
			Dist.	1516.204sft	0.035sft	-0.002sft	-0.09
B5	TXAU	504	Az.	337° 53'15.6946"	0°00'01.4076"	0°00'00.2657"	0.32
			ΔHt.	-31.588sft	0.035sft	-0.050sft	-2.46
			Dist.	5061.205sft	0.035sft	-0.001sft	-0.04
B1	TXAU	500	Az.	344° 19'14.0148"	0°00'02.7653"	-0° 00'00.0489"	-0.02
			ΔHt.	-68.706sft	0.025sft	0.045sft	1.92
			Dist.	1864.071sft	0.025sft	0.004sft	0.19
B20	507	501	Az.	133°	0°00'05.7908"	-0°	-0.33

				25'05.2218"		00'01.2838"	
			ΔHt.	72.702sft	0.033sft	-0.037sft	-1.71
			Dist.	1132.016sft	0.032sft	-0.003sft	-0.15
B9	500	501	Az.	215° 35'52.6233"	0°00'02.7588"	-0° 00'00.5852"	-0.31
			ΔHt.	-10.832sft	0.032sft	0.035sft	1.62
			Dist.	2335.897sft	0.031sft	0.004sft	0.18
B22	507	505	Az.	52°30'30.8967"	0°00'03.0940"	0°00'02.5052"	1.35
			ΔHt.	72.975sft	0.035sft	-0.020sft	-0.96
			Dist.	2278.768sft	0.034sft	-0.001sft	-0.05
B10	500	502	Az.	180° 24'57.9700"	0°00'04.2279"	-0° 00'00.3313"	-0.13
			ΔHt.	-11.139sft	0.034sft	0.026sft	1.25
			Dist.	1650.247sft	0.034sft	-0.002sft	-0.10
B19	507	1000	Az.	92°54'46.2345"	0°00'09.8766"	-0° 00'02.8953"	-0.65
			ΔHt.	71.762sft	0.042sft	0.018sft	0.96
			Dist.	829.120sft	0.040sft	-0.004sft	-0.21
B17	TXAU	1000	Az.	288° 46'08.5136"	0°00'04.1813"	-0° 00'01.0786"	-0.57
			ΔHt.	-80.478sft	0.042sft	-0.019sft	-0.95
			Dist.	1961.989sft	0.040sft	-0.007sft	-0.38
B12	500	504	Az.	334° 09'47.0103"	0°00'02.2152"	0°00'00.0840"	0.06
			ΔHt.	37.118sft	0.035sft	-0.019sft	-0.92
			Dist.	3215.661sft	0.035sft	-0.002sft	-0.09
B21	507	502	Az.	103° 41'44.5916"	0°00'03.1544"	0°00'01.1973"	0.63
			ΔHt.	72.394sft	0.035sft	-0.019sft	-0.92
			Dist.	2233.464sft	0.034sft	0.004sft	0.20
B13	500	505	Az.	305° 23'48.8117"	0°00'15.2355"	0°00'01.1151"	0.12
			ΔHt.	-10.559sft	0.034sft	0.018sft	0.89
			Dist.	458.502sft	0.034sft	0.012sft	0.57
B4	TXAU	503	Az.	353° 37'55.9535"	0°00'02.1421"	-0° 00'00.2835"	-0.23

			ΔHt.	-61.594sft	0.035sft	0.018sft	0.89
			Dist.	3325.408sft	0.035sft	0.001sft	0.07
B16	TXAU	507	Az.	284° 04'38.4524"	0°00'01.9560"	-0° 00'01.1739"	-0.68
			ΔHt.	-152.240sft	0.027sft	0.008sft	0.33
			Dist.	2768.856sft	0.026sft	-0.019sft	-0.80
B6	TXAU	505	Az.	336° 55'47.3253"	0°00'03.1076"	-0° 00'00.1781"	-0.09
			ΔHt.	-79.265sft	0.034sft	0.001sft	0.06
			Dist.	2239.386sft	0.034sft	0.016sft	0.77
B23	507	506	Az.	7°25'09.2168"	0°00'02.9898"	0°00'00.3507"	0.26
			ΔHt.	80.609sft	0.041sft	-0.012sft	-0.64
			Dist.	2743.843sft	0.040sft	-0.013sft	-0.74
B2	TXAU	501	Az.	266° 47'09.6618"	0°00'03.1538"	-0° 00'00.8731"	-0.35
			ΔHt.	-79.538sft	0.029sft	0.017sft	0.74
			Dist.	1866.448sft	0.029sft	-0.003sft	-0.13
B18	TXAU	501	Az.	266° 47'09.6618"	0°00'03.1538"	0°00'00.8844"	0.35
			ΔHt.	-79.538sft	0.029sft	-0.017sft	-0.72
			Dist.	1866.448sft	0.029sft	0.009sft	0.39
B14	500	506	Az.	311° 11'46.2367"	0°00'03.3869"	0°00'00.7077"	0.46
			ΔHt.	-2.925sft	0.041sft	0.012sft	0.63
			Dist.	2428.622sft	0.040sft	0.011sft	0.63
B3	TXAU	502	Az.	285° 39'03.2232"	0°00'12.9638"	0°00'03.8739"	0.49
			ΔHt.	-79.845sft	0.034sft	-0.007sft	-0.35
			Dist.	535.642sft	0.034sft	0.007sft	0.32

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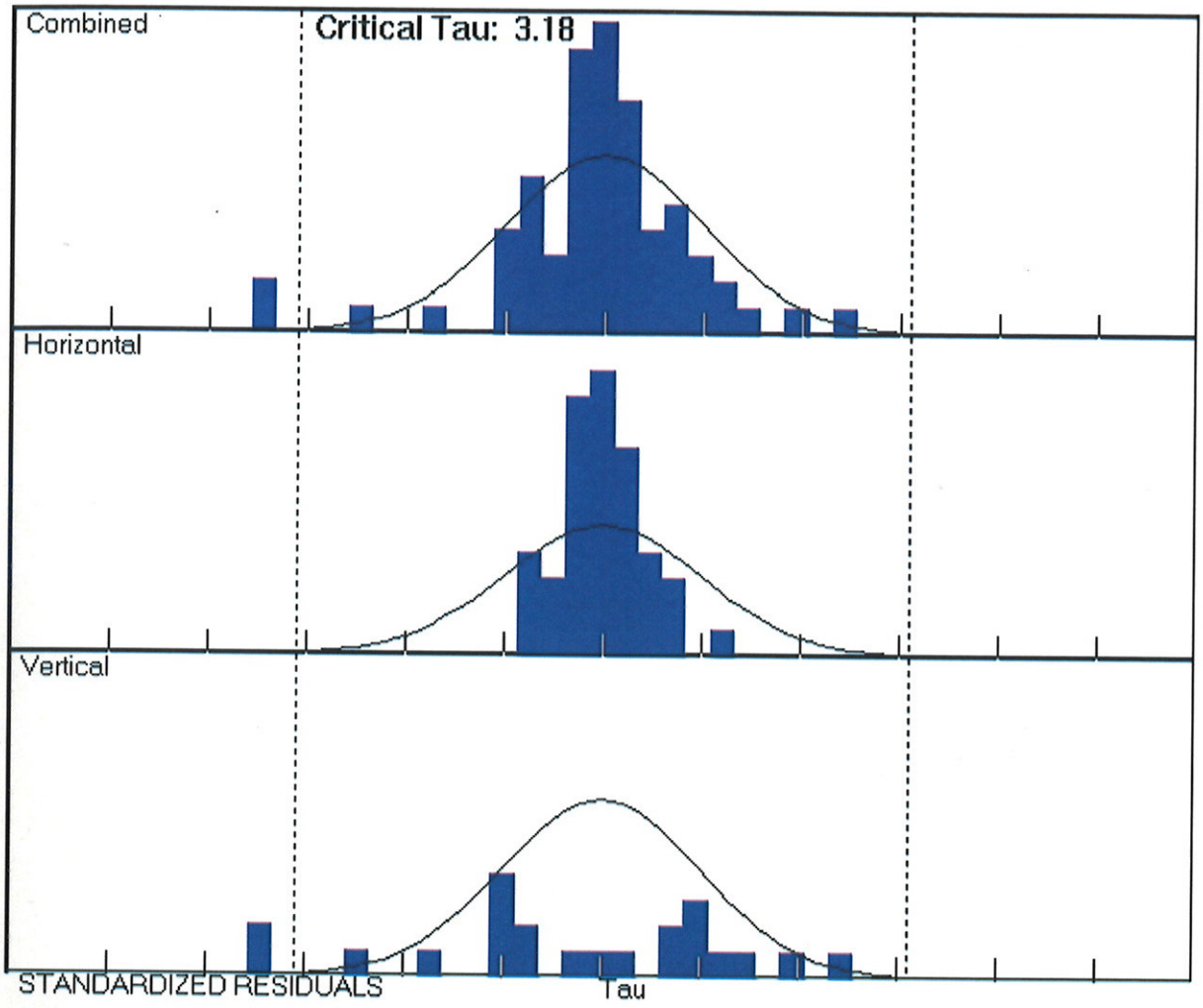
Histograms of Standardized Residuals



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Point Error Ellipses

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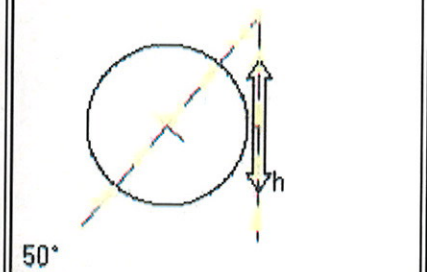
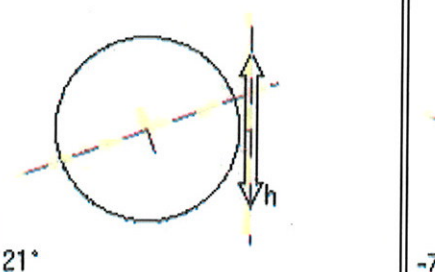
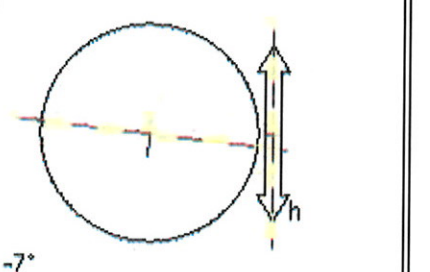
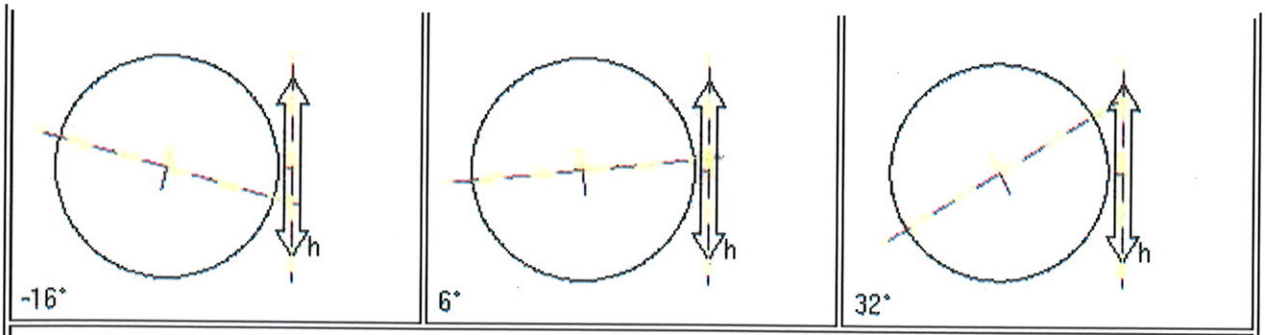
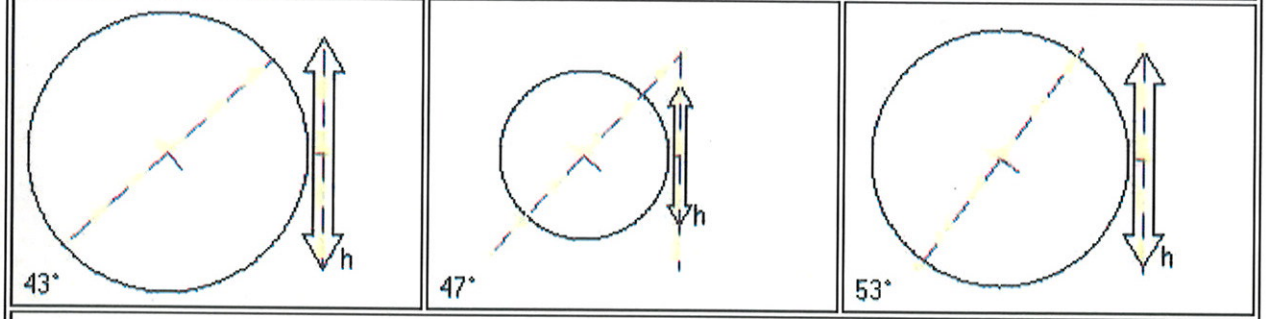
		
Tick Size: 0.0100sft Horizontal Bivariate Scalar: 2.45σ Vertical Univariate Scalar: 1.96σ		
503	**504**	**505**



Tick Size: 0.0100sft Horizontal Bivariate Scalar: 2.45σ Vertical Univariate Scalar: 1.96σ

506	507	1000



Tick Size: 0.0100sft Horizontal Bivariate Scalar: 2.45σ Vertical Univariate Scalar: 1.96σ

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Covariant Terms

Adjustment performed in WGS-84

From Point	To Point		Components	A-posteriori Error (1.96σ)	Horiz. Precision (Ratio)	3D Precision (Ratio)
TXAU	500	Az.	344° 19'14.0148"	0°00'02.7653"	1:74609	1:74609
		ΔHt.	-68.706sft	0.025sft		
		ΔElev.	?	?		
		Dist.	1864.071sft	0.025sft		
TXAU	501	Az.	266° 47'09.6618"	0°00'03.1538"	1:65381	1:65381
		ΔHt.	-79.538sft	0.029sft		
		ΔElev.	?	?		
		Dist.	1866.448sft	0.029sft		
			285°			

TXAU	502	Az.	39'03.2232"	0'00'12.9638"	1:15904	1:15904
		ΔHt.	-79.845sft	0.034sft		
		ΔElev.	?	?		
		Dist.	535.642sft	0.034sft		
TXAU	503	Az.	353° 37'55.9535"	0'00'02.1421"	1:96313	1:96313
		ΔHt.	-61.594sft	0.035sft		
		ΔElev.	?	?		
		Dist.	3325.408sft	0.035sft		
TXAU	504	Az.	337° 53'15.6946"	0'00'01.4076"	1:146563	1:146563
		ΔHt.	-31.588sft	0.035sft		
		ΔElev.	?	?		
		Dist.	5061.205sft	0.035sft		
TXAU	505	Az.	336° 55'47.3253"	0'00'03.1076"	1:66450	1:66450
		ΔHt.	-79.265sft	0.034sft		
		ΔElev.	?	?		
		Dist.	2239.386sft	0.034sft		
TXAU	507	Az.	284° 04'38.4524"	0'00'01.9560"	1:105507	1:105507
		ΔHt.	-152.240sft	0.027sft		
		ΔElev.	?	?		
		Dist.	2768.856sft	0.026sft		
TXAU	1000	Az.	288° 46'08.5136"	0'00'04.1813"	1:49382	1:49382
		ΔHt.	-80.478sft	0.042sft		
		ΔElev.	?	?		
		Dist.	1961.989sft	0.040sft		
500	501	Az.	215° 35'52.6233"	0'00'02.7588"	1:74739	1:74739
		ΔHt.	-10.832sft	0.032sft		
		ΔElev.	?	?		
		Dist.	2335.897sft	0.031sft		
500	502	Az.	180° 24'57.9700"	0'00'04.2279"	1:48798	1:48798

		ΔHt.	-11.139sft	0.034sft		
		ΔElev.	?	?		
		Dist.	1650.247sft	0.034sft		
500	503	Az.	5°06'20.4034"	0°00'04.6978"	1:43919	1:43919
		ΔHt.	7.112sft	0.035sft		
		ΔElev.	?	?		
		Dist.	1516.204sft	0.035sft		
500	504	Az.	334° 09'47.0103"	0°00'02.2152"	1:93128	1:93128
		ΔHt.	37.118sft	0.035sft		
		ΔElev.	?	?		
		Dist.	3215.661sft	0.035sft		
500	505	Az.	305° 23'48.8117"	0°00'15.2355"	1:13549	1:13549
		ΔHt.	-10.559sft	0.034sft		
		ΔElev.	?	?		
		Dist.	458.502sft	0.034sft		
500	506	Az.	311° 11'46.2367"	0°00'03.3869"	1:61212	1:61212
		ΔHt.	-2.925sft	0.041sft		
		ΔElev.	?	?		
		Dist.	2428.622sft	0.040sft		
500	507	Az.	242° 48'06.4821"	0°00'02.2546"	1:91359	1:91359
		ΔHt.	-83.534sft	0.028sft		
		ΔElev.	?	?		
		Dist.	2453.156sft	0.027sft		
501	507	Az.	313° 25'09.9562"	0°00'05.7907"	1:35641	1:35641
		ΔHt.	-72.702sft	0.033sft		
		ΔElev.	?	?		
		Dist.	1132.016sft	0.032sft		
502	507	Az.	283° 41'57.0863"	0°00'03.1544"	1:65378	1:65378
		ΔHt.	-72.394sft	0.035sft		

		ΔElev.	?	?		
		Dist.	2233.464sft	0.034sft		
503	504	Az.	312° 00'51.9633"	0°00'03.7080"	1:55615	1:55615
		ΔHt.	30.005sft	0.038sft		
		ΔElev.	?	?		
		Dist.	2067.829sft	0.037sft		
505	507	Az.	232° 30'41.3090"	0°00'03.0941"	1:66599	1:66599
		ΔHt.	-72.975sft	0.035sft		
		ΔElev.	?	?		
		Dist.	2278.768sft	0.034sft		
506	507	Az.	187° 25'11.2573"	0°00'02.9901"	1:69010	1:69010
		ΔHt.	-80.609sft	0.041sft		
		ΔElev.	?	?		
		Dist.	2743.843sft	0.040sft		
507	1000	Az.	92°54'46.2345"	0°00'09.8766"	1:20892	1:20892
		ΔHt.	71.762sft	0.042sft		
		ΔElev.	?	?		
		Dist.	829.120sft	0.040sft		

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Loop Closure Report

Project : Mabry Control Network

User name	User	**Date & Time**	12:56:01 PM 10/1/2009
Coordinate System	US State Plane 1983 (at ground)	**Zone**	Texas Central 4203
Project Datum	NAD 1983 (Conus)		
Vertical Datum	NAVD 88	**Geoid Model**	GEOID03 (Conus)
Coordinate Units	US survey feet		
Distance Units	US survey feet		
Height Units	US survey feet		

Contents

Summary

Report includes both active and inactive solutions (if any).
Report applies to current selection only.

Legs in loop: 3
Number of Loops: 18
Number Passed: 18
Number Failed: 0

	Length	ΔHoriz	ΔVert	PPM
Pass/Fail Criteria		0.098sft	0.164sft	
Best		0.002sft	-0.004sft	6.064
Worst		0.068sft	-0.158sft	26.736
Average Loop	6500.615sft	0.021sft	-0.074sft	13.870
Standard Deviation	1603.322sft	0.018sft	0.054sft	6.278

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Point Derivation Report

Project : Mabry Control Network

User name	User	**Date & Time**	12:58:03 PM 10/1/2009
Coordinate System	US State Plane 1983(at ground)	**Zone**	Texas Central 4203
Project Datum	NAD 1983 (Conus)		
Vertical Datum	NAVD 88	**Geoid Model**	GEOID03 (Conus)
Coordinate Units	US survey feet		
Distance Units	US survey feet		
Height Units	US survey feet		

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Point Derivations

Observations or coordinates in red are out of tolerance. They have not been used to determine the coordinate of the point.

Resultant coordinates for point : 504

Northing	Easting	Elevation	Height
10091159.426sft	3107669.225sft	689.013sft	604.496sft

ID	Used to calc.	Status	Δ North	Δ East	Distance (Horiz)	Δ Elevation	Δ Height
CW16 Adjustment	NEeh	Enabled	0.000sft	0.000sft	0.000sft	0.000sft	0.000sft

Resultant coordinates for point : 503

Northing	Easting	Elevation	Height
10089811.299sft	3109237.246sft	659.046sft	574.491sft

ID	Used to calc.	Status	Δ North	Δ East	Distance (Horiz)	Δ Elevation	Δ Height
CW15 Adjustment	NEeh	Enabled	0.000sft	0.000sft	0.000sft	0.000sft	0.000sft

Resultant coordinates for point : 506

Northing	Easting	Elevation	Height
10089855.247sft	3107273.281sft	648.968sft	564.453sft

ID	Used to calc.	Status	Δ North	Δ East	Distance (Horiz)	Δ Elevation	Δ Height
CW18 Adjustment	NEeh	Enabled	0.000sft	0.000sft	0.000sft	0.000sft	0.000sft

Resultant coordinates for point : 505

Northing	Easting	Elevation	Height
10088555.216sft	3108757.499sft	641.372sft	556.819sft

ID	Used to calc.	Status	Δ North	Δ East	Distance (Horiz)	Δ Elevation	Δ Height
CW17 Adjustment	NEeh	Enabled	0.000sft	0.000sft	0.000sft	0.000sft	0.000sft

Resultant coordinates for point : 500

Northing	Easting	Elevation	Height
10088298.352sft	3109137.309sft	651.939sft	567.378sft

ID	Used to calc.	Status	Δ North	Δ East	Distance (Horiz)	Δ Elevation	Δ Height
CW12 Adjustment	NEeh	Enabled	0.000sft	0.000sft	0.000sft	0.000sft	0.000sft

Resultant coordinates for point : 1000

Northing	Easting	Elevation	Height
10087103.842sft	3107810.702sft	640.146sft	555.606sft

ID	Used to calc.	Status	Δ North	Δ East	Distance (Horiz)	Δ Elevation	Δ Height
CW20 Adjustment	NEeh	Enabled	0.000sft	0.000sft	0.000sft	0.000sft	0.000sft

Resultant coordinates for point : 507

Northing	Easting	Elevation	Height
10087126.847sft	3106981.878sft	568.366sft	483.845sft

ID	Used to calc.	Status	Δ North	Δ East	Distance (Horiz)	Δ Elevation	Δ Height
CW19 Adjustment	NEeh	Enabled	0.000sft	0.000sft	0.000sft	0.000sft	0.000sft

Resultant coordinates for point : TXAU

Northing	Easting	Elevation	Height
10086515.747sft	3109682.535sft	720.665sft	636.084sft

ID	Used to calc.	Status	Δ North	Δ East	Distance (Horiz)	Δ Elevation	Δ Height
CW1 Office entered	NEeh	Enabled	0.000sft	0.000sft	0.000sft	0.000sft	0.000sft

Resultant coordinates for point : 502

Northing	Easting	Elevation	Height
10086648.268sft	3109163.530sft	640.808sft	556.239sft

ID	Used to calc.	Status	Δ North	Δ East	Distance (Horiz)	Δ Elevation	Δ Height
CW14 Adjustment	NEeh	Enabled	0.000sft	0.000sft	0.000sft	0.000sft	0.000sft

Resultant coordinates for point : 501

Northing	Easting	Elevation	Height
10086367.963sft	3107821.894sft	641.090sft	556.547sft

ID	Used to calc.	Status	Δ North	Δ East	Distance (Horiz)	Δ Elevation	Δ Height
CW13 Adjustment	NEeh	Enabled	0.000sft	0.000sft	0.000sft	0.000sft	0.000sft

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Survey Data

Coordinates

ID	Point Name	Source	Latitude	Longitude	Height	Elevation
C16(geod-WGS)	504	Adjustment	30° 19'28.49905"N	97° 45'44.45027"W	604.496sft	?
C15(geod-WGS)	503	Adjustment	30° 19'14.80006"N	97° 45'26.92096"W	574.490sft	?
C18(geod-WGS)	506	Adjustment	30° 19'15.68448"N	97° 45'49.31025"W	564.453sft	?
C17(geod-WGS)	505	Adjustment	30° 19'02.48080"N	97° 45'32.72452"W	556.819sft	?
C12(geod-WGS)	500	Adjustment	30° 18'59.85207"N	97° 45'28.46043"W	567.378sft	?
C20(geod-WGS)	1000	Adjustment	30° 18'48.33589"N	97° 45'43.90592"W	555.606sft	?
C19(geod-WGS)	507	Adjustment	30° 18'48.75302"N	97° 45'53.35266"W	483.845sft	?
C1(geod-WGS)	TXAU	Office entered	30° 18'42.08791"N	97° 45'22.71296"W	636.084sft	? ?
C14(geod-WGS)	502	Adjustment	30° 18'43.51818"N	97° 45'28.59715"W	556.239sft	?
C13(geod-WGS)	501	Adjustment	30° 18'41.05166"N	97° 45'43.97229"W	556.547sft	?

ID	Point Name	Source	Quality	Latitude	Longitude	Height
C5 (soln)	504	DAT file (49842730.DAT)	?	30° 19'28.51586"N	97° 45'44.49052"W	610.148sft
C19 (soln)	504	DAT file (46512735.dat)	?	30° 19'28.58512"N	97° 45'44.51408"W	606.252sft
C4 (soln)	503	DAT file (49842730.DAT)	?	30° 19'14.82741"N	97° 45'26.93383"W	575.596sft
C21 (soln)	503	DC file (MABRYNET3.dc)	?	30° 19'14.88185"N	97° 45'26.99000"W	574.563sft
C24 (soln)	503	DAT file (49842733.DAT)	?	30° 19'14.88724"N	97° 45'26.98377"W	573.191sft
C7 (soln)	506	DAT file (49842730.DAT)	?	30° 19'15.65823"N	97° 45'49.38871"W	567.893sft
C14 (soln)	506	DC file (MABRYNET2.dc)	?	30° 19'15.74091"N	97° 45'49.38427"W	564.777sft
C18 (soln)	506	DAT file (49842732.DAT)	?	30° 19'15.74408"N	97° 45'49.38682"W	565.829sft
C20 (soln)	506	DC file (MABRYNET3.dc)	?	30° 19'15.75351"N	97° 45'49.38306"W	563.533sft
C23 (soln)	506	DAT file (49842733.DAT)	?	30° 19'15.74486"N	97° 45'49.38941"W	565.726sft
C6	505	DAT file	?	30°	97°	561.248sft

(soln)		(49842730.DAT)		19'02.47057"N	45'32.77594"W	
C13 (soln)	505	DC file (MABRYNET2.dc)	?	30° 19'02.52034"N	97° 45'32.78034"W	556.411sft
C17 (soln)	505	DAT file (49842732.DAT)	?	30° 19'02.52663"N	97° 45'32.78971"W	554.562sft
C22 (soln)	505	DC file (MABRYNET3.dc)	?	30° 19'02.56481"N	97° 45'32.78216"W	557.690sft
C25 (soln)	505	DAT file (49842733.DAT)	?	30° 19'02.56794"N	97° 45'32.78846"W	559.903sft
C1 (soln)	500	DAT file (46512731.dat)	?	30° 18'59.87236"N	97° 45'28.48093"W	566.315sft
C10 (soln)	1000	DAT file (49842731.DAT)	?	30° 18'48.32084"N	97° 45'43.97714"W	550.247sft
C8 (soln)	507	DAT file (49842730.DAT)	?	30° 18'48.73952"N	97° 45'53.38736"W	482.122sft
C9 (soln)	507	DAT file (46512733.dat)	?	30° 18'48.79661"N	97° 45'53.41300"W	481.229sft
C3 (soln)	502	DAT file (49842730.DAT)	?	30° 18'43.54192"N	97° 45'28.61921"W	557.655sft
C12 (soln)	502	DC file (MABRYNET2.dc)	?	30° 18'43.55561"N	97° 45'28.65647"W	555.186sft
C16 (soln)	502	DAT file (49842731.DAT)	?	30° 18'43.53764"N	97° 45'28.67080"W	552.659sft
C2 (soln)	501	DAT file (49842730.DAT)	?	30° 18'41.08077"N	97° 45'43.98875"W	558.954sft
C11 (soln)	501	DC file (MABRYNET2.dc)	?	30° 18'41.07367"N	97° 45'44.03296"W	551.788sft
C15 (soln)	501	DAT file (49842731.DAT)	?	30° 18'41.05693"N	97° 45'44.02689"W	551.737sft

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