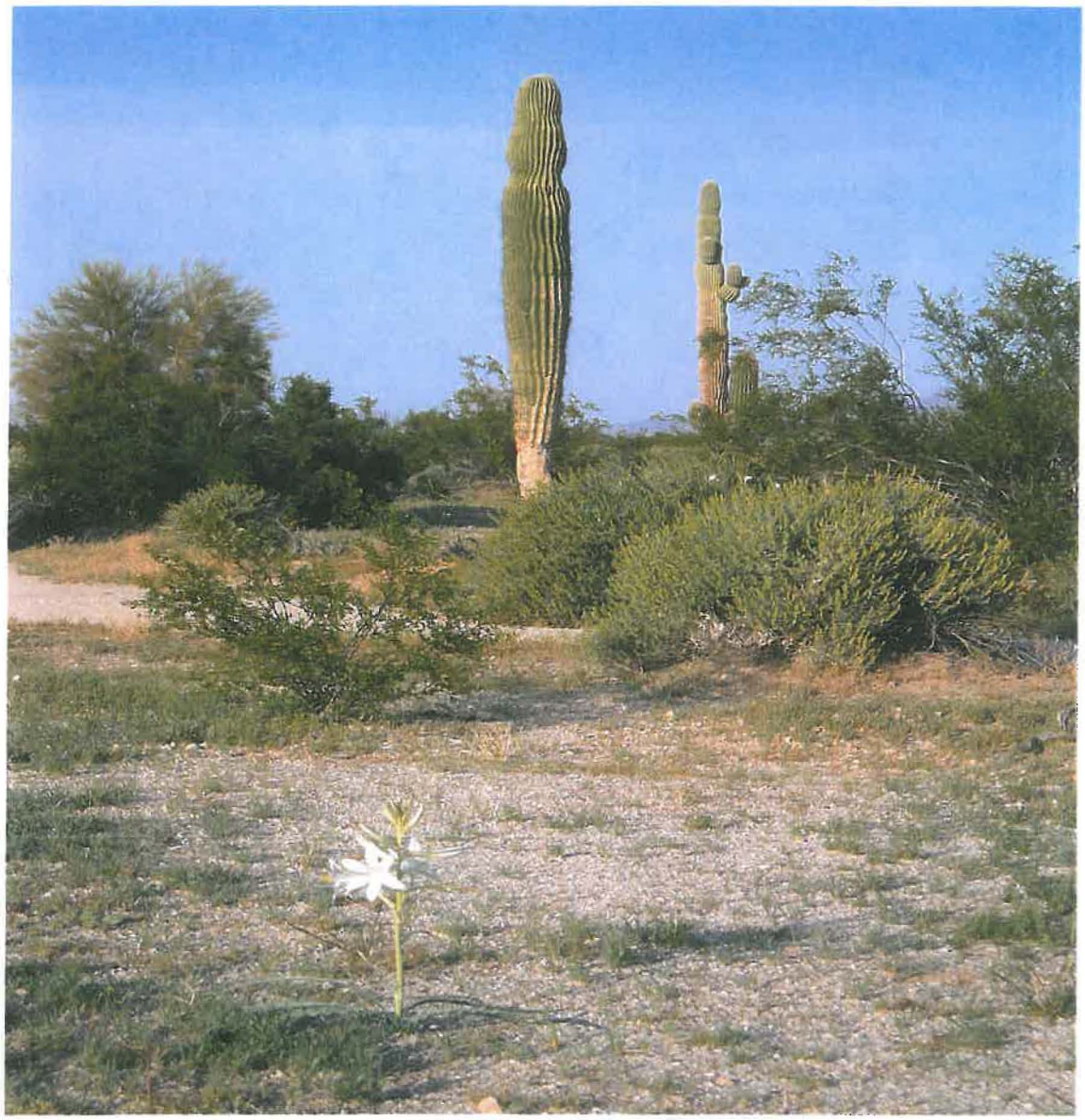
SURVEY CONTROL REPORT
RBF CONSULTING
RBF JOB # 45-104417
MARCH 2010
MAPPING SERVICES FOR ~~ROGER~~ CREEK IN ANTHEM AREA
RODGER



VERTICAL MAPPING RESOURCES, INC
An Evolution in Land Information

LETTER OF TRANSMITTAL

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PROJECT NUMBER: 10-1363 **CLIENT REFERENCE:** Rodger Creek **DATE:** 5/27/10

FLOOD CONTROL DISTRICT
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ROUTING	

CONTACT: JOHN STOCK

AGENCY / FIRM: Maricopa County Flood Control District

ADDRESS: 2801 West Durango Street
Phoenix, AZ 85009

SUBJECT: RODGER CREEK SURVEY REPORT

TRANSMITTED IS/ARE THE FOLLOWING:

One copy of the Survey Report for Rodger Creek from RBF Consulting, Inc

THE ENCLOSED MATERIAL IS:

- ☐ BEING RETURNED TO YOUR OFFICE.
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- ☐ FOR YOUR REVIEW, PLEASE COMMENT, NO NEED TO RETURN.
- ☐ FOR YOUR REVIEW, PLEASE RETURN TO OUR OFFICE WITH COMMENTS.

COMMENTS:

BY: _____
KURT J OKRASKI, CP, GISP
CHIEF EXECUTIVE OFFICER

7825 E. Gelding Drive, Suite 101
Scottsdale, Arizona 85260
Phone: 480.948.2555 – Fax: 480.948.2521
www.verticalmapping.com

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SURVEYORS SUMMARY AND CERTIFICATION

In March of 2010 RBF Consulting provided ground control for Vertical Mapping Resources (VMR) to map a portion of Roger Creek. The project area extended from approximately the east end of Anthem Golf Course to the top of Elephant Mountain in Cave Creek, Maricopa County. RBF Consulting was contracted by VMR to set twenty four aerial photogrammetry control targets and perform eight cross sections. No blind panels were set by RBF for this phase of the project.

The project horizontal datum is NAD 83 (1992 epoch) State Plane Coordinates 1983, Arizona Central Zone in international feet. The vertical datum is NAVD88. The Maricopa County Flood Control District (MCFCD) scope required the survey to use the Maricopa County Department of Transportation (MCDOT) Geodetic Densification and Cadastral Survey (GDACS) control monuments and apply the vertical adjustment (Geoid Inclined Plane) used in the GDACS Control Survey as the realization of NAVD88. The combined scale factor at each control point as calculated by Trimble Geomatics Office version 1.63 is listed in the primary coordinate list. No airborne GPS data was collected as a part of this project.

Field Preparation:

RBF created a GPS project using the above referenced State Plane projection. The coordinate values for GDACS control points in the area were added to the project for control and control verification. The planned coordinates for the layout of aerial targets as provided by VMR were added to the project so that survey crews could efficiently navigate to the location of each aerial control panel. The coordinates were then superimposed over maps with existing imagery to aid in field navigation.

Survey Control:

The GDACS control points 1LE2 (NGS PID AJ3743) and NR15 (NGS PID AE4806) were observed with Real Time Kinematic observations each day to verify datum. The Virtual Reference Station (VRS) network managed by AZGPS was utilized for GPS base data. Control point AZBC was the point utilized in the (VRS) network. This network broadcasts in the NAD 83 (2007) datum. The slight difference between the 2007 adjustment and the 1992 adjustment was accounted for by correcting our project coordinates based on the measurements to the two GDACS monuments listed above. In areas that had poor broadband coverage the network could not be accessed. In this situation a point was set at a location where broadband coverage was accessible. A GPS base station was set up to broadcast a correction via radio signal to the rovers.

Cross Sections:

RBF performed 8 (eight) cross sections to verify the accuracy of the map. These cross sections were measured perpendicular to the flow line of Roger Creek, approximately 1300 feet in length at 1 mile intervals. Cross section 3 (three) from the west had to be relocated 1800 feet in the westerly direction due to land owner denying access across property.

Equipment:

Field work was completed using Trimble dual frequency receivers. A Trimble 4700 receiver (SN0220149515) with a compact L1/L2 antenna was used as a base station. Trimble R8 receivers (SN4529153617 and 4588158257) were used as roving stations. Data management and static baseline processing was completed using Trimble Geomatics Office v1.63. (SN0032006125).

Surveyor's Certificate

This report represents a GPS control survey to establish NAD83/1992NAVD 1988 values for aerial panels and cross section measurements used by Vertical Mapping Resources for Maricopa County Flood Control District. The project was surveyed under my direct supervision in March, 2010.

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
37174
DANIEL K.
MARDOCK
4-29-10
Date Signed
ARIZONA, U.S.A.
Expires 3/31/13

March 29, 2010
Date

Daniel K Mardock, RLS 37174
RBF Consulting, 602-467-2200
16605 N 28th Ave, Suite 100
Phoenix, AZ 85053

CONTROL AND GPS VECTOR MAP

Field surveyor:

Computer operator:

Reference:

Scale 1:31000

0 4000 ift

International feet

N0°00'00"E

Plot Scale: 1:31000

Printed on 4/16/2010, at 1:06:02 PM

Printed from Trimble Geomatics Office

Site: NAD83 WITH GDACS VERT ADJUSTMENT, System: US State Plane 1983

Zone: Arizona Central 0202, Datum: NAD 1983 (Conus)

Project:

PRIMARY COORDINATE LIST

45-104417 Rodger Creek Control Project for FCDMC subcontract to VMR.
RBF Consulting, DK Mardock, RLS 37174, 602-467-2200, dmardock@rbf.com
Values depicted below are for panel targets for photogrammetry in NAD 1983/92, NAVD 1988 based on Maricopa County GDACS Control Points 1LE2 and NR15.

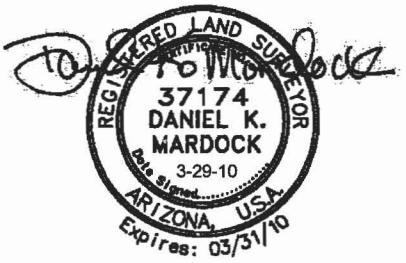
PRIMARY TARGET CONTROL COORDINATES

NAME	NORTHING	EASTING	ELEV	CODE
1001	1036879.192	648375.2174	1880.0458	AT-1
1002	1040527.223	647354.8474	1943.7448	AT-2
1003	1044332.502	646565.5874	2359.3338	AT-3
1004	1045386.744	650630.4144	1997.0128	AT-4
1005	1042047.174	653611.3494	2031.6798	AT-5
1006	1037954.388	652558.1054	1925.1358	AT-6
1007	1039070.438	656790.7114	2117.6048	AT-7
1008	1046389.525	654931.7214	2046.2638	AT-8
1009	1047568.664	659222.0254	2189.3328	AT-9
1010	1043871.271	660138.8364	2117.2978	AT-10
1011	1040122.506	661022.5734	2618.4888	AT-11
1012	1041314.066	665306.2214	2448.8058	AT-12
1013	1045519.723	666523.6504	2320.2588	AT 13
1014	1048625.447	663434.6584	2281.2288	AT-14
1015	1049671.56	667679.5354	2399.8168	AT-15
1016	1042322.02	669569.2124	2323.3978	AT-16
1017	1043400.168	673713.4974	2403.3538	AT-17
1018	1047054.895	672809.3344	2443.4918	AT-18
1019	1050679.636	671835.1004	2652.5388	AT-19
1020	1051372.155	674103.4204	2967.2748	AT-20
1021	1044462.426	678106.5594	2468.1838	AT-21
1022	1044974.027	680223.4514	2440.6818	AT-22
1023	1048629.76	679284.4244	2654.2368	AT-23
1024	1052379.916	678268.0254	3732.0218	AT-24

PRIMARY CONTROL STATIONS

NAME	NORTHING	EASTING	ELEV	CODE	
1LE2	1036757.808	649601.475	1903.522	2000	Published NGS Value
NR15	1050015.474	664284.888	2323.644	2001	Published NGS Value
2002	1047501.262	665617.0444	2337.3818	CP SET RB	Measured

The information depicted hereon represents a survey made under my supervisoin in March, 2010.
Daniel K. Mardock, RLS 37174 3-29-2010



45-104417 Rodger Creek Control Project for FCDMC subcontract to VMR.
RBF Consulting, DK Mardock, RLS 37174, 602-467-2200, dmardock@rbf.com
Values depicted below are for cross sections for photogrammetry in NAD 1983/92, NAVD 1988 based on Maricopa County GDACS Control Points 1LE2 and NR15.

CROSS SECTION COORDINATES

NAME	NORTHING	EASTING	ELEVATION	CODE
2010	1043535.158	654871.577	2032.129	GS
2011	1043480.539	654870.775	2030.028	GS
2012	1043430.423	654870.21	2023.76	GS
2013	1043342.147	654869.896	2009.29	GS
2015	1043274.027	654867.711	2002.597	GS
2016	1043208.234	654865.809	2000.017	GS
2017	1043102.224	654865.451	2001.16	GS
2018	1043000.600	654866.856	2001.482	GS
2019	1042953.679	654865.903	2001.25	TOP
2020	1042897.622	654867.417	1998.002	GS
2021	1042857.098	654869.656	1994.376	TOE
2022	1042838.669	654870.062	1993.524	FL
2023	1042828.648	654870.577	1994.021	TOE
2024	1042785.969	654876.381	1999.726	GS
2025	1042748.707	654884.651	2006.013	TOP
2026	1042723.021	654880.647	2008.608	TOP
2027	1042711.895	654878.853	2006.544	TOE
2028	1042680.225	654877.977	2007.973	TOE
2029	1042663.466	654877.814	2012.816	TOP
2030	1042622.753	654873.153	2018.049	TOP
2031	1042610.269	654871.673	2019.43	TOE
2032	1042594.770	654869.313	2023.489	TOP
2033	1042542.780	654864.661	2032.816	TOP
2034	1042511.511	654867.603	2032.589	TOE
2035	1042415.265	654868.79	2042.633	GS
2036	1042316.417	654864.091	2044.621	GS
2037	1042219.774	654865.497	2048.826	GS
2038	1042465.453	652029.722	1977.305	GS
2039	1042384.893	652066.926	1970.239	GS
2040	1042311.978	652103.482	1964.256	GS
2041	1042259.232	652127.692	1961.103	GS
2042	1042177.206	652169.247	1959.6	GS
2043	1042066.201	652212.992	1958.213	TOP
2044	1042048.362	652225.737	1955.175	TOE
2045	1042014.691	652248.171	1954.352	GS
2046	1041998.020	652260.127	1953.981	TOP
2047	1041983.729	652269.923	1951.804	TOP
2048	1041978.840	652271.182	1949.978	TOE
2049	1041966.667	652277.556	1949.547	FL
2050	1041952.333	652279.227	1950.161	TOE
2051	1041948.562	652281.622	1952.325	TOP
2052	1041925.220	652292.725	1954.327	EDGE OF TRAIL

2053	1041918.556	652293.452	1954.505	EDGE OF TRAIL
2054	1041911.567	652294.309	1955.516	EDGE OF TRAIL
2055	1041906.654	652295.507	1955.056	GS
2056	1041900.813	652296.032	1955.747	EDGE OF TRAIL
2057	1041876.256	652305.129	1958.719	GS
2058	1041817.360	652345.172	1962.495	GS
2059	1041761.562	652372.76	1965.126	TOP
2060	1041734.549	652384.13	1963.493	TOE
2061	1041720.332	652387.761	1963.296	FL
2062	1041690.310	652397.756	1964.743	TOE
2063	1041662.627	652412.656	1970.352	TOP
2064	1041617.412	652442.962	1977.22	GS
2065	1041556.934	652470.855	1988.28	GS
2066	1041474.032	652510.878	2001.936	TOP
2067	1041432.672	652530.663	2003.165	GS
2068	1041388.988	652555.2	2000.693	GS
2069	1041325.014	652585.39	1995.057	GS
2070	1042527.057	651996.984	1981.07	GS
2071	1042582.510	651971.88	1983.48	GS
2072	1039747.623	650655.555	1947.515	GS
2073	1039816.099	650580.334	1947.54	GS
2074	1039875.019	650526.017	1945.681	GS
2075	1039940.166	650458.473	1941.821	GS
2076	1039988.088	650404.628	1935.149	GS
2077	1040000.169	650388.228	1933.301	TOP
2078	1040009.528	650380.045	1930.839	TOE
2079	1040024.587	650372.706	1930.657	TOP
2080	1040037.627	650361.177	1929.699	GS
2081	1040063.765	650332.064	1924.477	GS
2082	1040082.298	650294.386	1919.071	TOP
2083	1040085.314	650284.472	1915.808	TOE
2084	1040116.771	650254.76	1916.926	FL
2085	1040167.647	650216.66	1917.505	TOE
2086	1040180.883	650209.841	1921.259	TOP
2087	1040200.284	650186.457	1920.694	TOP
2088	1040211.638	650167.548	1916.378	FL
2089	1040235.791	650148.422	1921.496	TOP
2090	1040253.020	650132.161	1922.211	EDGE OF TRAIL
2091	1040260.162	650126.856	1922.63	EDGE OF TRAIL
2092	1040307.876	650079.27	1924.017	GS
2093	1040361.336	650019.318	1923.389	GS
2094	1040389.209	649986.381	1921.358	TOP
2095	1040392.647	649979.43	1919.767	TOE
2096	1040400.903	649951.885	1918.845	TOP
2097	1040421.933	649944.605	1915.567	TOE
2098	1040434.664	649943.984	1915.083	FL
2099	1040441.259	649942.021	1915.349	TOE
2100	1040452.797	649927.584	1921.769	TOP
2101	1040500.795	649875.573	1922.287	TOE
2102	1040515.239	649859.382	1924.842	TOP
2103	1040539.769	649838.639	1925.912	EDGE OF TRAIL
2104	1040545.861	649832.011	1926.035	EDGE OF TRAIL

2105	1040589.799	649786.77	1927.141	GS
2106	1040623.535	649738.391	1927.327	GS
3002	1048921.092	679118.179	2680.228	ng
3003	1048861.252	679126.41	2674.325	ng
3004	1048798.781	679133.064	2668.517	ng
3005	1048725.137	679142.378	2660.285	ng
3006	1048680.889	679173.124	2654.854	ng
3007	1048666.898	679150.685	2646.994	toe
3008	1048649.174	679160.982	2648.452	toe
3009	1048642.070	679160.992	2651.316	top
3010	1048555.651	679169.683	2664.217	ng
3011	1048452.221	679184.135	2686.605	ng
3012	1048371.575	679195.772	2710.188	ng
3013	1048294.469	679201.711	2734.49	ng
3014	1048140.036	679216.322	2790.761	ng
3015	1048044.907	679227.751	2820.421	ng
3016	1047946.104	679251.412	2853.131	ng
3017	1047861.109	679250.716	2872.471	ng
3018	1047786.840	679262.089	2881.728	ng
3019	1047703.626	679283.759	2872.904	ng
3020	1046817.374	676246.283	2535.972	ng
3021	1046931.130	676228.396	2538.091	ng
3022	1047037.020	676150.52	2540.27	ng
3023	1047144.236	676101.904	2540.332	ng
3024	1047259.939	676046.356	2537.4	ng
3025	1047324.140	676027.659	2527.503	top
3026	1047364.453	676006.255	2513.024	toe
3027	1047404.531	675962.795	2505.566	fl
3028	1047419.952	675955.289	2507.489	toe
3029	1047437.696	675949.251	2514.82	top
3030	1047556.933	675920.19	2520.687	ng
3031	1047632.482	675883.673	2526.249	ng
3032	1047759.065	675823.014	2535.578	ng
3033	1047860.428	675781.855	2542.781	ng
3034	1047985.671	675727.729	2553.103	ng
3035	1045869.348	670989.414	2384.403	ng
3036	1045539.799	671089.78	2376.027	ng
3037	1045398.189	671139.127	2367.629	ng
3038	1045364.029	671146.621	2363.653	fl
3039	1045313.394	671184.649	2365.005	fl
3040	1045228.873	671210.136	2369.08	top
3041	1045129.361	671217.544	2373.929	ng
3042	1045036.611	671259.73	2379.156	ng
3043	1044930.062	671304.049	2381.31	ng
3044	1044798.689	671332.925	2381.191	ng
3045	1044718.049	671367.012	2381.111	ng
3500	1045960.294	666145.741	2301.829	NG
3501	1046042.107	666100.806	2295.146	NG
3502	1046134.941	666060.919	2284.601	NG
3503	1046212.698	666007.78	2272.489	NG
3504	1046300.347	665963.538	2259.54	NG
3505	1046381.516	665924.537	2247.411	NG

3506	1046446.538	665896.831	2236.678	NG
3507	1046490.111	665874.387	2225.692	TOE
3508	1046499.516	665865.072	2224.873	FL
3509	1046504.506	665862.949	2225.279	TOE
3510	1046521.933	665861.533	2227.9	TOP
3511	1046541.905	665844.545	2227.218	TOP
3512	1046544.621	665843.194	2226.293	TOE
3513	1046548.417	665840.576	2226.532	FL
3514	1046551.289	665838.028	2226.602	TOE
3515	1046565.540	665820.761	2231.451	TOP
3516	1046653.645	665790.031	2243.186	NG
3517	1046720.692	665745.978	2264.045	NG
3518	1046783.242	665718.607	2288.644	NG
3519	1046849.698	665686.975	2310.046	NG
3520	1046938.581	665648.591	2322.617	NG
3521	1047035.219	665592.425	2325.489	NG
3522	1044739.000	661879.623	2161.295	NG
3523	1044824.188	661834.327	2153.945	NG
3524	1044893.864	661782.916	2147.593	NG
3525	1044970.501	661737.446	2142.135	NG
3526	1045050.015	661695.659	2140.957	NG
3527	1045121.010	661647.748	2136.875	NG
3528	1045210.595	661593.148	2137.749	NG
3529	1045227.677	661572.247	2137.003	TOP
3530	1045237.227	661564.477	2131.792	TOE
3531	1045241.534	661558.182	2131.659	FL
3532	1045249.015	661554.094	2132.863	TOE
3533	1045263.127	661554.645	2135.924	TOP
3534	1045319.380	661525.817	2145.937	NG
3535	1045763.481	661267.361	2202.556	NG
3536	1045688.074	661307.68	2192.057	NG
3537	1045637.080	661339.828	2183.542	NG
3538	1045608.033	661360.748	2173.905	NG
3539	1045551.268	661397.23	2175.68	NG
3540	1045490.847	661434.011	2171.138	NG
3541	1045410.441	661466.219	2161.612	NG
3542	1045372.885	661482.079	2155.267	NG

The information depicted hereon represents a survey made under my supervision in March, 2010.
Daniel K. Mardock, RLS 37174 4-5-2010

NGS QUALITY CONTROL DIFFERENCE REPORT

NGS QUALITY CONTROL DIFFERENCES REPORT

Resultant coordinates for point : NR15

Northing	Easting	Elevation	Height				
1050015.474ift	664284.888ift	2323.644ift	2229.754ift	PUBLISHED (GDACS)			

ID	Used to calc.	Status	Δ North	Δ East	Distance (Horiz)	Δ Elevation	Δ Height
CG132 Office entered	NEeh	Enabled	0.000ift	0.000ift	0.000ift	0.000ift	0.000ift
40 (2002-NR15)		Enabled	-0.053ift	0.096ift	0.110ift	0.098ift	0.098ift
32 (2002-NR15)		Enabled	-0.061ift	0.083ift	0.103ift	0.057ift	0.057ift
35 (2002-NR15)		Enabled	-0.061ift	0.077ift	0.098ift	0.136ift	0.136ift
54 (AZBC-NR15)		Enabled	-0.069ift	0.038ift	0.078ift	0.045ift	0.045ift

Resultant coordinates for point : 1LE2

Northing	Easting	Elevation	Height				
1036757.808ift	649601.475ift	1903.522ift	1808.648ift	PUBLISHED (GDACS)			

ID	Used to calc.	Status	Δ North	Δ East	Distance (Horiz)	Δ Elevation	Δ Height
CG133 Office entered	NEeh	Enabled	0.000ift	0.000ift	0.000ift	0.000ift	0.000ift
1 (AZBC-1LE2)		Enabled	-0.088ift	0.055ift	0.104ift	0.079ift	0.079ift
30 (AZBC-1LE2)		Enabled	-0.104ift	0.080ift	0.131ift	0.095ift	0.095ift
425 (AZBC-1LE2)		Enabled	-0.071ift	0.058ift	0.091ift	0.067ift	0.067ift

COORDINATE QUALITY CONTROL REPORT

QUALITY CONTROL REPORT QC1 AND QC2 RESULTS

NAME	START TIME	STOP TIME	MAX RDOP	MAX HDOP	MAX VDOP	RMS	HORZ PERCISION	VERT PERCISION	MIN SATELLITES
1001	3/23/2010 13:08	3/23/2010 13:09	1.444	0.763	1.226	0.008m	0.022ift	0.036ift	9
1001	3/23/2010 13:07	3/23/2010 13:07	1.327	0.694	1.13	0.003m	0.022ift	0.036ift	9
1001	3/23/2010 13:12	3/23/2010 13:12	1.183	0.609	1.014	0.004m	0.022ift	0.036ift	9
1002	3/23/2010 16:26	3/23/2010 16:27	2.014	0.968	1.767	0.004m	0.022ift	0.041ift	6
1002	3/23/2010 16:27	3/23/2010 16:28	2.804	1.355	2.455	0.003m	0.019ift	0.035ift	6
1003	3/23/2010 14:10	3/23/2010 14:10	1.14	0.61	0.964	0.003m	0.020ift	0.031ift	7
1003	3/23/2010 14:08	3/23/2010 14:09	1.397	0.747	1.181	0.002m	0.021ift	0.033ift	7
1004	3/23/2010 10:17	3/23/2010 10:17	0.972	0.566	0.79	0.005m	0.026ift	0.037ift	12
1004	3/23/2010 10:23	3/23/2010 10:24	1.486	0.812	1.244	0.003m	0.020ift	0.031ift	11
1005	3/23/2010 9:35	3/23/2010 9:35	1.426	0.744	1.217	0.003m	0.022ift	0.036ift	9
1005	3/23/2010 9:37	3/23/2010 9:38	2.02	1.051	1.725	0.004m	0.020ift	0.033ift	9
1006	3/23/2010 9:07	3/23/2010 9:08	2.384	1.18	2.072	0.004m	0.018ift	0.032ift	8
1006	3/23/2010 9:08	3/23/2010 9:09	1.693	0.833	1.474	0.002m	0.018ift	0.031ift	8
1007	3/23/2010 12:08	3/23/2010 12:08	1.302	0.616	1.148	0.003m	0.017ift	0.032ift	11
1007	3/23/2010 12:09	3/23/2010 12:10	1.292	0.612	1.138	0.004m	0.018ift	0.034ift	11
1008	3/23/2010 11:29	3/23/2010 11:30	1.184	0.61	1.014	0.003m	0.021ift	0.035ift	11
1008	3/23/2010 11:31	3/23/2010 11:31	1.454	0.743	1.25	0.003m	0.020ift	0.033ift	11
1009	3/24/2010 9:59	3/24/2010 10:00	1.318	0.749	1.084	0.002m	0.019ift	0.028ift	9
1009	3/24/2010 10:02	3/24/2010 10:02	1.31	0.747	1.076	0.003m	0.022ift	0.031ift	9
1010	3/24/2010 10:46	3/24/2010 10:46	1.422	0.805	1.172	0.003m	0.020ift	0.029ift	9
1010	3/24/2010 10:48	3/24/2010 10:48	1.442	0.809	1.194	0.003m	0.020ift	0.030ift	9
1011	3/24/2010 12:33	3/24/2010 12:34	1.867	1.262	1.376	0.004m	0.025ift	0.028ift	7
1011	3/24/2010 12:37	3/24/2010 12:39	1.832	1.252	1.338	0.004m	0.039ift	0.042ift	7
1012	3/24/2010 14:35	3/24/2010 14:35	1.973	1.135	1.614	0.006m	0.030ift	0.043ift	6
1012	3/24/2010 14:36	3/24/2010 14:37	2.769	1.593	2.266	0.009m	0.030ift	0.043ift	6
1013	3/26/2010 9:29	3/26/2010 9:29	1.427	0.746	1.216	0.003m	0.020ift	0.033ift	9
1013	3/26/2010 9:28	3/26/2010 9:28	2.02	1.056	1.722	0.002m	0.019ift	0.031ift	9
1014	3/24/2010 9:34	3/24/2010 9:34	1.429	0.745	1.22	0.002m	0.018ift	0.029ift	9
1014	3/24/2010 9:35	3/24/2010 9:35	1.429	0.744	1.219	0.002m	0.019ift	0.031ift	9
1015	3/25/2010 8:41	3/25/2010 8:41	1.57	0.848	1.321	0.002m	0.019ift	0.030ift	8
1015	3/25/2010 8:42	3/25/2010 8:42	1.577	0.848	1.329	0.002m	0.018ift	0.028ift	8
1016	3/23/2010 10:08	3/23/2010 10:08	1.414	0.828	1.147	0.005m	0.025ift	0.034ift	11
1016	3/23/2010 10:06	3/23/2010 10:07	1.132	0.653	0.925	0.004m	0.025ift	0.034ift	10
1017	3/23/2010 10:37	3/23/2010 10:38	0.996	0.578	0.812	0.005m	0.024ift	0.034ift	12
1017	3/23/2010 10:39	3/23/2010 10:39	0.996	0.579	0.81	0.005m	0.024ift	0.034ift	12
1018	3/24/2010 13:45	3/24/2010 13:45	4.436	1.661	4.113	0.002m	0.017ift	0.043ift	6
1018	3/24/2010 13:48	3/24/2010 13:48	4.329	1.619	4.015	0.003m	0.023ift	0.056ift	6
1019	3/25/2010 9:25	3/25/2010 9:25	1.426	0.747	1.215	0.002m	0.022ift	0.036ift	9
1019	3/25/2010 9:26	3/25/2010 9:26	1.427	0.747	1.216	0.002m	0.020ift	0.033ift	9
1020	3/25/2010 10:06	3/25/2010 10:06	1.28	0.744	1.042	0.002m	0.021ift	0.029ift	9
1020	3/25/2010 10:06	3/25/2010 10:06	1.276	0.744	1.037	0.003m	0.021ift	0.030ift	9
1021	3/23/2010 11:04	3/23/2010 11:05	1.256	0.749	1.008	0.006m	0.025ift	0.034ift	11
1021	3/23/2010 11:06	3/23/2010 11:06	1.267	0.751	1.021	0.004m	0.025ift	0.034ift	11
1022	3/23/2010 11:30	3/23/2010 11:30	1.45	0.746	1.244	0.003m	0.018ift	0.031ift	11
1022	3/23/2010 11:31	3/23/2010 11:31	2.224	1.138	1.911	0.002m	0.017ift	0.029ift	11
1023	3/23/2010 12:30	3/23/2010 12:31	1.139	0.573	0.984	0.004m	0.022ift	0.037ift	11
1023	3/24/2010 10:48	3/24/2010 10:48	1.446	0.81	1.198	0.003m	0.023ift	0.034ift	9
1024	3/25/2010 11:58	3/25/2010 11:59	2.516	1.009	2.305	0.002m	0.015ift	0.034ift	9
1024	3/25/2010 11:58	3/25/2010 11:58	2.532	1.011	2.321	0.002m	0.014ift	0.032ift	9

NGS DATASHEETS

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE =  ,PROGRAM = datasheet, VERSION = 7.82
1         National Geodetic Survey,   Retrieval Date = MARCH 29, 2010
 AJ3743 ***********************************************************
 AJ3743  HT_MOD      -  This is a Height Modernization Survey Station.
 AJ3743  DESIGNATION -  1LE2
 AJ3743  PID         -  AJ3743
 AJ3743  STATE/COUNTY-  AZ/MARICOPA
 AJ3743  USGS QUAD   -  NEW RIVER SE (1981)
 AJ3743
 AJ3743                        *CURRENT SURVEY CONTROL
 AJ3743  ___________________________________________________________
 AJ3743* NAD 83(2007)-  33 50 59.15759(N)    112 04 57.60753(W)     AD
 AJ3743* NAVD 88     -       580.22   (meters)    1903.6    (feet)  GP
 AJ3743  ___________________________________________________________
 AJ3743  EPOCH DATE  -        2007.00
 AJ3743  X           -  -1,993,637.137 (meters)                     CO
 AJ3743  Y           -  -4,913,999.875 (meters)                     CO
 AJ3743  Z           -   3,532,926.247 (meters)                     CO
 AJ3743  LAPLACE CORR-           4.08  (seconds)                    DE
 AJ3743  ELLIP HEIGHT-         551.254 (meters)          (02/10/07) AD
 AJ3743  GEOID HEIGHT-         -28.97  (meters)                     GE
 AJ3743
 AJ3743  ------- Accuracy Estimates (at 95% Confidence Level in cm) --
 AJ3743  Type    PID    Designation                      North   East
 AJ3743  ------------------------------------------------------------
 AJ3743  NETWORK AJ3743 1LE2                              0.78   0.71
 AJ3743  ------------------------------------------------------------
 AJ3743
 AJ3743.The horizontal coordinates were established by GPS observation
 AJ3743.and adjusted by the National Geodetic Survey in February 2007.
 AJ3743
 AJ3743.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007
 AJ3743.See National Readjustment for more information.
 AJ3743.The horizontal coordinates are valid at the epoch date display
 AJ3743.The epoch date for horizontal control is a decimal equivalence
 AJ3743.of Year/Month/Day.
 AJ3743
 AJ3743.The orthometric height was determined by GPS observations and
 AJ3743.high-resolution geoid model using precise GPS observation and
 AJ3743.processing techniques.
 AJ3743
 AJ3743.The X, Y, and Z were computed from the position and the ellips
 AJ3743
```

```
AJ3743.The Laplace correction was computed from DEFLEC09 derived defl
AJ3743
AJ3743.The ellipsoidal height was determined by GPS observations
AJ3743.and is referenced to NAD 83.
AJ3743
AJ3743.The geoid height was determined by GEOID09.
AJ3743
AJ3743;                    North         East     Units Scale Factor
AJ3743;SPC AZ C     -   316,003.801   197,998.515   MT  0.99990291
AJ3743;SPC AZ C     - 1,036,757.88    649,601.43   iFT  0.99990291
AJ3743;UTM  12      - 3,746,025.686   399,839.936   MT  0.99972367
AJ3743
AJ3743!             -  Elev Factor  x  Scale Factor =   Combined Fact
AJ3743!SPC AZ C     -   0.99991347  x   0.99990291  =   0.99981639
AJ3743!UTM  12      -   0.99991347  x   0.99972367  =   0.99963716
AJ3743
AJ3743                          SUPERSEDED SURVEY CONTROL
AJ3743
AJ3743  NAD 83(1992)-  33 50 59.15689(N)    112 04 57.60695(W) AD(
AJ3743  ELLIP H (04/12/01)  551.276  (m)                       GP(
AJ3743
AJ3743.Superseded values are not recommended for survey control.
AJ3743.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums
AJ3743.See file dsdata.txt to determine how the superseded data were
AJ3743
AJ3743_U.S. NATIONAL GRID SPATIAL ADDRESS: 12SUC9983946025(NAD 83)
AJ3743_MARKER: I = METAL ROD
AJ3743_SETTING: 59 = STAINLESS STEEL ROD IN SLEEVE (10 FT.+)
AJ3743_STAMPING: 1LE2 1999
AJ3743_MARK LOGO: MCDOT
AJ3743_PROJECTION: FLUSH
AJ3743_MAGNETIC: B = BAR MAGNET IMBEDDED IN MONUMENT
AJ3743_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD
AJ3743+STABILITY: POSITION/ELEVATION WELL
AJ3743_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AJ3743+SATELLITE: SATELLITE OBSERVATIONS - 1999
AJ3743_ROD/PIPE-DEPTH:  3.0 meters
AJ3743_SLEEVE-DEPTH  :  0.8 meters
AJ3743
AJ3743  HISTORY     - Date     Condition        Report By
AJ3743  HISTORY     - 1999     MONUMENTED       MCDOT
AJ3743
AJ3743                          STATION DESCRIPTION
AJ3743
AJ3743'DESCRIBED BY MARICOPA CO DOT 1999 (CC)
AJ3743'THE STATION IS LOCATED WITHIN THE COUNTY OF MARICOPA, TOWNSHIP
AJ3743'NORTH, RANGE 03 EAST, SECTION 21
AJ3743'OWNERSHIP - PRIVATE
AJ3743'TO REACH THE STATION FROM THE JUNCTION OF I-17 AND CAREFREE HW
AJ3743'74) (EXIT 223) , DRIVE EAST ON THE CAREFREE HWY FOR 3.0 MI (4.
```

```
AJ3743'TO 7TH AVENUE, THENCE TURN LEFT (NORTH) ONTO 7TH AVENUE AND DR
AJ3743'MI (5.6 KM) TO THE END OF ASPHALT, THENCE CONTINUE NORTH ON 7T
AJ3743'(NORTH) FOR 0.5 MI (0.7 KM) AND PARK AND WALK EAST 25 FEET (7.
AJ3743'THE STATION AS DESCRIBED
AJ3743'MONUMENT DESCRIPTION - THE STATION IS MARKED BY AN ALUMINUM CA
AJ3743'COMPRESSED ON A 10 FOOT (3.0 M) STAINLESS STEEL ROD DRIVEN TO
AJ3743'ENCASED IN A 1 INCH GREASED PVC SLEEVE ENCLOSED IN A 5 INCH PV
AJ3743'WITH A COUNTY LOGO ACCESS COVER STAMPED 1LE2 1999, SURROUNDED
AJ3743'CONCRETE COLLAR FLUSH WITH THE GROUND, WITNESSED BY A WHITE CA
AJ3743'MARKER
AJ3743'STATION TIES
AJ3743'25 FT (7.6 M) EAST OF DIRT ROAD
AJ3743'FOR A TO REACH MAP, STATION IMAGES AND ADDITIONAL INFORMATION,
AJ3743'VISIT WWW.MCDOT.MARICOPA.GOV       SEARCH KEYWORD  GDACS

*** retrieval complete.
Elapsed Time = 00:00:00
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updated 11-20-2001 BPD

718

Maricopa County Department of Transportation

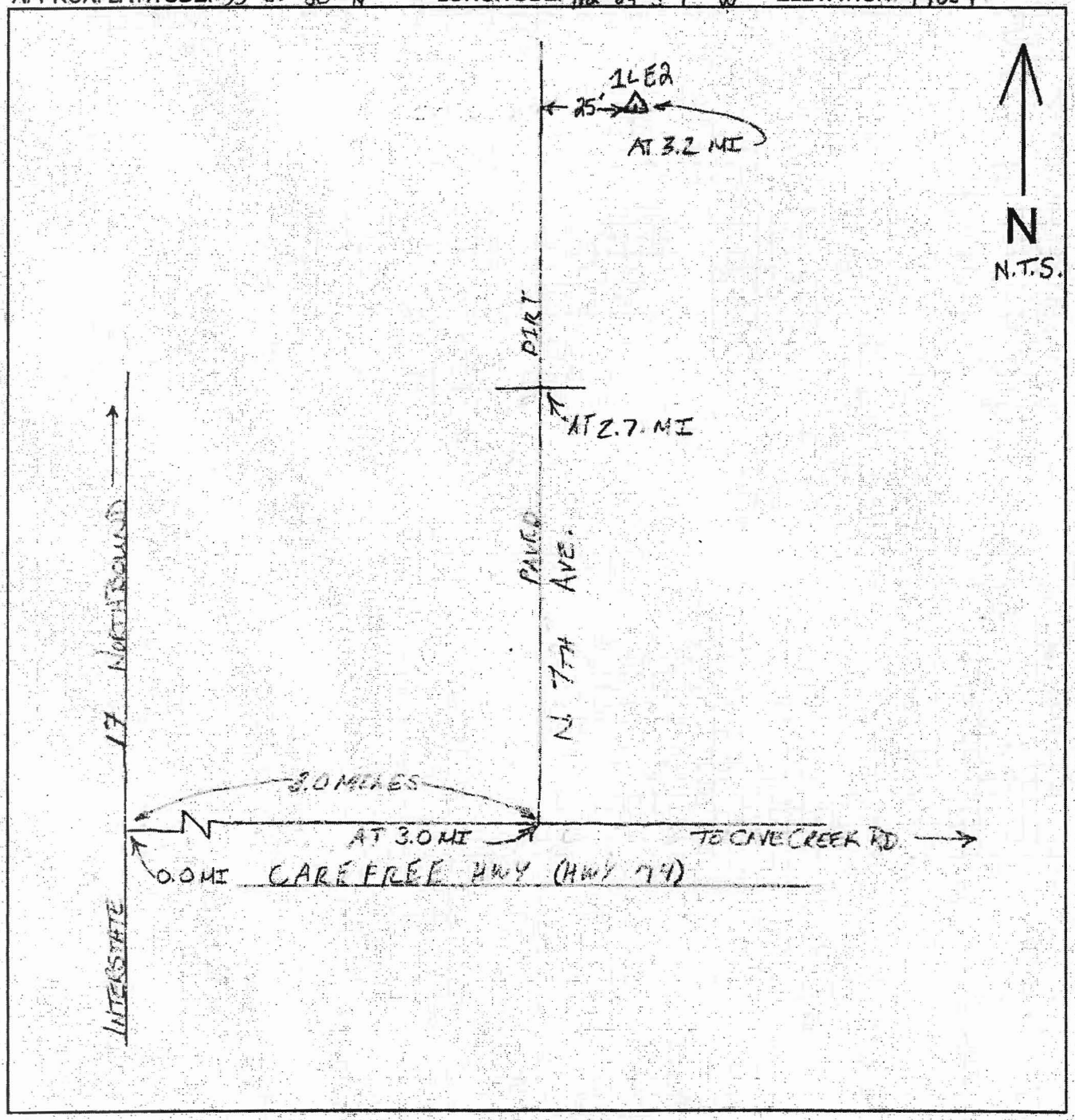
MONUMENT RECORD

STATION NAME: 1LE2 4 LETTER ID: 1LE2

APPROX. LOCATION: T 6N R 3E S 21 GILA AND SALT RIVER MERIDIAN AND BASELINE

AGENCY/FIRM: A-TEAM SKETCH BY: CHAD CLARK DATE: 1-7-00

APPROX. LATITUDE: 33°50'58" N LONGITUDE: 112°04'57" W ELEVATION: 1900 ft



DESCRIPTION OF MONUMENT: SET MCS STD 3D MONUMENT DRIVEN 10' TO REFUSAL.

StationS.xls

Sheet 1 of 1

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE =  ,PROGRAM = datasheet, VERSION = 7.82
1         National Geodetic Survey,   Retrieval Date = MARCH 29, 2010
 AE4806 ***********************************************************
 AE4806  HT_MOD      -  This is a Height Modernization Survey Station.
 AE4806  DESIGNATION -  NR15
 AE4806  PID         -  AE4806
 AE4806  STATE/COUNTY-  AZ/MARICOPA
 AE4806  USGS QUAD   -  DAISY MOUNTAIN (1964)
 AE4806
 AE4806                        *CURRENT SURVEY CONTROL
 AE4806  ___________________________________________________________
 AE4806* NAD 83(2007)-  33 53 10.52258(N)    112 02 03.67726(W)     AD
 AE4806* NAVD 88     -       708.28   (meters)    2323.7    (feet)  GP
 AE4806  ___________________________________________________________
 AE4806  EPOCH DATE  -        2007.00
 AE4806  X           -  -1,988,686.446 (meters)                     CO
 AE4806  Y           -  -4,913,686.984 (meters)                     CO
 AE4806  Z           -   3,536,358.841 (meters)                     CO
 AE4806  LAPLACE CORR-           4.14  (seconds)                   DE
 AE4806  ELLIP HEIGHT-         679.615 (meters)          (02/10/07) AD
 AE4806  GEOID HEIGHT-         -28.66  (meters)                     GE
 AE4806
 AE4806  ------- Accuracy Estimates (at 95% Confidence Level in cm) --
 AE4806  Type    PID    Designation                      North   East
 AE4806  -----------------------------------------------------------
 AE4806  NETWORK AE4806 NR15                               0.55   0.45
 AE4806  -----------------------------------------------------------
 AE4806
 AE4806.The horizontal coordinates were established by GPS observation
 AE4806.and adjusted by the National Geodetic Survey in February 2007.
 AE4806
 AE4806.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007
 AE4806.See National Readjustment for more information.
 AE4806.The horizontal coordinates are valid at the epoch date display
 AE4806.The epoch date for horizontal control is a decimal equivalence
 AE4806.of Year/Month/Day.
 AE4806
 AE4806.The orthometric height was determined by GPS observations and
 AE4806.high-resolution geoid model using precise GPS observation and
 AE4806.processing techniques.
 AE4806
 AE4806.The X, Y, and Z were computed from the position and the ellips
 AE4806
```

```
AE4806.The Laplace correction was computed from DEFLEC09 derived defl
AE4806
AE4806.The ellipsoidal height was determined by GPS observations
AE4806.and is referenced to NAD 83.
AE4806
AE4806.The geoid height was determined by GEOID09.
AE4806
AE4806;                    North         East     Units Scale Factor
AE4806;SPC AZ C     -   320,044.736   202,474.023   MT  0.99990146
AE4806;SPC AZ C     - 1,050,015.54    664,284.85   iFT  0.99990146
AE4806;UTM  12      - 3,750,025.818   404,350.468   MT  0.99971278
AE4806
AE4806!             -  Elev Factor  x  Scale Factor =   Combined Fact
AE4806!SPC AZ C     -   0.99989332  x   0.99990146  =   0.99979479
AE4806!UTM  12      -   0.99989332  x   0.99971278  =   0.99960613
AE4806
AE4806                          SUPERSEDED SURVEY CONTROL
AE4806
AE4806  NAD 83(1992)-  33 53 10.52194(N)    112 02 03.67684(W) AD(
AE4806  ELLIP H (04/12/01)  679.629  (m)                       GP(
AE4806  NAD 83(1992)-  33 53 10.52206(N)    112 02 03.67718(W) AD(
AE4806  NGVD 29 (11/28/97)  707.6    (m)         2322.     (f) GPS OB
AE4806
AE4806.Superseded values are not recommended for survey control.
AE4806.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums
AE4806.See file dsdata.txt to determine how the superseded data were
AE4806
AE4806_U.S. NATIONAL GRID SPATIAL ADDRESS: 12SVC0435050025(NAD 83)
AE4806_MARKER: I = METAL ROD
AE4806_SETTING: 59 = STAINLESS STEEL ROD IN SLEEVE (10 FT.+)
AE4806_STAMPING: NR-15
AE4806_MARK LOGO: MCDOT
AE4806_PROJECTION: PROJECTING 10 CENTIMETERS
AE4806_MAGNETIC: I = MARKER IS A STEEL ROD
AE4806_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD
AE4806+STABILITY: POSITION/ELEVATION WELL
AE4806_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AE4806+SATELLITE: SATELLITE OBSERVATIONS - January 15, 2007
AE4806_ROD/PIPE-DEPTH: .9   meters
AE4806_SLEEVE-DEPTH  : .3 meters
AE4806
AE4806  HISTORY     - Date     Condition        Report By
AE4806  HISTORY     - 1996     MONUMENTED       ATEAM
AE4806  HISTORY     - 20000427 GOOD             MCDOT
AE4806  HISTORY     - 20060319 GOOD             USPSQD
AE4806  HISTORY     - 20070115 GOOD             USPSQD
AE4806
AE4806                          STATION DESCRIPTION
AE4806
AE4806'DESCRIBED BY A TEAM PA INC 1996 (JJR)
```

```
AE4806'TO REACH STATION FROM EXIT 232 (NEW RIVER ROAD) OF INTERSTATE
AE4806'TRAVEL EAST ON NEW RIVER ROAD 0.25 MI (0.40 KM) TO T INTERSECT
AE4806'FRONTAGE ROAD. TURN LEFT (NORTH) AND TRAVEL 0.3 MI (0.48 KM) T
AE4806'INTERSECTION WITH NEW RIVER ROAD(EAST). TURN RIGHT (EAST) AND
AE4806'5.1 MI (8.21 KM) TO CIRCLE MOUNTAIN ROAD. TURN LEFT AND TRAVEL
AE4806'FOR 2.3 MI (3.70 KM) TO THE END OF CIRCLE MOUNTAIN ROAD AT 22N
AE4806'AND THE STATION (NORTHEAST). STATION MARK IS A 9/16 STAINLESS
AE4806'ROD IN A HANDWELL INCASED IN CONCRETE STAMPED NR-15 ON HANDWEL
AE4806'STATION IS APPROX. 70 FT (21.34 M) FROM THE EAST EDGE OF PAVEM
AE4806'22ND STREET ALONG THE NORTH R/W LINE ALIGNMENT OF CIRCLE MOUNT
AE4806'AND 3.5 FT (1.07 M) WEST OF A WITNESS POST.
AE4806
AE4806                          STATION RECOVERY (2000)
AE4806
AE4806'RECOVERY NOTE BY MARICOPA CO DOT 2000 (KH)
AE4806'RECOVERED AS DESCRIBED.
AE4806
AE4806                          STATION RECOVERY (2006)
AE4806
AE4806'RECOVERY NOTE BY US POWER SQUADRON 2006 (RW)
AE4806'RECOVERED AS DESCRIBED.
AE4806
AE4806                          STATION RECOVERY (2007)
AE4806
AE4806'RECOVERY NOTE BY US POWER SQUADRON 2007 (RW)
AE4806'RECOVERED AS DESCRIBED.

*** retrieval complete.
Elapsed Time = 00:00:00
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FIELD NOTES

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JOB Roger Creek 45-104417
SHEET NO. 1 OF 3
CALCULATED BY WW/RKW/DW DATE March 2010
CHECKED BY _____ DATE _____
SCALE _____

PT #	CODE	Description
1001	AT-1	Set paper target
1002	AT-2	Set PK Nail in asphalt (W. Medinah Ct) Cul-de-sac with painted target
1003	AT-3	Set paper target
1004	AT-4	Set paper target
1005	AT-5	Set paper target
1006	AT-6	Set paper target
1007	AT-7	Set paper target
1008	AT-8	Set paper target
1009	AT-9	Set paper target
1010	AT-10	Set paper target
1011	AT-11	Set paper target
1012	AT-12	Set paper target
1013	AT-13	Set paper target
1014	AT-14	Set paper target
1015	AT-15	Set paper target
1016	AT-16	Set paper target

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JOB Roger Creek 45-104417
SHEET NO. 2 OF 3
CALCULATED BY WW/RKW/DW DATE March 2010
CHECKED BY _____ DATE _____
SCALE _____

PT #	Code	Description
1017	AT-17	Set paper target
1018	AT-18	Set paper target
1019	AT-19	Set paper target
1020	AT-20	Set paper target
1021	AT-21	Set paper target
1022	AT-22	Set paper target
1023	AT-23	Set paper target
1024	AT-24	Set paper target
2000	1LE2	GDACS Control PT / steel rod in casing
2001	NR15	GDACS Control PT / steel rod in casing
2002	RBF Control PT	Set 1/2" Rebar for GPS Base use
2010-2106	X-section	Measurments inside project site to be used for quality check
3002-3045	X-section	measurments inside project site to be used for quality check
3500-3542	X-section	measurments inside project site to be used for quality check

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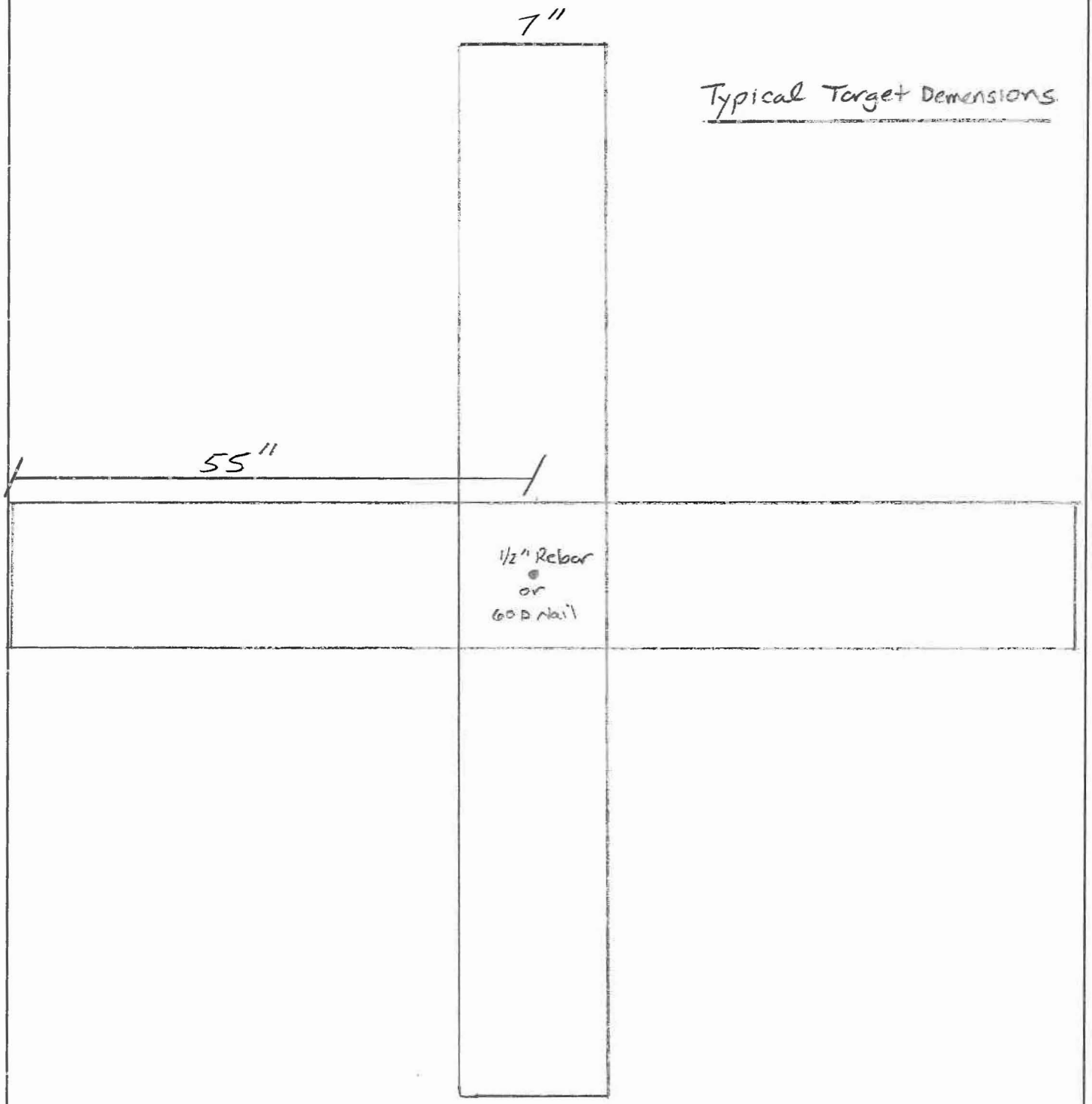
JOB Roger Creek 45-104417
SHEET NO. 3 OF 3
CALCULATED BY WW/RXW/DW DATE March 2010
CHECKED BY _____ DATE _____
SCALE _____



Typical Target Demensions