

Section 1

Adjusted Level Loops

| TSU Benchmark Level Loop 1 12/13/07 | | | | | | | | | |
|-------------------------------------|---------------------|---------------|------------------|----------------------|--------------------|----|----------------------------------------|--|--|
| BACKSIGHT (+) | HI AVERAGE DISTANCE | FORESIGHT (-) | AVERAGE DISTANCE | UNADJUSTED ELEVATION | ADJUSTED ELEVATION | SS | DESCRIPTION | | |
| 3.120 | 574.550 | | | | | | NGS AX2445 3"BRASS DISK IN CONC BRIDGE | | |
| 2.110 | 2.110 | | | 572.440 | | | | | |
| 1.100 | 202 | | | | | | | | |
| 11.980 | 585.005 | 1.625 | | | | | | | |
| 11.320 | 11.320 | 0.865 | 0.865 | 573.685 | 573.686 | | MARKED X ON CURB | | |
| 10.660 | 132 | 0.105 | 152 | | | | | | |
| 6.810 | 587.215 | 4.780 | | | | | | | |
| 6.120 | 6.120 | 3.910 | 3.910 | 581.095 | 581.097 | | MARKED X ON SW | | |
| 5.430 | 138 | 3.040 | 174 | | | | | | |
| 4.290 | 584.965 | 6.380 | | | | | | | |
| 3.240 | 3.240 | 5.490 | 5.490 | 581.725 | 581.728 | | SWT3 BRASS DISK IN CONCRETE | | |
| 2.190 | 210 | 4.600 | 178 | | | | | | |
| 4.405 | 583.290 | 6.040 | | | | | | | |
| 3.395 | 3.395 | 5.070 | 5.070 | 579.895 | 579.899 | | MARKED X ON STEP | | |
| 2.385 | 202 | 4.100 | 194 | | | | | | |
| 8.040 | 586.085 | 5.065 | | | | | | | |
| 6.830 | 6.830 | 4.035 | 4.035 | 579.255 | 579.260 | | MARKED X ON SW | | |
| 5.620 | 242 | 3.005 | 206 | | | | | | |
| 3.440 | 583.205 | 6.460 | | | | | | | |
| 2.350 | 2.350 | 5.230 | 5.230 | 580.855 | 580.861 | | MARKED X ON CURB | | |
| 1.260 | 218 | 4.000 | 246 | | | | | | |
| 9.400 | 586.645 | 5.910 | | | | | | | |
| 8.230 | 8.230 | 4.790 | 4.790 | 578.415 | 578.422 | | MARKED X ON BOC | | |
| 7.060 | 234 | 3.670 | 224 | | | | | | |
| 6.950 | 591.025 | 2.630 | | | | | | | |
| 5.840 | 5.840 | 1.460 | 1.460 | 585.185 | 585.193 | | MARKED X ON ASPH | | |
| 4.730 | 222 | 0.290 | 234 | | | | | | |
| 5.640 | 589.685 | 7.370 | | | | | | | |
| 4.950 | 4.950 | 6.290 | 6.290 | 584.735 | 584.745 | | MARKED X ON ASPH | | |
| 4.260 | 138 | 5.210 | 216 | | | | | | |

| | | | | | | | | | |
|-------|---------|--------|--------|---------|---------|--|--|--|-------------------------------------------|
| 8.830 | 589.775 | 8.690 | | | | | | | |
| 8.150 | 8.150 | 8.060 | 8.060 | 581.625 | 581.635 | | | | COSM 06 GPS ALUM DISK IN CONC |
| 7.470 | 136 | 7.430 | 126 | | | | | | |
| | | | | | | | | | |
| 7.480 | 591.155 | 5.690 | | | | | | | MARKED X ON ASPH |
| 6.420 | 6.420 | 5.040 | 5.040 | 584.735 | 584.746 | | | | |
| 5.360 | 212 | 4.390 | 130 | | | | | | |
| | | | | | | | | | |
| 2.480 | 586.515 | 7.100 | | | | | | | |
| 1.330 | 1.330 | 5.970 | 5.970 | 585.185 | 585.197 | | | | MARKED X ON ASPH |
| 0.180 | 230 | 4.840 | 226 | | | | | | |
| | | | | | | | | | |
| 5.915 | 583.225 | 9.310 | | | | | | | |
| 4.820 | 4.820 | 8.110 | 8.110 | 578.405 | 578.418 | | | | MARKED X ON BOC |
| 3.725 | 219 | 6.910 | 240 | | | | | | |
| | | | | | | | | | |
| 6.740 | 586.385 | 3.490 | | | | | | | |
| 5.540 | 5.540 | 2.380 | 2.380 | 580.845 | 580.860 | | | | MARKED X ON BOC |
| 4.340 | 240 | 1.270 | 222 | | | | | | |
| | | | | | | | | | |
| 5.130 | 583.395 | 8.385 | | | | | | | |
| 4.150 | 4.150 | 7.140 | 7.140 | 579.245 | 579.260 | | | | MARKED X ON SW |
| 3.170 | 196 | 5.895 | | | | | | | |
| | | | | | | | | | |
| 6.440 | 585.345 | 4.590 | | | | | | | |
| 5.470 | 5.470 | 3.520 | 3.520 | 579.875 | 579.891 | | | | MARKED X ON STEP |
| 4.500 | 194 | 2.450 | 214 | | | | | | |
| | | | | | | | | | |
| 6.280 | 587.120 | 4.685 | | | | | | | |
| 5.410 | 5.410 | 3.635 | 3.635 | 581.710 | 581.727 | | | | SWT3 BRASS DISK IN CONCRETE |
| 4.540 | 174 | 2.585 | 210 | | | | | | |
| | | | | | | | | | |
| 5.205 | 585.490 | 6.740 | | | | | | | |
| 4.410 | 4.410 | 6.040 | 6.040 | 581.080 | 581.098 | | | | MARKED X ON SW |
| 3.615 | 159 | 5.340 | 140 | | | | | | |
| | | | | | | | | | |
| 1.580 | 574.490 | 12.560 | | | | | | | |
| 0.820 | 0.820 | 11.820 | 11.820 | 573.670 | 573.689 | | | | MARKED X ON BOC |
| 0.060 | 152 | 11.080 | 148 | | | | | | |
| | | | | | | | | | |
| | | 3.070 | | | | | | | |
| | | 2.070 | 2.070 | 572.420 | 572.440 | | | | NGS AX2445 3"BRASS DISK IN CONC BRIDGE |
| | | 1.070 | 200 | | | | | | |

TSU Benchmark Level Loop 2 12/13/07

| BACKSIGHT (+) | HI AVERAGE DISTANCE | FORESIGHT (-) | AVERAGE DISTANCE | UNADJUSTED ELEVATION | ADJUSTED ELEVATION | SS 1 | DESCRIPTION |
|---------------|---------------------|---------------|------------------|----------------------|--------------------|------|-----------------------------------------------------------------------|
| 4.200 | 575.977 | | | | | | |
| 3.535 | 3.537 | | | 572.440 | | | NGS AX2445 3"BRASS DISK IN CONC BRIDGE |
| 2.875 | 132.5 | | | | | | |
| 11.685 | 586.115 | 1.255 | | | | | |
| 10.905 | 10.903 | 0.765 | 0.765 | 575.212 | 575.211 | | MRK ON CONC. WALK |
| 10.120 | 156.5 | 0.275 | 98 | | | | |
| 4.825 | 586.370 | 4.400 | | | | | |
| 3.915 | 3.915 | 3.660 | 3.660 | 582.455 | 582.452 | | MRK ON TOC |
| 3.005 | 182 | 2.920 | 148 | | | | |
| 5.485 | 586.727 | 4.945 | | | | | |
| 4.545 | 4.547 | 4.190 | 4.190 | 582.180 | 582.176 | | TSU BM 7 ALUM MON. SET IN CONC BASE OF LCRA POWER TRANS. POLE |
| 3.610 | 187.5 | 3.435 | 151 | | | | |
| 5.165 | 586.125 | 5.550 | | | | | |
| 4.195 | 4.195 | 4.795 | 4.797 | 581.930 | 581.924 | | MRK ON TOC |
| 3.225 | 194 | 4.045 | 150.5 | | | | |
| 5.580 | 586.463 | 5.245 | | | | | |
| 4.615 | 4.613 | 4.275 | 4.275 | 581.850 | 581.843 | | TSU BM 12 ALUM MON. SET IN CONC CUTTER OF CURB NEAR CAMPUS INFO SIGN. |
| 3.645 | 193.5 | 3.305 | 194 | | | | |
| 5.515 | 586.680 | 5.505 | | | | | |
| 4.745 | 4.745 | 4.530 | 4.528 | 581.935 | 581.926 | | TP 3 |
| 3.975 | 154 | 3.550 | 195.5 | | | | |
| 5.125 | 586.558 | 5.425 | | | | | |
| 4.375 | 4.375 | 4.495 | 4.497 | 582.183 | 582.172 | | TSU BM 7 ALUM MON. SET IN CONC BASE OF LCRA POWER TRANS. POLE |
| 3.625 | 150 | 3.570 | 185.5 | | | | |
| 4.175 | 585.888 | 5.005 | | | | | |
| 3.425 | 3.425 | 4.095 | 4.095 | 582.463 | 582.451 | | TP 2 |
| 2.675 | 150 | 3.185 | 182 | | | | |

| | | | | | | | | | |
|-------|---------|--------|--------|---------|---------|----------------------------------------|--|--|--|
| 1.575 | 576.272 | 11.440 | | | | | | | |
| 1.050 | 1.050 | 10.665 | 10.667 | 575.222 | 575.208 | TP 1 | | | |
| 0.525 | 105 | 9.895 | 154.5 | | | | | | |
| | | 4.455 | | | | | | | |
| | | 3.820 | 3.820 | 572.452 | 572.437 | NGS AX2445 3"BRASS DISK IN CONC BRIDGE | | | |
| | | 3.185 | 127 | | | | | | |

| TSU Benchmark Level Loop 3 | | | | | | | 12/13/07 |
|----------------------------|---------------------|---------------|------------------|----------------------|--------------------|----|----------------------------------------|
| BACKSIGHT (+) | HI AVERAGE DISTANCE | FORESIGHT (-) | AVERAGE DISTANCE | UNADJUSTED ELEVATION | ADJUSTED ELEVATION | SS | DESCRIPTION |
| 2.230 | 574.063 | | | | | | |
| 1.625 | 1.623 | | | 572.440 | | | NGS AX2445 3"BRASS DISK IN CONC BRIDGE |
| 1.015 | 121.5 | | | | | | |
| 10.805 | 582.150 | 2.415 | | | | | |
| 9.930 | 9.930 | 1.845 | 1.843 | 572.220 | 572.220 | | X ON CONC. SW |
| 9.055 | 175 | 1.270 | 114.5 | | | | |
| 6.780 | 585.723 | 3.405 | | | | | |
| 5.865 | 5.863 | 2.290 | 2.290 | 579.860 | 579.859 | | X ON CONC. TOC |
| 4.945 | 183.5 | 1.175 | 223 | | | | |
| 5.165 | 584.887 | 6.200 | | | | | |
| 4.320 | 4.320 | 5.155 | 5.157 | 580.567 | 580.565 | | MAG NAIL IN ASPHALT |
| 3.475 | 169 | 4.115 | 208.5 | | | | |
| 9.035 | 591.217 | 3.095 | | | | | |
| 8.675 | 8.675 | 2.345 | 2.345 | 582.542 | 582.540 | | MRK ON CONC. TOC |
| 8.315 | 72 | 1.595 | 150 | | | | |
| 12.865 | 603.220 | 0.825 | | | | | |
| 12.500 | 12.498 | 0.495 | 0.495 | 590.722 | 590.719 | | MRK ON CONC. TOC |
| 12.130 | 73.5 | 0.165 | 66 | | | | |
| 6.225 | 604.720 | 4.875 | | | | | |
| 6.085 | 6.087 | 4.585 | 4.587 | 598.633 | 598.631 | | X ON CONC. TOC |
| 5.950 | 27.5 | 4.300 | 57.5 | | | | |
| 1.270 | 604.513 | 1.475 | | | | | |
| 1.135 | 1.133 | 1.340 | 1.340 | 603.380 | 603.377 | | COSM BM # 37 1 ' PIN IN CONC. |
| 0.995 | 27.5 | 1.205 | 27 | | | | |
| 1.250 | 599.598 | 6.025 | | | | | |
| 0.970 | 0.970 | 5.885 | 5.885 | 598.628 | 598.626 | | TP 6 |
| 0.690 | 56 | 5.745 | 28 | | | | |

| | | | | | | | | | | |
|-------|---------|--------|--------|---------|---------|--|--|--|--|----------------------------------------------------------------------|
| 1.005 | 591.392 | 9.135 | | | | | | | | |
| 0.670 | 0.672 | 8.880 | 8.878 | 590.720 | 590.717 | | | | | TP 5 |
| 0.340 | 66.5 | 8.620 | 51.5 | | | | | | | |
| 3.335 | 585.175 | 9.215 | | | | | | | | |
| 2.640 | 2.638 | 8.855 | 8.855 | 582.537 | 582.534 | | | | | TP 4 |
| 1.940 | 139.5 | 8.495 | 72 | | | | | | | |
| 6.160 | 585.712 | 5.510 | | | | | | | | |
| 5.145 | 5.147 | 4.610 | 4.610 | 580.565 | 580.562 | | | | | TP 3 |
| 4.135 | 202.5 | 3.710 | 180 | | | | | | | |
| 3.875 | 582.707 | 6.795 | | | | | | | | |
| 2.845 | 2.845 | 5.850 | 5.850 | 579.862 | 579.858 | | | | | CUT SQUARE IN CONC. TOP OF CURB SE COR. OF INT. ED GREEN 7 SESSOM |
| 1.815 | 206 | 4.905 | 189 | | | | | | | |
| 2.145 | 573.802 | 11.435 | | | | | | | | |
| 1.575 | 1.575 | 10.480 | 10.480 | 572.227 | 572.222 | | | | | TP1 |
| 1.005 | 114 | 9.525 | 191 | | | | | | | |
| | | | | | | | | | | |
| | | 1.965 | | | | | | | | |
| | | 1.355 | 1.357 | 572.445 | 572.440 | | | | | NGS AX2445 3"BRASS DISK IN CONC BRIDGE |
| | | 0.750 | 121.5 | | | | | | | |

TSU Benchmark Level Loop 4 12/13/07

| BACKSIGHT (+) | HI AVERAGE DISTANCE | FORESIGHT (-) | AVERAGE DISTANCE | UNADJUSTED ELEVATION | ADJUSTED ELEVATION | SS 1 | DESCRIPTION |
|---------------|---------------------|---------------|------------------|----------------------|--------------------|------|-----------------------------------------|
| 5.860 | 586.490 | | | | | | |
| 4.760 | 4.760 | | | 581.730 | | | SWT 3 BRASS DISK IN CONC. |
| 3.660 | 220 | | | | | | |
| 10.470 | 589.830 | 7.250 | | | | | |
| 9.390 | 9.390 | 6.050 | 6.050 | 580.440 | 580.431 | | 60 D NAIL |
| 8.310 | 216 | 4.850 | 240 | | | | |
| 19.090 | 608.340 | 0.740 | | | | | |
| 18.910 | 18.910 | 0.400 | 0.400 | 589.430 | 589.415 | | MRK X ON STEPS |
| 18.730 | 36 | 0.060 | 68 | | | | |
| 19.320 | 621.615 | 5.905 | | | | | |
| 18.940 | 18.940 | 5.665 | 5.665 | 602.675 | 602.659 | | 60 D NAIL |
| 18.560 | 76 | 5.425 | 48 | | | | |
| 0.965 | 614.660 | 8.260 | | | | | |
| 0.535 | 0.535 | 7.490 | 7.490 | 614.125 | 614.104 | | TSU BM 6 ALUM DISK SET IN CONC HEADWALL |
| 0.105 | 86 | 6.720 | 154 | | | | |
| 1.830 | 605.810 | 10.860 | | | | | |
| 1.520 | 1.520 | 10.370 | 10.370 | 604.290 | 604.266 | | MRK X ON CUTTER |
| 1.210 | 62 | 9.880 | 98 | | | | |
| 1.125 | 594.355 | 12.760 | | | | | |
| 0.995 | 0.995 | 12.450 | 12.450 | 593.360 | 593.333 | | MRK X ON SW |
| 0.865 | 26 | 12.140 | 62 | | | | |
| 3.585 | 587.435 | 10.330 | | | | | |
| 3.240 | 3.240 | 10.160 | 10.160 | 584.195 | 584.167 | | MRK X ON SW |
| 2.895 | 69 | 9.990 | 34 | | | | |

| TSU Benchmark Level Loop 4 12/13/07 | | | | | | | |
|-------------------------------------|---------------------|---------------|------------------|----------------------|--------------------|----|-------------------------------------------------------------------|
| BACKSIGHT (+) | HI AVERAGE DISTANCE | FORESIGHT (-) | AVERAGE DISTANCE | UNADJUSTED ELEVATION | ADJUSTED ELEVATION | SS | DESCRIPTION |
| 4.490 | 584.765 | 7.170 | | | | 1 | |
| 3.980 | 3.980 | 6.650 | 6.650 | 580.785 | 580.754 | | MRK X ON BOC |
| 3.470 | 102 | 6.130 | 104 | | | | |
| | | 5.330 | | | | | |
| | | 4.870 | 4.870 | 579.895 | 579.860 | | CUT SQUARE IN CONC. TOP OF CURB SE COR. OF INT. ED GREEN 7 SESSOM |
| | | 4.410 | 92 | | | | |

TSU BENCHMARK LEVEL LOOP 5 (ELECTRONIC LEVEL) 12/17/07

| BACKSIGHT (+) | H.I. | FORESIGHT (-) | SIDESHOT (-) | UNADJUSTED ELEVATION | ADJUSTED ELEVATION | DESCRIPTION |
|----------------------|-------------|----------------------|---------------------|-----------------------------|---------------------------|----------------------------|
| | | | | 614.100 | | TSU BM 6 ALUMINUM DISK |
| 14.757 | 628.857 | | | | | |
| | | 0.788 | | 628.069 | 628.069 | TP |
| 14.525 | 642.595 | | | | | |
| | | 1.037 | | 641.558 | 641.557 | TP |
| 13.748 | 655.306 | | | | | |
| | | 0.703 | | 654.603 | 654.601 | TP |
| 13.207 | 667.810 | | | | | |
| | | 0.598 | | 667.212 | 667.210 | TP |
| 7.857 | 675.069 | | | | | |
| | | 14.556 | | 660.513 | 660.510 | TP |
| 2.410 | 662.923 | | | | | |
| | | 14.882 | | 648.041 | 648.038 | TSU BM 5 ALUMINUM DISK |
| 1.356 | 649.397 | | | | | |
| | | 13.516 | | 635.881 | 635.877 | TP |
| 1.310 | 637.191 | | | | | |
| | | 15.285 | | 621.906 | 621.902 | TP |
| 1.392 | 623.297 | | | | | |
| | | 15.643 | | 607.654 | 607.649 | TP |
| 1.159 | 608.813 | | | | | |
| | | 13.373 | | 595.440 | 595.435 | TP |
| 15.656 | 611.097 | | | | | |
| | | 1.363 | | 609.734 | 609.728 | TP |
| 14.737 | 624.471 | | | | | |
| | | 0.856 | | 623.615 | 623.609 | TP |
| 12.234 | 635.849 | | | | | |
| | | 6.672 | | 629.177 | 629.170 | TSU BM 1 GPS ALUMINUM DISK |
| 2.265 | 631.441 | | | | | |
| | | 6.218 | | 625.223 | 625.216 | TP |
| 10.342 | 635.565 | | | | | |
| | | 15.376 | | 620.189 | 620.181 | TP |
| 0.399 | 620.588 | | | | | |
| | | 15.640 | | 604.948 | 604.940 | TP |
| 1.043 | 605.991 | | | | | |

TSU BENCHMARK LEVEL LOOP 5 (ELECTRONIC LEVEL) 12/17/07

| BACKSIGHT (+) | H.I. | FORESIGHT (-) | SIDESHOT (-) | UNADJUSTED ELEVATION | ADJUSTED ELEVATION | DESCRIPTION |
|---------------|---------|---------------|--------------|----------------------|--------------------|------------------------|
| 0.738 | 593.493 | 13.237 | | 592.755 | 592.746 | TP |
| 12.597 | 595.666 | 10.424 | | 583.069 | 583.060 | TP |
| 13.417 | 608.536 | 0.546 | | 595.120 | 595.110 | TP |
| 7.188 | 614.957 | 0.768 | | 607.769 | 607.759 | TP |
| | | 0.846 | | 614.111 | 614.100 | TSU BM 6 ALUMINUM DISK |

| TSU BENCHMARK LEVEL LOOP 6 (ELECTRONIC LEVEL) 12/17-18/07 | | | | | | |
|-----------------------------------------------------------|---------|---------------|--------------|----------------------|--------------------|------------------------|
| BACKSIGHT (+) | H.I. | FORESIGHT (-) | SIDESHOT (-) | UNADJUSTED ELEVATION | ADJUSTED ELEVATION | DESCRIPTION |
| | | | | 581.730 | | SWT3 BRASS DISK |
| 7.011 | 588.741 | | | | | |
| 8.661 | 592.462 | 4.940 | | 583.801 | 583.803 | TP |
| 7.673 | 597.309 | 2.825 | | 589.637 | 589.640 | TP |
| 7.079 | 601.387 | 3.001 | | 594.308 | 594.314 | TP |
| 6.257 | 604.395 | 3.249 | | 598.138 | 598.146 | TSU BM 8 ALUMINUM IDSK |
| 9.904 | 613.208 | 1.092 | | 603.303 | 603.313 | TP |
| 15.391 | 627.291 | 1.308 | | 611.900 | 611.911 | TP |
| 15.861 | 642.444 | 0.708 | | 626.583 | 626.596 | TP |
| 15.610 | 657.713 | 0.341 | | 642.103 | 642.118 | TP |
| 15.722 | 672.374 | 1.061 | | 656.652 | 656.669 | TP |
| 15.248 | 686.353 | 1.268 | | 671.106 | 671.124 | TP |
| 10.476 | 696.087 | 0.743 | | 685.610 | 685.631 | TP |
| 0.606 | 691.313 | 5.380 | | 690.706 | 690.729 | TSU BM 9 ALUMINUM DISK |
| 2.387 | 679.096 | 14.603 | | 676.709 | 676.734 | TP |
| 7.972 | 672.914 | 14.154 | | 664.943 | 664.969 | TP |
| 3.595 | 663.119 | 13.390 | | 659.524 | 659.553 | TP |
| 3.357 | 651.704 | 14.772 | | 648.347 | 648.377 | TP |

TSU BENCHMARK LEVEL LOOP 6 (ELECTRONIC LEVEL) 12/17-18/07

| BACKSIGHT (+) | H.I. | FORESIGHT (-) | SIDESHOT (-) | UNADJUSTED ELEVATION | ADJUSTED ELEVATION | DESCRIPTION |
|---------------|------|---------------|--------------|----------------------|--------------------|------------------------|
| | | 3.696 | | 648.008 | 648.040 | TSU BM 5 ALUMINUM DISK |

| TSU BENCHMARK LEVELE LOOP 7 (ELECTRONIC Level) 12/18-19/07 | | | | | | | |
|------------------------------------------------------------|---------|---------------|--------------|----------------------|--------------------|-------------------------|--|
| BACKSIGHT (+) | H.I. | FORESIGHT (-) | SIDESHOT (-) | UNADJUSTED ELEVATION | ADJUSTED ELEVATION | DESCRIPTION | |
| 1.810 | 692.539 | | | 690.729 | | TSU BM 9 ALUMINUM DISK | |
| 1.374 | 678.214 | 15.699 | | 676.840 | 676.841 | TP | |
| 10.506 | 672.802 | 15.918 | | 662.296 | 662.298 | TP | |
| 15.891 | 688.182 | 0.511 | | 672.291 | 672.294 | TP | |
| 13.081 | 700.828 | 0.435 | | 687.747 | 687.751 | TP | |
| 4.671 | 704.374 | 1.125 | | 699.703 | 699.708 | TP | |
| 0.674 | 698.650 | 6.397 | | 697.976 | 697.983 | TSU BM 10 ALUMINUM DISK | |
| 0.948 | 687.206 | 12.392 | | 686.258 | 686.266 | TP | |
| 12.789 | 697.864 | 2.132 | | 685.075 | 685.084 | TP | |
| 15.626 | 711.273 | 2.217 | | 695.647 | 695.657 | TP | |
| 15.817 | 726.465 | 0.625 | | 710.648 | 710.659 | TP | |
| 14.710 | 740.745 | 0.429 | | 726.036 | 726.048 | TP | |
| 13.759 | 753.714 | 0.790 | | 739.955 | 739.968 | TP | |
| 14.281 | 766.878 | 1.117 | | 752.597 | 752.612 | TP | |
| 11.106 | 769.873 | 8.110 | | 758.767 | 758.783 | TP | |
| 2.285 | 770.097 | 2.061 | | 767.812 | 767.829 | SWT 1 BRASS DISK | |
| 1.515 | 760.174 | 11.439 | | 758.659 | 758.677 | TP | |

TSU BENCHMARK LEVELE LOOP 7 (ELECTRONIC Level) 12/18-19/07

| BACKSIGHT (+) | H.I. | FORESIGHT (-) | SIDESHOT (-) | UNADJUSTED ELEVATION | ADJUSTED ELEVATION | DESCRIPTION |
|----------------------|-------------|----------------------|---------------------|-----------------------------|---------------------------|------------------------|
| 0.996 | 750.926 | 10.244 | | 749.930 | 749.949 | TP |
| 2.153 | 738.984 | 14.094 | | 736.832 | 736.852 | TP |
| 3.088 | 735.216 | 6.856 | | 732.128 | 732.150 | TP |
| 0.579 | 723.935 | 11.860 | | 723.366 | 723.378 | TP |
| 0.807 | 717.332 | 7.470 | | 716.465 | 716.488 | TP |
| 5.913 | 721.441 | 1.804 | | 715.528 | 715.553 | TP |
| 5.049 | 712.257 | 14.233 | | 707.208 | 707.234 | TP |
| 0.562 | 701.920 | 10.899 | | 701.358 | 701.384 | TP |
| 2.428 | 701.161 | 3.187 | | 698.733 | 698.761 | TP |
| | | 10.461 | | 690.700 | 690.729 | TSU BM 9 ALUMINUM DISK |

| TSU LEVEL LOOP 8 (ELECTRONIC LEVEL) 12/19-20/07 (Revised 7/14/08) | | | | | | |
|-------------------------------------------------------------------|---------|---------------|--------------|----------------------|--------------------|--------------------------------------|
| BACKSIGHT (+) | H.I. | FORESIGHT (-) | SIDESHOT (-) | UNADJUSTED ELEVATION | ADJUSTED ELEVATION | DESCRIPTION |
| | | | | 648.038 | | TSU BM 5 ALUMINUM DISK |
| 3.396 | 651.434 | | | | | |
| | | 3.054 | | 648.380 | 648.380 | TP |
| 14.682 | 663.062 | | | | | |
| | | 1.304 | | 661.758 | 661.758 | TP |
| 15.874 | 677.632 | | | | | |
| | | 0.338 | | 677.294 | 677.294 | TP |
| 14.327 | 691.621 | | | | | |
| | | 0.336 | | 691.285 | 691.285 | TP |
| 16.096 | 707.381 | | | | | |
| | | 0.339 | | 707.042 | 707.042 | TP |
| 13.383 | 720.425 | | | | | |
| | | 13.940 | | 706.485 | 706.485 | TP |
| 1.777 | 708.262 | | | | | |
| | | 15.355 | | 692.907 | 692.907 | TP |
| 1.362 | 694.269 | | | | | |
| | | 6.824 | | 687.445 | 687.445 | TSU BM 3 ALUMINUM DISK |
| 12.231 | 699.676 | | | | | |
| | | 0.391 | | 699.286 | 699.286 | TP |
| 14.999 | 714.285 | | | | | |
| | | 0.546 | | 713.739 | 713.739 | TP |
| 14.915 | 728.654 | | | | | |
| | | 0.449 | | 728.205 | 728.205 | TP |
| 7.178 | 735.383 | | | | | |
| | | 4.839 | | 730.544 | 730.544 | TP (Rev7/14/08) |
| 5.470 | 736.015 | | | | | |
| | | 0.548 | | 735.467 | 735.467 | TSU BM 2 ALUMINUM DISK (Rev 7/14/08) |
| 1.193 | 736.659 | | | | | |
| | | 6.647 | | 730.012 | 730.012 | TP |
| 4.460 | 734.472 | | | | | |
| | | 6.193 | | 728.279 | 728.279 | TP |
| 3.493 | 731.772 | | | | | |
| | | 1.465 | | 730.307 | 730.307 | TSU BM 4 ALUMINUM DISK |
| 1.943 | 732.250 | | | | | |

| TSU LEVEL LOOP 8 (ELECTRONIC LEVEL) 12/19-20/07 (Revised 7/14/08) | | | | | | |
|-------------------------------------------------------------------|---------|---------------|--------------|----------------------|--------------------|------------------------|
| BACKSIGHT (+) | H.I. | FORESIGHT (-) | SIDESHOT (-) | UNADJUSTED ELEVATION | ADJUSTED ELEVATION | DESCRIPTION |
| | | 15.687 | | 716.563 | 716.563 | TP |
| 1.432 | 717.995 | | | | | |
| | | 13.991 | | 704.004 | 704.004 | TP |
| 7.322 | 711.326 | | | | | |
| | | 15.930 | | 695.396 | 695.396 | TP |
| 1.305 | 696.701 | | | | | |
| | | 5.942 | | 690.759 | 690.759 | TSU BM 9 ALUMINUM DISK |

| TSU LEVEL LOOP 9 (ELECTRONIC LEVEL) 12/19-20/07 | | | | | | | |
|-------------------------------------------------|---------|---------------|--------------|----------------------|--------------------|-------------------------|--|
| BACKSIGHT (+) | H.I. | FORESIGHT (-) | SIDESHOT (-) | UNADJUSTED ELEVATION | ADJUSTED ELEVATION | DESCRIPTION | |
| | | | | 767.830 | | SWT 1 BRASS DISK | |
| 5.662 | 773.492 | | | | | | |
| | | 6.686 | | 766.806 | 766.806 | TP | |
| 5.322 | 772.128 | | | | | | |
| | | 12.802 | | 759.326 | 759.326 | TP | |
| 5.189 | 764.515 | | | | | | |
| | | 5.488 | | 759.027 | 759.027 | TP | |
| 8.103 | 767.130 | | | | | | |
| | | 4.203 | | 762.927 | 762.927 | TSU BM 11 ALUMINUM DISK | |
| 1.467 | 764.394 | | | | | | |
| | | 5.325 | | 759.069 | 759.069 | TP | |
| 5.592 | 764.661 | | | | | | |
| | | 1.480 | | 763.182 | 763.182 | TP | |
| 10.582 | 773.764 | | | | | | |
| | | 6.833 | | 766.931 | 766.931 | TP | |
| 5.632 | 772.563 | | | | | | |
| | | 4.732 | | 767.831 | 767.831 | SWT 1 BRASS DISK | |

Section 2
GPS Network Adjustment

Network Adjustment Report

Project : TSU-BM

| | | | |
|--------------------------|---------------------|------------------------|-----------------------------|
| User name | javis | Date & Time | 11:23:12 AM 12/6/2007 |
| Coordinate System | US State Plane 1983 | Zone | Texas South Central 4204 |
| Project Datum | NAD 1983 (Conus) | | |
| Vertical Datum | NAVD88 | Geoid Model | CENTEX03 |
| Coordinate Units | US survey feet | | |
| Distance Units | US survey feet | | |
| Height Units | US survey feet | | |

Adjustment Style Settings - BA 95% Confidence Limits

Residual Tolerances

To End Iterations : 0.000033sft
Final Convergence Cutoff : 0.016484sft

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 : True
Horizontal and Vertical adjustment performed

Set-up Errors

GPS

Error in Height of Antenna : 0.000sft
Centering Error : 0.000sft

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Statistical Summary

Successful Adjustment in 1 iteration(s)

Network Reference Factor : 1.13
 Chi Square Test ($\alpha=95\%$) : PASS
 Degrees of Freedom : 6.00

GPS Observation Statistics

Reference Factor : 1.13
 Redundancy Number (r) : 6.00

Individual GPS Observation Statistics

| Observation ID | Reference Factor | Redundancy Number |
|----------------|------------------|-------------------|
| B25 | 1.29 | 1.45 |
| B28 | 0.46 | 0.76 |
| B29 | 0.51 | 1.34 |
| B30 | 1.37 | 0.97 |
| B31 | 1.40 | 1.49 |

Weighting Strategies

GPS Observations

Default Scalar Applied to All Observations
 Scalar : 1.00

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Adjusted Coordinates

Adjustment performed in NAD 1983 (Conus)

Number of Points : 4
 Number of Constrained Points : 2
 Horizontal Only : 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 |
|------------|-----------------|----------|----------------|----------|-----------|---------|----------|
| SM06 | 13869170.230sft | 0.000sft | 2304809.118sft | 0.000sft | N/A | N/A | N E h |
| SW01 | 13871968.760sft | 0.000sft | 2301498.550sft | 0.000sft | N/A | N/A | N E |
| GPS1 | 13873333.807sft | 0.001sft | 2304928.810sft | 0.001sft | N/A | N/A | |
| SWTUGPS12 | 13872945.319sft | 0.001sft | 2307562.978sft | 0.001sft | 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 |
|------------|----------------------|----------|----------------------|----------|------------|----------|------------------|
| SM06 | 29° 52'49.25109"N | 0.000sft | 97° 56'19.52457"W | 0.000sft | 496.980sft | 0.000sft | Lat Long h |
| SW01 | 29° 53'17.25039"N | 0.000sft | 97° 56'56.84497"W | 0.000sft | 683.275sft | 0.006sft | Lat Long |
| GPS1 | 29° 53'30.45660"N | 0.001sft | 97° 56'17.73555"W | 0.001sft | 544.558sft | 0.006sft | |
| SWTUGPS12 | 29° 53'26.37321"N | 0.001sft | 97° 55'47.85006"W | 0.001sft | 497.143sft | 0.008sft | |

Coordinate Deltas

| Point Name | Δ Northing | Δ Easting | Δ Elevation | Δ Height | Δ Geoid Separation |
|------------|-------------------|------------------|--------------------|-----------------|---------------------------|
| SM06 | 0.000sft | 0.000sft | N/A | 0.000sft | N/A |
| SW01 | 0.000sft | 0.000sft | N/A | -0.003sft | N/A |
| GPS1 | 0.005sft | 0.010sft | N/A | 0.000sft | N/A |
| SWTUGPS12 | -0.002sft | 0.011sft | N/A | 0.001sft | N/A |

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Control Coordinate Comparisons

Values shown are control coord minus adjusted coord.

| Point Name | Δ Northing | Δ Easting | Δ Elevation | Δ Height |
|------------|-------------------|------------------|--------------------|-----------------|
| SM06 | N/A | N/A | N/A | N/A |
| SW01 | N/A | N/A | N/A | N/A |

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Adjusted Observations

Adjustment performed in NAD 1983 (Conus)

GPS Observations

GPS Transformation Group: <GPS Default>

Azimuth Rotation : -0°00'00.4691" (1.96 σ) : 0°00'00.0416"

Network Scale : 0.99999877 (1.96 σ) : 0.00000022

Number of Observations : 5

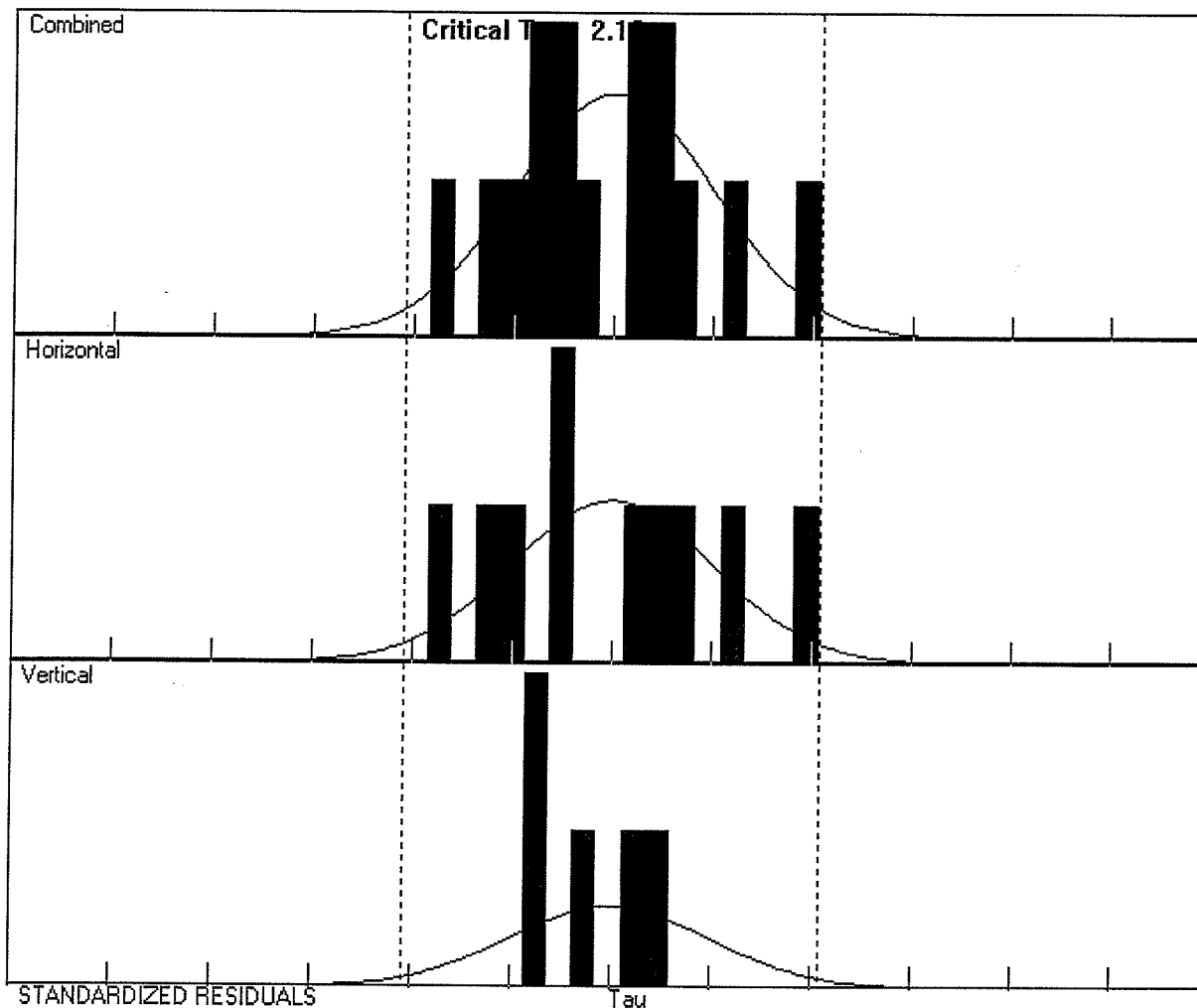
Number of Outliers : 0

Observation Adjustment (Critical Tau = 2.13). Any outliers are in red.

| Obs. ID | From Pt. | To Pt. | | Observation | A-posteriori Error (1.96 σ) | Residual | Stand. Residual |
|---------|----------|-----------|--------------|---------------------|-------------------------------------|--------------------|-----------------|
| B31 | SW01 | SWTUGPS12 | Az. | 81° 22'00.4140" | 0°00'00.0399" | -0° 00'00.0113" | -0.54 |
| | | | Δ Ht. | -186.132sft | 0.008sft | -0.003sft | -0.76 |
| | | | Dist. | 6143.098sft | 0.001sft | 0.001sft | 1.98 |
| B30 | SM06 | SWTUGPS12 | Az. | 36° 37'47.3962" | 0°00'00.0486" | -0° 00'00.0150" | -0.91 |
| | | | Δ Ht. | 0.164sft | 0.008sft | 0.001sft | 0.45 |
| | | | Dist. | 4673.216sft | 0.001sft | -0.001sft | -1.85 |
| B25 | SM06 | SW01 | Az. | 310° 43'43.4809" | 0°00'00.0416" | 0° 00'00.0273" | 1.33 |
| | | | Δ Ht. | 186.296sft | 0.006sft | -0.002sft | -0.84 |
| | | | Dist. | 4335.320sft | 0.001sft | -0.001sft | -1.29 |
| B29 | SW01 | GPS1 | Az. | 68° 48'53.7962" | 0°00'00.0568" | 0° 00'00.0195" | 0.72 |
| | | | Δ Ht. | -138.717sft | 0.007sft | -0.001sft | -0.25 |
| | | | Dist. | 3692.216sft | 0.001sft | 0.000sft | 0.22 |
| B28 | SM06 | GPS1 | Az. | 2°09'59.1795" | 0°00'00.0409" | -0° 00'00.0050" | -0.42 |
| | | | Δ Ht. | 47.579sft | 0.006sft | 0.000sft | 0.17 |
| | | | Dist. | 4165.669sft | 0.001sft | 0.000sft | 0.57 |

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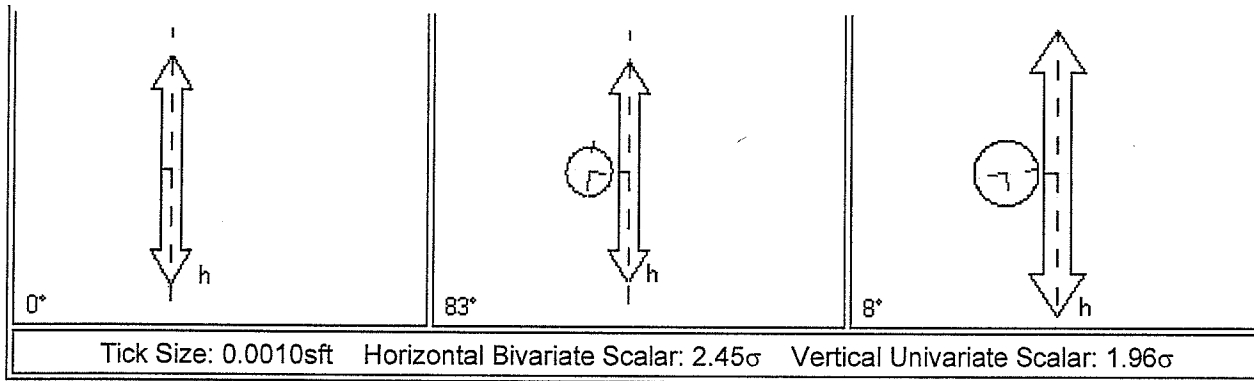
Histograms of Standardized Residuals



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Point Error Ellipses

| SW01 | GPS1 | SWTUGPS12 |
|------|------|-----------|
| | | |



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Covariant Terms

Adjustment performed in NAD 1983 (Conus)

| From Point | To Point | Components | A-posteriori Error (1.96σ) | Horiz. Precision (PPM) | 3D Precision (PPM) |
|------------|-----------|----------------------------------------------|----------------------------|------------------------|--------------------|
| SM06 | SW01 | Az. 310° 43'43.9500" | 0°00'00.0000" | 0.000000 | 0.000000 |
| | | ΔHt. 186.296sft | 0.006sft | | |
| | | ΔElev. ? | ? | | |
| | | Dist. 4335.326sft | 0.000sft | | |
| SM06 | GPS1 | Az. 2°09'59.6486" | 0°00'00.0512" | 0.261064 | 0.261064 |
| | | ΔHt. 47.578sft | 0.006sft | | |
| | | ΔElev. ? | ? | | |
| | | Dist. 4165.674sft | 0.001sft | | |
| SM06 | SWTUGPS12 | Az. 36° 37'47.8653" | 0°00'00.0635" | 0.307780 | 0.307780 |
| | | ΔHt. 0.163sft | 0.008sft | | |
| | | ΔElev. ? | ? | | |
| | | Dist. 4673.222sft | 0.001sft | | |
| SW01 | GPS1 | Az. 68° 48'54.2653" | 0°00'00.0601" | 0.283407 | 0.283407 |
| | | ΔHt. -138.718sft | 0.007sft | | |
| | | ΔElev. ? | ? | | |
| | | Dist. 3692.220sft | 0.001sft | | |

| | | | | | | |
|------|-----------|---------------|--------------------|---------------|----------|----------|
| SW01 | SWTUGPS12 | Az. | 81° 22'00.8831" | 0°00'00.0478" | 0.236305 | 0.236305 |
| | | ΔHt. | -186.132sft | 0.008sft | | |
| | | ΔElev. | ? | ? | | |
| | | Dist. | 6143.106sft | 0.001sft | | |

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Section 3
GPS Satellite Sky Plot and PDOP during observations

SkyPlot

Point: San Marcos

Lat 29:52:25 N Lon 97:56:20 W

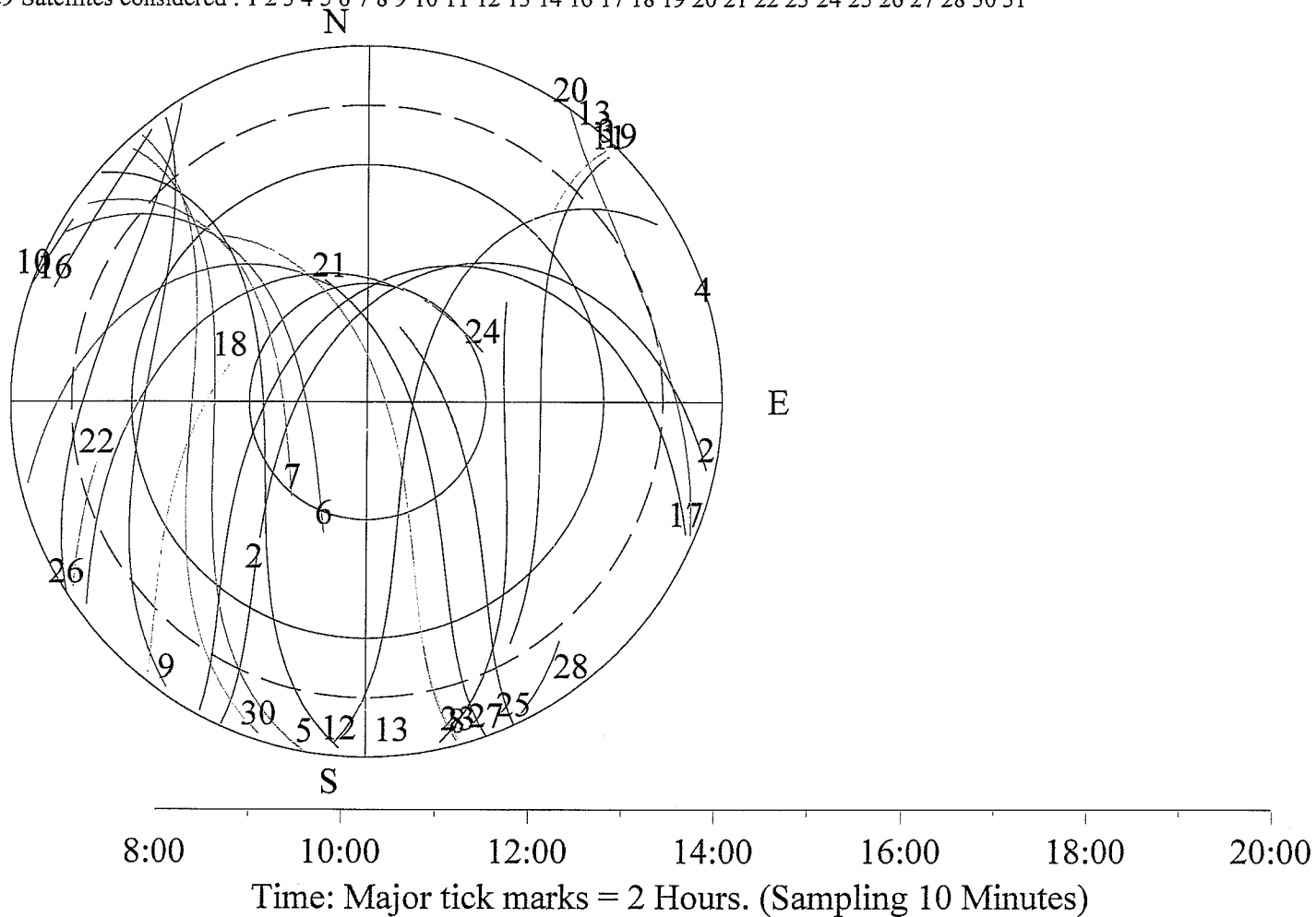
Almanac: SM063371.EPH 12/4/2007

Date: Monday, December 03, 2007

Threshold Elevation 15 (deg)

Time Zone 'Central Std USA' -6:00

29 Satellites considered : 1 2 3 4 5 6 7 8 9 10 11 12 13 14 16 17 18 19 20 21 22 23 24 25 26 27 28 30 31



Satellites

Point: San Marcos

Lat 29:52:25 N Lon 97:56:20 W

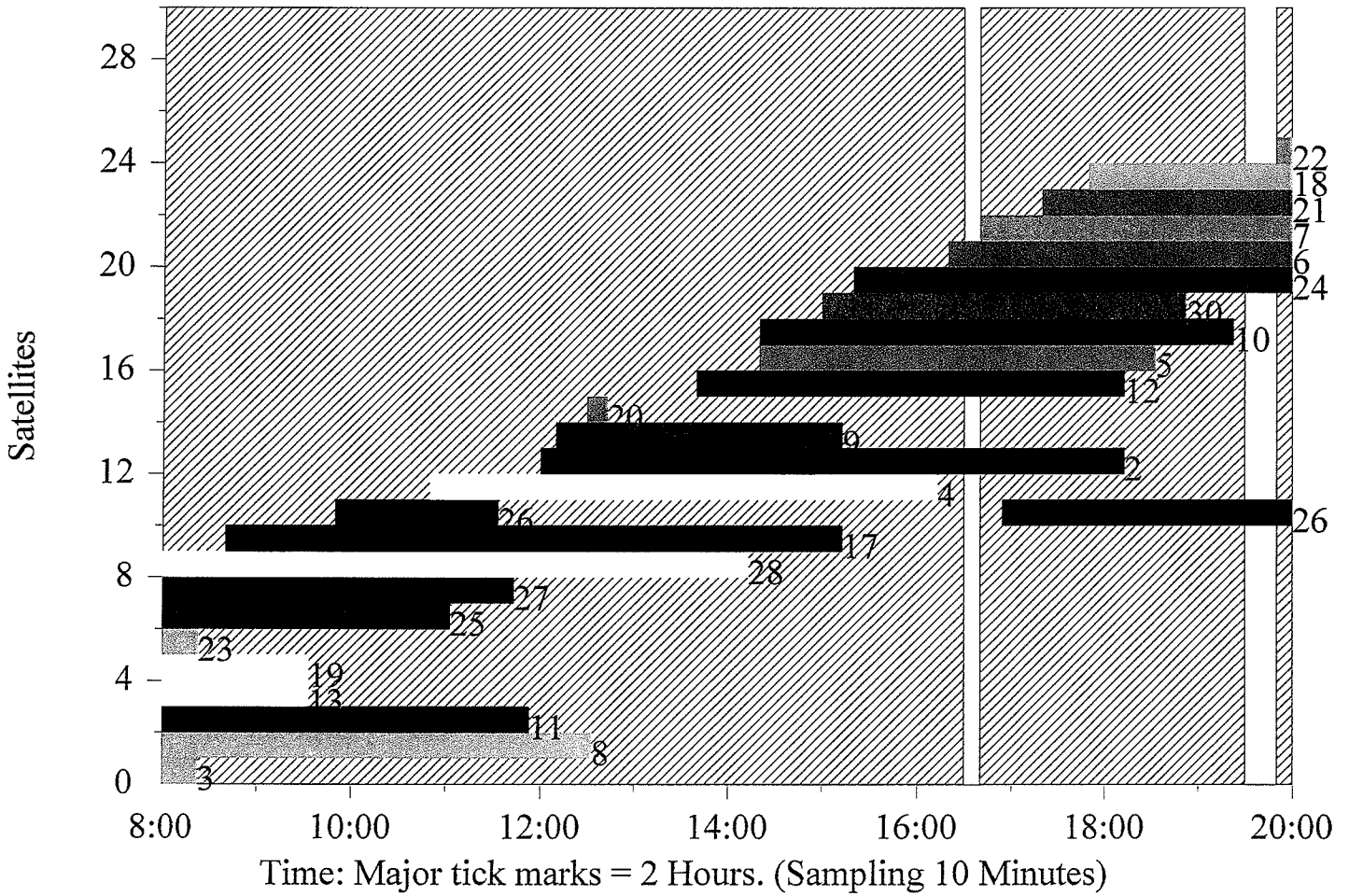
Almanac: SM063371.EPH 12/4/2007

Date: Monday, December 03, 2007

Threshold Elevation 15 (deg)

Time Zone 'Central Std USA' -6:00

29 Satellites considered : 1 2 3 4 5 6 7 8 9 10 11 12 13 14 16 17 18 19 20 21 22 23 24 25 26 27 28 30 31



Number SVs and PDOP

Point: San Marcos

Lat 29:52:25 N Lon 97:56:20 W

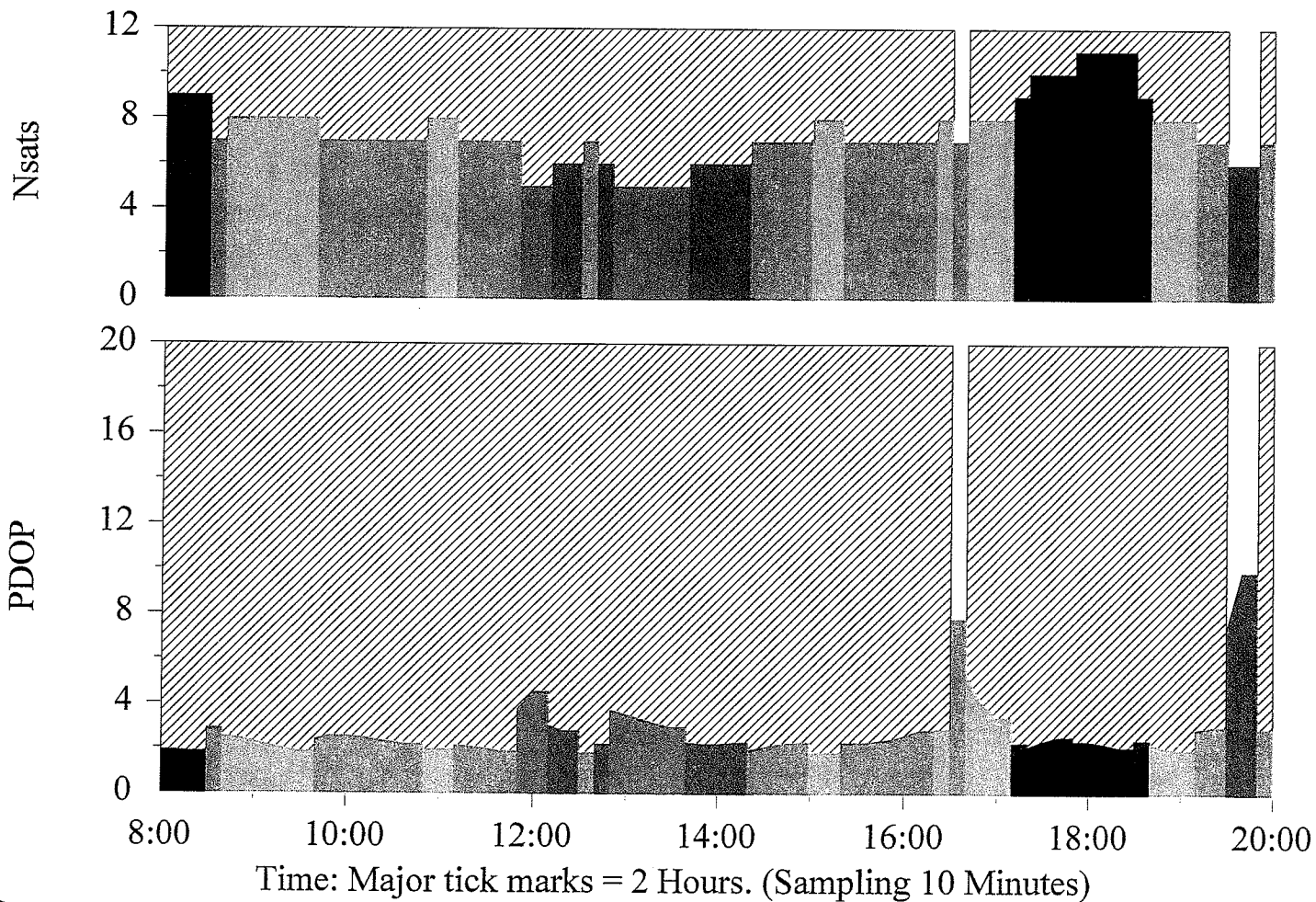
Almanac: SM063371.EPH 12/4/2007

Date: Monday, December 03, 2007

Threshold Elevation 15 (deg)

Time Zone 'Central Std USA' -6:00

29 Satellites considered : 1 2 3 4 5 6 7 8 9 10 11 12 13 14 16 17 18 19 20 21 22 23 24 25 26 27 28 30 31



Section 4
GPS Planning and Occupation Sheets

BAKER-AICKLEN & ASSOCIATES
 405 BRUSHY CREEK ROAD • AUSTIN, TEXAS 78613 • (512) 260-3700
 Static GPS Session Plan 12/3/07

The Planned Session Observation Time is Specified below. Starting Times are to be coordinated among Crews.

Crews should be on station and ready to observe by the Planned Time or notify Crew Leader by phone.

| Session | White Station | Green Station | Blue Station | Black Station | Planned Start | Obsrv. Time | Start Time | End Time | Ant. Height |
|---------|---------------|---------------|--------------|---------------|---------------|-------------|------------|----------|-------------|
| 1 | BM-1 | SWT1 | SM06 | BM-12 | 10:30 | 4-5 hrs | 10:37 | 5:30 | 2.0 m |
| 2 | | | | | | | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |

Notes:

Phones: Steve 422-2198, David 750-9376, Kevin 750-9549, Mike 750-4609, GPS1 750-0501, GPS2 750-6147

Trimble GPS 4000 SSI BASIC Operating Instructions

DO THIS AT THE BEGINNING OF EACH DAYS SESSIONS:

1. QUICK START NOW
2. LOG DATA → MORE → SET UP SURVEY
3. SETTINGS SHOULD BE:
 - a. ELEVATION MASK **13°**
 - b. MIN SVS (SATELLITES) **04**
 - c. MEAS SYNC TIME **5.0 SEC**

CONTINUE from Below

8. ACCEPT
9. STATUS

END SURVEY:

1. LOG DATA → END SURVEY → YES

DO THIS FOR EVERY SESSION:

1. QUICK START NOW
2. LOG DATA → CHANGES → ANTENNA HEIGHT
3. CHANGE ANTENNA HEIGHT
4. ACCEPT
5. STATUS
6. LOG DATA → CHANGES → FILENAME
7. CHANGE FILE NAME
 - a. FIRST FOUR CHARACTERS – FROM GPS STATION
 - b. NEXT THREE NUMBERS – FROM JULIAN DATE
 (YOU DON'T NEED TO CHANGE THIS)
 - c. LAST NUMBER – SESSION NUMBER

Examples
A241
A241-032
A241-032-4

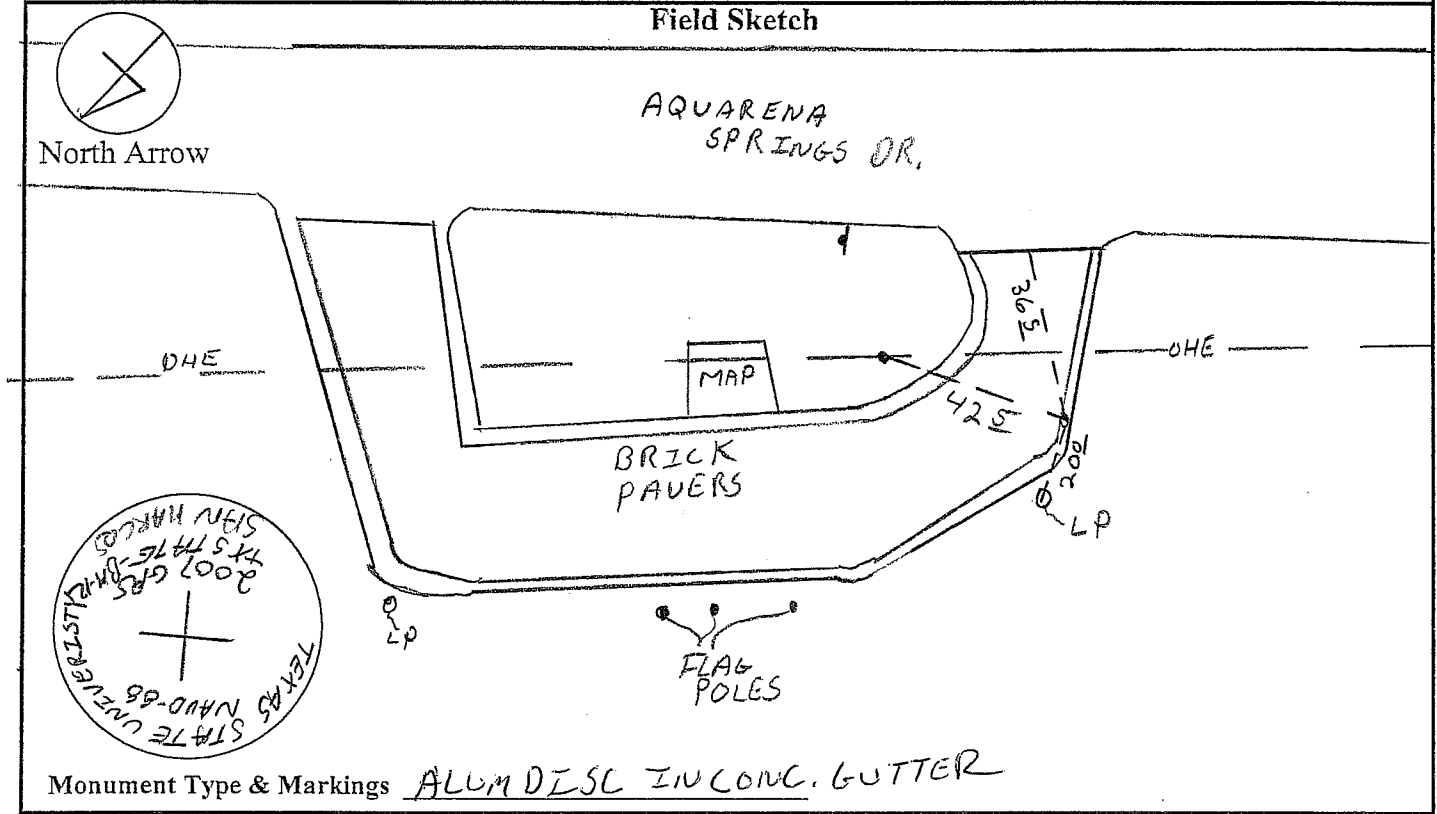
PURGE FILES:

1. CONTROL → FILE

BAKER-AICKLEN & ASSOCIATES
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GPS Survey Occupation Session Sheet

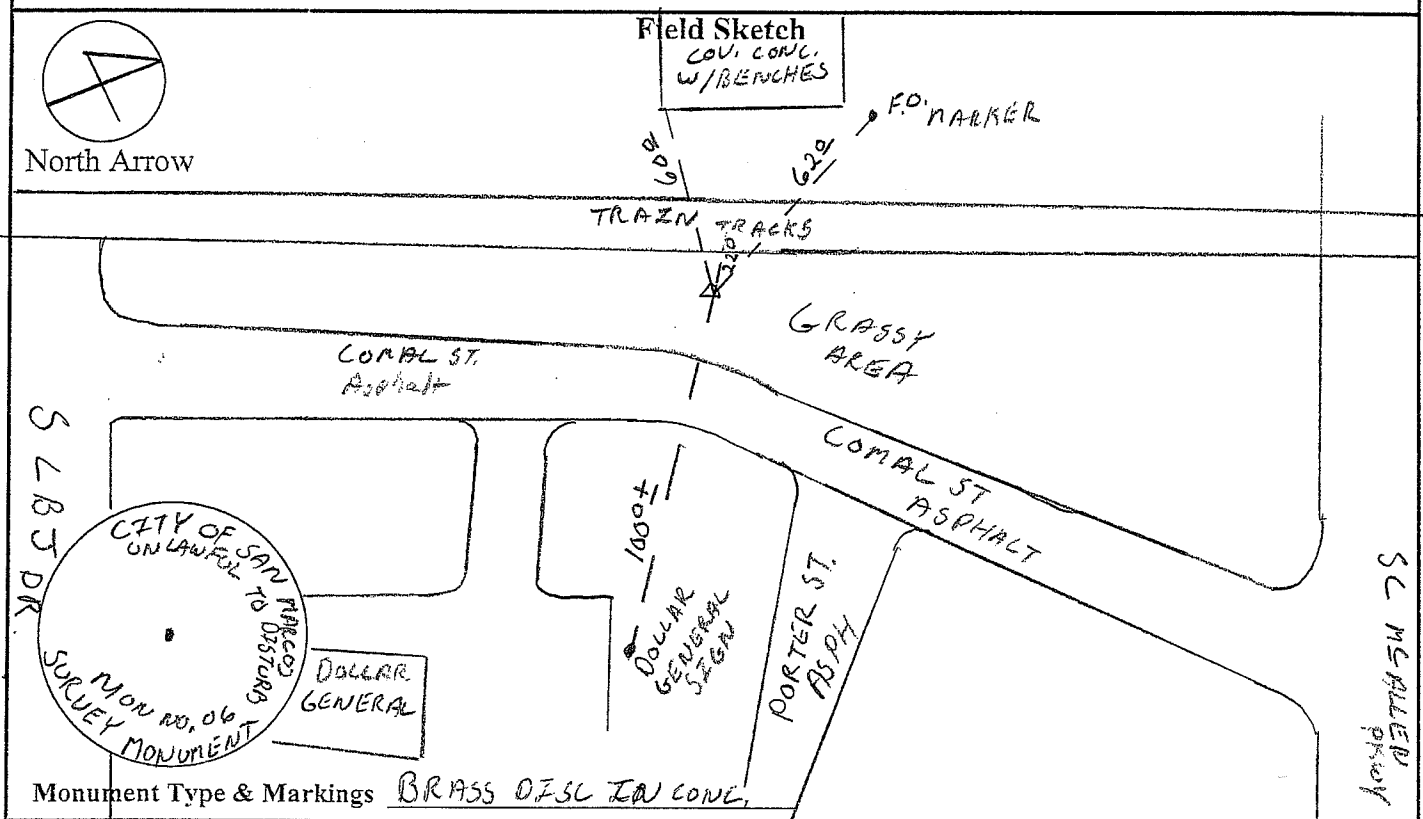
| | | | |
|----------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Project Name: TSU Benchmarks | | GPS Unit / unit 3 5700 | |
| Station PID / Name: SWT4BM12 | | Session #: 1 | Data File: GPS SWTU GPS 12 |
| Operator: K~ | | Date: 12-3-07 | Julian Date: 337 |
| Starting Time: 10:37 A.M. | | Ending Time: 16:30 | |
| CHECK BOX and ENTER HI Below | | CHECK BOX and ENTER HI Below | |
| Fixed Height Rod 2.0, <input checked="" type="checkbox"/> 1.8, <input type="checkbox"/> 1.5 <input type="checkbox"/> | | Fixed Height Rod 2.0, <input checked="" type="checkbox"/> 1.8, <input type="checkbox"/> 1.5 <input type="checkbox"/> | |
| <input type="checkbox"/> Trimble Meas. Rod to Top of Notch | | <input type="checkbox"/> Trimble Meas. Rod to Top of Notch | |
| <input type="checkbox"/> Pocket Tape Meas. to BASE Antenna | | <input type="checkbox"/> Pocket Tape Meas. to BASE Antenna | |
| HI:= Meters and also in | | HI:= Meters and also in | |
| HI:= 6.582 <input type="checkbox"/> FEET or <input type="checkbox"/> INCHES | | HI:= <input type="checkbox"/> FEET or <input type="checkbox"/> INCHES | |
| Antenna Type: GRD Plane <input type="checkbox"/> | | Zephyr <input checked="" type="checkbox"/> GEODIC Other <input type="checkbox"/> | |
| Latitude: N 138729 50.498 | | Longitude: E 2307560, 444 | |
| Ellipsoid Height: 578.911 SFT | | PDOP: 2.3 | |
| Satellites Tracked: 2, 4, 5, 10, 12, 24, 30 | | Epoch Interval: <input checked="" type="checkbox"/> 5Sec. <input type="checkbox"/> 10 Sec. | |
| Notes: | | | |

Field Sketch



BAKER-AICKLEN & ASSOCIATES
 405 BRUSHY CREEK ROAD • AUSTIN, TEXAS 78613 • (512) 260-3700
GPS Survey Occupation Session Sheet

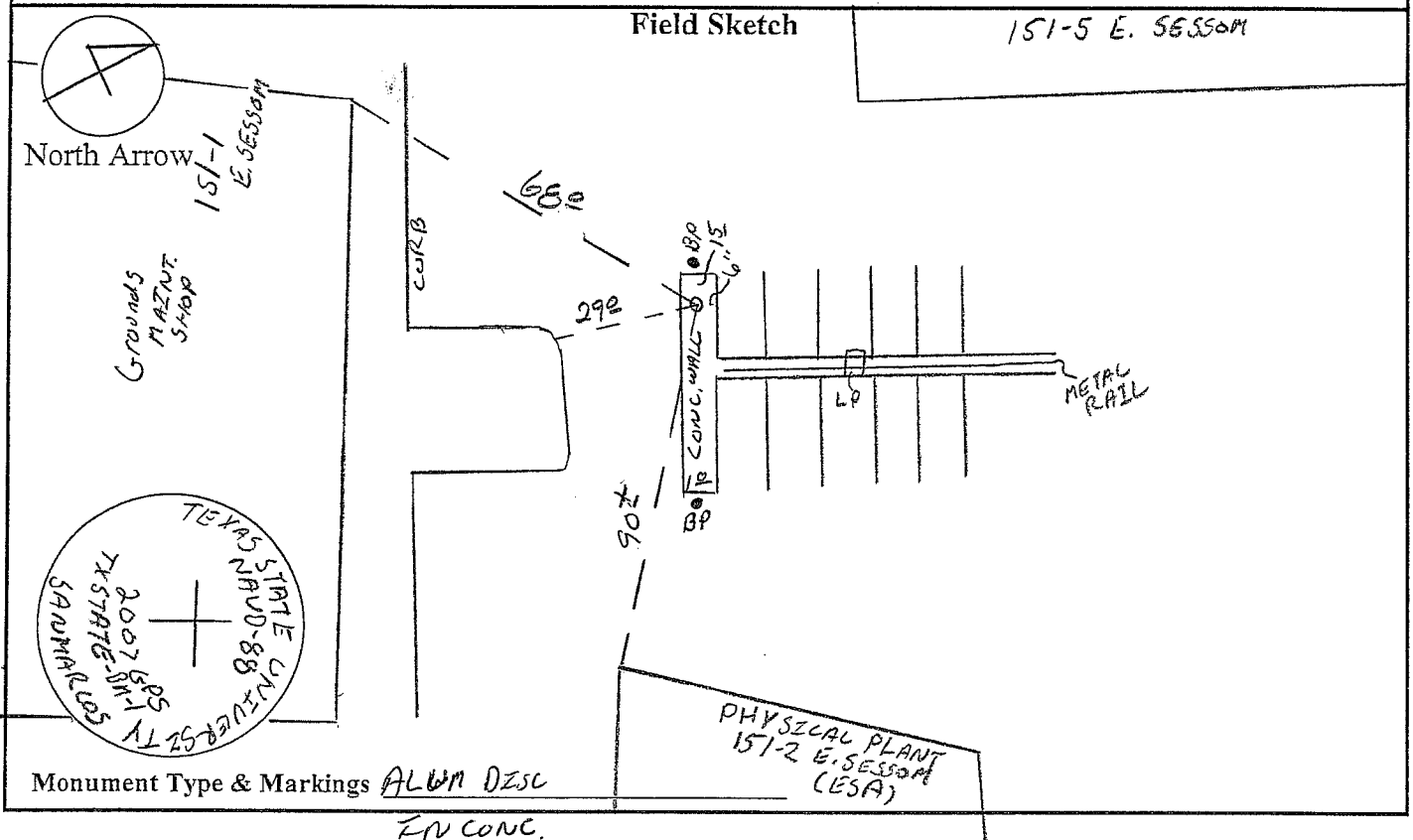
| | | |
|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|--------------------------------|
| Project Name: TSU Benchmarks | | GPS Unit / <u>WHITE</u> |
| Station PID / Name: <u>SM06</u> | Session #: <u>1</u> | Data File: <u>SM06-337-1</u> |
| Operator: <u>TOM PURSLEY</u> | Date: <u>12-03-07</u> | Julian Date: <u>337</u> |
| Starting Time: <u>10:46 A.M.</u> | | Ending Time: <u>4:25 P.M.</u> |
| CHECK BOX and ENTER HI Below | | CHECK BOX and ENTER HI Below |
| Fixed Height Rod 2.0, <input checked="" type="checkbox"/> 1.8, <input type="checkbox"/> 1.5 <input type="checkbox"/> | Fixed Height Rod 2.0, <input checked="" type="checkbox"/> 1.8, <input type="checkbox"/> 1.5 <input type="checkbox"/> | |
| <input type="checkbox"/> Trimble Meas. Rod to Top of Notch | <input type="checkbox"/> Trimble Meas. Rod to Top of Notch | |
| <input type="checkbox"/> Pocket Tape Meas. to BASE Antenna | <input type="checkbox"/> Pocket Tape Meas. to BASE Antenna | |
| HI:= Meters and also in | HI:= Meters and also in | |
| HI:= <input type="checkbox"/> FEET or <input type="checkbox"/> INCHES | HI:= <input type="checkbox"/> FEET or <input type="checkbox"/> INCHES | |
| Antenna Type: GRD Plane <input checked="" type="checkbox"/> | Zephyr <input type="checkbox"/> | Other <input type="checkbox"/> |
| Latitude: <u>29° 52.8219 N</u> | Longitude: <u>097° 56.3264 W</u> | |
| Ellipsoid Height: <u>+150.1 m</u> | PDOP: <u>3.0</u> | |
| Satellites Tracked: <u>8, 11, 28, 17, 25, 27, 26, 2</u> | Epoch Interval: <input checked="" type="checkbox"/> 5Sec. <input type="checkbox"/> 10 Sec. | |
| Notes: <u>10, 30, 5, 12</u> | | |



BAKER-AICKLEN & ASSOCIATES
 405 BRUSHY CREEK ROAD • AUSTIN, TEXAS 78613 • (512) 260-3700
GPS Survey Occupation Session Sheet

| | | | |
|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|--|
| Project Name: TSU Benchmarks | | GPS Unit / <i>BLUE</i> | |
| Station PID / Name: <i>GPS /</i> | Session #: <i>1</i> | Data File: GPS1-337-1 <i>GPS1-337-1</i> | |
| Operator: <i>M. K. Spilman</i> | Date: <i>12-3-07</i> | Julian Date: <i>337</i> | |
| Starting Time: <i>10:45 A.M.</i> | | Ending Time: <i>4:41 P.M.</i> | |
| <i>CHECK BOX and ENTER HI Below</i> | | <i>CHECK BOX and ENTER HI Below</i> | |
| Fixed Height Rod 2.0, <input checked="" type="checkbox"/> 1.8, <input type="checkbox"/> 1.5 <input type="checkbox"/> | Fixed Height Rod 2.0, <input checked="" type="checkbox"/> 1.8, <input type="checkbox"/> 1.5 <input type="checkbox"/> | | |
| <input type="checkbox"/> Trimble Meas. Rod to Top of Notch | <input type="checkbox"/> Trimble Meas. Rod to Top of Notch | | |
| <input type="checkbox"/> Pocket Tape Meas. to BASE Antenna | <input type="checkbox"/> Pocket Tape Meas. to BASE Antenna | | |
| HI:= Meters and also in | HI:= Meters and also in | | |
| HI:= <input type="checkbox"/> FEET or <input type="checkbox"/> INCHES | HI:= <input type="checkbox"/> FEET or <input type="checkbox"/> INCHES | | |
| Antenna Type: GRD Plane <input checked="" type="checkbox"/> | Zephyr <input type="checkbox"/> | Other <input type="checkbox"/> | |
| Latitude: <i>29° 53, 5087"</i> | Longitude: <i>097° 56.92945"</i> | | |
| Ellipsoid Height: <i>+0165.1m</i> | PDOP: <i>3.3</i> | | |
| Satellites Tracked: <i>04, 12, 02, 10, 05, 30, 07</i> | Epoch Interval: <input checked="" type="checkbox"/> 5Sec. <input type="checkbox"/> 10 Sec. | | |

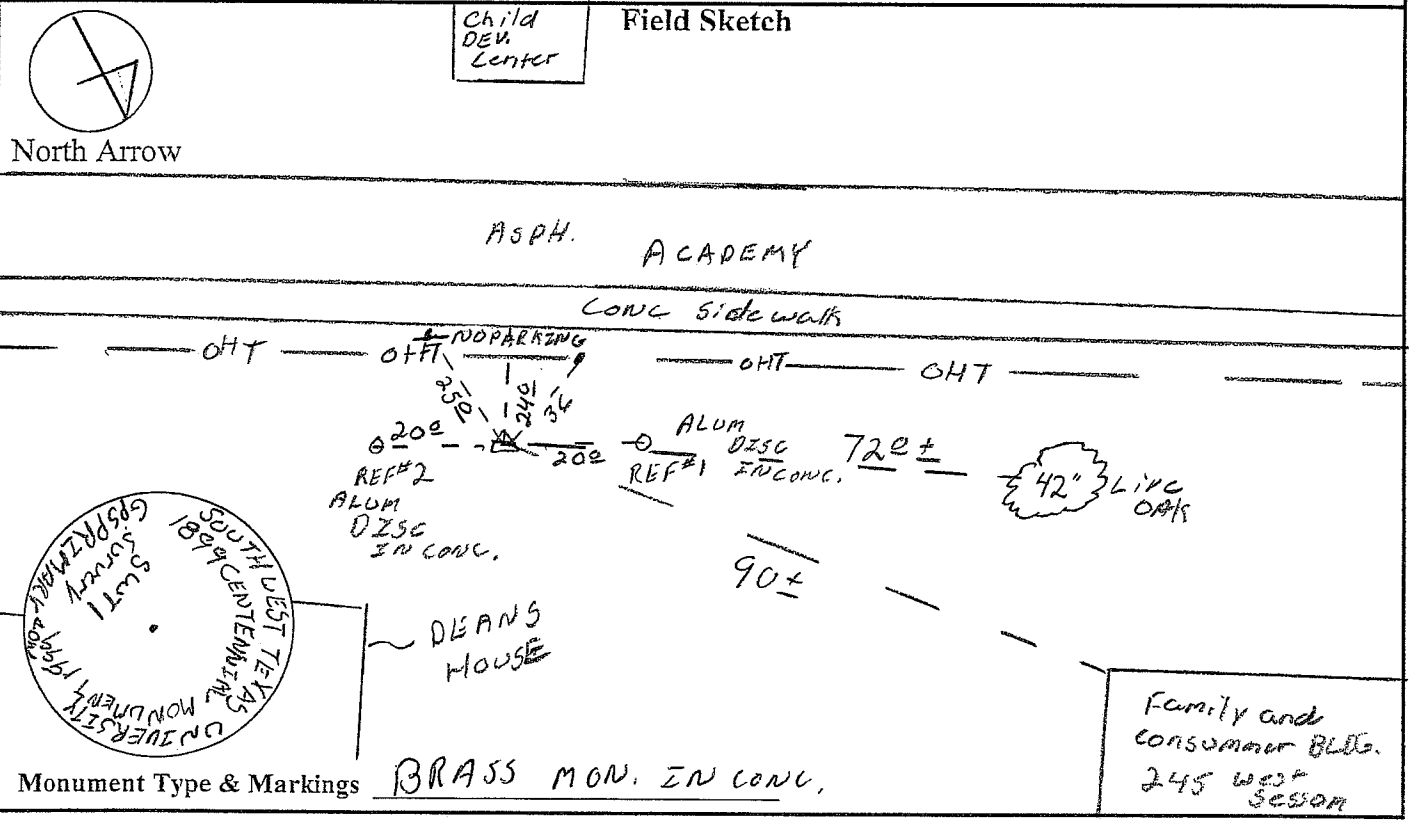
Notes:



BAKER-AICKLEN & ASSOCIATES
 405 BRUSHY CREEK ROAD • AUSTIN, TEXAS 78613 • (512) 260-3700
GPS Survey Occupation Session Sheet

| | | | |
|----------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------|---------------------------------|
| Project Name: TSU Benchmarks | | GPS Unit / Green | |
| Station PID / Name: 5W01 | | Session #: 1 | Data File: 5W01-337-1 (ATG 952) |
| Operator: M. Ke Spilmen | | Date: 12-3-07 | Julian Date: 337 |
| Starting Time: 11:15 | | Ending Time: 5:30 P.M. | |
| CHECK BOX and ENTER HI Below | | CHECK BOX and ENTER HI Below | |
| Fixed Height Rod 2.0, <input checked="" type="checkbox"/> 1.8, <input type="checkbox"/> 1.5 <input type="checkbox"/> | | Fixed Height Rod 2.0, <input checked="" type="checkbox"/> 1.8, <input type="checkbox"/> 1.5 <input type="checkbox"/> | |
| <input type="checkbox"/> Trimble Meas. Rod to Top of Notch | | <input type="checkbox"/> Trimble Meas. Rod to Top of Notch | |
| <input type="checkbox"/> Pocket Tape Meas. to BASE Antenna | | <input type="checkbox"/> Pocket Tape Meas. to BASE Antenna | |
| HI:= Meters and also in | | HI:= Meters and also in | |
| HI:= <input type="checkbox"/> FEET or <input type="checkbox"/> INCHES | | HI:= <input type="checkbox"/> FEET or <input type="checkbox"/> INCHES | |
| Antenna Type: GRD Plane <input checked="" type="checkbox"/> | | Zephyr <input type="checkbox"/> | Other <input type="checkbox"/> |
| Latitude: 29° 53.2886" | | Longitude: 097° 56.9482 | |
| Ellipsoid Height: +0207.3m | | PDOP: 3.6 | |
| Satellites Tracked: 04, 12, 02, 10, 05, 30 | | Epoch Interval: <input checked="" type="checkbox"/> 5Sec. <input type="checkbox"/> 10 Sec. | |

Notes:



Section 5
NGS and COSM Existing Monument Data Sheets

The NGS Data Sheet

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

DATABASE = Sybase , PROGRAM = datasheet, VERSION = 7.49

1 National Geodetic Survey, Retrieval Date = AUGUST 22, 2007

AX2445 *****
 AX2445 DESIGNATION - S 1307
 AX2445 PID - AX2445
 AX2445 STATE/COUNTY- TX/HAYS
 AX2445 USGS QUAD - SAN MARCOS NORTH (1995)

*CURRENT SURVEY CONTROL

| | | | | | | |
|---------|---------------|-----------|----------|------------|--------|-----------------|
| AX2445* | NAD 83(1986)- | 29 53 21. | (N) | 097 56 02. | (W) | SCALED |
| AX2445* | NAVD 88 | - | 174.480 | (meters) | 572.44 | (feet) ADJUSTED |
| AX2445 | GEOID HEIGHT- | -25.79 | (meters) | | | GEOID03 |
| AX2445 | DYNAMIC HT - | 174.233 | (meters) | 571.63 | (feet) | COMP |
| AX2445 | MODELED GRAV- | 979,226.3 | (mgal) | | | NAVD 88 |

AX2445 VERT ORDER - FIRST CLASS II

AX2445.The horizontal coordinates were scaled from a topographic map and have an estimated accuracy of +/- 6 seconds.

AX2445.The orthometric height was determined by differential leveling and adjusted by the NATIONAL GEODETIC SURVEY in June 1991.

AX2445.The geoid height was determined by GEOID03.

AX2445.The dynamic height is computed by dividing the NAVD 88 geopotential number by the normal gravity value computed on the Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45 degrees latitude (g = 980.6199 gals.).

AX2445.The modeled gravity was interpolated from observed gravity values.

| AX2445; | North | East | Units | Estimated Accuracy |
|-----------------|--------------|----------|-------|-------------------------|
| AX2445;SPC TXSC | - 4,228,310. | 702,970. | MT | (+/- 180 meters Scaled) |

SUPERSEDED SURVEY CONTROL

AX2445.No superseded survey control is available for this station.

AX2445_U.S. NATIONAL GRID SPATIAL ADDRESS: 14RPU029069(NAD 83)

AX2445_MARKER: DB = BENCH MARK DISK

AX2445_SETTING: 32 = SET IN A RETAINING WALL OR CONCRETE LEDGE

AX2445_SP_SET: BANISTER

AX2445_STAMPING: S 1307 1980

AX2445_MARK LOGO: NGS

AX2445_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL

| AX2445 | HISTORY | - Date | Condition | Report By |
|--------|---------|------------|------------|-----------|
| AX2445 | HISTORY | - 1980 | MONUMENTED | NGS |
| AX2445 | HISTORY | - 19910828 | GOOD | USPSQD |
| AX2445 | HISTORY | - 19930808 | GOOD | USPSQD |