

ARAPAHOE COUNTY URBAN AREA VERTICAL CONTROL NETWORK PHASE I

NOTES:

1. THE ELEVATIONS REPORTED HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). OBSERVATIONS COLLECTED DURING THIS SURVEY MEET THE SPECIFICATIONS FOR A FIRST ORDER, CLASS II VERTICAL CONTROL SURVEY REFERENCING. FIELD AND OFFICE PROCEDURES FOLLOWED FIRST ORDER, CLASS II TCS SPECIFICATIONS. THE EXISTING VERTICAL CONSTRAINTS ARE SECOND ORDER, CLASS I, THEREFORE THIS SURVEY IS CLASSIFIED AS A SECOND ORDER, CLASS I SURVEY AS DEFINED BY THE NATIONAL GEODETIC SURVEY (NGS).
2. ALL MONUMENTS SET BY NOLTE ARE COLORADO DEPARTMENT OF TRANSPORTATION TYPE 2 CONTROL MONUMENTS, WHICH CONSIST OF BERNSTEIN TOP SECURITY ROD MONUMENTS BEING 3 FOOT SMOOTH ALUMINUM ROD SECTIONS WITH A 3 FOOT FINNED ROD AT THE TOP SECTION CONNECTED BY FLOATING THREADS AND SELF LOCKING WASHERS, A SPIRAL DRIVE POINT ATTACHED TO THE BOTTOM AND A 3-1/4 INCH ALUMINUM CAP AFFIXED AND ANCHORED WITH EPOXY TO THE TOP. ADDITIONAL 3 FOOT SMOOTH ROD SECTIONS WERE ATTACHED TO THE BOTTOM SECTION UNTIL THE MONUMENT REACHED REFUSAL DEPTH. MONUMENT DEPTHS RANGE FROM 4 TO 27 FEET.
3. ALL GEODETIC POSITIONS LISTED HEREON ARE BASED UPON SURVEY GRADE GLOBAL POSITIONING SYSTEM (GPS) MEASUREMENTS AND HAVE A POSITIONAL TOLERANCE OF 40 FEET ±. POSITIONS ARE BASED UPON THE NORTH AMERICAN DATUM OF 1983 (2007).
4. THE EQUIPMENT USED IN THIS PROJECT CONSISTS OF FIRST ORDER DIFFERENTIAL LEVELING EQUIPMENT AS OUTLINED BY NGS. A LEICA DNA03 AUTOMATIC PRECISE DIGITAL LEVEL (SERIAL No. 335565) WITH A SET OF (2) 3mm PRECISE DIGITAL BAR CODE INVAR RODS (SERIAL No.'s 52661, 52664) WERE USED. STEEL TURNING PINS OR STEEL "TURTLES" WERE USED AS TURNING POINTS.
5. THE ELEVATION DIFFERENCE DATA WAS CORRECTED FOR SYSTEMATIC ERRORS BY APPLYING CORRECTIONS THAT ACCOUNTED FOR ROD SCALE ERRORS, ROD INVAR TEMPERATURE, REFRACTION AND COLLIMATION ERROR. DUE TO THE SMALL EXTENTS OF THIS PROJECT, IT WAS NOT NECESSARY TO APPLY CORRECTIONS THAT ACCOUNTED FOR EARTH TIDES AND CRUSTAL MOTION. THE MAGNETIC FIELD CORRECTION WAS NOT NECESSARY BECAUSE THE INSTRUMENTATION USED DURING OBSERVATIONS IS NOT SUSCEPTIBLE TO MAGNETIC EFFECTS. GRAVITY EFFECTS WERE ACCOUNTED FOR USING HAYDEN MODELED GRAVITY AS PROVIDED BY NGS. AVAILABLE FOR DOWNLOAD AT WWW.NGS.NOAA.GOV. THE MODELED GRAVITY VALUES WERE USED TO COMPUTE NAVD88 GEOPOTENTIAL NUMBERS AT EACH BENCHMARK. THE HELMERT ORTHOMETRIC REDUCTION EQUATION WAS USED TO REDUCE THE GEOPOTENTIAL VALUES TO NAVD88 HELMERT ORTHOMETRIC HEIGHTS. THIS IS THE CURRENT METHOD IN USE BY NGS.
6. TWO NGS FIRST ORDER, CLASS II BENCHMARKS (A 356 AND 2 407) WERE HELD FIXED IN THE FULLY CONSTRAINED LEAST SQUARES ADJUSTMENT.
7. NOTICE: ACCORDING TO COLORADO LAW, YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.
8. NO GUARANTEE AS TO THE ACCURACY OF THE INFORMATION CONTAINED ON THE ATTACHED DRAWING IS EITHER STATED OR IMPLIED UNLESS THIS COPY BEARS AN ORIGINAL SIGNATURE OF THE PROFESSIONAL LAND SURVEYOR NAMED HEREON.

SURVEYOR'S CERTIFICATION:

I, Todd G. Beers, a duly licensed Professional Land Surveyor in the State of Colorado, do hereby certify that this map reflects the results of a geodetic vertical control survey completed in February, 2011, made under my direct supervision and is true and correct to the best of my knowledge and belief.

For and on behalf of NOLTE ASSOCIATES, INC.
 Todd G. Beers
 Colorado Licensed Professional Land Surveyor No. 30822

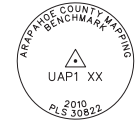
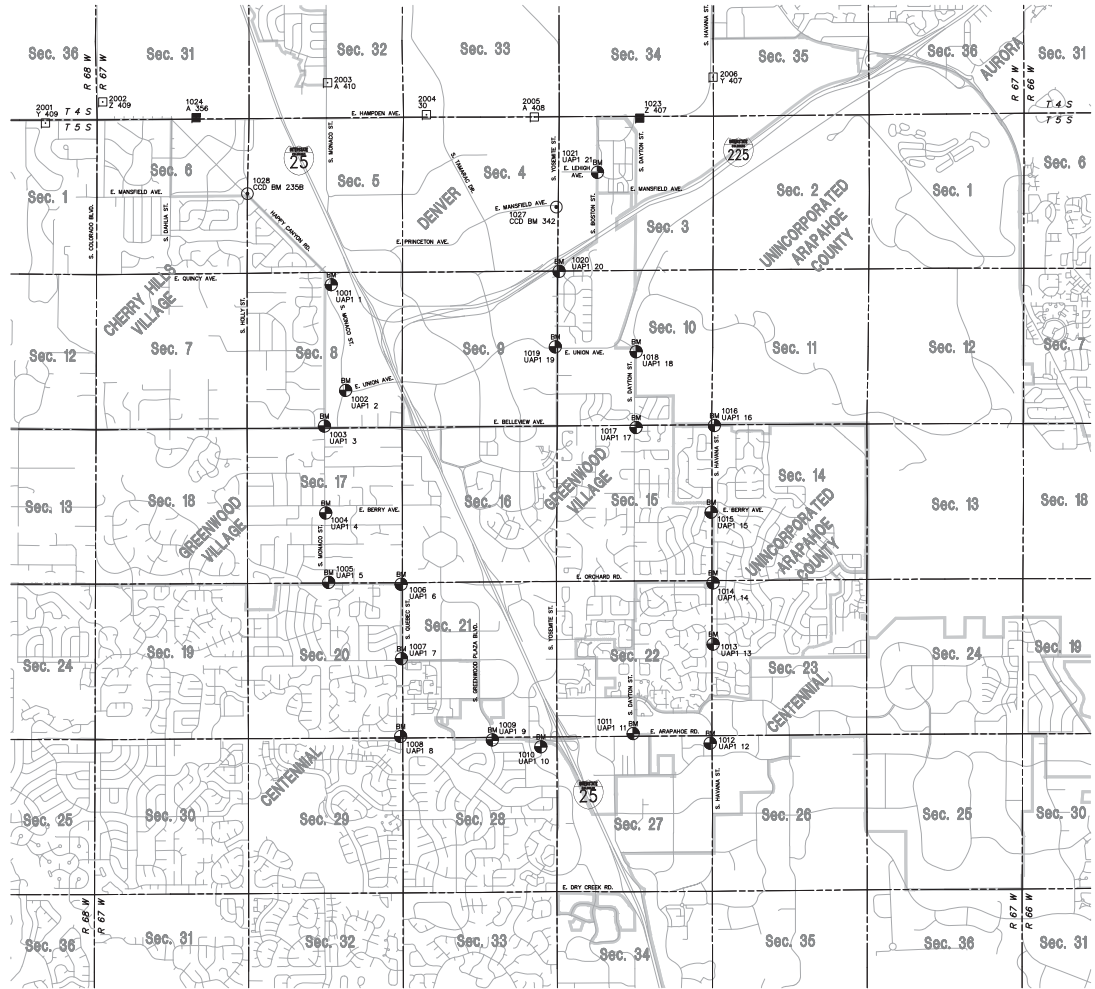
Date: _____



STATE OF COLORADO)
) SS
 COUNTY OF ARAPAHOE)

I hereby Certify That This Document Was Filed in My Office
 At _____ O'Clock _____ M. on the _____ day of _____, 20____
 By _____ County Clerk
 _____ Deputy
 Recording # _____
 Book _____ Page _____

NOTE: Deposited land survey plat has been signed.



TYPICAL CAP MARKING
 CAPS ARE 3.25 INCH ALUMINUM

- LEGEND**
- SET BENCHMARK
 - NGS BENCHMARK HELD FIXED
 - NGS BENCHMARK OBSERVED
 - CITY AND COUNTY OF DENVER BENCHMARK
 - CITY LIMITS



ARAPAHOE COUNTY
 URBAN AREA VERTICAL CONTROL NETWORK
 PHASE I

DATE:	04/07/2011
JOB NUMBER:	DVB046700
SHEET 1 OF 2	

ARAPAHOE COUNTY URBAN AREA VERTICAL CONTROL NETWORK PHASE I

POINT ID	BENCHMARK STAMPING	LATITUDE	LONGITUDE	ELEVATION (m)	ELEVATION (ft)	GRAVITY (kgal)	GEOPOTENTIAL (gpu)	LOCATION
1001	UAP1 1	39°38'15"N	104°54'45"W	1714.468	5624.89	0.9795835	1679.58959	SE QUADRANT OF E. QUINCY AVE. & S. MONACO ST., E. OF DENVER TECH CENTER SIGN
1002	UAP1 2	39°37'39"N	104°54'39"W	1719.744	5642.19	0.9795819	1684.75542	NE QUADRANT OF S. MONACO ST. & E. UNION AVE., IN NORTHEAST TRAFFIC MEDIAN
1003	UAP1 3	39°37'27"N	104°54'48"W	1704.518	5592.24	0.9795819	1669.83835	NW QUADRANT OF E. BELLEVUE AVE. & S. MONACO ST., AT SE FENCE CORNER
1004	UAP1 4	39°36'58"N	104°54'48"W	1715.913	5629.62	0.9795810	1681.00021	SE QUADRANT OF E. BERRY AVE. & S. MONACO ST., E. OF SIDEWALK - 300' S. OF CL OF E. BERRY AVE.
1005	UAP1 5	39°36'35"N	104°54'47"W	1699.757	5576.62	0.9795801	1665.17079	NE QUADRANT OF E. ORCHARD RD. & S. MONACO ST., AT E. END OF WOOD FENCE
1006	UAP1 6	39°36'34"N	104°54'15"W	1716.832	5632.64	0.9795794	1681.89844	SW QUADRANT OF E. ORCHARD RD. & S. QUEBEC ST., NE. OF SIDEWALK
1007	UAP1 7	39°36'09"N	104°54'15"W	1734.531	5690.71	0.9795786	1699.23729	NW QUADRANT OF E. CALEY AVE. & S. QUEBEC ST., AT S. END OF CONCRETE WALL - 42' N. OF N. FL OF E. CALEY AVE.
1008	UAP1 8	39°35'43"N	104°54'16"W	1720.623	5645.08	0.9795777	1685.60924	NW QUADRANT OF E. ARAPAHOE RD. & S. QUEBEC ST., AT SE CORNER OF CONCRETE WALL
1009	UAP1 9	39°35'41"N	104°53'36"W	1738.099	5702.41	0.9795775	1702.73080	SE QUADRANT OF E. ARAPAHOE RD. & S. UNITA ST., AT NW CORNER OF WOOD WALL
1010	UAP1 10	39°35'39"N	104°53'15"W	1758.191	5768.33	0.9795775	1722.41583	SW QUADRANT OF E. ARAPAHOE RD. & S. XANTHIA ST., AT SW CORNER OF DRIVEWAY
1011	UAP1 11	39°35'43"N	104°52'35"W	1762.521	5782.54	0.9795783	1726.65948	NW QUADRANT OF E. ARAPAHOE RD. & S. DAYTON ST., E. OF SIGN, W. OF SIDEWALK
1012	UAP1 12	39°35'40"N	104°52'01"W	1739.571	5707.24	0.9795788	1704.17499	SW QUADRANT OF E. ARAPAHOE RD. & S. HAVANA ST., AT SE CORNER OF METAL FENCE OF LIFT-STATION
1013	UAP1 13	39°36'13"N	104°52'00"W	1751.084	5745.02	0.9795803	1715.45789	SE QUADRANT OF E. FAIR AVE. & S. HAVANA ST., E. OF SIDEWALK & W. OF BRICK WALL
1014	UAP1 14	39°36'34"N	104°52'00"W	1754.577	5756.48	0.9795811	1718.88137	SE QUADRANT OF E. ORCHARD RD. & S. HAVANA ST., AT NW CORNER OF BRICK WALL
1015	UAP1 15	39°36'58"N	104°52'00"W	1731.751	5681.58	0.9795821	1696.51898	NW QUADRANT OF E. BERRY DR. & S. HAVANA ST., W. OF SIDEWALK & E. OF BRICK WALL - 66.5' N. OF N. FL. OF E. BERRY DR.
1016	UAP1 16	39°37'27"N	104°51'59"W	1717.072	5633.43	0.9795835	1682.14011	SE QUADRANT OF E. BELLEVUE AVE. & S. HAVANA ST., S. OF GUARD RAIL
1017	UAP1 17	39°37'26"N	104°52'33"W	1724.151	5656.65	0.9795821	1689.07331	SE QUADRANT OF E. BELLEVUE AVE. & S. DAYTON ST., AT NW CORNER OF BRICK WALL
1018	UAP1 18	39°37'52"N	104°52'32"W	1720.266	5643.91	0.9795833	1685.26971	SE QUADRANT OF CHERRY CREEK STATE PARK RD. & S. DAYTON ST., W. OF BARBED WIRE FENCE
1019	UAP1 19	39°37'54"N	104°53'08"W	1722.315	5650.63	0.9795818	1687.27423	NW QUADRANT OF E. UNION AVE. & S. YOSEMITE ST., IN LANDSCAPE AREA W. OF SIDEWALK
1020	UAP1 20	39°38'19"N	104°53'06"W	1710.849	5613.01	0.9795840	1676.04454	SE QUADRANT OF I-225 & S. YOSEMITE ST., AT NW CORNER OF BRICK WALL
1021	UAP1 21	39°38'52"N	104°52'49"W	1696.294	5565.26	0.9795879	1661.79069	NE QUADRANT OF E. LEHIGH AVE. & S. BOSTON ST., E. OF WIRE FENCE
1024	**A 356	39°39'11"N	104°55'43"W	1689.469	5542.87	0.9795857	1655.10086	NW QUADRANT OF E. HAMPDEN AVE. & S. FAIRFAX ST. - IN DRIVEWAY FOR 3493 S. FAIRFAX STREET
1023	**Z 407	39°39'10"N	104°52'30"W	1678.236	5506.01	0.9795902	1644.10296	SE QUADRANT OF E. HAMPDEN AVE. & S. DAYTON ST. - 21' WSW OF SW CORNER OF CONCRETE PAD FOR BUS STOP
1028	*CCD BM 235B	39°38'46"N	104°55'21"W	1707.720	5602.75	0.9795852	1672.98100	NE QUADRANT OF HAPPY CANYON ROAD & S. HOLLY WAY - 2" BRASS CAP IN SIDEWALK
1027	*CCD BM 342	39°38'41"N	104°53'07"W	1712.118	5617.17	0.9795861	1677.29160	SW QUADRANT OF E. MANSFIELD AVE. & S. YOSEMITE ST. - 2" BRASS CAP IN TOP OF CURB/INLET
2004	***30	39°39'12"N	104°54'03"W	1675.864	5498.23	0.9795879	1641.77494	NE QUADRANT OF E. HAMPDEN AVE. & S. ROSLYN ST. - ON HEADWALL FOR BOX CULVERT OVER GOLDSMITH GULCH
2005	***A 408	39°39'11"N	104°53'16"W	1695.385	5562.27	0.9795889	1660.90180	SE QUADRANT OF E. HAMPDEN AVE. & S. WILLOW ST. - 2.5' WEST OF A UTILITY POLE
2003	***A 410	39°39'23"N	104°54'46"W	1688.461	5539.56	0.9795879	1654.11641	SE QUADRANT OF E. FLOYD AVE. & S. MONACO ST. - JUST NE OF THE NE CORNER OF A WOODEN FENCE
2006	***Y 407	39°39'24"N	104°51'58"W	1672.021	5485.62	0.9795922	1638.01686	SE QUADRANT OF E. GIRARD AVE. & S. HAVANA ST. - 8' NORTH OF A UTILITY POLE
2001	***Y 409	39°39'10"N	104°56'49"W	1671.486	5483.87	0.9795921	1637.49282	SE QUADRANT OF E. HAMPDEN AVE. & SEDGWICK DRIVE - JUST WEST OF THE HIGHLINE CANAL TRAIL
2002	***Z 409	39°39'17"N	104°56'24"W	1673.376	5490.07	0.9795888	1639.33875	SE QUADRANT OF E. GIRARD AVE. & S. COLORADO BLVD. - IN THE NE CORNER OF A SMALL PARK

*NOT USED AS CONTROL IN PROJECT. ELEVATION BASED UPON THIS SURVEY.
 **ELEVATIONS HELD FIXED IN THE FINAL ADJUSTMENT
 ***ELEVATIONS BASED UPON THIS SURVEY DURING VERIFICATION TASK-ELEVATIONS UPDATED FROM PUBLISHED ELEVATIONS

