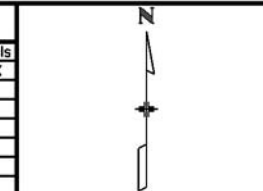
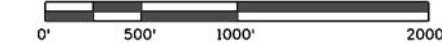




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Land Survey Control Diagram			
Title Sheet			
Project Number:	STU 177A-008		
Location:	SH-177/SH-88, Concrete Intersection Replacement		
Sec. 11, 12, 13, 14, T5S, R68W/6th PM, Arapahoe County			
Project Code:	Last Mod. Date	Subset	Sheet No.
18843	08-17-2012	3.01 to 3.03	3.01

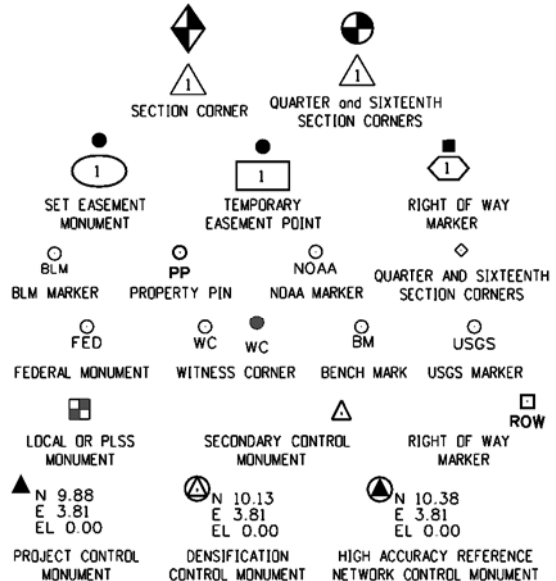


# DEPARTMENT OF TRANSPORTATION STATE OF COLORADO

## LAND SURVEY CONTROL DIAGRAM

State Highway 177 MP 4.01 to 4.19  
Township 5 South, Range 68 West  
of the 6th Principle Meridian  
County of Arapahoe

SHEET NO.	INDEX OF SHEETS
3.01	(1) Title Sheet
3.02	(1) Plan Sheet
3.03	(1) Monument Coordinate Tables
(3) Total Sheets	

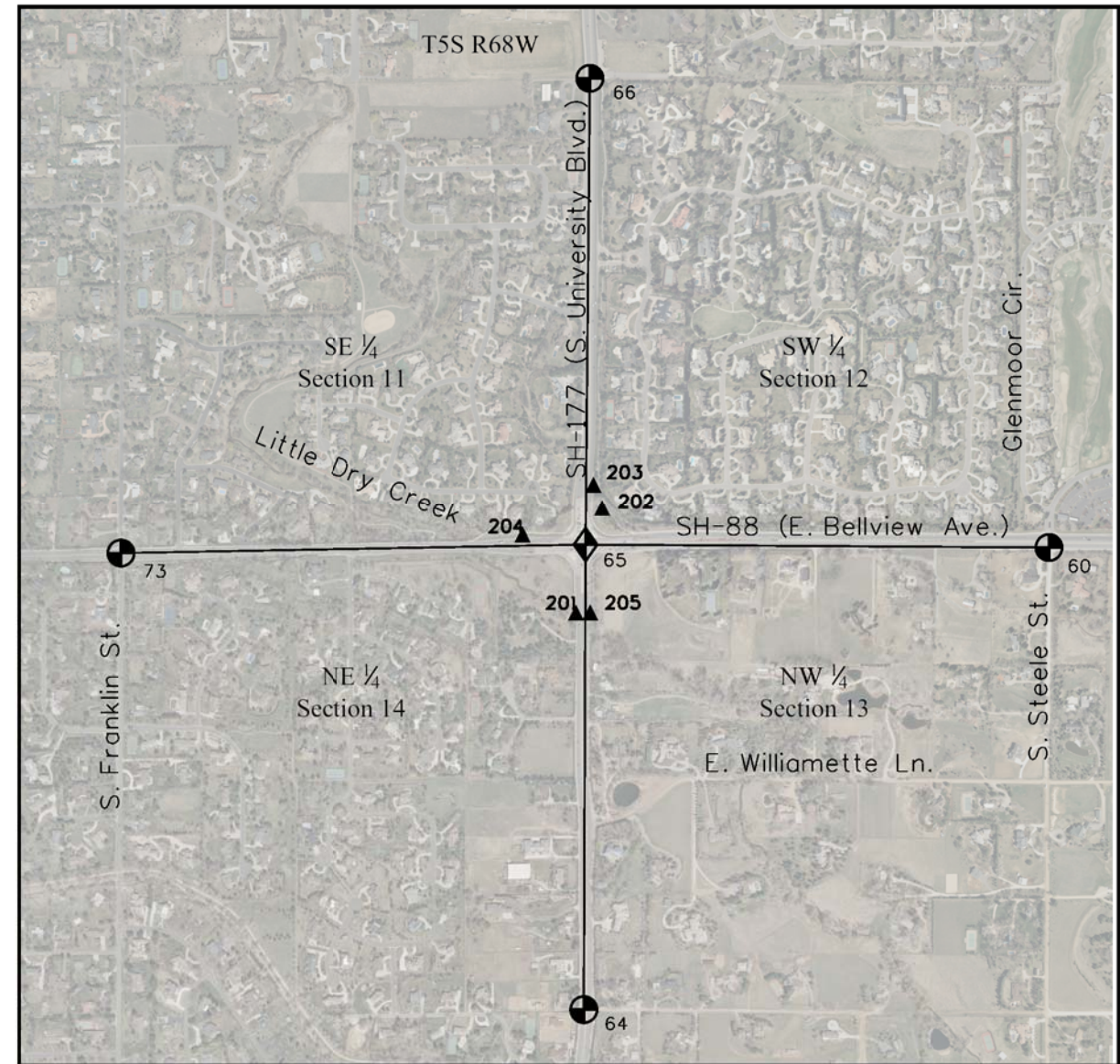


Refer to the M-629-1 Survey Monuments of the Standard Plans dated July, 2006 found in The Colorado Department of Transportation, M & S Standards for survey monument descriptions.

**GENERAL NOTES:**

- This **Land Survey Control Diagram** is to document the recovery and/or establishment of survey points that will be the basis of future surveys for design purposes, and/or roadway construction. This Land Survey Control Diagram is not a Monumented Land Survey or a Boundary Survey and does not address matters of title.
- BASIS OF BEARINGS:** Bearings are grid bearings of the Colorado state plane coordinate system of 1983, central zone. The line between point 80 and point 204, described herein, bears N20°18'09"W, a distance of 8545.77 feet.
- Geodetic coordinates are NAD'83 (1992) datum based on coordinates published in CDOT Region 6 MetroNet.
- Project specific** coordinates were obtained by multiplying the project's state plane coordinates by 1.000263082 and then truncating the northing by 1,000,000 and the easting by 3,000,000. Published units are in US survey feet: 1 survey foot = (1200/3937) meters
- Horizontal Control Tolerances meet the precision requirements of CDOT type A control (+/- 0.07' with 95% certainty).
- Vertical Datum: Elevations are NAVD '88 Datum established by digital differential levels run from control point 103 of CDOT Project No. STU 2854-126 elevation = 5423.82' established by digital differential levels run from NGS Bench Mark "Y409" (PID KK1491), elevation = 5483.81'.
- Elevations on control points were established by digital differential levels with an accuracy meeting or exceeding 0.035' times the square root of the distance leveled in miles.

**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.



**PROJECT LOCATION MAP**

**Surveyor's Statement (Land Survey Control Diagram):**

I, Donald D. Hansen, a professional land surveyor licensed in the State of Colorado, do hereby state to the Colorado Department of Transportation that this **Land Survey Control Diagram** was prepared and the field survey it represents was performed under my responsible charge and, based upon my knowledge, information and belief, is in accordance with applicable standards of practice defined by Colorado Department of Transportation publications. This statement is not a guaranty or warranty, either expressed or implied.

Donald D. Hansen, PLS No. 14599 Date \_\_\_\_\_

**Arapahoe County Survey Depositing Certificate:**

Deposited this \_\_\_\_\_ day of \_\_\_\_\_, 201\_\_\_\_, at \_\_\_\_\_ o'clock \_\_\_\_M. in Book \_\_\_\_\_ at page \_\_\_\_\_ of Land Surveys/Right of Way Surveys, under Reception No. \_\_\_\_\_.

By: \_\_\_\_\_

Title: \_\_\_\_\_



Sheet Revisions

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Sheet Revisions

Date	Description	Initials
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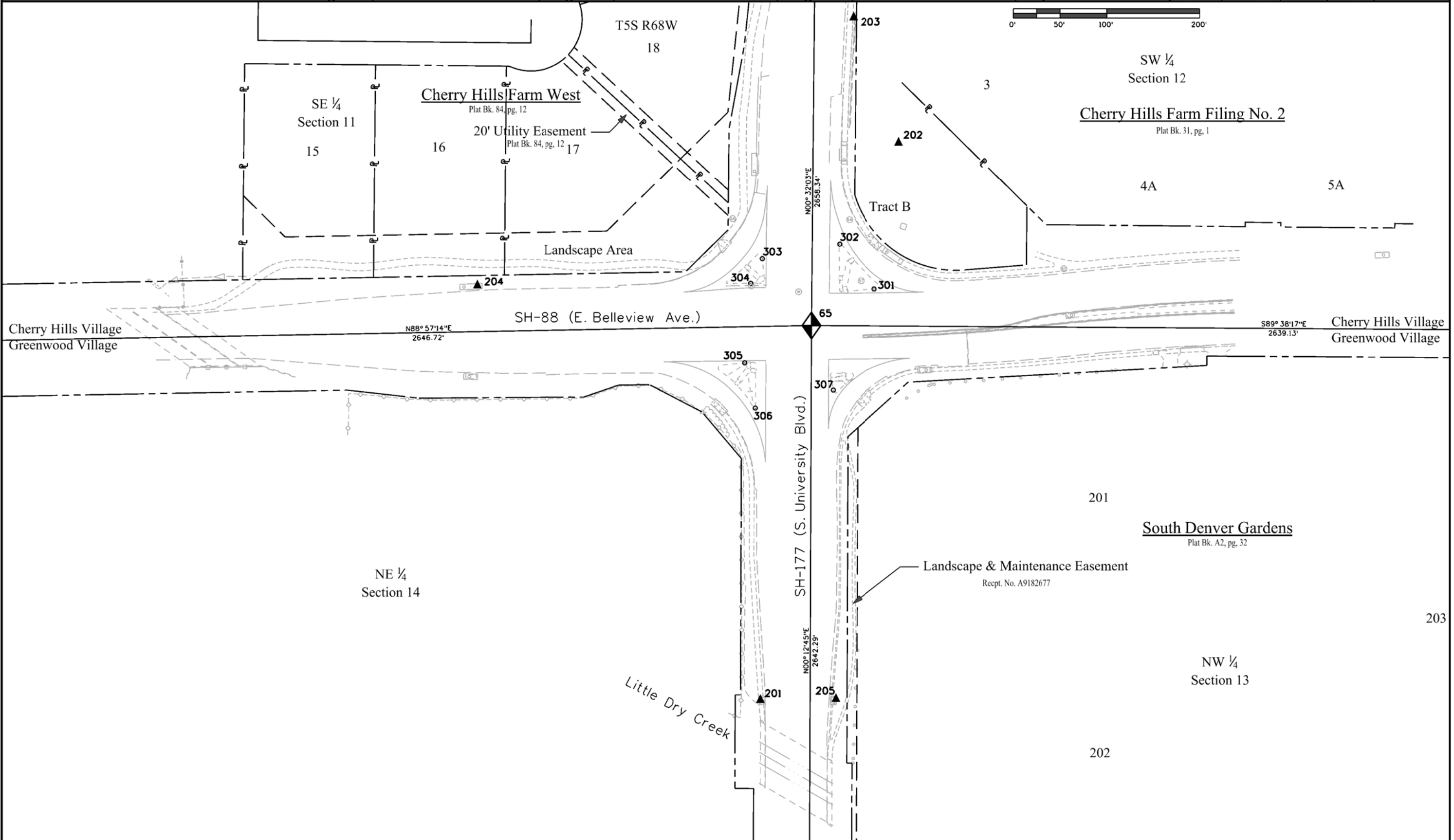
Date	Description	Initials
mm/dd/yy	XXXXXXXX	XXX



Land Survey Control Diagram

Plan Sheet

Project Number: STU 177A-008			
Location: SH-177/SH-88, Concrete Intersection Replacement			
Sec. 11, 12, 13, 14, T5S, R68W/6th PM, Arapahoe County			
Project Code:	Last Mod. Date	Subset	Sheet No.
18843	08-17-2012	3.01 to 3.03	3.02



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Land Survey Control Diagram			
Tabulation Sheet			
Project Number:	STU 177A-008		
Location:	SH-177/SH-88, Concrete Intersection Replacement		
Sec. 11, 12, 13, 14	T5S, R68W/6th PM,	Arapahoe County	
Project Code:	Last Mod. Date	Subset	Sheet No.
18843	08-17-2012	3.01 to 3.03	3.03

Existant control used to Double Base Project Control (CDOT R6 Metro Network Points)											
Geodetic and State Plane (NAD 1983 ('92) and Colorado central zone (502)) Coordinates							Project Specific Coordinates				Description
Point	Latitude	Longitude	Ellipsoid Height	Convergence Angle	Northing	Easting	Point	Northing	Easting	Elevation NAVD'88	
80	39°36'08.38854"N	104°57'02.52392"W	5521.39	0°20'47"	1,644,745.051	3,154,777.287	80	645,177.749	155,607.254	5576.96	3.25" Alum. CDOH cap in logo box with "WATER" lid "T5S R68W C 1/4 S24 1993 PLS NO 22571"
1710	39°34'50.74670"N	104°57'53.90078"W	5583.22	0°20'15"	1,636,865.336	3,150,802.327	1710	637,295.961	151,631.248	5638.45	3.25" Alum. CDOH cap "2.075020"

Double Based GPS Survey Project Control (Benched Elevations)											
Geodetic and State Plane (NAD 1983 ('92) and Colorado central zone (502)) Coordinates							Project Specific Coordinates				Description
Point	Latitude	Longitude	Ellipsoid Height	Convergence Angle	Northing	Easting	Point	Northing	Easting	Elevation NAVD'88	
201	39°37'23.36180"N	104°57'35.95366"W	5361.15	0°20'26"	1,652,315.127	3,152,115.677	201	652,749.816	152,944.943	5416.77	Set CDOT Type 5S monument "201" in Type R Inlet
202	39°37'29.25042"N	104°57'34.01660"W	5385.51	0°20'27"	1,652,911.838	3,152,263.699	202	653,346.684	153,093.004	5441.15	Set CDOT Type 5S monument "202" in conc sidewalk
203	39°37'30.57755"N	104°57'34.62542"W	5382.92	0°20'27"	1,653,045.834	3,152,215.263	203	653,480.715	153,044.556	5438.56	Set CDOT Type 5S monument "203" in conc sidewalk
204	39°37'27.75450"N	104°57'39.78980"W	5361.81	0°20'24"	1,652,757.798	3,151,812.877	204	653,192.603	152,642.064	5417.43	Set CDOT Type 5S monument "204" in Type R Inlet

Recovered Project Control by Conventional Survey				
Project Specific Coordinates				Description
Point	Northing	Easting	Elevation NAVD'88	
205	652,750.783	153,025.599	5416.87	2.5" brass cap "UDFCD DHL-LD2 2001" in Type R Inlet

Aliquot Points published values from Arapahoe County Horizontal Control Network-Phase VI (Held Fixed)											
Geodetic and State Plane (NAD 1983 ('92) and Colorado central zone (502)) Coordinates							Project Specific Coordinates				Description per Monument Record
Point	Latitude	Longitude	Ellipsoid Height	Convergence Angle	Northing	Easting	Point	Northing	Easting	Elevation NAVD'88	
60	39°37'26.98861"N	104°57'01.50925"W	-	0°20'48"	1,652,698.250	3,154,808.594	60	653,133.041	155,638.568	-	3.25" Alum Cap in monument box "LS 22571 1988"
64	39°37'01.20343"N	104°57'35.55237"W	-	0°20'26"	1,650,073.334	3,152,160.406	64	650,507.435	152,989.684	-	3.25" Alum Cap in monument box "LS 7735 1981"
65	39°37'27.30972"N	104°57'35.22640"W	-	0°20'26"	1,652,714.915	3,152,170.206	65	653,149.711	152,999.487	-	3.25" Alum CDOT Cap in monument box "LS 22571 1988"
66	39°37'53.57264"N	104°57'34.70781"W	-	0°20'27"	1,655,372.441	3,152,194.977	66	655,807.936	153,024.265	-	3.25" Alum CDOT Cap in monument box "LS 11434 1990"
73	39°37'26.98646"N	104°58'09.04040"W	-	0°20'05"	1,652,666.612	3,149,524.627	73	653,101.395	150,353.212	-	3.25" Alum Cap in monument box "LS 7735 1982"

Double Based Aliquot Reference Points, GPS derived elevations											
Geodetic and State Plane (NAD 1983 ('92) and Colorado central zone (502)) Coordinates							Project Specific Coordinates				Description
Point	Latitude	Longitude	Ellipsoid Height	Convergence Angle	Northing	Easting	Point	Northing	Easting	Elevation NAVD'88	
301	39°37'27.69198"N	104°57'34.36326"W	5371.53	0°20'27"	1,652,753.994	3,152,237.512	301	653,188.799	153,066.811	5427.17	Chisled X in conc curb
302	39°37'28.16805"N	104°57'34.83298"W	5372.72	0°20'27"	1,652,801.945	3,152,200.473	302	653,236.762	153,029.762	5428.35	Chisled X in conc curb
303	39°37'28.01967"N	104°57'35.89175"W	5371.75	0°20'26"	1,652,786.439	3,152,117.719	303	653,221.252	152,946.986	5427.38	Chisled X in conc curb
304	39°37'27.76024"N	104°57'36.05174"W	5370.43	0°20'26"	1,652,760.115	3,152,105.357	304	653,194.921	152,934.621	5426.06	Chisled X in conc curb
305	39°37'26.91978"N	104°57'36.14019"W	5368.10	0°20'26"	1,652,675.036	3,152,098.942	305	653,109.820	152,928.204	5423.73	Chisled X in conc curb
306	39°37'26.44053"N	104°57'36.00013"W	5366.55	0°20'26"	1,652,626.611	3,152,110.189	306	653,061.382	152,939.454	5422.18	Chisled X in conc curb
307	39°37'26.62640"N	104°57'34.93317"W	5367.75	0°20'27"	1,652,645.914	3,152,193.561	307	653,080.690	153,022.848	5423.39	Chisled X in conc curb
308	39°37'53.05691"N	104°57'34.10615"W	5380.62	0°20'27"	1,655,320.539	3,152,242.360	308	655,756.019	153,071.660	5436.31	0.75" brass washer "11434" in conc curb
309	39°37'53.36467"N	104°57'34.98190"W	5381.08	0°20'27"	1,655,351.271	3,152,173.659	309	655,786.760	153,002.941	5436.77	0.75" brass washer "11434" in conc sidewalk
310	39°37'53.80425"N	104°57'34.97930"W	5381.82	0°20'27"	1,655,395.749	3,152,173.597	310	655,831.249	153,002.879	5437.50	0.75" brass washer "11434" in conc sidewalk
311	39°37'27.35140"N	104°57'02.39902"W	5434.62	0°20'47"	1,652,734.535	3,154,738.752	311	653,169.335	155,568.709	5490.36	X in conc median
312	39°37'27.21487"N	104°57'00.56642"W	5434.57	0°20'48"	1,652,721.589	3,154,882.227	312	653,156.385	155,712.221	5490.32	X in conc median
313	39°37'26.71805"N	104°57'01.14306"W	5434.33	0°20'48"	1,652,671.048	3,154,837.412	313	653,105.831	155,667.395	5490.07	X in conc curb ramp
314	39°37'26.77862"N	104°57'01.78293"W	5433.97	0°20'48"	1,652,676.873	3,154,787.308	314	653,111.658	155,617.278	5489.71	X in conc curb ramp
315	39°37'01.66987"N	104°57'34.77730"W	5425.62	0°20'27"	1,650,120.888	3,152,220.776	315	650,555.001	153,050.071	5481.21	3.25" Alum CDOT Cap
316	39°37'00.70163"N	104°57'34.79285"W	5427.78	0°20'27"	1,650,022.915	3,152,220.142	316	650,457.002	153,049.436	5483.36	3.25" Alum CDOT Cap
317	39°37'01.43921"N	104°57'35.78247"W	5426.44	0°20'26"	1,650,097.083	3,152,142.258	317	650,531.189	152,971.531	5482.02	Chisled X in conc curb
318	39°37'00.97623"N	104°57'35.79099"W	5427.33	0°20'26"	1,650,050.235	3,152,141.870	318	650,484.328	152,971.143	5482.91	Chisled X in conc curb
319	39°37'00.79169"N	104°57'35.79191"W	5427.83	0°20'26"	1,650,031.559	3,152,141.339	319	650,465.648	152,970.613	5483.41	Chisled X in conc curb
320	39°37'26.49517"N	104°58'10.08093"W	5392.37	0°20'05"	1,652,616.427	3,149,443.502	320	653,051.196	150,272.065	5447.89	1.25" brass disk in conc curb "SURVEY MARK"
321	39°37'26.52266"N	104°58'07.75547"W	5387.77	0°20'06"	1,652,620.272	3,149,625.441	321	653,055.042	150,454.052	5443.29	1.25" brass disk in conc curb "SURVEY MARK"
322	39°37'27.29486"N	104°58'08.38555"W	5390.10	0°20'06"	1,652,698.114	3,149,575.683	322	653,132.905	150,404.282	5445.62	1.25" brass disk in conc sidewalk "SURVEY MARK"

**Surveyor's Notes:**

- None of the aliquot monuments listed were occupied (if occupied at all) for long enough to establish coordinates with sufficient confidence to contradict those published in the Arapahoe County GIS Control Diagrams.
- Inverse measurements between recovered Reference Monuments (shown on Monument Records filed with the State Board) and the published locations of the aliquot monuments were reasonably close and sufficient enough to allow this Land Surveyor to state that the proposed sidewalk replacements and grading lie within existing rights-of-way and/or easements.

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