

Sheet Revisions			Sheet Revisions			Sheet Revisions		
Date	Description	Initials	Date	Description	Initials	Date	Description	Initials
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Land Survey Control Diagram			
Title Sheet			
Project Number: FSA-R600-378			
Project Location: SH-88, Accel/Decel & Signal Improvements			
Sec. 22-27, T5S, R66W, R67W/6th PM, Arapahoe County			
Project Code:	Last Mod. Date	Subset	Sheet No.
17889	09-09-11	1 of 4	4.01

DEPARTMENT OF TRANSPORTATION

STATE OF COLORADO

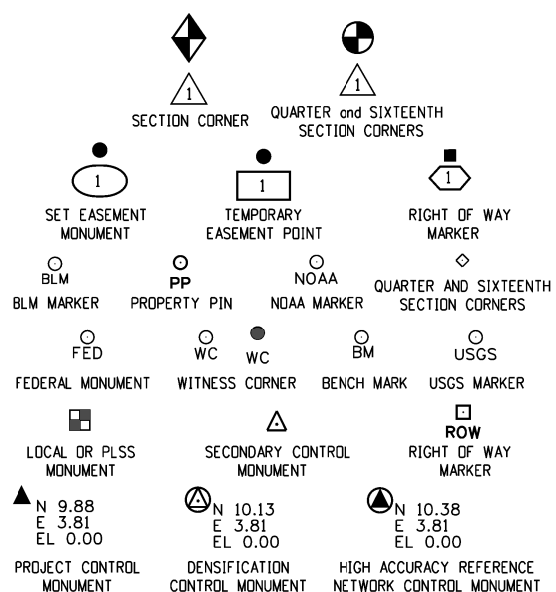


LAND SURVEY CONTROL DIAGRAM

State Highway 88 MP 17.72 to 20.84
 Township 5 South, Range 66 & 67 West
 of the 6th Principle Meridian
 County of Arapahoe

T5S, R66W: Sec. 19, 30
 T5S, R67W: Sec. 22, 23, 24, 25, 26, 27

SHEET NO.	INDEX OF SHEETS
4.01	(1) Title Sheet
4.02-4.03	(1) Plan Sheets
4.04	(1) Monument Coordinate Tables
	(4) 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.

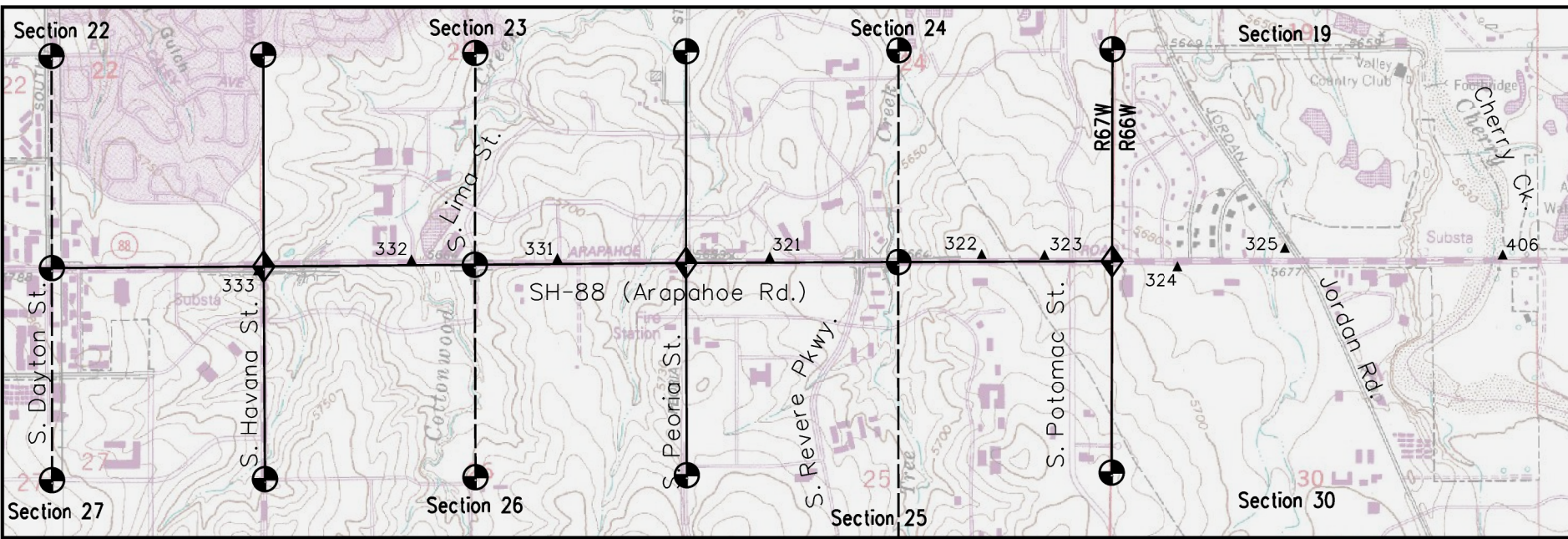
GENERAL NOTES:

- 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 Project 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 NGS Point JOG (PID KK1696) and Point 1200 (NGS Point CHERRY CREEK CBL 1200, PID AE5260), described herein, bears N21°58'19"E, a distance of 17753.22 feet.
- Geodetic coordinates are NAD'83 (1992) datum based on a Fast Static GPS survey holding published values on the primary control points shown herein.
- Project specific** coordinates were obtained by multiplying the project's state plane coordinates by 1.000300000 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 Point 703 from CDO1 Project No. S1A 0881-017 having elevation established by digital differential levels run from NGS benchmark "V407" (PID KK1504), elevation = 5646.84'.
- 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.
- Original control work was performed for Project Code 17036 (2009).

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.

NOTE: This Land Survey Control Diagram should be considered **PRELIMINARY AND SUBJECT TO CHANGE**, unless it bears the signature and seal of the Professional Land Surveyor in responsible charge.

Arapahoe County Depositing Certificate:
 Deposited this _____ day of _____ 201__ at _____ o'clock ____M. under
 Reception No. _____
 By: _____
 Title: _____



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.

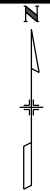
Donald D. Hansen, PLS No. 14599 Date _____



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Land Survey Control Diagram			
Plan Sheet			
Project Number: FSA-R600-378			
Project Location: SH-88, Accel/Decel & Signal Improvements			
Sec. 22-27, T5S, R66W, R67W/6th PM, Arapahoe County			
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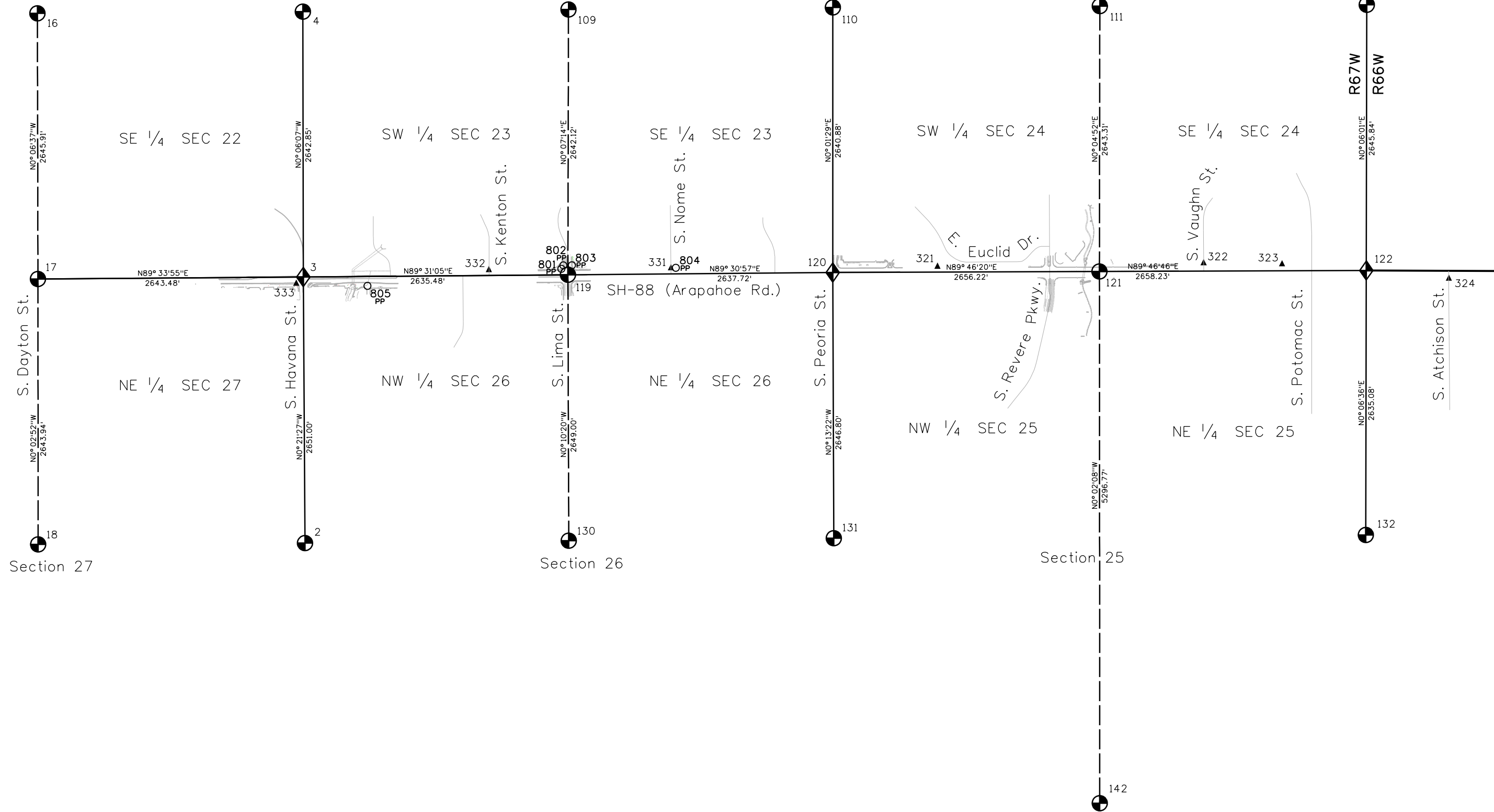
T5S R67W



Section 22

Section 23

Section 24





2000 South Holly
Denver, CO 80222
Phone: 303-757-9923 FAX: 303-757-9390

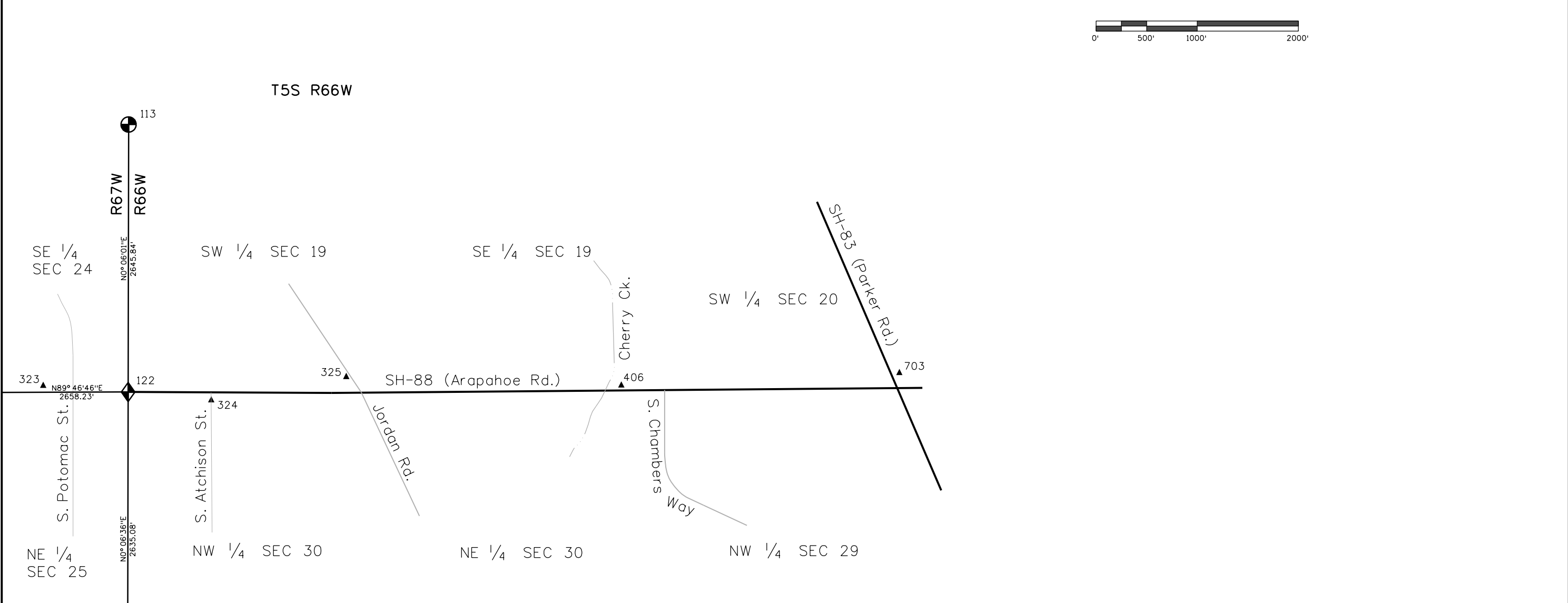
Region 6

SLK

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Land Survey Control Diagram			
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Project Location: SH-88, Accel/Decel & Signal Improvements			
Sec. 22-27, T5S, R66W, R67W/6th PM, Arapahoe County			
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Double-Based Property Pins				
Point	Project Specific Coordinates		Description	
	Northing	Easting		
801	642821.265	181961.125	1.5" Alum Cap stamped "ENG SER CO 27609"	
802	642855.384	181980.125	1.5" Alum Cap stamped "ENG SER CO 27609"	
803	642856.498	182065.220	0.5" Nail & Washer stamped "LS 24657"	
804	642831.291	183100.158	1.25" plastic cap on rebar stamped "C.R. Moore & Assoc. L.S. 10945"	
805	642650.841	180029.553	1.5" Alum Cap stamped "DR & CO PLS 28285"	

Local site settings
 Project latitude: 39°35'42.07162"N
 Project longitude: 104°49'45.25813"W
 Project height: 5637.573sft
 Ground scale factor: 1.0003000000
 False northing offset: 999507.306sft
 False easting offset: 2999043.294sft

Double-Based Aliquot Points (used only as check)										
Geodetic and State Plane (NAD 1983-92 Zone 502) coordinates						Project Specific Coordinates				Description
Point	Latitude	Longitude	Convergence Angle	Northing	Easting	Point	Northing	Easting		
620	39°35'42.16410"N	104°50'19.20670"W	0°25'01.5"	1642302.046	3186363.779	620	642794.737	187319.688	3.25" Alum Cap, "COLO DEPT OF TRANSPORTATION, T5S R67W 1/4 24/25 2005 PLS NO 36053" (used Point 121)	
621	39°35'42.24930"N	104°50'53.12898"W	0°24'40.1"	1642291.474	3183708.395	621	642784.162	184663.507	3.25" Alum Cap, "COLO DEPT OF HIGHWAYS T5S T67W S 23/24 S26/25 1992 PLS NO 11434" (used Point 120)	
622	39°35'42.21477"N	104°51'26.81596"W	0°24'18.9"	1642269.194	3181071.514	622	642761.875	182025.835	3.25" Alum Cap, "COLO DEPT OF TRANSPORTATION, 1993 PLS NO 27607" (used Point 119)	
623	39°35'42.17839"N	104°52'00.47322"W	0°23'57.7"	1642247.014	3178436.958	623	642739.688	179390.489	3.25" Alum Cap, "LAND CORNER", cap is partially illegible(per monument record 22/23/27/26 1988 LS 7735) (used Point 3)	
624	39°35'42.16072"N	104°52'34.23319"W	0°23'36.4"	1642226.943	3175794.347	624	642719.611	176747.085	3.25" Alum Cap, Illegible and partially broken at bottom (per monument record S22/S27 1988 LS 7735 (used Point 17)	

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2000 South Holly
Denver, CO 80222
Phone: 303-757-9923 FAX: 303-757-9390

Region 6

SLK

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Land Survey Control Diagram			
Tabulation Sheet			
Project Number: FSA-R600-378			
Project Location: SH-88, Accel/Decel & Signal Improvements			
Sec. 22-27, T5S, R66W, R67W/6th PM, Arapahoe County			
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Existant control used in constraining Fast Static GPS Survey (Published Elevations)

Geodetic and State Plane (NAD 1983-92 Zone 502) coordinates							Project Specific Coordinates				Description
Point	Latitude	Longitude	Ellipsoid Height	Convergence Angle	Northing	Easting	Point	Northing	Easting	Elevation NAVD'88	
406	39°35'42.35973"N	104°48'42.94892"W	5588.61	0°26'02.3"	1642377.800	3193898.357	406	642870.514	194856.526	5646.05	3.25" Alum. Cap: "Colo Dept of Transportation State Hwy, 406, Mile Post, Control Monument"
703	39°35'43.36497"N	104°48'07.81863"W	5617.55	0°26'24.4"	1642500.484	3196647.447	703	642993.234	197606.441	5674.39	3.25" Alum. Cap: "CDOT Control Monument, 2.067161"
1200	39°36'47.37617"N	104°50'51.94005"W	5575.58	0°24'40.9"	1648881.579	3183754.150	1200	649376.244	184709.276	5632.46	Calibration Baseline, Cherry Creek, 1200, 1997, The Director National Geodetic Survey, Washington D.C.
JOG	39°34'05.17514"N	104°52'18.24504"W	5837.26	0°23'46.5"	1632422.769	3177113.712	JOG	632912.496	178066.846	5893.63	Standard NGS bronze disk marked "JOG 1977".
CTMC	39°43'17.49292"N	105°11'34.33617"W	5970.64	0°11'37.3"	1687841.251	3086394.016	CTMC	688347.604	87319.934	6022.20	CDOT R6 CTMC Base Station
DU	39°40'28.29695"N	104°57'47.69959"W	5351.16	0°20'18.7"	1671021.570	3151086.047	DU	671522.877	152031.372	5407.28	Compass Tools, Inc. (University of Denver) Base Station

Fast Static GPS Survey Project Control, Project Code 17036 (2009) (Benched elevations)

Geodetic and State Plane (NAD 1983-92 Zone 502) coordinates							Project Specific Coordinates				Description
Point	Latitude	Longitude	Ellipsoid Height	Convergence Angle	Northing	Easting	Point	Northing	Easting	Elevation NAVD'88	
321	39°35'42.75401"N	104°50'39.79771"W	5647.87	0°24'48.6"	1642350.050	3184751.553	321	642842.755	185706.978	5704.93	Set CDOT Type 2, 3.25" Alum. Cap: "Colo Dept of Transportation State Hwy 88, CP 321, Control Monument"
322	39°35'42.91104"N	104°50'05.95109"W	5655.61	0°25'09.9"	1642385.195	3187400.830	322	642877.911	188357.050	5712.74	Set CDOT Type 5S, 1" Brass Cap Stamped: "CDOT CP 322"
323	39°35'42.74941"N	104°49'55.97976"W	5644.60	0°25'16.2"	1642374.568	3188181.471	323	642867.281	189137.925	5701.74	Set CDOT Type 5S, 1" Brass Cap Stamped: "CDOT CP 323"
324	39°35'41.21094"N	104°49'34.76555"W	5625.45	0°25'29.6"	1642231.169	3189843.197	324	642723.839	190800.149	5682.62	Set CDOT Type 5S, 1" Brass Cap Stamped: "CDOT CP 324"
325	39°35'43.39315"N	104°49'17.68999"W	5615.87	0°25'40.3"	1642461.907	3191178.168	325	642954.646	192135.521	5673.09	Set CDOT Type 2, 3.25" Alum. Cap: "Colo Dept of Transportation State Hwy 88, CP 325, Control Monument"

Fast Static GPS Survey Project Control, Project Code 17889 (2011) (Benched elevations)

Geodetic and State Plane (NAD 1983-92 Zone 502) coordinates							Project Specific Coordinates				Description
Point	Latitude	Longitude	Ellipsoid Height	Convergence Angle	Northing	Easting	Point	Northing	Easting	Elevation NAVD'88	
331	39°35'42.78541"N	104°51'13.70600"W	5666.30	0°24'27.2"	1642334.209	3182097.308	331	642826.886	183051.910	5723.04	Set CDOT Type 5S, 1" Brass Cap Stamped: "CP 331"
332	39°35'42.74244"N	104°51'36.86622"W	5615.81	0°24'12.6"	1642317.030	3180284.436	332	642809.705	181238.494	5672.49	Set CDOT Type 5S, 1" Brass Cap Stamped: "CP 332"
333	39°35'41.53370"N	104°52'01.38106"W	5653.43	0°23'57.1"	1642181.290	3178366.349	333	642673.945	179319.859	5710.06	Set CDOT Type 5S, 1" Brass Cap Stamped: "CP 333"

Aliquot Points from Arapahoe County Horizontal Control Network

Geodetic and State Plane (NAD 1983-92 Zone 502) coordinates						Project Specific Coordinates		Description	
Point	Latitude	Longitude	Convergence Angle	Northing	Easting	Point	Northing		
2	39°35'15.98581"N	104°52'00.49741"W	0°16'52.7"	1639596.882	3178453.536	2	640088.761	179407.072	3.25" Alum Cap in a monument box LS 19003 1987
3	39°35'42.17856"N	104°52'00.47273"W	0°16'52.9"	1642247.031	3178436.996	3	642739.705	179390.527	3.25" Alum Cap in a monument box LS 7735 1988
4	39°36'08.29042"N	104°52'00.29749"W	0°16'53.2"	1644889.084	3178432.298	4	645382.551	179385.827	3.25" Alum Cap in a monument box LS 7735 1988
16	39°36'08.30320"N	104°52'34.06568"W	0°19'22.4"	1644872.090	3175789.294	16	645365.552	176742.030	3.25" Alum Cap in a monument box LS 7735 1988
17	39°35'42.16108"N	104°52'34.23274"W	0°19'22.5"	1642226.979	3175794.382	17	642719.647	176747.120	3.25" Alum Cap in a monument box LS 7735 1988
18	39°35'16.03856"N	104°52'34.43642"W	0°19'42.5"	1639583.838	3175796.587	18	640075.713	176749.326	3.25" Alum Cap in a monument box LS 7735 1988
109	39°36'08.31875"N	104°51'26.50537"W	0°24'19.1"	1644910.523	3181077.142	109	645403.997	182031.465	# 5 Rebar
110	39°36'08.34136"N	104°50'52.87216"W	0°24'40.3"	1644931.569	3183709.551	110	645425.049	184664.663	Axle set 0.4' below asphalt surface
111	39°36'08.27980"N	104°50'18.91266"W	0°25'01.7"	1644944.555	3186367.558	111	645438.039	187323.468	1.5" Alum Cap (Cap Not Readable) Set 0.9' Below Ground Level
113	39°36'08.21327"N	104°49'44.94951"W	0°25'23.1"	1644957.314	3189025.853	113	645450.802	189982.560	#5 Rebar set 0.2' below ground level
119	39°35'42.21480"N	104°51'26.81502"W	0°24'18.9"	1642269.196	3181071.587	119	642761.877	182025.908	1" Steel Pin set in monument box 0.4' below asphalt surface
120	39°35'42.24933"N	104°50'53.12869"W	0°24'40.2"	1642291.476	3183708.416	120	642784.164	184663.528	1" Steel Pin set in monument box 0.4' below asphalt surface
121	39°35'42.16403"N	104°50'19.20626"W	0°25'01.5"	1642302.040	3186363.814	121	642794.731	187319.723	3" Alum Cap set in monument box 0.5' below asphalt surface
122	39°35'42.07260"N	104°49'45.25812"W	0°25'23.0"	1642312.273	3189021.227	122	642804.967	189977.933	2.5" Alum Cap properly marked and stamped "LS 11434 1984" set in monument box
130	39°35'16.04199"N	104°51'26.95259"W	0°24'18.8"	1639621.006	3181079.547	130	640112.893	182033.870	3.25" Alum Cap properly marked and stamped "LS 19003" set in monument box 0.4' below asphalt surface
131	39°35'16.09817"N	104°50'53.23984"W	0°24'40.1"	1639645.490	3183718.705	131	640137.384	184673.820	2.5" Brass Cap marked "PLS 43" set in monument box 0.7' below asphalt surface
132	39°35'16.03825"N	104°49'45.57111"W	0°25'22.8"	1639677.990	3189016.174	132	640169.894	189972.878	3" Alum Cap properly marked and stamped "CITY OF AURORA LS 16848" set in monument box
142	39°34'49.83120"N	104°50'19.65651"W	0°25'01.3"	1637006.860	3186367.108	142	637497.962	187323.018	Chisled "X" in top of 2.5' x 1.5' stone