



2000 South Holly
Denver, CO 80222
Phone: 303-757-9922 FAX: 303-757-9390
Region 6 Patricia Dickerson, PLS-II

Sheet Revisions

Date	Description	Initials
mm/dd/yy	XXXXXXXX	XXX

Land Survey Control Diagram

Title Sheet

Project Number: IM 0881-021			
Project Location: SH-088, I-25/Arapahoe Rd. Interchange			
Sec. 21 & 22, T5S R67W/6th PM, Arapahoe County			
Project Code:	Last Mod. Date	Subset	Sheet No.
16555	02-26-09	1 of 3	3.01

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, right-of-way acquisitions, monumentation, 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 400 (JOG) and point 410 (COMMITMENT), described herein, bears N21°48'16"W, a distance of 15,233.37 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 using Trimble software to create an "User-Defined Oblique Mercator Angle Projection (RSO)" with the following parameters:
Latitude of Central Point = N39°38'20.804470"
Longitude of Central Point = W104°54'49.026200"
Central Point False Northing = 656166.6667
Central Point False Easting = 984250.0000
Azimuth of Rotated Meridian = + 00°22'11.36910"
Scale along Rotated Meridian = 1.000263782082
A close **approximation** of **Project specific** coordinates can be obtained by multiplying the project's State Plane coordinates by 1.000287 and then truncating the northing by (-1,002,517.368) and the easting by (-2,181,797.913). 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 NGS benchmark "A 356" (PID KK0461), elevation = 5542.87' on CDOT Project NH-0252-299 (TREX) to point "PLAZA", elevation 5745.44' (5747.17' in construction control book).
- 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.

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.

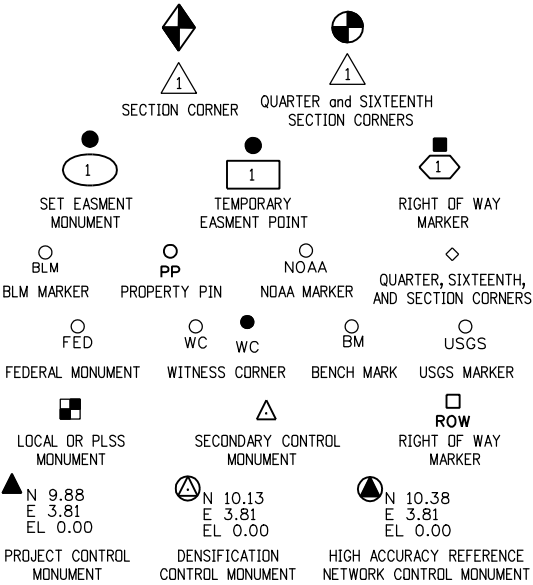
Donald D. Hansen, PLS No. 14599 Date

Arapahoe County Survey Depositing Certificate:

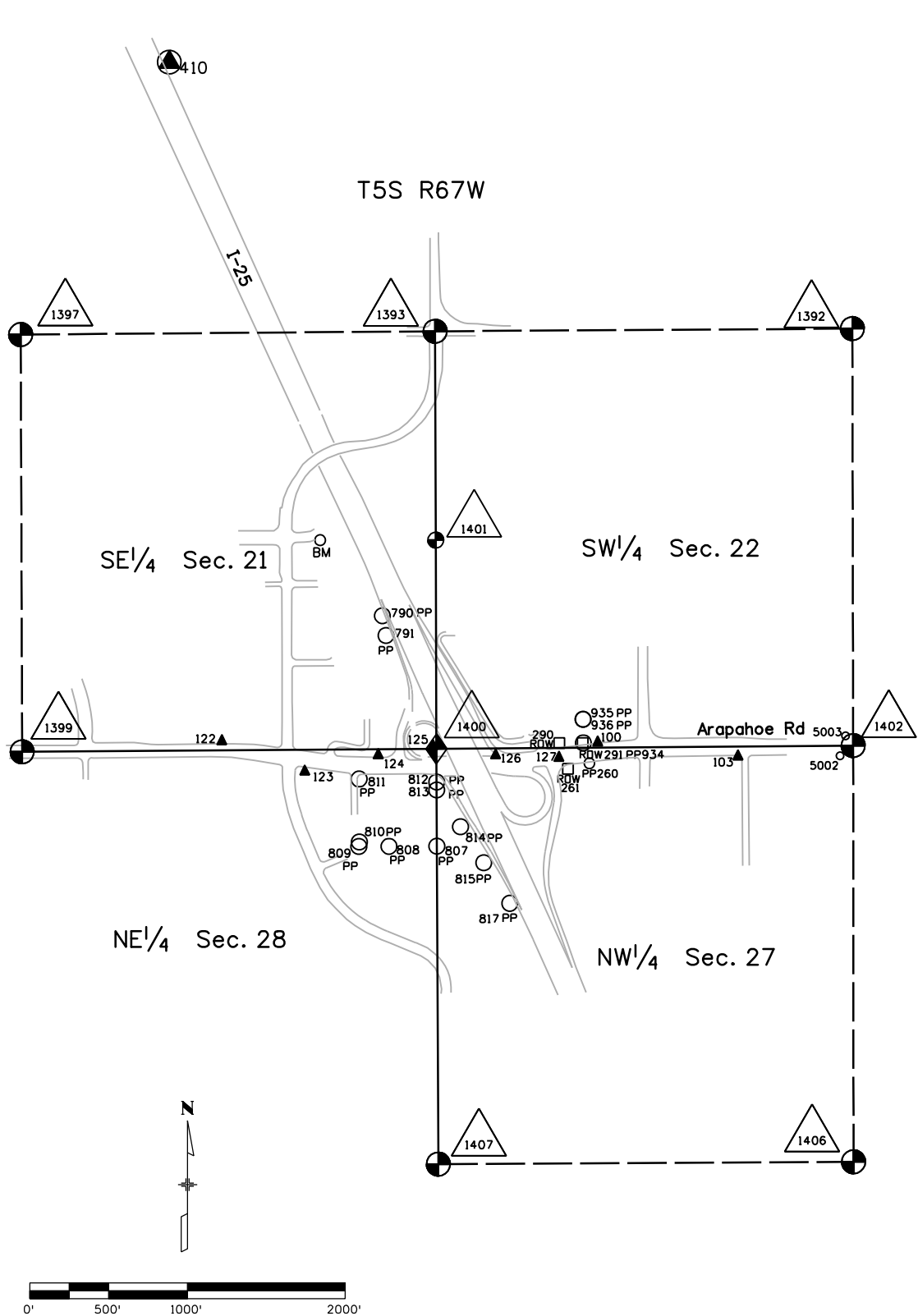
Deposited this ____ day of _____, 20____, at ____ o'clock ____M. in Book ____ at page ____ of Land Surveys/Right of Way Surveys, under Reception No. _____.

By: _____

Title: _____



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.





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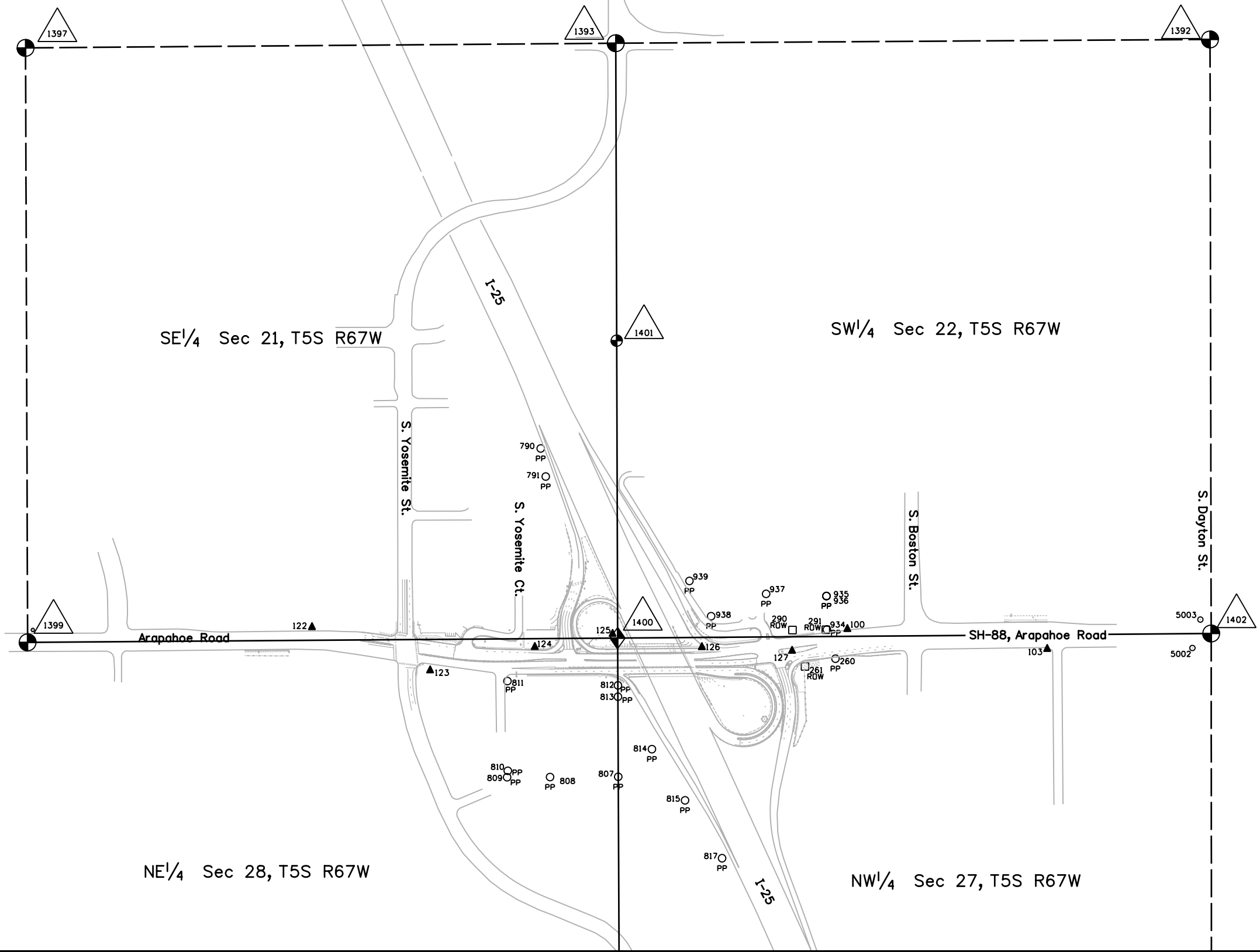
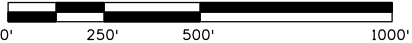
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Land Survey Control Diagram

Plan Sheet

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Sec. 21 & 22, T5S R67W/6th PM, Arapahoe County				
Project Code:	Last Mod. Date	Subset	Sheet No.	
16555	03-16-09	2 of 3	3.02	



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Project Code:	Last Mod. Date	Subset	Sheet No.	
16555	02-24-09	3 of 3	3.03	

Existant control used in constaining Fast Static GPS Survey ((P) - Benched Elevation)

Geodetic coordinates							Project Specific Coordinates				
Point	Latitude	Longittude	Ellipsoid Height	Convergence Angle	Northing (SP 502)	Easting (SP 502)	Point	Northing (Project)	Easting (Project)	Elevation NAVD'88	Description
100	39°35'42.46769"N	104°52'54.92539"W	5730.22	0°23'23.3"	1642246.931	3174174.415	100	640200.884	993287.492	5786.74 (P)	Project STU M580-005 (13696), CDOT Type 5 mon., "100.0"
398	39°43'17.49291"N	105°11'34.33618"W	5971.03	0°11'37.3"	1687841.250	3086394.015	398	685809.574	905483.065	6022.57	CDOT Region 6 CTMC base station
399	39°40'28.29695"N	104°57'47.69959"W	5351.20	0°20'18.7"	1671021.570	3151086.047	399	668983.738	970192.591	5407.35	Compass Tools Inc. (University of Denver) Base Station
400	39°34'05.17514"N	104°52'18.24504"W	5837.11	0°23'46.5"	1632422.769	3177113.712	400	630373.857	996227.691	5893.48 (P)	HARN sta. JOG, 3" NGS Brass Disk in 12" conc. mon. PID KK1696
410	39°36'25.29685"N	104°53'29.26842"W	5677.28	0°23'01.7"	1646562.181	3171457.123	410	644517.377	990569.399	5733.79 (P)	HARN sta. COMMITMENT, 3" NGS Brass disk in conc PID AE5259
1200	39°36'47.37616"N	104°50'51.94005"W	5575.35	0°24'40.9"	1648881.579	3183754.150	1200	646837.509	1002869.963	5632.26	HARN sta Cherry Creek CBL 1200, 3" NGS Brass disk PID AE5260
Point used to bring state plane values to project specific (Not Occupied in this project)											
516	39°38'20.80447"N	104°54'49.02620"W	5569.38	0°22'11.4"	1658208.143	3165139.550	516	656166.666	984250.000	5625.89 (P)	CHARN sta HILLCREST PID AE5257

Fast Static GPS Survey Project Control (Benched Elevations)

Point	Latitude	Longittude	Ellipsoid Height	Convergence Angle	Northing (SP 502)	Easting (SP 502)	Point	Northing (Project)	Easting (Project)	Elevation NAVD'88	Description
103	39°35'41.53106"N	104°52'43.56820"W	5736.09	0°23'30.5"	1642158.229	3175064.067	103	640112.156	994177.392	5792.64	Recovered Project STU M580-005 (13696), CP-103, CDOT Type 5 mon. "103.0"
122	39°35'42.71113"N	104°53'25.38058"W	5683.92	0°23'04.1"	1642255.454	3171790.314	122	640209.405	990902.699	5740.38	Set CDOT Type 2 mon w/3-1/4" Alum Cap "CP 122"
123	39°35'40.77234"N	104°53'18.67673"W	5706.07	0°23'08.4"	1642062.816	3172316.390	123	640016.710	991428.925	5762.53	Set CDOT Type 2 mon w/3-1/4" Alum Cap "CP 123"
124	39°35'41.77268"N	104°53'12.71160"W	5706.06	0°23'12.1"	1642167.176	3172782.641	124	640121.102	991895.312	5762.52	Set CDOT Type 2 mon w/3-1/4" Alum Cap "CP 124"
125	39°35'42.32354"N	104°53'08.28225"W	5721.52	0°23'14.9"	1642225.254	3173128.981	125	640179.198	992241.752	5778.00	Set CDOT Type 2 mon w/3-1/4" Alum Cap "CP 125"
126	39°35'41.71542"N	104°53'03.20720"W	5710.58	0°23'18.1"	1642166.415	3173526.657	126	640120.343	992639.544	5767.05	Set CDOT Type 5S mon "126"
127	39°35'41.52817"N	104°52'58.07980"W	5722.07	0°23'21.3"	1642150.193	3173928.143	127	640104.118	993041.147	5778.58	Set CDOT Type 5S mon "127"

Aliquot Corner data from Project No. NH-0252-299 (TREX) (NS/NR - not searched/not recovered)

Point	Northing (Project)	Easting (Project)	Elevation NAVD'88	Description
1392	642826.812	994902.868		C 1/4 cor. Sec. 22, 3.25" alum cap, LS 7735 in range box (NS/NR)
1393	642809.951	992255.965		1/4 cor. Sec. 21 22, 3.25" alum cap, illegible in range box (NS/NR)
1397	642789.203	989626.901		C 1/4 cor. Sec. 21, 3.25" alum cap, LS 15691 in range box (NS/NR)
1399	640141.605	989636.151		1/4 cor. Sec. 22 27, 3.25" alum cap, LS19003 (recovered)
1400	640160.571	992264.173		cor. Sec. 21 22 28 27, 3.25" alum cap, LS16401 (NR)
1401	641485.235	992260.051		S 1/16 cor. Sec. 21 22, 3.25" alum cap, LS16398 in range box (NS/NR)
1402	640180.928	994907.975		1/4 cor. Sec. 22 27, 3.25" alum cap, LS 7735 in range box (range box observed, tied reference monuments)
1406	637539.966	994910.080		C 1/4 cor. Sec. 27, 3.25" alum cap, RLS 7735 in range box (NS/NR)
1407	637525.419	992276.160		1/4 cor. Sec. 28 27, 3.25" alum cap, PLS 27275 (NS/NR)

Property evidence recovered this project (mean of double based RTK observations)

Point	Northing (Project)	Easting (Project)	Elevation NAVD'88	Description
260	640068.865	993234.435	5783.040	1.25" yellow plastic cap LS 14630
261	640034.210	993099.020	5785.195	3.25" alum cap, PLS 22088 (9161)
290	640196.470	993043.070	5778.770	3.25" alum cap, PLS 22088 (8790)
291	640197.650	993191.230	5783.160	3.25" alum cap, PLS 22088 (8791)
5002	640116.465	994824.440	5785.280	CDOT Type 5 mon., 1/4 cor. reference
5003	640243.070	994859.970	5784.880	Brass Tag LS 11434, 1/4 cor. reference

Property evidence recovered in Project No. NH-0252-299 (TREX)

Point	Northing (Project)	Easting (Project)	Elevation NAVD'88	Description
790	641005.124	991921.493		1.25" Yellow plastic cap PE LS 9010 (2790)
791	640880.017	991944.030		1.25" Yellow plastic cap PE LS 9010 (2791)
807	639542.926	992266.808		1.5" Alum. cap LS 23049 (2807)
808	639541.754	991963.306		1 brass tag LS 16406 (2808)
809	639540.927	991772.059		1.25"W LS 23049 (2809)
810	639569.521	991775.059		1.5" Alum. cap, illegible (2810)
811	639969.095	991773.406		1.5" Alum. cap, LS 23049 (2811)
812	639949.830	992265.630		1.5" Alum. cap, LS 23049 (2812)
813	639899.485	992265.630		No. 5 rebar, no cap (2813)
814	639665.968	992416.922		"X" in conc. (2814)
815	639437.944	992564.564		1.25" Yellow plastic cap, LS 4571 (2815)
817	639180.175	992729.492		1.25" Yellow plastic cap, PE LS 9010 (2817)
934	640198.422	993196.135		1.25" Yellow plastic cap, LS 14112 (2934)
935	640348.393	993194.719		1.25" Yellow plastic cap, LS 14112 (2935)
936	640347.580	993194.084		1.4" brass tag, LS 16401 (2936)
937	640357.453	992925.567		No. 3 rebar w/Yellow plastic cap (broken) (2937)
938	640258.115	992680.656		No. 5 rebar, no cap (2938)
939	640415.230	992584.053		No. 5 rebar, no cap (2939)