



Project Number: NH 2854-108				
Project Location: US 285 (MP 230.2 to MP 233.1)				
Project Location: US 285 (Shaffers Crossing)				
Project Code:	Last Mod. Date	Subest Sheets	Sheet No.	Total No. of Sheets
15048	December 14, 2005	1 of 3	3	

CONSTRUCTION SURVEYING AND MONUMENTATION REQUIREMENTS:

- 1). This Land Survey Control Diagram represents the horizontal and vertical control for the project established by the Division. It is possible that some of the survey control monuments listed have been disturbed or obliterated. It is the Contractor's responsibility to verify the existence and stability of the control monuments before submitting a bid price.
- 2). All Type 1 and Type 2 monuments shall be set flush with the ground. Witness posts shall be installed 1 foot from and facing all Type 1 and Type 2 monuments, or as directed by the Project Engineer.
- 3). Installation of Type 3 and Type 3-A monuments shall be completed in the same day that installation is commenced. Under no circumstances shall holes in the roadway be left open overnight.
- 4). When installing Type 3-A monuments, the aluminum access cover shall be positively secured to the PVC pipe with screws or glue. The access cover shall be caulked with asphalt caulking between the cover and the edges of the roadway surface to provide a positive moisture barrier around the access cover.
- 5). Control survey procedures, statistical analysis, and accuracy obtained for horizontal and vertical control shall be documented in the field book.
- 6). Legible copies of the field books shall be submitted to the Project Engineer for review on a monthly basis.
- 7). It is ultimately the prime Contractors responsibility to insure that these requirements, as well as any contained in the CDOT specifications, project special provisions, and CDOT Survey Manual are fulfilled under this contract.
- 8). The minimum staking intervals for each item are described on the plans or in the CDOT Survey Manual. If the contractor wishes to reduce the minimum intervals, a Contract Modification Order must be negotiated and the cost of the item reduced accordingly.

BASIS OF BEARINGS: Bearings used in the calculation of coordinates are based on a grid bearing of N62°10'09"E (1117.43') from CDOT CM-MP 230.9 to CDOT CM-MP 231.1 as obtained from a Global Positioning System (GPS) survey based on the Colorado High Accuracy Reference Network (CHARN). Said grid bearing is NAD '83 (1992) Colorado State Plane (Central Zone).

BASIS OF ELEVATIONS: Orthometric heights (elevations) are based on First Order Class II National Geodetic Survey (NGS) Bench Mark U 305 (NGS PID KK0739). The Published NAVD88 Height = 7855.22'. All Control Point Monuments on this project were established by differential leveling from said U 305, no orthometric corrections were applied to any of the differential level lines run on this project.

COORDINATE DATUM: Coordinates on this project are for the exclusive use of the CDOT for the construction of this project and are considered Project Coordinates only.

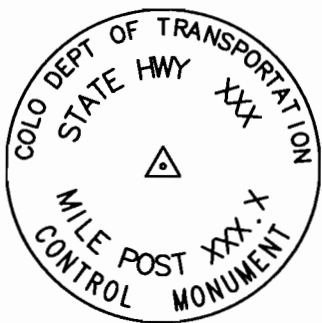
NOTE: Section lines shown herein were digitized from USGS maps and are shown for graphical reference purposes only. True aliquot lines were not surveyed or established for this land survey control diagram.

NOTE: This Land Survey Control Diagram is for the use of the Colorado Department of Transportation personnel. The survey is not a complete Boundary Survey. Title Policy, Title Commitment, and Title Research were not part of this Land Survey Control Diagram, therefore, easements, rights, and restrictions of record are not shown. The verification of the physical evidence with relation to easements, rights of way, property boundaries, and restriction, as described in the instruments of record, were not included in this control survey.

NOTE: In accordance with C.R.S. 13-80-105:
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 statement shown.

SURVEYOR'S STATEMENT: I, Geoffrey F. Stephenson, a Professional Land Surveyor in the State of Colorado, hereby state that this Land Survey Control Diagram was prepared under my direct supervision and checking, this 14th day of December, 2005, from a field Survey performed under my supervision and checking for and on behalf of the Department of Transportation, State of Colorado, and is not a Land Survey Plat or Right of Way Survey Plat and to the best of my knowledge and belief this Survey, as shown, meets the Minimum Horizontal and Vertical Precision Tolerance for a CDOT Class B - Secondary Control Survey in accordance with the CDOT Survey Manual.

Geoffrey F. Stephenson, P.L.S. 23521



Typical Control Monument Cap
Not to Scale

▲ CM - Control Point Monuments were set or found by Stephenson Land Surveying Services, LLC. All set Control Point Monuments are CDOT type 2 monuments, a 3-1/4" dia. aluminum control monument cap (as shown) on a 3' X 3/4" dia. finned aluminum security rod on a 3' X 3/4" dia. smooth aluminum rod (unless otherwise noted).

COLORADO DEPARTMENT OF TRANSPORTATION



Region 1
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Survey Unit: Joseph P. Conway, PLS

Sheet Revisions

US 285 (MP 230.2 TO MP 233.1)
Located in Sections 28, 31, 32, & 33 T. 6 S., R. 71 W., and
Section 6, T. 7 S., R. 71 W., of the 6th P.M.
Jefferson County, Colorado

Land Survey Control Diagram

Tabulation of Project Control

Project Number: NH 2854-108				
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15048	December 14, 2005	2 of 3	3A	

GEODETIC COORDINATE SUMMARY TABLE (ADJUSTED FIELD DATA)

POINT NAME	GEODETIC COORDINATES NAD-83(92) (CHARN)		NAD 83/92		ZONE 0502		ELLIP. HEIGHT (sft)	ELEV. (NAVD88) (sft)	MAPPING ANGLE	GRID SCALE	DESCRIPTION
	LATITUDE	LONGITUDE	NORTHING (m)	EASTING (m)	NORTHING (sft)	EASTING (sft)					
2302	39° 28' 11.24061" N	105° 22' 33.87847" W	486468.990	925064.990	1596023.67	3034984.04	8184.25	8229.59	0° 04' 41.4"	0.99995657	US 285 CM-MP 230.2
2303	39° 28' 17.99613" N	105° 22' 28.05373" W	486677.510	925203.920	1596707.80	3035439.86	8106.81	8152.16	0° 04' 45.0"	0.99995679	US 285 CM-MP 230.3
2305	39° 28' 27.27664" N	105° 22' 28.42556" W	486963.700	925194.640	1597646.73	3035409.41	8050.31	8095.65	0° 04' 44.8"	0.99995708	US 285 CM-MP 230.5
2307	39° 28' 37.34279" N	105° 22' 21.03381" W	487274.370	925370.870	1598666.00	3035987.59	7976.40	8021.76	0° 04' 49.5"	0.99995740	US 285 CM-MP 230.7
2309	39° 28' 44.94925" N	105° 22' 09.31895" W	487509.340	925650.510	1599436.91	3036905.05	7908.33	7953.72	0° 04' 56.8"	0.99995764	US 285 CM-MP 230.9
2311	39° 28' 50.08880" N	105° 21' 56.71214" W	487668.280	925951.560	1599958.35	3037892.75	7955.53	8001.00	0° 05' 04.8"	0.99995780	US 285 CM-MP 231.1
2313	39° 29' 00.17717" N	105° 21' 52.78565" W	487979.530	926044.930	1600979.52	3038199.09	8025.10	8070.59	0° 05' 07.3"	0.99995813	US 285 CM-MP 231.3
2315	39° 29' 06.26431" N	105° 21' 41.71434" W	488167.650	926309.220	1601596.71	3039066.17	8084.19	8129.73	0° 05' 14.3"	0.99995833	US 285 CM-MP 231.5
2317	39° 29' 13.71776" N	105° 21' 37.51679" W	488397.660	926409.180	1602351.33	3039394.11	8132.15	8177.72	0° 05' 16.9"	0.99995857	US 285 CM-MP 231.7
2319	39° 29' 17.84815" N	105° 21' 26.04304" W	488525.470	926683.150	1602770.63	3040292.98	8194.12	8239.75	0° 05' 24.1"	0.99995870	US 285 CM-MP 231.9
232103	39° 29' 23.61063" N	105° 21' 13.19082" W	488703.660	926989.980	1603355.27	3041299.62	8264.83	8310.53	0° 05' 32.2"	0.99995889	US 285 CM-MP 232.103
232309	39° 29' 23.75679" N	105° 20' 59.27900" W	488708.710	927322.400	1603371.84	3042390.22	8328.78	8374.57	0° 05' 41.0"	0.99995890	US 285 CM-MP 232.309
232511	39° 29' 30.81361" N	105° 20' 45.36150" W	488926.890	927654.590	1604087.65	3043480.08	8343.16	8389.00	0° 05' 49.8"	0.99995913	US 285 CM-MP 232.511
232665	39° 29' 33.55586" N	105° 20' 38.45842" W	489011.744	927819.386	1604366.03	3044020.77	8371.66	8417.48	0° 05' 54.2"	0.99995922	US 285 CM-MP 232.665
2327	39° 29' 34.28367" N	105° 20' 37.40454" W	489034.230	927844.530	1604439.81	3044103.25	8377.89	8423.76	0° 05' 54.8"	0.99995924	US 285 CM-MP 232.7
2329	39° 29' 40.08934" N	105° 20' 30.85436" W	489213.540	928000.730	1605028.10	3044615.72	8418.99	8464.89	0° 05' 58.9"	0.99995944	US 285 CM-MP 232.9
2331	39° 29' 44.94469" N	105° 20' 16.72927" W	489363.870	928337.960	1605521.30	3045722.12	8483.27	8529.26	0° 06' 07.9"	0.99995960	US 285 CM-MP 233.1
STOLLARD	39° 30' 25.26468" N	105° 17' 08.87239" W	490616.594	932823.496	1609631.28	3060438.42	7982.5	8029.5	0° 08' 06.3"	0.99996096	NGS PID AA7135
PINEHELL	39° 28' 20.77186" N	105° 24' 11.55205" W	486760.083	922730.089	1596978.71	3027323.63	8498.5	8543.0	0° 03' 39.8"	0.99995687	NGS PID AA7133

PROJECT COORDINATE SUMMARY TABLE (ADJUSTED FIELD DATA) – METERS

POINT NAME	PROJECT COORDINATES		ELEV. (NAVD 88)	DESCRIPTION
	NORTHING	EASTING		
2302	181902.796	315909.537	2508.384	US 285 CM-MP 230.2
2303	182111.419	316048.538	2484.783	US 285 CM-MP 230.3
2305	182397.744	316039.252	2467.559	US 285 CM-MP 230.5
2307	182708.568	316215.566	2445.037	US 285 CM-MP 230.7
2309	182943.654	316495.342	2424.299	US 285 CM-MP 230.9
2311	183102.667	316796.540	2438.710	US 285 CM-MP 231.1
2313	183414.070	316889.957	2459.921	US 285 CM-MP 231.3
2315	183602.280	317154.373	2477.947	US 285 CM-MP 231.5
2317	183832.401	317254.375	2492.574	US 285 CM-MP 231.7
2319	183960.265	317528.484	2511.481	US 285 CM-MP 231.9
232103	184138.548	317835.457	2533.055	US 285 CM-MP 232.103
232309	184143.601	318168.034	2552.574	US 285 CM-MP 232.309
232511	184361.887	318500.384	2556.972	US 285 CM-MP 232.511
232665	184446.779	318665.264	2583.936	US 285 CM-MP 232.665
2327	184469.277	318690.418	2567.567	US 285 CM-MP 232.7
2329	184648.675	318846.692	2580.104	US 285 CM-MP 232.9
2331	184799.076	319184.085	2599.724	US 285 CM-MP 233.1
STOLLARD	186052.403	323671.786	2447.4	NGS PID AA7135
PINEHELI	182194.033	313573.514	2603.9	NGS PID AA7133

PROJECT COORDINATE SUMMARY TABLE (ADJUSTED FIELD DATA) – US FEET

POINT NAME	PROJECT COORDINATES		ELEV. (NAVD 88)	DESCRIPTION
	NORTHING	EASTING		
2302	596792.76	1036446.54	8229.59	US 285 CM-MP 230.2
2303	597477.21	1036902.58	8152.16	US 285 CM-MP 230.3
2305	598416.60	1036872.11	8095.65	US 285 CM-MP 230.5
2307	599436.36	1037450.57	8021.76	US 285 CM-MP 230.7
2309	600207.64	1038368.47	7953.72	US 285 CM-MP 230.9
2311	600729.33	1039356.65	8001.00	US 285 CM-MP 231.1
2313	601751.00	1039663.14	8070.59	US 285 CM-MP 231.3
2315	602368.48	1040530.64	8129.73	US 285 CM-MP 231.5
2317	603123.47	1040858.73	8177.72	US 285 CM-MP 231.7
2319	603542.97	1041758.03	8239.75	US 285 CM-MP 231.9
232103	604127.89	1042765.16	8310.53	US 285 CM-MP 232.103
232309	604144.46	1043856.29	8374.57	US 285 CM-MP 232.309
232511	604860.63	1044946.68	8389.00	US 285 CM-MP 232.511
232665	605139.14	1045487.62	8417.46	US 285 CM-MP 232.665
2327	605212.95	1045570.15	8423.76	US 285 CM-MP 232.7
2329	605801.53	1046082.86	8464.89	US 285 CM-MP 232.9
2331	606294.97	1047189.79	8529.26	US 285 CM-MP 233.1
STOLLARD	610406.93	1061913.18	8029.5	NGS PID AA7135
PINEHELI	597748.26	1028782.43	8543.0	NGS PID AA7133

NOTE: National Geodetic Survey
First Order Horizontal Control
Stations held fixed in the final
fully constrained least squares
adjustment of the GPS data are
as follows:

Designation: STOLLARD
PID: AA7135
NAD 83(1992) CHARN
Latitude 39° 30' 25.26468 (N)
Longitude 105° 17' 08.87239 (W)
Ellip. Height 2433.08 (meters)

Designation: PINEHELI
PID: AA7133
NAD 83(1992) CHARN
Latitude 39° 28' 20.77186 (N)
Longitude 105° 24' 11.55205 (W)
Ellip. Height 2590.34 (meters)

Project Coordinate Parameters:

Geodetic coordinates are based on NAD 83(1992)
Orthometric Heights are shown in NAVD88
State Plane coordinates are Colorado Central Zone (502)
Units are in Meters (M) and US Survey Feet (sft)
Project (Ground) coordinates are Modified State Plane
Combined Project factor = 0.999518353
Combined Project Factor Reciprocal = 1.000481879
Conversion Meters to USFeet:
One meter equals 3937/1200 feet.
Truncation applied to State Plane Coordinates:
Northing Reduction 1,000,000 sft
Easting Reduction 2,000,000 sft

Conversion Example of State Plane Coordinates to Project Coordinates:

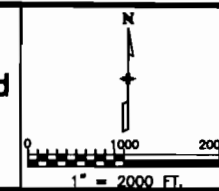
State Plane Northing x 1.000481879 - 1,000,000 (sft) = Project Northing (sft)
State Plane Easting x 1.000481879 - 2,000,000 (sft) = Project Easting (sft)



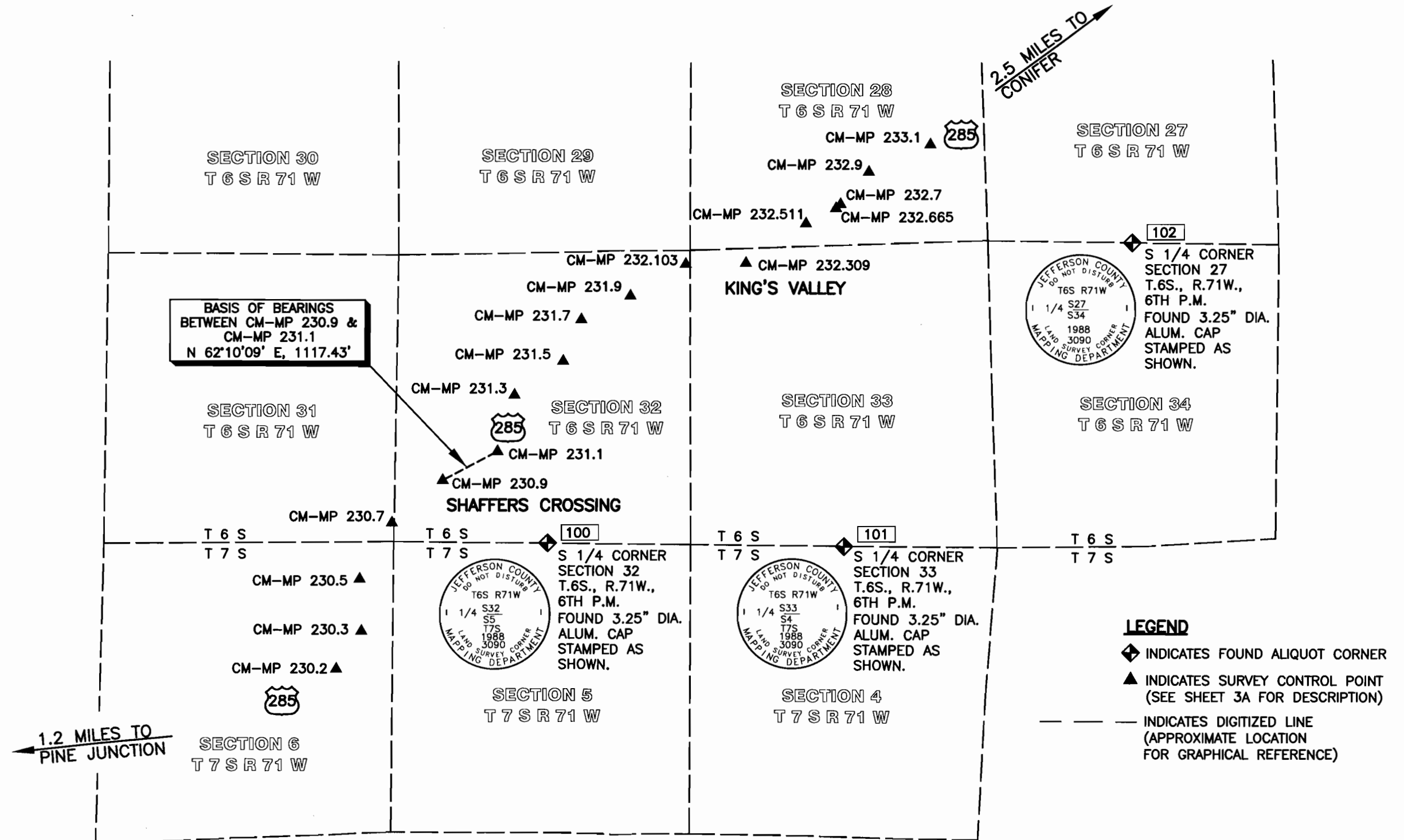
Region 1
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US 285 (MP 230.2 TO MP 233.1)
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Section 6, T. 7 S., R. 71 W., of the 6th P.M.
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Project Code:	15048
Last Mod. Date:	December 14, 2005
Submittal Sheets:	3 of 3
Sheet No.:	38
Total No. of Sheets:	



TABULATION OF FOUND ALIQUOT CORNERS

POINT NAME	PROJECT COORDINATES US FT		LOCATION	DESCRIPTION
	NORTHING	EASTING		
100	599070.67	1040266.75	S1/4 CORNER SECTION 32, TOWNSHIP 6 SOUTH, RANGE 71 WEST, 6TH P.M.	Found 3.25" dia. alum. cap set in concrete mound of stones, cap marked as shown above.
101	599014.65	1045663.51	S1/4 CORNER SECTION 33, TOWNSHIP 6 SOUTH, RANGE 71 WEST, 6TH P.M.	Found 3.25" dia. alum. cap set in concrete mound of stones, cap marked as shown above.
102	604520.12	1050848.98	S1/4 CORNER SECTION 27, TOWNSHIP 6 SOUTH, RANGE 71 WEST, 6TH P.M.	Found 3.25" dia. alum. cap set in concrete mound of stones, cap marked as shown above.