

COLORADO DEPARTMENT OF TRANSPORTATION



Region 1
18500 E. Colfax Avenue
Aurora, CO 80011
Phone: (303) 757-9744 FAX: (303) 757-9746

Survey Unit: Joe Conway

Sheet Revisions

DATE	DESCRIPTION	BY
06/14	ADD NEW MONUMENTS	JLT

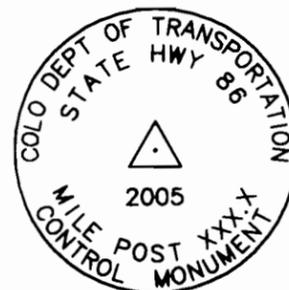
State Highway No. 86 MP 3.1 to MP 5.3
Being a part of Section 5, Township 8 South, Range 66 West,
and a part of Sections 32 & 33, Township 7 South,
Range 66 West of the 6th Principal Meridian,
County of Douglas, State of Colorado.

Project Control Diagram

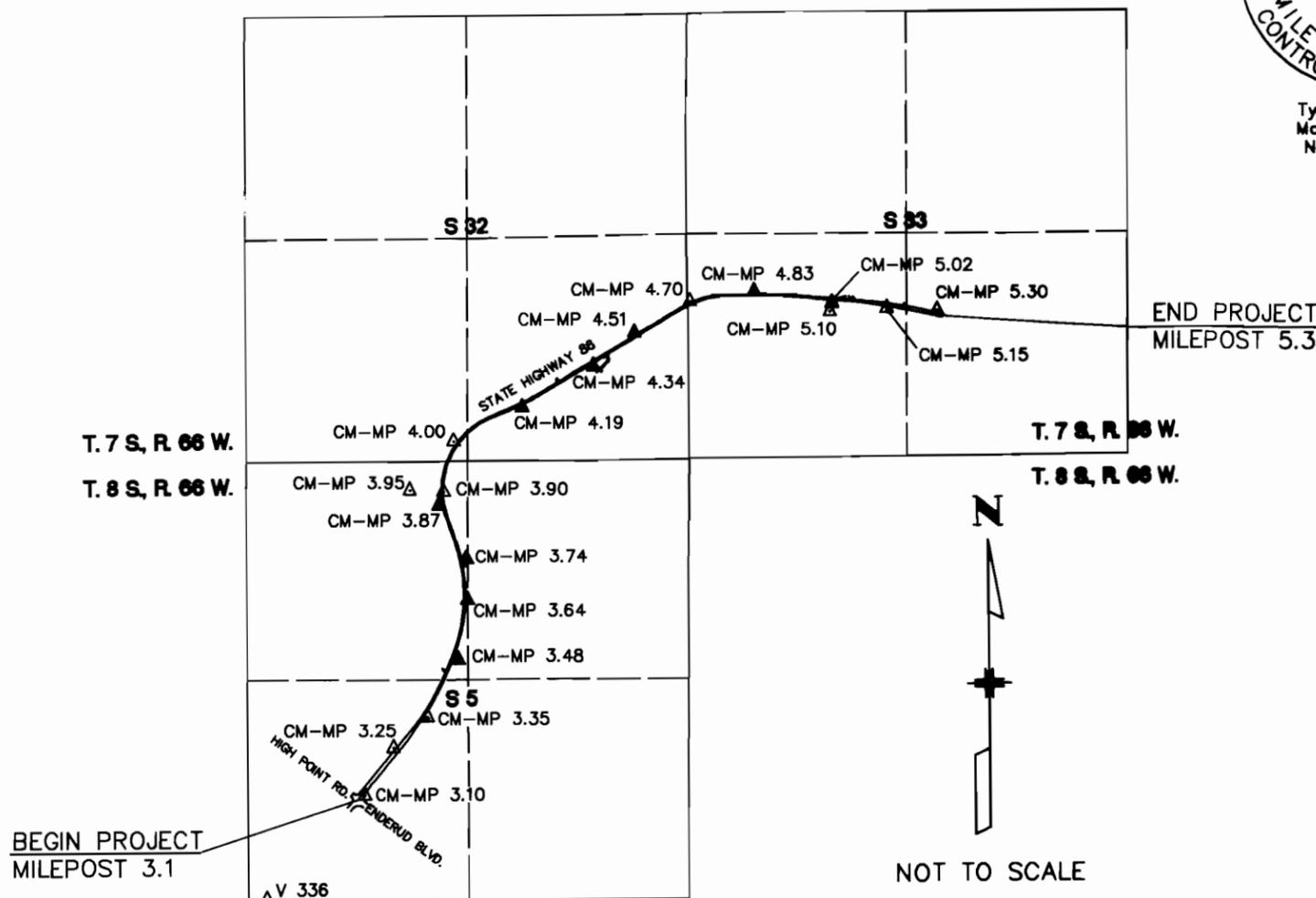
Title Sheet				
Project Number: C R100-094				
Project Location: STATE HIGHWAY No. 86				
Project Location: MILEPOST 3.1 to MILEPOST 5.3				
Project Code	Lead	Map	Sheet No.	Total No. of Sheets
14123	06-27-05	XXX of XXX	1	XXX

Prepared By:
MOUNTAIN SURVEYING MAPPING, INC.
8751 E. HAMPDEN AVE. SUITE E
DENVER, COLORADO 80231
(303) 308-1858

ZYLSTRA BAKER SURVEYING, INC.
1810 WEST TAPER AVENUE - BLENHEIM, CO 80511
PHONE (303) 781-0700 FAX (303) 781-4114
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Typical Control Monument Cap
Not to Scale



BASIS OF BEARINGS: All bearings are grid bearings of the Colorado State Plane Coordinate System, Central Zone, North American Datum 1983/92. The basis of grid bearing is the line between CDOT secondary control monuments (type 2) on State Highway 86 MP 5.15 and MP 5.30. That bearing being S 87° 32' 02" E.

BASIS OF ELEVATIONS: Project is based on NAVD 88 vertical datum. A bench loop was run starting at NSRS benchmark TT 17A (1976.226 m). All control monuments on this project were tied through a bench loop. Note: TT 17A is a posted elevation benchmark.

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.

▲ CP - Existing Control Point Monuments.

▲ CP - Control Point Monuments set by Zylstra Baker Surveying, Inc.. They 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.

NOTE: This control survey 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 control survey, 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: 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.

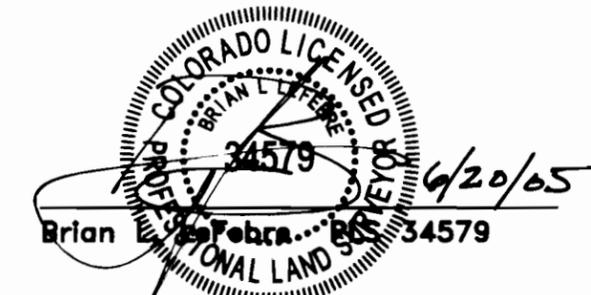
NOTE: No guarantee as to the accuracy of the information contained on the attached drawing is either stated or implied unless this copy bears an original signature of the professional land surveyor hereon named.

SURVEYORS STATEMENT: I, Brian L. LeFebre, a Professional Land Surveyor in the State of Colorado, hereby state that this Land Survey Control Diagram was prepared under my direct supervision this _____ day of _____, 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 control survey, as shown, meets the minimum horizontal control tolerances of a Type B Survey as listed in the Colorado Department of Transportation Survey Manual Chapter Three (Revised 4/29/92). (Certification for new monumentation only)

CONSTRUCTION SURVEYING AND MONUMENTATION STANDARDS

- This Control Survey 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 above 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.
- 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.
- 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.
- 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.

- Control survey procedures, statistical analysis, and accuracy obtained for horizontal and vertical control shall be documented in the field book.
- Legible copies of the field books shall be submitted to the Project Engineer for review on a monthly basis.
- It is ultimately the prime Contractor's 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.
- 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.



14123-LSCD.dwg 04 AUG 2003 10:28 PLOT/EDIT BY WMS/DWM

COLORADO DEPARTMENT OF TRANSPORTATION



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Survey Unit: Joe Conway

Sheet Revisions		
NO/14	REVISIONS	BY

State Highway No. 86 MP 3.1 to MP 5.3
Being a part of Section 5, Township 8 South, Range 66 West,
and a part of Sections 32 & 33, Township 7 South,
Range 66 West of the 6th Principal Meridian,
County of Douglas, State of Colorado.

Project Control Diagram

Title Sheet				
Project Number:	C R100-094			
Project Location:	STATE HIGHWAY No. 86			
Project Location:	MILEPOST 3.1 to MILEPOST 5.3			
Project Code:	Last Mod. Date	Sheet No.	Sheet No. of Sheets	Total No. of Sheets
14123	06/27/06	100 of 100	2	100

**GEODETTIC COORDINATE SUMMARY TABLE
(ADJUSTED FIELD DATA)**

Prepared By:
 MOUNTAIN SURVEYING & MAPPING, INC.
8751 E. HAMPODEN AVE. SUITE B-
DENVER, COLORADO 80231
(303) 306-1858

POINT NAME	GEODETTIC COORDINATES NAD-83(92) (CHARN)		ELLIP. (NAVD88)m	MAPPING ANGLE	SCALE	NAD-83(92) ZONE 0502	
	LATITUDE (N)	LONGITUDE (W)				NORTHING (m)	EASTING (m)
HARN STA N 393	39° 22' 45.84133" N	104° 51' 32.33290" W	1879.690	0° 24' 15.42154"	0.999947680	476621.787	969629.848
SH 86 CM-MP 2.90	39° 22' 36.88071" N	104° 48' 42.29181" W	1980.898	0° 26' 02.66468"	0.999947471	476375.219	973701.358
SH 86 CM-MP 3.10	39° 22' 48.93645" N	104° 48' 27.31006" W	1989.401	0° 26' 12.11351"	0.999947753	476749.709	974057.080
SH 86 CM-MP 3.25	39° 22' 54.49293" N	104° 48' 22.89592" W	1986.309	0° 26' 14.89746"	0.999947885	476921.880	974161.409
SH 86 CM-MP 3.35	39° 22' 58.08816" N	104° 48' 17.68094" W	1984.360	0° 26' 18.18649"	0.999947970	477033.681	974265.360
SH 86 CM-MP 3.50 *	39° 23' 05.66073" N	104° 48' 12.93323" W	1984.957	0° 26' 21.18083"	0.999948151	477268.088	974397.187
SH 86 CM-MP 3.65 *	39° 23' 12.11371" N	104° 48' 11.27097" W	1983.104	0° 26' 22.22920"	0.999948306	477467.385	974435.438
SH 86 CM-MP 3.80 *	39° 23' 19.59845" N	104° 48' 14.36927" W	1970.056	0° 26' 20.27513"	0.999948487	477697.804	974359.529
SH 86 CM-MP 3.90	39° 23' 24.51172" N	104° 48' 14.91887" W	1954.922	0° 26' 19.92850"	0.999948607	477849.015	974345.217
SH 86 CM-MP 3.95 (TT 17A)	39° 23' 24.73027" N	104° 48' 20.03895" W	1959.260	0° 26' 16.69932"	0.999948612	477854.817	974222.651
SH 86 CM-MP 4.00	39° 23' 30.43512" N	104° 48' 13.32600" W	1944.738	0° 26' 20.93311"	0.999948752	478031.989	974381.932
SH 86 CM-MP 4.20 *	39° 23' 34.29104" N	104° 48' 02.18375" W	1920.015	0° 26' 27.96041"	0.999948847	478152.922	974847.625
SH 86 CM-MP 4.35 *	39° 23' 39.40843" N	104° 47' 51.46088" W	1904.664	0° 26' 34.72322"	0.999948973	478312.646	974902.975
SH 86 CM-MP 4.50 *	39° 23' 42.73380" N	104° 47' 46.17601" W	1900.027	0° 26' 38.05632"	0.999949056	478416.232	975028.630
SH 86 CM-MP 4.70	39° 23' 46.62969" N	104° 47' 37.12329" W	1893.172	0° 26' 43.78578"	0.999949153	478538.051	975244.296
SH 86 CM-MP 4.85 *	39° 23' 47.62195" N	104° 47' 25.78288" W	1884.774	0° 26' 50.91808"	0.999949178	478570.784	975515.389
SH 86 CM-MP 5.00 *	39° 23' 46.39964" N	104° 47' 16.82586" W	1878.771	0° 26' 56.56718"	0.999949147	478534.749	975729.991
SH 86 CM-MP 5.10 (J 337)	39° 23' 45.31173" N	104° 47' 15.82676" W	1880.798	0° 26' 57.19728"	0.999949120	478501.388	975754.158
SH 86 CM-MP 5.15	39° 23' 45.59555" N	104° 47' 07.18877" W	1872.044	0° 27' 02.64517"	0.999949127	478511.783	975860.764
SH 86 CM-MP 5.30	39° 23' 45.29120" N	104° 46' 59.49216" W	1867.204	0° 27' 07.49934"	0.999949119	478503.829	976144.989
SH 86 CM-MP 6.50 (KULLMAN)	39° 23' 27.52152" N	104° 45' 33.35592" W	1840.370	0° 26' 01.82457"	0.999948681	477972.388	978210.372

* DENOTES MONUMENT DESTROYED DURING CONSTRUCTION

COLORADO DEPARTMENT OF TRANSPORTATION PICS 3.0.4

Project number: 14123
Project identifier: C R100-094
Route 86, from MP 3.1 to MP 5.3
Project location: East of Castle Rock in Douglas County, Colorado

Project Latitude: 39.232296
Project Longitude: 104.475928
Project Elevation: 1943.5997m
Zone: Colorado Central
Scale Factor: 0.9999485695
Combined Factor: 0.9996436563
Northing Reduction: 400000m
Easting Reduction: 900000m
Units are METERS.

YLSTRA BAKER SURVEYING, INC.
1916 WEST TUPPER AVENUE - ENGLEWOOD, CO 80111
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E-MAIL - m@ylstrabaker.com

**PROJECT COORDINATE SUMMARY TABLE
(ADJUSTED FIELD DATA)**

POINT NAME	PROJECT COORDINATES		ELEV (ft)	DESCRIPTION
	NORTH (ft)	EAST (ft)		
HARN STA N 393	251940.67	228577.93	6222.12	FOUND NGS BRASS DISK IN ROCK
SH 86 CM-MP 2.90	251131.50	242940.64	6554.50	FOUND NSRS BRASS DISK V 338
SH 86 CM-MP 3.10	252360.57	244108.12	6582.52	FOUND CDOT TYPE 2 MON.
SH 86 CM-MP 3.25	252825.57	244450.52	6572.43	FOUND CDOT TYPE 2 MON.
SH 86 CM-MP 3.35	253292.57	244857.33	6566.05	FOUND CDOT TYPE 2 MON.
SH 86 CM-MP 3.50 *	254061.83	245224.35	6568.01	MONUMENT NOT FOUND
SH 86 CM-MP 3.65 *	254715.92	245349.89	6561.95	MONUMENT NOT FOUND
SH 86 CM-MP 3.80 *	255471.57	245100.76	6519.12	MONUMENT NOT FOUND
SH 86 CM-MP 3.90	255968.50	245053.78	6469.44	FOUND CDOT TYPE 2 MON.
SH 86 CM-MP 3.95	255987.54	244651.52	6483.67	FOUND NSRS BRASS DISK TT 17A
SH 86 CM-MP 4.00	256568.95	245174.28	6436.02	FOUND CDOT TYPE 2 MON.
SH 86 CM-MP 4.20 *	256985.92	246046.29	6354.92	MONUMENT NOT FOUND
SH 86 CM-MP 4.35 *	257490.14	246884.35	6304.59	MONUMENT NOT FOUND
SH 86 CM-MP 4.50 *	257830.10	247296.75	6289.38	MONUMENT NOT FOUND
SH 86 CM-MP 4.70	258229.92	248004.56	6266.90	FOUND CDOT TYPE 2 MON.
SH 86 CM-MP 4.85 *	258337.28	248894.29	6239.38	MONUMENT NOT FOUND
SH 86 CM-MP 5.00 *	258219.08	249598.61	6219.72	MONUMENT NOT FOUND
SH 86 CM-MP 5.10	258109.59	249677.93	6226.36	FOUND NSRS BRASS DISK J 337
SH 86 CM-MP 5.15	258143.64	250356.01	6197.68	FOUND CDOT TYPE 2 MON.
SH 86 CM-MP 5.30	258117.60	250960.64	6181.83	FOUND CDOT TYPE 2 MON.
NSRS STA KULLMAN	256373.43	257739.23	6094.00	FOUND NOAA DEEP ROD KULLMAN

* DENOTES MONUMENT DESTROYED DURING CONSTRUCTION

Note: Elevations are derived from a differential level loop, which began at Station TT 17A (MP 3.95). The elevation at J 337 (MP 5.10) is relative to this project and is 0.15 feet lower than the posted NSRS elevation. Stations N 393 and V 336 were not included in the level loop. The elevations reported here are from NSRS.

**NEW MILEPOST MONUMENTS
GEODETTIC COORDINATE SUMMARY TABLE
(ADJUSTED FIELD DATA)**

POINT NAME	GEODETTIC COORDINATES NAD-83(92) (CHARN)		ELLIP. (NAVD88)m	MAPPING ANGLE	SCALE	NAD-83(92) ZONE 0502	
	LATITUDE (N)	LONGITUDE (W)				NORTHING (m)	EASTING (m)
SH 86 CM-MP 3.48	39°23'04.78517" N	104°48'12.96493" W	1983.884	0° 26' 21.1608	0.999948130	477240.446	974396.640
SH 86 CM-MP 3.64	39°23'11.80287" N	104°48'11.48051" W	1980.258	0° 26' 22.0970	0.999948299	477457.741	974430.497
SH 86 CM-MP 3.74	39°23'16.83988" N	104°48'11.58387" W	1971.680	0° 26' 22.0319	0.999948416	477606.875	974426.880
SH 86 CM-MP 3.87	39°23'22.81672" N	104°48'15.69197" W	1959.706	0° 26' 19.4409	0.999948569	477799.688	974327.095
SH 86 CM-MP 4.19	39°23'34.32691" N	104°48'02.83915" W	1923.482	0° 26' 27.5471	0.999948848	478153.877	974631.934
SH 86 CM-MP 4.34	39°23'39.08337" N	104°47'51.98781" W	1905.363	0° 26' 34.4036	0.999948966	478302.899	974890.925
SH 86 CM-MP 4.51	39°23'42.88670" N	104°47'45.64882" W	1899.649	0° 26' 38.3888	0.999949063	478424.406	975041.181
SH 86 CM-MP 4.83	39°23'47.88331" N	104°47'27.31276" W	1885.880	0° 26' 49.9532	0.999949180	478572.679	975478.768
SH 86 CM-MP 5.02	39°23'48.28803" N	104°47'15.52084" W	1877.147	0° 26' 57.3902	0.999949145	478531.490	975761.242

**NEW MILEPOST MONUMENTS
PROJECT COORDINATE SUMMARY TABLE
(ADJUSTED FIELD DATA)**

POINT NAME	PROJECT COORDINATES		ELEV (ft)	DESCRIPTION
	NORTH (ft)	EAST (ft)		
SH 86 CM-MP 3.48	253971.17	245222.55	6564.50	SET TYPE 2 MON.
SH 86 CM-MP 3.64	254884.34	245333.68	6552.58	SET TYPE 2 MON.
SH 86 CM-MP 3.74	256173.80	245321.80	6524.45	SET TYPE 2 MON.
SH 86 CM-MP 3.87	258806.61	244894.31	6485.16	SET TYPE 2 MON.
SH 86 CM-MP 4.19	258899.06	245994.79	6386.44	SET TYPE 2 MON.
SH 86 CM-MP 4.34	257488.15	246844.80	6307.04	SET TYPE 2 MON.
SH 86 CM-MP 4.51	257886.94	247337.94	6288.32	SET TYPE 2 MON.
SH 86 CM-MP 4.83	258343.57	248774.10	6243.15	SET TYPE 2 MON.
SH 86 CM-MP 5.02	258208.38	249701.18	6214.48	SET TYPE 2 MON.