

COLORADO DEPARTMENT OF TRANSPORTATION



Region 1
16500 E. Colfax Ave.
Aurora, CO 80011
Phone: (303) 757-9744 Phone: (303) 757-9748

Survey Unit: Joseph P. Conway

Sheet Revisions

mm/yy	xxxx	xxx

SH 83 MP 45.6 to MP 46.6
A PART OF SECTION 25, TOWNSHIP 8 SOUTH,
RANGE 66 WEST OF THE 6TH P.M., DOUGLAS COUNTY.
PREPARED BY:
MOUNTAIN SURVEYING & MAPPING INC.
8751 E. HAMPDEN AVE. SUITE B-1
DENVER, CO 80231 - (303) 306-1858

Survey Control Diagram

Title Sheet

Project Number: BR 0831 - 085				
Project Location: SH 83 - CASTLEWOOD CANYON BRIDGE				
Project Location:				
Project Code:	Last Mod. Date	Subset Sheets	Sheet No.	Total No. of Sheets
13398	02-02-01	of	1	2



Typical Control
Monument Cap
Not to Scale

BASIS OF BEARING: Bearings used in the calculations of coordinates are based on a grid bearing of N 02°16'59" E from SH 83 CM-MP CONTROL POINT 45.70 and SH 83 CM-MP CONTROL POINT 45.90 as obtained from a Global Positioning System (GPS) survey based on the Colorado High Accuracy Reference Network (CHARN).

BASIS OF ELEVATIONS: Elevations were established by differential leveling using as a reference NSRS HARN Station "MILLER" (SH 83 CM-MP45.90). The Geoid separation was interpolated using NGS GEOID99. The separation was applied to the ellipsoid height of MILLER and was used as the bases of the vertical control for this project.

COORDINATE DATUM: Project coordinates are modified Colorado State Plane Central Zone NAD'83(92). State plane coordinates were modified to a mean project elevation of 2027.400m. The combined elevation/scale factor used to modify the coordinates was 0.9996252964. Project coordinates were truncated by 1,000,000 ft. in the northing and by 3,000,000 ft. in the easting.



CP - Control Point Monuments set by MSM, Inc. They were 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 or Type 5 rock monuments.

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 person named.

SURVEYORS STATEMENT: I, Michael D. Heimbuck, a Professional Land Surveyor in the State of Colorado, hereby state that this Control Survey Diagram was prepared under my direct supervision this 2nd day of March, 2001, 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 and this topographic survey, as shown, meets the minimum horizontal control tolerances of a Type D Survey as listed in the Colorado Department of Transportation Survey Manual Chapter Three (Revised 4/29/92).

CONSTRUCTION SURVEYING AND MONUMENTATION REQUIREMENTS:

- 1). 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 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.

Michael D. Heimbuck, PLS 17488

FILED CERTIFICATION:
DEPOSITED THIS DAY OF 19 AT M., FOR INFORMATION
ONLY IN BOOK OF TH JNTY LAND SURVEYS/RIGHT OF WAY
SURVEYS AT PAGE RECEPTION NUMBER

SIGNED
DEPT.

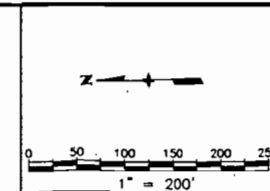


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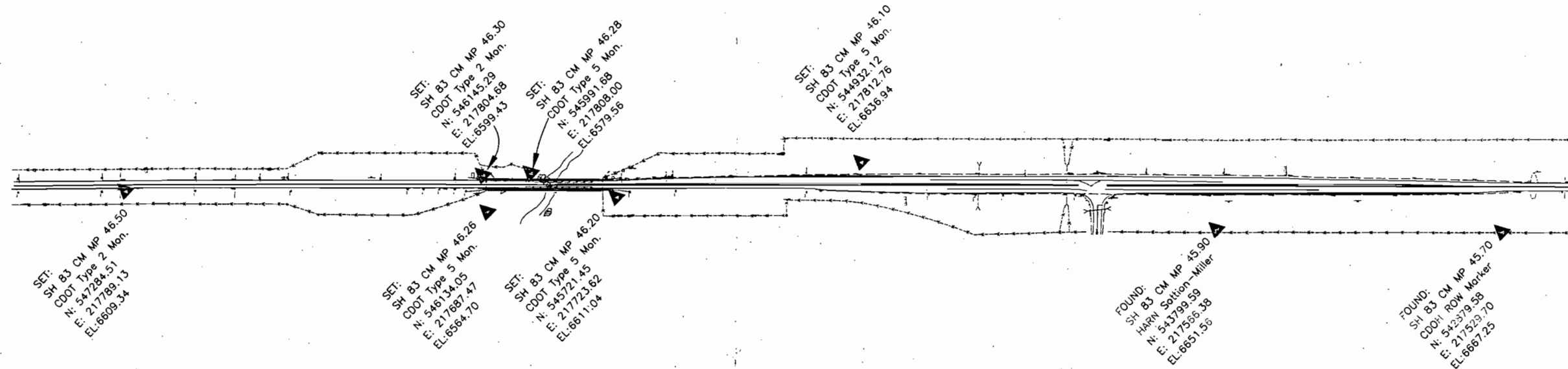
Survey Unit: Joseph P. Conway

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SH 83 MP 45.6 to MP 46.6
A PART OF SECTION 25, TOWNSHIP 8 SOUTH,
RANGE 66 WEST OF THE 6TH P.M., DOUGLAS COUNTY.
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Survey Control Diagram				
Plan Sheet				
Project Number: BR 0831 - 085				
Project Location: SH 83 - CASTLEWOOD CANYON BRIDGE				
Project Location:				
Project Code:	Last Mod. Date	Subset Sheets	Sheet No.	Total No. of Sheets
13398	02-02-01	of	2	2



GEODETIC COORDINATE SUMMARY TABLE
(ADJUSTED FIELD DATA)

POINT NAME	GEODETIC COORDINATES NAD-83(92) (CHARN)		ELLIP. ELEV. (NAVD '88)m	MAPPING ANGLE	SCALE	NAD 83(92) ZONE 0502	
	LATITUDE(N)	LONGITUDE(W)				NORTHING (m)	EASTING (m)
DC GIS Mon. 4.034052	39° 20' 27.33033" N	104° 44' 00.99519" W	2010.413	0° 29' 0.07552"	0.999944650	472434.203	980467.243
DC GIS Mon. 4.061051	39° 18' 09.49982" N	104° 44' 07.83203" W	2042.350	0° 28' 55.76360"	0.999942082	468182.612	980339.303
SH 83 CM MP 45.70	39° 19' 11.47489" N	104° 44' 07.26873" W	2015.103	0° 28' 56.11886"	0.999943182	470093.815	980336.713
SH 83 CM MP 45.90	39° 19' 20.56149" N	104° 44' 06.70365" W	2010.309	0° 28' 56.47525"	0.999943350	470374.128	980347.888
SH 83 CM MP 46.10	39° 19' 31.73037" N	104° 44' 03.44825" W	2005.857	0° 28' 58.52840"	0.999943561	470719.194	980422.956
SH 83 CM MP 46.20	39° 19' 39.53643" N	104° 44' 04.49761" W	1997.964	0° 28' 57.86658"	0.999943709	470959.695	980395.795
SH 83 CM MP 46.30	39° 19' 43.71721" N	104° 44' 03.42094" W	1994.426	0° 28' 58.54562"	0.999943789	471088.833	980420.494
SH 83 CM MP 46.50	39° 19' 54.97395" N	104° 44' 03.49663" W	1997.434	0° 28' 58.49788"	0.999944007	471435.936	980415.756
USC&GS BM - 8337	39° 23' 28.62949" N	104° 45' 09.82778" W	1859.324	0° 28' 16.66352"	0.999948708	478011.173	978773.070

PROJECT COORDINATE SUMMARY TABLE
(ADJUSTED FIELD DATA)

POINT NAME	PROJECT COORDINATES		ELEV(ft)	DESCRIPTION
	NORTH (ft)	EAST (ft)		
DC GIS Monument	550560.88	217958.11	6651.64	4.034052
DC GIS Monument	536606.89	217538.20	6756.37	4.061051
SH 83 CM MP 45.70	542879.58	217529.70	6667.25	CDOT ROW Marker
SH 83 CM MP 45.90	543799.59	217566.38	6651.56	HARN Sattion-Miller
SH 83 CM MP 46.10	544932.12	217812.76	6636.94	CDOT Type 5 Mon.
SH 83 CM MP 46.20	545721.45	217723.62	6611.04	CDOT Type 5 Mon.
SH 83 CM MP 46.30	546145.29	217804.68	6599.43	CDOT Type 2 Mon.
SH 83 CM MP 46.50	547284.51	217789.13	6609.34	CDOT Type 2 Mon.
SH 83 CM MP 46.28	545991.68	217808.00	6579.56	CDOT Type 5 Mon.
SH 83 CM MP 46.26	546134.05	217687.47	6564.70	CDOT Type 5 Mon.

FILED CERTIFICATION: DEPOSITED THIS DAY OF 19 AT M., FOR INFORMATION ONLY IN BOOK OF THE COUNTY LAND SURVEYS/RIGHT OF WAY SURVEYS AT PAGE RECEPTION NUMBER SIGNED DEPT.

COLORADO DEPARTMENT OF TRANSPORTATION

SH 83 - CASTLEWOOD CANYON
MP 45.6 to MP 46.6
CDOT PROJECT # BR 0831-085
SUB-Account # 13398
Douglas County, Colorado

Project Latitude 39°19'20.5615"
Project Longitude 104°44'06.7037"
Project Elevation 2027.4000m
Zone Colorado Central
Scale Factor 0.9999433505
Combined Factor 0.9996252964
Northing Reduction 304800.610m (1,000,000 USfeet)
Easting Reduction 914401.829m (3,000,000 USfeet)
Units are METERS.
Project Lat-Long-Elev. are at DC GIS HARN Pt. "MILLER"

GPS file P:\PROJECTS\CDOT\00096\GPS\13398ctl.gps

Name	Latitude	Longitude	Grid North	Grid East	Ellipsoid	Ortho	Convergence	Scale Fac.	Description
4034	39° 20' 27.33033" N	104° 44' 00.99519" W	472434.203	980467.243	2010.413	2027.424	0° 29' 0.07552"	0.999944650	DC GIS Mon. 4.034052
4061	39° 18' 09.49982" N	104° 44' 07.83203" W	468182.612	980339.303	2042.350	2059.345	0° 28' 55.76360"	0.999942082	DC GIS Mon. 4.061051
4570	39° 19' 11.47489" N	104° 44' 07.26873" W	470093.815	980336.713	2015.103	2032.181	0° 28' 56.11886"	0.999943182	CDOH ROW Marker MP 45.70
4590	39° 19' 20.56149" N	104° 44' 06.70365" W	470374.128	980347.888	2010.309	2027.400	0° 28' 56.47525"	0.999943350	DC GIS HARN Point "Miller" MP 45.90
4610	39° 19' 31.73037" N	104° 44' 03.44825" W	470719.194	980422.956	2005.857	2022.943	0° 28' 58.52840"	0.999943561	CM MP 46.10 - Type 5 Mon.
4620	39° 19' 39.53643" N	104° 44' 04.49761" W	470959.695	980395.795	1997.964	2015.050	0° 28' 57.86658"	0.999943709	CM MP 46.20 - Type 5 Mon.
4630	39° 19' 43.71721" N	104° 44' 03.42094" W	471088.833	980420.494	1994.426	2011.509	0° 28' 58.54562"	0.999943789	CM MP 46.30 - Type 2 mon.
4650	39° 19' 54.97395" N	104° 44' 03.49663" W	471435.936	980415.756	1997.434	2014.532	0° 28' 58.49788"	0.999944007	CM MP 46.50 - Type 2 Mon.
B337	39° 23' 28.62949" N	104° 45' 09.82778" W	478011.173	978773.070	1859.324	1876.459	0° 28' 16.66352"	0.999948708	USC&GS Benchmark "B337" - Brass disk

Points output in METERS:

Name	Project North	Project East	Ortho Height	Description
4034	167811.2918	66433.7648	2027.4240	DC GIS Mon. 4.034052
4061	163558.1080	66305.7773	2059.3450	DC GIS Mon. 4.061051
4570	165470.0275	66303.1858	2032.1810	CDOH ROW Marker MP 45.70
4590	165750.4454	66314.3658	2027.4000	DC GIS HARN Point "Miller" MP 45.90
4610	166095.6408	66389.4615	2022.9430	CM MP 46.10 - Type 5 Mon.
4620	166336.2310	66362.2909	2015.0500	CM MP 46.20 - Type 5 Mon.
4630	166465.4175	66386.9990	2011.5090	CM MP 46.30 - Type 2 mon.
4650	166812.6515	66382.2588	2014.5320	CM MP 46.50 - Type 2 Mon.

Points output in FEET:

Name	Project North	Project East	Ortho Height	Description
4034	550560.8798	217958.1100	6651.6402	DC GIS Mon. 4.034052
4061	536606.8925	217538.2043	6756.3677	DC GIS Mon. 4.061051
4570	542879.5817	217529.7022	6667.2472	CDOH ROW Marker MP 45.70
4590	543799.5862	217566.3820	6651.5615	DC GIS HARN Point "Miller" MP 45.90
4610	544932.1150	217812.7581	6636.9388	CM MP 46.10 - Type 5 Mon.
4620	545721.4513	217723.6161	6611.0432	CM MP 46.20 - Type 5 Mon.
4630	546145.2907	217804.6793	6599.4258	CM MP 46.30 - Type 2 mon.
4650	547284.5076	217789.1274	6609.3437	CM MP 46.50 - Type 2 Mon.