M.P. #72.66 TO M.P. #73.36 ON HWY. #35 (STATE ROUTE #26)
E. 1/2 SEC. 8, N.E. 1/4 SEC. 17, T. 2 S., R. 10 E., WILLAMETTE MERIDIAN
HOOD RIVER COUNTY, OREGON
NOVEMBER 12, 2003

# NARRATIVE

#### **PURPOSE**

THIS IS A MONUMENTATION SURVEY TO SHOW THE HORIZONTAL CONTROL
NETWORK AND ITS RELATIONSHIP TO THE NEW RIGHT OF WAY AND CONTROLLING
CENTERLINE FOR AN OREGON DEPARTMENT OF TRANSPORTATION (ODOT) PROJECT.
THIS SURVEY MEETS THE REQUIREMENTS OF ORS 209,155(2b).

KEY NO:: 09388

PROJECT NAME: HOOD RIVER CANYON ROCKFALL

CONTRACT NO:: 12800

CONTRACT DATE: DECEMBER 12, 2002

CONSTRUCTION PLANS: 35V-124

#### BASIS OF BEARING AND COORDINATES

HELD THE BEARING OF S 5°33'29" E BETWEEN FOUND GPS STATIONS "ROOK" AND "SHER" PER SN 2001 047.

HORIZONTAL CONTROL FOR THIS SURVEY WAS ESTABLISHED BY HOLDING
THE NAD 83/91 STATE PLANE (SP) COORDINATES OF NETWORK CONTROL
STATIONS "ROOK" AND "SHER" (SN 2001 047). THE STATE PLANE COORDINATES
WERE DIVIDED BY 0.99976222 TO REDUCE THEM TO A LOCAL DATUM PLANE (LDP).

### NEW RIGHT OF WAY AND CONTROLLING CENTERLINE

THE NEW RIGHT OF WAY AND CONTROLLING CENTERLINE WERE ESTABLISHED BY HOLDING CALLS SHOWN ON ODOT RIGHT OF WAY MAP 10B-16-21.

#### REFERENCE DOCUMENTS

CORNER NO. 152 SN 2001 047 ODOT RIGHT OF WAY MAP 10B-16-21 (MARCH 2002)

### INDEX

SHEET I-NARRATIVE, QUALITY CONTROL

SHEETS 2 & 3 - PROJECT CONTROL SHEETS

SHEETS 4 & 5 - PROJECT MONUMENTATION SHEETS

#### PROJECT TEAM

FIELD LEADER : J. BERSCHEID

DRAWN BY : S. MUMA

CALCULATED BY : S. MUMA

PROJECT SURVEYOR: F. OBIJIOFOR

STANDARDS : T. TAYLOR

SENIOR SURVEYOR : R. GALLES

SURVEY MANAGER : B. TANDY

#### SPECIAL NOTES

THIS SURVEY WAS PERFORMED USING METRIC MEASURE. TO CONVERT FROM METRIC TO INTERNATIONAL FEET, DIVIDE BY THE FOLLOWING CONVERSION FACTORS:

25.40 MILLIMETERS (mm)/INCH 0.3048 METERS (m)/FOOT

ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE.

WHEN CONVERTING FROM METRIC TO INTERNATIONAL FEET, ALL R/W WIDTHS SHOULD BE ROUNDED TO THE NEAREST FOOT.

THIS SURVEY WAS PREPARED USING HEWLETT-PACKARD PRODUCT NO. 51645A ON CONTINENTAL JPC4M2 POLYESTER FILM.

#### **OUALITY CONTROL**

HORIZONTAL CONTROL WAS ESTABLISHED BY EXECUTING A NETWORK USING FORCED CENTERING METHODS. TWO SETS OF HORIZONTAL ANGLES WERE TURNED AT EACH STATION. THE LENGTH OF EACH LEG OF THE NETWORK WAS DETERMINED BY MEASURING TWO SETS OF SLOPE DISTANCES AND TURNING TWO SETS OF ZENITH (VERTICAL) ANGLES BOTH IN THE AHEAD AND BACK DIRECTION. THE MEAN VALUES OF THE HORIZONTAL ANGLES AND DISTANCES WERE RECORDED AND USED FOR NETWORK COMPUTATIONS.

THE NETWORK WAS ADJUSTED USING THE LEAST SQUARES METHOD, SEE SHEET 2 FOR THE RESULTS OF THE NETWORK COMPUTATIONS.

INSTRUMENT USED:

LEICA TCA 1800 TOTAL STATION

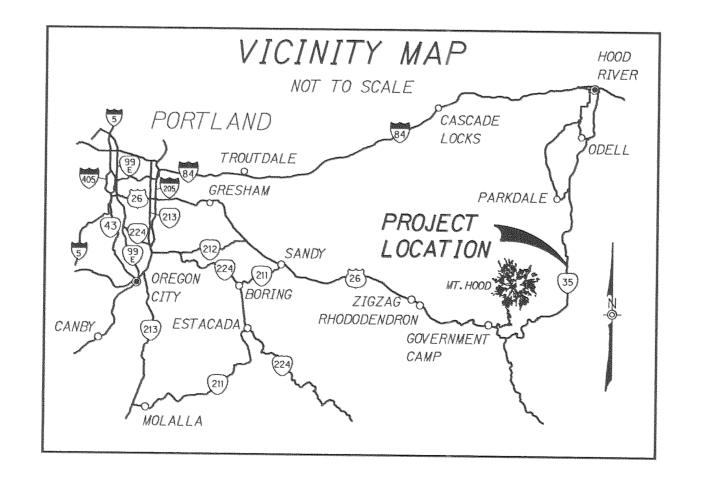
(SER, #4/6520)

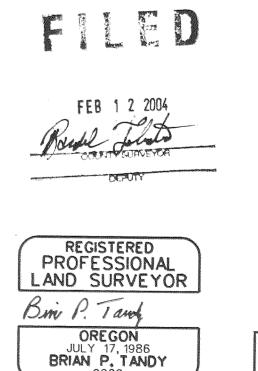
THE TOTAL STATION WAS CHECKED FOR CALIBRATION AND COLLIMATION PRIOR TO EXECUTING THE NETWORK. BASELINE RECORDS AND DETAILS REGARDING NETWORK PROCEDURES ARE ON FILE AT THE ADDRESS BELOW.

A SEARCH FOR SURVEY MONUMENTS WAS MADE WITHIN THE PROJECT LIMITS.
THE HORIZONTAL POSITIONS OF THE FOUND MONUMENTS WERE ESTABLISHED BY
TYING THE MONUMENTS FROM THE HORIZONTAL CONTROL. TWO INDEPENDENT
MEASUREMENTS WERE MADE TO THE MONUMENTS. THE EXTRA MEASUREMENTS
WERE PERFORMED TO INCREASE THE CONFIDENCE AND CREDIBILITY OF
PRESERVING THE MONUMENT LOCATIONS.

ALL PIPE SIZES ARE INSIDE DIAMETER.

A COPY OF THE ORIGINAL FIELD NOTES IS ON FILE AT THE ADDRESS BELOW.





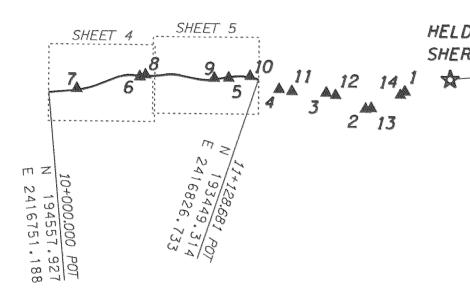
RENEWAL DATE 6-30-2004



GEOMETRONICS
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SHEET 1 OF 5

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HOOD RIVER COUNTY, OREGON
NOVEMBER 12, 2003



HELD

HELD

BASIS OF BEARING ROOK 16 17 18 20

SHER (SN 2001 047) 1579.716 m S 5°33'29" E 15

21

NOTE:

SEE SHEET 3 OF 5 FOR CONFIDENCE LEVEL LIMITS AND NETWORK LINES OF OBSERVATION BEARING TABLES.

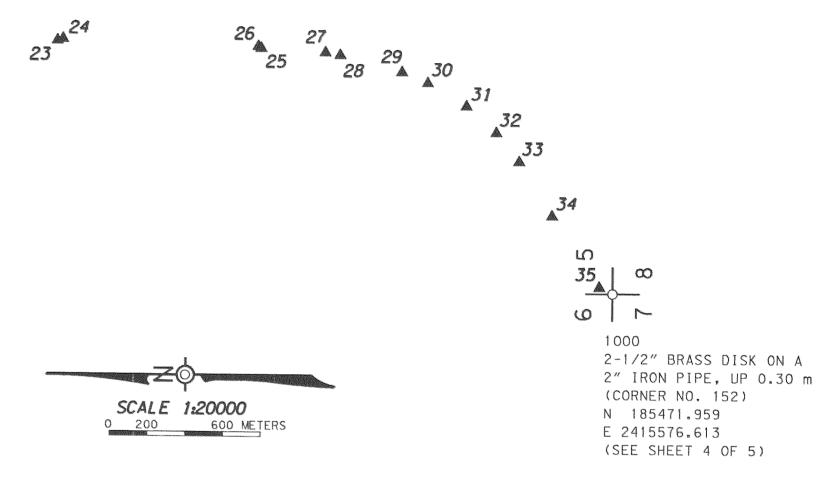
THE CONTROL NETWORK WAS ESTABLISHED IN APRIL AND JUNE OF 2001. CONTROL STATIONS 4 THROUGH 7 WERE RECOVERED NOVEMBER 2003. DUE TO ROAD CONDITIONS CONTROL STATIONS 8 THROUGH 10 WERE NOT RECOVERED. THEY MAY OR MAY NOT HAVE BEEN DESTROYED DURING CONSTRUCTION.

NO FIELD WORK WAS PERFORMED FOR THIS SURVEY. DATA FROM THE 2001 ODOT LOCATION PROJECT WAS USED.

COORDINATES SHOWN ON THIS SURVEY ARE LDP CONVERTED FROM NAD83(91)

### PROJECT NETWORK CONTROL TABLE

PT.	NORTHING	EASTING	DESCRIPTION
1	192672.827	2416769.232	SET 5/8" X 30" IRON ROD WITH 1-1/2" BRASS CAP STAMPED "ODOT CONTROL 1"
2	192879.652	2416676.106	SET 5/8" X 30" IRON ROD WITH 1-1/2" BRASS CAP STAMPED "ODOT CONTROL 2"
3	193089.939	2416759.054	SET 5/8" X 30" IRON ROD WITH 1-1/2" BRASS CAP STAMPED "ODOT CONTROL 3"
4	193339.272	2416775.021	SET 5/8" X 30" IRON ROD WITH 1-1/2" BRASS CAP STAMPED "ODOT CONTROL 4"
5	193607.272	2416833.190	SET 5/8" X 30" IRON ROD WITH 1-1/2" BRASS CAP STAMPED "ODOT CONTROL 5"
6	194077.474	2416835.822	SET 5/8" X 30" IRON ROD WITH 1-1/2" BRASS CAP STAMPED "ODOT CONTROL 6"
7	194409.445	2416770.178	SET 1.17" BRASS PLUG IN CONCRETE WALK ON EAST SIDE OF BRIDGE OVER EAST FORK HOOD R.
8	194047.579	2416846.268	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 8"
9	193683.859	2416831.490	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 9"
10	193493.455	2416843.241	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 10"
11	193272.070	2416765.262	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 11"
12	193040.007	2416746.105	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 12"
13	192849.801	2416679.610	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 13"
14	192696.269	2416750.912	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 14"
15	190703.525	2417006.601	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 15"
16	190721.760	2417016.626	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 16"
17	190509.343	2416982.771	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 17"
18	190495.385	2416992.108	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 18"
19	190180.916	2417030.689	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 19"
20	190148.234	2417038.258	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 20"
21	189546.062	2416937.033	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 21"
22	189515.824	2416945.849	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 22"
23	188424.390	2416899.752	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 23"
24	188394.690	2416907.908	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 24"
25	187347.561	2416865.615	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 25"
26	187362.307	2416874.853	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 26"
27	187006.285	2416844.886	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 27"
28	186927.679	2416831.612	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 28"
29	186600.504	2416743.292	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 29"
30	186462.553	2416687.773	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 30"
31	186256.330	2416566.108	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 31"
32	186096.719	2416426.218	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 32"
33	185973.746	2416274.941	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 33"
34	185796.132	2415986.023	SET MAG NAIL WITH 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 34"
35	185542.416	2415609.694	SET WHITE PLASTIC HUB WITH MAG NAIL & 1-1/4" BRASS WASHER STAMPED "ODOT CONTROL 35"
ROOK	190862.352	2416989.600	FOUND 3" BRASS DISK SET IN CONCRETE STAMPED "ROOK 1994", DOWN 0,15 m (SN 2001 047)
SHER	192434.641	2416836.598	FOUND 3" BRASS DISK SET IN CONCRETE STAMPED "SHER 1994", DOWN 0.20 m (SN 2001 047)



### LEGEND

SET NETWORK STATION AS NOTED FOUND G.P.S. STATION AS NOTED O FOUND MONUMENT AS NOTED



FEB 1 2 2004

PROFESSIONAL LAND SURVEYOR

Bus P. Tandy

OREGON
JULY 17, 1986
BRIAN P. TANDY
2222

RENEWAL DATE 6-30-2004



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SHEET 2 OF 5

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# CONFIDENCE LEVEL LIMITS (95% PROBABILITY LEVEL)

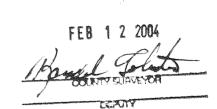
PT#	SEMI MAJOR	SEMI MINOR	ORIENTATION	
PT#  1 2 3 4 5 6 7 8 9 10 112 13 14 15 16 17 18 19 20 12 22 22 22 22 23 31			ORIENTATION  75°31'14" 69°27'55" 86°03'31" 89°02'56" 93°08'50" 92°19'25" 89°22'47" 92°55'02" 92°55'02" 92°55'58" 83°32'06" 67°43'46" 75°10'13" 74°48'49" 38°21'29" 94°01'32" 91°53'50" 86°44'50" 86°11'40" 93°05'46" 92°35'51" 92°35'51" 92°35'51" 92°35'56" 92°35'56" 92°37'56" 92°24'46" 92°34'38" 93°42'40" 94°25'00" 95°57'54"	
32 33 34 35	0.173 m 0.179 m 0.189 m 0.205 m	0.011 m 0.014 m 0.019 m 0.027 m	97°43′45″ 99°37′25″ 103°10′11″ 107°23′38″	

ORIENTATION IS FROM NORTH AZIMUTH

FIXED STATIONS NOT SUBJECT TO LEAST SQUARES ADJUSTMENT OR CONFIDENCE LEVEL ANALYSIS ARE SHER AND ROOK.

## NETWORK LINES OF OBSERVATION BEARING TABLE

FROM	ТО	DISTANCE	BEARING	FROM	ТО	DISTANCE	BEARING
4	2	226.824 m	N 24°14′25″ W	19	20	33.548 m	S 13°02′23″ E
2	3	226.055 m	N 21°31′36″ E	19	21	641.726 m	S 8°23′31″ W
2	13	30.057 m	S 6°41'41" E	19	22	670.481 m	S 7°16′10″ W
2	14	198.053 m	S 22°11′29″ E	20	21	610.621 m	S 9°32′32″ W
3	4	249.844 m	N 3°39′51″ E	20	22	639.125 m	S 8°18′48″ W
3	12	51.584 m	S 14°32′21″ W	21	22	31.496 m	S 16°15′14″ E
3	13	252.939 m	S 18°18′20″ W	21	23	1122.291 m	S 1°54′13″ W
4	5	274.240 m	N 12°14'45" E	21	24	1151.740 m	S 1°26′57″ W
4	11	67.908 m	S 8°15′46″ W	22	23	1092.408 m	S 2°25′06″ W
5	6	470.209 m	N 0°19'15" E	22	24	1121.776 m	S 1°56′18″ W
5	10	114.260 m	S 5°02′48″ E	23	24	30.800 m	S 15°21'22" E
6	7	338.399 m	N 11°11'07" W	23	25	1077.370 m	S 1°48′57″ W
6	9	393.638 m	S 0°37′50″ W	23	26	1062.375 m	S 1°20′35″ W
7	8	369.779 m	S 11°52′29″ E	24	25	1047.983 m	S 2°18′47″ W
8	6	31.667 m	N 19°15′41″ W	24	26	1032.912 m	S 1°50′02″ W
8	9	364.020 m	S 2°19'36" W	25	26	17.401 m	N 32°04′02″ E
9	5	76.606 m	S 1°16′18″ E	25	27	341.904 m	S 3°28′33″ W
9	10	190,767 m	S 3°31′54″ E	25	28	421.256 m	S 4°37′47″ W
10	4	168.601 m	S 23°52′03″ W	26	27	357.281 m	S 4°48′41″ W
10	11	234.717 m	S 19°24'14" W	26	28	436.773 m	S 5°40′54″ W
11	3	182.236 m	S 1°57′07″ W	27	28	79.719 m	S 9°35′07″ W
11	12	232.852 m	S 4°43′09″ W	27	29	418.306 m	S 14°03′22″ W
12	13	201.494 m	S 19°16′09″ W	28	29	338.887 m	S 15°06′24″ W
12	2	174.967 m	S 23°34′56″ W	28	30	486.859 m	S 17°11′02″ W
13	4	498.684 m	N 11°01'48" E	29	30	148.704 m	S 21°55′21″ W
13	14	169.280 m	S 24°54′38″ E	29	31	387.105 m	S 27°14′23″ W
13	1	198.373 m	S 26°51′30″ E	30	31	239.438 m	S 30°32'21" W
14	1	29.752 m	S 38°00′30″ E	30	32	449.718 m	S 35°33′47″ W
14	SHER	275.303 m	S 18°08′03″ E	31	32	212.238 m	S 41°13′58″ W
15	16	20.809 m	N 28°48′05″ E	31	33	405.749 m	S 45°51'25" W
15	17	195.638 m	S 6°59′47″ W	32	33	194.954 m	S 50°53′33″ W
15	18	208.644 m	S 3°58′59″ W	32	34	533.032 m	S 55°40′22″ W
16	17	215.097 m	S 9°03′20″ W	32	35	986.896 m	S 55°49'45" W
16	18	227.699 m	S 6°10′53″ W	33	34	339.146 m	S 58°25'07" W
17	18	16.794 m	S 33°46′43″ E	34	35	453.868 m	S 56°00'46" W
17	19	331.904 m	S 8°18′03″ E	ROOK	15	159.734 m	S 6°06′35″ E
17	20	365.348 m	S 8°44′08″ E	ROOK	16	143.166 m	S 10°52′52″ E
18	19	316.826 m	S 6°59′40″ E	SHER	ROOK	1579,716 m	S 5°33'29" E
18	20	350.205 m	S 7°34'21" E	SHER	1	247.529 m	N 15°47′32″ W



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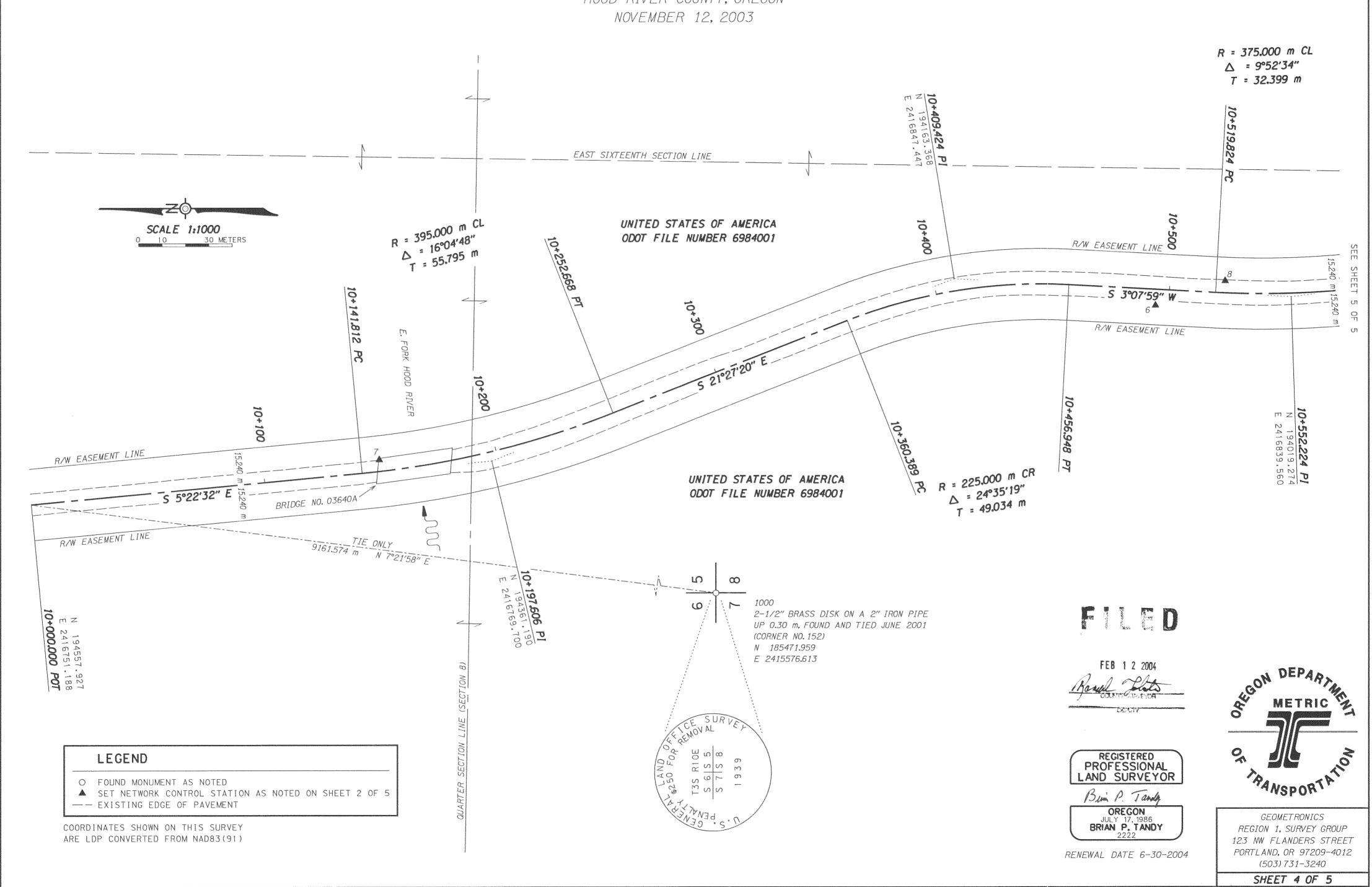
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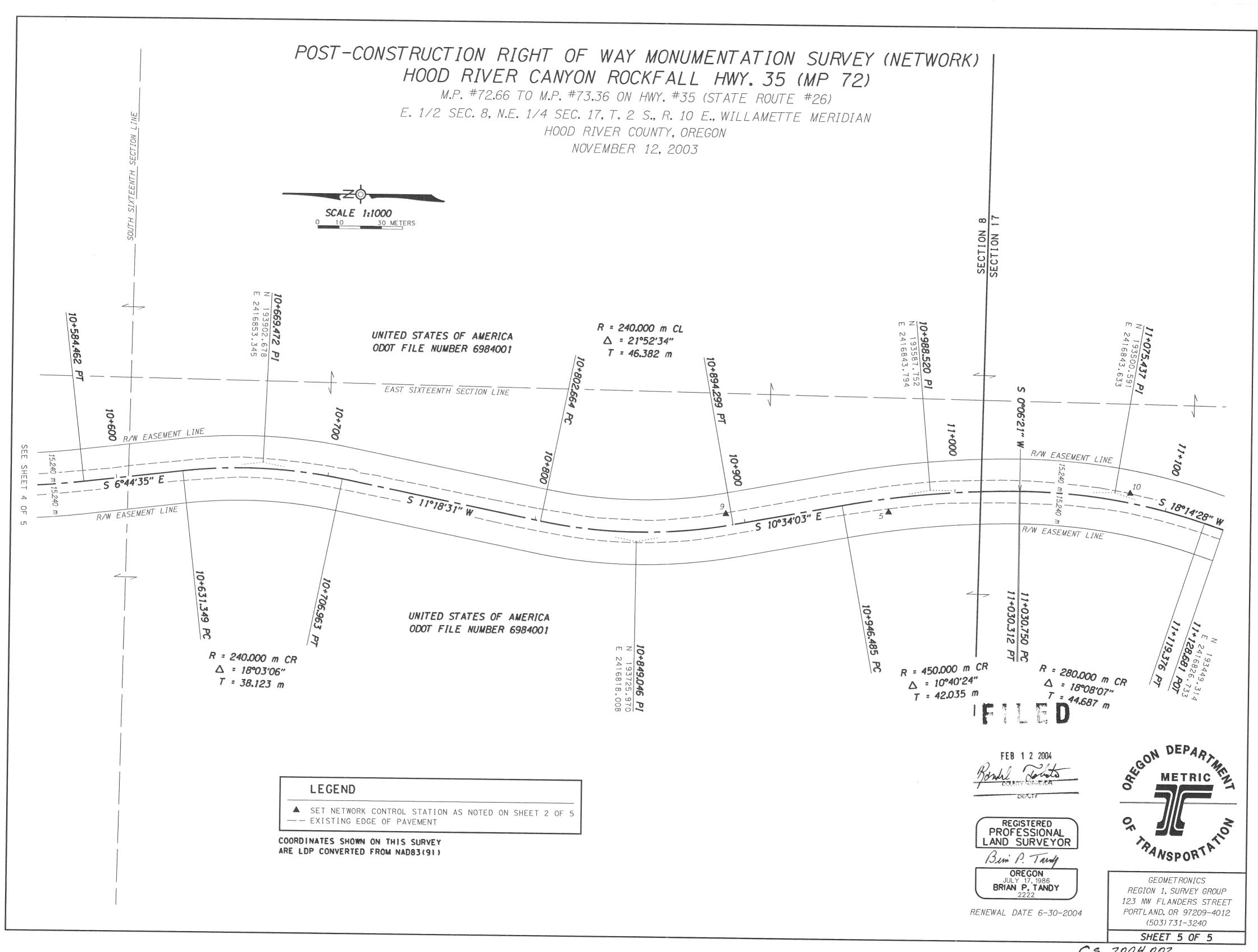
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CS 2004 00Z (5)



CS 200400Z