

Rec'd 5-14-03

Transmittal



To: Hood River County Surveyor
918 18th St.
Hood River, OR 97031

Date: May 12, 2003
Project No.: 2002-19
Project Name: 2002 Metro

RE: Photo control report of survey

Number	Description
2	Reports of survey for photogrammetric control

Comments:

Enclosed is a report of survey for mapping control per ORS 209.250.5b performed for METRO through Spencer B Gross, Inc.

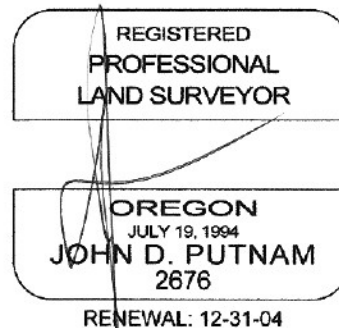
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May 11, 2003

Report of Photo Control Survey

The purpose of this survey was to provide ground control for Metro's 2002 small-scale orthometric mapping project. The resulting control is not meant to be a densification of existing geodetic control and is for use only with this project. Coordinates are in the Oregon Coordinate System of 1983, North Zone and are based on the North American Datum of 1983[98], the North American Vertical Datum of 1988 and GEOID 1999. The project included 16 pre-marked photo control panels and nine (9) post photo identification points located in eight Oregon counties. No permanent monuments were set at the control stations and all non-painted targets were removed. Static & real time kinematic GPS observations were collected between July 9th and October 28th, 2002 by John D Putnam, P.L.S, Philip M Harbour and Mark Olsen utilizing Trimble 5700 and 4800 geodetic grade receivers. The stations were tied into five National Geodetic Service (NGS) Continuous Operating Reference Stations (CORS), seven geodetic control stations from the NGS's National Spatial Reference System (NSRS) control stations and two Yamhill County control stations. The two Yamhill County control stations are based on NAD1983[91] which is shifted from five (5) to seven (7) centimeters in the project area. For the purposes of this project this shift is within acceptable tolerances. These control stations were used only for the two (2) post photo identification points located in Yamhill County. The field data was processed and adjusted in Trimble Geomatic Office suite by John D Putnam, P.L.S. The resulting photo control stations meet the specifications for the National Geodetic Reference System Group C, Order 3.



NGS CORS:

Station	Latitude	Longitude	Ellipsoid Height m	Northing m	Easting m	Ortho. Elev. m	Combined Factor	Convergence
GWEN	45°46'57.462"N	121°19'39.167"W	732.7	235464.2	2435649.2	753.7	0.999837332	-0°35'12.8"
MCSO SURVEYOR	44°58'25.702"N	122°57'20.640"W	53.2	148194.5	2306334.1	76.2	0.999892018	-1°44'29.7"
WACO	45°25'49.230"N	122°34'10.195"W	40.6	198057.0	2338085.8	63.4	0.999898626	-1°28'03.6"
	45°31'23.211"N	122°59'25.845"W	52.4	209291.6	2305473.6	75.2	0.999905480	-1°45'58.5"

WDBN 45°10'15.095"N 122°52'12.133"W 40.2 169880.2 2313732.7 63.2 0.999888299 -1°40'50.9"

NGS Control:

Station	Latitude	Longitude	Ellipsoid Height m	Northing m	Easting m	Ortho. Elev. m	Combined Factor	Convergence
1S4 B	45°45'56.466"N	122°51'32.225"W	-13.9	235930.2	2316533.5	8.6	0.999951039	-1°40'22.6"
BANKS	45°36'37.019"N	123°06'54.889"W	42.1	219281.8	2296047.9	64.3	0.999917668	-1°51'16.9"
ESTACADA	45°17'54.707"N	122°19'57.144"W	131.7	182965.1	2356289.4	154.3	0.999876535	-1°17'58.6"
F 609	45°28'29.307"N	122°23'46.923"W	118.9	202664.7	2351744.6	141.6	0.999890222	-1°20'41.6"
KENNEMER	45°20'38.297"N	121°56'40.561"W	413.5	187397.1	2386798.9	435.0	0.999834539	-1°01'28.2"
REST 26	45°47'48.463"N	123°27'39.882"W	415.9	240927.3	2269848.9	436.5	0.999889600	-2°05'59.8"
SCOGGINS AZ MK	45°28'08.941"N	123°12'14.065"W	77.7	203833.7	2288611.4	99.4	0.999896143	-1°55'03.3"

Yamhill County Control:

Station	Latitude	Longitude	Ellipsoid Height m	Northing m	Easting m	Ortho. Elev. m	Combined Factor	Convergence
S2	45°22'11.121"N	123°14'13.402"W	44.7	192881.6	2285646.6	66.3	0.999893723	-1°56'27.9"
S61	45°14'54.372"N	123°01'23.283"W	23.4	178861.0	2301973.3	46.0	0.999891886	-1°47'21.7"

Photo Panel Stations:

Station	Latitude	Longitude	Ellipsoid Height m	Northing m	Easting m	Ortho. Elev. m	Combined Factor	Convergence	County	P.L.S.S.
1001	45°46'24.952"N	123°23'59.184"W	451.8	238177.9	2274519.2	472.5	0.999879613	-2°03'23.3"	Tillamook	2T3NR3W
1002	45°45'19.233"N	123°02'51.045"W	368.4	235226.6	2301836.7	390.3	0.999889343	-1°48'24.0"	Washington	10T3NR3W
1003	45°46'06.468"N	122°46'13.938"W	-13.0	236041.8	2323416.6	9.5	0.999951406	-1°36'36.8"	Columbia	2T3NR1W
1004	45°37'00.007"N	123°23'22.484"W	413.3	220719.8	2274687.9	434.0	0.999860435	-2°02'57.3"	Tillamook	35T2NR6W
1005	45°28'31.733"N	123°11'48.896"W	75.7	204518.6	2289181.2	97.5	0.999897037	-1°54'45.4"	Washington	20T1SR4W
1006	45°21'16.246"N	122°59'25.170"W	419.8	190563.4	2304910.8	442.4	0.999834127	-1°45'58.0"	Yamhill	31T2SR2W
1009	45°01'58.260"N	122°44'04.913"W	72.1	154247.0	2323942.4	95.1	0.999886105	-1°35'05.3"	Marion	19T6SR1E
1010	44°55'39.845"N	122°32'18.036"W	724.2	142161.2	2339113.8	746.7	0.999790054	-1°26'44.0"	Marion	26T7SR2E
1011	44°58'50.895"N	122°28'56.020"W	274.3	147946.3	2343686.8	296.8	0.999857005	-1°24'20.8"	Clackamas	7T7SR3E
1013	45°08'27.576"N	122°14'06.388"W	1003.1	165294.3	2363553.1	1025.1	0.999737729	-1°13'49.9"	Clackamas	18T5SR5E
1014	45°17'51.028"N	122°10'47.695"W	527.7	182591.4	2368254.3	549.9	0.999814524	-1°11'28.9"	Clackamas	22T3SR5E
1015	45°21'35.954"N	122°08'19.530"W	403.0	189466.8	2371622.4	425.1	0.999837079	-1°09'43.9"	Clackamas	25T2SR5E
1017	45°30'25.544"N	121°47'16.016"W	951.2	205314.9	2399375.2	972.4	0.999763151	-0°54'47.8"	Hood River	2T1SR8E
1018	45°39'59.579"N	121°53'44.101"W	17.1	223173.0	2391258.7	38.8	0.999929638	-0°59'23.0"	Hood River	12T2N7E
1019	45°06'24.436"N	122°45'50.490"W	37.1	162524.2	2321862.7	60.2	0.999889351	-1°36'20.2"	Marion	24T5SR1W
1020	44°59'56.766"N	122°36'50.246"W	454.9	150242.1	2333354.4	477.7	0.999827749	-1°29'57.1"	Marion	31T6SR2E

BUTEMAN (KWBZ)
 Lost Lake 2
 Spur Road
 Hwy 30, BUTEMAN
 REGULATION
 ON ROUTE 575

Post Identification Stations:

Station	Latitude	Longitude	Ellipsoid Height m	Northing m	Easting m	Ortho. Elev. m	Combined Factor	Convergence	County	P.L.S.S.
21	45°14'40.934"N	123°02'26.446"W	33.4	178489.6	2300583.7	55.9	0.999890238	-1°48'06.5"	Yamhill	3T4SR3W
23	45°23'01.294"N	123°16'10.260"W	78.1	194516.1	2283158.5	99.5	0.999889381	-1°57'50.8"	Yamhill	23T2SR5W
24	45°30'17.375"N	121°48'13.070"W	1031.9	205082.6	2398132.9	1053.1	0.999750287	-0°55'28.3"	Hood River	10T1SR8E
25	45°39'02.493"N	123°07'39.954"W	50.1	223802.0	2295218.0	72.1	0.999922109	-1°51'48.9"	Washington	24T2NR4W
26	45°17'40.168"N	122°20'05.390"W	132.3	182520.5	2356099.6	155.0	0.999876274	-1°18'04.5"	Clackamas	20T3SR4E
27	45°29'11.048"N	122°21'18.458"W	143.6	203878.0	2354997.8	166.3	0.999887449	-1°18'56.3"	Multnomah	18TT1SR4E
1004a	45°37'00.100"N	123°23'22.912"W	412.8	220723.0	2274678.8	433.4	0.999860529	-2°02'57.6"	Tillamook	35T2NR6W
1004b	45°37'00.356"N	123°23'22.903"W	412.8	220730.9	2274679.2	433.4	0.999860538	-2°02'57.6"	Tillamook	35T2NR6W
1016	45°20'39.958"N	121°56'43.345"W	412.6	187449.4	2386739.2	434.1	0.999834701	-1°01'30.1"	Clackamas	4T3SR7E