

SURVEY NARRATIVE

**COUNTY SURVEYORS FILE DATA
DO NOT REMOVE FROM OFFICE**

FILED
Date: 10-19-2010 By: JC
This survey consists of:
Map: ST HWY
Narrative: IS-024
Corner Rpt: A-60
**DOUGLAS COUNTY
SURVEYOR**

LEGEND	
SB	SOUTH BOUND
NB	NORTH BOUND

THE PURPOSE OF THIS SURVEY IS TO RESOLVE THE CENTERLINE AND RIGHT OF WAY LOCATION OF OREGON STATE HIGHWAY 1-5 BETWEEN APPROXIMATE MILE POST 71.9 AND 81.0 IN DOUGLAS AND JOSEPHINE COUNTY, OREGON.

THE GPS PORTION OF THIS SURVEY WAS COMPLETED IN JULY, 2008. GPS SESSIONS WERE OBSERVED USING TWO LEICA SYSTEM 1200 DUAL FREQUENCY GPS RECEIVERS, MODEL GRX1230, ANTENNA MODEL AX1202. THE SYSTEM 1200 HAS A STATED ACCURACY SPECIFICATION OF FIVE MILLIMETERS PLUS ONE PART PER-MILLION WHEN USED IN STATIC OR RAPID STATIC POST-PROCESSING MODE. STATIC TIES WERE MADE FOR THE PROJECT FROM THREE CONTINUOUSLY OPERATING REFERENCE STATIONS. EACH OF THE STATIONS IN THE GPS NETWORK WERE OCCUPIED TWO OR MORE TIMES. ODOT GEOMETRONICS STAFF COMPLETED ALL OF THE OBSERVATIONS.

ANALYSIS AND ADJUSTMENT PROCEDURES ARE SUMMARIZED AS FOLLOWS. THE HORIZONTAL POSITIONS FOR THE SURVEY ARE BASED ON REFERENCE ELLIPSOID WGS84 AND NAD83 (CORS96) (EPOCH 2002.0) PUBLISHED VALUES FOR OREGON DEPARTMENT OF TRANSPORTATION - GPS NETWORK STATIONS "CENTRAL POINT", "GRANTS PASS" AND "SHUHS". ALL ORTHOMETRIC HEIGHTS WERE ESTABLISHED USING DIFFERENTIAL LEVELING WITH A LEICA DNA 10 DIGITAL LEVEL, CONSTRAINING TO NGS BENCH MARKS.

ALL POST PROCESSING INCLUDING CONVERSION TO THE OREGON STATE PLANE COORDINATE SYSTEM WAS USING VERSION 6.0 OF LEICA GEO OFFICE SOFTWARE. LEICA GEO OFFICE CALLS A THIRD PARTY LEAST SQUARES ADJUSTMENT ROUTINE IDENTIFIED AS "MOVE 3" VERSION 3.4. AN ADJUSTMENT WAS APPLIED TO A NETWORK OF 85 BASELINES.

- POSITIONAL ACCURACIES ARE RELATIVE TO THE FIXED POINTS AND ARE STATED AT A 95% CONFIDENCE LEVEL. SUPPORTING DATA FOR THIS SURVEY IS LOCATED IN FILE 14990 OF THE ODOT GEOMETRONICS UNIT, SALEM, OREGON.

UNLESS NOTED, ALL MONUMENTS REFERENCED ARE BRASS CAPS ON 5/8" x 30" RE-BAR, ALUMINUM CAPS ON 2" ALUMINUM ROD, OR R.R. SPIKE IN CONCRETE. ALL CENTERLINE CALCULATIONS ARE PRIMARILY FROM RECORD DATA, ODOT 8B-30-1, ODOT 8B-29-21, CS 076-97 & CS 077-97, UNLESS NOTED OTHERWISE.

GOVERNMENT SECTION AND QUARTER SECTION LINES:

THERE ARE A NUMBER OF FOUND MONUMENTS THAT EITHER ARE IDENTIFIED AS THE SECTION CORNERS PER RECORDS OF SURVEY FOR INDIVIDUAL LAND OWNERS OR PER OREGON STATE PARKS FOREST WAYSIDE SURVEYS OR CADASTRAL SURVEYS FOR THE SUBDIVISION OF SECTION 35, TOWNSHIP 33 SOUTH RANGE 06 WEST. ADDITIONAL SURVEYS BY STATE PARKS INDICATE FOUND MONUMENTS ALONG THE RIGHT OF WAY OF THE STATE HIGHWAY AS WELL AS QUARTER SECTION MONUMENTS WITHIN THE HIGHWAY RIGHT-OF-WAY. THE FOLLOWING MONUMENTS ARE THE MONUMENTS HELD FOR THE DETERMINATION AND PLACEMENT OF THE SECTIONS INCLUDED IN THIS HIGHWAY RETRACEMENT:

TOWNSHIP 33 SOUTH RANGE 6 WEST:

- POINT *1094, FOUND IRON ROD, SECTION CORNER FOR 11-12-13-14, AS SHOWN ON ODOT ROLL MAP 8B-30-1, CS 110-76, CS 076-094 AND CS 45-2002 (SEE SHEET 15 OF 33)
 - POINT *1108, FOUND 3-1/2" BRASS CAP STAMPED SECTION CORNER 22-23-26-27 (SEE SHEET 23 OF 33)
 - POINT *1112, FOUND 3-1/2" BRASS CAP STAMPED 1/4 SECTION 26-35 (LOCATED OFF OF THE WORKING DRAWINGS)
 - POINT *1020, FOUND 2 -1/2" BRASS DISK STAMPED 1/4 SECTION 35 (SEE SHEET 27 OF 33)
 - POINT *1038, FOUND 2" IRON PIPE, STAMPED 1/4 CORNER SECTION 2 & 3 (SEE SHEET 31 OF 33)
 - POINT *1050, FOUND 2-1/2" BRASS CAP (SEE SHEET 32 OF 33)
- THE ADDITIONAL MONUMENTS FOUND PER RECORD SURVEYS TO GIVE SECTION LINE ORIENTATION AND LOCATION ARE AS FOLLOWS:
POINTS *1021 & 1028, MONUMENTS SET PER OREGON STATE PARKS, CS 218-88, 1/16 CORNER T33S R06W SECTION 2.
POINTS *10999, 11005, 11007, 1130 & 1022, MONUMENTS PER OREGON STATE PARKS, CS 148-89, 1/4 CORNERS AND RIGHT OF WAY MONUMENTATION AS INDICATED.
POINT *1129, MONUMENTS PER OREGON STATE PARKS, CS 1/4 CORNER SECTION 26 AND RIGHT OF WAY MONUMENTATION AS INDICATED.
POINTS *1015 & 1016, MONUMENTS PER OREGON STATE PARKS, CS 100-089, 1/4 SECTION LINE AT THE HIGHWAY RIGHT-OF-WAY LINE.

PROJECT NORTH LIMITS AT NORTH BOUND STA. 440+00 THROUGH PT 475+95.20 (SHEETS 7 THRU 9):

THE ALIGNMENT REPORT INDICATES THERE WAS NO MONUMENTATION FOUND ALONG THE CENTERLINE OF THE HIGHWAY TO DETERMINE THE RECORD LOCATION. ALL MONUMENTATION FOUND WAS ALONG THE RIGHT-OF-WAY AND WAS USED TO CONFIGURE THE ODOT 8B-30-21 ODOT MAPPING. FOUND MONUMENTS 1118 AND 1120 WERE INVERSED BETWEEN TO FIND THEY WERE SET WITHIN 0.02' OF RECORD OFFSET TO CENTERLINE. THIS LOCKED IN THE ONE LOCATION OF THE TANGENT FOR THIS FIRST SPIRAL. FOUND MONUMENT 1119 WAS THEN HELD TO USE THE RECORD OFFSET OF 334 FEET TO CENTERLINE AND A TENTATIVE TANGENT WAS CREATED. HOLDING A STATION OF 442+00 AT THE OFFSET FROM MONUMENTS 1118 & 1120, THE END OF THE TANGENT WAS ESTABLISHED AT STATION 447+94.78 USING THEN THE ALREADY ESTABLISHED TANGENT AT THE 21' OFFSET IN THE RESOLVE "CENTERLINE RESOLVE BETWEEN STATIONS PT 475+95.20 AND STATION PS 523+75.84." THE SPIRAL BETWEEN THE P.S 447+94.78 THROUGH P.T. 475+95.20 WAS THEN CREATED AND REVIEWED. THERE WAS A PROBLEM WITH RECORD DATA AND FOUND MONUMENTATION FITTING THE SPIRAL END POINT STATIONING. THE END OF THE SPIRAL WAS NOT FITTING THE END LOCATION AT THE 21' OFFSET BY A DISTANCE OF 1.97'. THE ENDING STATION OF THIS PRELIMINARY SPIRAL ENDED AT 475+97.17 WHICH WAS PER RECORD TO BE 475+95.20. AS A RESULT THE RECORD CENTRAL CURVE DATA WAS HELD AND FOUND TO BE 2 FEET TOO LONG IN THE ARC LENGTH WHEN COMPARING CALCULATION DATA TO RECORD LOCATION. (RECORD LENGTH WAS AT THE PSC STA 452+94.78 TO PCS STA 470+95.20 OF 1800.42'). BUT USING THE RECORD DATA OF 4" CR AND SPIRALS OF 500' THE LENGTH OF THE CENTRAL CURVE IS 1801.39' AND A CENTRAL ANGLE WAS 72°03'20" RATHER THAN THE CALC'D DATA THAT SHOULD BE 72°01'01". THIS COMPARISON WHEN RESOLVING THE ARC LENGTH OF 0.96' AND MOVING THE SPIRAL ENDS TO THE 21 FOOT OFFSET ADDED IN FINDING THE ERROR TO BE ONLY 1.04 FEET. AGAIN THE ADJUSTMENT HAD TO BE MADE TO GET THE TANGENT LOCATIONS TO FIT PER RECORD FOUND MONUMENTATION. IN ORDER TO GET THE CENTRAL ANGLE LENGTH AND TANGENT LOCATIONS TO FIT PER RECORD DATA, THE ERROR WAS THROWN INTO THE SPIRAL LENGTHS, RESULTING IN FINAL SPIRAL LENGTHS TO BE 499.32' INSTEAD OF THE RECORD 500.00'. WITH THIS RESULTING CHANGE THE STATIONING WAS ALTERED AT THE 21' ALIGNMENT OFFSET TO BE 475+93.84 INSTEAD OF THE RECORD 475+95.20 (A VARIATION OF 1.36') AND AN EQUATION STATION WILL BE CREATED AT THIS ENDING SPIRAL PT. THE ERROR WOULD HAVE BEEN THROWN INTO THE TANGENT LENGTHS, BUT DUE TO THE 21' ALIGNMENT SHIFT, AND THE FOUND MONUMENTATION AT THIS SHIFT (FOUND MONUMENTS 1085, 1088 & 1087), THE ERROR HAD TO BE ADJUSTED WITHIN THE SPIRAL LENGTHS. FOUND MONUMENTS *1086 AND *1089 WERE SET PER CS 076-97 AND ARE STAMPED WITH REFERENCE TO THE "SOUTH BOUND LINE" OF THE HIGHWAY ALIGNMENT. ONLY THE NORTH BOUND "NB" ALIGNMENT HAS BEEN RESOLVED WITHIN THIS RETRACEMENT SURVEY.

CENTERLINE RESOLVE BETWEEN STATIONS PT 475+95.20 AND STATION PS 523+75.84 (SHEETS 9 THRU 11):

ALIGNMENT 2 IN .ALG REPORT INCLUDES 3 FULL SPIRALS AND THE DATA REFERRED TO IN OTAK CS 076-97 HAS THE SAME MATHEMATICAL RELATIONSHIP AS IDENTIFIED IN ODOT 8B-30-1. FOUND MONUMENTATION SET BY OTAK IN 1997 WAS USED TO FIND THE RELATIONSHIP OF CENTERLINE TO THE RECORD DATA (CS 076-97). ALL MONUMENTATION FIT IN INVERSE LOCATIONS BETWEEN 0.02' IN THE TANGENTS AND 0.23' OF THE 4268 FEET ALONG THIS SECTION OF RECORD DATA. NEW ALIGNMENT BETWEEN THESE STATIONS IS THEN CALCULATED AND THE RESULTING STATION COMPARED WITHIN 0.01'.

523+75.84 THROUGH 541+53.94 CENTERLINE RESOLVE (SHEETS 11 THRU 12):

WITHIN ALIGNMENT 3 IN .ALG REPORT, THIS SEGMENT OF RESOLVE WAS COMPLETED AFTER THE PREVIOUS SEGMENT (475+95.20) AND THE SEGMENT 541+75.84 WERE COMPLETED. DUE TO THE LOCATION OF THE RECOVERED MONUMENTATION HELD, THIS SEGMENT WAS COMPLETED USING THE RESOLVED TANGENTS AND THE RECORD DATA FROM ODOT 8B-30-1 TO COMPLETE THE ONE SPIRAL. THE 21' OFFSET IN ALIGNMENT PER RECORD WAS ESTABLISHED AND CONFIRMED USING THE FOUND MONUMENTS 1071 THRU 1076 PER CS 076-97.

541+53.94 P.T. THROUGH 635+02.04 P.S. CENTERLINE RESOLVE (SHEETS 12 THRU 17):

- USING FOUND MONUMENTS AT 541+53.94 (1091 & 1092), AND 576+17.24 (1006 & 1007), AS WELL AS MONUMENTS IDENTIFIED AS STATION OFFSETS ALONG THE ALIGNMENT, A BEST FIT FOR THE TANGENT COULD BE ESTABLISHED.
- USING FOUND MONUMENTS AT 635+02.73 PS (1043) AND 610+06.01 PT (1047) THIS TANGENT LENGTH MATCHED RECORD DISTANCE BY 0.02', THESE MONUMENTS WERE HELD AS CORRECT.
- USING FOUND MONUMENTS AT 565+57.50 PT (STATION OFFSET MONUMENTS 1203 & 1003) AND 576+17.24 PS (STATION OFFSET MONUMENTS 1006, 1007, AND 1302), THIS TANGENT LENGTH MATCHED RECORD TO WITHIN 0.4', THESE MONUMENTS WERE HELD AS CORRECT.
FROM THE RESOLVED TANGENTS, THE P.I. FOR THE SPIRAL CURVES WERE CREATED; THESE INTERSECTING TANGENT LINES WERE COMPARED AGAINST RECORD. FOUND PI MONUMENT POINT *1090 WAS COMPARED AGAINST THE PI INTERSECTION CREATED. RECORD DATA TO THE CALCULATED INTERSECTION MISSED BY 1.59 FEET. DUE TO THE OVERWHELMING ACCURACY OF THE STATION OFFSET MONUMENTS, THE CALCULATED PI LOCATION WAS HELD (THIS WAS TEMPORARILY HELD UNTIL THE REMAINING PI LOCATIONS AND SPIRAL DATA WAS COMPLETED). THE 3 SPIRAL CURVES THROUGH THIS SEGMENT COULD THEN BE COMPUTED USING THE ODOT 8B-30-1 RECORD SPIRAL CURVE DATA. THE TANGENTS WERE AGAIN CHECKED FOR LENGTH AND ADJUSTED TO MATCH RECORD WHERE POSSIBLE. THE FINAL RESOLVE FOR THIS SECTION HAS THREE SPIRAL CURVES MATCHING RECORD DATA. THE TANGENTS ARE HELD BY FOUND MONUMENTATION AND THE TOTAL LENGTH OF THIS SECTION VARIES FROM RECORD BY 0.36'.

635+02.04 P.S. THROUGH 686+45.10 PT THROUGH THE 20' ALIGNMENT SHIFT AT 645+09.42 CENTERLINE RESOLVE (SHEETS 17 THRU 18):

WITHIN ALIGNMENT 3 & 4 IN ALIGNMENT REPORT USING THE TANGENT CREATED IN THE 541+53.94 RESOLVE AND THE RECORD OFFSETS FOR THE 4 FOUND RIGHT-OF-WAY MONUMENTS AT RECORD STATION 642+59.40 AND 645+09.43, THE PT LOCATION FOR THE SPIRAL WAS CALCULATED; THE MONUMENTS FIT RECORD INVERSE VALUES WITHIN 0.07'. USING RIGHT-OF-WAY MONUMENTS 1103 & 1104 FOUND AT STATION 686+43.96 LOCATED AT THE END OF THE 4134.56' TANGENT, THIS PT WAS THEN CREATED AT RECORD DISTANCES FROM RIGHT-OF-WAY. THE 20' ALIGNMENT SHIFT LOCATED AT STATION 645+09.40 WAS THEN ESTABLISHED AS THE P.O.T. AFTER CREATING THIS 4134.56' RECORD TANGENT; THE CALCULATED TANGENT WAS FOUND TO BE 4134.76', 0.20' LONGER THAN RECORD. THIS NUMBER WILL CHANGE ONCE THE SPIRAL ALONG THE NEXT RESOLVE 686+43.96 PS THROUGH 230+78.20 PS IS DETERMINED.

THIS IS TO CERTIFY THAT THIS MAP WAS PREPARED USING HP DESIGNJET 1055CM, BLACK C4820g INK ON HP MATTE FILM #51642B.



FILE NAME: 16763RET.DGN



**DAVID EVANS
AND ASSOCIATES INC.**
530 CENTER STREET NE, SUITE 605
SALEM OREGON 97301
PHONE: 503.361.8635

REGISTERED
PROFESSIONAL
LAND SURVEYOR
Jon K. Broadwater
OREGON
JULY 11, 2006
JON KENNETH BROADWATER
61360LS
EXPIRES: 12/31/2011

OREGON DEPARTMENT OF TRANSPORTATION

HORIZONTAL CONTROL, RECOVERY, AND RETRACEMENT SURVEY
I-5: JUMPOFF JOE-GLENDALE PAVING AND CLIMBING LANES
GLENDALE TO SUNNY VALLEY
JOSEPHINE AND DOUGLAS COUNTIES

ODOT REGION 3 WHITE CITY
100 ANTELOPE ROAD
WHITE CITY, OREGON 97503

SEPTEMBER 28, 2010
SCALE: NO SCALE
SHEET 4 OF 33

ST. HWY. I 5 -024 D