## The Issue:

#### Common Property/Lot Boundary Dispute Between:

Lots 14 & Lot 15, within Area 1, of Colt Island Recreational Development (recorded as plat #75-11, Juneau Recording District), within United States Survey 1755. Line disputed: the most southerly property line of Lot 15, common to the most northerly property line of Lot 14.

#### Surveys in Disagreement:

A Record of Survey of Lot 15, conducted by R&M Engineering, Inc., Juneau, Alaska, and signed and stamped by by Mark Johnson, PLS, on December 7, 2012, and recorded on December 7, 2012, as plat #2012-32, Juneau Recording District.

A Record of Survey of Lot 14, conducted by J.W. Bean, Inc., Professional Surveyor, Juneau, Alaska, signed and stamped by J. W. Bean, PLS, and recorded on October 8, 2014, as plat # 2014-46, Juneau Recording District.

Expert Analysis of Record of Surveys vis-à-vis
Historic/Recorded, Plats, Maps and Surveys, and the
Dimensions, Bearings and Distances Shown Upon
Them:

Both surveys and surveyors are in agreement as to their Basis of Bearing, that being: the record bearing of S31°24'42"W between the Witness Corner to Meander Corner (WCMC) 1 of United States Survey 1755, and a point along the boundary of United States Mineral Survey (USLM) 1285. This bearing is mathematically computed from the information and data shown on the plat of United States Survey 1755. The former is a definitive "X" chiseled in slanted face of rock along

the NW shore of Colt Island; the latter a 3.25" diameter brass cap cemented atop a massive boulder on the easterly shore of Admiralty Island (see attached photos of these corners). The United States Department of Agriculture set the brass cap in 1989 at the original position of the "X" marking the point of the USLM.

The brass cap and "X" in rock are intervisible, (see attached Google Earth photo) and as such, using modern survey technology (infrared or red-laser electronic distance measuring – EDM – machines) direct measurements can be made between them, i.e. no mathematical computations need be conducted to determine the actual, physical, ground-distance between the two markers.

From this basis of bearing both surveys and surveyors use the exact same bearing (N38°22'00"W) and distance (13.86') from the WCMC 1 ("X" in slanted rock face on Colt Island) to the actual, physical position of the Meander Corner 1, of USS 1755, then both surveys and surveyors use the exact same bearings and distances as recording on plat #75-11 to establish the physical position of the southwest corner of Lot 15, being common with the northwest corner of Lot 14.

The discrepancy between these two records of surveys lies with the physical, ground distance between the two points/marks that both are using for their Basis of Bearing.

The record (via computation) distance by USS 1755 is 3814.61', and both surveys/surveyors agree upon this as shown in parenthesis for the line representing the Basis of Bearing. However, their actual field measurements differ greatly: R&M shows a field-measured distance of 3813.49' (a difference of -1.12' from record of USS 1755); JW Bean shows a field-measured distance of 3836.80' (a difference of +22.19' from record of USS 1755, and a difference of 23.31' from what R&M measured between the same two points).

JW Bean's measurement was made in 2014, R&M's in 2012, and in conducting a boundary study for a Colt Island property/lot owner in 2008, I physically field-measured 3813.48' (-.01' difference than that of R&M) between the two markers.

Why and how is Mr. Bean's distance so dramatically different than that of the measurements of two different surveyors, conducted independently, four years apart? The question is all the more perplexing when a research of recorded documents shows that on the 2004 plat of Alaska Tideland Survey No. 1620 (recorded as Plat #2004-10) the surveyor, Mr. John Bean, uses the same Basis of Bearing as both above named Record of Surveys, but clearly shows a field-measured distance of 3814.61' between the exact same points (see "1" under "General Notes" of that plat/survey). This distance differs by -22.19' from what Mr. Bean reports he measured in 2014, but coincidently exactly matches the record distance (3814.61') of the USS 1755 plat.

Analysis: Mr. Bean's 2014 field-measured distance between the marks that represent the Basis of Bearing differs greatly and significantly between those made by me in 2008 (see attached print out of my data collector raw data file of that measurement), R&M's in 2012, and between his own distance of 2002 in surveying for ATS 1620. Such a disparity can not be attributed or explained as a result of atmospheric correction (in parts-per-million – PPM) to adjust for the density of air through which an EDM's beam must travel when obtaining a distance measurement, because that number/input would have to be out of the range of common sense and reason. Therefore, Mr. Bean's distance as shown on his Record of Survey is either erroneous (a misprint or misread), his electronic distance measurer malfunctioned, or perhaps he was not physically occupying the "WCMC" X in the rock, but a different or other point or mark.

Holding the USLM brass cap on Admiralty Island as the starting point and basis of position, and adhering to Mr. Bean's questionable distance from it to the WCMC on Colt Island creates a positional shift (footprint) of Lot 14 that is north and east of the southerly lot/property line of Lot 15, as surveyed by R&M (see the transparency overlays included with this report as a graphic example).

Mr. Bean's position of Lot 14 is further questioned because its meander line (the most westerly line of the lot) is unrealistic in its location relative to where the original, platted

meander line would have been, as surveyed for the Colt Island Alaska Recreational Development plat. The field notes of US Survey 1755 describes the meander line running "over stony, sandy, and rocky beach." Mr. Bean's line is inland/uphill further than that survey's described terrain, and thus not where today's surveyor would expect or think it to be when referencing his Record of Survey.

#### Conclusion:

All bearings and distances being equal and agreed upon, except the distance between the points that represent the Basis of Bearing for both surveys, and having personally measured that distance, and it being .01' different than Mr. Johnson's, I conclude that R&M's Record of Survey represents the truest, most accurate and professional survey of the two. I believe Mr. Bean's distance between the Basis of Bearing points (monuments) is erroneous, and this error has displaced the actual, physical boundary/footprint of Lot 14, such that it overlaps Lot 15 as surveyed and presented by Mark Johnson, PLS, of R&M Engineering, Inc.

#### Attachments:

Plat of USS 1755

Plat of Colt Island Alaska Recreational Development (Plat #75-11)

Plat of Record of Survey of Lot 15, Area 1, of Colt Island Recreational Development, by R&M, Juneau (Plat #2012-32)

Plat of Record of Survey of Lot 14, Area 1, of Colt Island Recreational Development, by JW Bean, Juneau (Plat #2014-46).

Plat of ATS 1620, conducted by JW Bean (Plat #2004-10).

Detail (close up) of "General Notes" of ATS 1620, showing record and measured distances between the Basis of Bearing points.

Google Earth Aerial Photo showing line-of-sight between Basis of Bearing marks.

Sketch of Basis of Bearing showing differing distances between survey/ surveyors, and including photos of Basis of Bearing points.

Photo of WCMC 1, USS 1755, close-up of chiseling in rock face.

Photo of WCMW 1, USS 1755, from approx. 15' away.

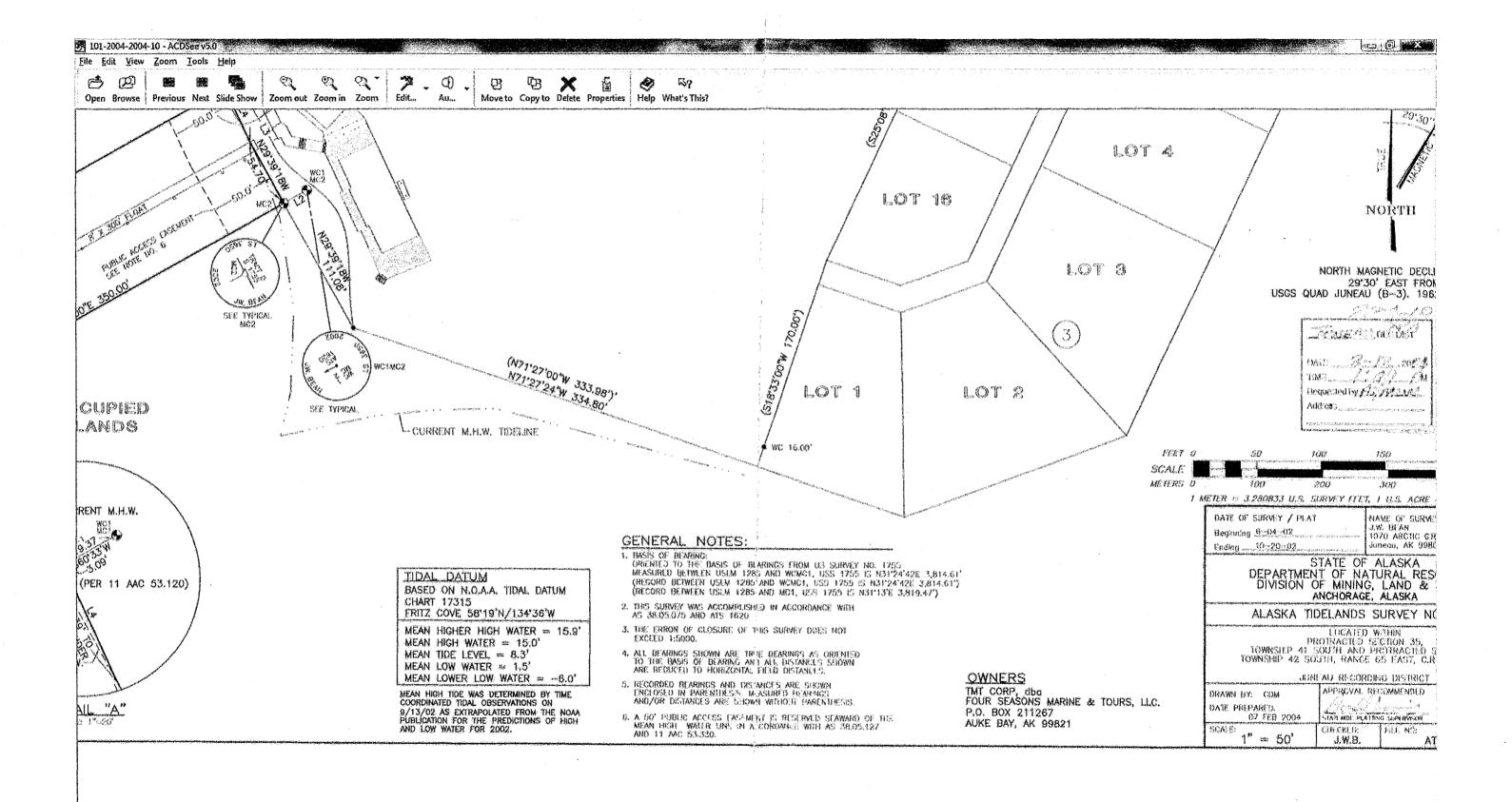
Photo of corner of USLM 1285, close-up of brass cap on huge boulder.

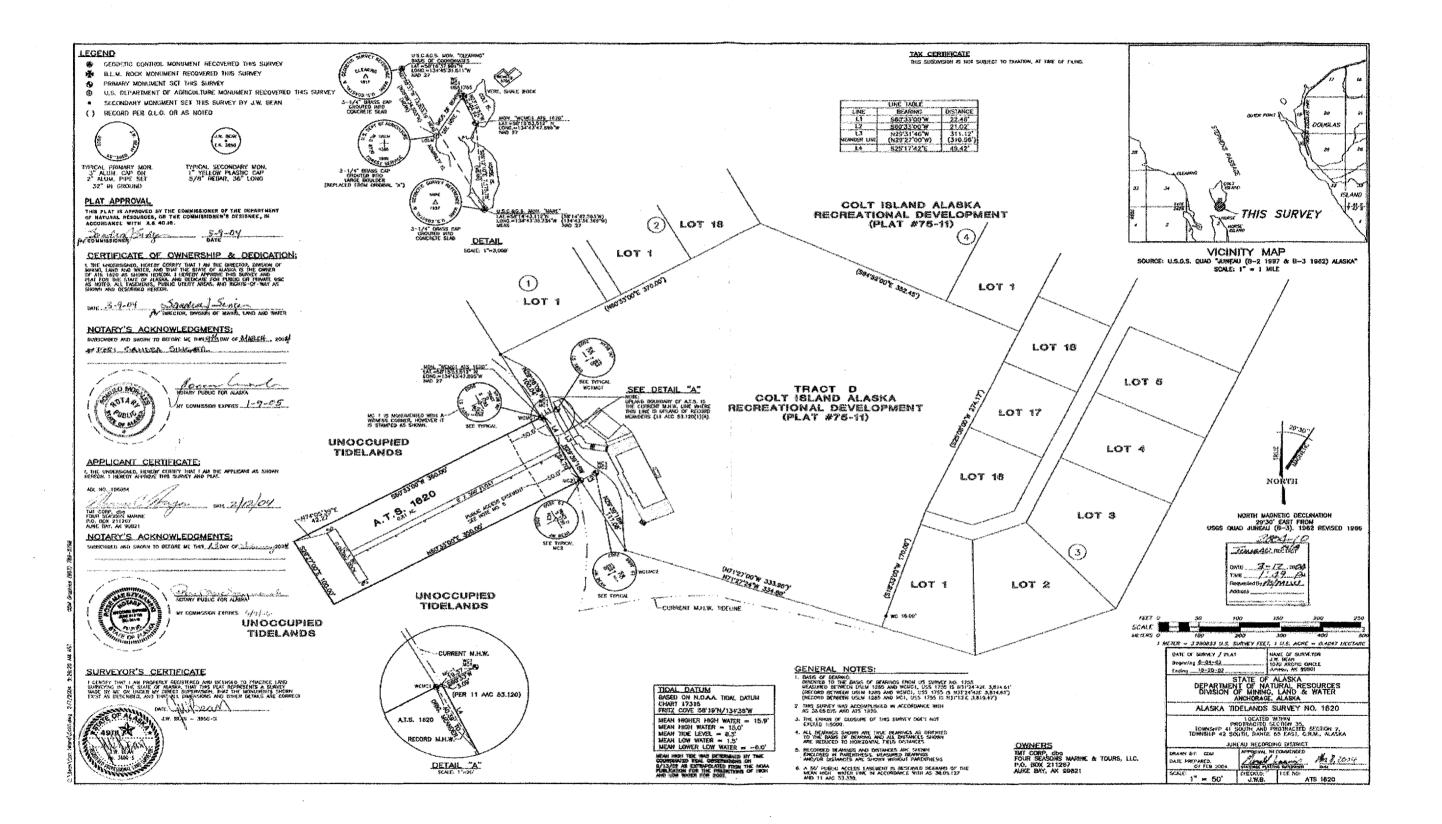
Portion of RV Davis' raw data collector file of August 2008, showing distance measured between basis of bearing points.

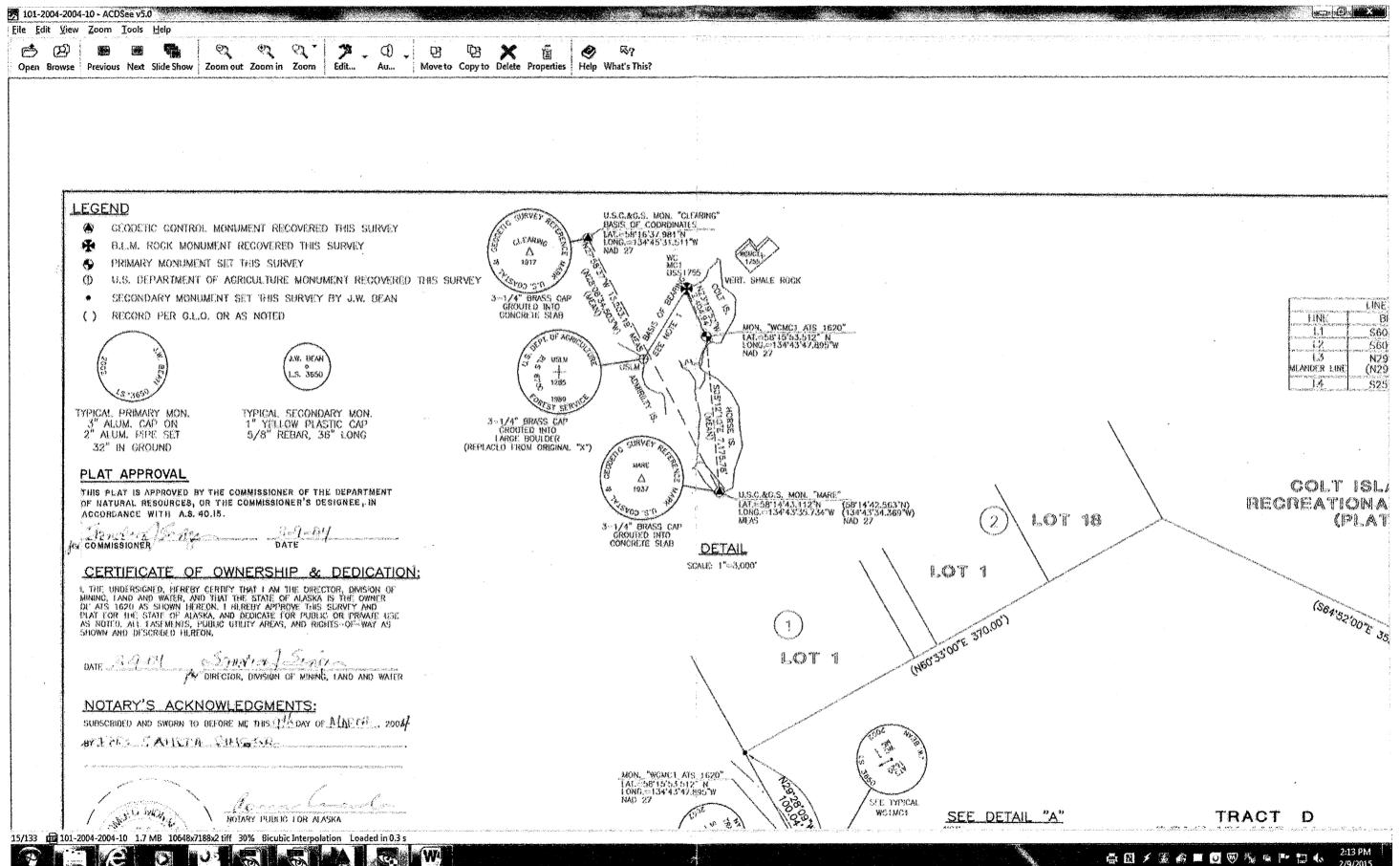
Transparency of measured Basis of Bearing, meander lines, and lot lines of Lot 15, per R&M's Record of Survey.

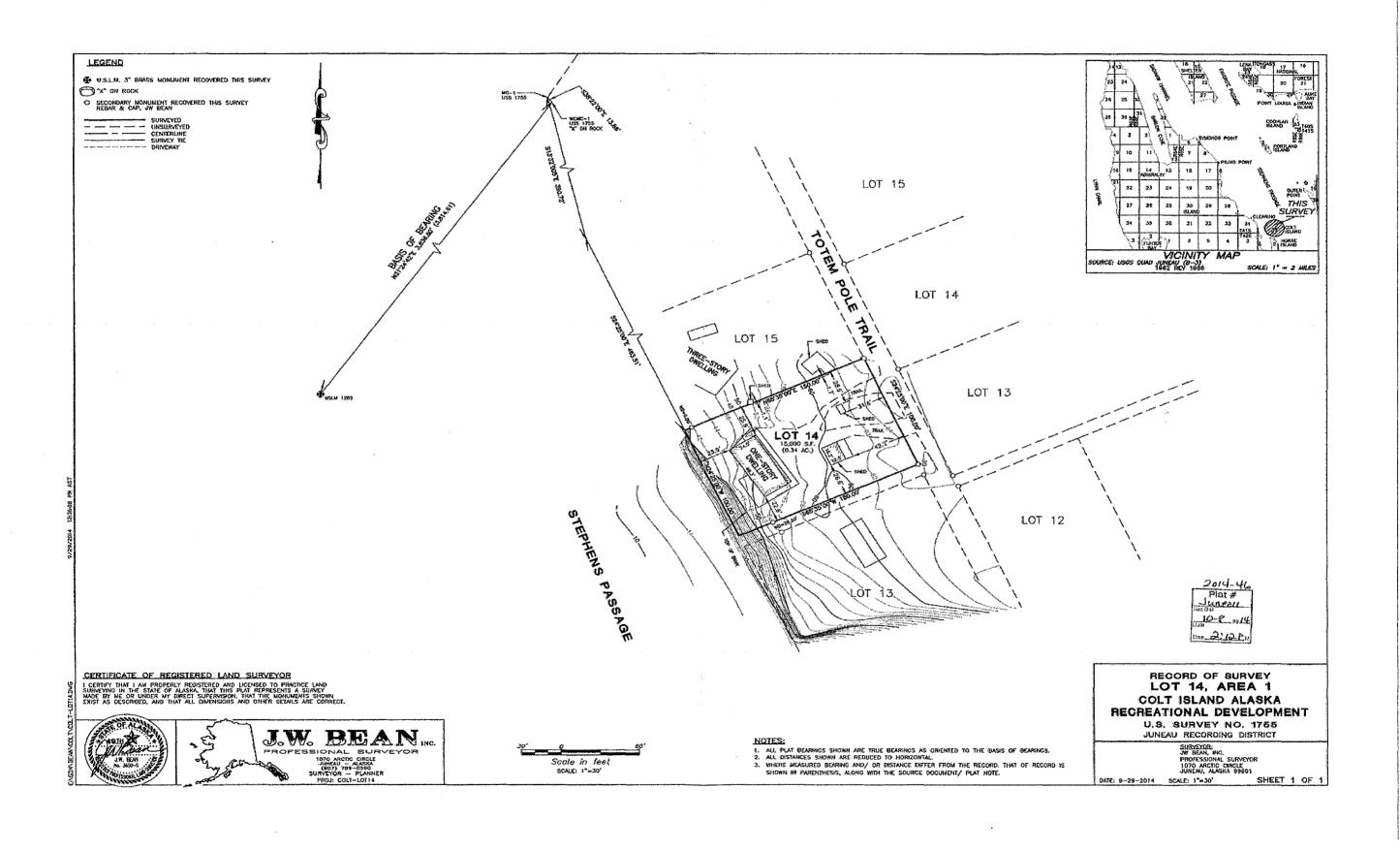
Transparency of measured Basis of Bearing, meander lines, and lot lines of Lot 14, per JW Bean's Record of Survey.

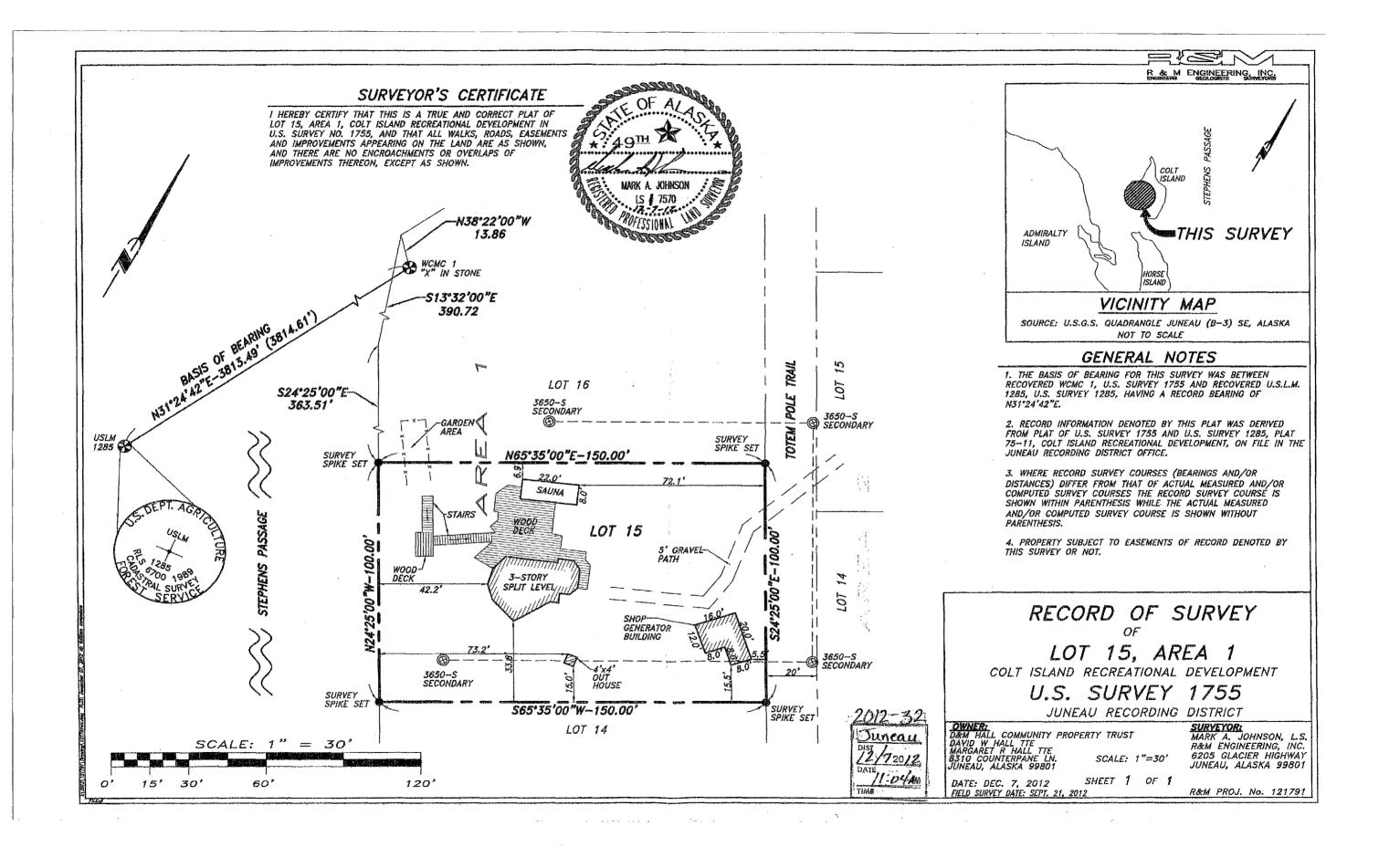
Professional fee schedule for Randal V. Davis, PLS

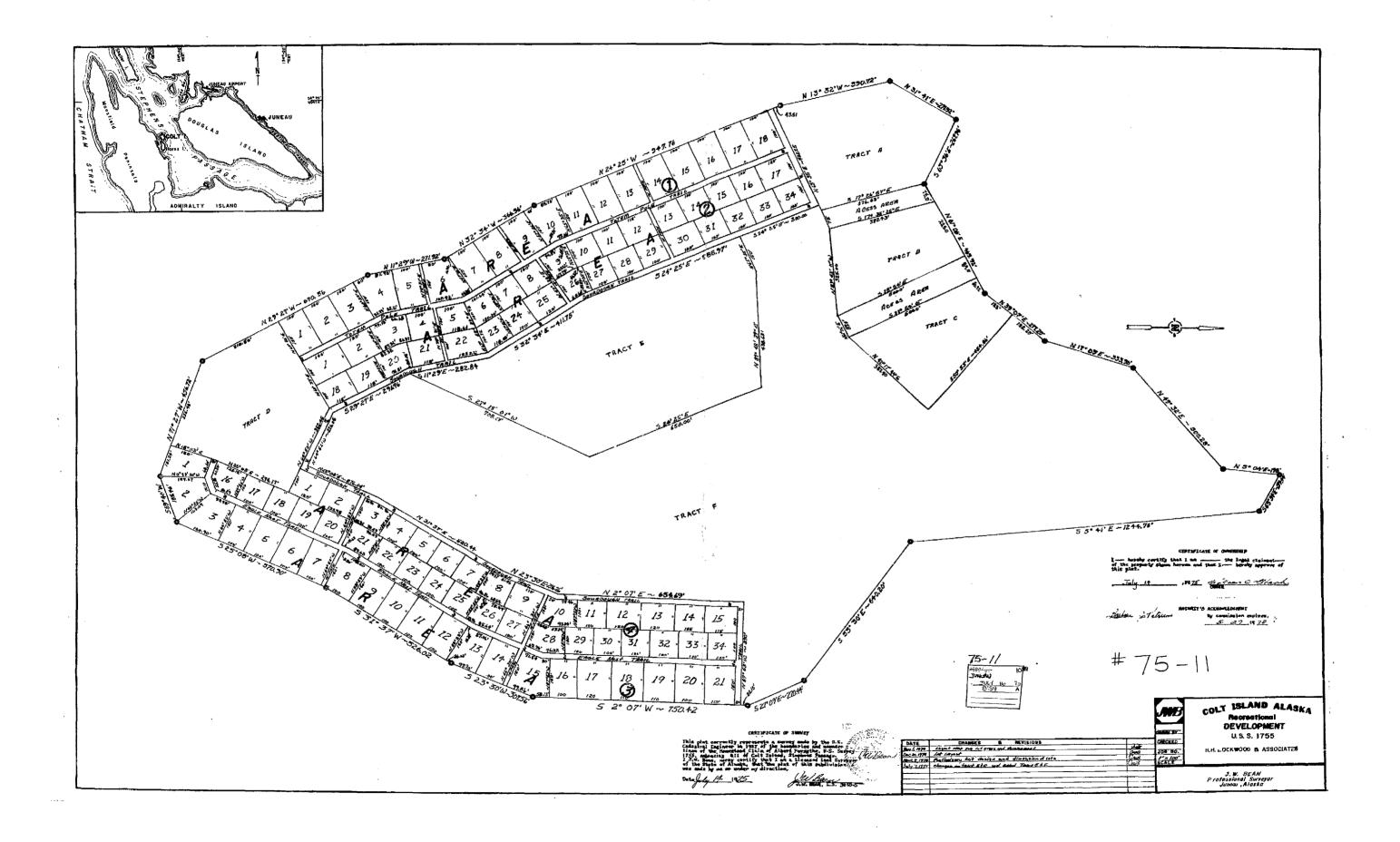


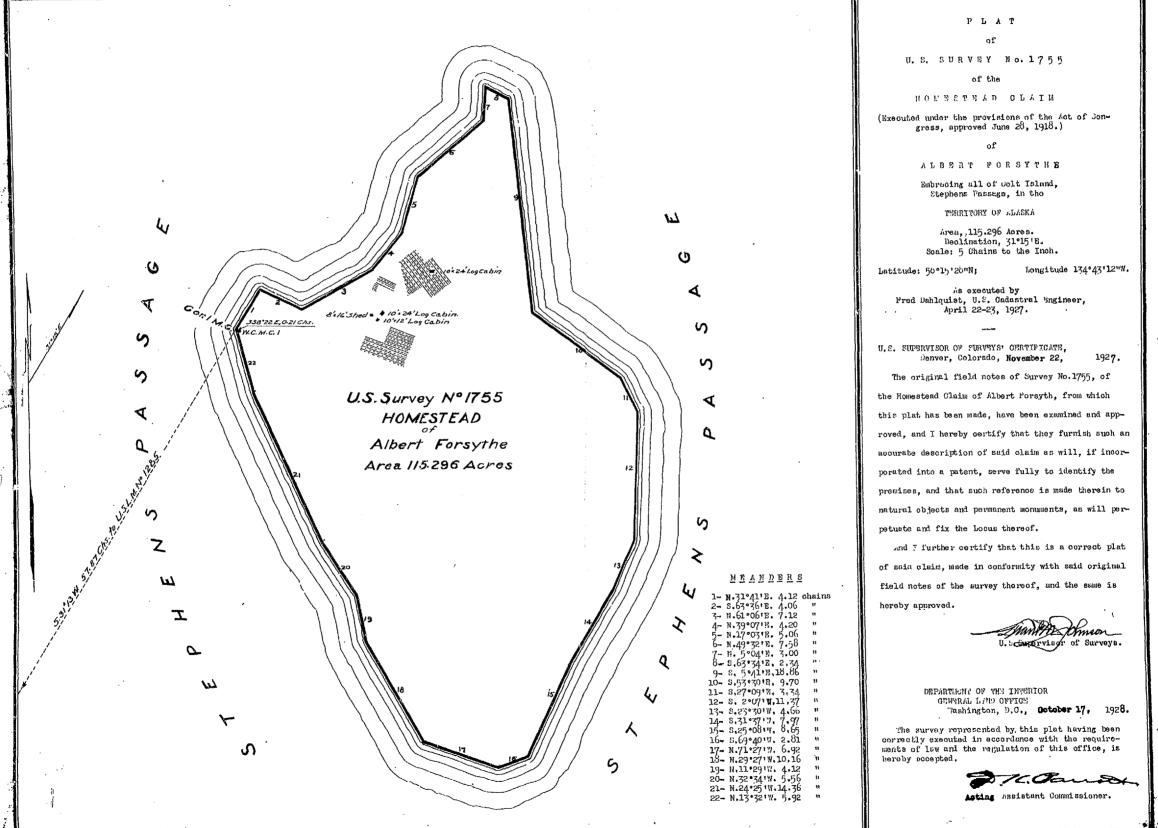


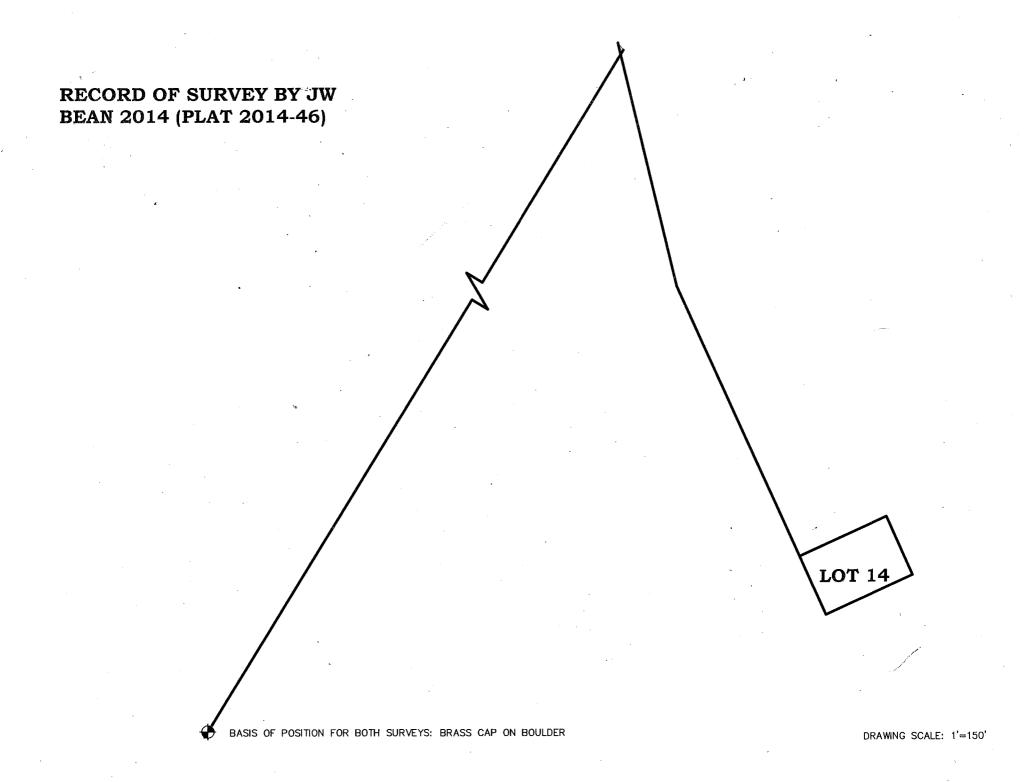


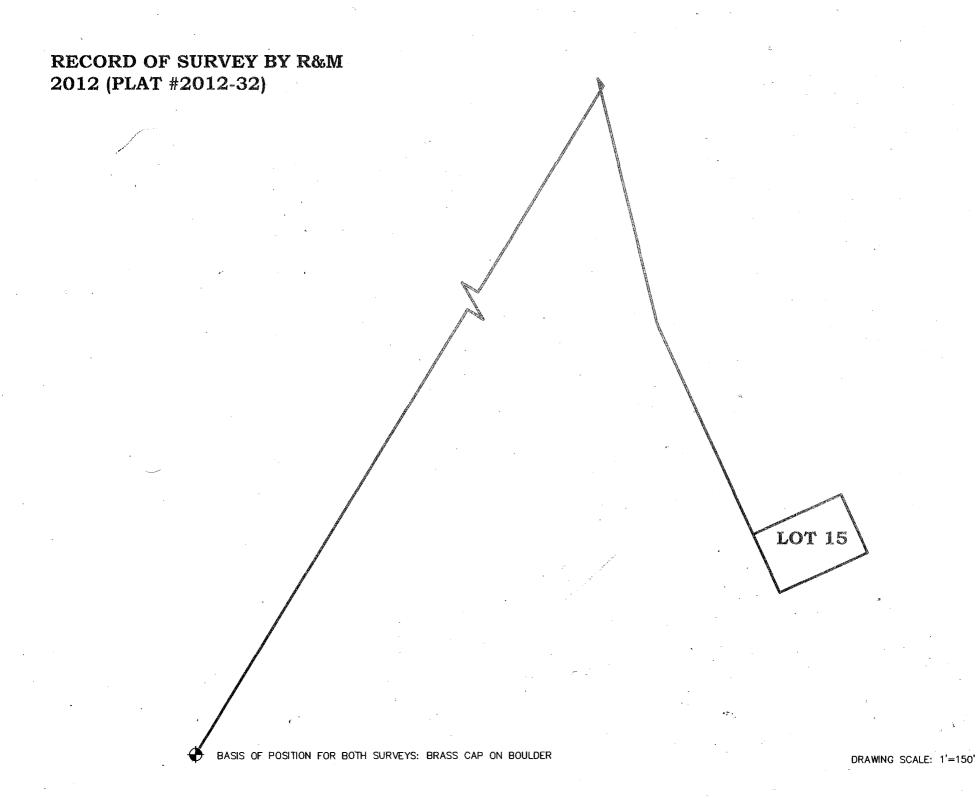


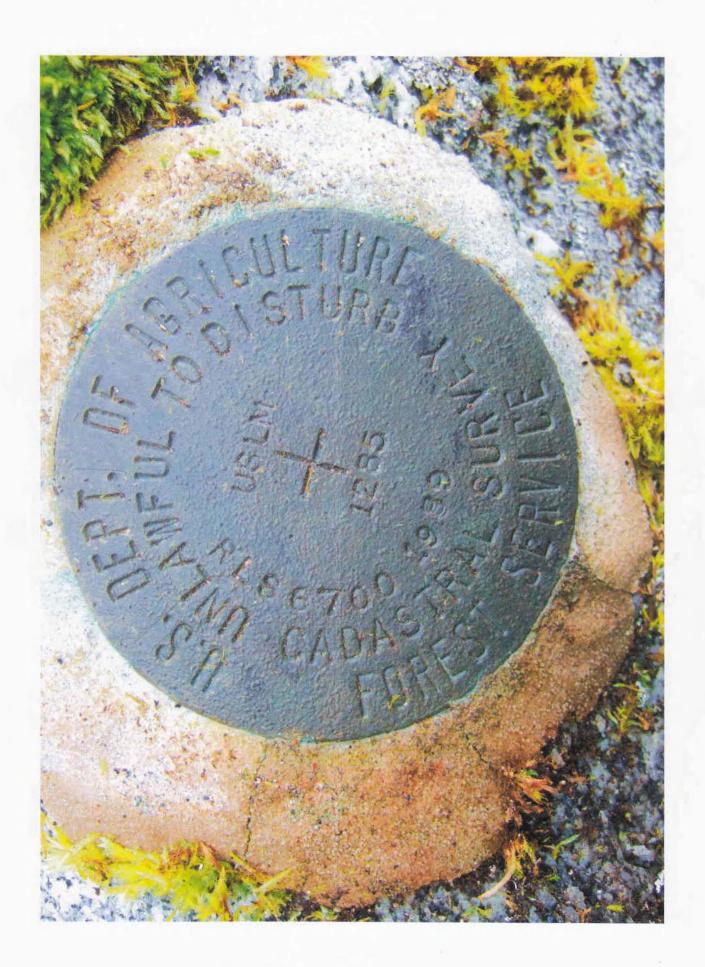






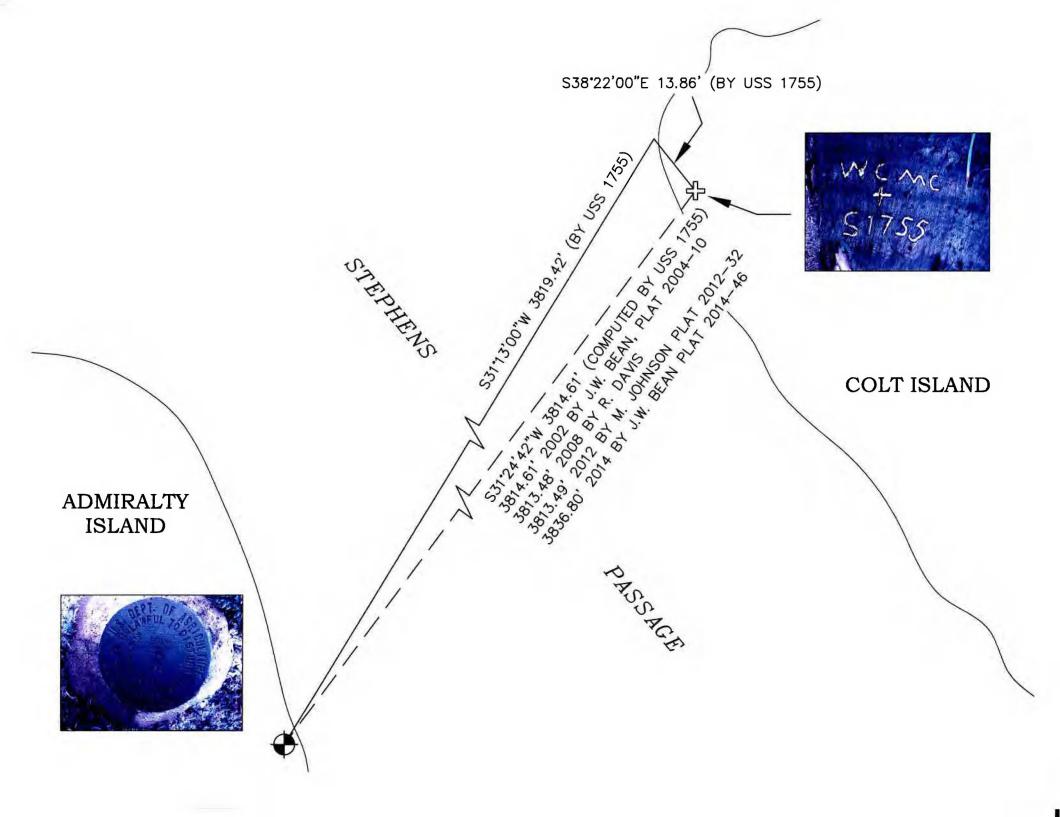


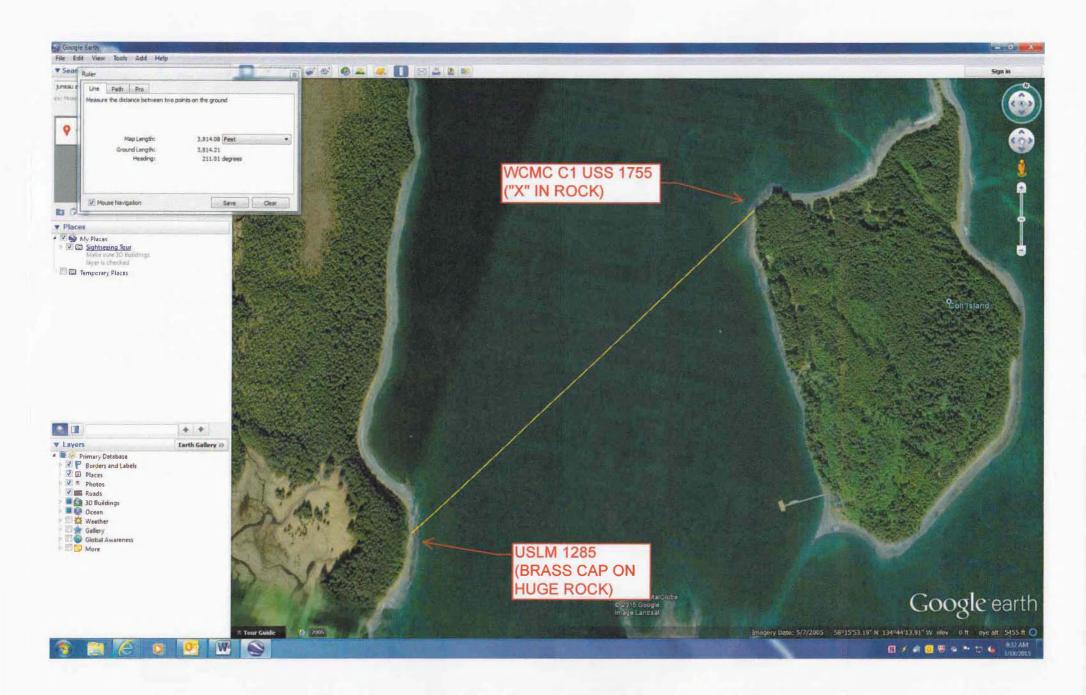












## DAVIS' FIELD COLLECTOR RAW FILE DATA FOR MEASUREMENT FROM WCMC 1, USS 1755 TO BRASS CAP - USLM 1285

OC,OP2,N 4989.1330,E 10008.6030,EL25.0000,--WC C1 USS1755 BK,OP2,BP49,BS222.49407,BC359.59515

BR,OP2,BP49,AR359.59515,ZE104.07395,SD-99999999.0000

RB,OP2,BP49,AR0.00020,ZE104.08180,SD,HR5.400,--WCMC USS 1285 RB,OP2,BP49,AR179.59410,ZE255.52590,SD,HR5.400,--WCMC USS 1285

RF,OP2,FP50,AR168.36140,ZE270.03170,SD3813.4824,HR5.400,--BC ON ROCK

RF,OP2,FP50,AR348.36140,ZE89.57010,SD3813.4824,HR5.400,--BC ON ROCK

SS,OP2,FP50,AR348.36140,ZE89.56520,**SD3813.4824**,--BC ON ROCK--FieldGenius v3.2.0

JB,NMPEARSALL-COLT IS,DT08-06-2008,TM09:43:38

## Professional Fee-Schedule/Rates Randal V. Davis, PLS

Field Surveying: \$70/hr. Computer Aided Drafting: \$50/hr.

Professional Consulting Services: \$80/hr.

## Curriculum Vitae for Randal V. Davis, PLS

#### Education:

High-School: Juneau-Douglas, Class of 1980

Post Secondary: University of Hawaii, Bachelor's of Art

Political Science 1985

#### **Professional Qualifications:**

Land Surveyor: State of Alaska, beginning June, 2002

# <u>Professional Work/Employment History (related to land surveying):</u>

State of Alaska, Department of Transportation and Public Facilities, Southeast Region, D&ES, ROW Section - Land Survey Journey (Head Chainman), July-August 1982, June-August 1983.

State of Alaska, Department of Transportation and Public Facilities, Southeast Region, D&ES, ROW Section - Land Survey Lead (Instrumentman), June-August 1983, June-August 1984, June 1985 – September 1989.

State of Alaska, Department of Transportation and Public Facilities, Southeast Region, D&ES, ROW Section - Land Survey Lead (Instrumentman), September 1995 – July 1999.

Davis & McLean Surveying & Mapping – Co-Owner/Party Chief, June 1999 – December 2000

State of Alaska, Department of Transportation and Public Facilities, Southeast Region, D&ES, ROW Section – Party Chief, January 2001- September 2001.

Toner-Nordling & Associates (now Dowl/HKM) – Party Chief, October 2001 – November 2002.

State of Alaska, Department of Transportation and Public Facilities, Southeast Region, D&ES, ROW Section – Party Chief, December 2002 – June 2005.

State of Alaska, Department of Transportation and Public Facilities, Southeast Region, D&ES, ROW Section – Chief of Parties, July 2005 – July 2009.

State of Alaska, Department of Transportation and Public Facilities, Southeast Region, D&ES, ROW Section - Land Survey Manager, August 2009 – present.

#### **Professional Accomplishments:**

Topographic Maps Produced (to include creation of triangular, irregular networks - TINs - and contour generation): ≥300 (some comprised of field observations totaling over 5000 individual points). These maps cover many communities and remote areas of SE Alaska, and also the Kenai Peninsula.

As-Built Surveys: ≥50; most in Juneau, Alaska, but several in Ketchikan, Haines, Yakutat, and Sitka.

Alaska State Land Surveys: ≥15; all while working for State DOT.

Alaska Tideland Surveys: ≥10; all while working for State DOT.

Accretion Surveys: 7; all in the Juneau Borough and while working in the private sector.

Subdivision Plats: ≤50; approximately ½ while working for State DOT, and ½ while working in the private sector.

Records of Survey: 5

US Surveys: 1 - "USS 13137"

#### Tools and Equipment Experience and Aptitude:

Survey Instruments - Theodolites: Wild (Leica) T-16, K&E Paragon.

Survey Instruments – Total Stations: Wild (Leica) T-1000, Wild (Leica) T-2000, Wild (Leica) T-1600, Wild (Leica) T-1610, Leica TRA 1100, Leica TCRA 1101, Leica TCR 407, Leica Viva Smart Station; Nikon DTM 420, Topcon GTS 2, Topcon GTS 3, Sokkia Set 530.

Survey Grade Global Positioning Systems (GPS) – Leica System 200, Leica System 500, Leica System 1200, Leica Viva System, Trimble R8, CHC X90 Static Receiver.

Software: Autocad R12 – Civil 3D (since 1992-present); Microsurvey's Office and Field Genius (1998-present); SMI's Construction 7 Data Collection (1999-present); Traverse PC (2008 – present); Triad Boundary Analysis (2012-present); Starnet Traverse Analysis and Adjustment (2002-present).

#### Personal:

Lifelong Juneau, Alaska resident.
Wife, Tiffany; two sons, Garrett (16), and Bill (13)