FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS

REVISIONS	
DESCRIPTION	DATE

OKLAHOMA DEPARTMENT OF TRANSPORTATION

SURVEY DIVISION (405) 521-2621 FAX (405) 522-0364

06/11/2012

To: Mr. Larry Reser, Chief of Surveys
From: Darren M. Smith, Professional Land Surveyor
Subject: Re: SWO4732(1), U.S. 75A, from approximately EW-79.5 Section line North to EW-77.5 Section line: This survey will begin at the Centerline of 14th Street, and will extend North approxamitley 5,838 feet.

Historical Letter and Written Report

1. **GENERAL**

   A. Survey began January 16, 2012
      Survey completed March 27, 2012
   B. The measurement unit for this project will be the U.S. Survey Foot.

2. **SURVEY ASSIGNMENT**

   The above described survey was assigned to me by Mr. Larry Reser, Chief of Surveys, and completed by my crew at Cobb Engineering.

3. **PURPOSE OF THIS SURVEY**

   The purpose of this survey is to develop plans to construct a new crossing over the S.L. & S.F. Railroad at the north edge of Mounds. This survey includes the Alignments(s), Topographic/Planimetric data, Surface Features/DTM data, utilities, Drainage and all other pertinent information needed to aid in the design. Land Ties and property line ties were performed sufficient to obtain any additional right-of-way necessary for proper design.

4. **SURVEY LIMITS**

   U.S. 75A Main Survey: This survey began at a point identified as P.O.T. Sta. 513+10.74 (centerline of 14th Street), as shown on U.S.W.P. No. W.P.G.N. 159-D plans, and extended north to a point identified as P.O.T. Sta. 454+84.54 (EW-77.5 ¼ Section Line), as shown on U.S.W.P. No. W.P.H. 159-D (ALTERNATE PLAN) plans (approximate centerline length = 1.10 miles).

5. **ALIGNMENTS**

   U.S. 75A Main Survey: The Centerline of Survey for this project is along and identical to the centerline of present U.S. 75A as shown on U.S.W.P. No. W.P.G.M. 159-D plans and U.S.W.P. No. W.P.H. 159-D (ALTERNATE PLAN) plans.

6. **STATIONING**

   U.S. 75A Main Survey: A station value of P.O.T. Sta. 100+00.00 was assigned to the Beginning of Survey (centerline of 14th Street) and stationing increases north from this point, field measured distance, to the End of Survey without equation, except with existing surveys and plans.

7. **HORIZONTAL CONTROL**

   A. Horizontal Control for this survey is NAD 83 (1993) Oklahoma State Plane Coordinate System, Lambert Projection, North Zone, and derived utilizing static GPS.

   B. Primary Horizontal control was established on 2 monuments along this survey. They are 3 inch aluminum caps marked C-19-836 and C-19-837.

   C. Secondary horizontal control was established along the centerline of survey and referenced and shown on the survey data sheets of this survey.

   D. The primary control network, the secondary network and section boundaries for this survey are in compliance with NGS Second Order Class 11 standards for horizontal control. (1 : 20,000).

8. **VERTICAL CONTROL**

   A. Level datum for this survey is NGS, NAVD 88, taken from PRIMARY CONTROL POINT NO. C-19-836. A complete set of check levels was run throughout the survey using a Sokkia digital level.

   B. The adjusted levels and vertical differences between bench marks are shown in Following file: SWO4732_1_V1.dgn (SDS 3) and SWO4732_1_V1_Level Worksheet.pdf

   C. Accuracy – 3rd order or better before adjustment.

9. **TOPOGRAPHY**

   Topography on this survey was obtained by utilizing the Topcon GPS RTK systems and Total Station technology with the TOPCON FC-2500 data collectors for field instruments. Centerline profile, bridge profiles, and drainage structures were obtained for the length of the project by utilizing conventional field methods. The supportive information pertaining to the surface features are available in the computer file SWO 4732_1_V1_SFF.dgn and SWO 4732_1_V1_TOPO.dgn.

10. DTM / CROSS SECTIONS

    Cross sections on this survey were obtained by utilizing the Topcon GPS RTK systems and Total Station technology processed and output in the form of a DTM survey and placed in a computer file SWO 4732_1_V1_SFF.dgn

11. LAND TIES

    Land ties for this survey were established for the following:

    T-16-N, R-12-E, I.M. – Sections 5 and 8

    A search was made for any trace of the original monuments and/or accessories. All filed certified corners received from the Oklahoma Department of Libraries were researched and noted. The original survey and survey notes were used from the following survey.

    Sledge Tatum & James E. Shelley 11/13/1897

    A complete detailed account of each of the corners set or used follows:

    Southeast corner of Section 8,
    O.D.O.T. Monument C-19-427, T-16-N, R-12-E I.M. found O.H.D. standard brass monument. Monument matches description and fits 2 references as called on O.C.C.R. filed by Jerry Wayne Haynes L.S.# 422 on 6-20-1983.

    South quarter corner of section 8,
    O.D.O.T. Monument C-19-838, T-16-N, R-12-E I.M. found PK nail with yellow tab. Monument fits description and 2 references on O.C.C.R. filed by L.S.# 1352 dated 10/29/07. Monument also fits location of brass cap monument set by L.S.# 422 on O.C.C.R. dated on 01/26/83. Found 5/8" iron pin set by unknown parties (did not use).

    Southwest corner of Section 8,
    O.D.O.T. Monument C-19-417, T-16-N, R-12-E I.M. found O.H.D. brass cap. Monument matches description and fits 2 references as called on O.C.C.R. filed by Charles W. Chastain L.S.# 1352 on 10-31-2007. Monument also fits 3 references as called on O.C.C.R. filed by Jerry Wayne Haynes L.S.# 422 on 6-20-1983.

    West quarter corner of Section 8,
    O.D.O.T. Monument C-19-839, T-16-N, R-12-E I.M. found a 3/8" iron pin with yellow cap. Monument's position fits 3 references as called on O.C.C.R. filed by Jerry Wayne Haynes L.S.# 422 on 6-20-1983.

    Center of section 8,
    O.D.O.T. Monument C-19-421, T-16-N, R-12-E I.M. found O.H.D. standard brass cap Monument C-19-421. Monument matches description on O.C.C.R. filed by L.S.# 422 dated 01/25/83.

    East quarter corner of Section 8,
    O.D.O.T. Monument C-19-428, T-16-N, R-12-E I.M. found O.H.D. standard brass cap monument. Monument matches description and 5 references on O.C.C.R. filed by L.S.# 422 dated 01/26/83.

    Northwest corner of section 8,
    O.D.O.T. Monument C-19-419, T-16-N, R-12-E I.M. found a 1" iron pin. Monument fits 3 references as called on O.C.C.R. filed by Jerry Wayne Haynes L.S.# 422 on 6-20-1983.

    North quarter corner of Section 8,
    O.D.O.T. Monument C-19-420, T-16-N, R-12-E I.M. found O.H.D. standard brass cap monument. Monument matches description and references on O.C.C.R. filed L.S.# 422 dated 01/24/83.

    Southeast corner of Section 5,
    O.D.O.T. Monument C-19-429, T-16-N, R-12-E I.M. found O.H.D. standard brass cap monument. Monument matches description and 3 references on O.C.C.R. filed by L.S.# 1233 dated 08/22/01.

    East quarter corner of Section 5,
    O.D.O.T. Monument C-19-841, T-16-N, R-12-E I.M. found 1/2" iron pin. Monument matches description and 3 references on O.C.C.R. filed by L.S.# 1086 dated 10/30/00 & by L.S.# 1233 dated 08/2/01.

    West quarter corner of section 5,
    O.D.O.T. Monument C-19-843, T-16-N, R-12-E I.M. found 7/8" iron pin in gravel road. Monument matches description and 4 references on O.C.C.R. filed by L.S.# 1086 dated 01/04/96.

    Northwest corner of Section 5,
    O.D.O.T. Monument C-19-844, T-16-N, R-12-E I.M. found 1/2" iron pin (1' exposed). Monument matches description and 4 references on O.C.C.R. filed by L.S.# 1086 dated 01/04/96.

    Northeast corner of Section 5,
    O.D.O.T. Monument C-19-846, T-16-N, R-12-E I.M. found 1/2" iron pin. Monument matches description and 3 references on O.C.C.R. filed L.S.# 1507 dated 05/01/09 & by L.S.# 1086 dated 10/30/00.

    North Quarter Corner of Section 5,
    O.D.O.T. Monument C-19-841, T-16-N, R-12-E I.M. found cut "X" in railroad crossing.

    Southwest corner of Section 32,
    O.D.O.T. Monuments C-19-840, T-17-N, R-12-E I.M. found 1/2" iron pin 6" deep. Monument fits description and 2 of 3 references as shown on O.C.C.R filed by L.S. #1086 on 7/26/11.

    South Quarter Corner of Section 32,
    O.D.O.T. Monument C-19-842, T-17-N, R-12-E I.M. found mag nail. Monument fits description and 3 of 4 references as shown on O.C.C.R. filed by L.S. #1086 on 7/26/11.

12. **EXISTING RIGHT-OF-WAY**

    U.S. 75A Existing right-of-way as shown on this survey is along and identical to the existing right-of-way of present U.S. 75A as shown on U.S.W.P. No. W.P.G.M. 159-D plans.

13. **UTILITIES**

    A. All utility companies servicing this survey project were contacted through "CALL OKIE"

    B. All underground utilities were located by the owning company with the exception of sanitary sewer lines owned by the city of Mounds. Approximate sanitary sewer line locations were determined from a hand sketch provided by the city of Mounds and field verified at sanitary sewer manholes. Oklahoma Natural Gas, Rural Water District #7, OG&E, & TDS Telecom also provided utility maps that were used to determine approximate utility line locations in addition to the utility lines that were marked in the field.

    C. Information regarding type, size, ownerships, location, depth, etc. is placed in computer file SWO 4732_1_ V1_SD-7.pdf

14. **HAZARDOUS WASTE**

    No possible hazardous waste sites were encountered.

15. **DRAINAGE INFORMATION**

    Drainage areas were taken from USGS Quad Maps in the project area and data taken field checked for accuracy and placed in computer file SWO 4732_1_V1_DRA.dgn and SWO 4732_1_ V1_USGS Drainage.pdf

16. **SURVEY DATA SHEETS**

    Survey Data Sheets were submitted in the form of a Microstation Design File archived on the O.D.O.T. Mainframe Computer, as per O.D.O.T. Survey Division Standards. These will be incorporated into the set of design drawings and will be in substantial conformity with the O.D.O.T. Survey Division Standards for Survey Data Sheets, as maintained on O.D.O.T.(s) Intranet.

17. **SUBMISSION OF SURVEY DATA**

    A. Historical Letter & Written Report.
    B. Form SD-1, Transmittal Letter w/FSVARCH.INDEX attached.
    C. Form SD-7, Public and Privately Owned Utilities List w/ vicinity maps where available.
    D. Form SD-11, Position and Description of Survey Monuments (GPS control monuments, Brass/Aluminum Caps for benchmarks, etc.) (if applicable).
    E. Form SD-20, Survey Control Data Statement.
    F. From SD-41, Surveyor's Certification.
    G. Cogo Data (coordinate list with alignments).
    H. Benchmarks & Check Levels list, including the SWO and description of the project.
    I. Original and reduced copy (8" x 11") of each Certified Land Corner form.
    J. NGS Recovery Form for each horizontal and vertical monument recorded or used during the course of the survey.

18. **EQUIPMENT USED**

    Topcon GR3 GPS
    Topcon Hiper II GPS
    Topcon IS 3" Imaging Robotic Total Station
    Topcon FC-2500 Data Collectors
    GPT-9005A 5" robotic Total Station
    Topcon GPT 3000W Total Station
    Topcon GPT 3005W Total Station
    Topcon GTS 3000 Total Station
    Topcon GTS 313 Total Station
    Trimble 5700 GPS
    Trimble 5800 GPS
    Sokkia SDL 30 Digital Level
    Eagle Point and Inroads working in AutoCad environments

19. **Personnel**

    Darren Smith, P.L.S. Division Manager 4
    Adam Hinds, P.L.S. Survey Manager 1
    Joe Farmer, L.S.I. Technician Manager 2
    Tanner Wentworth, L.S.I. Survey Intern 1
    Brian Bird, L.S.I. Survey Intern 1
    Cory Culpepper, Technician 1
    Sam McGee, Technician 1
    Chris Williams, Technician 1
    Eric Mentzer, Technician 3
    Michael Cook, Technician 1
    Eric Oldham, Technician 1
    Colton Schroder, Technician 1
    Abdul Abdulrahman, Technician 1
    Rebecca Robichaux, Technician 1

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              Project Name: SWO4732_1_V1_alg
               Description: Centerline of Survey
 Horizontal Alignment Name: U.S. 75A
                     Style: Default
                                     STATION     NORTHING      EASTING

 Element: Linear
              POB (10500)           100+00.00  325211.7595  2542990.5970
               PC (10011)           130+93.24  328304.2845  2542924.2676
      Tangent Direction:   N  1°13'43.35" W
         Tangent Length:              3093.24

 Element: Circular
               PC (10011)           130+93.24  328304.2845  2542924.2676
               PI (10014)           134+95.88  328706.8319  2542915.6336
               CC (10013)                      328365.6476  2545785.2465
               PT (10012)           138+93.26  329096.1325  2543018.4148
                 Radius:              2861.64
                  Delta:       16°01'05.47" Right
  Degree of Curvature(Arc):      2°00'07.93"
                 Length:               800.03
                Tangent:               402.64
                  Chord:               797.43
        Middle Ordinate:                27.91
               External:                28.19
      Tangent Direction:   N  1°13'43.35" W
       Radial Direction:   N 88°46'16.65" E
        Chord Direction:   N  6°46'49.38" E
       Radial Direction:   S 75°12'37.88" E
      Tangent Direction:   N 14°47'22.12" E

 Element: Linear
               PT (10012)           138+93.26  329096.1325  2543018.4148
               PC (10021)           142+06.63  329399.1162  2543098.4070
      Tangent Direction:   N 14°47'22.12" E
         Tangent Length:               313.37

 Element: Circular
               PC (10021)           142+06.63  329399.1162  2543098.4070
               PI (10024)           146+83.07  329859.7719  2543220.0270
               CC (10023)                      330129.7488  2540331.0158
               PT (10022)           151+50.85  330334.9855  2543185.8636
                 Radius:              2862.22
                  Delta:       18°54'05.15" Left
  Degree of Curvature(Arc):      2°00'06.47"
                 Length:               944.22
                Tangent:               476.44
                  Chord:               939.96
        Middle Ordinate:                38.86
               External:                39.38
      Tangent Direction:   N 14°47'22.12" E
       Radial Direction:   S 75°12'37.88" E
        Chord Direction:   N  5°20'19.55" E
       Radial Direction:   N 85°53'16.97" E
      Tangent Direction:   N  4°06'43.03" W

 Element: Linear
               PT (10022)           151+50.85  330334.9855  2543185.8636
              POE (10507)           157+37.82  330920.4389  2543143.7750
      Tangent Direction:   N  4°06'43.03" W
         Tangent Length:               586.96
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P.L.S.	D.M.S.	06/11/2012	U.S. 75A, FROM 14TH STREET, NORTHERLY TO EW-77.5 1/4 SECTION LINE — CREEK COUNTY
DRAWN	J.E.M.	06/11/2012	**HISTORICAL LETTER & ALIGNMENT CERT.**
CHECKED	A.K.H.	06/11/2012	
APPROV.	D.M.S.	06/11/2012	
CREW CHIEF	A.K.H.		SWO NO. 4732(1) J/P NO. 27075(04) SHEET NO. S2

05-03-16