

**Supplemental Agreement No. 1**  
**Job No. 090218**  
**FAP. No. HHP2-3314(1)**  
**8<sup>th</sup> Street Improvements**

**Date: April 27, 2010**

**WHEREAS**, the City of Bentonville, Arkansas and Burns & McDonnell entered into an Agreement for Engineering Services on September 25, 2007; and,

**WHEREAS**, representatives of the City of Bentonville, Arkansas requested work in addition to that defined in the Agreement.

**NOW THEREFORE**, the following modifications will be made to the Agreement to include the additional work requested:

**MODIFICATIONS:**

- 1) The "Contract Ceiling Price" (Section 1.2) is increased from \$780,062.39 to \$4,880,636.03.
- 2) The "Indirect Cost Rate" (Section 1.10) is increased from 172.42 to 205.72.
- 3) The "Title I Services Ceiling Price" (Section 1.12) is increased from \$780,062.39 to \$4,880,636.03.
- 4) The fixed fee (Section 3.4) is increased from \$58,981.33 to \$226,759.95.
- 5) The following personnel is added to Section 3.2.1 Schedule of Salary Ranges: Principle/Officer: \$55.00 - \$80.00
- 6) See Attachment A for modifications to Section 6, 7, and 13.
- 7) See Attachments B-1 through B-4 for modifications to Appendix A - Justification of fees and costs
- 8) Modify Appendix B-1 as follows:
  - a. The "Indirect Cost Rate" (Appendix B-1, Section 3.1) is increased from 103.79 to 187.39.
  - b. The following personnel is added to Appendix B-1, Section 3.2:  
Engineer X: \$80.00 - \$90.00.

9) Modify Appendix B-2 as follows:

a. Replace Appendix B-2, Section 3.5.1 "Schedule of Salary Ranges" with the following:

Senior Professional Surveyor	\$35.00 - \$50.00
Project Professional Surveyor	\$25.00 - \$35.00
Engineering Technician	\$20.00 - \$30.00
CAD Drafter	\$15.00 - \$25.00
Party Chief	\$20.00 - \$25.00
Instrument Person	\$15.00 - \$20.00
Rodman	\$10.00 - \$15.00
Word Processing/Clerical	\$10.00 - \$15.00

10) Modify Appendix B-4 as follows:

a. Replace Appendix B-4, Section 3.2 with the following:

Principal	\$60.00 - \$70.00
Senior Project Manager	\$35.00 - \$45.00
Project Engineer or Geologist	\$30.00 - \$40.00
Engineer or Environmental Spec.	\$20.00 - \$30.00
CADD Technician	\$14.00 - \$22.00
Administrative	\$14.00 - \$20.00
Driller	\$17.00 - \$25.00
Driller Helper	\$10.00 - \$15.00
Laboratory Technician	\$17.00 - \$25.00

b. The "Indirect Cost Rate" (Appendix B-4, Section 3.2) is changed from 202.60 to 202.50.

11) The completion time (Section 17.3) for Job No. 090218 is changed from 18 months following the original notice to proceed to 24 months following the execution of Supplemental Agreement No. 1.

12) Add other modifications to sections of the contract as required.

**IN WITNESS WHEREOF**, the parties execute this Supplemental Agreement No. 1, to be effective upon the date set out above.

BURNS & MCDONNELL, INC.

CITY OF BENTONVILLE, AR

BY: \_\_\_\_\_  
James L. Foil, P.E.

BY: \_\_\_\_\_  
The Honorable Bob McCaslin

Senior Vice President

Mayor

## **ATTACHMENTS**

### **ATTACHMENT A**

Revisions to Sections 6, 7, and 13.

Appendix A  
Appendix B  
Appendix C

Survey Scope of Work  
Right of Way Requirements  
Geotechnical Scope of Work

### **ATTACHMENT B**

Modifications to Appendix A – Justification of Fees and Costs

Attachment B-1  
Attachment B-2  
Attachment B-3  
Attachment B-4

Burns & McDonnell Engineering Co., Inc.  
USI Consulting Engineers  
B&F Engineering, Inc.  
Terracon Consultants, Inc.

## **Attachment A**

### **SUPPLEMENTAL AGREEMENT 1 SCOPE OF WORK AHTD Job No. 090218 FAP Job No. HHP2-3314(1) Benton County**

#### **I. DESCRIPTION OF THE PROJECT**

The City of Bentonville (City), in cooperation with the Arkansas State Highway and Transportation Department (AHTD) and the Federal Highway Administration (FHWA), is proposing to design the 8<sup>th</sup> Street Improvements Project in Benton County, Arkansas. The work includes engineering services for the following:

Project Number One, approximately 1.2 miles long, will extend from the intersection of SE J Street to U.S. Route 71 and includes a new interchange at Route 71. The configuration of the new interchange will generally conform to conceptual design Alternative 9B prepared for the Engineering and Operational Acceptability Review previously approved by AHTD and FHWA. For the purposes of developing this scope and fee estimate, it was assumed the proposed interchange design will include up to five grade separation structures as presented here:

- Northbound Route 71 Entrance Ramp from Highway 62/102 over Railroad
- Southbound Route 71 Exit Ramp to Highway 62/102 over Railroad
- Northbound Route 71 Entrance Ramp from Highway 62/102 beneath 8<sup>th</sup> Street
- Southbound Route 71 Exit Ramp to Highway 62/102 beneath 8<sup>th</sup> Street
- 8<sup>th</sup> Street over Route 71

Additionally, up to nine mechanically stabilized earth retaining walls of varying length and height will be required for the new interchange.

Burns & McDonnell will be responsible for design services for those portions of Project Number One that extend along U.S. Route 71 including the new interchange and bridges in addition to the 8<sup>th</sup> Street improvements extending from 200' east of Moberly to U.S. Route 71. USI Consulting Engineers will be responsible for design services for those portions of Project Number One that extend along 8<sup>th</sup> Street from SE J Street to 200' east of Moberly.

Project Number Two, approximately 1.4 miles long, will extend along 8<sup>th</sup> Street from the intersection of SW I Street to the intersection of SE J Street, and will consist of the reconstruction of 8<sup>th</sup> Street to a four-lane divided urban arterial. USI Consulting Engineers will be responsible for design services for all portions of Project Number Two.

The scope of work for engineering services is as follows:

**Project Number One and Two:**

Projects number One and Two consist of surveying, final environmental permitting and coordination, hydraulic study reports as needed, preliminary and final roadway and bridge design with construction plans and specifications, geotechnical studies and foundation reports, right-of-way plans, traffic analysis and related engineering services, estimates, and coordination.

**II. SERVICES TO BE FURNISHED BY AHTD**

1. Aerial photography and digital terrain model for the Route 71 corridor portion of the project.
2. Right-of-way (Project Number One)
  - a) Right-of-way appraisals, acquisition, and relocation
  - b) Design and construction of utility adjustments
  - c) Facilitator for value engineering studies
3. Advertise and receive bids (Project Number One)
4. Review and approval of all design plans (Project Number One and Two).

**III. SERVICES TO BE FURNISHED BY CITY OF BENTONVILLE**

1. Right-of-way (Project Number Two)
  - a) Right-of-way appraisals, acquisition, and relocation
  - b) Design and construction of utility adjustments
2. Advertise and receive bids (Project Number Two)
3. Review and approval of all design plans (Project Number One and Two).

**IV. SERVICES TO BE FURNISHED BY THE CONSULTANT**

**A. ADDITIONAL ENVIRONMENTAL SERVICES (Project Number One and Two)**

1. Section 4(f) Evaluation
  - a) Conduct background research for National Guard buildings
  - b) Coordinate with National Guard staff to obtain background and research availability of plan drawings.
  - c) Develop avoidance alternative; address review comments and revise figures
  - d) Prepare evaluation report based on provided example and revise figures per comments

- e) Coordinate with AHTD, SHPO, and FHWA
  - f) Should impacts to 4(f) resources be required, prepare mitigation plan and Memorandum of Agreement
  - g) Should impacts to 4(f) resources be required, complete required mitigation documents
  - h) Scope and fee estimate does not include HABS/HAER documentation.
2. Section 106 Coordination Cultural Resources
- a) Field Investigations with narrative and photographic documentation of over 60 buildings vs the 10 buildings that were included in the original proposal.
3. Public Involvement / Project Communications
- a) Update City's project website.
  - b) Meet with City staff, City council, other public officials, and additional interested parties to communicate project goals and progress.
  - c) Prepare additional written text for project communications.
  - d) Prepare and conduct up to two general public information meetings at milestone points to be determined by City of Bentonville.
  - e) Contact property owner for apartment building potentially being taken along 8<sup>th</sup> Street and conduct additional building specific public involvement.

## B. PRELIMINARY DESIGN (Project Number One and Two)

1. Surveys (See Appendix A for information about survey requirements as it pertains to the tasks that follow.)
- a) Control Surveys which includes
    - Elevation Control
    - Horizontal Control by total station traverses and, if approved, RTK GPS
  - b) Design surveys, which includes
    - Conventional ground field data collection to supplement data in areas inadequately covered by photogrammetry
    - Topography and terrain surveys to supplement the Photogrammetry.
    - Digital Terrain Modeling
  - c) Title Search
  - d) Parcel Surveys and Work sheets
  - e) Right of Way Staking
  - f) Staking for Geotechnical Investigations
  - g) Staking for Utility Adjustment Design
  - h) Right of Way Monumenting
  - i) Final Plat
2. Value Engineering Study
- a) Participate in Value Engineering (VE) Study.
  - b) Further review and analyze VE recommendations.
  - c) Prepare report of Value Engineering Study including implementation recommendations.

- d) Complete revisions if required to the Engineering and Operational Acceptability Review resulting from changes recommended by the Value Engineering Study.
  - e) Complete revision if required to the Environmental Assessment resulting from changes recommended by the Value Engineering Study.
3. Right-of-Way (See Appendix B “Stage Submittal Right-of-Way Plans”)
- a) Right of way plans
4. Utility Coordination
- a) Conduct and participate in a minimum of six (6) utility coordination meetings.
  - b) Provide 30%, 60%, and 90% plans to all affected utility owners for their review and coordination.
  - c) Provide survey staking of right of way and other improvements as required to assist in the development of utility relocation plans.
5. Combined Location/Design Public Hearing
- a) The Consultant will prepare all Public Hearing displays to be used at the Combined Location/Design Public Hearing. This will include, but not be limited to, plans of the proposed route illustrating the proposed horizontal and vertical alignments complete with all bridge structures, frontage roads, and crossing road realignments. Proposed and existing right of way requirements, including easements, shall be included on this display. The Consultant will assist the City at the Public Hearing by being prepared to answer and explain all concepts of the proposed design. A single joint Public Hearing will be held for Project Number One and Project Number Two. Professional fees associated with preparing for and conducting the Location/Design Public Hearing were included in the original agreement and no additional fees are included for this task within Supplemental Agreement No. 1.
  - b) The Consultant shall be responsible for developing a written transcript of the Public Hearing questions and provide written answers to each question. This written transcript shall be furnished to the Department for the completion of the project certification.
6. Traffic Analysis. The Consultant will provide the following services and information:
- a) Review and refine previously assembled AHTD traffic counts either measured or projected in the vicinity of the project.
  - b) Complete pedestrian studies and make recommendations for the development of grade-separated pedestrian crossings at up to two separate locations along 8<sup>th</sup> Street
  - c) Review and refine previous traffic volume counts and assemble all additional 24-hour hourly and peak period turning movement counts

needed on streets and highways proposed to intersect the project highway for assessment of existing system and for the basis for making projections of traffic for design year.

- d) Review and refine previously completed Capacity and Level of Service analysis for weaving distance, interchange ramps and ramp junctions and ramp intersections with intersecting highways and streets. This analysis will be done for main lanes and crossroads as applicable.
- e) Review and refine previously determined Average Annual Daily Traffic Volumes (ADT), appropriate Design Hour Volumes (DHV) for the main lanes and crossroads, and percent trucks. Traffic volume projections will be made for years 2012 and 2032.
- f) Calculate equivalent single axle loads (ESALs) for projected traffic conditions for main lanes, ramps and crossroads according to AASHTO procedures.
- g) Review and refine previously developed necessary interchange and intersection lane geometry and traffic control requirements for design alternatives considered, based on capacity and levels of service for projected conditions.
- h) Review and refine previously completed analysis of traffic movements for weaving distance for interchange ramps and ramp junctions and for ramp intersections with intersecting highways and streets.
- i) Conduct traffic signal warrants analysis per the latest edition of MUTCD criteria at up to nine (9) intersections.
- j) Provide complete traffic signalization plans and wiring diagrams and construction details for up to nine (9) intersections found to warrant traffic signal control per the latest edition of MUTCD warrant criteria.

## 7. Geotechnical

- a) Obtain soil borings and soil properties for bridge foundation, embankment design, and mechanically stabilized earth retaining walls.
- b) Interpret and evaluate geotechnical data for the foundation analysis and design, and bridge end embankment stability analysis
- c) Provide recommendations for embankment height and material at bridge ends.
- d) Provide anticipated settlement, allowable bearing capacities for bridge foundations, allowable foundation bearing capacities for MSE walls, recommendations for foundation type, and any recommendations on undercut and backfill.
- e) Obtain soil borings and provide soil testing for pavement design
- f) See attached Geotechnical Scope of Services Appendix C for additional detail of geotechnical services.

8. Provide a hydraulic study to determine the effects of the 50, 100 and 500 year floods and recommend waterway openings for stream crossings as required.
  - a. Submit design criteria to be used in the design of the projects for approval by AHTD prior to beginning preliminary design work.
  - b. Hydraulic study should include controlling overtopping floods and the effects of all floods for proposed and future conditions.
  - c. Provide a written certification that states the project complies with all hydraulic standards and floodplain regulations.
9. Provide pavement designs using AASHTO design procedures, and submit recommendations to AHTD for approval. Alternate pavement types will be developed and included in the contract documents according to the requirements of the Roadway Design Plan Development Guidelines.
10. Provide the preliminary bridge layouts and roadway plan sheets. A field inspection for each project will be performed at the 60% and 90% review level. Preliminary plans shall be submitted at the 30% level for AHTD approval of the geometric design, title sheet, and typical sections as defined in Appendix I of the Roadway Design Plan Development Guidelines. For projects designated as "SIGNIFICANT" according to the Work Zone Policy, Transportation Management Plan (TMP) meetings shall be held in accordance with the "Policy for Work Zone Safety and Mobility. These meeting should normally be held at the 30%, 60% and 90% plan review.
11. The roadway plans shall show, as a minimum:
  - a) Title sheet
  - b) Index of Sheets, Governing Specification and General Notes
  - c) Typical sections of improvement
  - d) Quantities and Summaries
  - e) Special details as needed
  - f) Roadway plan sheets showing:
    - i. Roadway grades for main lanes, interchange ramps, crossing roads and frontage roads
    - ii. Alignment data for main lanes, interchange ramps, crossing roads and frontage roads
    - iii. Tentative construction limits
    - iv. Right of way, permanent and temporary construction easements, and control of access (existing and proposed) including easements needed for sediment basins
    - v. All roadway/roadside features within the right of way
    - vi. Proposed roadside safety items such as guardrail, impact attenuation barriers, etc.
    - vii. Sketch of bridge layouts
    - viii. Preliminary size of drainage structures
    - ix. Retaining wall layouts as required.

- x. Sound wall layouts as required.
- g) Maintenance of traffic signing and striping conceptual plans
- h) Permanent Pavement Marking Details
- i) Permanent Signing Plans and Details
- j) Culvert Diagrams
- k) Erosion control plans
- l) Provide layouts for interchange and ramp locations.
- m) Cross Sections
- n) Signal warrants shall be performed for up to nine (9) signals by the Consultant. City of Bentonville and AHTD shall approve all signal locations prior to final signal design.

12. Fully developed bridge layouts shall be submitted for review and approval after the 30% roadway plans have been reviewed and approved. Additionally, any other features that will affect the bridges, such as ditch locations and superelevations, shall be considered and addressed before the bridge layout submittal. The bridge preliminary layouts for up to five (5) new bridges shall show, as a minimum:

- a) Topography and Utilities
- b) Geometric control dimensions
- c) Bridge length, width, and span lengths and types
- d) Design, construction, and material specifications
- e) Bridge foundation type, including, as applicable, estimated number and size of columns, pile sizes and lengths, etc.
- f) Schematic cross-section sketches of superstructure, showing deck thickness, girder type, girder size, and spacing, etc.
- g) "Exhibit A Drawings", data sheets, and checklists necessary to obtain railroad agreements.
- h) Preliminary MSE wall drawings including at bridge ends.

**Written approval of the bridge layout by AHTD and FHWA will be required before detail bridge design and plans are begun.**

- 13. Prepare conceptual construction work roads drawings for FEMA permits, as applicable
- 14. Attend preliminary and final field inspection
- 15. Perform alterations necessary to respond to comments made during the 30% review as well as comments made at the preliminary field inspection

#### C. FINAL DESIGN (Project Number One and Two)

- 1. Perform bridge design calculations for up to five (5) new bridges based on the approved layout.
- 2. Provide bridge and MSE Wall detail drawings for AHTD review. Drawings shall be complete and shall be thoroughly checked by the Consultant prior to submittal. **Submittal of bridge detail drawings for review shall be separate from the roadway plan submittal.**

3. Provide 90% roadway plans for AHTD review. All roadway design shall be complete, all information requested in item 11 shall be shown, and all drawings shall be thoroughly checked by the Consultant prior to submittal. **Submittal of the roadway plans for review shall be separate from bridge detail drawings submittal.**
  4. Provide quantities
  5. Provide special provisions
  6. Provide construction cost estimate
  7. Provide control detail sheets of the survey baseline and design centerline with control point data in accordance with the standard used by the Roadway Design Division of AHTD
  8. Provide eight (8) copies of plans for final field inspection and 90% review
  9. Attend final field inspections
  10. Make plan changes resulting from the initial and subsequent AHTD reviews, and final field inspection.
  11. Provide final signed and sealed plans.
  12. Perform all other work required to advertise and receive bids
- D. POST AWARD OF CONTRACT (TITLE II SERVICES) (Project Number One and Two)
1. Required Title II Services shall be provided per supplemental agreement at a later date.

## V. DELIVERABLES

1. During Preliminary Design Phase
  - a. PDF of Final Environmental Assessment
  - b. Project Design Criteria
  - c. Geotechnical Engineering Report
  - d. Hydraulic Report
  - e. 30% Complete plans with horizontal and vertical alignment shown, title sheet, and typical sections.
  - f. Pavement Designs for all main lines, ramps and sideroads
  - g. Preliminary Bridge Layout Drawings and MSE Retaining Wall Drawings including two (2) half-size sets submitted to AHTD. The preliminary bridge layouts submitted for approval shall show as a minimum:
    - i. Topography
    - ii. Geometric control dimensions
    - iii. Bridge length, width and span lengths and types
    - iv. Design, construction, and material specifications
    - v. Bridge foundation type, including as applicable, estimated number and size of columns, piles, sizes, etc.
    - vi. Schematic cross-section sketches of superstructure
    - vii. "Exhibit A Drawings", data sheets, and checklists necessary to obtain railroad agreements.

2. During Final Design Phase
  - a. 60% Complete plans (Roadway Only)
  - b. Final Right of Way Plans
  - c. 90% Complete plans (Bridge, Wall, & Roadway)
  - d. Revised final "Exhibit A Drawings", data sheets, and checklists necessary to obtain railroad agreements if required.
  - e. Final 100% un-signed un-sealed plans (Bridge, Wall, & Roadway)
  - f. Final signed and sealed plans (Bridge, Wall, & Roadway)
  - g. Final Project Special Provisions
  - h. Final Project Estimate of Probable Costs
  - i. One copy of Bridge Design and quantity computations
  - j. One (1) final stamped and signed full-size set of bridge and retaining wall drawings shall be submitted to AHTD
  - k. Information required to support a Corps of Engineers 404 permit application, submitted by the Owner.
  - l. Electronic copies of the final contract drawings. The submittal will consist of a compact disk developed in Microstation DGN format that is fully indexed (all reference files attached and set to load automatically). This includes the electronic copies of the Roadway, Bridge, Survey, and Right-of-Way submittals.

## **VI. PROJECT CONDITIONS OF THE WORK**

8<sup>th</sup> Street will be designed as a four-lane divided urban arterial with segments of five-lane, undivided sections. The new interchange will likely be one of the approved concepts included in the Engineering and Operational Acceptability Review report. Improvements will include two new grade separation structures across the existing railroad, a new bridge for 8<sup>th</sup> Street, and up to two additional structures as required to implement the proposed alternative, extensive MSE retaining walls, drainage, signing, and pavement marking.

All designs shall be in accordance with the latest edition of AASHTO, "A Policy on Geometric Design of Highways and Streets", the "AASHTO LRFD Bridge Design Specifications 2007 Edition" with 2009 interim revisions, and City of Bentonville design guidelines and specifications. In addition, AHTD design policies and memorandums shall be used for all bridge designs. Other appropriate AASHTO publications and guide specifications shall also be utilized. The projects are to be designed in AHTD format utilizing the "Roadway Design Plan Development Guidelines" and the "Roadway Design Training Guide". Upon completion of the contract, the Consultant shall furnish to the AHTD all electronic files of the project design and plans on a compact disc in Bentley System Microstation format.

All plans and surveys shall be in U.S. Foot Units and based on Arkansas State Plane Grid South Zone that have been converted to ground units based on the Combination Adjustment Factor (CAF) approved by, or provided by, the AHTD. All design and plans shall be Intergraph Inroads using the AHTD feature tables and cell libraries.

Construction specifications shall be the current edition of the AHTD's Standard Specifications for Highway Construction. Standard Drawings shall be the current edition of the AHTD's Roadway and Bridge Standard Drawings. Design Speed for the project and the individual elements such as ramps, etc. shall be as approved by the design criteria to be submitted before initiating any conceptual design. Access control for project one shall be fully controlled.

## **VII. SPECIAL CONDITIONS OF THE WORK**

The consulting firm must have a certificate of authorization to practice Professional Engineering in Arkansas and must have a working office in the state. (This office requirement may be met by subcontracting or forming a joint venture with an Arkansas engineering firm.) Plans shall be stamped by a Professional Engineer registered in Arkansas.

In addition, all design and land surveys shall be performed to Arkansas minimum standards and AHTD requirements. All design survey work shall be supervised and certified (stamped) by a Registered Land Surveyor registered in Arkansas who is on the current list of surveyors/consultants who has been approved to perform design surveys and/or land surveys for AHTD. All land survey work shall be supervised and certified (stamped) by a Registered Land Surveyor registered in Arkansas who is on the current list of surveyors/consultants who has been approved to perform land surveys for AHTD. A current list of such firms will be furnished upon request.

Bi-monthly coordination meetings will be conducted, as needed. These meetings shall include the Consultant, the City of Bentonville, AHTD and FHWA and others, as appropriate. The Consultant shall schedule these meetings with AHTD concurrence, and compile and distribute meeting minutes, as required.

The Consultant shall submit a work schedule, which will permit all work to be completed within 36 months after receiving notice to proceed. A detailed schedule is attached and made a part of the supplemental agreement.

# Arkansas Highway and Transportation Department

## APPENDIX A

### General and Detailed Scope of Work

#### For

### CONTROL SURVEYS, DESIGN SURVEYS, AND LAND SURVEYS,

The sections that follow will apply to a specific project based on the type of services specified in the project overview.

The required procedures for all surveying tasks are documented in *Requirements and Procedures for Control Surveys, Design Surveys and Land Surveys*, prepared by the Surveys Division, will be called the Surveys Manual throughout the remainder of this general scope of work. The most current Surveys Manual is to be used regardless of the start date of a survey project.

A copy of the most current version of the Surveys Manual is available on the AHTD's internet file transfer (ftp) site at:

<ftp://www.arkansashighways.com/outgoing/surveys/contents.htm>.

#### PART I A

##### Control Surveys

The project consists of performing Control Surveys for the City of Bentonville and the Arkansas State Highway Commission acting by and through its Director of Highways and Transportation, hereinafter called the Owner. Work is intended to commence immediately upon given the notice to proceed, and is to be completed and submitted no later than two months following the notice to proceed.

Ample time shall be scheduled and adequate resources dedicated to the project to complete the Control Surveys within the requested time. Completion includes submittal of 100% of Control Surveys.

#### 1. General Information

The following information shall apply to all phases of Control Surveys.

- 1.1 For all parts of the project and all sections that follow, more details and requirements can be found in the Surveys Manual.
- 1.2 All surveys shall be U. S. Foot unless specified otherwise.
- 1.3 Survey controls used and established shall comply with AHTD requirements for the type of work performed.

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Note: Hubs and tacks shall not be used for any purpose on this project.

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- 1.4 Accuracy of measurements –All measurement data shall be consistent with minimum standards. Distances are to be measured and displayed on drawings to two (2) decimal places for projects in U.S. Foot. Bearings shall be displayed to the second. Horizontal and vertical angles shall be measured

with an instrument capable of reading angles with a minimum accuracy of five seconds (5'') and recorded to one second (1''). Coordinates shall be displayed and copied to disk to the fourth decimal place as a minimum to avoid bearing and distance round off when inverting between data points.

- 1.5 The work shall be done in a professional and workmanlike manner satisfactory to the Owner, and except in the matter of advising the Consultant/Surveyor what work is to be done and the results that are expected to be obtained, the Owner shall have no supervision over the Consultant/Surveyor or any of his employees. The Consultant/Surveyor shall direct the work himself, using the methods prescribed by the Owner to accomplish it and shall represent the will of the Owner as to the results of his work.
- 1.6 The Consultant/Surveyor's surveyor shall be a Professional Surveyor (PS) in the State of Arkansas. All services performed by the surveyor shall be in compliance with Arkansas laws and regulations governing the practice of Professional Surveyors and with all Federal, State and Local laws, regulations and ordinances applicable to the work.
- 1.7 Survey operations shall be conducted with due regard to the safety of personnel and equipment. Contact with the airport traffic control tower is mandatory during surveys at any controlled airports.
- 1.8 All surveys are to be performed using Grid Coordinates based on the Arkansas State Plane Coordinate System Zone in which the project is located.
- 1.9 When entering or crossing private property, which is the case on many of the surveys, the Consultant/Surveyor shall contact the property owner. If personal contact cannot be made, a copy of the notification form shall be left at the in an "easy to be seen" location on the property. This form is found in the Surveys Manual.
- 1.10 The following information shall be placed on a control flag, supplied by the Owner, to be set near all control points:
  - Job Number
  - Point Number
  - AHTD Surveys Division (501) 569-2341
- 1.11 The Consultant/Surveyor shall inform the Owner when fieldwork has started on the project. During the course of the project a progress report shall be sent to the Owner each Thursday, indicating the percentage of the work completed. The report can be faxed to the Surveys Division at (501) 569-2344 or e-mailed to the Surveys Division Staff member who is responsible for this task as specified in the current Surveys Manual.
- 1.12 All field AASHTOWare® SDMS® data files (PRJ & EDI) for the field work completed each day shall be submitted to the Surveys Division Office via email on a daily basis. These files are to be sent to [surveysupport@arkansashighways.com](mailto:surveysupport@arkansashighways.com).

- 1.13 All raw and calculated data shall be submitted electronically on compact disk (CD) in the required formats.
- 1.14 The Surveys Manual includes the following:
- File Naming Procedures
  - Software Requirements
  - Point Numbering
  - Feature Codes
  - Survey Procedures for Control Surveys
  - AASHTOWare® SDMS® Configuration
  - AASHTOWare® SDMS® Sequences
  - Checklist
- 1.15 A hard copy of the checklists and inventory sheets in Appendix F of the Surveys Manual shall be submitted.
- 1.16 Any horizontal or vertical control work that requires using techniques other than GPS, shall be collected and processed using AASHTOWare® SDMS® Collector and AASHTOWare® SDMS® Processor, respectively, and using procedures required by the AHTD. Current procedures required can be reviewed in the Surveys Manual
- 1.17 All data collection and processing shall be done using the AASHTOWare® SDMS® Collector and AASHTOWare® SDMS® Processor, respectively. The software shall be furnished to Consultants/Surveyors currently certified to perform surveys for the AHTD under the site license held by the AHTD from AASHTO to use said software. The Consultant/Surveyor shall comply with all legal requirements of AASHTO while using the software.
- 1.18 Data shall be furnished to the AHTD as specified in the Surveys Manual as follows:
- Collection data shall be in AASHTOWare® SDMS® .PRJ format.
  - Edited data shall be in AASHTOWare® SDMS® .EDI format.
  - Processed SDMS formatted data shall be in the AASHTOWare® SDMS® .PAC format
  - Control Point data shall be in AASHTOWare® SDMS® .CTL format
  - Static GPS data shall be in RINEX v2.10 format.
  - RTK GPS data shall be in TRIMBLE® .DC format.
  - Calculated RTK GPS data shall be in AASHTOWare® SDMS® .CAL format.
- 1.19 Accounting Procedures – See Appendix A-1

## **2. Static GPS**

- 2.1 This part of the project consists of obtaining and submitting GPS Collection for Control Surveys, as detailed in the Surveys Manual as follows:

- 2.1.1 This survey shall observe the GPS Control stations along the task projects as listed in Table I, *Control Surveys (Task Projects) for GPS Collection*.
- 2.1.2 Static GPS techniques, approved by the AHTD, shall be used for this purpose.
- 2.1.3 The Owner, prior to the start of the task project, shall set all GPS Control points in Arkansas. The Consultant/Surveyor shall set all GPS Control points outside of the State Boundary.
  - 2.1.3.1 All GPS control points shall consist of pairs of inter-visible points. One point shall be designated the station monument and one as an azimuth mark.
  - 2.1.3.2 All GPS control points set shall consist of a 5/8" rebar with a 2 1/2" aluminum cap. These caps will be furnished by the Department. Sufficient length of rebar shall be used to provide stability for the soil conditions encountered for each point set with a minimum length of 48". Each point shall be stamped according to the AHTD marking and numbering system.
- 2.1.4 Global Positioning System (GPS) shall be used to establish survey controls on the task project. It shall be established from first order (1:100,000) NGS Geodetic Survey control points, Arkansas High Accuracy Regional Network points, and Continuous Operating Reference Stations (CORS) in the area based on NAD 83 (1997) and using GEOID96. First order (1:100,000) accuracy shall be maintained on all baselines. Procedures for GPS shall comply with those set out in Geometric Geodetic Standard and Specifications for using GPS Relative Positioning Techniques, by the Federal Geodetic Control Committee, version 5.0 (Reprinted 8/1/1989), or later.
- 2.1.5 Data from the CORS in the region shall be used in the processing. The seven AHTD NGS National CORS are located in Batesville (ARBT), Camden (ARCM), Fayetteville (ARFY), Hope (ARHP), Harrison (ARHR), Little Rock (ARLR), and Paragould (ARPG). There are fourteen NGS National CORS in addition to the AHTD CORS in the area. Positions and data for the NGS CORS are available from the NGS web site and the AHTD ftp web site.
- 2.1.6 Data from the surrounding NGS and AHTD CORS sites shall be retrieved and compiled by AHTD. All data processing shall be done by AHTD.
- 2.1.7 The observing scheme shall be arranged so that for each station, the start time of one of the observing sessions shall be at least four (4) hours different from the other two. The observing scheme shall be arranged to ensure that adjacent stations are directly connected in at least one observing session, and at least half of all base lines are repeated. Three (3) sessions of two (2) hours each shall be observed on each control point. In order to provide a check, the equipment shall be broken down and reset with a minimum of 30 minutes between the three sessions.

A typical schedule is as follows:

Monday / Travel Day

8:00 am – 11:00 am	Travel
11:00 am – 12:00 pm	Lunch

	12:00 pm – 12:30 pm	Setup
	12:30 pm – 2:30 pm	Session A
	2:30 pm – 3:00 pm	Break / Setup
	3:00 pm – 5:00 pm	Session B
Tuesday – Thursday		
	8:00 am – 8:30 am	Setup
	8:30 am – 10:30 am	Session A
	10:30 am – 11:00 am	Break
	11:00 am – 12:00 pm	Lunch
	12:00 pm – 12:30 pm	Setup
	12:30 pm – 2:30 pm	Session B
	2:30 pm – 3:00 pm	Break / Setup
	3:00 pm – 5:00 pm	Session C
Friday / Travel Day		
	8:00 am – 8:30 am	Setup
	8:30 am – 10:30 am	Session A
	10:30 am – 11:00 am	Break / Setup
	11:00 am – 1:00 pm	Session B
	1:00 pm – 2:00 pm	Lunch
	2:00 pm – 5:00 pm	Travel

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Note: This schedule should be adjusted accordingly so that optimum satellite coverage is utilized and occupation times should correspond to the operation times of area AHTD CORS Sites.

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- 2.1.8 Each station shall be occupied at least three times - twice at one observing window and once at the other. Adjacent stations shall be directly connected in at least one observing session, and at least one-half of all base lines shall be repeated. The CORS base lines shall be repeated. CORS data shall be used throughout the task project.

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NOTE: The observation schedule shall be provided to the Owner at the beginning of each task project and whenever the Consultant/Surveyor revises the observation schedule.

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- 2.1.9 The GPS receivers and antennae shall be of geodetic quality collecting full-wavelength L1/L2 Dual Frequency data and they shall be set to track satellites down to a 15-degree elevation angle. Data collection shall be accomplished as specified in the field utilizing a dual-frequency receiver in the compressed mode at a 15-second epoch collection interval. The model of the antenna used for observations shall be on the list of calibrated/modeled antenna by the National Geodetic Survey which can be found at <http://www.ngs.noaa.gov/ANTCAL/index.shtml>.

- The GPS system used shall produce Receiver Independent Exchange (Rinex) Version 2.10 data format which can be found at <http://www.ngs.noaa.gov/CORS/rinex210.txt>. The Consultant/Surveyor shall provide the raw GPS data in the manufacturer's native format and in the RINEX v2.10 format.

- The receivers used for network surveys should record the full wave-length carrier phase and signal strength of both the L1 and L2 frequencies, and track at least eight satellites simultaneously on parallel channels. Dual frequency instruments are required for all baselines. Receivers should have sufficient memory and battery power to record six (6) hours of data at 15-second epochs.

2.1.10 Special Requirements - Antenna set-up is critical to the success of this task. Fixed-height tripods are preferred for all receivers. The plumbing bubbles on the antenna pole of the fixed-height tripod shall be shaded when plumbing is performed. They shall be shaded for three (3) minutes before checking and/or re-plumbing. Also, the perpendicularity of the poles shall be checked at the beginning of the project and any other time there is suspicion of a problem.

When a fixed-height tripod is not used, the height of the antenna shall be carefully measured to prevent station set-up blunders from occurring. Tribrachs used for these set-ups shall be checked and adjusted when necessary. Totally independent measurements of the antenna height above the mark in both metric and English units shall be made before and after each session.

Some GPS antennas have detachable ground planes and radomes. In order to help identify what exactly was used at a particular site, it would be useful to have a snapshot of the setup and, if possible, a close-up of the antenna as viewed from the side. The GPS antennas shall have stable phase centers and choke rings or large (> 16 cm) ground planes to minimize multipath interference.

2.1.11 A rubbing of the stamping of the mark shall be made at each visit to a station. If it is impossible to make a rubbing of the mark, a plan sketch or digital picture of the mark shall be substituted, to accurately recording all markings.

2.1.12 For each station visited, a visibility obstruction diagram shall be prepared and the TO-REACH description carefully checked for errors or omissions.

2.1.13 The following shall be recorded at each occupation of a station:

- receiver manufacturer;
- antenna manufacturer;
- receiver model number (part number);
- antenna model number (part number);
- the complete serial number of the receiver, and;
- the complete serial number of the antenna;
- antenna heights.

2.1.14 Success of this task requires that the highest quality GPS data be collected. Therefore, during each station occupation, the operators shall carefully monitor the operation of the receivers. Any irregularities in the data due to equipment malfunction, DOD adjustment of the satellite orbit, obstructions, etc., shall be reported to the Surveys Division Staff member who is responsible for this task as specified in the current Surveys Manual.

- 2.2 The following additional information is attached:  
One (1) copy each of GPS Control Observation Log Form, GPS Recovery Form, GPS Visibility Form, and GPS Pencil Rubbing Form.
- 2.3 In lieu of submitting the checklists and inventory sheets in Appendix F of the Surveys Manual, the GPS Forms listed above shall be submitted for each session and for each station.

### **3. Photogrammetry Mapping Targets**

- 3.1 All photogrammetric surveys that will be utilized for this project have been completed by the Arkansas Highway and Transportation Department and will be provided to the Consultant. No additional photogrammetric surveys will be required.

### **4. Vertical Control Surveys – Elevation**

- 4.1 This part of the project consists of obtaining and submitting Vertical Data Collection for Control Surveys, as detailed in the Surveys Manual as follows:

4.1.1 This survey shall be vertical data collection to and through the task projects as listed in Table III, *Control Surveys (Task Projects) for Vertical Control*.

4.1.2 Vertical control shall be established from a minimum of two (2) NGS First or Second Order vertical control monuments and shall be based on NAVD 88 Datum. Three-wire leveling shall be used to establish vertical control to and within the task project limits for benches and control points as detailed in Surveys Manual.

An approved automatic level and a high quality wood Philadelphia type rod with readings made to the thousandth (###.###) shall be used on all projects.

4.1.3 The Consultant/Surveyor shall establish vertical control points on this task project. Each control point shall have an elevation established using three (3) wire level techniques.

4.1.4 As detailed in the Surveys Manual, vertical control points are to be set as follows:

4.1.4.1 Every ½ mile to the task project location and every ¼ mile within the task project location.

4.1.4.2 On every major culvert and bridge to and within the task project location.

4.1.4.3 All primary control points and random traverse points.

4.2 An elevation control plan shall be prepared. The plan shall include a narrative and a layout on an at least 1"=2000' aerial photograph or USGS Quadrangle sheet. The plan shall include:

- The NGS Bench Marks found and to be used.

- The elevation control route proposed.
- The types and proposed locations of the marks to be established along the elevation control route.

## **5. Horizontal Control Surveys – Traverse**

- 5.1 This part of the project consists of obtaining and submitting Horizontal Data Collection for Control Surveys, as detailed in the Surveys Manual as follows:
- 5.1.1 This survey shall be horizontal data collection on the control points for the task projects as listed in Table IV, *Control Surveys (Task Projects) for Horizontal Control*.
- 5.1.2 All horizontal traverse work shall be performed with an approved total station utilizing AASHTOWare® SDMS® Collector shall be used for all traverses. The traverse shall be a closed loop from either the GPS Control points or the primary control with adequate redundant ties between control points to perform a least squares analysis of the data. Certain GPS techniques, if approved by the AHTD in advance, may be used for this purpose. If approved in advance, RTK GPS may be done in lieu of running a conventional traverse.
- 5.1.3 The Consultant/Surveyor shall establish control points on this task project. Field generated control includes adequate control points on the ground to correctly geo-reference any alternatives, if part of the task project. Control points shall be inter-visible at distances no greater than 800 feet apart. Each control point set shall have an elevation established using three (3) wire level techniques.
- 5.1.3.1 Control points shall be a 5/8" x 24" rebar with a 2" aluminum cap as designated in the Surveys Manual. The owner, if requested by the Consultant/Surveyor, shall supply these materials.

## PART I B

### Design Surveys - Topography and Terrain Data

The project consists of performing Topographic & Digital Terrain Model Surveys for the City of Bentonville and the Arkansas State Highway Commission acting by and through its Director of Highways and Transportation, hereinafter called the Owner, at 8<sup>th</sup> Street, in the area shown on the previously provided map and required to supplement aerial photography, photogrammetry, and digital terrain modeling provided by the Arkansas Highway and Transportation Department. It is requested that the job be completed and submitted no later than six months following the notice to proceed. Ample time shall be scheduled and adequate resources dedicated to the project to complete the Topographic and Digital Terrain Model surveys by the submittal date. Completion includes submittal of 100% of Topographic and Digital Terrain Model surveys.

This part of the project consists of obtaining and submitting Topographic, and Digital Terrain Model Surveys, as detailed in the Surveys Manual as follows:

- 1.2 Obtain all pertinent topographic data. (Refer to Digital Terrain Modeling section of Surveys Manual.)
- 1.3 Set control references (Resection References) for the project. The reference monuments shall be set following procedures as described in the Surveys Manual.
- 1.4 All design data collection and processing shall be done using the AASHTOWare<sup>®</sup> SDMS Collector and SDMS Processor, respectively. The software will be furnished to Surveyors/Consultants currently certified to perform surveys for the AHTD under the site license held by the AHTD from AASHTO to use said software. The Surveyor/Consultant shall comply with all legal requirements of AASHTO while using the software.
- 1.5 All raw and calculated data shall be submitted electronically on compact disk (CD) in the required AASHTO SDMS formats.
- 1.6 All design surveys will be U.S. Foot unless specified otherwise.
- 1.7 All design surveys are to be performed using Grid Coordinates based on the Arkansas State Plane Coordinate System Zone in which the project is located.

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Note: Current procedure requires all grid coordinates be projected to ground coordinates, based on the combination adjustment factor assigned by or approved by the AHTD, for project design. This will be a specific task if it is part of a contract for work to be performed.

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- 1.8 Land Ties as described in the surveys manual.
- 1.9 Utility surveys to locate all above ground and below ground utilities. Procedures as described in the Surveys Manual shall be followed.

- 1.10. Field surveys for all drainage structures, including bridges. Procedures as described in the Surveys Manual shall be followed.
- 1.11 Provide a hard copy of the checklists and inventory sheets in Appendix F of the Surveys Manual.
2. Accuracy of measurements –All measurement data shall be consistent with minimum standards. Distances are to be measured and displayed on drawings to two (2) decimal places for projects in U.S. Foot. Bearings shall be displayed to the second. Horizontal and vertical angles shall be measured with an instrument capable of reading angles with a minimum accuracy of five seconds (5'') and recorded to one second (1''). Coordinates shall be displayed and copied to disk to the fourth decimal place as a minimum to avoid bearing and distance round off when inversing between data points.
3. The work shall be done in a professional and workmanlike manner satisfactory to the Owner, and except in the matter of advising the Consultant/Surveyor what work is to be done and the results that are expected to be obtained, the Owner shall have no supervision over the Consultant/Surveyor or any of his employees. The Consultant/Surveyor will direct the work himself, using the methods prescribed by the Owner to accomplish it and will represent the will of the Owner as to the results of his work.
4. The Consultant's surveyor shall be a Professional Surveyor (PS) in the State of Arkansas. All services performed by the surveyor shall be in compliance with Arkansas laws and regulations governing the practice of Professional Surveyors and with all Federal, State and Local laws, regulations and ordinances applicable to the work.
5. The Consultant will inform the Owner when fieldwork has started on the project. During the course of the project a progress report shall be sent to the Owner each Thursday, indicating the percentage of the work completed. The report can be faxed to Surveys Division at 501-569-2344, or e-mailed to the Surveys Division Staff member who is responsible for this task as specified in the current Surveys Manual.
6. The following information is attached:
  - 6.1 The Surveys Manual will include the following:
    - File Naming Procedures
    - Software Requirements
    - Point Numbering
    - Feature Codes
    - Survey Procedures for Topographic Surveys
    - Land Ties
    - SDMS Configuration
    - SDMS Sequences
    - Checklist
7. Accounting Procedures – See Appendix A-1.

## **PART I C**

### **Design Surveys – Photogrammetry**

All photogrammetry and aerial photography utilized for this project will be provided by the Arkansas Highway and Transportation Department.

## PART II LAND SURVEYS

### PART IIA

#### Title Services

1. This part of the project consists of furnishing the Arkansas Highway and Transportation Department, Surveys Division, and the City of Bentonville with current ownership data, including: certificates, deeds, surveys, subdivision plats, and strip map for properties that are or may be involved. The individual(s) performing this task shall have a current license as an Abstractor in the State of Arkansas.
- 1.1 The work required to be performed and furnished to the Surveys Division by the abstractor is as follows:
  - a. **Certificates of Title:** A Certificate of Title shall be furnished for each parcel of land fronting or touching each side of the highway, 8<sup>th</sup> Street, and other locations as required within the limits of the project. A copy of the record legal description of any contiguous lands owned by the person or persons listed in the certificates of title shall also be furnished.

Each certificate will be for the current ownership as of the date of the certificate of title is prepared for this project and shall contain the following data:

- AHTD Job Number;
- AHTD Job Name, Review Date;
- County,
- Grantee(s) Name and Address;
- Parcel (tax) ID;
- Land Value;
- Improvements Value;
- Area (acres);
- Type of Instrument;
- Date of Instrument;
- Date Filed;
- Record Book and Page and/or Instrument Number;
- Grantor(s) name(s)
- The Record Description per the deed.
- A Certificate Number shall be assigned and shall be displayed in the lower right hand corner of each certificate.

Certificate numbers shall be grouped together for all parcels within each land section and within each subdivision involved. The certificates with corresponding deeds are to be numbered and indexed by number and the owner's name. The certificates are to be furnished in booklet form with the index at the front of each booklet. The name, address and telephone number of the abstracting firm is to be on the index as well as on each certificate. Certificates are to be prepared on forms similar to the attached sample form.

- b. **Deeds:** An actual legible copy of each deed, (either photo copied or scanned), including acknowledgments, stamps, and recording data is to be furnished for each parcel and contiguous lands.
  - c. **Survey Plats:** Where deeds refer to surveys by a surveyor, a complete and legible copy (border to border) of the surveyor's plat is to be furnished. All other related surveys that come to light during the course of research are also to be furnished.
  - d. **Subdivision Plats:** Where parcels are deeded per subdivision plats of record or where deeds make reference to subdivision or survey plats, either recorded or unrecorded, complete and legible copies (border to border) of said subdivision or survey plats are to be furnished, along with any accompanying bills of assurance. All other related subdivision plats that come to light during the course of research are also to be furnished.
  - e. **Strip Map:** A strip map shall be made and furnished. The strip map is to show the approximate location of the highway project, as well as all intersecting streets, roads and highways, including their names and/or numbers. The relative location of the parcels with their certificate numbers is to be shown. Where the parcels are described by metes and bounds, their relationship is to be shown within sixteenth sections, section, township and range. Where the parcels are described within subdivisions, either recorded or unrecorded, their relationship within the subdivision is to be shown. This includes certificate numbers, lot and block numbers, street names, and subdivision names. The approximate boundaries of subdivisions are to be delineated on the strip map. The strip map is to be plotted at a scale large enough to show deed calls.
- 1.2 Title services must be completed and delivered within three months of the notice to proceed. Submittals are to include one copy of each certificate booklet and strip map, along with one copy of each survey plat, subdivision plat, and bill of assurance. Submittals are to be sent to the Engineer of Surveys Division. The address to use depends on method of delivery as follows:

Standard Mail

Kit Carson, PE, PS  
Engineer of Surveys Division  
Arkansas Highway and Transportation Department  
P.O. Box 2261  
Little Rock, AR 72203

Shipped – (UPS, Federal Express, etc.)

Kit Carson, PE, PS  
Engineer of Surveys Division  
Arkansas Highway and Transportation Department  
10324 Interstate 30  
Little Rock, AR 72209

2. Invoices for work completed on this project shall include:
  - Job name and number
  - Designated as Title Services
  - Federal Tax ID Number
  - Billing period dates
  - Total earned for the period
  - Total amount due for the period
3. A completed Microsoft® Excel spreadsheet for each billing period shall accompany each invoice. The actual Excel file, furnished by the Department, will be based on the Consultant's approved estimate. This file will be furnished provided to the Consultant once a contract has been signed by the AHTD. The Excel spreadsheet will be sent by E-mail. A sample Microsoft® Excel spreadsheet is attached.

## **PART IIB**

### **Land Surveys (Parcel Surveys) for Right of Way Acquisition**

- 1 This portion of the project consists of performing Land Surveys within the limits of the project. The work performed and plats prepared and furnished shall meet the current Arkansas Minimum Standards for Property Boundary Surveys and Plats as well as AHTD and City of Bentonville requirements. The Surveyor performing the work shall be on the current list of those certified to perform land surveys for the AHTD.

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**Note:** All land surveys are to be performed using Grid Coordinates from the Arkansas State Plane Coordinate System Zone in which the project is located projected to ground coordinates. The ground coordinates shall be based on the combination adjustment factor assigned by or approved by the AHTD.

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- 1.1 The Consultant/Surveyor shall coordinate the work and allocate sufficient time to complete and submit the Land Surveys at the 100% level no later than six months following the notice to proceed.
- 1.2 Any revisions or corrections required by the Owner in the submitted data shall be made by the Consultant and resubmitted to the Owner within two weeks of notification of such revisions.
2. The work required to be performed by the Surveyor will be as follows:
  - 2.1 All land survey data collection, as well as any design survey data, shall be done using the AASHTOWare® SDMS Collector. All data collected shall be processed using the AASHTOWare® SDMS Processor. This software is furnished at no charge to the Consultant/Surveyor under the site license held by the Owner for the AASHTOWare® SDMS Data Collection System. The Consultant/Surveyor is obligated to comply with all license requirements while using this software.

Field procedure shall comply with the Surveys Manual.

All field data files (PRJ) for the field work completed each day shall be submitted to the Surveys Division Office via email on a daily basis. These files are to be sent to <mailto:surveysupport@arkansashighways.com>

- 2.2 All field data processing should be performed using AASHTO SDMS Processor. This software is also furnished at no charge to the Consultant/Surveyor under the site license held by the Owner for the AASHTOWare® SDMS Data Collection and Processing System. The Consultant/Surveyor is obligated to comply with all license requirements while using this software. Processing procedures should comply with the Surveys Manual.

Processed data files shall be archived and submitted to the Surveys Division Office via email on a weekly basis. The archive shall include all files imported into, edited in, and developed by SDMS Processor. These files are to be sent to <mailto:surveysupport@arkansashighways.com>.

- 2.3 Establish field survey ties to pertinent land monuments, property corners and existing right of way monuments using the feature IP and as described in the Surveys Manual.

- 2.4 All raw and calculated field data shall be furnished to the Surveys Division as part of the final submittal on compact disk (CD) in the AASHTOWare® SDMS format, as described in the Surveys Manual.

- 2.5 Prepare all drawings, maps and plats using the Bentley Systems, Inc., Microstation Inroads, Version 8.9/SP2 and Microstation Version 8.5 or higher. The cell library, seed files, feature table, and preference tables furnished by the Department shall be used. This data shall be archived and emailed on the Thursday of each week. These files are to be sent to <mailto:surveysupport@arkansashighways.com>.

The design files (.DGN) graphics and geometry database (.ALG) shall be in the format prescribed, based on using Bentley Inroads 8.9/SP2 as specified in the information that follows:

#### **Bentley Inroads**

Land Survey coordinate geometry (COGO) and worksheets shall be developed using Bentley Inroads are as follows:

- Point Number Range based on the feature code shall be as described in the Surveys Manual.
- Feature Codes shall be used as specified in the Manual or in the Project Scope.
- Complete point descriptions and all pertinent and required attributes shall be stored and displayed for each tied or calculated point necessary to define that specific point or geometry chain.
- Coordinate geometry shall be done using coordinate geometry (cogo) commands. Graphic intersection commands shall not be used to create geometry points.
- All alignment points shall be stored as cogo points.
- All parcel tracts shall be stored as closed polygon alignment chains.
- All computed points not used are to be deleted from the data base.
- Surveyor's notes, text notes, and any legal descriptions displayed on the worksheet and/or plat shall be also stored in a text file. Specific requirements are defined elsewhere in this document.

- All pertinent graphical data shall be within the particular DGN file being submitted, to include project data, text, and sheet borders. Topographic survey data may be in a referenced DGN file.
- The Design History shall be turned-on for all Microstation design (.DGN) files.

**Data Files to be furnished**

- Complete database of points, survey chains, alignment chains, and text elements in ALG format (*See Note 1 above*).
- Finished graphics of points, survey chains, alignment chains, and text elements actually used saved as a DGN and the text files as specified in the Surveys Manual. *See Appendix J of the Surveys Manual for details.*
- Points with all pertinent and required attributes – SDMS PAC format and Inroads ALG format. *See Appendix J of the Surveys Manual for details.*
- Survey Chains
  - o SDMS PAC format
  - o Inroads ALG format.
- Alignment Chains (figures based on coordinate geometry and used as boundary lines with bearing and distance) and chain descriptions
  - o Inroads ALG format
- Individual sheets shall be saved in DGN format.
- Text file of Coordinate Geometry commands (Audit Trail) used to create points and alignments.

**Surveyor’s and Other Text Notes**

All surveyor’s notes and other pertinent text notes and any legal descriptions written shall be displayed on the worksheets and/or plats. These notes shall also be stored as separate text files for each sheet developed. The filename shall include the job number and sheet number where it appears. The format is:

*Job Number(SPACE)Note Number(same as sheet number).txt.*

If it is necessary to create more than one text file for a particular page, add an alpha character after the note (sheet) number. Use the letter “A” for the first additional file and continue through the alphabet as necessary. The format is:

*Job Number(SPACE)Note Number(same as sheet number)A.txt*  
*Job Number(SPACE)Note Number(same as sheet number)B.txt*  
*Etc..*

If a sheet should exceed 26 files, use the same procedure but add a second letter (AA, BB, etc.).

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- 2.6 Reproducible sheets in 11”x17” size shall be provided as a hard copy and electronic form on compact disk in the Microstation DGN format prescribed above. The CADD and hard copy drawings shall include the following:
  - 2.7.1 Section lines, quarter and quarter-quarter section land lines and established land corners found and computed. Corners shall be described as shown in Chapter IV of the *Manual of Surveying Instructions 1973*, U.S. Department of

Interior BLM; the *Handbook for Arkansas Land Surveys*, 2<sup>nd</sup> Edition, 1981; and as described in the Surveys Manual.

- 2.7.2 Ties to corners, monuments, corner accessories and other relevant witness information which control the location of said 1/16 section lines and corners; the surveyor's basis of acceptance and/or computations thereof, and the originating source of found monument.
- 2.7.3 Complete descriptions for said 1/16 corners, whether found or computed, using PLSS designations, as shown in the Surveys Manual.
- 2.7.4 1/16 Sections named and bearing and distance shown on all sides.
- 2.7.5 The existing right of way centerline and right of way lines.
- 2.7.6 The construction centerline if furnished by the Owner.
- 2.7.7 Property lines, with bearings and distances, and platted additions or subdivisions with lot and block numbers.
- 2.7.8 All pertinent topography located during Design Surveys and Land Surveys.
- 2.7.9 Description of land corners and property corners tied and other physical evidence of land lines; the basis of acceptance and/or computations thereof; and, the originating source of any found monument.
- 2.7.10 Easements of record shall be shown on the plat.
- 2.7.11 All gaps and overlaps found shall be clearly identified. An explanation for the gaps and overlaps shall be included in the surveyor's notes
- 2.7.12 Point number assigned to each point tied or computed. Computed points shall use the LC feature code for graphics and the point number range as described in the Surveys Manual.
- 2.7.13 Existing Right of Way for a roadway, if applicable, that has been established using existing monumentation and/or by computation. The geometry chain (figure) delineating the existing right of way, as established, shall use the line feature code of RE.
- 2.7.14 Basis of bearings and coordinates, based on the designation described in the Surveys Manual.
- 2.7.15 Surveyor's Report (Sample copies of the format required is available).
- 2.8 Sheet Scales – The CADD graphics and hard copy sheets shall be set up and submitted as 11" x 17" size sheets. The text shall be of a sufficient font (size) that it is legible on an 8.5" x 11" sheet when reduced on a copier. All sheets scales shall be standard Engineering scales. All sheets shall have the required information as follows:
  - 2.7.1 Section subdivision (section breakdown) sheets shall be submitted separate from the parcel sheets. Section subdivision shall be by 1/16 Section. Each sheet shall contain all information specified earlier in this section, and shall also include the location of the proposed construction centerline, if applicable. The scale used is determined by the amount of information required to justify and explain the methods and results being submitted.

- 2.7.2 Parcel sheets - Complete data is to be submitted to the Owner, consisting of a closed polygon for each parcel of property from which the Owner can prepare plans and property descriptions for the purchase of highway right of way. Each sheet may display as many ownership certificates as practical based on the scale used. The scale used is determined by the amount of information required to justify and explain the methods and results being submitted. Enlarged detailed sketches should be included on sheets with congested areas.
- 2.8 Parcel work sheets and preliminary parcel sheets shall be submitted for review and approval at the following phases of development:
- Phase I Preliminary Subdivision of Sections (Sectional Breakdown), including pertinent surveyor's notes.
  - Phase II Determination of any existing Rights of Way, including pertinent surveyor's notes.
  - Phase III Any conflicts in ownership encountered (Gaps, overlaps, etc.).
  - Phase IV Preliminary parcel sheets.
- 2.9 The data shall be submitted in the formats specified to the Engineer of Surveys Division. The raw field data files (PRJ) and edited files (EDI) shall be emailed daily to the Surveys Division Office. CADD files shall be archived and emailed weekly to the Surveys Division Office. This data shall be sent as specified in Section 2.1.

Hard copies of plats for review, as well as the final submittal of all data in the formats specified for the project shall be sent for delivery as follows:

Standard Mail

Kit Carson, Engineer of Surveys Division  
Arkansas Highway and Transportation Department  
P.O. Box 2261  
Little Rock, AR 72203

Shipped – (UPS, Federal Express, etc.)

Kit Carson, Engineer of Surveys Division  
Arkansas Highway and Transportation Department  
10324 Interstate 30  
Little Rock, AR 72209

Discussions necessary to resolve issues may be handled via teleconference. Complex issues may require “face to face” conferences to resolve.

3. Accuracy of Measurement – All measurement data shall be consistent with minimum standards. Distances are to be measured and displayed on drawings to two (2) decimal places for projects in U.S. Foot. Bearings shall be displayed to the second. Horizontal and vertical angles shall be measured with an instrument capable of reading angles with a minimum accuracy of 5” (seconds) and recorded to the second. Coordinates shall be displayed and copied to disk to the fourth decimal place as a minimum to avoid bearing and distance round off when inversing between data points.
4. Static, Rapid Static, or RTK GPS may be approved for establishing control on a case-by-case basis. All GPS procedures and techniques shall be submitted to the

AHTD for review and approval prior to performing any of this type work. The AHTD will not pay for any time or materials for any GPS type work done without prior approval.

Minimum requirements for GPS require that all receivers used be capable of collecting data from the L1 and L2 carrier signals. GPS data shall be furnished to the AHTD as follows:

- GPS collection data for control applications shall be in Trimble DAT (raw observations) and Trimble DC (point name and attributes) file formats.
- GPS Computed data shall be in SDMS points and chain (PAC) format.

Current requirements prohibit using RTK for land monument positioning. The Surveyor shall be certified for GPS control surveys to be considered for Land Survey applications.

5. The work to be performed by Surveyor shall be done in a professional and workmanlike manner satisfactory to the Owner, and except in the matter of advising the Surveyor what work is to be done and the results expected to be obtained, the Owner shall have no supervision over the Surveyor or any of his employees, but the Surveyor will prosecute and direct the work himself, using his own methods to accomplish it and will represent the will of the Owner only as to the result of his work.
6. The Surveyor shall be a Professional Surveyor (PS) in the State of Arkansas. All services performed by the Surveyor shall be in compliance with Arkansas laws and regulations governing the practice of Professional Surveyors and with all Federal, State and Local laws, regulations and ordinances applicable to the work.
7. During the course of the project a progress report shall be sent to the Owner each Thursday by 12:00 P.M., stating the approximate percentages of fieldwork and office work that has been completed. The Progress Reports are to be sent by e-mail to the Surveys Division Senior Staff Land Surveyor as specified in the current Surveys Manual.
8. Accounting Procedures – See Appendix A-1.
9. The following information is attached or can be provided upon request:
  - One (1) copy of existing Roadway or Right of Way plans showing existing right-of-way.
  - Sample copy of parcel survey drawings and/or right of way maps. \*
  - One (1) copy of property descriptions located along and adjacent to the highway and within the job limits.
  - One (1) copy of preliminary highway construction plans and/or mapping if available.
  - One (1) copy of General Land Office (GLO) plats of the area.
  - One (1) copy of aerial photographs, at a ratio of 1:9600, to cover the project area.
  - Sample copy of weekly progress report.
  - Sample invoice.
  - Sample Microsoft® Excel spreadsheet.

## PART IIC

### Right of Way Staking

The Right of Way shall be staked for acquisition on each tract requested by Right of Way Division or the City of Bentonville. AHTD vinyl flags with the proper designations shall be used for this task. Additionally, the Right of Way shall be temporarily staked as requested during utility coordination efforts.

## PART IID

### Right of Way Monumentation, and Final Plats Right of Way Monumenting and Final Plat

- 1.1. The Right of Way shall be monumented after property is acquired and with the approval of the AHTD and the City of Bentonville to proceed. Monuments shall be set at all Right of Way breaks, and at all property lines and “40 Acre” lines crossed by the Right of Way line. Land corners, such as Section Corners, Quarter Corners, and 1/16<sup>th</sup> Corners used as the basis of legal descriptions shall also be set, if required by the AHTD or the City of Bentonville. Each point shall set using the monument assembly and stampings prescribed and according to AHTD procedures described in Surveys Manual.

A monument assembly consists of:

- Monument Shaft - 5/8” diameter rebar of sufficient length for the monument to be set firmly in the ground. Minimum length shall be 24 inches, unless grouted in solid rock or set in concrete. The length used shall be approved by the AHTD.
- Monument cap – 2” aluminum flat cap, stamped as directed by the AHTD.
- Witness post and sign.

Exceptions will be approved on a case-by-case basis and in locations specified by the Surveys Division of AHTD.

Standard monument materials will be furnished by the AHTD. This includes rebar, 2” caps, witness post, and sign. Monument caps with specific stampings will be used. Most of the information is pre-stamped on the cap.

The Consultant/Surveyor shall notify the Surveys Division of the number of monument caps for each required designation necessary for this project. The PLS Number of the Consultant/Surveyor may be added if the number of caps required justifies.

Materials may have to be special ordered for this project. Therefore, the Surveys Division shall be notified a minimum of 45 days prior to the date field monumenting is expected to commence with the quantities of material and cap designations needed to allow adequate time to acquire the materials to complete this task.

- a. 1.2 Coordination with Resident Engineer

The Consultant/Surveyor shall maintain correspondence with the Resident Engineer that is responsible for this project. The Consultant/Surveyor shall send a representative to the pre-construction meeting held with the Resident Engineer. This meeting may be used to coordinate scheduling for final right of way monumentation.

b. 1.3 Final Plat

A final plat shall be prepared using the requirements that apply described in the section for parcel work sheets. The plat shall show all monuments set and markings placed on each cap. The Surveyor performing the work shall be on the current list of those certified to perform land surveys for the AHTD. The plat shall meet the current Arkansas Minimum Standards for Property Boundary Surveys and Plats as well as AHTD requirements. Therefore, it may be necessary to incorporate information contained on the parcel worksheets and the right of way plans to complete the final plat. The boundary lines shown on this plat shall not have the word “Proposed” as used on the plans for right of way acquisition. The plat shall be sealed (stamped) by the PLS who has oversight over the project as well as the PLS responsible for establishing the monuments if not the same. The final plat shall be recorded in the State Land Surveyor’s Office. Each plat sheet shall have an instrument number assigned by the State Land Surveyors Office and the date affixed by an official in the State Land Surveyor’s Office. Original versions of the recorded plat(s), as well as the electronic files for those plat(s), shall be furnished to the Surveys Division of the AHTD.

Copies of the recorded plat(s) shall be furnished to the Right of Way Division of the AHTD, and, the Circuit Clerk’s Office of the county or counties involved if the Circuit Clerk requests the plats.

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**Note:** All land surveys are to be performed using Grid Coordinates from the Arkansas State Plane Coordinate System Zone in which the project is located projected to ground coordinates. The ground coordinates shall be based on the combination adjustment factor assigned by or approved by the AHTD.

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# Appendix A-I

## Accounting Procedures

Travel Expense Procedures – State Travel Regulations issued by the AHTD:

- 1.1 Travel Day – For the Purpose of these regulations, the “calendar day” for travel shall commence at 6:00 A.M., and shall include (1) breakfast, (2) lunch, (3) dinner, and (4) one night’s lodging; and the travel “day” shall end at 6:00 A.M. the following morning. It should be remembered that the travel “day” as defined here applies to the traveler who is already in the field, in full travel status. Normally, at the beginning of the travel period, the traveler will commence his field trip “after” breakfast, and at the end of the trip he will normally return “before” dinner.
- 1.2 Maximum Daily Limits on Meals and Lodging (Not Per Diem): The maximum daily allowance for meals and lodging are those rates which are established and set forth in the General Services Administration’s Federal Travel Directory, except for the reduced rate for Arkansas which was determined by the Department of Finance and Administration.

For each calendar day in full travel status, when all four items of breakfast, lunch, dinner, and lodging are included, the maximum daily allowance will be the actual expenses incurred, limited to the standard rate set by the Fiscal Services Division of the AHTD.

Partial days shall be charged based on the statewide rates (plus state and local taxes) or specified rates set by the Fiscal Services Division of the AHTD. A copy will be furnished upon request.

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**Note:** Travel reimbursement IS NOT a per diem, and is to be claimed for actual expenses for meals and lodging not to exceed the maximum allowable rates. The maximum must not be claimed unless the actual expenditures for such purposes equal or exceed the maximum allowable rate. Reimbursement for meals without overnight travel is not allowed.

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- 1.3 Vehicle Allowance: Effective March 27, 2000, the rate of reimbursement for vehicles used on State projects will be as specified by the Fiscal Services Division of the AHTD.

Each invoice shall be for the services rendered within this agreement since the last invoice submitted. A ten percent (10%) retainage shall be shown on each invoice. Each invoice shall be accompanied by a spreadsheet showing the charges and retainage for each billing period in addition to the total charges and retainage to date. The retainage will be held for approximately one month after completed data is submitted. A final invoice can then be submitted for the retainage. Pending further review that requires revisions and corrections, the final invoice will be approved for payment.

Invoices for work completed on this project shall include:

- Job name and number
- Designated as design survey
- Federal Tax ID Number
- Billing period dates

- Total earned for the period
- Total amount due for the period

A sample invoice is attached.

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**Note:** It is not necessary to follow the format shown on the attached sample invoice. However, it is necessary the items listed above be included on your invoices.

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A completed Microsoft<sup>®</sup> Excel spreadsheet for each billing period shall accompany each invoice. The actual Excel file, furnished by the Department, will be based on the Consultant's approved estimate. This file will be furnished provided to the Consultant once a contract has been signed by the AHTD. The Excel spreadsheet will be sent by E-mail. A sample Microsoft<sup>®</sup> Excel spreadsheet is attached.

**ARKANSAS STATE HIGHWAY & TRANSPORTATION DEPARTMENT  
APPENDIX B  
STAGE SUBMITTAL OF RIGHT OF WAY PLANS AND PARCEL SURVEYS**

Right of Way Plans and Parcel Surveys shall be prepared and submitted to AHTD according to the following:

- Stage 1: Submit Parcel Surveys to the Surveys Division with a sectional breakdown of the entire project tied to the project centerline or baseline according to the requirements for land surveys as described in the AHTD Surveys Manual. This work includes a title search and preparation of a “current owner” title certificate. (Parcel surveys shall include all information necessary to comply with “Arkansas Minimum Standards For Property Boundary Surveys and Plats” as defined by the Arkansas Geological Commission, Land Survey Division). The centerline of the existing right of way, if different from the construction centerline must also be shown.
- Stage 2: Submit strip map to the Right of Way Division with construction centerline and proposed right of way plotted on complete parcel surveys with property lines identified.
- Stage 3: Prepare right of way plans to AHTD specifications including a metes and bounds legal description of each parcel. Plan scale shall be adequate to clearly show all details, dimensions, bearings, distances and notes at 11”x17” sheet size (Not smaller than 1”=100’). Electronic seed files may be accessed at the following ftp site:  
<ftp://www.ahtd.state.ar.us/outgoing/row/consultant>  
(NOTE: Close coordination should be maintained with the Engineering Section of the Right of Way Division to insure that all aspects of the right of way plans meet AHTD approval)
- Stage 4: Perform a thorough “in-house” review of the right of way plans.
- Stage 5: Submit 90% level right of way plans (11”x17”), legal descriptions, and “current owner” certificates of title with deeds attached, to the Right of Way Division including an electronic file of the following:
- Right of way plans (Micro Station DGN format)
  - Legal descriptions (MSWord format)
  - Point numbers of all points with coordinates, feature code and point descriptions (Intergraph ALG format preferred, but an ASCII formatted, comma delimited file of the data is acceptable). The format is: Point Number, Easting Coordinate (X), Northing Coordinate (Y), Elevation, Feature Code (Two-letter designation), Point Description.
  - Alignment report with point numbers used for the baseline, design alignment, and existing right of way alignment control.
- Stage 6: Submit final right of way plans and electronic files with corrections requested by AHTD.

**BURNS & MCDONNELL**

**8<sup>th</sup> Street and I-540 Intersection Improvements  
Bentonville, Arkansas**

**APPENDIX C  
SCOPE OF WORK**

**GEOTECHNICAL STUDIES**

Terracon Proposal No. P04090495  
February 26, 2010

**Geotechnical Studies**

The geotechnical work shall include:

1. 8<sup>th</sup> Street Bridge over I-540/Route 71
2. Northbound Route 71 Entrance Ramp from Highway 62/102 over Railroad
3. Southbound Route 71 Exit Ramp to Highway 62/102 over Railroad
4. Northbound Route 71 Entrance Ramp from Highway 62/102 beneath 8th Street
5. Southbound Route 71 Exit Ramp to Highway 62/102 beneath 8th Street
6. 8th Street Approach Embankment Subsurface Exploration
7. I-540 MSE Wall Subsurface Exploration
8. 8th Street Pavement Cores and Borings
9. 8th Street Pedestrian Tunnel Subsurface Exploration
10. Geophysical Study of Potential Karst Voids (if required)

We understand that bridge structures have not been finalized at this time. However, we do know that a new bridge will be constructed at the new intersection of 8<sup>th</sup> Street and I-540/Route 71 to carry 8<sup>th</sup> Street traffic over I-540. The interchange is planned as a single point urban interchange that will include a bridge with retaining walls at the two end abutments. Two new bridges will be constructed for south bound and north bound lanes of I-540/Route 71 entrance and exit ramps over the existing Burlington Northern railroad line between the 8<sup>th</sup> Street interchange and the existing diamond interchange at Highway 62/102.

A total of approximately 10,000 lineal feet of MSE wall is planned for the improvements between the new interchange at 8<sup>th</sup> Street and the existing interchange at Highway 62/102.

An approach embankment will be constructed to carry traffic 8<sup>th</sup> Street traffic over I-540/Route 71. We expect the approach embankment to be 20 to 30 feet in height.

Improvements to 8<sup>th</sup> Street will begin at Sam Walton Boulevard and extend eastward approximately 2 miles to the intersection with I-540. Two new pedestrian tunnel crossings are planned at each end of the 8<sup>th</sup> Street corridor alignment at each of the Wal-Mart facilities in these locations. It is anticipated that these pedestrian crossings will consist of below grade reinforced concrete box culvert structures.

Our work will be performed under the supervision of a Professional Engineer licensed to practice in the State of Arkansas. We understand that our Geotechnical Study will be performed under one study.

The project is located within the Boone Formation. We have encountered karst void formations at various locations within the Boone Formation. Pinnacled rock conditions could also be encountered. If voids and/or highly variable bedrock depths are encountered during the exploration, a geophysical evaluation may be warranted.

This scope of work for this proposal is divided into the following six sections:

- Bridges
- Embankments
- MSE Walls
- Pavements
- Pedestrian Tunnel
- Geophysical Study (if required)

### **Bridge Subsurface Exploration:**

Based on previous subsurface explorations in the area, we anticipate encountering lean clays and fat clay with chert gravel overlying limestone bedrock. Depth to bedrock may be greater than 30 feet. Due to the possibility of variable bedrock depths, our scope of work includes drilling borings at relatively close spacings.

The following bridges are planned:

1. 8<sup>th</sup> Street Bridge over I-540/Route 71
2. Northbound Route 71 Entrance Ramp from Highway 62/102 over Railroad
3. Southbound Route 71 Exit Ramp to Highway 62/102 over Railroad
4. Northbound Route 71 Entrance Ramp from Highway 62/102 beneath 8th Street
5. Southbound Route 71 Exit Ramp to Highway 62/102 beneath 8th Street

Our scope of work is based on drilling a total of 43 bridge borings. The borings will be as follows:

- 8th St. Bridge - 12 borings (four borings at each abutment and four borings at the interior support)
- N.B. Ramp Over R.R. - 6 borings (two borings at each abutment and one boring at each interior support)
- S.B. Ramp Over R.R. - 6 borings (two borings at each abutment and one boring at each interior support)
- N.B. Ramp beneath 8th Street - 10 borings (two borings at each abutment with interior borings drilled at approximate 50-foot spacing)
- S.B. Ramp beneath 8th Street - 9 borings (two borings at each abutment with interior borings drilled at approximate 50-foot spacing)

We have assumed that the boring locations will be within existing Arkansas Highway Department right-of-way and will be accessible to our all-terrain mounted drill rigs without the need to clear trees. For estimating purposes, we have assumed that there is an average of 40 feet of overburden soils. We will sample, log and test the native soils in all of the bridge borings. An engineer or geologist will log the borings in the field.

The bedrock in each of the borings will be cored with a 5-foot long NX-size double-barrel core barrel for a total penetration of 30 feet into rock.

We will set one monitor well at each bridge structure location to monitor ground water levels while we are at the project site. We will also measure 24-hour water levels in all borings. Water levels will be measured in the monitor wells for approximately 3 to 4 weeks after drilling completion.

Laboratory testing of the soil will include Atterberg limits and sieve analysis on samples from the borings. One unconfined compression test with stress-strain measurements will be performed on each five foot section of the bedrock cores.

Engineering analysis will include recommended foundation types, end bearing and unit skin friction design values for both drilled pier and driven pile foundations based on LRFD design methodology, and construction considerations for foundation installation in pinnacled rock conditions. Engineering analysis will also include recommended bearing values for spread footings on rock if the presence of pinnacled rock or voids could prohibit the use of drilled piers. We will also address seismic design parameters.

### **Embankment Subsurface Exploration:**

We anticipate a grade change that will involve approach embankments with heights of 20 to 30 feet to extend 8<sup>th</sup> Street over I-540.

Thus, we will evaluate the new embankment and underlying foundation soil for settlement, slope stability and design slopes.

We will drill four borings (two at each end of the proposed bridge) to collect soil and bedrock samples to depths of twice the anticipated embankment heights, or 10 feet into rock, whichever occurs first. Standard penetration tests (SPT) will be performed/collected at five foot intervals to the top of bedrock. When SPT refusal is realized, the rock will be cored for an additional 10 feet. We have assumed 40 feet of overburden drilling and 10 feet of rock drilling at each boring.

Laboratory testing of the soil will include Atterberg limits, sieve analysis, and consolidation tests on select samples from the borings.

Slope stability and settlement analysis of embankments and native foundation soils will be performed based on the subsurface exploration and laboratory test results. Analysis will also include estimated differential settlement due to pinnacled rock conditions, if encountered. Recommendations regarding subgrade soil improvements will also be provided.

#### **MSE Wall Subsurface Exploration:**

MSE wall structures along I-540 between the 8<sup>th</sup> Street and Highway 62/102 Street interchanges will total about 10,000 lineal feet. The MSE retaining walls will be designed using the AASHTO LRFD Design Guidelines.

Our scope of work is based on drilling a total of 100 MSE wall borings at approximate 100-foot spacings. We anticipate extending the borings to minimum depths of 20 feet or twice the maximum wall height. We assume the maximum wall height will be on the order of 20 feet.

We will set one monitor well at each MSE wall location to monitor ground water levels while we are at the project site. We will also measure 24-hour water levels in all borings. Water levels will be measured in the monitor wells for approximately 3 to 4 weeks after drilling completion.

Laboratory testing will include classification tests and triaxial shear strength tests to aid in determining foundation and slope stability design parameters. We have budgeted for 4 consolidated undrained tests with pore pressure measurements and 8 unconsolidated undrained shear strength tests. One set of classification tests will be performed on soil samples from each boring.

The Geotechnical Report will include recommendations for the foundation settlement and bearing capacity and design parameters for sliding stability, overturning, and global stability for an MSE wall. We understand that internal stability of the MSE wall system will be the responsibility of the contractor. Recommendations regarding subgrade soil improvements will also be provided as needed.

### **Pavement Cores and Borings:**

We understand that improvements to the existing 8<sup>th</sup> Street roadway may include widening of the existing pavement. We propose to core the existing pavement at 250-foot intervals (for a total of 40 boring locations), staggered between the east-bound and west-bound lanes. Pavement coring will be performed with a diamond bit core barrel to evaluate the thickness of the existing pavement section and to provide access to the underlying subgrade materials. The pavement subgrade will be tested in-situ with a dynamic cone penetrometer to depths of 3 feet and soil samples will be collected to depths of 10 feet for laboratory testing. We will drill an additional 5 borings for the extension of 8<sup>th</sup> Street from just east of Moberly Lane to the I-540 interchange. Our scope of work includes subcontracting to a traffic control firm while drilling on 8<sup>th</sup> Street to direct traffic around our drilling operation.

Laboratory testing of the soil will include Atterberg limits, sieve analysis, pH, resistivity, standard Proctor, and resilient modulus tests on select samples from the borings.

The report will include photo logs of the cores with dynamic cone penetrometer test results. We will provide both asphalt and Portland cement concrete pavement thickness design recommendations for the traffic loading provided to us by the design team.

### **Pedestrian Tunnel Subsurface Exploration:**

We understand that two pedestrian tunnel structures will be constructed along 8<sup>th</sup> Street. We will drill three borings at each Pedestrian Tunnel structure. Information from these borings will also be used for developing recommendations for the new pavement structure. We will advance one boring at each structure to rock or 40 feet, whichever occurs first, and two borings at each structure to a maximum depth of 20 feet.

We will sample, log and test the overburden soils. Standard Penetration tests and soil sampling with split spoon sampler will be performed in the soil strata above the bedrock at five foot intervals.

We will set one monitor well at each tunnel structure location to monitor ground water levels. Water levels will be measured in the monitor wells for approximately 3 to 4 weeks after drilling completion.

Laboratory testing of the soil will include moisture content and classification tests.

The engineering report will include boring logs with field and laboratory test data, and foundation bearing capacity, subgrade soil improvement, and lateral earth pressure recommendations.

**Geophysical Survey:**

If indications of voids are encountered in the borings, we recommend that electrical resistivity (ER) surveying be conducted to evaluate the extent of subsurface karst features. Should geophysical electrical resistivity survey services be required, we understand that the scope and fee will be negotiated at that time.

The objective of the geophysical electrical resistivity survey is to detect/delineate subsurface karst (void) features. Additionally, a confirmation borehole program (ground-truthing) should be conducted at select locations identified by the geophysical survey results, to confirm the results of the geophysical testing.

If geophysical electrical resistivity survey services are required to further evaluate the extent of karst activity at the site, a report will be prepared documenting the results of the field reconnaissance, the ER geophysical testing, and the borehole confirmation program. The report will include a description of geophysical data acquisition, processing, analysis, and geologic interpretation. For subsurface voids identified by the geophysical surveying, the report will specifically include the thickness of rock to top of the voids, and the location and approximate dimensions of subsurface voids as identified by the geophysical survey(s). Our report will include recommendations for karst remediation for foundation design and construction considerations.

**ATTACHMENT B-1**  
**BURNS & MCDONNELL ENGINEERING CO., INC.**



**Attachment B-1  
 Recapitulation of Fee Estimate - Supplemental Agreement No. 1**

<b>SALARY COSTS</b>	<b>Total</b>	<b>Current</b>	<b>Direct</b>
<b>Classification</b>	<b>Man Hours</b>	<b>Rate</b>	<b>Salary Cost</b>
Principal	80	\$ 55.00	\$ 4,400.00
Project Manager	938	\$ 53.00	\$ 49,714.00
Senior Engineer	4027	\$ 44.00	\$ 177,188.00
Staff Engineer	4956	\$ 32.00	\$ 158,592.00
GIS / CADD Technician	4718	\$ 28.00	\$ 132,104.00
Lead Environmental Scientist	100	\$ 49.50	\$ 4,950.00
Assistant Environmental Scientist	160	\$ 36.00	\$ 5,760.00
Wetlands Specialist	40	\$ 28.00	\$ 1,120.00
T&E Species Specialist	0	\$ 30.00	-
Cultural Resources Specialist	260	\$ 22.00	\$ 5,720.00
Water Quality	0	\$ 22.00	-
Air & Noise Specialist	0	\$ 32.00	-
Socio-Economics Specialist	0	\$ 35.00	-
Public Involvement	120	\$ 24.00	\$ 2,880.00
Administrative Support	140	\$ 19.00	\$ 2,660.00
<hr/>			
Total Hours	15539		
Salary Costs			\$ 540,688.00
Year Two Escalation (1/2 of Salary @ 3%)			\$ 8,110.32
Total Escalation			\$ 8,110.32
Total Direct Salary			\$ 548,798.32
2008 Approved Audit Rate Overhead		205.72%	\$ 1,128,987.90
<b>Total Direct Labor and Overhead</b>			<b>\$ 1,677,786.22</b>
<b>Fixed Fee @ 10%</b>			<b>\$ 167,778.62</b>
<b>Direct Expenses</b>	<b>Rate</b>	<b>No. of Units</b>	
Travel (Miles at \$0.485/Mi)	\$ 0.485	9,500	\$ 4,607.50
Long Distance Phone / Fax	\$ 0.07	5,470	\$ 382.90
Plotting (\$0.35 / 11"X17" Drawing)	\$ 0.35	17,730	\$ 6,205.50
Plotting (\$1.35 / 22"X34" Drawing)	\$ 1.35	3,570	\$ 4,819.50
Reproduction / Printing (\$0.08 per 8 1/2"X11" sheet)	\$ 0.08	3,330	\$ 266.40
Lodging and Meals (\$80 Lodging, \$20 Meals per day)	\$ 100.00	54	\$ 5,400.00
Other Direct Expenses (Cost)	\$2,000	1	\$ 2,000.00
<b>Total Direct Expenses</b>			<b>\$ 23,681.80</b>
<b>Burns &amp; McDonnell Base Fee</b>			<b>\$ 1,869,246.65</b>
<b>Subconsultant Fees</b>			
USI			\$ 1,309,437.45
B&F Survey			\$ 383,128.61
Terracon			\$ 538,760.93
<b>Total Subcontant Fees</b>			<b>\$ 2,231,326.99</b>
<hr/>			
<b>TOTAL ESTIMATE OF MAXIMUM FEE</b>			<b>\$ 4,100,573.64</b>



Responsibility Levels:  
 1 = Primary  
 2 = Secondary  
 3 = Support

ATTACHMENT B-1

March 26, 2010

PROJECT ESTIMATING SHEET-SUPPLEMENTAL AGREEMENT NO. 1

Client: Bentonville, AR

EXPENSES

Tasks	Burns & McDonnell	USI	B & F Survey	Terracon	Principal	Project Manager	Senior Engineer	Staff Engineer	GIS / CADD Technician	Lead Environmental Scientist	Assistant Environmental Scientist	Wetlands Specialist	T&E Species Specialist	Cultural Resources Specialist	Water Quality	Air & Noise Specialist	Socio-Economics Specialist	Public Involvement	Administrative Support	TOTAL HOURS	Travel (Vehicle Mileage)	Long Distance Phone/Fax (minutes)	Plotting (11" X 17" Sheets)	Plotting (22" X 34" Sheets)	Reproduction and Printing (Sheets)	Lodging & Meal Expenses (Days)	Remarks	
																												(time estimate in man hours)
<b>2 PHASE II - Additional Services</b>																												
<b>2.1 Environmental Services</b>																												
2.1.1	Section 4(f) Evaluation	1	2			20	60			40	100			180							400	500	60			100	2	
2.1.2	Section 106 Coordination Cultural Resources	1	2	3		8					40			80							128	500	60			100	4	
2.1.3	Public Involvement / Communications	1	2			40	40			40								40			160	500	30			100	8	
<b>3 PHASE III - Design and Construction Plans</b>																												
<b>3.1 Preliminary Design &amp; Right of Way Design</b>																												
<b>3.1.1 Surveys</b>																												
3.1.1.1	Design Surveys	2	2	1		2	40	40	40												122		180					
3.1.1.2	Land/Right of Way Surveys	2	2	1		2	40	40	40												122		180					
<b>3.1.2 30% Plans</b>																												
3.1.2.1	Value Engineering Study	1	2			40	40	40													120	500	30	100	50	200	8	
3.1.2.2	Revise Engineering & Operational Acceptability Review (resulting from VE)	1	2			8	40	40													88		30			50		
3.1.2.3	Revise Environmental Assessment (resulting from VE)	1	2			8	8			20	20										56		30			50		
3.1.2.4	Prepare Design Criteria Memorandum	1	2			8	16	16													40		30			100		
3.1.2.5	Prepare 30% Roadway Plans - Interchange (5 half-size copies)	1	2		16	30	140	240	300									16	20		762	1000	450	200	100	400	4	Includes utility coordination time
3.1.2.6	Prepare 30% Roadway Plans - 8th Street (5 half-size copies)	1	1			16	16	16													48							
3.1.2.7.1	Prepare 30% Bridge Plans - N.B. 8th Street Entrance Ramp over R.R.	1	2			4	40	40	56												140		120	10		60		
3.1.2.7.2	Prepare 30% Bridge Plans - S.B. 8th Street Exit Ramp over R.R.	1	2			4	40	40	56												140		120	10		60		
3.1.2.7.3	Prepare 30% Bridge Plans - N.B. 8th Street Entrance Ramp Tunnel	1	2			4	40	40	56												140		120	10		60		
3.1.2.7.4	Prepare 30% Bridge Plans - S.B. 8th Street Exit Ramp Tunnel	1	2			4	40	40	56												140		120	10		60		
3.1.2.7.5	Prepare 30% Bridge Plans - 8th Street over U.S. 71	1	2			6	60	60	72												198		120	10		60		
3.1.2.7.6	Prepare 30% MSE Wall No. 1 Plans (1470' long)	1	2			1	6	6	16												29		15	10		20		
3.1.2.7.7	Prepare 30% MSE Wall No. 2 Plans (1490' long)	1	2			1	6	6	16												29		15	10		20		
3.1.2.7.8	Prepare 30% MSE Wall No. 3 Plans (1760' long)	1	2			1	6	6	16												29		15	10		20		
3.1.2.7.9	Prepare 30% MSE Wall No. 4 Plans (1310' long)	1	2			1	6	6	16												29		15	10		20		
3.1.2.7.10	Prepare 30% MSE Wall No. 5 Plans (650' long)	1	2			1	4	6	16												27		15	10		20		
3.1.2.7.11	Prepare 30% MSE Wall No. 6 Plans (950' long)	1	2			1	4	6	16												27		15	10		20		
3.1.2.7.12	Prepare 30% MSE Wall No. 7 Plans (740' long)	1	2			1	4	6	16												27		15	10		20		
3.1.2.7.13	Prepare 30% MSE Wall No. 8 Plans (950' long)	1	2			1	4	6	16												27		15	10		20		
3.1.2.7.14	Prepare 30% MSE Wall No. 9 Plans (730' long)	1	2			1	4	6	16												27		15	10		20		
3.1.2.8	Refine Traffic Analysis (8th Street Intersections and Warrants)	1	1			40	40	80													160							Coordinated with previous studies.
3.1.2.9	30% QA/QC	1	1			20	60	60													140							
<b>3.1.3 60% Plans</b>																												
3.1.3.1	Prepare 60% Roadway Plans - Interchange (3 half-size copies)	1	2		16	40	240	384	520									16	20		1236	1500	300	1000	200	400	4	Includes utility coordination time
3.1.3.2	Prepare 60% Roadway Plans - 8th Street (3 half-size copies)	1	1			16	16	16													48							
3.1.3.4	60% QA/QC	1	1	1	1	40	100	100													240							
3.1.3.5	Attend Preliminary Field Check - Interchange (8 half-size copies)	1	2			8	8	8													24	500		4000			4	
3.1.3.6	Attend Preliminary Field Check - 8th Street (8 half-size copies)	1	1			8	8	8													24	500					4	
3.1.3.7	Incorporate Field Check Comments and Resubmit - Interchange (3 half-size copies)	1	2			20	80	80	80												260			1300				
3.1.3.8	Incorporate Field Check Comments and Resubmit - 8th Street (3 half-size copies)	1	1			4															4							
<b>3.1.4 Right of Way Plans</b>																												
3.1.4.1	Right of Way Plans - Interchange (6 half-size copies)	1	2	3	16	40	160	160	320									16	20		732	500	300	3500	200	200	4	Includes utility coordination time.
3.1.4.2	Right of Way Plans - 8th Street	2	1	3		16	16	16													48							
3.1.4.3	Right of Way & Easement Documents and Descriptions	3	3	1		4	4	40	40												88					200		
3.1.5	Prepare and Submit Section 404 Permit Application	1	2			4	40	40			40										124		200			200		
3.1.6	Combined Corridor/Highway Design Hearing	1	2																								Hours for Hearing were included in original agreement	
<b>3.1.7 Geotechnical Studies (Preliminary &amp; Final)</b>																												
3.1.7.1	Obtain Borings	2	2	1		4	20	20	20												64	1000						
3.1.7.2	Interpret data and Recommendations	2	2	1		8	88	40													136							
3.1.7.3	AASHTO Pavement Design	3	3	1		4	40														44					200		
3.1.7.4	Bridge & Retaining Wall Foundations	2	2	1		8	80														88							
3.1.7.5	Prepare Report of Findings	1	2	2		8	80														88		200			200		
3.1.8	Hydrological and Hydraulic Studies	1	1			8	80	80													168							
<b>3.2 Final Design</b>																												
3.2.1.1	Prepare Final Roadway Plans - Interchange	1	2		32	72	484	770	700									32	80		2170	2000	800	1100	500		4	Includes utility coordination time.
3.2.1.2	Prepare Final Roadway Plans - 8th Street	1	1			24	40	40	80												184							
3.2.1.3.1	Prepare Final Bridge Plans - N.B. 8th Street Entrance Ramp Over R.R.	1				16	200	296	290												802		200	60				
3.2.1.3.2	Prepare Final Bridge Plans - S.B. 8th Street Exit Ramp Over R.R.	1				16	200	296	290												802		200	60				
3.2.1.3.3	Prepare Final Bridge Plans - N.B. 8th Street Entrance Ramp Tunnel	1				12	140	200	200												552		200	60				
3.2.1.3.4	Prepare Final Bridge Plans - S.B. 8th Street Exit Ramp Tunnel	1				12	140	200	200												552		200	60				
3.2.1.3.5	Prepare Final Bridge Plans - 8th Street Over U.S. 71	1				24	400	586	520												1530		200	60				



**ATTACHMENT B-2  
USI CONSULTING ENGINEERS**

**City of Bentonville, Arkansas**

**8th Street Widening & Extension (Highway 71 to SW "I" Street)**

**Manhower Estimate to Perform the Work: Title I Services - Phase 3**

**Direct Labor Costs**

Job Classification	Estimated Hours	Hourly Raw Rate	Extension
Engineer X	248	\$ 82.70	\$ 20,509.60
Engineer VIII	628	\$ 67.50	\$ 42,390.00
Engineer VII	0	\$ 55.00	\$ -
Engineer VI	504	\$ 45.20	\$ 22,780.80
Engineer V	0	\$ 38.95	\$ -
Engineer IV	2067	\$ 36.66	\$ 75,776.22
Engineer III	2182	\$ 31.00	\$ 67,642.00
Engineer II	906	\$ 21.95	\$ 19,886.70
Engineer I	0	\$ 20.35	\$ -
Engineering Technician V	3876	\$ 31.30	\$ 121,318.80
Engineering Technician IV	156	\$ 26.80	\$ 4,180.80
Engineering Technician III	56	\$ 22.80	\$ 1,276.80
Engineering Technician II	124	\$ 18.00	\$ 2,232.00
Engineering Technician I	0	\$ 14.00	\$ -
Executive Assistant	234	\$ 18.00	\$ 4,212.00
Administrative III	620	\$ 15.90	\$ 9,858.00
Administrative II	82	\$ 14.00	\$ 1,148.00
Administrative I	32	\$ 9.00	\$ 288.00
<b>Total USI Labor Hours</b>	<b>11715</b>		
Subtotal Raw Labor		\$	393,499.72
Forward Pricing		\$	11,506.83
<b>Total Direct Salary</b>		\$	<b>405,006.55</b>
Overhead Rate - 187.39%		\$	758,941.77
<b>Subtotal Labor Plus Overhead</b>		\$	<b>1,163,948.32</b>
Professional Fee		\$	116,394.83
<b>Total Labor Costs</b>		\$	<b>1,280,343.15</b>

**Detailed Other Direct Costs**

	Number of Units	Cost Per Unit	Extension
Postage/Courier			
Postage	420 oz.	\$ 0.44	\$ 184.80
Courier (FedEX)	124 ea.	\$ 20.00	\$ 2,480.00
Communications - Long Distance & Conference Calls	Lump Sum	\$ -	\$ -
Travel - Meetings			
Mileage	3450 mi.	\$ 0.50	\$ 1,725.00
Lodging	6 day	\$ 76.00	\$ 456.00
Food	6 day	\$ 39.00	\$ 234.00
Incidentals	6 day	\$ 5.00	\$ 30.00
Printing/Reproduction			
8.5x11 Black & White	52800 ea.	\$ 0.05	\$ 2,640.00
8.5x11 Color	2500 ea.	\$ 0.50	\$ 1,250.00
11x17 Black & White	10725 ea.	\$ 0.10	\$ 1,072.50
11x17 Color	1350 ea.	\$ 1.00	\$ 1,350.00
Black & White Card Stock	90 ea.	\$ 0.25	\$ 22.50
Color Card Stock	90 ea.	\$ 0.85	\$ 76.50
Black & White Printing	58200 s.f.	\$ 0.09	\$ 5,238.00
Color Printing	4650 s.f.	\$ 1.00	\$ 4,650.00
Black & White Scanning	2500 s.f.	\$ 0.25	\$ 625.00
Color Scanning	775 s.f.	\$ 5.00	\$ 3,875.00
Mounting Boards (3/16")	450 s.f.	\$ 3.00	\$ 1,350.00
Laminating (Large Scale)	450 s.f.	\$ 1.00	\$ 450.00
Binding	90 ea.	\$ 1.50	\$ 135.00
Other Direct Costs			
ADH Permit Review Fees	Lump Sum	\$ 500.00	\$ 500.00
SWPPP (Notice of Intent)	3 ea.	\$ 250.00	\$ 750.00
			\$ -

**Total Other Direct Costs**

**\$ 29,094.30**

**TOTAL COST**

**\$ 1,309,437.45**

City of Bentonville, Arkansas

**8th Street Widening & Extension (Highway 71 to SW "I" Street)**

**Fee Summary: Title I Services - Phase III**

<b>SURVEY COORDINATION</b>	<b>\$</b>	<b>31,836.33</b>
<b>RIGHT OF WAY DOCUMENTATION PREPARATION</b>	<b>\$</b>	<b>152,504.84</b>
<b>PRELIMINARY DESIGN</b>	<b>\$</b>	<b>415,376.85</b>
<b>WATER &amp; SEWER RELOCATION DESIGN</b>	<b>\$</b>	<b>235,141.63</b>
<b>SIGNALIZATION DESIGN</b>	<b>\$</b>	<b>56,102.46</b>
<b>FINAL DESIGN</b>	<b>\$</b>	<b>387,770.26</b>
<b>BIDDING - AWARD SERVICES</b>	<b>\$</b>	<b>30,705.08</b>
<b>TOTAL FEES (Including Reimbursables)</b>		<b>\$1,309,437.45</b>

8th Street Widening & Extension (Highway 71 to SW "I" Street)

SURVEY COORDINATION - TOPOGRAPHIC/RIGHT-OF-WAY/UTILITY

Work Task Description	Engineer									Engineering Technician					Exec. Asst.	Administrative		
	X	VIII	VII	VI	V	IV	III	II	I	V	IV	III	II	I		III	II	I
	\$ 82.70	\$ 67.50	\$ 55.00	\$ 45.20	\$ 38.95	\$ 36.66	\$ 31.00	\$ 21.95	\$ 20.35	\$ 31.30	\$ 26.80	\$ 22.80	\$ 18.00	\$ 14.00	\$ 18.00	\$ 15.90	\$ 14.00	\$ 9.00
	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.
Coordination with B&F Engineering - Survey Control	4	4				16				8	12		40			8		8
Coordination w/ B&F - Topographic Surveys		4				8					40		40					
Coordination w/ B&F - Utility Surveys		4				8					40		40					
Coordination w/ B&F - Geotech Borings & Test Pits		4				8					24		24					
Record Research											40		20			8		8
Hours	4	16	0	0	0	40	0	0	0	8	156	0	124	0	0	16	0	16
Salary Costs	\$ 330.80	\$ 1,080.00	\$ -	\$ -	\$ -	\$ 1,466.40	\$ -	\$ -	\$ -	\$ 250.40	\$ 4,180.80	\$ -	\$ 2,232.00	\$ -	\$ -	\$ 254.40	\$ -	\$ 144.00

	Number of Units	Cost Per Unit	Extension
<b>Postage/Courier</b>			
Postage	85 oz.	\$ 0.44	\$ 37.40
Courier (FedEx)	10 ea.	\$ 20.00	\$ 200.00
<b>Subtotal</b>			<b>\$ 237.40</b>
<b>Communications - Long Distance &amp; Conference Calls</b>	Lump Sum	\$ -	\$ -
<b>Travel - Meetings</b>			
Mileage	200 mi.	\$ 0.50	\$ 100.00
Lodging	0 day	\$ 76.00	\$ -
Food	0 day	\$ 39.00	\$ -
Incidentals	0 day	\$ 5.00	\$ -
<b>Subtotal</b>			<b>\$ 100.00</b>
<b>Printing / Reproduction</b>			
8.5x11 Black & White	300 ea.	\$ 0.05	\$ 15.00
8.5x11 Color	ea.	\$ 0.50	\$ -
11x17 Black & White	125 ea.	\$ 0.10	\$ 12.50
11x17 Color	ea.	\$ 1.00	\$ -
Black & White Card Stock	ea.	\$ 0.25	\$ -
Color Card Stock	ea.	\$ 0.85	\$ -
Large Formant Printing (Black & White)	300 s.f.	\$ 0.09	\$ 27.00
Large Formant Printing (Color)	s.f.	\$ 1.00	\$ -
Scanning (Black & White)	100 s.f.	\$ 0.25	\$ 25.00
Scanning (Color)	s.f.	\$ 5.00	\$ -
Mounting Boards (3/16")	s.f.	\$ 3.00	\$ -
Laminating (Large Scale)	s.f.	\$ 1.00	\$ -
Binding	ea.	\$ 1.50	\$ -
<b>Subtotal</b>			<b>\$ 79.50</b>

SUBTOTAL - MANHOURS	380
<b>SUBTOTAL - SALARY COSTS</b>	<b>\$ 9,938.80</b>
<b>FORWARD PRICING (0%)</b>	<b>\$ -</b>
<b>TOTAL DIRECT SALARY</b>	<b>\$ 9,938.80</b>
<b>OVERHEAD RATE - 187.39%</b>	<b>\$ 18,624.32</b>
<b>PROFESSIONAL FEE</b>	<b>\$ 2,856.31</b>
<b>DIRECT NON-LABOR EXPENSES</b>	
Postage/Courier	\$ 237.40
Communications	\$ -
Travel - Meetings	\$ 100.00
Printing / Reproduction	\$ 79.50
Survey Supplies & Equipment	\$ -
<b>Subtotal - Non-Labor Expenses</b>	<b>\$ 416.90</b>
<b>TOTAL COST (Survey Coordination)</b>	<b>\$ 31,836.33</b>



City of Bentonville, Arkansas  
**8th Street Widening & Extension (Highway 71 to SW "I" Street)**  
**PRELIMINARY DESIGN**

Work Task Description	Engineer									Engineering Technician					Exec. Asst.	Administrative		
	X	VIII	VII	VI	V	IV	III	II	I	V	IV	III	II	I		III	II	I
	\$ 82.70	\$ 67.50	\$ 55.00	\$ 45.20	\$ 38.95	\$ 36.66	\$ 31.00	\$ 21.95	\$ 20.35	\$ 31.30	\$ 26.80	\$ 22.80	\$ 18.00	\$ 14.00	\$ 18.00	\$ 15.90	\$ 14.00	\$ 9.00
	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.
Address Conceptual Plan Review Comments	4	4				20	14			20								
Plan & Profile Sheets (21 Sheets)		8				60	288			400								
Typical Sections - Streets	4	4				12	16			60								
Pavement Design - Streets	4	4				16	4											
Cross Sections (Roadway, Side roads, Driveways)	4	4				12	16			40								
Intersecting Street Plans (23 Sheets)	4	4				32	60			100								
Driveway (Plan View in Plans & Separate Profile)						32	32			60								
Drainage Maps & Hydrology Calculations (7 Sheets)		8				32	296			140								
Drainage Improvements - Streets	8	8				16	100			40								
Culvert Diagrams						8	40											
Armory Avoidance Alternatives - Section 4F compliance	4	4				8	12			24								
Pedestrian Crossings - Studies & Design	8	8				40	40			100								
At Grade Railroad Crossing						8	24											
MOT / Sequence of Construction	4	4				40	24			48								
Stormwater & Erosion Control Plans						4	32			32								
Draft Special Provision / Conditions		8				40	40							8	40			
Calculate Quantities						32	60			60								
Summary of Pay Quantities Sheet																		
Opinion of Probable Construction Costs	4	8				24	24			32								
Preliminary Design Report	12	16				24	60			16				8	40			
Coordination with Geotechnical Consultant	2	4				8								2	2			
Coordination with B&McD (Environmental)	2	8				16								2	2			
Meetings & Coordination with City / AHTD	8	16				40	16							8	8			
Design Public Hearing	8	16				16				8				12	12			
Coordinate with Franchise Utilities		4				40	16							4	8			
Coordination with Planning		8				40	24			60								
Coordination with Railroad		8				16								4	4			
QC Review	16	40												32	4			
<b>Hours</b>	<b>96</b>	<b>196</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>636</b>	<b>1238</b>	<b>0</b>	<b>0</b>	<b>1240</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>80</b>	<b>120</b>	<b>0</b>	<b>0</b>
<b>Salary Costs</b>	<b>\$ 7,939.20</b>	<b>\$ 13,230.00</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 23,315.76</b>	<b>\$ 38,378.00</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 38,812.00</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 1,440.00</b>	<b>\$ 1,908.00</b>	<b>\$ -</b>	<b>\$ -</b>

	Number of Units	Cost Per Unit	Extension
<b>Postage/Courier</b>			
Postage	50 oz.	\$ 0.44	\$ 22.00
Courier (FedEx)	25 ea.	\$ 20.00	\$ 500.00
<b>Subtotal</b>			<b>\$ 522.00</b>
<b>Communications - Long Distance &amp; Conference Calls</b>	Lump Sum	\$ -	\$ -
<b>Travel - Meetings</b>			
Mileage	1000 mi.	\$ 0.50	\$ 500.00
Lodging	3 day	\$ 76.00	\$ 228.00
Food	3 day	\$ 39.00	\$ 117.00
Incidentals	3 day	\$ 5.00	\$ 15.00
<b>Subtotal</b>			<b>\$ 860.00</b>
<b>Printing / Reproduction</b>			
8.5x11 Black & White	2400 ea.	\$ 0.05	\$ 120.00
8.5x11 Color	400 ea.	\$ 0.50	\$ 200.00
11x17 Black & White	3200 ea.	\$ 0.10	\$ 320.00
11x17 Color	250 ea.	\$ 1.00	\$ 250.00
Black & White Card Stock	15 ea.	\$ 0.25	\$ 3.75
Color Card Stock	15 ea.	\$ 0.85	\$ 12.75
Large Formant Printing (Black & White)	10000 s.f.	\$ 0.09	\$ 900.00
Large Formant Printing (Color)	3000 s.f.	\$ 1.00	\$ 3,000.00
Scanning (Black & White)	300 s.f.	\$ 0.25	\$ 75.00
Scanning (Color)	200 s.f.	\$ 5.00	\$ 1,000.00
Mounting Boards (3/16")	250 s.f.	\$ 3.00	\$ 750.00
Laminating (Large Scale)	250 s.f.	\$ 1.00	\$ 250.00
Binding	15 ea.	\$ 1.50	\$ 22.50
<b>Subtotal</b>			<b>\$ 6,904.00</b>

SUBTOTAL - MANHOURS	3606
<b>SUBTOTAL - SALARY COSTS</b>	<b>\$ 125,022.96</b>
<b>FORWARD PRICING (3%)</b>	<b>\$ 3,750.69</b>
<b>TOTAL DIRECT SALARY</b>	<b>\$ 128,773.65</b>
<b>OVERHEAD RATE - 187.39%</b>	<b>\$ 241,308.94</b>
<b>PROFESSIONAL FEE</b>	<b>\$ 37,008.26</b>
<b>DIRECT NON-LABOR EXPENSES</b>	
Postage/Courier	\$ 522.00
Communications	\$ -
Travel - Meetings	\$ 860.00
Printing / Reproduction	\$ 6,904.00
<b>Subtotal - Non-Labor Expenses</b>	<b>\$ 8,286.00</b>
<b>TOTAL COST (Preliminary Design)</b>	<b>\$ 415,376.85</b>

City of Bentonville, Arkansas  
8th Street Widening & Extension (Highway 71 to SW "I" Street)

**WATER & SEWER RELOCATION DESIGN**

Work Task Description	Engineer									Engineering Technician					Exec. Asst.	Administrative		
	X	VIII	VII	VI	V	IV	III	II	I	V	IV	III	II	I		III	II	I
	\$ 82.70	\$ 67.50	\$ 55.00	\$ 45.20	\$ 38.95	\$ 36.66	\$ 31.00	\$ 21.95	\$ 20.35	\$ 31.30	\$ 26.80	\$ 22.80	\$ 18.00	\$ 14.00	\$ 18.00	\$ 15.90	\$ 14.00	\$ 9.00
	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.	hr.
<b>Preliminary Design</b>																		
Field Investigation				20				40										
Meeting/Coordination with City		8		8				12		12								
Coordinate w/ Franchise Utility Companies				8				16								6		
Produce Preliminary Plan & Profile Sheets	4	12		100				300		280								
Produce Draft Special Provisions/Conditions	4	8		20											8	16	12	
Calculate Construction Quantities				12				12										
Produce Opinion of Probable Construction Cost	4	8		12														
Submit Prelim. Plans & Opinion of Probable Construction Cost	4	4		4												4		
Submit One Set of Prelim. Plans to Each Utility Affected				8												8		
Incorporate City Comment into Preliminary Plans				8				32										
QA/QC	8	8		20				32							4			
<b>Final Design</b>																		
Field Investigation				12				12										
Meeting/Coordination with City		8		12				12								4		
Coordinate w/ Franchise Utility Companies				12				16								8		
Produce Final Plan & Profile Sheets	4	8		80				240		260								
Produce Water & Sewer Details		4		16				32		68								
Produce Final Special Provisions/Conditions	4	8		24													12	
Calculate Construction Quantities				12				12										
Produce Opinion of Probable Construction Cost	4	8		16														
Submit Final Plans, Specifications, & Opinion of Probable Construction Cost				4												8		
Submit One Set of Final Plans to Each Utility Affected				4				4								12		
Incorporate City Comment into Final Plans				16				40										
QA/QC	8	16		64											4			
Submittal to Arkansas Department of Health				4				2								4		
<b>Hours</b>	<b>44</b>	<b>100</b>	<b>0</b>	<b>496</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>814</b>	<b>0</b>	<b>620</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>16</b>	<b>70</b>	<b>24</b>	<b>0</b>
<b>Salary Costs</b>	\$ 3,638.80	\$ 6,750.00	\$ -	\$ 22,419.20	\$ -	\$ -	\$ -	\$ 17,867.30	\$ -	\$ 19,406.00	\$ -	\$ -	\$ -	\$ -	\$ 288.00	\$ 1,113.00	\$ 336.00	\$ -

	Number of Units	Cost Per Unit	Extension
<b>Postage/Courier</b>			
Postage	50 oz.	\$ 0.44	\$ 22.00
Courier (FedEx)	5 ea.	\$ 20.00	\$ 100.00
<b>Subtotal</b>			<b>\$ 122.00</b>
<b>Communications - Long Distance &amp; Conference Calls</b>	Lump Sum	\$ -	\$ -
<b>Travel - Meetings</b>			
Mileage	400 mi.	\$ 0.50	\$ 200.00
Lodging	0 day	\$ 76.00	\$ -
Food	0 day	\$ 39.00	\$ -
Incidentals	0 day	\$ 5.00	\$ -
<b>Subtotal</b>			<b>\$ 200.00</b>
<b>Printing / Reproduction</b>			
8.5x11 Black & White	300 ea.	\$ 0.05	\$ 15.00
8.5x11 Color	100 ea.	\$ 0.50	\$ 50.00
11x17 Black & White	400 ea.	\$ 0.10	\$ 40.00
11x17 Color	100 ea.	\$ 1.00	\$ 100.00
Black & White Card Stock	ea.	\$ 0.25	\$ -
Color Card Stock	ea.	\$ 0.85	\$ -
Large Formant Printing (Black & White)	1000 s.f.	\$ 0.09	\$ 90.00
Large Formant Printing (Color)	150 s.f.	\$ 1.00	\$ 150.00
Scanning (Black & White)	100 s.f.	\$ 0.25	\$ 25.00
Scanning (Color)	100 s.f.	\$ 5.00	\$ 500.00
Mounting Boards (3/16")	s.f.	\$ 3.00	\$ -
Laminating (Large Scale)	s.f.	\$ 1.00	\$ -
Binding	ea.	\$ 1.50	\$ -
<b>Subtotal</b>			<b>\$ 970.00</b>

SUBTOTAL - MANHOURS	2184
<b>SUBTOTAL - SALARY COSTS</b>	<b>\$ 71,818.30</b>
<b>FORWARD PRICING (3%)</b>	<b>\$ 2,154.55</b>
<b>TOTAL DIRECT SALARY</b>	<b>\$ 73,972.85</b>
<b>OVERHEAD RATE - 187.39%</b>	<b>\$ 138,617.72</b>
<b>PROFESSIONAL FEE</b>	<b>\$ 21,259.06</b>
<b>DIRECT NON-LABOR EXPENSES</b>	
Postage/Courier	\$ 122.00
Communications	\$ -
Travel - Meetings	\$ 200.00
Printing / Reproduction	\$ 970.00
<b>Subtotal - Non-Labor Expenses</b>	<b>\$ 1,292.00</b>
<b>TOTAL COST (Water &amp; Sewer Design)</b>	<b>\$ 235,141.63</b>



City of Bentonville, Arkansas  
8th Street Widening & Extension (Highway 71 to SW "I" Street)  
**FINAL DESIGN**

Work Task Description	Engineer										Engineering Technician					Exec. Asst.	Administrative		
	X	VIII	VII	VI	V	IV	III	II	I	V	IV	III	II	I	III		II	I	
	\$ 82.70 hr.	\$ 67.50 hr.	\$ 55.00 hr.	\$ 45.20 hr.	\$ 38.95 hr.	\$ 36.66 hr.	\$ 31.00 hr.	\$ 21.95 hr.	\$ 20.35 hr.	\$ 31.30 hr.	\$ 26.80 hr.	\$ 22.80 hr.	\$ 18.00 hr.	\$ 14.00 hr.	\$ 18.00 hr.	\$ 15.90 hr.	\$ 14.00 hr.	\$ 9.00 hr.	
Address Preliminary Plan Review Comments	4	4				32	24			48					4				
Plan & Profile Sheets (21 Sheets)	8	8				40	136			136									
Typical Sections - Streets	2	4				8	8			8									
Cross Sections (Roadway, Side roads, Driveways)		8				20	24			40									
Intersecting Street Plans (23 Sheets)	2	4				24	60			60									
Driveway (Plan View in Plans & Separate Profile)		2				8	8			20									
Drainage Maps & Hydrology Calculations (7 Sheets)	4	4				32	120			80									
Drainage Improvements - Streets						24	48			40									
Pedestrian Crossings - Final Design	4	40				48	48			100									
At Grade Railroad Crossing	2	2				24	24												
MOT / Sequence of Construction	4	4				24	24			32									
Stormwater & Erosion Control Plans	2	4				8	24			20						8			
Special Provision / Conditions	2	12				40	16									30			
Phasing (2 contract sections)	4	8				32	16							20		20			
Stormwater Pollution Prevention Plans						24	48			40						12			
Calculate Construction Quantities		4				24	32			40									
Summary of Pay Quantities Sheet						24	32			40				8					
Opinion of Probable Construction Cost / Bid Proposal	8	8				32	40			16						16			
Prepare Quality Control Testing Schedule		4				12													
Estimate Construction Time		2				8													
Final Design Report	8	4				80				40				16		30			
Meeting & Coordination with City / AHTD	8	16				56	12							2		4			
Address Final Design Review Comments	4	6				32	32			48				4		8			
Coordination with B&McD (Environmental)		8				8													
Coordination with Franchise Utilities		4				48	16							4		8			
Coordination with Planning		8				48	24			48									
Coordination with Railroad		8				24				24				4		8			
VE Review	8	16				40	40			40				8		8			
QC Review	16	40				40				40				40		8			
<b>Hours</b>	<b>90</b>	<b>232</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>864</b>	<b>856</b>	<b>0</b>	<b>0</b>	<b>960</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>110</b>	<b>160</b>	<b>0</b>	<b>0</b>	
<b>Salary Costs</b>	<b>\$ 7,443.00</b>	<b>\$ 15,660.00</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 31,674.24</b>	<b>\$ 26,536.00</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 30,048.00</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 1,980.00</b>	<b>\$ 2,544.00</b>	<b>\$ -</b>	<b>\$ -</b>	

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	Number of Units	Cost Per Unit	Extension
<b>Postage/Courier</b>			
Postage	75 oz.	\$ 0.44	\$ 33.00
Courier (FedEx)	25 ea.	\$ 20.00	\$ 500.00
<b>Subtotal</b>			<b>\$ 533.00</b>
<b>Communications - Long Distance &amp; Conference Calls</b>	Lump Sum	\$ -	\$ -
<b>Travel - Meetings</b>			
Mileage	1000 mi.	\$ 0.50	\$ 500.00
Lodging	3 day	\$ 76.00	\$ 228.00
Food	3 day	\$ 39.00	\$ 117.00
Incidentals	3 day	\$ 5.00	\$ 15.00
<b>Subtotal</b>			<b>\$ 860.00</b>
<b>Printing / Reproduction</b>			
8.5x11 Black & White	6000 ea.	\$ 0.05	\$ 300.00
8.5x11 Color	2000 ea.	\$ 0.50	\$ 1,000.00
11x17 Black & White	6000 ea.	\$ 0.10	\$ 600.00
11x17 Color	1000 ea.	\$ 1.00	\$ 1,000.00
Black & White Card Stock	25 ea.	\$ 0.25	\$ 6.25
Color Card Stock	25 ea.	\$ 0.85	\$ 21.25
Large Formant Printing (Black & White)	10000 s.f.	\$ 0.09	\$ 900.00
Large Formant Printing (Color)	1500 s.f.	\$ 1.00	\$ 1,500.00
Scanning (Black & White)	500 s.f.	\$ 0.25	\$ 125.00
Scanning (Color)	300 s.f.	\$ 5.00	\$ 1,500.00
Mounting Boards (3/16")	200 s.f.	\$ 3.00	\$ 600.00
Laminating (Large Scale)	200 s.f.	\$ 1.00	\$ 200.00
Binding	25 ea.	\$ 1.50	\$ 37.50
<b>Subtotal</b>			<b>\$ 7,790.00</b>
<b>Other Direct Costs</b>			
ADH Permit Review Fees	1 ea.	\$ 500.00	\$ 500.00
SWPPP (Notice of Intent)	3 ea.	\$ 250.00	\$ 750.00
<b>Subtotal</b>			<b>\$ 1,250.00</b>

SUBTOTAL - MANHOURS	3272
<b>SUBTOTAL - SALARY COSTS</b>	<b>\$ 115,885.24</b>
<b>FORWARD PRICING (3%)</b>	<b>\$ 3,476.56</b>
<b>TOTAL DIRECT SALARY</b>	<b>\$ 119,361.80</b>
<b>OVERHEAD RATE - 187.39%</b>	<b>\$ 223,672.07</b>
<b>PROFESSIONAL FEE</b>	<b>\$ 34,303.39</b>
<b>DIRECT NON-LABOR EXPENSES</b>	
Postage/Courier	\$ 533.00
Communications	\$ -
Travel - Meetings	\$ 860.00
Printing / Reproduction	\$ 7,790.00
Other Direct Costs	\$ 1,250.00
<b>Subtotal - Non-Labor Expenses</b>	<b>\$ 10,433.00</b>
<b>TOTAL COST (Final Design)</b>	<b>\$ 387,770.26</b>



**ATTACHMENT B-3  
B&F ENGINEERING, INC.**

ESTIMATE OF COSTS FOR SURVEYS PERFORMED FOR AHTD

DATE: 10/05/09

AHTD JOB #: 090218

JOB TITLE: 8th Street Improvements

HWY., ROUTE, and SECTION: Hwy 71

COUNTY: Benton

TYPE SURVEY: Preliminary Design &amp; Land Surveys

ESTIMATED COSTS BASED ON SCOPE OF WORK DATED: 09/30/2009

**\*\*\* Fee Basis - Hourly Rates with Overhead and Profit \*\*\***

POSITION	RATE	HRS REG	HRS ADD	HRS TOT	AMT
Senior Professional Surveyor	\$ 41.35	240.0	0.0	240.0	\$ 9,924.00
Project Professional Surveyor	\$ 27.88	880.0	0.0	880.0	\$ 24,534.40
Engineering Technician	\$ 21.00	648.0	0.0	648.0	\$ 13,608.00
CADD Drafter	\$ 20.50	580.0	0.0	580.0	\$ 11,890.00
Party Chief	\$ 21.00	1380.0	0.0	1380.0	\$ 28,980.00
Instrument Person	\$ 15.25	1380.0	0.0	1380.0	\$ 21,045.00
Rodman 1	\$ 11.50	1380.0	0.0	1380.0	\$ 15,870.00
Rodman 2 (4-man survey crew)	\$ 10.50	0.0	0.0	0.0	\$ -
Word Processing/Clerical	\$ 12.25	0.0	0.0	0.0	\$ -
<b>NOTE: AMT = (HRS REG x RATE) + (HRS OT x RATE x 1.5)</b>					
<b>(1) LABOR SUBTOTAL (REG + OT)</b>					<b>\$ 125,851.40</b>
<b>(1B) LABOR SUBTOTAL (HRS TOT x RATE; no OT)</b>					<b>\$ 125,851.40</b>
<b>(2) OVERHEAD (% of Total Labor (1B))</b>					<b>136.43%</b>
					<b>\$ 171,699.07</b>
<b>NOTE: OVERHEAD applied to straight time only.</b>					
	<b>RATE</b>	<b>QTY</b>			
<b>(3) Expenses Allowed In Fee</b>					
n/a	\$ -				\$ -
<b>(4) Sub Total (Labor + Overhead + Expenses)</b>					<b>\$ 297,550.47</b>
<b>(5) PROFIT OR FEE (% of Labor(1) + Overhead + Expenses)</b>					<b>\$ 35,706.06</b>
Sub Total (Labor(1) + Overhead + Expenses + Profit)					\$ 333,256.53
<b>(6) REIMBURSABLE EXPENSES (Not included in Overhead)</b>					
Mileage	\$ 0.42	23,000			\$ 9,660.00
Travel Expenses (Meals & Lodging per day ~ Statewide)	\$ 84.68	306			\$ 25,912.08
Miscellaneous Expenses (I.e. local surveyor fees, etc.)	\$ 500.00	1			\$ 500.00
Certificates of Title	\$ 120.00	115			\$ 13,800.00
<b>TOTAL REIMBURSABLE EXPENSES</b>					<b>\$ 49,872.08</b>
<b>(7) TOTAL COST OF SERVICES [(3)+(4)+(5)+(6)]</b>					<b>\$ 383,128.61</b>

**ESTIMATE OF HOURS PER TASK FOR SURVEYS PERFORMED FOR AHTD**DATE: 10/05/09AHTD JOB #: 090218JOB TITLE: 8th Street ImprovementsHWY., ROUTE, and SECTION: Hwy 71COUNTY: BentonTYPE SURVEY: Preliminary Design & Land Surveys

<b>No.</b>	<b>Task</b>	<b>Senior PS</b>	<b>Project PS</b>	<b>ET</b>	<b>CAD</b>	<b>Crew</b>	<b>Comments</b>
B.1	Surveys	40					Contract Admin & Mission Planning
B.1.a	Control Surveys						Included in original agreement (i.e. the task of providing primary horizontal & vertical).
B.1.b	Design Surveys	32		40	180	240	Secondary control, 150-ft strip topo, data processing, and modeling.
B.1.c	Land Surveys - Titles/Parcels	60	496	60	160	600	Estimated 115 certificates of title in 3 sections.
B.1.d	R/W Staking	16	40	40		160	R/W & easement staking for utility relocate.
B.1.e	R/W Monuments & Plats	32	200	120	240	280	Set r/w monuments & prepare final plats (i.e. plats of survey per r/w acquisition)
B.1.f	Geotechnical Stakeout	16		32		100	Stake approximately 200 boring locations.
B.1.g	R/W Plans - Interchange	16	40	40			PS review only; drafting by others.
B.1.h	R/W & Esmt Descriptions	24	100	300			Legal description preparation; estimating 200 descriptions (i.e. perm., const., etc.)
B.1.i	Control Detail Sheets	4	4	16			Review only; drafting by others.
<b>Total</b>		<b>240</b>	<b>880</b>	<b>648</b>	<b>580</b>	<b>1380</b>	

**ATTACHMENT B-4  
TERRACON CONSULTANTS, INC.**

APPENDIX C - ATTACHMENT 1

Summary Fee Estimate

**SALARY COSTS**

<b>Classification</b>	<b>Total Hours</b>	<b>Current Rate</b>	<b>Direct Salary Costs</b>
Principal	87	\$60.00	\$ 5,220.00
Senior Project Manager	55	\$36.00	\$ 1,980.00
Project Manager	55	\$30.00	\$ 1,650.00
Project Engineer or Geologist	529	\$27.00	\$ 14,283.00
Engineer or Environmental Specialist	29	\$21.50	\$ 623.50
CADD Technician	69	\$14.00	\$ 966.00
Administrative	55	\$14.50	\$ 797.50
Driller	386	\$17.50	\$ 6,755.00
Driller Helper	386	\$11.50	\$ 4,439.00
Laboratory Technician	1771	\$17.50	\$ 30,992.50
Total Hours:		3422	
Salary Costs - Year 1:			\$ 67,706.50
Principal	87	\$61.80	\$ 5,376.60
Senior Project Manager	55	\$37.08	\$ 2,039.40
Project Manager	55	\$30.90	\$ 1,699.50
Project Engineer or Geologist	529	\$27.81	\$ 14,711.49
Engineer or Environmental Specialist	29	\$22.15	\$ 642.21
CADD Technician	69	\$14.42	\$ 994.98
Administrative	55	\$14.94	\$ 821.43
Driller	386	\$18.03	\$ 6,957.65
Driller Helper	386	\$11.85	\$ 4,572.17
Laboratory Technician	1771	\$18.03	\$ 31,922.28
Total Hours:		3422	
Salary Costs - Year 2 (@3% Escalation):			\$ 69,737.70
Total Direct Salary:			\$ 137,444.20
2008 Overhead Audit Rate:			202.5%
Overhead:			\$ 278,324.49
<b>Total Direct Labor and Overhead:</b>			<b>\$ 415,768.69</b>
<b>Fixed Fee:</b>			<b>\$ 49,892.24</b>

**EXPENSES**

<b>Description</b>	<b>No. of Units</b>	<b>Current Rate</b>	<b>Direct Expenses</b>
Travel / Mileage	5,850	0.500	\$ 2,925.00
Railroad Access Permit and Insurance	1	\$ 10,000.00	\$ 10,000.00
Hole Abandonment Supplies, per bag	650	\$ 6.50	\$ 4,225.00
Diamond Core Bits, each	20	\$ 550.00	\$ 11,000.00
Monitoring Well Supplies, per foot	450	\$ 27.00	\$ 12,150.00
Lodging & Meals (\$70 Lodging, \$30 Meals)	190	\$ 100.00	\$ 19,000.00
<b>Total Direct Expenses:</b>			<b>\$ 59,300.00</b>

**SUB-CONSULTANT FEES**

<b>Sub-consultant</b>	<b>Direct Fees</b>
Zonge Geosciences	
Bulldozer Clearing	\$ 6,000.00
Direct Traffic Control	\$ 7,800.00
<b>Total Sub-consultant Fees:</b>	<b>\$ 13,800.00</b>

**TOTAL ESTIMATE OF MAXIMUM FEE: \$ 538,760.93**

## APPENDIX C - ATTACHMENT 1

### Summary Fee Estimate Breakdown of Hours by Classification

<b>Stage 1</b>	<b>Bridge</b>	<b>MSE Wall</b>	<b>Pavement</b>	<b>Pedestrian Tunnel</b>	<b>Embankment</b>	<b>Geophysical</b>	<b>TOTAL</b>
Principal	47	75	30	10	12		<b>174</b>
Senior Project Manager	27	55	16	6	6		<b>110</b>
Project Manager	27	55	16	6	6		<b>110</b>
Project Engineer or Geologist	554	300	110	34	60		<b>1058</b>
Engineer or Environmental Specialist	24	24			10		<b>58</b>
CADD Technician	62	40	20	8	8		<b>138</b>
Administrative	45	40	16	1	8		<b>110</b>
Driller	389	250	80	18	35		<b>772</b>
Driller Helper	389	250	80	18	35		<b>772</b>
Laboratory Technician	530	2000	750	112	150		<b>3542</b>