



## EXHIBIT A

Proposal/Agreement to Provide Professional Survey Services for  
**Aerial Mapping & Right-of-Way**  
**Right-of-Way Determination and Base Mapping**  
**East Broadway Road**  
**From Rural Road West to the Union Pacific Railroad**

### Scope of Services

1. **Right-of-Way** - Sunrise Engineering will perform the necessary research and calculations to determine the right-of way as shown in Exhibit B. The Rights-of-Way will be determined using the Maricopa County Recorder's Office "On-Line" data. All recorded data that is not readily available will be collected through a title company. Approximately 90 parcels will have title reports prepared as shown in Exhibit C. The right of way will be determined using the "Best Fit" method listed below.
  - Property lines for parcels that are coincident and contiguous to the Right-of-Way will also be determined and shown in the base drawing.
  - The Right-of-way dimension will be shown.
  - Easements will be determined and shown in the base file.
2. **Field Survey** - Sunrise Engineering will perform the survey based on City of Tempe Horizontal & Vertical Datum
  - Sunrise Engineering will tie the survey to existing monuments (quarter sections and street intersections) in the vicinity of the survey.
  - Sunrise Engineering will obtain full-width topographic survey data (location and elevation) to 10 feet behind the apparent right-of-way.
  - Sunrise Engineering will obtain location and elevation of existing surface utilities found within limits of the survey.
  - Sunrise Engineering will dip existing sewer, storm drain and irrigation manholes. (If any).
3. **Base Map** - Sunrise Engineering will prepare and provide a base map of the subject area in the following format:
  - Point files – ASCII (include all survey points)
  - Topo files – 3D .dgn
  - TDM – actual surface
4. **Aerial Mapping** - Sunrise Engineering will perform aerial mapping along the project corridor.

## **Deliverables**

1. 1 digital base drawing for the aforementioned project area
  - a. The drawing will include boundary, rights-of-way, section lines and property lines for the adjacent parcels based on recorder's documentation.
  - b. The line-types, line weights, layers and blocks will be prepared according to the City of Tempe Standards where the City's standards apply.
  - c. Line-work for edges of asphalt, curb, sidewalk, fences, toes and tops of slopes, canals, flow lines and ditches will be included.
  - d. Contours will be shown at 1ft intervals.
  - e. Microstation Format
2. 1 set of hard copies of the survey (drawn in plan view only)
  - a. The survey will be signed and sealed by an Arizona Registered Land Surveyor
  - b. The Drawing will be prepared at 1"=20' scale.
  - c. The drawing will publish 2 City benchmark used in the survey.
3. 1 set of coordinates in \*.csv format

**Title Research and Reports** – The significant expense of research for title documents can be reduced. The reduction in expense can be accomplished by manual research of the Maricopa County Recorder's Documents; thereby reducing the number of parcels that require title reports. This approach has associated risks due to the fact that not all adjoining parcels will have full title reports and without a title report there is a possibility that all the necessary document to define the Rights-of-way and easements may not be found and incorporated into the design plans. The expense could potentially be reduced by 60% to 70%.

## **Scope of Work Exclusions, Methods and Practices**

1. Additional services will be performed as requested at our rates in the following fee schedule shown in Exhibit A. Re-staking due to destroyed, disturbed, or lost property corners will be performed at written approval.
2. Sunrise Engineering, Inc cannot guarantee availability of survey crew without request for services 2 days in advance of scheduled work.
3. Sunrise Engineering will not start any work until this agreement is signed and received by the undersigned.
4. At the sole discretion of Sunrise Engineering, completion of the survey may be stopped if any conflict with the boundary of the subject parcels is discovered during the evaluation and survey of the property. All services required to resolve the conflict are additional to this agreement and not included in the cost of the survey. Approval for additional services shall be in writing in accordance to this contract before proceeding with any additional services to resolve the conflict(s).

The compensation for services under this agreement is Time and Material Not to Exceed **Fifty Six Thousand Five Hundred Fifty Five Dollars (\$56,555)**. Any further services requested in excess of those listed above will be performed at the rates and fees shown in the attached Exhibit A.

## Exhibit A

### SUNRISE ENGINEERING, INC.

#### Arizona Offices

#### 2010 Fee Schedule

<u>CODE</u>	<u>CLASSIFICATION</u>	<u>RATE</u>	<u>CODE</u>	<u>CLASSIFICATION</u>	<u>RATE</u>
101	Engineer (E.I.T.) I	\$85	051	Administrative I	\$40
102	Engineer (E.I.T.) II	\$95	052	Administrative II	\$49
103	Engineer III	\$105	053	Administrative III	\$59
104	Engineer IV	\$125	921	Survey Tech I	\$42
105	Engineer V	\$145	922	Survey Tech II	\$45
110	Principal Engineer	\$169	930	Survey CAD Tech	\$80
711	Project Manager I	\$99	935	Survey Crew Chief	\$100
712	Project Manager II	\$139	940	Survey Manager	\$105
301	Engineering Tech I	\$75	945	Registered Surveyor	\$115
302	Engineering Tech II	\$79	950	Principal Surveyor	\$135
303	Engineering Tech III	\$95	MILE	Mileage	\$0.55
304	Engineering Tech IV	\$105			
401	CAD Technician I	\$59			
402	CAD Technician II	\$69			
403	CAD Technician III	\$75			
404	CAD Technician IV	\$79			

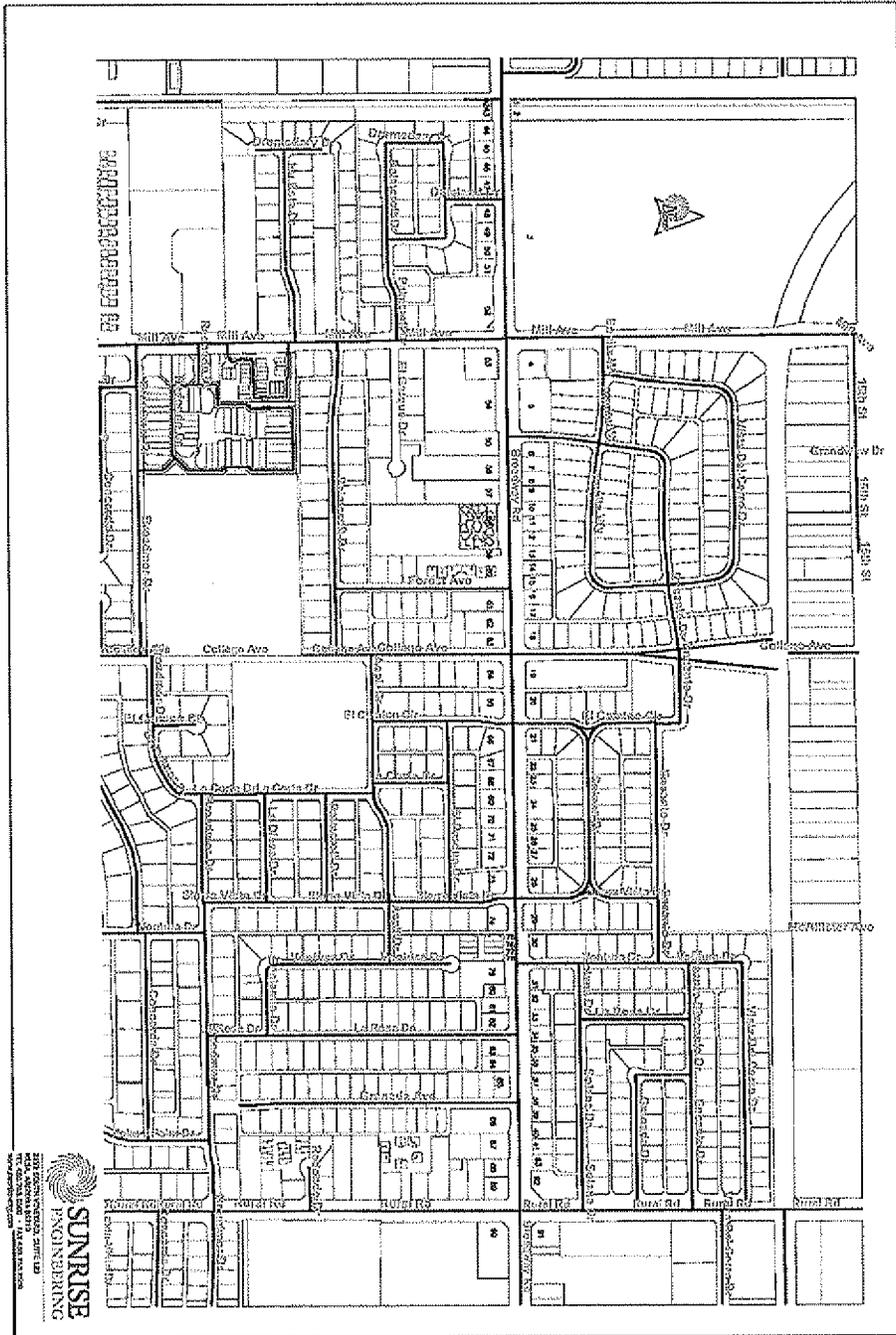
*Subconsultants and other direct expenses as incurred plus 10% handling fee*

**Exhibit B**  
**Subject Area Map**



# Exhibit C

## Parcel Map Title Reports



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K.D.C.

## Explanation of "Best-Fit" Rights of Way and Roadway Centerlines

A diligent field survey must be completed first, then the analysis and calculation of the right of way corridor shall commence. Generally speaking, the found monumentation is used as a guide in to fit the recorded intent and geometry of the right of way documentation. If an existing R/W report (*usually for state highway projects*) is available in a timely manner, the documentation and its intent will be held and will also be compared to the existing R/W shown on the available R/W maps and plans. If a discrepancy is discovered between the existing R/W report documentation and the R/W maps/plans, the documentation is takes precedence. If the existing R/W report is not available in a timely manner, the existing R/W maps and plans will be applied to calculate a preliminary alignment and existing right of way. After the existing right of way report is received, the documentation will be reviewed and compared to the preliminary alignment and any necessary revisions will be made and relayed to the R/W Plans Section. A discussion is needed concerning existing right of way monumentation. In general, existing right of way monuments and centerline monuments, may not be considered "errorless" or "original" monuments, and most of the time the positions should not, or cannot, be literally "held". Many of these monuments were set using inaccurate field methods, and/or were set by non-surveyors who did not have the knowledge or place the value on the monument location, that presumably a Registered Land Surveyor would. Nor is it possible to hold the intended record roadway right of way width (give it its due – no more or no less) when a pair of monuments at a control station do not match the record width.

The first element to be established is the existing right of way centerline. The centerline will not typically represent a "simple" or quick solution such as splitting pairs of found monuments and connecting the dots, or holding one pair of monuments and then holding the record geometry for the rest of the alignment. The centerline is typically solved piece by piece, by a trial and error method, until the entire project is solved. For projects without curve-linear geometry, and for tangent sections of roadway, a linear regression will be performed on the found monumentation, which will result in a best-fit alignment for the corridor and/or tangent sections.

For projects that have curve-linear geometry, the alignment of tangent sections are typically solved first, then the PI's of the curves are solved, then the PC's, PT's, SC's, etc. are solved. It should also be noted that preliminary calculations of centerline – section line intersections and comparing them to record ties can also have an influence on the position of the alignment.

General rules for solving the centerline alignment are:

- a) Hold the record degree of curvature and let the arc length (and delta) float to generally fit the monumentation and/or the best-fit alignment. If the radius distances are large (greater than 10,000') the radius can be adjusted, if necessary to solve the centerline.
- b) All points of curvature should be tangent. If absolutely necessary, non-tangent curves can be used, if all "tangent options" have been exhausted.
- c) Straight tangent segments should remain straight and not have minor deflections or angle points introduced in the alignment, when none have ever been recorded or intended. An exception may be made if: 1. the tangent is located within private property, 2. there is a preponderance of evidence to create an angle point, and, 3. approval is given by the R/W Plans Section.
- d) Spiral lengths are normally held at their record lengths.

- e) Basis of Stationing – the basis of stationing should be at the location of a centerline control point (PC, PT, TS, etc.) where a pair of R/W monuments have been found at that location and their measured relationship to each other is good compared to the record. Whenever possible, the station value for the basis of stationing will be a record station from an existing R/W map or R/W plan. If no R/W maps or plans exist, then a record as-built station can be used, if available. A secondary alternative is to hold the record station at the intersection of the R/W centerline and a measured section line. If there is more than one suitable choice for the basis of stationing on a project, the location that should be chosen is the one that will create the most harmony between record station values and measured station values on the found R/W monuments.

Unless other evidence is available, all record station equations will be re-established. Depending on the magnitude of measured or calculated differences between the final determination and position of centerline control points and existing r/w points, and existing monumentation, there is not a set rule to reconcile the differences. However, what is considered to be acceptable is on the order of several tenths of a foot to as much as 1-3 feet in other places. This applies to both the station and offset components. In the centerline analysis process, all monuments need to be considered, but not necessarily in the final accepted determination of the alignment. For example, in a hypothetical 3 mile project with several curves and tangents where 12 existing r/w monuments are field located and after performing some initial analysis and “trial and error solutions”, that 10 of the monuments all relate to each other quite well, according to the record geometry, and that the deviation of error in the centerline solution using only the 10 monuments is on the order of a couple of tenths. If introducing the other 2 monuments in the analysis then significantly moves the alignment and the maximum deviation then is close to one foot, then the 2 monuments will be rejected and will not be used the determination of the final alignment.

**PROJECT NAME**  
**PROJECT MANAGEMENT PLAN**  
 Sunrise Engineering Inc.  
 Surveyor's Estimate of Survey Services

Project No.: 00001  
 Prepared By: TE  
 Date: 8/17/09  
 Hours To Site: 1.00

DESCRIPTION			Survey									HOURS PER CLASS	COST PER CLASS			
TASK NUMBER			1	2	3	4	5	6	7	8	9					
BILL GROUP			001	002	003	004	005	006	007	008	009					
PHASE			0001	0001	0001	0001	0001	0001	0001	0001	0001					
TASK DESCRIPTION	COLLECT CL	SURVEY SURFACE	MISC TOPO	SET AERIAL PANELS	AERIAL TOPO	RESEAR CH/CALC.	DRAFTING Boundary	Title Research	Microstation Conversion							
CLASS	DESCRIPTION	RATE	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost		
920	Survey Tech	\$55.00	8	\$440	12	\$660	8	\$440	10	\$550			38	\$2,090		
931	Survey Cad Tech	\$75.00							65	\$4,875		30	\$2,250	95	\$7,125	
940	Survey Crew Chief	\$100.00	8	\$800	12	\$1,200	10	\$1,000	9	\$900	10	\$1,000	49	\$4,900		
950	Survey Manager	\$95.00	3	\$285	4	\$380	2	\$190	1	\$95	5	\$475	12	\$1,140	27	\$2,565
951	Registered Surveyor	\$110.00								20	\$2,200		20	\$2,200		
960	Principal Surveyor	\$135.00	1	\$135	1	\$135	1	\$135	1	\$135			5	\$675		
-	HDS Scanning	\$254.00														
-	Mobilization	\$75.00	On-Site Days													
-	Title Research	#####	Title Cost							1	\$33,000			\$33,000		
-	Aerial Topo	#####	Units Cost					1	\$4,000					\$4,000		
<b>TOTAL</b>			<b>TASK HOURS</b>	20	29	21	21	16	32	65		30	234	\$56,555		
			<b>TASK COST</b>	\$1,660	\$2,375	\$1,765	\$1,680	\$5,610	\$3,340	\$4,875	\$33,000	\$2,250		\$56,555		
			<b>Work Days</b>	2.0	2.9	2.1	2.1	1.6	3.2	6.5		3.0				

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