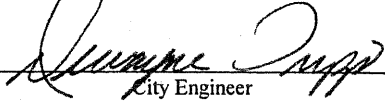


CITY OF TUCSON, ARIZONA
DEPARTMENT OF TRANSPORTATION

ENGINEERING DIVISION
ACTIVE PRACTICES GUIDELINES

PREPARED BY: David W. Preisch R.L.S. EFFECTIVE: 10/4/00
APPROVED BY:  DATE: 10/4/00
City Engineer

SUBJECT: GENERAL REQUIREMENTS FOR RIGHT-OF-WAY PLANS AND SURVEYS PREPARED FOR THE ENGINEERING DIVISION OF THE CITY OF TUCSON, ARIZONA

1.01 PURPOSE

- A. The following standards and procedures are to be used in the preparation of Right-of-Way plans, surveys, legal descriptions, and construction plans for the City of Tucson. Should it be necessary to deviate from these standards, the City Surveyor shall outline a course of action that will best suit the particular situation.
- B. These standards are intended to be used in conjunction with and as supplement to Office Procedures No. 8-1552-002 (included herein as attachment 'A') and the requirements cited therein shall govern for all items not specifically covered by this supplement.

1.02 DEFINITION AND CONTENT

- A. Right-of-way plans are an official public document showing existing monumented right-of-way and property lines with proposed changes thereto.
- B. Right-of-way plans are to be used in conjunction with the acquisition and disposal of property and property rights and are to be based upon a previously recorded record of survey drawing prepared by City staff, or the consultant, for the purposes of the given project.

- C. The right-of-way plans shall contain sufficient data to allow them to be used as follows:
1. In the preparation of legal descriptions necessary to implement the right-of-way changes shown on the plan.
 2. As a sole source for the field location of all-public right-of-way and property lines affected by the right-of-way changes as shown on the plan.
 3. The construction of a new road invariably destroys the survey monuments in the roadway and many monuments along the sidelines of the right-of-way. Proper analysis of the true sidelines of the right-of-way are usually determined from the sideline monuments. It is imperative that a diligent search be made for all property pins with a view toward perpetuating their locations, especially the locations of original monuments.

This shall be accomplished by preparing a record of land survey drawing showing existing monuments along right-of-way lines and the centerline or monument line(s). Said record of a land survey shall be in accordance with all Arizona Revised Statutes, rules and regulations of the State Board of Technical Registration, and local ordinances. The record of a land survey shall be submitted to the City Surveyor or designated representative for review, prior to recording the document with the Pima County Recorder's office.

- D. For those projects where new right-of-way is not required, the existing right-of-way location and dimensions will still be needed for roadway design. The existing right-of-way lines are typically shown on the construction plans. In these cases, the existing right-of-way shall be based upon all the proper survey work that would be required if right-of-way plans were prepared and shall be based upon a record of survey recently prepared by the City staff, or the consultant, for the purposes of the given project. The record of survey and required survey work (including right-of-way monumentation) shall conform to applicable portions of these standards.

1.03 SOURCES OF DATA

- A. The data required for the preparation of the right-of-way plans shall include, but not be limited to:
1. A previously recorded record of a land survey for this particular right-of-way project.

2. Records of survey, public or private.
3. Recorded subdivision plats.
4. Pima County Road Maps and Assessor's maps. (See Section 3.03)
5. Recorded deeds (Photostatic copies of recorded deeds, including the current deed for each parcel abutting the road right-of-way shall be submitted).
6. Existing City Engineer's plans and files and City survey records.
7. Any other source deemed appropriate and proper to establish boundary lines.

1.04 STANDARDS

A. Right-of-way plans shall show:

1. Existing and proposed right-of-way lines and temporary construction easements dimensioned in such a way that their widths are clear at all points on the plan.
2. Existing and proposed centerlines with ties to existing centerlines, section lines, and/or monument lines.
3. Existing public right-of-way, drainage and utility easements; other types, such as ingress/egress, shall be shown if they affect the design and operation of the improvements.
4. All parcels affected by the project. Each parcel affected shall be:
 - a. Shown in its entirety with full record of properly calculated dimensions. Sufficient data shall be shown so that the portion to be acquired, leased or vacated may be surveyed without resorting to any data other than shown on the plan.
 - b. Identified by a parcel letter and sheet number.
 - c. Listed in a Parcel Area Table which shall show:
 1. The original area
 2. The area to be acquired
 3. The remaining area

5. All pertinent data which may affect the cost of acquisition; including:
 - a. Permanent improvements within 50' of the proposed right-of-way lines.
 - b. Points of ingress/egress, i.e. driveways, access easements, private roads etc.
 - c. Fences sidewalk, patio walls, major landscaping, signs, and other structures, etc.
 - d. Easements of record and evidence of unwritten or unrecorded easements.
 6. Limited and/or controlled access lines, where applicable.
 7. Sufficient dimensional and angular data to permit field location of the project and all parcels affected by the project.
 8. All existing monumentation used in preparing the plan, including ties and physical description for each.
- B. Any deviation from the above standards must be approved by the City Engineer.

1.05 FHWA FEDERAL AID PROJECTS

Right-of-way plans for Federal Aid Projects shall conform to the standards outlined herein, unless otherwise instructed by the City Engineer.

1.06 DEGREE OF ACCURACY

- A. All mathematical data shall have a closure precision of at least:
 1. 1 in 50,000 for the primary closed traverse.
 2. 1 in 10,000 for the property lines, other than right-of-way lines.
- B. All bearings (or angles) shall be shown to the nearest second of arc; distances shall be shown to the nearest hundredth of a foot.

1.07 MATHEMATICS

The project engineer (consultant engineer) shall furnish the City Engineer a copy of the math drawing(s) and a list of all coordinate points shown to six places to the right of the decimal. This drawing shall clearly show how all new data was derived. If cogo is used, the City may request an ASCII file (on either 3-1/2" floppy or CD) containing northing and easting point data. The point numbering sheet will also be required.

2.01 TITLE SHEET

Title and plan sheets shall be drawn on a 24" x 36" high quality, double matte, 4 millimeter mylar. No splicing, stick-on materials or Diazo mylar will be acceptable. Refer to City of Tucson Office Procedures No. 8-1552-002 for Drafting Standards.

A. The following items shall be shown on a Standard Mylar City of Tucson Title Block:

1. A general location plan, at a scale of 3"=1 mile, showing the project location with respect to major streets.
2. A Title sheet index drawing at a scale of 1"=100' to show:
 - a. The full extent of the project with individual sheet coverage clearly delineated.
 - b. The existing and proposed project centerline or monument line and its relation to Section, Quarter Section, and monument lines, if any. Section, Township and Range shall be identified.
 - c. Street names, subdivision names, etc.
3. A separate monument line drawing, if appropriate.
4. The project name, City job number, and City Engineer's plan number.
5. The general notes and legend shall include, but not be limited to:
 - a. A statement of a basis of bearings which includes its record source (if assumed, so state) and clearly indicating the monuments on which it is based.


- b. All data sources used for preparing the plans that are not shown elsewhere in the plans.
 - c. Symbols indicating monumentation, whether found or set.
 - d. A statement of who performed any or all of the title search work. The dates of the first and last title report shall be indicated. The title reports are to include a 5 year chain-of-title and the requirements to convey free and clear title. Also, a photostatic copy of the most current deed shall be attached.
- B. A statement by the project surveyor which shall read as follows:
"I hereby certify that these plans have been prepared under my direction and that they are an accurate depiction of all existing and proposed conditions". This statement shall be accompanied by the surveyor's seal signature. Additional sheets need only have the surveyor's seal and signature affixed to the left of the Title Block.

2.02 PLAN SHEET(S) ON A STANDARD MYLAR CITY OF TUCSON TITLE BLOCK:

- A. The Plan Sheet(s) shall be prepared utilizing the following:
1. The scale shall be 1"=40', unless otherwise approved by the City Engineer
 2. North shall be oriented to the left, or top, of the sheet.
 3. Each street match line shall be at a property line, with a cross-reference to the adjacent sheet(s). Major street intersections shall be shown in their entirety on a single sheet, even if this results in the incomplete use of the sheet(s).
 4. All appropriate Section, Quarter Section, and One-Sixteenth Section lines shall be shown, labeled, and tied to the existing and proposed project centerline.
 5. Sufficient data in the form of found monumentation, distances, and bearings must be shown so that the existing and proposed project centerline and right-of-way lines may be field located from the project plans without the use of any additional data sources.
 6. All existing and proposed right-of-way lines and temporary construction easements shall be fully dimensioned.

7. Recorded subdivisions within and/or adjacent to the project shall be shown, including:
 - a. The subdivision name and recorded book and page.
 - b. Block and lot numbers
 - c. Lot or property address numbers.
 - d. Original lot and block lines shall be shown as dashed lines if they are no longer current property lines, and dimensioned to existing property lines.
8. References shall be shown for all existing or vacated rights-of-way indicating how they were established or vacated, e.g., Map and Plat, County Road Map (See Section 3.03), City Ordinance, recorded deed/easement, etc. The reference shall be placed in parentheses on the project side of the right-of-way lines, in a way that clearly indicates how the right-of-way was established at any location on the plan.
9. Where an existing street, created by a subdivision plat, has been widened by a recorded document, the original subdivision right-of-way line shall be shown as a dashed line with the amount of widening clearly shown.
10. Proposed widening shall be shaded; right-of-way vacated, or to be vacated, shall be hatched.
11. Rivers, washes, railroads, etc., shall be shown and labeled.
12. Each sheet shall have a Curve Data Table which shall list the number, delta, radius, arc, tangent and chord for each curve shown on that sheet. The curve number shall be enclosed in a circle and placed as near as possible to the pertinent curve; it may be arrowed to the curve for clarity. Curves that extend from one sheet to another shall be assigned only one curve number to be used on both sheets.
13. If a project centerline curve is composed of segments, the overall curve data shall be shown and identified in addition to the segment curve data.
14. Where required for clarity, radial to tangent bearings shall be shown and labeled.
15. Each sheet shall have an Area Table which shall list the gross area of the parcel, the area to be acquired, and the remaining area for each parcel

shown on that sheet. Areas for temporary construction easements shall also be included. Areas shall be to the nearest whole number for square footage or the nearest thousandth for acreage.

16. Parcels:
 - a. All parcels affected by the project shall be shown in their entirety; when this is not possible, a broken line or a small scale may be used.
 - b. Each parcel shall be fully dimensioned, with differences between record and measured or calculated distances shown.
 - c. Each parcel affected by the project shall be assigned a parcel letter for identification. This letter shall be placed over the sheet number and enclosed within a  and located in or near the parcel to which it pertains.
 - d. If a parcel is shown on more than one sheet, it shall be identified by the sheet number on which it first appears.
 - e. If the parcel is not a portion of a recorded subdivision, it shall be labeled "UNSUBDIVIDED", and its location stated by Section, Township and Range.
 - f. The portion to be acquired should be tied and dimensioned in such a manner that it is possible to survey and field locate the acquisition parcel without resorting to any additional data sources.
 - g. Tax code number to be shown for each parcel
 - h. Parcel address to be shown for each parcel.
 - i. Title report reference number to be shown in a table for each parcel.
17. Digital copies of all maps, Paving and Records of Survey will be Provided in DWG or DXF format.
18. All projects will be referenced to at least two local geodetic control points. Data for local geodetic control is available through the City Surveyor's office or over the internet by following the instructions in figure 1 on page 13.

2.03 SURVEY

- A. The survey and field notes shall conform to survey practices and standards acceptable to the City Engineer. The field notes shall contain a recap sheet(s) which clearly shows the entire survey net, together with final adjusted angles and distances throughout the net and so labeled.
- B. The mathematical error of closure for the adjusted project centerline and adjusted survey net shall be 1 part in 100,000.
- C. All field notes will be entered in a standard City survey book (6-1.2" x 8-1/2" cross section lined) to be turned in with the project tracing.
- D. The existing right-of-way lines shall be fully monumented with the project surveyor's pin and tag after approval of the record of survey as discussed in Section 2.04. Monuments shall be set at all block corners, angle points, points of curvature and tangency, etc. In addition to monumenting the actual right-of-way lines, a centerline, section line or monument line, whichever the case may be, shall also be fully monumented.

2.04 RECORD OF SURVEY

- A. A record of survey shall be prepared in accordance with all applicable statutes, ordinances, and rules and regulations of the State Board of Technical Registration. This record of survey shall be signed and sealed by the project surveyor and recorded with the Recorder of Pima County.
- B. The record of survey shall be reviewed by the City Surveyor or designated representative prior to recordation with the of Pima County recorder.
- C. At some point during the project after the initial survey work and before the preparation of the record of survey, the project surveyor shall review with the City Surveyor or designated representatives, the initial field data, monuments found, calculations and preliminary research materials, etc., before making final decisions as to the location of existing right-of-way lines.
- D. The recorded record of survey shall be the basis for preparation of the right-of-way plans.
- E. Along with the submittal of the record of survey, a copy of all deeds, road maps, adjoining or other plats, survey maps, title reports, etc. that were used in any way to determine right-of-way lines, must be submitted.

3.01 LEGAL DESCRIPTIONS

- A. Each legal description shall be identified by the pertinent parcel letter and sheet number.
- B. Metes and Bounds type of descriptions should be used; however, other types may be used providing the intent is clear.
- C. Each legal description prepared must be attested to by the seal and signature of an Arizona registered land surveyor or civil engineer.

3.02 LINE WEIGHTS AND SYMBOLS

- A. With the following exceptions, the line weights and symbols shown in Office Procedures No. 8-1552-002 shall be used:

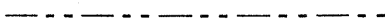


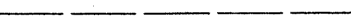



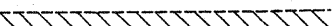
- 1. Line Weights [Rapidograph Pen # (or inches)]:

- a. Right-of-way lines

- 1. Existing - #3 (.028") for 40 scale drawings, #2-1/2 (.023") or 2 (.020") for 100 scale drawings.
 - 2. Proposed - #2-1/2 (.023") or 2 (.020").

- b. Easements - #1 (.015")

- 2. Line Types:

- a. Monument / survey line 
 - b. Section Line 
 - c. 1/4 Section line 
 - d. Original Subdivision Block Line 
 - e. Original Subdivision property line 
 - f. Existing Right-of-way line 
 - g. Proposed Right-of-way line 
 - h. Temporary construction easement 

3.03 ROAD MAPS

Road maps, in and of themselves, may not be sufficient to establish dedication of public right-of-way. When preparing right-of-way plans or legal descriptions for acquisition of new right-of-way, the following guidelines shall apply:

1. Determine what rights-of-way exist by dedication from maps and plats and dedication recorded by deeds. Note all deed exceptions.
2. Superimpose the recorded road map upon the dedicated right-of-way and deed exceptions.
3. When clearly dedicated right-of-way (such as Map and Plat, Docket Page and Easements, etc.) agrees with or exceeds the Road Map Proceedings, do not use the Road Map as right-of-way authority.
4. When no written evidence, other than a Road Map, purports to convey right-of-way to the public, right-of-way may or may not exist. Judgement shall be made on a case-by-case basis and involve input from the City Engineer, City Real Estate Administrator, and City Attorney. Factors to be considered include:
 - a. Does the property owner claim possession of the street by open and notorious acts of actual possession?
 - b. Has the possession been paid on that property?
 - c. Have taxes been paid on that property?
 - d. Has the possession been exclusive or shared?
 - e. Has the public used the property in a common manner?
 - f. Has the area been cleared and maintained by a governmental agency?
 - g. Have fences been relocated to the boundary of the Road Map?
5. Acts of adverse possession do not run against a governmental agency for lands held in trust for the people. Therefore, the factors mentioned in Item No.4 do not apply to lands clearly dedicated to the public for streets, highways, roads, drainage ways, etc.

4.0 AERIAL PHOTOGRAPHS

- A. The Consultant shall prepare aerial photographs at a scale of 1"=40'. The aerial drawings shall be added to the rear of the right-of-way drawings. Page numbers for the aerials shall be added and labeled "Aerials" to the cover sheet of the right-of-way drawings. Aerial coverage shall be a minimum of 400' each direction of the proposed centerline of the improvement. Each photo shall be on a 24" x 36" mylar with the Standard City of Tucson Title Block. No splicing, stick-on materials or Diazo mylar will be acceptable. Each photo on the sheet shall be 23" x 34" with photo coverage of 1" overlap. The date of the photo shall be in the lower right-hand corner of each sheet. Aerials will be a new flyover. The flight shall be commenced after notice to proceed with the contract is issued.

Aerial photographing will be done on a clear, cloudless day in the early to mid-morning. Middle density screening shall be used in the preparation of the photo mylars. The consultant shall submit a sample of the photography on mylar for the City approval prior to completing the photo work.

- B. The aerial photographs shall show the entire project and include the following:
1. New Right-of-way Lines
 2. Proposed Curb lines
 3. Parcel Addresses and Business Names
 4. Existing Right-of-way Lines
- C. The aerial photographs shall be scale rectified along the length of the project for each sheet in accordance with National Map Accuracy Standards.
- D. The original mylars are to be signed and sealed by a registered Land Surveyor in the State of Arizona, and shall be furnished to the City of Tucson.

FIGURE 1

INSTRUCTIONS FOR USING PIMA COUNTY'S MAPGUIDE TO DOWNLOAD GEODETIC DATA FOR THE TUCSON METROPOLITAN AREA

The City of Tucson's Geodetic Control Data is now available on the internet using Pima County's MapGuide site. The following is a brief explanation of how to access this information. If you are unable to use this site, the City of Tucson's Survey Section will continue to provide this information to you.

If you are already familiar with the MapGuide site, jump ahead to step 6.

1. Begin by starting your internet browser. The address for the Pima County MapGuide site is [//www.dot.co.pima.az.us/](http://www.dot.co.pima.az.us/). You will probably want to bookmark this site.
2. Once you have reached the Department of Transportation home page, select: **VIEW PIMA COUNTY DATA LAYERS**.
3. Under the heading of TO VIEW PIMA COUNTY DATA LAYERS, select **download**. This will take you to the AutoDesk MapGuide site; follow the installation instructions for MapGuide.
4. Return to the Department of Transportation home page and again select **VIEW PIMA COUNTY DATA LAYERS**. Then select **View Pima County GIS data layers**.
5. You should now be looking at a map of Pima County. Zoom in to your area of interest by either right-clicking and selecting zoom or by using the zoom button on the tool bar.
6. Once you are viewing your area of interest, select the **Geodetic Control** layer on the left side of the screen. Now blue and white boxes should be visible; these represent the Geodetic Control Points. Double-click on the point that you want.
7. This will bring you to the geodetic values for that point; you may want to print this page. If you would like a description of this point, select **GPS Static Data Session Sheet(s)**. At this point, you may need to download a TIFF Viewer. If so, follow the prompts. If not, you should now see the session sheet.

If you have any problems or questions, please contact the City of Tucson Survey Section at 791-5100, we will be happy to assist you.