



1650 Willow Creek Road  
Prescott, AZ 86301

April 18, 2024

Town of Prescott Valley  
Public Works Department  
(928) 759-3079

**Re: Brakes Plus Drainage Summary, Prescott Valley, Arizona**

The proposed Brakes Plus (BP) project is located in the southwest part of Prescott Valley, Arizona, covering a portion of Section 14 of Township 14 North, Range 01 West of the Gila and Salt River Base & Meridian. The project is a development of vacant lot within the existing shopping center located at the southwest corner of Glassford Hill Road and Centre Court. The site is located on Yavapai Assessor's Parcel Number 103-02-762M, and it is 1.49 acres in size.

The original drainage report for this property was completed by Erie & Associates, Dated January 24, 2000, and amended on May 2007 and September 2009. This report modeled the requirements for Detention Pond A, located at the southwest corner of Long Look Drive and Viewpoint Drive. Flows from the site are directed to the west where they flow north to Florentine Road. The location of the Brakes Plus site has been identified on Plate 3 Existing Sub-Basin Delineation and Developed sub-basins drainage map, each map includes the overall project area. Portions of this report are attached to this memorandum.

Flows from the project drain to the existing detention pond on Long Look, therefore detention for the site is not required. Surface flows from the site will be directed into existing storm water infrastructure already installed.

Respectfully Submitted,

Scott A. Lyon, P.E., R.L.S.  
President  
Lyon Engineering & Surveying Inc.  
Enclosures





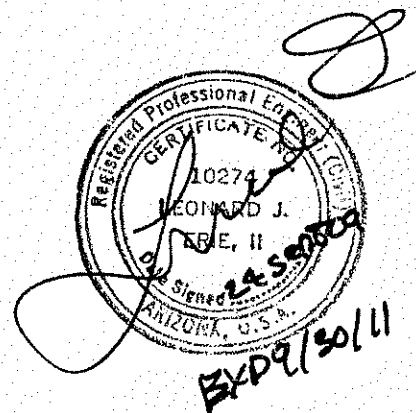


**Addendum to the Master Drainage Study  
Section 14 Fain Property  
Downtown Prescott Valley, AZ**

**Prepared For:  
Fain Signature Group  
3001 N. Main St., #2B  
Prescott Valley, AZ 86314**

**For Submittal To:  
Town of Prescott Valley**

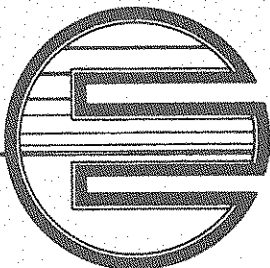
**Prepared By:  
Erie and Associates  
3120 N. 24<sup>th</sup> Street  
Phoenix, Arizona 85016**



**EA# 1624.01**

**July 27, 2005**

**Revised September 23, 2009**



**Erie & Associates, Inc.**  
CONSULTING ENGINEERS

3120 N. 24th St. / Phoenix, Arizona 85016 / (602) 954-6399

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### 3.0 Location/Description/Concepts

This report is an addendum to the approved master drainage study prepared by Erie & Associates, dated January 24, 2000 and an addendum dated May 8, 2007. The report includes the elements in the original report updated with detailed analysis of the expanded entertainment area north of Florentine Road, east of Glassford Hill and west of Lake Valley Road; a hydraulic analysis of flows on the Glassford Hill Market Place west of Glassford Hill Road north of Florentine Road; and an analysis of the Windsong Office Complex at the northeast and northwest corners of Windsong Drive and Lakeshore Road.

The overall site of this study is located just north of Highway 69 in Prescott Valley. The site is bordered on the north by Long Look Drive, on the south by Highway 69, and on the west by Pine View Drive. More particularly, the site is located in Section 14 and Section 23 of Township 14 North, Range 1 West of the Gila and Salt River Baseline and Meridian as shown on *Plate 1-Vicinity Map*. The site is surrounded on the north, east, and west by residential housing areas.

This master planned project includes a proposed mixed land use within the section consisting of retail, public uses, office, medical, school, church, and multiple family residential development. Large amounts of impervious surface (e.g. asphalt parking lots) are anticipated for the site. The property is master planned to provide regional master detention basins that will attenuate the peak storm flows resulting from the increase in impervious surfaces. The flows leaving the site will be held at or below pre-development levels.

Currently, stormflow across the site is a combination of sheet and shallow concentrated flow from the southwest to northeast, at gradients of approximately 1.5% to 2%. The tributary area contributing to stormflow leaving the site consists of approximately 1.36 square miles. Stormflow leaves the site at points along the northern boundary and along the eastern boundary, and eventually drains into the Agua Fria River, approximately three (3) miles downstream of the site, via existing flow corridors which include the El Camino Real Park, Navajo Drive Wash, and North Navajo Drive Wash.

The Federal Emergency Management Agency has identified the majority of the site as being within a Zone "C", or area of minimal flooding. Two (2) small areas along Long Look Drive have been identified as Zone "A", or areas of 100 year flooding with base flood elevations and flood hazard factors not determined. *Plate 2-FEMA Map* shows the proximity of flood zones to the project.

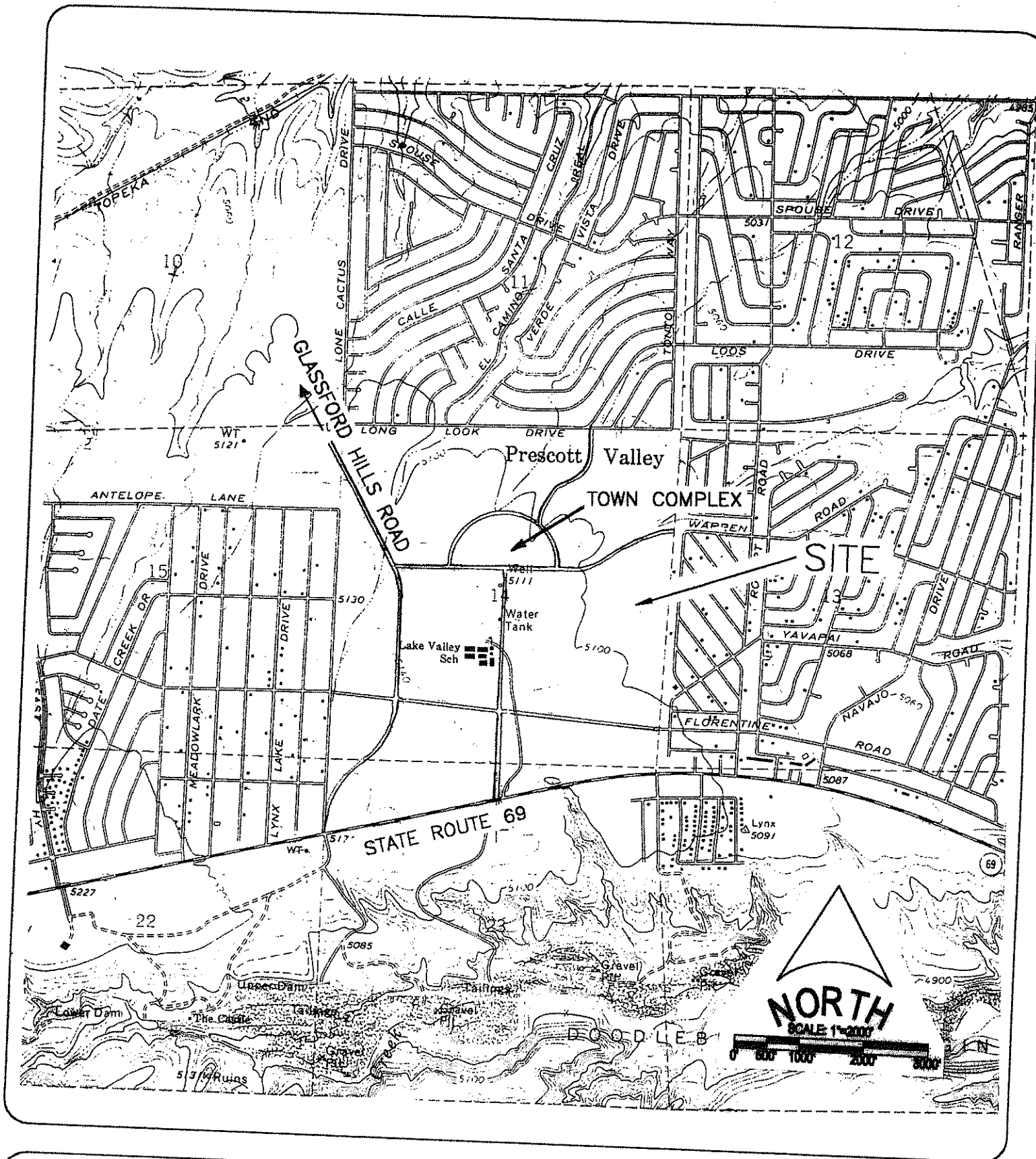
Conceptually, the drainage plan is to direct storm water runoff into two (2) master basins that will meter water out at or below pre-development flow rates for the 100 year storm. The basins will be “flow-through” basins to minimize siltation in the basin and retain existing sediment flows.

Smaller sub-basins will have the upper portion of the existing tributary area redirected to one (1) of the basins, thereby, not requiring numerous smaller basins on individual parcels.

*Plate 3* shows the existing patterns and *Plate 8* is the master plan with proposed updated drainage patterns identified. In addition, because the site is being developed in phases, an Entertainment Center Master Plan (*Plate 9*) is included and a “Big Box” site plan is included as *Plate 10*. The Big Box Plan includes the final grading for the site with the results of the hydraulic analysis superimposed. The Arena Area Plan includes fully developed conditions on the arena area parcel and expanded Entertainment Complex (area 8). Phase I also includes diversions (by open channel) of various sub-basins tributary to the eastern frontage of Long Look Drive to regional basin B. The as-built conditions for Basin B have been incorporated into these results. Basin A is under construction as part of development of the Glassford Hill Market Place west of Glassford Hill Road.

*Plate 11* is the Master Drainage Plan for the Windsong Professional Plaza Area. The plan is to accept offsite flows from the Arena area to the west and convey them thru the site into open channels that outfall to the existing culverts at Windsong Drive and Lake Valley Road. Those culverts were previously analyzed and sized for the fully developed flows from the tributary area. The flows east of Windsong Road along the east property line will be carried in an open channel to the new cross culvert inlet under Lake Valley Road.

A detailed hydrologic and hydraulic analysis follows.



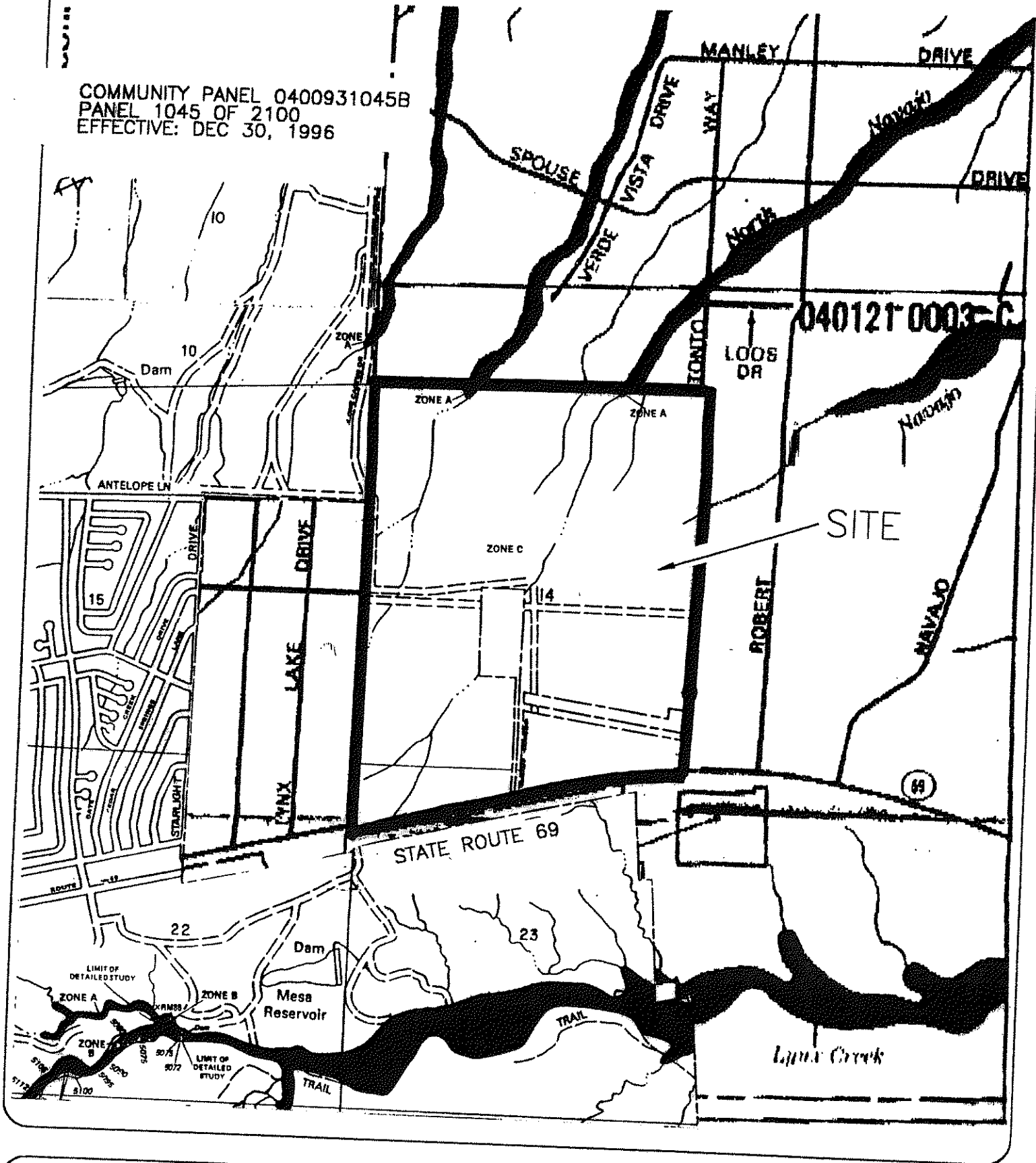
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**DOWNTOWN PRESCOTT VALLEY**  
 PRESCOTT VALLEY, ARIZONA  
 PLATE 1 - VICINITY MAP



COMMUNITY PANEL 0400931045B  
 PANEL 1045 OF 2100  
 EFFECTIVE: DEC 30, 1996



JOB NO. 1624

DATE: 8/18/99

SCALE: 1"=2000'

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**DOWNTOWN PRESCOTT VALLEY**  
 PRESCOTT VALLEY, ARIZONA  
 PLATE 2 - FEMA MAP

## 4.0 Hydrology

A flood hydrograph analysis for flood events of 100-year frequency, and 24 hour duration, was created for the site and offsite watershed by using the United States Army Corps of Engineers (USCE) HEC-1 Flood Hydrograph Analysis computer program, version 6.33, as implemented by *Haestad Methods Inc.* The development of the computerized hydrology models for both pre-development and post-development conditions (fully developed and phase I) is detailed in the following sections.

The contributing watershed delineation for the site was identified in order to estimate peak flow quantities entering and leaving the site. The watershed delineation was accomplished by using United States Geological Survey (USGS) 7.5 minutes series topographical maps at a scale of 1"=2000' with contour intervals of 20 feet. The USGS quadrangle used was *Prescott Valley South, Arizona*. In addition, aerial photographs and aerial photography with one (1) foot contour intervals were used, together with field verification of existing flow patterns.

A series of eighteen (18) onsite and offsite sub-basins were identified within the main tributary. The delineation is shown on *Plate 3-Existing Sub-Basin Drainage Map*.

The proposed conditions sub-areas and drainage patterns are included as *Plate 8-Master Drainage Plan*. In addition, *Plate 9* shows the Entertainment Center improvements proposed, *Plate 10* is the Big Box Area, and *Plate 11* is the Windsong Office Park.

The Clark Unit Hydrograph Method was used to compute peak discharges at concentration points and strategic locations. Three (3) parameters required by the Clark Unit Hydrograph Method include:

- ◇ Time of Concentration ( $T_c$ )
- ◇ Storage Coefficient ( $R$ )
- ◇ Time Area Function

The time of concentration is defined as the travel time for a flood wave to travel from the most hydraulically remote point in the watershed to the concentration point. Sub-basin concentration times were computed according to the equations given below:

**Undeveloped conditions:**

$$T_c = 2.4 A^{0.1} L^{0.25} L_{CA}^{0.25} S^{-0.2}$$

**Developed conditions:**

$$T_c = 3.2 A^{0.1} L^{0.25} L_{CA}^{0.25} S^{-0.14} RTIMP^{-0.36}$$

where:

$T_c$  = time of concentration in hours

$A$  = sub-basin area in square miles

$L$  = length of flowpath in miles

$L_{CA}$  = length of catchment in miles

$RTIMP$  = impervious area in percent

The storage coefficient represents the effect that temporary storage in the sub-basin has on the hydrograph. The empirical equation for approximating  $R$  is given as follows:

$$R = 0.37 T_c^{1.11} L^{0.80} A^{-0.57}$$

where:

$R$  = storage coefficient in hours

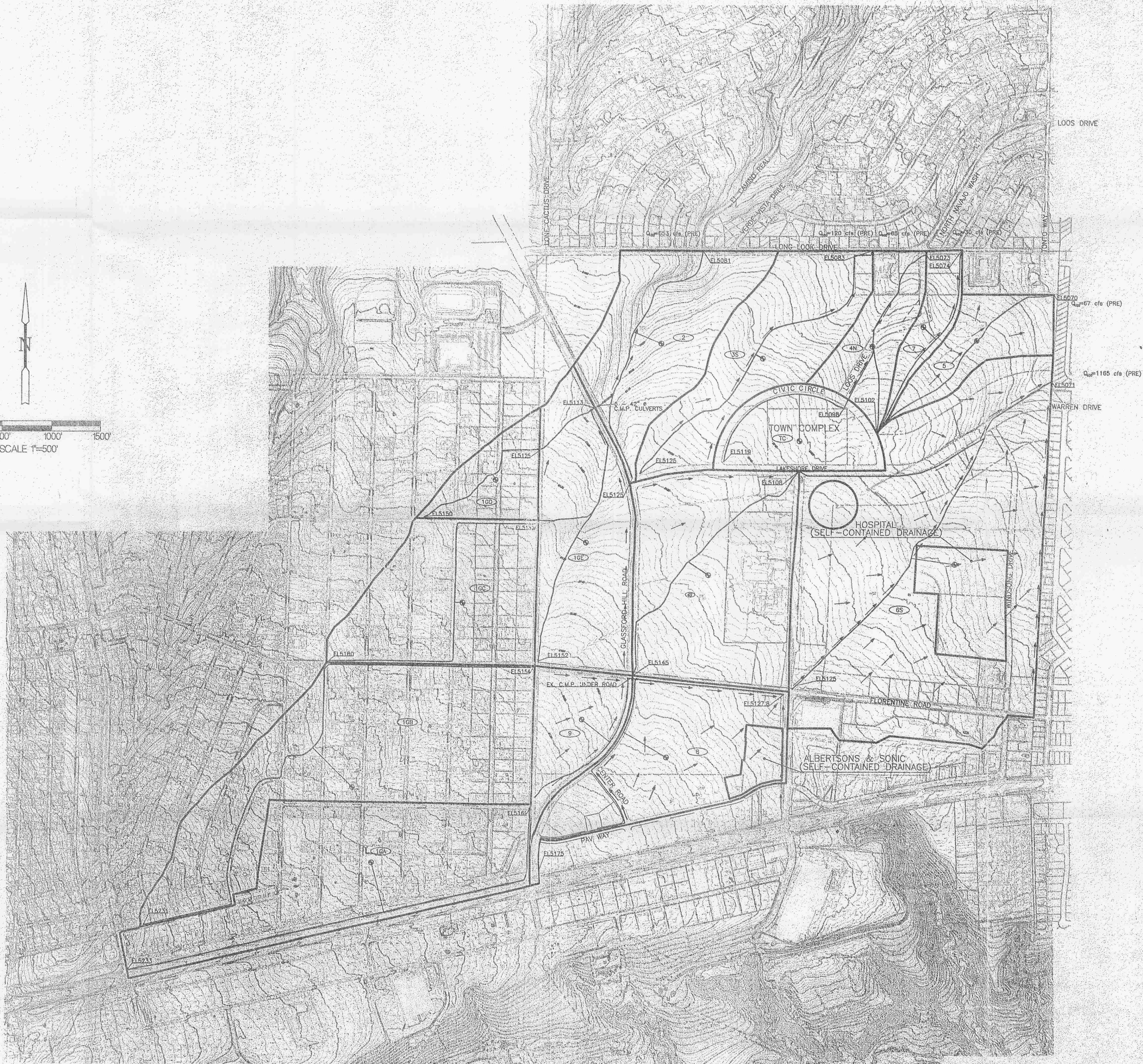
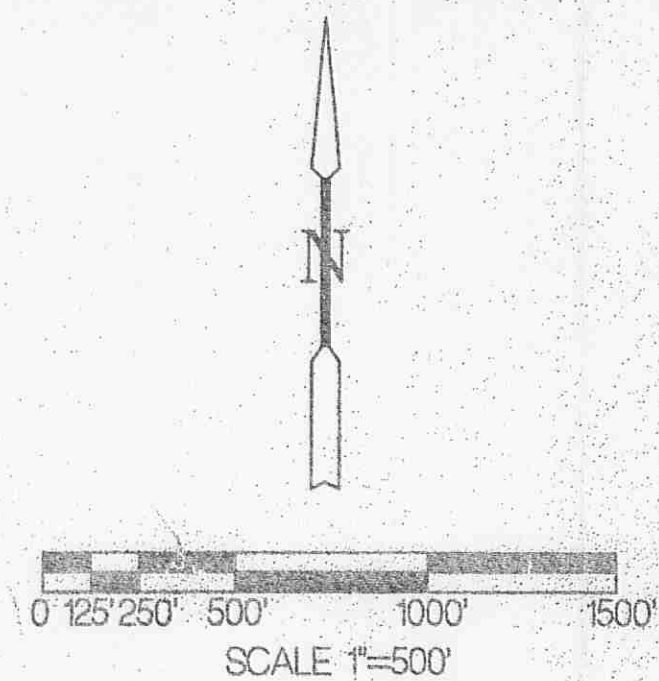
$T_c$  = time of concentration in hours

$L$  = length of flowpath in miles

$A$  = sub-basin area in square miles

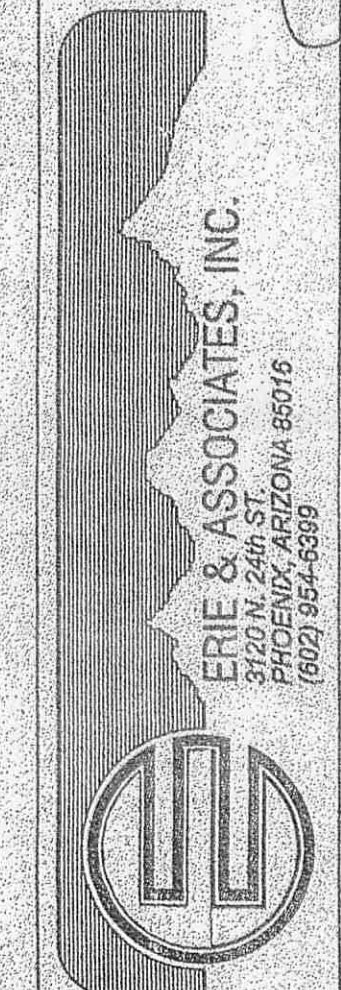
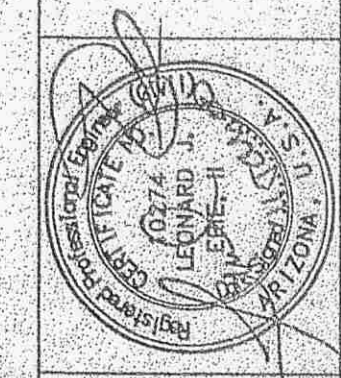
The synthetic time-area relation specifies the accumulated area of a watershed that is contributing runoff to the outlet of a watershed at any time. A time-area relation, representing rangeland, was used for existing land use conditions. A time-area relation for developed land use conditions was used for onsite conditions, as well as the entire offsite tributary.





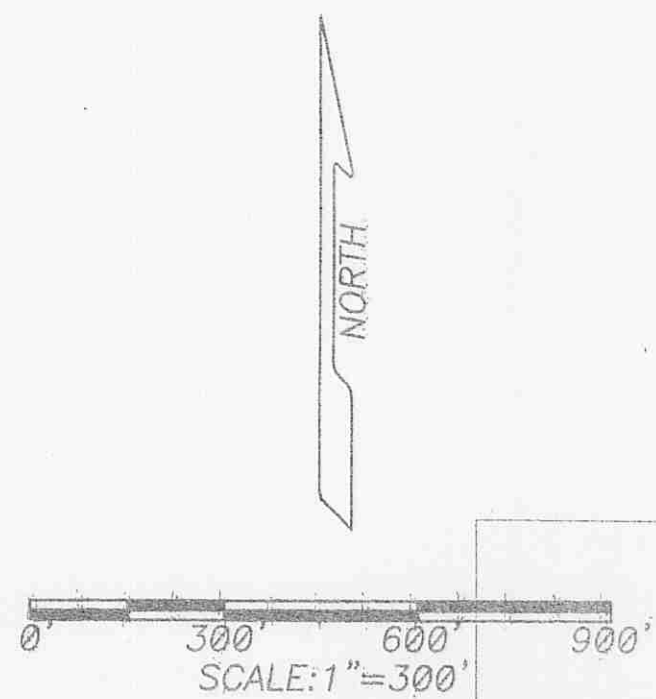
# DOWNTOWN PRESCOTT VALLEY

## PLATE 3 - EXISTING SUB-BASIN DELINEATION



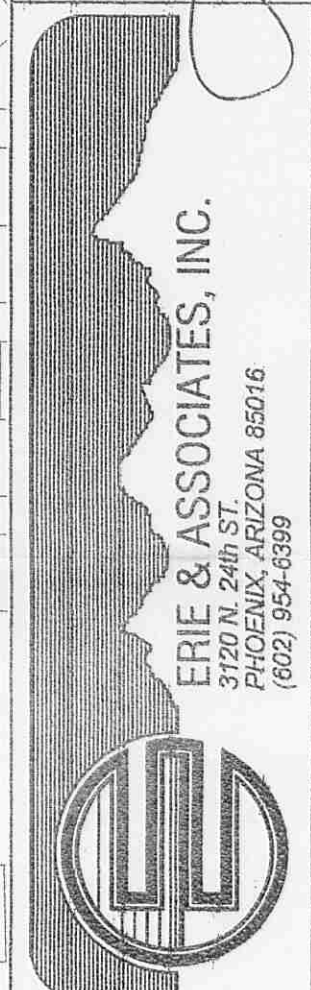
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**PV ARENA SITE**  
**DEVELOPED SUB-BASIN DRAINAGE MAP**

1981 - 2005  
**25**  
YEARS OF  
EXCELLENCE  
ERIE &  
ASSOCIATES



JOB NO. 1624.01  
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