SURPRISE
ARIZONA

Arizona Traditions / Villages at Surprise North

Amendment	Case Number	Approval Date	Approval Doc.	Page
Original PAD	PAD95-002	3/23/95	ORD95-05	2
Setback & Design Guideline Revision	PADA95-041	5/23/96	ORD96-09	366
Density Revision	PADA98-100	8/25/98		383
Setback Revision	PADA97-142	8/3/99		385
Density Revision	PADA01-144	12/6/01		397
Land Addition	PADA02-122	7/25/02	ORD02-30	399

The Villages at Surprise-North

City of Surprise, Arizona

CITY OF SURPRISE
PLANNING AND ZONING DEPARTMENT
APPROVED
THIS APPROVAL IS NOT TO BE CONSTRUED AS AN APPROVAL OF ANY VIOLATION OF THE SURPRISE MUNICIPAL CODE.
Case No. PAD 95-02
P&Z Comm. Approval 2-21-95 B.O.A. _____
City Council Approval 3-23-95
Stipulations: _____

SEP 20 [illegible]

Application for:
Planned Area Development (PAD) Zoning
With Preliminary Development Plan

Submitted February 16, 1995
Revised February 24, 1995
Revised March 29, 1995
Revised June 15, 1995
Revised December 20, 1995
Revised May 9, 1996

VOLUME I OF II

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B	Topographical Map (Revised 04-11-96)
C	Zoning Ordinance 17.24.020
D	Zoning Ordinance 17.28.040
E	Zoning Ordinance 17.28.060
F	*No Longer Required*
G	*No Longer Required*
H	Landscape Palette (Revised 04-11-96)
I	Zoning Ordinance 17.36.060 (G)(1)(2)
J	Design Guidelines (04-11-96)
K	Conceptual Single Family Elevations
L	Conceptual Cluster Housing Elevations (Revised 03-24-95)
M	Typical Detail Setbacks (02-20-96)
N	Zoning Ordinance 17.28.010(G)
O	Zoning Ordinance Chapter 17.32
P	Zoning Ordinance 17.28.120
Q	Zoning Ordinance 17.28.130
R	Zoning Ordinance 17.28.050
S	Roadway Cross-Sections (02-20-96)
T	Traffic Report (Revised 07-28-95)
U	Civil Site Plan and Other Plans (Water-Revised 12-30-94) (Sewer-Revised 02-3-95) (Drainage-Revised 06-8-95) and Other Pertinent Approval Correspondence
V	Ordinance No. 17.32.100 and Chapter 15.24
W	Zoning Ordinance 17.36.060(D)(3)(d)
X	Preliminary and Final Development Plan P.A.D. Stipulations

Figures

Figure	Description
1	Site Location Map
2	Aerial Photograph
3	Project Site Map
4	PAD Land Use Plan (Revised 04-11-96)
5	Community Center Conceptual Plan (Revised 2-20-96)
6	Village Entry Conceptual Plan (10-02-95)
7	Secondary Entry Conceptual Plan (10-05-95)
8	Phasing Conceptual Plan (Revised 04-11-96)

Project Overview

The Villages at Surprise-North will be a golf course or other significant open space community founded on the needs and life desires of active residents. The project is surrounded by the natural resources of native desert flora and fauna, has the Beardsley Canal as its primary western boundary, and the existing golf course and open space of the Happy Trails development as its eastern boundary. To the west of the Beardsley Canal is a planned regional park and the White Tank Mountains. Both the setting of the project and its PAD plan provide a general feeling of openness, with wide vistas and abundant recreational opportunities.

The project is anchored by a centralized golf course, with a clubhouse/ recreational center as its primary amenity. Neighborhoods are located around the interior and exterior boundaries of the golf course, maximizing the sense of openness within the project. Golf course frontage has also been placed along Bell Road to create a significant identifying feature from the major arterial approach to the project. In the alternative, the golf course may be replaced by a major open space amenity with integrated trail systems and a clubhouse/recreational center or other recreational amenities. The project will be age restricted.

The internal loop road within the project provides visual windows to the golf course/open space areas. The plan envisions a mix of detached, attached and cluster housing types with appropriate golf course/open space frontages. The streets within the project are planned to be private; however, at any time prior to platting thereof, the developer may elect that all of such streets be dedicated to the City of Surprise pursuant to the terms and conditions of the Development Agreement for the project. Private streets within the project may or may not have limited access. By offering

a wide variety of housing products, the Villages at Surprise-North will provide neighborhoods geared toward active, value-conscious families desiring quality homes and usable, affordable amenities.

The Project Site

As shown on the map included as Figure 1, and the aerial photograph included as Figure 2, the project site includes approximately 530 acres located between Bell Road and Union Hills Road, extending west from the existing Happy Trails Golf Course to the Beardsley Canal. The legal description of the project site is attached as Exhibit "A".

The site is situated in a semi-rural setting and has easy access to nearby employment areas, shopping centers, and the White Tank Mountain Regional Park. A portion of this site was at one time in agricultural use and still has remaining trees from what was a tree nursery. Currently the land comprising the Villages at Surprise-North is fallow. The Villages at Surprise-North is situated five miles west of Grand Avenue on Bell Road, 12 miles west of the Agua Fria Freeway and Arrowhead Towne Center, and 11 miles north of Interstate 10 via the 303 Loop. The map included as Figure 3 illustrates the project site and the surrounding area. Drive time to central Phoenix is approximately 35 to 45 minutes, drive time to Arrowhead Towne Center is approximately 20 minutes, and drive time to Interstate 17 is approximately 30 minutes.

Primary access to the project will be from Bell Road. Bell Road, which currently has a minimum 110 foot right-of-way, is fully improved with a divided six-

THE VILLAGES AT SURPRISE

Surprise Village Company

SITE LOCATION MAP

N O R T H

AWS&A

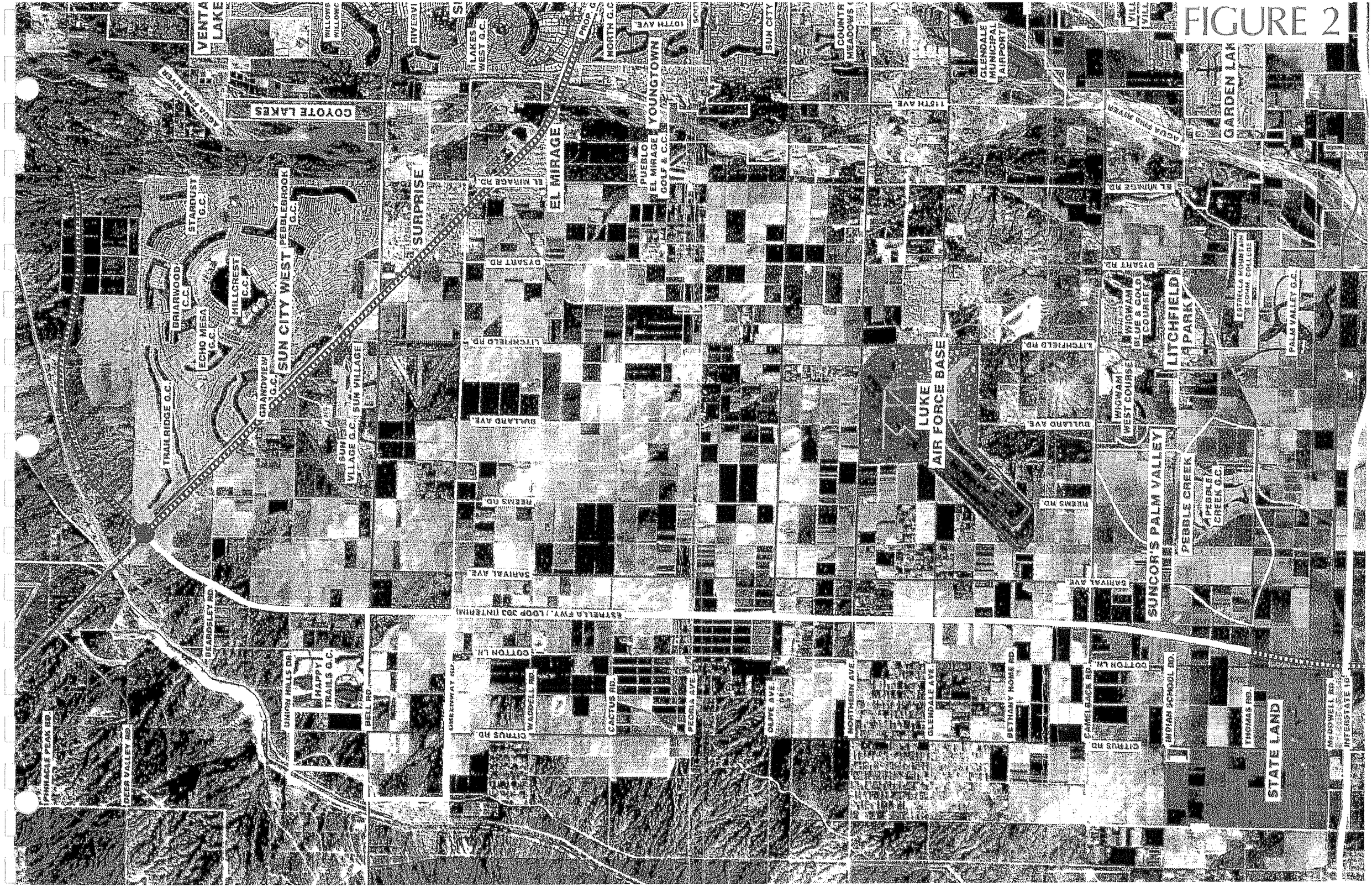
THE PLANNING CENTER

2525 E. ARIZONA BILTMORE CIRCLE, SUITE C-135
PHOENIX, ARIZONA 85016 (602) 957-2214

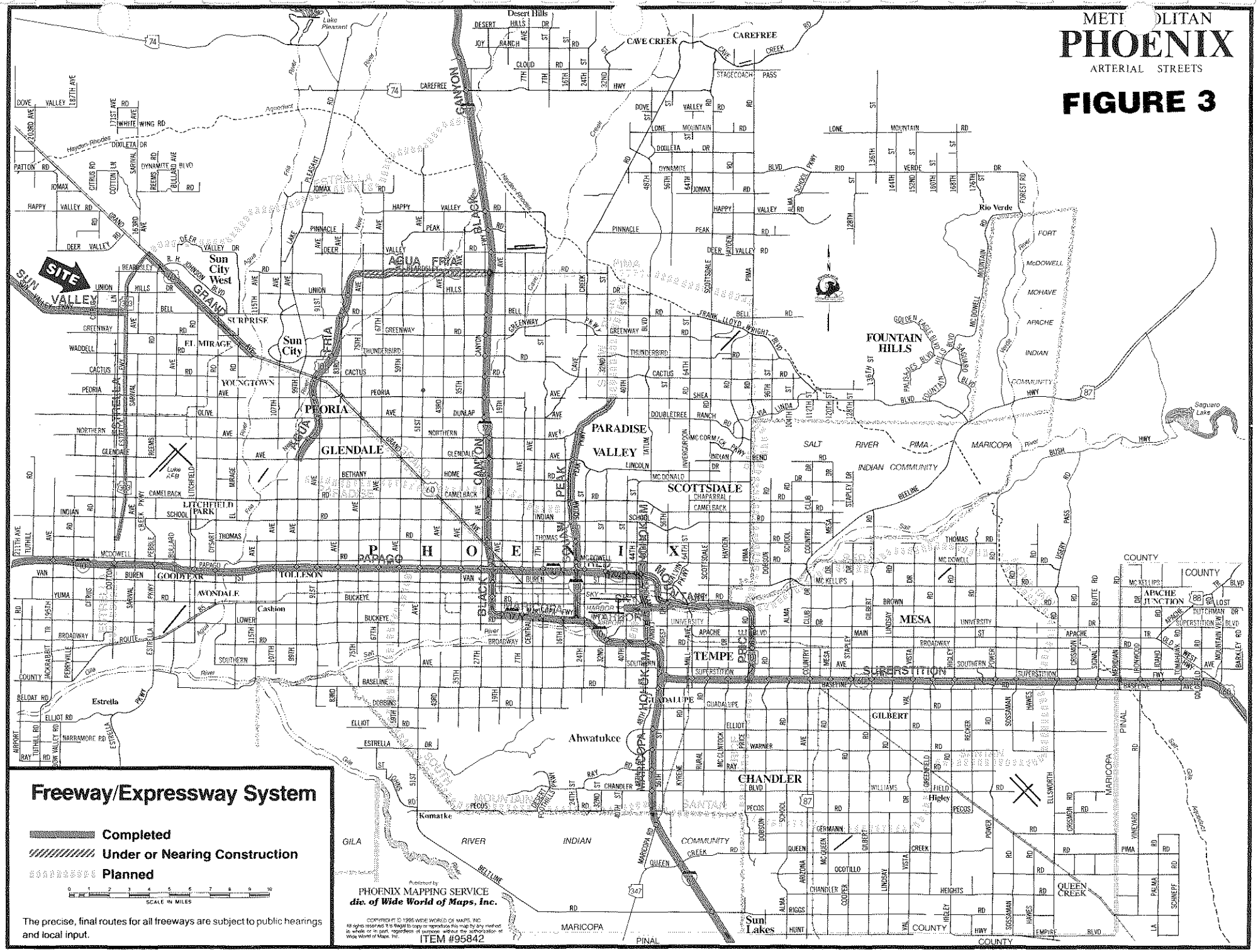
SCALE IN MILES

FIGURE 1

FIGURE 2



VENTA LAKE
COYOTE LAKES
AGUA FRIA RIVER
LAKES WEST G.C.
NORTH G.C.
10TH AVE.
SUN CITY
COUNTRY MEADOWS
GLENDALE MUNICIPAL AIRPORT
GARDEN LAK
YOUNGTOWN
PUEBLO EL MIRAGE GOLF & C.C.
EL MIRAGE
EL MIRAGE RD.
SURPRISE
STARDUST G.C.
PEBBLEBROOK G.C.
SUN CITY WEST
BRIARWOOD G.C.
HILLCREST C.C.
ECHO MESA G.C.
GRANDVIEW G.C.
TRAILRIDGE G.C.
SUN VILLAGE G.C.
SUN VILLAGE
DYSART RD.
LITCHFIELD RD.
BULLARD AVE.
REEMS RD.
SARIVAL AVE.
ESTRELLA FWY. / LOOP 303 (INTERIM)
LUKE AIR FORCE BASE
WIGWAM BLUE & GOLD COURSE
WIGWAM WEST COURSE
LITCHFIELD PARK
ESTRELLA MOUNTAIN COMM. COLLEGE
PALM VALLEY G.C.
SUNCOR'S PALM VALLEY
PEBBLE CREEK
PEBBLE CREEK G.C.
BEARDSLEY RD.
COTTON LN.
UNION HILLS DR.
HAPPY TRAILS G.C.
BELL RD.
GREENWAY RD.
WADDELL RD.
CACTUS RD.
PEORIA AVE.
OLIVE AVE.
NORTHERN AVE.
GLENDALE AVE.
BETHANY HOME RD.
CAMELBACK RD.
INDIAN SCHOOL RD.
THOMAS RD.
McDOWELL RD.
INTERSTATE 10
STATE LAND
CITRUS RD.
PINNACLE PEAK RD.
DEER VALLEY RD.


METROPOLITAN
PHOENIX
ARTERIAL STREETS
FIGURE 3
SITE
Freeway/Expressway System
Completed
Under or Nearing Construction
Planned
SCALE IN MILES
The precise, final routes for all freeways are subject to public hearings and local input.
Published by
PHOENIX MAPPING SERVICE
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ITEM #95842
PHOENIX
SCOTTSDALE
TEMPE
MESA
GLENDALE
PEORIA
CHANDLER
GILBERT
PARADISE VALLEY
FOUNTAIN HILLS
CAREFREE
CAVE CREEK
Sun City
Sun City West
SURPRISE
EL MIRAGE
YOUNGTOWN
LITCHFIELD PARK
GOODYEAR
AVONDALE
TOLLESON
Cashion
Estrella
Ahwatukee
Komatke
Sun Lakes
QUEEN CREEK
APACHE JUNCTION
Rio Verde
Saguaro Lake
Lake Pleasant
Luke AFB
SALT RIVER PIMA MARICOPA INDIAN COMMUNITY
GILA RIVER INDIAN COMMUNITY
Desert Hills
Aqueduct
Hayden-Rhodes
Fort McDowell Mohave Apache Indian Community
Papago Freeway
Black Canyon Freeway
Superstition Freeway
Agua Fria Freeway
Pima Freeway
Price Freeway
Maricopa Freeway
Squaw Peak Parkway
Deer Valley Drive
Grand Avenue
Bell Road
Thunderbird Road
Cactus Road
Peoria Avenue
Glendale Avenue
Camelback Road
Indian School Road
McDowell Road
Thomas Road
Van Buren Street
Buckeye Road
Broadway Road
Southern Avenue
Baseline Road
Elliot Road
Ray Road
Chandler Blvd
Pecos Road
Guadalupe Road
Germann Road
Queen Creek
Ocotillo Road
Riggs Road
Hunt Highway
Empire Blvd
Beltline Road
Gila River
Salt River
Verde River
Fort McDowell Mountain
Usery Pass
Stagecoach Pass
Golden Eagle Blvd
Palisades Blvd
Frank Lloyd Wright Blvd
Scottsdale Road
Tatum Blvd
Invergordon Road
McCormick Parkway
Shea Blvd
Doubletree Ranch Road
Lincoln Drive
McDonald Drive
Chaparral Road
Indian Bend Road
Beeline Highway
Bush Highway
Apache Trail
Superstition Mountain
Usery Mountain
Lone Mountain Road
Dynamite Blvd
Rio Verde Drive
Forest Road
Happy Valley Road
Pinnacle Peak Road
Scottsdale Airport
Deer Valley Airport
Phoenix Sky Harbor International Airport
Luke AFB
Williams Gateway Airport
Falcon Field
Chandler Municipal Airport
Gila River Indian Community
Maricopa County
Pinal County
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lane roadway complete with a landscaped median, vertical concrete curb and gutter, meandering concrete sidewalks, and landscaping on both sides of the roadway extending along the project's frontage. Bell Road is the major east/west arterial across the North Valley from Scottsdale to the Sun Valley Parkway. The Sun Valley Parkway then extends west around the White Tank Mountains and south to Interstate 10.

All required utilities (water, sewer, natural gas, electricity, telephone, and cable television) are available to the project. The site is located outside of the AICUZ noise contours of Luke Air Force Base, and there are no known hazardous conditions which would affect development. A topographical map of the site is attached as Exhibit "B".

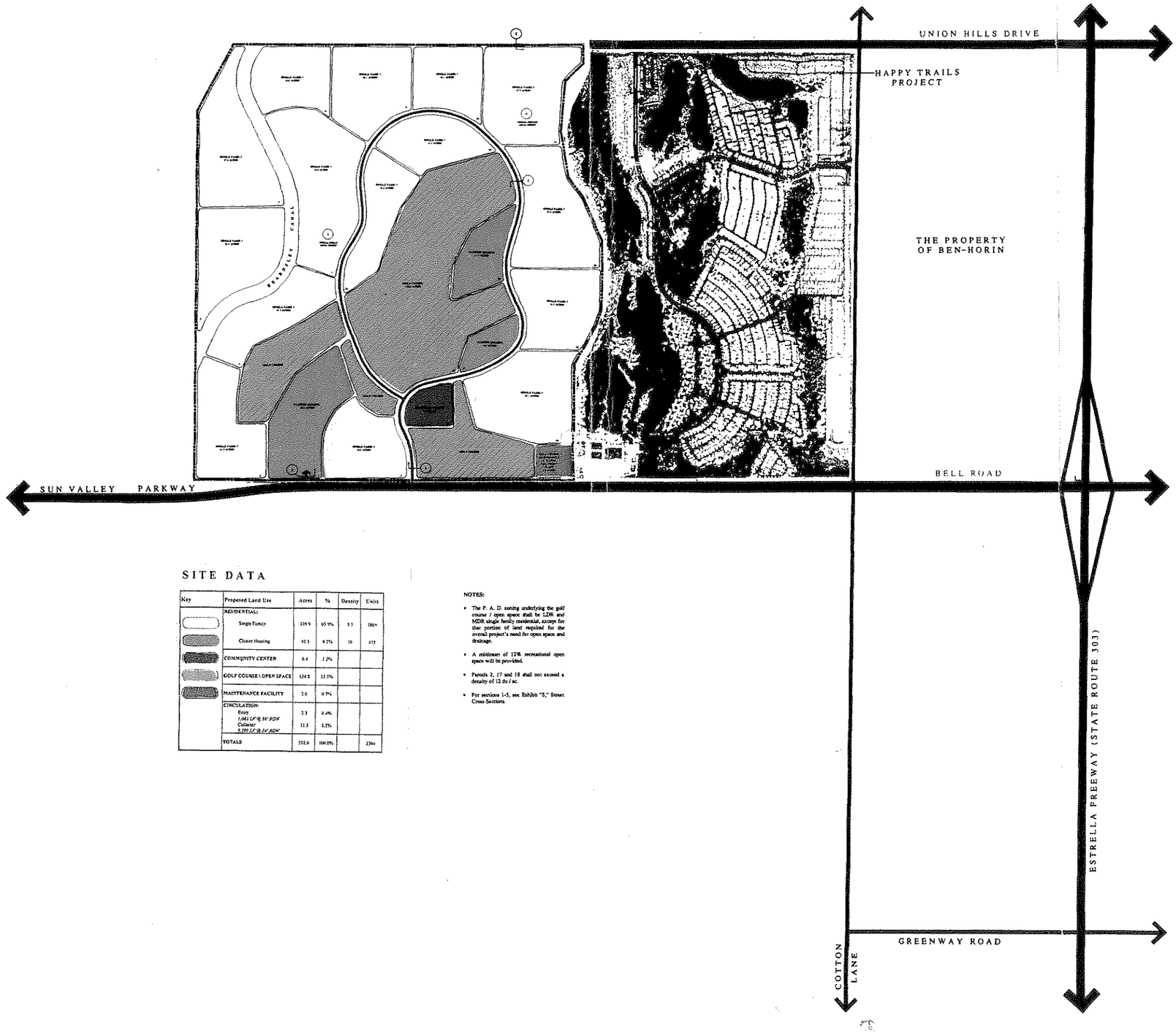
A portion of the site has been used as an aleppo pine tree nursery. Existing trees within the nursery will be removed and/or relocated in connection with the development of the project. An existing well site owned by Citizens Utilities is located within the project boundaries and will remain in place. As the project develops, some service lines for the well site will be relocated, the irrigation ditches located on the site will be removed or tiled, and the overhead power lines will be buried, removed or relocated.

Land Uses

(a) *Residential.* The Villages at Surprise-North will include approximately 1,869 single-family homes and 435 cluster homes situated in a series of neighborhoods located around the interior and exterior boundaries of

the golf course/open space and the perimeter of the loop road. The primary home sizes will range from 1,000 to 3,000 square feet. Sites for cluster housing consist of parcels located along Bell Road frontage and the interior loop road in general close proximity to the community center. The underlying PAD zoning for the residential parcels is Low Density Residential (LDR; 2-5.5 du/ac), Medium Density Residential (MDR; 5-10 du/ac) and High Density Residential (HDR; 8-18 du/ac) as shown on the PAD Land Use Plan, Figure 4.

Uses permitted on the LDR and MDR parcels shall be the uses permitted, or analogous to the uses permitted, as Principally Permitted Uses (e.g. golf course and golf maintenance facility with Administrative review and approval). Conditional Permitted Uses and Permitted Accessory Uses (e.g., community center, recreation facilities, pools, tennis courts, golf clubhouse (with liquor sales), model homes (temporary, with Administrative review and approval), temporary sales and office buildings and temporary construction offices and yards (with Administrative review and approval)) in the current R1-5 District as set forth in 17.24.020 and 17.28.040 of the Surprise Municipal Code Title 17 Zoning, included in the Appendix as Exhibits "C" and "D". In addition, cluster dwellings, which shall be defined as a grouped arrangement of residential product (detached or duplex dwelling units) that can share a common drive or motor court, shall be permitted as a Principally Permitted Use on parcels designated as MDR R1-5 only. R1-5 is the zoning category most nearly equivalent to the LDR and MDR land use categories. Current zoning is shown as PAD Zoning in Figure 9, Zoning (Planning Area), of the Surprise Comprehensive Development Guide. Permitted uses are described on page 42 of the Surprise Comprehensive Development Guide as "A minimum project area of 10



THE VILLAGES AT SURPRISE

Surprise Village Company

LAND USE PLAN

NORTH

FIGURE 4

SITE DATA

Key	Proposed Land Use	Acres	%	Density	Units
	RESIDENTIAL:				
	Single Family	359.9	67.9%	3.3	1186
	Cluster Housing	43.3	8.2%	10	433
	COMMUNITY CENTER	6.6	1.2%		
	GOLF COURSE \ OPEN SPACE	124.5	23.5%		
	MAINTENANCE FACILITY	3.6	0.7%		
	CIRCULATION:				
	Entry 1,041 LF @ 84' ROW	2.3	0.4%		
	Collector 9,799 LF @ 64' ROW	11.5	2.2%		
	TOTALS	532.0	100.0%		2304

NOTES:

- The P. A. D. zoning underlying the golf course / open space shall be LDR and MDR single family residential, except for that portion of land required for the overall project's need for open space and drainage.
- A minimum of 12% recreational open space will be provided.
- Parcels 2, 17 and 18 shall not exceed a density of 12 du / ac.
- For sections 1-5, see Exhibit "5," Street Cross Sections

REVISIONS		
#	Date	Comments
1	1/17/94	LDR/MDR/HDR designation, miscellaneous adjustments
2	1/13/95	Reduced golf course size, increased amount of single family
3	2/2/95	Incorporated overlay
4	3/24/95	Incorporated additional roads & sections
5	7/24/95	Adjusted golf course layout & loop road alignment
6	4/11/96	Parcel reconfiguration

THE PLANNING CENTER
2525 E. ARIZONA BILTMORE CIRCLE, SUITE 208
PHOENIX, ARIZONA 85016 (602) 957-2216

DATE: NOVEMBER 22, 1994
PROJECT: WCP-029

0 200 400 800

acres utilizing a cohesive mixture of residential, commercial, or industrial land uses in accordance with a carefully formulated and reviewed site plan."

Uses permitted on the HDR parcels shall be the uses permitted, or analogous to the uses permitted, as Principally Permitted Uses, Conditional Permitted Uses and Permitted Accessory Uses in the current R-3 District as set forth in Sections 17.24.020 and 17.28.060 of the Surprise Municipal Code Title 17 Zoning included in the Appendix as Exhibits "C" and "E". R-3 is the zoning category most nearly equivalent to the HDR land use category.

(b) *Community Facilities*. The central focus for the project will consist of a golf course, clubhouse and recreational facilities. A significant open space feature with integrated trail systems and a clubhouse/recreation center and other recreational amenities is a permitted alternative use of the golf course site. The golf course/open space will serve project drainage and retention needs.

The PAD zoning underlying the golf course/open space shall be Low Density Residential (LDR) and Medium Density Residential (MDR) as noted on the Land Use Plan. Irrespective of whether or not the golf course/open space is built in exactly the size, shape and location as is depicted on the PAD plan, the golf course/open space will be built so that the total open space provided within the Villages at Surprise-North will be twelve percent of the total project area or such greater amount as the developer elects to provide and the total number of residential units within the project does not exceed that shown in the Allocation of Land Uses section appearing on page 9 of this PAD.

Consistency with the Surprise Comprehensive Development Guide

The site is currently designated "Typical Neighborhood" (TN) on the City's Comprehensive Development Guide (the "Guide" The proposed Villages at Surprise-North consists of single-family residential, cluster housing, golf course/open space, clubhouse, and other recreational facilities and is consistent with the City's Guide Particular provisions of the City's Guide which are complemented by the proposed development include:

(a) In accordance with Objective D-2 of the Guide, the project will promote the development of quality, affordable housing for families in Surprise.

(b) In accordance with Objective D-3 of the Guide the project uses the PAD process to plan this large scale land holding and to achieve overall flexibility in development, while at the same time fulfilling the City's desire for quality neighborhood development.

(c) In accordance with Objective H-1 and Section D.1.2(j) of the Guide the project sets aside acreage for common use which will include golf course/open space, clubhouse and recreational facilities.

(d) In accordance with Sections D.1.2(a), (c) and (d) of the Guide gross residential densities on Low Density Residential (LDR) properties will not exceed 6 du/ac (LDR densities will be approximately 2-5.5 du/ac). Gross residential densities on Medium Density Residential (MDR) and High Density Residential (HDR) properties will not exceed 12 du/ac (MDR densities will be approximately 5-10 du/ac). All LDR and MDR/HDR

properties within the Villages at Surprise-North PAD will fall within these density ranges. And, in accordance with Section D.1.2(b) of the Guide the overall gross density will not exceed 7 du/ac, provided, however that densities may be transferred among parcels to exceed an individual parcel density cap pursuant to the provisions of the Density Transfer Section of this Guide.

(e) In accordance with Objective C-1 of the Guide, the project will offer a range of housing types and sizes.

(f) In accordance with Section D.1.2(p) of the Guide buffering and transition techniques, including open space, walls, extra deep yards and landscaped roadways, will be used to assure compatibility.

(g) In accordance with Objective G-1 of the Guide, the development sets minimum design standards for residential land uses and establishes Design Guidelines for such development.

(h) In accordance with Section D.2.3(b) of the Guide creative grading and drainage techniques, which may use the golf course/open space, will be utilized to create topographical relief and to add visual interest to the built environment.

(i) In accordance with Section D.2.3 of the Guide the development includes Design Guidelines which formulate appropriate generalized architectural treatment themes for residential development and will insure quality development and project conformity.

(j) In accordance with Section D.3.4(c) and Objective H-1 of the Guide, the development provides for appropriately located open space and recreational areas.

(k) In accordance with Objective J-2, the development provides for busbays in appropriate locations on Bell Road as needed.

(l) In accordance with Objective K-1 of the Guide, the development provides for pedestrian and bicycle circulation.

(m) In accordance with Objective L-1 of the Guide, the development is creating master plans for water, sewer and drainage and will extend public utilities and services in an orderly, planned manner to support the new development.

Allocation of Land Uses

The proposed allocation of land uses, expressed in acres and as a percentage of the area, is as follows:

SITE DATA

	Use	Acres	%	DU/Acres	Units
*	LDR Single Family	339.9	64.1%	5.5	1869
*	MDR/HDR Cluster Housing	43.5	8.2%	10	435
	TOTAL RESIDENTIAL:	383.4	72.3%		2304
**	Streets				
	Entry	2.3	.4%		
	Loop Road	11.5	2.2%		
***	Community Center	6.4	1.2%		
****	Golf Course/Open Space	124.8	23.2%		
	Maintenance Facility & Water Treatment Plant	3.6	.7%		
	TOTAL PROJECT:	532		4.35	2304

Common Areas

As depicted on the Land Use Plan, a minimum of 12.0% of open space, the majority of which is designated as golf course (with recreational open space alternative), will be provided within the Villages at Surprise-North PAD. Such open space will be maintained by a homeowner's association, private operator and/or one or more maintenance districts.

The golf course/open space is designed to accommodate necessary on-site retention. The golf course/open space feature will provide active and passive recreation opportunities for the community. A community center incorporating

clubhouse and fitness facilities will be a central feature of both the golf course and the recreational open space alternative. A Conceptual Plan for the community center follows as Figure 5.

The developer may also provide neighborhood parks within selected subdivisions which would be maintained by either a homeowner's association or maintenance district. The primary entry feature on Bell Road at Citrus Road will provide identity, openness, and attraction. Secondary entrance features will mimic the primary feature, but will be appropriately reduced in scale. Conceptual plans for these entry features follow as Figures 6 and 7.

In addition, appropriately located busbays will be included as part of the public facilities to be provided within the Villages at Surprise-North PAD. In particular, busbays are planned at or near the intersections of Bell Road, Citrus Road, and Cotton Lane.

Traditional sidewalks will be provided along the loop road collector street within the project. Sidewalks will be built in the LDR and MDR/HDR neighborhoods by the respective builders of such developments prior to the occupancy thereof.

Landscaping

Xeriscape plant materials will be visible to the public on the periphery of the site and within the Villages at Surprise-North. The recommended landscape palette, from which non-golf course open landscaping within the Villages at Surprise-North PAD shall be selected, is located in the Appendix as Exhibit "H".

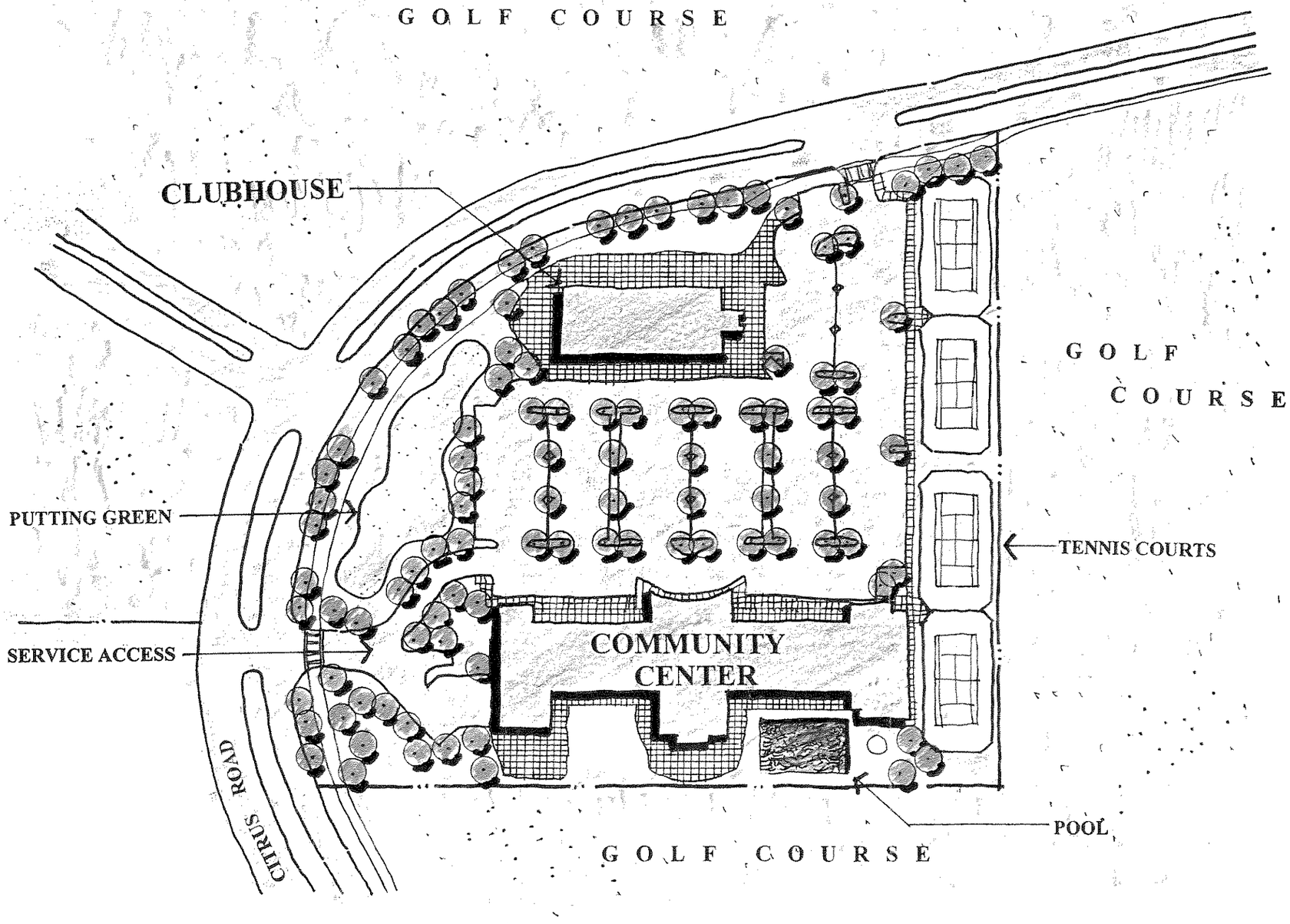
THE VILLAGES AT SURPRISE

Surprise Village Company

CONCEPTUAL COMMUNITY CENTER / CLUBHOUSE

NORTH

FIGURE 5



REVISIONS		
#	Date	Comments
1	02/23/95	Text revisions
2	10/02/95	New site layout & road alignment
3	02/20/96	Revised building & site layout

THE PLANNING CENTER
2525 E. ARIZONA BILTMORE CIRCLE, SUITE 230
PHOENIX, ARIZONA 85016 (602) 957-2210

THE VILLAGES AT SURPRISE

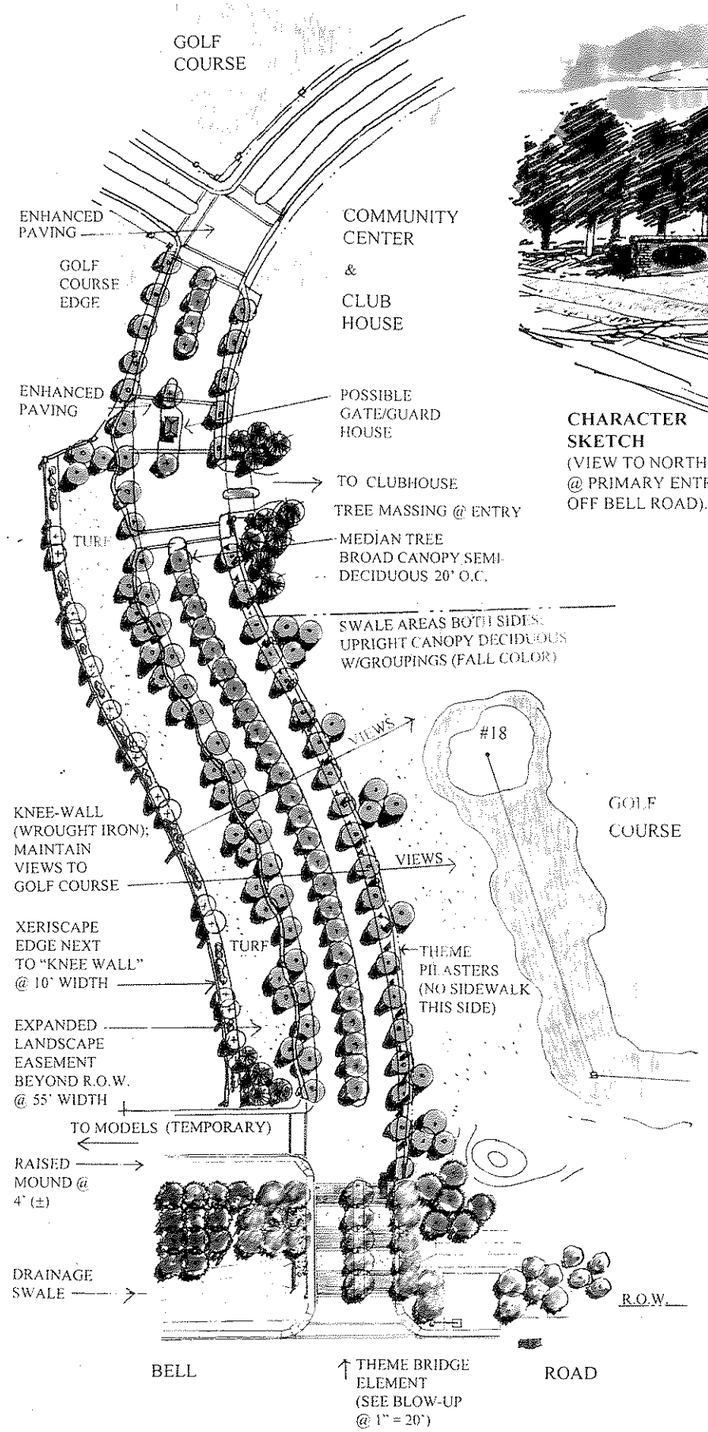
Surprise Village Company

MAIN ENTRY

CONCEPTUAL PLAN

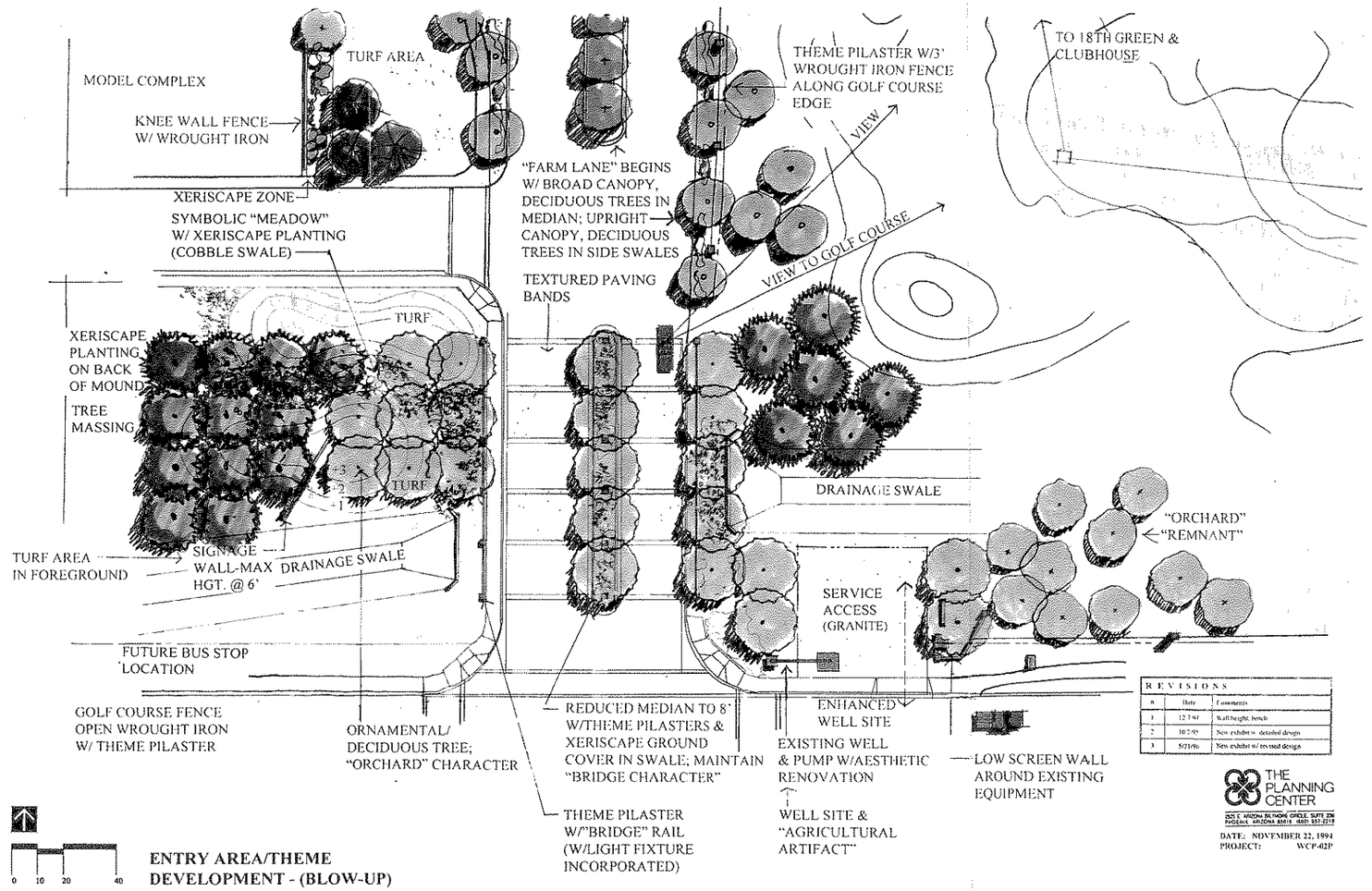
NORTH

FIGURE 6



ENTRY DRIVE CONCEPTUAL DESIGN

CHARACTER SKETCH
(VIEW TO NORTHWEST @ PRIMARY ENTRY OFF BELL ROAD)...

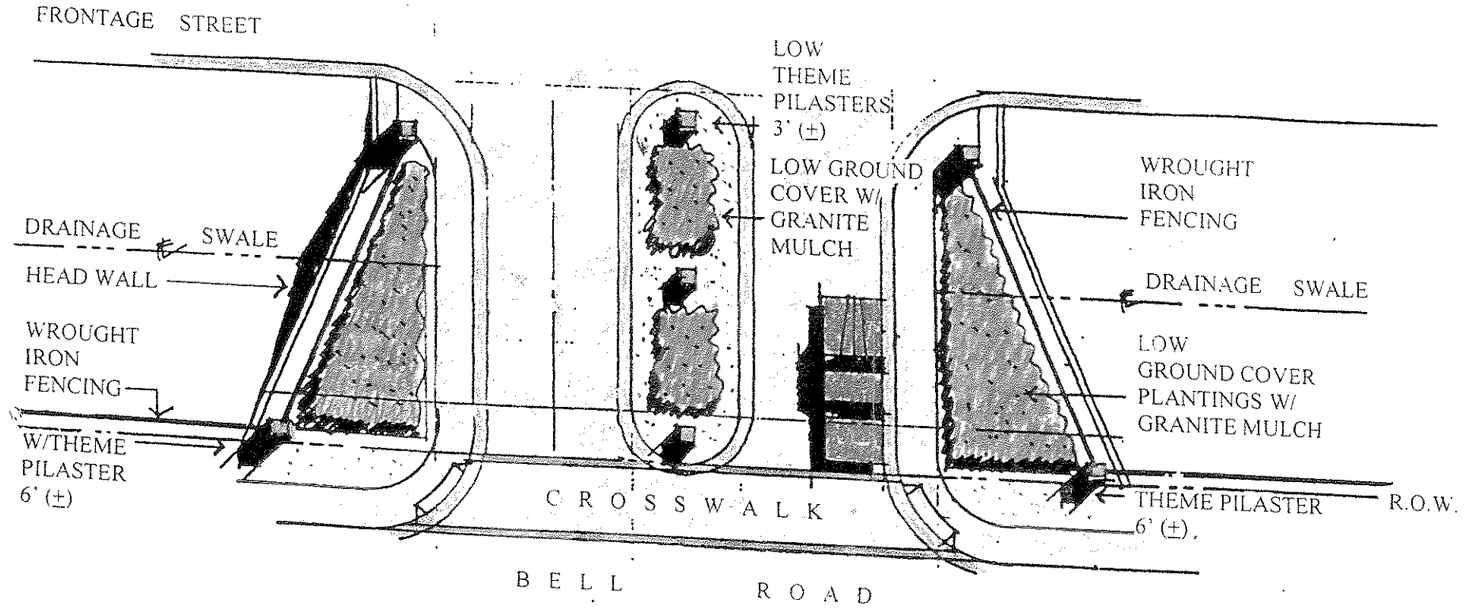


ENTRY AREA/THEME DEVELOPMENT - (BLOW-UP)

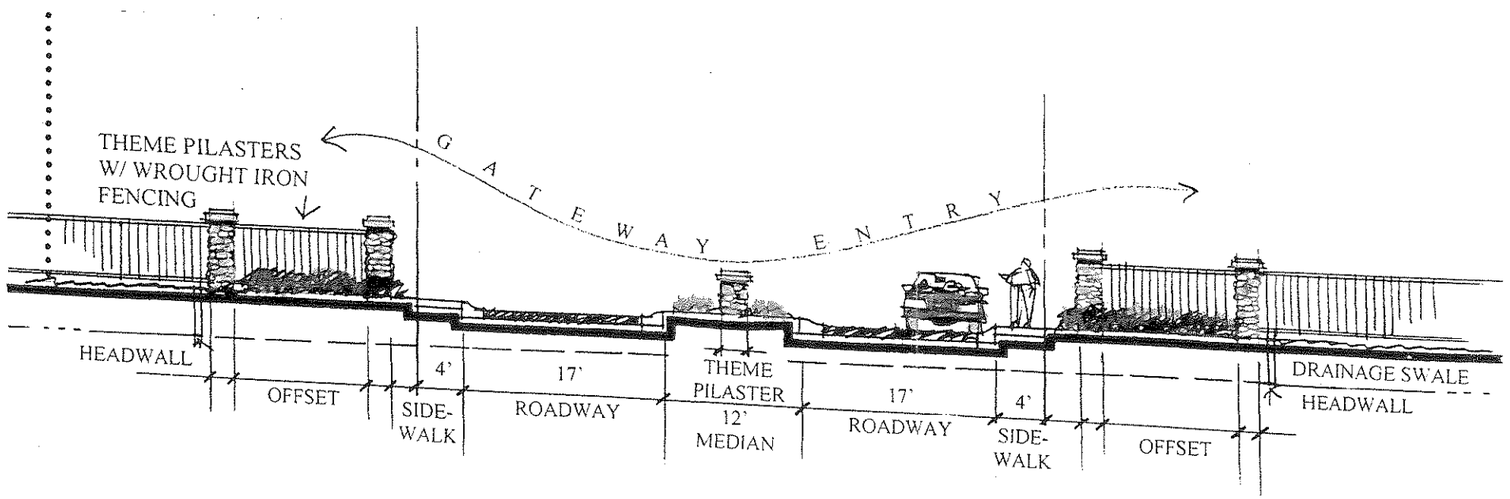
REVISIONS		
#	Date	Comments
1	12/7/94	Wall height, bench
2	10/2/95	New exhibit w/ detailed design
3	5/21/96	New exhibit w/ revised design

THE PLANNING CENTER
2525 E. ARIZONA BILTMORE CIRCLE, SUITE 226
PHOENIX, ARIZONA 85016 (602) 957-2219

DATE: NOVEMBER 22, 1994
PROJECT: WCP-02P



SECONDARY ENTRY @ BELL ROAD/PLAN



SECONDARY ENTRY @ BELL ROAD/SECTION

THE VILLAGES AT SURPRISE

Surprise Village Company

SECONDARY ENTRY

CONCEPTUAL PLAN

N O R T H

FIGURE 7

REVISIONS		
#	Date	Comments
1	10/5/93	New vision of detailed design

Upon request from the developer, the addition of plants and materials to the recommended landscape palette may be Administratively Approved by the City's Community Development Director. Significant changes in the recommended landscaping palette may be approved by the City when deemed necessary through either the minor changes or major changes processes for amendments to the PAD approval as found in Sections 17.36.060 (G)(1) and (2) of the City's current Surprise Municipal Code Title 17 Zoning, copies of which are located in the Appendix as Exhibit "I".

The internal loop road collector street and the Bell Road entry shall be landscaped with low water use, native canopy trees planted in a regular alignment with xeriscape planting below. To provide cohesiveness throughout the project, the landscaping along neighborhood streets shall be compatible with the landscaping along the perimeter roadways and internal loop road collector street.

To soften and screen the properties, the front yards of single-family homes shall be landscaped with at least two trees and two shrubs with the exception that housing product with the side loaded garage configuration may have only one tree, but the front yard landscaping in such cases shall be consistent with the landscape architectural design, intent and theme of two trees and shall be subject to Staff approval. Cluster homes shall be landscaped with at least one tree and one shrub per unit. Ground cover may be turf, decomposed granite or other natural rock material. All bare earth must be covered by an approved organic material to provide a neat, dust-free appearance.

The golf course clubhouse and community center developments shall be landscaped with trees, shrubs and ground covers compatible with the Villages at

Surprise-North turf and drought tolerant plant materials theme and in compliance with Section 17.32.030 of the Surprise Municipal Code Title 17 Zoning a copy of which is located in Appendix as Exhibit "O."

The minimum plant sizes to be used to provide the required landscaping are as follows:

Type	General Locations	Entries and Landscape Features
Trees	15 gallon	24" box
Shrubs	1 gallon	5 gallon
Ground covers	1 gallon	1 gallon

Rocks and boulders, railroad ties, and other decorative materials may be used to supplement and create imaginative landscaping design compatible with the southwest character of the development and the xeriscape theme. Creative use of landscape elements with lighting and thematic planting is encouraged. Artificially colored rock yards are not acceptable in any location.

The front yards of all single-family and cluster homes must be landscaped and street trees planted within 90 days of occupancy of such homes All landscaping areas visible to the public within the golf course clubhouse and community center developments must be landscaped at the time of completion of construction of such developments. Prior to landscaping, all yards must be maintained in a neat, weed-free condition.

All landscaped common areas shall be provided with an appropriate low water consumptive underground watering system and shall be appropriately maintained.

On-lot landscaping shall be provided and maintained by the owner/possessor of such lot. All landscaped areas shall be maintained in a reasonable and attractive manner.

Detailed landscaping plans for individual subdivisions and cluster developments shall be submitted as supplemental information and reviewed by Staff to assure continuity of a quality landscaped environment during the Final Plat (for single-family and cluster housing) and Site Plan (for other developments) processes.

Architectural Style and Design Guidelines

The Villages at Surprise-North Design Guidelines are located in the Appendix at Exhibit "J". These Design Guidelines will provide guidance to individual development efforts so that quality, compatibility and cohesiveness are maintained throughout the PAD. They address numerous issues and concepts such as landscaping, architecture, walls and fences, lighting, site development and other matters. As is described in more detail within the Design Guidelines, they shall serve as a general guide regarding development within the Villages at Surprise-North PAD.

The Villages at Surprise-North is a single-family and cluster residential PAD offering a variety of housing types and product ranges to meet the growing demands of the Surprise market. Various conceptual single-family and cluster housing elevations consistent with the Villages at Surprise-North Design Guidelines are located in the Appendix as Exhibits "K" and "L", respectively, and are offered to generally depict architectural style and exterior materials.

Building Height

Maximum building height for the single-family residences shall not exceed 30'.

Maximum building height for the cluster residences shall not exceed 35'.

Golf course clubhouse and community center buildings may be erected to a height not to exceed 35'; provided, however, such buildings, subject to the Planning and Zoning Commission's approval, may be erected to a height over 35' provided that minimum front and side yard setback shall be increased by 1' for every 3' of building height in excess of 35'. Buildings over 35' in height shall be subject to additional fire protection as determined by the City Fire Marshall.

Building heights for all buildings shall be measured as the vertical distance from the average contact ground level at the front wall of the building to the highest point of the coping of a flat roof, or to the deck line of a mansard roof, or to the mean height level between eaves and ridges for gable and hip or gambrel roofs.

Building Setbacks

Minimum building setbacks from property lines are illustrated on the following tables. Additional building setbacks needed for visibility, triangles and other health-safety requirements may be required during the subdivision plat process.

MINIMUM RESIDENTIAL BUILDING SETBACKS

Use	Front	Interior Side	Corner Side	Rear Yard
LDR Parcels[4]				
Single Family Detached	15'[1]	5'[2]	10'[3]	20'
Structures accessory to SF residences	20'	3'	10'[3]	1'
Structures for all other principal, conditional or accessory uses	15'	5'	10'[3]	10'
MDR/HDR Parcels[4 5]				
Cluster Housing[6]	10'	5'[2] and 0'	10'[3]	20'
Structure accessory to MDR/HDR residences	20'	3'	10'[3]	1'
Structures for all other principal or conditional uses	15'	5'[2]	10'[3]	10'

---

[1] 15' is measured from back of curb. Except for this LDR and MDR front yard setback, all other setbacks are measured from the property lines. A typical detail depicting such setbacks is located in the Appendix as Exhibit "M".

[2] On LDR and MDR properties developed with single-family detached homes, a minimum of 5'. The total of two side yards on one lot shall be 10' with no projection closer than 3' to the property line. A typical detail depicting such setbacks is located in the Appendix at Exhibit "M".

[3] Corner side setbacks of a minimum of 20' back of curb shall be provided adjacent to collector and arterial streets and for key lots.

[4] Maximum lot coverage (building area footprint including the garage divided by the total lot area) shall not exceed 55% for LDR and MDR parcels.

[5] Density shall not exceed 12 dwelling units per acre. Setbacks defined for MDR application only. HDR listed only due to dwelling unit count.

[6] Cluster housing is defined as a grouping of detached and/or duplex family dwelling units that can be sharing a common drive or motor court.

OTHER BUILDING SETBACKS

Use	Front	Interior Side	Corner Side	Rear Yard	Res. Zone Boundary
Buildings	35'	15'	25'	15'	50'
Parking Lots	4'	3'	4'	3'	3'

Lot Area and Dimensions

(a) *LDR Parcels.*

(i) Required Lot Area:

Use	Minimum Lot Area[7]
Single-family dwelling units	4,000 s.f.
Other permitted uses	Min. area to be determined by building area, parking requirements, and required setbacks

(ii) Required Lot Dimensions:

Use	Minimum Lot Width	Minimum Lot Depth
Single-family dwelling units	40'	75'
Other permitted uses	Lot dimensions to be determined by building area, parking requirements, and required setbacks	

[7] A diversity of lot sizes and housing types shall be encouraged. Typical expected single-family detached lot widths include 40' to 80', with a minimum allowed lot width of 40'. Typical expected lot depths include 75' to 200', with a minimum allowed lot depth of 75'. A maximum of 30% of the lots within LDR parcels shall be 40'x 100' (4,000 s.f.). The minimum size for the remaining lots within LDR parcels shall be 45' x 105' (4,725 sq. ft.). The total number of single-family and cluster family dwelling units shall not exceed 2,304.

(iii) Density: There shall not be more than one (1) single family dwelling unit on any one (1) lot, except for accessory attached residential units, which shall not be permitted to have separate kitchen facilities.

(iv) Encroachment into required front and side yards shall be permitted as provided in the current Section 17.28.010 (G) the Surprise Municipal Code Title 17 Zoning, which is located in the Appendix as Exhibit "N"; provided, however, that with respect to encroachment into a side yard, such encroachment shall occur only on a side yard that is at least seven feet wide in the area of the encroachment and shall not cause the distance from the outside edge of the encroachment to the property line to be less than five feet wide.

(v) Development of LDR and MDR parcels shall, except as otherwise provided in the Villages at Surprise-North PAD, be subject to all applicable requirements of the current Chapter 17.32 of the Surprise Municipal Code Title 17 Zoning ("General Building and Performance Requirements), a copy of which is located in the Appendix as Exhibit "O", provided, however, that with respect to rear yard setbacks no more than 15% of the units in each recorded plat shall be permitted to allow a minimum fifteen (15) foot rear yard setback. Builder shall note number of minimum 15' rear yard lots per plat upon submittal of plot plan subject to specific site Final Plat approval.

(vi) Any property located within a parcel designated LDR or MDR as well as the F-1 or F-2 overlay zones must comply with the current regulations of 17.28.120 and 17.28.130 of the Surprise Municipal Code Title 17 Zoning copies of which are located in the Appendix as Exhibits "P" and "Q", respectively.

(b) *MDR/HDR Parcels.*

(i) Lot area and dimensions. In determining minimum lot area and minimum lot dimensions, the following table shall be used:

Use	Minimum Area Per Unit	Minimum Lot Dimensions	Outdoor Living Area[9]
Cluster Housing[8]	1,000 sq. ft./unit[10]	Width: 30' Depth: 70'	300 sq. ft./unit
Other permitted uses:	Minimum area and lot dimensions to be determined by building area, parking requirements and required setbacks.		

(ii) Schedule of Allowances. The minimum areas per unit may be adjusted in accordance with the current Section 17.28.050 of the Surprise Municipal Code Title 17 Zoning, a copy of which is located in the Appendix as Exhibit "R".

(iii) Accessory Buildings. Accessory buildings shall observe the same setback requirements established for the cluster building except that accessory buildings located within the rear yard of the cluster building may be located to within three (3) feet of the rear or interior side property line. The City Council may require common walls for accessory buildings on the same lot where common walls will eliminate unsightly and hazardous areas. Accessory

buildings on the same lot shall otherwise be separated by a distance of not less than ten (10) feet.

(iv) Distances Between Buildings. When two (2) or more principal buildings are located on one (1) lot, the minimum separation between any two (2) adjacent principal buildings shall be a distance not less than an amount equal to the height of the taller of the two buildings or twenty (20) feet, whichever is greater.

---

[8] Density shall not exceed 12 dwelling units per acre.

[9] Outdoor living area in the minimum amount specified above must be provided on any lot occupied by the cluster building. This space must be easily accessible for daily recreational use by the occupants of the building. Driveways, parking, ornamental landscaped areas (having a width of 20') and required side or front yards shall not be considered as Outdoor Living Area, except in the case of interior cluster units where said unit is less than 20 feet in width, in which case the minimum width of the Outdoor Living Area shall be the width of the lot.

[10] May be calculated as average lot size per unit per structure.

(v) Additional Building and Performance Standards. Development of HDR parcels shall, except as otherwise provided in the Villages at Surprise-North PAD, be subject to all applicable requirements of the current Chapter 17.32 of the Surprise Municipal Code Title 17 Zoning, a copy of which is located in the Appendix as Exhibit "O".

(vi) Relationship to Overlay Zones. Any property designated HDR, as well as located in the F-1 or F-2 Overlay Zone, must comply with the current regulations of Sections 17.28.120 and 17.28.130 of the Surprise Municipal Code Title 17 Zoning, copies of which are located in the Appendix as Exhibits "P" and "Q", respectively.

(c) *Access.*

(i) Golf carts shall be permitted on streets within the project.

Specifications and Standards for Streets, Utilities and Services

Streets will be provided in accordance with the following minimum standards and specifications for such improvements:

(a) *Bell Road.* Existing/built.

(b) *Union Hills Drive.* The south one-half of Union Hills Drive is to be dedicated from any subdivision street penetration to the east property line of the development (Villages at Surprise-North). Improvements shall include a two lane minor arterial roadway section from the subdivision street penetration point east to Cotton Lane.

(c) *Major Entrance.* The major entrance into the Villages at Surprise North (from Bell at the Citrus Road alignment) shall consist of a short section of 4-lane divided roadway in general conformance with the depiction on the Land Use Plan. A minimum 80' R.O.W. shall be provided. Improvements shall consist of two travel lanes in each direction plus a raised median on 56' (28' on each side back of curb dimension) of pavement. The scope and phasing of such improvements, appropriate transitions, and similar matters shall be discussed and agreed to between the City and the Developer upon: (a) prior to the development of parcels that are abutting this entrance, or (b) such time as the Developer desires, whichever occurs first.

(d) *Secondary Entrances.* Any secondary entrances into the Villages at Surprise-North shall consist of an adequate number of travel lanes and R.O.W. as supported by the Traffic Report and approved by the City Engineer. Relocation of a secondary entrance shall require revision to the Traffic Report. The scope and phasing of such improvements, appropriate transitions, and similar matters shall be discussed and agreed to between the City and the Developer upon: (a) prior to the development of parcels that are abutting these entrances, or (b) such time as the Developer desires, whichever occurs first.

(e) *Typical Internal Loop Road.* Improvements shall consist of an adequate R.O.W. and number of travel lanes as supported by the Traffic Report and approved by the City Engineer. The scope and phasing of such improvements, appropriate transitions, and similar matters shall be discussed and agreed to between the City and the Developer upon: (a) prior to the

development of parcels that are abutting this road, or (b) such time as the Developer desires, whichever occurs first.

(f) *Local Public Streets.* 36' R.O.W. plus 2-8' public utility easements. Improvements shall consist of two travel lanes on 28' (back of curb dimension) of pavement with sidewalks on both sides and parking permitted on one side only. The scope and phasing of such improvements, appropriate transitions, and similar matters shall be discussed and agreed to between the City and the Developer upon: (a) prior to the development of parcels that include these streets, or (b) such time as the Developer desires, whichever occurs first.

R.O.W. dedications shall be made in conjunction with Final Plat Approval of the particular subdivision (a) within which such internal rights-of-way will be located and (b) adjacent to which such perimeter rights-of-way will abut.

(g) *Local Private Streets.* Local private streets shall consist of a 36' R.O.W. Improvements shall consist of two travel lanes on 28' (back of curb dimension) of pavement with sidewalks on both sides and parking permitted on one side only. The scope and phasing of such improvements, appropriate transitions, and similar matters shall be discussed and agreed to between the City and the Developer upon: (a) prior to the development of parcels that include these streets, or (b) such time as the Developer desires, whichever occurs first.

Typical cross-sections for the various roadway classifications are located in the Appendix as Exhibit "S". Lee Engineering's Traffic Report, providing appropriate

justification for the street standards and specifications, is located in the Appendix as Exhibit "T".

The Civil Site Plan, and other plans illustrating the location of existing and future water lines, sewer lines, and related facilities are located in the Appendix as Exhibit "U". Except as otherwise approved by the City through its plans review/approval processes, such utilities and services will be provided in accordance with the City's typical specifications and standards for such improvements.

All on-site utilities shall be installed underground.

Signage

Signage within the Villages at Surprise-North shall, except as provided below, be in compliance with Section 17.32.100 of the City's current Zoning Ordinance Surprise Municipal Code Title 17 Zoning and the ordinances referred to therein, copies, of which are located in the Appendix as Exhibit "V". In addition to signage allowed pursuant to Section 17.32.100 and such ordinances, subject to obtaining a Conditional Use Permit approving a Master Sign Plan for the Villages at Surprise-North, signage may be provided which is not in strict compliance with the provisions but which is appropriate to the character of the development, provides adequate identification and information, provides a good visual environment, promotes traffic safety and is regulated to the extent necessary to be safe and compatible with the Villages at Surprise-North PAD. The Conditional Use Permit for the Master Sign Plan, or any modification thereto, may contain such conditions, requirements or standards that may be stipulated by the City to assure

that signs covered by the Conditional Use Permit will not be detrimental to persons or property in the vicinity or to the pubic welfare in general.

Phasing

The Conceptual Phasing Plan is illustrated in Figure 8. The Phasing Plan sets forth the intended times for beginning and completion of each phase. Construction in any phase may be commenced prior to the time shown on the Phasing Plan. Commencement of construction of a phase prior to or within the time designated on the Phasing Plan for commencement of that phase shall satisfy the current Surprise Municipal Code Title 17 Zoning, Section 17.36.060 (D)(3)(d) provision concerning start of construction, a copy of which is located in the Appendix as Exhibit "W".

Extensions of time for up to two years to commence construction in any phase may he administratively approved by the City's Community Development Director. Extensions of time for greater than two years may be approved by the City when deemed necessary through either the minor changes or major changes processes for amendments to the PAD approval as found in the Sections 17.36.060 (G)(1) and (2) of the City's current Surprise Municipal Code Title 17 Zoning a copy of which is located in the Appendix as Exhibit "I".

Phase I provides four lane access onto Bell Road. Similar means of (paved) access and emergency (all weather) access will be provided, as necessary and appropriate, in conjunction with the development of subsequent phases of the PAD.

Amendment

The City of Surprise (the "City") and the Developer of the Villages at Surprise (the "Developer") agree that amendments to the Villages at Surprise-North PAD may be necessary from time to time. If and when the parties find that such amendments are necessary or appropriate, they shall, unless otherwise required by applicable law as discussed in the Development Agreement entered into between the parties (the "Development Agreement"), effectuate minor changes or adjustments through administrative amendments approved by the City Planning and Zoning Director with the approval of the City Manager. After execution, any such amendment shall be attached to the Villages at Surprise-North PAD as an addendum and become a part thereof, and may be further changed and amended from time to time as necessary, with the approval of the City and the Developer. Unless otherwise required by law, no such minor amendments shall require prior notice or hearing. All major changes or amendments shall be reviewed by the Planning and Zoning Commission and approved by the City Council. The following are examples of major changes or amendments:

(a) Substantial alteration of the permitted uses of the Villages at Surprise-North, except with regard to the Developer's ability to modify the golf course as discussed in the Villages at Surprise-North PAD;

(b) An increase in the density or intensity of use or number of dwelling units, except for Density Transfers as provided in the Villages at Surprise-North PAD and Development Agreement;

(c) Deletion of a requirement for the reservation or dedication of land for public purposes, except for minor boundary adjustments or street alignments which shall be treated as minor changes; and

(d) Addition, but not deletion, of streets to those shown on the

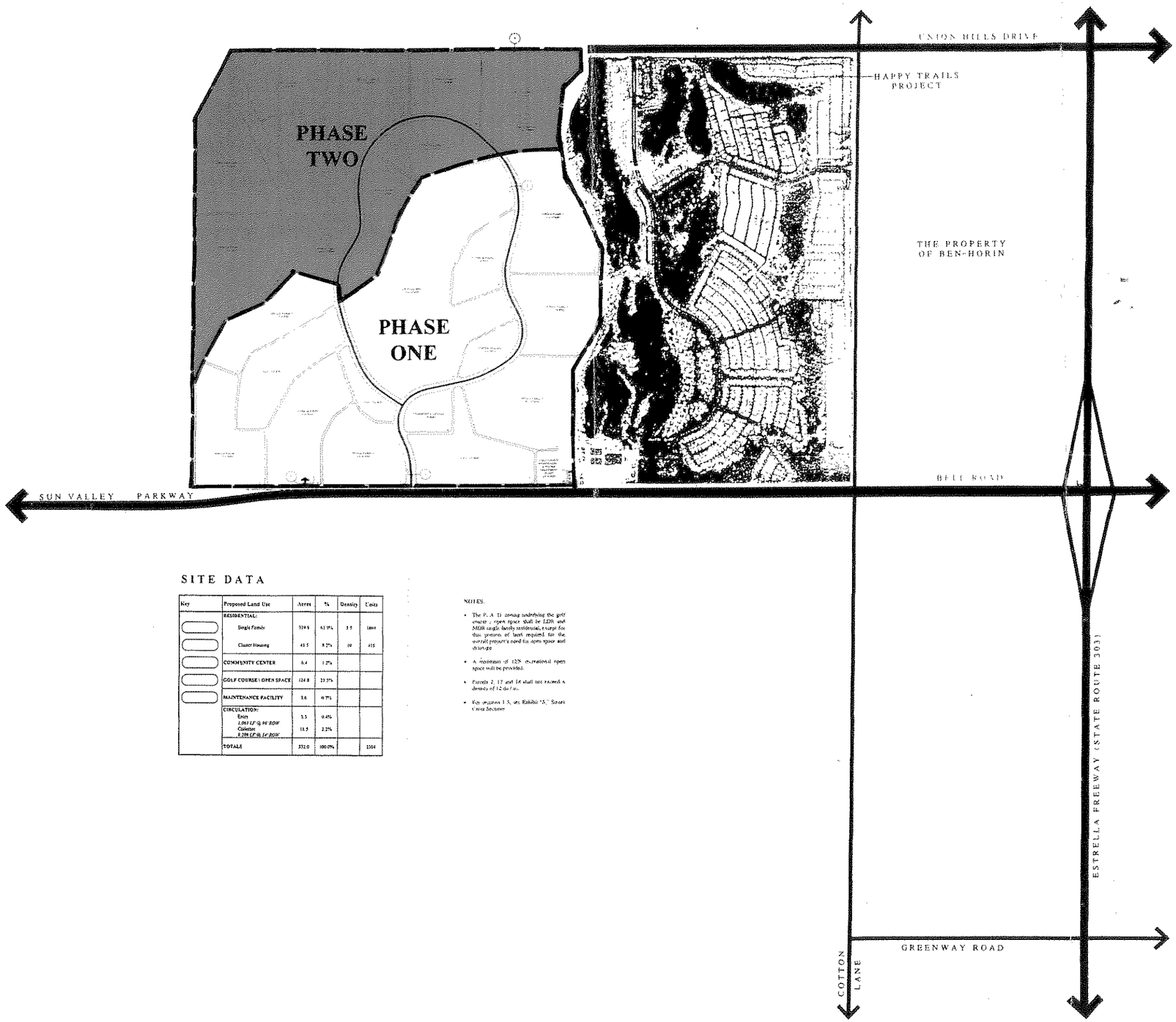
THE VILLAGES AT SURPRISE

Surprise Village Company

PHASING PLAN

NORTH

FIGURE 8



SITE DATA

Key	Proposed Land Use	Acres	%	Density	Units
	RESIDENTIAL:				
	Single Family	329.9	63.9%	3.5	1869
	Cluster Housing	43.5	8.2%	10	415
	COMMUNITY CENTER	6.4	1.2%		
	GOLF COURSE \ OPEN SPACE	124.8	23.5%		
	MAINTENANCE FACILITY	3.6	0.7%		
	CIRCULATION:				
	Entry *1,063 LF @ 94' ROW*	2.5	0.4%		
	Collector *8,296 LF @ 54' ROW*	11.5	2.2%		
	TOTALS	532.0	100.0%		2304

NOTES:

- The P. A. D. zoning underlying the golf course / open space shall be LDR and MDR single family residential, except for that portion of land required for the overall project's need for open space and drainage.
- A minimum of 125 recreational open space will be provided.
- Parcels 2, 17 and 18 shall not exceed a density of 12 du/ac.
- Key sections 1-5, see Exhibit "5," Street Cross Sections.

PROJECT TIMELINE:

PHASE ONE 1995 - 1998

PHASE TWO 1999 - 2003

REVISIONS		
#	Date	Comments
1	1/27/95	Land Use Base Revisions; Color Version of Phasing Plan
2	2/15/95	Site Data Tables, Land Use Base Revisions, Color Version of Phasing Plan
3	2/23/95	Incorporated ex-city
4	3/23/95	Land Use Base Revisions
5	10/2/95	Land Use Base Revisions
6	4/11/96	Land Use Base Revisions

0 200 400 800

THE PLANNING CENTER

2525 E. ARIZONA BILTMORE CIRCLE, SUITE 236
PHOENIX, ARIZONA 85016 (602) 957-2215

DATE: NOVEMBER 22, 1994
PROJECT: WCP-02P

Villages at Surprise-North PAD.

The parties shall cooperate in good faith to agree upon, and use reasonable best efforts to process, any minor or major amendments to the Villages at Surprise-North PAD, which amendments shall be incorporated by this reference into the Villages at Surprise-North PAD.

Density Transfers The City and the Developer hereby acknowledge and agree that the Villages at Surprise-North PAD provides both an overall maximum density for the Villages at Surprise-North (the "Maximum Density") and a land use category and unit per-acre designation for each particular parcel. The City acknowledges and agrees that provided the Developer does not exceed the Maximum Density, the Developer shall have the right, in its discretion to:

(a) develop any individual parcel up to the maximum density allowed for such parcel as shown on the Villages at Surprise-North PAD (see Table, page 9);

(b) develop any individual parcel at a density of not more than one hundred twenty-five percent (125%) of the maximum density allowed for such parcel as shown on the Villages at Surprise-North PAD, provided the Developer obtains prior written administrative approval from the City's Planning and Zoning Director and the City Manager; and

(c) develop any individual parcel at a density greater than one hundred twenty-five percent (125%) of the maximum density allowed for such

parcel as shown on the Villages at Surprise-North PAD, provided the Developer obtains prior written approval from the City Council.

Regardless of any density transfers which may have been approved. However, the Developer shall not exceed the Maximum Density of the Villages at Surprise without prior amendment of the Villages at Surprise-North PAD, which amendment shall be reviewed by the Planning and Zoning Commission and approved by the City Council. Neither the Planning and Zoning Commission nor the City Council shall be required or obligated to approve an increase in the maximum density. The Developer agrees to provide the City, at the time of platting, notice as to the density assigned to the parcel subject to platting.

Project Team

Ownership

Surprise Village North L.L.C.
11411 North Tatum Blvd.
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Attn: Richard B. West III

and

426 North 44th Street
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Phoenix, Arizona 85008
Attn: John W. Graham

and

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and

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Attn: Ryan Bale

Traffic Engineering

Lee Engineering
3240 East Camelback Road
Suite 180
Phoenix, AZ 85018
Attn: Ken Howell

Zoning/Legal

Fennemore Craig
Two N. Central Avenue
Suite 2200
Phoenix, AZ 85004-2390
Attn: Lesa J. Storey

City Approvals

The Preliminary and Final Development Plan PAD No. 95-02 for the Villages at Surprise-North was approved on March 27, 1995, and subsequently revised and such revision approved on May 23, 1996 subject to stipulations found in the Appendix at Exhibit "X".

April 9, 1996
Job No. 931007

CLOUSE ENGINEERING, INC.
ENGINEERS AND SURVEYORS
3815 NORTH 32ND STREET PHOENIX, ARIZONA 85018
TEL. 955-4690 FAX 955-0797

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
4369
ANSON B.
POTTER
Date Signed 4/10/96
ARIZONA, U.S.A.

EXHIBIT "A"

LEGAL DESCRIPTION

ARIZONA TRADITIONS GROSS

That part of the E.½ Section 34, and the W.½ Section 35, T. 4 N., R. 2W., G. & S. R. B. & M., Maricopa County, Arizona, described as follows:

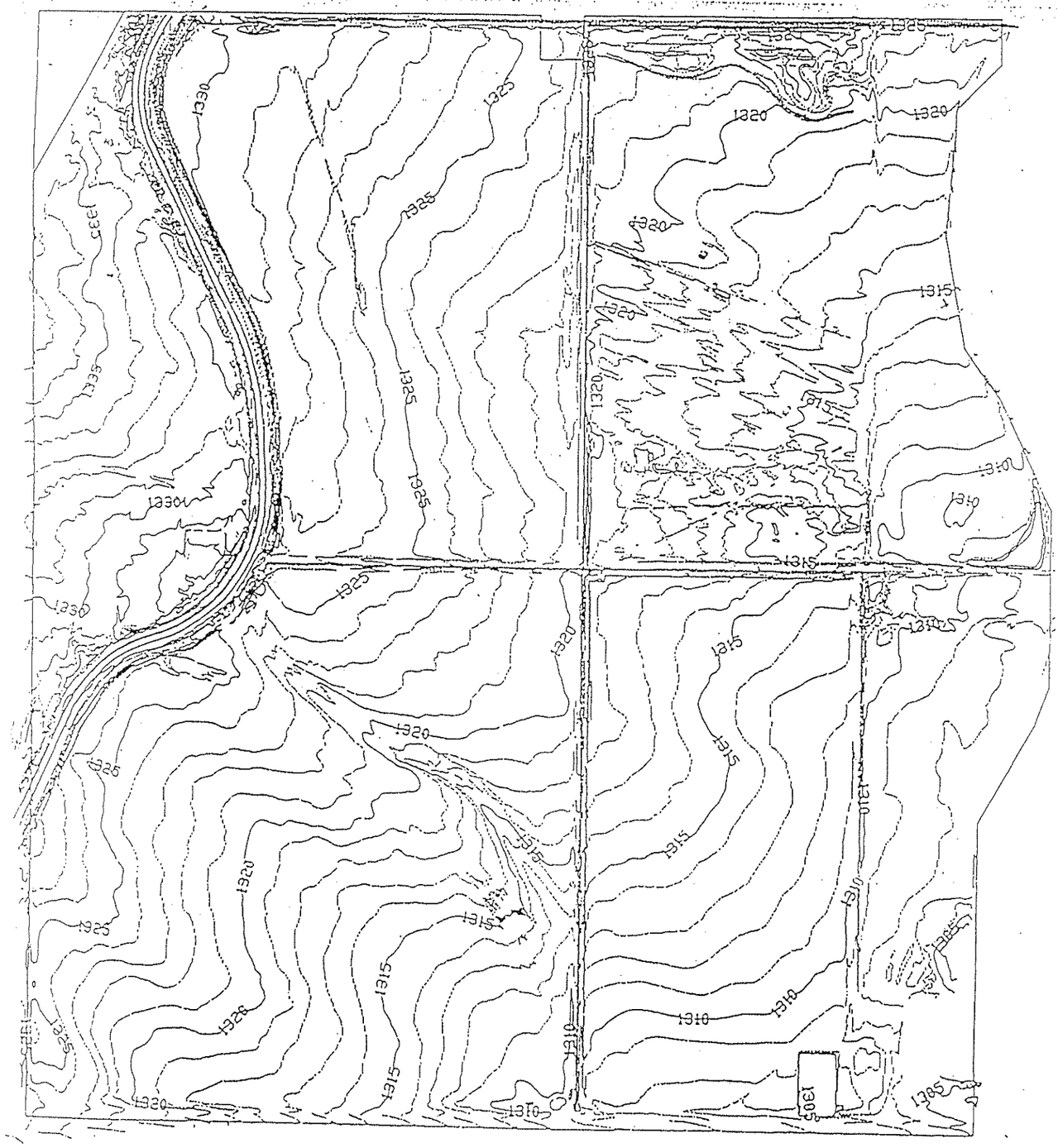
Beginning at the Southeast corner of the said E.½ Section 34; thence S. 89° 57' 40" W. 2638.10 feet to the Southwest corner of the said E.½ Section 34; thence N. 00° 02' 02" E. 2639.53 feet to the center of the said Section 34; thence continuing N. 00° 02' 02" E. along the West line of the said E.½ Section 34, a distance of 1843.95 feet to a point on the right-of-way line of Parcel 11-C Trilby Wash Project as shown in Book 63 of Maps, Page 31, M.C.R., this corner being Southerly 789.30 feet from the Northwest corner of the said E.½ Section 34; thence N. 28° 16' 53" E. along the said right-of-way line of Trilby Wash, a distance of 896.76 feet to a point on the North line of the said E.½ Section 34, this point being Easterly 424.42 feet from the Northwest corner of the said E.½ Section 34; thence N. 89° 56' 36" E. along the North line of the said E.½ Section 34, a distance of 2003.35 feet to a point 208.00 feet Westerly from the Northeast corner of the said E.½ Section 34; thence S. 00° 01' 04" W. 208.00 feet; thence N. 89° 56' 36" E. parallel to the North line of the said E.½ Section 34, a distance of 208.00 feet to a point on the East line of the said Section 34; thence N. 00° 01' 04" E. along the said East line a distance of 208.00 feet to the Northeast corner of the said E.½ Section 34, this corner also being the Northwest corner of the said W.½ Section 35; thence N. 89° 57' 49" E. along the North line of the said W.½ Section 35, a distance of 1975.68 feet, this point lying Westerly 666.00 feet from the Northeast corner of the said W.½ Section 35; thence S. 00° 00' 39" W. 215.00 feet; thence S. 45° 00' 39" W. 300.00 feet; thence S. 05° 00' 39" W. 484.09 feet; thence S. 09° 59' 22" E. 660.31 feet; thence S. 34° 59' 22" E. 290.87 feet; thence S. 25° 23' 16" E. 382.02 feet; thence S. 12° 31' 09" E. 271.18 feet; thence

S. 00° 20' 58" W. 770.00 feet; thence S. 19° 25' 45" W. 193.43 feet; thence S. 30° 00' 39" W. 530.00 feet; thence S. 00° 00' 39" W. 1380.43 feet; thence S. 00° 18' 43" E. 65.00 feet to a point on the South line of the said W.½ Section 35, this point lying Westerly 749.65 feet from the Southeast corner of the said W.½ Section 35; thence S. 89° 41' 17" W. along the South line of the said W.½ Section 35, a distance of 1891.88 feet to the point of beginning, subject to easements and rights-of-way of record.

Note: The above described parcel contains 24,053,289 square feet or 552.1875 acres.

THE VILLAGES AT SURPRISE - NORTH

EXHIBIT B



BELL ROAD

REVISED 04/11/96

EXHIBIT "C"
Section 17.24.020

17.24.020 Residential zone uses. Residential zone uses are as follows:

A. Principally permitted uses	R1-43	R1-18	R1-8	R1-5	R-2	R-3
Single-family dwelling unit	o	o	o	o		
Two-family structure				o	o	
Three-family structure					o	
Four-family structure					o	o

Principally permitted uses	R1-43	R1-18	R1-8	R1-5	R-2	R-3
Multiple-family structure						o
Townhouse cluster, not to exceed four units or 120 feet in length					o	
Townhouse cluster with four or more units, but not to exceed 160 feet in length						o
Public parks	o	o	o	o	o	o
Manufactured housing subdivisions	o	o	o	o		

B. Conditionally permitted uses	R1-43	R1-18	R1-8	R1-5	R-2	R-3
Churches	o	o	o	o	o	o
Day care center	o	o	o	o	o	o
Electrical substation	o	o	o	o	o	o
Farms	o					
Gas regulating station	o	o	o	o	o	o
Group homes				o	o	o
Mobile home parks as per Section 17.32.140					o	o
Model homes, temporary	o	o	o	o	o	o
Public buildings	o	o	o	o	o	o
Ranches	o					
Schools	o	o	o	o	o	o
Sewer lift station	o	o	o	o	o	o
Water pump station	o	o	o	o	o	o
Water tower	o	o	o	o	o	o
Golf courses	o	o	o	o	o	o
Temporary sales and office buildings, buildings incidental to construction work	o	o	o	o	o	o
Boarding of horses No more than 2 per acre to a maximum of 5 horses	o					

C. Permitted Accessory Uses	R1-43	R1-18	R1-8	R1-5	R-2	R-3
Greenhouse	o	o	o	o	o	o
Home occupations	o	o	o	o		
Private garage	o	o	o	o	o	o
Private or jointly owned community center recreational facilities pools, tennis courts	o	o	o	o	o	o
Signs, as per Chapter 15.16	o	o	o	o	o	o
Tool sheds, for storage of domestic supplies	o	o	o	o	o	o

(Ord. 90-5 §§3, 4, 1990; Ord. 86-6 §6-602, 1986)

EXHIBIT "D"

Section 17.28.040

17.28.040 Single-family residential zone (R1-5). A. Purpose. The purpose of the R1-5 single-family residential zone is to provide for the development of single-family detached dwellings and directly related complementary uses at a moderate density. The zone is intended to be strictly residential in character with a minimum of disturbances due to traffic or overcrowding.

B. Principally Permitted Uses. See Section 17.24.020A.

C. Conditionally Permitted Uses. See Section 17.24.020B.

D. Permitted Accessory Uses. See Section 17.24.020C.

E. Lot Area and Lot Dimensions.

1. Required lot area:

Use	Minimum Lot Area
Single-family dwelling units	5,500 square feet*
Other permitted uses	Minimum area to be determined by building area, parking requirements and required setbacks.

2. Required lot dimensions:

---

* This may be calculated as an average lot size for lots within a given subdivision, provided no lot is less than five thousand two hundred square feet in size and not more than ten percent of the lots are less than five thousand five hundred square feet in size.

Use	Minimum Lot Width	Minimum Lot Depth
Single-family dwelling units	50 feet	100 feet
Other permitted uses	Lot dimensions to be determined by building area, parking requirements and required setbacks.	

3. Density: There shall not be more than one single-family dwelling unit on any one lot.

F. Setbacks, Yards and Heights.

1. Minimum setbacks from property line:

Use	Front	Interior Side	Corner Side	Rear Yard
Single-family dwelling	20'	10'*	20'	20'
Schools, civic, cultural and religious institutions (including their accessory use structures)	50'	50'	50'	50'
Structures accessory to single-family residences	20'	3'	20'	3'
Structures for all other principal, conditional or accessory uses	20'	10'	20'	20'

Zero lot line development may be permitted which may result in the creation of a two-family residential structure.

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* At least one side yard shall be ten feet; the setback for the remaining side may be less than ten providing principal building separations are at least ten feet and that in the case of detached units, the other side yard is at least three feet.

2. Maximum building height: thirty feet.

G. Encroachment into Required Front and Side Yard Setbacks. See Section 17.28.010G.

H. Additional Building and Performance Standards. Development of any parcel of land within this district shall be subject to all applicable requirements of Chapter 17.32 of this title.

I. Relationship to Overlay Zones. Any property located in the R1-5 zone as well as in the F-1 or F-2 overlay zones must comply with the regulations of the overlay zone. (Ord. 86-6 §7-704, 1986)

EXHIBIT "E"
Section 17.28.060

17.28.060 Multifamily residential zone (R-3). A. Purpose. The purpose of the R-3 multifamily residential zone is to provide for high density housing in multiple-family structures and directly related complementary uses. The R-3 zone is designed to allow highly economical use of land while creating an attractive, functional and safe residential environment.

B. Principally Permitted Uses. See Section 17.24.020A.

C. Conditionally Permitted Uses. See Section 17.24.020B.

D. Permitted Accessory Uses. See Section 17.24.020C.

E. Lot Area and Lot Dimensions. In determining minimum lot area and minimum lot dimensions, the following table should be used:

Use	Minimum Area per Unit	Minimum Lot Dimensions*	Outdoor Living Area**
Multifamily structure	2,000 sq. ft./unit	Width: 90' Depth: 90'	300 sq. ft./unit
Townhouse cluster	2,000 sq.*** ft./unit	Width: 90' Depth: 90'	400 sq. ft./unit
Other permitted uses		Minimum area and lot dimensions to be determined by building area, parking requirements and required setbacks.	

F. Schedule of Allowances. The minimum areas per unit in subsection E of this section may be adjusted in accordance with Section 17.28.050F.

G. Setbacks, Yards, and Heights.

1. Minimum setbacks from property line:

Use	Front	Interior Side	Corner Side	Rear
Multifamily structure	20'	20'	20'	20'
Townhouse cluster	20'	15'	20'	20'
Schools, civic, cultural and religious institutions (including their accessory use structures)	50'	50'	50'	50'

---

* These dimensions apply to the initial lot size per structure. Initial lots may be divided to accommodate individual ownership of the structures' dwelling units.

** Outdoor living area in the minimum amount specified above must be provided on any lot occupied by the multiple-residence or townhouse building. This space must be easily accessible for daily recreational use by the occupants of the building. Driveways, parking areas, ornamental landscaped areas (having a width of less than twenty feet), and required side or front yards shall not be considered as an outdoor living area, except in the case of interior townhouse units where said unit is less than twenty feet in width, in which case the minimum width of the outdoor living area shall be the width of the lot.

*** May be calculated as average lot size per unit per structure.

Use	Front	Interior Side	Corner Side	Rear
Structures accessory to multifamily residences	20'	3'	20'	3'
Structures for all other principal or conditional uses	20'	10'	20'	20'

2. For apartment buildings, parking of motor vehicles shall not be allowed within the required front or corner side setbacks.

3. Maximum building height: thirty-five feet.

H. Accessory Buildings. See Section 17.28.050H of this chapter.

I. Distance Between Buildings. See Section 17.28.050I of this chapter.

J. Additional Building and Performance Standards. Development of any parcel of land within this district shall be subject to all applicable requirements of Chapter 17.32 of this title.

K. Relationship to Overlay Zones. Any property located in the R-3 zone as well as in the F-1 or F-2 overlay zones must comply with the regulations of the overlay zones. (Ord. 86-6 §7-706, 1986)

ARIZONA TRADITIONS
Surprise Village North

RECOMMENDED PLANT PALETTE

EXHIBIT "H"
(ONE OF TWO)

N O R T H

Botanical Name	Common Name
Trees:	
Acacia aneura	Mulga
Acacia salicina	Willow Acacia
Acacia smallii	Sweet Acacia
Cercidium floridum	Blue Palo Verde
Cercidium praecox	Palo Brea
Chilopsis linearis	Desert Willow
Dalbergia sissoo	Sissoo Tree
Fraxinus velutina 'Rio Grande'	Fan-tex Ash
Jacaranda mimosifolia	Jacaranda
Lysiloma microphylla var. thornberi	Desert Fern
Phoenix dactylifera	Date Palm
Pinus canariensis	Canary Island Pine
Pinus eldarica	Eldarica Pine
Pinus halepensis	Aleppo Pine
Pinus roxburghii	Chir Pine
Pistachia chinensis	Chinese Pistache
Pithecellobium flexicaule	Texas Ebony
Prosopis chilensis	Chilean Mesquite
Prosopis glandulosa	Honey Mesquite
Prosopis juliflora	Native Mesquite
Pyrus calleryana 'Bradford'	Bradford Pear
Ulmus parvifolia	Evergreen Elm
Shrubs:	
Buddleia marrubifolia	Woolly Butterfly Bush
Caesalpinia mexicana	Mexican Bird of Paradise
Caesalpinia pulcherrima	Red Bird of Paradise
Calliandra californica	Baja Fairy Duster
Cassia phyllodenia	Silverleaf Cassia
Convolvulus cneorum	Silverbush Morning Glory
Cordia boissieri	Texas Olive
Cordia parvifolia	Littleleaf Cordia
Dalea frutescens	Black Dalea
Dalea pulchra	Pea Bush
Dodonea viscosa	Green Hopbush
Encelia farinosa	Brittlebush
Justicia spicigera	Mexican Honeysuckle
Leucophyllum frutescens	'Green Cloud' ™
Leucophyllum laevigatum	Chihuahuan Sage
Leucophyllum zygophyllum	'Cimarron' ™
Myrtus communis 'Boetica'	Twisted Desert Myrtle
Nerium oleander 'Petite Pink'	Dwarf Pink
Ruellia peninsularis	Desert Ruellia
Salvia clevelandii	Chaparral Sage
Salvia greggi	Autumn Sage

REVISIONS		
#	Date	Comments
1	12/19/95	Additional Species
2	4/11/96	Additional Species

ARIZONA TRADITIONS
Surprise Village North

RECOMMENDED PLANT PALETTE

EXHIBIT "H"
(TWO OF TWO)

N O R T H

Botanical Name	Common Name
Shrubs:	
Salvia leucantha	Mexican Sage
Simmondsia chinensis	Jojoba
Sphaeralcea ambigua	Globemallow
Tecoma v. stans	Arizona Yellow Bells
Perennials/Groundcover/vines:	
Antigonon leptopus	Queen's Wreath
Baileya multiradiata	Desert Marigold
Bougainvillea sp. 'Barbara Karst'	Barbara Karst Bougainvillea
Dalea capitata	'Sierra Gold'™
Euphorbia rigida	Gopher Plant
Lantana camara	Trailing Yellow Lantana
Lantana montevidensis	Purple Trailing Lantana
Lantana 'New Gold'	'New Gold' Lantana
Mascagnia lilacaena	Purple orchid vine
Penstemon sp.	Penstemon
Verbena pulchella	Rock Verbena
Verbena rigida	Vervain
Accents/Cacti and Succulents:	
Agave vilmoriniana	Octopus Agave
Agave weberi	Smooth Edged Agave
Dasylirion wheeleri	Desert Spoon
Fouquieria splendens	Ocotillo
Hesperaloe parviflora	Red Yucca
Nolina microcarpa	Bear Grass
Opuntia basilaris	Beavertail Prickly Pear
Opuntia ficus-indica	Indian Fig Prickly Pear

REVISIONS		
#	Date	Comments
1	12/19/95	Additional Species
2	4/11/96	Additional Species

EXHIBIT "I"
Section 17.36.060; G. 1 & 2

G. Amendments to P.A.D. Approval.

1. Minor Changes. Minor changes in the location and placement of buildings may be authorized by the community development director and city engineer where unforeseen circumstances such as engineering requirements dictate such change. When in question, the community development director and the city engineer may determine whether the changes shall be classified as minor or major, or may refer the question to the planning and zoning commission, if they deem it necessary.

2. Major Changes. Major changes, such as alterations in structural types, in the shapes and arrangements of lots and blocks, in the allocation of open space or other land uses which increase density and/or intensity of the project, and all other changes which significantly affect the overall design or intent of the project shall be referred to the planning and zoning commission, after which the commission shall consider and shall either approve or deny the changes in the final development plan. If such changes are authorized, the developer shall submit a revised plan showing the authorized changes. Requirements of Section 17.36.040C and D shall apply to requests for major changes.

EXHIBIT "J"

The Villages at Surprise-North

A Planned Residential Development

DESIGN GUIDELINES

February 16, 1995
Revised February 23, 1995
Revised March 29, 1995
Revised May 9, 1996

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INTRODUCTION

A. Purpose and Intent.

These Design Guidelines have been prepared for the Villages at Surprise-North to assist in providing a high quality project. The Design Guidelines illustrate the desired character for future residential development. Aspects of the Design Guidelines address development, architecture, landscape, signage, and lighting. By guiding certain design elements throughout the Villages at Surprise-North, a unified community, compatible and complimentary to area development, will be provided.

It is not intended for these Design Guidelines to limit innovative design, but instead to protect owners, occupants and the community from undesirable or substandard design and development. The priority of development compliance is first with the Villages at Surprise-North PAD Preliminary Development Plan's requirements and restrictions and second with the Design Guidelines. The Design Guidelines should be considered through the development approval process.

B. Project Description.

The Villages at Surprise-North is located in Central Maricopa County in the City of Surprise. The Villages at Surprise-North is bounded on the south by Bell Road, on the north by the Union Hills alignment, on the west by Beardsley Canal, and on the east by the existing Happy Trails development.

DESIGN GUIDELINES

A. Site Development.

1. *Grading and Drainage*

- Any aesthetic landscape berming of individual lots shall not direct drainage onto adjacent lots.
- Berming of individual lots shall meet existing grade at a minimum of 2' before back of sidewalk or back of curb or property line. Grade transitions shall be even and smooth.
- Residential runoff shall be directed to the various open space retention areas which will serve as the major drainage and retention area for the community.
- Drainage swales shall be designed to minimize runoff velocities in order to protect sites from erosion.
- Grading shall be done to minimize erosion, on- or off-site. No slopes shall be steeper than 4 to 1, pursuant to the standards of the City of Surprise unless approved by a soils engineer.
- All excavation and fill areas shall be sufficiently compacted to prevent erosion problems.
- Any imported soil needed to create landscape berming shall be free of weeds and debris and shall be of equal quality of existing soils.
- Site grading design should complement and reinforce the architectural and landscape design character by screening undesirable elements such as loading and storage areas, by helping to reduce or encourage the perception of height

and mass of buildings, by providing reasonable transitions between on-site uses, and by providing elevation transitions between lots to encourage on-site and off-site views.

- All finished graded slopes shall be stabilized and planted with those plant materials listed in the plant palette.
- Retention areas on residential lots are discouraged. However, if this method is utilized, retention areas shall be located away from building foundations and utilized as grassy play areas, gardens or similar uses.
- Retention areas enclosed by solid walls and fences shall be prohibited.

2. *Setbacks*

- Building setbacks help to create view corridors and provide an open project feeling. Setbacks shall be as stated in the Villages at Surprise-North Planned Area Development (PAD) Preliminary Development Plan (PDP) document.
- Varied lot widths along a street frontage are encouraged to strengthen the character of the architectural theme.

3. *Lot Size and Coverage*

- Refer to the PDP for applicable lot sizes and lot coverage standards.

4. ***Parking Requirements***

- Parking lots shall include planted islands, a minimum of 5 feet in width, which shall be landscaped with both shrubs and trees. These trees and shrubs shall be maintained to assure adequate visibility and located within the parking areas to enhance the development. The intent of this parking area landscaping is to reduce the visual and physical impact of a "sea of parking" and to encourage a pedestrian-safe environment.

- Parking stall requirements shall follow the City of Surprise Zoning Code.
- Parking spaces shall be clearly defined by paint or contrasting paving material.
- All single family residential units shall have a minimum of one off-street space in addition to the garage spaces.
- Residential parking may be prohibited on the loop road collector street on either one side or both sides. Refer to the PDP document for street sections.
- Parking of boats, campers, trailers, etc., is not permitted within public or private view.

5. *Screening of Refuse Areas*

- Loading docks shall be screened from the right-of-way and adjacent residential properties. Screening techniques may include utilizing the building itself as a visual barrier, screen walls, utilizing landscaping to conceal activities, a grading plan which provides a below grade dock, or a combination thereof.
- Refuse areas shall be enclosed within a wall structure which has an average height of 6 feet. These enclosures are encouraged to abut the building's perimeter walls and be of the same materials. Isolated enclosures along the property's perimeter is discouraged.
- All enclosures must be provided with a solid gate and be of a size that shall accommodate all refuse generated between collection times.
- Loading areas shall not disrupt normal circulation of the site. No open storage of materials, supplies or equipment shall be permitted.

6. *Utility Structure Placement*

- All exterior on-site utilities, including, but not limited to, sewer, gas, and water lines, and electrical, telephone, cable television and communications wires and equipment, shall be installed and maintained underground.
- Mechanical equipment for non-residential buildings may be roof mounted but shall be appropriately screened.
- Roof mounted equipment for residential units shall be screened.
- Exterior transformers, utility pads, cable television, and telephone boxes are encouraged to be located out of view of the right-of-way and screened with vegetation.

B. Architecture.

Architectural guidelines will help to establish visual compatibility throughout the Villages at Surprise-North and assure an overall quality appearance. All structures in a neighborhood shall be of materials, colors, and styles that blend with or complement each other.

1. *General*

Style

Architectural Styles may vary from neighborhood to neighborhood but shall be cohesive throughout the Villages at Surprise-North. Styles may include, but are not limited to Southwest, Santa Barbara, Tudor, American Traditional, Cape Cod, etc. Within neighborhoods, diverse, but complimentary, styles are encouraged to prevent a "cookie cutter" type neighborhood. Innovation is encouraged.

Roofs

- Generally acceptable roof covering materials shall be asphalt shingles, wood shake shingles (only with larger than minimum side yard setback subject to approval by fire marshall), concrete tile, or clay tile.
- "Built-up" type roof covering materials shall be appropriately screened from view with roof parapets.
- Roof mounted equipment shall not be visible from any public street. Such equipment must be screened through the use of roof parapets or other appropriate screening.
- Roof parapets must be finished with compatible material and color to the building's skin and shall continue around all sides.
- Roof features, such as overhead screens, shade covers, patio roofs, and other similar structures, are encouraged and should flow out of the building form. These features shall be constructed of materials and color to match or complement the main roof.
- All vent pipe stacks, gutters, flues, and any other equipment protruding above the plane of the roof and visible from neighboring properties are discouraged and, to the extent they are necessary, must be painted and/or screened to match the roof.

Colors

- The predominant colors in the Villages at Surprise-North will be pastel or natural color tones.

- Trim colors shall not dominate the exterior appearance and shall be of compatible color as the major color. Roof colors shall not produce glare, such as being white, light colored aluminum, or reflective surface.

Accessory Buildings

- Accessory buildings are allowed pursuant to the requirements and restrictions of the PAD. Such buildings shall be painted a color to match or complement the main structure.

2. *Single Family Detached (SFD)*

- SFD uses shall be buffered from high traffic areas.
- SFD land uses will be designed in a manner which takes advantage of mountain peaks and other views.
- Adequate emergency service access shall be provided to all neighborhoods.
- Varied building setbacks are encouraged to soften the repetition from house to house.
- Landscape design can be used to enhance building setback variations.

3. *Single Family Attached (SFA)*

- Automobile and pedestrian areas shall be integrated by the minimization of vertical curbs. Rolled curbs shall be emphasized.
- Bollards, low walls and fences should be used to control traffic while maintaining a feeling of openness.
- Hardscape shall be used to break up the monotony of paving and define paving patterns or pedestrian paths.

- Site planning shall take advantage of mountain peaks and other views.
- SFA structures shall be buffered from high traffic areas.

4. *Overall Project*

- Interaction of residential, golf course/open space is encouraged through use of hardscape and trail systems.
- Visual access from roads and residential developments to facilitate exposure and security is recommended.
- Lighting shall be oriented to on-site uses to protect adjacent uses from unnecessary glare.
- Landscaping shall be used to break up otherwise uninterrupted building mass, frame views and connect with development on adjacent pads.
- Ancillary structures and service areas such as trash enclosures or loading docks shall be screened from view through the combination of landscaping and walls. Trash enclosures shall have closing, lockable doors.

C. Walls and Fences

When necessary for security, screening or to mitigate grading, walls can reinforce community identity and image. If not used carefully, however, walls can detract from the quality of open space. Walls should not be used simply to decorate property lines, with the exception of residential units. Acceptable fence materials shall include, but not be limited to, masonry, rails or pickets, stone, brick, metal, etc.

Guidelines:

- Residential developments requiring walls or fences around the parcel shall have the walls or fences installed by the builder prior to occupancy of any adjacent residences.
- Landscape berming is encouraged as an alternative and/or as a complement to screen walls.
- The texture, color, and form of walls adjacent to buildings shall harmonize with the building's design.
- Long, continuous lengths of screen wall at the same height are discouraged. Variations of height and form are encouraged.
- Perimeter walls should respect the right-of-way line but do not need to follow the alignment exactly.
- Walls and fences, under normal conditions, shall be a maximum of 6 feet, as measured from an adjacent grade, along rear and side lot lines and shall conform to City zoning ordinances and visibility triangles.
- When walls are located adjacent to a road for decorative or screening purposes, they shall be a maximum of 3 feet in height, conforming to City zoning ordinances and visibility triangles.
- Chain link fencing is not permitted for perimeter fencing. See the Zoning Ordinance for further restrictions.
- Walls and fences shall be constructed to City of Surprise engineering of design standards.

- Open fencing may be provided adjacent to open spaces, such as decorative block and wrought iron.

- Walls separating single family residential from cluster residential and non-residential shall be installed as part of the construction of whichever use is developed first.

- All parking lots adjacent to major arterial, the loop road, and minor roads shall be screened from the right-of-way by either walls, landscape, berms, or a combination of these. Screen walls shall be approximately 3 feet above the adjacent curb height and shall complement the building materials of building.

- The horizontal mass of continuance walls should be softened by landscape planting and vines.

- Walls built to screen ancillary structures shall complement the building materials of the principal structure.

D. Hardscape

Hardscape elements should be used in coordination with the architecture and landscape to provide a link between the street edge and individual developments. Attention to hardscape details can create a strong sense of community by relating developments and creating an overall theme. In addition, proper hardscaping can improve pedestrian safety, movement and visual enjoyment of public areas.

Patterned paving materials can be used in limited areas to emphasize entries and places of special interest. Utility lines should not be installed under such special materials if at all possible.

The places requiring this emphasis are as follows:

- community entries
- trail/road crossings
- plazas
- private walks
- village entries
- residential driveways
- cul-de-sac courts
- major intersections

Acceptable paving materials:

- Integrated color cement
- Brick
- Asphalt
- Native Stone
- Pre-cast interlocking pavers
- Cobbles
- Bomanite
- Combinations of the above

General Paving Guidelines:

- Near buildings, paving materials should be consistent with major intersection treatments.

- Painted paving surfaces other than those for traffic control and marking of parking areas within parking areas are prohibited.
- Use smooth materials to encourage movement and rough materials to slow movement down.
- Minimize the use of large areas of asphalt by combining the use of other materials as edges, walks, and entry areas.
- Limit the number of paving materials in one place to three.

Street Furniture:

Hardscape elements such as benches, bollards and trash receptacles should highlight the community themes as well as serve functional uses. Materials used in the construction of street furniture should reflect the surrounding architecture, walls, and fences and paving materials. Street furniture should be limited to a common design throughout each individual village and should tie into the overall theme.

General Guidelines:

- Street furniture should be conservative in use of sidewalk space, and maintain a clear width to accommodate pedestrian flow.
- Street furniture should be constructed of long-wearing, vandal- resistant materials capable of withstanding climatic conditions.
- To the greatest extent possible, street furniture should be integrated into landscape areas and off street amenity areas.
- Street furniture should consider the safety, comfort and convenience of the user, including the handicapped.

- Furniture should not obstruct stairs, ramps, building entrances or exits, or loading areas. Furniture will be placed to minimize policing or security hazards.

E. Landscape

Together with the Land Use Plan, the Landscape Concept is a central element in the design of an overall community identity. The landscape and open space concept will establish a community framework for all common and public areas within The Villages at Surprise-North. The objective of the landscape is to screen, accent, soften, and improve the visual character of the Villages at Surprise-North. All plant material should be drought resistant and water conserving. Drip irrigation systems are required, except for turf areas.

Streetscape is one of the most visible elements in a community. A consistent streetscape is one of the strongest cohesive features that helps portray the image of the community to the public. Landscape should be used:

- to soften, but not obstruct, the architecture;
- for screening;
- aesthetically as a reminder of the natural environment in which we live; and

Plant material listed on the Recommended Landscape Palette, which is included in the Appendix to the PDP, should be used throughout the Villages at Surprise-North and reflect the principles of xeriscape. Subdivision development shall develop similar plant lists to maintain cohesiveness throughout the Villages at Surprise-North.

Guidelines

- The minimum plant sizes are as follows:

Type	General Locations	Entries and Landscape Features
Trees	15 gallon	24" box
Shrubs	1 gallon	5 gallon
Groundcovers	1 gallon	1 gallon

- All plant material shall be provided with fully automated drip irrigation systems. Plants should be selected to fit naturally into their space to avoid the need for excessive trimming and allow normal growth.
- Water-conserving devices, such as drip irrigation for all plant materials except turf areas, must be utilized.
- Backflow prevention devices shall be fully screened.
- Exposed earth is not permitted due to erosion and dust concerns except in planting beds.

The following landscape standards shall apply to streetscape and residential site development.

1. Streetscape

In order to achieve an overall circulation system and provide a strong community structure and neighborhood identity, the landscape design shall be of consistent quality and shall clearly define streetscapes, major entries and intersections.

Loop Road

The landscaping along the loop road collector street and trail system shall be a xeriscape landscape accented with native canopy trees with desert planting below. Integration with existing Bell Road landscaping shall occur.

Neighborhood Streets

The landscaping along neighborhood streets should reflect the landscaping of the roadways to provide cohesiveness throughout the project.

Major Entries

A formal (linear) planting of trees and landscaping is intended to create a visual sense of arrival.

2. ***Residential Site Development***

- Landscaping shall comply with the Villages at Surprise-North Guidelines.
- Design shall reflect the character of the Villages at Surprise-North theme.
- Individual developments' landscape designs shall be integrated with streetscapes.

At least two trees are required in the front yard of each single family residential unit, and at least one tree is required in the front yard of each cluster residential unit. Shrubs will be required in all front yards and will be utilized to soften and screen. Groundcover may be turf, decomposed granite, or other natural rock material. All bare earth must be covered by an approved organic material to provide a neat, dust-free appearance.

All completed, sold and unsold spec dwelling units must have the front yards landscaped and street trees planted within the 90 days of occupancy. Prior to landscaping, all yards must be maintained in a neat, weed-free, dust-free condition.

All landscaping must reflect the character of the development:

- Rocks and boulders, patios, sidewalks, railroad ties, telephone poles, etc., may be used to supplement and create imaginative landscaping design.
- Artificially colored rock yards are not acceptable at any location.

3. Open Space/Retention Areas

- Landscaping shall comply with City of Surprise Codes and Ordinances. Design shall reflect the character of the Villages at Surprise-North theme.

F. Lighting

Light is used for both aesthetics and safety reasons. The fixtures themselves should be consistent with the overall image of the Villages at Surprise-North. They should be attractive to look at during the day, as well as be functional at night. For streets, parking lots, and walkways, lighting is primarily for security. An effective economical combination of ground and streetlight level fixtures shall be used. Landscape and architectural lighting is primarily for aesthetics. All lighting shall be compatible with the design character of the project. No bright, colored or flashing lights will be permitted.

G. Signage

All signs within The Villages at Surprise-North should be designed to provide a consistent reinforcement of The Villages at Surprise-North character. Signs must communicate not only specific information but should, in themselves, add to the attractiveness of the area.

Signs should advertise a place of business or provide directions and information. Signs shall be architecturally attractive and contribute to the retention of character of the area. Signs should not compete with each other or dominate the setting via inconsistent

height, size, shape, number, color, lighting or movement. All signage must comply with the PAD signage provisions.

Guidelines:

- Signs shall not be located within the right-of-way.
- All signs shall be kept in good repair.
- All wires, haulouts, transformers, and raceways must he concealed. Signs shall not be supported by guy wires or braces.
- Colors shall relate to other signs in the area to avoid clashing contrasts.
- Illumination shall be concealed. No flashing or blinking lights are permitted. No animated or sound emitting signs are permitted.
- No fluorescent or iridescent colors are permitted.
- No vehicular signs are permitted for advertising, such as on trucks, vans, automobiles, or trailers.
- No portable signs are permitted.
- Billboards and inflatable signs are not allowed
- Where possible, integrate signage into either a perimeter wall or the landscape, such as berms. Signs shall not restrict visibility at intersections, parking areas, or driveways. Roof signs are not allowed. Painted window signs are highly discouraged. If used, no more than 10 percent of the window area may be painted and it must be on the interior.

1. Entry Monument Signs

Master community signs shall be designed and installed by the developer. These signs establish the theme for the entire development and all other signs should reflect the master sign standard. Each development sign, as a small portion of the whole project, will

contribute significantly to the overall image.

- Subdivision signs shall be constructed of permanent materials.

2. *Directional Signage*

- There shall be no more than two directional signs per driveway entrance to a lot, parcel or multiple use lot or parcel. Only one of these signs may include business identification. There shall be no limit on the number of directional signs interior to a site which do not include business identification.

- No directional sign shall be greater than 6 sq. ft. in area and have a height greater than 3 feet above grade. No more than 25 percent of the area of a directional sign may be devoted to business identification. Such area shall not be assessed as business identification sign area.

3. *Open House Directional Signs*

- Open house directional signs may be provided pursuant to Article IX, Section 5 of the City's current Ordinance 85-8.

- "Open House" or similar "For Sale" signs in excess of the above Article IX, Section 5, Ordinance 85-8 criteria shall not be placed by either homebuilders or resale sellers.

H. Maintenance

Maintenance of all infrastructure is a necessary key to the continued quality appearance of the Villages at Surprise-North. Maintenance applies to buildings and other structures, paving and hardscape, landscape, and all other site amenities.

Guidelines:

- All improvements shall be kept in good and sufficient repair.
- Plants shall be maintained in a healthy and growing condition. Fertilization, cultivation, and natural looking pruning shall occur on a regular basis and shearing of plant material shall be minimized.
- All trash and weeds shall be removed on a regular basis.
- Dead plants shall be removed and replaced with a like species within ten working days, weather permitting.
- The irrigation system shall be maintained regularly to avoid plant and water loss.
- Lawns shall be kept mowed.
- Damages to any improvements shall be repaired as promptly as the extent of the damage shall allow.

I. Machinery and Equipment

No machinery, fixtures, or equipment of any type, including, but not limited to, heating, cooling, air conditioning and refrigeration equipment, and clotheslines, may be placed on any lot or parcel without screening or concealment from view of neighboring or public property. The screening or concealment shall be sold and integrated architecturally with the design of the building or structure, shall not have the appearance of a separate piece or pieces of machinery, fixtures, or equipment, and shall be constructed and positioned in such a manner so it is level and plumb with horizontal and vertical building components and shall be structurally stable in accordance with sound engineering principles.

Ground mounted air conditioning units shall be concealed by a solid enclosure on all sides visible to neighboring property.

All pool equipment shall be screened from off-site public view.

J. Solar Panels and Equipment

Solar energy devices may not be visible from public view.

Roof mounted solar panels and equipment must match the roof material. Panels must be an integrated part of the roof design and mounted directly to the roof plane. Solar units must not break the roof ridge line and must not be visible from view. Roof mounted hot water storage systems must not be visible from neighboring properties. Tacker type systems will be allowed only when not visible from neighboring property.

The criteria for screening set forth in Section I "Machinery and Equipment" shall apply to solar panels and equipment.

K. Exterior Accessories

1. Antennas

- Exterior television, radio, or other antenna or dishes of any kind shall not be visible from the street.
- Concealment of antennas in non-residential areas will be required, where practical.
- Cluster dwelling units must either have a television antenna installed and concealed therein when constructed or must be served by a master system.

2. Amplifier

- No radio, stereo, television, broadcast, or loudspeaker unit, and no

amplifier of any kind, may be placed upon or outside, or be directed to the outside, of any building in residential areas in a manner which would be disruptive to any such area.

3. *Basketball Backboards*

- When a basketball backboard is installed structurally on a building or structure, the backboard must be painted to match the color of the trim or roof.

4. *Flagpoles*

- Flagpoles shall be limited to a height of 20 feet in residential areas.
- Flagpoles at the project entry shall be permitted to a maximum height of 30 feet subject to Administrative Review and Approval when shown in context with mature adjacent complementary landscape materials.

5. *Utility and Service Lines*

- No gas, electric, power, telephone, water, sewer, cable television, or other utility or service lines of any nature or kind may be placed, allowed, or maintained upon or above the ground on any lot or parcel, except to the extent, if any, underground placement may be prohibited by law or would prevent the subject line from being functional; provided, however, above ground service pedestals, splice boxes, switch cabinets, and transformers will be permitted where required for public utilities or the landscaping of common areas.

6. *Clothes Drying Facilities*

- All clothes drying facilities must be located and maintained exclusively within a fenced service yard or otherwise concealed from the view of neighboring or public property.

7. Additions or Alterations

- Any addition or alteration to any building, structure, lot, or parcel must, unless the additions and alterations are not visible from neighboring properties or public properties, not violate or conflict with these Guidelines.

L. Garbage

- No garbage or trash may be placed on any lot or parcel except in covered containers meeting the specifications of the City of Surprise.

- Rubbish, debris, and garbage shall not be allowed to accumulate. Each owner shall be responsible for removal of rubbish, debris, and garbage not only from his lot or parcel but also from all public right-of-way either fronting or siding his lot or parcel, excluding (a) public roadway improvements, and (b) those areas on a Tract Declaration or subdivision plot to be maintained by the City of Surprise.

M. Window Treatment.

- No aluminum material or other reflective material may be installed in windows.

- Exterior window coverings or treatments used to shelf or decorate openings must be compatible, with respect to materials and color, with the design guidelines applicable to the structure on which the coverings or treatments are being placed.

USE OF DESIGN GUIDELINES

These guidelines shall serve as a general guide regarding development within the Villages at Surprise-North PAD. They are not CC&R's and they are not intended to be nor shall they be construed to be rigid or inflexible. Instead, they are a flexible guide to be considered by the developer, builders, residents, etc., of the PAD and by the City to achieve and maintain the Villages at Surprise-North as a compatible, cohesive, and high quality development. The Design Guidelines are issues and concepts that the developer, home builders, and others should consider in preparing their plans for the Villages at Surprise-North. Non-satisfaction of Design Guidelines is not grounds for rejecting a plan, but the inclusion or recognition of such issues and concepts in such plans where reasonable and appropriate is encouraged and may be considered by the City in its consideration of such plans.

RECOMMENDED LANDSCAPE PALETTE

Botanical Name	*Common Name*
Trees:	
Acacia aneura	Mulga
Acacia salicina	Willow Acacia
Acacia smallii	Sweet Acacia
Cercidium floridum	Blue Palo Verde
Cercidium praecox	Palo Brea
Chilopsis linearis	Desert Willow
Dahlbergia sissoo	Sissoo Tree
Fraxinus velutina 'Rio Grande'	Fan-Tex Ash
Jacaranda mimosifolia	Jacaranda
Lysiloma microphylla var. thornberi	Desert Fern
Phoenix dactylifera	Date Palm
Pinus canariensis	Canary island pine
Pinus eldarica	Eldarica pine
Pinus halepensis	Aleppo Pine
Pinus roxburghii	Chir pine
Pistachia chinensis	Chinese pistach
Pithecellobium flexicaule	Texas Ebony
Prosopis chilensis	Chilean Mesquite
Prosopis glandulosa	Honey Mesquite
Prosopis juliflora	Native Mesquite
Pyrus calleryana 'Bradford'	Bradford Pear
Ulmus parvifolia	Evergreen Elm
Shrubs:	
Buddleia marrubifolia	Woolly Butterfly Bush
Caesalpinia mexicana	Mexican Yellow Bird of Paradise
Caesalpinia pulcherrima	Mexican Red Bird of Paradise
Calliandra californica	Baja Fairyduster
Cassia phyllodenia	Silverleaf Cassia
Convolvulus cneorum	Silverbush Morning Glory
Cordia boissieri	Texas Olive
Cordia parvifolia	Littleleaf Cordia
Dalea frutescens	Black Dalea
Dalea pulchra	Pea Bush
Dodonea viscosa	Green Hopbush
Encelia farinosa	Brittlebush
Justicia specigera	Mexican Honeysuckle
Leucophyllum frutescens	'Green Cloud'™
Leucophyllum laevigatum	Chihuahuan Sage
Leucophyllum zygophyllum	'Cimarron'™
Myrtus communis 'Boetica'	Twisted Desert Myrtle
Nerium oleander 'Petite Pink'	Dwarf Pink

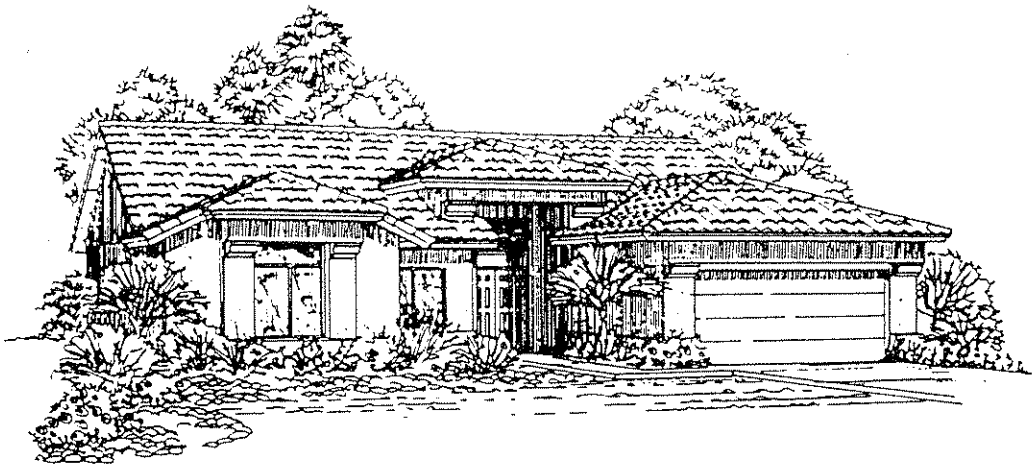
Botanical Name	*Common Name*
Shrubs (continued):	
Ruellia peninsularis	Desert Ruellia
Salvia clevelandii	Chaparral Sage
Salvia greggi	Autumn Sage
Salvia leucantha	Mexican Sage
Simmondsia chinensis	Jojoba
Sphaeralcea ambigua	Globemallow
Tecoma v stans	Arizona Yellowbells
Perennials/Groundcover/Vines:	
Antigonon leptopus	Queen's Wreath
Baileya multiradiata	Desert Marigold
Bougainvillea sp. 'Barbara Karst'	Barbara Karst Bougainvillea
Dalea capitata	'Sierra Gold' ™
Euphorbia rigida	Gopher Plant
Lantana camara	Trailing yellow lantana
Lantana montevidensis	Trailing purple lantana
Lantana 'New Gold'	'New Gold' Lantana
Mascagnia lilacaena	Purple orchid vine
Penstemon sp.	Penstemon
Verbena pulchella	Rock Verbena
Verbena rigida	Vervain
Accents/Cacti and Succulents:	
Agave vilmoriniana	Octopus Agave
Agave weberi	Smooth Edged Agave
Dasylirion wheeleri	Desert Spoon
Fouquieria splendens	Ocotillo
Hesperaloe parviflora	Red Yucca
Nolina microcarpa	Bear Grass
Opuntia basilaris	Beavertail Prickly Pear
Opuntia ficus-indica	Indian Fig Prickly Pear

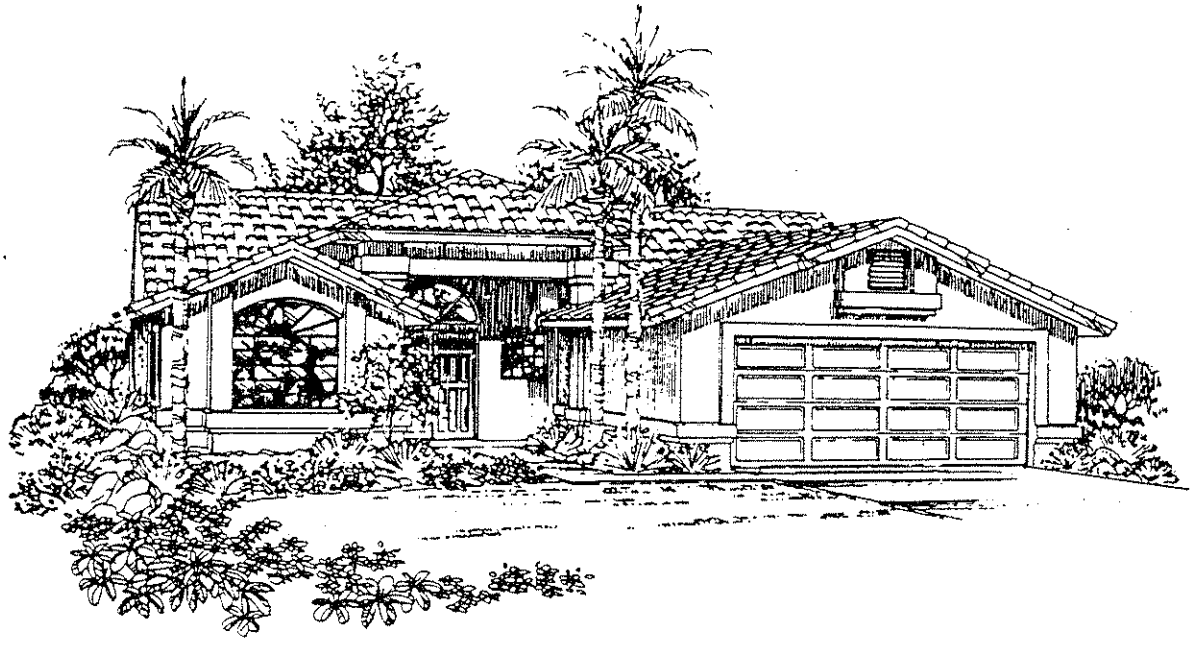
269620

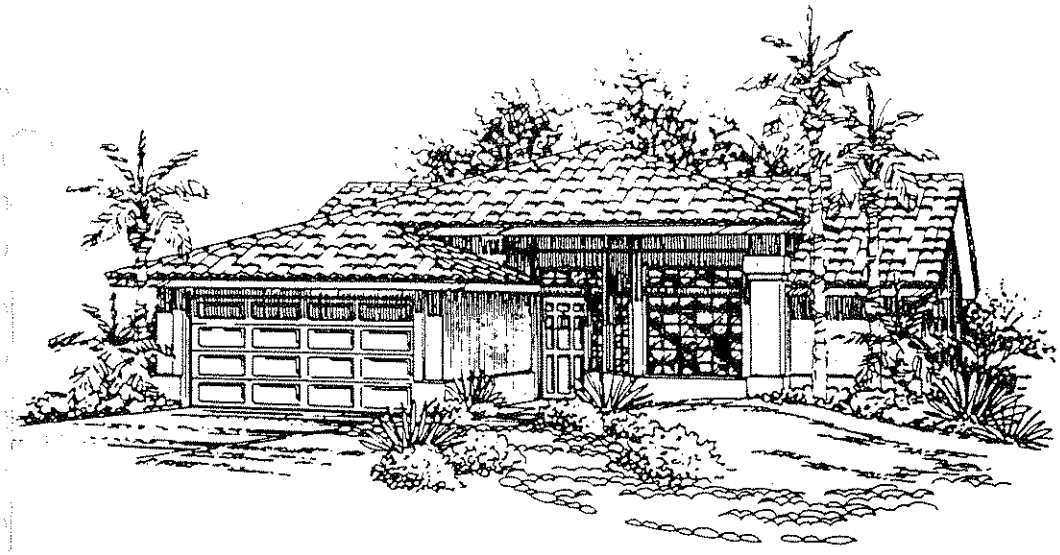
THE VILLAGES
AT SURPRISE
Surprise Village Company

SINGLE FAMILY
E X H I B I T S

EXHIBIT "K"
(ONE OF THREE)
N O R T H



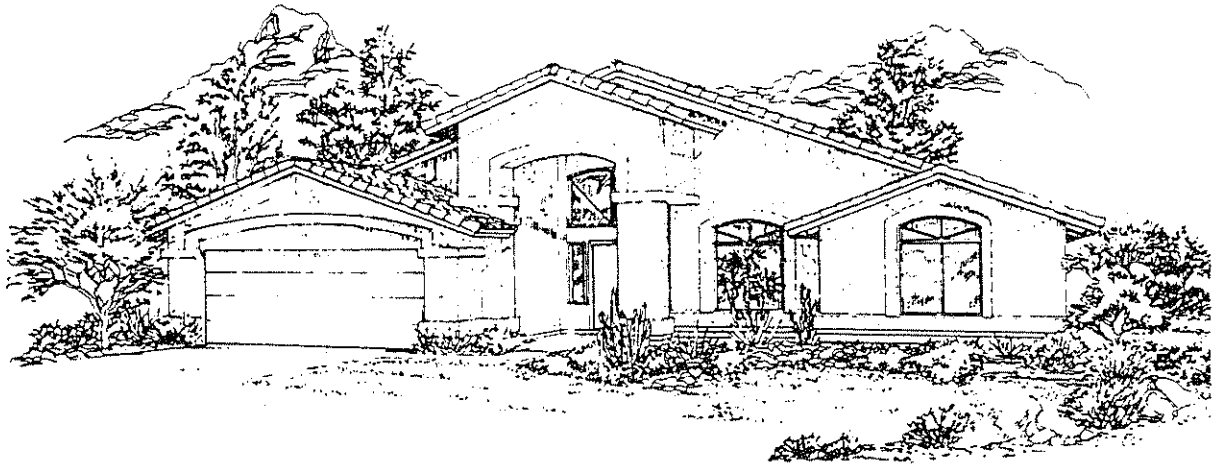


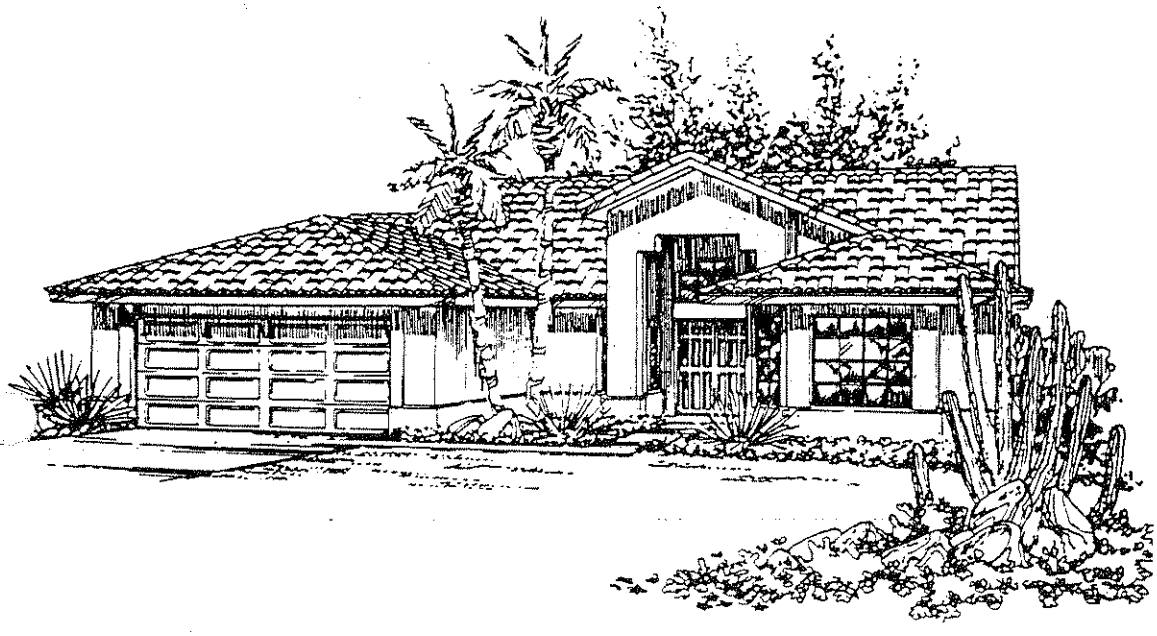


THE VILLAGES
AT SURPRISE
Surprise Village Company

SINGLE FAMILY
E X H I B I T S

EXHIBIT "K"
(TWO OF THREE)
N O R T H

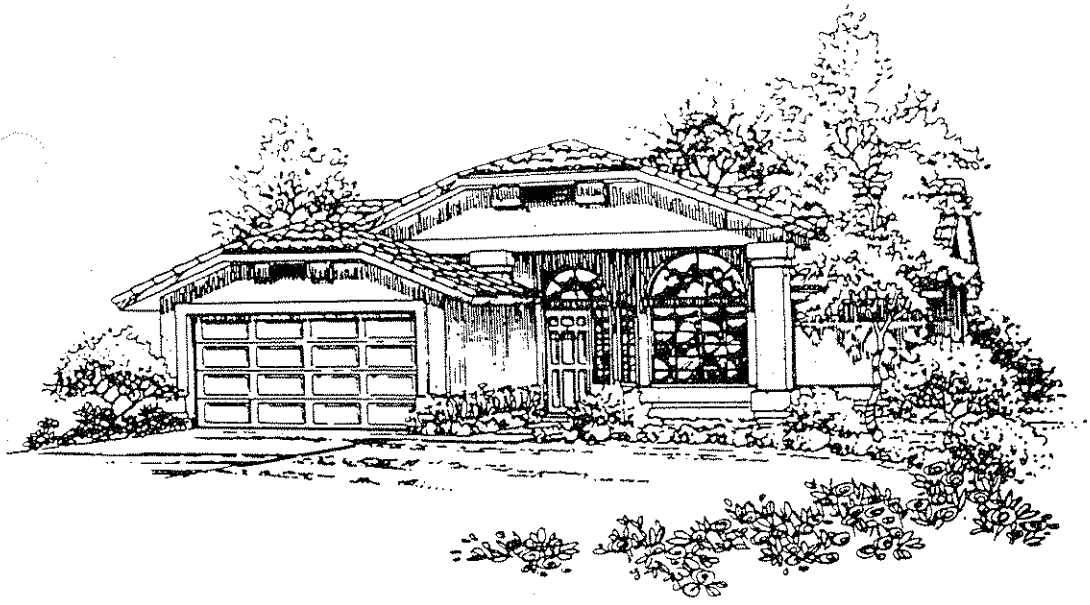


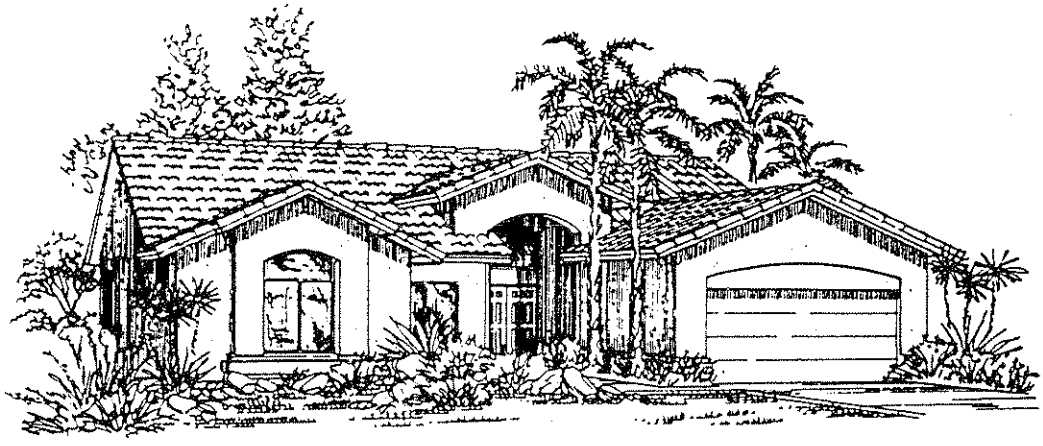


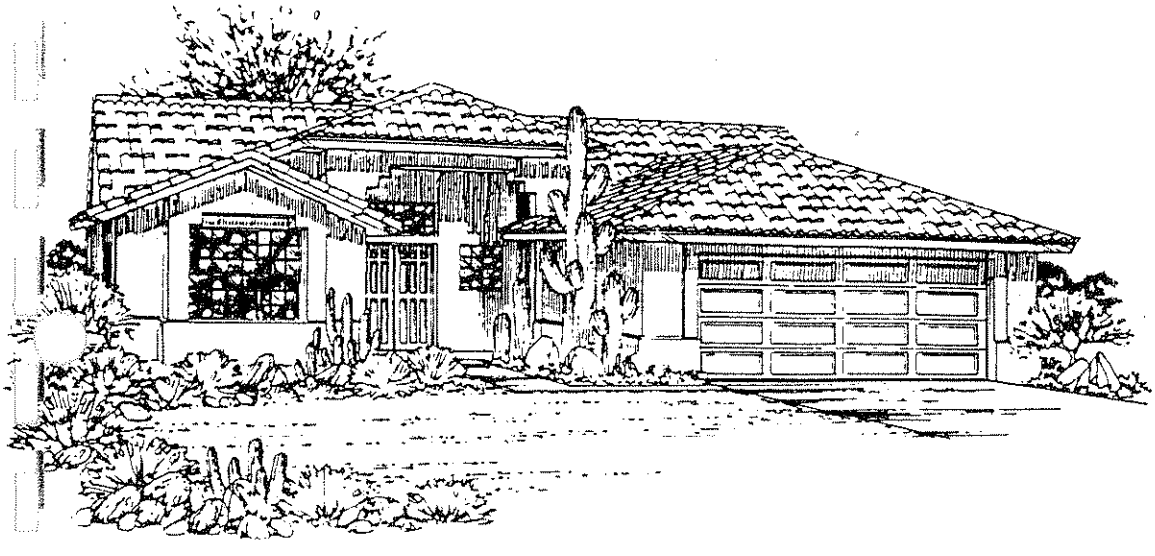
THE VILLAGES
AT SURPRISE
Surprise Village Company

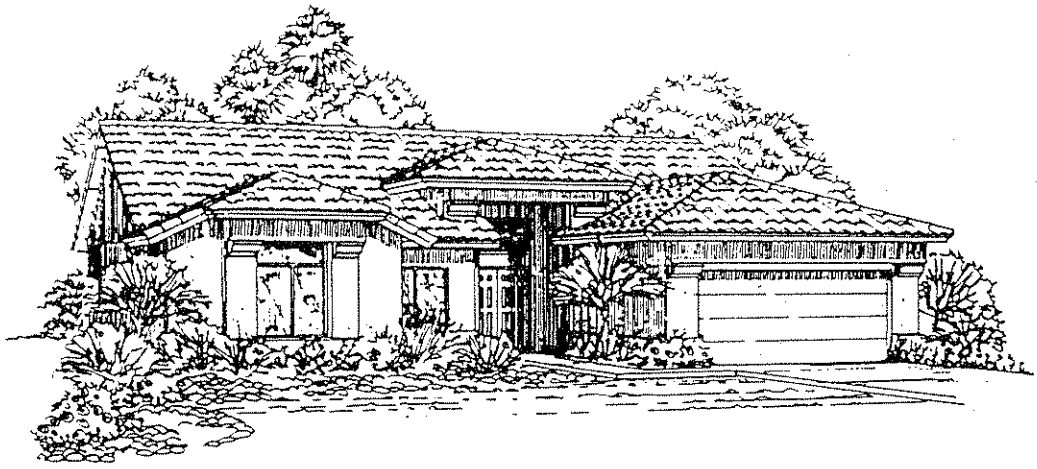
SINGLE FAMILY
E X H I B I T S

EXHIBIT "K"
(THREE OF THREE)
N O R T H





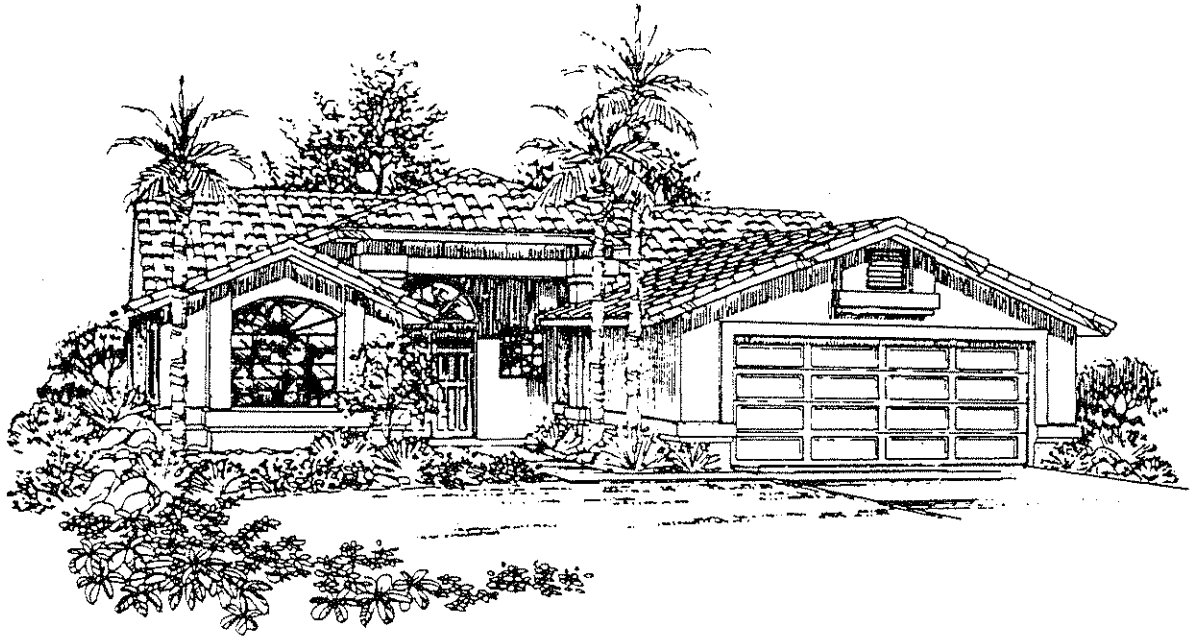


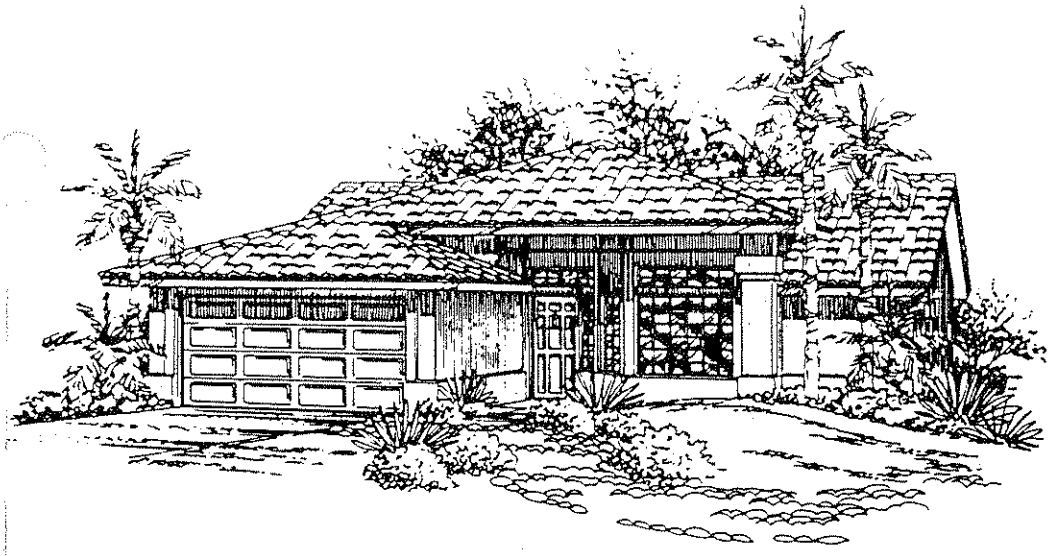


THE VILLAGES
AT SURPRISE
Surprise Village Company

SINGLE FAMILY
E X H I B I T S

EXHIBIT "K"
(ONE OF THREE)
N O R T H

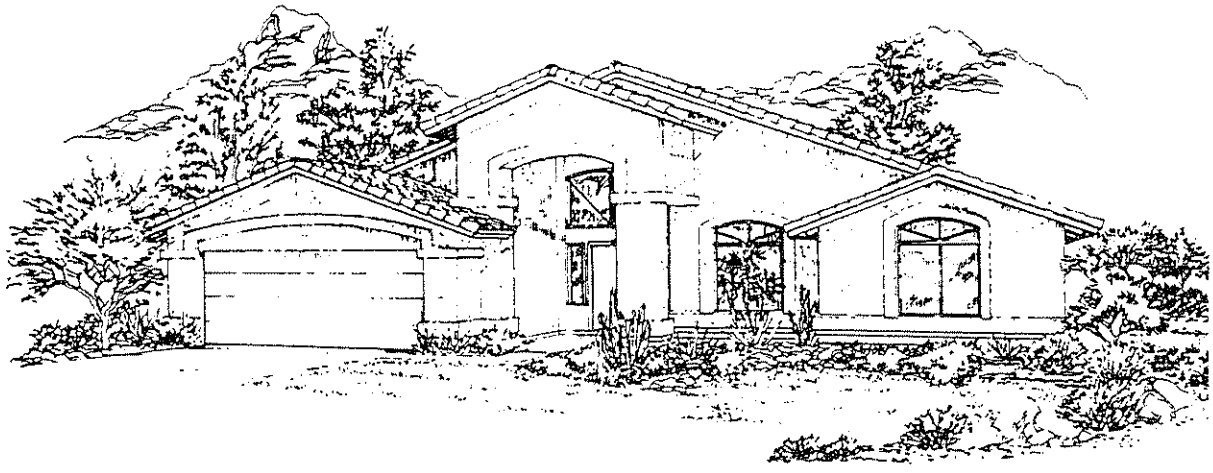


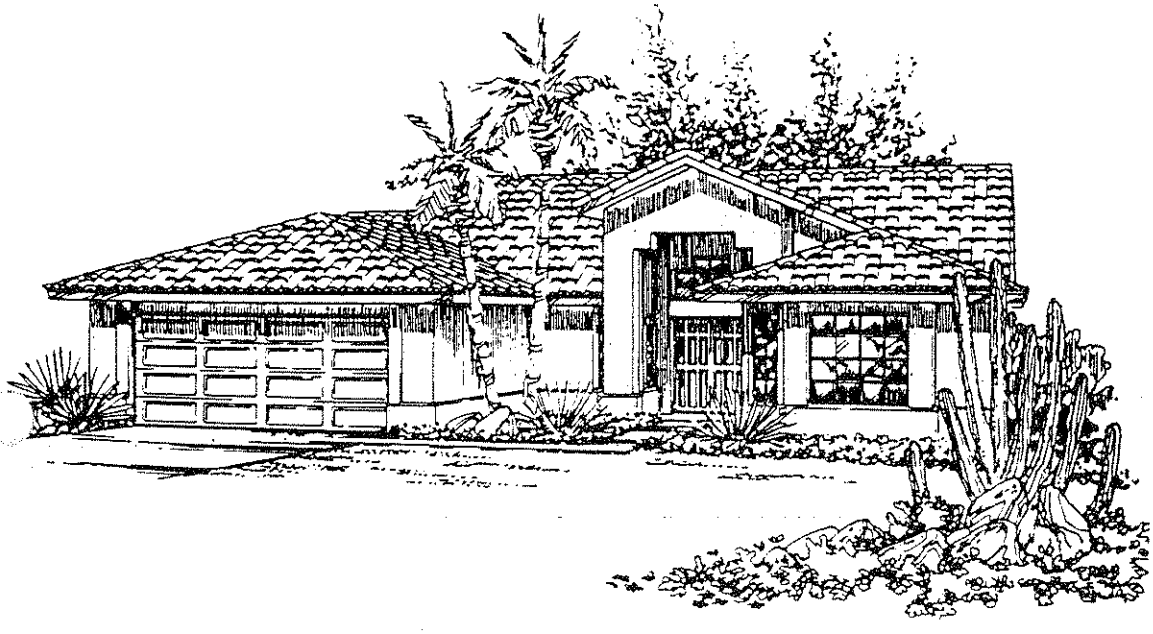


THE VILLAGES
AT SURPRISE
Surprise Village Company

SINGLE FAMILY
E X H I B I T S

EXHIBIT "K"
(TWO OF THREE)
N O R T H

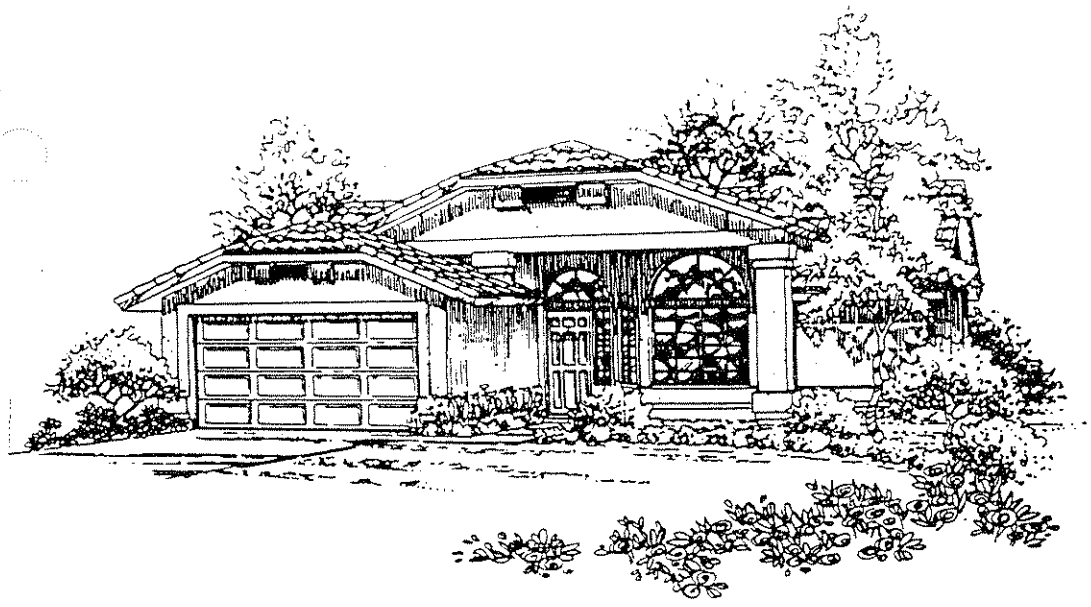


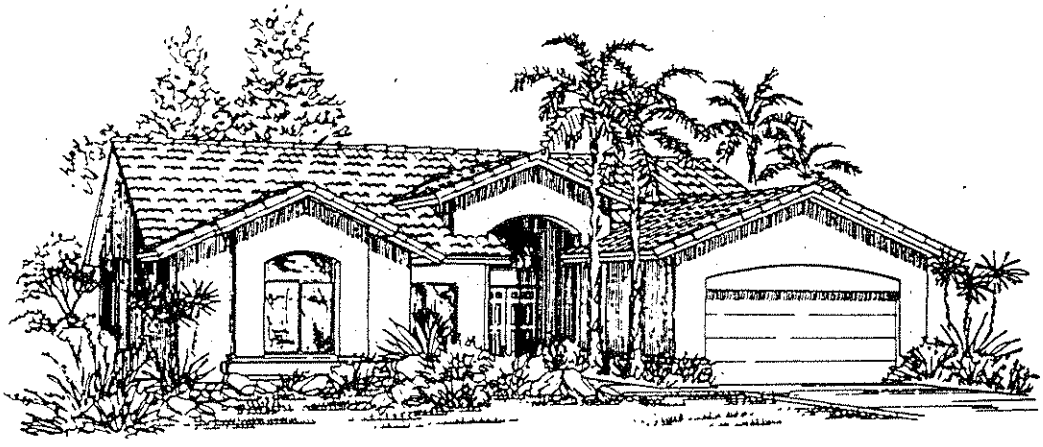


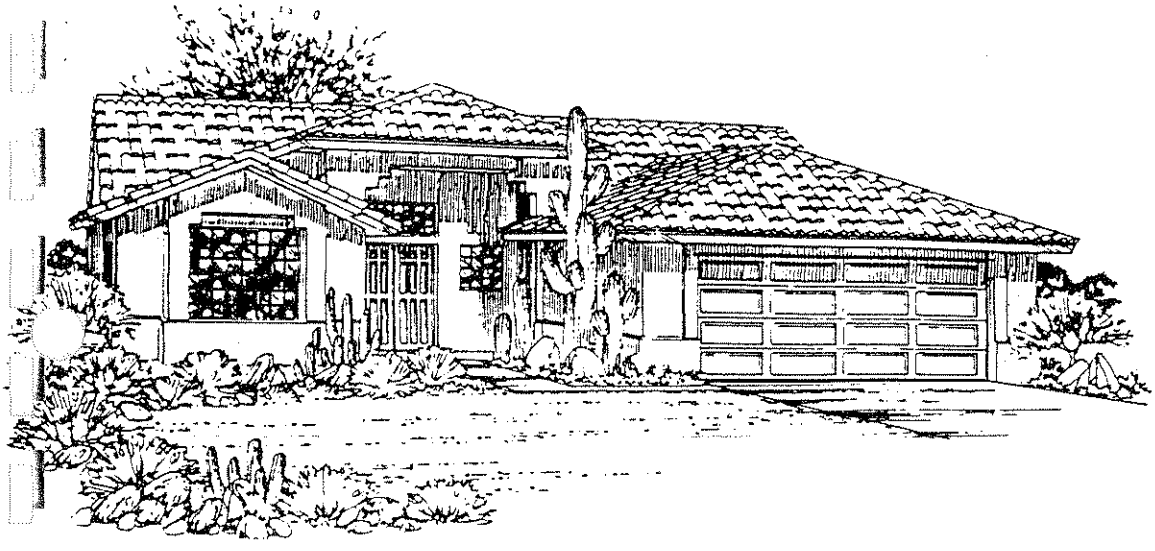
THE VILLAGES
AT SURPRISE
Surprise Village Company

SINGLE FAMILY
E X H I B I T S

EXHIBIT "K"
(THREE OF THREE)
N O R T H







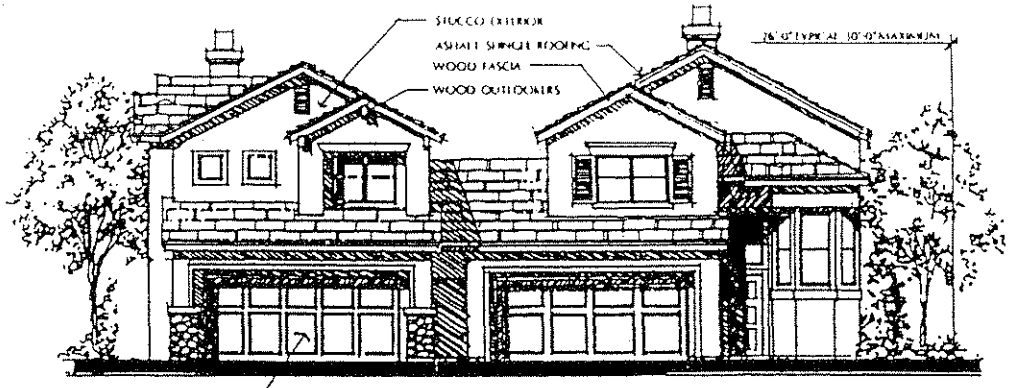
THE VILLAGES AT SURPRISE

Surprise Village Company

CLUSTER HOUSING EXHIBITS

EXHIBIT "L"
(ONE OF FOUR)

NORTH



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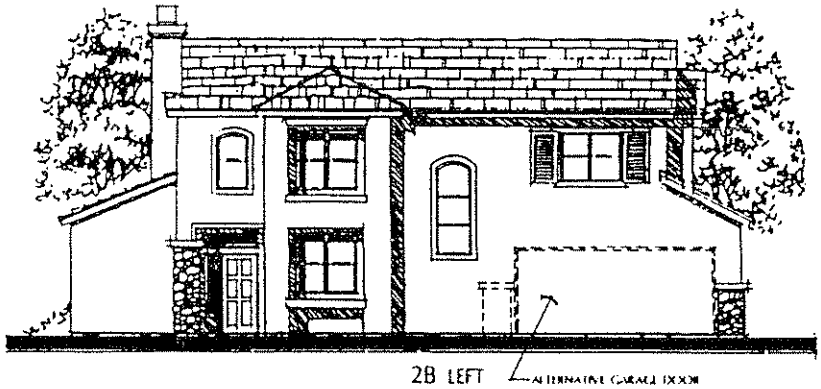

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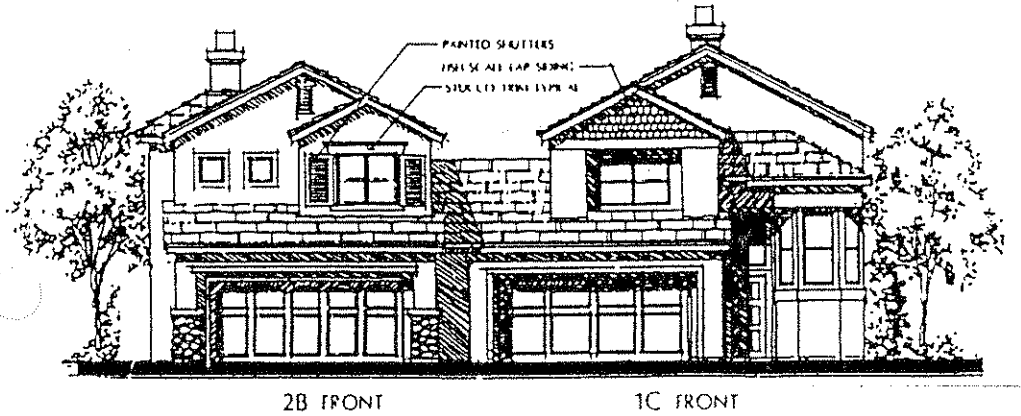
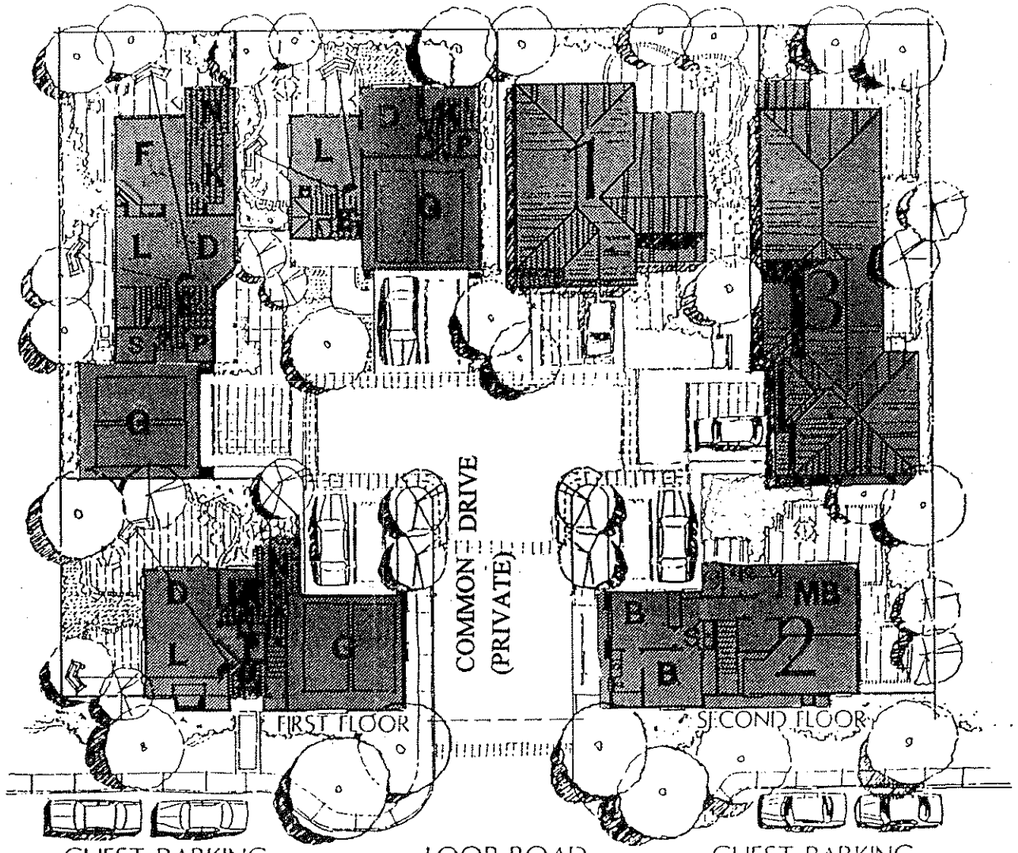


2B FRONT 1C FRONT

REVISIONS		
#	Date	Comments
1	02/15/95	Additional satellite
2	02/23/95	Title revision
3	03/24/95	Public/private designations; product

DETACHED CLUSTER



THE VILLAGES
AT SURPRISE
Surprise Village Company

CLUSTER HOUSING
EXHIBITS

EXHIBIT "L"
(TWO OF FOUR)

NORTH

REVISIONS		
#	Date	Comments
1	02/15/95	Additional exhibits
2	02/23/95	Title revision
3	03/24/95	Public/private designations; product

2B 2A

VIEW FROM LOOP ROAD

1A 1B

VIEW AT CLUSTER

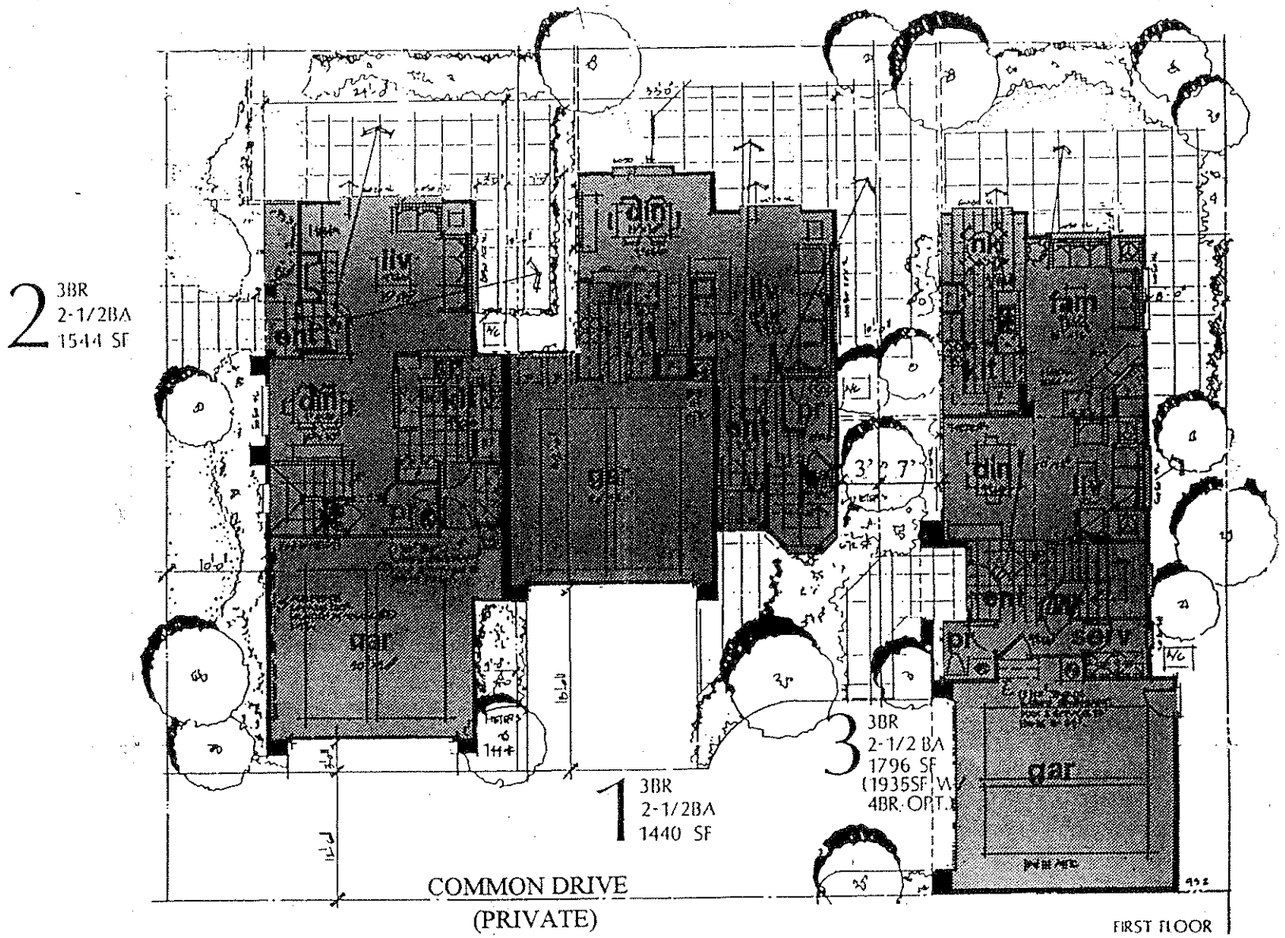
ATTACHED CLUSTER

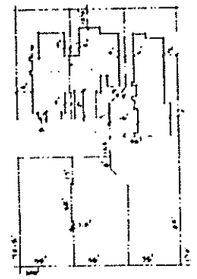
THE VILLAGES AT SURPRISE
Surprise Village Company

CLUSTER HOUSING EXHIBITS

EXHIBIT "L"
(THREE OF FOUR)

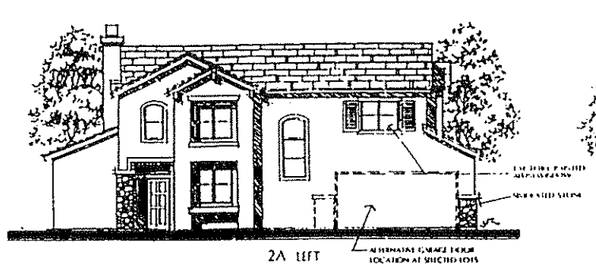
NORTH





CLUSTER LOT LAYOUT

REVISIONS		
#	Date	Comment
1	02/15/95	Additional exhibits
2	02/23/95	Title revision
3	03/24/95	Public/private designations; project



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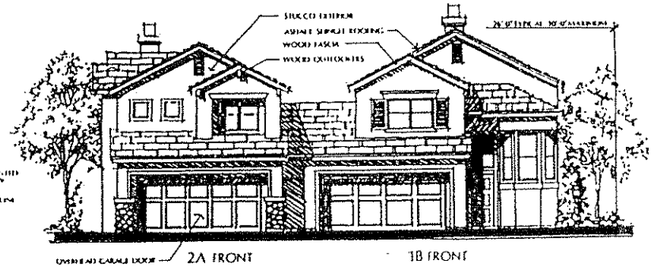

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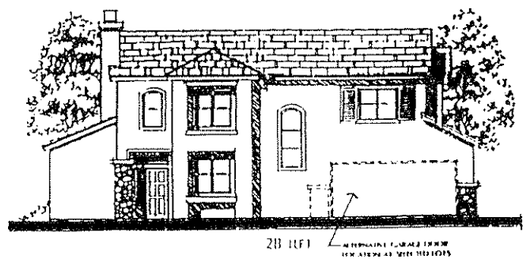

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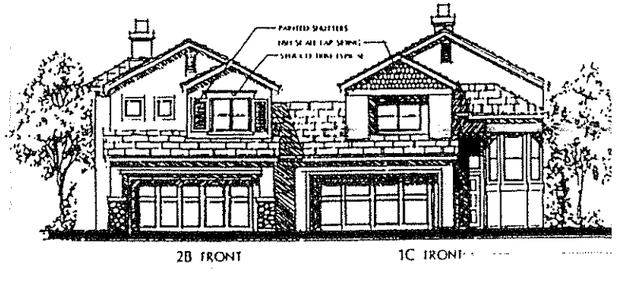

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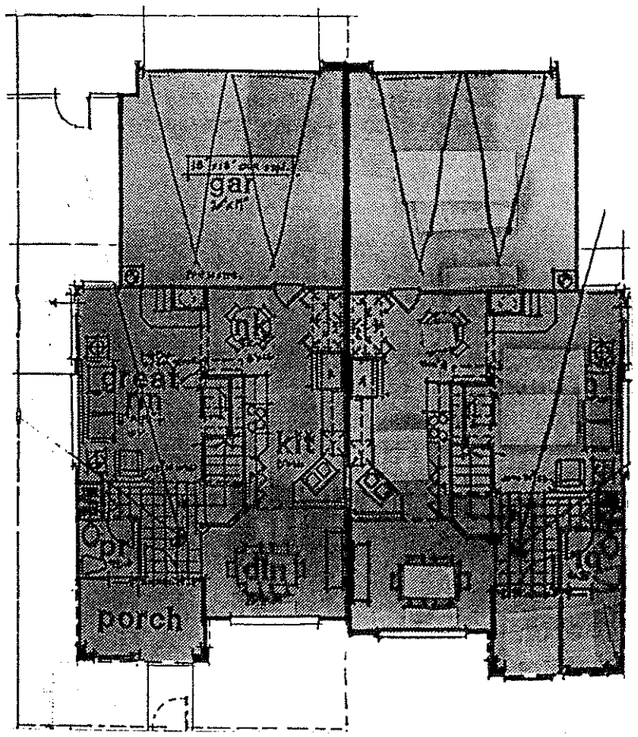
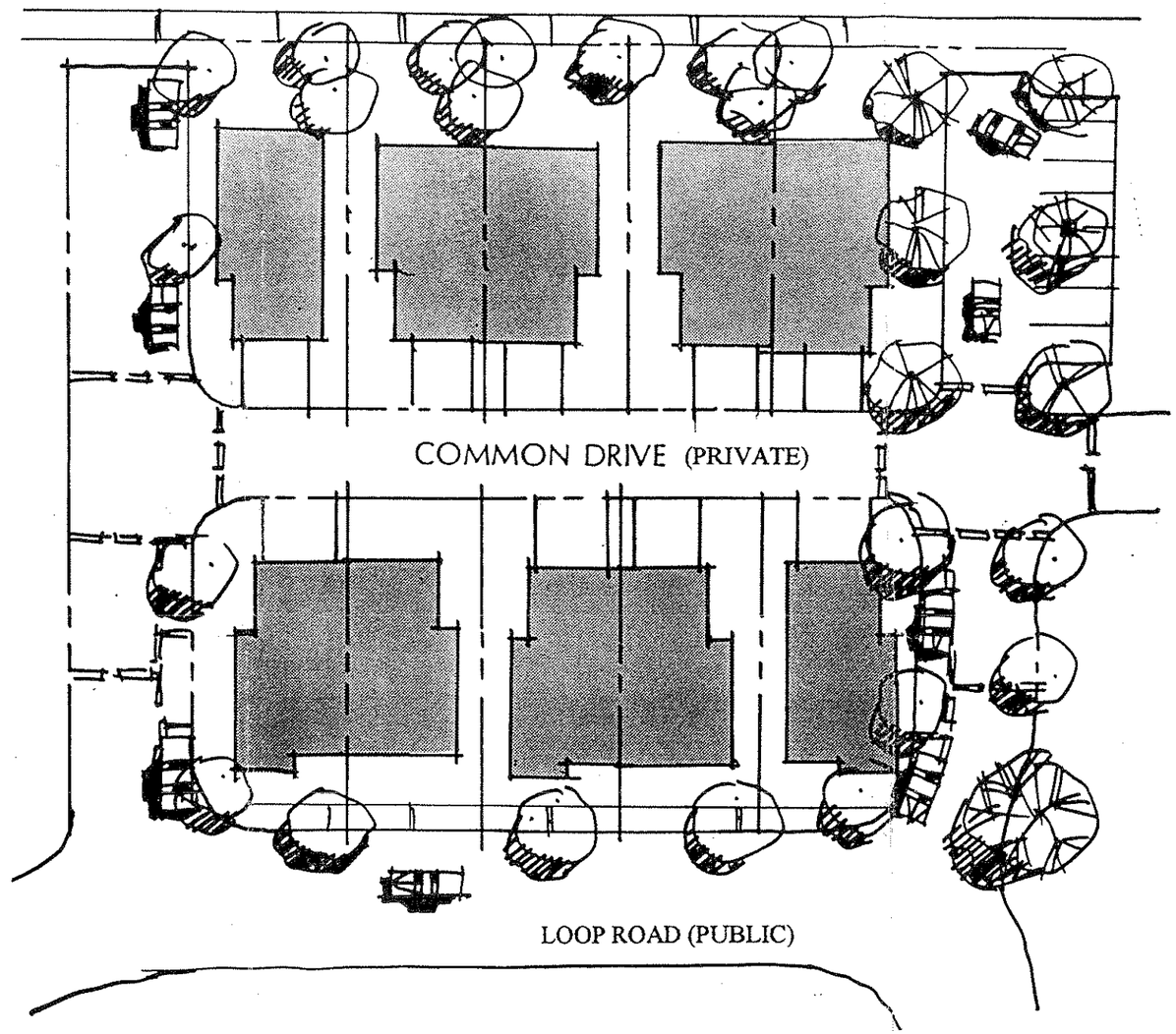




THE VILLAGES
AT SURPRISE
Surprise Village Company

CLUSTER HOUSING
EXHIBITS

EXHIBIT "L"
(FOUR OF FOUR)

NORTH

REVISIONS		
#	Date	Comments
1	02/15/95	Additional exhibits
2	02/23/95	Title revision
3	03/24/95	Pedicle/private designations; product

SINGLE FAMILY
COLLECTOR FRONTAGE

SETBACK NOTES:

Front-Yard Setback:

- All structures shall maintain a front-yard setback of 15', measured from back-of-curb.
- Front-loaded garages shall maintain a 20' setback, measured from back-of-sidewalk. Side-loaded garages shall maintain a 15' setback, measured from back-of-curb.

Side-Yard Setback:

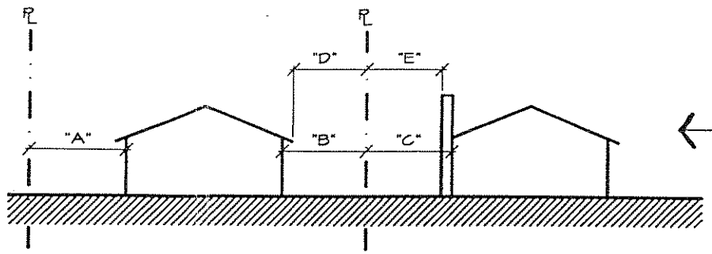
- The total of two side-yards on one lot shall be 10' with no projection closer than 3' to the property line.

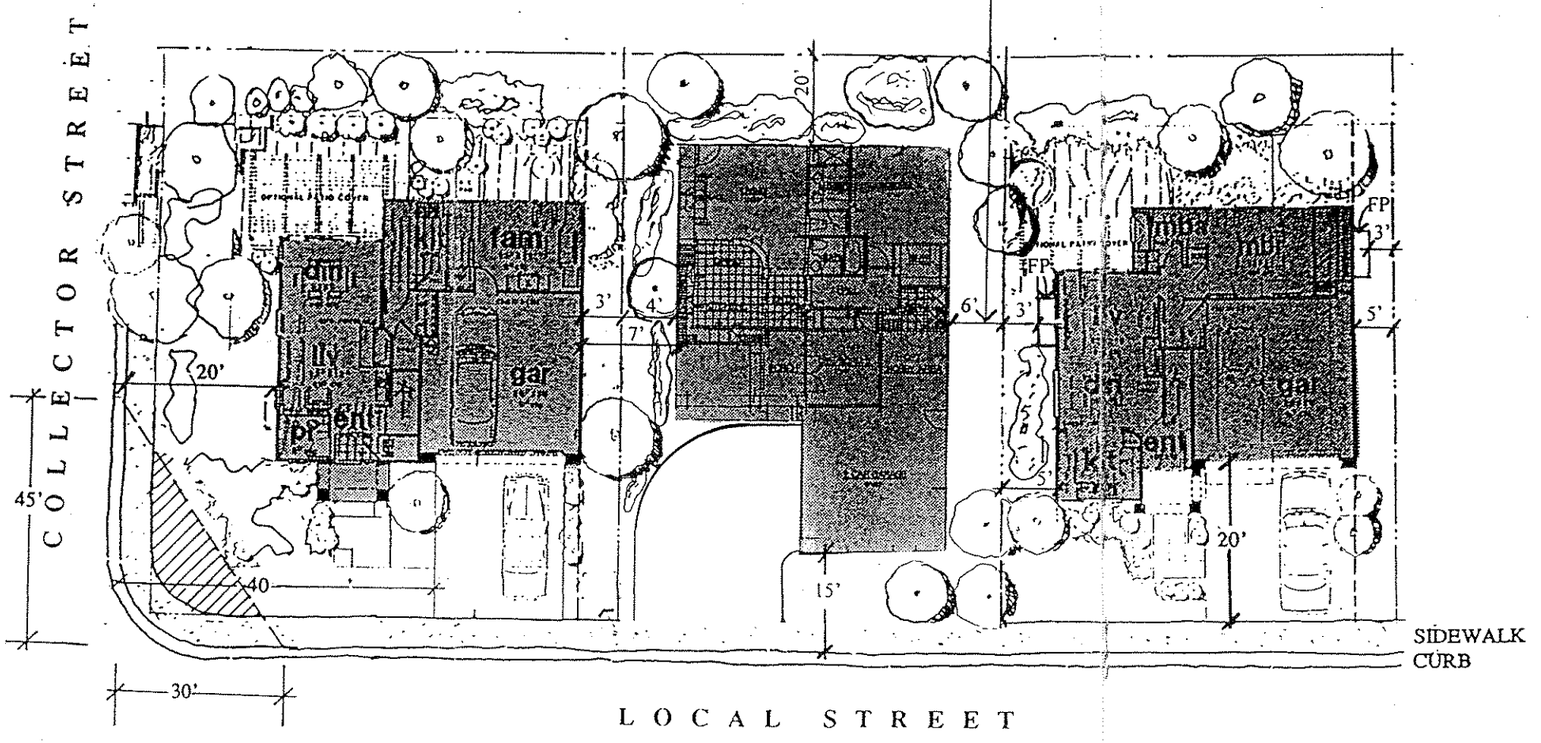
Rear-Yard Setback:

- All structures shall maintain a 20' rear-yard setback, measured from the property line.

Corner Lots:

- Driveways shall be set back a minimum of ~~40~~ 30' from the intersection. This distance is measured from back-of-curb at the intersection.
- A sight-triangle shall be maintained as shown, measured from back-of-curb. No structures, walls, vegetation, or other obstacles may exceed 30 inches in height.
- Corner lots shall maintain a 20' setback from adjacent collector street edges, measured from back-of-curb.





ARIZONA TRADITIONS
Surprise Village North

SETBACK EXHIBIT

EXHIBIT "M"
(ONE OF FIVE)

N O R T H

REVISIONS		
#	Date	Comments
1	02/15/95	Visibility triangles; text revisions
2	02/23/95	Text revisions
3	03/24/95	Front / rear / interior designations
4	05/15/95	Additional setback notes
5	10/02/95	Swing-garage plan, setback notes
6	12/19/95	Additional exhibit + dimensions
7	3/20/96	Revised flag lot exhibit (5/5)

SINGLE FAMILY
INTERNAL

SETBACK NOTES:

Front-Yard Setback:

- All structures shall maintain a front-yard setback of 15', measured from back-of-curb.
- Front-loaded garages shall maintain a 20' setback, measured from back-of-sidewalk. Side-loaded garages shall maintain a 15' setback, measured from back-of-curb.

Side-Yard Setback:

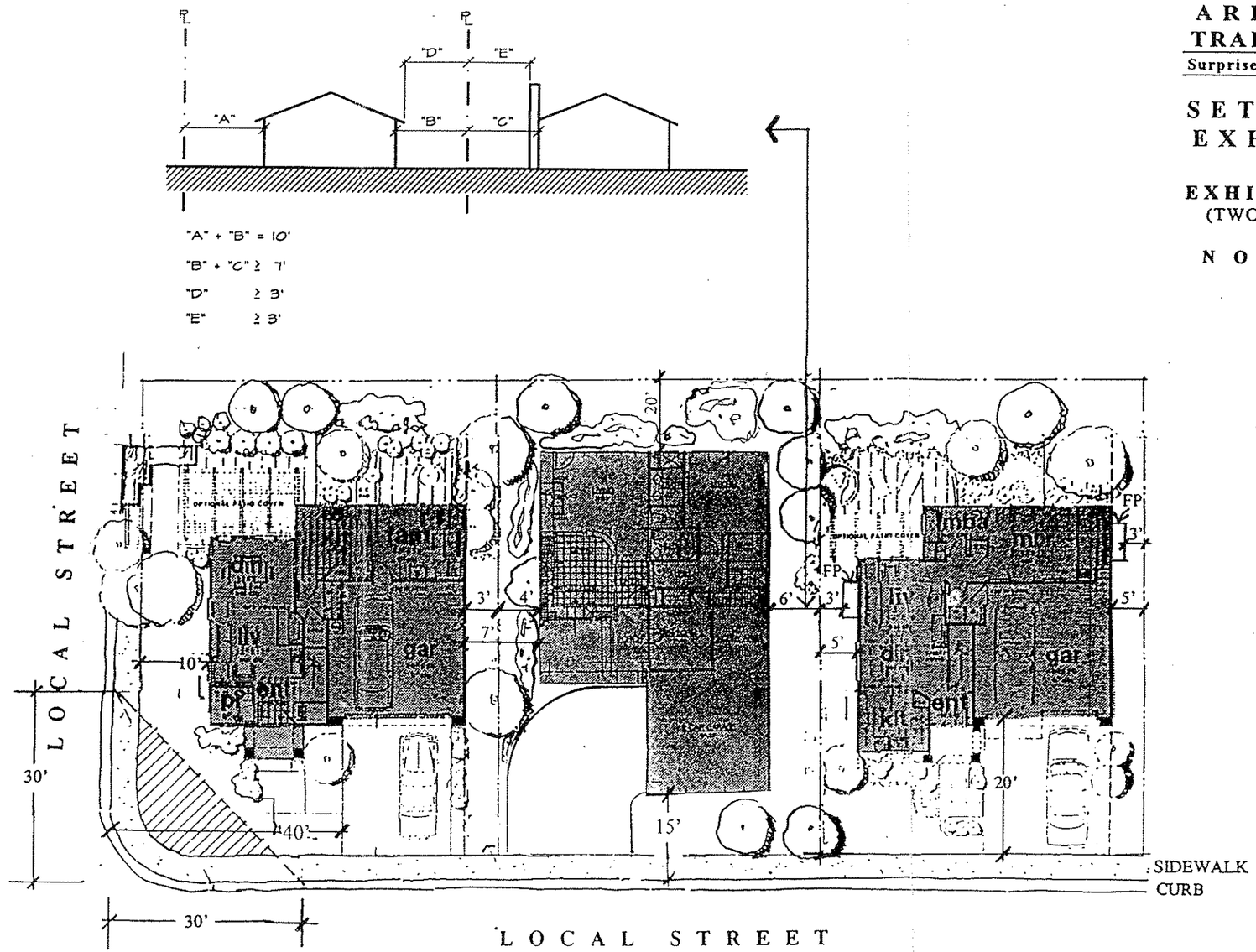
- The total of two side-yards on one lot shall be 10;' with no projection closer than 3' to the property line.

Rear-Yard Setback:

- All structures shall maintain a 20' rear-yard setback, measured from the property line.

Corner Lots:

- Driveways shall be set back a minimum of 40' from the intersection. This distance is measured from back-of-curb at the intersection.
- A sight-triangle shall be maintained as shown, measured from back-of-curb. No structures, walls, vegetation, or other obstacles may exceed 30 inches in height.
- Corner lots shall maintain a 10' setback from adjacent local street edges, measured from property line.



ARIZONA TRADITIONS
Surprise Village North

SETBACK EXHIBIT

EXHIBIT "M"
(TWO OF FIVE)

NORTH

REVISIONS		
#	Date	Comments
1	02/15/95	Visibility triangles, text revisions
2	02/23/95	Text revisions
3	03/24/95	Front / rear / interior designations
4	05/15/95	Additional setback notes
5	10/02/95	Swing-garage plan, setback notes
6	12/19/95	Additional exhibit - dimensions
7	2/20/96	Revised flag lot exhibit (5/5)

CLUSTER HOUSING
COLLECTOR FRONTAGE

SETBACK NOTES:

Front-Yard Setback:

- All structures shall maintain a front-yard setback of 10', measured from back-of-sidewalk.
- Side-loaded garages shall maintain a 15' setback from face of garage to property line.
- Per this example, only one-half of the common drive (private) is shown. Actual clear space for vehicle movement is 30'.
- No driveways shall be less than 20' and none shall obstruct pedestrian movement.
- Garages loaded directly onto local or collector streets shall maintain a 20' setback from back-of-sidewalk.

Side-Yard Setback:

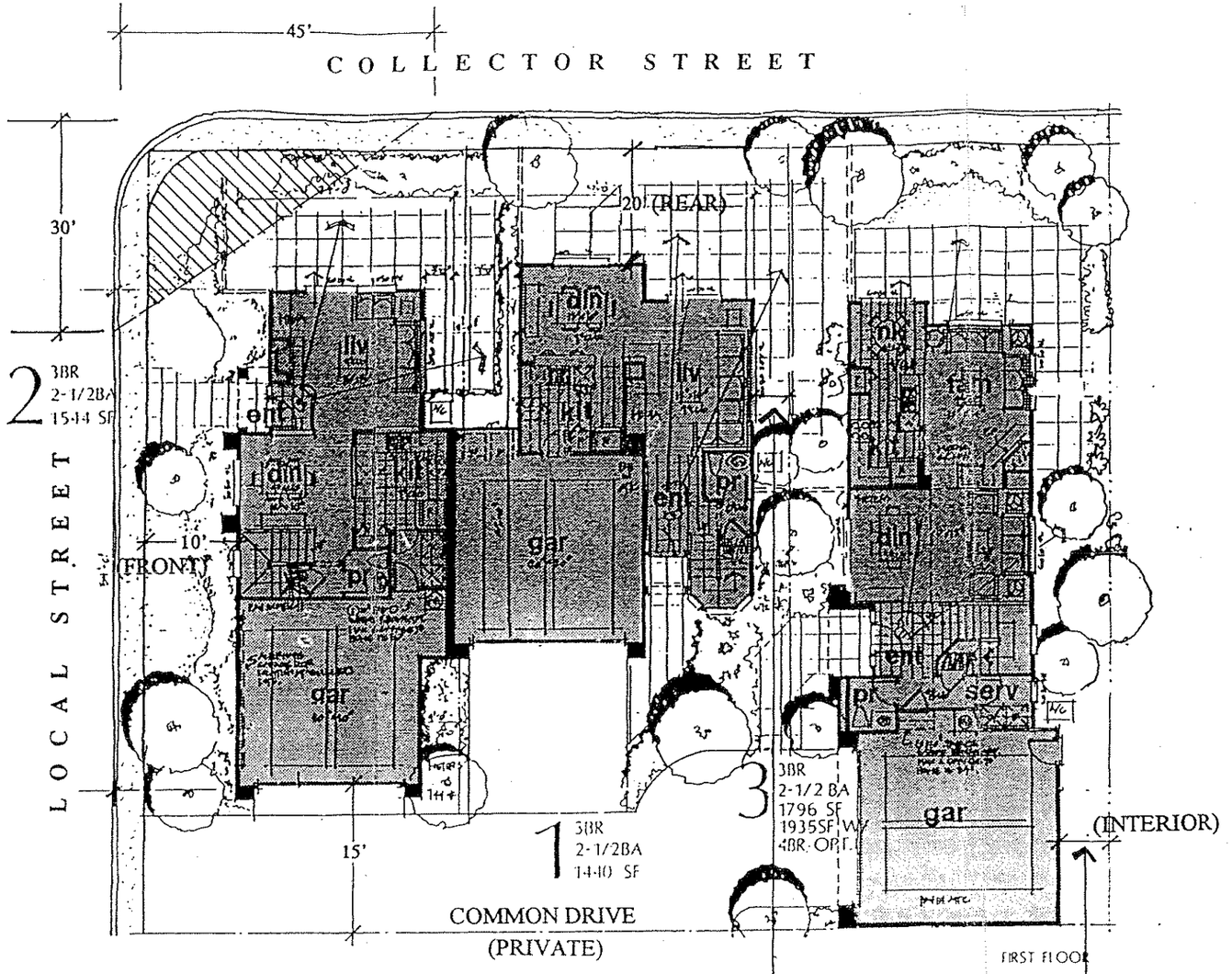
- The total of two side-yards on one lot shall be 10' with no projection closer than 3' to the property line.

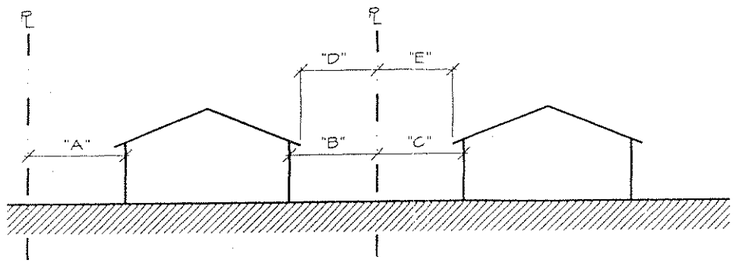
Rear-Yard Setback:

- All structures shall maintain a 20' rear-yard setback, measured from the property line.

Corner Lots:

- Driveways shall be set back a minimum of 40' from the intersection. This distance is measured from back-of-curb at the intersection.
- A sight-triangle shall be maintained as shown, measured from back-of-curb. No structures, walls, vegetation, or other obstacles may exceed 30 inches in height.
- Corner lots shall maintain a 20' setback from adjacent collector street edges, measured from back-of-curb.





"A" + "B" = 10'

"B" + "C" ≥ 7'

"D" ≥ 3'

"E" ≥ 3'

ARIZONA TRADITIONS
Surprise Village North

SETBACK EXHIBIT

EXHIBIT "M"
(THREE OF FIVE)

NORTH

REVISIONS		
#	Date	Comments
1	02/15/95	Visibility triangles; text revisions
2	02/23/95	Text revisions
3	03/24/95	Front / rear / interior designations
4	05/15/95	Additional setback notes
5	10/02/95	Swing-garage plan; setback notes
6	12/19/95	Additional exhibit + dimensions
7	2/20/96	Revised flag lot exhibit (5/5)

CLUSTER HOUSING
INTERNAL

SETBACK NOTES:

Front-Yard Setback:

- All structures shall maintain a front-yard setback of 10', measured from back-of-sidewalk.
- Side-loaded garages shall maintain a 15' setback from face of garage to property line.
- Per this example, only one-half of the common drive (private) is shown. Actual clear space for vehicle movement is 30'.
- No driveways shall be less than 20' and none shall obstruct pedestrian movement.
- Garages loaded directly onto local or collector streets shall maintain a 20' setback from back-of-sidewalk.

Side-Yard Setback:

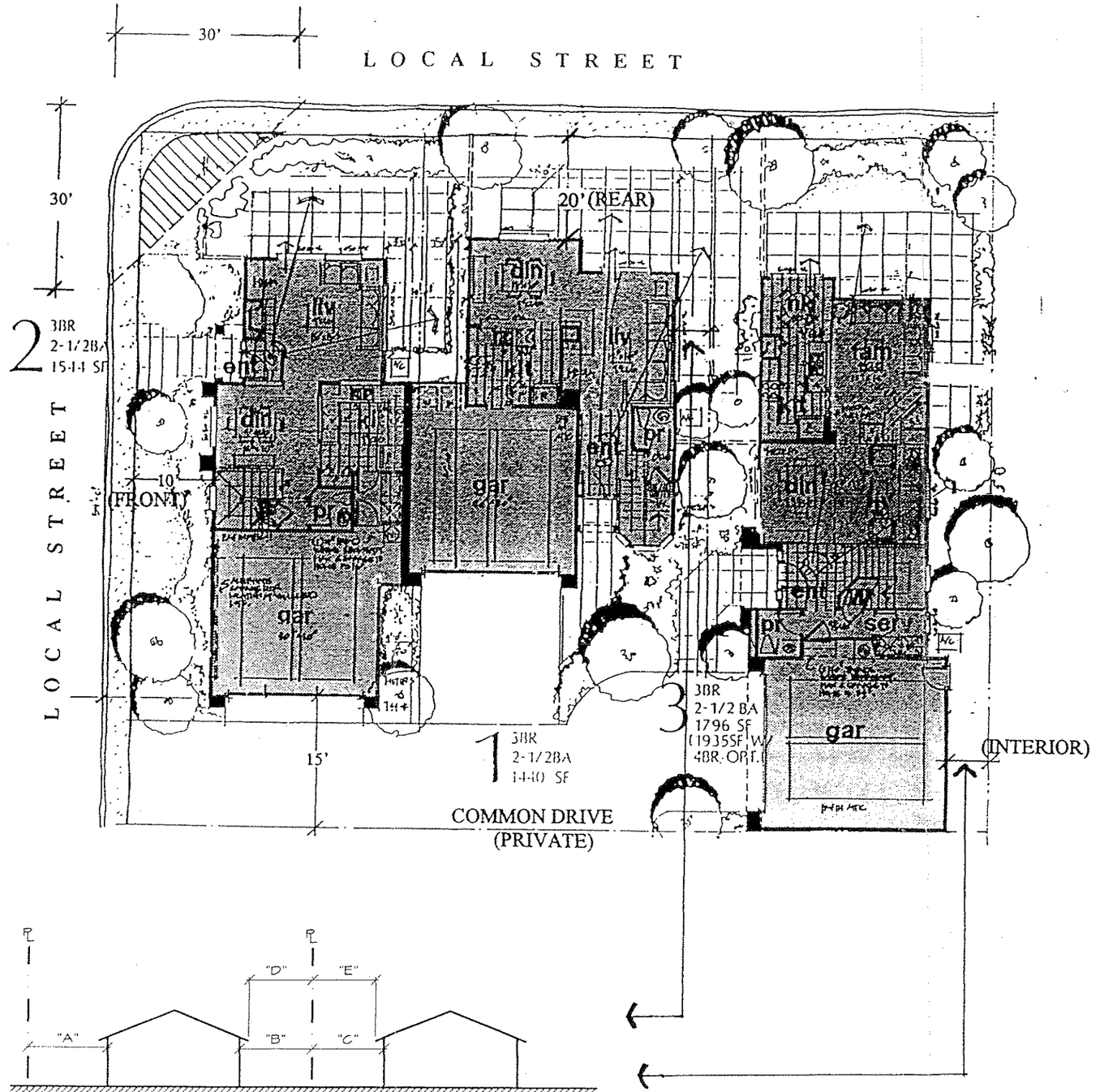
- The total of two side-yards on one lot shall be 10' with no projection closer than 3' to the property line.

Rear-Yard Setback:

- All structures shall maintain a 20' rear-yard setback, measured from the property line.

Corner Lots:

- Driveways shall be set back a minimum of 40' from the intersection. This distance is measured from back-of-curb at the intersection.
- A sight-triangle shall be maintained as shown, measured from back-of-curb. No structures, walls, vegetation, or other obstacles may exceed 30 inches in height.
- Corner lots shall maintain a 10' setback from adjacent local street edges, measured from back-of-sidewalk.



ARIZONA TRADITIONS
Surprise Village North

SETBACK EXHIBIT

EXHIBIT "M"
(FOUR OF FIVE)

N O R T H

REVISIONS		
#	Date	Comments
1	02/15/95	Visibility triangles; text revisions
2	02/23/95	Text revisions
3	03/24/95	Front / rear / interior designations
4	05/15/95	Additional setback notes
5	10/02/95	Swing-garage plan; setback notes
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SINGLE FAMILY
FLAG LOT DETAIL

Flag or Panhandle Lot: A lot where the only vehicular access to the lot is by way of a corridor or vehicular accessway which is less than thirty (30) feet wide and more than forty (40) feet long.

Flag lots or panhandle lots shall be permitted so long as it can be demonstrated that the lots will have adequate access to a dedicated roadway and adequate public utility service, subject to the following requirements:

a. The maximum length of the flag or panhandle portion of the lot shall be one hundred (100) feet, provided that by joint approval, the community development director and the fire chief may grant a limited exception allowing a maximum length of not more than one hundred and fifty (150) feet for special circumstances.

b. Each flag or panhandle portion of the lot shall be not less than twenty (20) feet wide and shall have a driveway minimum of sixteen (16) feet in width.

c. That portion of the flag lot which provides access to adjacent lots shall be dedicated as a vehicular access and public utility easement and shall be restricted to no parking. No more than two (2) lots may have access from the panhandle or flag portion of a lot.

d. Lots shall have a twenty (20) foot minimum driveway depth exclusive of the sixteen (16) foot access drive.

e. Fire hydrants shall be required on or near such flag or panhandle lots.

f. Building "A" shall be set back a minimum of twenty (20) feet from the front property line. Building "B" shall be set back a minimum of forty (40) feet from the property line. Rear and side setbacks will be consistent with the adjacent lots (see accompanying exhibits).

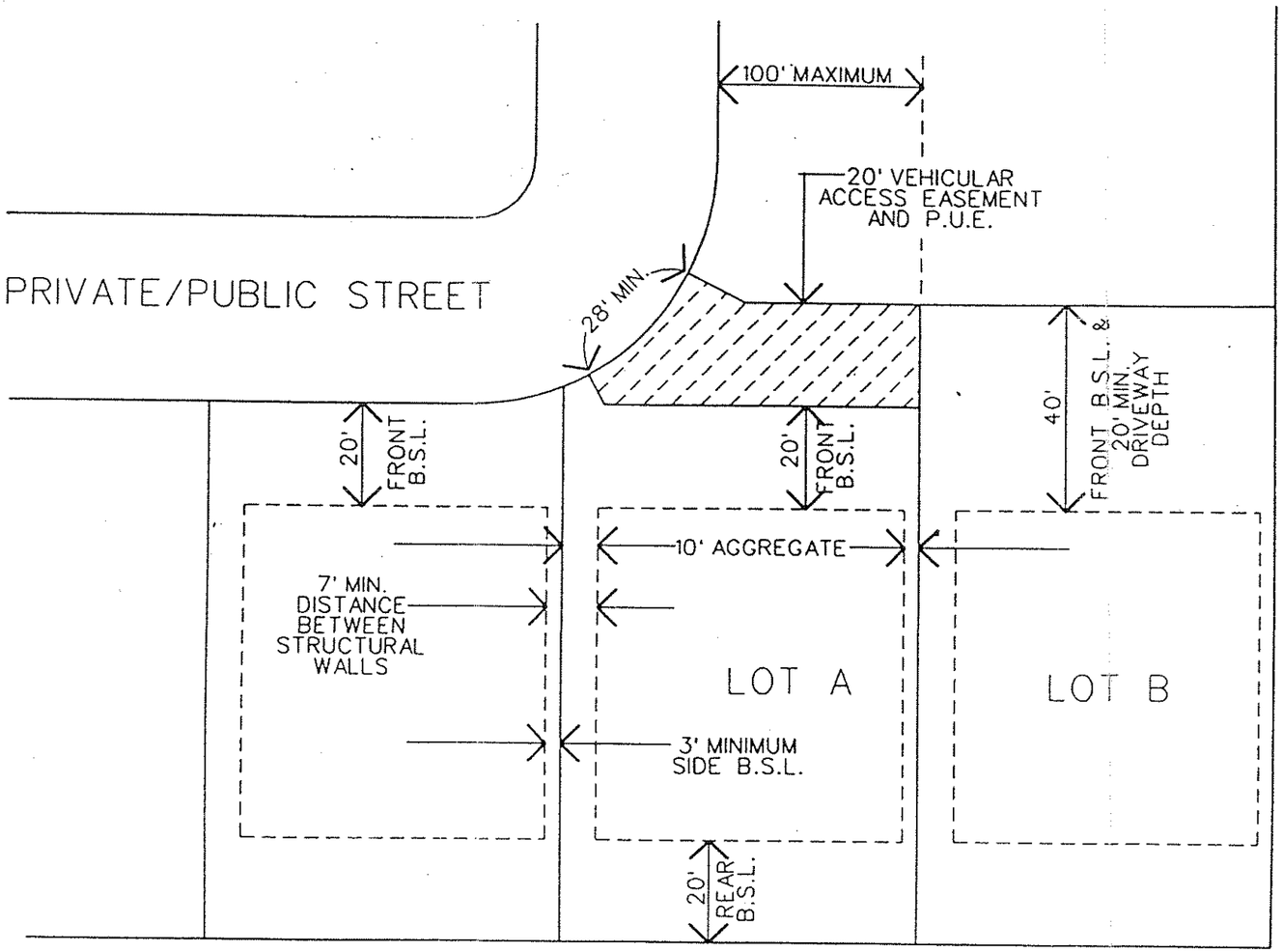
g. No swing garages are allowed on flag lots or a condition that would require the owner to back out of the entire distance of access drive.

h. Trash containers and mailboxes to be located adjacent to dedicated street frontage.

i. Landscaped areas on the flag or panhandle portion of the lot will be maintained by and be the responsibility of the flag lot owner.

j. The area of the panhandle on which driveways are located shall not be included in the required lot area.

k. Rights-of-way and easements must be clearly defined.



ARIZONA TRADITIONS
Surprise Village North

SETBACK EXHIBIT

EXHIBIT "M"
(FIVE OF FIVE)

NORTH

REVISIONS		
#	Date	Comments
1	02/15/95	Visibility triangles, text revisions
2	02/23/95	Text revisions
3	03/24/95	Front / rear / interior designations
4	05/15/95	Additional setback notes
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7	2/20/96	Revised flag lot exhibit (5/5)

EXHIBIT "N"
Section 17.28.010 (G)

G. Encroachment into Required Front and Side Yard Setbacks.

1. Open steps and decks shall be permitted to extend into the required front and side yard setbacks a distance of not more than five feet.

2. Covered patios, decks, porches or carports shall not be permitted encroachments in any required setbacks.

3. Normal Roof Projections (Eaves) into Required Side Yards. A house or garage roof may not be constructed within three feet of a side property line.

Chapter 17.32

GENERAL BUILDING AND PERFORMANCE REQUIREMENTS

Sections:

17.32.010 Purpose.
17.32.020 Screening.
17.32.030 Landscaping requirements.
17.32.040 Dwelling unit restrictions.
17.32.050 Accessory buildings, uses and equipment.
17.32.060 Fences.
17.32.070 Setback and height encroachments, limitations and exceptions.
17.32.080 Off-street parking requirements.
17.32.090 Off-street loading.
17.32.100 Signs.
17.32.110 Home occupations.
17.32.120 Miscellaneous performance requirements.
17.32.130 Nonconforming uses and structures.
17.32.140 Mobile homes, manufactured home parks and subdivisions, modular homes.

17.32.010 Purpose. The purpose of this section of the zoning ordinance is to establish general development performance standards. These standards are intended and designed to assure compatibility of uses; to prevent urban blight, deterioration and decay; an to enhance the health, safety and general welfare of the residents of the community. (Ord. 86-6 §8-801, 1986)

17.32.020 Screening. All multifamily and mobile home developments' principal and accessory uses (except signs) which are situated on a parcel which abuts a single-family

residential district and all business and industrial developments' principal and accessory uses (except signs) which are situated on a parcel which abuts a residential district shall be screened from such a district by an approved wall or fence not less than six feet in height above the level of the adjacent property at the district boundary. Walls or fences of lesser heights or planting screens may be permitted by the city if there is a finding that the nature or extent of the use being screened is such that a lesser degree of screening will adequately promote the use and enjoyment of the properties within the adjacent residential district, or there is a finding that a screening of the type required by this chapter would interfere with the provision of adequate amounts of light and air to same said properties. All required screening devices shall be designed so that they are architecturally harmonious with the principal structures on the site and they shall be properly maintained so as not to become unsightly, hazardous or less opaque than when originally constructed. (Ord. 86-6 §8-802, 1986)

17.32.030 Landscaping requirements. A. Generally. Landscaping requirements as set forth in this chapter have been established to encourage quality development within the city; to provide a smooth transition between adjoining properties; to screen service yards, parking lots and other areas which tend to be unsightly; to facilitate the buffering of one land use from other land uses; to encourage harmonious relationships between buildings which are part of one development and buildings located on abutting properties; to provide open space and recreational areas to serve the needs of the residents of the city; to soften the effect of development; to improve erosion and stormwater runoff control; to reduce the particulate matter in the air; to encourage a sense of commitment to the city and its residents on the part of developers; and to provide for the health, safety and general welfare of the residents of the city.

B. Definition. Landscaping for purposes of this chapter shall be defined as including any or all of the following: lawn or grass areas; trees, shrubs, ground cover or other plantings; sprinkler or irrigation systems; decorative rock, natural or man-made; decorative lighting; benches, tables, fountains, planters or other similar outdoor furniture; decorative fences; detention and retention ponds; waterfalls and man-made streams; and berms or mounds.

C. Landscaping Plan.

1. A landscaping plan shall be submitted in conjunction with any required site plan and shall be reviewed and approved, denied or modified in conjunction with said site plan. All exposed ground areas surrounding or within

a principal or accessory use, including street boulevards, which are not devoted to drives, parking lots, sidewalks, patios or other such uses shall be landscaped.

2. At minimum, seven percent of any site shall be landscaped with at least thirty percent of the landscaped area being covered by plant materials or a plant canopy at the end of the first year and fifty percent of the area being covered at plant maturity.

3. When possible, areas of any particular site allocated to landscaping shall be located on that site in such a way so as to provide substantial benefit to the general public as well as to the site itself.

4. Where practical, landscaping shall also be provided within parking lots in a manner which will serve to visually reduce the expanse of paved areas.

D. Minimum Landscaping.

1. Multifamily, apartment, condominium and commercial developments: All areas, including adjacent unpaved rights-of-way, not used for buildings, parking, drives or other impervious materials or used for storage of materials shall be landscaped according to an approved landscape plan. For townhouses with individually screened and/or fenced rear yards, landscaping shall be required only in the front yards, side yards and unpaved rights-of-way.

2. Industrial developments. All areas in front and corner side yards, including adjacent unpaved rights-of-way, not used for parking, drives or other impervious materials or storage shall be landscaped according to an approved landscape plan.

E. Installation Prior to Occupancy Permit. All landscaping materials and equipment as provided for on the approved landscape plan for any residential, business or industrial development, or in the case of phased development, for the particular phase, shall be installed prior to the issuance of any occupancy permit, unless a financial guarantee in the amount of one hundred fifty percent of the cost of the materials and labor is submitted to the city. Financial guarantees shall be of the types and forms provided in the city subdivision ordinance, Section 11-1106A. In the event that a cash deposit is made for the purpose of a financial guarantee, no interest shall be paid by the city unless specific arrangements are made for such interest to be paid, prior to city acceptance of the deposit.

Upon completion of the landscaping requirements as provided on the approved landscape plan, the financial guarantee shall be released except for a portion in the amount of twenty percent of the cost of materials and installation which shall be retained for a warranty period of one year as a guarantee of proper installation and maintenance. Following the warranty period the remaining twenty percent guarantee shall be released upon a finding that

installation and maintenance has occurred as per approved landscape plan.

F. Maintenance. All landscaped areas shall be kept neat, clean and uncluttered. No landscaped area shall be used for the parking of vehicles or the storage or display of materials, supplies or merchandise. (Ord. 86-6 §8-803, 1986)

17.32.040 Dwelling unit restrictions. No cellar, garage, tent, basement with unfinished structure above, or accessory building or any mobile home or recreational vehicle outside of an approved mobile home or recreational vehicle shall at any time be used as a dwelling unit. The basement portion of a finished home may be used for normal living, eating and sleeping purposes, provided it is properly damp-proofed and has suitable fire protection and exits. (Ord. 86-6 §8-804, 1986)

17.32.050 Accessory buildings, uses and equipment. A. An accessory building shall be considered an integral part of the principal building if it is connected to the principal building by a covered passageway.

B. Accessory buildings and garages in residential districts shall not exceed the height of the principal structure and shall not be located within a utility easement.

C. No accessory building or garage for single-family homes shall occupy more than twenty-five percent of a rear yard nor exceed six hundred square feet of floor area, except that garages which exceed the aforesaid maximum may be allowed with a conditional use permit.

D. No permit shall be issued for the construction of more than one accessory, detached, private garage structure for each dwelling.

E. No accessory building or use shall be constructed or developed on a lot prior to the time of construction of the principal building to which it is accessory, except by conditional use permit.

F. Accessory buildings in any business or industrial district may be located only to the rear of the principal building.

G. No accessory building in any business or industrial district shall exceed the height of the principal building except by conditional use permit. (Ord. 86-6 §8-805, 1986)

17.32.060 Fences. A. Permit Required. No persons, firm or corporation, except on a farm and related to farming, shall hereafter construct, or cause to be constructed or erected within the city any fence without first making an application for and securing a building permit.

B. Locations. All fences shall be located entirely upon the private property of the persons, firms or corporation constructing, or causing the construction of, such fence unless the owner of the property adjoining agrees, in writing, that such fence may be erected on the division line of the restrictive properties.

C. Construction, Maintenance and Height Measurement.

1. Construction and Maintenance. Every fence shall be constructed in a substantial, workmanlike manner and of substantial material reasonably suited for the purpose for which the fence is proposed to be used. Every fence shall be maintained in a condition of reasonable repair and shall not be allowed to become and remain in a condition of disrepair, damage, or unsightliness, or constitute a nuisance, public or private. Any such fence which is, or has become, dangerous to the public safety, health or welfare, or has become unsightly through improper maintenance or neglect is a public nuisance, and the zoning administrator shall commence proper proceedings for the abatement thereof.

b. Link, or wire fences, wherever permitted, shall be constructed in such a manner that no barbed ends shall be at the top, except in industrial districts and shall be constructed of at least eleven gauge wire or its comparable.

c. Electrical or barbed wire fences shall be prohibited, except in an I-1 district.

2. Measuring Fence Height. The height of any fence shall be calculated to the uppermost points as follows:

a. In required yards abutting a street, the height of the fence shall be the total effective height measured from the finished grade on the side nearest the street.

b. In other required yards, the height of the fence shall be the total effective height above the finished grade measured on the side nearest the abutting property.

c. On property lines the height may be measured from the finished grade of either side when the abutting property owners are in joint agreement, with such agreement submitted in writing.

D. Residential Fences.

1. In all parts of Surprise zoned residential, no fence or wall shall be erected or maintained more than six feet in height and also:

a. In R-2 and R-3 zones, no fence or wall shall be allowed in any required front yard.

b. In R1-5, R1-8, R1-18 or R1-43 zones, no fence or wall shall be allowed in any required front yard which has any supporting member measuring forty-eight inches in height, or any horizontal member or series of verti-

cal members spaced closer than four feet from one another over forty-two inches in height, or less than sixty-five percent transparent, except walls or fences twenty-four inches or less in height with a transparency of less than sixty-five percent shall be permitted. (Note: Generally chainlink fences and two-rail fences are seventy to ninety percent transparent.)

c. Any fence which exceeds thirty-six inches in height on a corner lot must maintain a minimum twenty feet corner setback, described as follows: Beginning at the intersection of the projected curbing lines of two local intersecting streets, thence a minimum of twenty feet along one curb line, thence diagonally to a point of a minimum twenty feet from the point of beginning on the other curbline, then to the point of beginning, so as not to obstruct the line of site visibility. (Note: Local streets as defined per Ordinance 86-07, Section 11-1105C(2)(a).)

2. Fences, walls or hedges which are erected in any side yard and which run parallel or approximately parallel to the front line of a building or mobile home shall be set back from the front line of the building or mobile home a minimum of five feet.

3. On corner lots in all districts except as permitted herein, no fence or planting in excess of thirty inches above the street center line grade shall be permitted within a triangular area defined as follows: beginning at the intersection of the projected curbing lines of two intersecting streets, thence forty feet along one curbline, thence diagonally to a point forty feet from the point of beginning on the other curbline, then to the point of beginning.

4. In those instances where a fence is erected as an enclosure which restricts access from the front to the rear yard, a gate, identifiable collapsible section, or other such means or recognizable ingress shall be installed, shall remain unobstructed and shall be a minimum of three feet in width. The location of such ingress points shall be positioned at any point paralleling the front lot line between the side lot property line and the principal structure.

5. In corner side yards, fences up to six feet in height may be permitted provided that no fence may be built in a corner side yard that is adjacent to a neighboring front yard.

E. Business and Industrial District Fences. Fences in all commercial and industrial districts shall not exceed ten feet in height except that boundary-line fences abutting residential districts shall not be greater than six feet in height.

F. Special Purpose Fences. Fences for special purposes and fences differing in construction, height or

length may be permitted in any district by issuance of conditional use permit approved by the planning and zoning commission. Findings shall be made that the fence is necessary to protect, buffer or improve the premises for which the fence is intended and will not detrimentally affect adjacent property.

G. Fences in all Districts. Any fence constructed so as to have only one elevation "finished," which shall be defined as not having its supporting members significantly visible, shall be erected such that the finished elevation of the fence is exposed to the adjacent property. (Ord. 88-16 §§1, 2, 1988; Ord. 87-5, 1987; Ord. 86-6 §8-806, 1986)

17.32.070 Setback and height encroachments, limitations and exceptions. The following shall be considered as permitted encroachments on setback and height requirements except as hereinafter provided:

A. In any yards: Posts; off-street, open-parking spaces; sills; pilasters; lintels, cornices; eaves; gutters; awnings; open terraces; service station pump islands; open canopies; steps; flag poles; ornamental features; open fire escapes; sidewalks; and fences, except as hereinafter amended. Also, terraces; steps; exposed ramps (wheelchair); uncovered porches; stoops; or similar features, provided they do not extend above the height of the ground floor level of the principal structure or to a distance of less than three feet from any lot line nor less than one foot from any existing or proposed access drive. Also, yard lights and nameplate signs in residential districts; trees, shrubs; plants; floodlights or other sources of light illumination, authorized lights or light standards for illuminating parking areas, loading areas or yards for safety and security reasons, provided the direct source of light is not visible from the public right-of-way or adjacent, residential property.

B. In side and rear yards: Balconies eight feet above grade may extend into the yards to within five feet of a lot line, provided said balconies do not extend over nonresidential driveways; recreational equipment, picnic tables and apparatus needed for the operation of active and passive solar-energy systems.

C. In rear yards: Laundry, drying equipment; covered but not enclosed porches, breezeways and detached outdoor livingrooms may extend twenty feet into the rear yard but not closer than ten feet from the rear lot line; apparatus needed for the operation of active and passive solar-energy systems.

D. Height. Height limitations shall not apply to church spires, belfries, cupolas and domes; monuments; chimneys and smokestacks; flag poles; pubic and private utility facilities; transmission towers or commercial and

private radio broadcasting stations; television antennae; parapet walls extending no more then four feet above the limiting height of the building except as hereinafter provided; and solar-energy collectors and equipment used for the mounting or operation of such collectors.

E. Side and Rear Setbacks–Zero Lot Line Provision. Subject to regulations contained in the Uniform Building Code and other applicable regulations, buildings may be excluded from side and rear setback requirements provided party walls are used and if the adjacent buildings are constructed as an integral unit. This primarily pertains to townhomes and condominium structures.

F. Front Setbacks Averaging. When more then twenty-five percent of the frontage on the side of a street between intersections is occupied by structures having setbacks from the street rights-of-way of greater or lesser amounts than hereinafter required, the average setback of all existing buildings between the intersections shall be maintained by all new or relocated structures. In the event a building is to be built where there is an established average setback different from that required hereinafter and there are existing buildings on one side only, the front setback of said new building needs to be no greater than that of the next adjoining existing building. In a case where a building is to be built where there is such an established average setback and there are existing buildings on both sides of the said new building, the front setback shall not be required to be greater than that which would be established by connecting a straight line between the furthest extension of the first adjacent building on each side. (Ord. 86-6 §8-807, 1986)

17.32.080 Off-street parking requirements. A. General Provisions.

1. Floor Area. The term "floor area," for the purpose of calculating the number of off-street parking spaces required, shall be determined on the basis of the exterior area dimensions of the building, structure or use multiplied by the number of floors, minus ten percent, except as may hereinafter be provided or modified.

2. Change of Use or Occupancy of Buildings. Any change of use or occupancy of any building or buildings including additions thereto requiring more parking shall not be permitted until such additional parking spaces as required by this chapter are furnished.

3. Parking Accessory to a Residential Use. Off-street parking facilities accessory to residential use shall be utilized solely for the parking of licensed and operable passenger automobiles; no more than one truck not to exceed gross capacity of twelve thousand pounds; and recreational vehicles and equipment. Under no circumstances shall required parking facilities accessory to a resi-

dential structure be used for storage of commercial vehicles or equipment or for the parking of automobiles belonging to the employees, owners, tenants or customers of business or manufacturing establishments.

4. Parking in Residential Setbacks. No motor or recreational vehicle shall be parked in any front or corner side setback except on a paved, parking surface.

B. Stall, Aisle and Driveway Design.

1. Parking dimensions: The following shall be the minimum parking space dimensions:

Angle	Width[1]			Length			Aisle Width[2]
	Standard	Handicapped	Compact[4]	Standard	Handicapped	Compact[4]	
90 degrees	9′	13′	8′	18′	18′	16′	25′
60 degrees	9′	13′	8′	18′	18′	16′	20′
45 degrees	9′	13′	8′	18′	18′	16′	15′[3]

2. Within structures. The off-street parking requirements may be furnished by providing spaces so designed within the principal building or structure attached thereto; however, unless provisions are made, no building permit shall be used to convert said parking structures into a dwelling unit or living area or other activity until other adequate provisions are made to comply with the required off-street parking provisions of this title.

3. Circulation between bays. Except in the case of single-family, two-family, townhouse, three-family and four-family dwellings, parking areas shall be designed so that circulation between parking bays occurs within the designated parking lot and does not depend upon a public street or alley. Except in the case of single-family, two-family, townhouse, three-family and four-family dwellings, parking area design which requires backing into the public street is prohibited.

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1 As measured by a line perpendicular to the stall line at a point on the outside end of the stall, except when the stall is on the inside edge of a curve, in which case the point of measurement shall be on the inside end of the stall.

2 For ninety degree parking, aisles are two-way; for sixty degree and seventy-five degree parking they are one-way only.

3 Except where needed as a fire lane in which case a twenty-foot minimum is required.

4 Unless otherwise approved all parking spaces shall be of standard width, but in no case shall compact spaces exceed thirty percent of the total required spaces.

4. Preserving off-site parking. When required, accessory off-street parking facilities are provided elsewhere than on the lot with the same ownership or control, either by deed or long-term lease, than the property occupied by such principal use, the owner of the principal use shall file a recordable document with the city and county clerk requiring the owner and his or her heirs and assigns to maintain the required number of off-street spaces during the existence of said principal use.

5. Drive access. All drive accesses shall be approved by the city engineer for width and location.

6. Drive access required. All off-street parking spaces shall have access from a drive access and not directly from the public street.

7. Distance from intersection. No drive access shall be located nearer than forty feet (in a residential district), one hundred fifty feet (in a commercial district), or one hundred fifty feet (in an industrial district) from the intersection of two public street rights-of-way.

8. Parallel parking spaces. Shall be a minimum of twenty-two feet in length.

9. Distance between drive accesses. Drive accesses to a public street except for single-family, two-family and townhouse dwellings shall not be located less than forty feet from one another as measured from inside of drive to inside of drive.

10. Number of drive accesses. Each property shall be allowed one drive access for each one hundred feet of street frontage. Single-family uses shall be limited to one drive access per property. These conditions shall apply unless otherwise granted by the planning and zoning commission.

11. Grade: The grade elevation of any parking area shall not exceed three percent.

12. Surfacing. All areas intended to be utilized for parking space and driveways shall be paved with materials suitable to control dust and drainage. Plans for paving and drainage of driveways and stalls for five or more vehicles shall be submitted to the city engineer for his/her review, and the final drainage plan shall be subject to his/her written approval.

13. Striping. Except for townhouses and single-family, two-family, three-family and four-family dwellings, all parking stalls shall be marked with painted lines not less than four inches wide.

14. Lighting. Any lighting used to illuminate an off-street parking area shall be so arranged as to reflect the light away from adjoining property, abutting residential uses and public rights-of-way and be in compliance with this title.

15. Signs. No sign shall be so located as to restrict the sight lines and orderly operation and traffic movement within any parking lot. All signs shall conform to city sign requirements.

16. Curbing. Except for townhouses and single-family, two-family, three-family and four-family dwellings, all open off-street parking areas and driveways shall have a perimeter concrete curb and gutter around the entire parking lot built according to standards provided by the city engineer.

17. Protruding vehicles. All on-site parking stalls which abut property lines shall be designed and constructed such that parked vehicles shall not protrude over property lines.

C. Maintenance. It shall be the joint and separate responsibility of the lessee and owner of the principal use, uses or building to maintain in a neat and adequate manner, the parking space, accessways, striping, landscaping and required fences.

D. Use of Required Parking Areas for Parking Only. Required accessory off-street parking spaces in any district shall not be utilized for open storage, sale or rental of goods, or storage of inoperable vehicles.

E. Number of Spaces Required. The following minimum number of off-street parking spaces shall be provided and maintained by ownership, easement and/or lease for and during the life of the respective uses hereinafter set forth:

1. Residential Uses.

Dwelling Types	Off-Street Parking Spaces Required	
	With Street Parking	Without Street Parking
Single-family dwelling	2 spaces/unit	3 spaces/unit
Mobile homes	2 spaces/unit	3 spaces/unit
Two-family dwelling	2 spaces/unit	2.25 spaces/unit
Three-family dwelling	2 spaces/unit	2.25 spaces/unit
Four-family dwelling	2 spaces/unit	2.25 spaces/unit
Townhouse	2 spaces/unit	2.25 spaces/unit
Apartments	2.25 spaces/unit	2.25 spaces/unit
Boarding houses	2.25 spaces/unit	2.25 spaces/unit
Group homes	1 space per potential guest room	1 space per potential guest room

2. Nonresidential uses.

Use Type	Off-Street Parking Spaces Required
Automobile sales	One space per 200 square feet of indoor floor area plus two spaces per 20 outdoor vehicle display spaces

Automobile service station	Two spaces per service stall but no less than four spaces
Automobile washing establishment automatic drive-through	Three spaces or one for each employee on maximum shift, in addition to stacking space
self-service	Two spaces per stall not including washing or drying spaces
Bowling alley	Four spaces per alley, plus two spaces per billiard tables, plus one space per pinball and/or electronic game machine, plus one space per each five visitor gallery seats
Church	One space per four seats based upon design capacity of main assembly hall
Community or recreation center	One space per 200 square feet of floor area
Dance halls, skating rinks or similar uses	One space per 300 square feet of floor area
Court clubs, (racquetball, handball, tennis)	One space per 200 square feet of floor area plus three spaces per court
Day care centers	One space per 200 square feet of floor area.
Elderly (senior citizens) housing	One space per unit
Furniture stores over 20,000 square feet	Three spaces per 1,000 square feet of floor area
Golf courses	One space per 200 square feet of main building floor area, plus one space for every two practice tees in driving range, plus four spaces per each green in the playing area
Hospital	One space per bed

Manufacturing and industrial uses	One space per 450 square feet of floor area, plus one space for each company owned truck if not stored within the building
Medical and dental offices	Four spaces for each doctor or dentist, plus one space for each employee
Motels, hotels	One and one-tenth spaces per each guest room, plus one space per employee on maximum shift, plus spaces for accessory uses as follows:
Restaurants, bars dining rooms	one space per 60 square feet
Commercial areas	one space per each 400 square feet of floor area
Public assembly areas	one space for each five seats based upon design capacity, except that total off-street parking for public assembly may be reduced by one space for every four guest rooms.
Nursing homes, rest homes or similar uses	Four spaces, plus one space for each three beds, plus one space for each employee on maximum shift
Offices (except medical and dental)	Minimum of four spaces and
Floor area 0—5,000 square feet	four spaces per 1,000 square feet
Floor area 5,000—20,000 square feet	three and one-half spaces per 1,000 square feet
Floor area of over 20,000 square feet	three spaces per 1,000 square feet
Outdoor sales (plant nurseries, building materials, equipment rental and similar uses)	One space per 300 square feet of sales and/or display area
Restaurants, cafes, bars and similar uses	One space per 50 square feet of indoor public floor area, plus one space per 200 square feet of outdoor serving (patio) area

Retail store and service establishments	One space per 250 square feet of floor area
Schools	
Elementary and/or junior high	One and one-half spaces for each classroom, library, lecture hall and cafeterias, plus one space per each three fixed seats in the main area of public assembly, or one space for each 21 square feet of area available for public assembly if fixed seats are not provided
Senior high	One and one-half spaces for each classroom or lecture hall, plus one space per each five students, plus one space for each nonteaching employee, plus one space per each three fixed seats in the area of public assembly, or one space per 21 square feet of area available for public assembly if fixed seats are not provided.
Business or similar school	One space for each 150 square feet of floor area
Theatre, auditorium or similar place of public assembly	One space per four seats based upon design capacity
Warehousing, storage or handling of bulk goods	One space per 1,000 square feet of floor area devoted to storage of goods, plus one space for each employee on maximum shift, plus one space for each company truck not stored inside the building, plus appropriate spaces to support accessory office or retail sales facilities, subject to the office and/or retail sales parking requirements.

F. Joint Use of Parking Facilities.

1. Up to eighty percent of the parking facilities required by this subsection for a church or for an auditorium incidental to a public or parochial school may be supplied by the off-street parking facilities by the following daytime uses: banks, business offices, retail stores, personal service shops, household equipment or furniture shops, clothing or shoe repair or service shops, manufacturing, wholesale or similar uses.

2. Other joint use of parking by adjacent commercial uses to reduce total parking spaces may be allowed with approved parking study submittal by a registered transportation engineer.

3. Conditions Required for Joint Use.

a. The building or use for which application is being made to utilize the off-street parking facilities provided by another building or use shall be located within three hundred feet of such parking facilities.

b. The applicant shall show that there is no substantial conflict in the operating hours of the two buildings or uses for which joint use of off-street parking facilities is proposed.

c. A properly drawn legal instrument, executed by the parties concerned for joint use of off-street parking facilities, duly approved as to form and manner of execution by the city attorney, shall be filed with the city clerk and recorded with the county recorder.

G. Off-Site Parking.

1. Any off-site parking which is used to meet the requirements of this title shall be a conditional use as regulated by this title and shall be subject to the conditions listed below.

2. Off-site parking shall be developed and maintained in compliance with all requirements and standards of this title.

3. Reasonable access from off-street parking facilities to the use being served shall be provided.

4. The site used for meeting the off-site parking requirements of this title shall be under the same ownership as the principal use being served, under public ownership, or shall have guaranteed permanent use by virtue of a perpetual lease filed with the city clerk and county clerk.

5. Off-site parking for multiple-family dwellings shall not be located more than two hundred feet from any normally used entrance of the principal use served.

6. Off-site parking for nonresidential uses shall not be located more than three hundred feet from the main entrance of the principal use being used.

7. Any use which depends upon off-site parking to meet the requirements of this title shall maintain ownership or prove a long term irrevocable lease agreement for parking utilization of the off-site location. (Ord. 86-6 §8-808, 1986)

17.32.090 Off-street loading. A. Location.

1. All required loading berths shall be off-street and located on the same lot as the building or use to be served.

2. Except for loading berths required for apartments, no loading berths shall be located closer than fifty feet from a residential district unless within a structure.

3. Loading berths shall not be located within the minimum front yard building setback.

4. Loading berths located at the front or at the side of buildings on a corner lot shall observe the following requirements:

a. Loading berths shall not conflict with pedestrian movement.

b. Loading berths shall not obstruct the view of the public right-of-way from off-street parking access.

c. Loading berths shall comply with all other requirements of this section.

B. Screening. Except in the case of multiple dwellings, all loading areas shall be screened and landscaped from abutting and surrounding residential uses.

C. Size. Unless otherwise specified in these zoning regulations, the first loading berth shall be at least seventy feet in length and additional berths required shall be at least thirty feet in length and all loading berths shall be at least ten feet in width and fourteen feet in height, exclusive of aisle and maneuvering space. (Ord. 86-6 §8-809, 1986)

17.32.100 Signs. All signs must conform to Chapter 15.24, city sign ordinances for all site plans, conditional uses, planned area developments and other applicable procedures addressed in this title. Any and all requirements pertaining to signs shall comply with Chapter 15.24. (Ord. 86-6 §8-810, 1986)

17.32.110 Home occupations. A. Generally. A home occupation is an accessory use of a dwelling unit, conducted entirely within the dwelling unit, carried on by one or more persons, all of whom reside within the dwelling unit, and where no persons are employed other than resident and domestic help; anywhere the use is clearly incidental and secondary to the use of the dwelling for residence purposes and does not change the character thereof or adversely affect the uses permitted in the residential district of which it is a part. There shall be no outside storage of any kind; any indoor storage, construction, alterations, or electrical or mechanical equipment used, shall not change the fire rating of the structure or the fire district in which the structure is located. The use may increase vehicular traffic flow and parking by no more than one additional vehicle at a time. It shall not cause an increase in the use of one or more utilities (water, sewer or garbage) so that the combined total use for dwelling and home occupation purposes of the one or more utilities exceeds the average for residences in the neighborhood. When a use

is a home occupation, it means that the owner, lessee, or other persons who have a legal right to the use of the dwelling unit also have the vested right to conduct the home occupation without securing special permission to do so. However, such person shall be subject to all conditions set forth in this title, such as off-street parking, and to all other permits required by the city, such as building permits and business licenses, and is encouraged to check with city officials before establishing such home occupation.

B. Purpose. It is the intent of this section to eliminate as home occupations all uses except those that conform to the standards set forth in this section. In general, a home occupation is an accessory use so located and conducted that the average neighbor, under normal circumstances, would not be aware of its existence. The standards for home occupations in this section are intended to ensure compatibility with other permitted uses and with the residential character of the neighborhood, and a clearly secondary or incidental status in relation to the residential use of the main building as the criteria for determining whether a proposed accessory use qualifies as a home occupation.

C. Necessary Conditions. Home occupations are permitted accessory uses in residential zones only so long as all the following conditions are observed:

1. Such occupation shall be conducted solely by resident occupants in their residence;

2. No more than one room or twenty-five percent of the gross area of one floor of said residence, whichever is less, shall be used for such purpose. Use of accessory buildings or garages for these purposes is prohibited;

3. No use shall require internal or external alterations or involve construction features or the use of electrical or mechanical equipment that would change the fire rating of the structure or the fire district in which the structure is located.

4. No home occupation shall cause an increase in the use of any one or more utilities (water, sewer, garbage, etc.) so that the combined total use for dwelling and home occupation purposes exceeds the average for residences in the neighborhood;

5. There shall be no outside storage of any kind related to the home occupation;

6. The use may increase vehicular traffic flow and parking by no more than one additional vehicle at a time;

7. No use shall create noise, dust, vibration, smell, smoke, glare, electrical interference, fire hazard, or any other hazard or nuisance to any greater or more frequent extent than that usually experienced in an average residential occupancy in the district in question under normal circumstances wherein no home occupation exists.

Complaints by citizens or residents may be cause for termination of the home occupation.

D. Examples of the Uses that Frequently Qualify as Home Occupations. The following are typical examples of uses which can be conducted within the limits of the restrictions established in this section and thereby qualify as home occupations. Uses which may qualify as "home occupations" are not limited to those named in this subsection (nor does listing of a use in this subsection automatically qualify as a home occupation): Accountant, architect; artist; attorney-at-law; author; consultant; dressmaking; individual stringed-instrument instruction; individual tutoring; insurance; millinery; preserving and home cooking; realtor.

E. Uses that are Prohibited. The following uses by the nature of the investment of operation have a pronounced tendency, once started, to rapidly increase beyond the limits permitted for home occupations and thereby impair the use and value of a residentially zoned area for residential purposes. Therefore, the following uses shall not be permitted as home occupations: auto repair, minor or major; barber shop; carpentry work; dance instruction; dental offices; medical offices; painting of vehicles, trailers or boats; photo developing; photo studios; private schools with organized classes; radio repair; television repair; upholstering. (Ord. 86-6 §8-811, 1986)

17.32.120 Miscellaneous performance requirements.

A. Glare and Lighting.

1. Any lighting used to illuminate an off-street parking area, sign or other structure shall be arranged so as to deflect light away from any adjoining residential zone or from the public streets. Direct or sky-reflected glare, whether from floodlights or from high temperature processes such as combustion or welding, shall not be directed into any adjoining property. The source of lights shall be hooded or controlled in some manner so as not to light adjacent property. Bare incandescent light bulbs shall not be permitted in view of adjacent property or public right-of-way. Any light or combination of lights which cause light on a public street, other than lights specifically intended for that purpose, shall not exceed one footcandle (meter reading) as measured from the center line of said street. Any light or combination of lights which cast light on residential property shall not exceed four footcandles (meter reading) as measured from said property.

2. No light which is flashing, revolving, or otherwise resembles a traffic-control signal shall be allowed in any area where it could create a hazard for passing vehicular traffic.

B. Surface Water Ponding. Natural ponding areas shall be retained as much as possible or, if necessary, enlarged or modified as directed by the city engineer to restrict the off-site runoff, subject to city subdivision requirements for storm water runoff control and Chapter 15.20, Stormwater retention.

C. Storage--Exterior Displays. All materials, supplies, merchandise or other similar matter not on display for direct sale, rental or lease to the ultimate consumer or user shall be stored within the confines of a one hundred percent opaque wall or fence not less than six feet tall. Merchandise which is offered for sale as described may be displayed beyond the confines of a building in any general commercial district, but the area occupied by such outdoor display shall not constitute a greater number of square feet than ten percent of the ground floor area of the building housing the principal use, unless such merchandise is a type customarily displayed outdoors, such as automobiles and garden supplies. No storage of any type shall be permitted within the one-half of the required front or side street setback nearest the street nor within any required interior side or rear setback.

D. Trash and Garbage Incinerators--Storage. No exterior incineration of trash or garbage is permissible. No exterior storage of trash or garbage is permissible except in an accessory building enclosed by walls and roof or in closed containers within a totally screened area.

E. Refuse Containers. It shall be the duty of the owner or developer of all new single-family residential construction and development within the city, when such development is not subject to the provisions of the Surprise subdivision ordinance with respect to refuse containers, to supply at his/her expense refuse containers which shall become the property of the city. The type of such containers shall be approved by the city engineer.

F. Public Street Frontage. Except as otherwise allowed or required by this title, no lot shall contain any building unless such lot abuts for at lest fifty feet on a pubic street or a private street approved as part of a city approved planned development.

G. Smoke, Dust and Other Particulate Matter. The emission of smoke, dust and other particulate matter shall be in compliance with the county bureau of air pollution standards as regulated by the Maricopa County health services development.

H. Bulk Storage (Liquid). All uses associated with bulk storage of all gasoline, liquid fertilizer, chemicals, flammable and similar liquids shall comply with Uniform Building and Fire Code requirements and Maricopa County regulations.

I. Water Quality, Hazardous Wastes and Wastewater. Discharge of hazardous waste, chemicals and wastewater will

be subject to Arizona Department of Health Services, Division of Environmental Health standards.

J. Odors. The emission of odors by any use shall be in compliance with city standards and regulations.

K. Noise. The emission of noise from any use shall be in compliance with city standards and regulations. (Ord. 86-6 §8-812, 1986)

17.32.130 Nonconforming uses and structures. A. Any structure or use lawfully existing upon the effective dated of the ordinance codified in this title may be continued at the size and in the manner of operating existing upon such date except as hereinafter specified.

B. When a structure has been declared unsafe by the building safety department it may be placed in a safe condition unless such condition was created as described in subsection D of this section.

C. When any unlawful nonconforming use of any structure or land in any district has been changed to a conforming use, it shall not thereafter be changed to any nonconforming use.

D. Whenever a lawful nonconforming use of a building or structure has been damaged by fire, flood, explosion, earthquake, war, riot or act of God to an extent greater than sixty percent of its originally appraised value, it shall not be reconstructed, but such property shall revert to a conforming use.

E. Whenever a lawful nonconforming use of a building or structure or land is discontinued for a period of ninety days, any future use of said building or structure or land shall be in conformity with the provisions of this title.

F. Normal maintenance of a building or other structure containing or related to a lawful nonconforming use is permitted, including necessary structural repairs provided such structural repairs do not enlarge or intensify the nonconforming use.

G. A lawful nonconforming use shall not be changed except in conformance with the use requirements of the zone in which it is located.

H. Alterations may be made to a structure or building containing lawful nonconforming residential units when they will improve the liveability thereof, provided they will not increase the number of dwelling units.

I. Existing Lots:

1. At the time of the enactment of the ordinance codified in this title, if any owner of a plot of land consisting of one or more adjacent lots in a subdivision of record does not own sufficient contiguous land to enable him/her to conform to the minimum lot size requirements or does not have sufficient lot width to conform to the minimum lot width requirements, such plot of land may nevertheless be used as a building site. The dimensional re-

quirements of the district in which the piece of land is located may be reduced by the smallest amount that will permit a structure of acceptable size to be built upon the lot, such reduction to be determined by the board of adjustment.

a. In the R1-43, R1-18, R1-8 and R1-5 zones, the reductions shall permit only a single-family residence.

b. In the R-2 zone, the reduction shall permit only a duplex.

c. In the R-3 zone, the reduction shall permit only a townhouse cluster or apartment containing no more than four units.

2. No lot, even though it may consist of one or more adjacent lots in the same ownership at the time of passage of the ordinance codified in this title, shall be reduced in size so that lot width or size of yards or lot area per family or any other requirement of this title is not maintained. This section shall not apply when a portion of a lot is acquired for a public purpose. (Ord. 86-6 §8-813, 1986)

17.32.140 Modular homes, manufactured home parks and subdivisions, modular homes. A. Purpose. The purpose of these regulations is to ensure quality manufactured home development within the city.

B. Permitted Uses.

1. No person shall occupy any mobile home in the city except in a mobile home park. No person shall occupy any recreational vehicle and/or travel trailer except in a permitted recreational vehicle park or a mobile home park as described herein;

2. Recreational vehicles in mobile home parks, not to exceed ten percent of mobile home spaces provided;

3. Storage of recreational vehicles and/or travel trailer: Should a recreational vehicle be stored on a lot outside of a garage or carport, it must be placed in the rear of the principal building or any projection thereof. All utilities shall be disconnected, and it may not be used for living, sleeping or housekeeping purposes of any kind;

4. Accessory uses approved by the planning and zoning commission.

C. Lot Area and Lot Dimensions.

1. Required Lot Area:

Use	Minimum Lot Area
Mobile and manufactured home in mobile home park	4,000 square feet
Manufactured and modular home in manufactured home park	4,000 square feet

Manufactured and modular home in manufactured home subdivision	See appropriate zoning classification regulations
Modular or sectional home in residential subdivision	See appropriate zoning classification regulations

2. Required Lot Dimensions:

Use	Minimum Lot Width	Minimum Lot Depth
Mobile and manufactured home in mobile home park	40′	100′
Manufactured and modular home in manufactured home park	40′	100′
Manufactured and modular home in manufactured home subdivision	See appropriate zoning classification regulations	
Modular or sectional home in residential subdivision	See appropriate zoning classification regulations	

D. Setbacks and Yards.

1. Minimum setbacks from property (lot) lines shall be as follows:

Use	Front	Interior Side	Corner Side	Rear
Recreational vehicle in mobile home park	10′	8′	15′	10′
Mobile/manufactured home in mobile home park	20′	8′	15′	10′

Use	Front	Interior Side	Corner Side	Rear
Manufactured/ modular home in manufactured home park	20'	8'	15'	10'
Manufactured/ modular home in manufactured home sub-division	See appropriate zoning classification			
Modular/sec-tional home in residential subdivision	See appropriate zoning classification			

E. Encroachment into Front and Side Yard Setbacks.

1. Open steps and decks shall be permitted to extend into the front and side yard setback a distance of not more than five feet in the case of front yards and not closer than five feet to the property line in the case of side yards.

2. Covered patios, decks, porches or carports shall not be permitted encroachments in any setback.

3. Roof Projections into Required Side Yards. A mobile, manufactured or modular home or garage roof shall not be constructed closer than five feet to a side property line.

F. Landscaping.

1. The front setback area of each mobile, manufactured and modular home shall be landscaped as approved by the planning and zoning administrator.

2. All private, commonly owned recreation areas not devoted to buildings, structures, surfaced courts, sand boxes, etc., shall be landscaped and irrigated as approved by the planning and zoning administrator.

G. Maintenance.

1. There shall be no occupancy of any mobile home until the occupancy permit is issued; no occupancy permit shall be issued unless the mobile home is connected to an approved sewer system and a public water line.

2. No mobile home may be parked on a roadway for more than twenty-four hours.

3. No abandoned, burned or wrecked mobile home may be kept on a lot for more than thirty days.

4. Each mobile home must bear an insignia which attests that the construction of the mobile home meets

regulation A119.1 of the American National Standards Institute (adopted by the U.S. Department of Housing and Urban Development).

5. Standard mobile home skirting must be provided around the entire perimeter of the mobile home between the bottom of the body of the mobile home and the ground, except where the mobile home is attached to a permanent foundation.

6. Each mobile home must be securely anchored to the ground in a manner acceptable to the city.

7. Each mobile home must be stabilized from beneath using a concrete masonry, and/or metal support system acceptable to the city.

8. There shall be no exposed outdoor storage of furniture (except lawn furniture), household goods, tools, equipment, or building materials or supplies.

H. Other Requirements.

1. Regulations of Chapter 17.28 of this title shall apply except when such regulations conflict with this chapter or the regulations are clearly noncompatible with structures governed by this chapter.

I. Manufactured Home Subdivision.

1. A plat for a manufactured home subdivision shall be prepared in the same manner, with the same restrictions as conventional subdivisions within the zoning district in which they are to be located.

2. A plat shall be submitted in conformance with Ordinance No. 86-07, Section 11-1103, platting procedures and requirements.

3. A manufactured home subdivision shall consist of not less than ten acres. (Ord. 90-5 §5, 1990: Ord. 86-6 §8-814, 1986)

EXHIBIT "P"
Section 17.28.120

17.28.120 Floodway overlay zone (F-1). A. Purpose. The F-1 floodway zone is intended to allow unimpeded passage of water during a flood through those areas of the city identified as floodway by the Federal Insurance Administration of the National Flood Insurance Program of the U.S. Department of Housing and Urban Development and shown as such on the Federal Emergency Management Agency (FEMA) flood insurance rate map for the city. The purpose of these regulations is to promote the public health, safety and general welfare, and to minimize public and private losses because of flood conditions. Since the floodway is an extremely hazardous area because of the velocity of flood water which carry debris and erosion potential, development is closely regulated.

B. Principally Permitted Uses. Those principally permitted uses which are allowed in the underlying zoning district only if a technical evaluation demonstrates that encroachments, fill, new construction, substantial improvements or other development shall not result in any increase in flood levels during the occurrence of the base flood discharge.

C. Conditionally Permitted Uses. Those conditionally permitted uses which are allowed in the underlying zoning district only if a technical evaluation demonstrates that encroachments, fill, new construction, substantial improvements or other development shall not result in any increase in flood levels during the occurrence of the base flood discharge.

D. Nonconforming Uses. Nonconforming uses in the floodway overlay zone shall not be expanded but may be modified, altered or repaired to incorporate floodproofing measures provided such measures do not raise the level of a one-hundred-year flood. (Ord. 86-6 §7-712, 1986)

EXHIBIT "Q"
Section 17.28.130

17.28.130 Floodplain overlay zone (F-2). A. Purpose. The F-2 floodplain overlay zone is intended to regulate the nature of permitted development in the one-hundred-year floodplain as identified by the Federal Insurance Administration of the National Flood Insurance Program of the U.S. Department of Housing and Urban Development and shown as "A" zones on the city's flood insurance rate maps, so as to lessen property damage and hazards resulting from such events.

B. Principally Permitted Uses. Those principally permitted uses of the underlying zoning district, which may be any of the residential, commercial or industrial zones defined in this title; provided, however, that such uses comply with the restrictions of subsections E and F of this section.

C. Conditionally Permitted Uses. Those conditionally permitted uses of the underlying zoning district, which may be any of the residential, commercial or industrial zones

defined in this title; provided, however, that such uses comply with the restrictions of subsections E and F of this section.

D. Permitted Accessory Uses. Those permitted accessory uses of the underlying zoning district, which may be any of the residential, commercial or industrial zones defined in this title; provided, however, that such uses comply with the restrictions of subsections E and F of this section.

E. General Standards for Flood Hazard Reduction. In all floodway and floodplain areas, the following standards are required:

1. Anchoring:

a. All new construction and substantial improvements shall be anchored to prevent flotation, collapse or lateral movement of the structure.

b. All mobile homes shall be anchored to resist flotation, collapse or lateral movement by providing over-the-top and frame ties to ground anchors. Special requirements shall be that:

i. Over-the-top ties be provided at each of the four corners of the mobile home, with two additional ties per side at intermediate locations; mobile homes less than fifty feet long require only one additional tie per side;

ii. Frame ties be provided at each corner of the mobile home with five additional ties per side at intermediate points with mobile homes less than fifty feet lone requiring only four additional ties per side;

iii. All components of the anchoring system are capable of carrying a force of four thousand eight hundred pounds; and

iv. Any additions to the mobile home be similarly anchored.

2. Construction Materials and Methods.

3. Utilities:

a. All new and replacement water supply systems shall be designed to minimize or eliminate filtration of floodwaters into the system.

b. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharge from the systems into flood waters.

c. On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

F. Specific Standards for Flood Hazard Reduction. The following standards shall apply in all areas where base flood elevation data has been established by the Federal Insurance Administrator of the National Flood Insurance Program of the U.S. Department of Housing and Urban Development.

1. Residential Construction.

a. New construction and substantial improvement of any residential structure shall have the lowest finished floor elevation, including basement, at least one foot above the base flood elevation.

b. New construction and substantial improvement of any residential structure located in an AO zone as specified on the community's flood insurance rate map (FIRM) shall have the lowest floor, including basement, elevated above the crown of the nearest street or to the depth number specified in the community's FIRM.

2. Nonresidential Construction.

a. New construction and substantial improvement of any commercial, industrial or other nonresidential structure shall either have the lowest floor, including basement, elevated to one foot above the base flood elevation; or, together with attendant utility and sanitary facilities, shall:

i. Be floodproofed so that below one foot above the base flood level the structure is watertight with walls substantially impermeable to the passage of water;

ii. Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; and

iii. Be certified by a registered professional engineer or architect that the standards of this subsection are satisfied. Such certifications shall be provided to the building safety department.

b. New construction and substantial improvement of any nonresidential structure located in an AO zone as specified on the community's FIRM shall have the lowest flood, including basement, elevated above the crown of the nearest street or to the depth number specified on the community's FIRM or together with attendant utility and sanitary facilities shall:

i. Be floodproofed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water;

ii. Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; and

iii. Be certified by a registered professional engineer that the standards of this subsection are satisfied. Such certifications shall be provided to the building safety department.

3. Mobile Homes.

a. Mobile homes shall be anchored in accordance with Section 17.32.140.

b. For new mobile home parks and mobile home subdivisions; for expansions to existing mobile home parks and mobile home subdivisions; for existing mobile home parks and mobile home subdivisions where the repair, recon-

struction or improvement has commenced; and for mobile homes not placed in a mobile home park or mobile home subdivision; require that:

i. Stands or lots are elevated on compacted fill or on pilings so that the lowest floor of the mobile home will be at or above one foot above the base flood level;

ii. Adequate surface drainage and access for a hauler are provided; and

iii. In the instance of elevation on piling, that lots are large enough to permit steps, and piling foundations are placed in stable soil no more than ten feet apart.

c. No mobile home shall be placed in a floodway. (Ord. 86-6 §7-713, 1986)

EXHIBIT "R"
Section 17.28.050

17.28.050 Multifamily residential zone (R-2). A. Purpose. The purpose of the R-2 multifamily residential zone is to provide for medium density housing in multiple-family structures and directly related complementary uses. The R-2 zone is designed to allow economical use of land while creating an attractive, functional and safe residential environment.

B. Principally Permitted Uses. See Section 17.24.020A.

C. Conditionally Permitted Uses. See Section 17.24.020B.

D. Permitted Accessory Uses. See Section 17.24.020C.

E. Lot Area and Lot Dimensions. In determining minimum lot area and minimum lot dimensions, the following table should be used:

Use	Minimum Area per Unit	Minimum Lot Dimensions*	Outdoor Living Area**
Two-family dwelling	3,000 sq. ft.	Width: 70' Depth: 90'	600 sq. ft./ dwelling unit

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* These dimensions apply to the initial lot size per structure. Initial lots may be divided to accommodate individual ownership of the structures' dwelling units

** Outdoor living area in the minimum amount specified above must be provided on any lot occupied by the multiple residence or townhouse building. This space must be easily accessible for daily recreational use by the occupants of the building. Driveways, parking areas, ornamental landscaped areas (having a width of less than twenty feet), and required side or front yards shall not be considered as an outdoor living area, except in the case of interior townhouse units where said unit is less than twenty feet in width, in which case the minimum width of the outdoor living area shall be the width of the lot.

Use	Minimum Area per Unit	Minimum Lot Dimensions*	Outdoor Living Area**
Three-family dwelling	3,000 sq. ft.	Width: 80' Depth: 90'	500 sq. ft./ dwelling unit
Four-family dwelling	3,000 sq. ft.	Width: 80' Depth: 90'	400 sq. ft./ dwelling unit
Townhouse cluster	3,000 sq. ft.***	Width: 90' Depth: 90'	400 sq. ft./ dwelling unit
Other permitted uses		Minimum area and lot dimensions to be determined by building area, parking requirements and required setbacks.	

F. Schedule of Allowances. The minimum areas per unit in subsection E of this section may be adjusted according to the following, except allowance shall not be made for two-family or three-family dwellings.

1. For each parking stall in or under the residence, or otherwise completely underground, subtract four hundred square feet from the total minimum lot area.

2. For each unit with a balcony or patio greater than forty square feet, subtract one hundred square feet from the outdoor living area.

G. Setbacks, Yards, and Heights.

1. Minimum setbacks from property line:

Use	Front	Interior Side	Corner Side	Rear
Two-family dwelling structure	20'	10'	20'	20'
Three-family dwelling structure	20'	10'	20'	20'
Four-family dwelling structure	20'	15'	20'	20'
Townhouse cluster structure	20'	15'	20'	20'
Schools, civic, cultural and religious institutions (including their accessory use structures)	50'	50'	50'	50'
Structures accessory to two-family dwelling structures	20'	3'	20'	3'
Structures for all other principal or conditional uses	20'	10'	20'	20'

*** May be calculated as average lot size per unit per structure.

2. For apartment buildings, parking of motor vehicles shall not be allowed within the required front or corner side setbacks.

3. Maximum building height: thirty feet.

H. Multifamily Accessory Buildings.

1. Accessory buildings shall observe the same setback requirements established for the multiple residence building except that accessory buildings located within the rear yard of the multiple-residence buildings may be located to within five feet of the rear or interior side property line. The city council may require common walls for accessory buildings on the same lot where common walls will eliminate unsightly and hazardous areas. Accessory buildings on the same lot shall otherwise be separated by a distance of not less than ten feet.

2. Exteriors of accessory buildings shall have an exterior finish compatible to the main structure. Compatibility shall be determined by the city based on type and use of building materials.

I. Distance Between Buildings. When two or more principal buildings are located on one lot, the minimum separation between any two adjacent principal buildings shall be a distance not less than an amount equal to the height of the taller of the two buildings or twenty feet, whichever is greater when developed as a planned area development. For major and minor site plans, building separation shall be the sum of two interior side yard setbacks.

J. Additional Building and Performance Standards. Development of any parcel of land within this district shall be subject to all applicable requirements of Chapter 17.32 of this title.

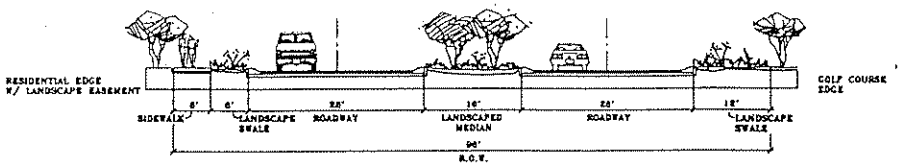
K. Relationship to Overlay Zones. Any property located in the R-2 zone as well as in the F-1 or F-2 overlay zones must comply with the regulations of the overlay zones. (Ord. 86-6 §7-705, 1986)

ARIZONA
TRADITIONS
Surprise Village North

MINIMUM STREET CROSS SECTIONS

EXHIBIT "S"

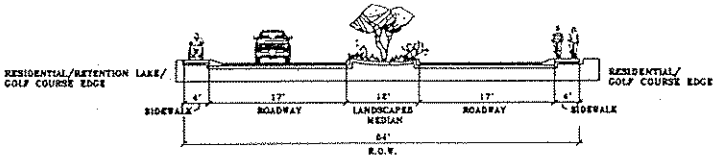
N O R T H



(1.) Main Entry Drive

NOTES:

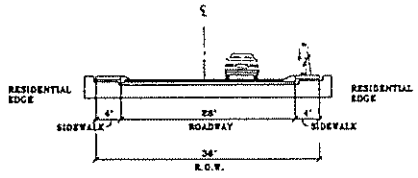
1. Final roadway cross section and R.O.W. width.



(2.) Typical Loop Road of Secondary Entrance

NOTES:

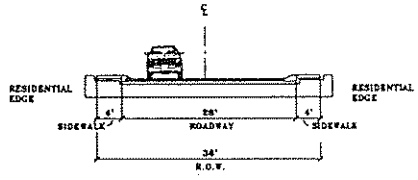
1. Final roadway cross section and R.O.W. width.



(3.) Typical Public Local Street

NOTES:

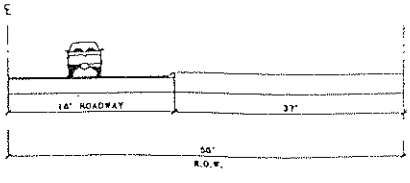
1. Final roadway cross section and R.O.W. width.
2. Parking on one side typically for this section.



(4.) Typical Private Local Street

NOTES:

1. Final roadway cross section and R.O.W. width.



(5.) Union Hills Drive

REVISIONS		
#	Date	Comments
1	12/7/94	Roadway widths
2	2/15/95	Roadway dimension change
3	02/23/95	Roadway dimension change
4	03/24/95	Roadway widths; notes
5	10/02/95	Roadway dimensions; notes
6	12/19/95	Landscape character; notes
7	02/20/96	Exhibit title

THE PLANNING CENTER
2633 E. ARIZONA BILTMORE CIRCLE SUITE 136
PHOENIX ARIZONA 85016 (602) 957 2233

CAREFREE
PARTNERS

October 23, 1995

Shirley Berg
CITY OF SURPRISE
12425 West Bell Road, #D-100
Surprise, AZ 85374

Re: PAD Revisions - Traffic

Dear Shirley:

Please find enclosed revised Page 5 and Figure 2 from The Villages at Surprise - North, Addendum to Traffic Impact Study, dated July 28, 1995. These are to be inserted in the referenced Traffic Report Addendum, which you already have. This Page and Figure have been revised to incorporate your Staff comments regarding the Secondary Entrance along Bell Road.

After your final review of this Addendum, we plan to incorporate your final comments, if any, redate the cover page and reissue it for file and record purposes. We look forward to your timely review and response.

Sincerely,

SURPRISE VILLAGE COMPANY

Russell E. Ewers

cc: Ken Howell
Eric Brown
John Graham
Rick West

11411 North Tatum Boulevard / Phoenix, Arizona 85028 / Tel 602 953 8700 Fax 602 953 1964

Based on the results of this analysis, the principal recommendations are:

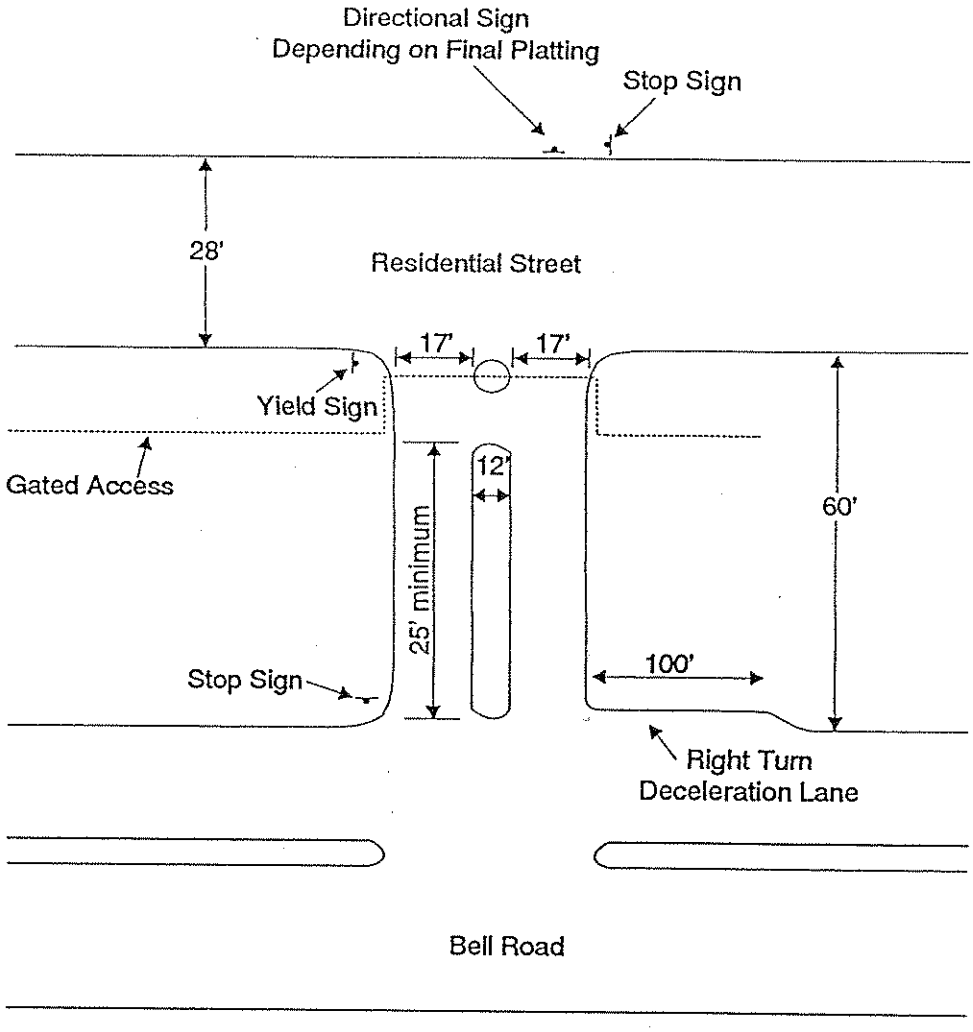
- The main entrance, Citrus Road, to the Villages at Surprise-North should be four lanes. The secondary entrance should be two lanes wide. All other internal roads should be two lanes wide.

- A traffic signal will be needed at the intersection of Citrus Road/Bell Road. Traffic signals should be installed when volumes warrant a signal based on the signal warrants contained in the *Manual on Uniform Traffic Control Devices* (MUTCD).

- The secondary entrance should be designed as shown on Figure 2, which assumes the majority of traffic travels to and from the western section of the neighborhood. A yield sign should be placed on the eastbound residential street, at the T-intersection. A stop sign should be placed on the westbound residential street at the T-intersection. A reflective directional sign should be placed on the far side of the intersection directly ahead of inbound traffic, depending on final platting. A stop sign should be placed on the secondary road for southbound exiting traffic onto Bell Road.

- A right turn deceleration lane is justified for westbound traffic on Bell Road turning north on the secondary entrance, as shown on Figure 2.

- The Villages at Surprise-North revised plan does not significantly alter traffic patterns to the south. Therefore, all recommendations for the Villages at Surprise-South remain the same as in the previous traffic report.



not to scale

Revised 10/7/95

LEE ENGINEERING

Figure 2
Schematic Description
of Secondary Access

Villages at Surprise
Traffic Impact Study

THE VILLAGES AT SURPRISE - NORTH
Addendum to Traffic Impact Study

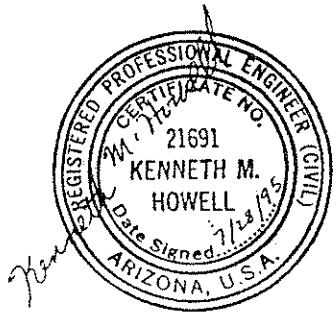
for:

Surprise Village Company

July 28, 1995

by:

Lee Engineering, Inc.
3240 East Camelback Road, Suite 180
Phoenix, Arizona 85018
(602) 955-7206



INTRODUCTION

This addendum to the traffic report addresses the changed land use plan and revised road network for the Villages at Surprise-North. This study examines the traffic impact due to a new secondary entrance on Bell Road and no connection to Union Hills Road.

The Villages at Surprise-North consists of Village 1, a potential retirement-oriented community north of Bell Road. The main entrance to the Village will be via Citrus Road, which is located one mile west of Cotton Lane. A secondary, gated entrance will be located one quarter mile west of the main entrance on Bell Road. There are existing median breaks at the proposed entrance locations. The major route for interior circulation within the Village consists of a loop road. The revised site plan is shown on Figure 1.

The previous plan for the Villages at Surprise-North included a commercial parcel along Bell Road and a secondary connection to Union Hills Road on the north. However, Union Hills road is unimproved and there are no plans to improve it, so this addendum explores the feasibility of providing a secondary entrance off Bell Road.

The secondary, gated access road will not serve as a direct route to the Loop Road. Secondary access will be provided to the Loop Road via a network of local, neighborhood streets. Figure 1 provides a simplified view of the secondary access routes by representing them as a single route, whereas there may be several routes through the neighborhood. The Loop Road to Citrus Road will be the main access route for the Villages at Surprise-North.

The secondary road will consist of a short stub to a T-intersection with local internal streets, as shown on Figure 2. This arrangement allows housing units to front on Bell Road with a setback. It also discourages through traffic and high speeds on residential streets. Queuing space, if needed, is provided along the east-west residential street. The secondary entrance is designed as an entry drive with two 17-foot-wide lanes and a 12-foot-wide median. The residential streets are 28 feet wide and designed as local streets. All other cross sections are the same as in the previous report.

Traffic for the Villages at Surprise was projected using Lee Engineering's regional travel demand model. This model is a conversion and modification of the Maricopa Association of Governments (MAG) regional travel demand model to the MINUTP set of computer programs. The previous model datasets were revised to reflect the new land use plan for Village 1.

LAND USES

The Villages at Surprise-North will include approximately 1,872 single-family homes and approximately 435 cluster homes in a series of neighborhoods located around the interior and exterior boundaries of the golf course/open space and the perimeter of the loop road. The primary home sizes will range from 1,000 to 3,000 square feet. This study assumes a golf course, club house, and community center will be located on the southeast corner of Citrus Road (Main Entrance) and the

loop road intersection. Land uses are summarized in Table 1. This study assumes there is no commercial land use. The Villages at Surprise-North are assumed to be built out by 2003.

TRIP GENERATION

Average densities of 5.5 DUs/acre for single family homes and 10 DUs/acre for cluster homes were used, which is consistent with the densities that were used in the original traffic study.

Table 1: Trip Generation Variable for Villages at Surprise-North

Variable	Village 1
Dwelling Units	2,307
Population	4,152
Other Employment	18
Public Employment	0
Retail Employment	18
Office Employment	0
Industrial Employment	0
Mean Household Income ($)	30,000

TRIP DISTRIBUTION AND ASSIGNMENT

Trip distribution and assignment followed the same procedure that was used in the original traffic study. Person trips were distributed for each trip purpose using the "gravity" trip distribution model similar to the MAG regional travel demand model.

The computer traffic analysis gives traffic projections for an average weekday in the forecast year. The resulting average daily traffic (ADT) volumes are presented on Figures 3 and 4 for the years 2005 and 2015, respectively. These volumes were converted to AM and PM peak hour traffic volumes, using the same procedure as was followed in the original study. The ADTs were multiplied by the percentage of traffic that occurs during the peak hour, and then split between the peak and off peak directions.

The following peak hour factors were determined from the original study. For consistency, these peak hour factors were also used for this analysis.

Table 2: Peak Hour Factors

	Arterial Roads	Village 1 Internal Streets
AM Peak Hour		
Percent of ADT	0.08	0.06
Directional Split (in/out)	40/60	40/60
PM Peak Hour		
Percent of ADT	0.08	0.08
Directional Split (in/out)	60/40	57/43

Approach and departure volumes at the intersections were balanced so that the approach volumes equalled the departure volumes. The balanced approach and departure volumes were processed using the TURNS program to obtain the AM and PM peak hour intersection turning movements. The resulting AM and PM peak hour turning movements are shown on Figures 5 and 6 for the years 2005 and 2015, respectively.

TRAFFIC ANALYSIS

Capacity analysis was performed for the two entrances to the Villages at Surprise-North, the intersection of Citrus Road/Loop Road, and the T-intersection of the secondary access road with the residential street. The analysis was conducted using the methodologies presented in *Special Report 209, 1994 Highway Capacity Manual*. Bell Road is an existing six lane divided roadway with a median. There exist two median openings along Bell Road; one at the Citrus Road alignment and another located approximately 1,250 feet west of the Citrus Road alignment. The two entrances to the Villages will align with the existing median openings.

The main entrance, Citrus Road/Bell Road was initially analyzed as an unsignalized intersection. It was found to operate at level of service F for 2005, which is unacceptable. The intersection was then analyzed as a signalized intersection. The intersection operated at level of service B for the year 2005 AM and PM peak hours conditions and at level of service C for the year 2015 AM and PM peak hour conditions. Bell Road was assumed to have one left turn lane and three through lanes with a shared right turn lane on each approach. Citrus Road was assumed to have one left turn lane and one through/right turn lane on each approach.

The secondary entrance, which intersects with Bell Road, was found to operate well as an unsignalized intersection. Levels of service for the critical movements are shown on Figures 7 and 8 for the year 2005 and 2015, respectively. The secondary access road was assumed to be a two lane roadway. It was also assumed that Village 2, on the south side of Bell Road, would also have an access road at this location to utilize the existing median opening. This is a conservative assumption.

Village 2 may or may not have an access road at this location. If it does not, then traffic conditions at the subject intersection will be better than estimated in this analysis.

The Citrus Road/Loop Road intersection was analyzed as a T-intersection, controlled by a stop sign on the west leg only. This intersection operated at a very good levels of service for both 2005 and 2015 conditions, as shown in Figures 7 and 8. The northbound approach was assumed to have a dedicated left turn lane and a through lane. The Loop Road was assumed to be a two lane roadway (one lane in each direction) with no left or right turn bays. Travel on the west leg is expected to be interrupted periodically due to golf carts crossing from one side of the street to the other. It is expected that a total of one minute out of every hour is used for golf cart crossings when the golf course is operating at full capacity. To account for this, the eastbound left, eastbound right, and northbound left turning movement capacities were multiplied by 59/60 to get adjusted movement capacities. All movements operated at level of service A, so there is little effect on the traffic due to the golf cart crossings.

The intersection of Secondary Access Road with the residential street was analyzed as a T-intersection. Traffic control as shown on Figure 2 was assumed. Travel between the west leg and the south leg was assumed to have the right of way, since the eastbound traffic is controlled by a yield sign. The east leg is controlled with a stop sign on the westbound lane. A 30/70 east/west split was assumed. Traffic analysis indicates that this intersection will operate at level of service A and queues are not expected to form, due to the relatively low volumes and the traffic control plan.

OTHER ISSUES

Design of the secondary access road should be considered. As it is currently planned, the access road will extend north of Bell Road for approximately 60 feet and then form a T-intersection with a neighborhood street. The 60 foot length, less curb returns, will accommodate a queue of 1-2 cars. Assuming the majority of the traffic is traveling to and from the west, it is recommended that at the T-intersection a stop sign be installed on the westbound lane and a yield sign be installed on the eastbound lane. According to the *Manual on Uniform Traffic Control Devices* (MUTCD), "yield signs may be installed to control a major traffic movement where a majority of drivers in that movement are making right turns." This applies for the T-intersection if the majority of traffic is traveling to and from the west. This signing control plan allows the south and west legs to have the right-of-way. Exiting traffic from the neighborhood would have to stop or slow down before turning onto the access road. Inbound traffic from Bell Road would not have to stop at the T-intersection, thus avoiding the possibility of forming a queue and backing up traffic at the intersection on Bell Road.

CONCLUSIONS

Traffic service for the Villages at Surprise-North will operate well for the revised roadway network, which proposes two access roads off of Bell Road and no connection to Union Hills to the north.

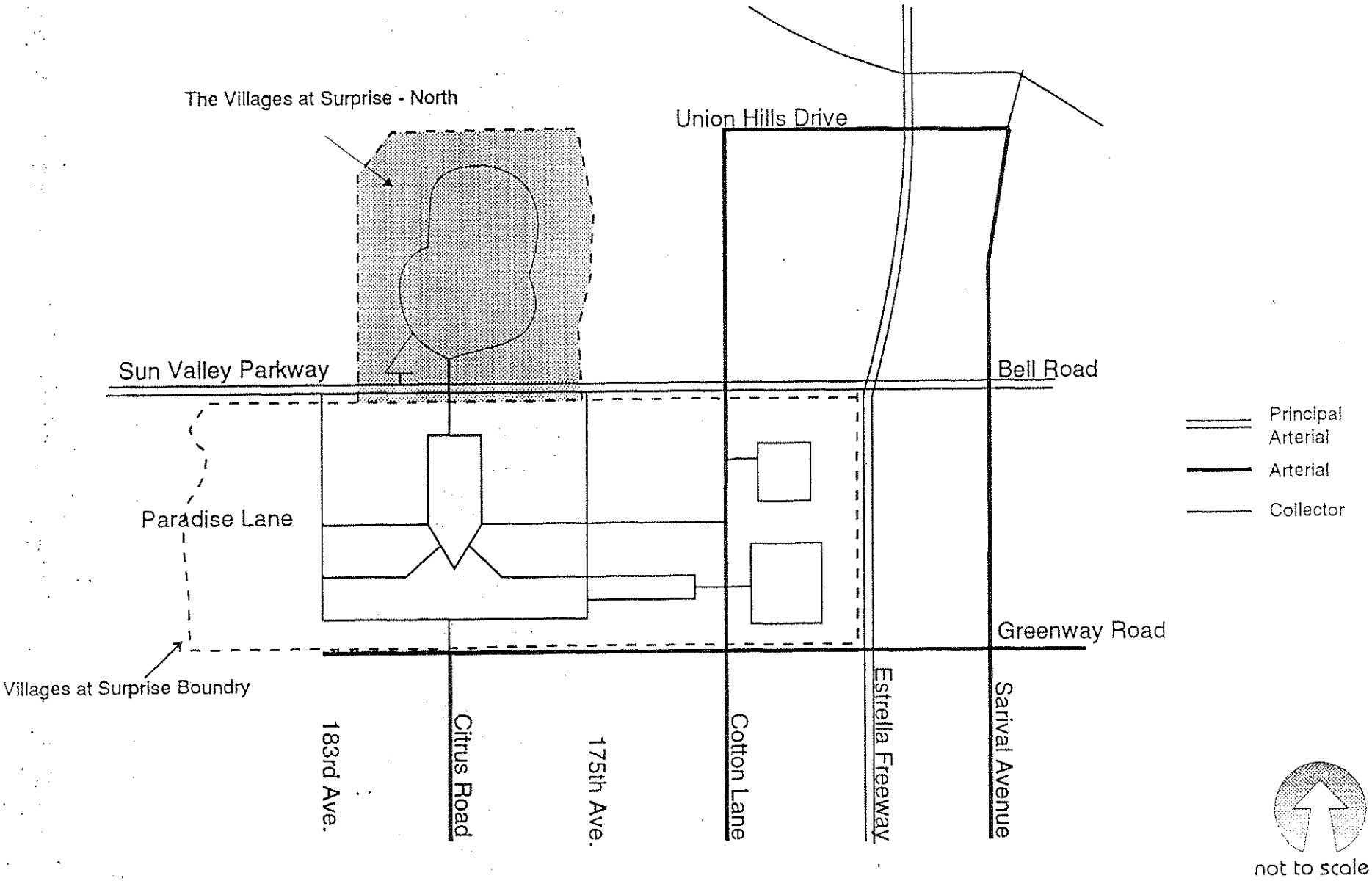
Based on the results of this analysis, the principal recommendations are:

- The main entrance, Citrus Road, to the Villages at Surprise-North should be four lanes. The secondary entrance should be two lanes wide. All other internal roads should be two lanes wide.

- A traffic signal will be needed at the intersection of Citrus Road/Bell Road. Traffic signals should be installed when volumes warrant a signal based on the signal warrants contained in the *Manual on Uniform Traffic Control Devices* (MUTCD).

- The secondary entrance should be designed as shown on Figure 2, which assumes the majority of traffic travels to and from the western section of the neighborhood. A yield sign should be placed on the eastbound residential street, at the T-intersection. A stop sign should be placed on the westbound residential street at the T-intersection. A reflective directional sign should be placed on the far side of the intersection directly ahead of inbound traffic, depending on final platting. A stop sign should be placed on the secondary road for southbound exiting traffic onto Bell Road.

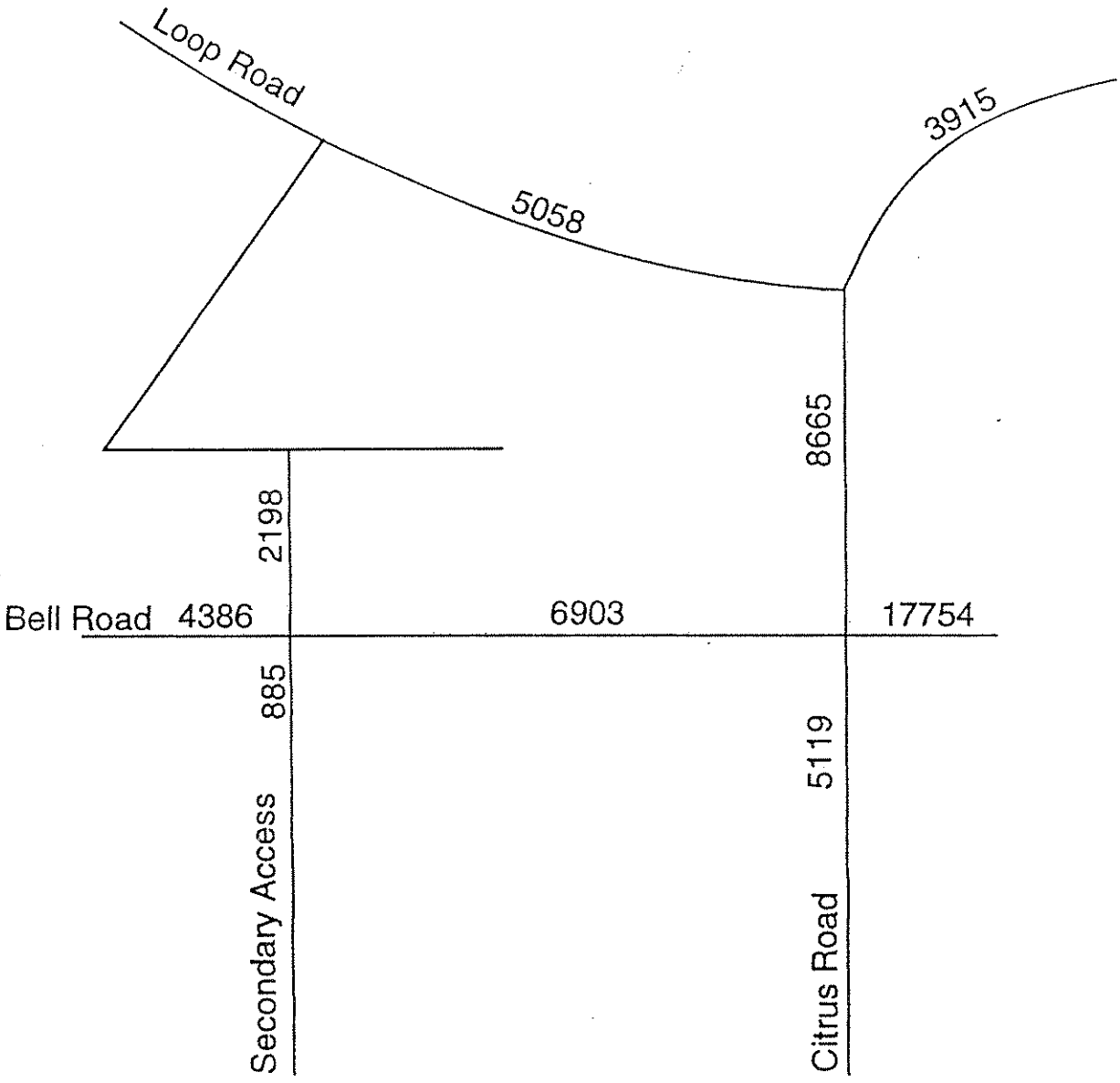
- The Villages at Surprise-North revised plan does not significantly alter traffic patterns to the south. Therefore, all recommendations for the Villages at Surprise-South remain the same as in the previous traffic report.



LEE ENGINEERING

Figure 1
Site Plan

Villages at Surprise
Traffic Impact Study



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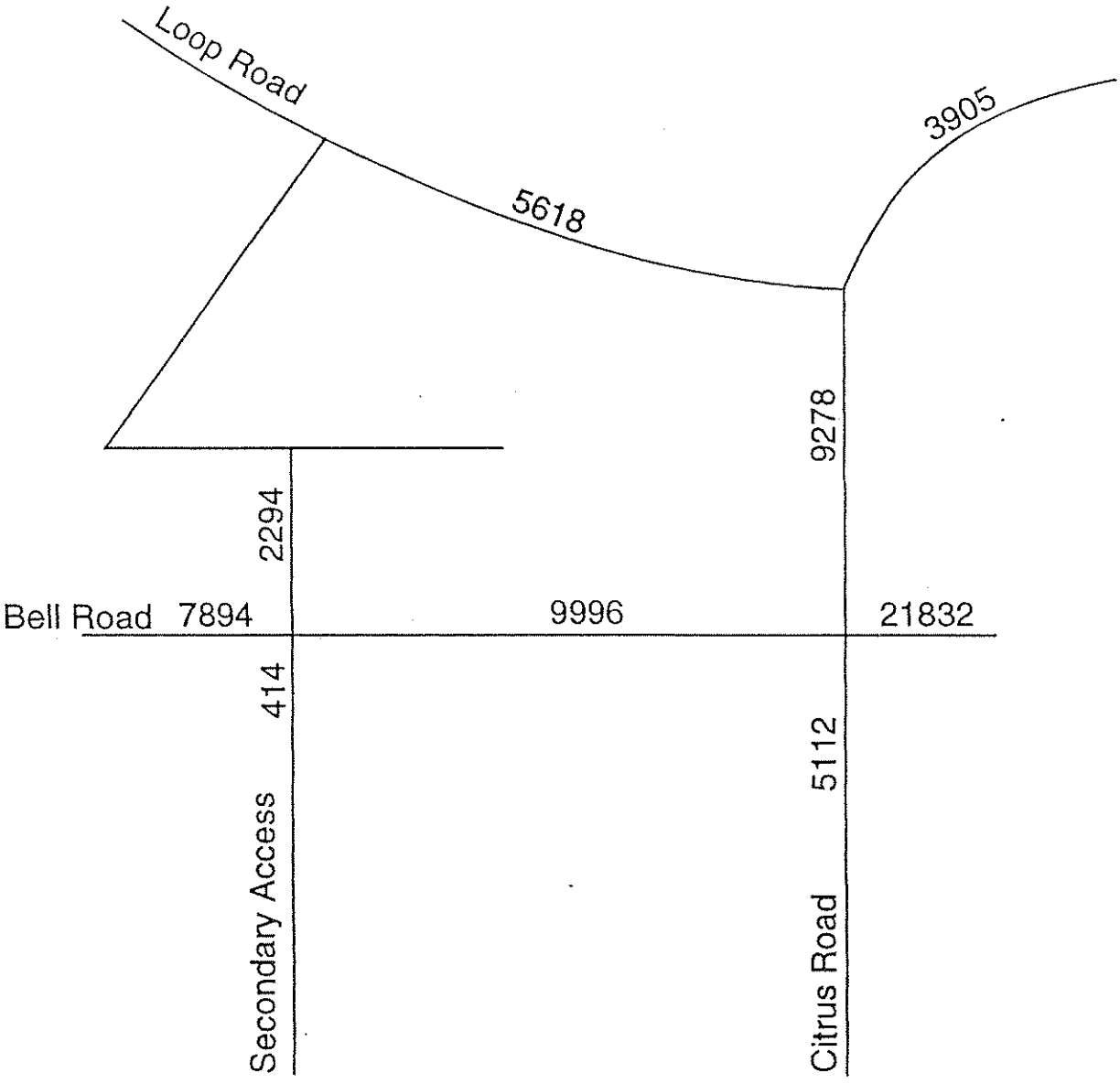
LEE ENGINEERING

Figure 3
2005 Average
Daily Traffic Volumes

Villages at Surprise
Traffic Impact Study

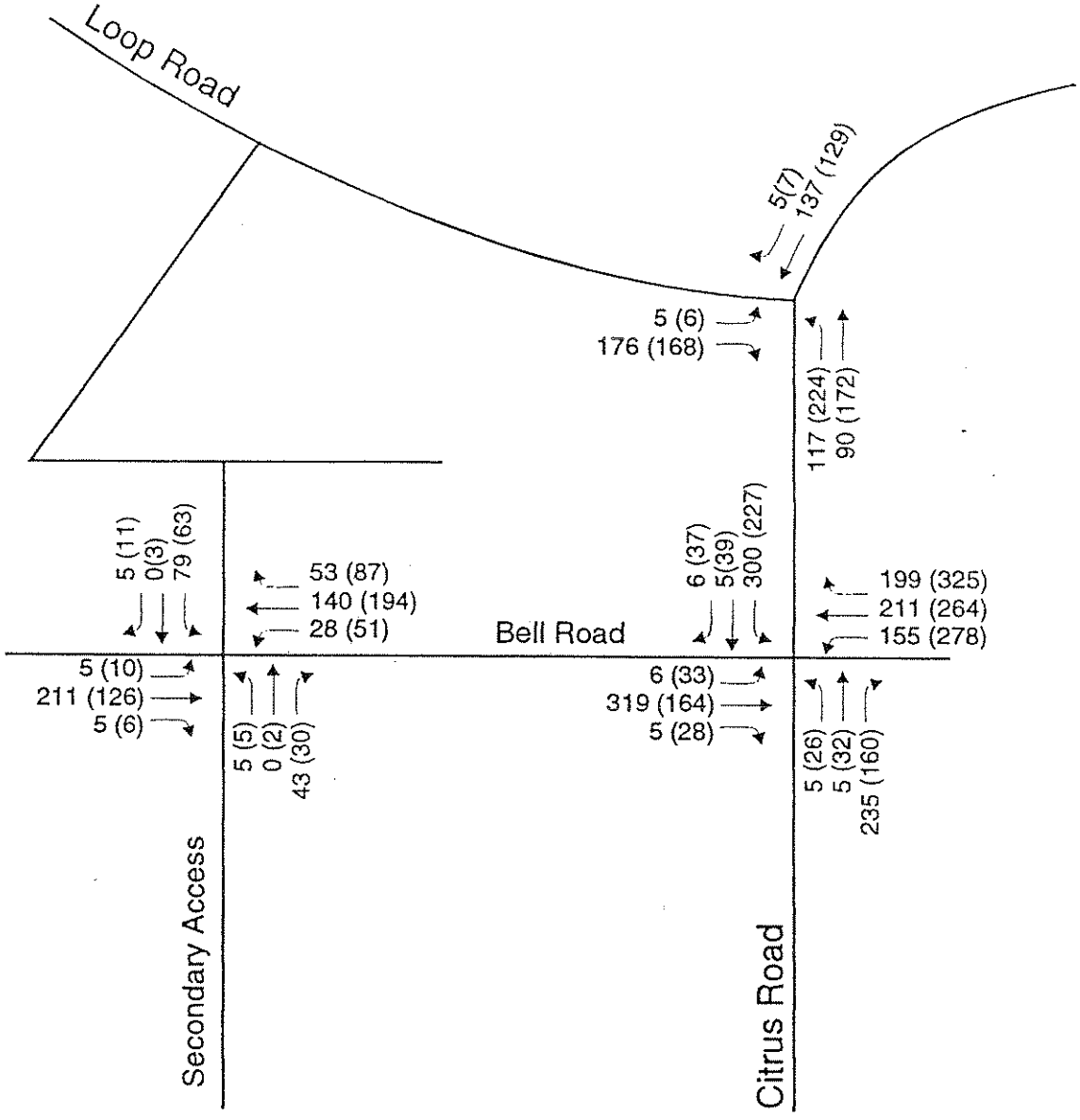


not to scale

LEE ENGINEERING

Figure 4
2015 Average
Daily Traffic Volumes

Villages at Surprise
Traffic Impact Study



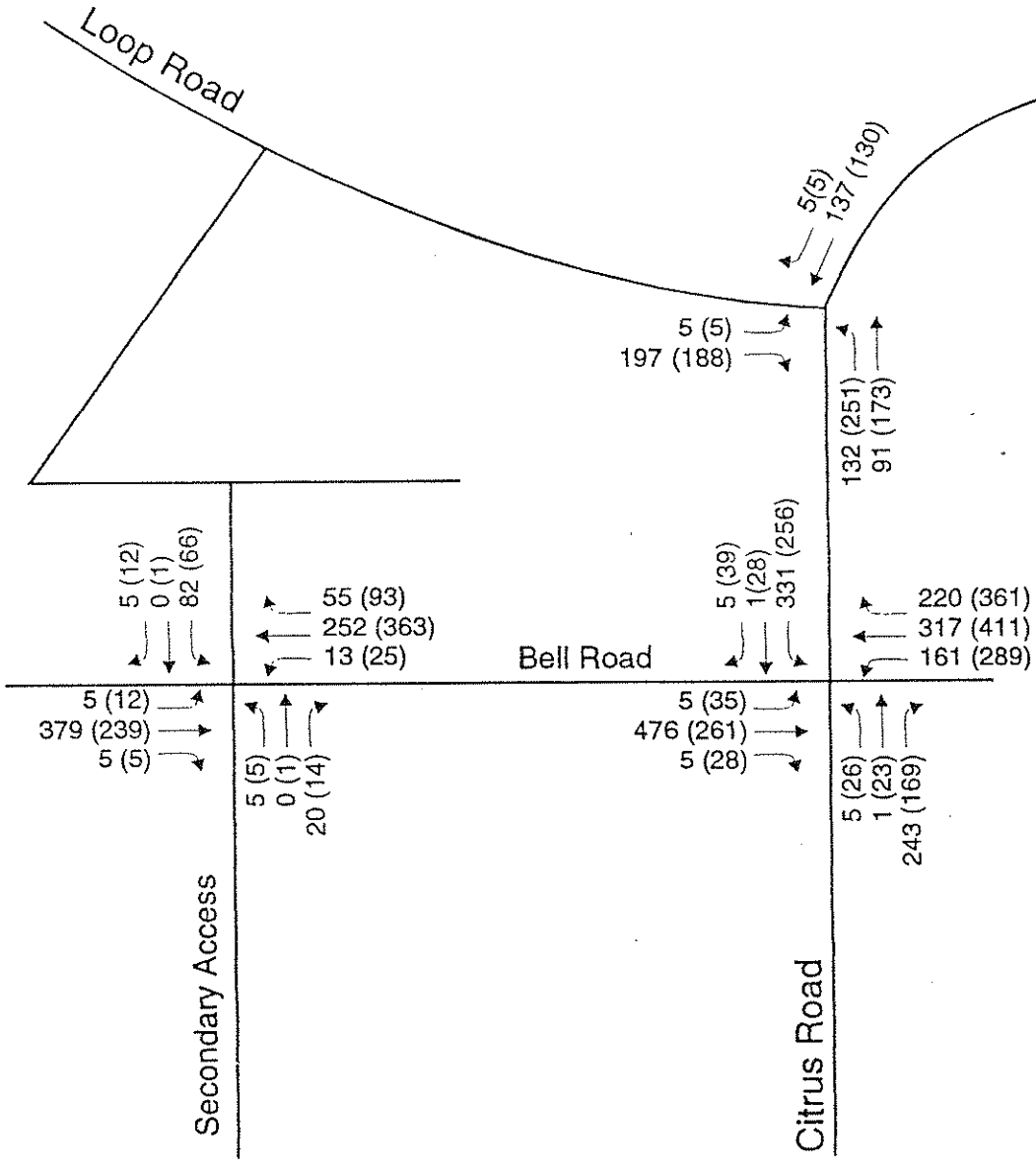
AM (PM) Traffic Volumes

not to scale

LEE ENGINEERING

Figure 5
2005 AM / PM
Peak Hour Traffic

Villages at Surprise
Traffic Impact Study



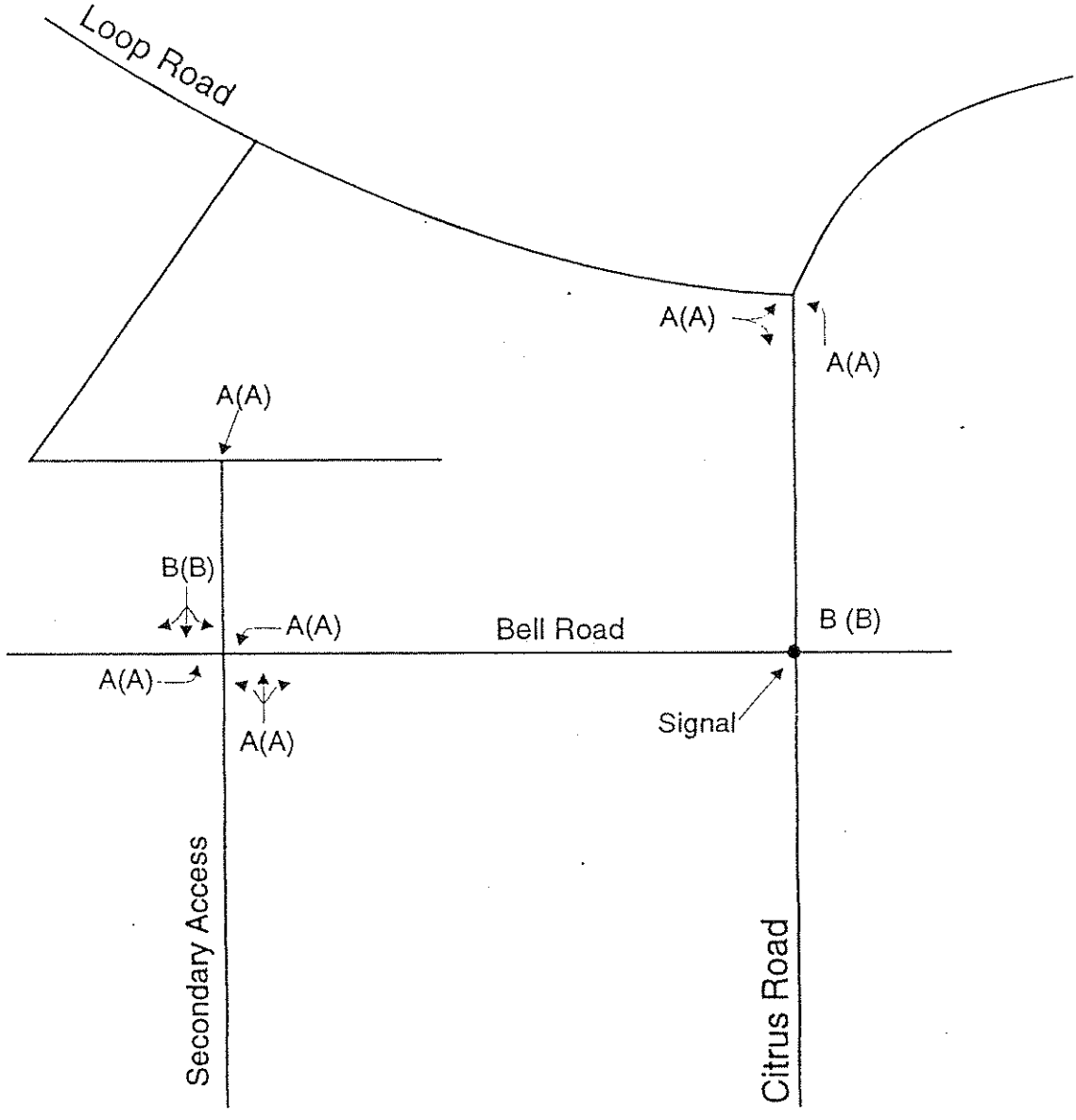
AM (PM) Traffic Volumes

not to scale

LEE ENGINEERING

Figure 6
2015 AM / PM
Peak Hour Traffic

Villages at Surprise
Traffic Impact Study



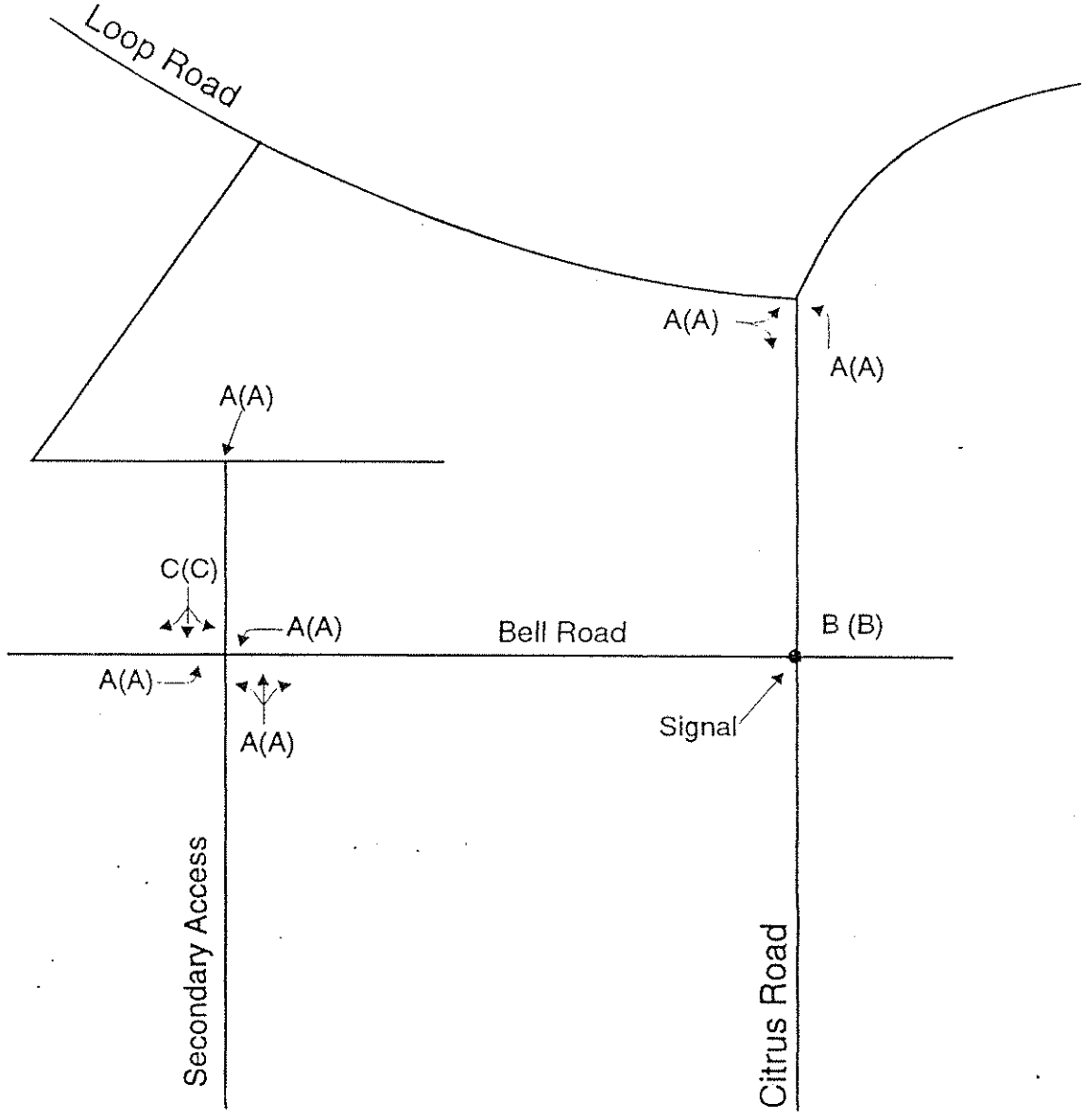
AM (PM) Level of Service

not to scale

LEE ENGINEERING

Figure 7
2005 Level of Service

Villages at Surprise
Traffic Impact Study



AM (PM) Level of Service

not to scale

LEE ENGINEERING

Figure 8
2015 Level of Service

Villages at Surprise
Traffic Impact Study

APPENDIX

****

File Name 1A2005AM.HC0
Streets: (N-S) Village 1 Access (E-W) Bell Road
Major Street Direction.... EW
Length of Time Analyzed... 15 (min)
Analyst..... SEA
Date of Analysis..... 7/19/95
Other Information..... 2005 AM Peak Hour

Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	3<	0	1	3<	0	0>	1<	0	0>	1<	0
Stop/Yield			N			N						
Volumes	5	211	5	28	140	53	5	0	43	79	0	5
PHF	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Grade		0			0			0			0	
MC's (%)	0	0	0	0	0	0	0	0	0	0	0	0
SU/RV's (%)	0	0	0	0	0	0	0	0	0	0	0	0
CV's (%)	0	0	0	0	0	0	0	0	0	0	0	0
PCE's	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.50	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.50	3.30
Left Turn Minor Road	7.00	3.40

WorkSheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	73	73
Potential Capacity: (pcph)	1272	1272
Movement Capacity: (pcph)	1272	1272
Prob. of Queue-free State:	0.96	1.00
Step 2: LT from Major Street	**WB**	**EB**
Conflicting Flows: (vph)	216	193
Potential Capacity: (pcph)	1313	1350
Movement Capacity: (pcph)	1313	1350
Prob. of Queue-free State:	0.98	1.00
Step 3: TH from Minor Street	**NB**	**SB**
Conflicting Flows: (vph)	440	416
Potential Capacity: (pcph)	603	623
Capacity Adjustment Factor due to Impeding Movements	0.97	0.97
Movement Capacity: (pcph)	586	605
Prob. of Queue-free State:	1.00	1.00
Step 4: LT from Minor Street	**NB**	**SB**
Conflicting Flows: (vph)	388	410
Potential Capacity: (pcph)	598	579
Major LT, Minor TH Impedance Factor:	0.97	0.97
Adjusted Impedance Factor:	0.98	0.98
Capacity Adjustment Factor due to Impeding Movements	0.97	0.94
Movement Capacity: (pcph)	582	544

****

Intersection Performance Summary

Movement		FlowRate v(pcph)	MoveCap Cm(pcph)	SharedCap Csh(pcph)	Avg.Total Delay	LOS	Delay By App
NB	L	6	582	1129	3.4	A	3.4
NB	R	50	1272				
SB	L	91	544	564	7.7	B	7.7
SB	R	6	1272				
EB	L	6	1350		2.7	A	0.1
WB	L	32	1313		2.8	A	0.4

Intersection Delay = 1.6

****

File Name 1A2005PM.HC0
Streets: (N-S) Village 1 Access (E-W) Bell Road
Major Street Direction.... EW
Length of Time Analyzed... 15 (min)
Analyst..... SEA
Date of Analysis..... 7/19/95
Other Information..... 2005 PM Peak Hour

Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	3<	0	1	3<	0	0>	1<	0	0>	1<	0
Stop/Yield			N			N						
Volumes	10	126	6	51	194	87	5	2	30	63	3	11
PHF	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Grade		0			0			0			0	
MC's (%)	0	0	0	0	0	0	0	0	0	0	0	0
SU/RV's (%)	0	0	0	0	0	0	0	0	0	0	0	0
CV's (%)	0	0	0	0	0	0	0	0	0	0	0	0
PCE's	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.50	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.50	3.30
Left Turn Minor Road	7.00	3.40

WorkSheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	45	108
Potential Capacity: (pcph)	1314	1221
Movement Capacity: (pcph)	1314	1221
Prob. of Queue-free State:	0.97	0.99
Step 2: LT from Major Street	**WB**	**EB**
Conflicting Flows: (vph)	132	281
Potential Capacity: (pcph)	1456	1211
Movement Capacity: (pcph)	1456	1211
Prob. of Queue-free State:	0.96	0.99
Step 3: TH from Minor Street	**NB**	**SB**
Conflicting Flows: (vph)	471	430
Potential Capacity: (pcph)	578	611
Capacity Adjustment Factor due to Impeding Movements	0.95	0.95
Movement Capacity: (pcph)	549	580
Prob. of Queue-free State:	1.00	0.99
Step 4: LT from Minor Street	**NB**	**SB**
Conflicting Flows: (vph)	384	426
Potential Capacity: (pcph)	602	566
Major LT, Minor TH Impedance Factor:	0.95	0.95
Adjusted Impedance Factor:	0.96	0.96
Capacity Adjustment Factor due to Impeding Movements	0.95	0.93
Movement Capacity: (pcph)	571	528

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Intersection Performance Summary

Movement		FlowRate v(pcph)	MoveCap Cm(pcph)	SharedCap Csh(pcph)	Avg.Total Delay	LOS	Delay By App
NB	L	6	571				
NB	T	2	549	1054	3.6	A	3.6
NB	R	35	1314				
SB	L	73	528				
SB	T	3	580	578	7.4	B	7.4
SB	R	13	1221				
EB	L	12	1211		3.0	A	0.2
WB	L	59	1456		2.6	A	0.4

Intersection Delay = 1.5

****

File Name 1A2015AM.HC0
Streets: (N-S) Village 1 Access (E-W) Bell Road
Major Street Direction.... EW
Length of Time Analyzed... 15 (min)
Analyst..... SEA
Date of Analysis..... 7/19/95
Other Information..... 2015 AM Peak Hour

Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	3<	0	1	3<	0	0>	1<	0	0>	1<	0
Stop/Yield			N			N						
Volumes	5	379	5	13	252	55	5	0	20	82	0	5
PHF	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Grade		0			0			0			0	
MC's (%)	0	0	0	0	0	0	0	0	0	0	0	0
SU/RV's (%)	0	0	0	0	0	0	0	0	0	0	0	0
CV's (%)	0	0	0	0	0	0	0	0	0	0	0	0
PCE's	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.50	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.50	3.30
Left Turn Minor Road	7.00	3.40

WorkSheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	129	112
Potential Capacity: (pcph)	1191	1215
Movement Capacity: (pcph)	1191	1215
Prob. of Queue-free State:	0.98	1.00
Step 2: LT from Major Street	**WB**	**EB**
Conflicting Flows: (vph)	384	307
Potential Capacity: (pcph)	1066	1173
Movement Capacity: (pcph)	1066	1173
Prob. of Queue-free State:	0.99	0.99
Step 3: TH from Minor Street	**NB**	**SB**
Conflicting Flows: (vph)	706	682
Potential Capacity: (pcph)	421	435
Capacity Adjustment Factor due to Impeding Movements	0.98	0.98
Movement Capacity: (pcph)	413	427
Prob. of Queue-free State:	1.00	1.00
Step 4: LT from Minor Street	**NB**	**SB**
Conflicting Flows: (vph)	652	676
Potential Capacity: (pcph)	405	391
Major LT, Minor TH Impedance Factor:	0.98	0.98
Adjusted Impedance Factor:	0.99	0.99
Capacity Adjustment Factor due to Impeding Movements	0.98	0.97
Movement Capacity: (pcph)	397	378

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Intersection Performance Summary

Movement		FlowRate v(pcph)	MoveCap Cm(pcph)		SharedCap Csh(pcph)	Avg.Total Delay	LOS	Delay By App
NB	L	6	397	>		>	>	
					842	4.4	A	4.4
NB	R	23	1191	>		>	>	
SB	L	95	378	>		>	>	
					394	12.3	C	12.3
SB	R	6	1215	>		>	>	
EB	L	6	1173			3.1	A	0.0
WB	L	15	1066			3.4	A	0.1

Intersection Delay = 1.5

****

File Name 1A2015PM.HC0
Streets: (N-S) Village 1 Access (E-W) Bell Road
Major Street Direction.... EW
Length of Time Analyzed... 15 (min)
Analyst..... SEA
Date of Analysis..... 7/19/95
Other Information..... 2005 PM Peak Hour

Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	3<	0	1	3<	0	0>	1<	0	0>	1<	0
Stop/Yield			N			N						
Volumes	12	239	5	25	363	93	5	1	14	66	1	12
PHF	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Grade		0			0			0			0	
MC's (%)	0	0	0	0	0	0	0	0	0	0	0	0
SU/RV's (%)	0	0	0	0	0	0	0	0	0	0	0	0
CV's (%)	0	0	0	0	0	0	0	0	0	0	0	0
PCE's	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.50	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.50	3.30
Left Turn Minor Road	7.00	3.40

WorkSheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	82	168
Potential Capacity: (pcph)	1258	1138
Movement Capacity: (pcph)	1258	1138
Prob. of Queue-free State:	0.99	0.99
Step 2: LT from Major Street	**WB**	**EB**
Conflicting Flows: (vph)	244	456
Potential Capacity: (pcph)	1268	976
Movement Capacity: (pcph)	1268	976
Prob. of Queue-free State:	0.98	0.99
Step 3: TH from Minor Street	**NB**	**SB**
Conflicting Flows: (vph)	734	690
Potential Capacity: (pcph)	406	431
Capacity Adjustment Factor due to Impeding Movements	0.96	0.96
Movement Capacity: (pcph)	391	415
Prob. of Queue-free State:	1.00	1.00
Step 4: LT from Minor Street	**NB**	**SB**
Conflicting Flows: (vph)	642	687
Potential Capacity: (pcph)	411	385
Major LT, Minor TH Impedance Factor:	0.96	0.96
Adjusted Impedance Factor:	0.97	0.97
Capacity Adjustment Factor due to Impeding Movements	0.96	0.96
Movement Capacity: (pcph)	394	368

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Intersection Performance Summary

Movement		FlowRate v(pcph)	MoveCap Cm(pcph)		SharedCap Csh(pcph)	Avg.Total Delay		LOS		Delay By App
NB	L	6	394	>		>		>		
NB	T	1	391	>	767	>	4.8	>	A	4.8
NB	R	17	1258	>		>		>		
SB	L	76	368	>		>		>		
SB	T	1	415	>	411	>	11.2	>	C	11.2
SB	R	14	1138	>		>		>		
EB	L	14	976			3.7		A		0.2
WB	L	29	1268			2.9		A		0.2

Intersection Delay = 1.3

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4 07-20-1995
Center For Microcomputers In Transportation

Streets: (E-W) Bell Road (N-S) Citrus Road
Analyst: SEA File Name: 2A2005AM.HC9
Area Type: Other 7-19-95 2005 AM

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	3	<	1	3	<	1	1	<	1	1	<
Volumes	6	319	5	155	211	199	5	5	235	300	5	6
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	
RTOR Vols			0			0			0			0
Lost Time	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*							
Thru	*							
Right	*							
Peds								
WB Left	*							
Thru	*							
Right	*							
Peds								
NB Right								
SB Right								
Green	24.0P				28.0P			
Yellow/AR	4.0				4.0			

NB Left					*			
Thru					*			
Right					*			
Peds								
SB Left					*			
Thru					*			
Right					*			
Peds								
EB Right								
WB Right								

Cycle Length: 60 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	341	819	0.018	0.417	7.8	B	8.3	B
	TR	2448	5874	0.153	0.417	8.3	B		
WB	L	401	962	0.407	0.417	9.7	B	8.8	B
	TR	2275	5459	0.208	0.417	8.5	B		
NB	L	873	1806	0.006	0.483	6.1	B	7.2	B
	TR	809	1673	0.312	0.483	7.2	B		
SB	L	455	942	0.694	0.483	12.3	B	12.1	B
	TR	870	1799	0.013	0.483	6.1	B		

Intersection Delay = 9.1 sec/veh Intersection LOS = B
Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.561

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4 07-20-1995
Center For Microcomputers In Transportation

Streets: (E-W) Bell Road (N-S) Citrus Road
Analyst: SEA File Name: 2A2005PM.HC9
Area Type: Other 7-19-95 2005 PM

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	3	<	1	3	<	1	1	<	1	1	<
Volumes	33	164	28	278	264	325	26	32	160	227	39	37
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	
RTOR Vols			0			0			0			0
Lost Time	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	*				NB Left	*			
Thru	*				Thru	*			
Right	*				Right	*			
Peds					Peds				
WB Left	*				SB Left	*			
Thru	*				Thru	*			
Right	*				Right	*			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	31.0P				Green	21.0P			
Yellow/AR	4.0				Yellow/AR	4.0			

Cycle Length: 60 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	323	606	0.108	0.533	5.3	B	5.2	B
	TR	3071	5759	0.072	0.533	5.2	B		
WB	L	632	1185	0.464	0.533	7.0	B	6.1	B
	TR	2878	5397	0.237	0.533	5.7	B		
NB	L	549	1497	0.049	0.367	9.3	B	10.3	B
	TR	630	1717	0.321	0.367	10.5	B		
SB	L	386	1053	0.619	0.367	14.0	B	12.9	B
	TR	666	1817	0.120	0.367	9.6	B		

Intersection Delay = 7.7 sec/veh Intersection LOS = B

Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.527

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4 07-20-1995
Center For Microcomputers In Transportation

Streets: (E-W) Bell Road (N-S) Citrus Road
Analyst: SEA File Name: 2A2015AM.HC9
Area Type: Other 7-19-95 2015 AM

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	3	<	1	3	<	1	1	<	1	1	<
Volumes	5	476	5	161	317	220	5	5	243	331	5	5
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	
RTOR Vols			0			0			0			0
Lost Time	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*				NB Left *			
Thru	*				Thru *			
Right	*				Right *			
Peds					Peds			
WB Left	*				SB Left *			
Thru	*				Thru *			
Right	*				Right *			
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	23.0P				Green 29.0P			
Yellow/AR	4.0				Yellow/AR 4.0			

Cycle Length: 60 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	252	630	0.020	0.400	8.3	B	9.1	B
	TR	2350	5874	0.237	0.400	9.1	B		
WB	L	282	705	0.599	0.400	13.3	B	10.1	B
	TR	2208	5521	0.282	0.400	9.3	B		
NB	L	906	1811	0.006	0.500	5.7	B	6.8	B
	TR	836	1673	0.312	0.500	6.8	B		
SB	L	462	924	0.753	0.500	13.9	B	13.6	B
	TR	907	1814	0.011	0.500	5.7	B		

Intersection Delay = 10.0 sec/veh Intersection LOS = B

Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.685

HCM: SIGNALIZED INTERSECTION SUMMARY Version 2.4 07-20-1995
Center For Microcomputers In Transportation

Streets: (E-W) Bell Road (N-S) Citrus Road
Analyst: SEA File Name: 2A2015PM.HC9
Area Type: Other 7-19-95 2015 PM

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	3	<	1	3	<	1	1	<	1	1	<
Volumes	35	261	28	289	411	361	26	23	169	256	28	39
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	
RTOR Vols			0			0			0			0
Lost Time	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*				NB Left	*		
Thru	*				Thru	*		
Right	*				Right	*		
Peds					Peds			
WB Left	*				SB Left	*		
Thru	*				Thru	*		
Right	*				Right	*		
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	32.0P				Green	20.0P		
Yellow/AR	4.0				Yellow/AR	4.0		

Cycle Length: 60 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Group: Mvmts	Adj Sat Flow Cap	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	240	437	0.154	0.550	5.1	B	4.9	A
	TR	3187	5794	0.105	0.550	4.9	A		
WB	L	557	1013	0.546	0.550	7.5	B	6.0	B
	TR	3007	5468	0.297	0.550	5.5	B		
NB	L	537	1535	0.050	0.350	9.8	B	10.9	B
	TR	596	1702	0.339	0.350	11.1	B		
SB	L	365	1042	0.738	0.350	18.2	C	16.5	C
	TR	625	1787	0.112	0.350	10.0	B		

Intersection Delay = 8.0 sec/veh Intersection LOS = B

Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.620

****

File Name 3A2005AM.HC0
Streets: (N-S) Citrus Road (E-W) Loop Road
Major Street Direction.... NS
Length of Time Analyzed... 15 (min)
Analyst..... SEA
Date of Analysis..... 7/19/95
Other Information..... 2005 AM Peak Hour

Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	0	1<	0	0>	0<	0	0	0	0
Stop/Yield			N			N						
Volumes	117	90			137	5	5		176			
PHF	.95	.95			.95	.95	.95		.95			
Grade		0			0			0			0	
MC's (%)	0	0			0	0	0		0			
SU/RV's (%)	0	0			0	0	0		0			
CV's (%)	0	0			0	0	0		0			
PCE's	1.1	1.1			1.1	1.1	1.1		1.1			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

WorkSheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)		140
Potential Capacity: (pcph)		1176
Movement Capacity: (pcph)		1176
Prob. of Queue-free State:		0.83

Step 2: LT from Major Street	SB	NB
Conflicting Flows: (vph)		142
Potential Capacity: (pcph)		1467
Movement Capacity: (pcph)		1467
Prob. of Queue-free State:		0.91

Step 4: LT from Minor Street	WB	EB
Conflicting Flows: (vph)		346
Potential Capacity: (pcph)		668
Major LT, Minor TH Impedance Factor:		0.91
Adjusted Impedance Factor:		0.91
Capacity Adjustment Factor due to Impeding Movements		0.91
Movement Capacity: (pcph)		607

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Intersection Performance Summary

Movement	FlowRate v(pcph)	MoveCap Cm(pcph)	SharedCap Csh(pcph)	Avg.Total Delay	LOS	Delay By App
EB L	6	607 >		>	>	
			1145	3.8	A	3.8
EB R	204	1176 >		>	>	
NB L	135	1467		2.7	A	1.5

Intersection Delay = 1.9

Adjust for golf carts

		Cm	Csh	Ave. Tot Delay	LOS
EB L	6	$607 \times \frac{59}{60} = 597$ >	1126	< 5	A
EB R	204	$1176 \times \frac{59}{60} = 1156$ >			
NB L	135	$1467 \times \frac{59}{60} = 1443$		< 5	A

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File Name 3A2005PM.HC0
Streets: (N-S) Citrus Road (E-W) Loop Road
Major Street Direction.... NS
Length of Time Analyzed... 15 (min)
Analyst..... SEA
Date of Analysis..... 7/19/95
Other Information..... 2005 PM Peak Hour

Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	0	1<	0	0>	0<	0	0	0	0
Stop/Yield			N			N						
Volumes	224	172			129	7	6		168			
PHF	.95	.95			.95	.95	.95		.95			
Grade		0			0			0			0	
MC's (%)	0	0			0	0	0		0			
SU/RV's (%)	0	0			0	0	0		0			
CV's (%)	0	0			0	0	0		0			
PCE's	1.1	1.1			1.1	1.1	1.1		1.1			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

****

WorkSheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)		132
Potential Capacity: (pcph)		1187
Movement Capacity: (pcph)		1187
Prob. of Queue-free State:		0.84

Step 2: LT from Major Street	SB	NB
Conflicting Flows: (vph)		136
Potential Capacity: (pcph)		1477
Movement Capacity: (pcph)		1477
Prob. of Queue-free State:		0.82

Step 4: LT from Minor Street	WB	EB
Conflicting Flows: (vph)		528
Potential Capacity: (pcph)		524
Major LT, Minor TH Impedance Factor:		0.82
Adjusted Impedance Factor:		0.82
Capacity Adjustment Factor due to Impeding Movements		0.82
Movement Capacity: (pcph)		432

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Intersection Performance Summary

Movement	FlowRate v(pcph)	MoveCap Cm(pcph)	SharedCap Csh(pcph)	Avg.Total Delay	LOS	Delay By App
EB L	7	432 >		>	>	
			1119	3.9	A	3.9
EB R	195	1187 >		>	>	
NB L	260	1477		3.0	A	1.7

Intersection Delay = 1.9

Adjust for golf carts crossing

		Cm	Csh	Av. Tot Delay	LOS
EB L	7	432 × 59/60 = 425	> 1100	< 5	A
EB R	195	1187 × 59/60 = 1167			
NB L	260	1477 × 59/60 = 1452		< 5	A

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File Name 3A2015AM.HC0
Streets: (N-S) Citrus Road (E-W) Loop Road
Major Street Direction.... NS
Length of Time Analyzed... 15 (min)
Analyst..... SEA
Date of Analysis..... 7/19/95
Other Information..... 2015 AM Peak Hour

Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	0	1<	0	0>	0<	0	0	0	0
Stop/Yield			N			N						
Volumes	132	91			137	5	5		197			
PHF	.95	.95			.95	.95	.95		.95			
Grade		0			0			0			0	
MC's (%)	0	0			0	0	0		0			
SU/RV's (%)	0	0			0	0	0		0			
CV's (%)	0	0			0	0	0		0			
PCE's	1.1	1.1			1.1	1.1	1.1		1.1			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

WorkSheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)		140
Potential Capacity: (pcph)		1176
Movement Capacity: (pcph)		1176
Prob. of Queue-free State:		0.81

Step 2: LT from Major Street	SB	NB
Conflicting Flows: (vph)		142
Potential Capacity: (pcph)		1467
Movement Capacity: (pcph)		1467
Prob. of Queue-free State:		0.90

Step 4: LT from Minor Street	WB	EB
Conflicting Flows: (vph)		362
Potential Capacity: (pcph)		653
Major LT, Minor TH Impedance Factor:		0.90
Adjusted Impedance Factor:		0.90
Capacity Adjustment Factor due to Impeding Movements		0.90
Movement Capacity: (pcph)		585

****

File Name 3A2015PM.HC0
Streets: (N-S) Citrus Road (E-W) Loop Road
Major Street Direction.... NS
Length of Time Analyzed... 15 (min)
Analyst..... SEA
Date of Analysis..... 7/19/95
Other Information..... 2015 PM Peak Hour

Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	0	1<	0	0>	0<	0	0	0	0
Stop/Yield			N			N						
Volumes	251	173			130	5	5		188			
PHF	.95	.95			.95	.95	.95		.95			
Grade		0			0			0			0	
MC's (%)	0	0			0	0	0		0			
SU/RV's (%)	0	0			0	0	0		0			
CV's (%)	0	0			0	0	0		0			
PCE's	1.1	1.1			1.1	1.1	1.1		1.1			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

WorkSheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)		132
Potential Capacity: (pcph)		1187
Movement Capacity: (pcph)		1187
Prob. of Queue-free State:		0.82

Step 2: LT from Major Street	SB	NB
Conflicting Flows: (vph)		135
Potential Capacity: (pcph)		1478
Movement Capacity: (pcph)		1478
Prob. of Queue-free State:		0.80

Step 4: LT from Minor Street	WB	EB
Conflicting Flows: (vph)		556
Potential Capacity: (pcph)		505
Major LT, Minor TH Impedance Factor:		0.80
Adjusted Impedance Factor:		0.80
Capacity Adjustment Factor due to Impeding Movements		0.80
Movement Capacity: (pcph)		406

****

Intersection Performance Summary

Movement	FlowRate v(pcph)	MoveCap Cm(pcph)		SharedCap Csh(pcph)	Avg.Total Delay		LOS		Delay By App
EB L	6	406	>		>		>		
				1129		4.0		A	4.0
EB R	218	1187	>		>		>		
NB L	290	1478			3.0		A		1.8

Intersection Delay = 2.0

Adjust For golf cart crossing:

		Cm		Csh	Av. Tot. Delay	LOS
EB L	6	$406 \times \frac{59}{60} =$	399	> 1110	< 5	A
EB R	218	$1187 \times \frac{59}{60} =$	1167			
NB L	290	$1478 \times \frac{59}{60} =$	1452		< 5	A

****

File Name 4A2005AM.HC0
Streets: (N-S) Secondary Road (E-W) Residential Street
Major Street Direction.... NS
Length of Time Analyzed... 15 (min)
Analyst..... SEA
Date of Analysis..... 7/21/95
Other Information.....

Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1<	0	0>	1	0	0	0	0	0>	0<	0
Stop/Yield			N			N						
Volumes		37	16	5	59					25		5
PHF		.95	.95	.95	.95					.95		.95
Grade		0			0			0			0	
MC's (%)		0	0	0	0					0		0
SU/RV's (%)		0	0	0	0					0		0
CV's (%)		0	0	0	0					0		0
PCE's		1.1	1.1	1.1	1.1					1.1		1.1

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

****

WorkSheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)	45	
Potential Capacity: (pcph)	1314	
Movement Capacity: (pcph)	1314	
Prob. of Queue-free State:	1.00	
Step 2: LT from Major Street	**SB**	**NB**
Conflicting Flows: (vph)	53	
Potential Capacity: (pcph)	1617	
Movement Capacity: (pcph)	1617	
Prob. of Queue-free State:	1.00	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-free State:	1.00	
Step 4: LT from Minor Street	**WB**	**EB**
Conflicting Flows: (vph)	109	
Potential Capacity: (pcph)	916	
Major LT, Minor TH Impedance Factor:	1.00	
Adjusted Impedance Factor:	1.00	
Capacity Adjustment Factor due to Impeding Movements	1.00	
Movement Capacity: (pcph)	912	

****

Intersection Performance Summary

Movement		FlowRate v(pcph)	MoveCap Cm(pcph)	SharedCap Csh(pcph)	Avg.Total Delay	LOS	Delay By App
WB	L	29	912	962	3.9	A	3.9
WB	R	6	1314				
SB	L	6	1617		2.2	A	0.2

Intersection Delay = 0.9

****

File Name 4A2005PM.HC0
Streets: (N-S) Secondary Road (E-W) Residential Street
Major Street Direction.... NS
Length of Time Analyzed... 15 (min)
Analyst..... SEA
Date of Analysis..... 7/21/95
Other Information..... 2005 PM Peak

Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1<	0	0>	1	0	0	0	0	0>	0<	0
Stop/Yield			N			N						
Volumes		69	30	5	54					23		5
PHF		.95	.95	.95	.95					.95		.95
Grade		0			0			0			0	
MC's (%)		0	0	0	0					0		0
SU/RV's (%)		0	0	0	0					0		0
CV's (%)		0	0	0	0					0		0
PCE's		1.1	1.1	1.1	1.1					1.1		1.1

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

WorkSheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)	84	
Potential Capacity: (pcph)	1255	
Movement Capacity: (pcph)	1255	
Prob. of Queue-free State:	1.00	
Step 2: LT from Major Street	**SB**	**NB**
Conflicting Flows: (vph)	99	
Potential Capacity: (pcph)	1538	
Movement Capacity: (pcph)	1538	
Prob. of Queue-free State:	1.00	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-free State:	1.00	
Step 4: LT from Minor Street	**WB**	**EB**
Conflicting Flows: (vph)	143	
Potential Capacity: (pcph)	875	
Major LT, Minor TH Impedance Factor:	1.00	
Adjusted Impedance Factor:	1.00	
Capacity Adjustment Factor due to Impeding Movements	1.00	
Movement Capacity: (pcph)	871	

****

Intersection Performance Summary

Movement		FlowRate v(pcph)	MoveCap Cm(pcph)	SharedCap Csh(pcph)	Avg.Total Delay	LOS	Delay By App
WB	L	26	871	924	4.0	A	4.0
WB	R	6	1255				
SB	L	6	1538		2.3	A	0.2

Intersection Delay = 0.7

****

File Name 4A2015AM.HC0
Streets: (N-S) Secondary Road (E-W) Residential Street
Major Street Direction.... NS
Length of Time Analyzed... 15 (min)
Analyst..... SEA
Date of Analysis..... 7/21/95
Other Information..... 2015 AM Peak

Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1<	0	0>	1	0	0	0	0	0>	0<	0
Stop/Yield			N			N						
Volumes		39	16	5	61					26		5
PHF		.95	.95	.95	.95					.95		.95
Grade		0			0			0			0	
MC's (%)		0	0	0	0					0		0
SU/RV's (%)		0	0	0	0					0		0
CV's (%)		0	0	0	0					0		0
PCE's		1.1	1.1	1.1	1.1					1.1		1.1

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

****

WorkSheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)	47	
Potential Capacity: (pcph)	1311	
Movement Capacity: (pcph)	1311	
Prob. of Queue-free State:	1.00	
Step 2: LT from Major Street	**SB**	**NB**
Conflicting Flows: (vph)	55	
Potential Capacity: (pcph)	1614	
Movement Capacity: (pcph)	1614	
Prob. of Queue-free State:	1.00	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-free State:	1.00	
Step 4: LT from Minor Street	**WB**	**EB**
Conflicting Flows: (vph)	113	
Potential Capacity: (pcph)	911	
Major LT, Minor TH Impedance Factor:	1.00	
Adjusted Impedance Factor:	1.00	
Capacity Adjustment Factor due to Impeding Movements	1.00	
Movement Capacity: (pcph)	907	

****

Intersection Performance Summary

Movement		FlowRate v(pcph)	MoveCap Cm(pcph)	SharedCap Csh(pcph)	Avg.Total Delay	LOS	Delay By App
WB	L	30	907	956	3.9	A	3.9
WB	R	6	1311				
SB	L	6	1614		2.2	A	0.2

Intersection Delay = 0.9

****

File Name 4A2015PM.HC0
Streets: (N-S) Secondary Road (E-W) Residential Street
Major Street Direction.... NS
Length of Time Analyzed... 15 (min)
Analyst..... SEA
Date of Analysis..... 7/21/95
Other Information..... 2015 PM Peak

Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1<	0	0>	1	0	0	0	0	0>	0<	0
Stop/Yield			N			N						
Volumes		74	31	5	55					24		5
PHF		.95	.95	.95	.95					.95		.95
Grade		0			0			0			0	
MC's (%)		0	0	0	0					0		0
SU/RV's (%)		0	0	0	0					0		0
CV's (%)		0	0	0	0					0		0
PCE's		1.1	1.1	1.1	1.1					1.1		1.1

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

****

WorkSheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)	90	
Potential Capacity: (pcph)	1247	
Movement Capacity: (pcph)	1247	
Prob. of Queue-free State:	1.00	
Step 2: LT from Major Street	**SB**	**NB**
Conflicting Flows: (vph)	105	
Potential Capacity: (pcph)	1528	
Movement Capacity: (pcph)	1528	
Prob. of Queue-free State:	1.00	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-free State:	1.00	
Step 4: LT from Minor Street	**WB**	**EB**
Conflicting Flows: (vph)	150	
Potential Capacity: (pcph)	867	
Major LT, Minor TH Impedance Factor:	1.00	
Adjusted Impedance Factor:	1.00	
Capacity Adjustment Factor due to Impeding Movements	1.00	
Movement Capacity: (pcph)	863	

****

Intersection Performance Summary

Movement		FlowRate v(pcph)	MoveCap Cm(pcph)	SharedCap Csh(pcph)	Avg.Total Delay	LOS	Delay By App
WB	L	28	863	913	4.1	A	4.1
WB	R	6	1247				
SB	L	6	1528		2.4	A	0.2

Intersection Delay = 0.7

Executive Summary

The Villages at Surprise
Traffic Impact Study

for:

Surprise Village Company

December 22, 1994
Revised February 16, 1995

by:

Lee Engineering, Inc.
3240 East Camelback, Suite 180
Phoenix, Arizona 85018
(602) 955-7206

I. INTRODUCTION AND SUMMARY

The Villages at Surprise will be a 2,000 acre residential community fronting on Bell Road west of the Estrella Freeway. Village 1, north of Bell Road, is planned as an active adult community with a golf course. Villages 2 and 3, south of Bell Road, are planned as affordable family residential areas, with a community center, schools and neighborhood commercial activities.

Village 1 is expected to be built from 1995 to 2003, Village 2 from 1995 to 2004, and Village 3 from 2001 to 2007. At build-out, up to 25,000 people may live at the Villages at Surprise.

PURPOSE OF THE REPORT AND STUDY OBJECTIVES

This report analyzes traffic conditions expected in and around the Villages at Surprise in 2005 and 2015. It includes both site and regional traffic. Because of the size of the project, a regional travel demand model was used to analyze traffic conditions, and the proposed Villages at Surprise were included in the model simulation.

The objectives of this analysis are:

1) To determine the level of roadway improvements, both on and off site, needed to accommodate future traffic at acceptable levels of service;

2) To determine the timing and phasing for roadway improvements; and

3) To provide reliable traffic projections for use in further design and planning activities for the Villages at Surprise.

Procedures and assumptions used in this report conform to the requirements for traffic impact studies provided by the *Surprise Comprehensive Development Guide,* adopted February, 1987, Pages 179-181.

PRINCIPAL FINDINGS AND RECOMMENDATIONS

Traffic service in and around the Villages at Surprise will move very well during peak periods in both 2005 and 2015 given the proposed roadway network. Bell Road and the Estrella Interim Freeway have significant extra capacity available, while the unique characteristics of the area reduce the amount of through traffic on other roads.

Based on the results of this analysis, the principal recommendations are:

- The Main Entrance road from the Village 1 loop road south Bell Road should be four lanes.

- The Main Entrance road for Village 2 from Bell Road south to the Village Center should be 4 lanes.

- All other internal roads should be 2 lanes wide.

- Cotton Lane should be two lanes from Bell Road to Greenway Road, with left turn lanes at each quarter mile cross street. Four-way stop sign control is appropriate for intersections on Cotton Lane one-quarter mile south of Bell Road and one-quarter mile north of Greenway; two-way stop sign is appropriate for the intersection of Cotton Lane and Paradise Lane.

- Traffic signals will be needed at the intersections of Bell Road and the Main Entrance (Citrus alignment), and Bell Road and 175th Avenue. Traffic signals should be installed when volumes warrant a signal based on the signal warrants contained in the *Manual on Uniform Traffic Control Devices* (MUTCD).

- If the area south of Greenway Road, west of the Estrella Interim Freeway, develops faster than anticipated by the Maricopa Association of Governments' population forecasts, then a traffic signal would probably be warranted at the Greenway Road/Cotton Lane intersection sometime after 2005.

  If this area remains undeveloped or very low density, then stop signs on Greenway Road and a free right turn for westbound to northbound traffic (with yield sign) would accommodate traffic through 2015.

- Greenway Road should be widened to 4 lanes from Cotton Lane to the Estrella Interim Freeway when traffic exceeds 8,000 vehicles per average weekday.

- If expansion of the Marketplace exceeding the trip generation potential of 250,000 square feet of retail development is proposed in the future, then further traffic analysis of the specific proposed uses should be undertaken at that time.

- In general, the network of local roads will be highly interconnected with alternate routes to each destination and numerous connections to collector and arterial streets.

The Villages at Surprise-North

City of Surprise, Arizona

CITY OF SURPRISE
PLANNING AND ZONING DEPARTMENT
APPROVED
THIS APPROVAL IS NOT TO BE CONSTRUED AS AN APPROVAL OF ANY VIOLATION OF THE SURPRISE MUNICIPAL CODE.
Case No. PAD 95-02
P&Z Comm. Approval: 2-21-95 B.O.A.
City Council Approval: 3-23-95
Stipulations:

SEP 20 1996

Application for:
Planned Area Development (PAD) Zoning
With Preliminary Development Plan

Submitted February 16, 1995
Revised February 24, 1995
Revised March 29, 1995
Revised June 15, 1995
Revised December 20, 1995
Revised May 9, 1996

VOLUME II OF II

WATER MASTER STUDY REPORT

For

The Villages at Surprise

EXHIBIT U

Prepared for:

Surprise Village Company, LLC

11411 North Tatum Boulevard

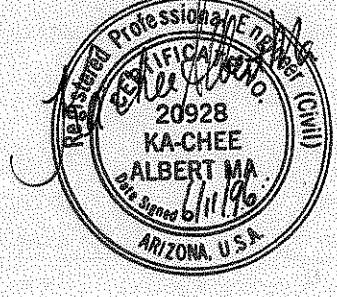
Phoenix, AZ 85028-2399

Prepared by:

Greiner, Inc.

7310 N. 16th Street, Suite 160

Phoenix, AZ 85020



December 30, 1994

PREFACE

The report was originally published and distributed on December 30, 1994. This second distribution of the report was printed and sealed on June 11, 1996. No revisions have been made to update the contents of the original since last publishing date.

LETTER OF TRANSMITTAL

CITY OF SURPRISE
Community Development Division
12425 West Bell Road, Suite D-100
Surprise, Arizona 85374
(602) 583-1089

TO WEST COR
11441 NORTH TATUM BLVD
PHOENIX, ARIZONA 85028

ATTN: RUSS EWERS

RE: VILLAGE AT SURPRISE

DATE	LOG NO.
1-24-95	180

GENTLEMEN:

WE ARE SENDING YOU HEREWITH ☐ ORIGINALS ☐ COPIES OF THE FOLLOWING

PLATS:
- ____ SKETCH
- ____ PRELIMINARY PLAT
- ____ PRE-FINAL
- ____ FINAL
- ____ MAP OF DEDICATION
- ____ _____
- ____ _____

PLANS & DRAWINGS:
- ____ MASTER PLAN
- ____ SITE PLAN
- ____ WATER
- ____ SEWER
- ____ PAVING
- ____ GRADING & DRAINAGE
- ____ BOUNDARY & TOPO SURVEY
- ____ LANDSCAPE/IRRIGATION PLAN
- ____ IMPROVEMENT PLAN
- ____ STRUCTURAL PLAN SET
- ____ _____
- ____ _____
- ____ _____
- ____ _____

REPORTS & DESCRIPTIONS:
- ____ SOILS TEST
- ____ LEGAL DESCRIPTION
- ____ COST ESTIMATES
- ____ QUANTITY ESTIMATE
- ____ SPECIFICATIONS
- ____ DRAINAGE STUDY

FORMS AND APPLICATIONS
- ____ SUBDIVISION APPLICATION
- ____ WATER SERVICE AGREEMENT
- ____ GARBAGE SERVICE AGREEMENT
- ____ _____
- ____ _____
- ____ _____
- ____ _____

FEES IN THE AMOUNT OF $ _____

FOR _____

THESE ARE TRANSMITTED:

☐ FOR REVIEW ☐ FOR APPROVAL ☐ FOR YOUR USE ☐ FOR SIGNATURE

REMARKS: CORRECTION LETTER: MASTER REPORTS FOR WATER/SEWER/DRAINAGE

THE CITY OF SURPRISE IN AN EFFORT TO SAVE TAXPAYERS MONEY, WILL NOT SEND A COPY OF THIS FACSIMILE VIA U.S. MAIL UNLESS SPECIFICALLY REQUESTED BY THE ADDRESSE.

FACSIMILE 4 PAGES

COPY TO: _____

SINCERELY,
CITY OF SURPRISE

Kitty DeLeon

RECEIVED BY: _____ DATE: _____

JAN 25 '95 10:52 1 602 583 1091 PAGE.001

PAGE.002/005 TO 9431891 FROM WESTCOR PARTNERS JN 25 '95 13:30

CITY OF SURPRISE

12425 WEST BELL ROAD
SUITE D-100
SURPRISE, AZ 85374
OFFICE 583-1000 FAX 583-1084

January 18, 1995

Greiner, Inc.
7310 N. 16th Street
Phoenix, Arizona 85020

Re: **THE VILLAGES AT SURPRISE: MASTER REPORTS FOR WATER, SEWER and DRAINAGE**

Gentlemen:

Plan review for the above referenced Reports has been completed. This letter reflects comments to be addressed. In order to facilitate a shorter backcheck time, we request that you please provide revised reports, plans and calculations, highlighting any changes, along with a written response to each of the noted items indicating the action taken.

MASTER WATER REPORT

1. The report appears to address the main concerns of the development.

MASTER SEWER REPORT

1. Land Use Plans are to be reviewed by City staff and coordinated with the report.

2. The impact of Mountain Vista Ranch development on the Bell Road sewer and the Reems Road interceptor is not addressed in this report.

3. The impact on plant capacity of diverting flow from the Sunflower WWTP to the South Surprise WWTP is not addressed in this report.

4. On page 6, it is stated that only 0.19 MGD of Village 1 wastewater can be transported in the existing 15-inch main in Bell Road. This statement should be revisited keeping in mind the capacity to be used by Del Webb and also Mountain Vista Ranch.

5. Tables 16 and 17 forecast construction phasing. It should be noted that these projections are dependent upon construction of conveyance and treatment facilities.

6. The last paragraph on page 19 indicates that three emission pathways occur for air pollution, but only two are listed.

THE VILLAGES AT SURPRISE
Master Water Study Report

Executive Summary

The master study on the proposed domestic water system and irrigation system for the Villages at Surprise project includes predictions of domestic and irrigation water consumptions; investigation of the existing water supplies; and analyses of a new proposed water distribution system. The study was based on the Land Use Plans, dated November 22, 1994. The entire property consists of approximately 1,950 acres of land which will include about 9,300 homes. The development is planned for three distinct villages in nine phases which will include communities for retired and working families as well as commercial sites, a golf course, parks and schools.

The average domestic water demand for the ultimate build-out is estimated to be 3,223 gallons per minute or about 4.64 million gallons per day. The annual amount of irrigation water for the 287 acres of golf course and parks was estimated to be 1,695 acre feet for the first year and 1,407 acre feet for the years after in accordance with the Arizona Department of Water Resources' conservation requirements.

Existing potential domestic water supplies to the planned area include the Happy Trails Water Plant owned by the Citizens Utilities Company (CUC) and the 10 wells owned by the Maricopa Water District (MWD) and located within or adjacent to the project site. In this study, a flow capacity of 640 gpm is provided to this project by the Happy Trails Water Plant. It is also anticipated that nine of the 10 MWD wells will be used for the domestic supply. The production of these wells ranges from 540 to 1,100 gpm. The quality of groundwater in the planning area is generally good and chlorination should be the only treatment process required. Supply of irrigation water can also come from these sources. Moreover, drilling new on-site wells or purchasing water from the Central Arizona Project are also possible alternatives.

Two system layout alternatives were considered in the study. The water system for Alternative No. 1 consists of nine wells which pump water through a common transmission line to a central water plant. The plant consists of five 200-horsepower service pumps, one 3-MG ground or underground storage system, one chlorination system and two 15,000-gallon hydropneumatic tanks. Alternative No. 2 will consist of the same number of wells and storage volume as for Alternative No. 1 except that each well will pump water directly into the system through an on-line booster station. A pumping system consisting of three 200-horsepower service pumps will be required at the reservoirs to deliver water to the service areas. A separate chlorination system will be installed at each station for water disinfection before discharge. Supply from the Happy Trails Water Plant are considered in both alternatives.

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SURP-WR.GEN

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LIST OF EXHIBITS

EXHIBIT NO.	*TITLE*
*	*(Exhibits are placed in the pockets of the report)*
A	Proposed Water System – Alternative No. 1
B	Proposed Water System – Alternative No. 2

LIST OF CHARTS

CHART NO.	*TITLE*	*PAGE*
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C	Required Wells and Storage for Development Phases	14
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1	Domestic Water Demand for Village One - Scenario 1
2	Domestic Water Demand for Village One - Scenario 2
3	Domestic Water Demand for Village Two - Scenario 1
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7	Domestic Water Demand for Phase 1 of Village 1
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9	Domestic Water Demand for Phase 1–6 of Village 3
10	Domestic Water Demand for Phase 2 of Village 2
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21	Storage Required for Phase 1 of Village 1, Phases 1–4 of Village 2, Phases 1–6 of Village 3
22	Storage Required for Phase 1 of Village 1, Phases 1–5 of Village 2, Phases 1–6 of Village 3
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24	Storage Required for All Phases – Ultimate System

INTRODUCTION

Purpose

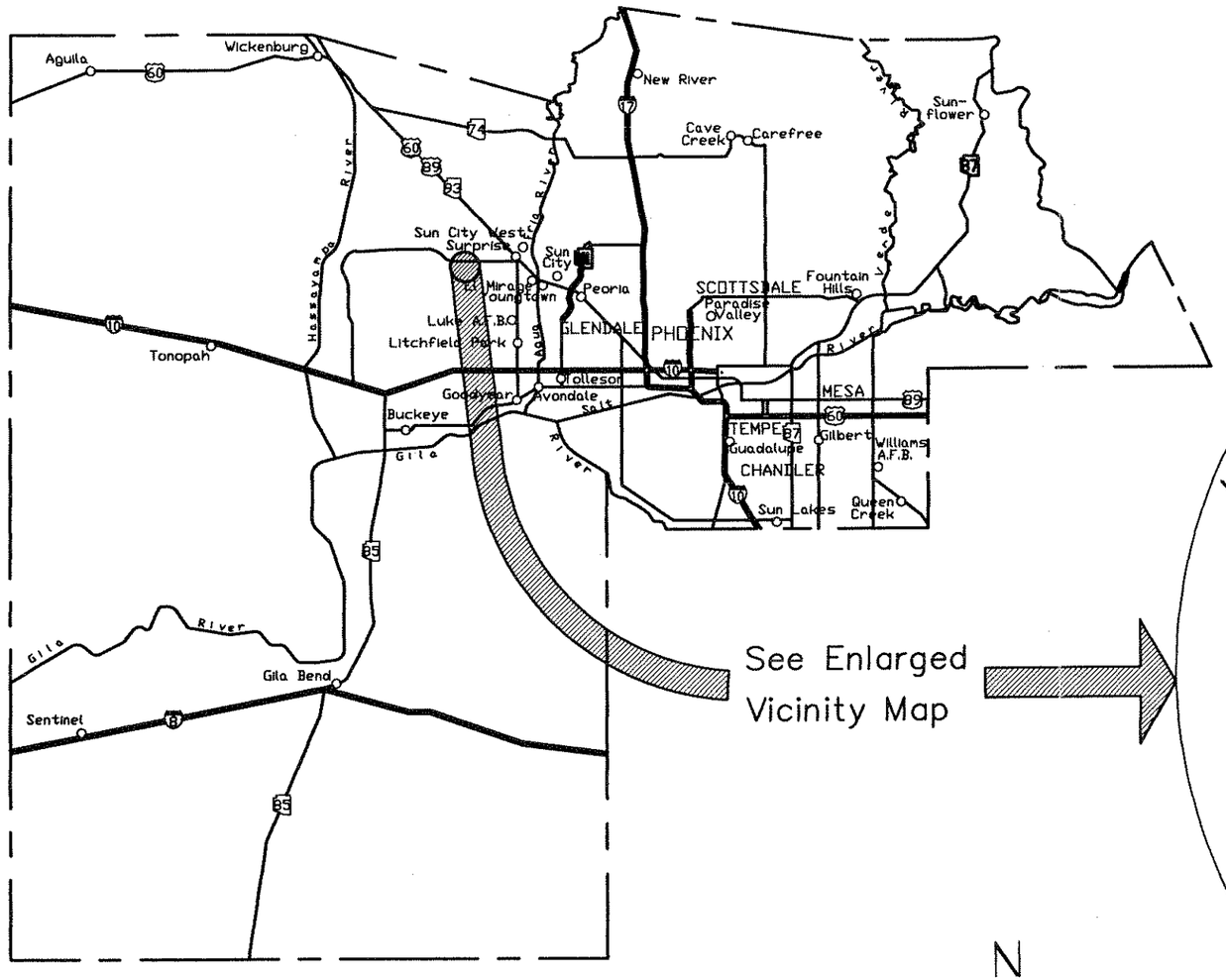
The intent of this report is to document the master study on the proposed domestic water system and irrigation system for The Villages at Surprise project. The study includes the predictions of domestic and irrigation water consumptions; investigation of the existing water supplies; and analyses of a new water distribution system. Conceptual design of the well system, storage system, booster stations and water distribution network is recommended.

Project Description

This study is based on the Land Use Plans, dated November 22, 1994, taken from the application for Planned Area Development (PAD) Zoning for The Villages at Surprise - North, and The Villages at Surprise - South. The project site is located between Union Hills Drive and Greenway Road, east of the Beardsley Canal and west of Estrella Freeway (SR 303) within the City of Surprise (see Figure 1). The entire property consists of approximately 1,950 acres of land which will include about 9,300 units. The development is planned for three distinct villages in six phases which will include communities for retired and working families as well as commercial sites, a golf course, parks and schools (see Figure 2).

Scope of Study

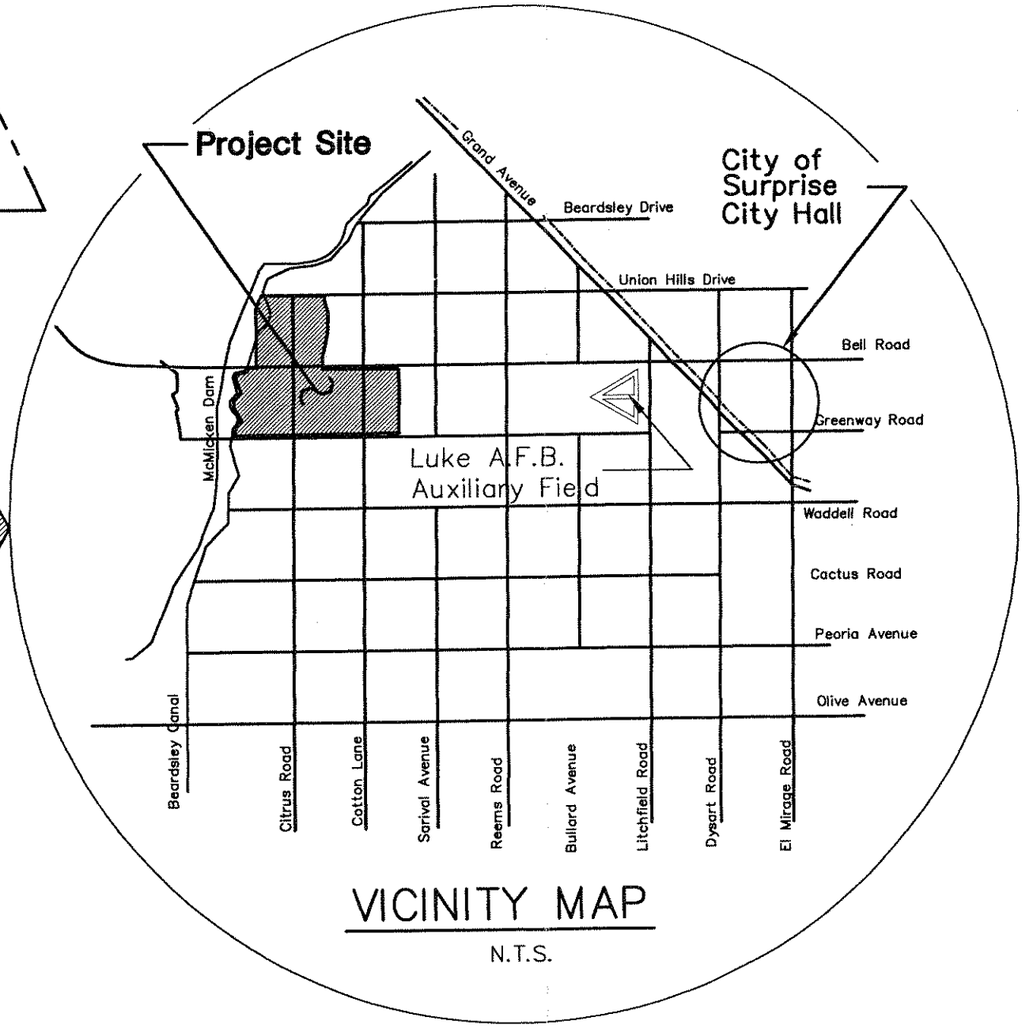
- Estimating water consumption for domestic and irrigation uses based on the land use and phasing plans of this project.
- Estimating the excess capacity of the Happy Trails Water Plant (HTWP) facilities for the use of this development.
- Performing water balance studies and determining the amount of water available in the planning area. Quality and quantity are the two main factors in the selection of water sources.
- Calculating the storage volumes to meet daily demand and fire flow requirements.
- Establishing pressure zones within the site for water distribution design to meet the minimum pressure requirements on various conditions.
- Developing system layouts for the water system and alternatives according to water use and development phasing conditions.
- Estimating construction costs for each alternative.
- Recommending a feasible alternative.
- Documenting the master water study in report and plan formats for the Planned Area Development Zoning application.



See Enlarged Vicinity Map

LOCATION MAP

N.T.S.



VICINITY MAP

N.T.S.

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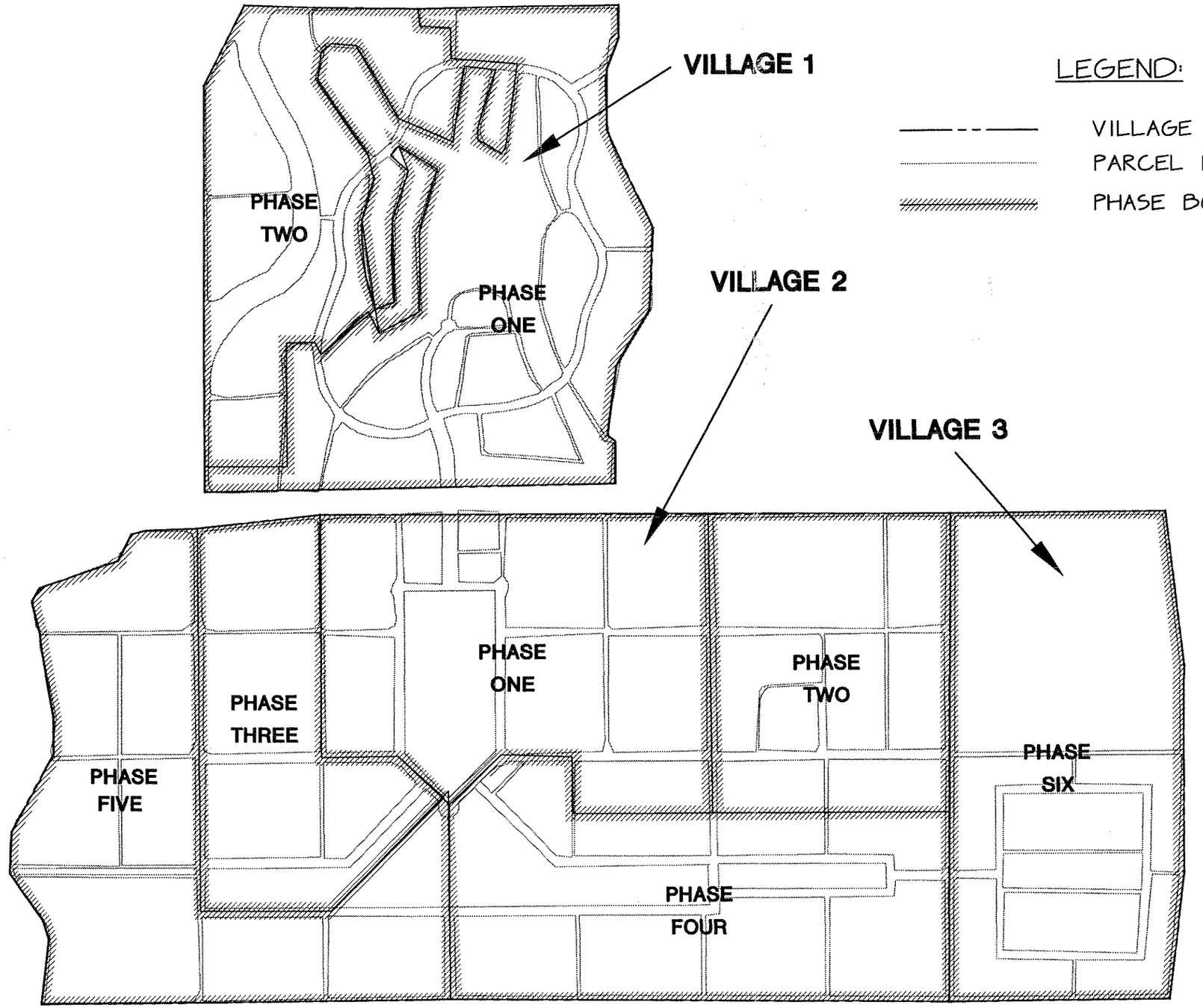
Project: E037501 P:\CADD\VICINITY.DWG

The Villages at Surprise	Greiner
Project no.: E037501	
December 23, 1994	Figure 1



LEGEND:

- VILLAGE BOUNDARY
- PARCEL BOUNDARY
- PHASE BOUNDARY

N

Graphic Scale in Feet
600 0 600 1200

The Villages at Surprise	Greiner
Village Locations and Development Phases	
Project no.: E037501	
December 23, 1994	**Figure 2**

EXISTING WATER SUPPLIES FOR PLANNING AREA

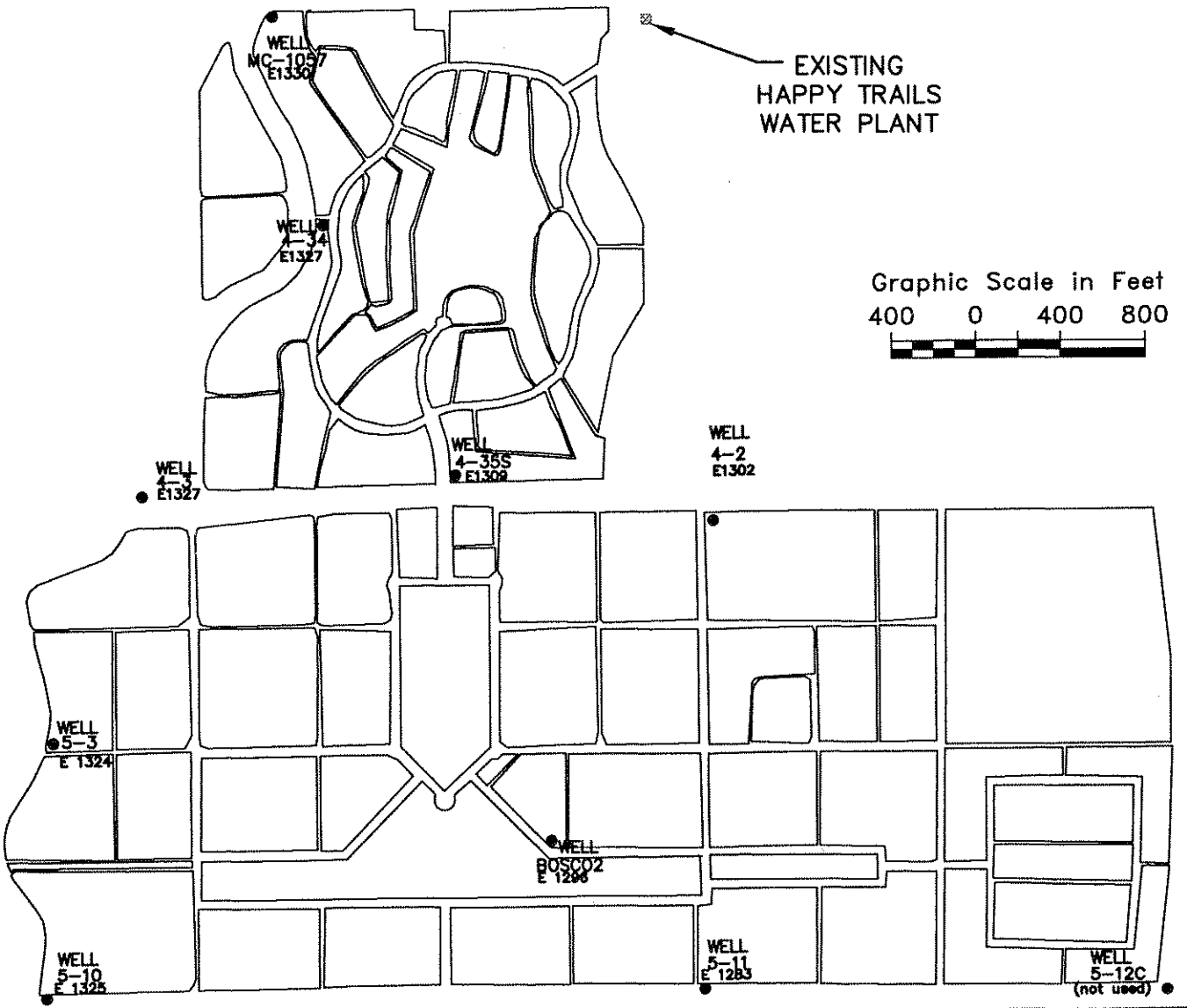
The domestic water sources for this development will be mainly the Happy Trails Water Plant (HTWP) owned by the Citizens Utilities Company (CUC) and some of the wells located within or near the project site (see Figure 3).

HTWP is located in the northwest corner of the northeast quarter of Section 35. Water is supplied to this facility from a well situated near the northwest corner of the southwest quarter of Section 35 within the project site. The well has a production yield of about 900 gallons per minute (gpm). The excess capacity of the HTWP will be considered for this development use, according to CUC's agreement.

The Happy Trails Development which consists of mobile homes, RV's and park units is being served by the water plant. The total number of lots is 1,875 of which about 1,250 lots have been sold at present. The occupancy is 1,100 lots during winter and 350 lots during summer. Based on the water billing records provided by the Citizens Utilities Company, the existing average water consumption per lot of Happy Trails is about 200 gpd (see Appendix B).

The average day and peak day demands for the ultimate design of Happy Trails (see Appendix B) are estimated to be 260 and 520 gpm, respectively. The total pumping capacity of the plant is 3,180 gpm, including the fire pump. During the average flow period, it will take about seven hours to fill up both the reservoir and the hydropneumatic tank. At full pumping capacity with a fire flow of 1,500 gpm, the storage will be depleted in less than four hours. The depletion time has taken into account the 900 gpm well supply. To be conservative, the required storage for this project is estimated without considering the existing storage at HTWP. A surplus supply of 640 gpm (i.e., 900 - 260 = 640) will be considered from HTWP to this development.

There are 10 wells owned by the Maricopa Water District (MWD) and located within or adjacent to the project site which can be considered for domestic water supply (Figure 3). The description of these wells is provided in the Section, "Development of Water System."



The Villages at Surprise

Greiner

Water Supplies for Planning Area

Project no.: E037501

December 27, 1994

Figure 3

DESIGN CRITERIA AND ASSUMPTIONS

For the prediction of domestic water consumption, the following criteria and guidelines were used. The density and capita per unit for single family, cluster housing and multi-family are according to the Land Use Plan provided by The Planning Center, the planner for The Villages at Surprise, on November 22, 1994.

- Single Family [1]
  5.5 dwelling units per acre
  2.0 capita per unit (Village One)
  3.2 capita per unit (Villages Two and Three)

- Cluster Housing [1]
  10 dwelling units per acre
  2.0 capita per units (All Villages)

- Multi Family [1]
  18 dwelling units per acre
  2.0 capita per unit (All Villages)

- Elementary School [2]
  500 students plus 10 percent staff
  Average 20 gallons per student or staff per day

- Middle School [2]
  1,000 students plus 10 percent staff
  Average 25 gallons per student or staff per day

- Church [3]
  1,000 people per church
  Average 3 gallons per person per day

- Commercial [4]
  3,000 gallons per acre per day

- Fire Flows [5]
  3,000 gpm for Commercial
  1,000 gpm for Residential

- Community Center [6]
  200 people per day
  Average 10 gallons per person per day

- Peak Day Demand [7] = 2.0 x Average Day Demand
  Peak Hour Demand [7] = 1.76 x Peak Day Demand
  Average Day Demand per person [8] = 175 gpd

[1] According to the Land Use Plans provided by the Planning Center, dated November 22, 1994.
[2] The number of students for each type of school was recommended by the Planning Center on August 3, 1994, based on their contacts with the Tempe and Kyrene School Districts.
An assumption of 10 percent staff was made.
The average consumption rates per student are referenced from "Manual of Individual Water Supply Systems" by the U.S. Environmental Protection Agency, 1973.

[3] Reference from "Community Water Systems Source Book," by Joseph S. Ameen, 5th edition, 1980.

[4] Based on the City of Phoenix Planning Department's ratio between estimated employees and projected employment square footage of 480 square feet per employee; and the rate for winter commercial/industrial of 141 gpd/employee (25-percent lot coverage was assumed).

[5] Data provided by Surprise Fire Department on August 15, 1994.

[6] Same as (3).

[7] Peak factors were recommended by Citizens Utilities Company, dated December 23, 1994.

[8] Different sources indicate the average day demand per person varies from 100 to 250 gpcd. The average number is approximately 175 gpcd.

For establishments such as schools, churches and community centers, water consumption based on the number of fixture units was also estimated and compared with that based on the number of persons. The larger of the two was used in the study.

The Hazen-Williams equation was used to calculate friction head losses in the water distribution system. For study purposes, Polyvinyl Chloride (PVC) pipes were assumed with a "C" value of 150. Minor pipe losses were assumed insignificant.

The amount of irrigation water for the golf course in Village One will be estimated according to the Arizona Department of Water Resources' (ADWR's) criteria. For various "turf-related facilities," such as schools, parks, golf courses and common areas with more than 10 acres of water intensive landscaping, ADWR requires the water application rate for turfed acres to be 4.9 acre feet per acre per year and 1.5 acre feet per acre for low-water-use landscaped areas. "Turfed acres" are those acres planted primarily in grass or other high-water-use plants, while low-water-use landscaped areas are planted primarily with low-water-use plants identified by ADWR. During the first year the property is landscaped, the facility will be allowed an additional one acre foot of water for each acre planted in grass for grow-in purposes.

DEVELOPMENT OF WATER SYSTEM

Sources of Water Supply

Domestic Water

For domestic water, both the Happy Trails Water Plant (HTWP) and Maricopa Water District (MWD) wells adjacent to the project site can be considered as water sources. According to MWD well information, there are 10 district wells located within or near the project site (see Figure 3). The production and static water levels below ground of each well are provided by MWD on September 7, 1994 as in Chart A below.

Chart A: Maricopa Water District Well Data

Wells	Ground Elevation (feet)	Production (gpm)	Static Water Level (feet)	Pump Horsepower (HP)
4-2	1,302	538	427	125
4-3	1,327	799	442	150
4-34	1,327	609	439	150
4-35S	1,309	1,038	438	200
BOSC02	1296	543	471	125
MC1057	1329	707	440	150
5-3	1324	777	442	150
5-10	1325	1092	458	200
5-11	1283	598	443	200
5-12C	1255	1000	414	200

The existing plant consists of two 15-horsepower booster pumps, two 50-horsepower booster pumps, one 100-horsepower fire pump, a 250,000-gallon storage tank, a 10,000-gallon hydropneumatic tank and a 10-inch transmission line connecting the well and the plant. The 15-horsepower pumps can provide a capacity of 190 gpm at 165 feet of head, while the 50-horsepower pumps have a capacity of 725 gpm at 165 feet of head. The fire pump can discharge 1,350 gpm at 150 feet of head (see Appendix B).

Irrigation Water

The MWD wells can be used to provide water for irrigation purposes. The other source which can be used to replace groundwater for irrigating the golf courses and public landscape areas is the Beardsley Canal which is located along the west boundary of the property and is managed

by MWD. Water is now being diverted from the CAP Canal, Lake Pleasant, Agua Fria River and other areas into this canal.

Reuse water can be another source for irrigation use depending on the treatment cost. The costs and water rights for using different sources shall be compared to determine the most feasible one. If groundwater is not used for irrigation, a dual water pumping and distribution system should be designed.

Water Demand

Domestic Water

The domestic water consumptions were estimated in accordance with the Land Use Plans, dated November 22, 1994:

- Ultimate Conditions (3 Villages)

Acreage	- 1,942 acres
Dwelling Units	- 8,762 DU
Population (Residential)	- 24,171 persons
Average Day Demand	- 3,223 gpm
Peak Day Demand	- 6,445 gpm
Peak Hour Demand	- 11,343 gpm
Average Day Flow	- 4,637,591 gpd

- Village One (Without Commercial Overlay)

Acreage	- 530 acres
Dwelling Units	- 2,214 DU
Population (Residential)	- 4,428 persons
Average Day Demand	- 540 gpm
Peak Day Demand	- 1,081 gpm
Peak Hour Demand	- 1,902 gpm
Average Day Flow	- 778,282 gpd

- Village Two (Without Golf Course Overlay)

Acreage	- 1,128 acres
Dwelling Units	- 5,873 DU
Population (Residential)	- 17,584 persons
Average Day Demand	- 2,129 gpm
Peak Day Demand	- 4,258 gpm
Peak Hour Demand	- 7,493 gpm
Average Day Flow	- 3,065,393 gpd

- Village Three (With Commercial Overlay)

Acreage	- 284 acres
Dwelling Units	- 675 DU
Population (Residential)	- 2,159 persons
Average Day Demand	- 552 gpm
Peak Day Demand	- 1,103 gpm
Peak Hour Demand	- 1,941 gpm
Average Day Flow	- 793,916 gpd

Derivations of these data for each Village are shown in Tables 1 through 6. Water demands for the phases of the development are also estimated according to the development schedule indicated on the Land Use Maps, dated November 22, 1994 (see Chart B) and provided in Tables 7 through 15 of this report. For planning purposes, the overlay with the larger water demand for each Village will be used.

Chart B: Development Schedule for The Villages at Surprise Project

Order of Development	Village No.	Phase	Average Day Demand (gpm)	Peak Day Demand (gpm)	Year
1	1	1	266.87	533.73	1995 - 1998
2	2	1	489.10	978.21	1995 - 1998
3	3	1 - 6	281.25	562.50	Not Indicated
4	2	2	423.22	846.43	1996 - 1999
5	2	3	284.08	568.16	1997 - 2000
6	2	4	425.23	850.46	1998 - 2003
7	2	5	509.06	1018.11	1999 - 2004
8	1	2	273.61	547.22	2000 - 2003
9	2	6	270.08	540.16	2001 - 2007
		Total	**3222.50**	**6444.98**	

Irrigation Water

Golf course, schools, parks and landscaped areas are planned for the project. A plan is needed to provide irrigation water to these areas. This plan has to comply with ADWR's conservation requirements. Storage may be required based on the reliability of MWD's daily deliveries from the Beardsley Canal and MWD wells. According to the hydrogeological draft report by Water Development Corporation, the total area for golf course and parks is approximately 287 acres. Assuming that the areas are turf acres, the annual amount of irrigation water will be 1,695 (= 287 x 5.9) acre feet for the first year and 1,407 (= 287 x 4.9) acre feet for the years after.

Several supplemental sources of water are potentially available to the project besides MWD. Two of the likely options are using the Citizen Utilities Company's (CUC's) service and/or developing a well system. In addition to these two supplemental sources, the possibility of using effluent and the Central Arizona Project (CAP) water as supplemental supplies may be considered. Using CUC's service may end up with a higher potable water service rate for a supplemental supply. However, the potable delivery system would already be in place and no additional storage capacity would be required.

A well may be drilled at the property and used to pump water with the Grandfathered Groundwater Rights. There are three types of Grandfathered Groundwater Rights: Irrigation Right, Type 1 Right and Type 2 Right. Irrigation Right can be used for farming and may be converted to Type 1 Right. There are about 988 acres of land within the project site which have Irrigation Right. Type 1 Right can be used for golf courses and parks, but not for agricultural usages, and is limited to 3 acre feet per acre per year. Type 2 Right is also not for agricultural, but for feeding lots and rural uses. Type 2 Right can be purchased or leased and is based on the total volume instead of per acre limit. If groundwater is used, an appropriate location of the well would be determined and a well impact analysis would be required. If water rights in addition to the present Type 1 Rights are required, then Type 2 Rights could be purchased or leased.

Due to the probable timing of the construction of a wastewater treatment plant by the City, reuse water may not be available when the golf course and the Village Center are finished. However, the effluent option may become viable in the future.

Arrangements could be made to purchase sufficient CAP water to offset any shortages that might occur from whatever primary method of golf course irrigation might be developed. Physical delivery of CAP storage reservoir at Lake Pleasant (behind New Waddell Dam), then through the MWD Beardsley Canal to the northwest corner of The Villages at Surprise.

Quality and Treatment

According to the water quality laboratory test results on selective wells provided by MWD, the water from well sites in the planning area is generally of good quality without organic contents. Chlorination should be the only treatment process required for the project (see Appendix A for detailed water quality data).

A review of groundwater quality in the vicinity of the planned project was also performed by Water Development Corporation in June, 1994. The data indicates that the groundwater underlying the project and other nearby projects meets all of the Arizona Drinking Water Standards.

Pressure Zones

According to CUC's pressure zone map, dated May 1993, the project site will be divided into two different pressure zones (see Figure 4). The boundary for Zone 3 is south of Bell Road and east of Cotton Lane. The design pressure for this zone is 1,290 feet with desirable low and high

residual pressure limits from 55 psi to 70 psi. The remainder areas are in Zone 4 which has a design pressure of 1,290 feet with a low and high pressure range of 75 psi to 90 psi. Elevation 1,290 is the elevation at which the pressure zones are divided.

Since the site has a very uniform and mild slope of 0.6 percent, with an approximate 65-foot elevation drop across the entire property, and also since the area within Zone 3 is comparatively small, the pressure zone division will not have much impact on the overall design of the water system.

Fire Flow Requirements

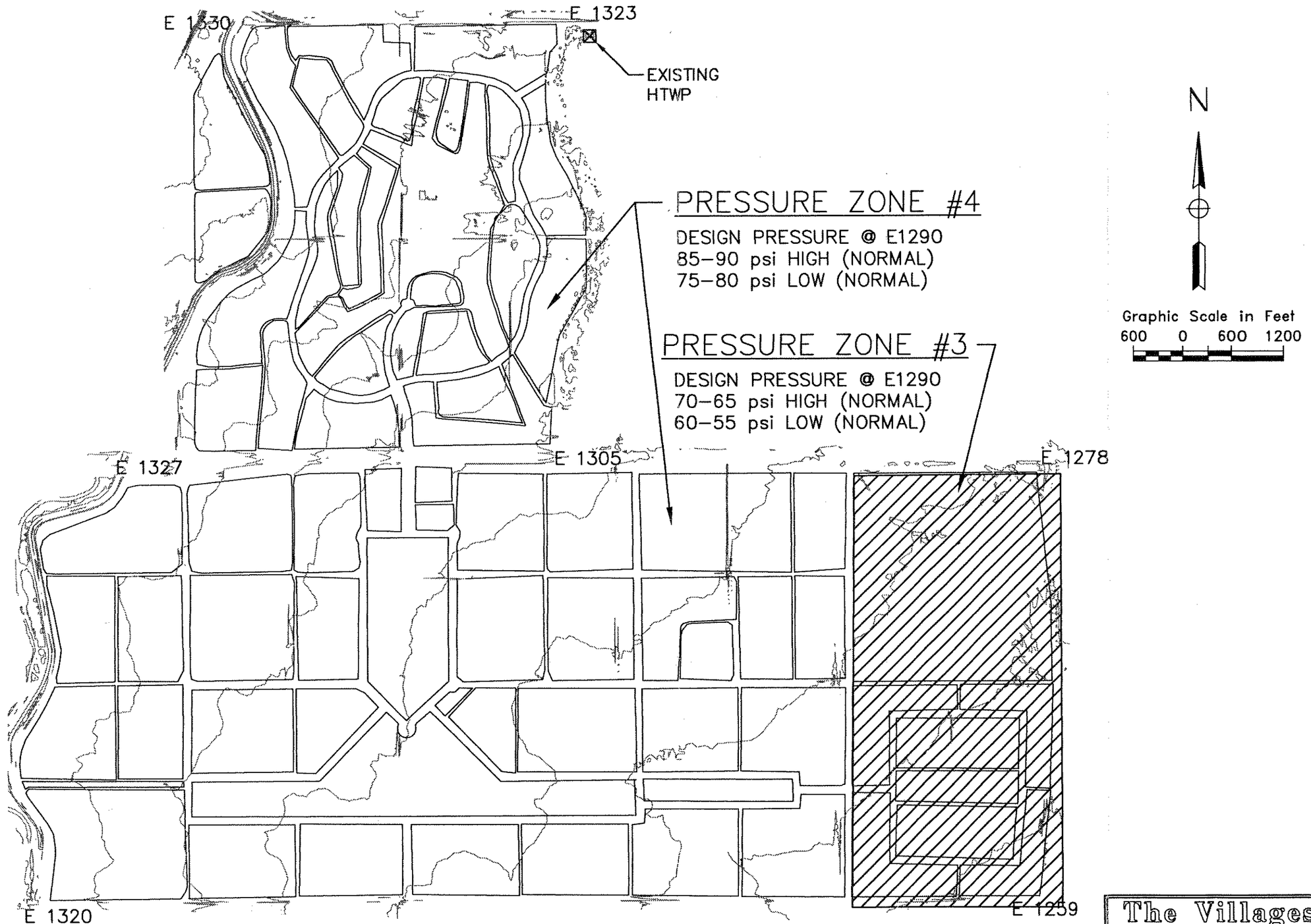
According to the Surprise Fire Department, the fire flow requirements for the residential area are 700 to 1,100 gpm and 2,500 to 3,500 gpm for commercial areas. For this study, a fire flow of 3,000 gpm was assumed to be the worst case to occur in the commercial area for a duration of two hours. However, a fire flow of 1,000 gpm was used for the residential development in Phase 1 of Village 1. A minimum residual pressure of 20 pounds per square inch (psi) under all conditions must be maintained throughout the entire distribution system.

The City of Surprise Subdivision Ordinance indicates that the maximum distance between fire hydrants should not exceed 400 feet and the distance of fire hydrant from the exterior wall of any structure should not exceed 300 feet.

Storage Requirements

The required storage volume includes the fire flow for a duration of two hours and the net volume between supply capacity and system demand (see Tables 16 through 24). It is based on the assumption that the total system demand and the total supply capacity of the well system are the same. A fire flow of 1,000 gpm is considered for Phase 1 of Village 1. When the commercial areas are being developed for Phase 1 of Village 2, a fire flow of 3,000 gpm is used. The peak hour distribution data were provided by the Citizens Utilities Company on October 14, 1994.

Chart C shows the number of wells and storage required for each phase of the development. Since the total capacity of the well system selected is actually larger than the peak day demand, the system is expected to run 90 percent or less of the time in one day to fill up the reservoir.



SOURCE: CITIZEN'S UTILITIES COMPANY PRESSURE ZONE MAP 5/13/93

The Villages at Surprise	Greiner
Pressure Zone Map	
Project no.: E037501	
December 27, 1994	**Figure 4**

Chart C: Required Wells and Storage for Development Phases

Phases	Wells in System	Well System Running Time Per Day (%)	Total Design Storage, MG
Phase 1 of Village 1	HTWP + No Well	83	0.36
Phase 1 of Villages 1 & 2 Combined	HTWP + Well 4-35S	90	1.03
Phase 1 of Villages 1 & 2 Combined + Phases 1-6 of Village 3	HTWP + Wells 4-35S, 4-34	90	1.25
Phase 1 of Village 1, Phases 1-2 of Village 2 + Phases 1-6 of Village 3	HTWP + Wells 4-35S, 4-34, 4-3, 4-2	81	1.59
Phase 1 of Village 1, Phases 1-3 of Village 2 + Phases 1-6 of Village 3	HTWP + Wells 4-35S, 4-34, 4-3, 4-2, MC1057	81	1.81
Phase 1 of Village 1, Phases 1-4 of Village 2 + Phases 1-6 of Village 3	HTWP + Wells 4-35S, 4-34, 4-3, 4-2, MC1057, 5-10	80	2.15
Phase 1 of Village 1, Phases 1-5 of Village 2, Phases 1-6 of Village 3	HTWP + Wells 4-35S, 4-34, 4-3, 4-2, MC1057, 5-10, 5-3	86	2.55
Phased 1-2 of Village 1, Phases 1-5 of Village 2, Phases 1-6 of Village 3	HTWP + Wells 4-35S, 4-34, 4-3, 4-2, MC1057, 5-10, 5-3, BOSCO2	88	2.77
All Phases - Ultimate	HTWP + Wells 4-35S, 4-34, 4-3, 4-2, MC1057, 5-10, 5-3, BOSCO2, 5-11	88	2.98

System Layouts and Alternatives

For domestic water, two system layout alternatives are considered for the ultimate water system:

Alternative No. 1

The proposed water system will consist of nine wells (Wells 4-2, 4-3, 4-34, 4-35S, MC1057, 5-10, 5-3, BOSCO2 and 5-11) which pump water through a common transmission line of sizes varying from eight to 20 inches, to a water plant located near Well No. 4-3 on the east side of the Beardsley Canal. The location of the plant is tentative for the purpose of the study only, and the site will be determined during the final design. The production of each well is provided in the "Development of Water System" Section. The well pumps will be sized so that water is pumped from each well to the proposed water plant without adding extra booster stations. The plant will consist of five 200-horsepower service pumps, one 3 MG ground or underground storage system, one chlorination system and two 15,000 gallon hydropneumatic tanks. The total capacity of the service pumps are selected to handle at least the peak hourly flow and the fire

flow. Water will be discharged at about 80 psi from the plant to the service areas through a network of 12-inch diameter distribution lines. The system will connect HTWP through a 10-inch line (see Exhibit A). The discharge pressure at HTWP will be maintained at about 70 psi.

Another option is to connect the wells which are closer to the proposed plant location, such as Wells 4-3, 4-34, 4-35S, 4-2 and 5-3, and discharge water to the plant through the transmission main while the remaining wells farther away discharge directly into the distribution system with booster stations. This option can reduce the cost for constructing a long transmission main for all wells.

Alternative No. 2

The proposed water system will consist of the same new wells as Alternative No. 1 except that each well will pump water directly into the system through an on-line booster station. Each booster station will consist of two centrifugal pumps, each with a capacity approximately equal to the corresponding well yield. A separate chlorination system will be installed at each station for water disinfection before discharge. The required storage is 3 MG. The distribution network is similar to that for Alternative No. 1 and will connect to HTWP for additional supply. A pumping system consisting of three 200-horsepower service pumps will be installed near the reservoirs to supply water from the storage system to the service areas during periods of peak demand and fire (See Exhibit B). The total capacity of the service pumps are selected to handle at least the peak hourly flows and the fire flow minus the total capacity of the supply system. The discharge pressure at HTWP will be maintained at approximately 70 psi.

SYSTEM ANALYSES AND RESULTS

The Hazen-Williams equation was used to calculate friction head losses in the water distribution system. For study purposes, Polyvinyl Chloride (PVC) pipes were assumed with a "C" value of 150. Minor pipe losses were assumed insignificant.

Three flow conditions were considered for each alternative to obtain the residual pressures at the demand nodes of the distribution network system: (1) Average Flow Demand, (2) Peak Day Demand and (3) Peak Day Demand plus Fire Flow. Assuming that a commercial fire occurs at the most hydraulically remote portion of the project, the location was determined to be at Node No. 306 in Village 3.

Alternative No. 1

Under Average Flow Conditions, the minimum residual pressure is 74 psi at Node No. 115 and the maximum pressure is 104 psi at Node No. 312 (see Exhibit A). HTWP discharges at a rate of 640 gpm into the Villages at Surprise system while the new plant discharges 2,583 gpm.

Under Peak Day Flow Conditions, the minimum and maximum residual pressures are 56 psi and 85 psi, respectively, at the same nodes as in Average Flow Conditions. The discharges from the HTWP and the proposed plant are 640 gpm and 5,805 gpm, respectively.

Under Peak Day Flow plus Fire Flow Conditions, the minimum and maximum residual pressures are found to be 30 and 47 psi at the same locations. The fire demand of 3,000 gpm occurs at Node No. 306 with a residual pressure of 39 psi. The discharges from the HTWP and the new plant are 640 gpm and 8,805 gpm, respectively.

Alternative No. 2

Under Average Flow Conditions, the minimum and maximum residual pressures are 54 psi and 83 psi at Nodes 115 and 312, respectively (see Exhibit B). The HTWP contributes a flow of 640 gpm while the wells are working approximately at their yield limits. The storage system is being filled at a rate of 4,118 gpm.

Under Peak Day Flow Conditions, the minimum and maximum pressures in the system are 53 psi and 82 psi. The HTWP contributes 640 gpm to the system while the wells are yielding at their maximum capacities. The storage system is being filled at a rate of 896 gpm.

Under Peak Day Flow plus Fire Flow Conditions, the minimum and maximum pressures in the system are found to be 36 psi and 48 psi. The HTWP contributes 640 gpm while the wells are yielding at their maximum capacities. The fire demand of 3,000 gpm occurs at Node No. 306 with a pressure of 39 psi. The discharge from the storage system is 2,104 gpm.

CONCLUSIONS AND RECOMMENDATIONS

The pros and cons for each alternative layout are indicated in Chart D below:

Chart D: Comparisons of Alternative No. 1 and Alternative No. 2

Item No.	Issue	Alternative No. 1 (Exhibit A)	Alternative No. 2 (Exhibit B)
1	Residual pressure condition in water system	Pro: This provides a better pressure in the system due to the centralized pressure control/regulation at the water plant.	Con: This provides a comparatively lower but satisfactory pressure in the system than in Alternative No. 1.
2	Operation and maintenance work	Pro: O&M work is reduced and limited at the plant.	Con: O&M work is performed at different locations of the well site, due to the numbers of chlorination systems and booster stations.
3	Flow of supply	Pro: This provides a more consistent flow supply and metering due to the level pressure control of the storage system.	Con: The flow of supply depends on the water production and pump performance at each well.
4	Surge occurrence	Pro: No cavitation problems. Surge effect will be eliminated with hydropneumatic tank system.	Con: Cavitation and surge problem may occur at well discharge.
5	System upgrade or modification	Con: Upgrade or modification of the system is more complicated and inflexible than in Alternative No. 2.	Pro: Upgrading or modification of the system is flexible. Well systems can be connected or disconnected according to the phasing needs.
6	Construction costs	Con: Higher in total construction costs.	Pro: Lower in total construction costs.

The above information will be used for discussions with the Citizen Utilities Company staff.

REFERENCES

1. Metropolitan Domestic Water Improvement District - Water System Management Plan Draft Report, Camp Dresser & McKee, Inc., February 1994.

2. Guidelines for the Construction of Water Systems, Engineering Bulletin No. 10, Arizona Department of Environmental Quality, May 1978.

3. Maricopa Water District Wells Location Map, January 1993.

4. Draft Hydrogeological Report for the Villages at Surprise Project, Water Development Corporation, June 1994.

5. Citizen Utilities Company Maricopa County Operations Map, Latest Edition.

6. Happy Trails Water Plant As-Built Plans, January 1985.

7. PAD Master Water Report for Mountain Vista Ranch, American Engineering Company, April 1994.

8. Water Distribution System Report for Sun City West Expansion Area, Stanley Consultants Inc., January 1992.

9. Maricopa Water District Well Yields and Water Quality Data.

10. Citizen Utilities Company Pressure Zone Map for the Agua Fria System.

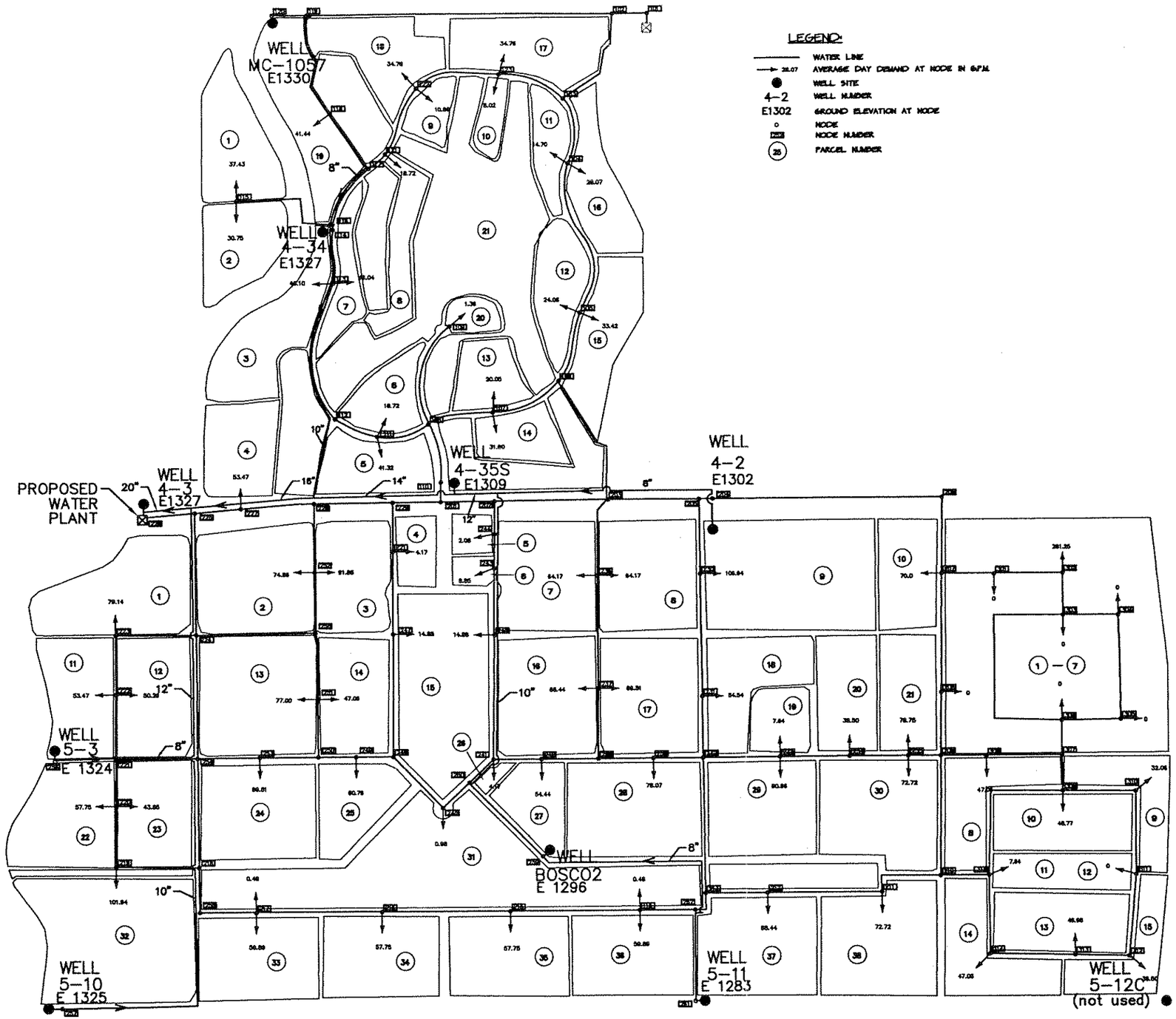
11. Land Use Maps for The Villages at Surprise Project, The Planning Center, dated November 22, 1994.

12. PAD Report for Del Webb's Grand Avenue Project.

13. Water Quality Data by Maricopa Water District (Appendix A).

14. Water Billing Records for Happy Trails Development (Appendix B).

SURP-WR.GEN



LEGEND:

- WATER LINE
- 28.07 AVERAGE DAY DEMAND AT NODE IN G.P.M.
- WELL SITE
- 4-2 WELL NUMBER
- E1302 GROUND ELEVATION AT NODE
- NODE
- NODE NUMBER
- (25) PARCEL NUMBER

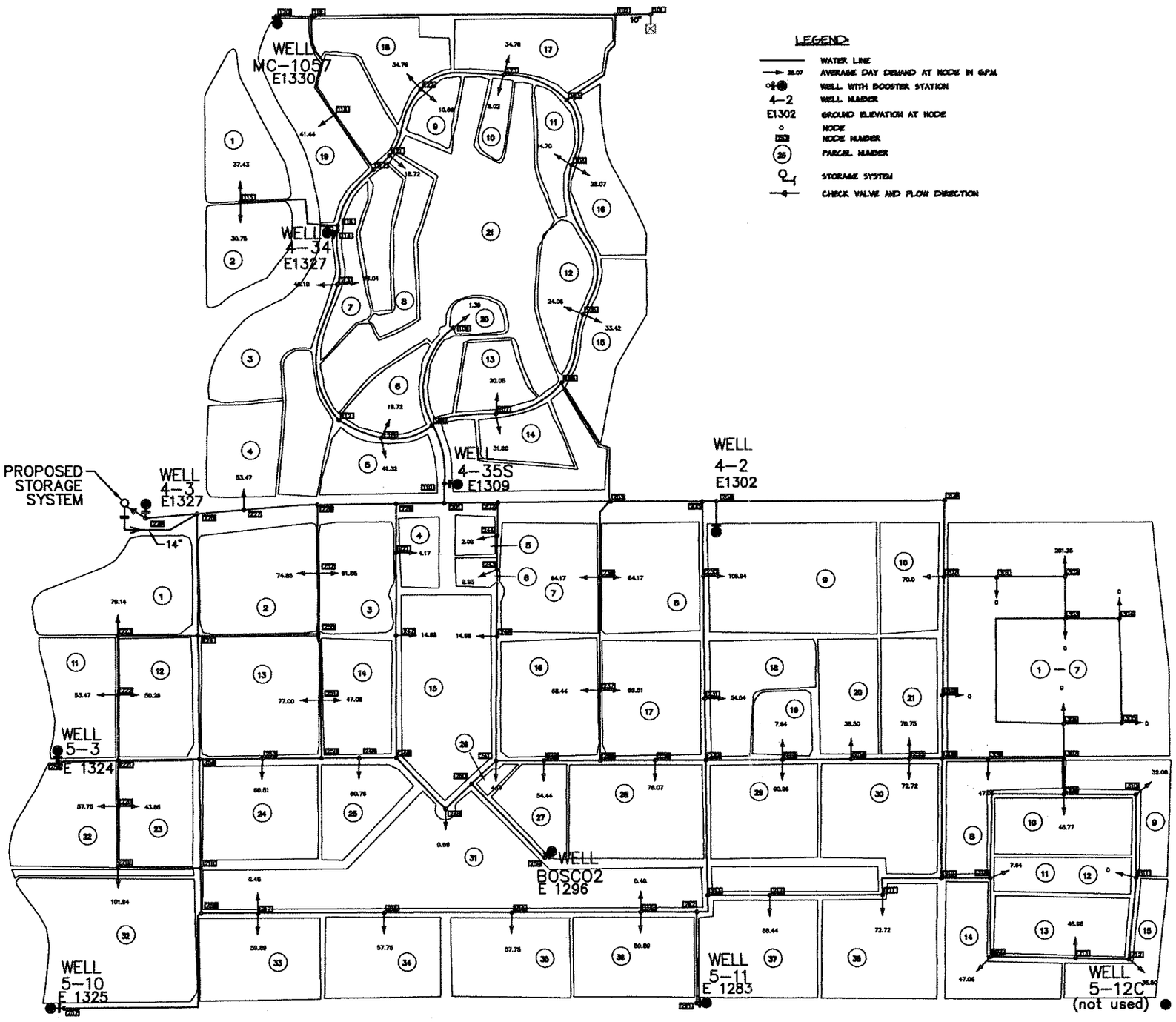
N

Graphic Scale in Feet

600 0 600 1200

Note: FullSize Exhibit is in Pocket

The Villages at Surprise	Greiner
Water System Layout	
Project no.: E037501	Alternative No. 1
December 27, 1994	**Exhibit A**



LEGEND:

- WATER LINE
- 38.07 AVERAGE DAY DEMAND AT NODE IN G.P.M.
- WELL WITH BOOSTER STATION
- 4-2 WELL NUMBER
- E1302 GROUND ELEVATION AT NODE
- NODE
- 225 NODE NUMBER
- (25) PARCEL NUMBER
- STORAGE SYSTEM
- CHECK VALVE AND FLOW DIRECTION

N

Graphic Scale in Feet
600 0 600 1200

Note: FullSize Exhibit is in Pocket

The Villages at Surprise	Greiner
Water System Layout	
Project no.: E037501	Alternative No. 2
December 27, 1994	Exhibit B

TABLE 1: DOMESTIC WATER DEMAND FOR VILLAGE ONE (SCENERIO 1 - W/O COMMERCIAL OVERLAY)

THE VILLAGES AT SURPRISE WATER MASTER STUDY
GREINER, INC. AS OF 12/27/94 (FILE: SV1XA.WK3)

PARCEL NO.	TYPE	AREA (Ac)	DENSITY	UNIT	TOTAL DU	CAPITA/UNIT	POPULATION	AVG RATE (GPCD)	AVG DAY FLOW (GPD)	AVG DAY FLOW (GPM)	PEAK DAY FLOW (GPM)	PEAK HR FLOW (GPM)
1	SF	28.00	5.50	DU/Ac	154.00	2.00	308.00	175.00	53,900.00	37.43	74.86	131.76
2	SF	23.00	5.50	DU/Ac	126.50	2.00	253.00	175.00	44,275.00	30.75	61.49	108.23
3	SF	30.00	5.50	DU/Ac	165.00	2.00	330.00	175.00	57,750.00	40.10	80.21	141.17
4	CL	22.00	10.00	DU/Ac	220.00	2.00	440.00	175.00	77,000.00	53.47	106.94	188.22
5	CL	17.00	10.00	DU/Ac	170.00	2.00	340.00	175.00	59,500.00	41.32	82.64	145.44
6	SF	14.00	5.50	DU/Ac	77.00	2.00	154.00	175.00	26,950.00	18.72	37.43	65.88
7	SF	12.00	5.50	DU/Ac	66.00	2.00	132.00	175.00	23,100.00	16.04	32.08	56.47
8	SF	14.00	5.50	DU/Ac	77.00	2.00	154.00	175.00	26,950.00	18.72	37.43	65.88
9	SF	8.00	5.50	DU/Ac	44.00	2.00	88.00	175.00	15,400.00	10.69	21.39	37.64
10	SF	6.00	5.50	DU/Ac	33.00	2.00	66.00	175.00	11,550.00	8.02	16.04	28.23
11	SF	11.00	5.50	DU/Ac	60.50	2.00	121.00	175.00	21,175.00	14.70	29.41	51.76
12	SF	18.00	5.50	DU/Ac	99.00	2.00	198.00	175.00	34,650.00	24.06	48.13	84.70
13	SF	15.00	5.50	DU/Ac	82.50	2.00	165.00	175.00	28,875.00	20.05	40.10	70.58
14	CL	13.00	10.00	DU/Ac	130.00	2.00	260.00	175.00	45,500.00	31.60	63.19	111.22
15	SF	25.00	5.50	DU/Ac	137.50	2.00	275.00	175.00	48,125.00	33.42	66.84	117.64
16	SF	21.00	5.50	DU/Ac	115.50	2.00	231.00	175.00	40,425.00	28.07	56.15	98.82
17	SF	26.00	5.50	DU/Ac	143.00	2.00	286.00	175.00	50,050.00	34.76	69.51	122.34
18	SF	26.00	5.50	DU/Ac	143.00	2.00	286.00	175.00	50,050.00	34.76	69.51	122.34
19	SF	31.00	5.50	DU/Ac	170.50	2.00	341.00	175.00	59,675.00	41.44	82.88	145.87
20	CC	4.00	****	Ac	****	****	200.00	10.00	2,000.00	1.39	2.78	4.89
21	GC	148.00	****	Ac	****	****	0.00	0.00	1,382.00	0.96	1.92	3.38
22	ROW	18.00	****	Ac	****	****	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL		530.00			2,214.00		4,628.00		778,282.00	540.47	1,080.95	1,902.47

ABBREVIATION:

SF - SINGLE FAMILY
CC - COMMUNITY CENTER
CL - CLUSTER HOUSING
ROW - RIGHT-OF-WAY
GC - GOLF COURSE

GPD - Gallons Per Day
GPCD - Gallons Per Capita Per Day
GPM - Gallons Per Minute
DU - Dwelling Unit
Ac - Acres

PEAK DAY FLOW = 2.00 * AVERAGE DAY FLOW
PEAK HOUR FLOW = 1.76 * PEAK DAY FLOW
PARCEL 21: TWO SETS OF RESTROOMS FOR THE CLUBHOUSE IN GOLF COURSE AREA.

TABLE 2: DOMESTIC WATER DEMAND FOR VILLAGE ONE (SCENERIO 2 - W/ COMMERCIAL OVERLAY)

THE VILLAGES AT SURPRISE WATER MASTER STUDY
GREINER, INC. AS OF 12/27/94 (FILE: SV1XB.WK3)

PARCEL NO.	TYPE	AREA (Ac)	DENSITY	UNIT	TOTAL DU	CAPITA/UNIT	POPULATION	AVG RATE (GPCD)	AVG DAY FLOW (GPD)	AVG DAY FLOW (GPM)	PEAK DAY FLOW (GPM)	PEAK HR FLOW (GPM)
1	SF	28.00	5.50	DU/Ac	154.00	2.00	308.00	175.00	53,900.00	37.43	74.86	131.76
2	SF	23.00	5.50	DU/Ac	126.50	2.00	253.00	175.00	44,275.00	30.75	61.49	108.23
3	SF	30.00	5.50	DU/Ac	165.00	2.00	330.00	175.00	57,750.00	40.10	80.21	141.17
4	CL	22.00	10.00	DU/Ac	220.00	2.00	440.00	175.00	77,000.00	53.47	106.94	188.22
5A	CL	5.00	10.00	DU/Ac	50.00	2.00	100.00	175.00	17,500.00	12.15	24.31	42.78
5B	CM	12.00	3,000.00	GPD/Ac	****	****	****	****	36,000.00	25.00	50.00	88.00
6	SF	14.00	5.50	DU/Ac	77.00	2.00	154.00	175.00	26,950.00	18.72	37.43	65.88
7	SF	12.00	5.50	DU/Ac	66.00	2.00	132.00	175.00	23,100.00	16.04	32.08	56.47
8	SF	14.00	5.50	DU/Ac	77.00	2.00	154.00	175.00	26,950.00	18.72	37.43	65.88
9	SF	8.00	5.50	DU/Ac	44.00	2.00	88.00	175.00	15,400.00	10.69	21.39	37.64
10	SF	6.00	5.50	DU/Ac	33.00	2.00	66.00	175.00	11,550.00	8.02	16.04	28.23
11	SF	11.00	5.50	DU/Ac	60.50	2.00	121.00	175.00	21,175.00	14.70	29.41	51.76
12	SF	18.00	5.50	DU/Ac	99.00	2.00	198.00	175.00	34,650.00	24.06	48.13	84.70
13	SF	15.00	5.50	DU/Ac	82.50	2.00	165.00	175.00	28,875.00	20.05	40.10	70.58
14	CL	13.00	10.00	DU/Ac	130.00	2.00	260.00	175.00	45,500.00	31.60	63.19	111.22
15	SF	25.00	5.50	DU/Ac	137.50	2.00	275.00	175.00	48,125.00	33.42	66.84	117.64
16	SF	21.00	5.50	DU/Ac	115.50	2.00	231.00	175.00	40,425.00	28.07	56.15	98.82
17	SF	26.00	5.50	DU/Ac	143.00	2.00	286.00	175.00	50,050.00	34.76	69.51	122.34
18	SF	26.00	5.50	DU/Ac	143.00	2.00	286.00	175.00	50,050.00	34.76	69.51	122.34
19	SF	31.00	5.50	DU/Ac	170.50	2.00	341.00	175.00	59,675.00	41.44	82.88	145.87
20	CC	4.00	****	Ac	****	****	200.00	10.00	2,000.00	1.39	2.78	4.89
21	GC	148.00	****	DU/Ac	****	****	0.00	0.00	1,382.00	0.96	1.92	3.38
22	ROW	18.00	****	DU/Ac	****	****	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL		530.00			2,094.00		4,388.00		772,282.00	536.31	1,072.61	1,887.80

ABBREVIATION:

SF - SINGLE FAMILY
CC - COMMUNITY CENTER
CL - CLUSTER HOUSING
ROW - RIGHT-OF-WAY
GC - GOLF COURSE
CM - COMMERCIAL

GPD - Gallons Per Day
GPCD - Gallons Per Capita Per Day
GPM - Gallons Per Minute
DU - Dwelling Unit
Ac - Acres

PEAK DAY FLOW = 2.00 * AVERAGE DAY FLOW
PEAK HOUR FLOW = 1.76 * PEAK DAY FLOW
PARCEL 21: TWO SETS OF RESTROOMS FOR THE CLUBHOUSE IN GOLF COURSE AREA.

TABLE 3: DOMESTIC WATER DEMAND FOR VILLAGE TWO (SCENERIO 1 - W/O GOLF COURSE OVERLAY)

THE VILLAGES AT SURPRISE WATER MASTER STUDY
GREINER, INC. AS OF 12/27/94 (FILE: SV2XA.WK3)

PARCEL NO.	TYPE	AREA (Ac)	DENSITY	UNIT	TOTAL DU	CAPITA/UNIT	POPULATION	AVG RATE (GPCD)	AVG DAY FLOW (GPD)	AVG DAY FLOW (GPM)	PEAK DAY FLOW (GPM)	PEAK HR FLOW (GPM)
1	SF	37.00	5.50	DU/Ac	203.50	3.20	651.20	175.00	113,960.00	79.14	158.28	278.57
2	SF	35.00	5.50	DU/Ac	192.50	3.20	616.00	175.00	107,800.00	74.86	149.72	263.51
3	MF	21.00	18.00	DU/Ac	378.00	2.00	756.00	175.00	132,300.00	91.88	183.75	323.40
4	CH	8.50	2.00	EACH	****	****	2,000.00	3.00	6,000.00	4.17	8.33	14.67
5	CH	4.25	1.00	EACH	****	****	1,000.00	3.00	3,000.00	2.08	4.17	7.33
6	CM	4.25	3,000.00	GPD/Ac	****	****	****	****	12,750.00	8.85	17.71	31.17
7	SF	30.00	5.50	DU/Ac	165.00	3.20	528.00	175.00	92,400.00	64.17	128.33	225.87
8	SF	30.00	5.50	DU/Ac	165.00	3.20	528.00	175.00	92,400.00	64.17	128.33	225.87
9	SF	50.00	5.50	DU/Ac	275.00	3.20	880.00	175.00	154,000.00	106.94	213.89	376.44
10	MF	16.00	18.00	DU/Ac	288.00	2.00	576.00	175.00	100,800.00	70.00	140.00	246.40
11	SF	25.00	5.50	DU/Ac	137.50	3.20	440.00	175.00	77,000.00	53.47	106.94	188.22
12	SF	23.50	5.50	DU/Ac	129.25	3.20	413.60	175.00	72,380.00	50.26	100.53	176.93
13	SF	36.00	5.50	DU/Ac	198.00	3.20	633.60	175.00	110,880.00	77.00	154.00	271.04
14	SF	22.00	5.50	DU/Ac	121.00	3.20	387.20	175.00	67,760.00	47.06	94.11	165.64
15A	ES	7.50	1.00	EACH	****	****	550.00	20.00	11,000.00	7.64	15.28	26.89
15B	MS	11.90	1.00	EACH	****	****	1,100.00	25.00	27,500.00	19.10	38.19	67.22
15C	CF	7.20	****	Ac	****	****	300.00	10.00	4,329.00	3.01	6.01	10.58
15D	OS/PK/R	22.20	****	Ac	****	****	****	****	0.00	0.00	0.00	0.00
16	SF	32.00	5.50	DU/Ac	176.00	3.20	563.20	175.00	98,560.00	68.44	136.89	240.92
17	SF	32.50	5.50	DU/Ac	178.75	3.20	572.00	175.00	100,100.00	69.51	139.03	244.69
18	SF	25.50	5.50	DU/Ac	140.25	3.20	448.80	175.00	78,540.00	54.54	109.08	191.99
19A	ES	8.00	1.00	EACH	****	****	550.00	20.00	11,000.00	7.64	15.28	26.89
19B	OS	2.00	****	Ac	****	****	****	****	0.00	0.00	0.00	0.00
20	SF	18.00	5.50	DU/Ac	99.00	3.20	316.80	175.00	55,440.00	38.50	77.00	135.52
21	MF	18.00	18.00	DU/Ac	324.00	2.00	648.00	175.00	113,400.00	78.75	157.50	277.20
22	SF	27.00	5.50	DU/Ac	148.50	3.20	475.20	175.00	83,160.00	57.75	115.50	203.28
23	SF	20.50	5.50	DU/Ac	112.75	3.20	360.80	175.00	63,140.00	43.85	87.69	154.34
24	SF	32.50	5.50	DU/Ac	178.75	3.20	572.00	175.00	100,100.00	69.51	139.03	244.69
25	CL	25.00	10.00	DU/Ac	250.00	2.00	500.00	175.00	87,500.00	60.76	121.53	213.89
26	CM	2.00	3,000.00	GPD/Ac	****	****	****	****	6,000.00	4.17	8.33	14.67
27	CL	22.40	10.00	DU/Ac	224.00	2.00	448.00	175.00	78,400.00	54.44	108.89	191.64
28	SF	36.50	5.50	DU/Ac	200.75	3.20	642.40	175.00	112,420.00	78.07	156.14	274.80
29	SF	28.50	5.50	DU/Ac	156.75	3.20	501.60	175.00	87,780.00	60.96	121.92	214.57
30	SF	34.00	5.50	DU/Ac	187.00	3.20	598.40	175.00	104,720.00	72.72	145.44	255.98
31	OS/R	101.00	****	Ac	****	****	****	****	2,794.00	1.94	3.88	6.83
32	SF	50.00	5.50	DU/Ac	275.00	3.20	880.00	175.00	154,000.00	106.94	213.89	376.44
33	SF	28.00	5.50	DU/Ac	154.00	3.20	492.80	175.00	86,240.00	59.89	119.78	210.81
34	SF	27.00	5.50	DU/Ac	148.50	3.20	475.20	175.00	83,160.00	57.75	115.50	203.28
35	SF	27.00	5.50	DU/Ac	148.50	3.20	475.20	175.00	83,160.00	57.75	115.50	203.28
36	SF	28.00	5.50	DU/Ac	154.00	3.20	492.80	175.00	86,240.00	59.89	119.78	210.81
37	SF	32.00	5.50	DU/Ac	176.00	3.20	563.20	175.00	98,560.00	68.44	136.89	240.92
38	SF	34.00	5.50	DU/Ac	187.00	3.20	598.40	175.00	104,720.00	72.72	145.44	255.98
39	ROW	44.80	****	Ac	****	****	****	****	0.00	0.00	0.00	0.00
TOTAL		1,127.50			5,872.25		22,534.40		3,065,393.00	2,128.75	4,257.49	7,493.18

ABBREVIATION:

SF - SINGLE FAMILY
CL - CLUSTER HOUSING
CH - CHURCH
OS - OPEN SPACE
CF - COMMUNITY FACILITY
R - RETENTION
GPD - Gallons Per Day
GPCD - Gallons Per Capita Per Day
Ac - Acres
CM - COMMERCIAL
ROW - RIGHT-OF-WAY
ES - ELEMENTARY SCHOOL
MF - MULTI-FAMILY
MS - MIDDLE SCHOOL
GPM - Gallons Per Minute
DU - Dwelling Unit

PEAK DAY FLOW = 2.00 * AVERAGE DAY FLOW
PEAK HOUR FLOW = 1.76 * PEAK DAY FLOW
*FOR PARCEL 15C, USE 10.58 GPM BASED ON NO. OF FIXTURE UNITS INSTEAD OF 7.33 GPM BASED ON NO. OF PERSONS.
THREE RESTROOM FACILITIES WERE CONSIDERED FOR PARCEL 31.

TABLE 4: DOMESTIC WATER DEMAND FOR VILLAGE TWO (SCENERIO 2 - W/ GOLF COURSE OVERLAY)

THE VILLAGES AT SURPRISE WATER MASTER STUDY
GREINER, INC. AS OF 12/27/94 (FILE: SV2XB.WK3)

PARCEL NO.	TYPE	AREA (Ac)	DENSITY	UNIT	TOTAL DU	CAPITA/UNIT	POPULATION	AVG RATE (GPCD)	AVG DAY FLOW (GPD)	AVG DAY FLOW (GPM)	PEAK DAY FLOW (GPM)	PEAK HR FLOW (GPM)
1	SF	37.00	5.50	DU/Ac	203.50	3.20	651.20	175.00	113,960.00	79.14	158.28	278.57
2	SF	35.00	5.50	DU/Ac	192.50	3.20	616.00	175.00	107,800.00	74.86	149.72	263.51
3	MF	21.00	18.00	DU/Ac	378.00	2.00	756.00	175.00	132,300.00	91.88	183.75	323.40
4	CH	8.50	2.00	EACH	****	****	2,000.00	10.00	20,000.00	13.89	27.78	48.89
5	CH	4.25	1.00	EACH	****	****	1,000.00	10.00	10,000.00	6.94	13.89	24.44
6	CM	4.25	3,000.00	GPD/Ac	****	****	****	****	12,750.00	8.85	17.71	31.17
7	SF	30.00	5.50	DU/Ac	165.00	3.20	528.00	175.00	92,400.00	64.17	128.33	225.87
8	SF	30.00	5.50	DU/Ac	165.00	3.20	528.00	175.00	92,400.00	64.17	128.33	225.87
9	SF	50.00	5.50	DU/Ac	275.00	3.20	880.00	175.00	154,000.00	106.94	213.89	376.44
10	MF	16.00	18.00	DU/Ac	288.00	2.00	576.00	175.00	100,800.00	70.00	140.00	246.40
11	SF	25.00	5.50	DU/Ac	137.50	3.20	440.00	175.00	77,000.00	53.47	106.94	188.22
12	SF	23.50	5.50	DU/Ac	129.25	3.20	413.60	175.00	72,380.00	50.26	100.53	176.93
13	SF	36.00	5.50	DU/Ac	198.00	3.20	633.60	175.00	110,880.00	77.00	154.00	271.04
14	SF	22.00	5.50	DU/Ac	121.00	3.20	387.20	175.00	67,760.00	47.06	94.11	165.64
15A	ES	7.50	1.00	EACH	****	****	550.00	20.00	11,000.00	7.64	15.28	26.89
15B	MS	11.90	1.00	EACH	****	****	1,100.00	25.00	27,500.00	19.10	38.19	67.22
15C	CF	7.20	****	Ac	****	****	300.00	10.00	4,329.00	3.01	6.01	10.58
15D	OS/PK/R	27.20	****	Ac	****	****	****	****	0.00	0.00	0.00	0.00
16	SF	32.00	5.50	DU/Ac	176.00	3.20	563.20	175.00	98,560.00	68.44	136.89	240.92
17	SF	32.50	5.50	DU/Ac	178.75	3.20	572.00	175.00	100,100.00	69.51	139.03	244.69
18	SF	25.50	5.50	DU/Ac	140.25	3.20	448.80	175.00	78,540.00	54.54	109.08	191.99
19A	ES	8.00	1.00	EACH	****	****	550.00	20.00	11,000.00	7.64	15.28	26.89
19B	OS	2.00	****	Ac	****	****	****	****	0.00	0.00	0.00	0.00
20	SF	18.00	5.50	DU/Ac	99.00	3.20	316.80	175.00	55,440.00	38.50	77.00	135.52
21	MF	18.00	18.00	DU/Ac	324.00	2.00	648.00	175.00	113,400.00	78.75	157.50	277.20
22	SF	27.00	5.50	DU/Ac	148.50	3.20	475.20	175.00	83,160.00	57.75	115.50	203.28
23	SF	20.50	5.50	DU/Ac	112.75	3.20	360.80	175.00	63,140.00	43.85	87.69	154.34
24	SF	32.50	5.50	DU/Ac	178.75	3.20	572.00	175.00	100,100.00	69.51	139.03	244.69
25	CL	24.00	10.00	DU/Ac	240.00	2.00	480.00	175.00	84,000.00	58.33	116.67	205.33
26	CM	2.00	3,000.00	GPD/Ac	****	****	0.00	****	6,000.00	4.17	8.33	14.67
27	CL	21.00	10.00	DU/Ac	210.00	2.00	420.00	175.00	73,500.00	51.04	102.08	179.67
28	SF	36.50	5.50	DU/Ac	200.75	3.20	642.40	175.00	112,420.00	78.07	156.14	274.80
29	SF	28.50	5.50	DU/Ac	156.75	3.20	501.60	175.00	87,780.00	60.96	121.92	214.57
30	SF	34.00	5.50	DU/Ac	187.00	3.20	598.40	175.00	104,720.00	72.72	145.44	255.98
31	GC	146.00	****	AC	****	****	****	****	1,382.00	0.96	1.92	3.38
32	SF	30.00	5.50	DU/Ac	165.00	3.20	528.00	175.00	92,400.00	64.17	128.33	225.87
33	SF	23.00	5.50	DU/Ac	126.50	3.20	404.80	175.00	70,840.00	49.19	98.39	173.16
34	SF	23.00	5.50	DU/Ac	126.50	3.20	404.80	175.00	70,840.00	49.19	98.39	173.16
35	SF	23.00	5.50	DU/Ac	126.50	3.20	404.80	175.00	70,840.00	49.19	98.39	173.16
36	SF	24.00	5.50	DU/Ac	132.00	3.20	422.40	175.00	73,920.00	51.33	102.67	180.69
37	SF	23.00	5.50	DU/Ac	126.50	3.20	404.80	175.00	70,840.00	49.19	98.39	173.16
38	SF	29.00	5.50	DU/Ac	159.50	3.20	510.40	175.00	89,320.00	62.03	124.06	218.34
39	ROW	50.20	****	Ac	****	****	****	****	0.00	0.00	0.00	0.00
TOTAL		1,129.50			5,567.75		21,588.80		2,919,501.00	2,027.43	4,054.86	7,136.56

ABBREVIATION:

SF - SINGLE FAMILY
CL - CLUSTER HOUSING
CH - CHURCH
OS - OPEN SPACE
GC - GOLF COURSE
CM - COMMERCIAL
ROW - RIGHT-OF-WAY
ES - ELEMENTARY SCHOOL
MF - MULTI-FAMILY
MS - MIDDLE SCHOOL

GPD - Gallons Per Day
GPCD - Gallons Per Capita Per Day
Ac - Acres
GPM - Gallons Per Minute
DU - Dwelling Unit

PEAK DAY FLOW = 2.00 * AVERAGE DAY FLOW
PEAK HOUR FLOW = 1.76 * PEAK DAY FLOW
PARCEL 31: TWO SETS OF RESTROOMS FOR THE CLUBHOUSE IN GOLF COURSE AREA.
PARCEL 15C: USE 10.58 GPM BASED ON NO. OF FIXTURE UNITS INSTEAD OF 7.33 GPM BASED ON NO. OF PERSONS.

TABLE 5: DOMESTIC WATER DEMAND FOR VILLAGE THREE (SCENARIO 1 -W/O COMMERCIAL OVERLAY)

THE VILLAGES AT SURPRISE WATER MASTER STUDY
GREINER, INC. AS OF 12/27/94 (FILE: SV3XA.WK3)

PARCEL NO.	TYPE	AREA (Ac)	DENSITY	UNIT	TOTAL UNIT	CAPITA/UNIT	POPULATION	AVG RATE (GPCD)	AVG DAY FLOW (GPD)	AVG DAY FLOW (GPM)	PEAK DAY FLOW (GPM)	PEAK HR FLOW (GPM)
1	CM	25.00	3000.00	GPD/Ac	****	****	****	****	75,000.00	52.08	104.17	183.33
2	SF	15.00	5.50	DU/Ac	82.50	3.20	264.00	175.00	46,200.00	32.08	64.17	112.93
3	SF	16.00	5.50	DU/Ac	88.00	3.20	281.60	175.00	49,280.00	34.22	68.44	120.46
4	SF	23.60	5.50	DU/Ac	129.80	3.20	415.36	175.00	72,688.00	50.48	100.96	177.68
5	SF	23.00	5.50	DU/Ac	126.50	3.20	404.80	175.00	70,840.00	49.19	98.39	173.16
6	OS/PK/R	9.00	****	Ac	****	****	****	****	0.00	0.00	0.00	0.00
7	SF	16.00	5.50	DU/Ac	88.00	3.20	281.60	175.00	49,280.00	34.22	68.44	120.46
8	SF	22.00	5.50	DU/Ac	121.00	3.20	387.20	175.00	67,760.00	47.06	94.11	165.64
9	SF	15.00	5.50	DU/Ac	82.50	3.20	264.00	175.00	46,200.00	32.08	64.17	112.93
10	SF	22.80	5.50	DU/Ac	125.40	3.20	401.28	175.00	70,224.00	48.77	97.53	171.66
11	ES	8.00	1.00	EACH	****	****	550.00	20.00	11,000.00	7.64	15.28	26.89
12	PK/R	7.00	****	Ac	****	****	****	****	0.00	0.00	0.00	0.00
13	SF	22.90	5.50	DU/Ac	125.95	3.20	403.04	175.00	70,532.00	48.98	97.96	172.41
14	SF	22.00	5.50	DU/Ac	121.00	3.20	387.20	175.00	67,760.00	47.06	94.11	165.64
15	SF	18.00	5.50	DU/Ac	99.00	3.20	316.80	175.00	55,440.00	38.50	77.00	135.52
16	ROW	18.70	****	Ac	****	****	****	****	0.00	0.00	0.00	0.00
TOTAL		284.00			1,189.65		4,356.88		752,204.00	522.36	1,044.73	1,838.72

ABBREVIATION:
SF - SINGLE FAMILY
PK/R - PARK/RETENTION
ES - ELEMENTARY SCHOOL
CM - COMMERCIAL AREA
ROW - RIGHT-OF-WAY
OS - OPEN SPACE

Ac - Acres
DU - Dwelling Unit
GPD - Gallons Per Day
GPCD - Gallons Per Capita Per Day
GPM - Gallons Per Minute

PEAK DAY FLOW = 2.00 * AVERAGE DAY FLOW
PEAK HOUR FLOW = 1.76 * PEAK DAY FLOW

TABLE 6: DOMESTIC WATER DEMAND FOR VILLAGE THREE (SCENARIO 2 -W/ COMMERCIAL OVERLAY)

THE VILLAGES AT SURPRISE WATER MASTER STUDY
GREINER, INC. AS OF 12/27/94 (FILE: SV3XB.WK3)

PARCEL NO.	TYPE	AREA (Ac)	DENSITY	UNIT	TOTAL UNIT	CAPITA/UNIT	POPULATION	AVG RATE (GPCD)	AVG DAY FLOW (GPD)	AVG DAY FLOW (GPM)	PEAK DAY FLOW (GPM)	PEAK HR FLOW (GPM)
1-7	CM	135.00	3000.00	GPD/Ac	****	****	****	****	405,000.00	281.25	562.50	990.00
8	SF	22.00	5.50	DU/Ac	121.00	3.20	387.20	175.00	67,760.00	47.06	94.11	165.64
9	SF	15.00	5.50	DU/Ac	82.50	3.20	264.00	175.00	46,200.00	32.08	64.17	112.93
10	SF	22.80	5.50	DU/Ac	125.40	3.20	401.28	175.00	70,224.00	48.77	97.53	171.66
11	ES	8.00	1.00	EACH	****	****	550.00	20.00	11,000.00	7.64	15.28	26.89
12	PK/R	7.00	****	Ac	****	****	****	****	0.00	0.00	0.00	0.00
13	SF	22.90	5.50	DU/Ac	125.95	3.20	403.04	175.00	70,532.00	48.98	97.96	172.41
14	SF	22.00	5.50	DU/Ac	121.00	3.20	387.20	175.00	67,760.00	47.06	94.11	165.64
15	SF	18.00	5.50	DU/Ac	99.00	3.20	316.80	175.00	55,440.00	38.50	77.00	135.52
16	ROW	11.30	****	Ac	****	****	****	****	0.00	0.00	0.00	0.00
TOTAL		284.00			674.85		2,709.52		793,916.00	551.33	1,102.66	1,940.68

ABBREVIATION:
SF - SINGLE FAMILY
PK/R - PARK/RETENTION
ES - ELEMENTARY SCHOOL
CM - COMMERCIAL AREA
ROW - RIGHT-OF-WAY
OS - OPEN SPACE

Ac - Acres
DU - Dwelling Unit
GPD - Gallons Per Day
GPCD - Gallons Per Capita Per Day
GPM - Gallons Per Minute

PEAK DAY FLOW = 2.00 * AVERAGE DAY FLOW
PEAK HOUR FLOW = 1.76 * PEAK DAY FLOW

TABLE 7: DOMESTIC WATER DEMAND FOR PHASE 1 OF VILLAGE 1

THE VILLAGES AT SURPRISE WATER MASTER STUDY
GREINER, INC. AS OF 12/27/94 (FILE: SV1P1XA.WK3)

VILLAGE NO.	PARCEL NO.	TYPE	AREA (Ac)	DENSITY	UNIT	TOTAL DU	CAPITA/UNIT	POPULATION	AVG RATE (GPCD)	AVG DAY FLOW (GPD)	AVG DAY FLOW (GPM)	PEAK DAY FLOW (GPM)	PEAK HR FLOW (GPM)
1	4	CL	7.33	10.00	DU/Ac	73.30	2.00	146.60	175.00	25,655.00	17.82	35.63	62.71
	5	CL	17.00	10.00	DU/Ac	170.00	2.00	340.00	175.00	59,500.00	41.32	82.64	145.44
	6	SF	14.00	5.50	DU/Ac	77.00	2.00	154.00	175.00	26,950.00	18.72	37.43	65.88
	11	SF	11.00	5.50	DU/Ac	60.50	2.00	121.00	175.00	21,175.00	14.70	29.41	51.76
	12	SF	18.00	5.50	DU/Ac	99.00	2.00	198.00	175.00	34,650.00	24.06	48.13	84.70
	13	SF	15.00	5.50	DU/Ac	82.50	2.00	165.00	175.00	28,875.00	20.05	40.10	70.58
	14	CL	13.00	10.00	DU/Ac	130.00	2.00	260.00	175.00	45,500.00	31.60	63.19	111.22
	15	SF	25.00	5.50	DU/Ac	137.50	2.00	275.00	175.00	48,125.00	33.42	66.84	117.64
	16	SF	21.00	5.50	DU/Ac	115.50	2.00	231.00	175.00	40,425.00	28.07	56.15	98.82
	17	SF	26.00	5.50	DU/Ac	143.00	2.00	286.00	175.00	50,050.00	34.76	69.51	122.34
	20	CC	4.00	****	Ac	****	****	200.00	10.00	2,000.00	1.39	2.78	4.89
	21	GC	148.00	****	Ac	****	****	0.00	0.00	1,382.00	0.96	1.92	3.38
	22	ROW	18.00	****	Ac	****	****	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL			337.33			1,088.30		2,376.60		384,287.00	266.87	533.73	939.37

ABBREVIATION:
SF - SINGLE FAMILY
CC - COMMUNITY CENTER
CL - CLUSTER HOUSING
ROW - RIGHT-OF-WAY
GC - GOLF COURSE

GPD - Gallons Per Day
GPCD - Gallons Per Capita Per Day
GPM - Gallons Per Minute
DU - Dwelling Unit
Ac - Acres

PEAK DAY FLOW = 2.00 * AVERAGE DAY FLOW
PEAK HOUR FLOW = 1.76 * PEAK DAY FLOW

TABLE 8: DOMESTIC WATER DEMAND FOR PHASE 1 OF VILLAGE 2

THE VILLAGES AT SURPRISE WATER MASTER STUDY
GREINER, INC. AS OF 12/27/94 (FILE: SV1P1XB.WK3)

VILLAGE NO.	PARCEL NO.	TYPE	AREA (Ac)	DENSITY	UNIT	TOTAL DU	CAPITA/UNIT	POPULATION	AVG RATE (GPCD)	AVG DAY FLOW (GPD)	AVG DAY FLOW (GPM)	PEAK DAY FLOW (GPM)	PEAK HR FLOW (GPM)
2	3	MF	21.00	18.00	DU/Ac	378.00	2.00	756.00	175.00	132,300.00	91.88	183.75	323.40
	4	CH	8.50	2.00	EACH	****	****	2,000.00	3.00	6,000.00	4.17	8.33	14.67
	5	CH	4.25	1.00	EACH	****	****	1,000.00	3.00	3,000.00	2.08	4.17	7.33
	6	CM	4.25	3,000.00	GPD/Ac	****	****	****	****	12,750.00	8.85	17.71	31.17
	7	SF	30.00	5.50	DU/Ac	165.00	3.20	528.00	175.00	92,400.00	64.17	128.33	225.87
	8	SF	30.00	5.50	DU/Ac	165.00	3.20	528.00	175.00	92,400.00	64.17	128.33	225.87
	14	SF	22.00	5.50	DU/Ac	121.00	3.20	387.20	175.00	67,760.00	47.06	94.11	165.64
	15A	ES	7.50	1.00	EACH	****	****	550.00	20.00	11,000.00	7.64	15.28	26.89
	15B	MS	11.90	1.00	EACH	****	****	1,100.00	25.00	27,500.00	19.10	38.19	67.22
	15C	CF	7.20	****	Ac	****	****	300.00	10.00	4,329.00	3.01	6.01	10.58
	15D	OS/PK/R	22.20	****	Ac	****	****	****	****	0.00	0.00	0.00	0.00
	16	SF	32.00	5.50	DU/Ac	176.00	3.20	563.20	175.00	98,560.00	68.44	136.89	240.92
	17	SF	32.50	5.50	DU/Ac	178.75	3.20	572.00	175.00	100,100.00	69.51	139.03	244.69
	28	SF	18.25	5.50	DU/Ac	100.38	3.20	321.20	175.00	56,210.00	39.03	78.07	137.40
	39	ROW	44.80	****	Ac	****	****	****	****	0.00	0.00	0.00	0.00
TOTAL			296.35			1,284.13		8,605.60		704,309.00	489.10	978.21	1,721.64

ABBREVIATION:
SF - SINGLE FAMILY
CF - COMMUNITY FACILITY
OS/PK/R - OPEN SPACE/PARK/RETENTION
ROW - RIGHT-OF-WAY
MF - MULTI-FAMILY
CM - COMMERCIAL
CH - CHURCH
ES - ELEMENTARY SCHOOL
MS - MIDDLE SCHOOL

GPD - Gallons Per Day
GPCD - Gallons Per Capita Per Day
GPM - Gallons Per Minute
DU - Dwelling Unit
Ac - Acres

PEAK DAY FLOW = 2.00 * AVERAGE DAY FLOW
PEAK HOUR FLOW = 1.76 * PEAK DAY FLOW

TABLE 9: DOMESTIC WATER DEMAND FOR PHASES 1-6 OF VILLAGE 3

THE VILLAGES AT SURPRISE WATER MASTER STUDY
GREINER, INC. AS OF 12/27/94 (FILE: SV1P1XC.WK3)

VILLAGE NO.	PARCEL NO.	TYPE	AREA (Ac)	DENSITY	UNIT	TOTAL DU	CAPITA/UNIT	POPULATION	AVG RATE (GPCD)	AVG DAY FLOW (GPD)	AVG DAY FLOW (GPM)	PEAK DAY FLOW (GPM)	PEAK HR FLOW (GPM)
3	1-7	CM	135.00	3,000.00	GPD/Ac	****	****	****	****	405,000.00	281.25	562.50	990.00
TOTAL			135.00			0.00		0.00		405,000.00	281.25	562.50	990.00

ABBREVIATION:
GPD - Gallons Per Day
GPCD - Gallons Per Capita Per Day
GPM - Gallons Per Minute
DU - Dwelling Unit
Ac - Acres
CM - COMMERCIAL

PEAK DAY FLOW = 2.00 * AVERAGE DAY FLOW
PEAK HOUR FLOW = 1.76 * PEAK DAY FLOW

TABLE 10: DOMESTIC WATER DEMAND FOR PHASE 2 OF VILLAGE 2

THE VILLAGES AT SURPRISE WATER MASTER STUDY
GREINER, INC. AS OF 12/27/94 (FILE: SV1PIXD.WK3)

VILLAGE NO.	PARCEL NO.	TYPE	AREA (Ac)	DENSITY	UNIT	TOTAL DU	CAPITA/UNIT	POPULATION	AVG RATE (GPCD)	AVG DAY FLOW (GPD)	AVG DAY FLOW (GPM)	PEAK DAY FLOW (GPM)	PEAK HR FLOW (GPM)
2	9	SF	50.00	5.50	DU/Ac	275.00	3.20	880.00	175.00	154,000.00	106.94	213.89	376.44
	10	MF	16.00	18.00	DU/Ac	288.00	2.00	576.00	175.00	100,800.00	70.00	140.00	246.40
	18	SF	25.50	5.50	DU/Ac	140.25	3.20	448.80	175.00	78,540.00	54.54	109.08	191.99
	19A	ES	8.00	1.00	EACH	****	****	550.00	20.00	11,000.00	7.64	15.28	26.89
	19B	OS	2.00	****	Ac	****	****	****	****	0.00	0.00	0.00	0.00
	20	SF	18.00	5.50	DU/Ac	99.00	3.20	316.80	175.00	55,440.00	38.50	77.00	135.52
	21	MF	18.00	18.00	DU/Ac	324.00	2.00	648.00	175.00	113,400.00	78.75	157.50	277.20
	29	SF	14.25	5.50	DU/Ac	78.38	3.20	250.80	175.00	43,890.00	30.48	60.96	107.29
	30	SF	17.00	5.50	DU/Ac	93.50	3.20	299.20	175.00	52,360.00	36.36	72.72	127.99
													0.00
TOTAL			168.75			1,298.13		3,969.60		609,430.00	423.22	846.43	1,489.72

ABBREVIATION:
SF - SINGLE FAMILY
MF - MULTI-FAMILY
OS - OPEN SPACE
ES - ELEMENTARY SCHOOL

GPD - Gallons Per Day
GPCD - Gallons Per Capita Per Day
GPM - Gallons Per Minute
DU - Dwelling Unit
Ac - Acres

PEAK DAY FLOW = 2.00 * AVERAGE DAY FLOW
PEAK HOUR FLOW = 1.76 * PEAK DAY FLOW

TABLE 11: DOMESTIC WATER DEMAND FOR PHASE 3 OF VILLAGE 2

THE VILLAGES AT SURPRISE WATER MASTER STUDY
GREINER, INC. AS OF 12/27/94 (FILE: SV1P1XF.WK3)

VILLAGE NO.	PARCEL NO.	TYPE	AREA (Ac)	DENSITY	UNIT	TOTAL DU	CAPITA/UNIT	POPULATION	AVG RATE (GPCD)	AVG DAY FLOW (GPD)	AVG DAY FLOW (GPM)	PEAK DAY FLOW (GPM)	PEAK HR FLOW (GPM)
2	2	SF	35.00	5.50	DU/Ac	192.50	3.20	616.00	175.00	107,800.00	74.86	149.72	263.51
	13	SF	36.00	5.50	DU/Ac	198.00	3.20	633.60	175.00	110,880.00	77.00	154.00	271.04
	24	SF	32.50	5.50	DU/Ac	178.75	3.20	572.00	175.00	100,100.00	69.51	139.03	244.69
	25	CL	25.00	10.00	DU/Ac	250.00	2.00	500.00	175.00	87,500.00	60.76	121.53	213.89
	31	OS/R	28.00	****	Ac	****	****	****	****	2,794.00	1.94	3.88	6.83
TOTAL			156.50			819.25		2,321.60		409,074.00	284.08	568.16	999.96

ABBREVIATION:
SF - SINGLE FAMILY
OS - OPEN SPACE
CL - CLUSTER HOUSING
R - RETENTION

GPD - Gallons Per Day
GPCD - Gallons Per Capita Per Day
GPM - Gallons Per Minute
DU - Dwelling Unit
Ac - Acres

PEAK DAY FLOW = 2.00 * AVERAGE DAY FLOW
PEAK HOUR FLOW = 1.76 * PEAK DAY FLOW

TABLE 12: DOMESTIC WATER DEMAND FOR PHASE 4 OF VILLAGE 2

THE VILLAGES AT SURPRISE WATER MASTER STUDY
GREINER, INC. AS OF 12/27/94 (FILE: SV1P1XG.WK3)

VILLAGE NO.	PARCEL NO.	TYPE	AREA (Ac)	DENSITY	UNIT	TOTAL DU	CAPITA/UNIT	POPULATION	AVG RATE (GPCD)	AVG DAY FLOW (GPD)	AVG DAY FLOW (GPM)	PEAK DAY FLOW (GPM)	PEAK HR FLOW (GPM)
2	26	CM	2.00	3,000.00	GPD/AC	****	****	****	****	6,000.00	4.17	8.33	14.67
	27	CL	22.40	10.00	DU/Ac	224.00	2.00	448.00	175.00	78,400.00	54.44	108.89	191.64
	28	SF	18.25	5.50	DU/Ac	100.38	3.20	321.20	175.00	56,210.00	39.03	78.07	137.40
	29	SF	14.25	5.50	DU/Ac	78.38	3.20	250.80	175.00	43,890.00	30.48	60.96	107.29
	30	SF	17.00	5.50	DU/Ac	93.50	3.20	299.20	175.00	52,360.00	36.36	72.72	127.99
	31	OS/R	55.00	****	Ac	****	****	****	****	2,794.00	1.94	3.88	6.83
	35	SF	27.00	5.50	DU/Ac	148.50	3.20	475.20	175.00	83,160.00	57.75	115.50	203.28
	36	SF	28.00	5.50	DU/Ac	154.00	3.20	492.80	175.00	86,240.00	59.89	119.78	210.81
	37	SF	32.00	5.50	DU/Ac	176.00	3.20	563.20	175.00	98,560.00	68.44	136.89	240.92
	38	SF	34.00	5.50	DU/Ac	187.00	3.20	598.40	175.00	104,720.00	72.72	145.44	255.98
TOTAL			249.90			1,161.75		3,448.80		612,334.00	425.23	850.46	1,496.82

ABBREVIATION:
SF - SINGLE FAMILY
CM - COMMERCIAL
CL - CLUSTER HOUSING
OS - OPEN SPACE
R - RETENTION

GPD - Gallons Per Day
GPCD - Gallons Per Capita Per Day
GPM - Gallons Per Minute
DU - Dwelling Unit
Ac - Acres

PEAK DAY FLOW = 2.00 * AVERAGE DAY FLOW
PEAK HOUR FLOW = 1.76 * PEAK DAY FLOW
THREE RESTROOM FACILITIES WERE ASSUMED IN PARCEL 31.

TABLE 13: DOMESTIC WATER DEMAND FOR PHASE 5 OF VILLAGE 2

THE VILLAGES AT SURPRISE WATER MASTER STUDY
GREINER, INC. AS OF 12/27/94 (FILE: SV1P1XH.WK3)

VILLAGE NO.	PARCEL NO.	TYPE	AREA (Ac)	DENSITY	UNIT	TOTAL DU	CAPITA/UNIT	POPULATION	AVG RATE (GPCD)	AVG DAY FLOW (GPD)	AVG DAY FLOW (GPM)	PEAK DAY FLOW (GPM)	PEAK HR FLOW (GPM)
2	1	SF	37.00	5.50	DU/Ac	203.50	3.20	651.20	175.00	113,960.00	79.14	158.28	278.57
	11	SF	25.00	5.50	DU/Ac	137.50	3.20	440.00	175.00	77,000.00	53.47	106.94	188.22
	12	SF	23.50	5.50	DU/Ac	129.25	3.20	413.60	175.00	72,380.00	50.26	100.53	176.93
	22	SF	27.00	5.50	DU/Ac	148.50	3.20	475.20	175.00	83,160.00	57.75	115.50	203.28
	23	SF	20.50	5.50	DU/Ac	112.75	3.20	360.80	175.00	63,140.00	43.85	87.69	154.34
	31	OS/R	18.00	****	Ac	****	****	****	****	0.00	0.00	0.00	0.00
	32	SF	50.00	5.50	DU/Ac	275.00	3.20	880.00	175.00	154,000.00	106.94	213.89	376.44
	33	SF	28.00	5.50	DU/Ac	154.00	3.20	492.80	175.00	86,240.00	59.89	119.78	210.81
	34	SF	27.00	5.50	DU/Ac	148.50	3.20	475.20	175.00	83,160.00	57.75	115.50	203.28
TOTAL			256.00			1,309.00		4,188.80		733,040.00	509.06	1,018.11	1,791.88

ABBREVIATION:
SF - SINGLE FAMILY
OS - OPEN SPACE
R - RETENTION

GPD - Gallons Per Day
GPCD - Gallons Per Capita Per Day
GPM - Gallons Per Minute
DU - Dwelling Unit
Ac - Acres

PEAK DAY FLOW = 2.00 * AVERAGE DAY FLOW
PEAK HOUR FLOW = 1.76 * PEAK DAY FLOW

TABLE 14: DOMESTIC WATER DEMAND FOR PHASE 2 OF VILLAGE 1

THE VILLAGES AT SURPRISE WATER MASTER STUDY
GREINER, INC. AS OF 12/27/94 (FILE: SV1PIXE.WK3)

VILLAGE NO.	PARCEL NO.	TYPE	AREA (Ac)	DENSITY	UNIT	TOTAL DU	CAPITA/UNIT	POPULATION	AVG RATE (GPCD)	AVG DAY FLOW (GPD)	AVG DAY FLOW (GPM)	PEAK DAY FLOW (GPM)	PEAK HR FLOW (GPM)
1	1	SF	28.00	5.50	DU/Ac	154.00	2.00	308.00	175.00	53,900.00	37.43	74.86	131.76
	2	SF	23.00	5.50	DU/Ac	126.50	2.00	253.00	175.00	44,275.00	30.75	61.49	108.23
	3	SF	30.00	5.50	DU/Ac	165.00	2.00	330.00	175.00	57,750.00	40.10	80.21	141.17
	4	CL	14.67	10.00	DU/Ac	146.70	2.00	293.40	175.00	51,345.00	35.66	71.31	125.51
	7	SF	12.00	5.50	DU/Ac	66.00	2.00	132.00	175.00	23,100.00	16.04	32.08	56.47
	8	SF	14.00	5.50	DU/Ac	77.00	2.00	154.00	175.00	26,950.00	18.72	37.43	65.88
	9	SF	8.00	5.50	DU/Ac	44.00	2.00	88.00	175.00	15,400.00	10.69	21.39	37.64
	10	SF	6.00	5.50	DU/Ac	33.00	2.00	66.00	175.00	11,550.00	8.02	16.04	28.23
	18	SF	26.00	5.50	DU/Ac	143.00	2.00	286.00	175.00	50,050.00	34.76	69.51	122.34
	19	SF	31.00	5.50	DU/Ac	170.50	2.00	341.00	175.00	59,675.00	41.44	82.88	145.87
													0.00
TOTAL			192.67			1,125.70		2,251.40		393,995.00	273.61	547.22	963.10

ABBREVIATION:
SF - SINGLE FAMILY
CL - CLUSTER HOUSING

GPD - Gallons Per Day
GPCD - Gallons Per Capita Per Day
GPM - Gallons Per Minute
DU - Dwelling Unit
Ac - Acres

PEAK DAY FLOW = 2.00 * AVERAGE DAY FLOW
PEAK HOUR FLOW = 1.76 * PEAK DAY FLOW

TABLE 15: DOMESTIC WATER DEMAND FOR PHASE 6 OF VILLAGE 3

THE VILLAGES AT SURPRISE WATER MASTER STUDY
GREINER, INC. AS OF 12/27/94 (FILE: SV1P1XI.WK3)

VILLAGE NO.	PARCEL NO.	TYPE	AREA (Ac)	DENSITY	UNIT	TOTAL DU	CAPITA/UNIT	POPULATION	AVG RATE (GPCD)	AVG DAY FLOW (GPD)	AVG DAY FLOW (GPM)	PEAK DAY FLOW (GPM)	PEAK HR FLOW (GPM)
3	8	SF	22.00	5.50	DU/Ac	121.00	3.20	387.20	175.00	67,760.00	47.06	94.11	165.64
	9	SF	15.00	5.50	DU/Ac	82.50	3.20	264.00	175.00	46,200.00	32.08	64.17	112.93
	10	SF	22.80	5.50	DU/Ac	125.40	3.20	401.28	175.00	70,224.00	48.77	97.53	171.66
	11	ES	8.00	1.00	EACH	****	****	550.00	20.00	11,000.00	7.64	15.28	26.89
	12	PK/R	7.00	****	Ac	****	****	****	****	0.00	0.00	0.00	0.00
	13	SF	22.90	5.50	DU/Ac	125.95	3.20	403.04	175.00	70,532.00	48.98	97.96	172.41
	14	SF	22.00	5.50	DU/Ac	121.00	3.20	387.20	175.00	67,760.00	47.06	94.11	165.64
	15	SF	18.00	5.50	DU/Ac	99.00	3.20	316.80	175.00	55,440.00	38.50	77.00	135.52
	16	ROW	11.30	****	Ac	****	****	****	****	0.00	0.00	0.00	0.00
TOTAL			149.00			674.85		2,709.52		388,916.00	270.08	540.16	950.68

ABBREVIATION:
SF - SINGLE FAMILY
ROW - RIGHT-OF-WAY
ES - ELEMENTARY SCHOOL
PK - PARK
OS - OPEN SPACE

GPD - Gallons Per Day
GPCD - Gallons Per Capita Per Day
GPM - Gallons Per Minute
DU - Dwelling Unit
Ac - Acres

PEAK DAY FLOW = 2.00 * AVERAGE DAY FLOW
PEAK HOUR FLOW = 1.76 * PEAK DAY FLOW

TABLE 16: STORAGE REQUIRED FOR PHASE 1 OF VILLAGE 1

FILE: VSEXTRAB.WK3

Time	Peak Day Demand (%)	System Demand (1000 gph)	Supply Capacity (1000 gph)	Flow to/ from Storage (1000 gal)	Net Storage Required (1000 gal)
6-7 am	5.3	40.73	32.02	(8.71)	8.71
7-8	9.4	72.25	32.02	(40.22)	48.93
8-9	11.4	87.62	32.02	(55.59)	104.53
9-10	8.6	66.10	32.02	(34.07)	138.60
10-11	6.1	46.88	32.02	(14.86)	153.46
11-12	4.6	35.35	32.02	(3.33)	156.79
12-1 pm	4.0	30.74	32.02	1.28	155.51
1-2	3.2	24.59	32.02	7.43	148.08
2-3	2.9	22.29	32.02	9.74	138.34
3-4	3.6	27.67	32.02	4.36	133.99
4-5	4.1	31.51	32.02	0.51	133.48
5-6	4.2	32.28	32.02	(0.26)	133.73
6-7	6.0	46.11	32.02	(14.09)	147.82
7-8	6.7	51.49	32.02	(19.47)	167.29
8-9	5.3	40.73	32.02	(8.71)	176.00
9-10	3.3	25.36	32.02	6.66	169.34
10-11	2.2	16.91	32.02	15.12	154.23
11-12	1.4	10.76	32.02	21.26	132.96
12-1 am	0.9	6.92	32.02	25.11	107.86
1-2	0.9	6.92	32.02	25.11	82.75
2-3	0.9	6.92	32.02	25.11	57.64
3-4	0.9	6.92	32.02	25.11	32.54
4-5	1.4	10.76	32.02	21.26	11.27
5-6	2.7	20.75	32.02	11.27	(0.00)
	100.0	768.57	768.57		

NOTE: THE PEAK HOURLY DISTRIBUTION DATA WERE PROVIDED BY CUC ON OCT 14, 1994.

Average Day Flow = 384,293 gpd (or 267 gpm)
Peak Day Demand = 768,570 gpd (or 534 gpm or 32,024 gph)

Net Storage =	176,000.00 gal
2-Hr Fire Flow @ 1,000 gpm =	120,000.00 gal
	296,000.00 gal
Total Required Storage (x 1.2)	355,200.00 gal

Booster Station Capacity =	87,620.00 gph
	1,460.33 gpm @ 40 psi (minimum)
	1,000.00
TOTAL	2,460.33 gpm @ 20 psi (minimum)

TABLE 17: STORAGE REQUIRED FOR PHASE 1 OF VILLAGES 1 & 2 COMBINED

FILE: VSEXTRAC.WK3

Time	Peak Day Demand (%)	System Demand (1000 gph)	Supply Capacity (1000 gph)	Flow to/ from Storage (1000 gal)	Net Storage Required (1000 gal)
6-7 am	5.3	115.39	90.72	(24.67)	24.67
7-8	9.4	204.66	90.72	(113.94)	138.61
8-9	11.4	248.20	90.72	(157.48)	296.10
9-10	8.6	187.24	90.72	(96.52)	392.62
10-11	6.1	132.81	90.72	(42.09)	434.71
11-12	4.6	100.15	90.72	(9.43)	444.15
12-1 pm	4.0	87.09	90.72	3.63	440.52
1-2	3.2	69.67	90.72	21.05	419.47
2-3	2.9	63.14	90.72	27.58	391.89
3-4	3.6	78.38	90.72	12.34	379.56
4-5	4.1	89.26	90.72	1.45	378.11
5-6	4.2	91.44	90.72	(0.73)	378.83
6-7	6.0	130.63	90.72	(39.92)	418.75
7-8	6.7	145.87	90.72	(55.16)	473.90
8-9	5.3	115.39	90.72	(24.67)	498.58
9-10	3.3	71.85	90.72	18.87	479.71
10-11	2.2	47.90	90.72	42.82	436.89
11-12	1.4	30.48	90.72	60.24	376.65
12-1 am	0.9	19.59	90.72	71.12	305.53
1-2	0.9	19.59	90.72	71.12	234.41
2-3	0.9	19.59	90.72	71.12	163.29
3-4	0.9	19.59	90.72	71.12	92.17
4-5	1.4	30.48	90.72	60.24	31.93
5-6	2.7	58.78	90.72	31.93	(0.00)
	100.0	2,177.19	2,177.19		

NOTE: THE PEAK HOURLY DISTRIBUTION DATA WERE PROVIDED BY CUC ON OCT 14, 1994.

Average Day Flow = 1,088,597 gpd (or 756 gpm)
Peak Day Demand = 2,177,194 gpd (or 1,512 gpm or 90,716 gph)

Net Storage =	498,580.00 gal
2-Hr Fire Flow @ 3,000 gpm =	360,000.00 gal
	858,580.00 gal
Total Required Storage (x 1.2)	1,030,296.00 gal

Booster Station Capacity =	248,200.00 gph
	4,136.67 gpm @ 40 psi (minimum)
	3,000.00
TOTAL	7,136.67 gpm @ 20 psi (minimum)

TABLE 18: STORAGE REQUIRED FOR PHASE 1 OF VILLAGES 1 & 2 COMBINED + PHASES 1-6 OF VILLAGE 3

FILE: VSEXTRAD.WK3

Time	Peak Day Demand (%)	System Demand (1000 gph)	Supply Capacity (1000 gph)	Flow to/ from Storage (1000 gal)	Net Storage Required (1000 gal)
6-7 am	5.3	158.32	124.47	(33.85)	33.85
7-8	9.4	280.80	124.47	(156.33)	190.18
8-9	11.4	340.54	124.47	(216.07)	406.26
9-10	8.6	256.90	124.47	(132.43)	538.69
10-11	6.1	182.22	124.47	(57.75)	596.44
11-12	4.6	137.41	124.47	(12.94)	609.39
12-1 pm	4.0	119.49	124.47	4.98	604.41
1-2	3.2	95.59	124.47	28.88	575.53
2-3	2.9	86.63	124.47	37.84	537.69
3-4	3.6	107.54	124.47	16.93	520.77
4-5	4.1	122.47	124.47	1.99	518.78
5-6	4.2	125.46	124.47	(1.00)	519.77
6-7	6.0	179.23	124.47	(54.77)	574.54
7-8	6.7	200.14	124.47	(75.68)	650.21
8-9	5.3	158.32	124.47	(33.85)	684.07
9-10	3.3	98.58	124.47	25.89	658.18
10-11	2.2	65.72	124.47	58.75	599.43
11-12	1.4	41.82	124.47	82.65	516.78
12-1 am	0.9	26.88	124.47	97.58	419.20
1-2	0.9	26.88	124.47	97.58	321.62
2-3	0.9	26.88	124.47	97.58	224.04
3-4	0.9	26.88	124.47	97.58	126.46
4-5	1.4	41.82	124.47	82.65	43.81
5-6	2.7	80.65	124.47	43.81	(0.00)
	100.0	2,987.19	2,987.19		

NOTE: THE PEAK HOURLY DISTRIBUTION DATA WERE PROVIDED BY CUC ON OCT 14, 1994.

Average Day Flow = 1,493,597 gpd (or 1,037 gpm)
Peak Day Demand = 2,987,194 gpd (or 2,074 gpm or 124,466 gph)

Net Storage =	684,070.00 gal
2-Hr Fire Flow @ 3,000 gpm =	360,000.00 gal
	1,044,070.00 gal
Total Required Storage (x 1.2)	1,252,884.00 gal

Booster Station Capacity =	340,540.00 gph
	5,675.67 gpm @ 40 psi (minimum)
	3,000.00
TOTAL	8,675.67 gpm @ 20 psi (minimum)

TABLE 19: STORAGE REQUIRED FOR PHASE 1 OF VILLAGE 1, PHASES 1-2 OF VILLAGE 2, PHASES 1-6 OF VILLAGE 3

FILE: VSEXTRAE.WK3

Time	Peak Day Demand (%)	System Demand (1000 gph)	Supply Capacity (1000 gph)	Flow to/ from Storage (1000 gal)	Net Storage Required (1000 gal)
6-7 am	5.3	222.92	175.25	(47.67)	47.67
7-8	9.4	395.37	175.25	(220.12)	267.79
8-9	11.4	479.49	175.25	(304.24)	572.02
9-10	8.6	361.72	175.25	(186.47)	758.49
10-11	6.1	256.57	175.25	(81.32)	839.81
11-12	4.6	193.48	175.25	(18.23)	858.03
12-1 pm	4.0	168.24	175.25	7.01	851.02
1-2	3.2	134.59	175.25	40.66	810.37
2-3	2.9	121.98	175.25	53.28	757.09
3-4	3.6	151.42	175.25	23.83	733.26
4-5	4.1	172.45	175.25	2.80	730.45
5-6	4.2	176.65	175.25	(1.40)	731.85
6-7	6.0	252.36	175.25	(77.11)	808.96
7-8	6.7	281.81	175.25	(106.55)	915.52
8-9	5.3	222.92	175.25	(47.67)	963.19
9-10	3.3	138.80	175.25	36.45	926.73
10-11	2.2	92.53	175.25	82.72	844.01
11-12	1.4	58.88	175.25	116.37	727.65
12-1 am	0.9	37.85	175.25	137.40	590.25
1-2	0.9	37.85	175.25	137.40	452.85
2-3	0.9	37.85	175.25	137.40	315.45
3-4	0.9	37.85	175.25	137.40	178.06
4-5	1.4	58.88	175.25	116.37	61.69
5-6	2.7	113.56	175.25	61.69	0.00
	100.0	4,206.05	4,206.05		

NOTE: THE PEAK HOURLY DISTRIBUTION DATA WERE PROVIDED BY CUC ON OCT 14, 1994.

Average Day Flow = 2,103,034 gpd (or 1,460 gpm)
Peak Day Demand = 4,206,067 gpd (or 2,921 gpm or 175,253 gph)

Net Storage =	963,190.00 gal
2-Hr Fire Flow @ 3,000 gpm =	360,000.00 gal
	1,323,190.00 gal
Total Required Storage (x 1.2)	1,587,828.00 gal

Booster Station Capacity =	479,490.00 gph
	7,991.50 gpm @ 40 psi (minimum)
	3,000.00
TOTAL	10,991.50 gpm @ 20 psi (minimum)

TABLE 20: STORAGE REQUIRED FOR PHASE 1 OF VILLAGE 1, PHASES 1-3 OF VILLAGE 2, PHASES 1-6 OF VILLAGE 3

FILE: VSEXTRAF.WK3

Time	Peak Day Demand (%)	System Demand (1000 gph)	Supply Capacity (1000 gph)	Flow to/ from Storage (1000 gal)	Net Storage Required (1000 gal)
6-7 am	5.3	266.28	209.34	(56.94)	56.94
7-8	9.4	472.28	209.34	(262.93)	319.87
8-9	11.4	572.76	209.34	(363.42)	683.29
9-10	8.6	432.08	209.34	(222.74)	906.03
10-11	6.1	306.48	209.34	(97.13)	1,003.17
11-12	4.6	231.11	209.34	(21.77)	1,024.94
12-1 pm	4.0	200.97	209.34	8.37	1,016.56
1-2	3.2	160.77	209.34	48.57	968.00
2-3	2.9	145.70	209.34	63.64	904.36
3-4	3.6	180.87	209.34	28.47	875.89
4-5	4.1	205.99	209.34	3.35	872.54
5-6	4.2	211.02	209.34	(1.67)	874.21
6-7	6.0	301.45	209.34	(92.11)	966.32
7-8	6.7	336.62	209.34	(127.28)	1,093.60
8-9	5.3	266.28	209.34	(56.94)	1,150.54
9-10	3.3	165.80	209.34	43.54	1,107.00
10-11	2.2	110.53	209.34	98.81	1,008.19
11-12	1.4	70.34	209.34	139.00	869.19
12-1 am	0.9	45.22	209.34	164.12	705.06
1-2	0.9	45.22	209.34	164.12	540.94
2-3	0.9	45.22	209.34	164.12	376.82
3-4	0.9	45.22	209.34	164.12	212.69
4-5	1.4	70.34	209.34	139.00	73.69
5-6	2.7	135.65	209.34	73.69	(0.00)
	100.0	5,024.20	5,024.20		

NOTE: THE PEAK HOURLY DISTRIBUTION DATA WERE PROVIDED BY CUC ON OCT 14, 1994.

Average Day Flow = 2,512,109 gpd (or 1,745 gpm)
Peak Day Demand = 5,024,218 gpd (or 3,489 gpm or 209,342 gph)

Net Storage =	1,150,540.00 gal
2-Hr Fire Flow @ 3,000 gpm =	360,000.00 gal
	1,510,540.00 gal
Total Required Storage (x 1.2)	1,812,648.00 gal

Booster Station Capacity =	572,760.00 gph
	9,546.00 gpm @ 40 psi (minimum)
	3,000.00
TOTAL	12,546.00 gpm @ 20 psi (minimum)

TABLE 21: STORAGE REQUIRED FOR PHASE 1 OF VILLAGE 1, PHASES 1-4 OF VILLAGE 2, PHASES 1-6 OF VILLAGE 3

FILE: VSEXTRAG.WK3

Time	Peak Day Demand (%)	System Demand (1000 gph)	Supply Capacity (1000 gph)	Flow to/ from Storage (1000 gal)	Net Storage Required (1000 gal)
6-7 am	5.3	331.19	260.37	(70.82)	70.82
7-8	9.4	587.39	260.37	(327.02)	397.84
8-9	11.4	712.37	260.37	(452.00)	849.85
9-10	8.6	537.40	260.37	(277.03)	1,126.88
10-11	6.1	381.18	260.37	(120.81)	1,247.69
11-12	4.6	287.45	260.37	(27.08)	1,274.77
12-1 pm	4.0	249.95	260.37	10.41	1,264.35
1-2	3.2	199.96	260.37	60.41	1,203.95
2-3	2.9	181.22	260.37	79.15	1,124.80
3-4	3.6	224.96	260.37	35.41	1,089.39
4-5	4.1	256.20	260.37	4.17	1,085.22
5-6	4.2	262.45	260.37	(2.08)	1,087.30
6-7	6.0	374.93	260.37	(114.56)	1,201.87
7-8	6.7	418.67	260.37	(158.30)	1,360.17
8-9	5.3	331.19	260.37	(70.82)	1,430.99
9-10	3.3	206.21	260.37	54.16	1,376.83
10-11	2.2	137.48	260.37	122.89	1,253.94
11-12	1.4	87.48	260.37	172.89	1,081.05
12-1 am	0.9	56.24	260.37	204.13	876.92
1-2	0.9	56.24	260.37	204.13	672.79
2-3	0.9	56.24	260.37	204.13	468.66
3-4	0.9	56.24	260.37	204.13	264.54
4-5	1.4	87.48	260.37	172.89	91.65
5-6	2.7	168.72	260.37	91.65	(0.00)
	100.0	6,248.87	6,248.87		

NOTE: THE PEAK HOURLY DISTRIBUTION DATA WERE PROVIDED BY CUC ON OCT 14, 1994.

Average Day Flow = 3,124,440 gpd (or 2,170 gpm)
Peak Day Demand = 6,248,880 gpd (or 4,340 gpm or 260,370 gph)

Net Storage =	1,430,990.00 gal
2-Hr Fire Flow @ 3,000 gpm =	360,000.00 gal
	1,790,990.00 gal
Total Required Storage (x 1.2)	2,149,188.00 gal

Booster Station Capacity =	712,370.00 gph
	11,872.83 gpm @ 40 psi (minimum)
	3,000.00
TOTAL	14,872.83 gpm @ 20 psi (minimum)

TABLE 22: STORAGE REQUIRED FOR PHASE 1 OF VILLAGE 1, PHASES 1-5 OF VILLAGE 2, PHASES 1-6 OF VILLAGE 3

FILE: VSEXTRAH.WK3

Time	Peak Day Demand (%)	System Demand (1000 gph)	Supply Capacity (1000 gph)	Flow to/ from Storage (1000 gal)	Net Storage Required (1000 gal)
6-7 am	5.3	408.89	321.46	(87.44)	87.44
7-8	9.4	725.20	321.46	(403.75)	491.18
8-9	11.4	879.50	321.46	(558.05)	1,049.23
9-10	8.6	663.49	321.46	(342.03)	1,391.26
10-11	6.1	470.61	321.46	(149.16)	1,540.42
11-12	4.6	354.89	321.46	(33.43)	1,573.85
12-1 pm	4.0	308.60	321.46	12.86	1,560.99
1-2	3.2	246.88	321.46	74.58	1,486.41
2-3	2.9	223.73	321.46	97.72	1,388.69
3-4	3.6	277.74	321.46	43.72	1,344.97
4-5	4.1	316.31	321.46	5.14	1,339.83
5-6	4.2	324.03	321.46	(2.57)	1,342.40
6-7	6.0	462.90	321.46	(141.44)	1,483.84
7-8	6.7	516.90	321.46	(195.45)	1,679.29
8-9	5.3	408.89	321.46	(87.44)	1,766.72
9-10	3.3	254.59	321.46	66.86	1,699.86
10-11	2.2	169.73	321.46	151.73	1,548.13
11-12	1.4	108.01	321.46	213.45	1,334.69
12-1 am	0.9	69.43	321.46	252.02	1,082.66
1-2	0.9	69.43	321.46	252.02	830.64
2-3	0.9	69.43	321.46	252.02	578.62
3-4	0.9	69.43	321.46	252.02	326.60
4-5	1.4	108.01	321.46	213.45	113.15
5-6	2.7	208.30	321.46	113.15	0.00
	100.0	7,714.94	7,714.94		

NOTE: THE PEAK HOURLY DISTRIBUTION DATA WERE PROVIDED BY CUC ON OCT 14, 1994.

Average Day Flow = 3,857,486 gpd (or 2,679 gpm)
Peak Day Demand = 7,714,973 gpd (or 5,358 gpm or 321,457 gph)

Net Storage =	1,766,720.00 gal
2-Hr Fire Flow @ 3,000 gpm =	360,000.00 gal
	2,126,720.00 gal
Total Required Storage (x 1.2)	2,552,064.00 gal

Booster Station Capacity =	879,500.00 gph
	14,658.33 gpm @ 40 psi (minimum)
	3,000.00
TOTAL	17,658.33 gpm @ 20 psi (minimum)

TABLE 23: STORAGE REQUIRED FOR PHASES 1-2 OF VILLAGE 1, PHASES 1-5 OF VILLAGE 2, PHASES 1-6 OF VILLAGE 3

FILE: VSEXTRAI.WK3

Time	Peak Day Demand (%)	System Demand (1000 gph)	Supply Capacity (1000 gph)	Flow to/ from Storage (1000 gal)	Net Storage Required (1000 gal)
6-7 am	5.3	450.66	354.29	(96.37)	96.37
7-8	9.4	799.28	354.29	(444.99)	541.35
8-9	11.4	969.34	354.29	(615.05)	1,156.40
9-10	8.6	731.25	354.29	(376.96)	1,533.36
10-11	6.1	518.68	354.29	(164.39)	1,697.75
11-12	4.6	391.14	354.29	(36.85)	1,734.60
12-1 pm	4.0	340.12	354.29	14.17	1,720.43
1-2	3.2	272.09	354.29	82.20	1,638.23
2-3	2.9	246.59	354.29	107.70	1,530.53
3-4	3.6	306.11	354.29	48.18	1,482.35
4-5	4.1	348.62	354.29	5.67	1,476.68
5-6	4.2	357.12	354.29	(2.83)	1,479.51
6-7	6.0	510.18	354.29	(155.89)	1,635.40
7-8	6.7	569.70	354.29	(215.41)	1,850.81
8-9	5.3	450.66	354.29	(96.37)	1,947.17
9-10	3.3	280.60	354.29	73.69	1,873.48
10-11	2.2	187.06	354.29	167.22	1,706.26
11-12	1.4	119.04	354.29	235.25	1,471.01
12-1 am	0.9	76.53	354.29	277.76	1,193.25
1-2	0.9	76.53	354.29	277.76	915.48
2-3	0.9	76.53	354.29	277.76	637.72
3-4	0.9	76.53	354.29	277.76	359.96
4-5	1.4	119.04	354.29	235.25	124.71
5-6	2.7	229.58	354.29	124.71	(0.00)
	100.0	8,502.94	8,502.94		

NOTE: THE PEAK HOURLY DISTRIBUTION DATA WERE PROVIDED BY CUC ON OCT 14, 1994.

Average Day Flow = 4,251,485 gpd (or 2,952 gpm)
Peak Day Demand = 8,502,970 gpd (or 5,905 gpm or 354,290 gph)

Net Storage =	1,947,170.00 gal
2-Hr Fire Flow @ 3,000 gpm =	360,000.00 gal
	2,307,170.00 gal
Total Required Storage (x 1.2)	2,768,604.00 gal

Booster Station Capacity =	969,340.00 gph
	16,155.67 gpm @ 40 psi (minimum)
	3,000.00
TOTAL	19,155.67 gpm @ 20 psi (minimum)

TABLE 24: STORAGE REQUIRED FOR ALL PHASES - ULTIMATE SYSTEM FOR THE VILLAGES AT SURPRISE

FILE: VSEXTRAA.WK3

Time	Peak Day Demand (%)	System Demand (1000 gph)	Supply Capacity (1000 gph)	Flow to/from Storage (1000 gal)	Net Storage Required (1000 gal)
6-7 am	5.3	491.88	386.70	(105.18)	105.18
7-8	9.4	872.39	386.70	(485.69)	590.88
8-9	11.4	1,058.01	386.70	(671.31)	1,262.18
9-10	8.6	798.15	386.70	(411.45)	1,673.63
10-11	6.1	566.13	386.70	(179.43)	1,853.06
11-12	4.6	426.92	386.70	(40.22)	1,893.28
12-1 pm	4.0	371.23	386.70	15.47	1,877.81
1-2	3.2	296.98	386.70	89.71	1,788.10
2-3	2.9	269.14	386.70	117.56	1,670.54
3-4	3.6	334.11	386.70	52.59	1,617.95
4-5	4.1	380.51	386.70	6.19	1,611.76
5-6	4.2	389.79	386.70	(3.09)	1,614.85
6-7	6.0	556.85	386.70	(170.15)	1,785.00
7-8	6.7	621.81	386.70	(235.11)	2,020.11
8-9	5.3	491.88	386.70	(105.18)	2,125.30
9-10	3.3	306.27	386.70	80.43	2,044.86
10-11	2.2	204.18	386.70	182.52	1,862.34
11-12	1.4	129.93	386.70	256.77	1,605.57
12-1 am	0.9	83.53	386.70	303.17	1,302.40
1-2	0.9	83.53	386.70	303.17	999.23
2-3	0.9	83.53	386.70	303.17	696.06
3-4	0.9	83.53	386.70	303.17	392.89
4-5	1.4	129.93	386.70	256.77	136.12
5-6	2.7	250.58	386.70	136.12	0.00
TOTAL	100.0	9,280.77	9,280.77		

NOTE: THE PEAK HOURLY DISTRIBUTION DATA WERE PROVIDED BY CUC ON OCT 14, 1994.

Average Day Flow = 4,637,520 gpd (or 3,223 gpm)
Peak Day Demand = 9,280,771 gpd (or 6,445 gpm or 386,699 gph)

Net Storage =	2,125,300.00 gal
2-Hr Fire Flow =	360,000.00 gal
	2,485,300.00 gal
Total Required Storage =	2,982,360.00 (= 1.2 x 2,485,300)

Booster Station Capacity =	1,058,010.00 gph
	17,633.50 gpm @ 40 psi (minimum)
	3,000.00
TOTAL	20,633.50 gpm @ 20 psi (minimum)

APPENDICES

APPENDIX A
Water Quality Data

Source: Maricopa Water District

Arizona Testing Laboratories

816 West Madison · Phoenix, Arizona 85007 · Telephone 254-6181

For: Maricopa County Municipal Water Conservation District Number One
Post Office Box 730
Peoria, Arizona 85345

Date: July 10, 1978

Lab. No.: 7307

Received: 7-5-78

Marked: Your Purchase Order 721 (also see below)

Submitted by: Mr. Lavoy Henry

REPORT OF WATER TESTS

	14-28-E	14-28W	15-27	BOS-2
Total Dissolved Solids @180°C	301	240	260	190
Chromium, hexavalent	0.03	0.03	0.03	0.05
Iron, total	lt* 0.2	lt* 0.2	lt* 0.2	lt* 0.2
Calcium	12	3	22	9
Magnesium	6	0.7	9	5
Sodium	78	76	49	44
Chloride	60	34	46	26
Carbonate	2	14	0	0
Bicarbonate	112	102	122	124
Sulfate	49	22	23	17
Nitrate, N	3.5	1.4	4.3	0.9
Fluoride	2.5	1.8	2.2	1.6
Phenolphthalein Alkalinity	2	12	0	0
Methyl Orange Alkalinity	96	108	100	102
Calcium Hardness	30	8	55	23
Magnesium Hardness	25	3	37	21
Total Hardness	55	11	92	44
pH	8.7	9.1	8.2	8.3

lt* = less than above reported in mg/l

Respectfully submitted,
ARIZONA TESTING LABORATORIES

Steven Hankins
Steven Hankins

American Analytical Laboratories

Tucson — Phoenix — Mexico

LABORATORY ANALYSIS REPORT

Code: MARWAT
MARICOPA WATER
ATTN: MIKE LAFORM
P.O. BOX 900
WADDELL, AZ 85355-

SAMPLE INFORMATION

Sample..: 017161-02
Clnt Smp:
Descript: WELL WATER
Location: MC 1057
Samp D/T: 12/02/93 10:12
Sampler.: LARRY
Trans By: CLIENT
Recvd By: REBECCA DIXON
Date Rcv: 12/02/93
Date Rpt: 12/20/93

Analysis		MCL	Results	Date
SELENIUM	EPA 270.2		<0.005	
SILVER	EPA 200.7		<0.001	
SODIUM	EPA 273.1		36	
SULFATE	EPA 375.2		26	
TOT DISS SOLIDS	EPA 160.1		170	
ZINC	EPA 200.7		0.020	

Comments:
All units are MG/L unless otherwise specified.
ND means analyte not detected.
MDL is the Method Detection Limit.

Thomas Graf
Analyst(s)

Arizona Testing Laboratories
810 East Hammond Lane ☐ Phoenix, Arizona 85034 ☐ 602/254-6181

For: Maricopa Water District
Attn: Mike Laform
P.O. Box 260
Waddell, Arizona 85355

Date: December 11, 1992

Lab. No.: 92-107393

Sample: Water

Marked: 4-2

Received: 11/09/92

Sampled: 11/09/92

Submitted by: Same

REPORT OF LABORATORY TESTS

METHOD	ANALYSIS DATE			
150.1	11/11/92	pH	7.9	
310.1	11/11/92	Alkalinity	88.	mg/L
407A	11/20/92	Chloride	82.	
340.2	11/16/92	Fluoride	0.45	
314A	12/08/92	Hardness	210.	
300.0	11/12/92	Nitrate-N	17.	
375.4	11/20/92	Sulfate	70.	
160.1	11/12/92	Total Dissolved Solids	400.	
206.2	11/18/92	Arsenic	< 0.01	
200.7	12/04/92	Barium	< 0.5	
213.2	11/16/92	Cadmium	< 0.005	
200.7	12/04/92	Calcium	47.	
218*2	11/17/92	Chromium	0.017	
200.7	12/04/92	Copper	< 0.05	
200.7	12/04/92	Iron	< 0.1	
239.2	11/17/92	Lead	< 0.002	
200.7	12/04/92	Magnesium	22.	
200.7	12/04/92	Manganese	< 0.05	
245.1	11/16/92	Mercury	< 0.001	
270.2	12/01/92	Selenium	< 0.005	
272.2	11/18/92	Silver	< 0.02	
325B	12/07/92	Sodium	53.	
200.7	12/04/92	Zinc	< 0.05	

< = less than the practical quantitation limit (PQL) given

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Steven Hankins

Steven Hankins

American Analytical Laboratories

Tucson — Phoenix — Mexico

LABORATORY ANALYSIS REPORT

Code: MARWAT
MARICOPA WATER
ATTN: MIKE LAFORM
P.O. BOX 900
WADDELL, AZ 85355-

SAMPLE INFORMATION

Sample..: 017178-01
Clnt Smp:
Descript: DRINKING WATER
Location: 4-3
Samp D/T: 12/03/93 10:09
Sampler.: CLIENT
Trans By: CLIENT
Recvd By: REBECCA DIXON
Date Rcv: 12/03/93
Date Rpt: 12/21/93

Analysis		MCL	Results	Date
SELENIUM	EPA 270.2		<0.005	
SILVER	EPA 200.7		<0.001	
SODIUM	EPA 273.1		40	
SULFATE	EPA 375.2		28	
TOT DISS SOLIDS	EPA 160.1		200	
ZINC	EPA 200.7		0.002	

Comments:
All units are MG/L unless otherwise specified.
ND means analyte not detected.
MDL is the Method Detection Limit.

Thomas Lief
Analyst(s)

American Analytical Laboratories

Tucson — Phoenix — Mexico

LABORATORY ANALYSIS REPORT

Code: MARWAT
MARICOPA WATER
ATTN: MIKE LAFORM
P.O. BOX 900
WADDELL, AZ 85355-

SAMPLE INFORMATION

Sample..: 017161-03
Clnt Smp:
Descript: WELL WATER
Location: 4-34
Samp D/T: 12/02/93 10:19
Sampler.: LARRY
Trans By: CLIENT
Recvd By: REBECCA DIXON
Date Rcv: 12/02/93
Date Rpt: 12/15/93

Analysis		MCL	Results	Date
EQ01	DW-TOTAL INORGANIC ANALYSIS			12/14/93
	ALKALINITY	EPA 310.2	100	
	ARSENIC	EPA 206.2	<0.005	
	BARIUM	EPA 200.7	0.077	
	CADMIUM	EPA 213.1	<0.0005	
	CALCIUM	EPA 200.7	18.3	
	CHLORIDE	EPA 407A	19	
	CHROMIUM	EPA 218.2	0.023	
	COPPER	EPA 200.7	<0.003	
	FLUORIDE	EPA 340.2	0.63	
	HARDNESS	EPA 130.1	81	
	IRON	EPA 200.7	0.104	
	LEAD	EPA 239.2	<0.007	
	MAGNESIUM	EPA 200.7	8.54	
	MANGANESE	EPA 200.7	<0.007	
	MERCURY	EPA 245.1	<0.0002	
	NITRATE (N)	EPA 300.0	2.2	
	PH	EPA 150.1	8.0	

Comments:
All units are MG/L unless otherwise specified.
ND means analyte not detected.
MDL is the Method Detection Limit.

Analyst(s)

American Analytical Laboratories

Tucson — Phoenix — Mexico

LABORATORY ANALYSIS REPORT

Code: MARWAT
MARICOPA WATER
ATTN: MIKE LAFORM
P.O. BOX 900
WADDELL, AZ 85355-

SAMPLE INFORMATION

Sample..: 017161-03
Clnt Smp:
Descript: WELL WATER
Location: 4-34
Samp D/T: 12/02/93 10:19
Sampler.: LARRY
Trans By: CLIENT
Recvd By: REBECCA DIXON
Date Rcv: 12/02/93
Date Rpt: 12/15/93

Analysis		MCL	Results	Date
SELENIUM	EPA 270.2		<0.005	
SILVER	EPA 200.7		<0.001	
SODIUM	EPA 273.1		38	
SULFATE	EPA 375.2		34	
TOT DISS SOLIDS	EPA 160.1		190	
ZINC	EPA 200.7		0.013	

Comments:
All units are MG/L unless otherwise specified.
ND means analyte not detected.
MDL is the Method Detection Limit.

Analyst(s)

American Analytical Laboratories

Tucson — Phoenix — Mexico

LABORATORY ANALYSIS REPORT

Code: MARWAT
MARICOPA WATER
ATTN: MIKE LAFORM
P.O. BOX 900
WADDELL, AZ 85355-

SAMPLE INFORMATION
Sample..: 017161-05
Clnt Smp:
Descript: WELL WATER
Location: 5-11
Samp D/T: 12/02/93 10:38
Sampler.: LARRY
Trans By: CLIENT
Recvd By: REBECCA DIXON
Date Rcv: 12/02/93
Date Rpt: 12/15/93

Analysis		MCL	Results	Date
EQ01	DW-TOTAL INORGANIC ANALYSIS			12/14/93
	ALKALINITY	EPA 310.2	78	
	ARSENIC	EPA 206.2	<0.005	
	BARIUM	EPA 200.7	0.147	
	CADMIUM	EPA 213.1	<0.0005	
	CALCIUM	EPA 200.7	50.3	
	CHLORIDE	EPA 407A	90	
	CHROMIUM	EPA 218.2	0.013	
	COPPER	EPA 200.7	<0.003	
	FLUORIDE	EPA 340.2	0.52	
	HARDNESS	EPA 130.1	243	
	IRON	EPA 200.7	0.122	
	LEAD	EPA 239.2	<0.007	
	MAGNESIUM	EPA 200.7	19.2	
	MANGANESE	EPA 200.7	0.007	
	MERCURY	EPA 245.1	<0.0002	
	NITRATE (N)	EPA 300.0	20.3	
	PH	EPA 150.1	7.8	

Comments:
All units are MG/L unless otherwise specified.
ND means analyte not detected.
DL is the Method Detection Limit.

Analyst(s)

American Analytical Laboratories

Tucson — Phoenix — Mexico

LABORATORY ANALYSIS REPORT

Code: MARWAT
MARICOPA WATER
ATTN: MIKE LAFORM
P.O. BOX 900
WADDELL, AZ 85355-

SAMPLE INFORMATION
Sample..: 017161-05
Clnt Smp:
Descript: WELL WATER
Location: 5-11
Samp D/T: 12/02/93 10:38
Sampler.: LARRY
Trans By: CLIENT
Recvd By: REBECCA DIXON
Date Rcv: 12/02/93
Date Rpt: 12/15/93

Analysis		MCL	Results	Date
SELENIUM	EPA 270.2		<0.005	
SILVER	EPA 200.7		<0.001	
SODIUM	EPA 273.1		57	
SULFATE	EPA 375.2		68	
TOT DISS SOLIDS	EPA 160.1		410	
ZINC	EPA 200.7		0.012	

Comments:
All units are MG/L unless otherwise specified.
ND means analyte not detected.
MDL is the Method Detection Limit.

Analyst(s)

American Analytical Laboratories

Tucson — Phoenix — Mexico

LABORATORY ANALYSIS REPORT

Code: MARWAT
MARICOPA WATER
ATTN: MIKE LAFORM
P.O. BOX 900
WADDELL, AZ 85355-

SAMPLE INFORMATION
Sample..: 017161-06
Clnt Smp:
Descript: WELL WATER
Location: 5-12C
Samp D/T: 12/02/93 10:45
Sampler.: LARRY
Trans By: CLIENT
Recvd By: REBECCA DIXON
Date Rcv: 12/02/93
Date Rpt: 12/15/93

Analysis		MCL	Results	Date
EQ01	DW-TOTAL INORGANIC ANALYSIS			12/14/93
	ALKALINITY	EPA 310.2	74	
	ARSENIC	EPA 206.2	<0.005	
	BARIUM	EPA 200.7	0.086	
	CADMIUM	EPA 213.1	<0.0005	
	CALCIUM	EPA 200.7	37.9	
	CHLORIDE	EPA 407A	120	
	CHROMIUM	EPA 218.2	0.020	
	COPPER	EPA 200.7	<0.003	
	FLUORIDE	EPA 340.2	0.52	
	HARDNESS	EPA 130.1	170	
	IRON	EPA 200.7	0.075	
	LEAD	EPA 239.2	<0.007	
	MAGNESIUM	EPA 200.7	18.2	
	MANGANESE	EPA 200.7	<0.007	
	MERCURY	EPA 245.1	<0.0002	
	NITRATE (N)	EPA 300.0	19.8	
	PH	EPA 150.1	8.0	

Comments:
All units are MG/L unless otherwise specified.
ND means analyte not detected.
MDL is the Method Detection Limit.

Analyst(s)

American Analytical Laboratories
Tucson — Phoenix — Mexico

LABORATORY ANALYSIS REPORT

Code: MARWAT
MARICOPA WATER
ATTN: MIKE LAFORM
P.O. BOX 900
WADDELL, AZ 85355-

SAMPLE INFORMATION
Sample..: 017161-06
Clnt Smp:
Descript: WELL WATER
Location: 5-12C
Samp D/T: 12/02/93 10:45
Sampler.: LARRY
Trans By: CLIENT
Recvd By: REBECCA DIXON
Date Rcv: 12/02/93
Date Rpt: 12/15/93

Analysis		MCL	Results	Date
SELENIUM	EPA 270.2		<0.005	
SILVER	EPA 200.7		<0.001	
SODIUM	EPA 273.1		73	
SULFATE	EPA 375.2		44	
TOT DISS SOLIDS	EPA 160.1		400	
ZINC	EPA 200.7		<0.010	

Comments:
All units are MG/L unless otherwise specified.
ND means analyte not detected.
MDL is the Method Detection Limit.

Analyst(s)

810 E. Hammond Lane Phoenix, Arizona 85034 FAX 602-340-0473 602-254-6181 800-279-6181

APPENDIX B
Happy Trails Data

Source: Citizen Utilities Company

Happy Trails

FIRE PUMP (1)

MFR.	Goulds - Centrifugal pump
Impeller dia.	13 1/4
Model	3405
Size	5x8 14
GPM	1350
FT-Head	150
RPM	1780
Serial No.	275 B 849

Motor:

MFR.	Cummins Engine Co.
HP	100 @ 2500 RPM
Model Name	4BT - 3.9
low Idle	750 RPM

BOOSTER PUMPS #3 & #4

MFR	Goulds
Impeller dia.	6.87
Model	3655
Size	5x5-7
GPM	725
FT Head	165
RPM	3600
Serial NO.	765 C 948-1-2

Motor:

MFR.	Marathon Elect.
HP	50
Model Name	RE 326TTFS7606 AN W

BOOSTER PUMPS #1 & #2

MFR.	Goulds
Impeller dia.	6.75
Model	3655
Size	2x3-7
GPM	190
FT-Head	165
RPM	3600
Serial No.	765 C 947-1

Motor:

MFR	Marathon Elect
HP	15
Model Name	RE 254TTFS7512 AN W

HAPPY TRAILS INFORMATION

Total No. of lots	1875
Lots sold	1250
Occupancy	600 (present 4/19/94)
Winter	1100
Summer	350
Projected Growth	15% (1 year) 4 to 5 years to sell the rest of lots

AGUA FRIA WELLS

WELL SITE	PUMP HORSEPOWER	WELL YIELD	CASING SIZE	CASING DEPTH	METER SIZE
2A	75	300	10	975	6
2B	200	1,000	16	1,000	12
SUN VILLAGE	250	1,200	20	1,000	

SUN CITY WELLS

WELL SITE	PUMP HORSEPOWER	WELL YIELD	CASING SIZE	CASING DEPTH	METER SIZE
HAPPY TRAILS	200	1,000	16	1,000	
4B	400	1,200	20	910	12
4C	NONE	STAND BY	16	1,200	NONE
4D	450	1,820	16	1,317	12
5A	350	1,320	20	1,176	12
5D	400	1,910	16	1,206	12
7B	400	1,420	20	1,000	12
7C	325	1,250	20	1,200	10
8D	350	1,340	20	760	12
9A	350	1,325	20	1,006	12
17A	450	2,000	20	1,000	12
17E	400	2,000	16	1,200	14
18B	250	1,575	20	900	12
19B	200	875	20	750	12
20A	NONE	OBSERVATION	16	650	NONE
29A	125	300	16	600	10
30A	250	1,025	20	1,000	12
31D	500	1,850	16	1,214	12
32B	350	1,600	20	1,000	12
32C	400	1,765	16	1,215	12
33B	200	1,100	20	1,000	8

4/9.2

Monthly usage

1	Happy Trails	Sun Plant	Village Well
01/31/93	2868	4431	3843
02/28/93	2918	4026	3080
03/31/93	3384	5208	4958
04/30/93	2799	5800	5112
05/31/93	2002	7225	6418
06/30/93	1759	6814	6059
07/31/93	1840	7376	6564
08/31/93	1731	6934	5945
09/30/93	1739	6623	5868
10/31/93	2269	6559	5608
11/30/93	2769	6512	5661
12/31/93	2805	7050	6358
	28,883	74,558	65,474

Weekly Usage

	Happy Trails	Sun Plant	Village Well
01/04/93	477	842	715
01/11/93	511	940	819
01/18/93	739	1031	876
01/25/93	670	1013	868
02/01/93	639	989	838
02/08/93	706	1020	857
02/15/93	806	941	805
02/22/93	717	943	828
03/01/93	750	1186	806
03/08/93	789	1085	1014
03/15/93	831	1143	1012
03/22/93	758	1378	1282
03/29/93	745	1095	995
04/05/93	599	1195	1101
04/12/93	687	1586	1419
04/19/93	713	1262	1112
04/26/93	615	1294	1131
05/03/93	471	1335	1246
05/10/93	436	1222	1217
05/17/93	539	1748	1303
05/24/93	438	1939	1750
05/31/93	449	1761	1582
06/07/93	333	1331	1242
06/14/93	447	1557	1356
06/21/93	411	1663	1482
06/28/93	454	1683	1477
07/05/93	449	1757	1549
07/12/93	362	1811	1642
07/19/93	438	1563	1386
07/26/93	453	1529	1343
08/02/93	441	1819	1622
08/09/93	460	1490	1207
08/16/93	321	1691	1537
08/23/93	448	1646	1359
08/30/93	206	1391	1239
09/06/93	419	1542	1235
09/13/93	435	1659	1531
09/20/93	326	1500	1334
09/27/93	446	1541	1341
10/04/93	450	1487	1340
10/11/93	448	1302	1089
10/18/93	560	1515	1239
10/25/93	449	1488	1239
11/01/93	582	1784	1479
11/08/93	701	1349	1271
11/15/93	687	1494	1331
11/22/93	572	1490	1220
11/29/93	694	1437	1367
12/06/93	694	1804	1606
12/13/93	592	1719	1606
12/20/93	586	1447	1311
12/27/93	582	1510	1288
01/03/94	722	1424	1354
	29,253	75,371	66,198

1994 Pumpage Report
prepared for Ricardo Jimenez

1/	HAPTRLS	SUNVIL	SVILWELL	_2/	HAPTRLS	SUNVIL	SVILWELL
01/04/94	384	813	734	01/04/94	625	1131	1198
01/11/94	686	1722	1301	01/11/94	686	1722	1301
01/18/94	776	1759	1347	01/18/94	776	1759	1347
01/25/94	823	1978	1721	01/25/94	823	1978	1721
01/31/94	702	1961	1762				
	3,371	8,233	6,865		2,910	6,590	5,567
02/01/94	114	530	523	02/01/94	816	2491	2285
02/08/94	800	2078	1784	02/08/94	800	2078	1784
02/15/94	821	1912	1733	02/15/94	821	1912	1733
02/22/94	923	2089	1800	02/22/94	923	2089	1800
02/28/94	800	1589	1464				
	3,458	8,198	7,304		3,360	8,570	7,602
03/01/94	131	315	257	03/01/94	931	1904	1721
03/08/94	715	1847	1604	03/08/94	715	1847	1604
03/15/94	1007	1649	1483	03/15/94	1007	1649	1483
03/22/94	930	1979	1823	03/22/94	930	1979	1823
03/29/94	973	1801	1639	03/29/94	973	1801	1639
03/31/94	140	473	346				
	3896	8064	7152		4556	9180	8270
04/01/94	119	299	234	04/05/94	779	1916	1676
04/05/94	520	1144	1096	04/12/94	701	1787	1636
04/12/94	701	1787	1636				
04/16/94	426	1092	1037				
	1766	4322	4003		1480	3703	3312
Grand Total 94 Year To Date:	12,491	28,817	25,324		12,306	28,043	24,751

_1/ Modified to reflect any pumpage in the month through complete or partial weeks as needed.

_2/ Monthly pumpage as pulled directly from the Pumpage Spreadsheet. Numbers from each month may reflect several days usage from any given month reported.

MASTER DRAINAGE REPORT

For

The Villages at Surprise

EXHIBIT U

Prepared for:
Surprise Village Company, LLC
11411 North Tatum Boulevard
Phoenix, AZ 85028-2399

Prepared by:
Greiner, Inc.
7310 N. 16th Street, Suite 160
Phoenix, AZ 85020

December 30, 1994
Revised June 8, 1995

PREFACE

The report was originally published on December 30, 1994, and revised on June 8, 1995, to incorporate the City of Surprise's review comments. This distribution of the report was printed and sealed on June 11, 1996. No revisions have been made to update the contents of the original report since the last revision.

WILLDAN ASSOCIATES ☐ ENGINEERS & PLANNERS
Professional Consulting Services Since 1964

May 22, 1995

Ms. Shirley Berg,
Planning Director
City of Surprise
12425 West Bell Road, Suite D-100
Surprise, Arizona 85374

Re: **THE VILLAGES AT SURPRISE, MASTER DRAINAGE REPORT**

Dear Ms. Berg:

Please be advised that plan review backcheck for the above referenced project has been completed and accepted, with one stipulation. This being that the design engineer, Greiner, verifies that the ADMS event duration used for the hydrographs is 6 hours. If it is not, then the 24 hour duration used by PCDMC is not compatible with Greiner's HEC 1 analysis.

Sincerely

WILLDAN ASSOCIATES

Wm. Ross "Skip" Nelson
Director of Public Works Plan Review

SN:db

Greiner

Greiner, Inc.
7310 N. 16th Street, Suite 160
Phoenix, Arizona 85020-2402
(602) 275-5400
FAX: (602) 943-1891

Project No. E10037502

June 14, 1995

Mr. Wm. Ross "Skip" Nelson
Director of Public Works Plan Review
1717 West Northern Ave., Suite 112
Phoenix, AZ 85021

RE: The Villages at Surprise Master Drainage Report Approval

Dear Mr. Nelson:

The attached report has been modified to reflect the changes resulting from your approval letter dated 5-22-95. Our expectation is that this work effort concludes our analysis and the approval of this report provided by your on firm 5-22-95 is still valid.

Please don't hesitate to call or inform our firm if this expectation is not acceptable.

Sincerely,

GREINER, INC.

Ryan Bale, P.E.
Senior Engineering Manager

Attachment

RGB/ml
RG061495.L01

cc: Russ Ewers
Correspondence File

Greiner

Greiner, Inc.
7310 N. 16th Street, Suite 160
Phoenix, Arizona 85020-2402
(602) 275-5400
FAX: (602) 943-1891

Project No. E10037501

June 9, 1995

Mr. Bill Parrish, P.E., City Engineer
City of Surprise
12425 W. Bell Road, Suite D-100
Surprise, AZ 85374

RE: Response to City Comments dated 5-22-95, Verify Storm Duration Compatibility Between the White Tanks/Agua Fria Area Drainage Master Study and the Villages at Surprise Master Drainage Report

Dear Mr. Parrish:

In response to the letter, dated May 22, 1995, from Willdan Associates, the review engineer for the City of Surprise, we have reviewed the inflow hydrographs taken from the White Tanks/Agua Fria Area Drainage Master Study (ADMS), which are modeled for a 24-hour (Q24) duration precipitation pattern, and have made a revised computer run with the 6-hour (Q6) duration storm. These Hydrographs are the existing condition discharges at off-site and on-site locations adjacent to the Villages at Surprise project property lines as they either enter or exit the site. These peak flow rates are shown on Figure 4 in the report. As requested by the Arizona Department of Water Resources (ADWR), flows that exit the site must be of a magnitude less than or equal to the existing condition flows. Greiner incorporated these hydrographs into the Villages at Surprise study following the drainage requirements of ADWR and FCDMC.

The results from the Q6 model have been used to update the tables in the report. As a result, the times to peak for all discharges were shortened and the discharges which inflow and exit the site were increased. A review of the results of the revised HEC-1 computer model for the Villages at Surprise indicate that no changes need to be made to the on-site retention basins or local developed area channels or culverts leading to on-site basins. This is because the off-site flows, which did increase in peak magnitude, do not flow through on-site structures. Consequently, no changes need to be made to the on-site connector channels, culverts and the basins themselves or their outflow structures. However, flows which exit retention basins do combine with off-site flows and these channels will have to be increased in size.

The only impacted areas of the project by the Q24 to Q6 change in the upstream off-site hydrographs are Village 2 Drainage Basin C and Village 3. The following items address the specific anticipated drainage structures which will have to be enlarged.

- The culvert under Bell Road on the west side of Cotton Lane that conveys flows into Village 2 Drainage Basin C from off-site areas. The 100-year, 24-hour discharge was 263 cfs, and the 100-year, 6-hour discharge is 399 cfs.

- The channel within Village 2 Drainage Basin C, runs parallel and west of Cotton Lane, flowing south through the site.

    - The channel will have to convey 399 cfs, an increase from 263 cfs, at the upstream reach.

- The channel flow increases to 405 cfs from 268 cfs at approximately 245 feet south of Bell Road at Concentration Point C1V2P3 where the outflow from Retention Basin B9-V2 confluences with the off-site flow.

- The flows will increase from 275 cfs to 439 cfs at Concentration Point C2V2P3 at approximately 400 feet south of Bell Road where the outflow from Retention Basin B10-V2 confluences with the flow from Concentration Point C1V2P3.

- At Greenway Road, the 38 cfs from Village 2 Drainage Basin B will confluence with the flow from C2V2P3.

- The revised flow is 471 cfs at concentration Point C3V2P3, which is an increase from 286 cfs.

- The culvert under the intersection of Bell Road and Cotton Lane coming from off-site into Village 3 had to convey 263 cfs for the 100-year, 24-hour flow. It will now have to convey 399 cfs.

- The channel which runs from west to east on the south side of Bell Road in Village 3 will have to convey 399 cfs rather than 263 cfs.

- The culvert under Bell Road adjacent to the proposed Estrella Freeway which conveys flows into Village 3 will have to convey 129 cfs, an increase from 58 cfs.

- The channel which runs adjacent to the proposed Estrella Freeway alignment from north to south in Village 3, which conveys the combined discharges of off-site flows with outflows from retention basins. The total flow in this channel beginning at the north end will be the 513 cfs from Concentration Point C1-V3, an increase from 316 cfs. About 190 feet south of Concentration Point C1-V3, outflow from Retention Basin B2-V3 will confluence with the upstream flow at Concentration Point C3-V3 and the channel will have to convey 518 cfs, an increase from 321 cfs. The total flow which is directed off-site is 527 cfs, an increase from 330 cfs.

Sincerely,

GREINER, INC.

Ryan Bale, P.E.
Senior Engineering Manager

RGB/ml
RG060995.L01

THE VILLAGES AT SURPRISE
Master Drainage Report

Executive Summary

The master study of the proposed drainage system for the Villages at Surprise project includes predictions of storm flows, storage area sizes and locations, and conveyance alignments and routes. The study was based on the Land Use Plans, dated November 22, 1994. The entire property consists of approximately 1,950 acres of land which will include about 9,300 homes. The development is planned for three distinct villages in nine phases which will include communities for retired and working families, as well as commercial sites, a golf course, parks and schools.

The design solutions presented within the Master Drainage Report are based on the Area Drainage Master Study (ADMS) for the region prepared by WLB Engineering for the Flood Control District of Maricopa County (FCDMC). In addition, the FCDMC Design Manuals, Volumes 1 and 2, were used to develop discharges, flows and volumes. Contact with both the FCDMC and the Arizona Department of Water Resources was maintained during the preparation of the report to ensure compliance with the City's adopted guidelines.

In summary, the routings and calculations presented within the Master Drainage Report comply with standard practice as presented within the FCDMC Design Manuals and the City of Surprise standards and practices.

Results of this analysis and planning process are as follows:

- Village One is planned to contain two small basins that, when combined, provide a total of 71.0-acre-feet of retention storage.

- Village Two is planned to contain 10 drainage basins, ranging from 8.7-acre-feet to 58.2-acre-feet in volume that, when combined, provide the Villages with a total of 171.9-acre-feet of retention storage.

- Village Three is planned to contain three small basins that provide a combined total of 45.8-acre-feet of storage volume for retention.

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1.0 INTRODUCTION

1.1 Scope

This is the Master Drainage Study (MDS) for The Villages at Surprise, a planned residential community. This MDS shall be used as the drainage guidelines to design parcels for development of this site. This study is based on the Land Use Maps dated November 22, 1994, taken from the application for Planned Area Development (PAD) Zoning for The Villages at Surprise-North and The Villages at Surprise-South.

1.2 Location

The Villages at Surprise is located in Maricopa County in the City of Surprise. A portion of the development is located in the east one-half of Section 34 and the west one-half of Section 35, T4N, R2W, adjacent and west of the existing golf course mobile home development, Happy Trails. The majority of the parcel lies to the east of the Beardsley Canal (Canal) with a small portion north of Bell Road situated between the McMicken Dam and the Canal. The remainder of the project is located south of Bell Road in Section 2, the west one-half of Section 1 and approximately the east three-quarters of Section 3, T3N, R2W Gila and Salt River Base and Meridian. Bell Road is the division line between T3N and T4N. The project is located between Union Hills Drive on the north and Greenway Road on the south (Figure 1).

2.0 METHODOLOGY

The Area Drainage Master Study (ADMS) prepared by WLB for the Flood Control District of Maricopa County (FCDMC) provided the design approach and the backup hydrologic parameters used in the calculations for this report. The original ADMS was modeled in HEC-1 for a 100-year, 24-hour storm precipitation distribution. However, the HEC-1 model created for the Villages at Surprise was modeled for the 100-year, 6-hour storm precipitation distribution. The portion of the ADMS which is off-site and affects the site, as well as the on-site area, were edited out of the original ADMS HEC-1 model and a new HEC-1 model was created using the 100-year, 6-hour storm precipitation distribution. Hydrographs for off-site flows which flow onto the site were directly input into the HEC-1 model for the Villages at Surprise.

The FCDMC Design Manuals Volumes 1 and 2 were used to develop discharges, means of conveyance and retention volume requirements for this project as directed by the City Engineer of the City of Surprise. The City has adopted the FCDMC Design Volumes 1 and 2 as their design manuals. Specific issues regarding design approach were directed to the Hydrologic and Development Sections of the FCDMC. The Arizona Department of Water Resources was contacted and informed of the proposed development location and design approach. Their comments have been incorporated into this report.

Drainage areas were delineated using US Geologic Survey 7.5-minute Quadrangle Maps, topographic maps flown for this study and supplied by the client, data taken from the ADMS, aerial photographs and telephone conversations with FCDMC Staff and City of Surprise Staff.

Off-site contributing discharges, where possible, were taken directly from the ADMS but modified to the 100-year, six-hour storm from the 100-year, 24-hour storm. Where appropriate, ADMS subareas were subdivided as determined by investigation of more detailed topographic maps and their discharges computed by the US Army Corps of Engineers' hydrologic program HEC-1.

Developed discharges were computed using the US Army Corps of Engineers Program HEC-1. The hydrologic variables entered into the program were computed using procedures described in the FCDMC Volume 1, Hydrology, and entered into the computer program developed for the FCDMC, MCUHP1 – Green and Ampt Loss Procedure. Precipitation data were taken from the ADMS for the area appropriate for this location. Drainage areas were delineated on the soils maps prepared by FCDMC and percentages of soil type for each area computed (Figure 2). Water course lengths were measured on 400-scale topographic maps in miles (On-site Drainage Area Map, Figure 3).

The Kinematic Wave Routing Procedure was used to route hydrographs through proposed channels from one concentration point to another so that they can be combined with the downstream hydrograph. This procedure is considered acceptable by the FCDMC.

Retention volumes were calculated for the 100-year, 2-hour storm using procedures in the FCDMC Volume 1, Hydrology, Section 3, Pgs. 3-7 through 3-8. The 100-year, 2-hour precipitation value is 2.78 inches. The proposed retention basins will be sized to contain the design volume with a small bleed-off pipe located at the invert of the basin to allow for complete draining within 36 hours. Specific outfall locations from each basin are discussed in Section 5, On-Site Drainage. Because the design storm for the runoff magnitudes are for the 100-year, 6-hour storm, the inflow volume will be greater than the basin can contain. Therefore, a weir structure has been provided to allow for flows in excess of the 100-year, 2-hour storm to exit the basin.

The site was analyzed for retention requirements for both regional and local parcel sizes. Where possible, the retention basins shall be located in golf courses, parks and school playgrounds. Off-site flows shall be routed around the retention basins as specified by the FCDMC. Retention basins that are located internal to a Village, not at a property line, shall have their outflows confluenced with an off-site flow being conveyed through or around a Village. Retention basins which are located adjacent to a property line shall be released into an existing natural outflow location such as a natural wash.

Developed discharges released after retention shall be returned to their existing water courses in magnitudes equal to or less than the existing condition discharges. Flows from one watershed shall not be released into adjacent watersheds unless the flow would ultimately join the flow of the adjacent watershed downstream. This downstream existing confluence must occur within a reasonable reach and the released combined flow shall be less than the existing conditions flow. Channels will be located in the roadway rights-of-way where possible. They shall be designed to convey the 100-year, 6-hour storm with a minimum of one foot of freeboard for subcritical flow conditions. Depths of flow shall not exceed three feet as specified in the PAD Exhibit S.

3.0 FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

The most recent FEMA flood maps were acquired and the site plotted on the maps. The project site lies within Zone X, which is defined as: "Areas of 500-year flood; areas of 100-year flood with average depths of less than one foot or with drainage areas less than one square mile; and areas protected by levees from the 100-year flood." Please refer to FEMA Flood Insurance Rate Map (FIRM) Numbers 0413C1140 F, 0413C1145 E and 04013C1600 E with revision dates December 3, 1993, September 4, 1991, and September 4, 1991, respectively (not included with this report).

4.0 EXISTING DRAINAGE CONDITIONS AND OFF-SITE AREAS

The existing McMicken Dam and the Trilby Wash Detention Basin flood control facilities remove the majority of the pre-dam off-site drainage areas from the project. There are some small areas located north of Union Hills Drive which contribute runoff directly to Village I (see Figure 4). According to the ADMS, 236 cfs is directed into the Happy Trails development from Village 1 and 166 cfs is directed into Village 2 from Village 1 at Bell Road and Citrus Road.

There is an existing retention basin located north of Bell Road, west of the entrance to Happy Trails that intercepts runoff from Bell Road. This basin shall be incorporated in the final design of the project.

The existing land use for the proposed development site is a combination natural desert that has been used for farming in the past but has been allowed to return to natural desert conditions and areas currently used for agricultural. That area north of Bell Road, east of the McMicken Dam and west of Happy Trails development is natural desert. The portion of the site south of Bell Road and situated between the McMicken Dam and the proposed Estrella Freeway. Portions of Sections 1, 2 and 3 are currently used for agriculture.

According to the ADMS, there is a diversion located at Bell Road and Cotton Lane. There is 399 cfs directed south into Village 2 and 399 cfs directed south east into Village 3 (see Figure 4 and Figure 5). At the corner of Bell Road and the proposed Estrella Freeway Alignment, 129 cfs is directed south into Village 3.

The flows which exit Village 2 include diversions located at Greenway Road and Citrus, Cotton Lane and the proposed Estrella Freeway. At Citrus and Greenway, 454 cfs is directed south and 417 cfs directed east north of Greenway Road into the west one-half of Section 2. At about the one-half section line, 903 cfs is directed east north of Greenway Road into the east one-half of Section 2. At the corner of Cotton Lane and Greenway Road, 1,696 cfs is diverted south of Greenway Road.

There is 702 cfs which exits Village 3 to the east at the Estrella Freeway alignment north of Greenway Road. There is no flow which is directed south at this location. Table 1 lists the off-site drainage area names and their flows.

5.0 ON-SITE DRAINAGE

5.1 Village 1

Village 1, consisting of 530 acres, is located between Union Hills Drive on the north and Bell Road on the south, with the Beardsley Canal (Canal) on the west and the existing Happy Trails development on the east (see Village Location Map – Figure 6). The Canal which separates Village 1 on the west side of the development provides a natural divide for storm water flows. Village 1 was analyzed assuming a non-commercial overlay. The area to the east of the canal is called Drainage Basin A. Figure 7 shows the areas and the HEC-1 hydrologic schematic diagram for this basin. Figure 8 shows Drainage Basin B for Village 1 both as a map and as an HEC-1 hydrologic schematic diagram. Tables 2 and 3, Discharges per Drainage Area and Discharges at Concentration Points, respectively, list the discharges for the developed conditions. Figure 3, On-Site Drainage Area Map, illustrates drainage areas, flow paths, concentration points and retention basin locations.

Discharges from the retention basins will be of magnitudes less than the existing condition and will be discharged into Village 2. The off-site flow from the north will have 236 cfs directed into Happy Trails. The remainder of the off-site flow will combine with the outflow from the retention basin and be directed under Bell Road and into Village 2.

5.2 Village 2

Village 2, consisting of 1,128 acres, is located between Bell Road on the north, Greenway Road on the south, the Beardsley Canal on the west and Cotton Lane on the east (Figures 3 and 6). Village 2 was analyzed based on the open space overlay. The area is split into three hydrologic drainage basins: A, B and C which closely resemble the existing areas from the ADMS. The hydrologic response of the proposed drainage scheme will discharge flows downstream in a manner that will not mix runoff from different drainage basins. Figures 9, 10 and 11 show a small Location Map and HEC-1 Hydrologic Schematic Map for the three basins. Tables 4 and 5, Discharge per Drainage Area and Discharges at Concentration Points, respectively, list the discharges at important locations. Flows exiting the parcel will be south of Greenway Road at Citrus Road and Cotton Lane and shall be released with a magnitude less than the existing conditions. Regional retention basins have been shown on the map which are schematic only.

5.3 Village 3

Village 3, consisting of 287 acres, is located between Bell Road on the north, Greenway Road on the south, Cotton Lane on the west and the proposed Estrella Freeway on the east. Village 3 was analyzed not assuming the marketplace overlay. It was divided into three drainage basins based on the topographic map. Figure 12 provides a small Location Map and the Hydrologic Schematic Diagram. The development is subdivided into commercial, single family, schools and parks. Retention volumes were calculated and basins located appropriately. Figure 3, On-Site Drainage Area Map, illustrates these locations along with proposed outflow locations. Tables 6 and 7 list the developed discharges per drainage area and discharges at concentration points.

6.0 RETENTION REQUIREMENTS

Both individual and regional retention basin volumes have been calculated and are listed in Tables 8 and 9. The basins have been analyzed with 4:1 side slopes and a maximum of three feet of depth to eliminate the need for fencing. The 100-year, 2-hour volume is provided at the first 1.5 feet of depth, the weir crest height, with an additional one-half foot of depth provided for the rise and fall of the hydrograph of the 100-year, 6-hour storm. One foot of freeboard is designed into the basin.

7.0 PHASING RECOMMENDATIONS

The Villages at Surprise is a planned, phased community having a total of six proposed development phases which will be completed over a span of several years. However, the guidelines require retention during all phases of development. Should a portion of any of the drainage basins be developed in one phase, with the remaining portion of the drainage basin left in existing condition, a retention basin will be built that can accommodate the retention volume required for the developed portion of the drainage basin. Where the phased development ends, temporary channels shall be constructed to convey the flow to the developed retention basin. These basins will be maintained throughout the phasing process by the City of Surprise.

8.0 REFERENCES

1. Drainage Design Manual for Maricopa County, Arizona, Volume I, Hydrology, Special Project Branch Hydrology Division. FCDMC, June, 1992.

2. Drainage Design Manual for Maricopa County, Arizona, volume II, Hydraulics, Prepared by NBS Lowry Engineers and Planners and McLaughlin Water Engineers, Ltd. for FCDMC, November, 1991.

3. HEC-1 Flood Hydrograph Package Users Manual. U.S. Army Corps of Engineers, the Hydrologic Engineering Center. September 1990, Version 4.0.

4. Introduction and Application of Kinematic Wave Routing Techniques Using HEC-1. They Hydrologic Engineering Center Training Document No. 10, May 1979.

5. White Tanks/Agua Fria Area Drainage Master Study. Prepared by WLB, City of Phoenix, October, 1992.

SURP-DR.GEN

TABLE 1
DISCHARGES FOR OFF-SITE AREAS

Drainage Area Name	*Drainage Area (sq. mi.)*	*HEC-1 Q^{100} (cfs)*
111A	0.03	19
111B	0.01	17
111C	0.04	87
111D	0.02	64
111E	0.03	93
111F	0.06	176
104A	0.05	120
104B	0.10	189
Diversion From	***Diversion To***	***FCDMC Q_{100} (cfs)***
104	0.15	263
112	Village 2	399
112	Village 3 – Farmer's Mkt.	399
112	113A	399
113A	Village 3 – Farmer's Mkt.	129

Note: Discharges for Drainage Areas 111A, 111B, 111C, 104A and 104B were computed by HEC-1.

Note: Discharges for the Diversions came from the FCDMC, ADMS Study by WLB.

PROJECT NAME: THE VILLAGES OF SURPRISE

PROJECT NO. : E037501

TABLE 2

VILLAGE 1 DISCHARGES PER DRAINAGE AREA

DRAINAGE AREA NAME	AREA OF DRAINAGE AREA (Ac.)	LAND USE	100-YR. 6-HR. DISCHARGE (cfs)
1-V1	28	SINGLE FAMILY	118
2-V1	23	SINGLE FAMILY	78
3-V1	30	SINGLE FAMILY	103
4-V1	22	CLUSTER HOUSING	94
5-V1	17	CLUSTER HOUSING	64
6-V1	14	SINGLE FAMILY	45
7-V1	12	SINGLE FAMILY	35
8A-V1	6.7	SINGLE FAMILY	24
8B-V1	7.3	SINGLE FAMILY	24
9-V1	8	SINGLE FAMILY	33
10-V1	6	SINGLE FAMILY	18
11-V1	11	SINGLE FAMILY	29
12-V1	18	SINGLE FAMILY	56
13-V1	15.3	SINGLE FAMILY	66
14-V1	13	CLUSTER HOUSING	52
15-V1	25	SINGLE FAMILY	72
16-V1	21	SINGLE FAMILY	63
17-V1	26	SINGLE FAMILY	118
18-V1	26	SINGLE FAMILY	86
19-V1	31.3	SINGLE FAMILY	94
20-V1	4	COMMERCIAL	18
G1-V1	14	GOLF COURSE	48
G2-V1	3.1	GOLF COURSE	12
G3-V1	5.2	GOLF COURSE	13
G4-V1	5.8	GOLF COURSE	17
G5-V1	32.5	GOLF COURSE	126
G6-V1	15.2	GOLF COURSE	61
G7-V1	4.7	GOLF COURSE	20
G8-V1	6.5	GOLF COURSE	26
G9-V1	5.9	GOLF COURSE	20
G10-V1	10.2	GOLF COURSE	24
G11-V1	15.7	GOLF COURSE	41
G12-V1	7.5	GOLF COURSE	27
G13-V1	7.5	GOLF COURSE	24
G14-V1	5.4	GOLF COURSE	21
G15-V1	5.4	GOLF COURSE	21
G16-V1	3.4	GOLF COURSE	11

TOTAL DEVELOPED AREA:	**512.6**
TOTAL CIRCULATION AREA:	**18.0**

PROJECT NAME: THE VILLAGES AT SURPRISE

PROJECT NO. : E037501

TABLE 3

VILLAGE 1: DISCHARGES AT CONCENTRATION POINTS

CONCENTRATION POINT NAME	CONTRIBUTING AREA (Ac.)	DISCHARGE (cfs)
C1-V1	70.4	227
C2-V1	89.6	289
C3-V1	96.0	303
C4-V1	38.4	143
C5-V1	134.4	445
C6-V1	140.8	474
C7-V1	179.2	592
C8-V1	198.4	667
C9-V1	230.4	802
C10-V1	249.6	880
C11-V1	44.8	134
C12-V1	300.8	1000
C13-V1	300.8	1020
C14-V1	32.0	81
C15-V1	44.8	121
C16-V1	83.2	249
C17-V1	115.2	353
C18-V1	128.0	415
C19-V1	19.2	65
C20-V1	153.6	499
C21-V1	160.0	510
C22-V1	460.8	1530
C23-V1	51.2	193
C1-OF1*	-	394
C1V1P1*	467.2	134

* OFF-SITE ADDITIONAL CONTRIBUTING AREA

PROJECT NAME: THE VILLAGES OF SURPRISE

PROJECT NO. : E037501

TABLE 4

VILLAGE 2 DISCHARGES PER DRAINAGE AREA

DRAINAGE AREA NAME	AREA OF DRAINAGE AREA (Ac.)	LAND USE	100-YR. 6-HR. DISCHARGE (cfs)
1-V2	37	SINGLE FAMILY	142
2-V2	35	SINGLE FAMILY	138
3-V2	21	APPARTMENTS	88
4-V2	10	CHURCH	42
5-V2	6	CHURCH	29
6-V2	4	COMMERCIAL	19
7-V2	30	SINGLE FAMILY	139
8-V2	30	SINGLE FAMILY	147
9a-V2	32	SINGLE FAMILY	157
9b-V2	18	SINGLE FAMILY	78
10-V2	16	APPARTMENTS	66
11-V2	25	SINGLE FAMILY	85
12-V2	23.5	SINGLE FAMILY	83
13-V2	36	SINGLE FAMILY	135
14-V2	22	SINGLE FAMILY	83
15a-V2	6	PARK	21
15b-V2	14	SCHOOL	1
15c-V2	24	PARK	106
16-V2	32	SINGLE FAMILY	146
17-V2	32.5	SINGLE FAMILY	142
18a-V2	14	SINGLE FAMILY	63
18b-V2	11.5	SINGLE FAMILY	50
19-V2	10	SCHOOL	55
20-V2	18	SINGLE FAMILY	85
21-V2	18	APPARTMENTS	84
22-V2	27	SINGLE FAMILY	113
23-V2	20.5	SINGLE FAMILY	75
24-V2	32.5	SINGLE FAMILY	132
25-V2	25	CLUSTER HOUSING	95
26-V2	2	COMMERCIAL	10
27-V2	22.4	CLUSTER HOUSING	115
28a-V2	18.2	SINGLE FAMILY	84
28b-V2	18.2	SINGLE FAMILY	90
29a-V2	14.3	SINGLE FAMILY	66
29b-V2	14.3	SINGLE FAMILY	70
30a-V2	15.5	SINGLE FAMILY	78
30b-V2	18.5	SINGLE FAMILY	96
31a-V2	18	PARK	68
31b-V2	20.5	PARK	81
31c-V2	46.5	PARK	169
31d-V2	12	PARK	39
32-V2	50	SINGLE FAMILY	197
33-V2	28	SINGLE FAMILY	111
34-V2	27	SINGLE FAMILY	102
35-V2	27	SINGLE FAMILY	112
36-V2	28	SINGLE FAMILY	140
37-V2	32	SINGLE FAMILY	150
38-V2	34	SINGLE FAMILY	174

TOTAL DEVELOPED AREA:	**1076.9**
TOTAL CIRCULATION AREA:	**44.8**

PROJECT NAME: THE VILLAGES OF SURPRISE

PROJECT NO. : E037501

TABLE 6

VILLAGE 3 DISCHARGES PER DRAINAGE AREA

DRAINAGE AREA NAME	AREA OF DRAINAGE AREA (Ac.)	LAND USE	100-YR. 6-HR. DISCHARGE (cfs)
1-V3	25	COMMERCIAL	81
2-V3	15	SINGLE FAMILY	55
3-V3	16	SINGLE FAMILY	60
4-V3	23.6	SINGLE FAMILY	106
5-V3	23	SINGLE FAMILY	92
6-V3	9	PARK	33
7-V3	16	SINGLE FAMILY	75
8A-V3	9.2	SINGLE FAMILY	37
8B-V3	12.8	SINGLE FAMILY	60
9-V3	15	SINGLE FAMILY	50
10-V3	22.8	SINGLE FAMILY	101
11-V3	15	SCHOOL	58
13-V3	22.9	SINGLE FAMILY	91
14-V3	22	SINGLE FAMILY	80
15-V3	18	SINGLE FAMILY	67

TOTAL DEVELOPED AREA:	**265.3**
TOTAL CIRCULATION AREA:	**18.7**

PROJECT NAME: THE VILLAGES AT SURPRISE

PROJECT NO. : E037501

TABLE 5

VILLAGE 2: DISCHARGES AT CONCENTRATION POINTS

CONCENTRATION POINT NAME	CONTRIBUTING AREA (Ac.)	DISCHARGE (cfs)
C1–V2	51.2	194
C2–V2	57.6	223
C3–V2	83.2	297
C4–V2	134.4	494
C40–V2	70.4	270
C5–V2	102.4	401
C6–V2	121.6	496
C7–V2	300.8	1,105
C8–V2	345.6	1,274
C10–V2	44.8	171
C11–V2	19.2	91
C12–V2	70.4	283
C14–V2	108.8	389
C50–V2	25.6	120
C15–V2	64.0	285
C16–V2	83.2	369
C17–V2	64.0	290
C18–V2	102.4	490
C60–V2	83.2	380
C19–V2	185.6	869
C20–V2	230.4	1,017
C70–V2	57.6	252
C75–V2	288.0	1,269
C22–V2	44.8	208
C23–V2	51.2	263
C24–V2	25.6	129
C25–V2	44.8	199
C26–V2	38.4	162
C27–V2	51.2	240
C28–V2	96.0	439
C29–V2	224.0	1,043
C30–V2	32.0	150
C31–V2	51.2	246
C1V1P1*	25.6	134
C1V2P1*	128.0	138
C2V2P1*	480.0	152
C3V2P1*	531.2	161
C1V2P3*	64.0	405
C2V2P3*	288.0	439
C1V2P2*	32.0	38
C3V293*	320.0	471

* OFF–SITE ADDITONAL CONTRIBUTING AREA

PROJECT NAME: THE VILLAGES AT SURPRISE

PROJECT NO. : E037501

TABLE 7

VILLAGE 3: DISCHARGES AT CONCENTRATION POINTS

CONCENTRATION POINT NAME	CONTRIBUTING AREA (Ac.)	DISCHARGE (cfs)
C1–V3*	76.8	513
C2–V3	102.4	417
C3–V3*	179.2	518
C4–V3	25.6	116
C5–V3	76.8	299
C6–V3	134.4	535
C1V3P1*	313.6	527

* OFF–SITE ADDITIONAL CONTRIBUTING AREA

TABLE 8
REGIONAL RETENTION VOLUMES

Basin Name	*Inflow (cfs)*	*Outflow (cfs)*	*Volume (ac.-ft.)*	*Peak Depth in Basin (ft.)*	*Time to Peak (hr.)*	*Drainage Basin Name*
VILLAGE 1	**(Village 1 Total Retention Volume = 71.0 ac.-ft.)**					
B1-V1	1,530	57	61.5	2.9	5.1	Basin A
B2-V1	193	11	9.5	2.4	5.0	Basin B
VILLAGE 2	**(Village 2 Total Retention Volume = 171.9 ac.-ft.)**					
B1-V2	194	11	8.7	2.3	4.7	Basin A
B2-V2	1,274	11	58.2	2.6	6.0	Basin A
B5-V2	389	11	15.6	2.5	4.9	Basin A
B6-V2	252	7	45.4	1.4	4.7	Basin B
B9-V2	263	15	9	2.7	4.6	Basin C
B10-V2	1,043	37	35	2.8	4.8	Basin C
VILLAGE 3	**(Village 3 Retention Volume = 45.8 ac.-ft.)**					
B1-V3	81	10	5.1	2.2	5.0	Basin A
B2-V3	417	11	17.2	2.4	4.8	Basin A
B3-V3	302	17	23.5	2.4	4.8	Basin A

Note: Retention Basin B10-V2 (Basin 10, Village 2) had to have its total calculated retention volume increased from 16.4 ac.-ft. to 35.0 ac.-ft. at 1.5 feet deep in the retention basin to prevent overtopping the retention basin.

PROJECT NAME: The Villages at Surprise

PROJECT NO.: E037500

DATE PREPARED : 10-27-94

TABLE 9A

Flood Control District of Maricopa County – Retention Requirements

100-YEAR, 2-HOUR PRECIPITATION = **2.78**

VILLAGE 1

DRAINAGE AREA NAME	AREA sq. mi.	AREA ac.	From Table 3.2 (FCDMC Vol. 1) LAND USE TYPE	LANE USE ABBREVIATION	LAND USE "C"	100-YEAR 2-HOUR PRECIPICATION	RETENTION VOLUME (AC-FT)
1-V1	0.04	28.0	SINGLE FAMILY DETACHED	F	0.69	2.78	4.5
	0.00	1.0	ROAD	R	0.95	2.78	0.2
							4.7
TOTAL	**0.045**	**29.0**					
2-V1	0.04	23.0	SINGLE FAMILY DETACHED	F	0.69	2.78	3.7
	0.00	0.8	ROAD	R	0.95	2.78	0.2
							3.9
TOTAL	**0.037**	**23.8**					
3-V1	0.05	30.0	SINGLE FAMILY DETACHED	F	0.69	2.78	4.8
	0.00	1.1	ROAD	R	0.95	2.78	0.2
							5.0
TOTAL	**0.05**	**31.1**					
4-V1	0.03	22.0	MULTI-FAMILY - ATTACHED	M	0.75	2.78	3.8
	0.00	0.8	ROAD	R	0.95	2.78	0.2
							4.0
TOTAL	**0.03**	**22.0**					
5-V1	0.03	17.0	MULTI-FAMILY - ATTACHED	M	0.75	2.78	3.0
	0.00	0.6	ROAD	R	0.95	2.78	0.1
							3.1
TOTAL	**0.03**	**17.0**					
6-V1	0.02	14.0	SINGLE FAMILY DETACHED	F	0.69	2.78	2.2
	0.00	0.5	ROAD	R	0.95	2.78	0.1
							2.3
TOTAL	**0.02**	**14.5**					
7-V1	0.02	12.0	SINGLE FAMILY DETACHED	F	0.69	2.78	1.9
	0.00	0.4	ROAD	R	0.95	2.78	0.1
							2.0
TOTAL	**0.02**	**12.5**					
8A-V1	0.01	6.7	SINGLE FAMILY DETACHED	F	0.69	2.78	1.1
	0.00	0.2	ROAD	R	0.95	2.78	0.1
							1.1
TOTAL	**0.01**	**7.0**					
8B-V1	0.01	7.3	MULTI-FAMILY - APPARTMENTS	A	0.88	2.78	1.5
	0.00	0.3	ROAD	R	0.95	2.78	0.1
							1.5
TOTAL	**0.01**	**7.6**					
9-V1	0.01	8.0	SINGLE FAMILY DETACHED	F	0.69	2.78	1.3
	0.00	0.3	ROAD	R	0.95	2.78	0.1
							1.3
TOTAL	**0.01**	**8.3**					
10-V1	0.01	6.0	SINGLE FAMILY DETACHED	F	0.69	2.78	1.0
	0.00	0.2	ROAD	R	0.95	2.78	0.0
							1.0
TOTAL	**0.01**	**6.2**					
11-V1	0.02	11.0	SINGLE FAMILY DETACHED	F	0.69	2.78	1.8
	0.00	0.4	ROAD	R	0.95	2.78	0.1
							1.8
TOTAL	**0.02**	**11.4**					
12-V1	0.03	18.0	SINGLE FAMILY DETACHED	F	0.69	2.78	2.9
	0.00	0.6	ROAD	R	0.95	2.78	0.1
							3.0
TOTAL	**0.03**	**18.6**					
13-V1	0.02	15.3	SINGLE FAMILY DETACHED	F	0.69	2.78	2.4
	0.00	0.5	ROAD	R	0.95	2.78	0.1
							2.6
TOTAL	**0.02**	**15.8**					
14-V1	0.02	13.0	MULTI-FAMILY - ATTACHED	M	0.75	2.78	2.3
	0.00	0.5	ROAD	R	0.95	2.78	0.1
							2.4
TOTAL	**0.02**	**13.4**					
15-V1	0.04	25.0	SINGLE FAMILY DETACHED	F	0.69	2.78	4.0
	0.00	0.9	ROAD	R	0.95	2.78	0.2
							4.2
TOTAL	**0.04**	**25.9**					
16-V1	0.03	21.0	SINGLE FAMILY DETACHED	F	0.69	2.78	3.4
	0.00	0.7	ROAD	R	0.95	2.78	0.2

PROJECT NAME: The Villages at Surprise

PROJECT NO.: E037500

DATE PREPARED : 10-27-94

TABLE 9A

Flood Control District of Maricopa County – Retention Requirements

100-YEAR, 2-HOUR PRECIPITATION = 2.78

VILLAGE 1

DRAINAGE AREA NAME	AREA sq. mi.	AREA ac.	From Table 3.2 (FCDMC Vol. 1) LAND USE TYPE	LANE USE ABBREVIATION	LAND USE "C"	100-YEAR 2-HOUR PRECIPICATION	RETENTION VOLUME (AC-FT)
TOTAL	**0.03**	**21.7**					**3.5**
17-V1	0.04	26.0	SINGLE FAMILY DETACHED	F	0.69	2.78	4.2
	0.00	0.9	ROAD	R	0.95	2.78	0.2
TOTAL	**0.04**	**26.9**					**4.4**
18-V1	0.04	26.0	SINGLE FAMILY DETACHED	F	0.69	2.78	4.2
	0.00	0.9	ROAD	R	0.95	2.78	0.2
TOTAL	**0.04**	**26.9**					**4.4**
19-V1	0.05	31.3	SINGLE FAMILY DETACHED	F	0.69	2.78	5.0
	0.00	1.1	ROAD	R	0.95	2.78	0.2
TOTAL	**0.05**	**32.4**					**5.2**
20-V1	0.01	4.0	COMMERCIAL / CHURCHES	C	0.81	2.78	0.8
	0.00	0.1	ROAD	R	0.95	2.78	0.0
TOTAL	**0.01**	**4.2**					**0.8**
G1-V1	0.02	14.0	GOLF COURSE/OPEN SPACE	GC/OS	0.31	2.78	1.0
	0.00	0.5	ROAD	R	0.95	2.78	0.1
TOTAL	**0.02**	**14.5**					**1.1**
G2-V1	0.00	3.1	GOLF COURSE/OPEN SPACE	GC/OS	0.31	2.78	0.2
	0.00	0.1	ROAD	R	0.95	2.78	0.0
TOTAL	**0.00**	**3.2**					**0.2**
G3-V1	0.01	5.2	GOLF COURSE/OPEN SPACE	GC/OS	0.31	2.78	0.4
	0.00	0.2	ROAD	R	0.95	2.78	0.0
TOTAL	**0.01**	**5.4**					**0.4**
G4-V1	0.01	5.8	GOLF COURSE/OPEN SPACE	GC/OS	0.31	2.78	0.4
	0.00	0.2	ROAD	R	0.95	2.78	0.0
TOTAL	**0.01**	**6.0**					**0.5**
G5-V1	0.05	32.5	GOLF COURSE/OPEN SPACE	GC/OS	0.31	2.78	2.3
	0.00	1.1	ROAD	R	0.95	2.78	0.3
TOTAL	**0.05**	**33.7**					**2.6**
G6-V1	0.02	15.2	GOLF COURSE/OPEN SPACE	GC/OS	0.31	2.78	1.1
	0.00	0.5	ROAD	R	0.95	2.78	0.1
TOTAL	**0.02**	**15.8**					**1.2**
G7-V1	0.01	4.7	GOLF COURSE/OPEN SPACE	GC/OS	0.31	2.78	0.3
	0.00	0.2	ROAD	R	0.95	2.78	0.0
TOTAL	**0.01**	**4.8**					**0.4**
G8-V1	0.01	6.5	GOLF COURSE/OPEN SPACE	GC/OS	0.31	2.78	0.5
	0.00	0.2	ROAD	R	0.95	2.78	0.1
TOTAL	**0.01**	**6.8**					**0.5**
G9-V1	0.01	5.9	GOLF COURSE/OPEN SPACE	GC/OS	0.31	2.78	0.4
	0.00	0.2	ROAD	R	0.95	2.78	0.0
TOTAL	**0.01**	**6.1**					**0.5**
G10-V1	0.02	10.2	GOLF COURSE/OPEN SPACE	GC/OS	0.31	2.78	0.7
	0.00	0.4	ROAD	R	0.95	2.78	0.1
TOTAL	**0.02**	**10.5**					**0.8**
G11-V1	0.02	15.7	GOLF COURSE/OPEN SPACE	GC/OS	0.31	2.78	1.1
	0.00	0.6	ROAD	R	0.95	2.78	0.1
TOTAL	**0.03**	**16.2**					**1.2**
G12-V1	0.01	7.5	GOLF COURSE/OPEN SPACE	GC/OS	0.31	2.78	0.5
	0.00	0.3	ROAD	R	0.95	2.78	0.1
TOTAL	**0.01**	**7.8**					**0.6**
G13-V1	0.01	7.5	GOLF COURSE/OPEN SPACE	GC/OS	0.31	2.78	0.5
	0.00	0.3	ROAD	R	0.95	2.78	0.1

PROJECT NAME: The Villages at Surprise

PROJECT NO.: E037500

DATE PREPARED : 10-27-94

TABLE 9A

Flood Control District of Maricopa County – Retention Requirements

100-YEAR, 2-HOUR PRECIPITATION = 2.78

VILLAGE 1

DRAINAGE AREA NAME	AREA sq. mi.	AREA ac.	From Table 3.2 (FCDMC Vol. 1) LAND USE TYPE	LANE USE ABBREVIATION	LAND USE "C"	100-YEAR 2-HOUR PRECIPICATION	RETENTION VOLUME (AC-FT)
TOTAL	**0.01**	**7.8**					**0.6**
G14-V1	0.01	5.4	GOLF COURSE/OPEN SPACE	GC/OS	0.31	2.78	0.4
	0.00	0.2	ROAD	R	0.95	2.78	0.0
TOTAL	**0.01**	**5.6**					**0.4**
G15-V1	0.01	5.4	GOLF COURSE/OPEN SPACE	GC/OS	0.31	2.78	0.4
	0.00	0.2	ROAD	R	0.95	2.78	0.0
TOTAL	**0.01**	**5.6**					**0.4**
G16-V1	0.01	3.4	GOLF COURSE/OPEN SPACE	GC/OS	0.31	2.78	0.2
	0.00	0.1	ROAD	R	0.95	2.78	0.0
TOTAL	**0.01**	**3.5**					**0.3**

TOTAL AREA W/O CIRCULATION	
0.801	**512.6**

TOTAL AREA OF CIRCULATION	
0.028	**18.0**

MINIMUM REQUIRED RETENTION VOLUME	
0.115	**73.8**

PROJECT NAME: The Villages at Surprise

PROJECT NO.: E037500

DATE PREPARED : 10-27-94

TABLE 9B

Flood Control District of Maricopa County -- Retention Requirements

100-YEAR, 2-HOUR PRECIPITATION = 2.78

VILLAGE 2

DRAINAGE AREA NAME	AREA sq. mi.	AREA ac.	From Table 3.2 (FCDMC Vol. 1) LAND USE TYPE	LANE USE ABBREVIATION	LAND USE "C"	100-YEAR 2-HOUR PRECIPICATION	RETENTION VOLUME (AC-FT)
1-V2	0.06	37.0	SINGLE FAMILY DETACHED	F	0.69	2.78	5.9
	0.00	1.5	ROAD	R	0.95	2.78	0.3
TOTAL	**0.06**	**38.5**					**6.3**
2-V2	0.05	35.0	SINGLE FAMILY DETACHED	F	0.69	2.78	5.6
	0.00	1.5	ROAD	R	0.95	2.78	0.3
TOTAL	**0.057**	**36.5**					**5.9**
3-V2	0.03	21.0	MULTI-FAMILY - APPARTMENTS	A	0.88	2.78	4.3
	0.00	0.9	ROAD	R	0.95	2.78	0.2
TOTAL	**0.03**	**21.9**					**4.5**
4-V2	0.02	10.0	COMMERCIAL / CHURCHES	C	0.81	2.78	1.9
	0.00	0.4	ROAD	R	0.95	2.78	0.1
TOTAL	**0.02**	**10.0**					**2.0**
5-V2	0.01	6.0	COMMERCIAL / CHURCHES	C	0.81	2.78	1.1
	0.00	0.3	ROAD	R	0.95	2.78	0.1
TOTAL	**0.01**	**6.0**					**1.2**
6-V2	0.01	4.0	COMMERCIAL / CHURCHES	C	0.81	2.78	0.8
	0.00	0.2	ROAD	R	0.95	2.78	0.0
TOTAL	**0.01**	**4.2**					**0.8**
7-V2	0.05	30.0	SINGLE FAMILY DETACHED	F	0.69	2.78	4.8
	0.00	1.2	ROAD	R	0.95	2.78	0.3
TOTAL	**0.05**	**31.3**					**5.1**
8-V2	0.05	30.0	SINGLE FAMILY DETACHED	F	0.69	2.78	4.8
	0.00	1.2	ROAD	R	0.95	2.78	0.3
TOTAL	**0.05**	**31.3**					**5.1**
9A-V2	0.05	32.0	SINGLE FAMILY DETACHED	F	0.69	2.78	5.1
	0.00	1.3	ROAD	R	0.95	2.78	0.3
TOTAL	**0.05**	**33.3**					**5.4**
9B-V2	0.03	18.0	SINGLE FAMILY DETACHED	F	0.69	2.78	2.9
	0.00	0.7	ROAD	R	0.95	2.78	0.2
TOTAL	**0.03**	**18.7**					**3.0**
10-V2	0.03	16.0	MULTI-FAMILY - APPARTMENTS	A	0.88	2.78	3.3
	0.00	0.7	ROAD	R	0.95	2.78	0.1
TOTAL	**0.03**	**16.7**					**3.4**
11-V2	0.04	25.0	SINGLE FAMILY DETACHED	F	0.69	2.78	4.0
	0.00	1.0	ROAD	R	0.95	2.78	0.2
TOTAL	**0.04**	**26.1**					**4.2**
12-V2	0.04	23.5	SINGLE FAMILY DETACHED	F	0.69	2.78	3.8
	0.00	1.0	ROAD	R	0.95	2.78	0.2
TOTAL	**0.04**	**24.5**					**4.0**
13-V2	0.06	36.0	SINGLE FAMILY DETACHED	F	0.69	2.78	5.8
	0.00	1.5	ROAD	R	0.95	2.78	0.3
TOTAL	**0.06**	**37.5**					**6.1**
14-V2	0.03	22.0	SINGLE FAMILY DETACHED	F	0.69	2.78	3.5
	0.00	0.9	ROAD	R	0.95	2.78	0.2
TOTAL	**0.04**	**22.9**					**3.7**
15A-V2	0.01	6.0	PARK	P	0.31	2.78	0.4
	0.00	0.3	ROAD	R	0.95	2.78	0.1
TOTAL	**0.01**	**6.3**					**0.5**
15B-V2	0.02	14.0	SCHOOL	S	0.5	2.78	1.6
	0.00	0.6	ROAD	R	0.95	2.78	0.1

PROJECT NAME: The Villages at Surprise

PROJECT NO.: E037500

DATE PREPARED : 10-27-94

TABLE 9B

Flood Control District of Maricopa County – Retention Requirements

100-YEAR, 2-HOUR PRECIPITATION = 2.78

VILLAGE 2

DRAINAGE AREA NAME	AREA sq. mi.	AREA ac.	From Table 3.2 (FCDMC Vol. 1) LAND USE TYPE	LANE USE ABBREVIATION	LAND USE "C"	100-YEAR 2-HOUR PRECIPICATION	RETENTION VOLUME (AC-FT)
TOTAL	**0.02**	**14.6**					**1.8**
15C-V2	0.04	24.0	PARK	P	0.31	2.78	1.7
	0.00	1.0	ROAD	R	0.95	2.78	0.2
TOTAL	**0.04**	**25.0**					**1.9**
16-V2	0.05	32.0	SINGLE FAMILY DETACHED	F	0.69	2.78	5.1
	0.00	1.3	ROAD	R	0.95	2.78	0.3
TOTAL	**0.05**	**33.3**					**5.4**
17-V2	0.05	32.5	SINGLE FAMILY DETACHED	F	0.69	2.78	5.2
	0.00	1.4	ROAD	R	0.95	2.78	0.3
TOTAL	**0.05**	**33.9**					**5.5**
18A-V2	0.02	14.0	SINGLE FAMILY DETACHED	F	0.69	2.78	2.2
	0.00	0.6	ROAD	R	0.95	2.78	0.1
TOTAL	**0.02**	**14.6**					**2.4**
18B-V2	0.02	11.5	SINGLE FAMILY DETACHED	F	0.69	2.78	1.8
	0.00	0.5	ROAD	R	0.95	2.78	0.1
TOTAL	**0.02**	**12.0**					**1.9**
19-V2	0.02	10.0	SCHOOL	S	0.5	2.78	1.2
	0.00	0.4	ROAD	R	0.95	2.78	0.1
TOTAL	**0.02**	**10.4**					**1.2**
20-V2	0.03	18.0	SINGLE FAMILY DETACHED	F	0.69	2.78	2.9
	0.00	0.7	ROAD	R	0.95	2.78	0.2
TOTAL	**0.03**	**18.7**					**3.0**
21-V2	0.03	18.0	MULTI-FAMILY - APPARTMENTS	A	0.88	2.78	3.7
	0.00	0.7	ROAD	R	0.95	2.78	0.2
TOTAL	**0.03**	**18.7**					**3.8**
22-V2	0.04	27.0	SINGLE FAMILY DETACHED	F	0.69	2.78	4.3
	0.00	1.1	ROAD	R	0.95	2.78	0.2
TOTAL	**0.04**	**28.1**					**4.6**
23-V2	0.03	20.5	SINGLE FAMILY DETACHED	F	0.69	2.78	3.3
	0.00	0.9	ROAD	R	0.95	2.78	0.2
TOTAL	**0.03**	**21.3**					**3.5**
24-V2	0.05	32.5	SINGLE FAMILY DETACHED	F	0.69	2.78	5.2
	0.00	1.4	ROAD	R	0.95	2.78	0.3
TOTAL	**0.05**	**33.9**					**5.5**
25-V2	0.04	25.0	MULTI-FAMILY - ATTACHED	M	0.75	2.78	4.3
	0.00	1.0	ROAD	R	0.95	2.78	0.2
TOTAL	**0.04**	**26.1**					**4.6**
26-V2	0.00	2.0	COMMERCIAL / CHURCHES	C	0.81	2.78	0.4
	0.00	0.1	ROAD	R	0.95	2.78	0.0
TOTAL	**0.00**	**2.1**					**0.4**
27-V2	0.04	22.4	MULTI-FAMILY - ATTACHED	M	0.75	2.78	3.9
	0.00	0.9	ROAD	R	0.95	2.78	0.2
TOTAL	**0.04**	**23.3**					**4.1**
28A-V2	0.03	18.2	SINGLE FAMILY DETACHED	F	0.69	2.78	2.9
	0.00	0.8	ROAD	R	0.95	2.78	0.2
TOTAL	**0.03**	**19.0**					**3.1**
28B-V2	0.03	18.2	SINGLE FAMILY DETACHED	F	0.69	2.78	2.9
	0.00	0.8	ROAD	R	0.95	2.78	0.2
TOTAL	**0.03**	**19.0**					**3.1**
29A-V2	0.02	14.3	SINGLE FAMILY DETACHED	F	0.69	2.78	2.3
	0.00	0.6	ROAD	R	0.95	2.78	0.1

PROJECT NAME: The Villages at Surprise

PROJECT NO.: E037500

DATE PREPARED : 10-27-94

TABLE 9B

Flood Control District of Maricopa County -- Retention Requirements

100-YEAR, 2-HOUR PRECIPITATION = 2.78

VILLAGE 2

DRAINAGE AREA NAME	AREA sq. mi.	AREA ac.	From Table 3.2 (FCDMC Vol. 1) LAND USE TYPE	LANE USE ABBREVIATION	LAND USE "C"	100-YEAR 2-HOUR PRECIPICATION	RETENTION VOLUME (AC-FT)
1-V2	0.06	37.0	SINGLE FAMILY DETACHED	F	0.69	2.78	5.9
	0.00	1.5	ROAD	R	0.95	2.78	0.3
TOTAL	**0.06**	**38.5**					**6.3**
2-V2	0.05	35.0	SINGLE FAMILY DETACHED	F	0.69	2.78	5.6
	0.00	1.5	ROAD	R	0.95	2.78	0.3
TOTAL	**0.057**	**36.5**					**5.9**
3-V2	0.03	21.0	MULTI-FAMILY - APPARTMENTS	A	0.88	2.78	4.3
	0.00	0.9	ROAD	R	0.95	2.78	0.2
TOTAL	**0.03**	**21.9**					**4.5**
4-V2	0.02	10.0	COMMERCIAL / CHURCHES	C	0.81	2.78	1.9
	0.00	0.4	ROAD	R	0.95	2.78	0.1
TOTAL	**0.02**	**10.0**					**2.0**
5-V2	0.01	6.0	COMMERCIAL / CHURCHES	C	0.81	2.78	1.1
	0.00	0.3	ROAD	R	0.95	2.78	0.1
TOTAL	**0.01**	**6.0**					**1.2**
6-V2	0.01	4.0	COMMERCIAL / CHURCHES	C	0.81	2.78	0.8
	0.00	0.2	ROAD	R	0.95	2.78	0.0
TOTAL	**0.01**	**4.2**					**0.8**
7-V2	0.05	30.0	SINGLE FAMILY DETACHED	F	0.69	2.78	4.8
	0.00	1.2	ROAD	R	0.95	2.78	0.3
TOTAL	**0.05**	**31.3**					**5.1**
8-V2	0.05	30.0	SINGLE FAMILY DETACHED	F	0.69	2.78	4.8
	0.00	1.2	ROAD	R	0.95	2.78	0.3
TOTAL	**0.05**	**31.3**					**5.1**
9A-V2	0.05	32.0	SINGLE FAMILY DETACHED	F	0.69	2.78	5.1
	0.00	1.3	ROAD	R	0.95	2.78	0.3
TOTAL	**0.05**	**33.3**					**5.4**
9B-V2	0.03	18.0	SINGLE FAMILY DETACHED	F	0.69	2.78	2.9
	0.00	0.7	ROAD	R	0.95	2.78	0.2
TOTAL	**0.03**	**18.7**					**3.0**
10-V2	0.03	16.0	MULTI-FAMILY - APPARTMENTS	A	0.88	2.78	3.3
	0.00	0.7	ROAD	R	0.95	2.78	0.1
TOTAL	**0.03**	**16.7**					**3.4**
11-V2	0.04	25.0	SINGLE FAMILY DETACHED	F	0.69	2.78	4.0
	0.00	1.0	ROAD	R	0.95	2.78	0.2
TOTAL	**0.04**	**26.1**					**4.2**
12-V2	0.04	23.5	SINGLE FAMILY DETACHED	F	0.69	2.78	3.8
	0.00	1.0	ROAD	R	0.95	2.78	0.2
TOTAL	**0.04**	**24.5**					**4.0**
13-V2	0.06	36.0	SINGLE FAMILY DETACHED	F	0.69	2.78	5.8
	0.00	1.5	ROAD	R	0.95	2.78	0.3
TOTAL	**0.06**	**37.5**					**6.1**
14-V2	0.03	22.0	SINGLE FAMILY DETACHED	F	0.69	2.78	3.5
	0.00	0.9	ROAD	R	0.95	2.78	0.2
TOTAL	**0.04**	**22.9**					**3.7**
15A-V2	0.01	6.0	PARK	P	0.31	2.78	0.4
	0.00	0.3	ROAD	R	0.95	2.78	0.1
TOTAL	**0.01**	**6.3**					**0.5**
15B-V2	0.02	14.0	SCHOOL	S	0.5	2.78	1.6
	0.00	0.6	ROAD	R	0.95	2.78	0.1

PROJECT NAME: The Villages at Surprise

PROJECT NO.: E037500

DATE PREPARED : 10-27-94

TABLE 9B

Flood Control District of Maricopa County – Retention Requirements

100-YEAR, 2-HOUR PRECIPITATION = 2.78

VILLAGE 2

DRAINAGE AREA NAME	AREA sq. mi.	AREA ac.	From Table 3.2 (FCDMC Vol. 1) LAND USE TYPE	LANE USE ABBREVIATION	LAND USE "C"	100-YEAR 2-HOUR PRECIPICATION	RETENTION VOLUME (AC-FT)
TOTAL	**0.02**	**14.9**					**2.4**
29B-V2	0.02	14.3	SINGLE FAMILY DETACHED	F	0.69	2.78	2.3
	0.00	0.6	ROAD	R	0.95	2.78	0.1
TOTAL	**0.02**	**14.9**					**2.4**
30A-V2	0.02	15.5	SINGLE FAMILY DETACHED	F	0.69	2.78	2.5
	0.00	0.6	ROAD	R	0.95	2.78	0.1
TOTAL	**0.03**	**16.1**					**2.6**
30B-V2	0.03	18.5	SINGLE FAMILY DETACHED	F	0.69	2.78	3.0
	0.00	0.8	ROAD	R	0.95	2.78	0.2
TOTAL	**0.03**	**19.3**					**3.1**
31A-V2	0.03	18.0	PARK	P	0.31	2.78	1.3
	0.00	0.7	ROAD	R	0.95	2.78	0.2
TOTAL	**0.03**	**18.7**					**1.5**
31B-V2	0.03	20.5	PARK	P	0.31	2.78	1.5
	0.00	0.9	ROAD	R	0.95	2.78	0.2
TOTAL	**0.03**	**21.3**					**1.7**
31C-V2	0.07	46.5	PARK	P	0.31	2.78	3.3
	0.00	1.9	ROAD	R	0.95	2.78	0.4
TOTAL	**0.08**	**48.5**					**3.8**
31D-V2	0.02	12.0	PARK	P	0.31	2.78	0.9
	0.00	0.5	ROAD	R	0.95	2.78	0.1
TOTAL	**0.02**	**12.5**					**1.0**
32-V2	0.08	50.0	SINGLE FAMILY DETACHED	F	0.69	2.78	8.0
	0.00	2.1	ROAD	R	0.95	2.78	0.5
TOTAL	**0.08**	**52.1**					**8.4**
33-V2	0.04	28.0	SINGLE FAMILY DETACHED	F	0.69	2.78	4.5
	0.00	1.2	ROAD	R	0.95	2.78	0.3
TOTAL	**0.05**	**29.1**					**4.7**
34-V2	0.04	27.0	SINGLE FAMILY DETACHED	F	0.69	2.78	4.3
	0.00	1.1	ROAD	R	0.95	2.78	0.2
TOTAL	**0.04**	**28.1**					**4.6**
35-V2	0.04	27.0	SINGLE FAMILY DETACHED	F	0.69	2.78	4.3
	0.00	1.1	ROAD	R	0.95	2.78	0.2
TOTAL	**0.04**	**28.1**					**4.6**
36-V2	0.04	28.0	SINGLE FAMILY DETACHED	F	0.69	2.78	4.5
	0.00	1.2	ROAD	R	0.95	2.78	0.3
TOTAL	**0.05**	**29.1**					**4.7**
37-V2	0.05	32.0	SINGLE FAMILY DETACHED	F	0.69	2.78	5.1
	0.00	1.3	ROAD	R	0.95	2.78	0.3
TOTAL	**0.05**	**33.3**					**5.4**
38-V2	0.05	34.0	SINGLE FAMILY DETACHED	F	0.69	2.78	5.4
	0.00	1.4	ROAD	R	0.95	2.78	0.3
TOTAL	**0.06**	**35.4**					**5.7**

PROJECT NAME: The Villages at Surprise

PROJECT NO.: E037500

DATE PREPARED : 10-27-94

TABLE 9B

Flood Control District of Maricopa County -- Retention Requirements

100-YEAR, 2-HOUR PRECIPITATION = 2.78

VILLAGE 2

DRAINAGE AREA NAME	AREA sq. mi.	AREA ac.	From Table 3.2 (FCDMC Vol. 1) LAND USE TYPE	LANE USE ABBREVIATION	LAND USE "C"	100-YEAR 2-HOUR PRECIPICATION	RETENTION VOLUME (AC-FT)
TOTAL AREA W/O CIRCULATION							
	1.68						**1076.9**
TOTAL AREA OF CIRCULATION							
	0.07						**44.8**
MINIMUM REQUIRED RETENTION VOLUME							
	0.27						**173.5**

PROJECT NAME: The Villages at Surprise

PROJECT NO.: E037500

DATE PREPARED : 10-27-94

TABLE 9C

Flood Control District of Maricopa County – Retention Requirements

100-YEAR, 2-HOUR PRECIPITATION = 2.78

VILLAGE 3

DRAINAGE AREA NAME	AREA sq. mi.	AREA ac.	From Table 3.2 (FCDMC Vol. 1) LAND USE TYPE	LANE USE ABBREVIATION	LAND USE "C"	100-YEAR 2-HOUR PRECIPICATION	RETENTION VOLUME (AC-FT)
1-V3	0.04	25.0	SINGLE FAMILY DETACHED	F	0.69	2.78	4.0
	0.00	1.8	ROAD	R	0.95	2.78	0.4
TOTAL	**0.042**	**26.8**					**4.4**
2-V3	0.02	15.0	SINGLE FAMILY DETACHED	F	0.69	2.78	2.4
	0.00	1.1	ROAD	R	0.95	2.78	0.2
TOTAL	**0.025**	**16.0**					**2.6**
3-V3	0.03	16.0	MULTI-FAMILY - APPARTMENTS	A	0.88	2.78	3.3
	0.00	1.1	ROAD	R	0.95	2.78	0.2
TOTAL	**0.03**	**17.1**					**3.5**
4-V3	0.04	23.6	COMMERCIAL / CHURCHES	C	0.81	2.78	4.4
	0.00	1.7	ROAD	R	0.95	2.78	0.4
TOTAL	**0.04**	**23.6**					**4.8**
5-V3	0.04	23.0	COMMERCIAL / CHURCHES	C	0.81	2.78	4.3
	0.00	1.6	ROAD	R	0.95	2.78	0.4
TOTAL	**0.04**	**23.0**					**4.7**
6-V3	0.01	9.0	COMMERCIAL / CHURCHES	C	0.81	2.78	1.7
	0.00	0.6	ROAD	R	0.95	2.78	0.1
TOTAL	**0.02**	**9.7**					**1.8**
7-V3	0.03	16.0	SINGLE FAMILY DETACHED	F	0.69	2.78	2.6
	0.00	1.1	ROAD	R	0.95	2.78	0.2
TOTAL	**0.03**	**17.1**					**2.8**
8A-V3	0.01	9.2	SINGLE FAMILY DETACHED	F	0.69	2.78	1.5
	0.00	0.6	ROAD	R	0.95	2.78	0.1
TOTAL	**0.02**	**9.9**					**1.6**
8B-V3	0.02	12.8	SINGLE FAMILY DETACHED	F	0.69	2.78	2.0
	0.00	0.9	ROAD	R	0.95	2.78	0.2
TOTAL	**0.02**	**13.7**					**2.2**
9-V3	0.02	15.0	SINGLE FAMILY DETACHED	F	0.69	2.78	2.4
	0.00	1.1	ROAD	R	0.95	2.78	0.2
TOTAL	**0.03**	**16.0**					**2.6**
10-V3	0.04	22.8	MULTI-FAMILY - APPARTMENTS	A	0.88	2.78	4.6
	0.00	1.6	ROAD	R	0.95	2.78	0.4
TOTAL	**0.04**	**24.4**					**5.0**
11-V3	0.02	15.0	SINGLE FAMILY DETACHED	F	0.69	2.78	2.4
	0.00	1.1	ROAD	R	0.95	2.78	0.2
TOTAL	**0.03**	**16.0**					**2.6**
13-V3	0.04	22.9	SINGLE FAMILY DETACHED	F	0.69	2.78	3.7
	0.00	1.6	ROAD	R	0.95	2.78	0.4
TOTAL	**0.04**	**24.5**					**4.0**
14-V3	0.03	22.0	SINGLE FAMILY DETACHED	F	0.69	2.78	3.5
	0.00	1.6	ROAD	R	0.95	2.78	0.3
TOTAL	**0.04**	**23.6**					**3.9**
15-V3	0.03	18.0	SINGLE FAMILY DETACHED	F	0.69	2.78	2.9
	0.00	1.3	ROAD	R	0.95	2.78	0.3
TOTAL	**0.03**	**19.3**					**3.2**

PROJECT NAME: The Villages at Surprise

PROJECT NO.: E037500

DATE PREPARED : 10-27-94

TABLE 9C

Flood Control District of Maricopa County – Retention Requirements

100-YEAR, 2-HOUR PRECIPITATION = 2.78

VILLAGE 3

DRAINAGE AREA NAME	AREA sq. mi.	AREA ac.	From Table 3.2 (FCDMC Vol. 1) LAND USE TYPE	LANE USE ABBREVIATION	LAND USE "C"	100-YEAR 2-HOUR PRECIPICATION	RETENTION VOLUME (AC-FT)

TOTAL AREA W/O CIRCULATION

0.415	265.3

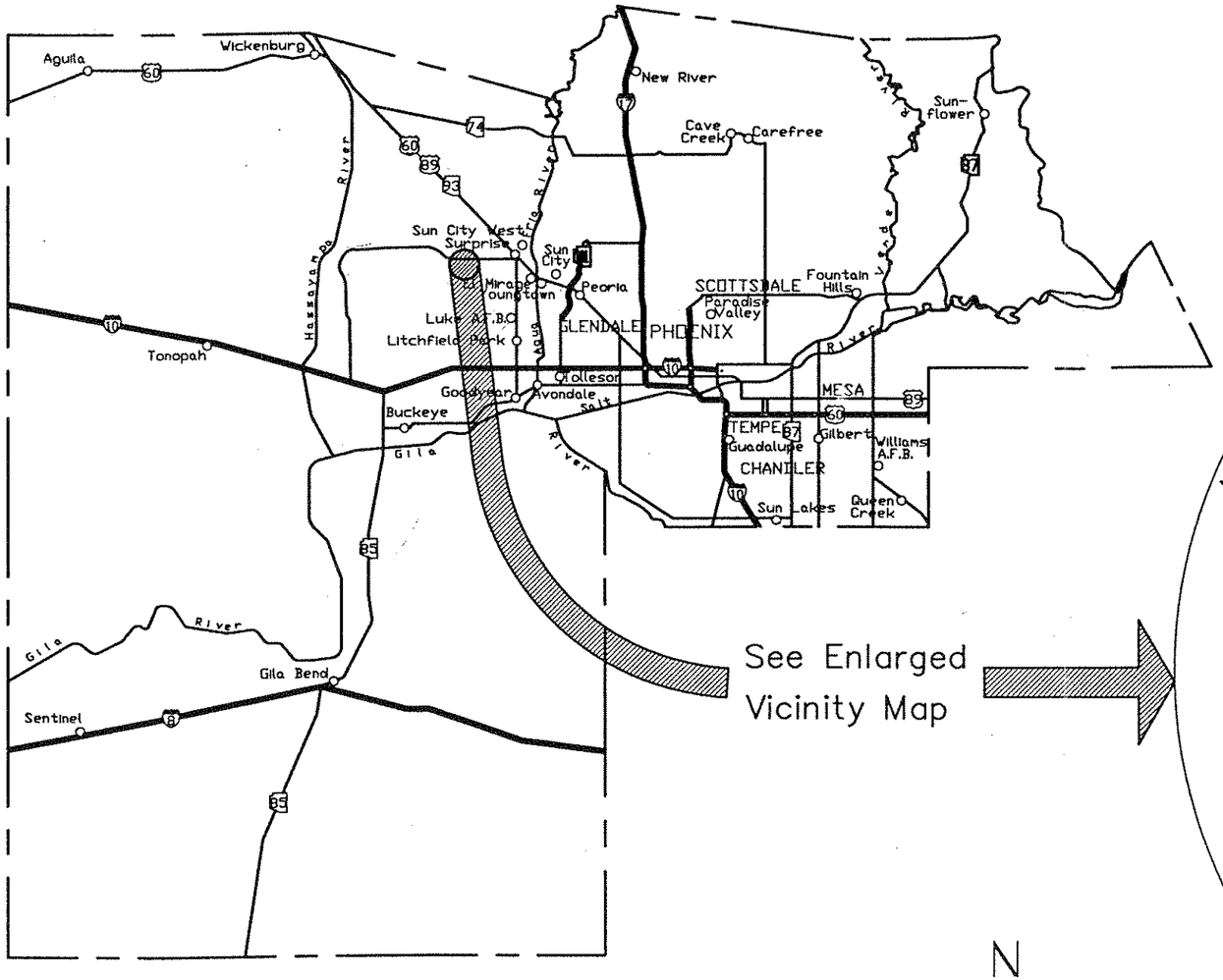
TOTAL AREA OF CIRCULATION

0.029	18.7

MINIMUM REQUIRED RETENTION VOLUME

0.078	49.8

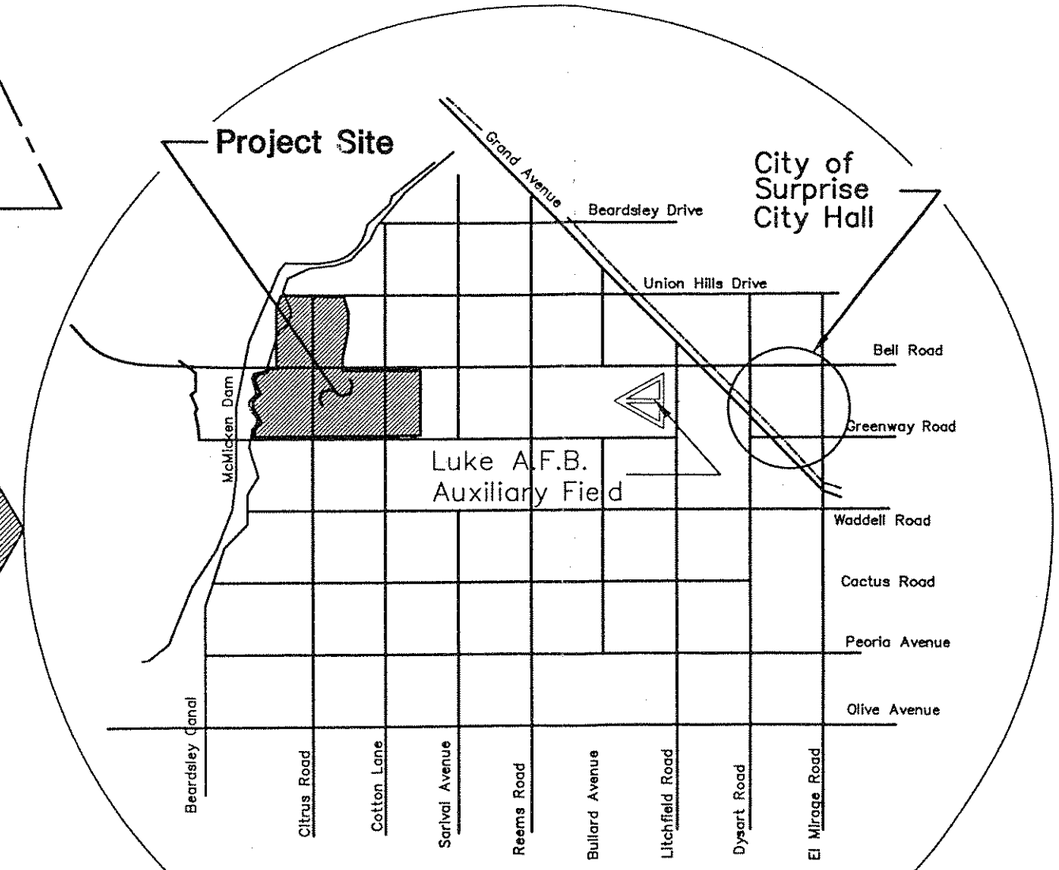
APPENDIX



See Enlarged Vicinity Map

LOCATION MAP

N.T.S.



VICINITY MAP

N.T.S.

N

The Villages at Surprise

Greiner

December 1994

P:\CADD\VICINITY.DWG

oject: E0375

Graphic Scale in Feet
1000 0 1000 2000

VILLAGE I

VILLAGE II

VILLAGE III

HAPPY TRAILS

UNION HILLS DRIVE

BELL ROAD

GREENWAY ROAD

BEARDSLEY CANAL

MCMICKEN DAM DETENTION

TRILBY WASH

LEGEND:

PROJECT BOUNDARY

VILLAGE BOUNDARY

DRAINAGE AREA BOUNDARY

★ refer to onsite drainage area map for drainage area names

The Villages at Surprise

Greiner

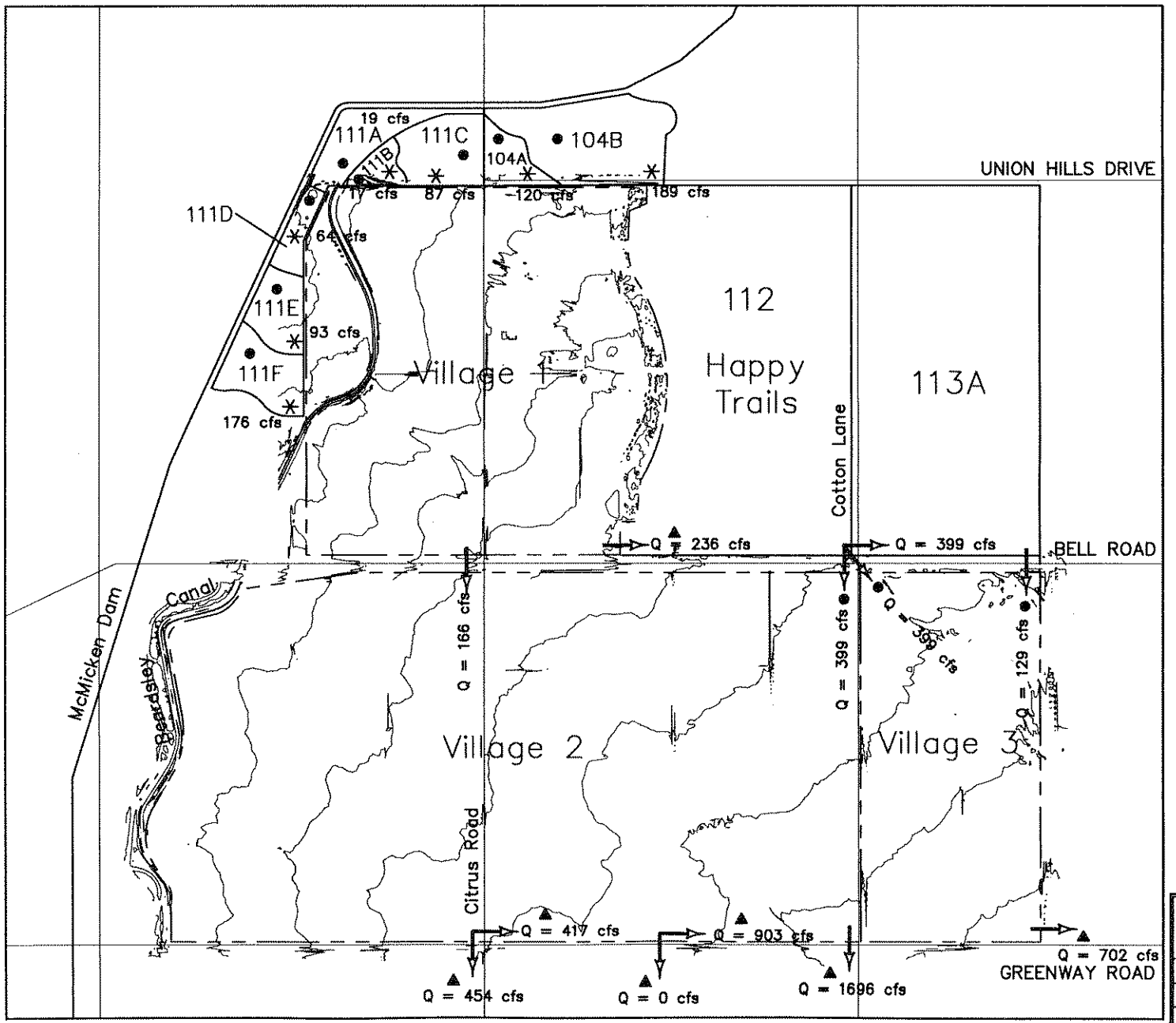
Soils Map

December 1994

Project no.: E037501

FIGURE 2

Project: E0 J1 P:\CADD\DRAINAGE.DWG



Legend

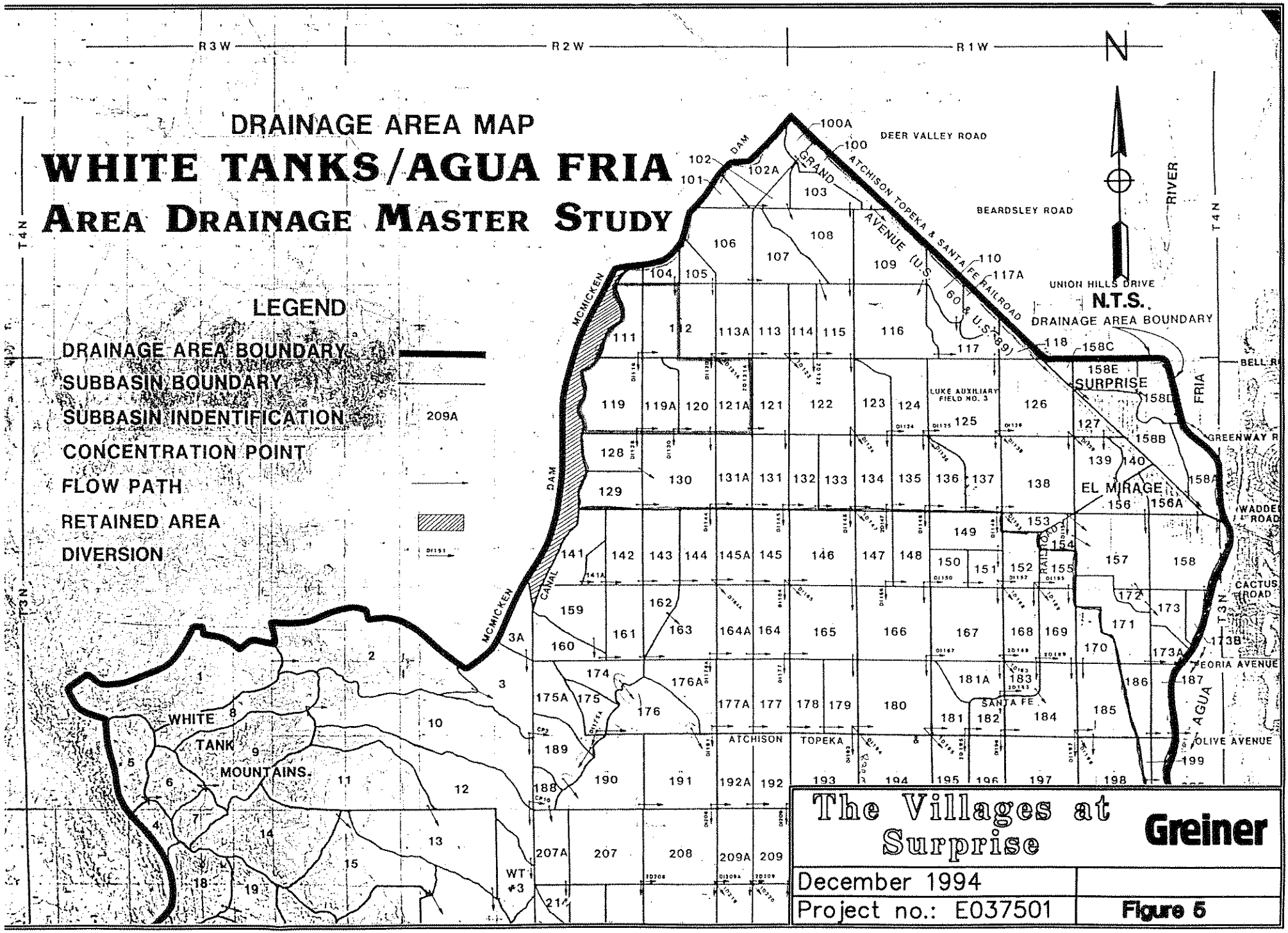
- Project Boundary
- Drainage Area Boundary
- 111D Offsite Area Name
- 64 cfs 100 Year Discharge
- ✳ Concentration Point
- Q = 399 cfs Discharge Values from F.C.D.M.C.
- ● Offsite FLow/Drainage Area
- ▲ Flow Exiting the Site

N

N.T.S.

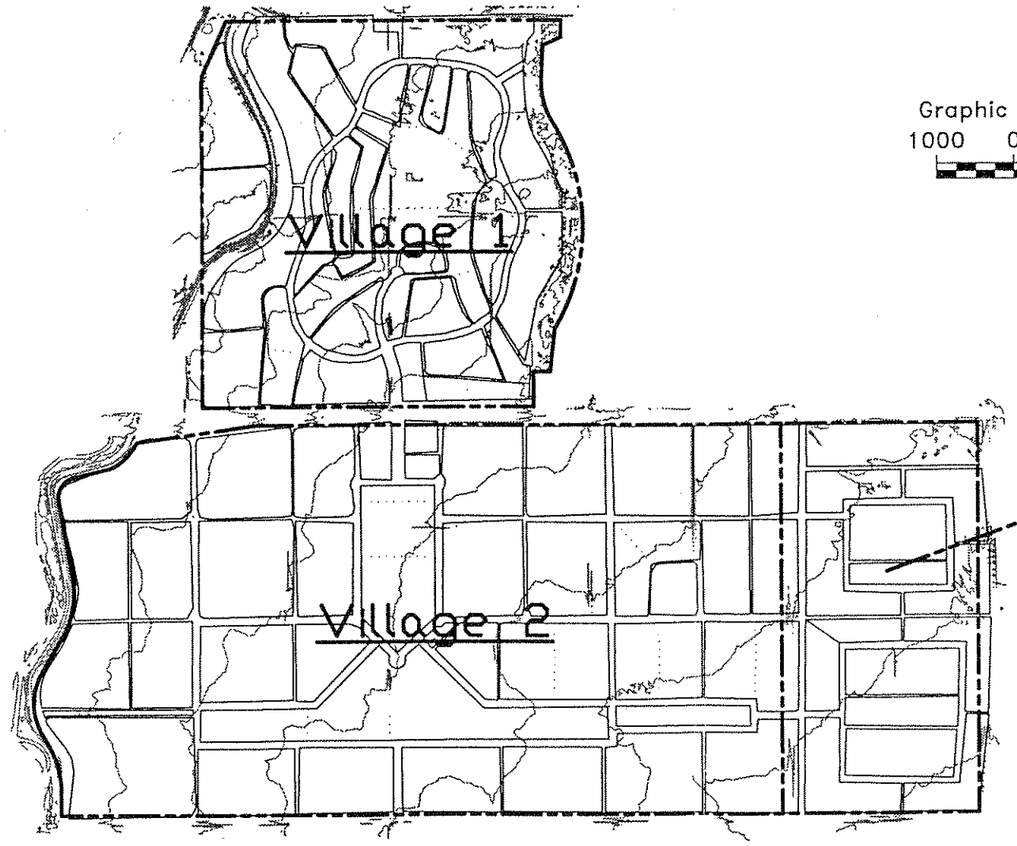
The Villages at Surprise	Greiner
Existing Conditions Drainage Area Map	
January 1995	REVISED: 5-30-95 R.H.F.
Project no.: E037501	Figure 4

Project: E03 I P:\CADD\FLOWDIA\SCHMATIC.DWG

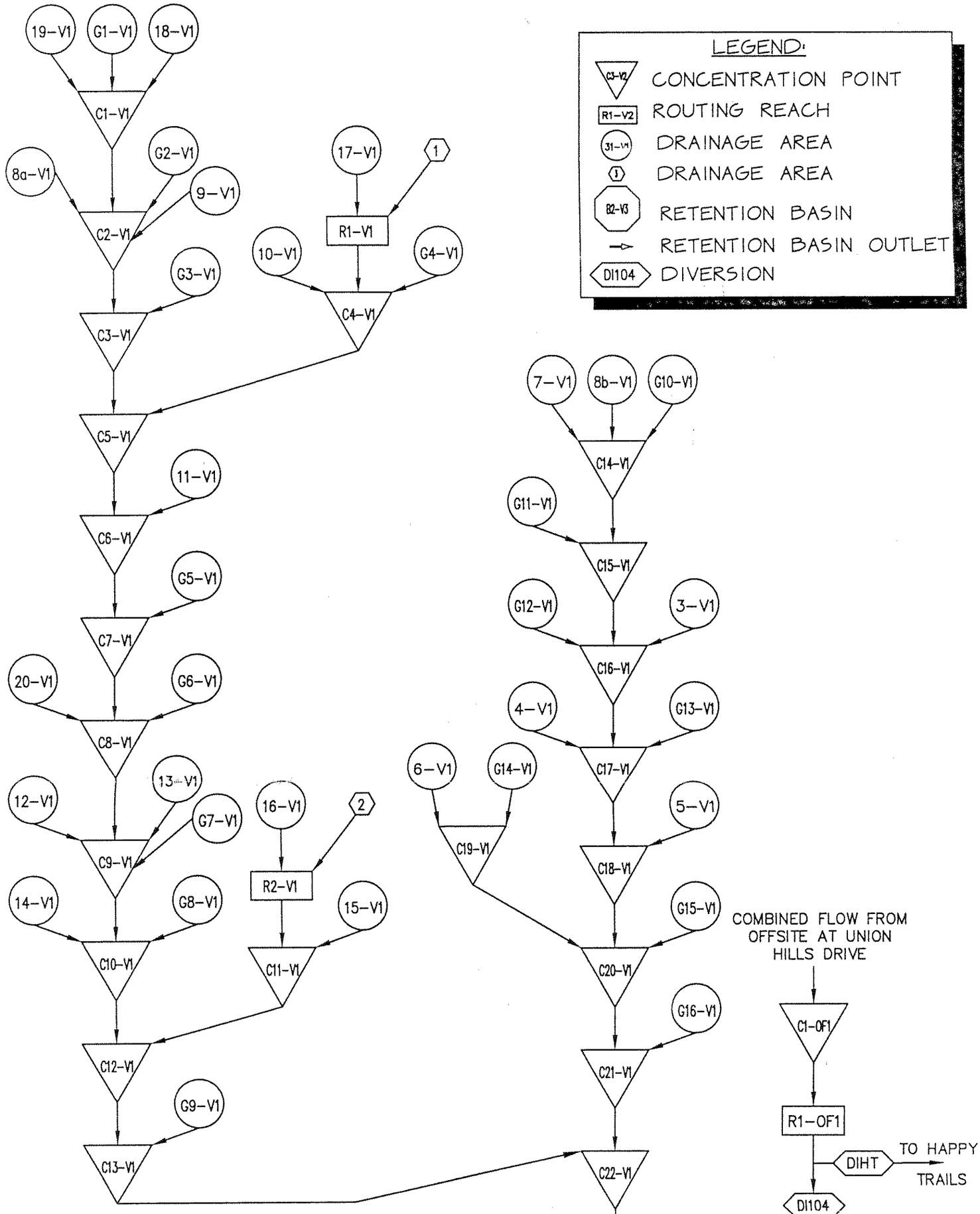


N

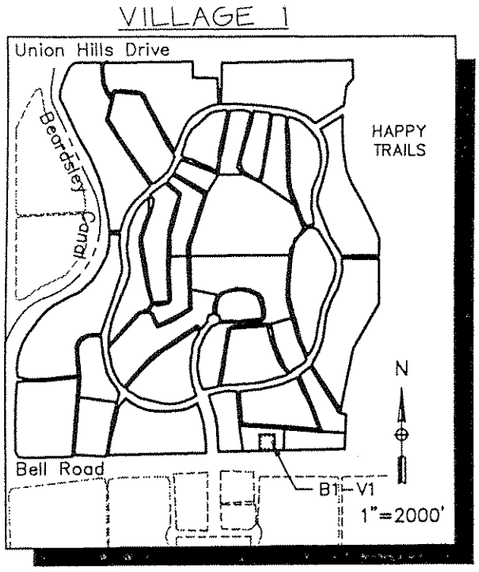
Graphic Scale in Feet
1000 0 1000 2000



The Villages at Surprise	Greiner
Village Locations	
December 1994	
Project no.: E037501	FIGURE 6



VILLAGE 1



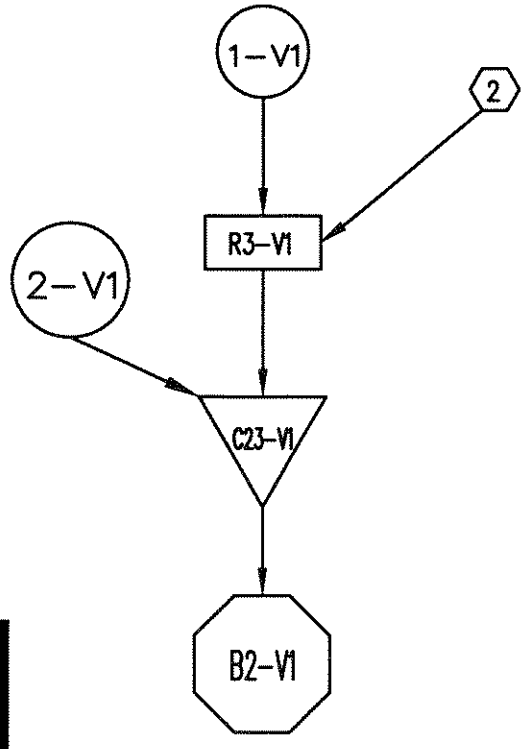
LOCATION MAP

The Villages at Surprise	Greiner
Village 1 Drainage Basin A	
December 1994	
Project no.: E037501	Figure 7

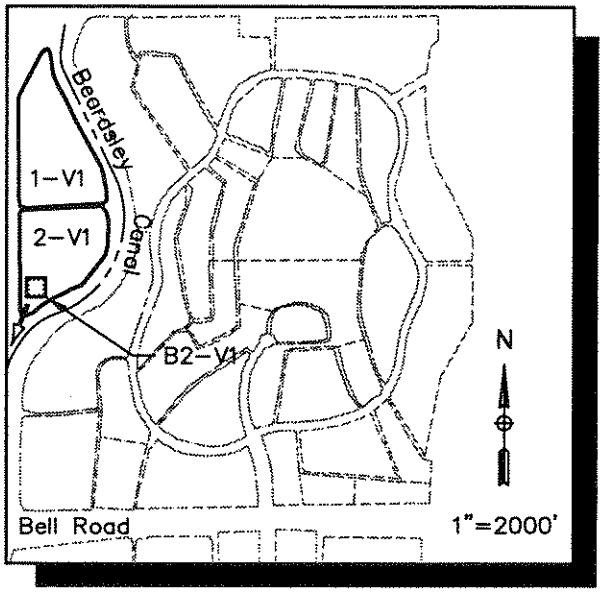
Project: E037501 P:\CADD\FLOWD.CHMATIC.DWG

LEGEND:

- C3-V2 — CONCENTRATION POINT
- R1-V2 — REACH
- 31-V1 — DRAINAGE AREA
- 3 — DRAINAGE AREA
- B2-V3 — RETENTION BASIN
- RETENTION BASIN OUTLET



VILLAGE 1



LOCATION MAP

The Villages at Surprise

Greiner

Village 1 Drainage Basin B

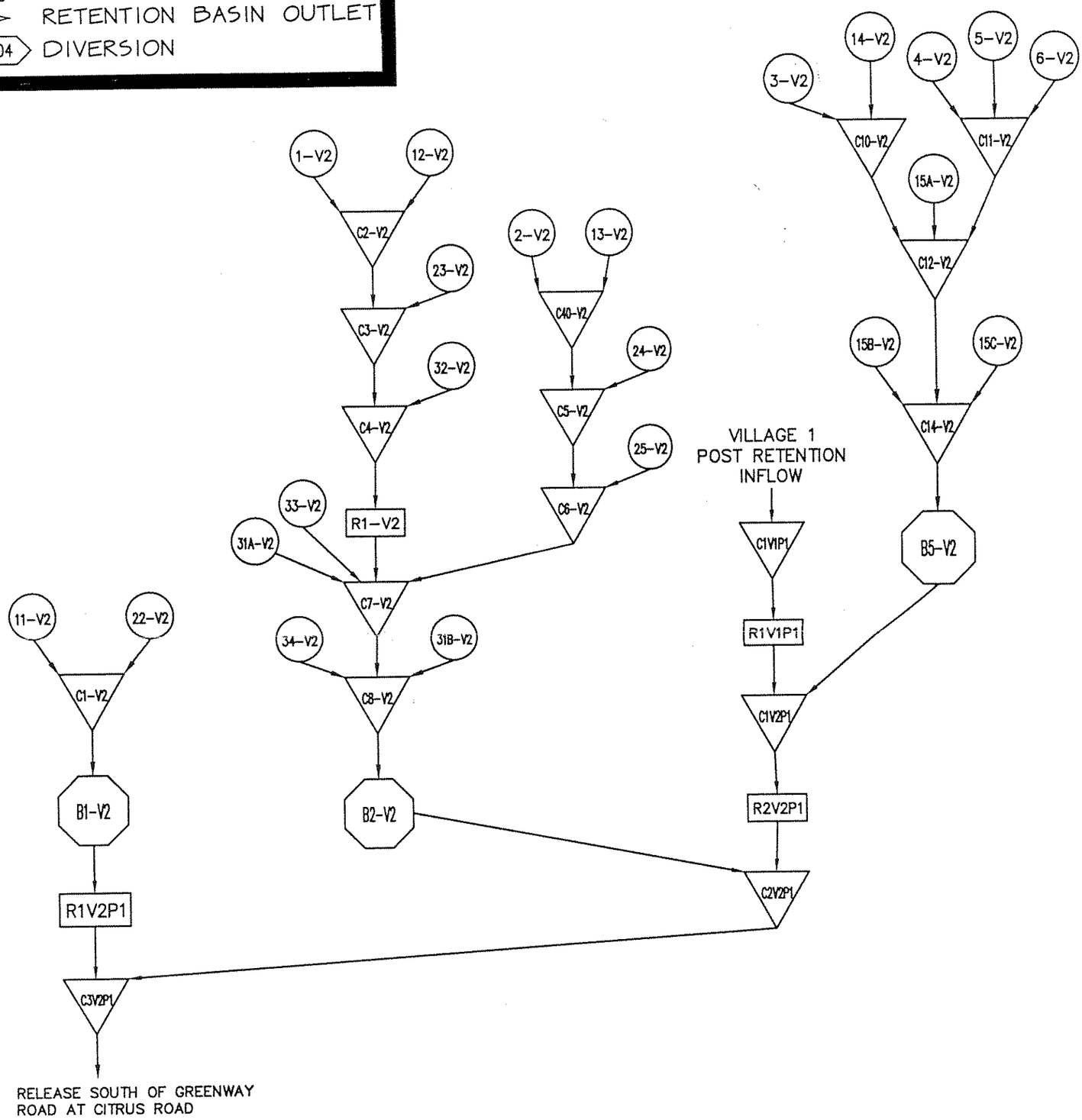
December 1994

Project no: E037501

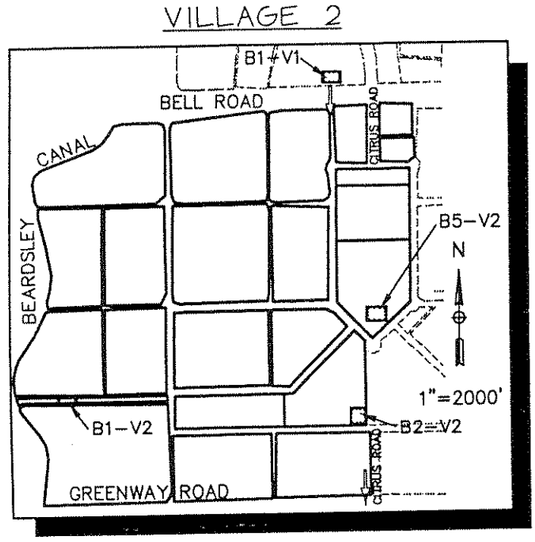
Figure 8

LEGEND:

- C3-V2 — CONCENTRATION POINT
- R1-V2 — ROUTING REACH
- 31-V1 — DRAINAGE AREA
- 1 — DRAINAGE AREA
- B2-V3 — RETENTION BASIN
- RETENTION BASIN OUTLET
- DI104 — DIVERSION

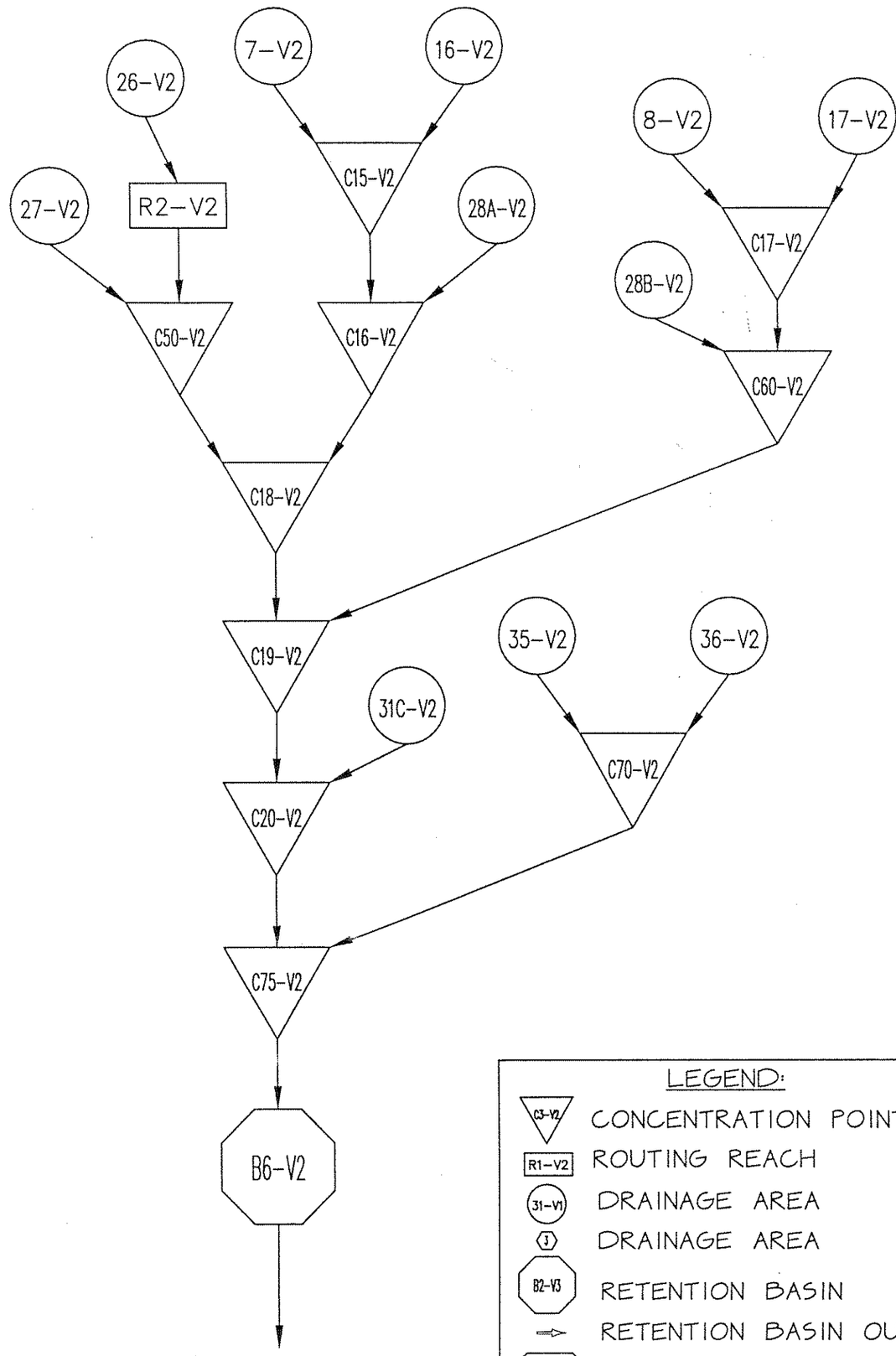


VILLAGE 2



LOCATION MAP

The Villages at Surprise	Greiner
Village 2 Drainage Basin A	
December 1994	
Project no.: E037501	Figure 9

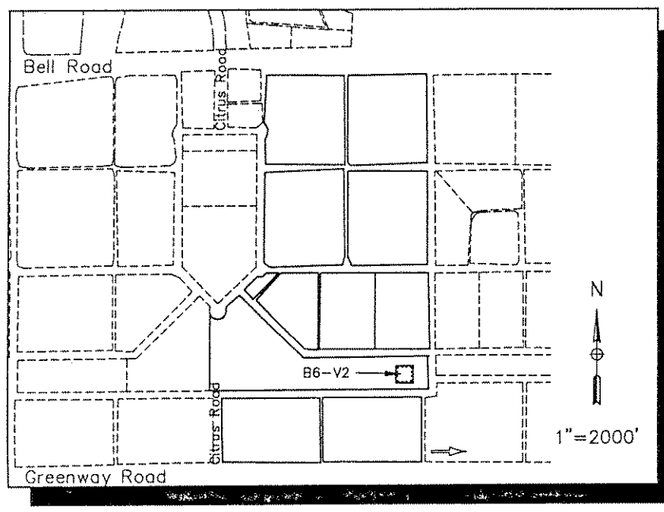


RELEASED COMBINED POST-RETAINED FLOW TO THE EAST, INTO VILLAGE 2 DRAINAGE BASIN C

LEGEND:

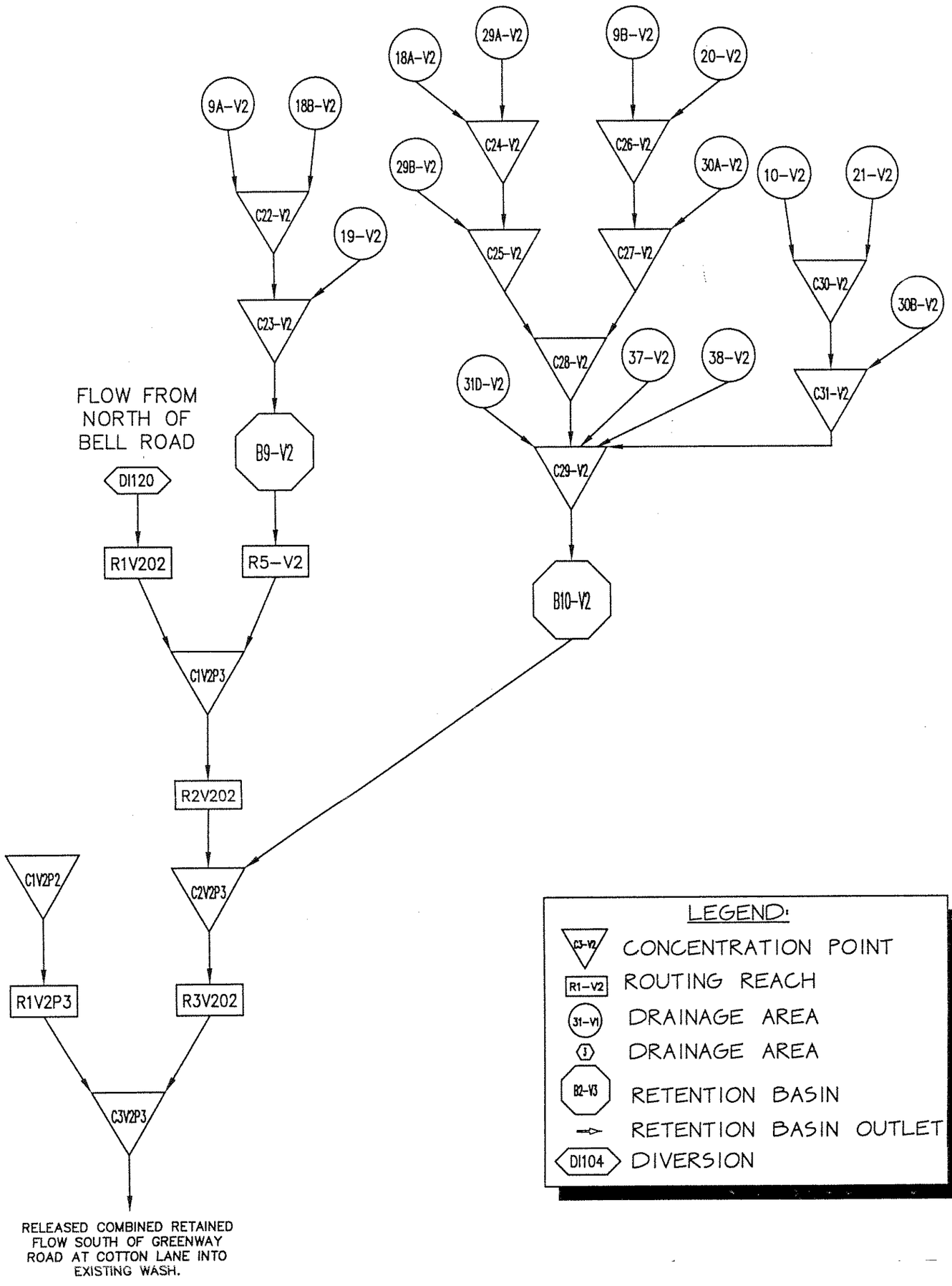
- C3-V2 — CONCENTRATION POINT
- R1-V2 — ROUTING REACH
- 31-V1 — DRAINAGE AREA
- 3 — DRAINAGE AREA
- B2-V3 — RETENTION BASIN
- RETENTION BASIN OUTLET
- D1104 — DIVERSION

VILLAGE 2



LOCATION MAP

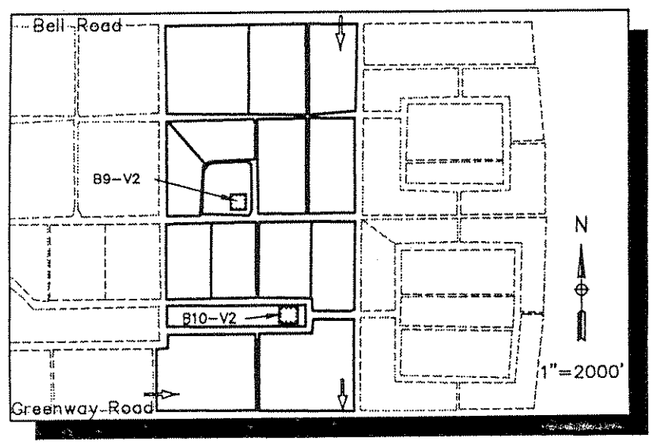
The Villages at Surprise	Greiner
Village 2 Drainage Basin B	
December 1994	
Project no.: E037501	Figure 10



LEGEND:

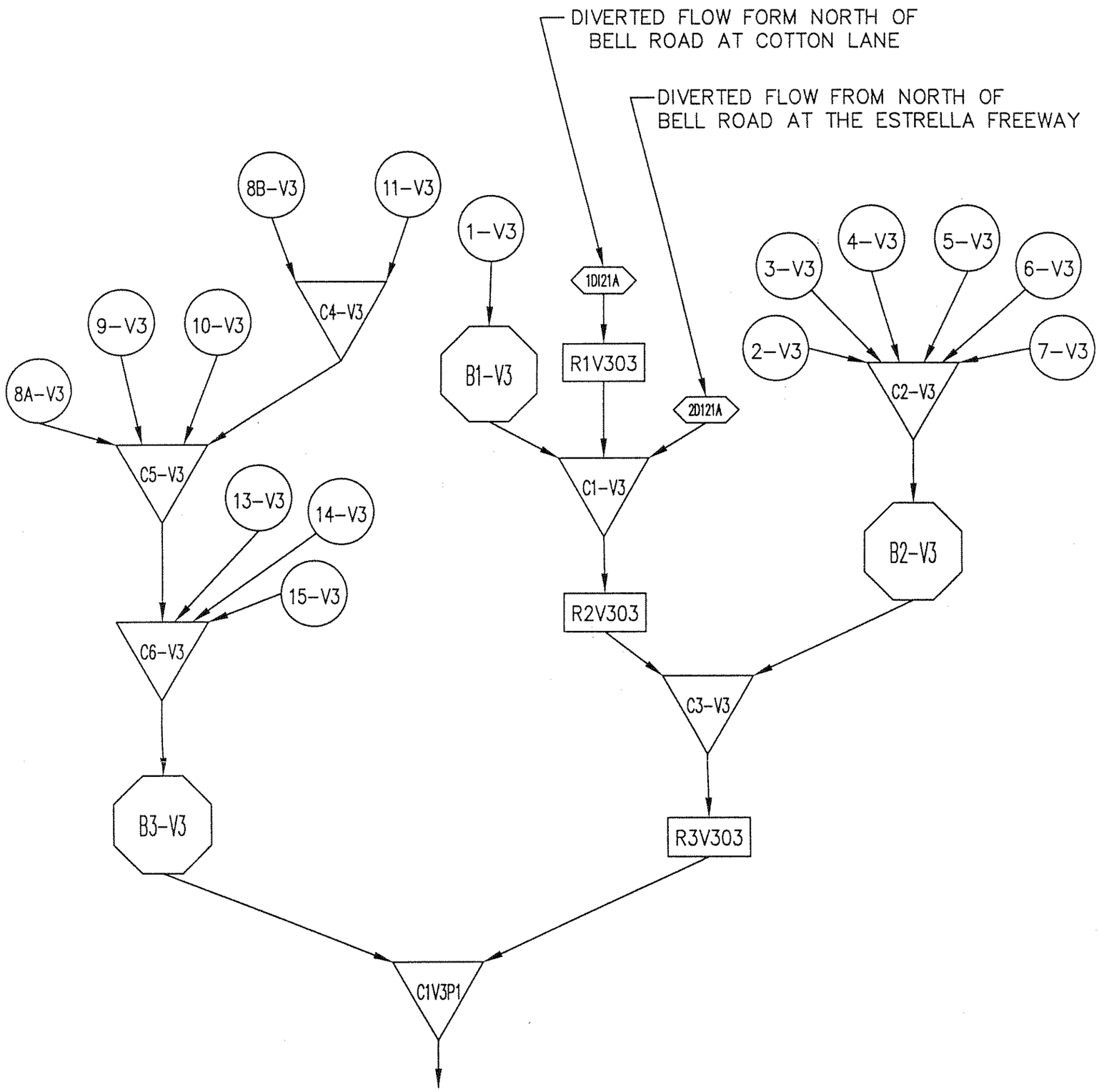
- C3-V2 — CONCENTRATION POINT
- R1-V2 — ROUTING REACH
- 31-V1 — DRAINAGE AREA
- J — DRAINAGE AREA
- B2-V3 — RETENTION BASIN
- RETENTION BASIN OUTLET
- DI104 — DIVERSION

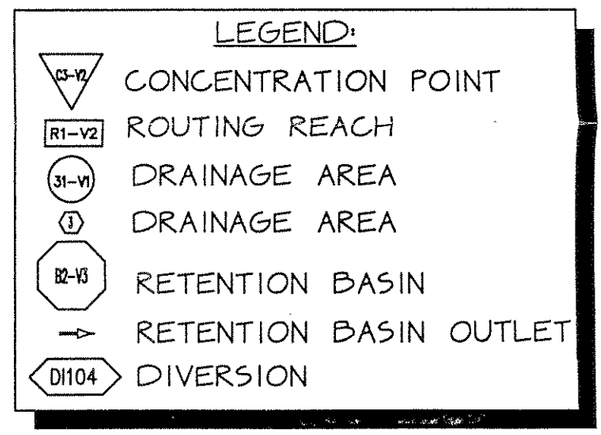
VILLAGE 2



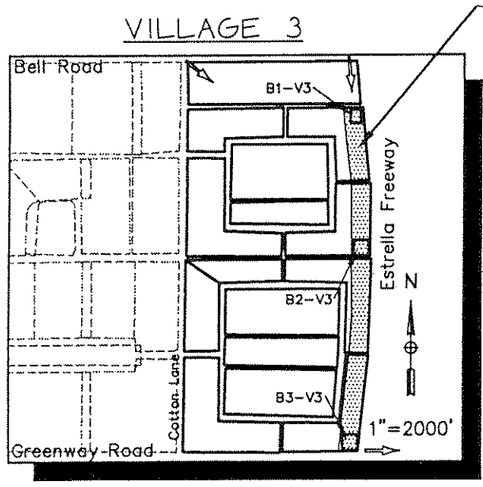
LOCATION MAP

The Villages at Surprise	Greiner
Village 2 Drainage Basin C	
December 1994	
Project no.: E037501	Figure 11





VILLAGE 3



LOCATION MAP

The Villages at Surprise	Greiner
Village 3 Drainage Basins	
December 1994	
Project no.: E037501	Figure 12

EXHIBIT "V"
Section 17.32.100

17.32.100 Signs. All signs must conform to Chapter 15.24, city sign ordinances for all site plans, conditional uses, planned area developments and other applicable procedures addressed in this title. Any and all requirements pertaining to signs shall comply with Chapter 15.24. (Ord. 86-6 §8-810, 1986)

Chapter 15.24

SIGNS

Sections:

ARTICLE I. GENERAL PROVISIONS

15.24.010 Purpose of provisions.
15.24.020 Definitions.
15.24.030 Conformance required.

no assessment at all shall be made. The decision of the council shall be final and binding on all persons. (Ord. 85-1 §7, 1985)

15.20.080 Service of notice. Notice shall be personally served on the owner or person controlling such property, by an officer of the town police department, in the manner provided in Rule 4(d) of the Arizona Rules of Civil Procedure, or mailed to the owner or person controlling such property at his last known address by certified or registered mail, or the address to which the tax bills for the property were last mailed. If the owner does not reside on such property, a duplicate notice shall also be sent to him by certified or registered mail at his last known address. (Ord. 85-1 §8, 1985)

15.20.090 Lien for drainage of basin. If no appeal is taken from the amount of the assessment, or if an appeal is taken and the council has affirmed or modified the amount of the assessment, the original assessment or the assessment as so modified shall be recorded in the office of the county recorder and from the date of its recording, shall be a lien on said lot or tract of land until paid. Such liens shall be subject and inferior to the lien for general taxes and to all prior recorded mortgages and encumbrances of record. A sale of the property to satisfy a lien obtained under the provisions of this section shall be made upon judgment of foreclosure or order of sale. The town shall have the right to bring an action to enforce the lien in a court of competent jurisdiction at any time after the recording of the assessment, but failure to enforce the lien by such action shall not affect its validity. The recorded assessment shall be prima facie evidence of the truth of all matters recited therein, and of the regularity of all proceedings prior to the recording thereof. A prior assessment for the purposes provided in this section shall not be a bar to a subsequent assessment or assessments for such purposes, and any number of liens on the same lot or tract of land may be enforced in the same action. (Ord. 85-1 §9, 1985)

Chapter 15.24

SIGNS

Sections:

ARTICLE I. GENERAL PROVISIONS

15.24.010 Purpose of provisions.
15.24.020 Definitions.
15.24.030 Conformance required.

15.24.040 Nonconforming signs.
15.24.050 Prohibited signs.
15.24.060 Abandoned signs.
15.24.070 Encroachments.
15.24.080 Illumination.
15.24.090 Change of business name.
15.24.100 Window sign--Permitted area.

ARTICLE II. ADMINISTRATION AND ENFORCEMENT

15.24.110 Failure to obtain permits or comply with conditions and fees.
15.24.120 Revocation of permits.
15.24.130 Removal of signs.
15.24.140 Summary removal of signs.
15.24.150 Liability for damages.

ARTICLE III. MEASUREMENT OF SIGNS

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15.24.200 Mobile home, recreational vehicle and trailer parks.

ARTICLE V. SIGNS PERMITTED FOR NONRESIDENTIAL USE

15.24.210 Residential areas.
15.24.220 Nonresidential areas.
15.24.230 Price signs for service stations.
15.24.240 Menu boards for drive-in restaurants.
15.24.250 Central business district (CBD).
15.24.260 Planned area developments (PAD).

ARTICLE VI. TEMPORARY SIGNS

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15.24.280 Sale, lease or rent signs.
15.24.290 Subdivision advertising signs.
15.24.300 Future development signs.
15.24.310 Banners, pennants and display.
15.24.320 Open house directional signs.
15.24.330 Flags.

ARTICLE VII. POLITICAL SIGNS

15.24.340 Political and campaign signs.

ARTICLE I. GENERAL PROVISIONS

15.24.010 Purpose of provisions. A. It is declared that the regulation of signs within the town is necessary and in the public interest:

1. To protect the property values within the town;

2. To encourage the creation of an aesthetic appearance along street frontages through the use of attractive signing;

3. To promote and aid in the tourist industry which is of importance to the economy of the town;

4. To protect the general public from damage and injury which may be caused by the faulty and uncontrolled construction of signs within the town;

5. To protect pedestrians and motorists from damage or injury caused, or partially attributable to the distractions and obstructions which are declared to be caused by improperly situated signs;

6. To promote the public safety, welfare, convenience and enjoyment of travel and the free flow of traffic within the town.

B. The sign regulations as set forth in Articles V, VI and VII of this chapter are designed to be both logical and equitable for the various uses and identification needs. These sign standards and regulations help to effectuate an aesthetic and functional street environment. (Ord. 85-8 Art. 1, 1985)

15.24.020 Definitions. As used in this chapter:

1. "Abandoned sign" means a sign is presumed to have been abandoned when it is located on property which becomes vacant and unoccupied for a period of three or more months.

2. "Advertising sign" means a sign which includes any copy and/or graphics relating to any service, product, person, business, place, activity or organization in addition to simple identification, excluding directional information.

3. "Arterial street" means any street within the town with a right-of-way of sixty feet or greater.

4. Board of Appeals. In the absence of a board of appeals, the planning and zoning commission will exercise that function.

5. "CBD" or "central business district" comprises two principal areas:

a. The Grand Avenue CBD, extending from Greenway Road to Union Hills Drive and extending roughly three hundred feet west from the Grand Avenue right-of-way; and

b. The Bell Road CBD, extending from 115th Avenue to 183rd Avenue and extending roughly three hundred feet

north and south (within the Surprise corporate limits) from the Bell Road right-of-way.

6. Department of Community Development or Town Community Development Director. In the absence of a department of community development, the town manager or his/her appointee will exercise that function.

7. Design Review Board. In the absence of a design review board, the town manager, director of community development, and director of building safety will exercise that function.

8. "Directional sign" means a sign that does not contain either identification or advertising copy, but includes pertinent information, including assisting the flow of traffic.

9. "Directory sign" means any sign listing the names and/or uses, and/or locations of the various businesses or activities within a building, or a multitenant development, not for the purpose of advertising products, goods or services to the attention of vehicular traffic.

10. "Fascia sign" means a sign which is permanently affixed to the horizontal piece covering the joint between the top of a wall and the projecting eaves of the roof.

11. "Freestanding signs" means an identification sign which is erected on or mounted upon its own self-supporting permanent structure, detached from the supporting elements of the main building which it identifies. Such signs shall have a maximum height of eight feet and a maximum area of twenty-four square feet, or as provided in this chapter.

12. "Grand opening" means the introduction, promotion, or announcement of a new business, store, shopping center, office or the introduction, promotion or announcement of an established business changing ownership.

13. "Ground level" means the finished grade of existing sidewalk or where there is no sidewalk six inches above street grade measured at the base of the curb, or at the shoulder of the roadway where no curb exists.

14. "Identification sign" means a sign that includes, as copy, only the name of the business, place, organization, building or person it identifies.

15. "Illuminated sign" means a sign whose surface is lighted internally or externally and which identifies, advertises, or attracts attention to a use or activity.

16. "Maintenance" means the replacing or repairing of a part or portion of a sign made unusable by ordinary wear, tear or damage beyond the control of the owner, or the reprinting of existing copy without changing the wording, composition or color of said copy.

17. "Mansard and parapet signs" means a sign permanently affixed to a wall or surface designed to protect the edge of a roof, constructed no more than twenty degrees from vertical.

18. "Menu board" means a permanently mounted sign displaying the bill of fare of a drive-in or drive-through restaurant.

19. "Nonconforming sign" means any sign which is not allowed under this chapter, but which, when first constructed, was legally allowed by the town or the political subdivision then having the control and regulation over construction of signs.

20. "Off-premises" means a structure which bears a sign which is not appurtenant to the use of the property where the sign is located, or a product sold or a service offered upon the property where the sign is located, and which does not identify the place of business where the sign is located as a purveyor of the merchandise or services advertised upon the sign. Permanent off-premises signs are prohibited absolutely.

21. "PAD (planned area development)" means a legally designated area no smaller than ten acres in size which may form a miniature community within the municipality because of its regulated mix of land uses.

22. "Permanent sign" means any sign which is intended to be and is so constructed as to be a lasting and enduring condition, remaining unchanged in character, condition (beyond normal wear) and position, and in a permanent manner affixed to the ground, wall or building.

23. "Price sign" means a permanently mounted sign displaying the retailing cost of a gallon of gasoline on the premises of a service station.

24. "Sandwich sign" means any sign which is not permanently affixed to any structure on the site or permanently ground-mounted; any portable sign.

25. "Sign" means any device providing identification, advertising or directional information for a specific business, service, product, person, organization, place or building. Included in this definition as signs are graphic devices such as logos, attention-attracting media such as banners or logo sculpture, and obtrusive, colored fascia or architectural elements.

26. "Temporary sign" means any sign, banner, pennant, valance of advertising display constructed of cloth, canvas, light fabric, cardboard, wallboard or other like materials, with or without frames, and any type sign not permanently attached to the ground, wall or building, intended to be displayed for a short period of time only.

27. "Wall-mounted sign" means an identification or advertising sign which is fastened to any vertical portion of the main building which identifies or advertises. (Ord. 85-8 Art. 2, 1985)

15.24.030 Conformance required. A. It is illegal for a sign to be placed or maintained in the town except as provided in this chapter.

B. All signs maintained contrary to the provisions of this chapter are declared to be nuisances, and such nuisances may be abated as provided by law.

C. Any person, firm or corporation violating any provisions of this chapter or failing to comply with any order or regulations made hereunder is guilty of a misdemeanor. (Ord. 85-8 Art. 3(1), 1985)

15.24.040 Nonconforming signs. Reasonable repairs and alterations may be made to nonconforming signs. However, in the event any such sign is hereafter damaged exceeding fifty percent of the reproduction value according to appraisal thereof by competent appraisers, or is removed by any means whatsoever, including an act of God, such sign may be restored, reconstructed, altered or repaired only to conform with the provisions of this chapter. (Ord. 85-8 Art. 3(2), 1985)

15.24.050 Prohibited signs. Signs not specifically authorized are prohibited, including, but not limited to the following:

A. Political signs in public right-of-way or public property;

B. Sandwich signs except as otherwise provided (see Article VI of this chapter);

C. Signs mounted, attached or painted on trailers, boats or motor vehicles when used as additional advertising signs on or near the premises;

D. Awning signs except as otherwise provided for nonresidential uses in the CBD;

E. Roof-mounted signs, or signs that project above the highest point of the roofline, parapet, or fascia of the building;

F. Any sign emitting sound;

G. Any sign with intermittent or flashing illumination, animated or moving signs;

H. Flag-mounted signs, or signs that project from the roof or wall or a building perpendicular to a wall surface except as otherwise provided for nonresidential uses in the CBD;

I. Off-premises signs except subdivision advertising signs obtained with use permits. (See Section 15.24.290) (Ord. 85-8 Art. 3(3), 1985)

15.24.060 Abandoned signs. Nonconforming freestanding signs, sign structures, poles and other related equipment that has been abandoned or not in use for more than three months shall be removed by the owner of the property on which the sign is located. (See Section 15.24.130 of this chapter). (Ord. 85-8 Art. 3(4), 1985)

15.24.070 Encroachments. No sign shall be erected or placed within any traffic median or any public sidewalk or bicycle path. The town employees may remove any sign located in these areas. (Ord. 85-8 Art. 6(1), 1985)

15.24.080 Illumination. The source of a sign's illumination shall not be visible from any adjacent residential areas or streets. (Ord. 85-8 Art. 6(2), 1985)

15.24.090 Change of business name. Whenever the name of a business changes, the signs on the premises shall be modified to bring them into conformance with these regulations, even though the intended change is a change of sign copy only. This regulation shall not apply to directory signs designed with interchangeable letters or panels. (Ord. 85-8 Art. 6(3), 1985)

15.24.100 Window sign--Permitted area. When any window sign or signs are placed so as to attract the attention of persons outside the building where such signs are displayed, the total area of all such window signs shall not exceed twenty-five percent of the total window area of the window in which such sign is placed. (Ord. 85-8 Art. 6(4), 1985)

ARTICLE II. ADMINISTRATION AND ENFORCEMENT

15.24.110 Failure to obtain permits or comply with conditions and fees. A. It is unlawful for any person to erect, install and/or modify any sign within the town without first applying for and obtaining a sign permit from the department of community development. "Modify," as it is used in this chapter, means any change in or to an existing sign, its face, copy, colors and/or supporting structures.

B. It is unlawful for any person to erect, install and/or modify any sign within the town except in full compliance with the provisions of this chapter. "Person," as it is used in this section, shall include any person, firm, partnership, corporation or other business association engaged in the business of erecting, installing and/or modifying signs in exchange for consideration.

C. Failure to conform to the conditions of a sign permit, including any conditions and/or stipulations attached thereto by the town council, design review board and/or board of appeals shall render such permit void.

D. Fees for sign permits shall be required and payable in such sums as the town council may from time to time establish by resolution.

E. A sign permit does not include electrical work; however, this exemption shall not be deemed to grant authorization for any work to be done in violation of the pro-

visions of Chapter 15.04 of this chapter or any other laws or ordinances. (Ord. 85-8 Art. 4(1), 1985)

15.24.120 Revocation of permits. The director of building safety shall have the authority to revoke any permit which has been granted when he/she has determined that the sign authorized by the permit has been constructed or is being constructed or is being maintained in violation of the permit.

A. Notice of the building safety director's decision to revoke a sign permit shall be served upon the holder of the permit:

1. By delivering personally a copy of the notice to the holder of the permit, or to one of its officer; or

2. By leaving a copy of the notice with any person in charge of the premises; or

3. In the event that no such person can be found on the premises, by affixing a copy of the notice in a conspicuous position at an entrance to the premises and by certified mailing of another copy of the notice to the last known post office address of the holder of the permit.

B. The holder of the permit may appeal the decision of the building safety director to revoke the permit to the board of appeals. This appeal must be made within fifteen days from the date when the notice was served.

C. If no appeal has been taken by the end of the fifteen-day appeal period, then the permit is revoked and the sign is illegal. The director of building safety then shall initiate the procedure for the removal of the illegal sign. (Ord. 85-8 Art. 4(2), 1985)

15.24.130 Removal of signs. The director of building safety is authorized to require the removal of any illegal sign as defined by this chapter:

A. Before bringing an action to require removal of any illegal sign, the director of building safety shall give written notice to the owner of the sign or the owner of the premises on which such sign is located. The notice shall state the reasons and grounds for removal, specifying the deficiencies charged; such notice shall specify what repairs, if any, will make such an installation conform to the requirements of this chapter, and specify that the sign must be removed or made to conform with the provisions of this chapter within the notice period provided in this section. Service of notice may be made personally on the owner, or lessee, or by certified mail addressed to the owner or lessee at the address specified in the permit or the last known address.

1. Notice Period.

a. The notice period for permanent signs is ten days.

b. The notice period for temporary signs is forty-eight hours.

2. Re-erection of any sign or substantially similar sign on the same premises after a compliance notice has been issued shall be deemed a continuance of the original violation.

B. If the owner or lessee of the premises upon which the sign is located has not demonstrated to the satisfaction of the director of building safety that his/her sign has been removed or brought into compliance with the provisions of this chapter by the end of the notice period, then the director of building safety shall certify the violations to the town attorney for prosecution. In prosecuting violations, the town attorney may pursue either or both of the remedies set forth in Sections 15.24.030 and 15.24.040 of this chapter, which remedies are cumulative and not exclusive. In connection with any suit brought to abate a nonconforming or invalid sign as a nuisance, the town may collect its costs incurred together with reasonable amounts expended as attorney's fees.

1. The director of building safety is authorized to cause the removal of any sign adjudged to be illegal by a court of competent jurisdiction if the court so orders. All the actual cost and expense of any such removal by the director of building safety shall be borne by the owner of such sign installation and the owner of the premises on which located; each of them shall be jointly and severally liable therefor, and an action for recovery thereof may be brought by the town attorney upon proper certification thereof to him/her by the director of building safety.

2. The director of building safety or his/her representative is authorized to seize any illegal temporary sign which is maintained or reerected after the expiration of the notice period, where the owner or lessee of the premises has been issued a compliance notice at least once before for a violation involving the same or a similar sign. (Ord. 85-8 Art. 4(3), 1985)

15.24.140 Summary removal of signs. A. The director of building safety is authorized to cause the immediate removal or repair of any sign or signs found to be unsafe or defective to the extent that such sign creates an immediate and emergency hazard to persons or property.

B. Notice. If the director of building safety has determined that an immediate hazard to persons or property exists, then actual notice to the property owner or lessee shall not be required. The director shall make a reasonable effort to notify the property owner or lessee that the unsafe or defective sign must be removed or repaired immediately.

C. All the actual cost and expense of any such removal or repair by the director of building safety shall be borne

by the owner of such sign installation and by the owner of the premises on which the sign is located; each of them shall be jointly and severally liable therefor, and an action for recovery thereof may be brought by the town attorney upon proper certification thereof to him or her by the director of building safety. (Ord. 85-8 Art. 4(4), 1985)

15.24.150 Liability for damages. The provisions of this chapter shall not be construed to relieve or to limit in anyway the responsibility or liability of any person, firm or corporation which erects or owns any sign; nor shall the provisions of this chapter be construed to impose upon the town, its officers, or its employees any responsibility or liability by reason of the approval of any sign under the provisions of this chapter. (Ord. 85-8 Art. 4(5), 1985)

ARTICLE III. MEASUREMENT OF SIGNS

15.24.160 Area. Sign area shall be measured as follows:

A. For sign copy mounted or painted on a background panel or area distinctively painted, textured or constructed as a background for the sign copy, the sign area is measured as that area contained within the outside dimensions of the background panel or surface.

B. For sign copy mounted as individual letters and/or graphics against a wall or fascia of a building or other structure that has not been painted, textured or otherwise altered to provide a distinct background for the sign copy, the sign area is measured as the area enclosed by the smallest single rectangle that will enclose all sign copy.

C. For sign copy mounted or painted on an illuminated sign or illuminated sign or illuminated architectural element of a building, for the entire illuminated surface or illuminated architectural element which contains sign copy, will be counted as sign area.

D. Number of Sign Faces.

1. For one sign, area of the single face only;

2. For two signs, the maximum allowable interior angle between two sign faces is forty-five degrees. If the distance between the two signs faces at their widest point is six feet or less, the area will be the area of one face only; if the distance between the two sign faces is greater than six feet, the sign area will be the sum of the areas of the two faces.

3. For three or more signs, the sign area will be the sum of the areas of the three or more faces.

E. For spherical, freeform, sculptural and other nonplanar signs, the sign area is be the sum of the areas of the four vertical sides of the smallest polyhedron that will encompass the sign structure.

F. Sign area includes the areas of all permitted signs, except nonresidential district directional signs assisting the flow of traffic, street addresses, or signs necessary for safety (e.g., "stop engine," "no smoking") that do not exceed two square feet in area.

G. For a sign having more than one component (e.g., a service station identification/price sign combination on a monument base) mounted on the same surface, the sign area is the area of the smallest rectangle that will encompass the several components of the sign. (Ord. 85-8 Art. 5(1), 1985)

15.24.170 Height. Sign heights shall be measured as follows:

A. Freestanding Sign. Height shall be the distance from the top of the sign structure to the top of curb or crown of roadway where no curb exists. The height of any monument base or other structure erected to support or ornament the sign shall be measured as part of the sign height.

B. Wall-mounted or Fascia-mounted Signs. Height shall be the distance from the top of the sign structure to the top of curb or crown of road where no curb exists. (Ord. 85-8 Art. 5(2), 1985)

ARTICLE IV. SIGNS PERMITTED FOR RESIDENTIAL USE

15.24.180 One-family and two-family dwellings. A. Identification Signs. A sign not exceeding one square foot in area, giving the name only of the land or building on which displayed, or of the owner or lessee thereof.

B. Temporary signs, See Article VI of this chapter.

C. Permanent subdivision identification signs for recorded subdivisions in accordance with the following:

1. Maximum area of such sign to be twenty-four square feet with a maximum height of five feet;

2. Such signs to be monument type, i.e., individually mounted letters on a freestanding wall;

3. Final location of such signs to be approved by the town community development director;

4. Such signs shall be located in a landscaped area of at least two square feet per each one square foot of sign area.

D. Directional signs, not to exceed two square feet in area or three feet in height. (Ord. 85-8 Art. 7(1), 1985)

15.24.190 Multifamily dwellings. The following sign types are permitted:

A. All signs permitted in Section 15.24.180 of this chapter;

B. Identification signs for apartments and condominium complexes and such uses as follows:

1. A freestanding sign, not exceeding twenty-four square feet in area. Such sign shall not exceed ten feet in

width or five feet in height. Such sign must be located at least five feet from any property line.

2. A wall-mounted sign, not exceeding six square feet in area. Height of such sign shall not exceed ten feet. (Ord. 85-8 Art. 7(2), 1985)

15.24.200 Mobile home, recreational vehicle and trailer parks. The following sign types are permitted:

A. All signs permitted in Section 15.24.180 of this chapter;

B. One identification sign for each entrance to the park set back at least five feet from the park's exterior property line. Each sign shall not exceed twenty-four square feet in area, five feet in height, nor ten feet in width. (Ord. 85-8 Art. 7(3), 1985)

ARTICLE IV. SIGNS PERMITTED FOR NONRESIDENTIAL USE

15.24.210 Residential areas. The following sign types are permitted:

A. All signs permitted in Section 15.24.180 of this chapter;

B. Civic organizations such as Kiwanis, Rotary, Jaycees, etc., may be identified on group display structures in accordance with the following standards:

1. Such structures shall be on arterial streets and in commercial or industrial districts and within one quarter mile of the town limits.

2. Structures shall not be over six feet in height or an area in excess of sixty square feet.

3. The signs shall not be illuminated.

4. Each civic organization shall be limited to a maximum area of two square feet.

5. Churches shall not be included in the above.

6. Exact location and design of the sign structure shall require approval of the community development director.

C. Identification signs displaying only the name of the building or tenant business with a total maximum sign area not exceeding twenty-four square feet. Such signs may be wall-mounted with a maximum height of ten feet, and/or such signs may be freestanding according to the following:

1. One freestanding identification sign shall be permitted with a maximum height of five feet. A second such freestanding sign shall be permitted for a lot whose front property line measures greater than eighty lineal feet. Where two freestanding signs are permitted, they shall be located at least sixty feet apart.

2. Freestanding identification signs shall be located at least five feet from any property line.

3. A landscaped area shall be provided, on site at the street frontage at the base of the freestanding sign,

with said landscaped area to have a minimum area of four square feet for each one square foot of sign area.

D. In addition to the provisions of this section, each tenant may be allocated three square feet of nonilluminated sign area, identifying the business. Such sign shall be located on the wall adjacent to the entry of the tenant's business.

E. In addition to the above, a directory with a maximum area of six square feet and a maximum height of six feet may be permitted behind the required front yard setback. (Ord. 85-8 Art. 8(1), 1985)

15.24.220 Nonresidential areas. The following sign types are permitted:

A. All signs permitted in Section 15.24.180 of this chapter;

B. Civic organization identification signs, as set out in Section 15.24.210B;

C. Business signs shall be in accordance with the following regulations:

1. The total aggregate sign area of one face of all signs on the premises pertaining to any one business shall not exceed fifty square feet. However, if the portion of the building adjacent to its lot's street property line measures more than fifty feet, then the aggregate area of one face of all such signs on the premises may be increased in area to the rate of one square foot of sign area for each foot of building frontage in excess of fifty lineal feet; but the total aggregate area of one face of such signs on the premises shall not exceed one hundred square feet for each business. For corner buildings, only the main entrance frontage shall be so measured.

2. Freestanding identification signs shall be counted as a portion of the total aggregate sign area of the premises and shall be restricted to the following:

a. One freestanding identification sign for each street upon which the lot has frontage;

b. Such signs shall have a maximum area of twenty-four square feet;

c. Such signs shall not be closer than thirty feet to any residential district;

d. A landscaped area shall be provided, on site at the street frontage at the base of the freestanding sign, with said landscaped area to have a minimum area of four square feet for each square foot of sign area.

3. For building complexes or centers, the regulations listed in Section 15.24.230D of this chapter shall apply and preclude those listed heretofore. For purposes of this section, a "building complex or center" means any number of businesses greater than one, which share the same site, using common points of ingress and egress to and from the site. (Ord. 85-8 Art. 8(2), 1985)

15.24.230 Price signs for service stations. Price signs for service stations are permitted only in accordance with the following:

A. Maximum area shall not exceed twelve square feet each and shall be counted in the total aggregate sign area of the premises as permitted above.

B. Maximum height shall not exceed five feet.

C. One freestanding price sign per each street frontage on which the service station has frontage.

D. A landscaped area shall be provided, on site at the street frontage, at the base of the freestanding sign, with said landscaped area of four square feet for each square foot of sign area.

E. The maximum sign area for freestanding signs shall not exceed twenty-four feet including all identification and price signs. (Ord. 85-8 Art. 8(2A), 1985)

15.24.240 Menu boards for drive-in restaurants. Menu boards for drive-in restaurants are permitted in accordance with the following:

A. One freestanding or wall-mounted menu board per business and shall be located not less than forty-five feet from the street property line.

B. Maximum area shall not exceed twelve square feet and shall be counted in the total aggregate sign area of the premises.

C. Maximum sign height shall not exceed five feet for freestanding menu signs.

D. A landscaped area shall be provided, at the base of the freestanding sign with said landscaped area of four square feet of sign area. (Ord. 85-8 Art. 8(2B), 1985)

15.24.250 Central business district (CBD). Signs are permitted in the central business district in accordance with the following:

A. Awning signs, with the following requirements may be permitted on tenant-leased areas:

1. Business name and building address numerals only to be allowed on the vertical portion of the awning with a maximum copy height of ten inches;

2. Logos (with design review board approval) may be permitted on the diagonal portion of the awning;

3. Total area of logo or awning sign not to exceed twenty-five percent of allowed sign area and to be deducted from that area;

4. Awnings and signs to be nonilluminated and displayed on tenant's leased area only.

B. Flag-mounted signs, with the following requirements, may be permitted on individual tenants' leased area only:

1. Maximum area of six square feet, identifying primary businesses and building address numerals only, to be deducted from allowed sign area;

2. Height to be eight feet minimum to the bottom of the sign and fifteen feet maximum to the top of the sign with the sign centrally located on the tenant's leased area;

3. Signs to be wall-mounted shall be nonilluminated. (Ord. 85-8 Art. 8(2C), 1985)

15.24.260 Planned area developments (PAD). Signs are permitted in planned area developments in accordance with the following:

A. All signs permitted in Section 15.24.210 and in Sections 15.24.180 and 15.24.190;

B. Business signs shall be in accordance with the following regulations:

1. The total aggregate area of one face of all signs on the premises pertaining to any one business shall not exceed forty square feet. However, if the portion of the building adjacent to its lot's street property line measures more than forty lineal feet, then the total aggregate area of one face of all such signs on the premises may be increased in area at the rate of one square foot of sign area for each foot of building frontage in excess of forty lineal feet; but the total aggregate area of one face of all such signs on the premises shall not exceed eighty square feet for each business. For corner buildings, only the main entrance frontage shall be so measured.

2. One freestanding identification sign per street frontage of the entire site is permitted in accordance with the following:

a. Such signs shall identify the center only, and shall not be counted in the total aggregate sign area for individual business identification.

b. Maximum area of twenty-four square feet per sign.

c. A freestanding sign identifying an individual business rather than the center shall be obtained only by the approval of the director of community development with the final plan of development.

d. A landscaped area shall be provided on site at the street frontage at the base of the freestanding sign, with said landscaped area of four square feet for each square foot of sign area.

3. All wall or fascia-mounted signs for individual business shall be uniform in terms of colors, shapes, and maximum vertical dimension with all other such signs in the center. A proposal for signing for the entire center shall be submitted prior to the issuance of any sign permit.

C. Service station price signs shall be as specified in Section 15.24.230. (Ord. 85-8 Art. 8(2D), 1985)

ARTICLE VI. TEMPORARY SIGNS

15.24.270 Generally. The signs in this article shall be permitted in all zoning districts according to the provisions of this article. (Ord. 85-8 Art. 9(part), 1985)

15.24.280 Sale, lease or rent signs. Sale, lease or rent signs shall be nonilluminated and not exceeding six square feet in aggregate area and eight feet in maximum height pertaining only to the land or building upon which displayed. (Ord. 85-8 Art. 9(1), 1985)

15.24.290 Subdivision advertising signs. Subdivision advertising signs are to be located on the site or within three quarters of a mile radius of the recorded subdivision and in accordance with the following schedule:

A. One sign per arterial street or major entry;

B. Maximum sum of all such signs to total one hundred sixty square feet;

C. Maximum height above grade level shall be eighteen feet for all such signs;

D. Such signs may be illuminated only by nonflashing lights and so shielded that only the face of the sign is illuminated;

E. Such signs may be maintained for a period of two years, or until all the lots in the subdivision are sold, whichever occurs first;

F. Such signs shall not be located within one hundred feet of any existing residential structure;

G. All off-site subdivision signs shall be subject to a use permit. (Ord. 85-8 Art. 9(2), 1985)

15.24.300 Future development signs. Signs announcing the proposed development of property prior to issuance of a building permit for the purpose of displaying the name of the project, contractors, architect and any additional information pertaining to the site on which the signs are located are allowed in accordance with the following:

A. Maximum sign area shall not exceed thirty-two square feet.

B. Such signs shall not be internally illuminated.

C. Such signs may be double-faced.

D. One freestanding sign per each street on which the development has frontage.

E. Maximum height shall not exceed eight feet for all such signs.

F. Such signs may be maintained for a period not to exceed six months prior to obtaining building permits for a development and must be removed upon issuance of a certificate of occupancy.

G. Prior to obtaining building permits for a proposed development a sign permit must be obtained from the town

building safety department for all development signs located on the site. (Ord. 85-8 Art. 9(3), 1985)

15.24.310 Banners, pennants and displays. Banners, pennants and displays shall be allowed on a one-time basis for a maximum of fourteen consecutive days during the grand opening of a business. A permit shall be obtained prior to the installation of any banners, pennants or displays. (Ord. 85-8 Art. 9(4), 1985)

15.24.320 Open house directional signs. A. Open house directional signs are temporary signs used to direct traffic to a home for sale.

B. There shall be a maximum of four such signs for each home for sale.

C. These signs may be a maximum of three square feet and three feet in height, and shall be portable.

D. These signs may be double-faced and shall not be illuminated.

E. These signs may be used only when a sales person is on duty at the home for sale and in no event may be left overnight.

F. No such sign shall be so placed as to create a traffic hazard as determined by town staff.

G. No such sign shall be placed in a traffic median or on a public sidewalk. (Ord. 85-8 Art. 9(5), 1985)

15.24.330 Flags. State, U.S. and corporate flags for registered corporations or flags of foreign nations are permitted in accordance with the following:

A. Only one of each type of flag mentioned in this section with a maximum of three flags on any one site or structure shall be allowed.

B. Any flag flown in conjunction with the U.S. and/or state of Arizona flag must be flown beneath them and must not exceed them in size.

C. The maximum size of any corporate flag shall not exceed fifteen square feet. No one dimension shall exceed six feet in any direction.

D. Flags shall not include any advertising copy.

E. A permit is required to display any corporate flag.

F. Corporate flags shall be permitted in industrial zoned districts only. (Ord. 85-8 Art. 9(6), 1985)

ARTICLE VII. POLITICAL SIGNS

15.24.340 Political and campaign signs. Political and campaign signs on behalf of candidates for public office, measures on primary, general or special election ballots or relating to the exercise of the powers of initiative, referendum or recall are allowed in all zoning districts subject to the following requirements:

A. Said signs shall not be erected earlier than sixty days prior to the election to which they relate, and shall be removed within forty-eight hours after the election to which they relate. In the case of signs posted in connection with the exercise of the power of initiative, referendum or recall, no sign shall be posted until application for petitions has been made in accordance with law and the time allowed for removal of signs shall run from the earlier of the date the signed petitions are filed with the applicable public official, or the date the time allowed for circulation expires.

B. The person, political party or parties responsible for the erection or distribution of any political sign shall be jointly and individually liable for their removal.

C. Political signs shall be nonilluminated, and shall not exceed a maximum of thirty-two square feet in surface area. No political sign shall be located in such manner that it causes a traffic or safety hazard and such signs shall not be affixed to any utility pole or utility structure whether within the public right-of-way or on private property.

D. Each political party, parties, individual or nonpartisan candidate shall, prior to posting any sign, make application for a permit to post such signs and shall pay the amount of the deposit or bond established therefor by resolution of the town council, which deposit shall be fully refundable if the sign is removed within the time limits set forth in subsection A of this section. No permit shall be issued until the name and address of the party responsible for removal of the sign or signs has been furnished to the town in writing. In the event the responsible party is not the person making the permit application, the responsible party shall submit a signed statement consenting to exercise such responsibility.

E. Failure to remove any political sign within ten days after the election to which it relates (or the filing date in the event of initiative, referendum or recall) shall constitute a misdemeanor. In addition to all other penalties, failure to remove one or more signs within the period established in this subsection shall constitute a nuisance and the responsible party may be fined an amount not in excess of one hundred dollars per day for each day the violation of the provisions hereof shall continue. (Ord. 88-2 §7, 1988)

EXHIBIT "W"
Section 17.36.060 (D)(3)(d)

d. Duration of P.A.D. Zoning. Approval of a P.A.D. rezoning request shall be conditioned upon the start of construction beginning within one year of the date of approval action taken by the city council. If, at the expiration of this period, the start of construction has not begun, the property shall revert to its former zoning classification without council or commission action.

In the case of a proposed phased development, start of construction for the first phase must commence within one year, with the remaining phases commencing according to the approved phasing plan.

The city may authorize extensions when deemed necessary.

ORDINANCE NO. 96-09

AN ORDINANCE AMENDING PORTIONS OF THE PLANNED AREA DEVELOPMENT (PAD) WITH PRELIMINARY DEVELOPMENT PLAN (CASE NO. PAD 95-02) PREVIOUSLY APPROVED AND ADOPTED PURSUANT TO CITY OF SURPRISE, ARIZONA, ORDINANCE NO. 95-05 WITH RESPECT TO THE PROPERTY BOUNDED GENERALLY BY BELL ROAD, BEARDSLEY CANAL, UNION HILLS ROAD, AND HAPPY TRAILS GOLF COURSE.

WHEREAS, this Ordinance has been properly noticed for public hearing, pursuant to the requirements of the Surprise Zoning Ordinance and the statutes of the State of Arizona, and the necessary hearings have been completed; and

WHEREAS, on March 27, 1995, the Council of the City of Surprise passed and adopted Ordinance No. 95-05, approving the Planned Area Development with Preliminary Development Plan (Case No. 95-02) for the property known as "Arizona Traditions" (previously known as "The Villages at Surprise-North"), which property is more particularly described in such Ordinance;

WHEREAS, the Council of the City of Surprise now desires to approve the amendment of the foregoing Planned Area Development with Preliminary Development Plan as hereinafter provided;

NOW, THEREFORE, BE IT ORDAINED by the Council of the City of Surprise, Arizona, that:

1. The Planned Area Development with Preliminary Development Plan (Case No. 95-02) approved by the Council of the City of Surprise on March 27, 1995 pursuant to Ordinance No. 95-05 is hereby amended in accordance with the provisions of Exhibit "A" attached hereto and incorporated herein, provided that the property owner comply with stipulations in Exhibit "B".

PASSED AND ADOPTED by the City Council of the City of Surprise, Arizona, this 23rd day of May, 1996.

Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:

City Attorney

YEAS: Mayor Shafer, Vice-Mayor Villanueva, Councilmembers, Broich, Palm, Reafleng & Montoya.

NEAS: Councilmember Johnson absent due to illness.

RECOMMENDATION: (PADA95-41)

Subject request is consistent with the proposed Surprise Comprehensive Development Guide. Furthermore, approval of this request would allow for a timely, efficient and orderly development of the Village at Surprise - North (Arizona Traditions) Planned Area Development. Additionally, approval of this request will not adversely impact the surrounding area. Accordingly, it is **recommended** that this request, a Planned Area Development - Amendment (Application No. PADA95-41), **be approved** subject to the following stipulations:

a) Major changes to the Planned Area Development - Amendment with regards to use and intensity, must be processed as a revised application with approval by the City Council upon recommendation by the Planning and Zoning Commission. Minor changes may be administratively approved by the City Manager and the Planning and Zoning Department,

b) The Landscape Master Plan must be approved by the Community Development Director,

c) All stipulations approved for the previous PAD 95-02 must be adhered to,

d) Submission of six (6) copies of the revised Planned Area Development with Preliminary Development Plan revised as necessary to comply with these approved stipulations prior to approval of any further applications or permits and to incorporate all the data and information regarding the overall project, within 30 days from date of Council approval.

VILLAGE AT SUPRISE-NORTH P.A.D.

APPLICATION NO. PAD95-02

It is recommended to approve this request, PAD95-02, a Planned Area Area Development with a Preliminary Development Plan (dated February 24, 1995) be approved with the following stipulations:

a) Development in accordance with the Report entitled "Application for: Planned Area Development (PAD) Zoning with Preliminary Development Plan for The Villages at Surprise-North" as required to be revised,

b) Major changes to this P.A.D. and Land Use Plan with regard to use and intensity, must be processed as a revised application with approval by the City Council upon recommendation of the Commission. Minor changes to the Land Use Plan may be administratively approved by the City Manager and the Planning and Zoning Department,

c) Phased final water, sewer, and drainage reports for subject site must be approved by the City Engineer prior to any further approval or the issuance of permits,

d) The irrigation system should be of the type which keeps spray and wind drift to a minimum,

e) The applicant shall obtain an Earth Moving Permit from the County Bureau of Air Pollution Control prior to construction,

f) Upon submittal of the first subdivision plat, the developer shall declare their choice of either the golf course plan or the open space plan for subject development,

g) Upon submittal of a Golf Course Plan, a golf cart crossing detail shall be provided,

h) If developer elects not to construct the golf course, the developer shall submit an Open Space Plan, prior to any further applications or issuance of permits. The Open Space Plan to be administratively approved,

i) Surprise Village Co. L.L.C. or its successor in interest, shall provide financial assurance for construction of a busbay to be located on the northside of Citrus and Bell Road. Futhermore, a financial assurance shall be provided for construction of a bus shelter upon commencement of bus services to subject area or when deemed necessary by City Council,

j) Surprise Village Co. L.L.C. or its successor in interest shall be responsible for 50% of the cost for traffic signalization at the Citrus Road and Bell Road intersection,

k) The Surprise Village Co. L.L.C. or its sucessor in interest agrees to dedicate the south half (55' to centerline) of Union Hills Drive, along the entire northern boundary line.

l) If, Surprise Village Company L.L.C. or its successor in interest, provides access to the Property by connecting the Property's road system to the Union Hills alignment, then Surprise Village Co. L.L.C. or its sucessor must connect that access point to the City's existing improved road network. Surprise Village Co. L.L.C. or its successor, must make this connection by constructing the necessary portion of Union Hills Drive, and such other roads as may be necessary, to the standard of one half of a two lane minor arterial roadway section, which provides two lanes of traffic. If land must be condemned for this purpose, the City will assist the Surprise Village Co. L.L.C. or its successor in acquiring necessary rights-of-way at no cost to the City,

m) The City agrees to provide reasonable cooperation to Surprise Village Co. L.L.C. or its successor in interest, for consideration of two access points (one primary and one secondary) onto Bell Road,

n) Any proposed changes to the location of the secondary access point will require revision to and City reapproval of the Traffic Impact Study,

o) The developer is required to submit a Master Landscape Plan prior to approval of any further application or permits,

p) Amend the Cluster Housing - Building Setbacks (page 15) to match the the Village at Surprise - South Cluster Housing building setback dimensions,

q) Submission of five (5) copies of the Report revised to incorporate all of the following data and information regarding the overall project within 30 days from date of Council approval:

1) Exhibit A, Legal description, the legal description and associated maps must be approved by the City Engineer,

2) Exhibit B, Design Guidelines, Parking Requirement noted on page 3, must be revised to clarify intent to provide additional landscaping in parking lot areas,

3) Exhibit L, clarification of proposed plot plan (i.e. public streets, private common drives),

4) Exhibit S, indicate Figure 2 as Secondary Entrance. Provide cross-section for Union Hills,

5) Modify Figure 4 to include the following items:

   i) Designate the Community Commercial parcel (number 5B) as C-2;
   ii) Parcels 4, 5A, 6 and 14 designated as MDR/HDR shall be limited to 12 dwelling units per acre;
   iii) Note a minimum 12% recreational open space shall be provided; and
   iv) Note secondary access as Figure #2 of Exhibit S,

6) Clarify under the Consistency with the Surprise Comprehensive Development Guide section, page 7, that the MDR/HDR shall not exceed 12 dwelling units per acre. And eliminate HDR language refering to 22 dwelling units per acre. Be consistent with intent,

7) Building Setbacks, page 15, modify rear yard setback as 20' for MDR/HDR cluster housing,

8) Lot Area and Dimensions, page 17, delete "cluster dwelling unit" category from subparagraph (ii) Required Lot Dimensions,

9) Under LDR Lot Area and Dimensions, (iii) Density, page 17, revise to read except for accessory attached residential unit which shall not be permitted to have a separate kitchen facilities,

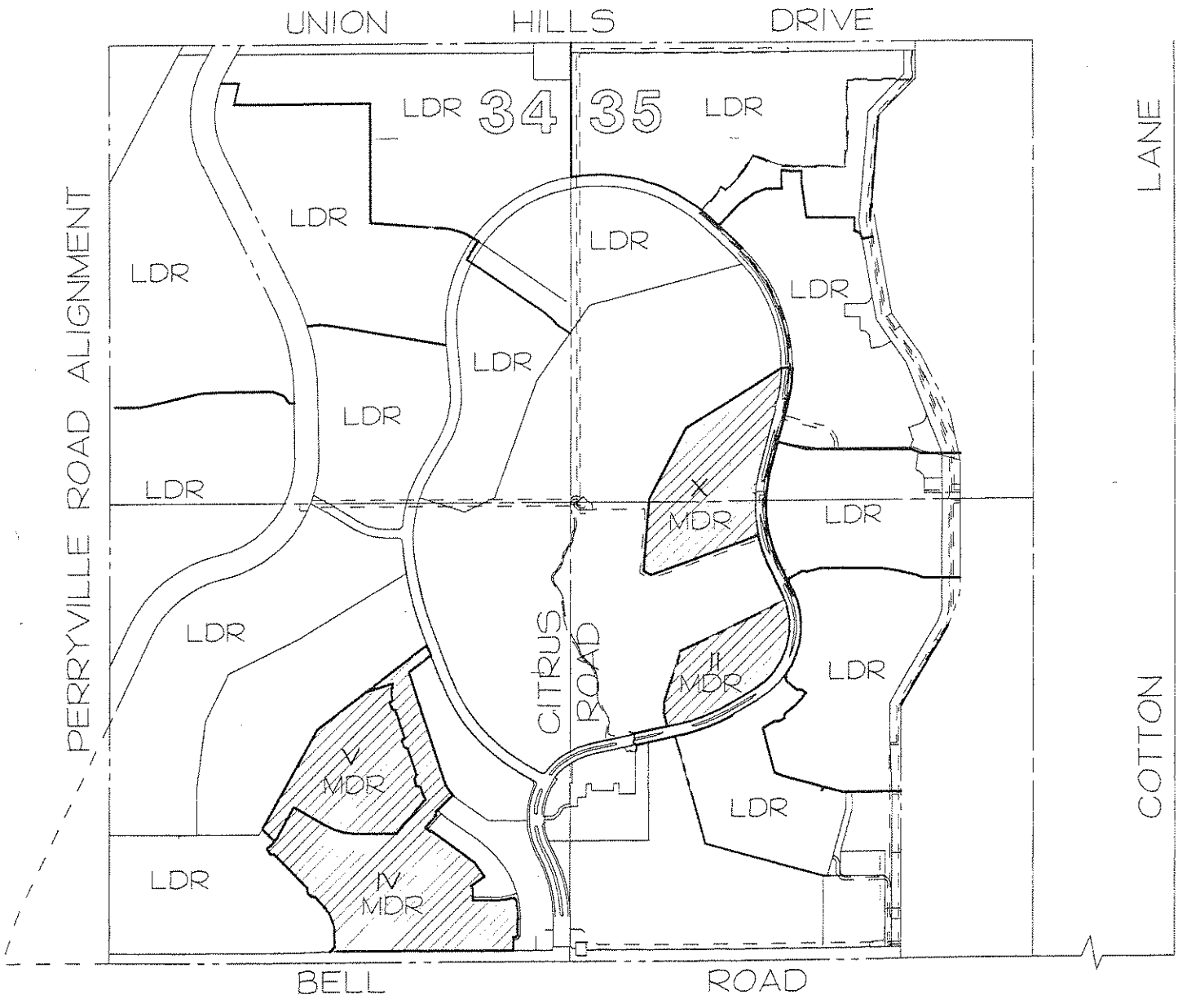
10) MDR/HDR Lot Area and Dimensions, (i) Lot area and dimensions, page 18, delete language of footnote #6 and revise to state maximum density shall not exceed 12 dwelling units per acre,

11) MDR/HDR Lot Area and Dimensions, (iv) Distances Between Buildings, to include language that the minimum separation between any two adjacent principal buildings shall be a distance not less than an amount equal to the height of the taller of the two buildings or twenty (20) feet, which ever is greater on page 19,

12) Specifications and Standards for Streets, Utilities and Services, page 22, shall address construction requirements for Union Hills Drive,

13) Specifications and Standards for Streets, Utilities and Services, page 22, shall note that relocation of the secondary entrance shall require revision to the Traffic Study, and

14) Density Transfer, page 27, shall include language which states that neither the Planning and Zoning Commission nor the City Council shall be required or obligated to approve an increase in the Maximum Density. The Developer agrees to provide the City at the time of platting, notice as to the density assigned to parcel subject to platting.



VICINITY MAP FOR ARIZONA TRADITIONS PARCELS II, IV, V, & X

DATE: Sep. 04, 1998
TIME: 07:
FILE: \590001\land\vicmap.dgn

ARIZONA TRADITIONS
PARCELS II,IV,V, AND X
ALLOCATION OF LAND USES FOR
MINOR P.A.D. AMENDMENT
(MDR RANGE AT 5-10 DU/AC)

PARCEL	ACRES	5 DU/AC ALLOWED	10 DU/AC ALLOWED	PROPOSED UNITS
II	13.9	69.50	139.00	66
IV	21.77	108.85	217.70	84
V	10.662	53.31	106.62	71
X	13.8	69.00	138.00	54
TOTAL	60.132	300.66	601.32	275

NOTE: A RANGE OF 5-10 DU/AC IS ALLOWED FOR THE MDR CATEGORY. THE PROPOSED UNITS COLUMN REFLECTS THE PERMITTED BUILDOUT AT A LOWER DENSITY AS ALLOWED BY THE P.A.D. AND AS SHOWN ON THE FINAL PLATS FOR THOSE PARCELS.

09/04/98

VILLAGES AT Surprise North
PADA 95-41

ORDINANCE NO. 96-09

AN ORDINANCE AMENDING PORTIONS OF THE PLANNED AREA DEVELOPMENT (PAD) WITH PRELIMINARY DEVELOPMENT PLAN (CASE NO. PAD 95-02) PREVIOUSLY APPROVED AND ADOPTED PURSUANT TO CITY OF SURPRISE, ARIZONA, ORDINANCE NO. 95-05 WITH RESPECT TO THE PROPERTY BOUNDED GENERALLY BY BELL ROAD, BEARDSLEY CANAL, UNION HILLS ROAD, AND HAPPY TRAILS GOLF COURSE.

WHEREAS, this Ordinance has been properly noticed for public hearing, pursuant to the requirements of the Surprise Zoning Ordinance and the statutes of the State of Arizona, and the necessary hearings have been completed; and

WHEREAS, on March 27, 1995, the Council of the City of Surprise passed and adopted Ordinance No. 95-05, approving the Planned Area Development with Preliminary Development Plan (Case No. 95-02) for the property known as "Arizona Traditions" (previously known as "The Villages at Surprise-North"), which property is more particularly described in such Ordinance;

WHEREAS, the Council of the City of Surprise now desires to approve the amendment of the foregoing Planned Area Development with Preliminary Development Plan as hereinafter provided;

NOW, THEREFORE, BE IT ORDAINED by the Council of the City of Surprise, Arizona, that:

1. The Planned Area Development with Preliminary Development Plan (Case No. 95-02) approved by the Council of the City of Surprise on March 27, 1995 pursuant to Ordinance No. 95-05 is hereby amended in accordance with the provisions of Exhibit "A" attached hereto and incorporated herein, provided that the property owner comply with stipulations in Exhibit "B".

PASSED AND ADOPTED by the City Council of the City of Surprise, Arizona, this 23rd day of May, 1996.

Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:

City Attorney

YEAS: Mayor Shafer, Vice-Mayor Villanueva, Councilmembers, Broich, Palm, Reafleng & Montoya.

NEAS: Councilmember Johnson absent due to illness.

Exhibits

Exhibit	Description
A	Legal Description
B	Topographical Map (Revised 04-11-96)
C	Zoning Ordinance 17.24.020
D	Zoning Ordinance 17.28.040
E	Zoning Ordinance 17.28.060
F	*No Longer Required*
G	*No Longer Required*
H	Landscape Palette (Revised 12-19-95)
I	Zoning Ordinance 17.36.060 (G)(1)(2)
J	Design Guidelines (12-12-95)
K	Conceptual Single Family Elevations
L	Conceptual Cluster Housing Elevations (Revised 3-24-95)
M	Typical Detail Setbacks (2-20-96)
N	Zoning Ordinance 17.28.010(G)
O	Zoning Ordinance Chapter 17.32
P	Zoning Ordinance 17.28.120
Q	Zoning Ordinance 17.28.130
R	Zoning Ordinance 17.28.050
S	Roadway Cross-Sections (2-20-96)
T	Traffic Report (Revised 7-28-95)
U	Civil Site Plan and Other Plans (Water-Revised 12-30-94) (Sewer-Revised 2-3-95) (Drainage-Revised 6-8-95) and Other Pertinent Approval Correspondence
V	Ordinance No. 17.32.100 and Chapter 15.24
W	Zoning Ordinance 17.36.060(D)(3)(d)
X	Preliminary and Final Development Plan P.A.D. Stipulations

EXHIBIT - A
TO ORDINANCE NO. 96-09

Figures

Figure	Description
1	Site Location Map
2	Aerial Photograph
3	Project Site Map
4	PAD Land Use Plan (Revised 04-11-96)
5	Community Center Conceptual Plan (Revised 2-20-96)
6	Village Entry Conceptual Plan (10-02-95)
7	Secondary Entry Conceptual Plan (10-05-95)
8	Phasing Conceptual Plan (Revised 04-11-96)

EXHIBIT - A
TO ORDINANCE NO. 96-09

Allocation of Land Uses

The proposed allocation of land uses, expressed in acres and as a percentage of the area, is as follows:

SITE DATA

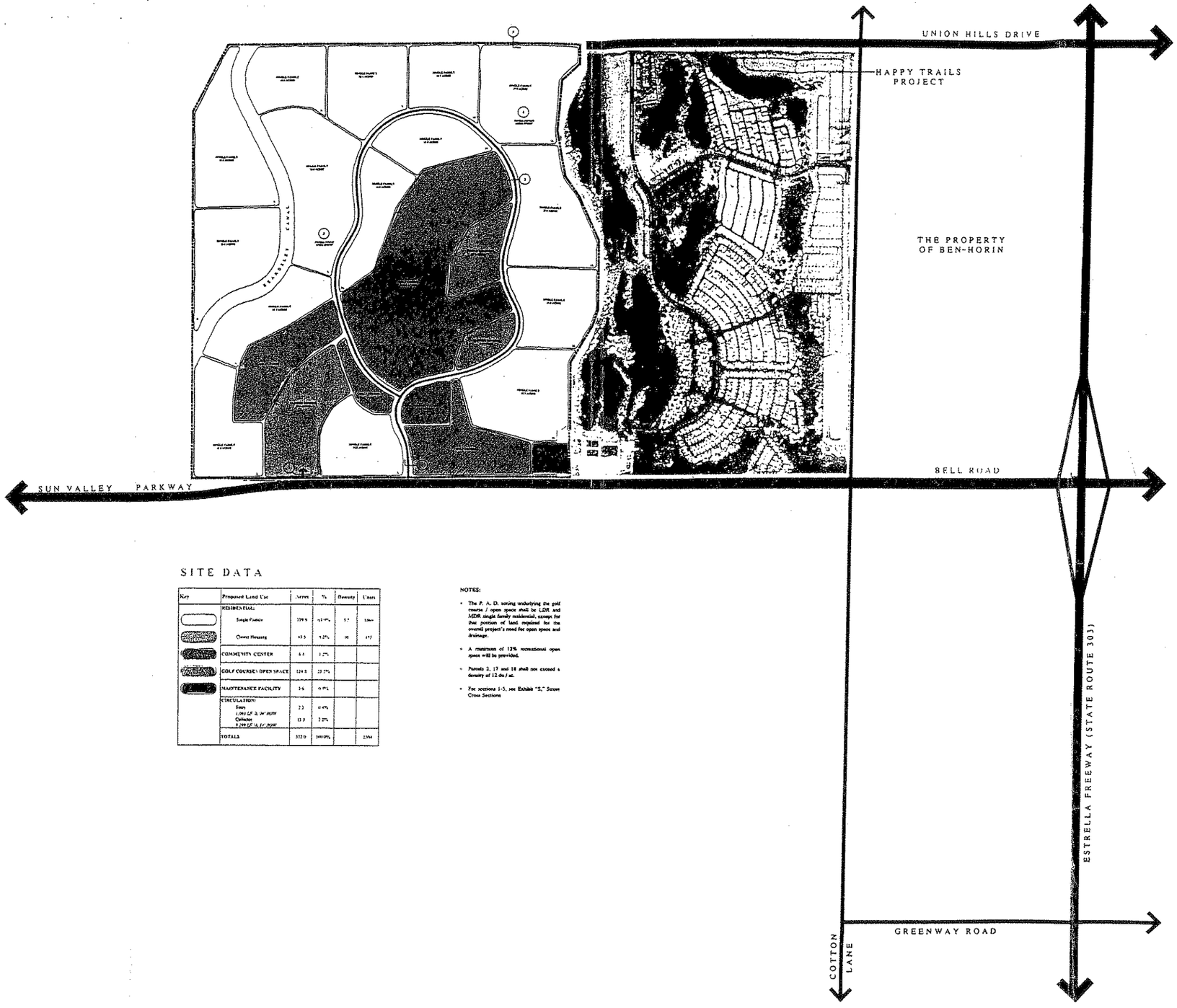
	Use	Acres	%	DU/Acres	Units
*	LDR Single Family	339.9	64.1%	5.5	1869
*	MDR/HDR Cluster Housing	43.5	8.2%	10	435
	TOTAL RESIDENTIAL:	383.4	72.3%		2304
**	Streets				
	Entry	2.3	.4%		
	Loop Road	11.5	2.2%		
***	Community Center	6.4	1.2%		
****	Golf Course/Open Space	124.8	23.2%		
	Maintenance Facility & Water Treatment Plant	3.6	.7%		
	TOTAL PROJECT:	532		4.35	2304

Common Areas

As depicted on the Land Use Plan, a minimum of 12.0% of open space, the majority of which is designated as golf course (with recreational open space alternative), will be provided within the Villages at Surprise-North PAD. Such open space will be maintained by a homeowner's association, private operator and/or one or more maintenance districts.

The golf course/open space is designed to accommodate necessary on-site retention. The golf course/open space feature will provide active and passive recreation opportunities for the community. A community center incorporating

EXHIBIT - A



THE VILLAGES AT SURPRISE

Surprise Village Company

LAND USE PLAN

NORTH

FIGURE 4

SITE DATA

Key	Proposed Land Use	Acres	%	Density	Units
	RESIDENTIAL:				
	Single Family	339.9	[illegible]	5.7	[illegible]
	Cluster Housing	43.5	9.2%	10	[illegible]
	COMMUNITY CENTER	6.4	1.2%		
	GOLF COURSE/ OPEN SPACE	124.8	23.7%		
	MAINTENANCE FACILITY	3.6	0.8%		
	CIRCULATION:				
	Entry 1,093 LF @ 30' RUW	2.2	0.4%		
	Collector 8,299 LF @ 50' RUW	11.9	2.2%		
	TOTALS	532.0	100.0%		2304

NOTES:

- The P. A. D. zoning underlying the golf course / open space shall be LDR and MDR single family residential, except for that portion of land required for the overall project's need for open space and drainage.
- A minimum of 12% recreational open space will be provided.
- Parcels 2, 17 and 18 shall not exceed a density of 12 du / ac.
- For sections 1-5, see Exhibit "S," Street Cross Sections

EXHIBIT - A

TO ORDINANCE NO. 96-09

REVISIONS

#	Date	Comments
1	12/2/93	LDR/MDR/MDR designation, miscellaneous adjustments
2	1/13/93	Reduced golf course size, increased amount of single family
3	2/23/93	Incorporated overlay
4	3/24/93	Incorporated additional notes & sections
5	3/24/93	Adjusted golf course layout & loop road alignment
6	4/11/96	Parcel configuration

0 200 400 800

THE PLANNING CENTER

2525 E. ARIZONA BILTMORE CIRCLE, SUITE 226
PHOENIX, ARIZONA 85016 (602) 957-2218

DATE: NOVEMBER 12, 1994
PROJECT: WCP-42P

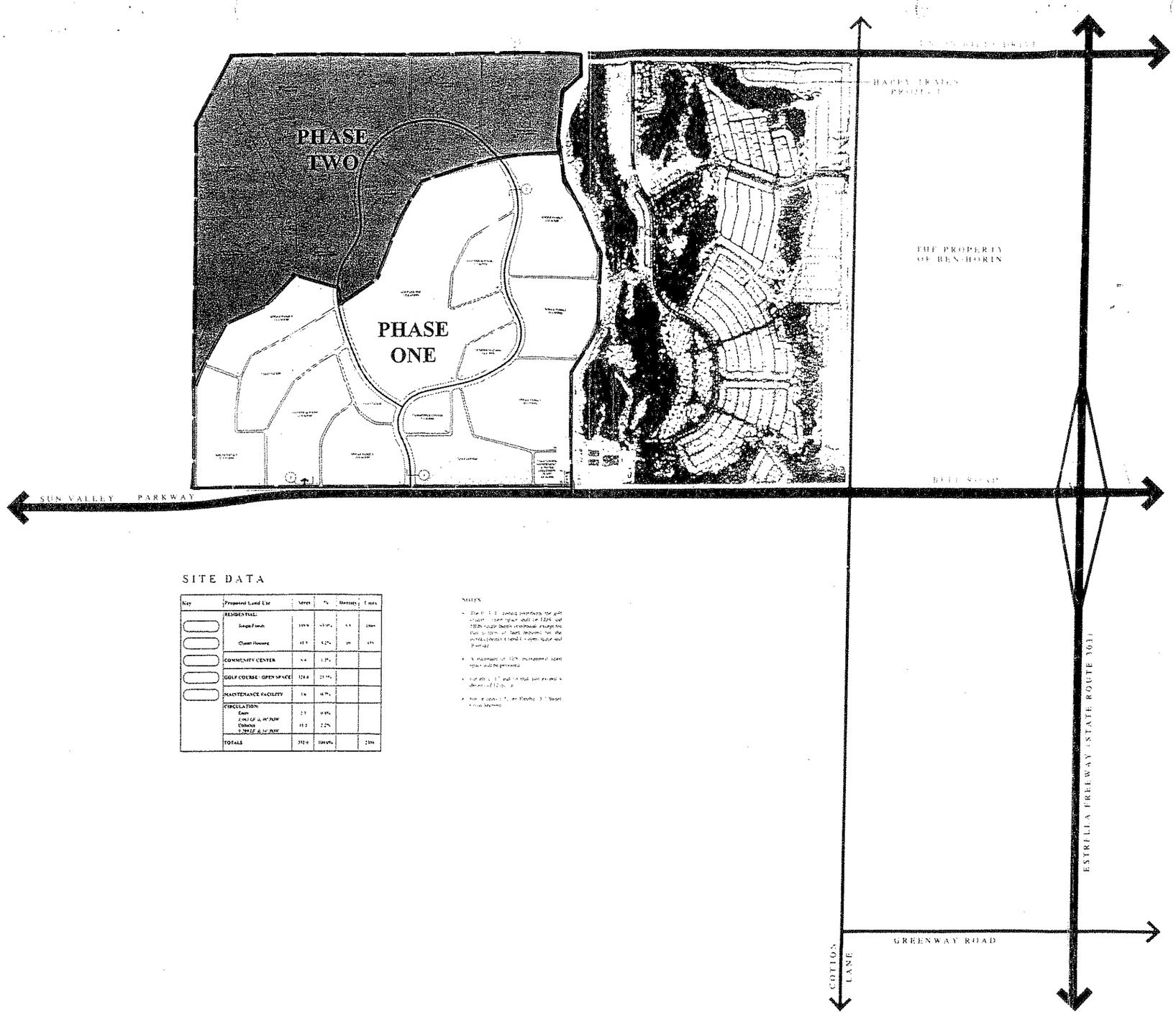
THE VILLAGES AT SURPRISE

Surprise Village Company

PHASING PLAN

NORTH

FIGURE 8



SITE DATA

Key	Proposed Land Use	Acres	%	Density	Units
	RESIDENTIAL:				
	Single Family	309.9	83.9%	4.4	1366
	Guest Housing	10.3	2.8%	20	205
	COMMUNITY CENTER	9.4	2.5%		
	GOLF COURSE / OPEN SPACE	124.8	33.8%		
	MAINTENANCE FACILITY	3.6	0.9%		
	CIRCULATION:				
	Entry 1,043 LF @ 36' ROW	2.3	0.6%		
	Collector 3,264 LF @ 56' ROW	11.2	3.0%		
	TOTALS	352.0	100.0%		1571

NOTES

- The U.S. Forest Service has the right to purchase up to 320 acres of land in Section 36, T3N, R3W, Gila and Salt River Meridian, for the purpose of constructing a ranger station. If the U.S. Forest Service does not exercise its option, the land will be developed as single family residential.
- A maximum of 10% encroachment of open space will be permitted.
- For the 1.7 gallon per minute per acre irrigation allotment, a density of 12 du/ac is assumed.
- For a density of 4.4 du/ac, an Electric 3.5 Single Family lot size is assumed.

PROJECT TIMELINE:

PHASE ONE 1995 - 1998

PHASE TWO 1999 - 2003

EXHIBIT - A

TO ORDINANCE NO. 96-09

REVISIONS		
#	Date	Comments
1	3/23/95	Land Use Base Revisions, Color Version of Phasing Plan
2	5/15/95	Site Data Tables, Land Use Base Revisions, Color Version of Phasing Plan
3	7/27/95	Incorporated overlay
4	9/21/95	Land Use Base Revisions
5	10/26/95	Land Use Base Revisions
6a	4/18/96	Land Use Base Revisions

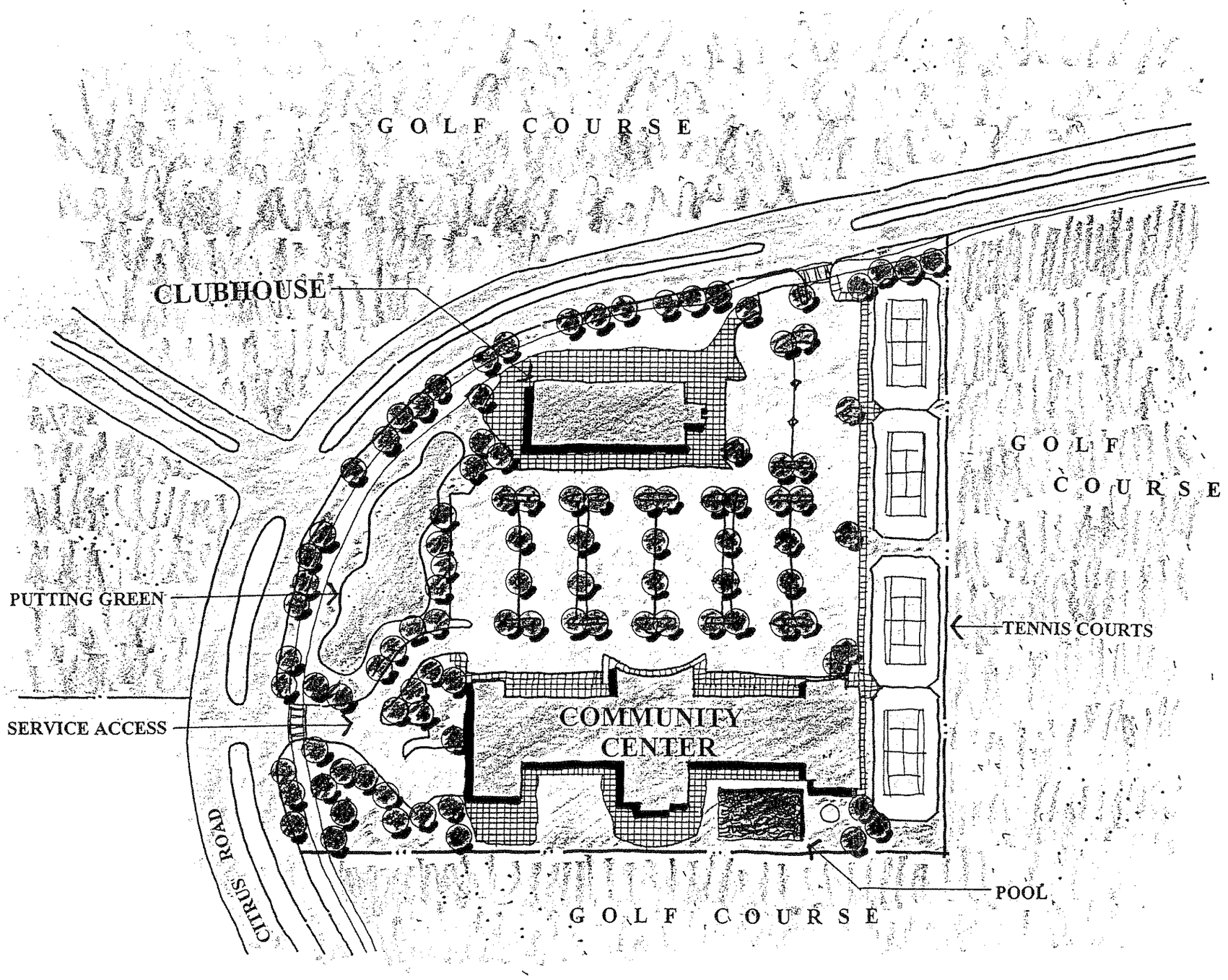
0 200 400 800

THE PLANNING CENTER

2525 E. ARIZONA BILTMORE CIRCLE, SUITE 220
PHOENIX, ARIZONA 85016 (602) 957-7214

DATE: NOVEMBER 22, 1994

PROJECT: WCP-02P



THE VILLAGES AT SURPRISE

Surprise Village Company

CONCEPTUAL COMMUNITY CENTER / CLUBHOUSE

NORTH

FIGURE 5

EXHIBIT - A

TO ORDINANCE NO. 96-09

REVISIONS		
#	Date	Comments
1	02/23/95	Text revisions
2	10/02/95	New site layout & road alignment
3	02/20/96	Revised building & site layout

THE PLANNING CENTER

2525 E. ARIZONA BILTMORE CIRCLE, SUITE 208

ARIZONA TRADITIONS
Surprise Village North

RECOMMENDED PLANT PALETTE

EXHIBIT "H"
(ONE OF TWO)

N O R T H

Botanical Name	Common Name
Trees:	
Acacia aneura	Mulga
Acacia salicina	Willow Acacia
Acacia smallii	Sweet Acacia
Cercidium floridum	Blue Palo Verde
Cercidium praecox	Palo Brea
Chilopsis linearis	Desert Willow
Dalbergia sissoo	Sissoo Tree
Fraxinus velutina 'Rio Grande'	Fan-tex Ash
Jacaranda mimosifolia	Jacaranda
Lysiloma microphylla var. thornberi	Desert Fern
Phoenix dactylifera	Date Palm
Pinus canariensis	Canary Island Pine
Pinus eldarica	Eldarica Pine
Pinus halepensis	Aleppo Pine
Pinus roxburghii	Chir Pine
Pistachia chinensis	Chinese Pistache
Pithecellobium flexicaule	Texas Ebony
Prosopis chilensis	Chilean Mesquite
Prosopis glandulosa	Honey Mesquite
Prosopis juliflora	Native Mesquite
Pyrus calleryana 'Bradford'	Bradford Pear
Ulmus parvifolia	Evergreen Elm
Shrubs:	
Buddleia marrubifolia	Woolly Butterfly Bush
Caesalpinia mexicana	Mexican Bird of Paradise
Caesalpinia pulcherrima	Red Bird of Paradise
Calliandra californica	Baja Fairy Duster
Cassia phyllodenia	Silverleaf Cassia
Convolvulus cneorum	Silverbush Morning Glory
Cordia boissieri	Texas Olive
Cordia parvifolia	Littleleaf Cordia
Dalea frutescens	Black Dalea
Dalea pulchra	Pea Bush
Dodonea viscosa	Green Hopbush
Encelia farinosa	Brittlebush
Justicia spicigera	Mexican Honeysuckle
Leucophyllum frutescens	'Green Cloud' ™
Leucophyllum laevigatum	Chihuahuan Sage
Leucophyllum zygophyllum	'Cimarron' ™
Myrtus communis 'Boetica'	Twisted Desert Myrtle
Nerium oleander 'Petite Pink'	Dwarf Pink
Ruellia peninsularis	Desert Ruellia
Salvia clevelandii	Chaparral Sage
Salvia greggi	Autumn Sage

EXHIBIT - A
TO ORDINANCE NO. 96-0

REVISIONS		
#	Date	Comments
1	12/19/95	Additional Species
2	4/11/96	Additional Species

ARIZONA TRADITIONS
Surprise Village North

RECOMMENDED PLANT PALETTE

EXHIBIT "H"
(TWO OF TWO)

N O R T H

Botanical Name	Common Name
Shrubs:	
Salvia leucantha	Mexican Sage
Simmondsia chinensis	Jojoba
Sphaeralcea ambigua	Globemallow
Tecoma v. stans	Arizona Yellow Bells
Perennials/Groundcover/vines:	
Antigonon leptopus	Queen's Wreath
Baileya multiradiata	Desert Marigold
Bougainvillea sp. 'Barbara Karst'	Barbara Karst Bougainvillea
Dalea capitata	'Sierra Gold'™
Euphorbia rigida	Gopher Plant
Lantana camara	Trailing Yellow Lantana
Lantana montevidensis	Purple Trailing Lantana
Lantana 'New Gold'	'New Gold' Lantana
Mascagnia lilacaena	Purple orchid vine
Penstemon sp.	Penstemon
Verbena pulchella	Rock Verbena
Verbena rigida	Vervain
Accents/Cacti and Succulents:	
Agave vilmoriniana	Octopus Agave
Agave weberi	Smooth Edged Agave
Dasylirion wheeleri	Desert Spoon
Fouquieria splendens	Ocotillo
Hesperaloe parviflora	Red Yucca
Nolina microcarpa	Bear Grass
Opuntia basilaris	Beavertail Prickly Pear
Opuntia ficus-indica	Indian Fig Prickly Pear

EXHIBIT - A
TO ORDINANCE NO. 96-09

REVISIONS		
#	Date	Comments
1	12/19/95	Additional Species
2	4/11/96	Additional Species

amplifier of any kind, may be placed upon or outside, or be directed to the outside, of any building in residential areas in a manner which would be disruptive to any such area.

3. ***Basketball Backboards***

- When a basketball backboard is installed structurally on a building or structure, the backboard must be painted to match the color of the trim or roof.

4. ***Flagpoles***

- Flagpoles shall be limited to a height of 20 feet in residential areas.
- Flagpoles at the project entry shall be permitted to a maximum height of 30 feet subject to Administrative Review and Approval when shown in context with mature adjacent complementary landscape materials.

5. ***Utility and Service Lines***

- No gas, electric, power, telephone, water, sewer, cable television, or other utility or service lines of any nature or kind may be placed, allowed, or maintained upon or above the ground on any lot or parcel, except to the extent, if any, underground placement may be prohibited by law or would prevent the subject line from being functional; provided, however, above ground service pedestals, splice boxes, switch cabinets, and transformers will be permitted where required for public utilities or the landscaping of common areas.

6. ***Clothes Drying Facilities***

- All clothes drying facilities must be located and maintained exclusively within a fenced service yard or otherwise concealed from the view of neighboring or public property.

EXHIBIT - A
TO ORDINANCE No. 96-09

RECOMMENDED LANDSCAPE PALETTE

Botanical Name	*Common Name*
Trees	
Acacia aneura	Mulga
Acacia salicina	Willow Acacia
Acacia smallii	Sweet Acacia
Cercidium floridum	Blue Palo Verde
Cercidium praecox	Palo Brea
Chilopsis linearis	Desert Willow
Dahlbergia sissoo	Sissoo Tree
Fraxinus velutina 'Rio Grande'	Fan-Tex Ash
Jacaranda mimosifolia	Jacaranda
Phoenix dactylifera	Date Palm
Pinus brutia eldarica	Eldarica pine
Pinus canariensis	Canary island pine
Pinus halepensis	Aleppo Pine
Pinus roxburghii	Chir pine
Pistachia chinensis	Chinese pistach
Pithecellobium flexicaule	Texas Ebony
Prosopis chilensis	Chilean Mesquite
Prosopis glandulosa	Honey Mesquite
Prosopis juliflora	Native Mesquite
Pyrus calleryana 'Bradford'	Bradford Pear
Ulmus parvifolia	Evergreen Elm
Shrubs	
Caesalpinia mexicana	Mexican Yellow Bird of Paradise
Caesalpinia pulcherrima	Mexican Red Bird of Paradise
Calliandra californica	Baja Fairyduster
Cassia phyllodenia	Silverleaf Cassia
Convolvulus cneorum	Silverbush Morning Glory
Cordia boissieri	Texas Olive
Cordia parvifolia	Littleleaf Cordia
Dalea frutescens	Black Dalea
Dalea pulchra	Pea Bush
Dodonea Viscosa	Green Hopbush
Justicia californica	Chuparosa
Justicia spicigera	Mexican Honeysuckle
Leucophyllum frutescens 'Green Cloud'	Green Cloud Texas Sage
Leucophyllum laevigatum	Chihuahuan Sage
Myrtus communis 'Boetica'	Twisted Desert Myrtle
Nerium oleander 'Petite Pink'	Dwarf Oleander
Ruellia peninsularis	Baja Ruellia
Simmondsia chinensis	Jojoba
Tecoma stans 'stans'	Arizona Yellowbells

EXHIBIT - A

Botanical Name	*Common Name*
Groundcover/Vines/Perennials	
Bougainvillea sp. 'Barbara Karst'	Barbara Karst Bougainvillea
Lantana camara	Trailing yellow lantana
Lantana montevidensis	Trailing purple lantana
Verbena pulchella	Rock Verbena
Verbena rigida	Vervain
Accents	
Agave vilmoriniana	Octopus Agave
Agave weberi	Smooth Edged Agave
Dasylirion wheeleri	Desert Spoon
Eouquieria splendens	Ocotillo
Hesperaloe parviflora	Red Yucca
Nolina microcarpa	Bear Grass
Opuntia basilaris	Beavertail Prickly Pear

269620

EXHIBIT - A

EXHIBIT - A

THE VILLAGES AT SURPRISE - NORTH

EXHIBIT B

BELL ROAD

REVISED 04/11/96

SINGLE FAMILY
COLLECTOR FRONTAGE

SETBACK NOTES:

Front-Yard Setback:

- All structures shall maintain a front-yard setback of 15', measured from back-of-curb.
- Front-loaded garages shall maintain a 20' setback, measured from back-of-sidewalk. Side-loaded garages shall maintain a 15' setback, measured from back-of-curb.

Side-Yard Setback:

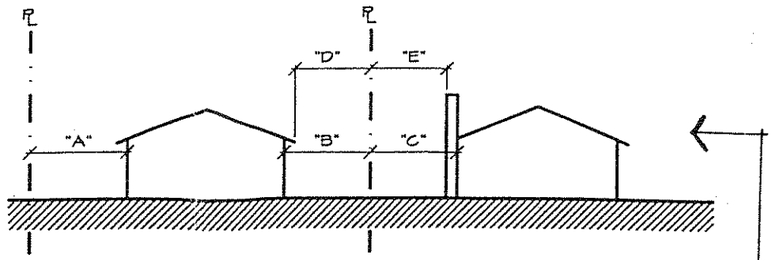
- The total of two side-yards on one lot shall be 10' with no projection closer than 3' to the property line.

Rear-Yard Setback:

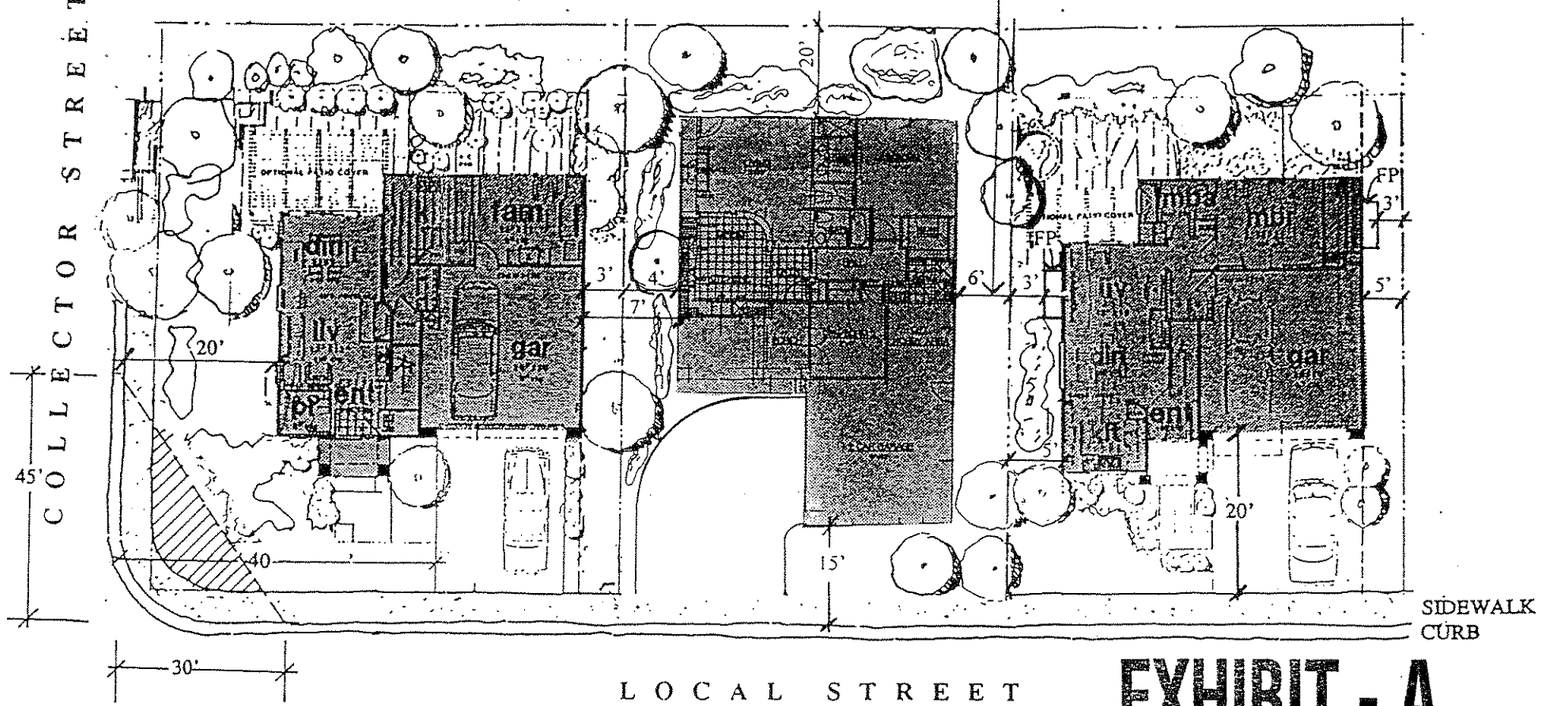
- All structures shall maintain a 20' rear-yard setback, measured from the property line.

Corner Lots:

- Driveways shall be set back a minimum of 40' from the intersection. This distance is measured from back-of-curb at the intersection.
- A sight-triangle shall be maintained as shown, measured from back-of-curb. No structures, walls, vegetation, or other obstacles may exceed 30 inches in height.
- Corner lots shall maintain a 20' setback from adjacent collector street edges, measured from back-of-curb.



"A" + "B" = 10'
"B" + "C" ≥ 7'
"D" ≥ 3'
"E" ≥ 3'



ARIZONA TRADITIONS
Surprise Village North

SETBACK EXHIBIT

EXHIBIT "M"
(ONE OF FIVE)

N O R T H

EXHIBIT - A
TO ORDINANCE NO. 96-09

REVISIONS		
#	Date	Comments
1	02/15/95	Visibility triangles; text revisions
2	02/23/95	Text revisions
3	03/24/95	Front / rear / interior designations
4	05/15/95	Additional setback notes
5	10/02/95	Swing-garage plan; setback notes
6	12/19/95	Additional exhibit + dimensions
7	2/20/96	Revised flag lot exhibit (5/5)

SINGLE FAMILY
INTERNAL

SETBACK NOTES:

Front-Yard Setback:

- All structures shall maintain a front-yard setback of 15', measured from back-of-curb.
- Front-loaded garages shall maintain a 20' setback, measured from back-of-sidewalk. Side-loaded garages shall maintain a 15' setback, measured from back-of-curb.

Side-Yard Setback:

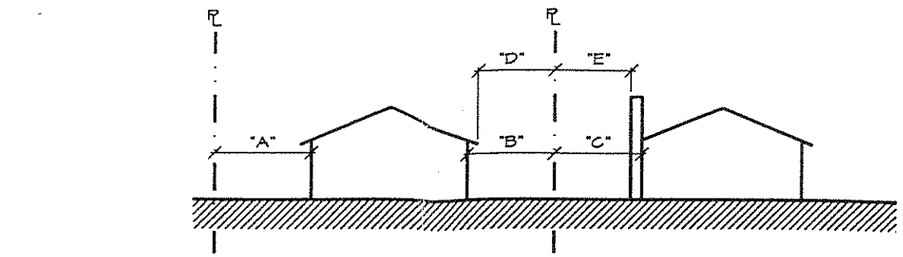
- The total of two side-yards on one lot shall be 10;' with no projection closer than 3' to the property line.

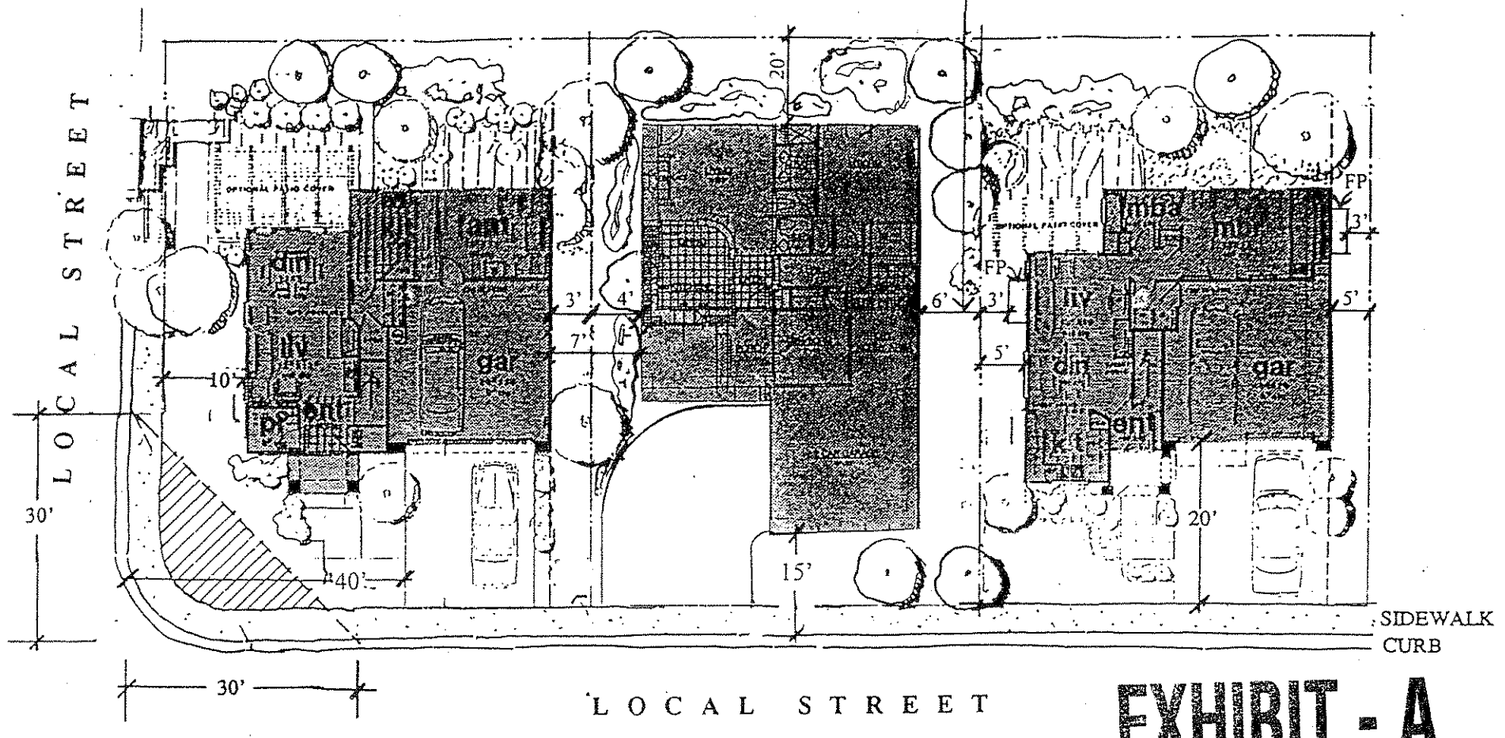
Rear-Yard Setback:

- All structures shall maintain a 20' rear-yard setback, measured from the property line.

Corner Lots:

- Driveways shall be set back a minimum of 40' from the intersection. This distance is measured from back-of-curb at the intersection.
- A sight-triangle shall be maintained as shown, measured from back-of-curb. No structures, walls, vegetation, or other obstacles may exceed 30 inches in height.
- Corner lots shall maintain a 10' setback from adjacent local street edges, measured from property line.





ARIZONA TRADITIONS
Surprise Village North

SETBACK EXHIBIT

EXHIBIT "M"
(TWO OF FIVE)

NORTH

EXHIBIT - A
TO ORDINANCE NO. 96-09

REVISIONS		
#	Date	Comments
1	02/15/95	Visibility triangles; text revisions
2	02/23/95	Text revisions
3	03/24/95	Front / rear / interior designations
4	05/15/95	Additional setback notes
5	10/02/95	Swing-garage plan; setback notes
6	12/19/95	Additional exhibit - dimensions
7	2/20/96	Revised flag lot exhibit (5/5)

CLUSTER HOUSING
INTERNAL

SETBACK NOTES:

Front-Yard Setback:

- All structures shall maintain a front-yard setback of 10', measured from back-of-sidewalk.
- Side-loaded garages shall maintain a 15' setback from face of garage to property line.
- Per this example, only one-half of the common drive (private) is shown. Actual clear space for vehicle movement is 30'.
- No driveways shall be less than 20' and none shall obstruct pedestrian movement.
- Garages loaded directly onto local or collector streets shall maintain a 20' setback from back-of-sidewalk.

Side-Yard Setback:

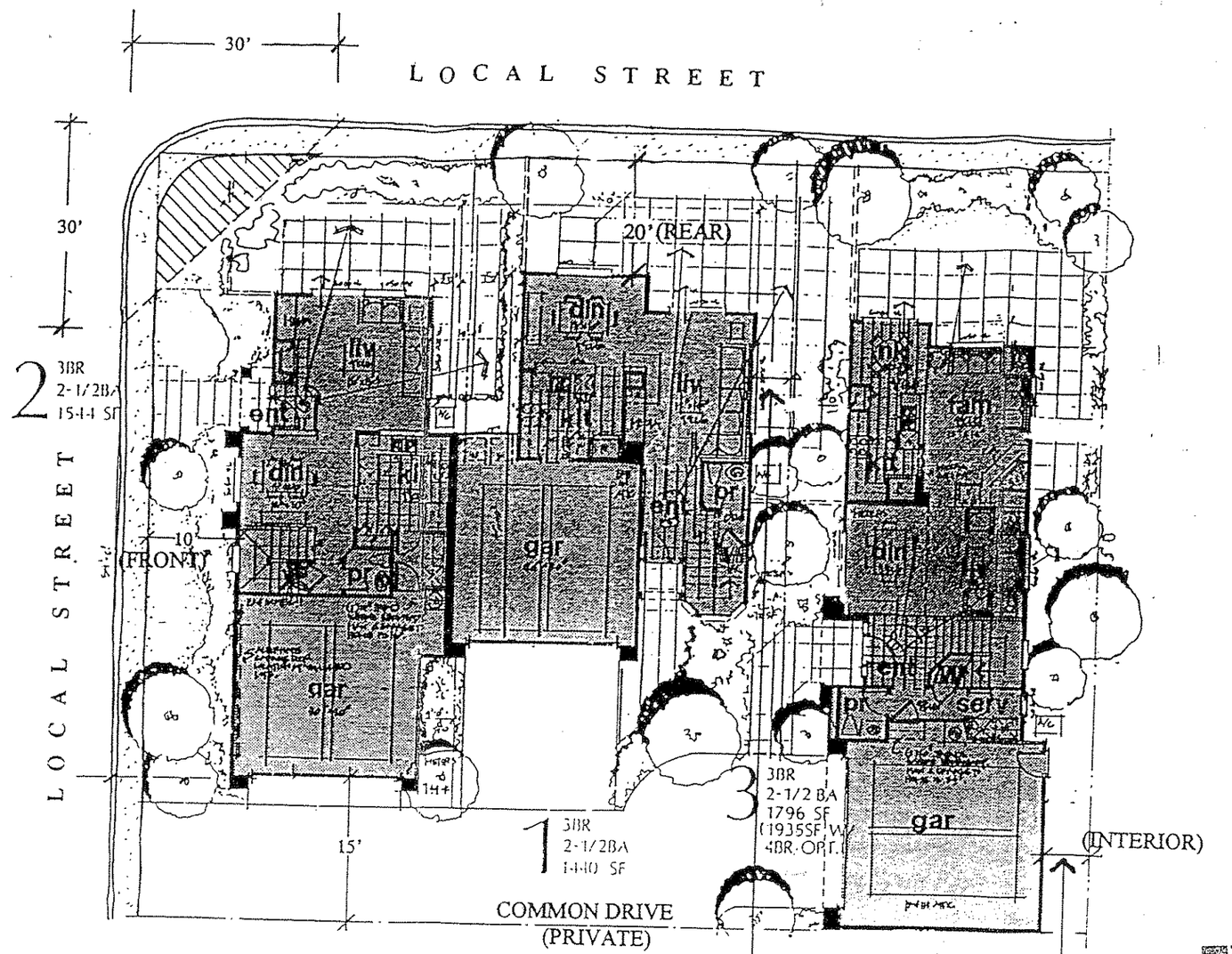
- The total of two side-yards on one lot shall be 10' with no projection closer than 3' to the property line.

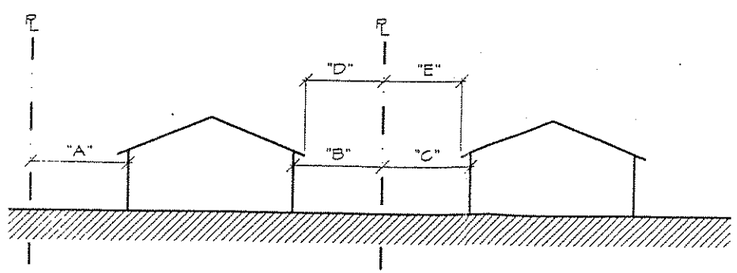
Rear-Yard Setback:

- All structures shall maintain a 20' rear-yard setback, measured from the property line.

Corner Lots:

- Driveways shall be set back a minimum of 40' from the intersection. This distance is measured from back-of-curb at the intersection.
- A sight-triangle shall be maintained as shown, measured from back-of-curb. No structures, walls, vegetation, or other obstacles may exceed 30 inches in height.
- Corner lots shall maintain a 10' setback from adjacent local street edges, measured from back-of-sidewalk.





"A" + "B" = 10'
"B" + "C" ≥ 7'
"D" ≥ 3'
"E" ≥ 3'

ARIZONA TRADITIONS
Surprise Village North

SETBACK EXHIBIT

EXHIBIT "M"
(FOUR OF FIVE)

NORTH

EXHIBIT - A
TO ORDINANCE NO. 96-09

REVISIONS		
#	Date	Comments
1	02/15/95	Visibility triangles; text revisions
2	02/23/95	Text revisions
3	03/24/95	Front / rear / interior designations
4	05/15/95	Additional setback notes
5	10/02/95	Swing-garage plan; setback notes
6	12/19/95	Additional exhibit + dimensions
7	2/20/96	Revised flag lot exhibit (5/5)

CLUSTER HOUSING
COLLECTOR FRONTAGE

SETBACK NOTES:

Front-Yard Setback:

- All structures shall maintain a front-yard setback of 10', measured from back-of-sidewalk.
- Side-loaded garages shall maintain a 15' setback from face of garage to property line.
- Per this example, only one-half of the common drive (private) is shown. Actual clear space for vehicle movement is 30'.
- No driveways shall be less than 20' and none shall obstruct pedestrian movement.
- Garages loaded directly onto local or collector streets shall maintain a 20' setback from back-of-sidewalk.

Side-Yard Setback:

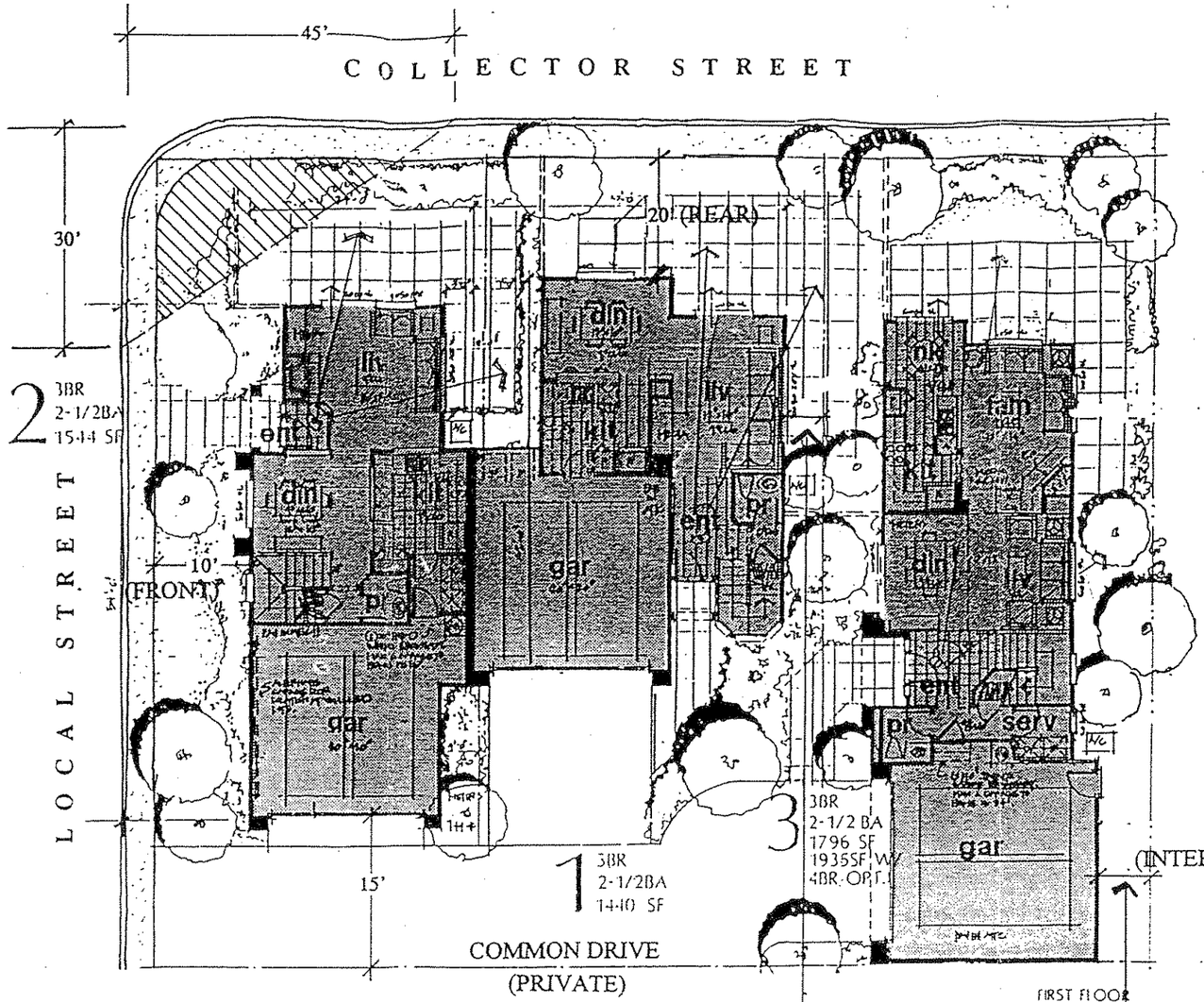
- The total of two side-yards on one lot shall be 10' with no projection closer than 3' to the property line.

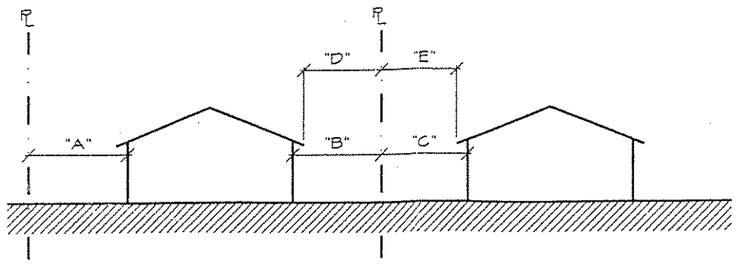
Rear-Yard Setback:

- All structures shall maintain a 20' rear-yard setback, measured from the property line.

Corner Lots:

- Driveways shall be set back a minimum of 40' from the intersection. This distance is measured from back-of-curb at the intersection.
- A sight-triangle shall be maintained as shown, measured from back-of-curb. No structures, walls, vegetation, or other obstacles may exceed 30 inches in height.
- Corner lots shall maintain a 20' setback from adjacent collector street edges, measured from back-of-curb.





"A" + "B" = 10'
"B" + "C" ≥ 7'
"D" ≥ 3'
"E" ≥ 3'

ARIZONA TRADITIONS
Surprise Village North

SETBACK EXHIBIT

EXHIBIT "M"
(THREE OF FIVE)

NORTH

EXHIBIT - A
TO ORDINANCE NO. 96-09

REVISIONS		
#	Date	Comments
1	02/15/95	Visibility triangles; text revisions
2	02/23/95	Text revisions
3	03/24/95	Front / rear / interior designations
4	05/15/95	Additional setback notes
5	10/02/95	Swing-garage plan; setback notes
6	12/19/95	Additional exhibit - dimensions
7	2/20/96	Revised flag lot exhibit (5/5)

SINGLE FAMILY
FLAG LOT DETAIL

Flag or Panhandle Lot: A lot where the only vehicular access to the lot is by way of a corridor or vehicular accessway which is less than thirty (30) feet wide and more than forty (40) feet long.

Flag lots or panhandle lots shall be permitted so long as it can be demonstrated that the lots will have adequate access to a dedicated roadway and adequate public utility service, subject to the following requirements:

a. The maximum length of the flag or panhandle portion of the lot shall be one hundred (100) feet, provided that by joint approval, the community development director and the fire chief may grant a limited exception allowing a maximum length of not more than one hundred and fifty (150) feet for special circumstances.

b. Each flag or panhandle portion of the lot shall be not less than twenty (20) feet wide and shall have a driveway minimum of sixteen (16) feet in width.

c. That portion of the flag lot which provides access to adjacent lots shall be dedicated as a vehicular access and public utility easement and shall be restricted to no parking. No more than two (2) lots may have access from the panhandle or flag portion of a lot.

d. Lots shall have a twenty (20) foot minimum driveway depth exclusive of the sixteen (16) foot access drive.

e. Fire hydrants shall be required on or near such flag or panhandle lots.

f. Building "A" shall be set back a minimum of twenty (20) feet from the front property line. Building "B" shall be set back a minimum of forty (40) feet from the property line. Rear and side setbacks will be consistent with the adjacent lots (see accompanying exhibits).

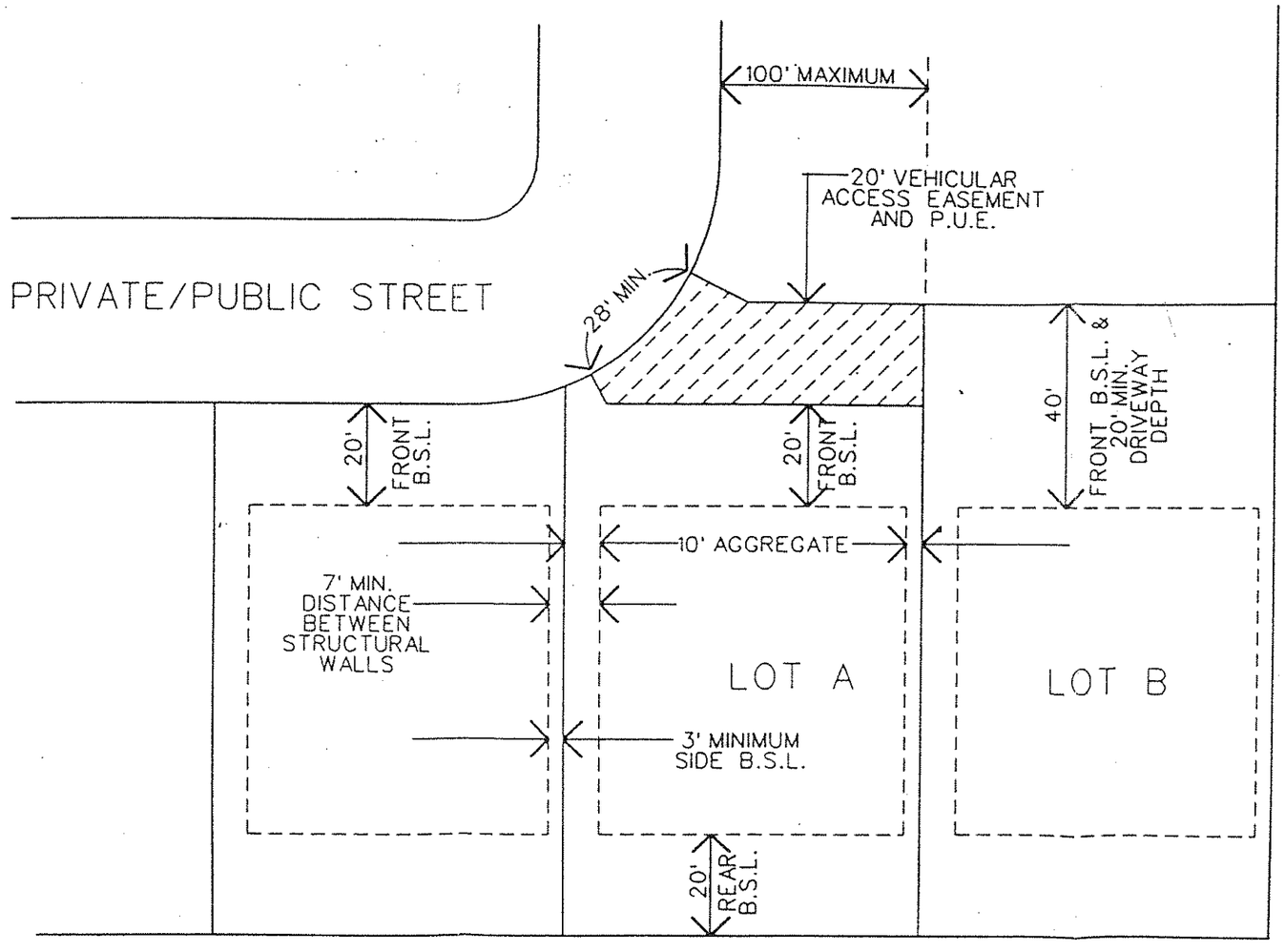
g. No swing garages are allowed on flag lots or a condition that would require the owner to back out of the entire distance of access drive.

h. Trash containers and mailboxes to be located adjacent to dedicated street frontage.

i. Landscaped areas on the flag or panhandle portion of the lot will be maintained by and be the responsibility of the flag lot owner.

j. The area of the panhandle on which driveways are located shall not be included in the required lot area.

k. Rights-of-way and easements must be clearly defined.



ARIZONA TRADITIONS
Surprise Village North

SETBACK EXHIBIT

EXHIBIT "M"
(FIVE OF FIVE)

NORTH

EXHIBIT - A
TO ORDINANCE NO. 96-09

REVISIONS		
#	Date	Comments
1	02/15/95	Visibility triangles; text revisions
2	02/23/95	Text revisions
3	03/24/95	Front / rear / interior designations
4	05/15/95	Additional setback notes
5	10/02/95	Swing-garage plan; setback notes
6	12/19/95	Additional exhibit + dimensions
7	2/20/96	Revised flag lot exhibit (5/5)

April 9, 1996
Job No. 931007

CLOUSE ENGINEERING, INC.
ENGINEERS AND SURVEYORS
3815 NORTH 32ND STREET PHOENIX, ARIZONA 85018
TEL. 955-4690 FAX 955-0797

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
4369
ANSON B.
POTTER
Date Signed 4/10/96
ARIZONA, U.S.A.

EXHIBIT "A"

LEGAL DESCRIPTION

ARIZONA TRADITIONS GROSS

That part of the E.½ Section 34, and the W.½ Section 35, T. 4 N., R. 2W., G. & S. R. B. & M., Maricopa County, Arizona, described as follows:

Beginning at the Southeast corner of the said E.½ Section 34; thence S. 89° 57' 40" W. 2638.10 feet to the Southwest corner of the said E.½ Section 34; thence N. 00° 02' 02" E. 2639.53 feet to the center of the said Section 34; thence continuing N. 00° 02' 02" E. along the West line of the said E.½ Section 34, a distance of 1843.95 feet to a point on the right-of-way line of Parcel 11-C Trilby Wash Project as shown in Book 63 of Maps, Page 31, M.C.R., this corner being Southerly 789.30 feet from the Northwest corner of the said E.½ Section 34; thence N. 28° 16' 53" E. along the said right-of-way line of Trilby Wash, a distance of 896.76 feet to a point on the North line of the said E.½ Section 34, this point being Easterly 424.42 feet from the Northwest corner of the said E.½ Section 34; thence N. 89° 56' 36" E. along the North line of the said E.½ Section 34, a distance of 2003.35 feet to a point 208.00 feet Westerly from the Northeast corner of the said E.½ Section 34; thence S. 00° 01' 04" W. 208.00 feet; thence N. 89° 56' 36" E. parallel to the North line of the said E.½ Section 34, a distance of 208.00 feet to a point on the East line of the said Section 34; thence N. 00° 01' 04" E. along the said East line a distance of 208.00 feet to the Northeast corner of the said E.½ Section 34, this corner also being the Northwest corner of the said W.½ Section 35; thence N. 89° 57' 49" E. along the North line of the said W.½ Section 35, a distance of 1975.68 feet, this point lying Westerly 666.00 feet from the Northeast corner of the said W.½ Section 35; thence S. 00° 00' 39" W. 215.00 feet; thence S. 45° 00' 39" W. 300.00 feet; thence S. 05° 00' 39" W. 484.09 feet; thence S. 09° 59' 22" E. 660.31 feet; thence S. 34° 59' 22" E. 290.87 feet; thence S. 25° 23' 16" E. 382.02 feet; thence S. 12° 31' 09" E. 271.18 feet; thence

EXHIBIT - A
TO ORDINANCE NO. 96-09

S. 00° 20' 58" W. 770.00 feet; thence S. 19° 25' 45" W. 193.43 feet; thence S. 30° 00' 39" W. 530.00 feet; thence S. 00° 00' 39" W. 1380.43 feet; thence S. 00° 18' 43" E. 65.00 feet to a point on the South line of the said W.½ Section 35, this point lying Westerly 749.65 feet from the Southeast corner of the said W.½ Section 35; thence S. 89° 41' 17" W. along the South line of the said W.½ Section 35, a distance of 1891.88 feet to the point of beginning, subject to easements and rights-of-way of record.

Note: The above described parcel contains 24,053,289 square feet or 552.1875 acres.

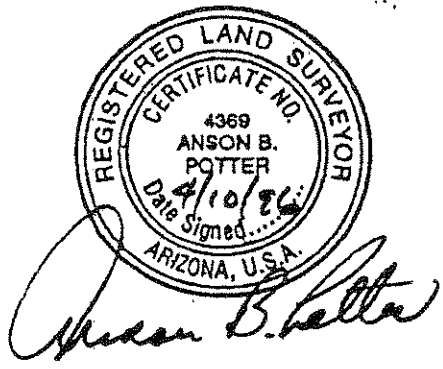


EXHIBIT - A
TO ORDINANCE NO. 96-09

EXHIBIT "J"

The Villages at Surprise-North

A Planned Residential Development

DESIGN GUIDELINES

February 16, 1995
Revised February 23, 1995
Revised March 29, 1995
Revised April 11, 1996

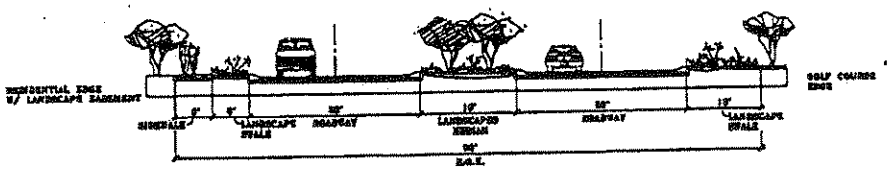
EXHIBIT - A
TO ORDINANCE NO. 96-0

ARIZONA
TRADITIONS
Surprise Village North

MINIMUM STREET CROSS SECTIONS

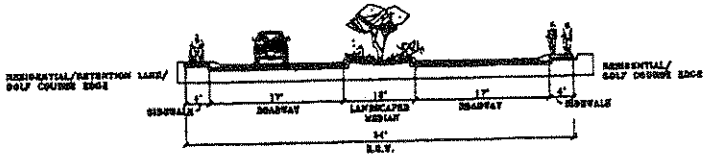
EXHIBIT "S"

N O R T H



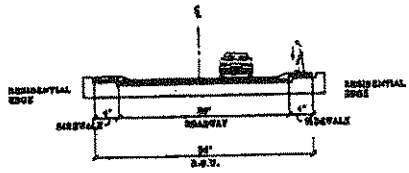
(1.) Main Entry Drive

NOTES:
1. Final roadway cross section and R.O.W. width.



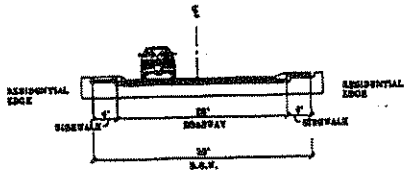
(2.) Typical Loop Road of Secondary Entrance

NOTES:
1. Final roadway cross section and R.O.W. width.



(3.) Typical Public Local Street

NOTES:
1. Final roadway cross section and R.O.W. width.
2. Parking on one side typically for this section.



(4.) Typical Private Local Street

NOTES:
1. Final roadway cross section and R.O.W. width.

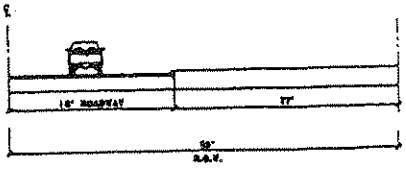


EXHIBIT - A

TO ORDINANCE NO. 96-09

REVISIONS		
#	Date	Comments
1	12/7/94	Roadway widths
2	2/15/95	Roadway dimension change
3	02/23/95	Roadway dimension change
4	03/24/95	Roadway widths: notes
5	10/02/95	Roadway dimensions: notes
6	12/19/95	Landscape character; notes
7	02/20/96	Exhibit title

THE PLANNING CENTER
2525 E. ARIZONA BILTMORE CIRCLE SUITE 236
PHOENIX, ARIZONA 85016 (602) 957-1214

RECOMMENDATION: (PADA95-41)

Subject request is consistent with the proposed Surprise Comprehensive Development Guide. Furthermore, approval of this request would allow for a timely, efficient and orderly development of the Village at Surprise - North (Arizona Traditions) Planned Area Development. Additionally, approval of this request will not adversely impact the surrounding area. Accordingly, it is **recommended** that this request, a Planned Area Development - Amendment (Application No. PADA95-41), **be approved** subject to the following stipulations:

a) Major changes to the Planned Area Development - Amendment with regards to use and intensity, must be processed as a revised application with approval by the City Council upon recommendation by the Planning and Zoning Commission. Minor changes may be administratively approved by the City Manager and the Planning and Zoning Department,

b) The Landscape Master Plan must be approved by the Community Development Director,

c) All stipulations approved for the previous PAD 95-02 must be adhered to,

d) Submission of six (6) copies of the revised Planned Area Development with Preliminary Development Plan revised as necessary to comply with these approved stipulations prior to approval of any further applications or permits and to incorporate all the data and information regarding the overall project, within 30 days from date of Council approval.

EXHIBIT "B"

TO ORDINANCE NO. 96 - 09

CITY OF SURPRISE
COUNCIL AGENDA ACTION FORM

__X__ Regular Meeting
___ Special Meeting
___ Workshop

MEETING SCHEDULED
Time: 7:00 p.m.
Date: 05/23/96

Agenda Item:#2 **OLD BUSINESS (CONSENT ITEM)** **X Consent Agenda** **_ Regular Agenda**

Ordinance No. 96-09 (Second Reading)

Title: **SECOND READING - Ordinance No. 96-09; Consideration and action to approve a second reading of Ordinance No. 96-09. An Ordinance amending portions of the Planned Area Development (PAD) with preliminary development plan (Case No. 95-02) previously approved and adopted persuant to City of Surprise Ordinance No. 95-05 with respect to the property bounded generally by Bell Road, Beardsley Canal, Union Hills Road and Happy Trails Golf Course.**

Requested By: **Community Development Dept.**
Action Requested: **Council Approval of Ordinance No.** 96-09
Attached: **Copy of Ordinance No. 96-09**
Exhibit A

Comments:

Fiscal Impact: _____ Budgeted ___ Not Budgeted

Finance Dir. (initial)_____

City Manager's Recommendation:_____ Approve ___ Disapprove ___ None

Council Action:

Motion/ Second	Councillor's ,Name	Vote	Results:
_____	Shafer	_____	Votes: For ____Against ____
_____	Villanueva	_____	Abstained _____
_____	Broich	_____	Passed_____ Failed _____
_____	Johnson	_____	
_____	Montoya	_____	
_____	Palm	_____	
_____	Reafleng	_____	

Legend: Motion-M, Second-S, Yes-Y, No-N, Abstain-A, Absent-X

April 9, 1996
Job No. 931007

CLOUSE ENGINEERING, INC.
ENGINEERS AND SURVEYORS
3815 NORTH 32ND STREET PHOENIX, ARIZONA 85018
TEL. 955-4690 FAX 955-0797

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
4369
ANSON B.
POTTER
Date Signed 4/10/96
ARIZONA, U.S.A.

EXHIBIT "A"

LEGAL DESCRIPTION

ARIZONA TRADITIONS GROSS

That part of the E.½ Section 34, and the W.½ Section 35, T. 4 N., R. 2W., G. & S. R. B. & M., Maricopa County, Arizona, described as follows:

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EXHIBIT - A
TO ORDINANCE NO. 96-09

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Note: The above described parcel contains 24,053,289 square feet or 552.1875 acres.

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
4369
ANSON B.
POTTER
Date Signed 4/10/96
ARIZONA, U.S.A.

Anson B. Potter

EXHIBIT - A
TO ORDINANCE NO. 96-09

EXHIBIT "J"

The Villages at Surprise-North

A Planned Residential Development

DESIGN GUIDELINES

February 16, 1995
Revised February 23, 1995
Revised March 29, 1995
Revised April 11, 1996

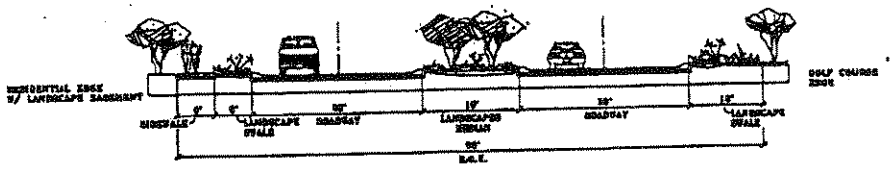
EXHIBIT - A
TO ORDINANCE NO. 96-0

ARIZONA
TRADITIONS
Surprise Village North

MINIMUM STREET CROSS SECTIONS

EXHIBIT "S"

N O R T H



1. Main Entry Drive

NOTES:
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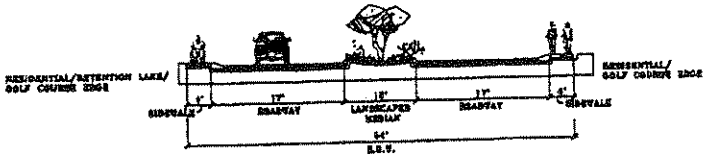

2. Typical Loop Road of Secondary Entrance

NOTES:
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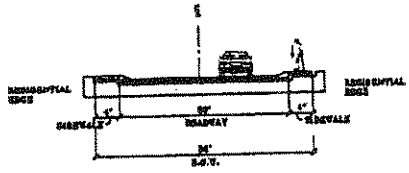

3. Typical Public Local Street

NOTES:
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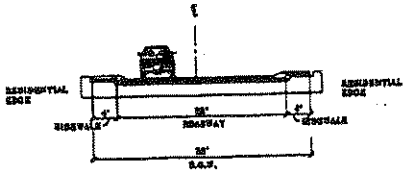

4. Typical Private Local Street

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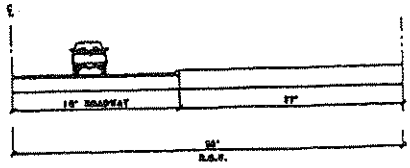

EXHIBIT - A

TO ORDINANCE NO. 96-09

REVISIONS		
#	Date	Comments
1	12/7/94	Roadway widths
2	2/15/95	Roadway dimension change
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6	12/19/95	Landscape character; notes
7	02/20/96	Exhibit title

THE PLANNING CENTER
2525 E. ARIZONA BILTMORE CIRCLE SUITE 236
PHOENIX, ARIZONA 85016 (602) 957-2216

RECOMMENDATION: (PADA95-41)

Subject request is consistent with the proposed Surprise Comprehensive Development Guide. Furthermore, approval of this request would allow for a timely, efficient and orderly development of the Village at Surprise - North (Arizona Traditions) Planned Area Development. Additionally, approval of this request will not adversely impact the surrounding area. Accordingly, it is **recommended** that this request, a Planned Area Development - Amendment (Application No. PADA95-41), **be approved** subject to the following stipulations:

a) Major changes to the Planned Area Development - Amendment with regards to use and intensity, must be processed as a revised application with approval by the City Council upon recommendation by the Planning and Zoning Commission. Minor changes may be administratively approved by the City Manager and the Planning and Zoning Department,

b) The Landscape Master Plan must be approved by the Community Development Director,

c) All stipulations approved for the previous PAD 95-02 must be adhered to,

d) Submission of six (6) copies of the revised Planned Area Development with Preliminary Development Plan revised as necessary to comply with these approved stipulations prior to approval of any further applications or permits and to incorporate all the data and information regarding the overall project, within 30 days from date of Council approval.

EXHIBIT "B"

TO ORDINANCE NO. 96 - 09

CITY OF SURPRISE
COUNCIL AGENDA ACTION FORM

_X_ Regular Meeting
___ Special Meeting
___ Workshop

MEETING SCHEDULED
Time: 7:00 p.m.
Date: 05/23/96

Agenda Item:#2 **OLD BUSINESS (CONSENT ITEM)** **X Consent Agenda _ Regular Agenda**

Ordinance No. 96-09 (Second Reading)

Title: **SECOND READING - Ordinance No. 96-09; Consideration and action to approve a second reading of Ordinance No. 96-09. An Ordinance amending portions of the Planned Area Development (PAD) with preliminary development plan (Case No. 95-02) previously approved and adopted persuant to City of Surprise Ordinance No. 95-05 with respect to the property bounded generally by Bell Road, Beardsley Canal, Union Hills Road and Happy Trails Golf Course.**

Requested By: **Community Development Dept.**
Action Requested: **Council Approval of Ordinance No.** 96-09
Attached: **Copy of Ordinance No. 96-09**
Exhibit A

Comments:

Fiscal Impact: _____ Budgeted ___ Not Budgeted

Finance Dir. (initial)_____

City Manager's Recommendation:_____Approve ___ Disapprove ___ None

Council Action:

Motion/ Second	Councillor's ,Name	Vote
_____	Shafer	_____
_____	Villanueva	_____
_____	Broich	_____
_____	Johnson	_____
_____	Montoya	_____
_____	Palm	_____
_____	Reafleng	_____

Results:
Votes: For ____Against ____
Abstained _____
Passed_____ Failed _____

Legend: Motion-M, Second-S, Yes-Y, No-N, Abstain-A, Absent-X

CITY OF SURPRISE
PLANNING AND ZONING DEPARTMENT
A P P R O V E D

Case No.: PADA 95-041

P&Z Comm. Approval: _____

City Council Approval: 5/23/1996

B.O.A. Approval: _____

Stipulations: _____

VILLAGES AT Surprise
PADA 95-41 North

ORDINANCE NO. 96-09

AN ORDINANCE AMENDING PORTIONS OF THE PLANNED AREA DEVELOPMENT (PAD) WITH PRELIMINARY DEVELOPMENT PLAN (CASE NO. PAD 95-02) PREVIOUSLY APPROVED AND ADOPTED PURSUANT TO CITY OF SURPRISE, ARIZONA, ORDINANCE NO. 95-05 WITH RESPECT TO THE PROPERTY BOUNDED GENERALLY BY BELL ROAD, BEARDSLEY CANAL, UNION HILLS ROAD, AND HAPPY TRAILS GOLF COURSE.

WHEREAS, this Ordinance has been properly noticed for public hearing, pursuant to the requirements of the Surprise Zoning Ordinance and the statutes of the State of Arizona, and the necessary hearings have been completed; and

WHEREAS, on March 27, 1995, the Council of the City of Surprise passed and adopted Ordinance No. 95-05, approving the Planned Area Development with Preliminary Development Plan (Case No. 95-02) for the property known as "Arizona Traditions" (previously known as "The Villages at Surprise-North"), which property is more particularly described in such Ordinance;

WHEREAS, the Council of the City of Surprise now desires to approve the amendment of the foregoing Planned Area Development with Preliminary Development Plan as hereinafter provided;

NOW, THEREFORE, BE IT ORDAINED by the Council of the City of Surprise, Arizona, that:

1. The Planned Area Development with Preliminary Development Plan (Case No. 95-02) approved by the Council of the City of Surprise on March 27, 1995 pursuant to Ordinance No. 95-05 is hereby amended in accordance with the provisions of Exhibit "A" attached hereto and incorporated herein, provided that the property owner comply with stipulations in Exhibit "B".

PASSED AND ADOPTED by the City Council of the City of Surprise, Arizona, this 23rd day of May, 1996.

Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:

City Attorney

YEAS: Mayor Shafer, Vice-Mayor Villanueva, Councilmembers, Broich, Palm, Reafleng & Montoya.

NEAS: Councilmember Johnson absent due to illness.

WHEN RECORDED RETURN TO:

Fennemore Craig
Two North Central Avenue
Suite 2200
Phoenix, Arizona 85004
Attn: Lesa J. Storey

OFFICIAL RECORDS OF
MARICOPA COUNTY RECORDER
HELEN PURCELL
96-0724814 10/11/96 09:53
CHRISTINA 1 OF 1

MEMORANDUM OF AMENDMENT

This Memorandum of Amendment (the "Memorandum") is made and executed as of the 9th day of May, 1996, by the City of Surprise, an Arizona municipal corporation ("*City*") and Surprise Village North L.L.C., an Arizona limited liability company ("*Owner*").

RECITALS

A. There has previously been executed that certain Development Agreement between Surprise Village Company L.L.C., an Arizona limited liability company ("*Company*") and the City, which was recorded on July 14, 1995, in Instrument No. 95-0411253, and re-recorded July 17, 1995, in Instrument No. 95-0415114, official records of Maricopa County, Arizona, the Developer's interest in which was thereafter assigned by Company to Owner pursuant to that certain Assignment and Assumption of Development Agreement recorded on July 25, 1995, in Instrument No. 95-0433896, official records of Maricopa County, Arizona (collectively, the "*Development Agreement*").

B. As described in Section 1.1 of the Development Agreement, the City has approved a PAD Plan (as defined in the Development Agreement), which PAD Plan is attached as Exhibit B to the Development Agreement.

C. Pursuant to City Ordinance No. 96-09 the City has approved certain amendments to the PAD Plan, which amendments are generally described in **Exhibit A** attached hereto. The PAD Plan, as amended pursuant to City Ordinance No. 96-09, is referred to herein as the "*Amended PAD Plan*". The Amended PAD Plan affects the real property described in **Exhibit B** attached hereto (the "*Property*").

D. Owner and the City desire to give actual and constructive notice to all persons dealing with the Property that the PAD Plan has been amended pursuant to City Ordinance No. 96-09.

MEMORANDUM

Owner and the City hereby give actual and constructive notice to all persons dealing with the Property that the PAD Plan has been amended pursuant to City Ordinance No. 96-09, which amendments are generally described in **Exhibit A** attached hereto. A copy of the Amended PAD Plan is in the possession of the City and is available for examination at the office of the City's Planning and Zoning Department, 12425 West Bell Road, Suite # D-100, Surprise, Arizona 85374.

RECEIVED
OCT 11 1996
TITLE OF ARIZONA

In the event of any conflict between the terms of this Memorandum (including, but not limited to, the provisions of Exhibit A hereof) and the Amended PAD Plan, the terms of the Amended PAD Plan shall control.

IN WITNESS WHEREOF, the City and Owner have executed this Memorandum as of the date first set forth above.

SURPRISE VILLAGE NORTH L.L.C., an Arizona limited liability company

By: CONTINENTAL HOMES, INC., a Delaware corporation
Its: Member

By: _____
Its: _____

By: SURPRISE VILLAGE COMPANY L.L.C., an Arizona limited liability company
Its: Member

By: Carefree Sunbelt I L.L.C., an Arizona limited liability company
Its: Manager

By: Sunbelt Holdings Management, Inc., an Arizona corporation
Its: Member

By: _____
John W. Graham
Its: President

By: Carefree Partners, L.L.C., an Arizona limited liability company
Its: Member

By: West Management Limited Partnership, an Arizona limited partnership
Its: Manager

By: The Richard West Company, an Arizona corporation
Its: General Partner

By: _____
Richard B. West III
Its: President

CITY OF SURPRISE, an Arizona municipal corporation

By: _____
Joan Shafer, its Mayor

APPROVED AS TO FORM:

By: _____
Paul H. Cragan
City Attorney

ATTEST:

By: _____
City Clerk

STATE OF ARIZONA)
) ss.
County of Maricopa)

The foregoing instrument was acknowledged before me this 10th day of October, 1996, by Joan Shafer, Mayor of the CITY OF SURPRISE, an Arizona municipal corporation, on behalf of that municipal corporation.

_____
Notary Public

My Commission Expires:

4-20-98

STATE OF ARIZONA)
) ss.
County of Maricopa)

The foregoing instrument was acknowledged before me this 2nd day of October, 1996, by Richard B. West III, the President of The Richard West Company, an Arizona corporation, the General Partner in West Management Limited Partnership, an Arizona limited partnership, Manager of CAREFREE PARTNERS, L.L.C., an Arizona limited liability company, the Member of CAREFREE SUNBELT I L.L.C., an Arizona limited liability company, the Manager of SURPRISE VILLAGE COMPANY L.L.C., an Arizona limited liability company, the Member of SURPRISE VILLAGE NORTH L.L.C., an Arizona limited liability company, for and on behalf thereof.

Valerie L. McCulloch
Notary Public

My Commission Expires:

August 3, 1997

OFFICIAL SEAL
VALERIE L. McCULLOCH
NOTARY PUBLIC—ARIZONA
MARICOPA COUNTY
My comm. expires Aug. 3, 1997

STATE OF ARIZONA)
) ss.
County of Maricopa)

The foregoing instrument was acknowledged before me this 7th day of October, 1996, by John W. Graham, the President of SUNBELT HOLDINGS MANAGEMENT, INC., an Arizona corporation, the Member of CAREFREE SUNBELT I L.L.C., an Arizona limited liability company, the Manager of SURPRISE VILLAGE COMPANY L.L.C., an Arizona limited liability company, the Member of SURPRISE VILLAGE NORTH L.L.C., an Arizona limited liability company, for and on behalf thereof.

Sandra K. Johnson
Notary Public

My Commission Expires:

May 13, 2000

SANDRA K. JOHNSON
Notary Public-Arizona
Maricopa County
My Commission Expires
May 13, 2000

STATE OF ARIZONA)
) ss.
County of Maricopa)

The foregoing instrument was acknowledged before me this 2nd day of October, 1996, by Donald Lobsack, the CEO of CONTINENTAL HOMES, INC., a Delaware corporation, the Member of SURPRISE VILLAGE NORTH L.L.C., an Arizona limited liability company, for and on behalf thereof.

Valerie L. McCulloch
Notary Public

My Commission Expires:

August 3, 1997

OFFICIAL SEAL
VALERIE L. McCULLOCH
NOTARY PUBLIC—ARIZONA
MARICOPA COUNTY
My comm. expires Aug 3 1997

LENDER CONSENT

The undersigned is the Beneficiary, and Surprise Village North L.L.C., an Arizona limited liability company, is the Trustor, under that certain Deed of Trust recorded on February 12, 1996, in Instrument No. 96-0095036, official records of Maricopa County, Arizona, as amended. The undersigned does hereby consent to, ratify and approve of the foregoing instrument as of this 4 day of October, 1996.

BANK ONE, ARIZONA, NA, a national banking association

By: _____
Its: Vice President

STATE OF ARIZONA)
) ss.
County of Maricopa)

The foregoing instrument was acknowledged before me this 4th day of October, 1996, by Barry Dore, the Vice President of Bank One, Arizona, NA, a national banking association, for and on behalf thereof.

Valerie L. McCulloch
Notary Public

My Commission Expires:
August 3, 1997

OFFICIAL SEAL
VALERIE L. McCULLOCH
NOTARY PUBLIC—ARIZONA
MARICOPA COUNTY
My comm. expires Aug. 3, 1997

EXHIBIT "A"

1. Exhibit Index is revised as follows:
Exhibit "M" - Typical Detail Setback; the revision date is changed to February 20, 1996.

2. Exhibit Index is revised as follows:
Exhibit "S" - *Minimum* Street Cross Sections; the revision date is changed to February 20, 1996.

3. Figure Index is revised as follows:
Figure 4 - Land Use Plan; the revision date is change to April 11, 1996.
Figure 5 - Community Center Conceptual Plan; the revision date is changed to February 20, 1996.
Figure 8 - Phasing Conceptual Plan; the revision date is change to April 11, 1996.

4. In the last paragraph on page 2 add the word "minimum" as follows: "Bell Road currently has a *minimum* 110 foot right-of-way, is fully improved and with a divided six lane . . ."

4a. On page 4 - "Principally Permitted Uses (e.g., golf course, *and golf maintenance facility) with Administrative review and approval*" is added.

Again on page 4, insert after ". . . temporary sales and office buildings *and temporary construction offices and yards.*"

4b. Figure 4 - Land Use Plan is changed to reflect the revised east property boundary.

5. On page 9, under the table labeled Allocation of Land Uses the shaded boxes are unshaded and in addition the table reflects the total overall DU/Acres average for the entire site. Pursuant to the revised east property line, two (2) acres are added to golf course and open space reflecting a total of 532 acres.

6. Figure 5 is revised to reflect the current concept of the Community Center/Clubhouse layout and redated to February 20, 1996.

7. On page 11, in the third paragraph, revise as follows: "may have only one tree, but *the front yard landscaping in such cases shall be consistent with the landscape architectural design intent and theme of two trees and shall be subject to Staff approval.*"

8. Page 17 in the last paragraph, the last sentence is changed to read: ". . . no more than 15% *of the units in each recorded plat* shall be permitted to allow a *minimum* fifteen (15) foot rear yard setback. *Builder shall note number of minimum 15' rear yard lots per plat upon submittal of plot plan . . .*"

9. Page 20 under Specifications and Standards for Streets, Utilities and Services, the word "minimum" is added as follows: "Streets will be provided in accordance with the following *minimum* standards and specifications . . ."

9a. Figure 8 - Phasing Plan is revised to reflect the revised east property boundary with a revision date of April 11, 1996.

9b. Exhibit "A" - Legal Description is changed to reflect the revised east property line.

9c. Exhibit "B" - Topographical map is changed to reflect the revised east property line with a revision date of April 11, 1996.

9d. Exhibit "H" - Landscape Palette - five new trees have been added to the list of trees.

9e. Exhibit "J" - Cover Sheet is revised to reflect a revision date of May 9, 1996.

10. Exhibit "J" - Design Guidelines, page 22, item 4, a new bullet point is added as follows: *Flagpoles at the project entry shall be permitted to a maximum height of 30' subject to Administrative Review and Approval when shown in context with mature adjacent complementary landscape materials.*

The five new trees added to Exhibit H are added to page 25 of Exhibit J.

11. Exhibit "M" - pages one through four are revised to reflect the addition of a new fifth page. The new page five of five adds the approved layout for flaglots and includes the description and readable, revised notes.

12. Exhibit "S" - the heading "*Minimum* Street Cross Sections" is added with a new revision date of February 20, 1996.

EXHIBIT B

THIRD AMENDED
NO. DR-1022583C

PARCEL NO. 1:

That part of the East half of Section 34, and the West half of Section 35, Township 4 North, Range 2 West of the Gila and Salt River Base and Meridian, Maricopa County, Arizona, described as follows:

BEGINNING at the Southeast corner of the said East half of Section 34;

thence South 89 degrees 57 minutes 40 seconds West, 2638.10 feet to the Southwest corner of the said East half of Section 34;

thence North 00 degrees 02 minutes 02 seconds East, 2639.53 feet to the center of the said Section 34;

thence continuing North 00 degrees 02 minutes 02 seconds East along the West line of the said East half of Section 34, a distance of 1843.95 feet to a point on the right-of-way line of Parcel 11-C Trilby Wash Project as shown in Book 63 of Maps, Page 31, Maricopa County Records, this corner being Southerly 789.30 feet from the Northwest corner of the said East half of Section 34;

thence North 28 degrees 16 minutes 53 seconds East along the said right-of-way line of Trilby Wash, a distance of 896.76 feet to a point on the North line of the said East half of Section 34, this point being Easterly 424.42 feet from the Northwest corner of the said East half of Section 34;

thence North 89 degrees 56 minutes 36 seconds East along the North line of the said East half of Section 34, a distance of 2003.35 feet to a point 208.00 feet Westerly from the Northeast corner of the said East half of Section 34;

thence South 00 degrees 01 minutes 04 seconds West, 208.00 feet;

thence North 89 degrees 56 minutes 36 seconds East parallel to the North line of the said East half of Section 34, a distance of 208.00 feet to a point on the East line of the said Section 34;

thence North 00 degrees 01 minutes 04 seconds East along the East line, a distance of 208.00 feet to the Northeast corner of the said East half of Section 34, this corner also being the Northwest corner of the said West half of Section 35;

thence North 89 degrees 57 minutes 49 seconds East along the North line of the said West half of Section 35, a distance of 1975.68 feet, this point lying Westerly 666.00 feet from the Northeast corner of the said West half of Section 35;

No: (DR-1022583C)

thence South 00 degrees 00 minutes 39 seconds West, 215.00 feet;

thence South 45 degrees 00 minutes 39 seconds West, 300.00 feet;

thence South 05 degrees 00 minutes 39 seconds West, 600.00 feet;

thence South 09 degrees 59 minutes 22 seconds East, 555.00 feet;

thence South 34 degrees 59 minutes 22 seconds East, 295.00 feet;

thence South 25 degrees 23 minutes 16 seconds East, 580.82 feet;

thence South 00 degrees 20 minutes 58 seconds West, 840.00 feet;

thence South 19 degrees 25 minutes 45 seconds West, 193.43 feet;

thence South 30 degrees 00 minutes 39 seconds West, 530.00 feet;

thence South 00 degrees 00 minutes 39 seconds West, 841.21 feet to a point on the North line of that certain property deeded to Turner Ranches Water and Sanitation Company recorded in 92-061803, of Official Records;

thence South 89 degrees 41 minutes 17 seconds West, 120.26 feet to a corner of the said property;

thence South 00 degrees 00 minutes 38 seconds West, 319.57 feet to a corner of the said property;

thence North 89 degrees 41 minutes 17 seconds East along the South line of the said property, a distance of 120.25 feet to a corner of that certain property deeded to HTR, INC. recorded in 91-222309, of Official Records, as set forth in Parcel 10 therein;

thence along the periphery lines of this property as follows:

South 00 degrees 00 minutes 38 seconds West, 60.26 feet;

thence North 89 degrees 59 minutes 22 seconds West, 52.24 feet;

thence South 00 degrees 00 minutes 38 seconds West, 143.16 feet;

thence South 89 degrees 59 minutes 22 seconds East, 52.24 feet;

thence South 00 degrees 00 minutes 18 seconds West, 16.23 feet;

thence leaving the said Parcel 10 South 00 degrees 18 minutes 43 seconds East, 65.00 feet to a point on the South line of the said West half of Section 35, this point lying Westerly 749.65 feet from the Southeast corner of the said West half of Section 35;

thence South 89 degrees 41 minutes 17 seconds West along the South line of said West half of Section 35, a distance of 1891.88 feet to the POINT OF BEGINNING.

No: (DR-1022583C)

EXCEPT that portion of said Section 34 conveyed to MARICOPA COUNTY MUNICIPAL WATER CONSERVATION DISTRICT NO. 1, described as follows:

BEGINNING AT a point 1,510 feet West of the East quarter corner of said Section;

thence South, a distance of 40 feet to a point;

thence West on a line parallel to and 40 feet South of the East/West mid-section line, a distance of 40 feet to a point;

thence North, a distance of 40 feet to a point on the mid-section line;

thence East along said mid-section line, a distance of 40 feet to the POINT OF BEGINNING.

EXCEPT that portion of said Section 35 conveyed to MARICOPA COUNTY MUNICIPAL WATER CONSERVATION DISTRICT NO. 1, described as follows:

BEGINNING at a point 33 feet North and 33 feet East of the Southwest corner of said Section;

thence North on a line parallel to the West boundary line of said Section, a distance of 75 feet to a point;

thence East, a distance of 60 feet to a point;

thence South, a distance of 75 feet to a point;

thence West on a line parallel to the South boundary line of said Section, a distance of 60 feet to the POINT OF BEGINNING.

EXCEPT that certain strip of land in said Section 35 conveyed to MARICOPA COUNTY MUNICIPAL WATER CONSERVATION DISTRICT NO. 1, and described as Parcel No. 1 in Deed recorded in Book 562 of Deeds, Page 269.

EXCEPT that certain strip of land in said Section 35 conveyed to MARICOPA COUNTY MUNICIPAL WATER CONSERVATION DISTRICT NO. 1 in Deed recorded in Book 6509 of Deeds, Page 306.

EXCEPT that portion of land in said Section 35 conveyed to the TOWN OF SURPRISE in Deed recorded in 85-310427, of Official Records.

EXCEPT that portion of land in said Section 34 conveyed to the TOWN OF SURPRISE in Deed recorded in 85-310437, of Official Records.

EXCEPT those portions of land in the Southeast quarter of Section 34 and the Southwest quarter of said Section 35, conveyed to the TOWN OF SURPRISE and described as Exhibits "A", "B", "D" and "E" of Parcel No. 1 in Deed recorded in 88-219441, of Official Records.

No: (DR-1022583C)

EXCEPT that portion of land in said Section 35 to SUN CITY WATER COMPANY in Deed recorded in 93-0104787, of Official Records.

PARCEL NO. 2:

That part of the Southwest quarter of Section 35, Township 4 North, Range 2 West of the Gila and Salt River Base and Meridian, Maricopa County, Arizona, described as follows:

The following described parcel is the Westerly 52.24 feet (more or less) of the property deeded to in HTR, INC., in 91-222309, of Official Records, Maricopa County Records as set forth in Parcel No. 10 thereof;

From the Southeast corner of the said Southwest quarter of Section 35 (S. 1/4 corner);

measure thence South 89 degrees 41 minutes 17 seconds West along the South line of the said Southwest quarter of Section 35, a distance of 749.65 feet;

thence North 00 degrees 18 minutes 43 seconds West 65.00 feet to the POINT OF BEGINNING, this point also being a corner of the said property described in 91-222309, of Official Records;

thence continuing along the periphery lines of the said parcel as follows:

North 00 degrees 00 minutes 18 seconds East 16.23 feet;

thence North 89 degrees 59 minutes 22 seconds West 52.24 feet;

thence North 00 degrees 00 minutes 38 seconds East 143.16 feet;

thence South 89 degrees 59 minutes 22 seconds East 52.24 feet;

thence North 00 degrees 00 minutes 38 seconds East 60.26 feet;

thence North 89 degrees 41 minutes 17 seconds East a distance of 0.01 feet (more or less) to a point on a line that bears North 00 degrees 00 minutes 39 seconds East from the POINT OF BEGINNING;

thence South 00 degrees 00 minutes 39 seconds West 219.65 feet to the POINT OF BEGINNING.

PARCEL NO. 3:

That part of the Southwest quarter of Section 35, Township 4 North, Range 2 West of the Gila and Salt River Base and Meridian, Maricopa County, Arizona, described as follows:

No: (DR-1022583C)

The following described parcel is the Westerly 120.26 feet (more or less) of the property deeded to TURNER RANCHES WATER AND SANITATION COMPANY, in 92-061803, of Official Records, Maricopa County Records;

From the Southeast corner of the said Southwest quarter of Section 35 (S. 1/4 corner);

measure thence South 89 degrees 41 minutes 17 seconds West along the South line of the said Southwest quarter of Section 35, a distance of 749.65 feet;

thence North 00 degrees 18 minutes 43 seconds West 65.00 feet;

thence North 00 degrees 00 minutes 39 seconds East 219.65 feet to the POINT OF BEGINNING and a point on the South line of the said property described in 92-061803, of Official Records;

thence along the periphery lines of the said parcel as follows:

South 89 degrees 41 minutes 17 seconds West 120.25 feet;

thence North 00 degrees 00 minutes 38 seconds East 319.57 feet;

thence North 89 degrees 41 minutes 17 seconds East 120.26 feet to a point which bears North 00 degrees 00 minutes 39 seconds East from the POINT OF BEGINNING;

thence South 00 degrees 00 minutes 39 seconds West 319.57 feet to the POINT OF BEGINNING.

PARCEL NO. 4:

That part of the West half of Section 35, Township 4 North, Range 2 West of the Gila and Salt River Base and Meridian, Maricopa County, Arizona, described as follows:

From the Southeast corner of the said West half of Section 35 (S. 1/4 corner);

measure thence South 89 degrees 41 minutes 17 seconds West along the South line of the said West half of Section 35, a distance of 749.65 feet;

thence North 00 degrees 18 minutes 43 seconds West 65.00 feet;

thence North 00 degrees 00 minutes 39 seconds East 1380.43 feet;

thence North 30 degrees 00 minutes 39 seconds East 530.00 feet;

thence North 19 degrees 25 minutes 45 seconds East 193.43 feet;

thence North 00 degrees 20 minutes 58 seconds East 770.00 feet;

No: (DR-1022583C)

thence North 12 degrees 31 minutes 09 seconds West 136.48 feet to the POINT OF BEGINNING;

thence North 25 degrees 23 minutes 16 seconds West (this line called Line "A" for reference within this description) a distance of 510.82 feet;

thence North 34 degrees 59 minutes 22 seconds West (called Line "B") a distance of 295.00 feet;

thence North 09 degrees 59 minutes 22 seconds West (called Line "C") a distance of 555.00 feet;

thence North 05 degrees 00 minutes 39 seconds East 115.91 feet;

thence South 09 degrees 59 minutes 22 seconds East along a line that is parallel with and 30.00 feet Northerly (measured at right angles) from the said Line "C" a distance of 660.31 feet;

thence South 34 degrees 59 minutes 22 seconds East parallel with and 30.00 feet Northerly (measured at right angles) from the said Line "B" a distance of 290.87 feet;

thence South 25 degrees 23 minutes 16 seconds East parallel with and 30.00 feet Northerly (measured at right angles) from the said line "A" a distance of 382.02 feet;

thence South 12 degrees 31 minutes 09 seconds East 134.70 feet to the POINT OF BEGINNING.

PARCEL NO. 5:

That portion of the Southwest quarter of Section 35, Township 4 North, Range 2 West of the Gila and Salt River Base and Meridian, Maricopa County, Arizona, described as follows:

A strip of land 20 feet wide, 10 feet on each side of a center line, beginning at a point approximately 43 feet East and 20 feet South of the West quarter corner of said Section 35;

thence in a Southerly direction parallel to the West line of said Section 35 to a point 43 feet East and 108 feet North of the Southwest corner of said Section 35, said point being the North line of that certain well site described in Book 605 of Deeds, Page 407-410 and the point of terminus.

Exhibits

Exhibit	Description
A	Legal Description
B	Topographical Map (Revised 04-11-96)
C	Zoning Ordinance 17.24.020
D	Zoning Ordinance 17.28.040
E	Zoning Ordinance 17.28.060
F	*No Longer Required*
G	*No Longer Required*
H	Landscape Palette (Revised 12-19-95)
I	Zoning Ordinance 17.36.060 (G)(1)(2)
J	Design Guidelines (12-12-95)
K	Conceptual Single Family Elevations
L	Conceptual Cluster Housing Elevations (Revised 3-24-95)
M	Typical Detail Setbacks (2-20-96)
N	Zoning Ordinance 17.28.010(G)
O	Zoning Ordinance Chapter 17.32
P	Zoning Ordinance 17.28.120
Q	Zoning Ordinance 17.28.130
R	Zoning Ordinance 17.28.050
S	Roadway Cross-Sections (2-20-96)
T	Traffic Report (Revised 7-28-95)
U	Civil Site Plan and Other Plans (Water-Revised 12-30-94) (Sewer-Revised 2-3-95) (Drainage-Revised 6-8-95) and Other Pertinent Approval Correspondence
V	Ordinance No. 17.32.100 and Chapter 15.24
W	Zoning Ordinance 17.36.060(D)(3)(d)
X	Preliminary and Final Development Plan P.A.D. Stipulations

EXHIBIT - A
TO ORDINANCE NO. 96-09

CITY OF
PLANNING AND ZONING DEPARTMENT
APPROVED
Case No. PADA 98-100
P&Z Comm Approval:
City Council Approval:
Admin 8/25/1998
B.O.A. Approval:
Stipulations:

PADA 98-100

RECEIVED
SEP 1

The Villages at Surprise North
Minor PAD Amendment
August 25, 1998

In accordance with the Density Transfer Section of the PAD the Developer shall have the right in its discretion to develop any individual parcel up to the maximum density allowed for such parcel.

Current market conditions have dictated that areas in the original Land Use Plan (Figure 4) designated as Cluster Housing (MDR) (Parcels II, IV, V, and X) are now better suited for lower density (LDR; R1-5). The flexibility of the Density Transfer Section of the PAD entitles our development of these parcels to the lower single family density.

Please approve this minor amendment request by acknowledging and accepting below.

ACKNOWLEDGED AND ACCEPTED

Shirley Berg, Development Services

Richard McComb, City Manager

N:\590001\ADMIN\1-185l.wp8

CITY OF [illegible]
PLANNING AND ZONING [illegible]
APPROVED
Case No.: PMDA 97-142
P&Z Comm. Approval:
City Council Approval:
~~B.O.A. Approval:~~ Admin 8/3/1999
Stipulations:

PADA 97-142

The Villages at Surprise-North

City of Surprise, Arizona

PLANNING & ZONING
APPROVED
Community Development 8-3-99
City Manager 8-3-99

Application for:
Planned Area Development (PAD) Zoning
With Preliminary Development Plan

Submitted February 16, 1995
Revised February 24, 1995
Revised March 29, 1995
Revised June 15, 1995
Revised December 20, 1995
Revised May 9, 1996
Revised August 25, 1998
Revised July 26, 1999

RECEIVED
JUL 30 1999

VOLUME I OF II

The Villages at Surprise-North

City of Surprise, Arizona

Application for:
Planned Area Development (PAD) Zoning
With Preliminary Development Plan

Submitted February 16, 1995
Revised February 24, 1995
Revised March 29, 1995
Revised June 15, 1995
Revised December 20, 1995
Revised May 9, 1996
Revised August 25, 1998
Revised July 26, 1999

Condensed Version

Exhibits

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J	Design Guidelines (04-11-96)
K	Conceptual Single Family Elevations
L	Conceptual Cluster Housing Elevations (Revised 03-24-95)
M	Typical Detail Setbacks (02-20-96) (Revised 07-26-99)
N	Zoning Ordinance 17.28.010(G)
O	Zoning Ordinance Chapter 17.32
P	Zoning Ordinance 17.28.120
Q	Zoning Ordinance 17.28.130
R	Zoning Ordinance 17.28.050
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X	Preliminary and Final Development Plan P.A.D. Stipulations
Y	Minor and Administrative Amendment Approvals

Exhibits

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W	Zoning Ordinance 17.36.060(D)(3)(d)
X	Preliminary and Final Development Plan P.A.D. Stipulations
Y	Minor and Administrative Amendment Approvals

SINGLE FAMILY
COLLECTOR FRONTAGE

SETBACK NOTES:

Front-Yard Setback:

- All structures shall maintain a front-yard setback of 15', measured from back-of-curb.
- Front-loaded garages shall maintain a 20' setback, measured from back-of-sidewalk. Side-loaded garages shall maintain a 15' setback, measured from back-of-curb.

Side-Yard Setback:

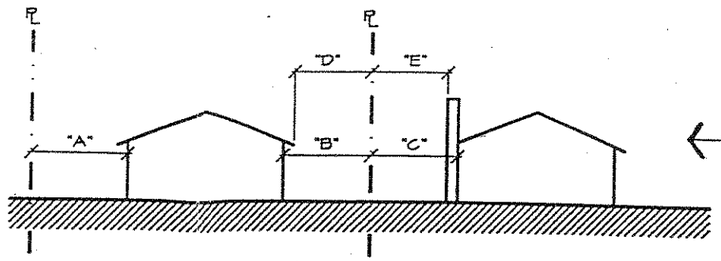
- The total of two side-yards on one lot shall be 10' with no projection closer than 3' to the property line.

Rear-Yard Setback:

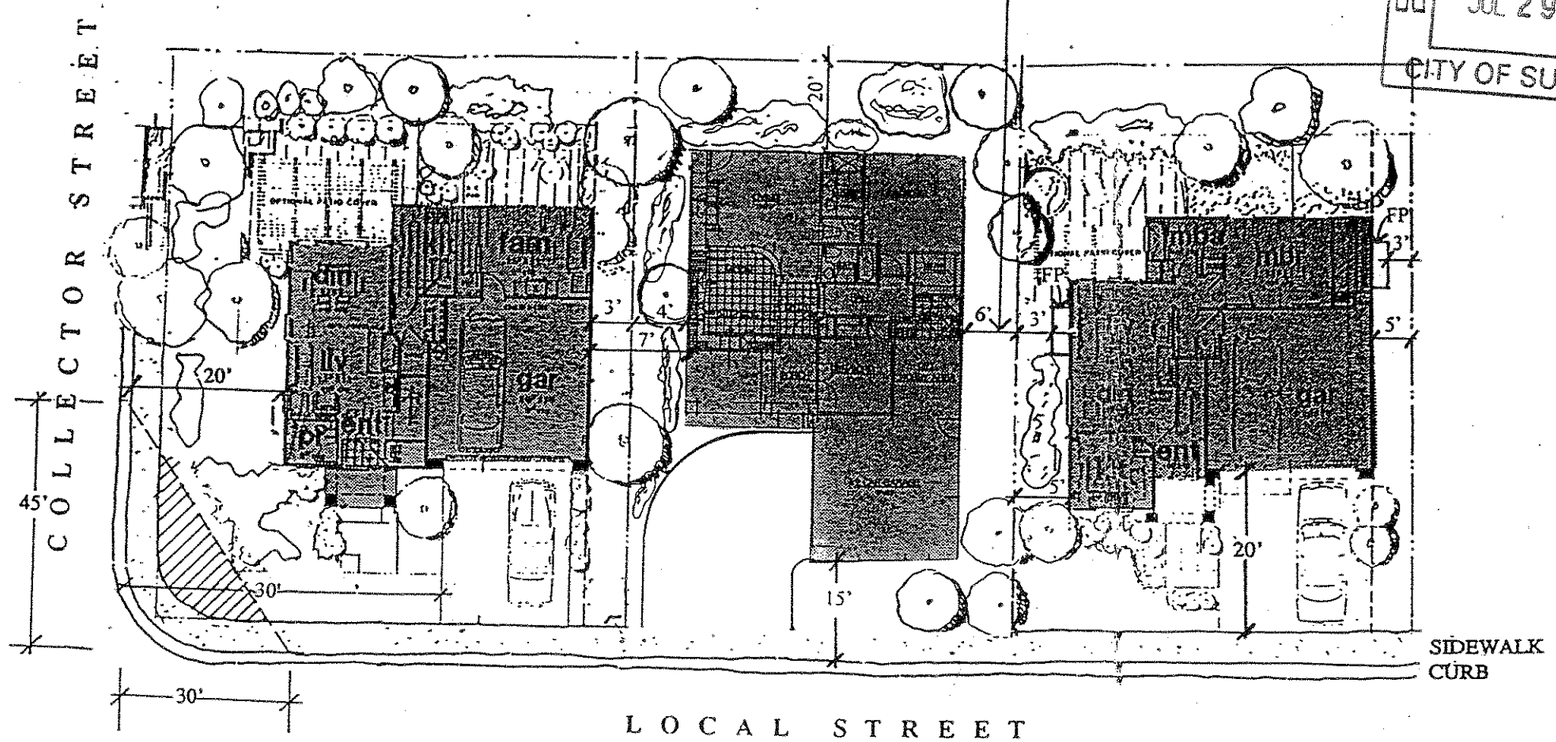
- All structures shall maintain a 20' rear-yard setback, measured from the property line.

Corner Lots:

- Driveways shall be set back a minimum of 30' from the intersection. This distance is measured from back-of-curb at the intersection.
- A sight-triangle shall be maintained as shown, measured from back-of-curb. No structures, walls, vegetation. or other obstacles may exceed 30 inches in height.
- Corner lots shall maintain a 20' setback from adjacent collector street edges, measured from back-of-curb.



"A" + "B" = 10'
"B" + "C" ≥ 7'
"D" ≥ 3'
"E" ≥ 3'



ARIZONA TRADITIONS
Surprise Village North

SETBACK EXHIBIT

EXHIBIT "M"
(ONE OF FIVE)

NORTH

RECEIVED
JUL 29 1999
CITY OF SURPRISE

REVISIONS		
#	Date	Comments
1	02/15/95	Visibility triangles; text revisions
2	02/23/95	Text revisions
3	03/24/95	Front / rear / interior designations
4	05/15/95	Additional setback notes
5	10/02/95	Swing-garage plan, setback notes
6	12/19/95	Additional exhibit + dimensions
7	2/20/96	Revised flag lot exhibit (5/5)
8	7/26/98	Revised driveway exhibit

SINGLE FAMILY
INTERNAL

SETBACK NOTES:

Front-Yard Setback:

- All structures shall maintain a front-yard setback of 15', measured from back-of-curb.
- Front-loaded garages shall maintain a 20' setback, measured from back-of-sidewalk. Side-loaded garages shall maintain a 15' setback, measured from back-of-curb.

Side-Yard Setback:

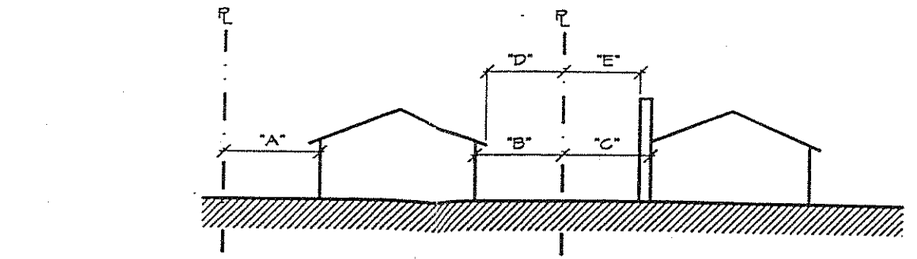
- The total of two side-yards on one lot shall be 10;' with no projection closer than 3' to the property line.

Rear-Yard Setback:

- All structures shall maintain a 20' rear-yard setback, measured from the property line.

Corner Lots:

- Driveways shall be set back a minimum of 30' from the intersection. This distance is measured from back-of-curb at the intersection.
- A sight-triangle shall be maintained as shown, measured from back-of-curb. No structures, walls, vegetation, or other obstacles may exceed 30 inches in height.
- Corner lots shall maintain a 10' setback from adjacent local street edges, measured from property line.



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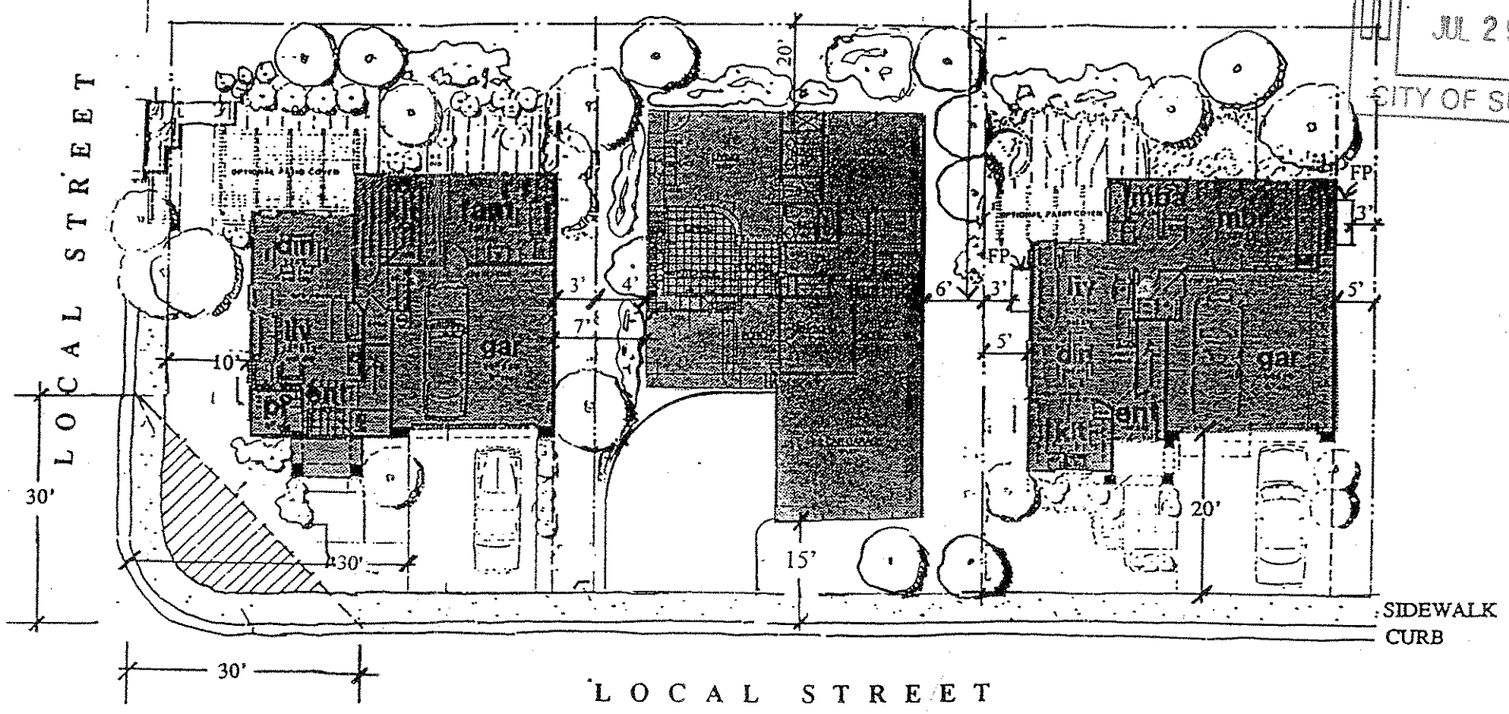

ARIZONA TRADITIONS
Surprise Village North

SETBACK EXHIBIT

EXHIBIT "M"
(TWO OF FIVE)

NORTH

RECEIVED
JUL 29 1999
CITY OF SURPRISE

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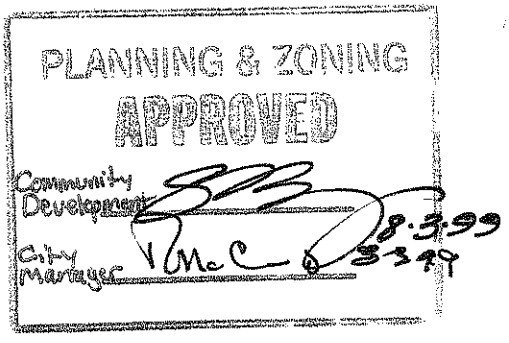
The Villages at Surprise-North

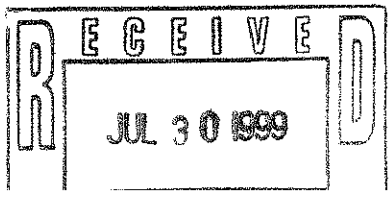
City of Surprise, Arizona



Application for:
Planned Area Development (PAD) Zoning
With Preliminary Development Plan

Submitted February 16, 1995
Revised February 24, 1995
Revised March 29, 1995
Revised June 15, 1995
Revised December 20, 1995
Revised May 9, 1996
Revised August 25, 1998
Revised July 26, 1999

VOLUME I OF II



Exhibits

Exhibit	Description
A	Legal Description (Revised 04-09-96)
B	Topographical Map (Revised 04-11-96)
C	Zoning Ordinance 17.24.020
D	Zoning Ordinance 17.28.040
E	Zoning Ordinance 17.28.060
F	*No Longer Required*
G	*No Longer Required*
H	Landscape Palette (Revised 04-11-96)
I	Zoning Ordinance 17.36.060 (G)(1)(2)
J	Design Guidelines (04-11-96)
K	Conceptual Single Family Elevations
L	Conceptual Cluster Housing Elevations (Revised 03-24-95)
M	Typical Detail Setbacks (02-20-96) (Revised 07-26-99)
N	Zoning Ordinance 17.28.010(G)
O	Zoning Ordinance Chapter 17.32
P	Zoning Ordinance 17.28.120
Q	Zoning Ordinance 17.28.130
R	Zoning Ordinance 17.28.050
S	Roadway Cross-Sections (02-20-96)
T	Traffic Report (Revised 07-28-95)
U	Civil Site Plan and Other Plans (Water-Revised 12-30-94) (Sewer-Revised 02-3-95) (Drainage-Revised 06-8-95) and Other Pertinent Approval Correspondence
V	Ordinance No. 17.32.100 and Chapter 15.24
W	Zoning Ordinance 17.36.060(D)(3)(d)
X	Preliminary and Final Development Plan P.A.D. Stipulations
Y	Minor and Administrative Amendment Approvals

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SINGLE FAMILY
COLLECTOR FRONTAGE

SETBACK NOTES:

Front-Yard Setback:

- All structures shall maintain a front-yard setback of 15', measured from back-of-curb.
- Front-loaded garages shall maintain a 20' setback, measured from back-of-sidewalk. Side-loaded garages shall maintain a 15' setback, measured from back-of-curb.

Side-Yard Setback:

- The total of two side-yards on one lot shall be 10' with no projection closer than 3' to the property line.

Rear-Yard Setback:

- All structures shall maintain a 20' rear-yard setback, measured from the property line.

Corner Lots:

- Driveways shall be set back a minimum of 30' from the intersection. This distance is measured from back-of-curb at the intersection.
- A sight-triangle shall be maintained as shown, measured from back-of-curb. No structures, walls, vegetation, or other obstacles may exceed 30 inches in height.
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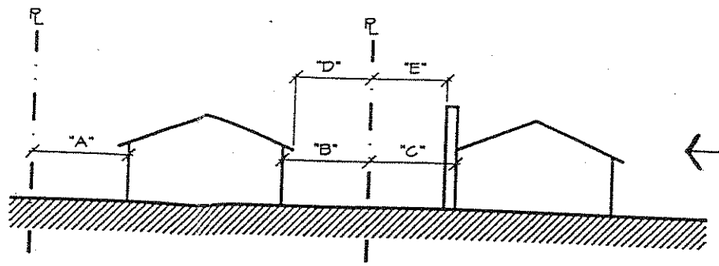

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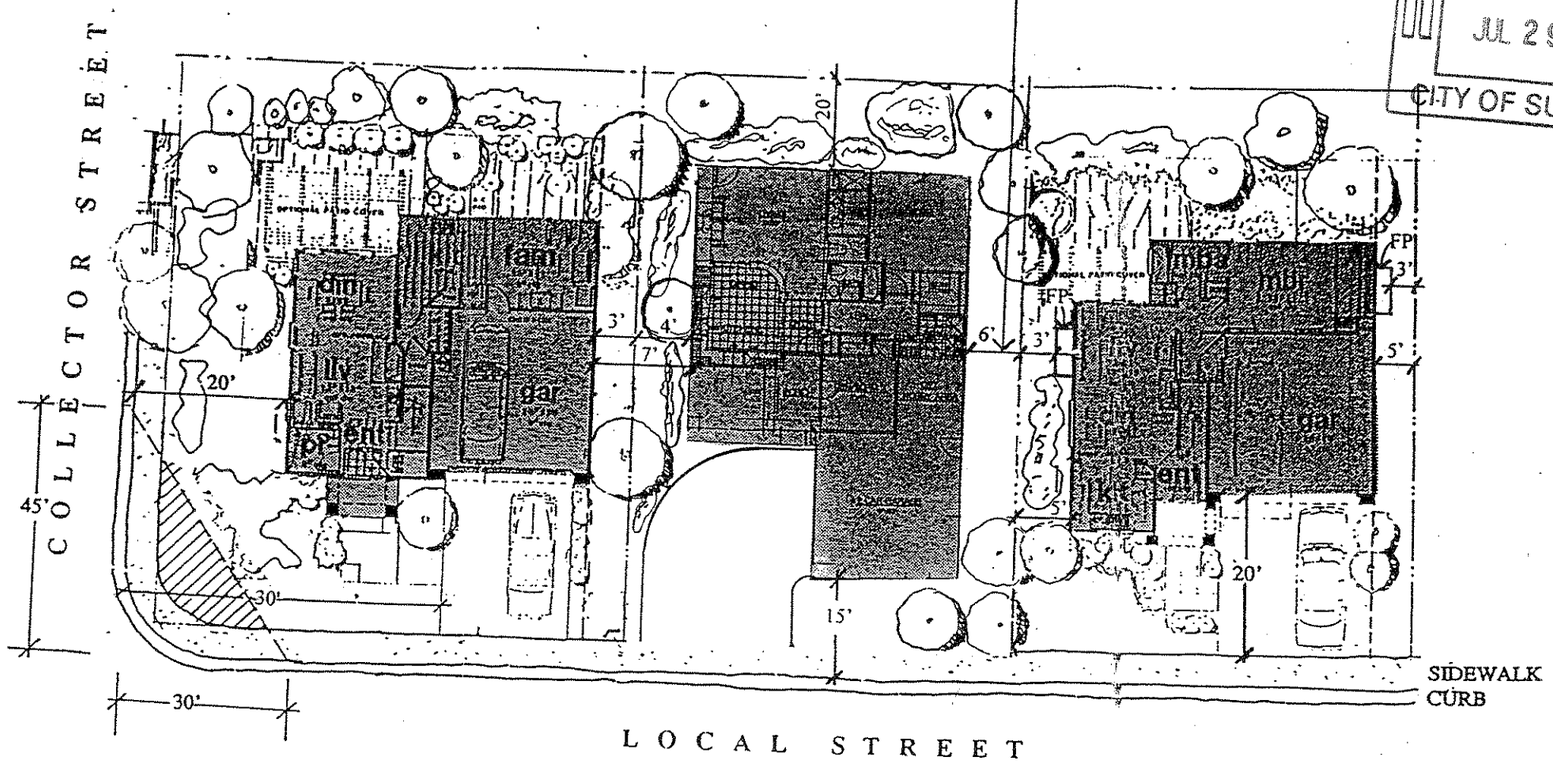

ARIZONA TRADITIONS
Surprise Village North

SETBACK EXHIBIT

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(ONE OF FIVE)

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INTERNAL

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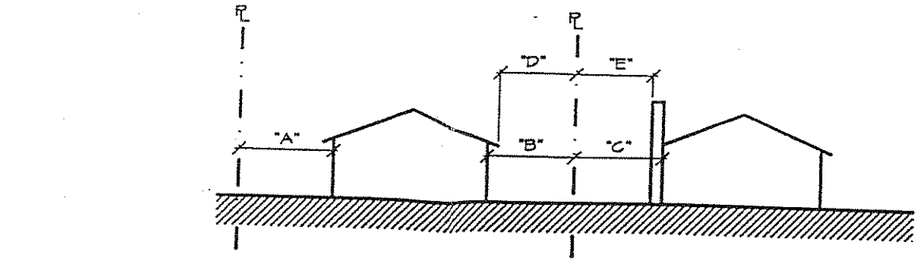

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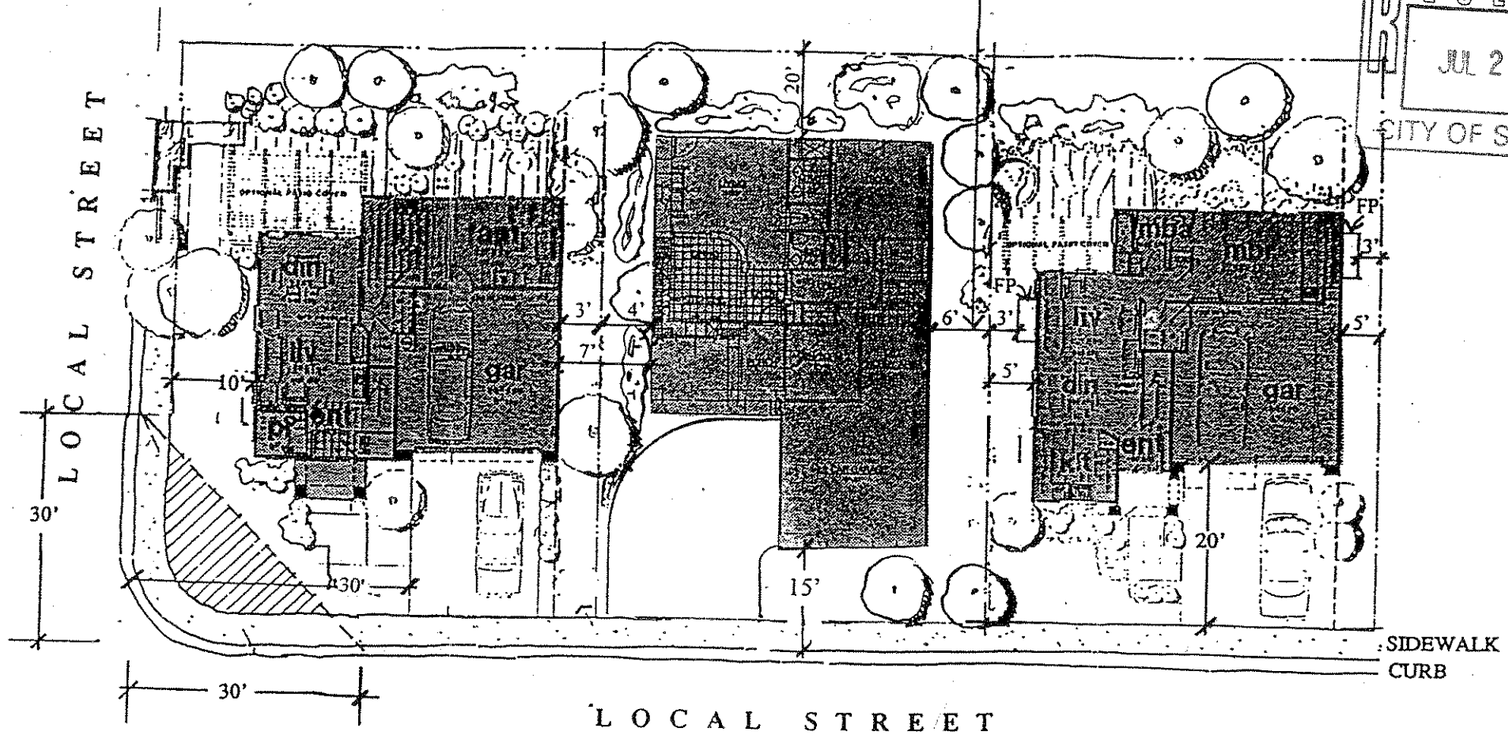

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Surprise Village North

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CITY OF SURPRISE
PLANNING AND ZONING DEPARTMENT
A P P R O V E D

Case No.: PADA01-144

P&Z Comm. Approval: _____

City Council Approval: _____

~~D.O.A. Approval:~~ Admin 12/6/2001

Stipulations: _____

ORIGINAL

The Villages at Surprise North
Minor PAD Amendment
December 6, 2001
PADA 01- 144

In accordance with the Density Transfer Section of the P.A.D., the developer shall have the right to develop any individual parcel at a density of not more than on hundred twenty-five percent (125%) of the maximum density allowed for such parcel as shown on the Villages at Surprise-North P.A.D., provided the Developer obtains prior written administrative approval from the City's Planning and Zoning Director and the City Manager.

The Developer wishes to develop Parcel 16 at a density of 5.72 dwelling units per acre to meet changing market conditions for the area. The prescribed maximum density for Parcel 16 (Low Density Residential designation) is 5.5 dwelling units per acre. The Development Transfer Section of the P.A.D. allows for this flexibility provided the maximum density of the Villages at Surprise-North is not exceeded. Several parcels within the development have been developed at a lesser overall density than originally prescribed in the P.A.D., thereby the making the development's density much less than the allowed maximum density.

Please approve this minor amendment to the P.A.D. by acknowledging and accepting below.

ACKNOWLEDGED AND ACCEPTED

Philip A. Testa
Community Development Director

E M Dushoz ACM
City Manager or Designee

CITY OF SEATTLE
PLANNING AND DEVELOPMENT
APPROVED
Case No.: LIDA02-122
P&Z Comm Approval:
City Council Approval: 7/25/2002
B.O.A. Approval:
Stipulations:

RECYCLED PAPER MADE FROM 20% POST CONSUMER CONTENT

CITY OF SURPRISE
COUNCIL AGENDA ACTION FORM

Meeting Type: Regular Meeting **Time Scheduled:** July 25, 2002 7:00PM #7
If Special submit date time

Submitting Department: Community Development **Contact Person:** Phil Testa
Consent ☒ **Regular** ☐ **Requesting Action** ☒ **Report Only** ☐

Type of Document Needing Approval (Check all that apply):

☐ Public Hearing ☐ Resolution ☐ First Reading/Ordinance
☐ Agreement ☐ Emergency Clause ☒ Final Reading/Ordinance
☐ Special Consideration ☐ Intergovernmental Agreement
☐ Grant ☐ Submission ☐ Acceptance
☐ Liquor/Bingo License Application

Council Priority (Check Appropriate Areas):

☐ Education	☐ Public Fitness	☐ Neighborhood Revitalization
☐ Job Creation	☐ Quality Service Delivery	☐ Employment Infrastructure
☐ Public Safety	☐ Housing Rehabilitation	☐ Work Force Preparation
☐ Transportation	☐ Human Service Needs	☐ Parks, Recreation & Library
☐ City Elections	☒ Community Activities	

Regular Agenda Wording: Consideration and Action to move Ordinance No. 02-30 to a second reading, an ordinance approving the Planned Area Development Amendment PADA02-122, amending the Villages at Surprise North PAD to incorporate a one-acre parcel located on the south side of the Union Hills Alignment and on the west side of the Citrus Road alignment.

Staff Recommendation: Approve Fiscal Impact: No If yes: Budget code:
Available:

Background Info: Planning and Zoning Commission recommended approval of this application on June 18, 2002.

List Attachments as Follows: Ordinance, Staff report, project maps

Signatures of Submitting Officers (Sign Legibly):

Phil A. Testa — Department Head
Supervisor
Budget Authorization
Legal Review
E M Deshazo — City Manager/Designee 7-2-02

Distribution After Council Action:
Shelley H
-agenda file

Council Action:

	Motion/Second
Shafer	
Vukanovich	
Villanueva	
Cox	2nd
Montoya	M
Smith	
Allen	

Results:

For	6
Against	0
Passed	✓
Failed	
Deny	
Continue	
Tabled	
Absent	Vukanovich
Other	

CITY OF SURPRISE
COUNCIL AGENDA ACTION FORM

City Clerk: Originals – Rosa
DNOS + Lex./Rex.

ORDINANCE NO. 02-30

AN ORDINANCE APPROVING THE PLANNED AREA DEVELOPMENT AMENDMENT PADA02-122, AMENDING THE VILLAGES AT SURPRISE NORTH PAD TO INCORPORATE A ONE-ACRE PARCEL LOCATED ON THE SOUTH SIDE OF THE UNION HILLS ALIGNMENT AND ON THE WEST SIDE OF THE CITRUS ROAD ALIGNMENT.

WHEREAS, this Ordinance has been properly noticed for public hearing and the necessary hearings and opportunity for public input have been completed; and

WHEREAS, changes have occurred in the vicinity of the southwest corner of the Union Hills Road Alignment and the Citrus Road alignment.

WHEREAS, rezoning of the subject property will not cause traffic congestion or depreciate surrounding property values and, at the same time is in harmony with the purposes and intent of the zoning ordinance, the plan for the area, and the City of Surprise General Plan; and

WHEREAS, the Planning and Zoning Commission has recommended approval of this rezone application.

NOW THEREFORE BE IT ORDAINED, by the City Council of the City of Surprise, Arizona, that:

Section 1. This Ordinance is not of a general and permanent nature and shall not be codified.

Section 2. The property described in Exhibit A is rezoned from R1-43 (Single Family Residential) to PAD R1-5 (Single Family Residential).

Section 3. The property described in Exhibit A remains subject to all applicable stipulations relating to the original Villages at Surprise, North PAD, any subsequent amendments of the PAD, and all provisions of the Development Agreement.

Section 4. All present and future owners of the property described on Exhibit A shall develop the property only in accordance with the requirements of the PAD R1-5 zoning standards, and in compliance with the Stipulations contained in Exhibit B.

PASSED AND ADOPTED THIS 25 day of July, 2002

Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:

City Attorney

YEAS: Mayor Shafer; Vice-Mayor Smith; Councilmember: Allen, Cox, Montoya, Villanueva. Absent: Vukanovich.

NEAS:

LEGAL DESCRIPTION
OF ONE ACRE
PAD AMENDMENT SITE

THAT PART OF THE NORTHEAST QUARTER OF SECTION 34, TOWNSHIP 4 NORTH, RANGE 2 WEST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHEAST CORNER OF SECTION 34, TOWNSHIP 4 NORTH, RANGE 2 WEST;

THENCE WEST ALONG THE NORTH LINE OF SAID SECTION A DISTANCE OF 208 FEET;

THENCE SOUTHERLY PARALLEL TO THE EAST LINE OF SAID SECTION A DISTANCE OF 208 FEET;

THENCE EASTERLY PARALLEL TO THE NORTH LINE OF SAID SECTION A DISTANCE OF 208 FEET TO A POINT ON THE EAST LINE OF SAID SECTION;

THENCE NORTH ALONG THE EAST LINE OF SAID SECTION A DISTANCE OF 208 FEET TO THE NORTHEAST CORNER THEREOF AND THE POINT OF BEGINNING.

RECOMMENDATIONS: (PADA02-122)

Subject request is consistent with Surprise 2020 General Plan. Furthermore, approval of this request would allow for efficient and orderly development. The Planning and Zoning Commission recommends approval of this PAD Amendment for Arizona Traditions (PADA02-122), subject to the following stipulations:

STANDARD STIPULATIONS:

a) Major changes to this Planned Area Development with regard to use and intensity, must be processed as a revised application with approval by the City Council upon recommendation of the Planning and Zoning Commission. Minor changes to this Planned Area Development may be administratively approved by the City Manager and the Community Development Director;

b) The applicant shall submit a Written Response to Stipulations and two (2) copies of the revised PADA. Said submission must be under one (1) transmittal package;

REPORT TO THE PLANNING AND ZONING COMMISSION AND CITY COUNCIL

PREPARED BY THE COMMUNITY DEVELOPMENT DEPARTMENT

CASE NO.: PADA02-122 (PAD Amendment to Arizona Traditions)
Stipulations: a,b
Scott Phillips (623) 583-1088
Planning & Zoning Commission Hearing Date: June 18, 2001
City Council Hearing Date: July 11, 2001

APPLICANT:

Joe Walsh
Coe Van Loo Consultants, Inc
4550 N. 12th Street
Phoenix, AZ 85014
602.264.6831
602.264.0928 Fax

REQUEST: Approval of a PAD Amendment to add one acre to the Arizona Traditions (Villages at Surprise, North) PAD.

SITE LOCATION: Subject site is located immediately south of the Union Hills Drive Alignment at the Citrus Road Alignment

SITE SIZE: ± 1 gross acre

CONFORMANCE TO ADOPTED LAND USE PLANS:

GENERAL PLAN: If approved, this will be consistent with the General Plan 2020 land use plan.

DEVELOPMENT PLAN: The Arizona Traditions PAD will be the governing development plan if this is approved.

COMMENTING JURISDICTIONS:

Town of Buckeye:	No comments were received.
City of El Mirage:	No comments were received.
City of Peoria:	No comments were received.
Maricopa County:	No comments were received.
Peoria Unified School District:	No comments were received.
Maricopa Water District:	Comments attached
Luke Air Force Base:	No comments were received.

DEPARTMENTAL REVIEW:

The **Engineering Department** has reviewed this application and has no additional comments.

The **Fire Department** has reviewed this application and has no additional comments.

The **Public Works Department** has reviewed this application and has no additional comments.

The **Water Services Department** has reviewed this application and has no additional comments.

STAFF RECOMMENDATION:

Staff recommends that the Planning and Zoning Commission recommend approval to the City Council on application PAD02-122, a PAD Amendment for Arizona Traditions, subject to stipulations listed in Recommendations.

EXISTING ZONING:

1. ON-SITE: R1-43
   NORTH: PAD (Sun City Grand)
   EAST: PAD (Arizona Traditions)
   SOUTH: PAD (Arizona Traditions)
   WEST: PAD (Arizona Traditions)

EXISTING LAND USE:

2. ON-SITE: Vacant Land
   NORTH: Single Family Residential (Sun City Grand)
   EAST: Single Family Residential (Arizona Traditions)
   SOUTH: Single Family Residential (Arizona Traditions)
   WEST: Single Family Residential (Arizona Traditions)

ADJACENT ROAD STATUS:

3. Existing

Street Name	Right of Way	Pavement Width	Landscape	Lanes /each direction	Sidewalks
Traditions Loop Road	80 feet	50	Both sides, median	One lane	Both sides

UTILITIES AND SERVICES STATUS:

4	**WATER**	Arizona-American Water
5.	**SEWER**	City of Surprise
6.	**FIRE PROTECTION:**	The Surprise Fire Department has a fire station located at 15616 North Hollyhock Street and one located at 18600 N. Reems Road. Additionally, a fire station is under development at Cotton Lane and Union Hills Drive
7.	**POLICE PROTECTION:**	The Surprise Police Department currently has a station located at 12425 W. Bell Road and a substation located at 18600 Reems Road.

100 YEAR ASSURED WATER SUPPLY CERTIFICATION:

8. The applicant shall be required to provide verification from Arizona Department of Water Resources of having an assured water supply pursuant to ARS 45-576 (D), prior to recordation of any final plat within Canyon Ridge West Parcel 5.

FINANCIAL ASSURANCE FOR COMPLETION OF INFRASTRUCTURE:

9. Financial assurance be will required prior to the recordation of any final plat or map of dedication associated with the development.

STREET LIGHT IMPROVEMENT DISTRICT

10. Developer or any future successor shall be required to enter into an agreement with the City of Surprise for street lighting improvements and maintenance upon plat submission

PLAN ANALYSIS:

BACKGROUND

11. Subject site is a former well site originally owned by Sun City Grand. Because of the proximity to the Arizona Traditions site, and the easy incorporation into the current development, the developer purchased the property for purposes of incorporating the property into the development.

12. The Arizona Traditions PAD was originally approved for 5.5 du/ac. The addition of the subject site will not change the approval or the intensity of the development. As it is, the Arizona Traditions development is developing at a lesser density than was approved in the PAD. Therefore, there will be no noticeable impact with the addition of this property.

PROPOSAL

13. If approved, the subject site will be incorporated into Parcel 15 of the Arizona Traditions master plan. The preliminary plat for Parcel 15 is moving forward through the City process, and is taking into account the addition of the one-acre parcel. The plat is more appropriately designed based upon the addition of this acre piece.

CONCLUSION

14. Staff believes that this PADA request is in harmony with the Arizona Traditions PAD and with the Surprise 2020 general plan. If approved, it would not be detrimental to the health, safety or welfare of the citizens of the City of Surprise.

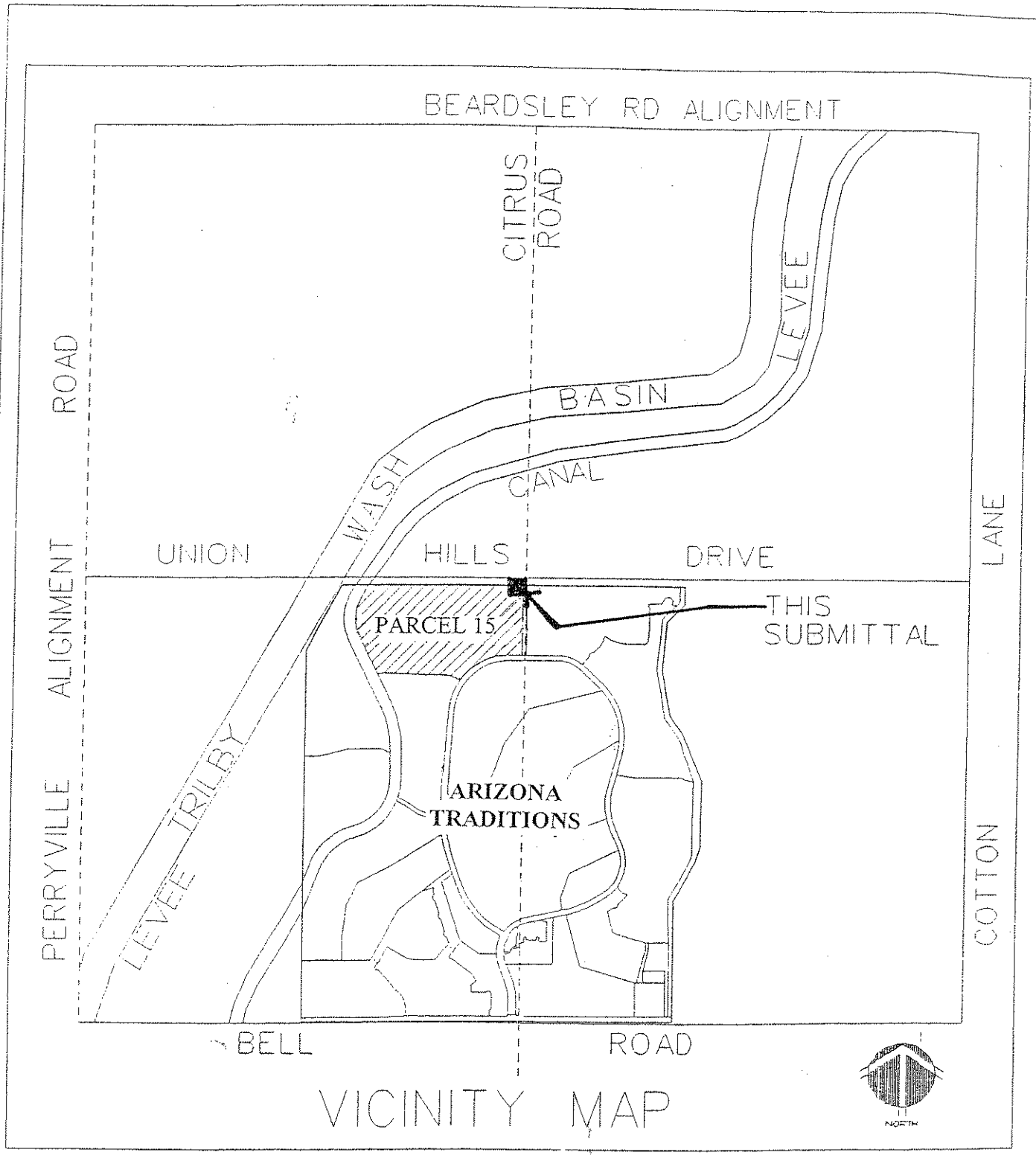
ARIZONA TRADITIONS
AT SURPRISE VILLAGE NORTH
PARCEL XV
MINOR PAD AMENDMENT

PROJECT NARRATIVE
May 6, 2001

Surprise Village North L.L.C. is requesting approval of a Minor Amendment to the Arizona Traditions Planned Area Development. The P.A.D. is an approved 530-acre project located within the square mile of Perryville Road Alignment to Cotton Lane and Union Hills Drive to Bell Road. On the northern boundary of this project (adjacent to Union Hills Drive) is a 1-acre exception parcel that was not included in the original PAD, however it was included in the land use plan. Surprise Village North L.L.C. would like to amend the PAD to include this exception in the Parcel XV Plat. The approval of this amendment will incorporate this 1-acre exception into the design of the P.A.D. providing a seamless overall community.

The original P.A.D. allows for 5.5 du/ac density and a total of 1869 single-family units. (The Villages at Surprise-North dated May 9, 1996) The addition of this 1-acre parcel will not result in any alteration of the approved standards of this P.A.D.

Currently the property is zoned R1-43 and will be rezoned to R1-5 PAD to meet the requirements of the PAD



VICINITY MAP

SCALE 1"=2000'

.../S30005-land/par15/ppl5s01.dgn Jun. 03, 2002 09:23:08

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JUN 10 2002
CITY OF SURPRISE

COE & VAN LOO CONSULTANTS, INC.

Land Planning • Civil Engineering • Water Resources Engineering • Environmental Sciences • Landscape Architecture • Surveying • Construction Management

Founded in 1958 by
P.E. Coe, P.E. (1915-1977)
H.W. Van Loo, P.E.

Desmond McGeough
Planner II
City of Surprise
12425 W. Bell Road Suite D-100
Surprise, Az. 85375-9002

Re: Arizona Traditions Parcel 15
CVL Project No.: 59-0005-01

Dear Desmond:

On behalf of our client, Arizona Traditions, we are requesting an administrative amendment to the Villages at Surprise-North PAD. Arizona Traditions wants to include a one acre piece of property, located at the northeast corner of Parcel 15, into the master planned community. This property is surrounded on three sides by Arizona Traditions and is further land locked by Sun City Grand to the north.

This property was not included in the original PAD, however, it was included in the Land Use Plan and designated Single Family Residential. We believe this amendment constitutes a minor change and should be administratively approved by the City Planning and Zoning Director as outlined in the Development Agreement for Arizona Traditions.

I have included a copy of the Land Use Plan along with excerpts of the Villages at Surprise-North PAD relating to amendments to the plan for your reference. I look forward to your review and action of this request.

If you have any questions please call me at (602)264-6831.

Sincerely,

COE & VAN LOO
Consultants, Inc.

Joe Walsh
Project Manager

Enclosures

JW:pk

N:\590005\ADMIN\05-012L.doc

Amendment

The City of Surprise (the "City") and the Developer of the Villages at Surprise (the "Developer") agree that amendments to the Villages at Surprise-North PAD may be necessary from time to time. If and when the parties find that such amendments are necessary or appropriate, they shall, unless otherwise required by applicable law as discussed in the Development Agreement entered into between the parties (the "Development Agreement"), effectuate minor changes or adjustments through administrative amendments approved by the City Planning and Zoning Director with the approval of the City Manager. After execution, any such amendment shall be attached to the Villages at Surprise-North PAD as an addendum and become a part thereof, and may be further changed and amended from time to time as necessary, with the approval of the City and the Developer. Unless otherwise required by law, no such minor amendments shall require prior notice or hearing. All major changes or amendments shall be reviewed by the Planning and Zoning Commission and approved by the City Council. The following are examples of major changes or amendments:

(a) Substantial alteration of the permitted uses of the Villages at Surprise-North, except with regard to the Developer's ability to modify the golf course as discussed in the Villages at Surprise-North PAD;

(b) An increase in the density or intensity of use or number of dwelling units, except for Density Transfers as provided in the Villages at Surprise-North PAD and Development Agreement;

(c) Deletion of a requirement for the reservation or dedication of land for public purposes, except for minor boundary adjustments or street alignments which shall be treated as minor changes; and

(d) Addition, but not deletion, of streets to those shown on the

Villages at Surprise-North PAD.

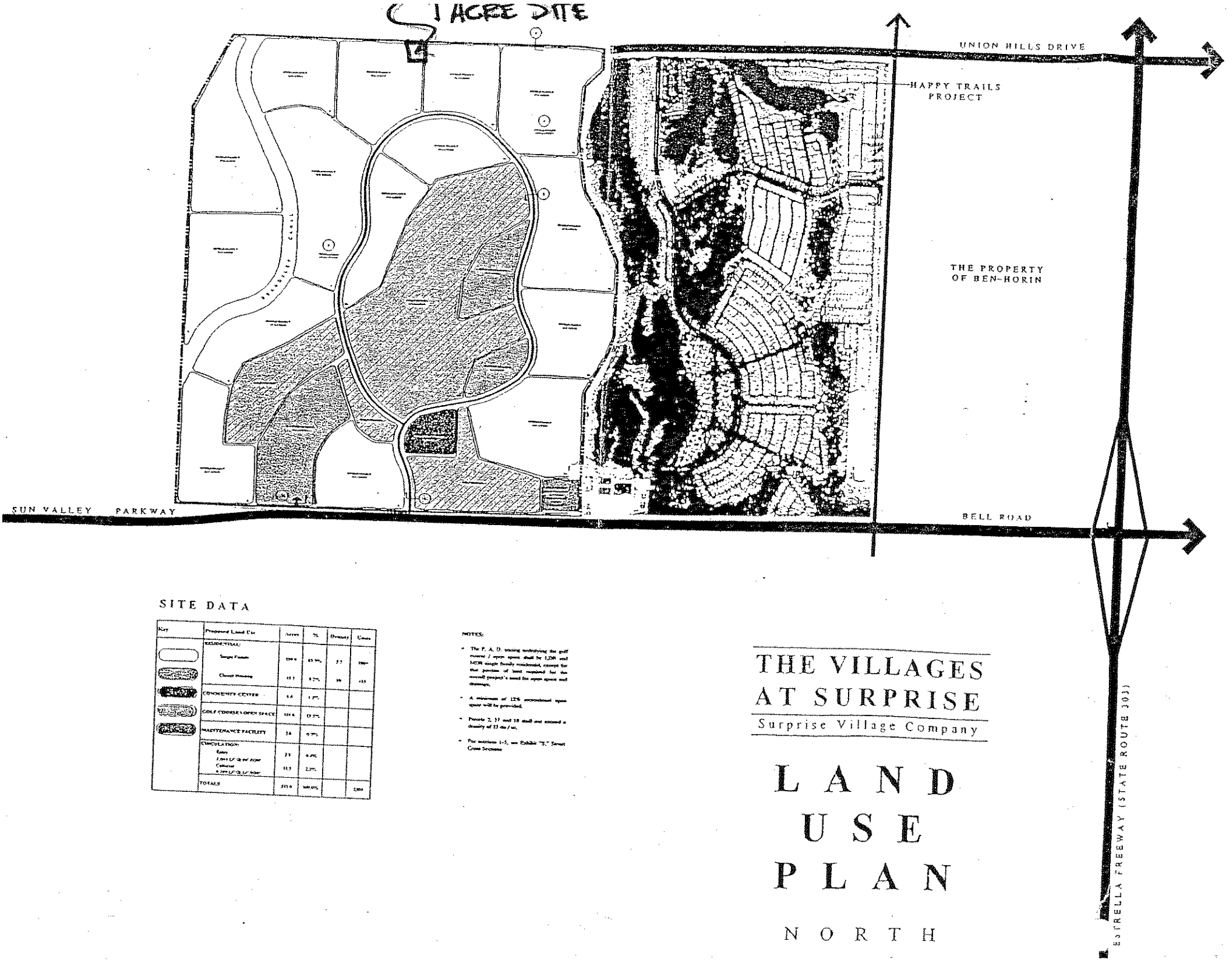
The parties shall cooperate in good faith to agree upon, and use reasonable best efforts to process, any minor or major amendments to the Villages at Surprise-North PAD, which amendments shall be incorporated by this reference into the Villages at Surprise-North PAD.

Density Transfers The City and the Developer hereby acknowledge and agree that the Villages at Surprise-North PAD provides both an overall maximum density for the Villages at Surprise-North (the "Maximum Density") and a land use category and unit per-acre designation for each particular parcel. The City acknowledges and agrees that provided the Developer does not exceed the Maximum Density, the Developer shall have the right, in its discretion to:

(a) develop any individual parcel up to the maximum density allowed for such parcel as shown on the Villages at Surprise-North PAD (see Table, page 9);

(b) develop any individual parcel at a density of not more than one hundred twenty-five percent (125%) of the maximum density allowed for such parcel as shown on the Villages at Surprise-North PAD, provided the Developer obtains prior written administrative approval from the City's Planning and Zoning Director and the City Manager; and

(c) develop any individual parcel at a density greater than one hundred twenty-five percent (125%) of the maximum density allowed for such



SITE DATA

Key	Proposed Land Use	Acres	%	Density	Units
	RESIDENTIAL:				
	Single Family	[illegible]	[illegible]	[illegible]	[illegible]
	Clover Housing	[illegible]	[illegible]	[illegible]	[illegible]
	CONDIMENTY CENTER	[illegible]	[illegible]		
	GOLF COURSE/OPEN SPACE	[illegible]	[illegible]		
	MAINTENANCE FACILITY	[illegible]	[illegible]		
	CIRCULATION:				
	Entry	[illegible]	[illegible]		
	Collector	[illegible]	[illegible]		
	TOTALS	[illegible]	[illegible]		[illegible]

NOTES:

- The P. A. D. zoning underlying the golf course / open space shall be LDR and MDR single family residential, except for that portion of land required for the overall project's need for open space and drainage.
- A minimum of 12% recreational open space will be provided.
- Parcels 2, 17 and 18 shall not exceed a density of 12 du / ac.
- For sections 1-5, see Exhibit "S," Street Cross Sections

THE VILLAGES AT SURPRISE

Surprise Village Company

LAND USE PLAN

NORTH

RECOMMENDATIONS: (PADA02-122)

Subject request is consistent with Surprise 2020 General Plan. Furthermore, approval of this request would allow for efficient and orderly development. Staff recommends that the Planning and Zoning Commission recommend approval of this PAD Amendment for Arizona Traditions (PADA02-122), subject to the following stipulations:

STANDARD STIPULATIONS:

a) Major changes to this Planned Area Development with regard to use and intensity, must be processed as a revised application with approval by the City Council upon recommendation of the Planning and Zoning Commission. Minor changes to this Planned Area Development may be administratively approved by the City Manager and the Community Development Director;

b) The applicant shall submit a Written Response to Stipulations and two (2) copies of the revised Preliminary Plat. Said submission must be under one (1) transmittal package;

IGA NOTIFICATION

MWD RESPONSE TO SURPRISE ENHANCED NOTIFICATION

TO: City of Surprise
12425 West Bell Road, Suite D100
Surprise, AZ 85374
Attn: Phil Testa

FROM: Maricopa Water District
P.O. Box 900
Waddell, AZ 85355
Attn: KoKo Kvistad

CASE: PADA02-122 **MWD RESPONSE DATE:** 6/05/02

NAME: Surprise Village North, L.L.C.

LOCATION: **Section:** 34-4N-2W **General:** Arizona Traditions Loop & North Goldwater Dr.

RE: Minor PAD Amendment for Arizona Traditions at Surprise Village North – Parcel XV

NOTICE: **Date:** 5/29/02 **Comment Deadline:** 6/11/02 **Public Hearing:** 6/18/02

MWD RESPONSE:

1. **MWD Service Area:** X Within MWD ____ Outside MWD

2. **MWD Existing Facilities/Properties:**
   X None ____ Undetermined ____ Facilities ____ Properties

3. **MWD Impacts:**
   X MWD Is Not Impacted ____ MWD Is Or May Be Impacted

4. **MWD Development Agreement:**
   ____ Not Applicable X Applicable, Development Agreement Notice Required
   ____ A Development Agreement with the Owner is required to address impacts on MWD.
   X MWD has a(n) **Arizona Traditions** Development Agreement.

5. **MWD Facilities/Properties - Disposition Or Treatment:**
   X Not Applicable
   ____ Undetermined - Needs to be Addressed Between MWD and Owner
   ____ MWD's Development Agreement provides for MWD Facilities/Property Interests to be:
   ____ Abandoned by MWD: All ___ Portion
   ____ Relocated by the Owner/Developer: All ___ Portion
   ____ Unaffected and Remain in Place: All ___ Portion

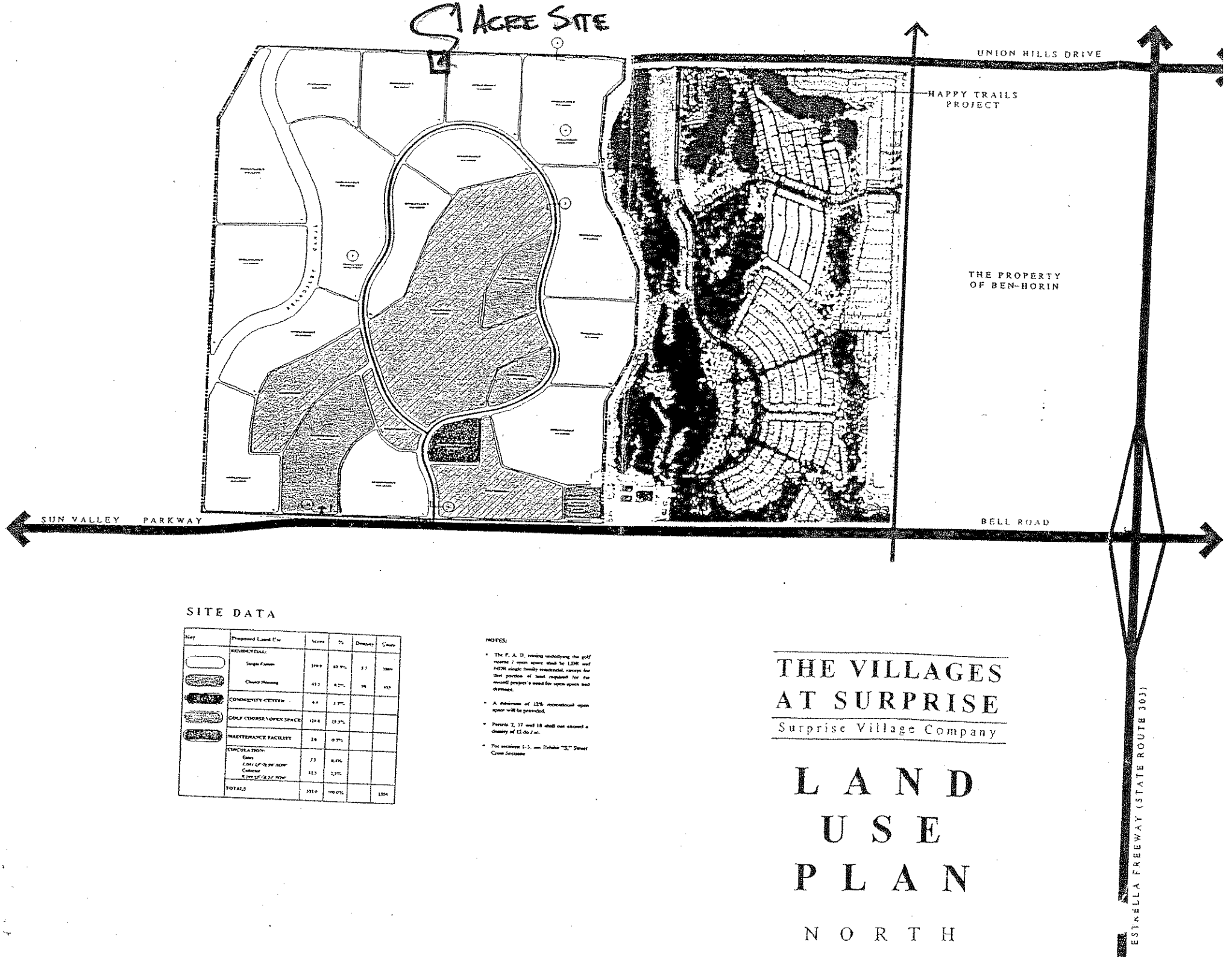
6. **IGA Notice:** X Required ____ Undetermined ____ Not Applicable

7. **IGA Submittals:** X Required ____ Undetermined ____ Not Applicable

8. **Additional Information Required By MWD:**
   ____ No Further Information Required
   X Request To Be Kept Informed
   ____ MWD Needs Further Information Prior To Commenting

9. **Comments:** ____

MWD Staff cc: JBS / KKK / CV / DF / CK / FI



SITE DATA

Key	Proposed Land Use	Acres	%	Density	Units
	RESIDENTIAL:				
	Single Family	319.9	67.9%	3.5	1[illegible]
	Cluster Housing	41.5	8.2%	[illegible]	455
	COMMUNITY CENTER	6.4	1.7%		
	GOLF COURSE / OPEN SPACE	124.8	25.5%		
	MAINTENANCE FACILITY	2.6	0.7%		
	CIRCULATION:				
	Entry	2.3	0.4%		
	Collector	11.5	2.3%		
	TOTALS	511.0	100.0%		1[illegible]

NOTES:

- The P. A. D. zoning underlying the golf course / open space shall be LDR and MDR single family residential, except for that portion of land required for the overall project's need for open space and drainage.
- A minimum of 12% recreational open space will be provided.
- Parcels 2, 17 and 18 shall not exceed a density of 12 du / ac.
- For sections 1-5, see Exhibit "S," Street Cross Sections

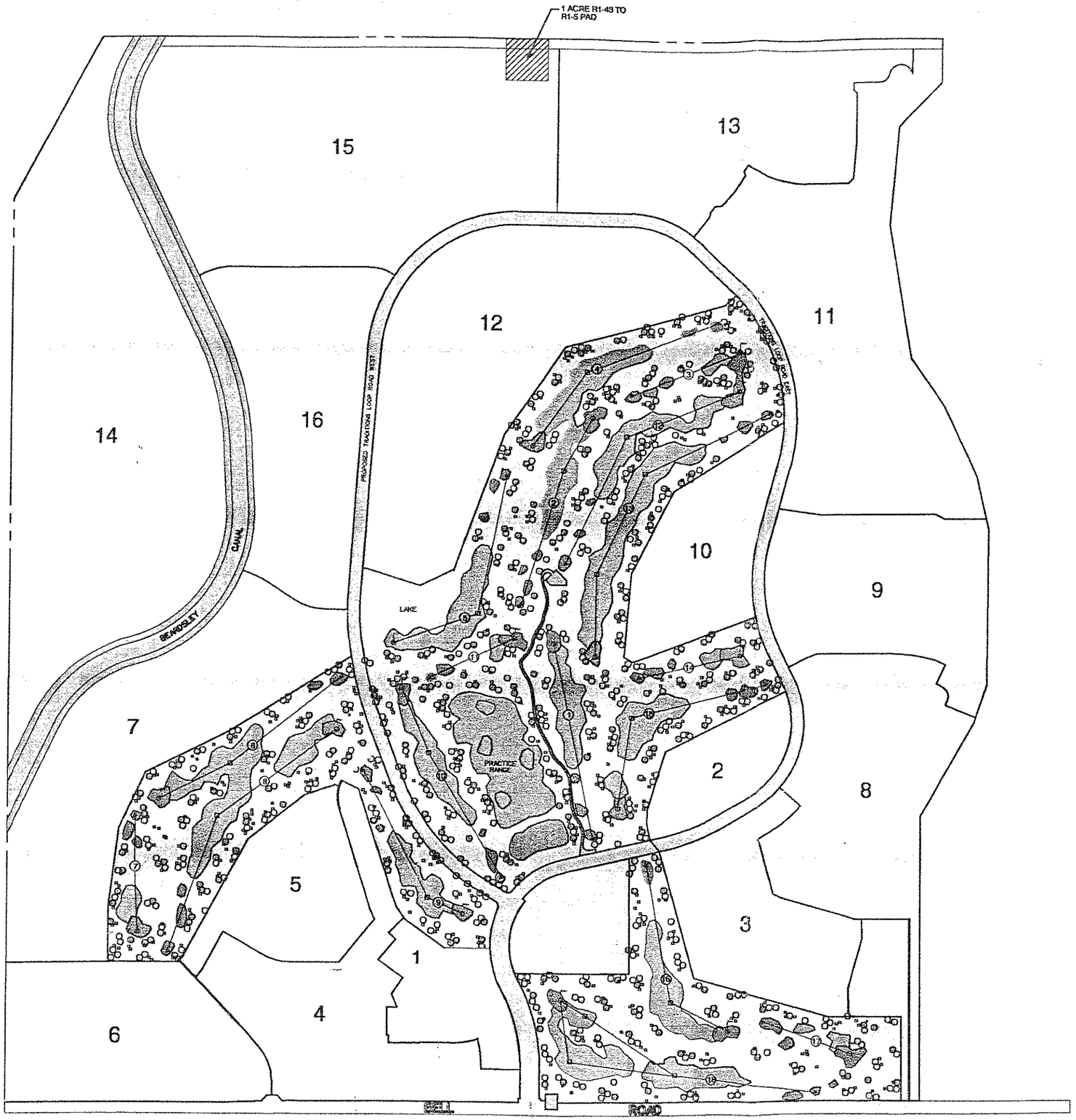
THE VILLAGES AT SURPRISE

Surprise Village Company

LAND USE PLAN

NORTH

ARIZONA TRADITIONS
MASTER PLAN
AMENDMENT TO PARCEL XV



LEGEND

- SINGLE FAMILY RESIDENTIAL
- GOLF COURSE/OPEN SPACE
- COMMUNITY CENTER
- MAINTENANCE FACILITY

NORTH

10-24-01