



Drainage Reports

PRELIMINARY DRAINAGE REPORT

ALTA Raintree Scottsdale

8688 E. Raintree Drive
Scottsdale, AZ 85260

Prepared For:



Prepared by:



Sustainability Engineering Group

8280 E. Gelding Drive, Suite 101
Scottsdale, AZ 85260
480.588.7226 www.azSEG.com

Project Number: 180961

Date: February 15, 2019 (DRB)

Revised: May 16, 2019 (DRB)

Case No.: 3-ZN-2019

Plan Check No.: TBD

Table of Contents

LIST OF FIGURES:	2
APPENDIX:	2
1. INTRODUCTION	3
2. LOCATION AND PROJECT DESCRIPTION	3
2.1 LOCATION:	3
2.2 EXISTING AND PROPOSED DEVELOPMENTS SURROUNDING THE SITE:	3
2.3 EXISTING SITE DESCRIPTION:	3
2.4 PROPOSED SITE DEVELOPMENT:	3
2.5 FLOOD HAZARD ZONE:	3
3. EXISTING DRAINAGE CONDITIONS	4
4. PROPOSED STORM WATER MANAGEMENT	4
4.1 DESIGN INTENT:	4
4.2 DESIGN STORM REQUIREMENTS:	5
4.4 STORMWATER RETENTION:	5
4.5 PIPE CAPACITY CALCULATIONS:	7
4.6 STORM DRAIN INLET CALCULATIONS	7
5. FLOOD SAFETY FOR DWELLINGS	7
6. CONCLUSIONS	7
6.1 OVERALL PROJECT:	7
6.2 PROJECT PHASING:	7
7. WARNING AND DISCLAIMER OF LIABILITY	7
8. REFERENCES	7



LIST OF FIGURES:

FIGURE 1	-	Vicinity Map
FIGURE 2	-	Aerial
FIGURE 3	-	FIRM

APPENDIX:

APPENDIX I	-	Rainfall Data
APPENDIX II	-	Calculations
APPENDIX III	-	Preliminary Site Exhibit
APPENDIX IV	-	Preliminary Drainage Report Northsight and Raintree
APPENDIX V	-	As- Bults: Grading, Drainage & Utility Plan Reference Sheets

1. INTRODUCTION

This Preliminary Drainage Report represents the storm water analysis for the Wood Partners Alta Raintree Residential development proposed in Scottsdale, Arizona. The purpose of this report is to provide the hydrologic and hydraulic analyses, required by the City of Scottsdale, to support the proposed site plan for said development. This report includes discussions and calculations defining the storm water management concepts for the collection and conveyance necessary to comply with the drainage requirements of the City of Scottsdale and Maricopa County. Preparation of this report has been done in accordance with the requirements of the City of Scottsdale Design Standards & Policies Manual (DS&PM) 2018 ¹, and the Drainage Design Manuals for Maricopa County, Arizona, Volumes I² and Volume II³.

2. LOCATION AND PROJECT DESCRIPTION

2.1 LOCATION:

The subject property consists of land fronting bound by private roads. It is further defined as follows:

- A portion of the Northeast 1/4 quarter of Section 12, Township 3 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, Scottsdale, Arizona.
- Parcel ID: Portion of APN: 215-52-034M
- Address: 8688 E. Raintree Drive, Scottsdale, AZ

Refer to **FIGURE 1 - Vicinity Map** for the project's location with respect to major cross streets

2.2 EXISTING AND PROPOSED DEVELOPMENTS SURROUNDING THE SITE:

The site is bound as follows:

- South: Parcel 215-52-034E; M.O.D. KOHLS subdivision; Zoning is C-2
- West: Parcel 215-52-034S; Northsight II subdivision; Zoning is C-2
- North: Parcel 215-52-037H; owned by Sam's Club; Zoning is C-3
- East: Parcel 215-52-034L; Property subdivision; Zoning is C-2.

2.3 EXISTING SITE DESCRIPTION:

The project area includes approximately 241,322.4 sq. ft. (5.54 acres) of land designated as C-2 per COS Zoning Map 19. The site is currently developed includes: three 1 story shop and a parking lot.

Refer to **FIGURE 2** attached for an aerial of the site.

2.4 PROPOSED SITE DEVELOPMENT:

Site development includes the demolition of the existing three stores and the parking lot, and construction of a new multi-family apartment with a maximum of 110 units. The development will include one proposed access on the south side of the building to an underground parking garage. Refer to Appendix III - Preliminary Site Exhibit for site layout.

2.5 FLOOD HAZARD ZONE:

FIRM Map Number 04013C1760L dated October 16, 2013 indicates most of this site is designated as Zone "X". As such, it is defined as areas determined to be outside the 0.2% annual chance floodplain and therefore is not in a special flood hazard area.

Refer to **FIGURE 3** for the FIRM.

3. EXISTING DRAINAGE CONDITIONS

3.1 OFF-SITE DRAINAGE PATTERNS:

The site is minimally affected by any offsite overland flow adjacent to the property. However, easements and drainage structures were created across and adjacent to the Subject Property as part of an overall stormwater conveyance for the surrounding properties. Under existing conditions, parking lots for Lots 1 and 2 flow into catch basins located at the north boundary of this property, Lot 3. The catch basins then convey the flow into basin A-2.

Refer to the **Existing Conditions Drainage Area Map** in **Appendix II**, and **Preliminary Drainage Report Northsight and Raintree** in **Appendix IV**.

3.2 ON-SITE DRAINAGE:

The existing onsite drainage system was designed based on the whole parcel 215-52-034M and 215-52-034L areas. According to the report of record, Master Drainage report for Northsight Commercial Development dated January 17, 2002, the site is separated to 5 sub-areas. Three interconnected retention basins are provided for sub-area A, and single detached basins are provided for sub-areas B and C. Area D flows offsite and sub-area E discharges directly into the 87th Street storm drain through an onsite collection system. Per the Grading, Drainage and Utility Plans for Scottsdale Shops (39-DR-2003), dated re-approved on 9/28/2004, the existing retention sub basins provide the following retention volume:

- Sub Basin A1 = 592 cf
- Sub Basin A2 = 24,856 cf
- Sub Basin A3 = 38,434 cf
- Sub Basin B = 12,387 cf
- Sub Basin C = 7,106 cf
- Sub Basin D = 3,234 cf

The total storage of the three sub basins A1, A2, and B1 is **37,835 cf** provided volume.

Refer to the **Existing Conditions Drainage Area Map** in **Appendix II**, and **As- Built: Grading, Drainage & Utility Plan Reference Sheets** in **Appendix IV and V**.

4. PROPOSED STORM WATER MANAGEMENT

4.1 DESIGN INTENT:

On-site drainage will be handled within paved areas through catch basins, open retention area and underground storm systems where necessary. On-site retention will be provided for the 100-year 2-hour storm event for the whole site, maintaining or exceeding storage volumes, and have total discharge of the storm water within thirty-six hours.

Refer to Section 5 below for a discussion on proposed finished floor elevations. Refer to **Proposed Conditions Drainage Area Map**.

4.2 DESIGN STORM REQUIREMENTS:

The storm water system will be designed in accordance with City of Scottsdale Design Standards and Policies Manual.

4.3 LAND CHARACTERISTICS:

Stormwater will be directed to onsite underground storage pipes. Based on the DS&PM, runoff coefficients for the 100-year storm event used are as follows:

- C=0.95 for roof areas
- C=0.95 for paved surface
- C=0.45 for undisturbed natural desert or desert landscape

HYDROLOGIC ANALYSIS: The hydrologic analysis is determined using the procedures in the City of Scottsdale Design Standards & Policies Manual and the Drainage Design Manual for Maricopa County, Arizona, Volume I. The Rational Method was utilized to compute the on-site peak discharges. The Rational Method equation is displayed as shown below:

$$Q = C_{wt}IA$$

Where: C_{wt} = The runoff coefficient relating runoff to rainfall

I = Average rainfall intensity in inches/hour, lasting for T_c

T_c = The time of concentration (Using Five minutes for the developed areas)

A = The contributing drainage area in acres

Overall project area includes **5.55 Acres at $C_{wt} = 0.88$** (Proposed conditions)

Overall site runoff = $Q_{100} = 37.88$ cfs proposed

Refer to the **Proposed Conditions Drainage Area Map** and Calculations in **Appendix II**.

4.4 STORMWATER RETENTION:

In accordance with the COS request to provide retention, the 100-year, 2-hour retention for the entire site is calculated in this preliminary report to determine potential impact on the site. Onsite open retention (for DA-1) and underground retention pipes (for DA-2) are proposed. The underground storage system will comply with the City of Scottsdale underground storage policy.

REQUIRED STORAGE:

Stormwater storage required for the 100-year, 2-hour event is calculated in accordance with the COS – DS&PM. Required Retention (Acre-Feet) = $(P/12) * A * (C)$

Where: P = 100 Yr. 2 Hr. Precipitation in Inches (Ref: Isopluvial from DS&PM, Appendix 4-1D, pg. 11 and NOAA Atlas 14 table). Refer to **Appendix I** for rainfall data.

A = Area (Acres)

$C = C_{post}$

Based on the C-value identified in Section 4.3 above, the following retention is required for each drainage area:

Basin-1: DA-1: 0.75 Ac @ $C_{wt} = 0.70$

- 100-yr, 2-hr.:

$$V_r = 2.27/12 * 0.75 \text{ ac} * 0.70 = \mathbf{0.09 \text{ ac.ft. (4,315 c.f.) REQUIRED STORAGE}}$$

Basin-2 (Underground Storage): DA-2, DA-3, DA-4, DA-5, DA-6, DA-7, DA-8, and DA-9 :

4.80 Ac @ $C_{wt} = 0.95$

- 100-yr, 2-hr.:

$$V_r = 2.27/12 * 4.80 \text{ ac} * 0.91 = \mathbf{0.83 \text{ ac.ft. (36,115 c.f.) REQUIRED STORAGE}}$$

STORAGE PROVIDED:

Retention Basin 1:

Existing detention Basin B has the capacity to retain approximately **12,387 cf** of runoff under existing conditions. The existing detention basin bleeds off to the neighboring basin southwest of the property. Under proposed conditions, the bleed off headwall will be removed, isolating the basin. The existing basin can adequately retain the required volume for DA-1 of **4,315 cf**.

Underground Storage Pipes:

Storage volume of underground piping is calculated using $V = \pi r^2 L$.

- Total proposed 10' Dia. CMP storage pipe, 466 LF = $3.1416 * 5^2 * 466 = 36,600 \text{ cf}$.

STORMWATER DISCHARGE:

For Basins with no direct bleed-off available, Drywells are proposed in the on-site storage facilities to dispose of the stormwater within thirty-six (36) hours. The calculation is as follows:

- Minimum percolating rate of a drywell (for planning purposes) = 0.1 cfs
- Volume to be drained in 36 hours = $0.1 \text{ cfs} * 36 \text{ hours} * 3600 \text{ sec/hour} = 12,960 \text{ cf} = 0.298 \text{ acre-feet}$.
- The number of drywells will be reduced if geotechnical testing for percolation rates determine adequate infiltration is available in the native soils at lower depths. If the percolation rate of the drywells is less than 0.1 cfs the number of drywells may have to be increased.

Basin 1 Provided storage = 12,387 cf

$12,387 \text{ cf} / 12,960 \text{ cf per drywell} = 0.96 = 1 \text{ drywell required}$.

Underground Storage Pipes provide storage = 36,600 cf

$36,600 \text{ cf} / 12,960 \text{ cf per drywell} = 2.82 = 3 \text{ drywells required}$.

OFFSITE RETENTION:

The remainder Lots 1, 2, and 4 will be future developments. These lots will be self-retained for the 100-year, 2- hour storm event. Runoff flowing into the site under existing conditions will not affect the proposed development.

Refer to the **Ultimate Proposed Conditions Drainage Area Map** in **Appendix II** for proposed conditions and calculations.

4.5 PIPE CAPACITY CALCULATIONS:

The calculations will be provided in the Final Drainage Report

4.6 STORM DRAIN INLET CALCULATIONS

These calculations will be provided in the Final Drainage Report

5. FLOOD SAFETY FOR DWELLINGS

5.1 FINISHED FLOOR ELEVATIONS

This project lies in an "X" Flood Zone. Therefore, the finished floor elevation is set a minimum of 1' above the greater of the highest adjacent ground elevation. Proposed building finished floor elevations will be set a minimum of 12 inches above the 100-year high-water elevation of any adjacent streets and drainage paths. This will ensure that each building will be well above the 100-year water level

6. CONCLUSIONS

6.1 OVERALL PROJECT:

1. The finish floor elevations will be designed a minimum of 12 inches above the 100-year water surface in adjacent streets and drainage paths and a minimum of 14 inches above the low top of curb of the lot.
2. On-site storm water storage will be provided for the 100-yr, 2-hr storm event and discharge within 36 hours.

6.2 PROJECT PHASING:

This project will be constructed in a single phase.

7. WARNING AND DISCLAIMER OF LIABILITY

RE: following page.

8. REFERENCES

1. *Design Standards & Policies Manual, City of Scottsdale – January 2018*
2. *Drainage Design Manual for Maricopa County, Arizona, Volume I, Hydrology, Flood Control District of Maricopa County, Fourth Edition, December 14, 2018.*
3. *Drainage Design Manual for Maricopa County, Arizona, Volume II, Hydraulics, Flood Control District of Maricopa County, December 14, 2018.*
4. *Preliminary Drainage Report Northsight and Raintree Retail Development prepared by JMA Engineering Corporation. dated May 15, 2003.*

GRADING & DRAINAGE LANGUAGE

WARNING AND DISCLAIMER OF LIABILITY

The City's Stormwater and Floodplain Management Ordinance is intended to minimize the occurrence of losses, hazards and conditions adversely affecting the public health, safety and general welfare which might result from flooding. The Stormwater and Floodplain Management Ordinance identifies floodplains, floodways, flood fringes and special flood hazard areas. However, a property outside these areas could be inundated by floods. Also, much of the city is a dynamic flood area; floodways, floodplains, flood fringes and special flood hazard areas may shift from one location to another, over time, due to natural processes.

WARNING AND DISCLAIMER OF LIABILITY

The flood protection provided by the Stormwater and Floodplain Management Ordinance is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Floods larger than the base flood can and will occur on rare occasions. Floodwater heights may be increased by constructed or natural causes. The Stormwater and Floodplain Management Ordinance does not create liability on the part of the city, any officer or employee thereof, or the federal, state or county government for any flood damages that result from reliance on the Ordinance or any administrative decision lawfully made thereunder.

Compliance with the Stormwater and Floodplain Management Ordinance does not ensure complete protection from flooding. Flood-related problems such as natural erosion, streambed meander, or constructed obstructions and diversions may occur and have an adverse effect in the event of a flood. You are advised to consult your own engineer or other expert regarding these considerations.

I have read and understand the above.

Plan Check #

Owner

Date

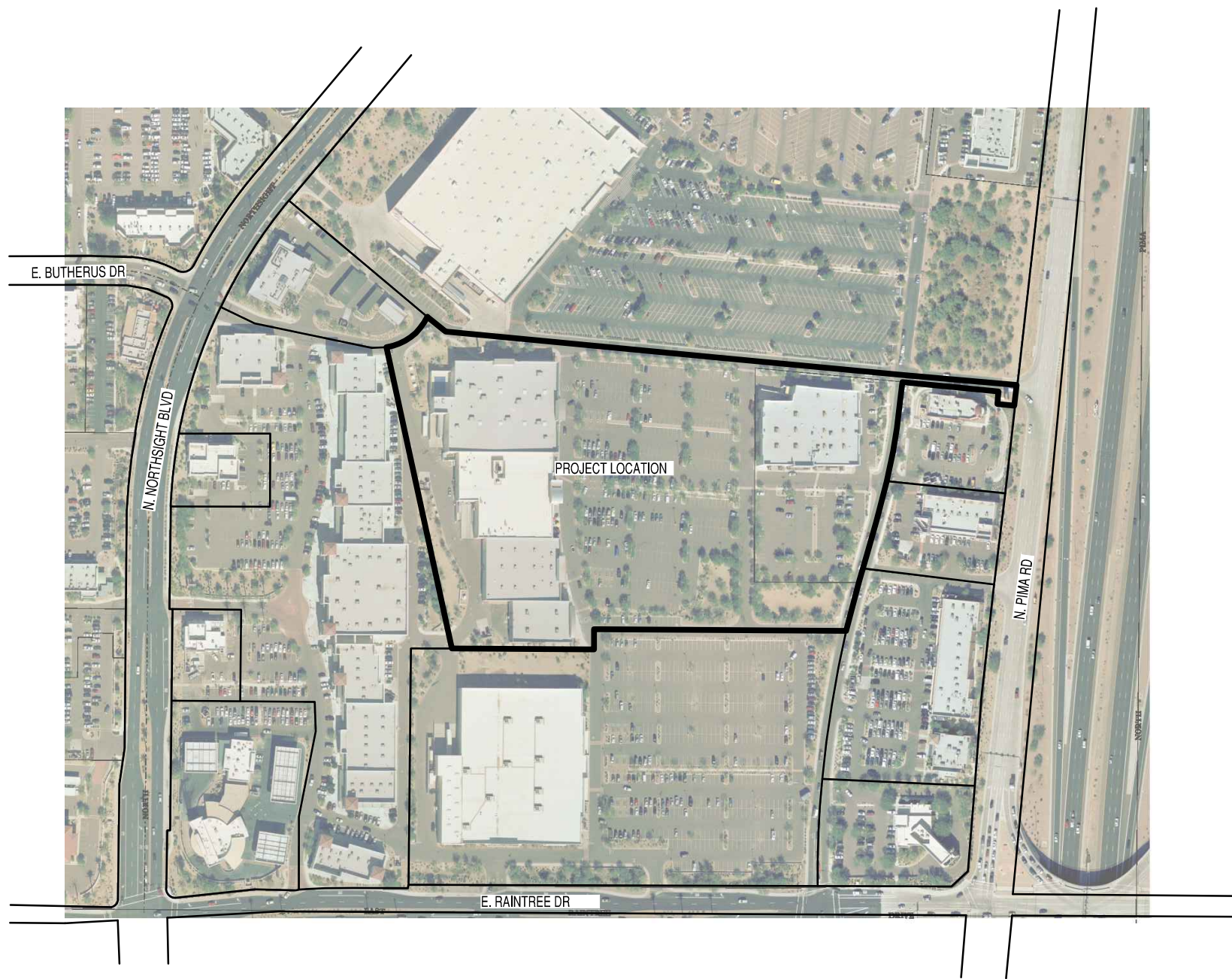


FIGURE 1
Vicinity Map
3-ZN-2019
7/22/2019



FIGURE 2
Aerial Map

sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only to landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with respect to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arizona State Plane Central zone (FIPSZONE 0020). The **horizontal datum** was NAD 83 HARN, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRM for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988 (NAVD 88). These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. Map users wishing to obtain flood elevations referenced to the National Geodetic Vertical Datum of 1929 (NGVD 29) may use the following Maricopa County website application: <http://www.fcd.maricopa.gov/Maps/gis/maps/apps/gdacs/application/index.cfm>

This web tool allows users to obtain point-specific datum conversion values by zooming in and hovering over a VERTCON checkbox on the layers menu on the left side of the screen. The VERTCON grid referenced in this web application was also used to convert existing flood elevations from NGVD 29 to NAVD 88.

To obtain current elevation, description, and/or location information for National Geodetic Survey bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov>. To obtain information about Geodetic Identification and Cadastral Survey bench marks produced by the Maricopa County Department of Transportation, please visit the Flood Control District of Maricopa County website at: <http://www.fcd.maricopa.gov/Maps/gis/maps/apps/gdacs/application/index.cfm>

Base map information shown on this FIRM was derived from multiple sources. Aerial imagery was provided in digital format by the Maricopa County Department of Public Works, Flood Control District. The imagery is dated October 2009 to November 2009. Additional National Aerial Imagery Program (NAIP) imagery was provided by the Arizona State Land Department (ALDIS) and is dated 2007. The coordinate system used for the production of the digital FIRM is State Plane Arizona Central NAD83 HARN, International Feet.

The **profile base line** depicted on this map represents the hydraulic modeling baselines that match flood profiles in the FIS report. As a result of improved topographic data, the profile base line, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

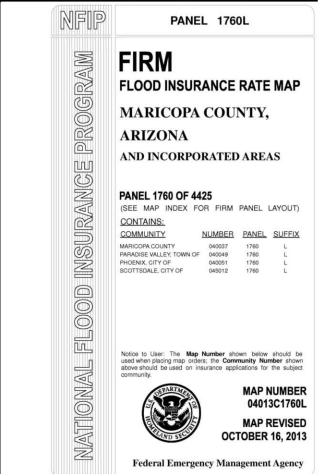
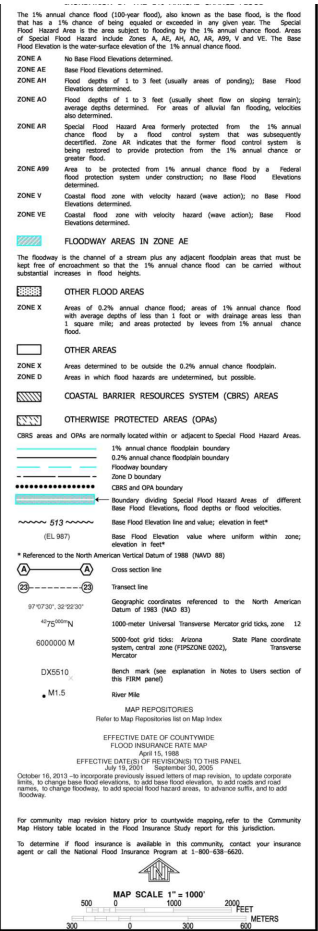
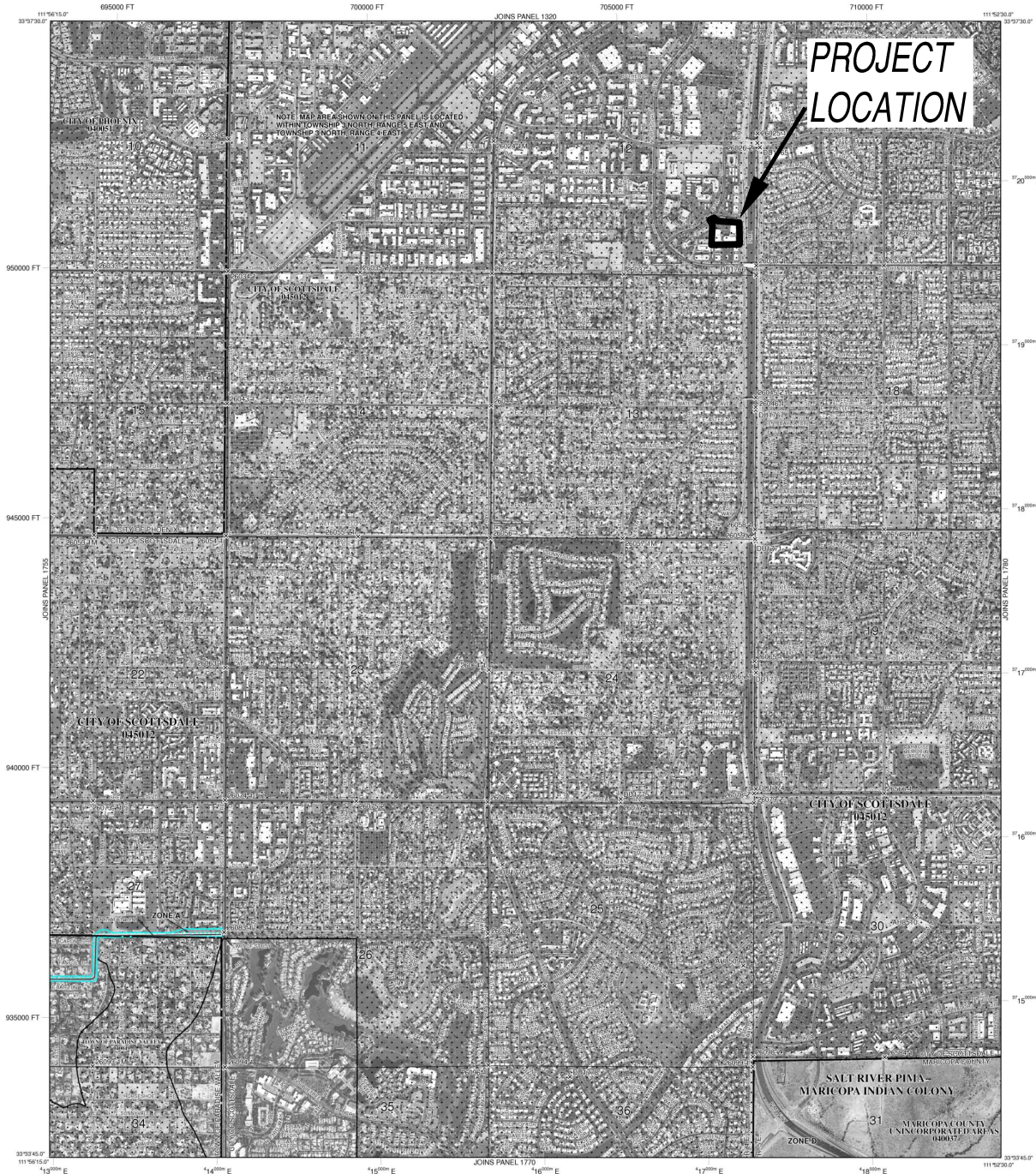
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community, as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM, visit the **FEMA Map Service Center (MSC)** website at <http://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov>.

FIGURE 3
FIRM Map



APPENDIX I

Rainfall Data



NOAA Atlas 14, Volume 1, Version 5
Location name: Scottsdale, Arizona, USA*
Latitude: 33.6209°, Longitude: -111.8943°
Elevation: 1473.44 ft**

* source: ESRI Maps

** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps_&_aerials](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	2.33 (1.93-2.86)	3.04 (2.54-3.72)	4.09 (3.40-5.00)	4.92 (4.06-5.98)	6.01 (4.87-7.28)	6.85 (5.50-8.23)	7.72 (6.07-9.26)	8.57 (6.65-10.3)	9.73 (7.36-11.7)	10.6 (7.86-12.8)
10-min	1.77 (1.47-2.17)	2.31 (1.93-2.83)	3.12 (2.59-3.80)	3.74 (3.08-4.55)	4.57 (3.71-5.54)	5.21 (4.18-6.27)	5.87 (4.63-7.05)	6.52 (5.05-7.82)	7.41 (5.60-8.90)	8.08 (5.98-9.72)
15-min	1.46 (1.22-1.79)	1.91 (1.60-2.34)	2.58 (2.13-3.14)	3.09 (2.55-3.76)	3.78 (3.06-4.58)	4.30 (3.45-5.18)	4.85 (3.82-5.83)	5.39 (4.18-6.46)	6.12 (4.62-7.35)	6.68 (4.94-8.03)
30-min	0.984 (0.818-1.21)	1.29 (1.08-1.58)	1.74 (1.44-2.12)	2.08 (1.72-2.53)	2.54 (2.06-3.09)	2.90 (2.33-3.49)	3.27 (2.57-3.92)	3.63 (2.81-4.35)	4.12 (3.11-4.95)	4.50 (3.33-5.41)
60-min	0.609 (0.506-0.746)	0.796 (0.665-0.976)	1.07 (0.889-1.31)	1.29 (1.06-1.57)	1.57 (1.28-1.91)	1.79 (1.44-2.16)	2.02 (1.59-2.43)	2.25 (1.74-2.69)	2.55 (1.93-3.06)	2.78 (2.06-3.35)
2-hr	0.356 (0.300-0.426)	0.462 (0.390-0.553)	0.614 (0.516-0.732)	0.730 (0.607-0.870)	0.890 (0.733-1.05)	1.01 (0.820-1.19)	1.14 (0.906-1.34)	1.26 (0.990-1.48)	1.43 (1.10-1.68)	1.56 (1.17-1.84)
3-hr	0.263 (0.222-0.323)	0.337 (0.285-0.415)	0.440 (0.370-0.539)	0.522 (0.434-0.635)	0.636 (0.521-0.769)	0.728 (0.588-0.874)	0.822 (0.652-0.987)	0.921 (0.718-1.10)	1.06 (0.799-1.26)	1.17 (0.861-1.40)
6-hr	0.159 (0.137-0.189)	0.201 (0.172-0.239)	0.256 (0.218-0.303)	0.300 (0.254-0.354)	0.361 (0.301-0.423)	0.407 (0.334-0.476)	0.456 (0.369-0.532)	0.506 (0.402-0.592)	0.573 (0.444-0.669)	0.627 (0.474-0.733)
12-hr	0.089 (0.077-0.105)	0.112 (0.096-0.132)	0.141 (0.121-0.166)	0.164 (0.140-0.192)	0.195 (0.164-0.228)	0.219 (0.182-0.255)	0.244 (0.200-0.283)	0.269 (0.217-0.312)	0.302 (0.238-0.352)	0.327 (0.254-0.385)
24-hr	0.052 (0.046-0.060)	0.066 (0.058-0.076)	0.085 (0.075-0.099)	0.101 (0.088-0.116)	0.122 (0.106-0.140)	0.139 (0.119-0.159)	0.156 (0.133-0.180)	0.175 (0.147-0.201)	0.200 (0.166-0.230)	0.220 (0.180-0.254)
2-day	0.028 (0.025-0.032)	0.036 (0.031-0.041)	0.047 (0.041-0.054)	0.056 (0.048-0.064)	0.068 (0.059-0.078)	0.078 (0.066-0.089)	0.088 (0.075-0.101)	0.099 (0.083-0.114)	0.114 (0.094-0.132)	0.126 (0.102-0.146)
3-day	0.020 (0.018-0.023)	0.026 (0.023-0.030)	0.034 (0.030-0.039)	0.041 (0.035-0.046)	0.050 (0.043-0.057)	0.057 (0.049-0.065)	0.065 (0.056-0.075)	0.074 (0.062-0.085)	0.086 (0.071-0.098)	0.095 (0.078-0.110)
4-day	0.016 (0.014-0.019)	0.021 (0.018-0.024)	0.028 (0.024-0.031)	0.033 (0.029-0.037)	0.041 (0.036-0.046)	0.047 (0.041-0.054)	0.054 (0.046-0.061)	0.061 (0.052-0.070)	0.071 (0.060-0.082)	0.080 (0.066-0.092)
7-day	0.010 (0.009-0.012)	0.013 (0.012-0.015)	0.018 (0.016-0.020)	0.021 (0.019-0.024)	0.026 (0.023-0.030)	0.030 (0.026-0.035)	0.035 (0.030-0.040)	0.040 (0.033-0.045)	0.046 (0.039-0.053)	0.052 (0.043-0.060)
10-day	0.008 (0.007-0.009)	0.010 (0.009-0.012)	0.013 (0.012-0.015)	0.016 (0.014-0.018)	0.020 (0.017-0.023)	0.023 (0.020-0.026)	0.026 (0.022-0.030)	0.030 (0.025-0.034)	0.035 (0.029-0.040)	0.039 (0.032-0.044)
20-day	0.005 (0.004-0.006)	0.006 (0.006-0.007)	0.008 (0.007-0.010)	0.010 (0.009-0.011)	0.012 (0.011-0.014)	0.014 (0.012-0.016)	0.015 (0.013-0.018)	0.017 (0.015-0.020)	0.019 (0.017-0.022)	0.021 (0.018-0.024)
30-day	0.004 (0.003-0.004)	0.005 (0.004-0.006)	0.007 (0.006-0.007)	0.008 (0.007-0.009)	0.009 (0.008-0.011)	0.011 (0.009-0.012)	0.012 (0.010-0.014)	0.013 (0.011-0.015)	0.015 (0.013-0.017)	0.017 (0.014-0.019)
45-day	0.003 (0.003-0.003)	0.004 (0.003-0.004)	0.005 (0.005-0.006)	0.006 (0.005-0.007)	0.007 (0.006-0.008)	0.008 (0.007-0.009)	0.009 (0.008-0.010)	0.010 (0.009-0.012)	0.011 (0.010-0.013)	0.012 (0.011-0.014)
60-day	0.002 (0.002-0.003)	0.003 (0.003-0.004)	0.004 (0.004-0.005)	0.005 (0.004-0.006)	0.006 (0.005-0.007)	0.007 (0.006-0.008)	0.007 (0.007-0.008)	0.008 (0.007-0.009)	0.009 (0.008-0.010)	0.010 (0.008-0.011)

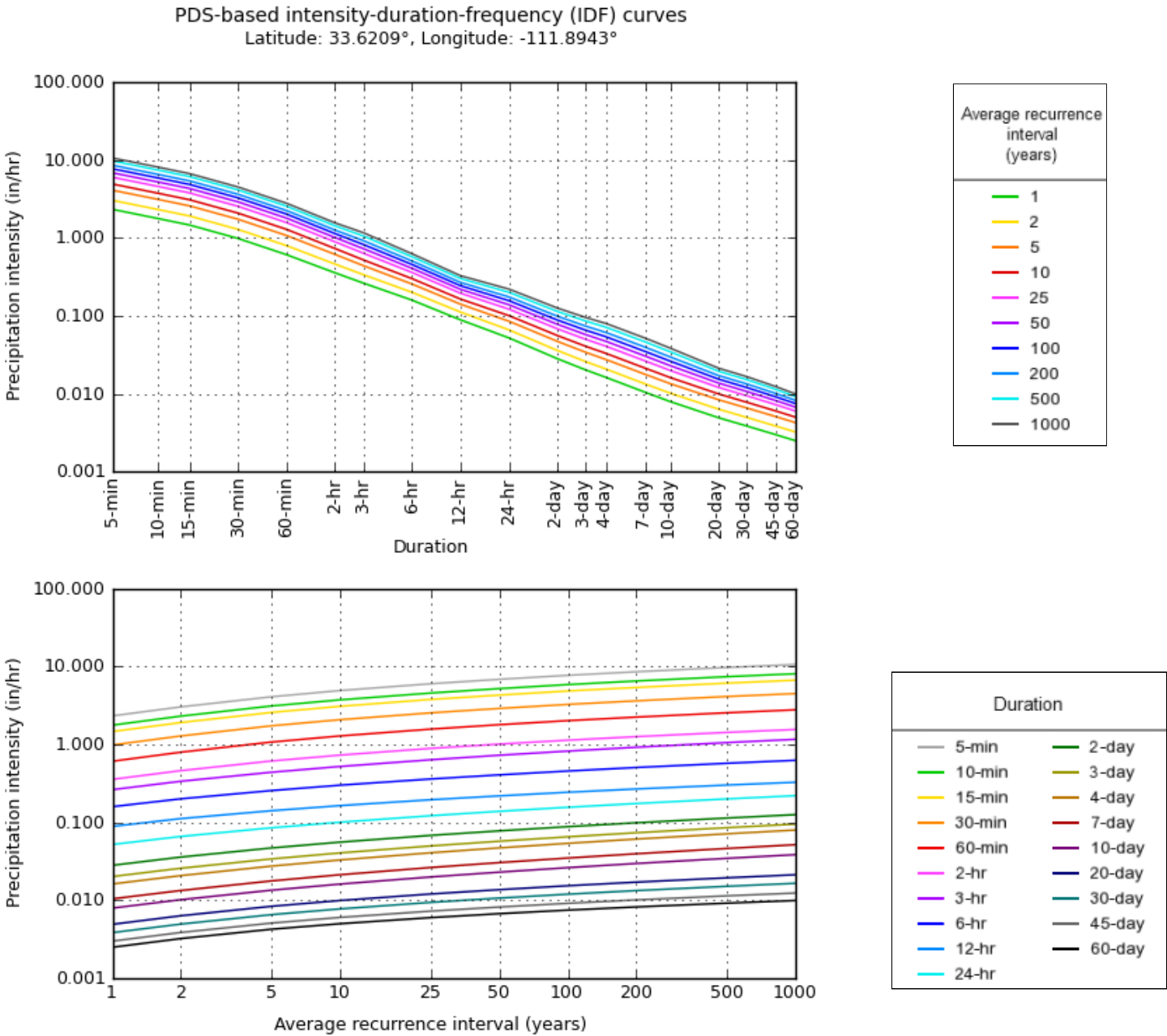
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

[Back to Top](#)

PF graphical



Maps & aerials

Small scale terrain



NOAA Atlas 14, Volume 1, Version 5
Location name: Scottsdale, Arizona, USA*
Latitude: 33.6209°, Longitude: -111.8943°
Elevation: 1473.44 ft**

* source: ESRI Maps

** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps_&_aerials](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.194 (0.161-0.238)	0.253 (0.212-0.310)	0.341 (0.283-0.417)	0.410 (0.338-0.498)	0.501 (0.406-0.607)	0.571 (0.458-0.686)	0.643 (0.506-0.772)	0.714 (0.554-0.856)	0.811 (0.613-0.974)	0.885 (0.655-1.06)
10-min	0.295 (0.245-0.362)	0.385 (0.322-0.472)	0.520 (0.431-0.634)	0.623 (0.514-0.758)	0.762 (0.618-0.924)	0.868 (0.696-1.05)	0.978 (0.771-1.18)	1.09 (0.842-1.30)	1.24 (0.933-1.48)	1.35 (0.997-1.62)
15-min	0.366 (0.304-0.448)	0.478 (0.399-0.585)	0.644 (0.533-0.786)	0.772 (0.637-0.940)	0.945 (0.766-1.15)	1.08 (0.863-1.30)	1.21 (0.955-1.46)	1.35 (1.04-1.62)	1.53 (1.16-1.84)	1.67 (1.24-2.01)
30-min	0.492 (0.409-0.603)	0.643 (0.538-0.788)	0.868 (0.718-1.06)	1.04 (0.858-1.27)	1.27 (1.03-1.54)	1.45 (1.16-1.74)	1.63 (1.29-1.96)	1.81 (1.41-2.18)	2.06 (1.56-2.48)	2.25 (1.67-2.70)
60-min	0.609 (0.506-0.746)	0.796 (0.665-0.976)	1.07 (0.889-1.31)	1.29 (1.06-1.57)	1.57 (1.28-1.91)	1.79 (1.44-2.16)	2.02 (1.59-2.43)	2.25 (1.74-2.69)	2.55 (1.93-3.06)	2.78 (2.06-3.35)
2-hr	0.713 (0.600-0.853)	0.923 (0.780-1.11)	1.23 (1.03-1.46)	1.46 (1.21-1.74)	1.78 (1.47-2.11)	2.02 (1.64-2.39)	2.27 (1.81-2.67)	2.52 (1.98-2.97)	2.86 (2.19-3.36)	3.12 (2.34-3.69)
3-hr	0.790 (0.666-0.969)	1.01 (0.855-1.25)	1.32 (1.11-1.62)	1.57 (1.30-1.91)	1.91 (1.56-2.31)	2.19 (1.77-2.63)	2.47 (1.96-2.96)	2.77 (2.16-3.31)	3.17 (2.40-3.80)	3.50 (2.59-4.20)
6-hr	0.953 (0.818-1.13)	1.20 (1.03-1.43)	1.53 (1.31-1.82)	1.80 (1.52-2.12)	2.16 (1.80-2.54)	2.44 (2.00-2.85)	2.73 (2.21-3.18)	3.03 (2.41-3.54)	3.43 (2.66-4.01)	3.75 (2.84-4.39)
12-hr	1.07 (0.922-1.26)	1.35 (1.16-1.59)	1.70 (1.46-2.00)	1.98 (1.68-2.32)	2.35 (1.98-2.75)	2.64 (2.20-3.07)	2.94 (2.41-3.41)	3.24 (2.62-3.76)	3.63 (2.87-4.24)	3.94 (3.06-4.63)
24-hr	1.25 (1.10-1.44)	1.59 (1.40-1.83)	2.05 (1.79-2.36)	2.41 (2.11-2.78)	2.93 (2.54-3.36)	3.33 (2.86-3.82)	3.75 (3.19-4.31)	4.19 (3.53-4.81)	4.80 (3.97-5.52)	5.29 (4.31-6.10)
2-day	1.35 (1.18-1.56)	1.72 (1.50-1.99)	2.26 (1.96-2.60)	2.68 (2.33-3.08)	3.27 (2.82-3.76)	3.74 (3.19-4.29)	4.23 (3.58-4.87)	4.75 (3.98-5.47)	5.46 (4.51-6.31)	6.04 (4.91-7.01)
3-day	1.45 (1.28-1.67)	1.86 (1.63-2.13)	2.45 (2.14-2.80)	2.92 (2.55-3.34)	3.59 (3.11-4.10)	4.13 (3.55-4.71)	4.70 (4.01-5.38)	5.31 (4.48-6.09)	6.16 (5.12-7.08)	6.85 (5.63-7.91)
4-day	1.56 (1.38-1.78)	1.99 (1.76-2.27)	2.64 (2.32-3.00)	3.17 (2.78-3.60)	3.91 (3.41-4.45)	4.52 (3.92-5.14)	5.17 (4.44-5.89)	5.87 (4.99-6.70)	6.85 (5.74-7.84)	7.66 (6.34-8.81)
7-day	1.76 (1.54-2.02)	2.25 (1.97-2.58)	2.98 (2.61-3.41)	3.58 (3.12-4.09)	4.43 (3.84-5.06)	5.12 (4.41-5.85)	5.86 (5.01-6.71)	6.66 (5.63-7.64)	7.78 (6.48-8.96)	8.70 (7.16-10.1)
10-day	1.91 (1.68-2.18)	2.45 (2.15-2.79)	3.24 (2.84-3.69)	3.88 (3.39-4.41)	4.79 (4.16-5.44)	5.52 (4.76-6.27)	6.30 (5.40-7.17)	7.13 (6.05-8.13)	8.30 (6.94-9.50)	9.25 (7.64-10.6)
20-day	2.36 (2.09-2.69)	3.05 (2.69-3.46)	4.03 (3.55-4.57)	4.78 (4.19-5.42)	5.79 (5.06-6.57)	6.58 (5.72-7.47)	7.39 (6.39-8.41)	8.22 (7.06-9.38)	9.34 (7.94-10.7)	10.2 (8.61-11.8)
30-day	2.78 (2.44-3.15)	3.57 (3.15-4.06)	4.72 (4.16-5.35)	5.60 (4.92-6.33)	6.78 (5.93-7.67)	7.70 (6.70-8.71)	8.64 (7.48-9.78)	9.61 (8.26-10.9)	10.9 (9.29-12.4)	11.9 (10.1-13.6)
45-day	3.24 (2.87-3.67)	4.18 (3.70-4.73)	5.52 (4.88-6.24)	6.52 (5.75-7.37)	7.85 (6.89-8.87)	8.86 (7.75-10.0)	9.90 (8.60-11.2)	10.9 (9.45-12.4)	12.3 (10.5-14.1)	13.4 (11.4-15.4)
60-day	3.60 (3.20-4.07)	4.66 (4.13-5.25)	6.14 (5.44-6.91)	7.22 (6.38-8.14)	8.64 (7.61-9.74)	9.71 (8.51-11.0)	10.8 (9.40-12.2)	11.9 (10.3-13.4)	13.3 (11.4-15.1)	14.3 (12.2-16.4)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

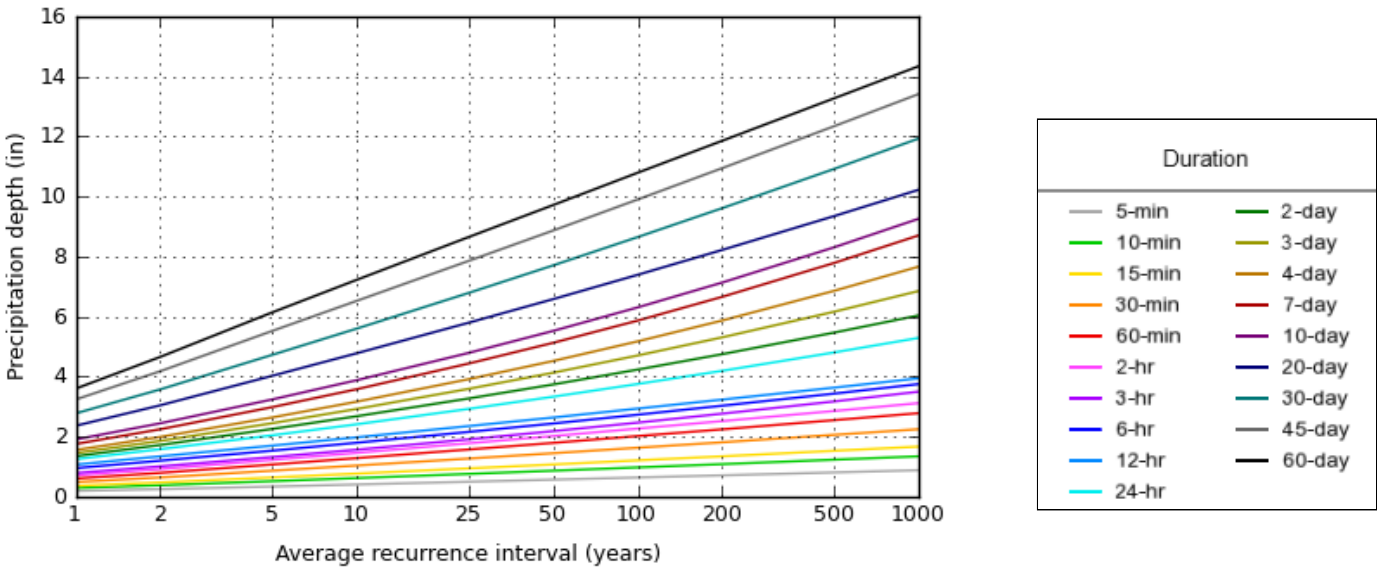
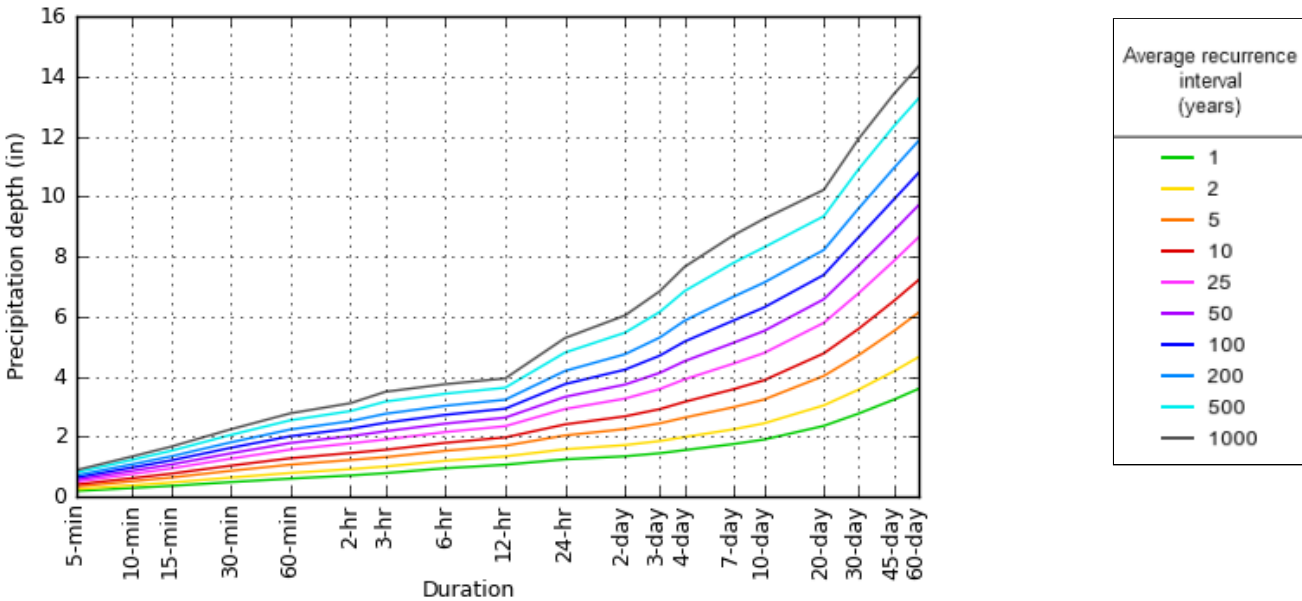
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

[Back to Top](#)

PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 33.6209°, Longitude: -111.8943°



Maps & aerials

Small scale terrain

APPENDIX II

Calculations

2. A rainfall runoff model using the USACE's HEC 1 Flood Hydrograph Package (generally used for watersheds that are larger than 160 acres, irregular in shape and contour, or if routing of flows is necessary).

B. Watershed Conditions

Watersheds are subject to change. Grading and drainage plans shall consider all watershed conditions that would result in the greatest peak discharge rate, to:

1. Size drainage facilities, and
2. Determine lowest floor elevations.

C. Split-Flow Conditions

Projects in northern parts of Scottsdale must address split-flow channel conditions where applicable. These splits in the alluvial channels usually include highly erosive soils and are generally unstable and unpredictable. In setting lowest floor elevations relative to upstream splits, assume that 100% of the flow could go either direction in any given flood event. For infrastructure design, the estimate of the actual split, based on a hydraulic analysis of the current channel cross sections, must include a minimum safety factor of 30% of the total flow. If there are extenuating factors affecting the stability of the split, the safety factor should be increased accordingly.

D. Environmentally Sensitive Lands

For special considerations regarding Environmentally Sensitive Lands, refer to the City Zoning Ordinance and DSPM Chapter 2 Section 2-2. Modification of natural watercourses with a flow of 50 cfs or greater are addressed in the City Zoning Ordinance.

E. The Rational Method

1. Precipitation. Precipitation input is rainfall intensity, "i," and can be obtained directly from [NOAA 14](#).
2. Time of Concentration. Time of concentration " t_c " is the total time of travel from the most hydraulically remote part of the watershed to the concentration point of interest. The calculation of " t_c " must follow FCDMC Hydrology Manual procedures.
3. Runoff Coefficients. Use Fig. 4-1.5, Runoff Coefficients for Use with Rational Method, or equivalent to obtain the runoff coefficients or "C" values. Composite "C" values for the appropriate zoning category or weighted average values calculated for the specific site are both acceptable approaches.

RUNOFF COEFFICIENTS – "C" VALUE

LAND USE	STORM FREQUENCY		
	2-25 Year	50 Yea r	100 Yea r
Composite Area-wide Values			
Commercial & Industrial Areas	0.80	0.83	0.86
Residential Areas – Single Family, slopes 10% or less			
R1-190	0.33	0.50	0.53
R1-130	0.35	0.51	0.59

R1-70	0.37	0.52	0.60
R1-43	0.38	0.55	0.61
R1-35	0.40	0.56	0.62
R1-18	0.43	0.58	0.64
R1-10	0.47	0.62	0.70
R1-7	0.51	0.66	0.80
R1-5	0.54	0.69	0.86
Residential Areas – Single Family, slopes greater than 10%			
R1-190	0.65	0.74	0.82
R1-130	0.68	0.76	0.84
R1-70	0.69	0.77	0.85
R1-43	0.70	0.77	0.85
R1-35	0.70	0.78	0.85
R1-18	0.71	0.79	0.86
R1-10	0.75	0.82	0.88
R1-7	0.81	0.86	0.91
R1-5	0.85	0.89	0.92
Townhouse (R-2, R-4)	0.63	0.74	0.94
Apartments & Condominiums (Condos) (R-3, R-5)	0.76	0.83	0.94
Specified Surface Type Values			
Paved streets, parking lots (concrete or asphalt), roofs, driveways, etc.	0.90	0.93	0.95
Lawns, golf courses, & parks (grassed areas)	0.20	0.25	0.30
Undisturbed natural desert or desert landscaping (no impervious weed barrier)	0.37	0.42	0.45
Desert landscaping (with impervious weed barrier)	0.63	0.73	0.83
Mountain terrain - slopes greater than 10%	0.60	0.70	0.80
Agricultural areas (flood irrigated fields)	0.16	0.18	0.20
Gravel floodways and shoulders	0.68	0.78	0.82

FIGURE 4-1.5 RUNOFF COEFFICIENTS FOR RATIONAL METHOD

F. HEC-1 Model

1. Minimum submittals
 - a. A printout of the input data.
 - b. A schematic (routing) diagram of the stream network.
 - c. The runoff summary output table, including drainage basin name, area, 2, 10, and 100- year flow values.
 - d. Electronic input file(s) on compact disc (CD) or digital versatile/video disc (DVD).
 - e. Supporting documentation and source material for parameter selection.

Weighted Runoff Coefficient-Calculations (Cw)					
EXISTING OVERALL SITE C _w					
	BUILDING or CONCRETE	ASPHALT	DESERT LANDSCAPE	TOTAL AREA	Cwt
C-VALUE	0.95	0.95	0.45		
AREA (ac)	0.00	10.89	2.15	13.05	0.87
A	0.00	5.15	1.18	6.34	0.86
B	0.00	1.59	0.34	1.94	0.86
C	0.00	0.68	0.35	1.03	0.78
D	0.00	0.29	0.00	0.29	0.95
E	0.00	3.17	0.28	3.45	0.91

PROPOSED OVERALL SITE C _w					
	BUILDING or CONCRETE	ASPHALT	DESERT LANDSCAPE	TOTAL AREA	Cwt
C-VALUE	0.95	0.95	0.45		
AREA (ac)	3.72	1.10	0.73	5.55	0.88
DA-1	0.02	0.36	0.37	0.75	0.70
DA-2	1.06	0.00	0.33	1.39	0.83
DA-3	0.00	0.14	0.03	0.16	0.87
DA-4	0.26	0.00	0.00	0.26	0.95
DA-5	0.72	0.00	0.00	0.72	0.95
DA-6	1.67	0.00	0.00	1.67	0.95
DA-7	0.00	0.20	0.00	0.20	0.95
DA-8	0.00	0.25	0.00	0.25	0.95
DA-9	0.00	0.16	0.00	0.16	0.95

Required Storage Volume Calculations						
					Vr=1*(P/12)*Cw*A	
					P=100-yr, 2-hr=2.27 in.	
Drainage	Area	C _w	intensity	Q	Volume Req.	Volume Req.
Area ID	(acres)	(-)	(in/hr)	(cfs)	(acre-ft)	(CF)
RETENTION BASIN 1						
DA-1	0.75	0.70	7.72	4.04	0.099	4,315.00
Basin 1 Totals:	0.75	0.70		4.04	0.099	4,315.00
RETENTION BASIN 2						
DA-2	1.39	0.83	7.72	8.91	0.218	9,505.85
DA-3	0.16	0.87	7.72	1.11	0.027	1,184.14
DA-4	0.26	0.95	7.72	1.87	0.046	1,996.64
DA-5	0.72	0.95	7.72	5.29	0.130	5,643.52
DA-6	1.67	0.95	7.72	12.24	0.300	13,060.84
DA-7	0.20	0.95	7.72	1.43	0.035	1,528.78
DA-8	0.25	0.95	7.72	1.84	0.045	1,962.96
DA-9	0.16	0.95	7.72	1.15	0.028	1,232.14
Basin 2 Totals:	4.80	0.91		33.84	0.829	36,114.87
Totals	5.55			37.88	0.93	40,429.87

WOOD PARTNERS ALTA RAIN TREE
EXISTING CONDITION DRAINAGE AREA MAP
NWC RAIN TREE DRIVE & LOOP 101, SCOTTSDALE, AZ 85255

Basin Data:

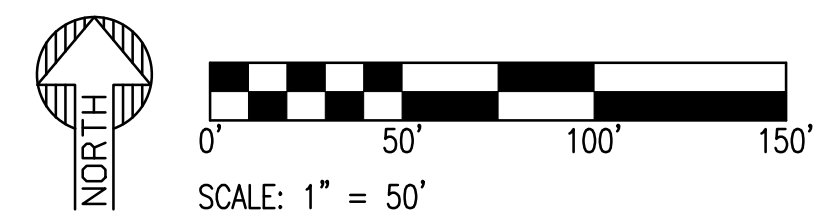
Basin Label	Area (Acres)	Volume (CF)
A	6.34	0.86
B	1.94	0.86
C	1.03	0.78
D	0.29	0.95
E	3.45	0.91

Other Labels on Map:

- BASIN C1 AND C3 $V_p = 7,108$ CF
- BASIN B1 $V_p = 12,387$ CF
- BASIN A1 $V_p = 592$ CF
- BASIN A2 $V_p = 24,856$ CF
- BASIN A3 $V_p = 38,434$ CF
- PARCEL NO. 1 LOT 1
- PARCEL NO. 2
- PARCEL NO. 3
- PARCEL NO. 4
- 1 STORY BUILDING
- UTILITY EASEMENT
- PARKING EASEMENT
- INGRESS/EGRESS EASEMENT
- 40' TEMPORARY ACCESS EASEMENT

Existing Required Storage Volume Calculations						
					$V_r = 1 * (P/12) * C_w * A$ $P = 100 - yr, 2-hr = 2.42$ in.	
Drainage	Area	Cw	intensity	Q	Volume Req.	Volume Req.
Area ID	(acres)	(-)	(in/hr)	(cfs)	(acre-ft)	(CF)
Existing Conditions						
A	6.34	0.86	7.72	41.91	1.027	44,733.13
B	1.94	0.86	7.72	12.89	0.316	13,753.85
C	1.03	0.78	7.72	6.19	0.152	6,603.29
D	0.29	0.95	7.72	2.12	0.052	2,267.28
E	3.45	0.91	7.72	24.25	0.594	25,886.77
Totals	13.05			87.36	2.14	93,244.33

DRAINAGE AREA KEY



Call at least two full working days
before you begin excavation.

ARIZONA811
Arizona Blue Stake, Inc.

Dial 8-1-1 or 1-800-STAKE-IT (782-5344)
In Maricopa County: (602) 263-1100

8280 E GELDING DR #101, SCOTTSDALE, ARIZONA 85260
WWW.AZSEG.COM TEL. 480.588.7226



LOCATION
NWC RAINTREE DRIVE & LOOP 101
SCOTTSDALE, ARIZONA

SHEET NO.:

THIS DRAWING IS AN INSTRUMENT OF SERVICE AND THE PROPERTY OF SUSTAINABILITY ENGINEERING GROUP, AND SHALL REMAIN THEIR PROPERTY. THE USE OF THIS DRAWING SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH IT IS PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE.

PROPOSED CONDITION DRAINAGE AREA MAP
NWC RAINTREE DRIVE & LOOP 101, SCOTTSDALE, AZ 85255

The map shows the following drainage areas and their characteristics:

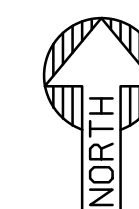
Drainage Area	Area	Cw
DA-1	0.75	0.70
DA-2	1.39	0.83
DA-3	0.16	0.87
DA-4	0.26	0.95
DA-5	0.72	0.95
DA-6	1.67	0.95
DA-7	0.20	0.95
DA-8	0.25	0.95
DA-9	0.16	0.95

Required Storage Volume Calculations

Drainage	Area	Cw	intensity	Q	Volume Req.	Volume Req.
					$V_r = 1 \cdot (P/12) \cdot C_w \cdot A$	
					$P = 100\text{-yr, } 2\text{-hr} = 2.27\text{ in.}$	



Required Storage Volume Calculations						
					$V = 1 \cdot (P/12) \cdot C_w \cdot A$ $P = 100\text{-yr, } 2\text{-hr} = 2.27 \text{ in.}$	
Drainage	Area	Cw	intensity	Q	Volume Req.	Volume Req.
Area ID	(acres)	(-)	(in/hr)	(cfs)	(acre-ft)	(CF)
RETENTION BASIN 1						
DA-1	0.75	0.70	7.72	4.04	0.099	4,315.00
Basin 1 Totals:	0.75	0.70		4.04	0.099	4,315.00
RETENTION BASIN 2						
DA-2	1.39	0.83	7.72	8.91	0.218	9,505.85
DA-3	0.16	0.87	7.72	1.11	0.027	1,184.14
DA-4	0.26	0.95	7.72	1.87	0.046	1,996.64
DA-5	0.72	0.95	7.72	5.29	0.130	5,643.52
DA-6	1.67	0.95	7.72	12.24	0.300	13,060.84
DA-7	0.20	0.95	7.72	1.43	0.035	1,528.78
DA-8	0.25	0.95	7.72	1.84	0.045	1,962.96
DA-9	0.16	0.95	7.72	1.15	0.028	1,232.14
Basin 2 Totals:	4.80	0.91		33.84	0.829	36,114.87
Totals	5.55			37.88	0.93	40,429.87



NOTE TO CONTRACTOR:
THIS SET OF DRAWINGS AND DOCUMENTS IS INTENDED AS A SET OF GUIDELINES FOR THE PROJECT AND ARE INTENDED TO BE USED IN CONJUNCTION WITH A SET OF CONSTRUCTION SPECIFICATIONS TO BE SUPPLIED BY OWNER. THEY MUST BE USED IN CONJUNCTION WITH THE SPECIFICATIONS. THE SET OF DOCUMENTS INCLUDING FEDERAL, A.D. REQUIREMENTS. THIS SET ASSUMES THAT THERE ARE NO UNUSUAL SOIL CONDITIONS OR WIND LOADS. THE FAILURE OF THIS CONDITION MAY REQUIRE SIGNIFICANT CHANGES TO THESE DOCUMENTS.
THE CONTRACTOR IS RESPONSIBLE FOR THE GENERAL CONTRACTOR TO COMPLY TO ALL APPLICABLE CODES AND TO INFORM THE OWNERS/ARCHITECTS OF ANY QUESTION OR CLARIFICATIONS WHICH ARE DESIRED. CONTRACTORS SHALL ALSO VISIT THE SITE OF THE PROJECT AND ARE REQUIRED TO KNOW ALL OBSERVABLE CONDITIONS AND APPLICABLE CODES.



PROJECT
WOOD PARTNERS ALTA RAIN TREE
SCOTTSDALE

LOCATION
NWC RAINTREE DRIVE & LOOP 101
SCOTTSDALE, ARIZONA

DRAWN _____ AVINA
DESIGNED _____ JUNKER
CHECKED _____
PROJ. MGR. _____ JUNKER

DATE: 5/15/2019

ISSUED FOR:
PRELIMINARY DESIGN

REVISION NO.:		DATE
1		
2		
3		
4		

JOB NO.: 180961

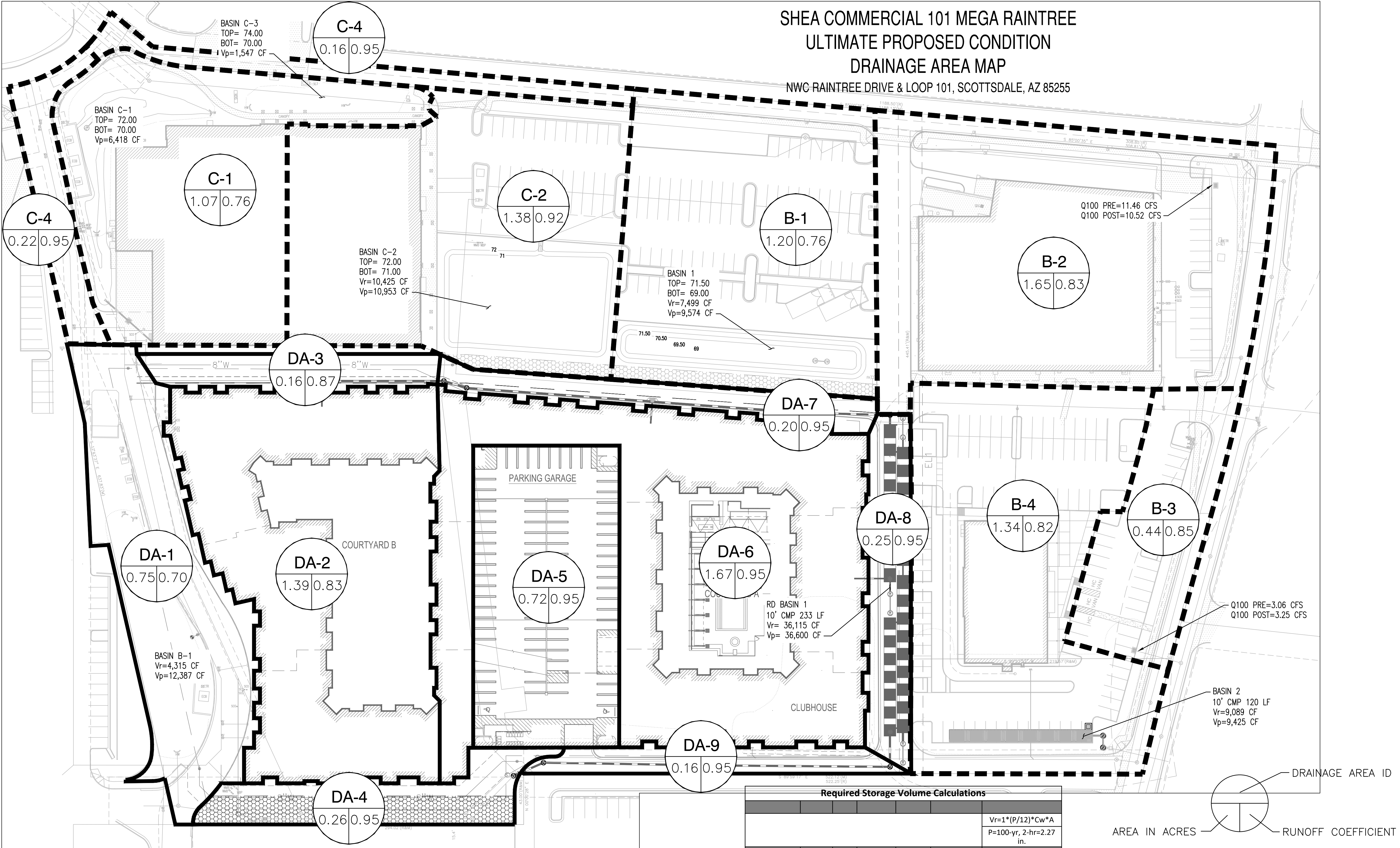
SHEET TITLE:

PROPOSED DRAINAGE AREA MAP

SHEET NO.:

SHEA COMMERCIAL 101 MEGA RAINTREE
ULTIMATE PROPOSED CONDITION
DRAINAGE AREA MAP

NWC RAINTREE DRIVE & LOOP 101, SCOTTSDALE, AZ 85255

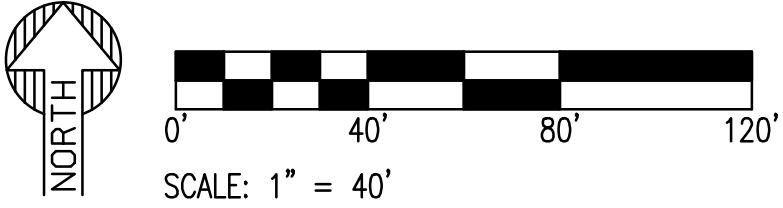


Required Storage Volume Calculations						
						$Vr=1*(P/12)*Cw*A$ P=100-yr, 2-hr=2.27 in.
Drainage	Area	Cw	intensity	Q	Volume Req.	Volume Req.
Area ID	(acres)	(-)	(in/hr)	(cfs)	(acre-ft)	(CF)
RETENTION BASIN 1						
DA-1	1.20	0.76	7.72	7.03	0.172	7,498.49
Basin 1 Totals:	1.20	0.76		7.03	0.172	7,498.49
RETENTION BASIN 2						
DA-4	1.34	0.82	7.72	8.52	0.209	9,088.83
Basin 2 Totals:	1.34	0.82		8.52	0.209	9,088.83
DIRECT DISCHARGE						
DA-2	1.65	0.83	7.72	10.52	0.258	11,227.14
DA-3	0.44	0.85	8.72	3.25	0.071	3,073.56
Total:	13.77					

Lot 1 Proposed Required Storage Volume Calculations						
						$Vr=1*(P/12)*Cw*A$ P=100-yr, 2-hr=2.27 in.
Drainage	Area	Cw	intensity	Q	Volume Req.	Volume Req.
Area ID	(acres)	(-)	(in/hr)	(cfs)	(acre-ft)	(CF)
RETENTION BASIN 1						
C-1	1.07	0.76	7.72	6.26	0.153	6678.78
RETENTION BASIN 2						
C-2	1.38	0.92	7.72	9.77	0.239	10425.13
Totals:	2.45	0.85		16.02	0.393	17,103.90
OFFSITE DISCHARGE						
C-3	0.22	0.95	7.72	1.62	0.040	1728.40
C-4	0.16	0.95	7.72	1.16	0.028	1236.23
Totals:	0.38	0.95		2.78	0.068	2,964.62

Required Storage Volume Calculations						
						$Vr=1*(P/12)*Cw*A$ P=100-yr, 2-hr=2.27 in.
Drainage	Area	Cw	intensity	Q	Volume Req.	Volume Req.
Area ID	(acres)	(-)	(in/hr)	(cfs)	(acre-ft)	(CF)
RETENTION BASIN 1						
DA-1	0.75	0.70	7.72	4.04	0.099	4,315.00
Basin 1 Totals:	0.75	0.70		4.04	0.099	4,315.00
RETENTION BASIN 2						
DA-2	1.39	0.83	7.72	8.91	0.218	9,505.85
DA-3	0.16	0.87	7.72	1.11	0.027	1,184.14
DA-4	0.26	0.95	7.72	1.87	0.046	1,996.64
DA-5	0.72	0.95	7.72	5.29	0.130	5,643.52
DA-6	1.67	0.95	7.72	12.24	0.300	13,060.84
DA-7	0.20	0.95	7.72	1.43	0.035	1,528.78
DA-8	0.25	0.95	7.72	1.84	0.045	1,962.96
DA-9	0.16	0.95	7.72	1.15	0.028	1,232.14
Basin 2 Totals:	4.80	0.91		33.84	0.829	36,114.87
Totals	5.55			37.88	0.93	40,429.87

DRAINAGE AREA KEY



PROPOSED LEGEND

- ONSITE DRAINAGE AREAS
- OFFSITE DRAINAGE AREAS



NOTE TO CONTRACTOR:
THIS SET OF DRAWINGS AND DOCUMENTS IS INTENDED AS A SET OF GUIDELINES FOR THE PROJECT AND ARE INTENDED TO BE USED IN CONJUNCTION WITH A SET OF CONSTRUCTION SPECIFICATIONS TO BE SUPPLIED BY OWNER. THEY MUST BE READ TO INCORPORATE ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES INCLUDING FEDERAL, A.D.A. REQUIREMENTS. THIS SET ASSUMES THAT THERE ARE NO UNUSUAL SOIL CONDITIONS OR WIND LOADS. THE FAILURE OF THIS CONDITION MAY REQUIRE SIGNIFICANT CHANGES TO THESE DOCUMENTS. IF THE RESPONSIBILITY FOR THE GENERAL CONTRACTOR TO COMPLY TO ALL APPLICABLE CODES AND TO INFORM THE OWNER/ARCHITECTS OF ANY QUESTIONS OR CLARIFICATIONS NEEDED ARE DESIRED, CONTRACTORS SHALL ALSO VISIT THE SITE BEFORE BIDDING. CONTRACTORS ARE REQUIRED TO KNOW ALL OBSERVABLE CONDITIONS AND APPLICABLE CODES.



8280 E GELDING DR #101, SCOTTSDALE, ARIZONA 85260
WWW.AZSEG.COM TEL. 480.588.7226



PROJECT
WOOD PARTNERS ALTA RAINTREE
SCOTTSDALE

LOCATION
NWC RAINTREE DRIVE & LOOP 101
SCOTTSDALE, ARIZONA

DRAWN: AVINA
DESIGNED: JUNKER
CHECKED: JUNKER
PROJ. MGR: JUNKER

DATE: 5/15/2019
ISSUED FOR: PRELIMINARY DESIGN

REVISION NO.: DATE:

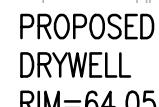
JOB NO.: 180961
SHEET TITLE: ULTIMATE PROPOSED CONDITION DRAINAGE AREA MAP
SHEET NO.:

THIS DRAWING IS AN INSTRUMENT OF SERVICE AND THE PROPERTY OF SUSTAINABILITY ENGINEERING GROUP, AND SHALL REMAIN THEIR PROPERTY. THE USE OF THIS DRAWING SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH IT IS PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE.

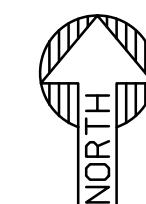
APPENDIX III

Preliminary Grading & Drainage Plan

NWC RAINTREE DRIVE & LOOP 101, SCOTTSDALE, AZ 85255



- | | |
|---|-------------|
|  | STORM PIPE |
|  | CATCH BASIN |
|  | FLOW ARROW |
|  | DRYWELL |



Call at least two full working days
before you begin excavation.

ARIZONA 811
Arizona Blue Stake, Inc.

Dial 8-1-1 or 1-800-STAKE-IT (762-6344)
In Maricopa County: (602) 263-1100

NOTE TO CONTRACTOR:
THIS SET OF DRAWINGS AND DOCUMENTS IS INTENDED AS A SET OF GUIDELINES FOR THE PROJECT AND ARE INTENDED TO BE USED IN CONJUNCTION WITH A SET OF CONSTRUCTION SPECIFICATIONS TO BE SUPPLIED BY OWNER. THEY MUST BE READ TO INCORPORATE ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES AND ORDINANCES. THERE ARE NO UNUSUAL SOIL CONDITIONS OR WIND LOADS. THE FAILURE OF THIS CONDITION MAY REQUIRE SIGNIFICANT CHANGES TO THESE DOCUMENTS. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO CONFORM TO ALL LOCAL CODES AND TO INFORM THE OWNER/ARCHITECTS OF ANY QUESTION OR CLARIFICATIONS WHICH ARE DESIRED. CONTRACTORS SHALL ALSO VISIT THE SITE BEFORE BIDDING. CONTRACTORS ARE REQUIRED TO KNOW ALL OBSERVABLE



8280 E GELDING DR #101, SCOTTSDALE, ARIZONA 85260
WWW.AZSEG.COM TEL. 480.588.7226



PARTNERS

PROJECT
WOOD PARTNERS ALTA RAINTEE
SCOTTSDALE

LOCATION
NWC RAINTREE DRIVE & LOOP 101
SCOTTSDALE, ARIZONA

DRAWN _____ AVINA
DESIGNED _____ JUNKER
CHECKED _____
PROJ. MGR. _____ JUNKER

DATE: 5/15/2019

ISSUED FOR:
PRELIMINARY DESIGN

REVISION NO.:		DATE
1		
2		
3		
4		

JOB NO.: 180961

SHEET TITLE:

PRELIMINARY GRADING AND
DRAINAGE PLAN

SHEET NO.:

THIS DRAWING IS AN INSTRUMENT OF SERVICE AND THE PROPERTY OF SUSTAINABILITY ENGINEERING GROUP, AND SHALL REMAIN THEIR PROPERTY. THE USE OF THIS DRAWING SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH IT IS PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE.

APPENDIX IV

Preliminary Drainage Report Northsight and Raintree

PRELIMINARY DRAINAGE REPORT

NORTHSIGHT AND RAINTREE

39-DR-2003

5-19-2003

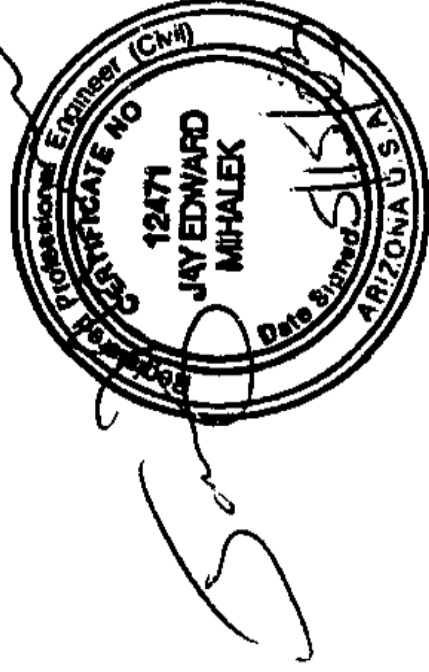
A Proposed Retail Development
Near the NWC Raintree Drive & Loop 101
Scottsdale, Arizona

Prepared for:

Continental Properties
Continental 138 Funds, LLC

and

City of Scottsdale
Development Services Department



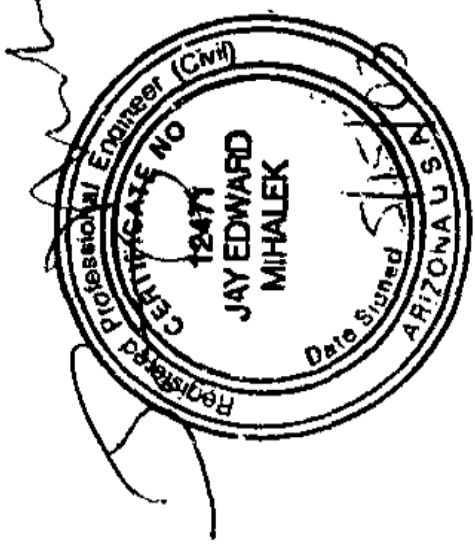
October 11, 2002
Revised May 15, 2003

Prepared by:
JMA Engineering Corporation
531 East Bethany Home Road, Garden Suite
Phoenix, Arizona 85012
(602) 248-0286
Contact: Jay Mihalek, PE

TABLE OF CONTENTS

Page

Project Location and Description
Flood Plain Classification
Existing Topography and Hydrology
Proposed Onsite Stormwater Management
 Master Drainage Report for Northsight
 Proposed Site Grading.....
 Stormwater Retention
 Table 1 - Stormwater Retention Summary
Offsite Drainage
Finish Floor
Vicinity Map Exhibit
Contour Map Exhibit
Aerial Photo Exhibit
JPRT / IPRT Drainage Areas..... Exhibit
Tributary Drainage Areas Exhibit



PROJECT LOCATION AND DESCRIPTION

This project consists of a new 129,800-sf retail center with associated drives and parking constructed on a 13.07 gross acre parcel of land. The site is located west of 87th Street, south of existing Sam's Club, approximately 500 feet east of Northsight Boulevard, and north of proposed I-10. See enclosed Exhibit A. The site is described as a portion of Parcel 6 of Map of Dedication for Northsight Boulevard, recorded in Maricopa County Records, Book 315, Page 15. Presently, the site is undeveloped desert land.

The east 20 feet of the site has been dedicated as right-of-way for the recent extension of 87th Street to a private street. The 87th Street improvements include curb and gutter, paving, stormdrain, and water and sewer lines. These improvements were installed as a part of the Kohl's project (see enclosed Exhibit B). Group, Inc. city project number 83-DR-01).

FLOOD PLAIN CLASSIFICATION

The site is located within Zone X as shown on FEMA Flood Insurance Rate Map (FIRM) No. 0405001A, Panel 1685, Suffix G, dated July 19, 2001. Zone X is defined as areas outside the 500-year flood limits.

EXISTING TOPOGRAPHY AND HYDROLOGY

The site is undeveloped natural desert sloping at about a 1.3% grade from north to south. An existing graded channel crosses the west side of the property. This channel is for temporary pre-developed discharge from the Sam's Club project to the north. The discharges will be collected and piped directly to the future 87th Street stormdrain as part of this and the Kohl's development. The site slopes from north to south at approximately one-percent, see enclosed Exhibit B and Exhibit C.

PROPOSED ONSITE STORMWATER MANAGEMENT

MASTER DRAINAGE REPORT FOR NORTHSIGHT

A master drainage report for the 330-acre Northsight region was prepared by Gilbertson and Associates, Inc. dated January 17, 2002 and revised January 28, 2002. "Northsight" is a masterplanned commercial development bounded by Thunderbird Road to the south, Frank Lloyd Wright Boulevard to the north, Pima Freeway to the east, and a line west of Northsight Boulevard. This latest issue amends the master drainage report prepared in 1986. The amended report was approved by the Stormwater Management Division, City of Scottsdale, on July 23, 2002. The subject "Northsight and Rainwater Management" is completely within the report's study area and utilizes the amended report as its basis for drainage design.

The site is divided into two drainage areas in the report; "JPRT" on the west two-thirds and "IPRT" on the east third. There are unusual retention requirements for the area due to the development sequence of the area with the construction of the new Pima Freeway to the east. The result is that some portions of the Northsight region's properties already have retention provided by a regional basin.

The west area, named JPRT, has two possibilities to its stormwater retention. The first is the normal ordinance retention requirements of a 100-year, 2-hour storm. The second alternative is to apply a waiver, which would allow design for the pre versus post stormwater runoff. This option will be pursued as it would result in only about 10 to 15 percent reduction of the normal city of Scottsdale retention ordinance requirements. The Northsight Boulevard 36-inch stormdrain system is sized to bleed-off to empty the required basins within 36 hours.

The east area, named IPRT, can discharge into the proposed 87th Street stormdrain system with no stormwater retention. The existing 48-inch 87th Street stormdrain system will convey approximately 70 cfs which includes the 70-cfs discharge from Sam's Club plus the fully developed IPRT area runoff. A portion of this site and the remainder out-parcels east of 87th Street have this direct discharge privilege and do not require stormwater retention. The waiver process will be required because of the pre-versus post approach and the IPRT direct discharge.

PROPOSED SITE GRADING

The proposed grading for separating the JPRT-IPRT tributary areas of this development does not change the delineation of the Master Drainage Report. The JPRT-IPRT area sizes within the site, and the runoff amounts, have been preserved. Considering the above, we have computed the total stormwater retention for the site to be 88,116 cubic feet. This amount is based on the JPRT area (416,622-sf) of the site, a soil Group B, and the pre-post concept. The JPRT area has been divided into four sub-areas named A, B, C and D. See enclosed Exhibit D and Exhibit E.

Retention has been accommodated with three interconnected retention basins for sub-area A, and three detached basins for sub-areas B and C. Area D flows offsite due to grades established by the development. A 12-inch gravity stormdrain will meter discharge from the basins to the stormwater main on Northsight Boulevard via Raintree Drive. The remaining IPRT area named "E" (149,773-sf) will discharge directly into the proposed 87th Street stormdrain through an onsite collection system. See enclosed Exhibit E.

STORMWATER RETENTION

Stormwater retention is provided for the JPRT area in accordance with city of Scottsdale requirements follows.

$$V_R = P/12(CA)$$

Where:

P = rainfall
A = area
C = runoff
coefficient

2.82 inches
0.9

A summary of the site's stormwater retention accommodation is as follows in Table 1.

TABLE 1
Stormwater Retention Summary

Tributary Area Name	JPRT Area, sf	Volume Required, cf	Basin Name	Volume Provided, cf
A	317,437	67,138		
			A ₃ 1	1,000
			A ₄ 2	22,500
			A ₅ 3	43,638
B				
	40,038	8,468	B	8,468
C	43,855	9,275	C	9,275
D	15,292	3,234	Offsite	3,234
Totals:	416,622	88,115		89,115

Source: JMA Engineering Corporation

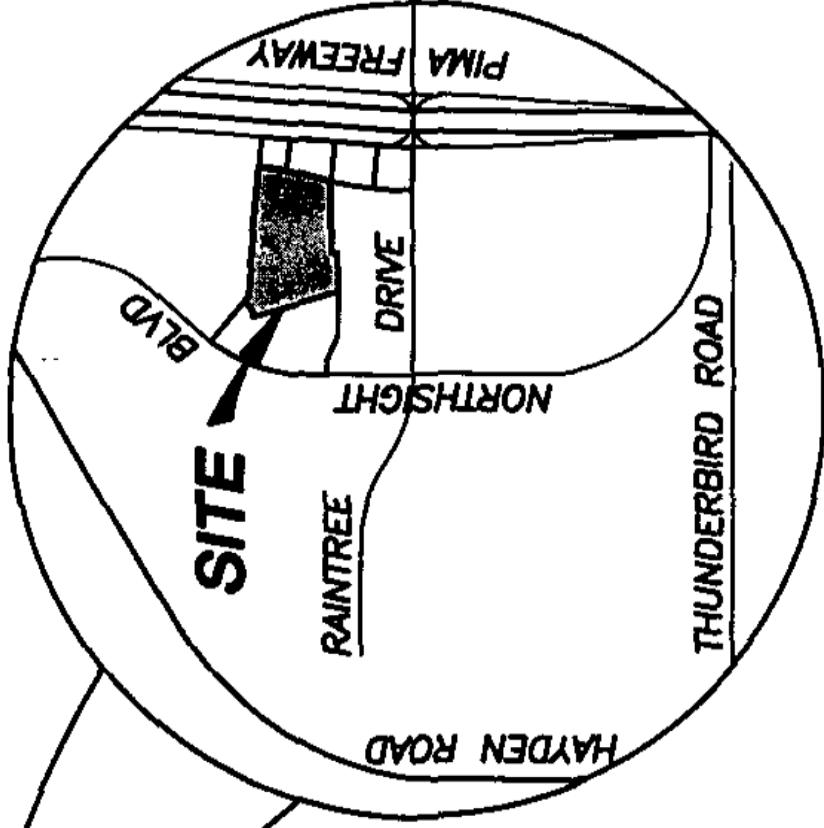
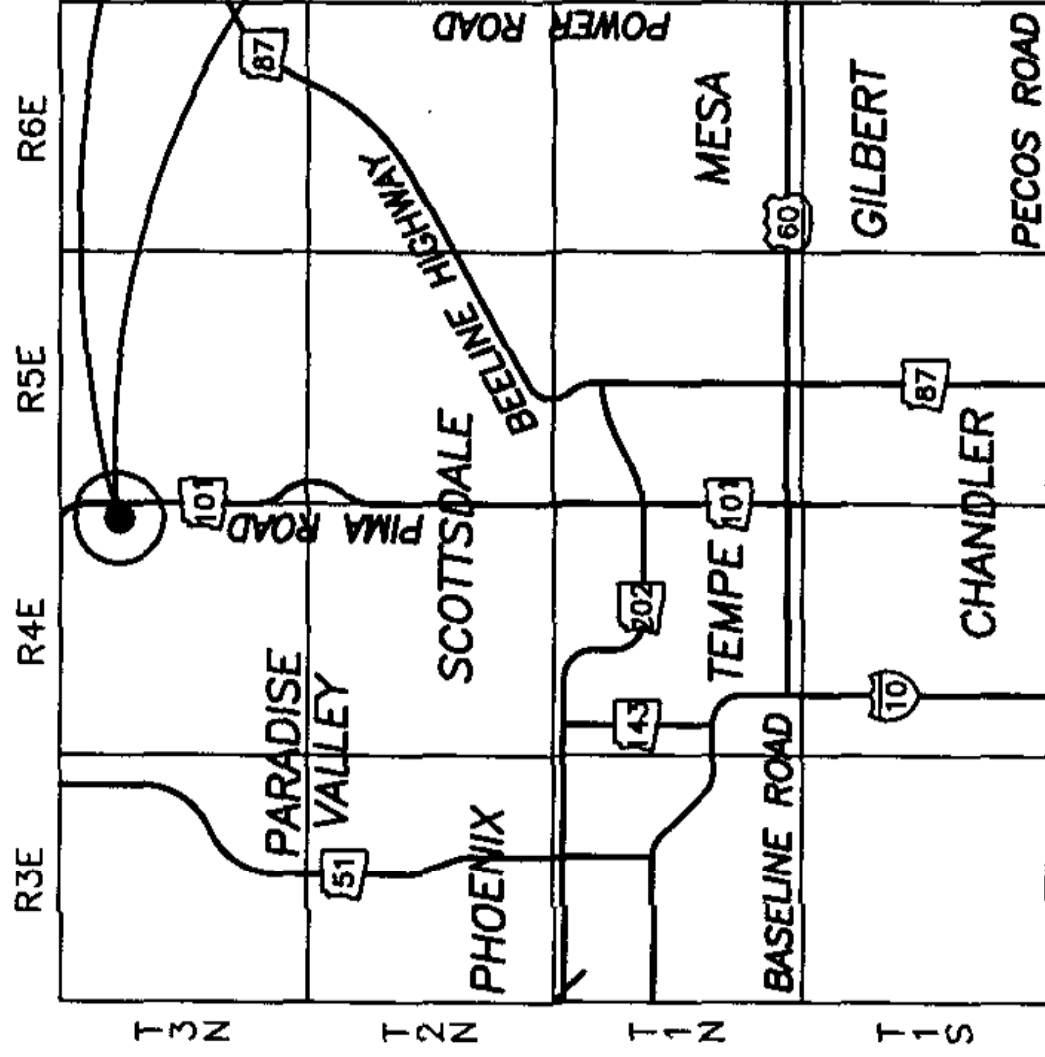
OFFSITE DRAINAGE

Offsite drainage is eliminated from the site by the existing Sam's Club stormwater detention system new construction of adjacent private streets and their associated stormdrain piping system. The construction of 87th street and its stormdrain is a separate project, (see CMX Group, Inc. city number 83-DR-01).

FINISH FLOOR

The finish floor elevations are at various heights and generally more than a foot above the ponded water heights.

H:\02jobs\0229-2DR1



VICINITY MAP

SCOTTSDALE, ARIZONA

SCOTTSDALE, ARIZONA

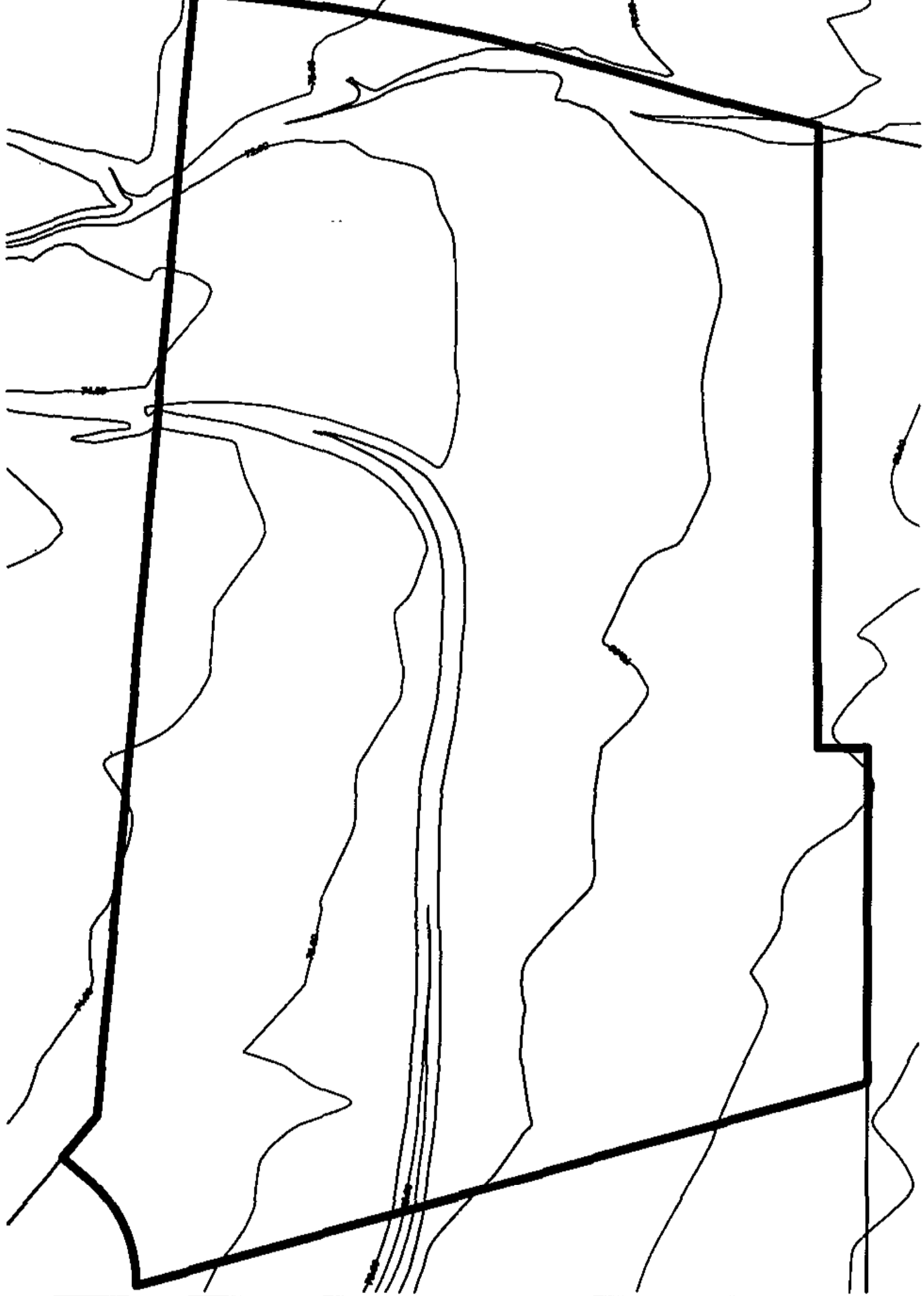


JMA ENGINEERING CORPORATION
531 E. Bethany Home Road, Garden Suite
Phoenix, Arizona 85012

EXHIBIT A VICINITY MAP NORTHSIGHT AND RAINTREE

29x_vicinity.dwg

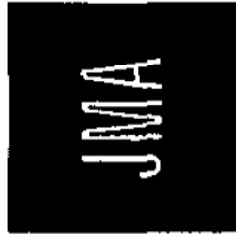
10/02



SCOTTSDALE, ARIZONA

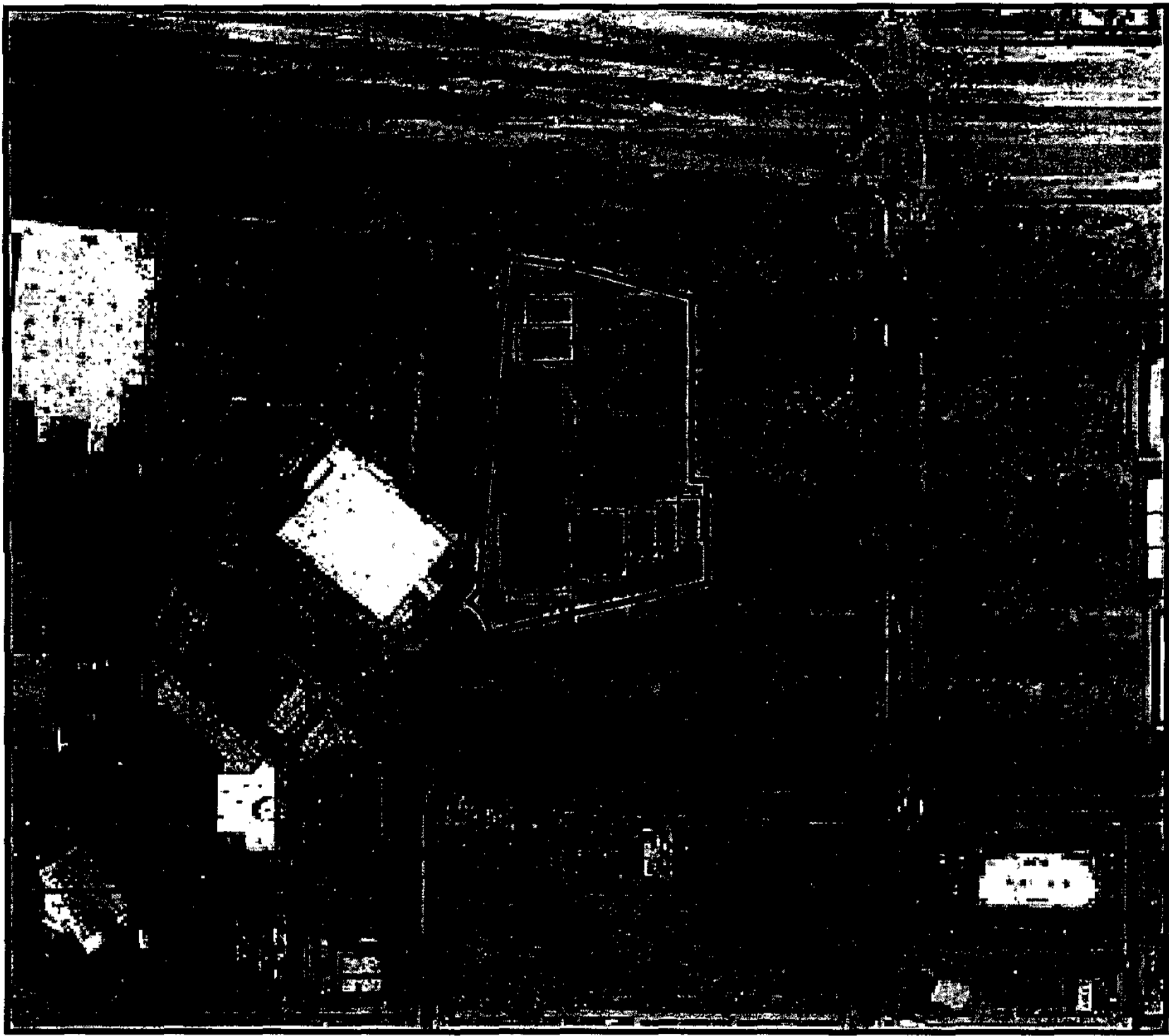
EXHIBIT B
CONTOUR MAP
NORTHSIGHT AND RAINTREE

JMA ENGINEERING CORPORATION
531 E. Bethany Home Road, Garden Suite
Phoenix, Arizona 85012



29x_contour.dwg

10/02



SCOTTSDALE, ARIZONA

AERIAL PHOTO - EXHIBIT C
NORTHSIGHT AND RAINTREE

JMA ENGINEERING CORPORATION

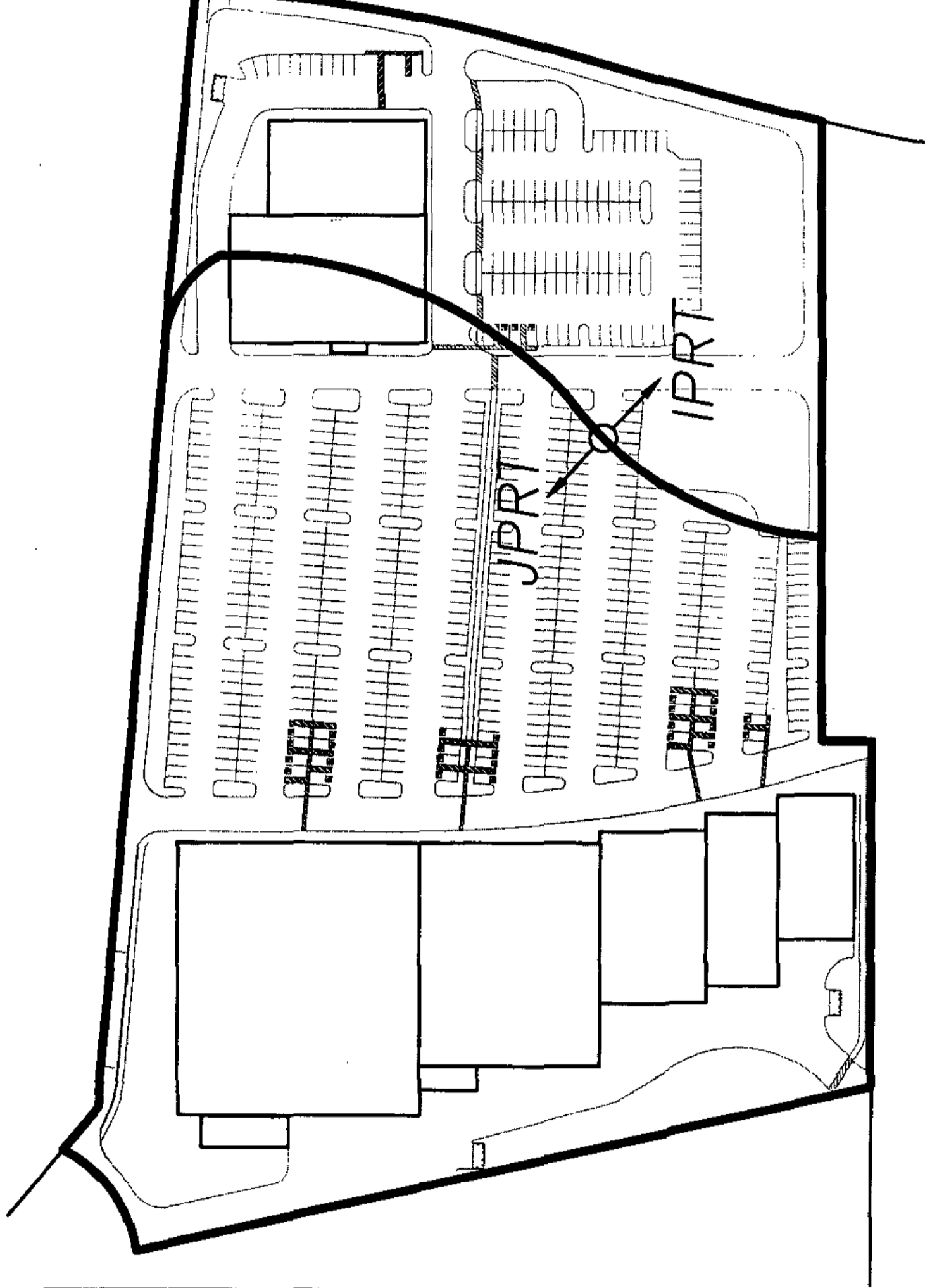
531 E. Bethany Home Road, Garden Suite
Phoenix, Arizona 85012

JMA

99x_aerial.dwg

3-2N-2019
7/22/2019

10/02



JPRT AREA, SF	IPRT AREA, SF
415,622	149,711



NTS

SCOTTSDALE, ARIZONA

JMA

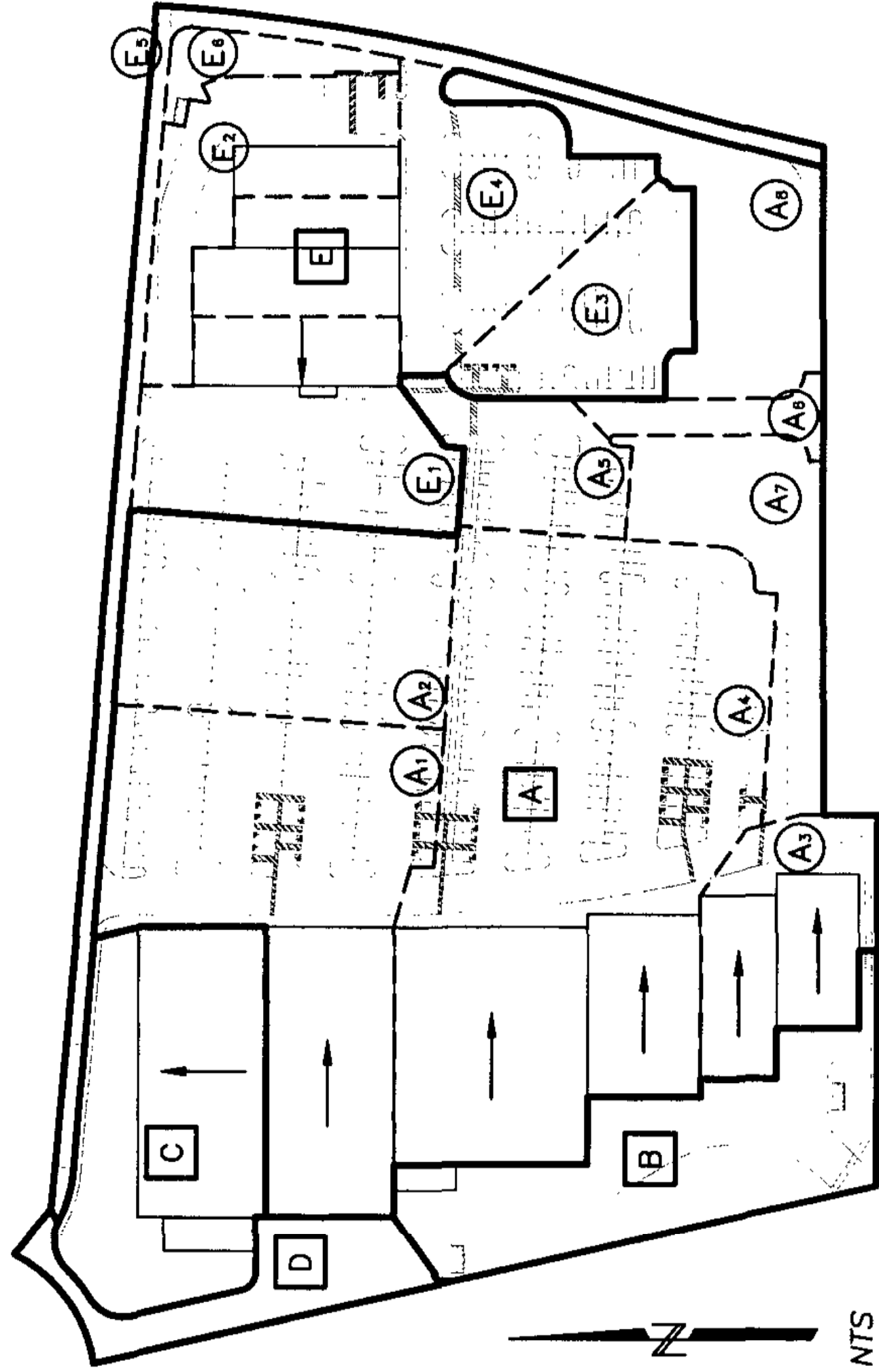
JMA ENGINEERING CORPORATION

531 E. Bethany Home Road, Garden Suite
Phoenix, Arizona 85012

EXHIBIT D
JPRT-IPRT DRAINAGE AREAS
NORTHSIGHT AND RAINTREE

29x_drainagearea.dwg

10/02



KEY

(A1)	66,972 SF	1.5375 AC
(A2)	40,106 SF	0.9207 AC
(A3)	23,595 SF	0.5417 AC
(A4)	118,091 SF	2.7110 AC
(A5)	14,640 SF	0.3361 AC
(A6)	5,934 SF	0.1362 AC
(A7)	22,526 SF	0.5171 AC
(A8)	25,572 SF	0.5871 AC
(E1)	34,889 SF	0.8009 AC
(E2)	23,722 SF	0.5446 AC
(E3)	19,997 SF	0.4591 AC
(E4)	42,442 SF	0.9743 AC
(E5)	21,409 SF	0.4915 AC
(E6)	6,252 SF	0.1435 AC

[A]	BASIN TRIBUTARY AREA
(A3)	BASIN SUB-TRIB AREA
→	ROOF SLOPE

[A]	317,437 SF	7.2873 AC
[B]	40,038 SF	0.9192 AC
[C]	43,855 SF	1.0068 AC
[D]	15,292 SF	0.3511 AC
[E]	148,711 SF	3.4139 AC

SCOTTSDALE, ARIZONA

JMA

JMA ENGINEERING CORPORATION

531 E. Bethany Home Road, Garden Suite
Phoenix, Arizona 85012

EXHIBIT E TRIBUTARY AREAS NORTHSIGHT AND RAINTREE

APPENDIX V

As- Builts: Grading, Drainage & Utility Plan Reference Sheets

GRADING, DRAINAGE AND UTILITY PLANS FOR SCOTTSDALE SHOPS SCOTTSDALE, ARIZONA

GENERAL NOTES

- ALL CONSTRUCTION IN THE PUBLIC RIGHTS-OF-WAY OR IN EASEMENTS GRANTED FOR PUBLIC USE MUST CONFORM TO THE LATEST MARICOPA ASSOCIATION OF GOVERNMENTS (MAG) UNIFORM STANDARD SPECIFICATIONS AND UNIFORM STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION AS AMENDED BY THE LATEST VERSION OF THE CITY OF SCOTTSDALE (COS) SUPPLEMENTAL STANDARD SPECIFICATIONS AND SUPPLEMENTAL STANDARD DETAILS. IF THERE IS A CONFLICT, THE LATTER SHALL GOVERN.
- THE ENGINEERING DESIGNS ON THESE PLANS ARE ONLY APPROVED BY THE CITY IN SCOPE AND NOT IN DETAIL. IF CONSTRUCTION QUANTITIES ARE SHOWN ON THESE PLANS, THEY ARE NOT VERIFIED BY THE CITY.
- APPROVAL OF PLANS IS VALID FOR SIX (6) MONTHS. IF AN ENCROACHMENT PERMIT FOR THE CONSTRUCTION HAS NOT BEEN ISSUED WITHIN SIX MONTHS, THE PLANS SHALL BE RESUBMITTED TO THE CITY FOR REAPPROVAL.
- A PUBLIC WORKS INSPECTOR WILL INSPECT ALL WORKS WITHIN THE CITY OF SCOTTSDALE RIGHTS-OF-WAY AND IN EASEMENTS. NOTIFY INSPECTION SERVICES 24 HOURS PRIOR TO STARTING OF CONSTRUCTION (TELEPHONE 480-312-5750).
- WHENEVER EXCAVATION IS TO BE DONE, CALL THE "BLUE STAKE CENTER," 602-263-1100, TWO WORKING DAYS BEFORE EXCAVATION IS TO BEGIN. THE CENTER WILL SEE THAT THE LOCATION OF THE UNDERGROUND UTILITY LINES IS IDENTIFIED FOR THE PROJECT. CALL "COLLECT" IF NECESSARY.
- ENCROACHMENT PERMITS ARE REQUIRED FOR ALL WORK IN PUBLIC RIGHTS-OF-WAY AND EASEMENTS GRANTED FOR PUBLIC PURPOSES. AN ENCROACHMENT PERMIT WILL BE ISSUED BY THE CITY UPON RECEIPT OF PAYMENT OF A BASE FEE PLUS A FEE FOR INSPECTION SERVICES TO BE PROVIDED BY THE CITY. COPIES OF ALL PERMITS SHALL BE RETAINED ON SITE AND SHALL BE AVAILABLE FOR INSPECTION AT ALL TIMES. FAILURE TO PRODUCE THE REQUIRED PERMITS WILL RESULT IN IMMEDIATE WORK STOPPAGE UNTIL THE PROPER PERMIT DOCUMENTATION IS OBTAINED.
- ALL EXCAVATION AND GRADING WHICH IS NOT IN THE PUBLIC RIGHTS-OF-WAY OR NOT IN EASEMENTS GRANTED FOR PUBLIC USE MUST CONFORM TO CHAPTER 70, "EXCAVATION AND GRADING," OF THE LATEST EDITION OF THE UNIFORM BUILDING CODE PREPARED BY THE INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS. A PERMIT FOR THIS GRADING MUST BE SECURED FROM THE CITY FOR A FEE ESTABLISHED BY THE UNIFORM BUILDING CODE.
- SIGNS REQUIRE SEPARATE APPROVALS AND PERMITS.
- PRIOR TO THE START OF GRADING, A DUST CONTROL PERMIT MUST BE OBTAINED FROM MARICOPA COUNTY DIVISION OF AIR POLLUTION CONTROL (CALL 480-507-6727).
- STORAGE BASIN VOLUME SHALL BE CERTIFIED BY THE DESIGN ENGINEER. THE VOLUME PROVIDED SHALL MEET OR EXCEED THE REQUIRED VOLUME PER THE APPROVED PLANS AND CITY ORDINANCE.
- DRAINAGE STRUCTURES AND FACILITIES ARE PRIVATE AND SHALL BE MAINTAINED BY THE OWNER.
- ONSITE SEWER AND WATER UTILITIES ARE PRIVATE AND ARE TO BE CONSTRUCTED PER UNIFORM PLUMBING CODE (UPC). MAINTENANCE IS THE RESPONSIBILITY OF THE OWNER.
- UNDERGROUND STORMWATER STORAGE FACILITIES ARE PRIVATE. OWNER IS RESPONSIBLE FOR OBTAINING ALL REQUIRED GOVERNMENTAL AGENCY PERMITS FOR UNDERGROUND STORAGE FACILITIES CONSTRUCTION AND OPERATION. MAINTENANCE OF UNDERGROUND STORMWATER STORAGE FACILITIES IS THE RESPONSIBILITY OF THE OWNER IN PERPETUITY.
- "IN ACCORDANCE WITH AAC R18-4-119, ALL MATERIALS ADDED AFTER JANUARY 1, 1993 WHICH MAY COME INTO CONTACT WITH DRINKING WATER SHALL CONFORM TO NATIONAL SANITATION STANDARDS 60 AND 61."

UTILITY NOTE

(UTILITY RECORDS FROM CMX GROUP INC 10/07/02,
PROJECT NUMBER 1732-02 AND GILBERTSON ASSOCIATES
INC 07-14-03, PROJECT NUMBER 5672-02-1)

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. JMA MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES. THE AREA, EITHER IN SERVICE OR ABANDONED. JMA FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH THEY DO CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. JMA HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

NO CONFLICT SIGNATURE BLOCK

UTILITY	UTILITY COMPANY	NAME OF COMPANY REPRESENTATIVE	TELEPHONE NUMBER	DATE RECEIVED
IRRIGATION	SRP	BOB MAURER	(602)236-2962	7/17/03
WATER	CITY OF SCOTTSDALE			
SANITARY SEWER	CITY OF SCOTTSDALE			
ELECTRIC	APS	DAWN ROBERTS	(602)483-4403	6/10/03
TELEPHONE	QWEST	MARK POIRIER	(602)630-3370	6/23/03
NATURAL GAS	SOUTHWEST GAS	MARCUS WATANABE	(602)881-1999	6/10/03
CABLE TV	COX COMMUNICATIONS	ROGER YENSEN	(602)322-7088	7/31/03
NATURAL GAS	EL PASO GAS	DENNIS SEGATO	(602)436-4244	6/29/03
TELEPHONE	AT&T	JOHNNY G. GONZALES	(480)827-6046	7/31/03

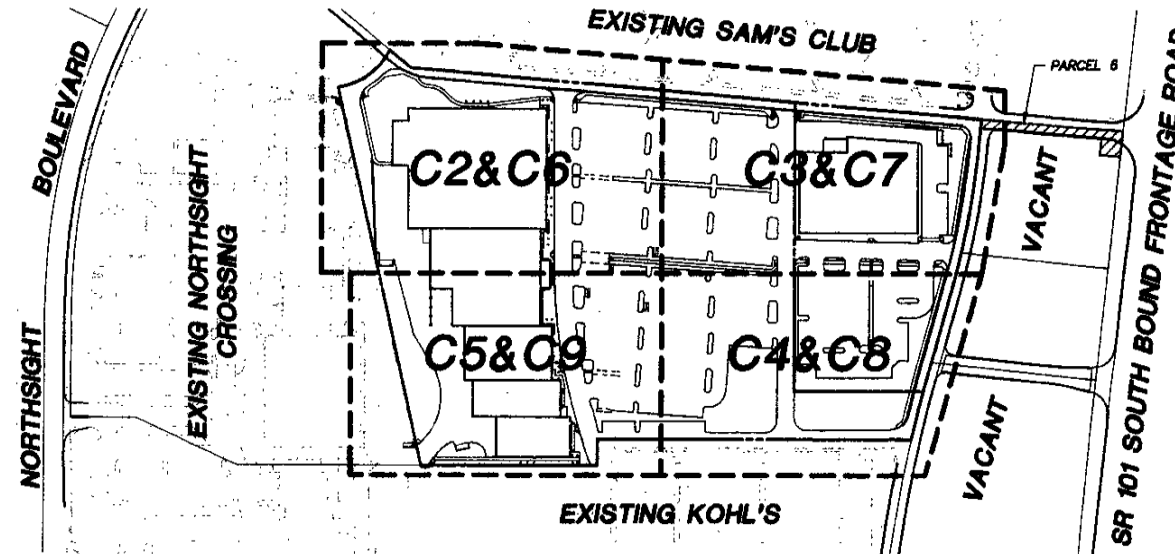
ENGINEER'S CERTIFICATION:

I, KAY MIALEK, BEING THE PERSON RESPONSIBLE FOR DESIGNING THE FACILITIES NECESSARY TO SERVE THIS DEVELOPMENT, HEREBY CERTIFY THAT ALL THE UTILITY COMPANIES LISTED ABOVE, HAVE REVIEWED THIS PROJECT PROPOSAL AND ALL CONFLICTS HAVE BEEN RESOLVED AT THIS POINT. "NO CONFLICT" FORMS HAVE BEEN OBTAINED FROM EACH UTILITY COMPANY AND ARE INCLUDED IN THIS SUBMITTAL. I ALSO CERTIFY THAT ALL ONSITE TRANSFORMERS, CABLE BOXES AND ANY OTHER PUBLIC/PRIVATE UTILITY APPLIANCES ARE PLACED SUCH THAT THEY DO NOT NEGATIVELY IMPACT THE USE OR INTENDED USE OF ANY DEDICATED EASEMENTS OR FACILITIES DEVELOPED WITH THIS PROJECT INCLUDING BUT NOT LIMITED TO STORMWATER STORAGE BASINS, SIGHT DISTANCE EASEMENTS AND NADS OR OTHER OPEN SPACE EASEMENTS.

SIGNATURE DATE 3/10/04

NOTE

THE ENGINEER OF RECORD ON THESE PLANS HAS RECEIVED A COPY OF THE APPROVED STIPULATIONS FOR THIS PROJECT AND HAS DESIGNED THESE PLANS IN CONFORMANCE WITH THE APPROVED STIPULATIONS.



KEY MAP

SCALE: NTS

LEGAL DESCRIPTION

PARCEL NO. 1:

THOSE PORTIONS OF PARCELS 1, 5, AND 6, ACCORDING TO THE MAP OF DEDICATION FOR NORTHSTIGHT II, RECORDED IN BOOK 315 OF MAPS, PAGE 15 AND THE AFFIDAVIT OF CORRECTION RECORDED IN DOCUMENT NO. 88312897, AND G.L.O. LOT 17, SECTION 12, TOWNSHIP 3 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHEAST CORNER OF SAID SECTION 12;

THENCE NORTH 89° 57' 13" WEST ALONG SAID NORTH LINE, A DISTANCE OF 99.22 FEET TO A POINT ON THE WEST RIGHT-OF-WAY LINE OF STATE HIGHWAY 117 AS RECORDED IN DOCUMENT NO. 98062667, RECORDS OF MARICOPA COUNTY, ARIZONA, SAID POINT LYING ON A CURVE, THE RADIUS OF WHICH BEARS NORTH 87° 00' 27" WEST, A DISTANCE OF 11258.53 FEET;

THENCE SOUTHERLY ALONG SAID WEST LINE AND THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 00° 26' 46", A DISTANCE OF 87.67 FEET TO A POINT OF NON-TANGENCY;

THENCE SOUTH 08° 06' 51" WEST ALONG SAID WEST LINE, A DISTANCE OF 1487.29 FEET;

THENCE NORTH 85° 00' 35" WEST LEAVING SAID WEST LINE, A DISTANCE OF 237.06 FEET TO THE (21° 43" WEST, A DISTANCE OF 1422.50 FEET;

THENCE SOUTHERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 11° 46' 34", A DISTANCE OF 292.37 FEET TO A POINT OF TANGENCY;

THENCE SOUTH 15° 24' 50" WEST A DISTANCE OF 148.93 FEET TO THE BEGINNING OF A CURVE CONCAVE SOUTHEASTERLY AND HAVING A RADIUS OF 2277.50 FEET;

THENCE SOUTHERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 02° 38' 39", A DISTANCE OF 103.78 FEET;

THENCE NORTH 89° 59' 17" WEST LEAVING SAID CURVE, A DISTANCE OF 522.25 FEET;

THENCE SOUTH 00° 00' 28" WEST, A DISTANCE OF 43.00 FEET;

THENCE NORTH 89° 59' 17" WEST, A DISTANCE OF 294.02 FEET;

THENCE NORTH 12° 43' 37" WEST, A DISTANCE OF 638.33 FEET TO A POINT ON A CURVE THE RADIUS OF WHICH BEARS NORTH 08° 42' 29" WEST AND HAVING A RADIUS OF 116.00 FEET;

THENCE NORTHEASTERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 54° 34' 58", A DISTANCE OF 110.51 FEET;

THENCE SOUTH 50° 25' 46" EAST, A DISTANCE OF 46.26 FEET;

THENCE SOUTH 85° 00' 35" EAST, A DISTANCE OF 951.44 FEET TO THE TRUE POINT OF BEGINNING.

PARCEL NO. 6

THOSE PORTIONS OF PARCEL NO. 1, ACCORDING TO THE MAP OF DEDICATION FOR NORTHSTIGHT II, RECORDED IN BOOK 315 OF MAPS, PAGE 15 AND THE AFFIDAVIT OF CORRECTION RECORDED IN DOCUMENT NO. 88312897, RECORDS OF MARICOPA COUNTY, ARIZONA, AND G.L.O. LOT 17, SECTION 12, TOWNSHIP 3 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHEAST CORNER OF SAID SECTION 12;

THENCE NORTH 89° 57' 13" WEST ALONG SAID NORTH LINE, A DISTANCE OF 99.22 FEET TO A POINT ON THE WEST RIGHT-OF-WAY LINE OF STATE HIGHWAY 117, AS RECORDED IN DOCUMENT NO. 98062667, RECORDS OF MARICOPA COUNTY, SAID POINT LYING ON A CURVE, THE RADIUS OF WHICH BEARS NORTH 87° 00' 27" WEST A DISTANCE OF 11258.53 FEET;

THENCE SOUTHERLY ALONG SAID WEST LINE AND THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 00° 26' 46", A DISTANCE OF 87.67 FEET TO A POINT OF NON-TANGENCY;

THENCE SOUTH 08° 06' 51" WEST ALONG SAID WEST LINE, A DISTANCE OF 1487.29 FEET TO THE TRUE POINT OF BEGINNING;

THENCE CONTINUING SOUTH 08° 06' 51" WEST ALONG SAID WEST LINE, A DISTANCE OF 42.00 FEET;

THENCE NORTH 85° 00' 35" WEST, LEAVING SAID WEST LINE, A DISTANCE OF 35.00 FEET;

THENCE NORTH 08° 06' 51" EAST, A DISTANCE OF 27.00 FEET;

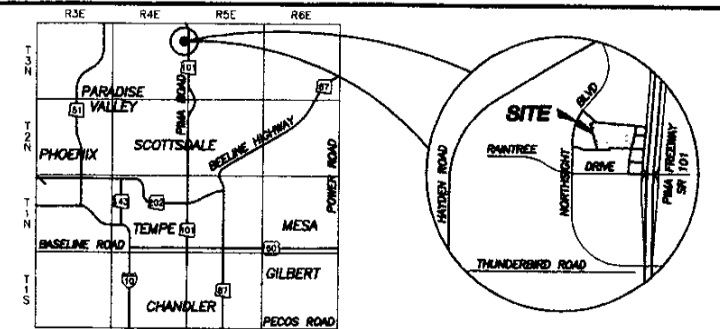
THENCE NORTH 85° 00' 35" WEST, A DISTANCE OF 201.49 FEET TO A POINT ON A CURVE, THE RADIUS OF WHICH BEARS NORTH 85° 45' 28" WEST, A DISTANCE OF 1422.50 FEET;

THENCE NORTHERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 00° 38' 15", A DISTANCE OF 15.00 FEET;

THENCE SOUTH 85° 00' 35" EAST, LEAVING SAID CURVE, A DISTANCE OF 237.06 FEET TO THE TRUE POINT OF BEGINNING.

THESE DOCUMENTS ARE NOT FOR
CONSTRUCTION UNLESS REVIEWED
AND APPROVED BY ALL
GOVERNING AGENCIES.

602-263-1100
BLUE STAKE CENTER



VICINITY MAP

SCOTTSDALE, ARIZONA

ARCHITECT

KURT D. REED ASSOCIATES, INC.
7400 EAST McDOWD DRIVE, SUITE 101
SCOTTSDALE, ARIZONA 85250
PHONE: (480) 941-1440
CONTACT: JORGE PIERSON

DEVELOPER

CONTINENTAL 31 FUND LIMITED PARTNERSHIP
10850 W PARK PLACE, ST 600
MILWAUKEE, WI 53224
CONTACT: KIM GRIMM
PHONE: (262) 502-5500
FAX: (262) 502-5522

PUBLIC QUANTITIES

WATER METER	6 EA
WATER VALVES	12 EA
8" WATERLINE	1,759 LF
FIRE HYDRANT	3 EA

BASIS OF BEARING

THE EAST LINE OF THE NORTHEAST QUARTER
OF SECTION 12, T3N, R4E, GSR&M. BEARING
S00°07'35"W.

ZONING

C-2

BENCHMARK

CITY OF SCOTTSDALE BRASS CAP FLUSH AT INTERSECTION OF FRANK LLOYD WRIGHT BOULEVARD AND HAYDEN ROAD ELEVATION 1510.86 (NAVD '88 DATUM)

ADD 1400 TO ALL ELEVATIONS TO EQUAL CITY DATUM.

FLOOD INSURANCE RATE MAP INFORMATION

COMMUNITY NUMBER	PANEL DATE	SUFFIX	DATE OF FIRM (INDEX DATE)	FIRM ZONE	BASE FLOOD ELEVATION (IN AO ZONE, USE DEPTH)
045012	1685	E	7/19/01	X	N/A
	7/19/01				

ENGINEER'S CERTIFICATION:

THE LOWEST FINISH FLOOR ELEVATION(S) AND OR FLOODPROOFING ELEVATION(S) ON THIS PLAN ARE SUFFICIENTLY HIGH TO PROVIDE PROTECTION FROM FLOODING CAUSED BY A ONE-HUNDRED YEAR STORM, AND ARE IN ACCORDANCE WITH CITY OF SCOTTSDALE REVISED CODE CHAPTER 37 - FLOODWAYS & FLOODPLAINS ORDINANCE.

CITY OF SCOTTSDALE			
REVIEW AND RECOMMENDED APPROVAL BY:			
PAVING	<i>[Signature]</i>	TRAFFIC	<i>[Signature]</i>
G & D	<i>[Signature]</i>	PLANNING	<i>[Signature]</i>
W & S	<i>[Signature]</i>	FIRE	<i>[Signature]</i>
RETAINING WALLS	<i>[Signature]</i>		
JMA ENGINEERING CORPORATION			3/18/04
ENGINEERING COORDINATION MANAGER (OR DESIGNEE)			DATE

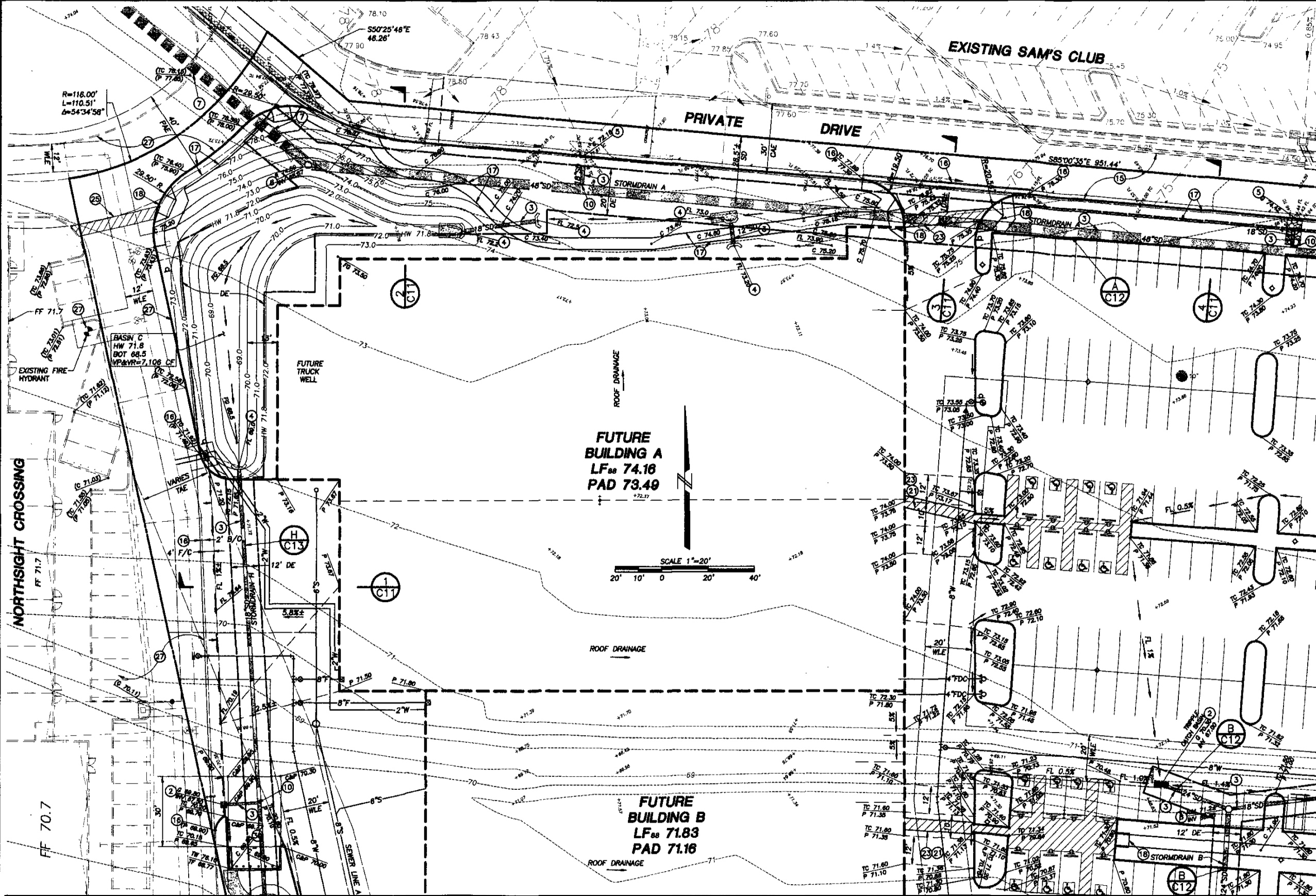
040169 040170
MARICOPA COUNTY ENVIRONMENTAL SERVICES DEPT

IN ACCORDANCE WITH AAC R18-4-119, ALL MATERIALS ADDED AFTER JANUARY 1, 1993 WHICH MAY COME INTO CONTACT WITH DRINKING WATER SHALL CONFORM TO NATIONAL SANITATION FOUNDATION STANDARDS 60 AND 61.

COVER SHEET SCOTTSDALE SHOPS

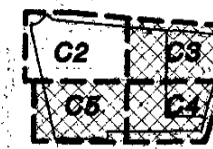
Design	JM
CAD	JM
Checked	JE
Date	3/10/04
Job No.	0229.2
Sheet	C1 of 14

JMA ENGINEERING CORPORATION
531 E. Bethany Home Road, Garden Suite
Phoenix, Arizona 85012
Voice 602.248.0286
Fax 602.248.0976



- LEGEND**
- CENTERLINE
 - RIGHT-OF-WAY
 - PROPERTY LINE
 - EASEMENT
 - EXISTING CURB AND GUTTER
 - EXISTING ELECTRICAL
 - EXISTING PAVEMENT
 - EXISTING SANITARY SEWER
 - EXISTING STORMDRAIN
 - EXISTING TELEPHONE
 - EXISTING WATER
 - EXISTING FENCE
 - EXISTING STORMDRAIN REBAR
 - BRASS CAP
 - BRASS CAP IN HANDHOLE
 - EXISTING LIGHT POLE
 - EXISTING MANHOLE
 - EXISTING CLEANOUT
 - EXISTING CATCH BASIN
 - EXISTING FIRE HYDRANT
 - EXISTING WATER METER
 - EXISTING WATER VALVE
 - EXISTING BOX
 - EXISTING SIGN
 - EXISTING PALO VERDE TREE
 - EXISTING TREE
 - EXISTING MESQUITE
 - EXISTING STREET LIGHT
 - NEW SANITARY SEWER
 - NEW STORMDRAIN
 - NEW WATER
 - NEW MANHOLE
 - NEW CLEANOUT
 - NEW DRYWELL
 - NEW CATCH BASIN
 - NEW DOUBLE CHECK VALVE
 - NEW FIRE HYDRANT
 - NEW WATER METER
 - NEW WATER VALVE
 - NEW SIGN
 - GRADE BREAK
 - EXISTING SPOT
 - LIMITS OF CONSTRUCTION
 - WLE WATER LINE EASEMENT
 - PAE PROPOSED ACCESS EASEMENT
 - DE DRAINAGE EASEMENT
 - TAE TRUCK ACCESS EASEMENT
 - FUTURE NORTHSIGHT CROSSING

NOTE: SEE DETAILS 3 AND 6, SHEET C10 FOR PAVEMENT SECTIONS AND DETAIL 1, SHEET C10 FOR CURB.



KEY MAP
SCALE: NTS

CONSTRUCTION KEY NOTES

- 1 NEW CURB OPENING AND EROSION APRON PER DETAIL 2, SHEET C10.
- 2 NEW CATCH BASIN PER MAG STANDARD DETAIL 535. DOUBLE OR TRIPLE GRATE WHERE INDICATED.
- 3 NEW CORRUGATED HOPE STORM DRAIN.
- 4 NEW HEADWALL PER MAG STANDARD DETAIL 501, "U" TYPE AND EROSION APRON WHERE SHOWN SIMILAR TO DETAIL 2, SHEET C10, SIZE PER PLAN.
- 5 NEW 3'-6" CURB OPENING CATCH BASIN PER MAG STANDARD DETAIL 530. SAWCUT, REMOVE AND REPLACE EXISTING V&G AND PAVEMENT AS NECESSARY.
- 6 NEW TYPE "D", 7' CURB OPENING CATCH BASIN PER MAG STANDARD DETAIL 533.
- 7 EXISTING 48-INCH STORMDRAIN CONSTRUCTED BY NORTHSIGHT CROSSING DEVELOPMENT (5-DR-2003). CONTRACTOR TO VERIFY SIZE AND DEPTH.
- 8 NEW "SHALLOW" STORMDRAIN MANHOLE PER MAG STANDARD DETAIL 520 AND 522.
- 9 PROVIDE 1/4-INCH ORIFICE PLATE WITH 8-INCH ROUND OPENING TO METER FLOW.
- 10 NEW PRE-MANUFACTURED TEE.
- 11 RETAINING BUILDING STEM WALL.
- 12 METERED DISCHARGE SOUTH TO RAINTREE STORMDRAIN.
- 13 EXISTING STREET IMPROVEMENTS.
- 14 SAWCUT NEAT LINE AND MATCH EXISTING.
- 15 NEW CONCRETE SIDEWALK.
- 16 NEW ADA RAMP. SEE ARCHITECTURAL PLANS, SHEET SP1 DETAILS 14 AND 15.
- 17 REMOVE EXISTING EXTRUDED CURB AND PAVEMENT.
- 18 NEW RAISED PEDESTRIAN CROSSING PER MAG STANDARD DETAIL 210 MODIFIED FOR 10-FOOT WIDE FLAT TOP, SEE ARCHITECTURAL PLANS SHEET SP1 DETAIL 3.
- 19 DECORATIVE CONCRETE PEDESTRIAN CROSSING. SEE ARCHITECTURAL PLANS.
- 20 STRIPED PEDESTRIAN CROSSING. SEE ARCHITECTURAL PLANS FOR MARKINGS.
- 21 CONSTRUCTED BY NORTHERN CROSSING DEVELOPMENT (5-DR-2003).
- 22 NEW 8-INCH HIGH X 32-INCH WIDE WALL OPENING FOR DRAINAGE. PROVIDE EROSION APRON SIMILAR TO DETAIL 2, SHEET C10.

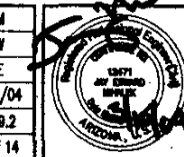
**GRADING AND DRAINAGE PLANS
SCOTTSDALE SHOPS**



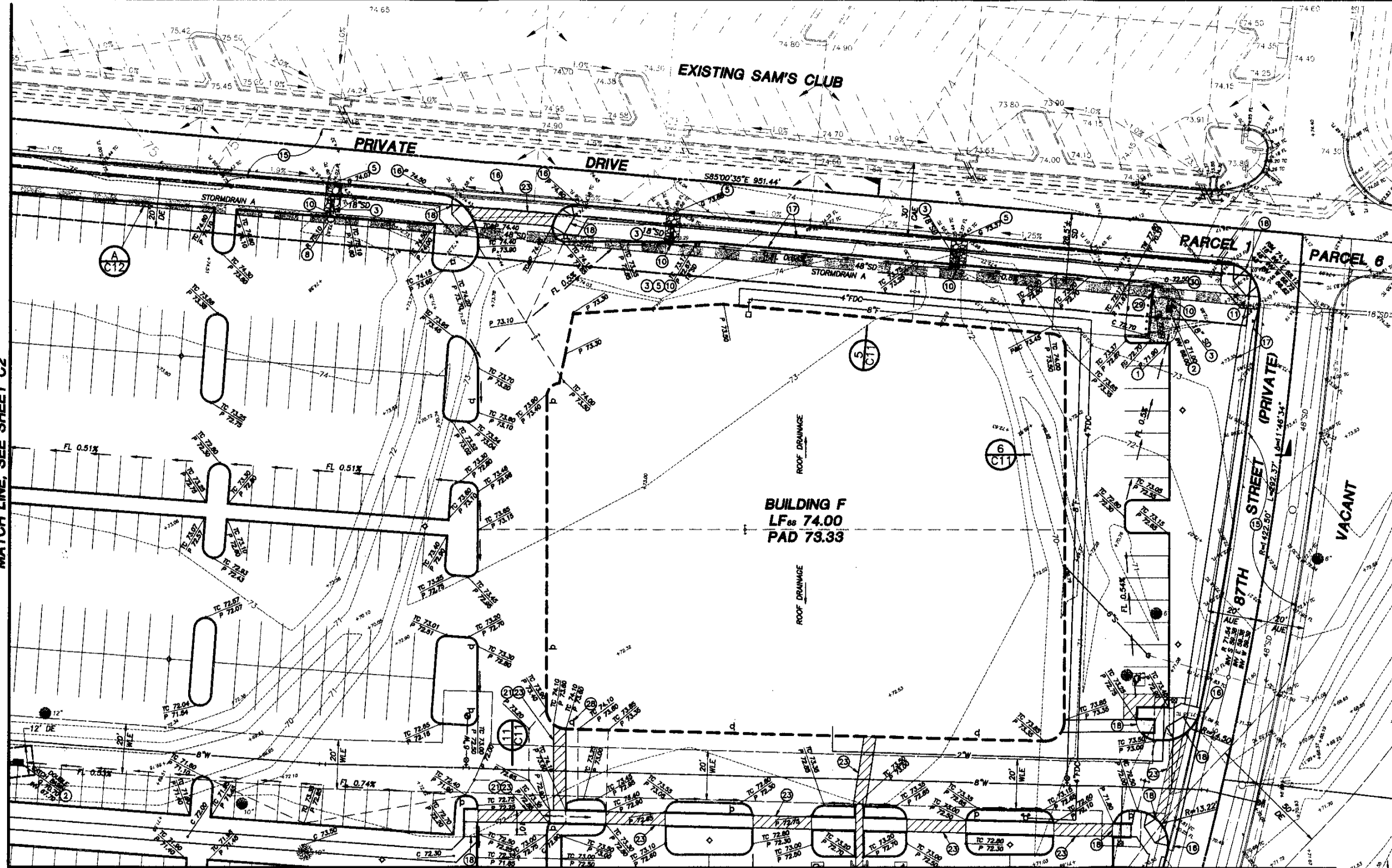
JMA ENGINEERING CORPORATION

531 E. Bethany Home Road, Garden Suite Phoenix, Arizona 85012
Voice 602.248.0286 Fax 602.248.0976

Design	JM
CAD	JW
Checked	JE
Date	3/10/04
Job No.	0229.2
Sheet	C2 of 14



MATCH LINE, SEE SHEET C2



MATCH LINE, SEE SHEET C4

CONSTRUCTION KEY NOTES

- 1 NEW CURB OPENING AND EROSION APRON PER DETAIL 2, SHEET C10.
- 2 NEW CATCH BASIN PER MAG STANDARD DETAIL 535. DOUBLE OR TRIPLE GRATE WHERE INDICATED.
- 3 NEW CORRUGATED HDPE STORM DRAIN.
- 4 NEW HEADWALL PER MAG STANDARD DETAIL 501, "U" TYPE AND EROSION APRON WHERE SHOWN SIMILAR TO DETAIL 2, SHEET C10, SIZE PER PLAN.
- 5 NEW 3'-6" CURB OPENING CATCH BASIN PER MAG STANDARD DETAIL 530. SAWCUT, REMOVE AND REPLACE EXISTING VC&G AND PAVEMENT AS NECESSARY.
- 6 NEW TYPE "D", 7' CURB OPENING CATCH BASIN PER MAG STANDARD DETAIL 533.
- 7 NEW "SHALLOW" STORMDRAIN MANHOLE PER MAG STANDARD DETAIL 520 AND 522.
- 8 NEW PRE-MANUFACTURED BEND. NEW 12-INCH SURFACE CLEANOUT SIMILAR TO MAG STANDARD DETAIL 441.
- 9 NEW PRE-MANUFACTURED TEE.
- 10 NEW PRE-MANUFACTURED TEE.
- 11 RETAINING BUILDING STEM WALL.
- 12 METERED DISCHARGE SOUTH TO RAINTREE STORMDRAIN.
- 13 EXISTING STREET IMPROVEMENTS.
- 14 SAWCUT NEAT LINE AND MATCH EXISTING.
- 15 NEW CONCRETE SIDEWALK.
- 16 NEW ADA RAMP. SEE ARCHITECTURAL PLANS, SHEET SP1 DETAILS 14 AND 15.
- 17 REMOVE EXISTING EXTRUDED CURB AND PAVEMENT.
- 18 NEW RAISED PEDESTRIAN CROSSING PER MAG STANDARD DETAIL 210 MODIFIED FOR 10-FOOT WIDE FLAT TOP, SEE ARCHITECTURAL PLANS SHEET SP1 DETAIL 3.
- 19 DECORATIVE CONCRETE PEDESTRIAN CROSSING. SEE ARCHITECTURAL PLANS.
- 20 PROPOSED SIGN. SEE ARCHITECTURAL SHEET SP, DETAIL 17SP1.
- 21 CONTRACTOR TO PROVIDE BRIDGE IN FOOTING OVER PROPOSED 48-INCH STORMDRAIN.
- 22 NEW 8-INCH HIGH X 32-INCH WIDE WALL OPENING FOR DRAINAGE. PROVIDE EROSION APRON SIMILAR TO DETAIL 2, SHEET C10.

LEGEND

- CENTERLINE
- RIGHT-OF-WAY
- PROPERTY LINE
- EASEMENT
- EXISTING CURB AND GUTTER
- EXISTING ELECTRICAL
- EXISTING PAVEMENT
- EXISTING SANITARY SEWER
- EXISTING STORMDRAIN
- EXISTING TELEPHONE
- EXISTING WATER
- EXISTING FENCE
- REBAR
- ⊙ BRASS CAP
- ⊙ BRASS CAP IN HANDHOLE
- ◇ EXISTING LIGHT POLE
- EXISTING MANHOLE
- EXISTING CLEANOUT
- ⊙ EXISTING CATCH BASIN
- ⊙ EXISTING FIRE HYDRANT
- ⊙ EXISTING WATER METER
- ⊙ EXISTING WATER VALVE
- ⊙ EXISTING BOX
- ⊙ EXISTING SIGN
- ⊙ EXISTING PALO VERDE TREE
- ⊙ EXISTING TREE
- ⊙ EXISTING MESQUITE
- ⊙ EXISTING STREET LIGHT
- NEW SANITARY SEWER
- NEW STORMDRAIN
- NEW WATER
- NEW MANHOLE
- NEW CLEANOUT
- NEW DRYWELL
- ⊙ NEW CATCH BASIN
- ⊙ NEW DOUBLE CHECK VALVE
- ⊙ NEW FIRE HYDRANT
- ⊙ NEW WATER METER
- ⊙ NEW WATER VALVE
- GRADE BREAK
- NEW SIGN
- ⊙ EXISTING SPOT
- LIMITS OF CONSTRUCTION
- AUE ACCESS AND UTILITY EASEMENT
- DE DRAINAGE EASEMENT
- CAE CROSS ACCESS EASEMENT
- WLE WATER LINE EASEMENT

NOTE: SEE DETAILS 3 AND 6, SHEET C10 FOR PAVEMENT SECTIONS AND DETAIL 1, SHEET C10 FOR CURB.



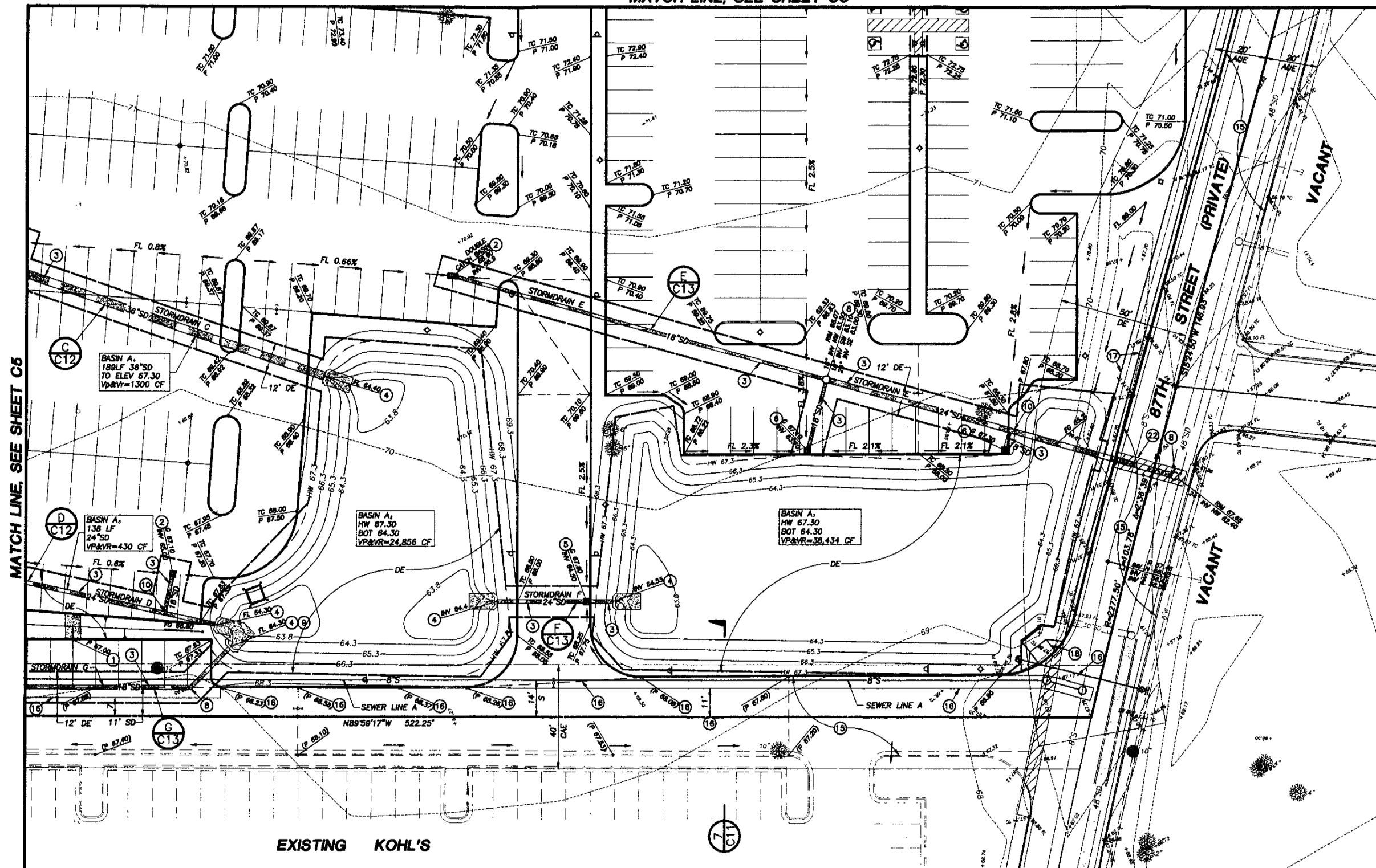
KEY MAP
SCALE: NTS

GRADING AND DRAINAGE PLANS SCOTTSDALE SHOPS

JMA ENGINEERING CORPORATION
531 E. Bethany Home Road, Garden Suite
Phoenix, Arizona 85012
Voice 602.248.0286
Fax 602.248.0976

Design	JM
CAD	JW
Checked	JE
Date	3/10/04
Job No.	0229.2
Sheet	C3 of 14





LEGEND

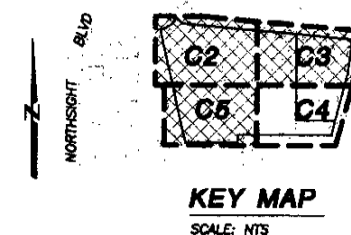
- CENTERLINE
- RIGHT-OF-WAY
- PROPERTY LINE
- EASEMENT
- EXISTING CURB AND GUTTER
- EXISTING ELECTRICAL
- EXISTING PAVEMENT
- EXISTING SANITARY SEWER
- EXISTING STORMDRAIN
- EXISTING TELEPHONE
- EXISTING WATER
- EXISTING FENCE
- REBAR
- ⊙ BRASS CAP
- ⊙ BRASS CAP IN HANDHOLE
- ⊙ EXISTING LIGHT POLE
- EXISTING MANHOLE
- EXISTING CLEANOUT
- ⊙ EXISTING CATCH BASIN
- ⊙ EXISTING FIRE HYDRANT
- ⊙ EXISTING WATER METER
- ⊙ EXISTING WATER VALVE
- ⊙ EXISTING BOX
- ⊙ EXISTING SIGN
- ⊙ EXISTING PALO VERDE TREE
- ⊙ EXISTING TREE
- ⊙ EXISTING MESQUITE
- ⊙ EXISTING STREET LIGHT
- NEW SANITARY SEWER
- NEW STORMDRAIN
- NEW WATER
- NEW MANHOLE
- NEW CLEANOUT
- NEW DRYWELL
- ⊙ NEW CATCH BASIN
- ⊙ NEW DOUBLE CHECK VALVE
- ⊙ NEW FIRE HYDRANT
- ⊙ NEW WATER METER
- ⊙ NEW WATER VALVE
- GRADE BREAK
- EXISTING SPOT
- LIMITS OF CONSTRUCTION
- ACCESS AND UTILITY EASEMENT
- CROSS ACCESS EASEMENT
- DRAINAGE EASEMENT

NOTE: SEE DETAILS 3 AND 6, SHEET C10 FOR PAVEMENT SECTIONS AND DETAIL 1, SHEET C10 FOR CURB.

CONSTRUCTION KEY NOTES

- 1 NEW CURB OPENING AND EROSION APRON PER DETAIL 2, SHEET C10.
- 2 NEW CATCH BASIN PER MAG STANDARD DETAIL 535. DOUBLE OR TRIPLE GRATE WHERE INDICATED.
- 3 NEW CORRUGATED HDPE STORM DRAIN.
- 4 NEW HEADWALL PER MAG STANDARD DETAIL 501, "U" TYPE AND EROSION APRON WHERE SHOWN SIMILAR TO DETAIL 2, SHEET C10, SIZE PER PLAN.
- 5 NEW 3'-6" CURB OPENING CATCH BASIN PER MAG STANDARD DETAIL 530. SAWCUT, REMOVE AND REPLACE EXISTING V&G AND PAVEMENT AS NECESSARY.
- 6 NEW TYPE "D", 7' CURB OPENING CATCH BASIN PER MAG STANDARD DETAIL 533.
- 8 NEW "SHALLOW" STORMDRAIN MANHOLE PER MAG STANDARD DETAIL 520 AND 522.
- 9 PROVIDE 1/4-INCH ORIFICE PLATE WITH 8-INCH ROUND OPENING TO METER FLOW.
- 10 NEW PRE-MANUFACTURED TEE.
- 13 RETAINING BUILDING STEM WALL.
- 14 METERED DISCHARGE SOUTH TO RAINTREE STORMDRAIN.
- 15 EXISTING STREET IMPROVEMENTS.
- 16 SAWCUT NEAT LINE AND MATCH EXISTING.
- 17 NEW CONCRETE SIDEWALK.
- 18 NEW ADA RAMP. SEE ARCHITECTURAL PLANS, SHEET SP1 DETAILS 14 AND 15.
- 19 REMOVE EXISTING EXTRUDED CURB AND PAVEMENT.
- 21 NEW RAISED PEDESTRIAN CROSSING PER MAG STANDARD DETAIL 210 MODIFIED FOR 10-FOOT WIDE FLAT TOP, SEE ARCHITECTURAL PLANS SHEET SP1 DETAIL 3.
- 22 SAWCUT, REMOVE AND REPLACE AC PAVEMENT IN KIND PER MAG STANDARD DETAIL 200 T-TOP. TUNNEL BENEATH EXISTING CURB.

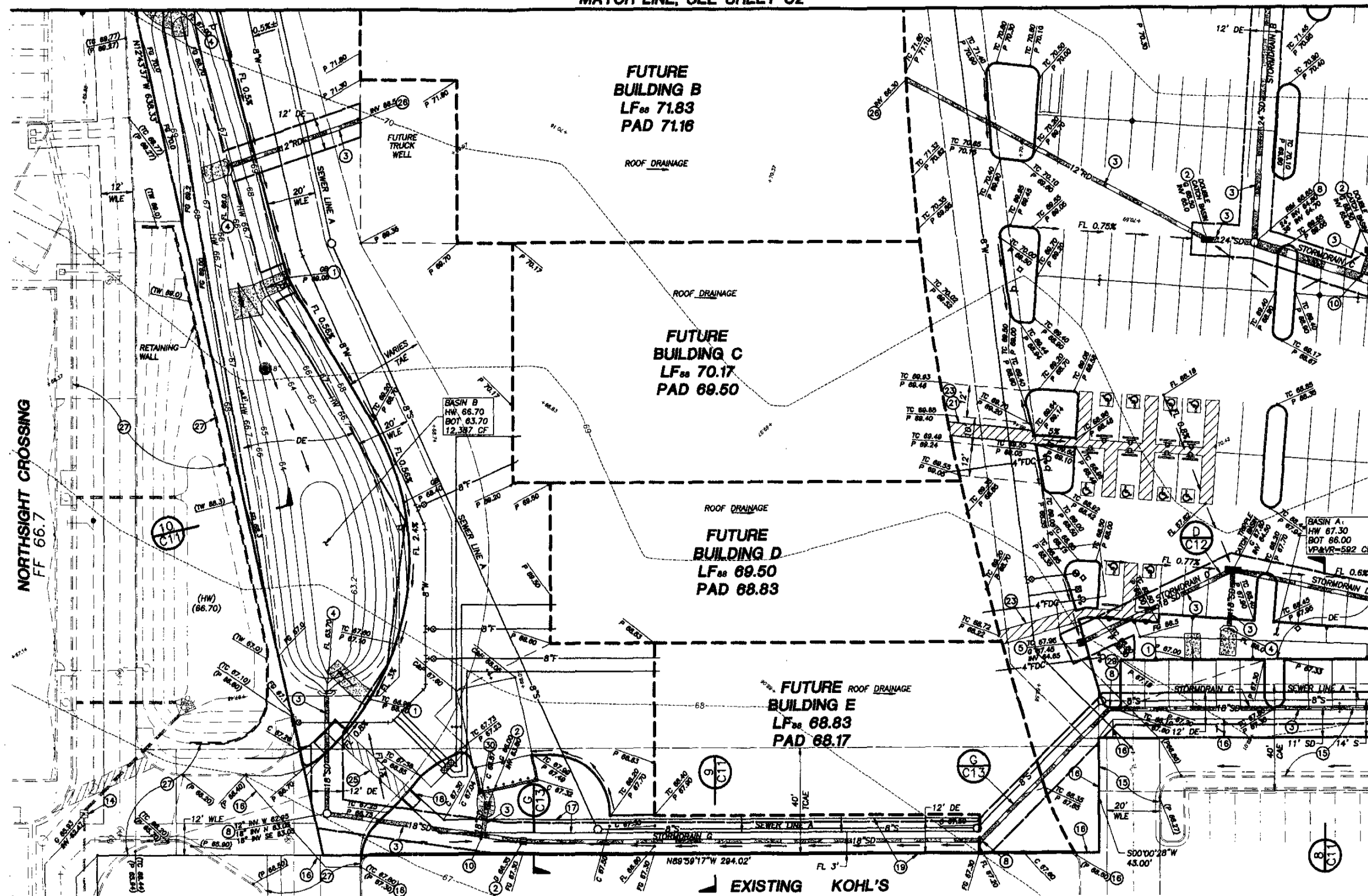
SCALE 1"=20'

GRADING AND DRAINAGE PLANS
SCOTTSDALE SHOPS

JMA ENGINEERING CORPORATION
531 E. Bethany Home Road, Garden Suite
Phoenix, Arizona 85012
Voice 602.248.0286
Fax 602.248.0976

Design	JM
CAD	JW
Checked	JM
Date	3/10/04
Job No.	0229.2
Sheet	C4 of 14



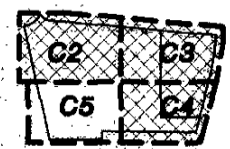


MATCH LINE, SEE SHEET C4

- CENTERLINE
--- RIGHT-OF-WAY
--- PROPERTY LINE
--- EASEMENT
--- EXISTING CURB AND GUTTER
--- EXISTING ELECTRICAL
--- EXISTING PAVEMENT
--- EXISTING SANITARY SEWER
--- EXISTING STORMDRAIN
--- EXISTING TELEPHONE
--- EXISTING WATER
--- EXISTING FENCE
○ REBAR
⊙ BRASS CAP
⊙ BRASS CAP IN HANDHOLE
⊙ EXISTING LIGHT POLE
○ EXISTING MANHOLE
○ EXISTING CLEANOUT
⊞ EXISTING CATCH BASIN
⊙ EXISTING FIRE HYDRANT
⊙ EXISTING WATER METER
⊙ EXISTING WATER VALVE
⊙ EXISTING BOX
⊙ EXISTING SIGN
⊙ EXISTING PALO VERDE TREE
⊙ EXISTING TREE
⊙ EXISTING MESQUITE
⊙ EXISTING STREET LIGHT
--- NEW SANITARY SEWER
--- NEW STORMDRAIN
--- NEW WATER
○ NEW MANHOLE
○ NEW CLEANOUT
○ NEW DRYWELL
⊞ NEW CATCH BASIN
⊞ NEW DOUBLE CHECK VALVE
⊙ NEW FIRE HYDRANT
⊙ NEW WATER METER
⊙ NEW WATER VALVE
--- GRADE BREAK
--- EXISTING SPOT
--- LIMITS OF CONSTRUCTION
WLE WATER LINE EASEMENT
CAE CROSS ACCESS EASEMENT
TAE TRUCK ACCESS EASEMENT
TCAE TEMPORARY CROSS ACCESS EASEMENT
--- FUTURE NORTHSIGHT CROSSING

NOTE: SEE DETAILS 3 AND 6, SHEET C10 FOR PAVEMENT SECTIONS AND DETAIL 1, SHEET C10 FOR CURB.

N
NORTHSIGHT
BLVD



KEY MAP
SCALE: NTS

GRADING AND DRAINAGE PLANS SCOTTSDALE SHOPS



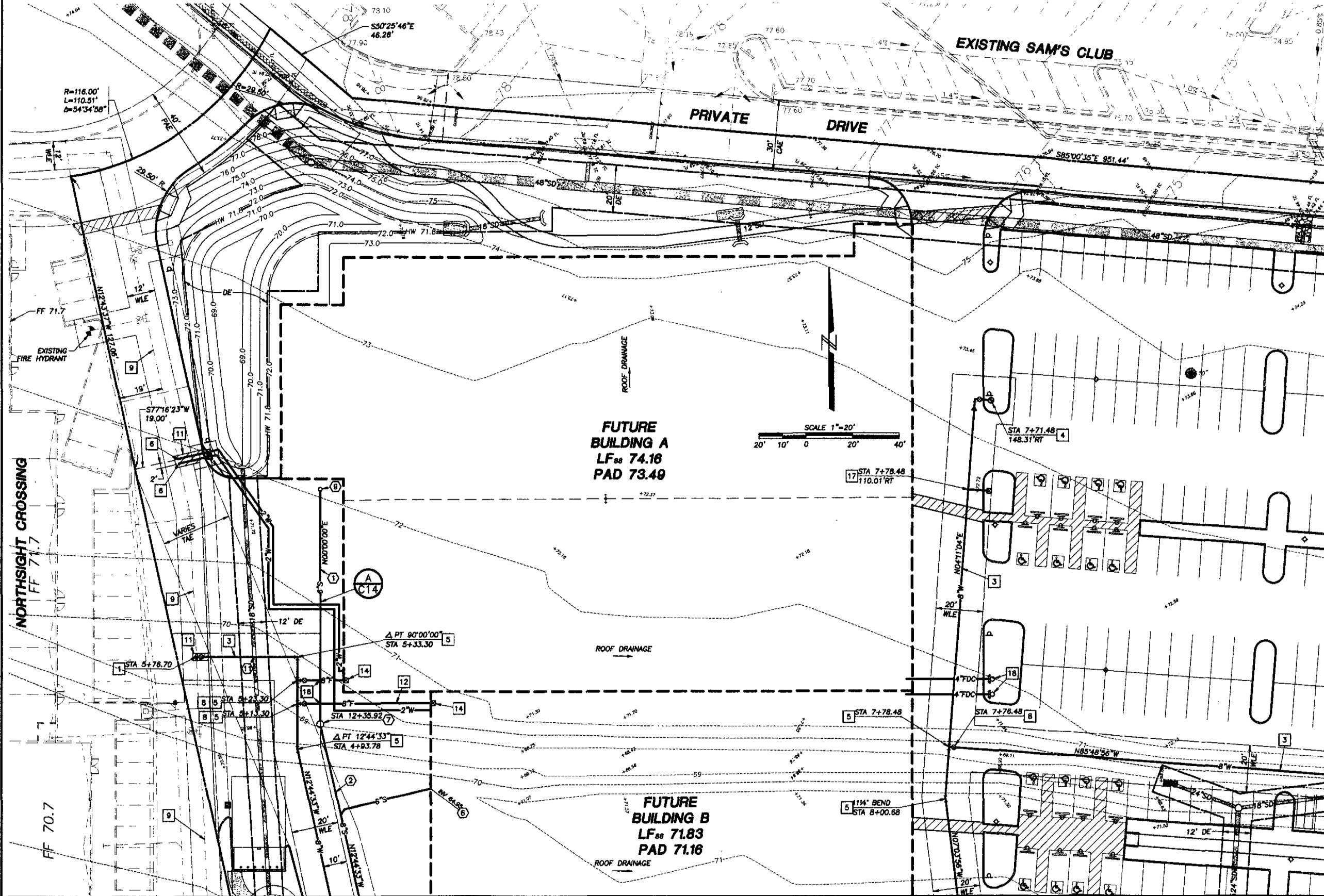
JMA ENGINEERING CORPORATION

531 E. Bethany Home Road, Garden Suite
Phoenix, Arizona 85012

Voice 602.248.0286
Fax 602.248.0976

Design	JM
CAD	JW
Checked	JE
Date	3/10/04
Job No.	0229.2
Sheet	C5 of 14

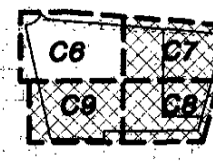


**CONSTRUCTION KEY NOTES - WATER LINE (MAG SPEC)**

- 1 NEW TSV&C PER MAG STANDARD DETAIL 340 AND 391 "C". PROVIDE RESTRAINED JOINTS PER MAG STANDARD DETAIL 303.
- 3 NEW 8-INCH CLASS 350 PSI, DIP PUBLIC WATER LINE WITH POLYWRAP, 3'-0" MINIMUM COVER.
- 4 NEW FIRE HYDRANT WITH VALVE, COMPLETE PER MAG STANDARD DETAIL 380.
- 5 NEW BEND OR TEE WITH ELECTRONIC MARKER PER CITY OF SCOTTSDALE SPECIFICATION 610.4 AND RESTRAINED JOINTS PER MAG STANDARD DETAIL 303-1 AND 303-2.
- 6 NEW 2-INCH DOMESTIC WATER METER PER COS STANDARD DETAIL 2330, AND BACKFLOW PREVENTOR PER COS STANDARD DETAIL 2354.
- 8 NEW VALVE, BOX AND COVER PER MAG STANDARD DETAIL 391 "C".
- 9 EXISTING NORTHSIGHT CROSSING WATER LINE (5-DR-2003).

- 11 SAWCUT, REMOVE AND REPLACE AC PAVEMENT IN KIND PER MAG STANDARD DETAIL 200 T-TO-P.
- 12 NEW 8-INCH DIP CLASS 350 PSI, PRIVATE FIRE LINE. 3'-0" MINIMUM COVER.
- 14 CURB STOP WITH FLUSHING PIPE PER MAG STANDARD DETAIL 390 "B".
- 16 MAINTAIN MIN 2-FOOT SEPARATION FROM SEWER, BURY FIRE LINE AT INCREASED DEPTH FROM MAIN TO BUILDING.
- 17 NEW 1-INCH LANDSCAPE METER, AND BACKFLOW PREVENTOR.
- 18 NEW REMOTE FIRE DEPARTMENT CONNECTION. SEE DETAIL 5, SHEET C14.

MATCH LINE, SEE SHEET C9

**KEY MAP**
SCALE: NTSSR 101 SOUTHBOND
FRONTAGE ROAD**WATER AND SEWER PLANS
SCOTTSDALE SHOPS**

JMA ENGINEERING CORPORATION

531 E. Bethany Home Road, Garden Suite
Phoenix, Arizona 85012

Design	JM
CAD	JM
Checked	JE
Date	3/10/04
Job No.	0229.2
Sheet	C6 of 14



MATCH LINE, SEE SHEET C7

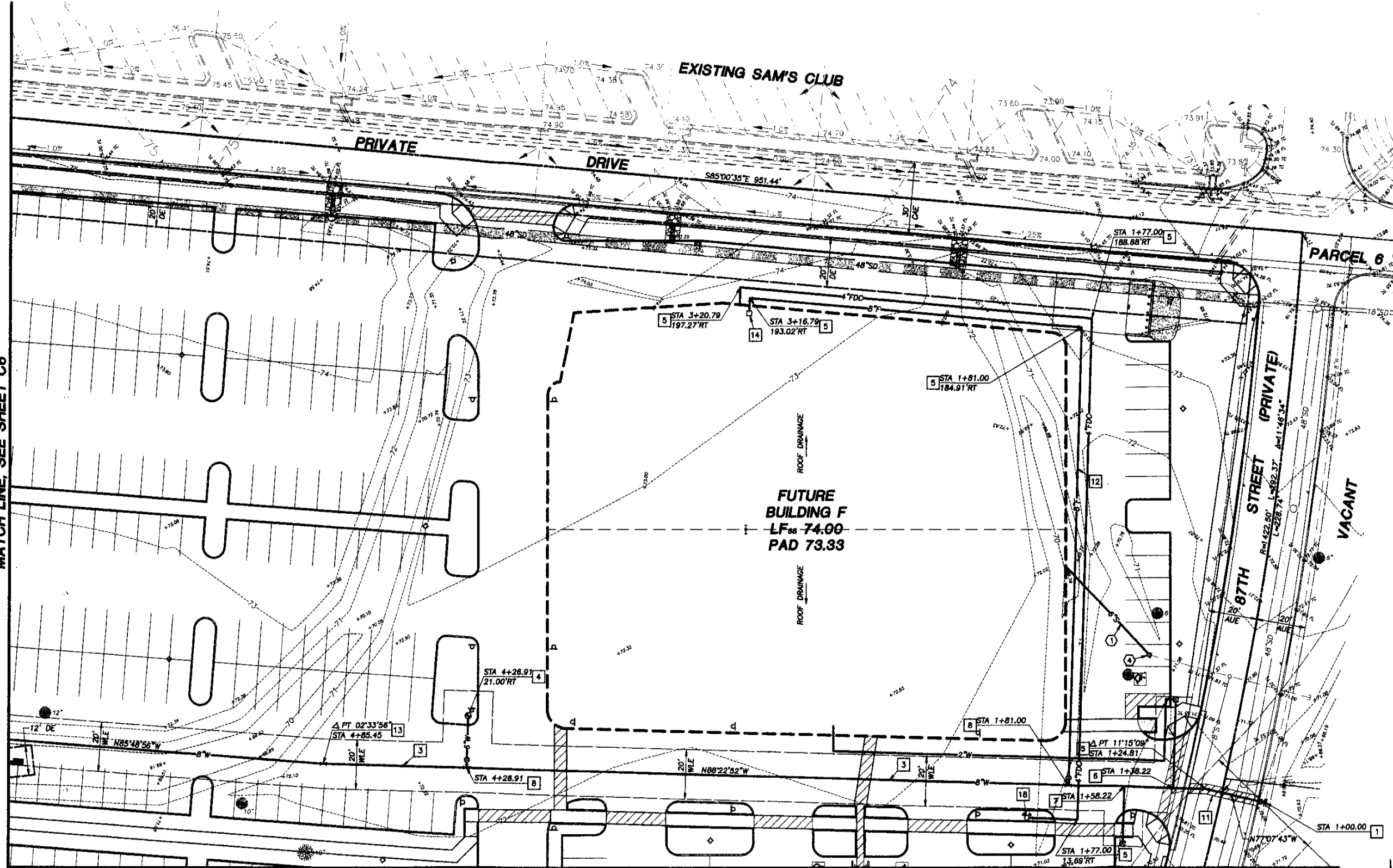
**CONSTRUCTION KEY NOTES -
SEWER LINE (MAG SPEC)**

- 1 NEW SDR35 8-INCH SANITARY SEWER AT 0.01 FT/FT MINIMUM, PROVIDE CLEANOUTS PER UPC. SEE SHEET C14 FOR PROFILE.
- 2 NEW SDR35 8-INCH PRIVATE SANITARY SEWER, SEE SHEET C14 FOR PROFILE.
- 6 NEW SEWER BUILDING CONNECTION PER MAG STANDARD DETAIL 440.
- 7 NEW SEWER MANHOLE PER MAG STANDARD DETAIL 420 AND 422.
- 8 NEW SEWER CLEANOUT PER MAG STANDARD DETAIL 441.
- 11 WATER AND SANITARY SEWER SEPARATION PER MAG STANDARD DETAIL 404.

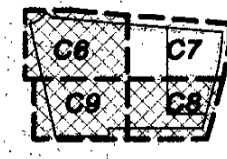
GENERAL NOTE:
1. REMOTE FIRE DEPARTMENT CONNECTION 2.5"x2.5"x4" NST WITH CITY OF SCOTTSDALE DETAIL 2363. SEE DETAIL 5, SHEET C14.
2. PROVIDE AN APPROVED VERTICAL CHECK BACK FLOW ASSEMBLY IN THE FIRE SPRINKLER RISER.
3. THE FIRE SPRINKLER RISER SHALL BE NO GREATER THAN 3'-0" INTO THE BUILDING.

LEGEND	
	CENTERLINE
	RIGHT-OF-WAY
	PROPERTY LINE
	EASEMENT
	EXISTING CURB AND GUTTER
	EXISTING ELECTRICAL
	EXISTING PAVEMENT
	EXISTING SANITARY SEWER
	EXISTING STORMDRAIN
	EXISTING TELEPHONE
	EXISTING WATER
	EXISTING FENCE
	EXISTING STORMDRAIN REBAR
	BRASS CAP
	BRASS CAP IN HANDHOLE
	EXISTING LIGHT POLE
	EXISTING MANHOLE
	EXISTING CLEANOUT
	EXISTING CATCH BASIN
	EXISTING FIRE HYDRANT
	EXISTING WATER METER
	EXISTING WATER VALVE
	EXISTING BOX
	EXISTING SIGN
	EXISTING PALO VERDE TREE
	EXISTING TREE
	EXISTING MESQUITE
	EXISTING STREET LIGHT
	NEW SANITARY SEWER
	NEW WATER
	NEW FIRE
	NEW STORMDRAIN
	NEW MANHOLE
	NEW CLEANOUT
	NEW DRYWELL
	NEW CATCH BASIN
	NEW DOUBLE CHECK VALVE
	NEW FIRE HYDRANT
	NEW WATER METER
	NEW WATER VALVE
	GRADE BREAK
	EXISTING SPOT
	LIMITS OF CONSTRUCTION
	WATER LINE EASEMENT
	CROSS ACCESS EASEMENT
	PROPOSED ACCESS EASEMENT
	DRAINAGE EASEMENT
	TRUCK ACCESS EASEMENT
	FUTURE NORTHSIGHT CROSSING

MATCH LINE, SEE SHEET C6

**LEGEND**

—	CENTERLINE
- - -	RIGHT-OF-WAY
—	PROPERTY LINE
—	EASEMENT
—	EXISTING CURB AND GUTTER
—	EXISTING ELECTRICAL
—	EXISTING PAVEMENT
S	EXISTING SANITARY SEWER
—	EXISTING SANITARY SEWER CAP
—	EXISTING STORMDRAIN
T	EXISTING TELEPHONE
W	EXISTING WATER
- x -	EXISTING FENCE
o	REBAR
⊙	BRASS CAP
⊕	BRASS CAP IN HANDHOLE
◇	EXISTING LIGHT POLE
○	EXISTING MANHOLE
○	EXISTING CLEANOUT
⊞	EXISTING CATCH BASIN
⊞	EXISTING FIRE HYDRANT
⊞	EXISTING WATER METER
⊞	EXISTING WATER VALVE
□ TYPE	EXISTING BOX
⊞	EXISTING SIGN
⊞	EXISTING PALO VERDE TREE
⊞	EXISTING TREE
⊞	EXISTING MESQUITE
⊞	EXISTING STREET LIGHT
S	NEW SANITARY SEWER
W	NEW WATER
F	NEW FIRE
—	NEW STORMDRAIN
○	NEW MANHOLE
○	NEW CLEANOUT
⊞	NEW DRYWELL
⊞	NEW CATCH BASIN
⊞	NEW DOUBLE CHECK VALVE
⊞	NEW FIRE HYDRANT
⊞	NEW WATER METER
⊞	NEW WATER VALVE
—	GRADE BREAK
—	LIMITS OF CONSTRUCTION
AUE	ACCESS AND UTILITY EASEMENT
DE	DRAINAGE EASEMENT
WLE	WATER LINE EASEMENT

NORTH
BLVD**KEY MAP**
SCALE: NTS**CONSTRUCTION KEY NOTES - WATER LINE (MAG SPEC)**

1. NEW TSV&C PER MAG STANDARD DETAIL 340 AND 391 "C". PROVIDE RESTRAINED JOINTS PER MAG STANDARD DETAIL 303.
3. NEW 8-INCH CLASS 350 PSI, DIP PUBLIC WATER LINE WITH POLYWRAP, 3'-0" MINIMUM COVER.
4. NEW FIRE HYDRANT WITH VALVE, COMPLETE PER MAG STANDARD DETAIL 360.
5. NEW BEND OR TEE WITH ELECTRONIC MARKER PER CITY OF SCOTTSDALE SPECIFICATION 610.4 AND RESTRAINED JOINTS PER MAG STANDARD DETAIL 303-1 AND 303-2.
6. NEW 2-INCH DOMESTIC WATER METER PER COS STANDARD DETAIL 2330, AND BACKFLOW PREVENTOR PER COS STANDARD DETAIL 2354.
7. NEW 2-INCH LANDSCAPE METER, AND BACKFLOW PREVENTOR.
8. NEW VALVE, BOX AND COVER PER MAG STANDARD DETAIL 391 "C".
11. SAWCUT, REMOVE AND REPLACE AC PAVEMENT IN KIND PER MAG STANDARD DETAIL 200 T-TOP.
12. NEW 8-INCH DIP CLASS 350 PSI, PRIVATE FIRE LINE. SIZE PER PLAN. 3'-0" MINIMUM COVER.
13. DEFLECT PIPE JOINT PROVIDE ELECTRONIC MARKER.
14. CURB STOP WITH FLUSHING PIPE PER MAG STANDARD DETAIL 390 "B".
18. NEW REMOTE FIRE DEPARTMENT CONNECTION. SEE DETAIL 5, SHEET C14.

CONSTRUCTION KEY NOTES - SEWER LINE (UPC)

1. NEW SDR35 6-INCH SANITARY SEWER AT 0.01 FT/FT MINIMUM, PROVIDE CLEANOUTS PER UPC. SEE SHEET C14 FOR PROFILE.
4. CONNECT TO EXISTING SEWER STUB-OUT.

GENERAL NOTE: 1. REMOTE FIRE DEPARTMENT CONNECTION 2.5"x2.5"x4" NST WITH CITY OF SCOTTSDALE DETAIL 2363. SEE DETAIL 5, SHEET C14.
2. PROVIDE AN APPROVED VERTICAL CHECK BACK FLOW ASSEMBLY IN THE FIRE SPRINKLER RISER.
3. THE FIRE SPRINKLER RISER SHALL BE NO GREATER THAN 3'-0" INTO THE BUILDING.

**WATER AND SEWER PLANS
SCOTTSDALE SHOPS**

JMA ENGINEERING CORPORATION

531 E. Bethany Home Road, Garden Suite
Phoenix, Arizona 85012Voice 602.248.0286
Fax 602.248.0286

Design	JM
CAD	JM
Checked	JE
Date	3/10/04
Job No.	0229.2
Sheet	C7 of 14



38-DR-03 1016-03 90-NP-2003

NORTHSIGHT AND RAIN TREE

JMA 0229.2