



## Drainage Reports

**PRELIMINARY DRAINAGE REPORT**  
**ALTA Raintree Scottsdale**  
**Lot 3**

**8682 E. Raintree Drive**  
**Scottsdale, AZ 85260**

**Prepared For:**



**Prepared by:**



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**Project Number: 180961**

**Date: December 20, 2019 (DRB)**

**Case No.: 3-ZN-2019**

**Plan Check No.: TBD**

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## 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 <sup>1</sup>, and the Drainage Design Manuals for Maricopa County, Arizona, Volumes I<sup>2</sup> and Volume II<sup>3</sup>.

## 2. LOCATION AND PROJECT DESCRIPTION

### 2.1 LOCATION:

The subject property consists of land 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: 215-52-034W
- Address: 8682 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 215-52-034U; owned by Sam's Club; Zoning is C-2.
- East: Parcel 215-52-034X; Property subdivision; Zoning is C-2.

### 2.3 EXISTING SITE DESCRIPTION:

The project area includes approximately 242,067 sq. ft. (5.56 acres) of land designated as C-2 per COS Zoning Map 19. The site is currently developed and includes three 1 story shops 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 330 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 Grading and Drainage Plan**.

### 2.5 FLOOD HAZARD ZONE:

FIRM Map Number 04013C1760L dated October 16, 2013 indicates most of this site is designated as shaded Zone "X" shaded. As such, it is defined as areas determined to be an area of 0.2% annual chance

flooding with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance.

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 Existing 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 87<sup>th</sup> 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 B1 = 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-Builts: Grading, Drainage & Utility Plan Reference Sheets** in **Appendix 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 existing 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.

#### 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 **5.56 Acres at  $C_{wt} = 0.91$**  (Proposed conditions)

Overall site runoff =  $Q_{100} = 38.89$  cfs **proposed**

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

#### 4.4 STORMWATER RETENTION:

In accordance with the C.O.S. 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 interconnected open retention and underground retention is proposed along the southwest boundary for drainage areas A-1 through A-7. Underground retention pipes along the east boundary area are proposed for drainage areas B-1 through B-12. The underground storage system will comply with the City of Scottsdale underground storage policy.

The design intent for the overall site is for all four adjacent lots to be self-retaining. In case of overflow Lot 1 would overflow into Lot 2, and Lot 2 will overflow into Lot 4. Lot 4 will overflow at the ultimate outfall of 67.18. The ultimate outfall for Lot 3 is located at the southwest corner at 1467.82.

**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-A (Open Retention and Underground Storage):** A-1 through A-7: 1.61 ac @  $C_{wt} = 0.85$

- 100-yr, 2-hr.:

$$V_r = 2.27/12 * 1.61 \text{ ac} * 0.85 = \mathbf{0.25 \text{ ac.ft. (11,290 c.f.) REQUIRED STORAGE}}$$

**Basin-B (Underground Storage):** B-1 through B-12: 3.95 ac @  $C_{wt} = 0.93$

- 100-yr, 2-hr.:

$$V_r = 2.27/12 * 3.95 \text{ ac} * 0.93 = \mathbf{0.69 \text{ ac.ft. (30,217 c.f.) REQUIRED STORAGE}}$$

Refer to **Appendix II for Proposed Overall  $C_w$  and Required Storage Volume** for calculations of each drainage area.

**STORAGE PROVIDED:****Retention Basin A:**

Existing detention Basin B1 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. In addition, the basin will be modified to allow room for proposed structures. The existing basin was modified in accordance with C.O.S. design requirements, an open basin is limited to three (3) feet maximum depth with maximum side slopes of 4:1 (6:1 near streets) with one (1) foot freeboard and include an emergency overflow outlet.

- The volume for open basins is calculated using the area-sum volume method based on design contours.

Table 1 summarizes the available open storage in Basin A.

**Table 1**

<b>BASIN A</b>					
ELEV.	AREA	DEPTH	AVG V	SUM V	COMMENT
(FT)	(SF)	(FT)	(CF)	(CF)	
1465.0	721			0.00	Pond Bottom
		1.00	1,181.72		
1466.0	1,643			1,181.72	
		1.00	2,388.82		
1467.0	3,135			3,570.54	
		1.00	3,990.17		
1468.0	4,846			7,560.71	Pond Top

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

- One proposed 10' Dia. CMP storage pipe, 50 lf =  $3.1416 * 5^2 * 50' = 3,927$  c.f.

Total provided storage for Basin A = 7,561 cf + 3,927 = **11,488 cf**.

The provided volume of 11,488 c.f. can adequately store the required volume of 11,290 c.f. The emergency overflow for the basin will be located at the curb opening located at the southwest corner of the basin. An inline check valve will be installed at catch basin CB-3 to maintain the overflow location for basin A to be at the curb opening at an elevation of **1480.15**, and the ultimate outfall for drainage areas to be at the lower southwest corner at an elevation of **1466.80**.

#### **Retention Basin B:**

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

- Total proposed 10' Dia. CMP storage pipe, 400 LF =  $3.1416 * 5^2 * 400 = 31,416$  cf.

The proposed provided underground storage of 31,416 cf can adequately store the required storage of 30,217 cf. An inline check valve will be installed at catch basin CB-2 to maintain the overflow location for basin B to be at CB-1 at an elevation of **1467.65**, and the ultimate outfall for drainage areas B-1 through B-12 to be at the lower southeast corner at an elevation of **1467.82**.

#### **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 cfs \* 36 hours \* 3600 sec/hour = 12,960 cf = 0.298 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 A Provided storage = 11,488 cf

11,488 cf / 12,960 cf per drywell = 0.89 = 1 drywell required.

Basin B Provided Storage = 31,416 cf

31,416 cf/12,960 cf per drywell = 2.42 = 3 drywells required

Add paragraph discussing approach and methodology used to model subject system. Please discuss and analyze system surcharge.

#### 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:

For the proposed drainage design, 18", 24", and 36" HDPE pipes have been proposed to connect from the catch basins to the **underground storage system**, Basin B. The proposed 18", 24", 36" storm drains can adequately convey the maximum 100-year, 2-hour event runoff. The proposed storm drain system was modeled using Bentley's StormCAD V8i (SELECTseries1). The storm drain calculations are included in **Appendix II**.

#### 4.6 STORM DRAIN INLET CALCULATIONS

Catch basins per MAG Standard Detail 535 are proposed for storm drain inlets within the main drives.

- A single MAG 535 catch basin can convey a flow of 10.30 cfs, while considering a clogging factor of 0.50. The proposed catch basin inlets can adequately convey the maximum 100-year, 5-min event runoff,  $Q_{100} = 2.15 \text{ cfs (CB-1)}$ .
- An 18" Nyloplast grate inlet can convey a flow of 1.38 cfs, while considering a clogging factor of 0.50. The proposed 18" Nyloplast grate inlet can adequately convey the 100-year, 5-min event runoff  $Q_{100} = 0.38 \text{ cfs (CB-7)}$ .
- A 30" riser inlet with grated lid can convey a flow of 4.62 cfs, while considering a clogging factor of 0.50. The proposed 30" risers can adequately convey the 100-year, 5-minute event runoff  $Q_{100} = 0.91 \text{ cfs (CB-4)}$ . See Table 2 for flow calculations.

**Table 2**

<b>Drainage Structure Runoff Calculations</b>					
Q=CIA					
I=100-yr,5-min =7.72 in./hr					
Structure		Area	C <sub>w</sub>	intensity	Q
ID	Type	(acres)	(-)	(in/hr)	(cfs)
<b>CB-1</b>	<b>MAG 535</b>	<b>0.32</b>	<b>0.87</b>	<b>7.72</b>	<b>2.15</b>
CB-2	MAG 535	0.17	0.89	7.72	1.13
CB-3	MAG 535	0.26	0.80	7.72	1.61
<b>CB-4</b>	<b>30" Riser</b>	<b>0.03</b>	<b>0.91</b>	<b>7.72</b>	<b>0.21</b>
CB-5	18" Nyloplast	0.03	0.71	7.72	0.15
CB-6	18" Nyloplast	0.02	0.80	7.72	0.11
<b>CB-7</b>	<b>18" Nyloplast</b>	<b>0.05</b>	<b>0.80</b>	<b>7.72</b>	<b>0.30</b>
CB-8	18" Nyloplast	0.02	0.80	7.72	0.14
CB-9	18" Nyloplast	0.04	0.80	7.72	0.25
CB-10	18" Nyloplast	0.05	0.80	7.72	0.29
CB-11	18" Nyloplast	0.02	0.80	7.72	0.13
CB-12	18" Nyloplast	0.04	0.89	7.72	0.25
CB-13	18" Nyloplast	0.03	0.88	7.72	0.22
CB-14	MAG 535	0.22	0.90	7.72	1.54
CB-15	30" Riser	0.18	0.46	7.72	0.65

Refer to **Appendix II** for inlet capacity calculations.

## **5. FLOOD SAFETY FOR DWELLINGS**

### **5.1 FINISHED FLOOR ELEVATIONS**

This project lies in a shaded "X" Flood Zone. Therefore, proposed building finished floor elevations will be set a minimum of 14 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
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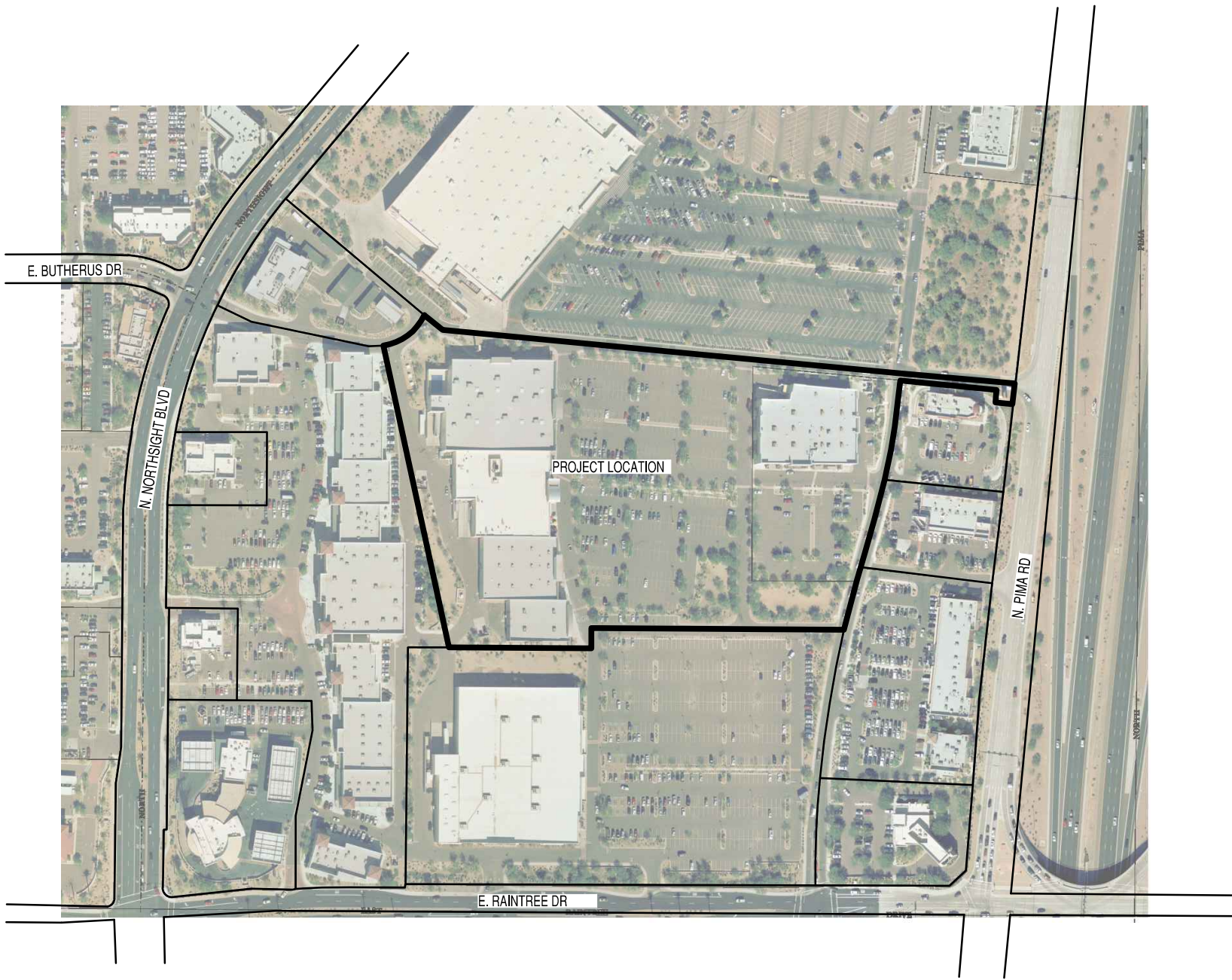


FIGURE 2  
AERIAL MAP



FIGURE 1  
VICINITY MAP

**NOTES TO USERS**

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage 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 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 regard 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 0202). The **horizontal datum** was NAD 83 HARN, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this 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/gismaps/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 Densification 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/gismaps/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 Agricultural Imagery Program (NAIP) imagery was provided by the Arizona State Land Department (ALRIS) and is dated 2007. The coordinate system used for the production of the digital FIRM is State Plane Arizona Central NAD83 HARN, International Feet.

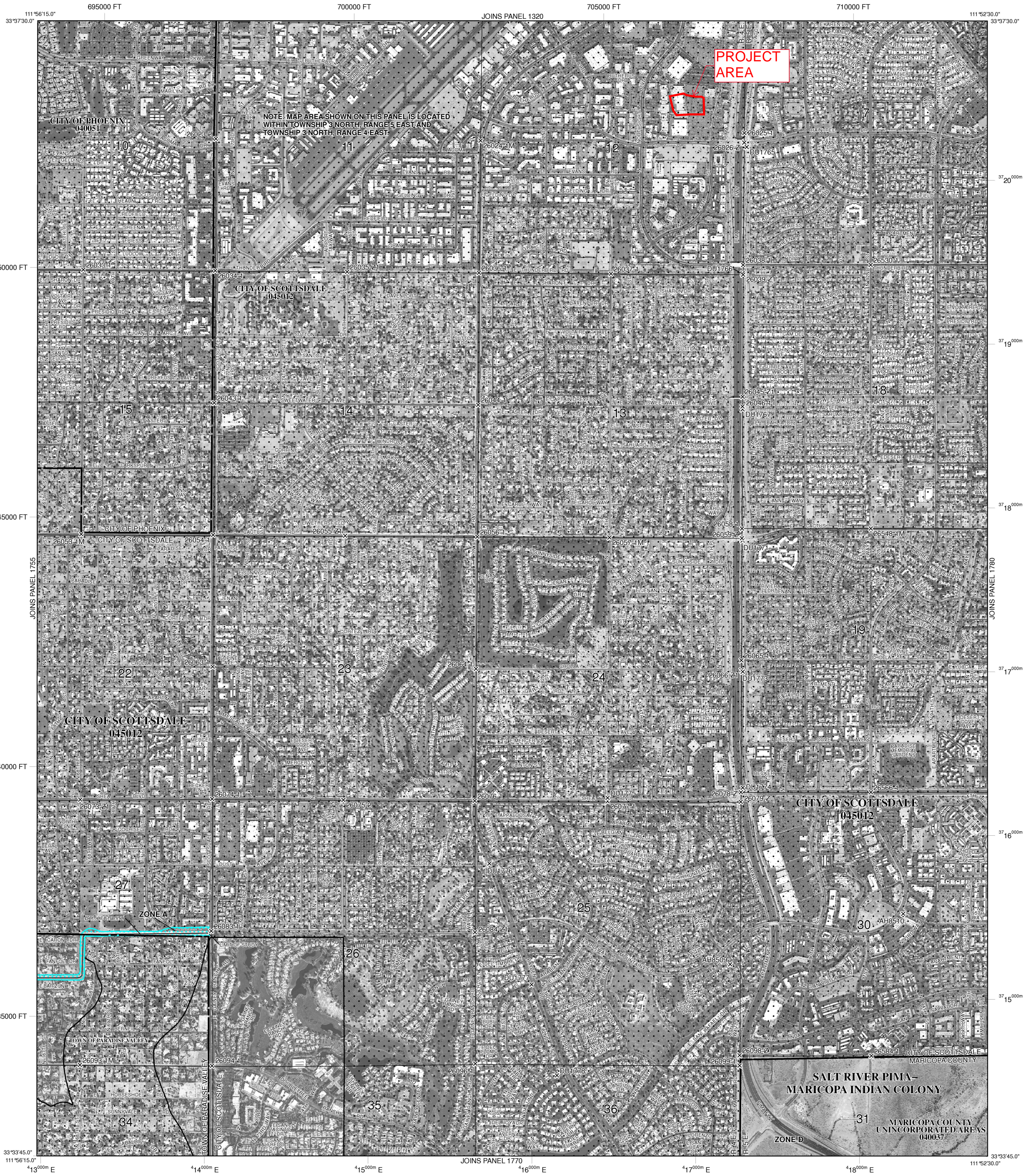
The **profile base line** depicted on this map represents the hydraulic modeling baselines that match flood profiles in the FIS report. As a result of improved topographic data, the profile base line, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

**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/>.



**LEGEND**

**SPECIAL FLOOD HAZARD AREAS (SFHAS) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

**Zone A:** No Base Flood Elevations determined.

**Zone AE:** Base Flood Elevations determined.

**Zone AH:** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

**Zone AO:** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

**Zone AR:** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

**Zone A99:** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

**Zone V:** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

**Zone VE:** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

**FLOODWAY AREAS IN ZONE AE**

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

**OTHER FLOOD AREAS**

**Zone X:** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

**OTHER AREAS**

**Zone X:** Areas determined to be outside the 0.2% annual chance floodplain.

**Zone D:** Areas in which flood hazards are undetermined, but possible.

**COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**

**OTHERWISE PROTECTED AREAS (OPAs)**

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513 (EL 987) Base Flood Elevation line and value; elevation in feet\*

(EL 987) Base Flood Elevation value where uniform within zone; elevation in feet\*

\* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A Cross section line

23-23 Transsect line

57°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)

4975000N 1000-meter Universal Transverse Mercator grid ticks, zone 12

6000000M 5000-foot grid ticks: Arizona State Plane coordinate system, central zone (FIPSZONE 0202), Transverse Mercator

DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)

M1.5 River Mile

**MAP REPOSITORIES**

Refer to Map Repositories list on Map Index

**EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP**

April 15, 1988

**EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL**

July 13, 2001 September 30, 2002

October 16, 2013 - to incorporate previously issued letters of map revision, to update corporate limits, to change base flood elevations, to add base flood elevation, to add roads and road names, to change floodway, to add special flood hazard areas, to advance suffix, and to add floodway.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

**MAP SCALE 1" = 1000'**

500 0 1000 2000 FEET

300 0 300 600 METERS

**NFIP**

**PANEL 1760L**

**FIRM**

**FLOOD INSURANCE RATE MAP**

**MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS**

**PANEL 1760 OF 4425**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

**CONTAINS:**

COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY	040037	1760	L
PARADISE VALLEY TOWN OF	040049	1760	L
PHOENIX, CITY OF	040051	1760	L
SCOTTSDALE, CITY OF	040012	1760	L

**FIGURE 3**

Notes to User: The **Map Number** shown below should be used when placing map orders. The **Community Number** shown above should be used on insurance applications for the subject community.

**MAP NUMBER 04013C1760L**

**MAP REVISED OCTOBER 16, 2013**

**Federal Emergency Management Agency**

*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**

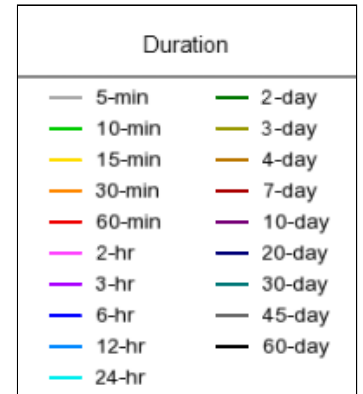
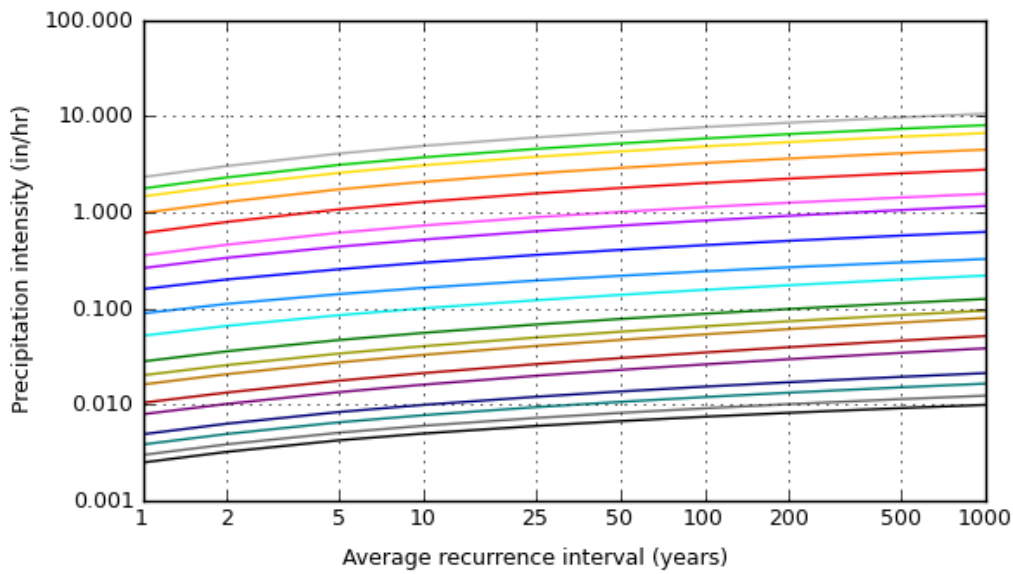
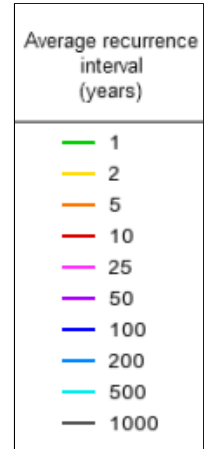
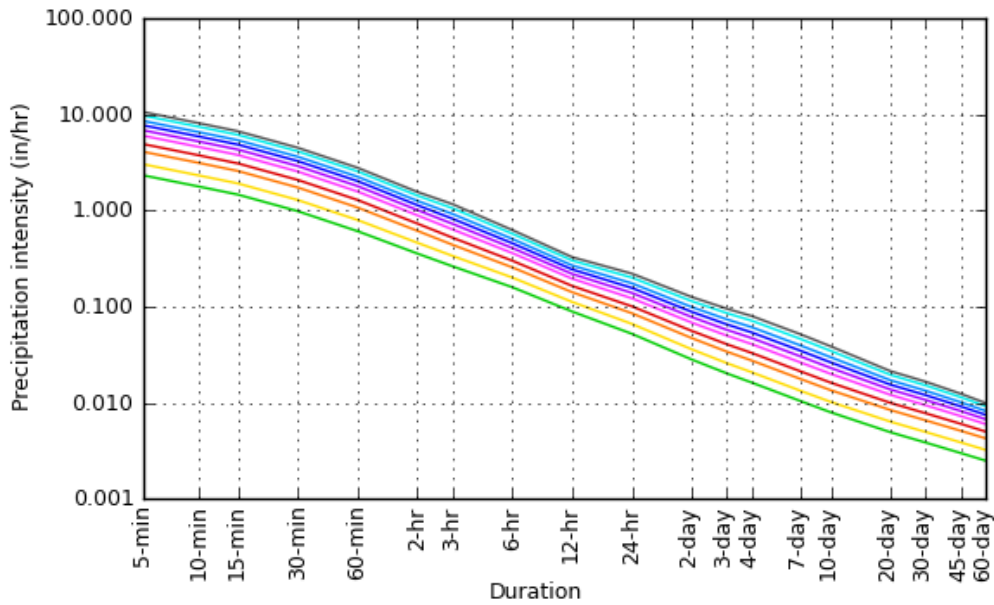
<b>PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)<sup>1</sup></b>										
<b>Duration</b>	<b>Average recurrence interval (years)</b>									
	<b>1</b>	<b>2</b>	<b>5</b>	<b>10</b>	<b>25</b>	<b>50</b>	<b>100</b>	<b>200</b>	<b>500</b>	<b>1000</b>
<b>5-min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

<sup>1</sup> 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.

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# PF graphical

PDS-based intensity-duration-frequency (IDF) curves  
Latitude: 33.6209°, Longitude: -111.8943°



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## 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**

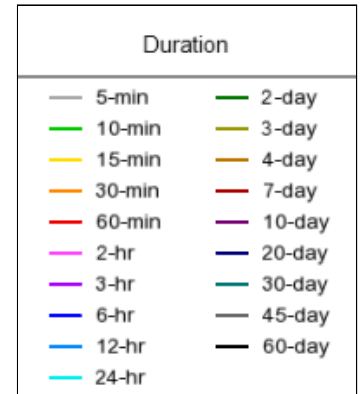
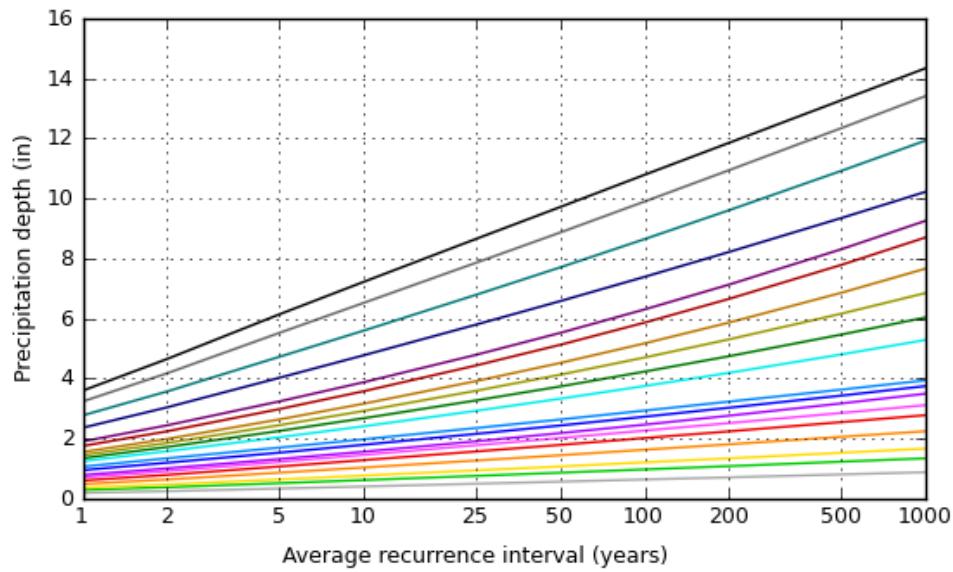
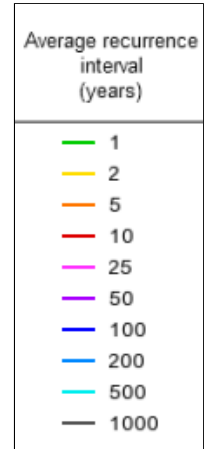
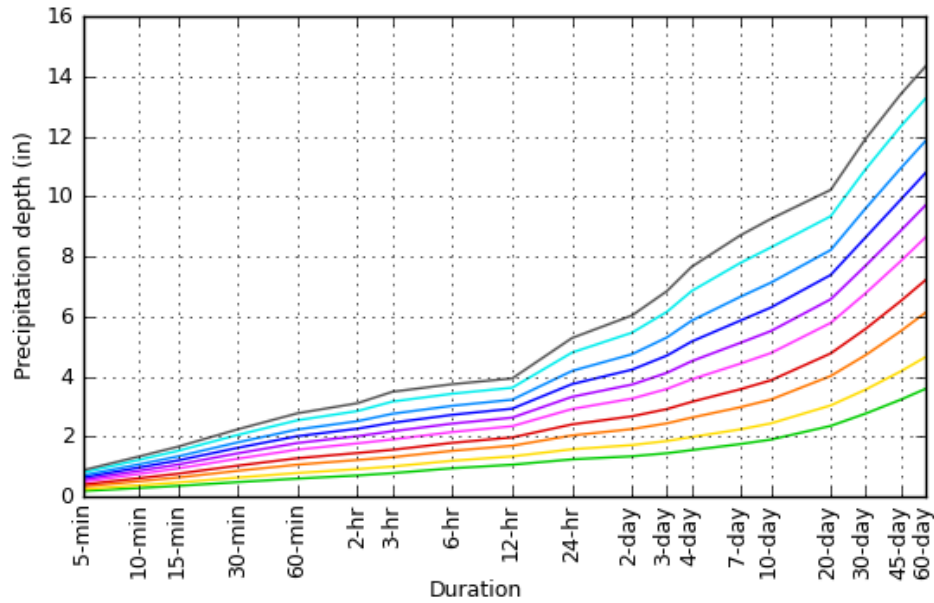
<b>PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)<sup>1</sup></b>										
<b>Duration</b>	<b>Average recurrence interval (years)</b>									
	<b>1</b>	<b>2</b>	<b>5</b>	<b>10</b>	<b>25</b>	<b>50</b>	<b>100</b>	<b>200</b>	<b>500</b>	<b>1000</b>
<b>5-min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

<sup>1</sup> 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.

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### PF graphical

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



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### 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
<hr/>			
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
<hr/>			
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.

**PROPOSED OVERALL SITE C<sub>w</sub>**

	BUILDING or CONCRETE	DESERT LANDSCAPE	TOTAL AREA	Cwt
C-VALUE	0.95	0.45		
AREA (ac)	5.07	0.48	<b>5.56</b>	<b>0.91</b>
A-1	0.01	0.18	0.18	0.46
A-2	0.22	0.04	0.26	0.88
A-3	0.08	0.00	0.08	0.95
A-4	0.18	0.08	0.26	0.80
A-5	0.56	0.00	0.56	0.95
A-6	0.20	0.02	0.22	0.90
A-7	0.04	0.00	0.04	0.95
B-1	0.15	0.02	0.17	0.89
B-2	0.27	0.05	0.32	0.87
B-3	0.01	0.01	0.03	0.71
B-4	0.19	0.08	0.26	0.80
B-5	0.03	0.00	0.04	0.89
B-6	0.03	0.00	0.03	0.88
B-7	0.66	0.00	0.66	0.95
B-8	0.31	0.00	0.31	0.95
B-9	1.02	0.00	1.02	0.95
B-10	0.43	0.00	0.43	0.95
B-11	0.65	0.00	0.65	0.95
B-12	0.03	0.00	0.03	0.91

## Required Storage Volume Calculations

$$Vr=1*(P/12)*Cw*A$$

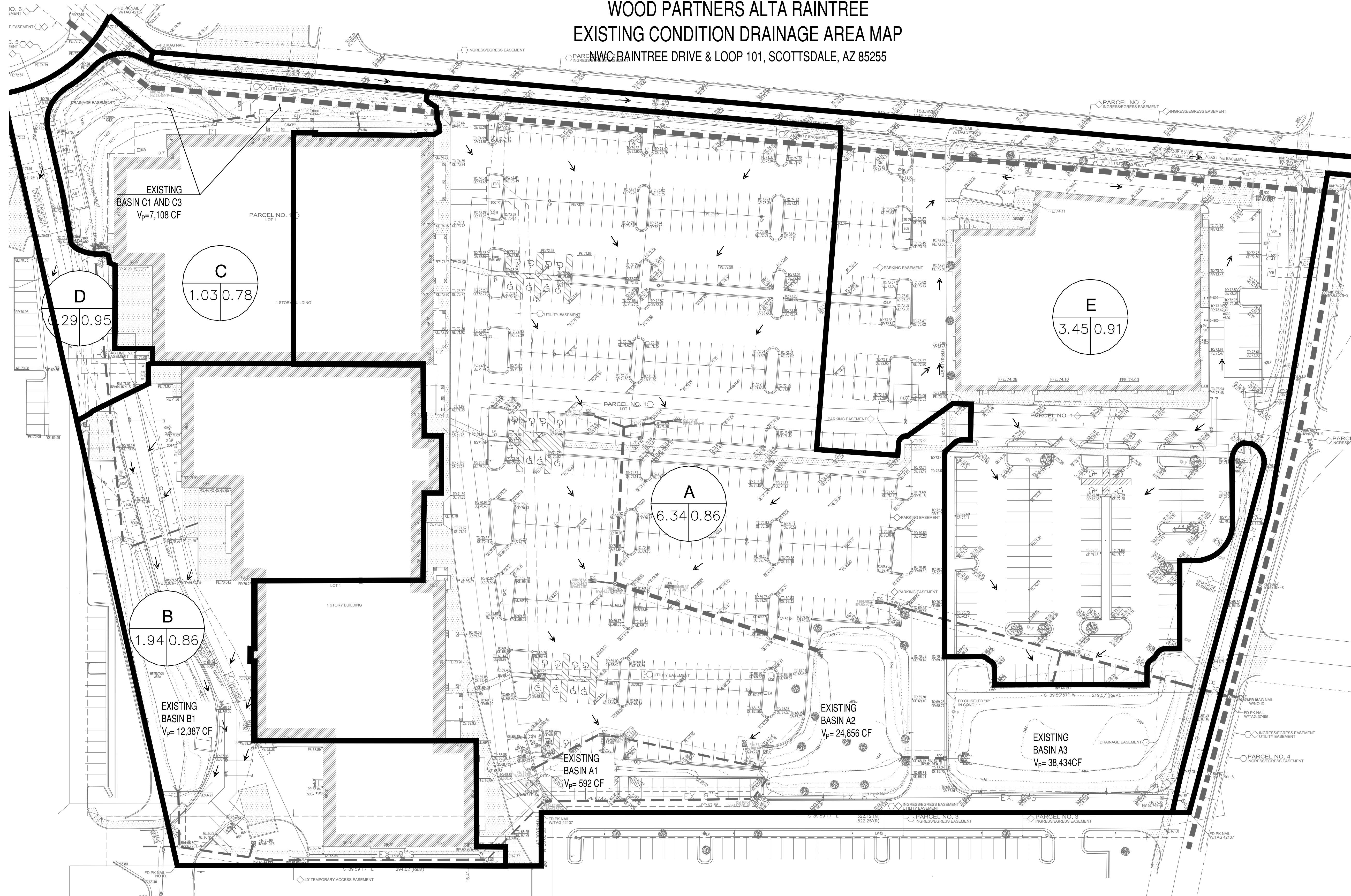
$$P=100\text{-yr, } 2\text{-hr}=2.27 \text{ in.}$$

Drainage	Area	C <sub>w</sub>	intensity	Q	Volume Req.	Volume Req.
Area ID	(acres)	(-)	(in/hr)	(cfs)	(acre-ft)	(CF)
<b>RETENTION BASIN 1</b>						
A-1	0.18	0.46	7.72	0.65	0.016	695.64
A-2	0.26	0.88	7.72	1.77	0.043	1,889.65
A-3	0.08	0.95	7.72	0.58	0.014	619.17
A-4	0.26	0.80	7.72	1.61	0.039	1,714.88
A-5	0.56	0.95	7.72	4.13	0.101	4,409.14
A-6	0.22	0.90	7.72	1.54	0.038	1,645.19
A-7	0.04	0.95	7.72	0.30	0.007	316.81
<b>Basin A Totals:</b>	<b>1.61</b>	<b>0.85</b>		<b>10.58</b>	<b>0.259</b>	<b>11,290.48</b>

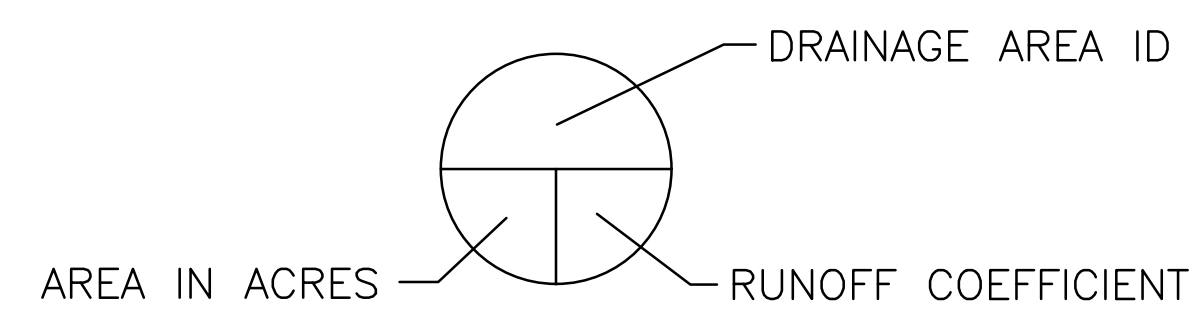
<b>RETENTION BASIN 2</b>						
B-1	0.17	0.89	7.72	1.13	0.028	1,210.32
B-2	0.32	0.87	7.72	2.15	0.053	2,291.87
B-3	0.03	0.71	7.72	0.15	0.004	164.85
B-4	0.26	0.80	7.72	1.63	0.040	1,736.20
B-5	0.04	0.89	7.72	0.25	0.006	271.38
B-6	0.03	0.88	7.72	0.22	0.005	235.94
B-7	0.66	0.95	7.72	4.86	0.119	5,182.32
B-8	0.31	0.95	7.72	2.26	0.055	2,416.43
B-9	1.02	0.95	7.72	7.50	0.184	8,001.20
B-10	0.43	0.95	7.72	3.17	0.078	3,378.25
B-11	0.65	0.95	7.72	4.78	0.117	5,105.98
B-12	0.03	0.91	7.72	0.21	0.005	222.48
<b>Basin B Totals:</b>	<b>3.95</b>	<b>0.93</b>		<b>28.31</b>	<b>0.694</b>	<b>30,217.23</b>
<b>Totals</b>	<b>5.56</b>	<b>0.91</b>	<b>7.72</b>	<b>38.89</b>	<b>0.95</b>	<b>41,507.70</b>

# WOOD PARTNERS ALTA RAINTREE EXISTING CONDITION DRAINAGE AREA MAP

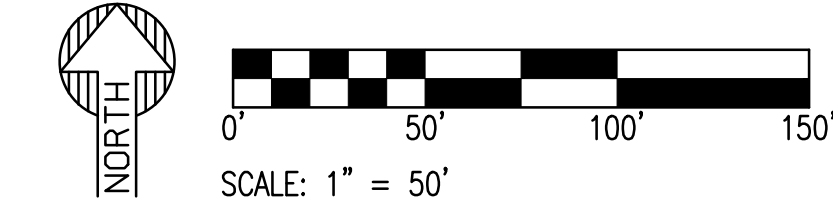
NWC RAIN TREE DRIVE & LOOP 101, SCOTTSDALE, AZ 85255



Existing Required Storage Volume Calculations						
Drainage Area ID	Area (acres)	Cw (-)	Intensity (in/hr)	Q (cfs)	Volume Req. (acre-ft)	Volume Req. (CF)
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
<b>Totals</b>	<b>13.05</b>			<b>87.36</b>	<b>2.14</b>	<b>93,244.33</b>



DRAINAGE AREA KEY



NOTE:  
EXISTING RETENTION VOLUMES WERE DETERMINED PER GRADING, DRAINAGE AND UTILITY PLAN FOR SCOTTSDALE SHOPS AS-BUILTS.

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8280 E. GELDING DRIVE SUITE 101, SCOTTSDALE, ARIZONA 85260  
WWW.AZSEG.COM TEL. 480.586.7226 FAX. 480.259.3534



PROJECT: WOOD PARTNERS ALTA RAINTREE SCOTTSDALE  
LOCATION: NWC RAIN TREE DRIVE & LOOP 101 SCOTTSDALE, ARIZONA

DESIGNED: KA 12/18/2019  
DC: SC 12/20/2019  
DATE: 12/20/2019

ISSUED FOR: DRB

REVISION NO.: DATE:

JOB NO.: 180961

SHEET TITLE: EXISTING CONDITIONS DRAINAGE AREA MAP

SHEET NO.: 1 OF 3

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WOOD PARTNERS ALTA RAINTREE - LOT 3  
 PROPOSED CONDITIONS DRAINAGE AREA MAP  
 NWC RAINTREE DRIVE & LOOP 101, SCOTTSDALE, AZ 85255

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PROJECT: WOOD PARTNERS ALTA RAINTREE SCOTTSDALE  
 LOCATION: NWC RAINTREE DRIVE & LOOP 101 SCOTTSDALE, ARIZONA

DRAWN: KA 12/18/2019  
 DESIGNED: SC 12/18/2019  
 QC: SC 12/20/2019  
 QA: AF 12/20/2019  
 PROJ. MGR.: NS

DATE: 12/20/2019

ISSUED FOR: DRB

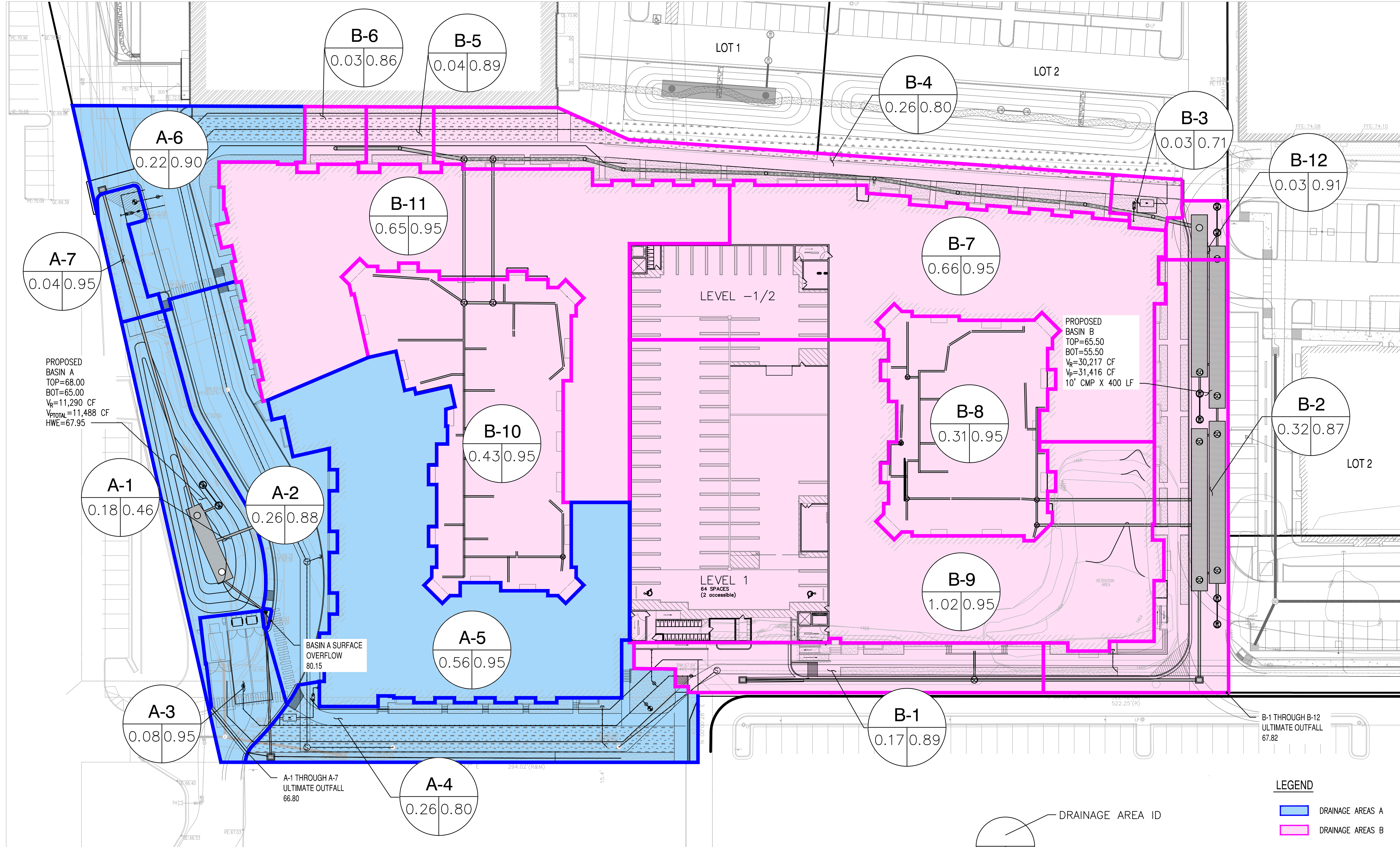
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JOB NO.: 180961

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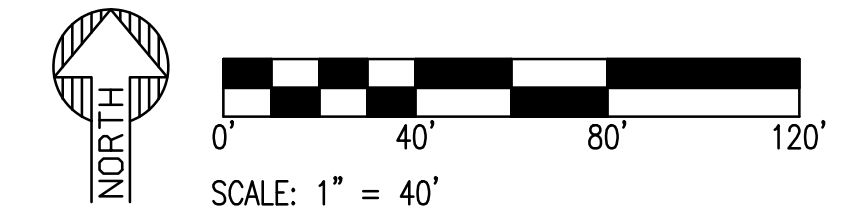
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WOOD PARTNERS ALTA RAINTREE  
 ULTIMATE CONDITION DRAINAGE AREA MAP  
 NWC RAINTREE DRIVE & LOOP 101, SCOTTSDALE, AZ 85255



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SUSTAINABILITY  
 ENGINEERING  
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PROJECT  
 WOOD PARTNERS ALTA RAINTREE  
 SCOTTSDALE

LOCATION  
 NWC RAINTREE DRIVE & LOOP 101  
 SCOTTSDALE, ARIZONA

DRAWN: KA 12/18/2019  
 DESIGNED: KA 12/18/2019  
 QC: SC 12/20/2019  
 QA: AF 12/20/2019  
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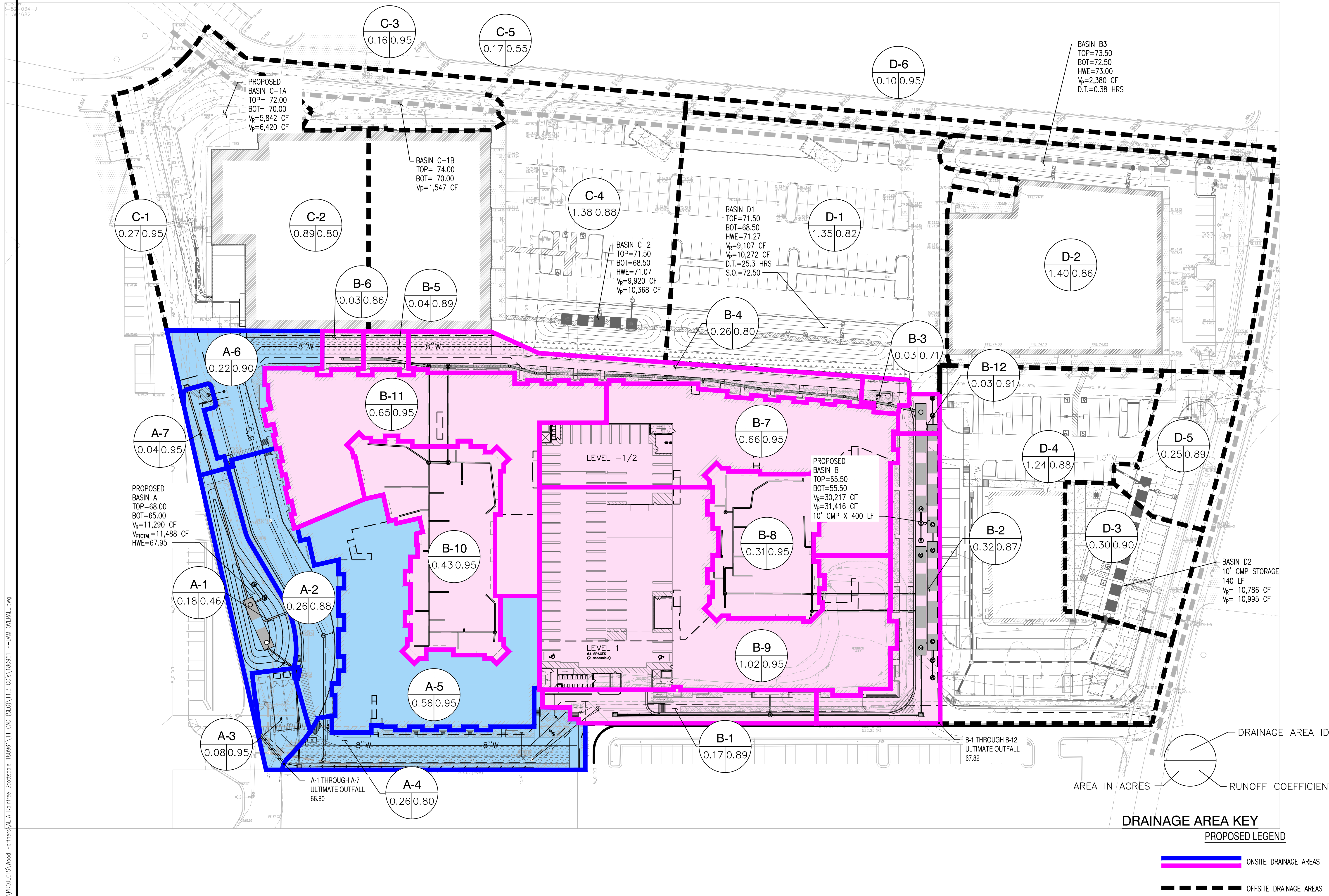
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REVISION NO.	DATE

JOB NO.: 180961  
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ULTIMATE CONDITIONS  
 DRAINAGE AREA MAP

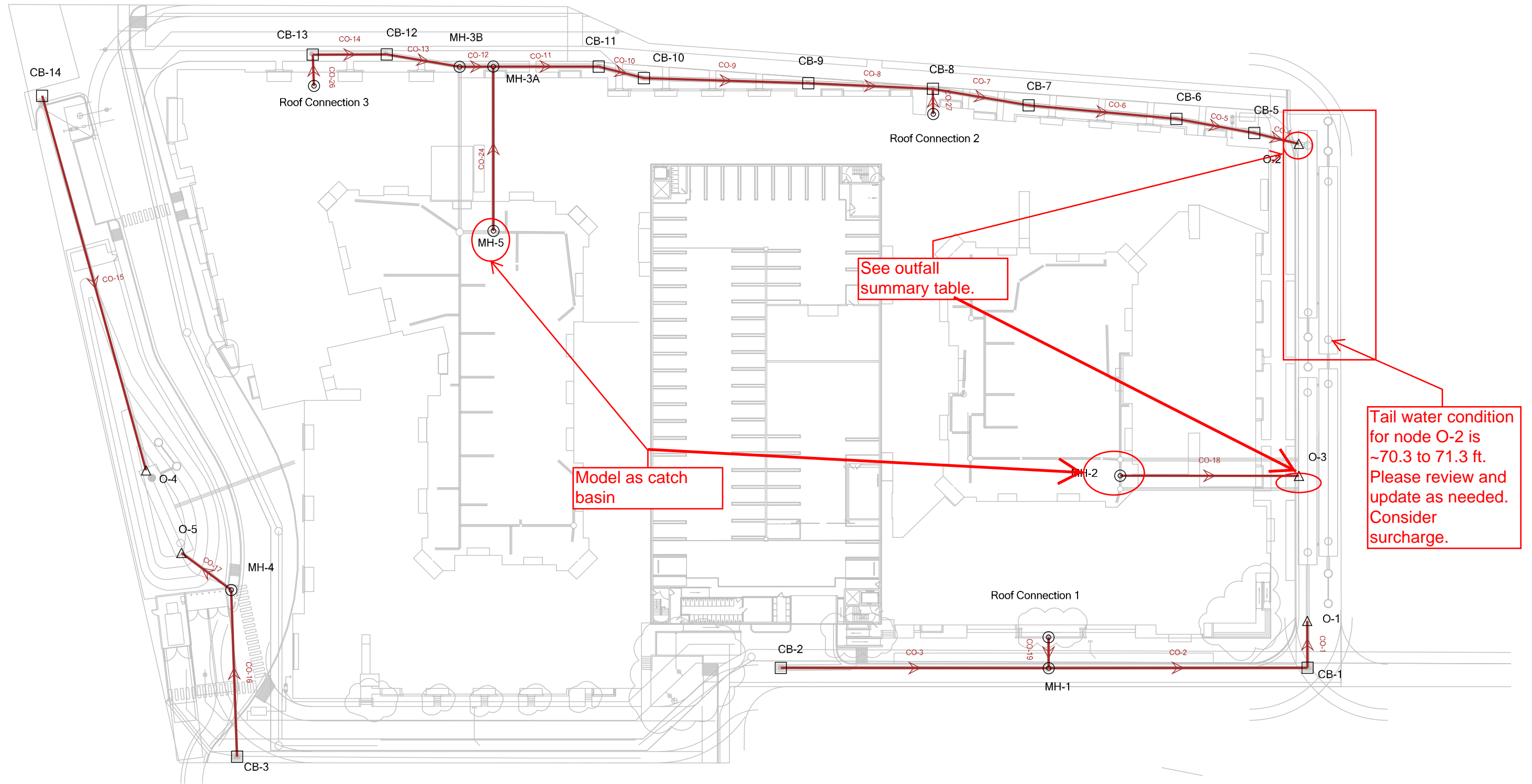
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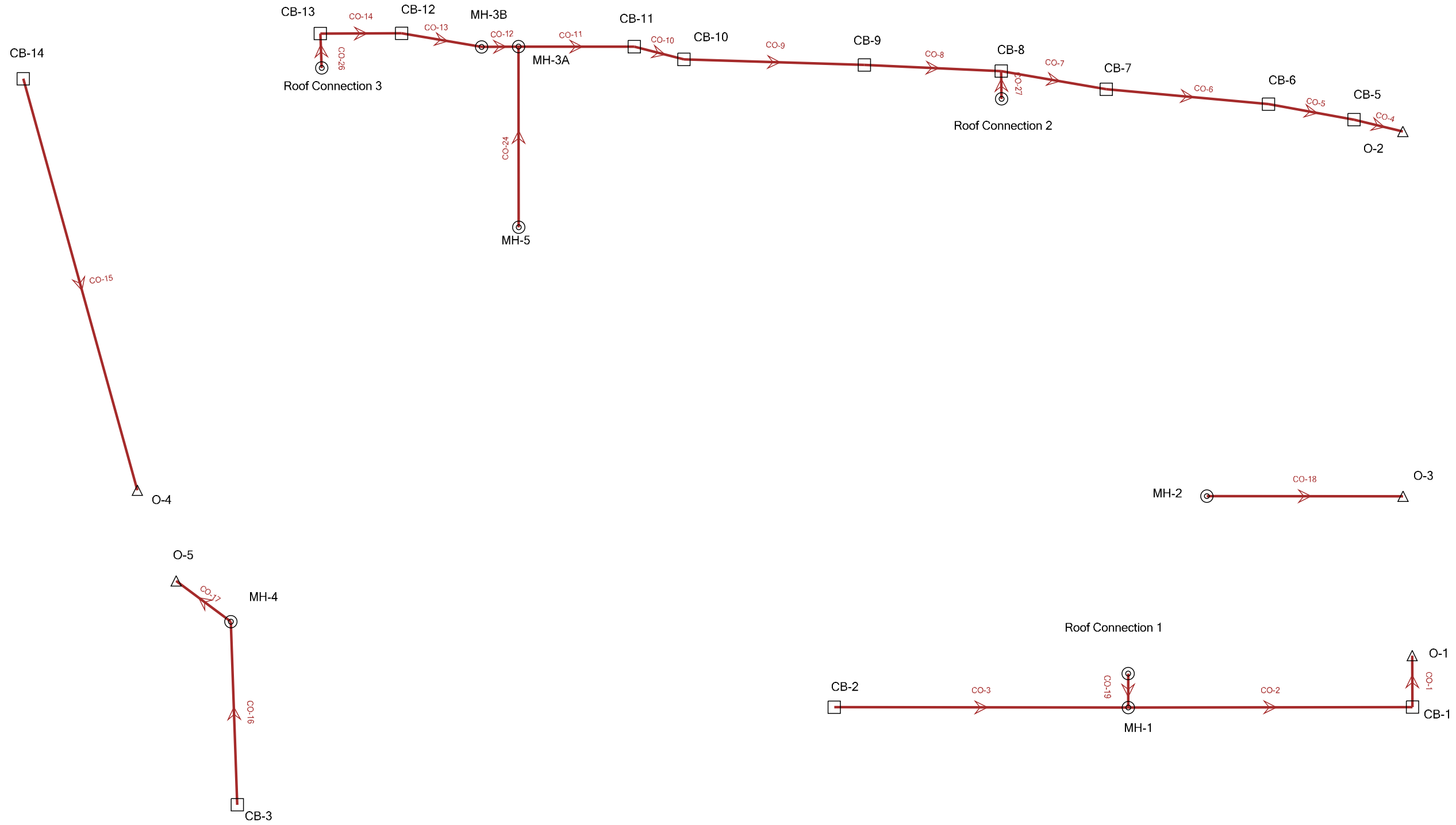
X:\PROJECTS\Wood Partners\ALTA Raintree\Scottsdale\_180961\11 CAD (SEG)\11.3 CD\180961\_P-DAM OVERALL.dwg

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**Scenario: 100-YR, 5-MIN**



**Scenario: 100-YR, 5-MIN**



**FlexTable: Catch Basin Table**

ID	Label	Elevation (Ground) (ft)	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Structure Type	Inlet	Inlet Location	Clogging Factor (%)	Headloss Method	Headloss Coefficient (Standard)	Flow (Captured) (cfs)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Spread / Top Width (ft)	Headloss (ft)
30	CB-1	1,467.65	1,467.65	1,461.05	Box Structure	MAG 535	In Sag	50.0	Standard	0.670	2.15	1,467.77	1,467.65	14.2	0.12
32	CB-2	1,467.41	1,467.41	1,463.96	Box Structure	MAG 535	In Sag	50.0	Standard	0.670	1.13	1,467.41	1,467.41	9.9	0.00
83	CB-3	1,466.52	1,466.52	1,460.25	Box Structure	MAG 535	In Sag	50.0	Standard	0.670	1.61	1,466.56	1,466.52	12.1	0.04
79	CB-5	1,472.30	1,472.30	1,461.24	Circular Structure	18 in Nyloplast	In Sag	50.0	Standard	0.670	0.15	1,467.90	1,467.84	4.4	0.07
78	CB-6	1,472.30	1,472.30	1,461.67	Circular Structure	18 in Nyloplast	In Sag	50.0	Standard	0.670	0.11	1,468.00	1,467.93	3.8	0.07
31	CB-7	1,472.30	1,472.30	1,462.46	Circular Structure	18 in Nyloplast	In Sag	50.0	Standard	0.670	0.30	1,468.12	1,468.05	6.3	0.06
33	CB-8	1,472.30	1,472.30	1,462.98	Circular Structure	18 in Nyloplast	In Sag	50.0	Standard	0.670	0.14	1,468.21	1,468.15	4.2	0.06
34	CB-9	1,472.30	1,472.30	1,463.65	Circular Structure	18 in Nyloplast	In Sag	50.0	Standard	0.670	0.30	1,468.57	1,468.41	6.3	0.16
76	CB-10	1,472.30	1,472.30	1,464.52	Circular Structure	18 in Nyloplast	In Sag	50.0	Standard	0.670	0.25	1,468.97	1,468.82	5.7	0.15
35	CB-11	1,472.30	1,472.30	1,464.77	Circular Structure	18 in Nyloplast	In Sag	50.0	Standard	0.670	0.13	1,469.18	1,469.03	4.1	0.14
36	CB-12	1,472.30	1,472.30	1,465.92	Circular Structure	18 in Nyloplast	In Sag	50.0	Standard	0.670	0.25	1,469.70	1,469.61	5.7	0.09
37	CB-13	1,472.30	1,472.30	1,466.31	Circular Structure	18 in Nyloplast	In Sag	50.0	Standard	0.670	0.22	1,469.87	1,469.79	5.3	0.08
38	CB-14	1,469.83	1,469.83	1,465.08	Box Structure	MAG 535	In Sag	50.0	Standard	0.670	1.54	1,468.57	1,468.53	11.8	0.04

**FlexTable: Conduit Table**

ID	Label	Start Node	Invert (Start) (ft)	Stop Node	Invert (Stop) (ft)	Length (User Defined) (ft)	Slope (Calculated) (ft/ft)	Diameter (in)	Manning's n	Flow (cfs)	Velocity (ft/s)	Depth (Out) (ft)	Depth (Normal) / Rise (%)	Capacity (Full Flow) (cfs)	Headloss (ft)	Flow / Capacity (Design) (%)
50	CO-1	CB-1	1,461.05	O-1	1,460.50	55.0	0.010	24.0	0.013	10.78	3.43	7.32	48.6	22.62	0.13	47.7
51	CO-2	MH-1	1,462.54	CB-1	1,461.15	139.0	0.010	24.0	0.013	8.63	2.75	6.50	42.8	22.62	0.20	38.2
52	CO-3	CB-2	1,463.96	MH-1	1,462.54	143.0	0.010	18.0	0.013	1.13	0.64	5.06	22.2	10.47	0.02	10.8
89	CO-4	CB-5	1,461.24	O-2	1,461.00	24.0	0.010	36.0	0.013	17.82	2.52	6.82	35.3	66.69	0.02	26.7
80	CO-5	CB-6	1,461.67	CB-5	1,461.24	43.0	0.010	36.0	0.013	17.67	2.50	6.66	35.1	66.69	0.03	26.5
82	CO-6	CB-7	1,462.46	CB-6	1,461.67	79.0	0.010	36.0	0.013	17.56	2.48	6.33	35.0	66.69	0.05	26.3
55	CO-7	CB-8	1,462.98	CB-7	1,462.46	52.0	0.010	36.0	0.013	17.26	2.44	5.66	34.7	66.69	0.03	25.9
56	CO-8	CB-9	1,463.65	CB-8	1,462.98	67.0	0.010	24.0	0.013	12.26	3.90	5.23	52.5	22.62	0.20	54.2
57	CO-9	CB-10	1,464.52	CB-9	1,463.65	88.0	0.010	24.0	0.013	11.96	3.81	4.92	51.9	22.49	0.25	53.2
77	CO-10	CB-11	1,464.77	CB-10	1,464.52	25.0	0.010	24.0	0.013	11.71	3.73	4.45	51.0	22.62	0.07	51.8
74	CO-11	MH-3A	1,465.34	CB-11	1,464.77	54.4	0.010	24.0	0.013	11.58	3.69	4.41	50.0	23.15	0.14	50.0
73	CO-12	MH-3B	1,465.52	MH-3A	1,465.34	18.0	0.010	24.0	0.013	8.41	2.68	4.09	42.2	22.62	0.02	37.2
61	CO-13	CB-12	1,465.92	MH-3B	1,465.52	40.0	0.010	18.0	0.013	5.25	2.97	3.99	50.0	10.50	0.10	50.0
62	CO-14	CB-13	1,466.31	CB-12	1,465.92	40.0	0.010	18.0	0.013	5.00	2.83	3.78	48.9	10.37	0.09	48.2
65	CO-15	CB-14	1,465.08	O-4	1,460.00	203.0	0.025	12.0	0.013	1.54	1.96	8.15	35.7	5.64	0.38	27.3
86	CO-16	CB-3	1,460.25	MH-4	1,459.32	89.0	0.010	12.0	0.013	1.61	2.05	7.58	46.5	3.64	0.18	44.2
87	CO-17	MH-4	1,459.00	O-5	1,458.69	31.0	0.010	12.0	0.013	1.61	2.05	8.11	47.1	3.56	0.06	45.2
69	CO-18	MH-2	1,462.95	O-3	1,462.00	95.0	0.010	12.0	0.013	2.26	2.88	5.82	57.8	3.56	0.38	63.4
116	CO-19	Roof Connecti on 1	1,462.74	MH-1	1,462.64	5.0	0.020	18.0	0.013	7.50	4.24	4.96	50.3	14.85	0.03	50.5
95	CO-24	MH-5	1,467.39	MH-3A	1,466.50	89.0	0.010	12.0	0.013	3.17	4.04	2.93	73.5	3.56	0.70	89.0
109	CO-26	Roof Connecti on 3	1,466.50	CB-13	1,466.31	5.0	0.038	18.0	0.013	4.78	2.70	3.56	32.9	20.48	0.01	23.3
111	CO-27	Roof Connecti on 2	1,463.10	CB-8	1,462.98	5.0	0.024	18.0	0.013	4.86	2.75	5.23	37.5	16.27	0.01	29.9

**FlexTable: Manhole Table**

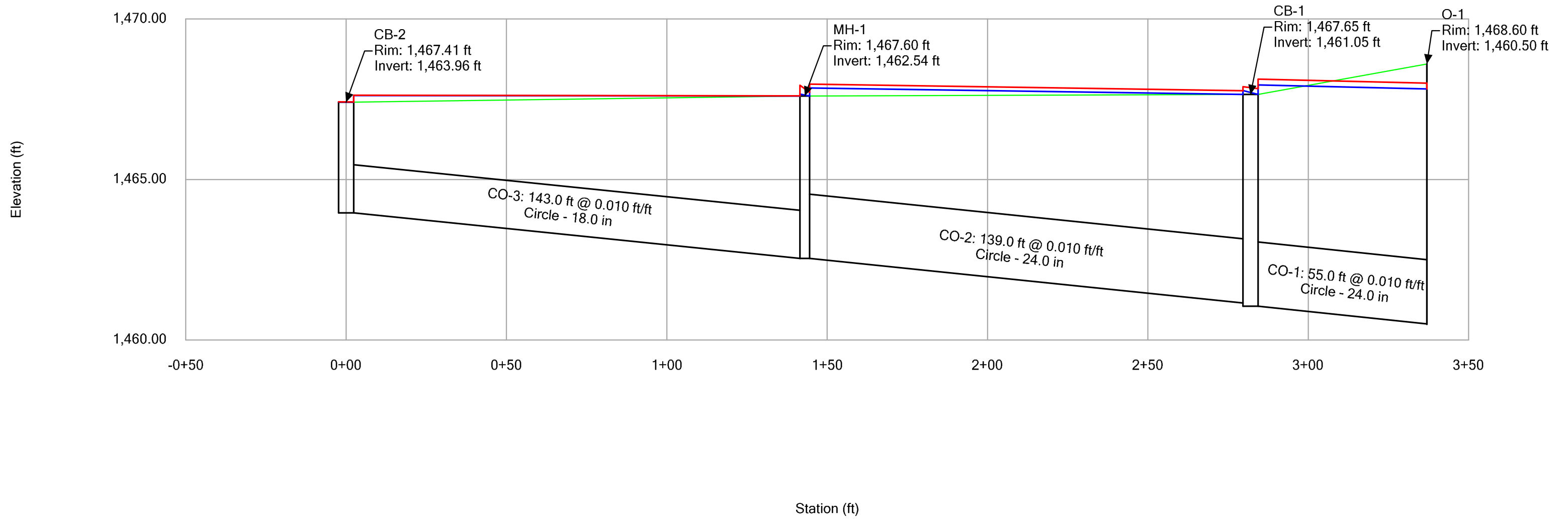
ID	Label	Elevation (Ground) (ft)	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Headloss Method	Headloss Coefficient (Standard)	Flow (Total Out) (cfs)	Depth (Out) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Headloss (ft)
41	MH-1	1,467.60	1,467.60	1,462.54	Standard	0.500	8.63	5.06	1,467.66	1,467.60	0.06
68	MH-2	1,470.82	1,470.82	1,462.95	Standard	1.000	2.26	5.25	1,468.33	1,468.20	0.13
72	MH-3A	1,472.17	1,472.17	1,465.34	Standard	0.500	11.58	3.98	1,469.43	1,469.32	0.11
43	MH-3B	1,472.30	1,472.30	1,465.52	Standard	0.500	8.41	3.93	1,469.51	1,469.45	0.06
85	MH-4	1,468.88	1,468.88	1,459.00	Standard	0.600	1.61	7.86	1,466.90	1,466.86	0.04
92	MH-5	1,472.67	1,472.67	1,467.39	Standard	1.000	3.17	2.74	1,470.38	1,470.13	0.25
114	Roof Connection 1	1,470.25	1,470.25	1,462.74	Standard	0.500	7.50	4.89	1,467.77	1,467.63	0.14
110	Roof Connection 2	1,473.00	1,473.00	1,463.10	Standard	0.500	4.86	5.13	1,468.28	1,468.23	0.06
108	Roof Connection 3	1,473.00	1,473.00	1,466.50	Standard	0.500	4.78	3.38	1,469.94	1,469.88	0.06

**FlexTable: Outfall Table**

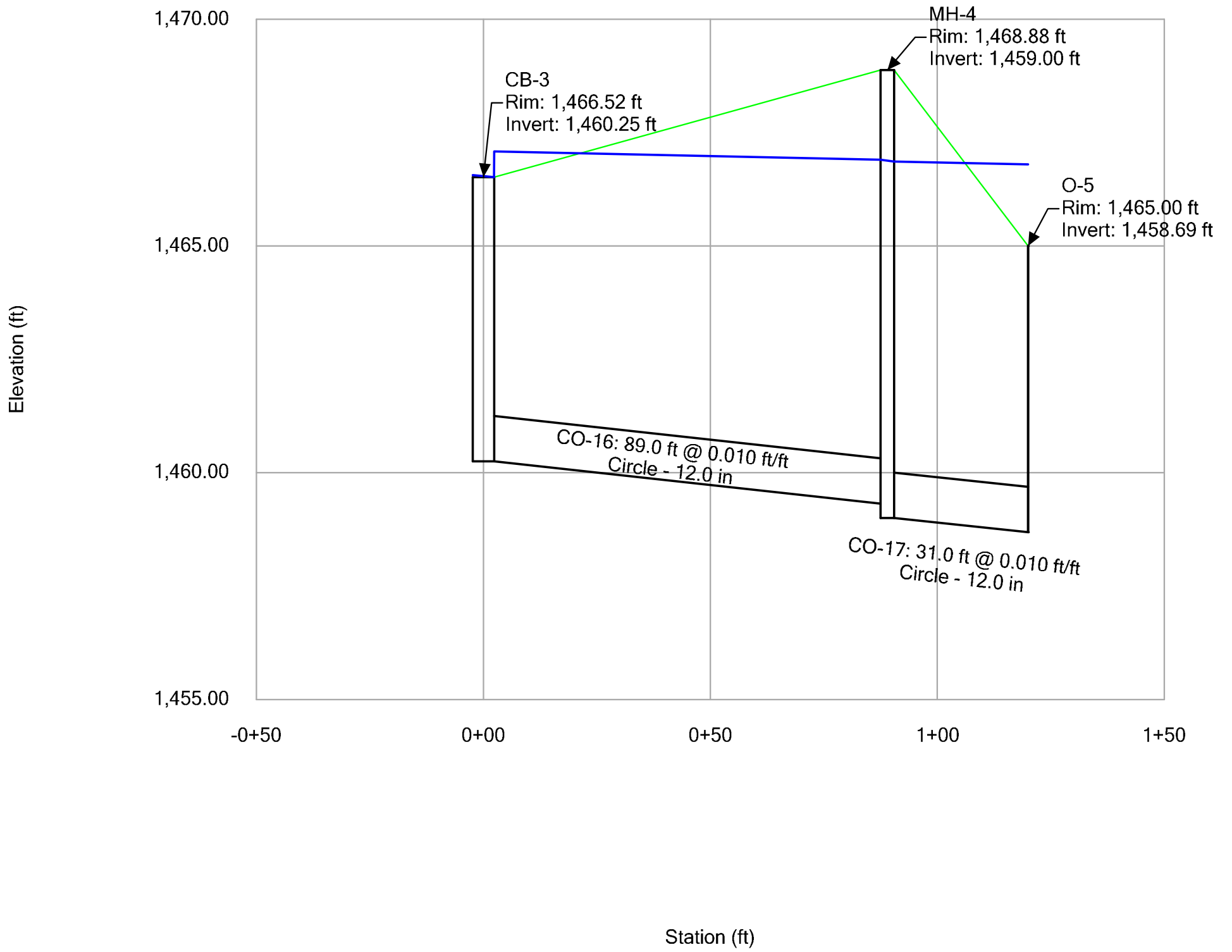
ID	Label	Elevation (Ground) (ft)	Elevation (Invert) (ft)	Boundary Condition Type	Elevation (User Defined Tailwater) (ft)	Hydraulic Grade (ft)	Flow (Total Out) (cfs)
47	O-1	1,468.60	1,460.50	User Defined Tailwater	1,467.82	1,467.82	10.78
48	O-2	1,472.42	1,461.00	User Defined Tailwater	1,467.82	1,467.82	17.82
49	O-3	1,472.45	1,462.00	User Defined Tailwater	1,467.82	1,467.82	2.26
71	O-4	1,465.00	1,460.00	User Defined Tailwater	1,468.15	1,468.15	1.54
84	O-5	1,465.00	1,458.69	User Defined Tailwater	1,466.80	1,466.80	1.61

See Sheet C3.11

**Profile Report**  
**Engineering Profile - CB-2 to O-1 (ALTA RAIN TREE STORMCAD.stsw)**

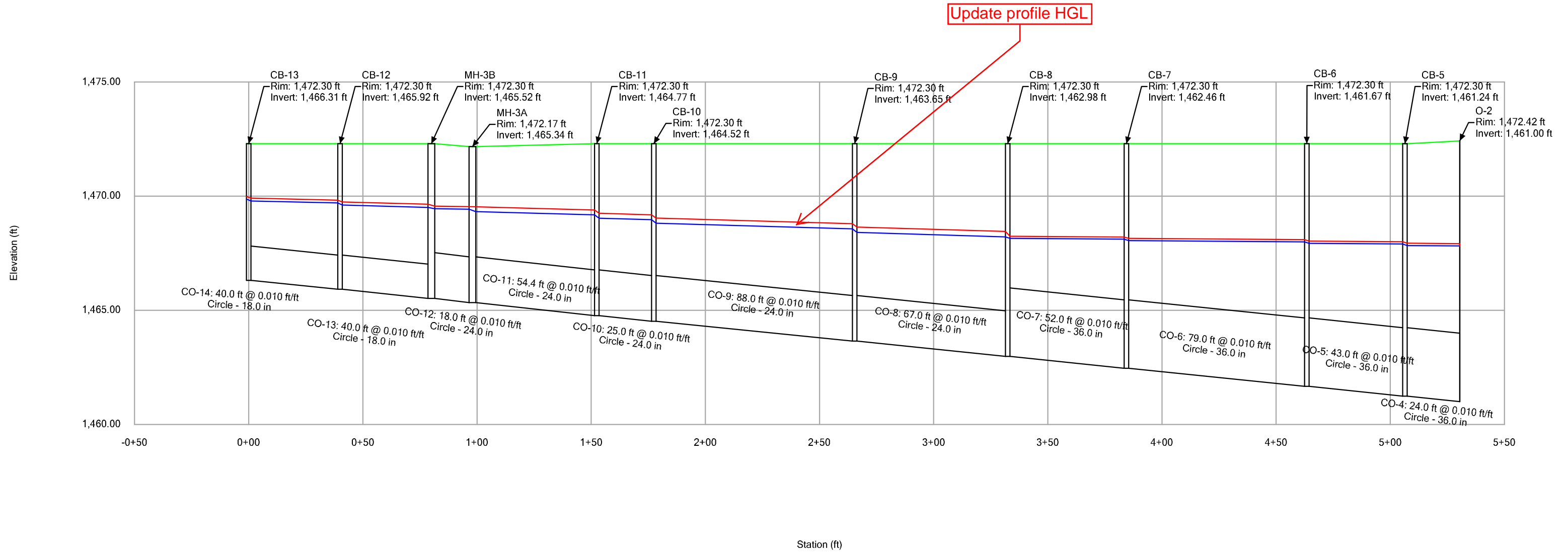


**Profile Report**  
**Engineering Profile - CB-3 to O-5 (ALTA RAINTREE STORMCAD.stsw)**

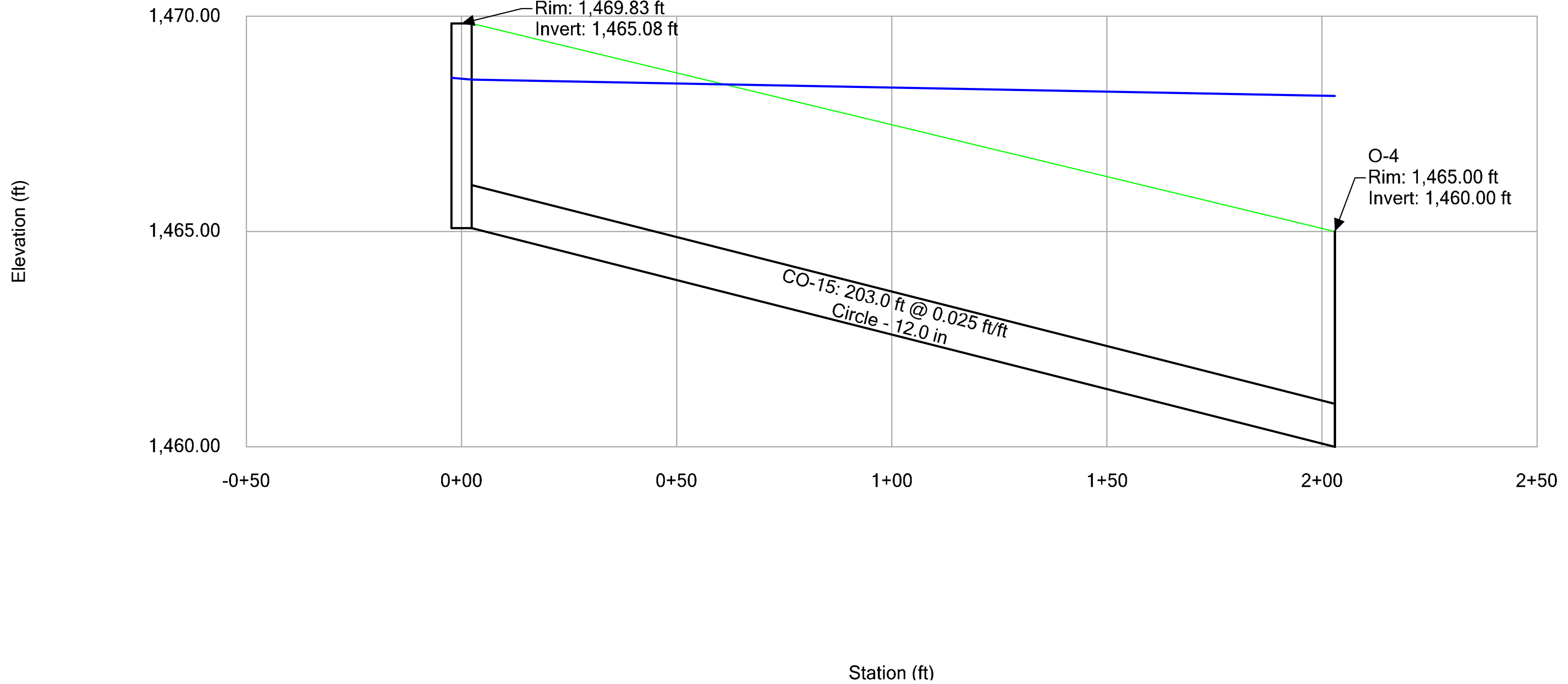


# Profile Report

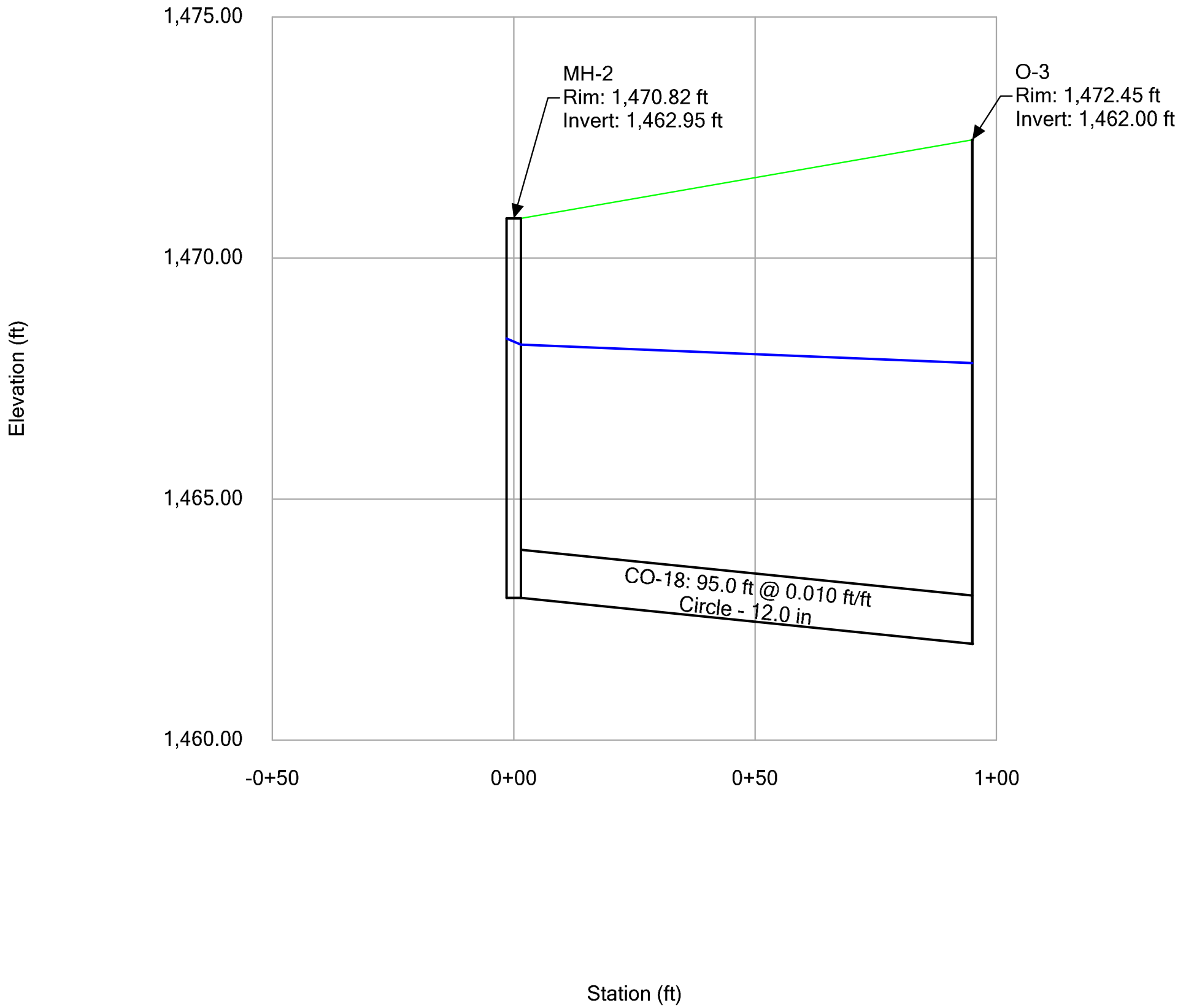
## Engineering Profile - CB-13 to O-2 (ALTA RAINTREE STORMCAD.stsw)



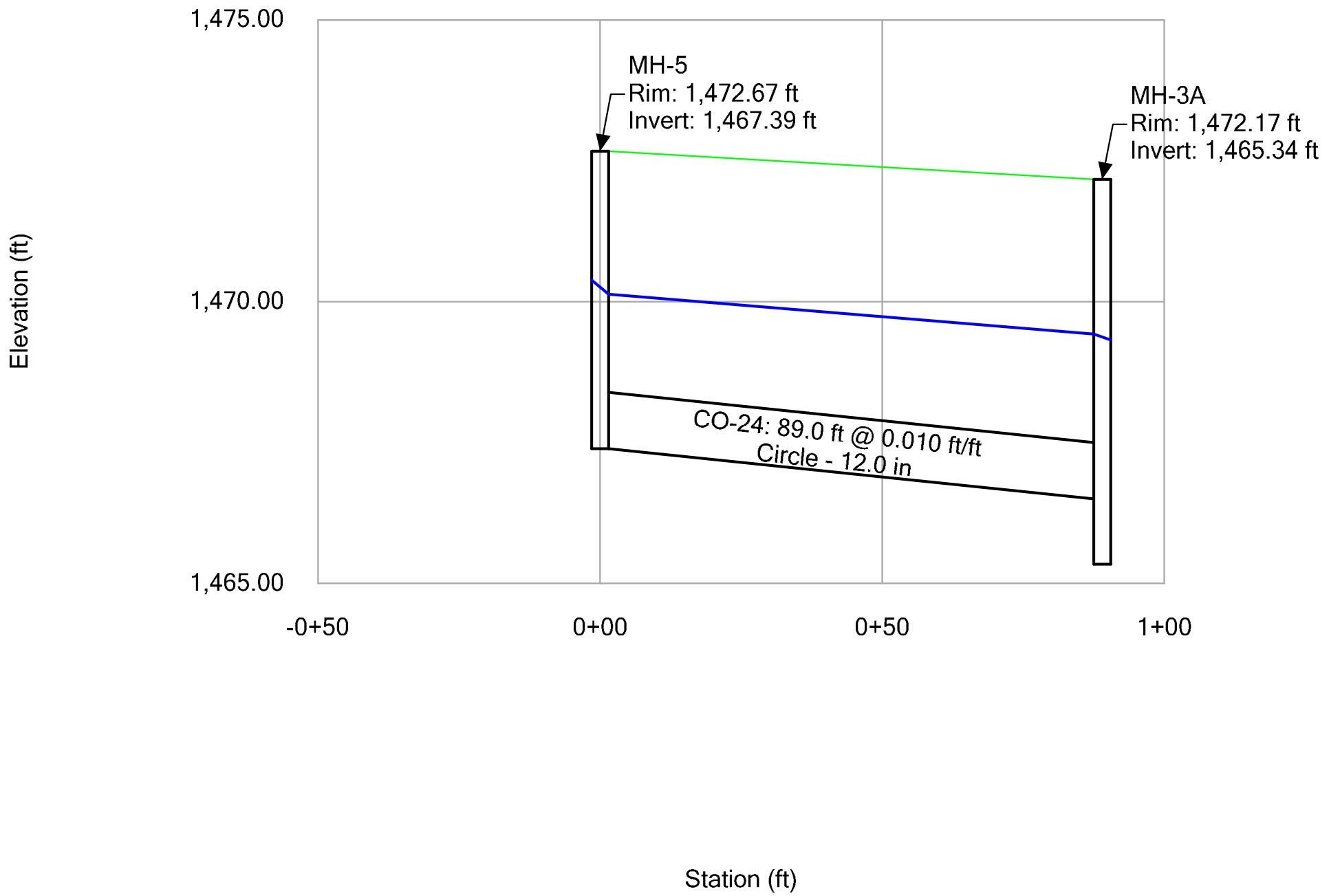
**Profile Report**  
**Engineering Profile - CB-14 to O-4 (ALTA RAIN TREE STORMCAD.stsw)**



**Profile Report**  
**Engineering Profile - MH-2 to O-3 (ALTA RAIN TREE STORMCAD.stsw)**



**Profile Report**  
**Engineering Profile - MH-5 to MH-3 (ALTA RAINTREE STORMCAD.stsw)**



# Sustainability Engineering Group

## Inlet Capacity - Sump Locations

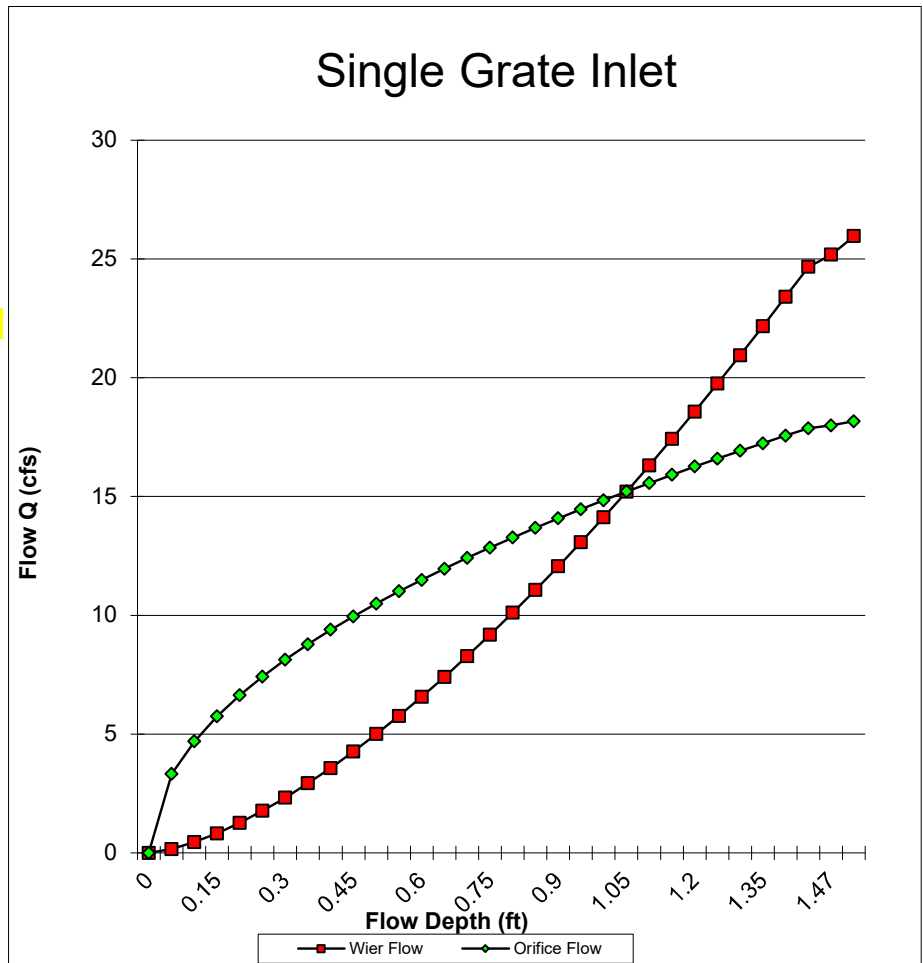
**Description:** Calculation of Inlet Capacity for Single MAG 535 Catch Basin  
**Date:** December 18, 2019  
**Location:** 8682 E. Raintree Dr., Scottsdale, AZ 85260  
**Reference:** Drainage Design Manual for Maricopa County, Vol. II, Hydraulics, pg. 3-27

**Weir EQ.**  $Q_i = C_w P d^{1.5} (C_f)$       **Orifice EQ.**  $Q_i = C_o A (2gd)^{0.5} (C_f)$

**Where:**  $C_w = 3.0$ ,  $C_o = 0.67$ , and  $C_f = \text{clogging factor} = 0.5$

Depth (ft)	Weir Qi (cfs)	Orifice Qi (cfs)
0.00	0.00	0.00
0.05	0.10	3.26
0.10	0.28	4.61
0.15	0.51	5.64
0.20	0.78	6.52
0.25	1.09	7.29
0.30	1.43	7.98
0.35	1.80	8.62
0.40	2.20	9.22
0.45	2.63	9.77
0.50	3.08	<b>10.30</b>
0.55	3.55	10.81
0.60	4.04	11.29
0.65	4.56	11.75
0.70	5.10	12.19
0.75	5.65	12.62
0.80	6.23	13.03
0.85	6.82	13.43
0.90	7.43	13.82
0.95	8.06	14.20
1.00	8.70	14.57
1.05	9.36	14.93
1.10	10.04	15.28
1.15	10.73	15.63
1.20	11.44	15.96
1.25	12.16	16.29
1.30	12.90	16.61
1.35	13.65	16.93
1.40	14.41	17.24
1.45	15.19	17.55
1.47	15.51	17.67
1.50	15.98	17.85

where,  
 P = Perimeter of Catchbasin minus  
 area of longitudinal & lateral bars  
 A = Total area of grate minus  
 area of longitudinal & lateral bars



## Sustainability Engineering Group

### Inlet Capacity - Sump Locations

**Description:** Calculation of 30" Inlet Capacity for CMP Riser Inlet

**Date:** December 18, 2019

**Location:** 8682 E. Raintree Dr., Scottsdale, AZ 85260

**Reference:** Drainage Design Manual for Maricopa County, Vol. II, Hydraulics, pg. 3-27

**Orifice EQ.**  $Q_i = C_o A (2gd)^{0.5} (C_f)$

**Where:**  $C_o = 0.67$ , and  $C_f = \text{clogging factor} = 0.5$

**A = 2.43 sq.ft.**

where,

**Orifice**

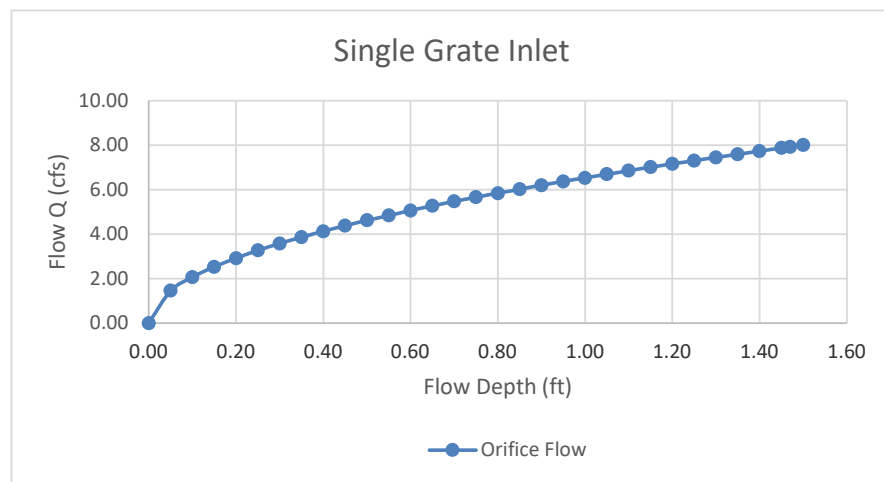
A = Total area of grate minus

**Depth (ft)**

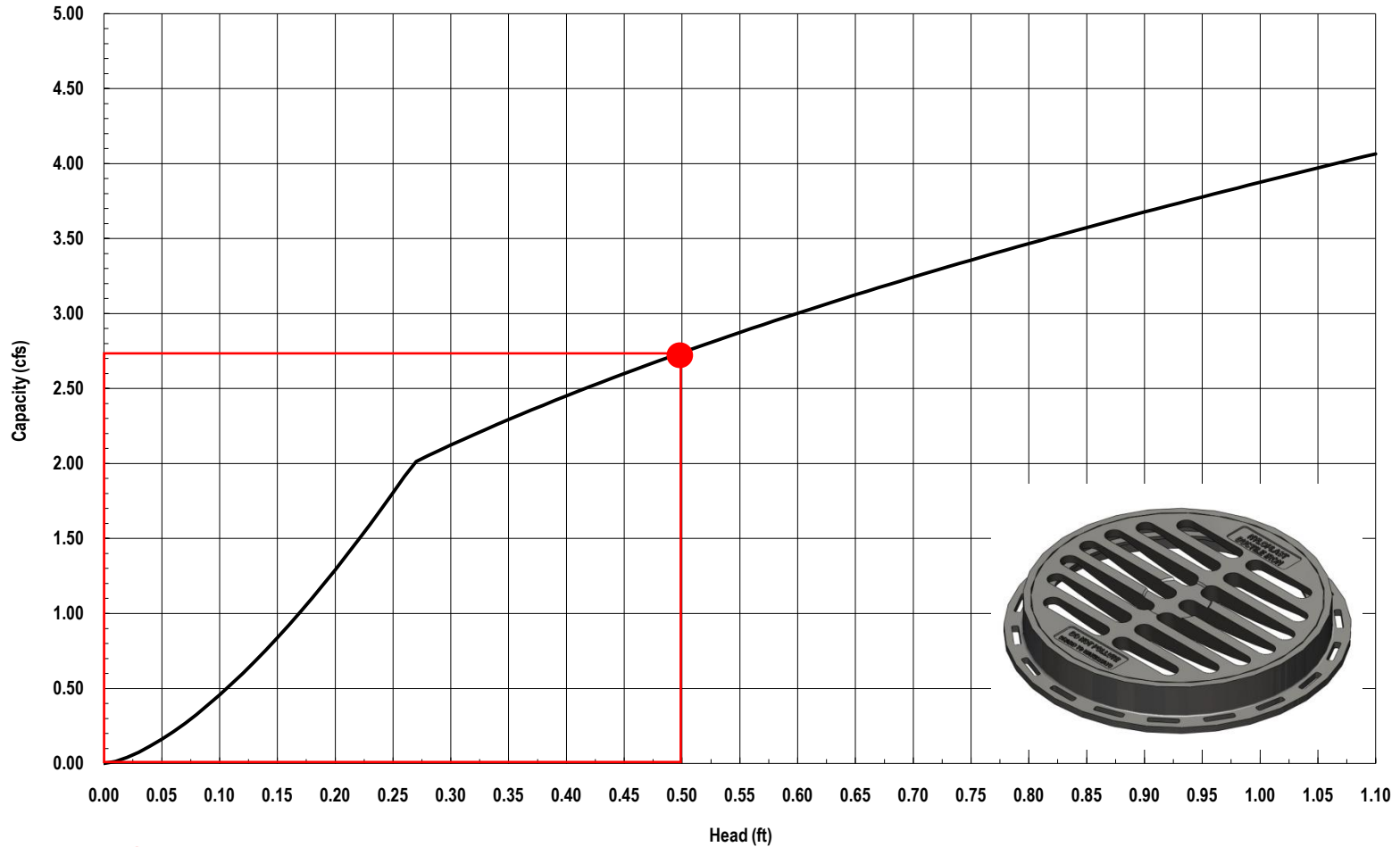
**Qi (cfs)**

area of longitudinal & lateral bars

0.00	0.00
0.05	1.46
0.10	2.07
0.15	2.53
0.20	2.92
0.25	3.27
0.30	3.58
0.35	3.86
0.40	4.13
0.45	4.38
0.50	<b>4.62</b>
0.55	4.84
0.60	5.06
0.65	5.27
0.70	5.47
0.75	5.66
0.80	5.84
0.85	6.02
0.90	6.20
0.95	6.37
1.00	6.53
1.05	6.69
1.10	6.85
1.15	7.01
1.20	7.16
1.25	7.30
1.30	7.45
1.35	7.59
1.40	7.73
1.45	7.87
1.47	7.92
1.50	8.00



### Nyloplast 18" Standard Grate Inlet Capacity Chart



Inlet Capacity @ 0.50' ponding depth = 2.75 cfs  
Inlet Capacity @ 0.50% Clogging factor= 1.38 cfs

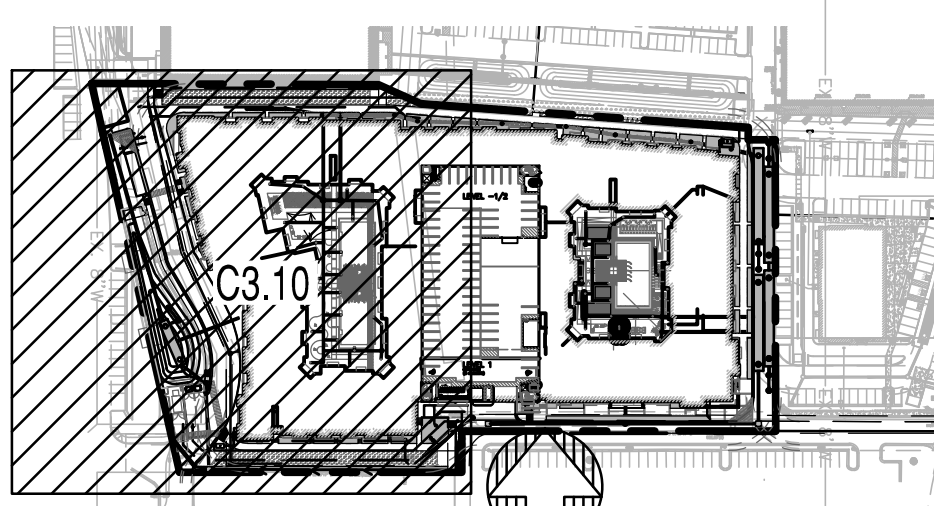
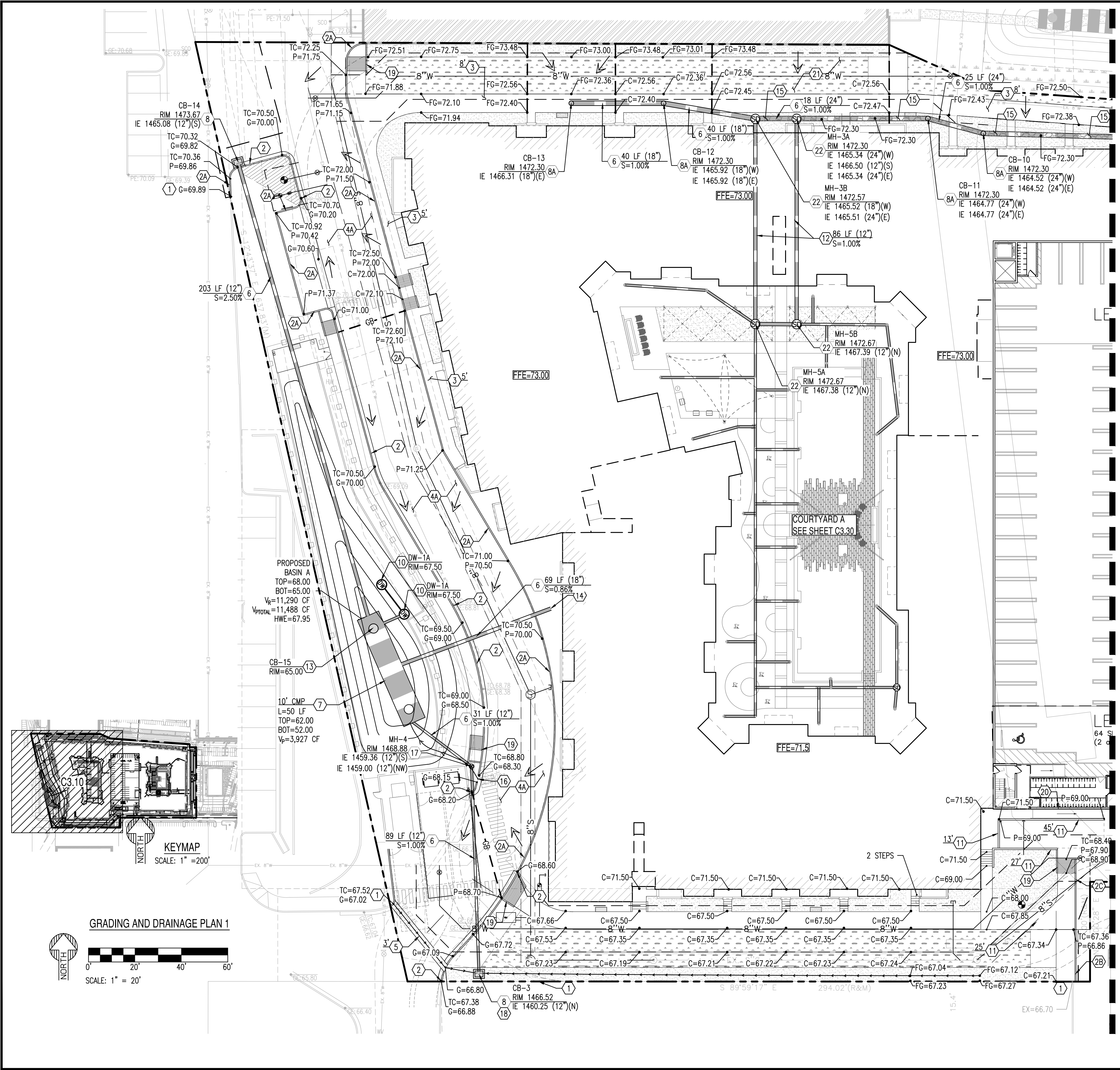


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© Nyloplast Inlet Capacity Charts June 2012

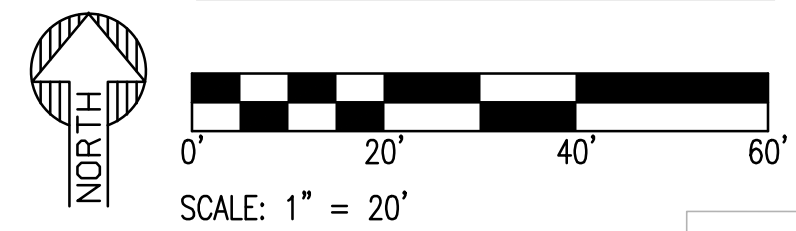
## *APPENDIX III*

# *Grading & Drainage Plan*

X:\PROJECTS\Wood Partners\ALTA Raintree\Scottsdale\_180961\11 CAD (SEC)\11.3 CD\3\_180961\_L\_C3.00.dwg



GRADING AND DRAINAGE PLAN 1



GRADING CONSTRUCTION KEY NOTES

- 1 MATCH EXISTING GRADE. CONTRACTOR TO VERIFY IN FIELD ALL GRADES PRIOR TO CONSTRUCTION ACTIVITIES AND CONTACT ENGINEER IN CASE OF ANY DISCREPANCIES.
- 2 CONSTRUCT 6" CONCRETE CURB AND GUTTER PER M.A.G. STD. DET. 220-1 TYPE "A".
- 2A CONSTRUCT 6" VERTICAL CURB PER M.A.G. STD. DET. 222 TYPE "A" "B"
- 2B CONSTRUCT 4" CONCRETE ROLLED CURB AND GUTTER PER M.A.G. STD. DET. 220-1 TYPE "D".
- 2C CONSTRUCT VERTICAL CURB TO ROLL CURB TRANSITION.
- 3 CONSTRUCT CONCRETE SIDEWALK PER M.A.G. STD. DET. 230; WIDTH PER PLAN.
- 4 CONSTRUCT 3" AC ON 6" ABC ON COMPACTED SUBGRADE PER M.A.G. SPECIFICATION 301, 310, AND 321. RE: DET. 3/C3.20.
- 4A CONSTRUCT 5" AC ON 8" ABC ON COMPACTED SUBGRADE PER M.A.G. SPECIFICATION 301, 310, AND 321. RE: DET. 3/C3.20.
- 5 CONSTRUCT CONCRETE VALLEY GUTTER PER M.A.G. STD. DET. 240 MODIFIED TO 3' WIDE PER DETAIL 4/C3.20.
- 6 FURNISH AND INSTALL HDPE DOUBLE WALL PIPE, CLASS 100; PIPE MATERIAL PER M.A.G. SPECIFICATION 738. LENGTH, SIZE AND SLOPE PER PLAN.
- 7 FURNISH AND INSTALL 120" CMP STORMWATER STORAGE SYSTEM. PIPE MATERIAL PER M.A.G. SPECIFICATION 621. LENGTH AND SLOPE PER PLAN. REFER TO CONTECH DETAILS, SHEET C3.22. CONTRACTOR TO PROVIDE SIGNED AND SEALED SHOP DRAWINGS TO ENGINEER FOR APPROVAL PRIOR TO MANUFACTURING.
- 8 FURNISH AND INSTALL CONCRETE CATCH BASIN PER M.A.G. ST DET. 535.
- 8A FURNISH AND INSTALL 18" NYLOPLAST DRAIN BASIN WITH GRATED LID. REFER TO DETAIL C3.21.
- 9 FURNISH AND INSTALL PRECAST MAHNOLE WITH 48" BASE PER M.A.G. STD. DET. 520 AND 522; COVER PER C.O.S. STD. DET. 2520.
- 10 FURNISH AND INSTALL MAXWELL DRYWELL PLUS. NOTE: CONTRACTOR TO HAVE A PERCOLATION TEST DONE ON FIRST CONSTRUCTED DRYWELL AND PROVIDE RESULTS TO ENGINEER FOR DETERMINATION OF ULTIMATE NUMBER OF REQUIRED DRYWELLS.
- 11 CONSTRUCT RETAINING WALL. LENGTH PER PLAN. REFER STRUCTURAL PLAN FOR DETAILS.
- 12 INSTALL 2-12" SCH. 40 PVC PIPES. SEE MECHANICAL PLAN FOR INSTALLATION.
- 13 INSTALL CMP RISER INLET WITH CATCH BASIN GRATE.
- 14 ROOF DRAIN CONNECTION. SEE PLUMBING PLANS FOR CONTINUATION.
- 15 CONSTRUCT FRENCH DRAIN UNDER LANDSCAPE AREA PER DETAIL 5/C3.21.
- 16 CONSTRUCT 2' WIDE CURB OPENING PER DETAIL 2/C3.20.
- 17 FURNISH AND INSTALL 24" NYLOPLAST DRAIN BASIN WITH SOLI LID. REFER TO DETAIL C3.21.
- 18 FURNISH AND INSTALL INLINE CHECK VALVE OR EQUIVALENT BACKFLOW PREVENTION SYSTEM PER ENGINEER'S APPROVAL.
- 19 CONSTRUCT ADA RAMP PER DETAIL 1/C3.21.
- 20 CONSTRUCT RAMP PER ARCHITECTURAL PLANS AND INSTALL HANDRAIL PER C.O.S. STD. DET. 2508.
- 21 CONSTRUCT GRASSCRETE PAVEMENT PER LANDSCAPE PLAN.
- 22 FURNISH AND INSTALL 36" NYLOPLAST DRAIN BASIN WITH SOLI LID. REFER TO DETAIL C3.21.

**PROPOSED LEGEND**

P=XX.XX	PAVEMENT ELEVATION	---	PROPERTY LINE
G=XX.XX	GUTTER ELEVATION	---	SETBACK
---	FIRE LANE ACCESS	---	
---	STORM PIPE	---	
---	CATCH BASIN	---	
---	FLOW ARROW	---	
---	DRYWELL	---	
---	SAWCUT	---	

PRELIMINARY  
NOT FOR  
CONSTRUCTION

SUSTAINABILITY  
ENGINEERING  
GROUP



WOOD  
PARTNERS



PROJECT: WOOD PARTNERS ALTA RAIN TREE SCOTTSDALE  
LOCATION: NWC RAIN TREE DRIVE & LOOP 101 SCOTTSDALE, ARIZONA

DATE: 12/20/2019

ISSUED FOR: DRB

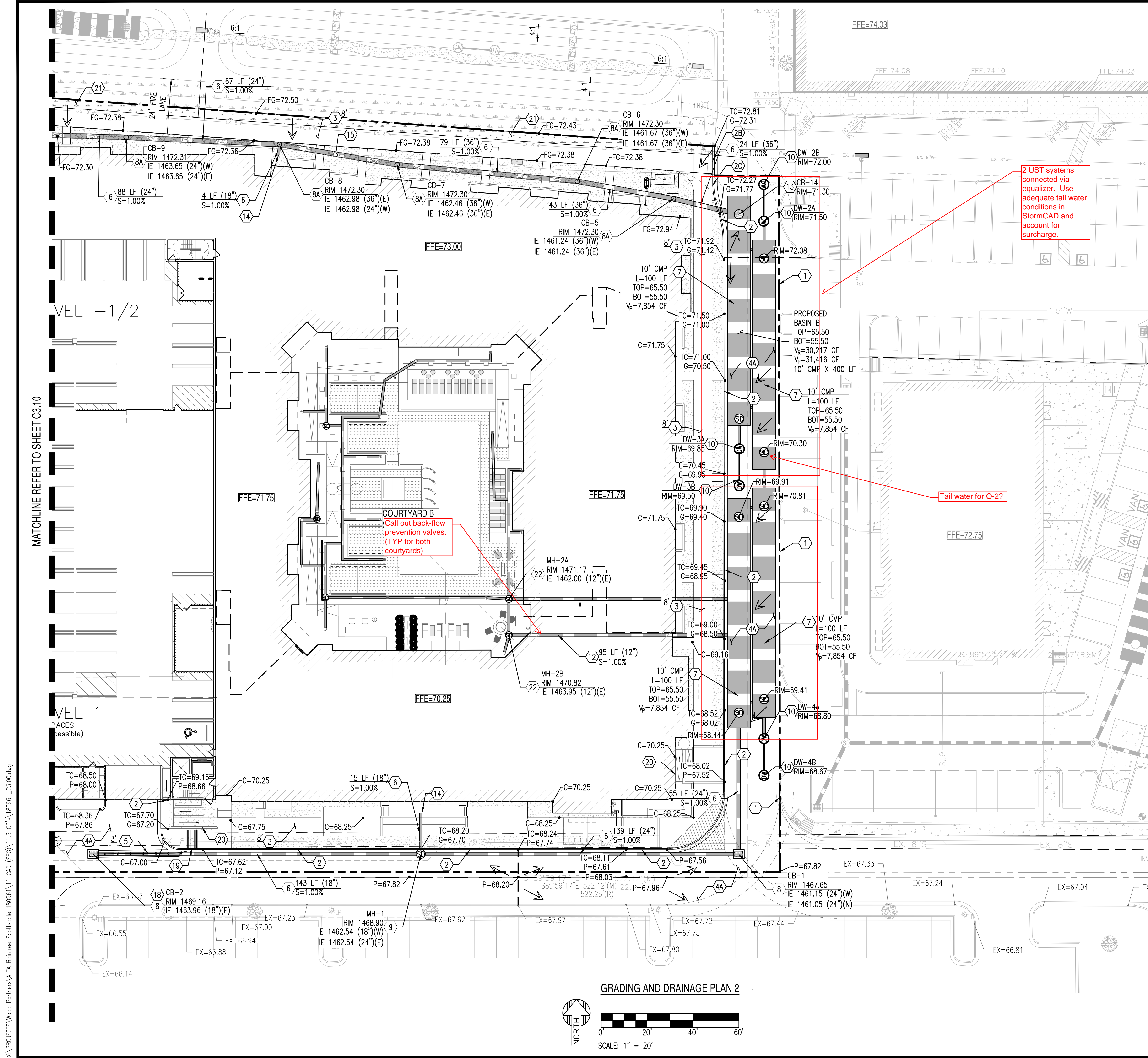
REVISION NO.: DATE:

JOB NO.: 180961

SHEET TITLE: GRADING AND DRAINAGE PLAN 1

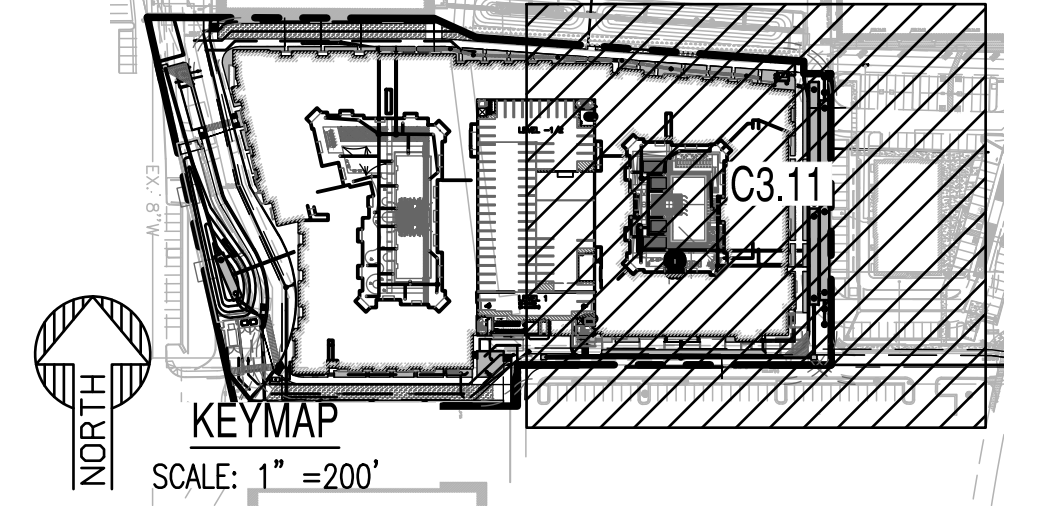
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**GRADING CONSTRUCTION KEY NOTES**

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- FURNISH AND INSTALL CONCRETE CATCH BASIN PER M.A.G. STD. DET. 535.
- FURNISH AND INSTALL 18" NYLOPLAST DRAIN BASIN WITH GRATED LID. REFER TO DETAIL C3.21.
- FURNISH AND INSTALL PRECAST MAHNOLE WITH 48" BASE PER M.A.G. STD. DET. 520 AND 522; COVER PER C.O.S. STD. DET. 2520.
- FURNISH AND INSTALL MAXWELL DRYWELL PLUS. NOTE: CONTRACTOR TO HAVE A PERCOLATION TEST DONE ON FIRST CONSTRUCTED DRYWELL AND PROVIDE RESULTS TO ENGINEER FOR DETERMINATION OF ULTIMATE NUMBER OF REQUIRED DRYWELLS.
- CONSTRUCT RETAINING WALL. LENGTH PER PLAN. REFER STRUCTURAL PLAN FOR DETAILS.
- INSTALL 2-12" SCH. 40 PVC PIPES. SEE MECHANICAL PLAN FOR INSTALLATION.
- INSTALL CMP RISER INLET WITH CATCH BASIN GRATE.
- ROOF DRAIN CONNECTION. SEE PLUMBING PLANS FOR CONTINUATION.
- CONSTRUCT FRENCH DRAIN UNDER LANDSCAPE AREA PER DETAIL 5/C3.21.
- CONSTRUCT 2' WIDE CURB OPENING PER DETAIL 2/C3.20.
- FURNISH AND INSTALL 24" NYLOPLAST DRAIN BASIN WITH SOLID LID. REFER TO DETAIL C3.21.
- FURNISH AND INSTALL INLINE CHECK VALVE OR EQUIVALENT BACKFLOW PREVENTION SYSTEM PER ENGINEER'S APPROVAL.
- CONSTRUCT ADA RAMP PER DETAIL 1/C3.21.
- CONSTRUCT RAMP PER ARCHITECTURAL PLANS AND INSTALL HANDRAIL PER C.O.S. STD. DET. 2508.
- CONSTRUCT GRASSCRETE PAVEMENT PER LANDSCAPE PLAN.
- FURNISH AND INSTALL 36" NYLOPLAST DRAIN BASIN WITH SOLID LID. REFER TO DETAIL C3.21.



**PROPOSED LEGEND**

- P=XX.XX PAVEMENT ELEVATION
- G=XX.XX GUTTER ELEVATION
- FIRE LANE ACCESS
- STORM PIPE
- CATCH BASIN
- ← FLOW ARROW
- DRYWELL
- SAWCUT
- PROPERTY LINE
- SETBACK

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WOOD  
PARTNERS



PROJECT: WOOD PARTNERS ALTA RAINTREE SCOTTSDALE  
LOCATION: NWC RAINTREE DRIVE & LOOP 101 SCOTTSDALE, ARIZONA

DRAWN: KA 12/18/2019  
DESIGNED: KA 12/18/2019  
QC: SC 12/20/2019  
QA: AF 12/20/2019  
PROJ. MGR.: NS

DATE: 12/20/2019  
ISSUED FOR: DRB

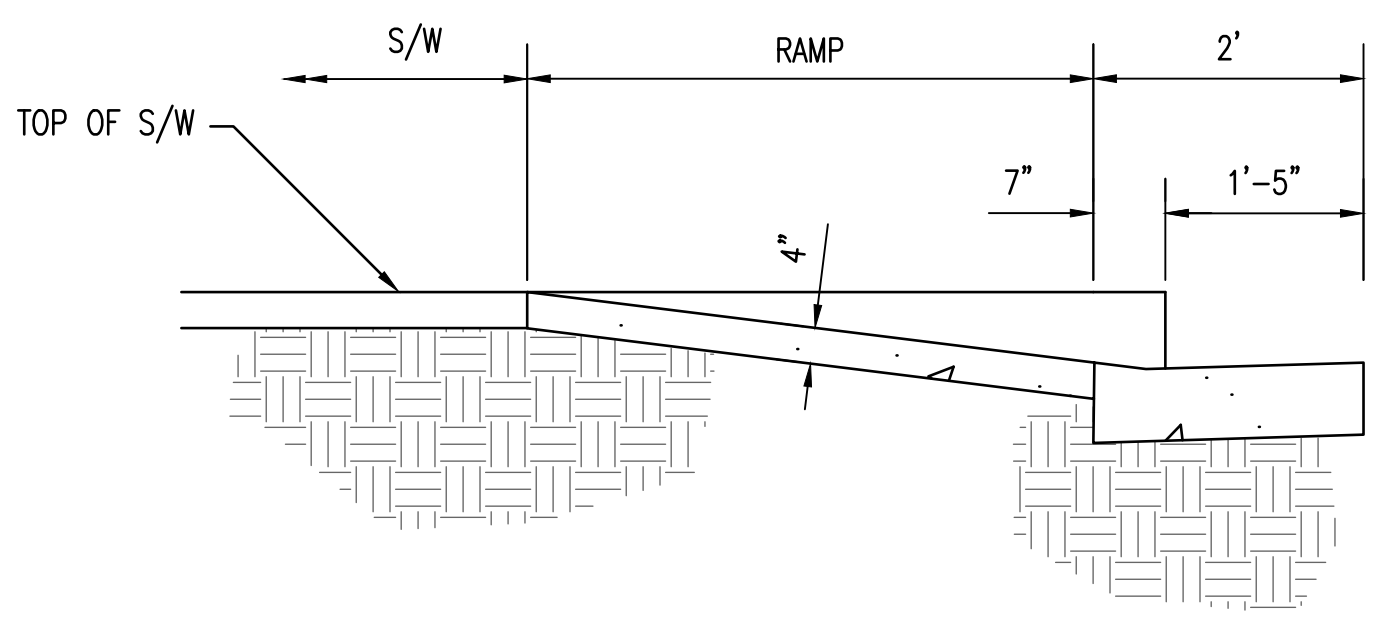
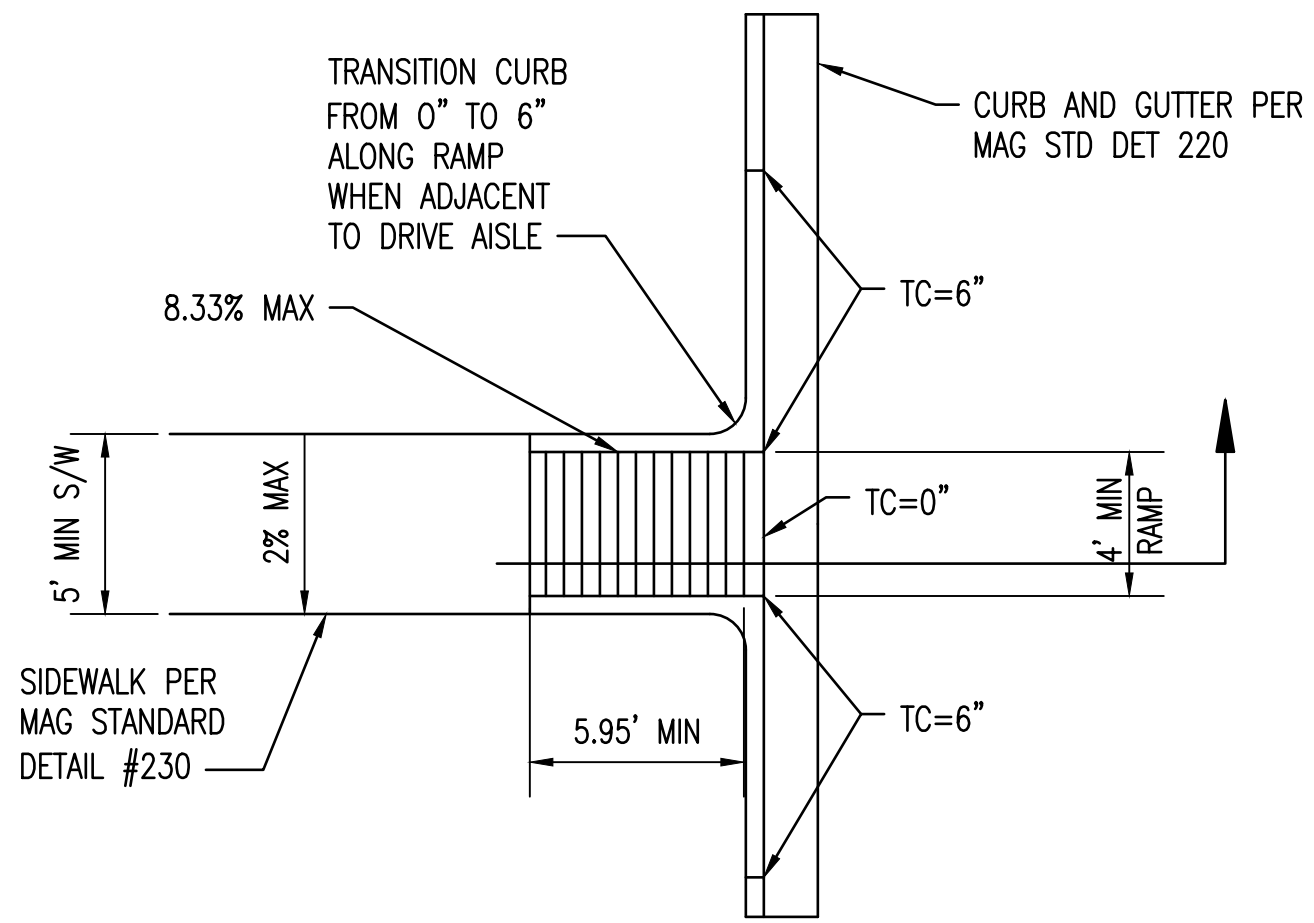
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JOB NO.: 180961  
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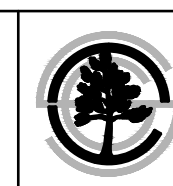
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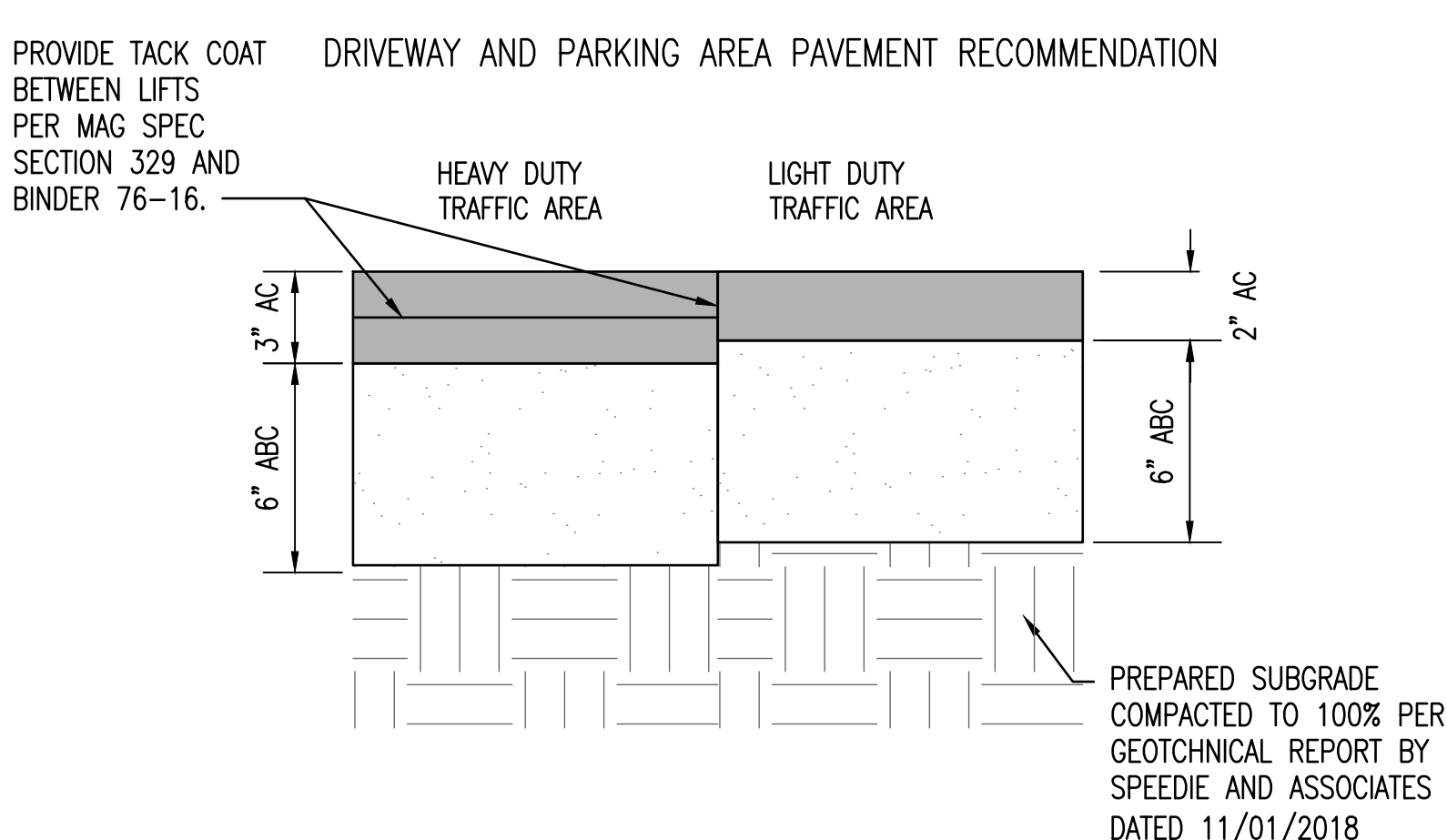
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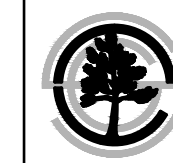
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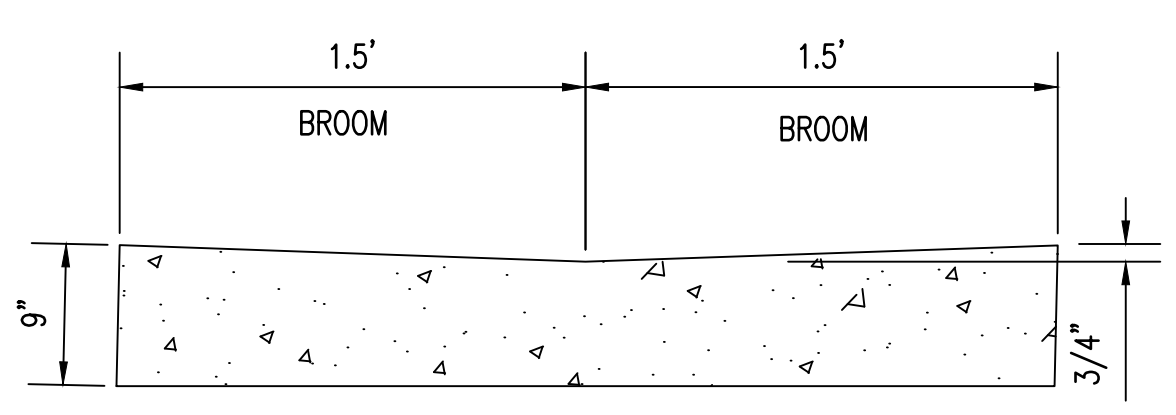
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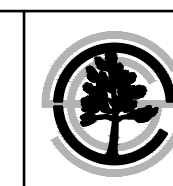
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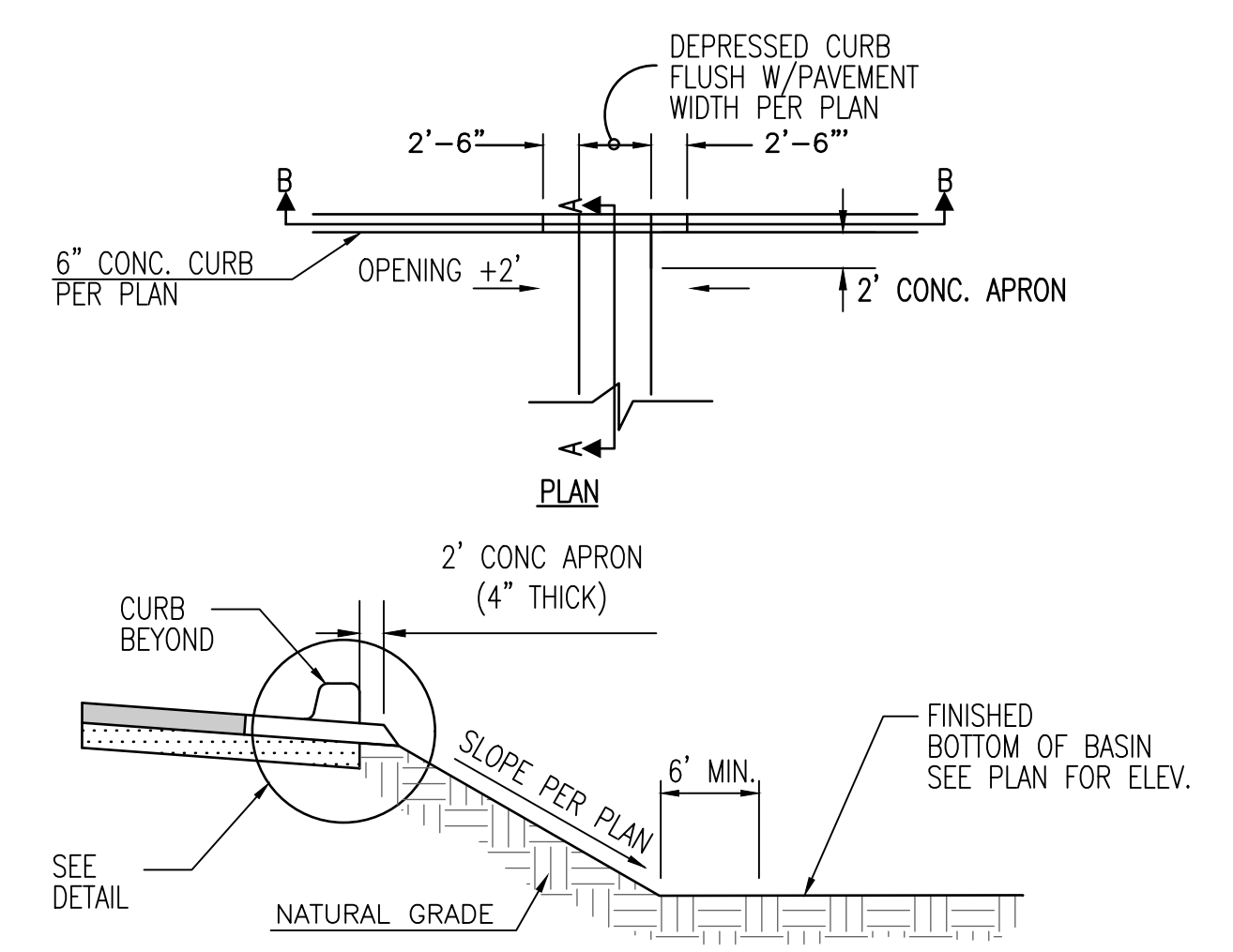
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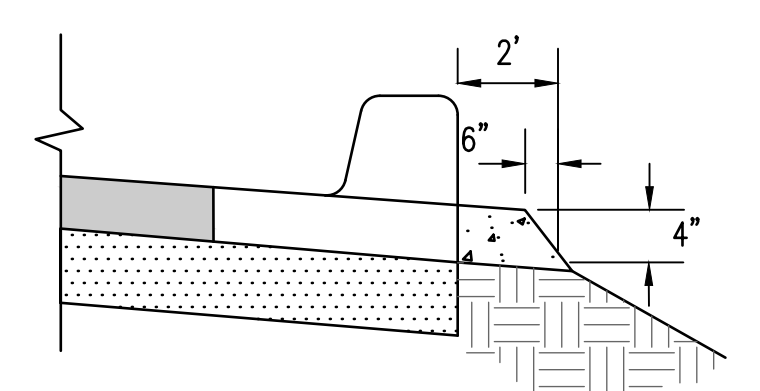
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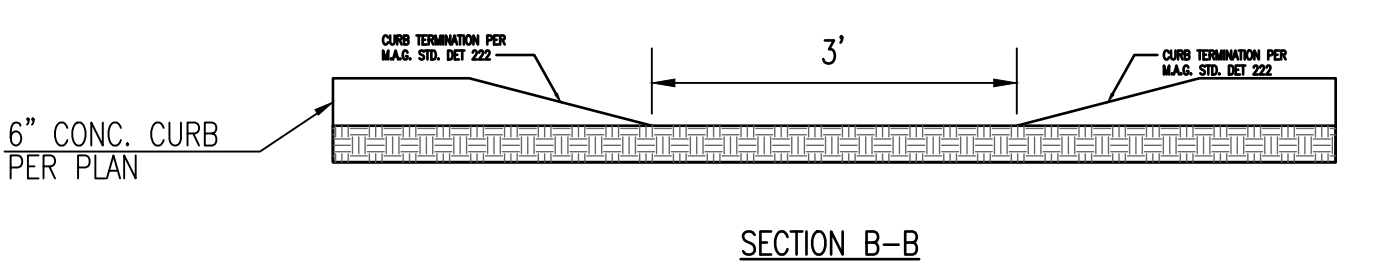
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SECTION A-A

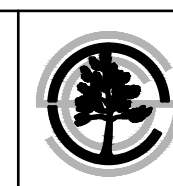


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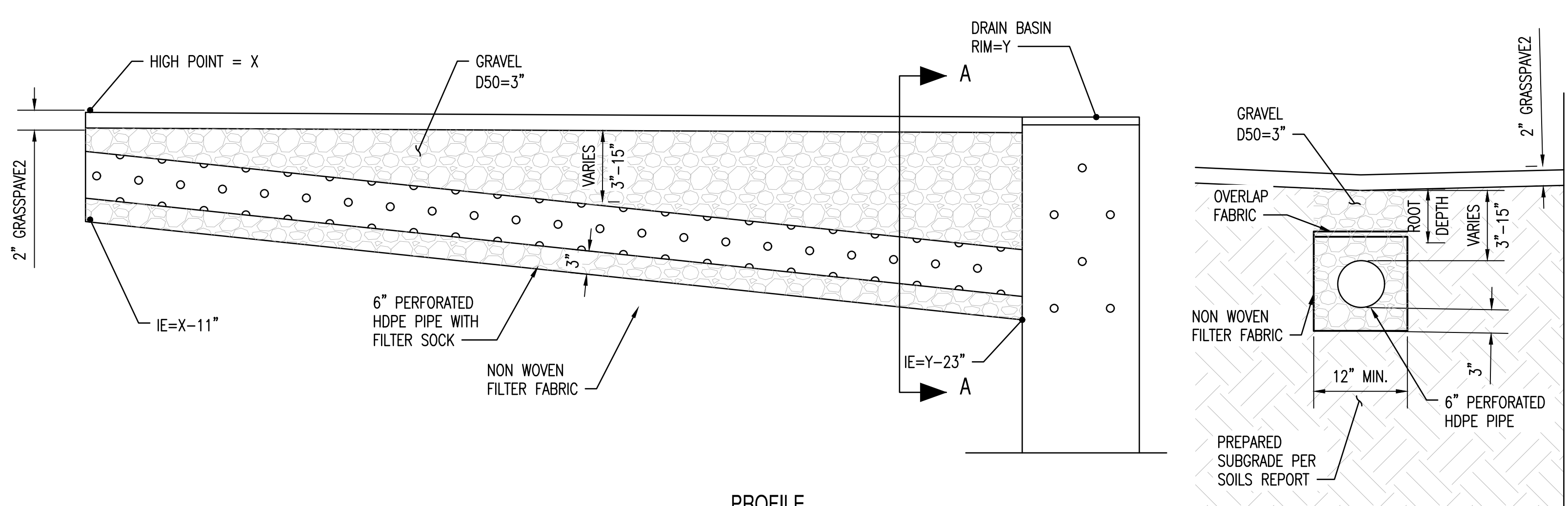


SECTION B-B

CURB OPENING



2



PROFILE

SECTION A-A

FRENCH DRAIN TYPICAL DETAIL

N.T.S.



5

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PROJECT	WOOD PARTNERS ALTA RAINTREE SCOTTSDALE	LOCATION	NWC RAINTREE DRIVE & LOOP 101 SCOTTSDALE, ARIZONA
DRAWN	KA	12/18/2019	
DESIGNED	KA	12/18/2019	
QC	SC	12/20/2019	
QA	AF	12/20/2019	
PROJ. MGR.	NS		

DATE: 12/20/2019  
ISSUED FOR: DRB

REVISION NO.	DATE

JOB NO.: 180961

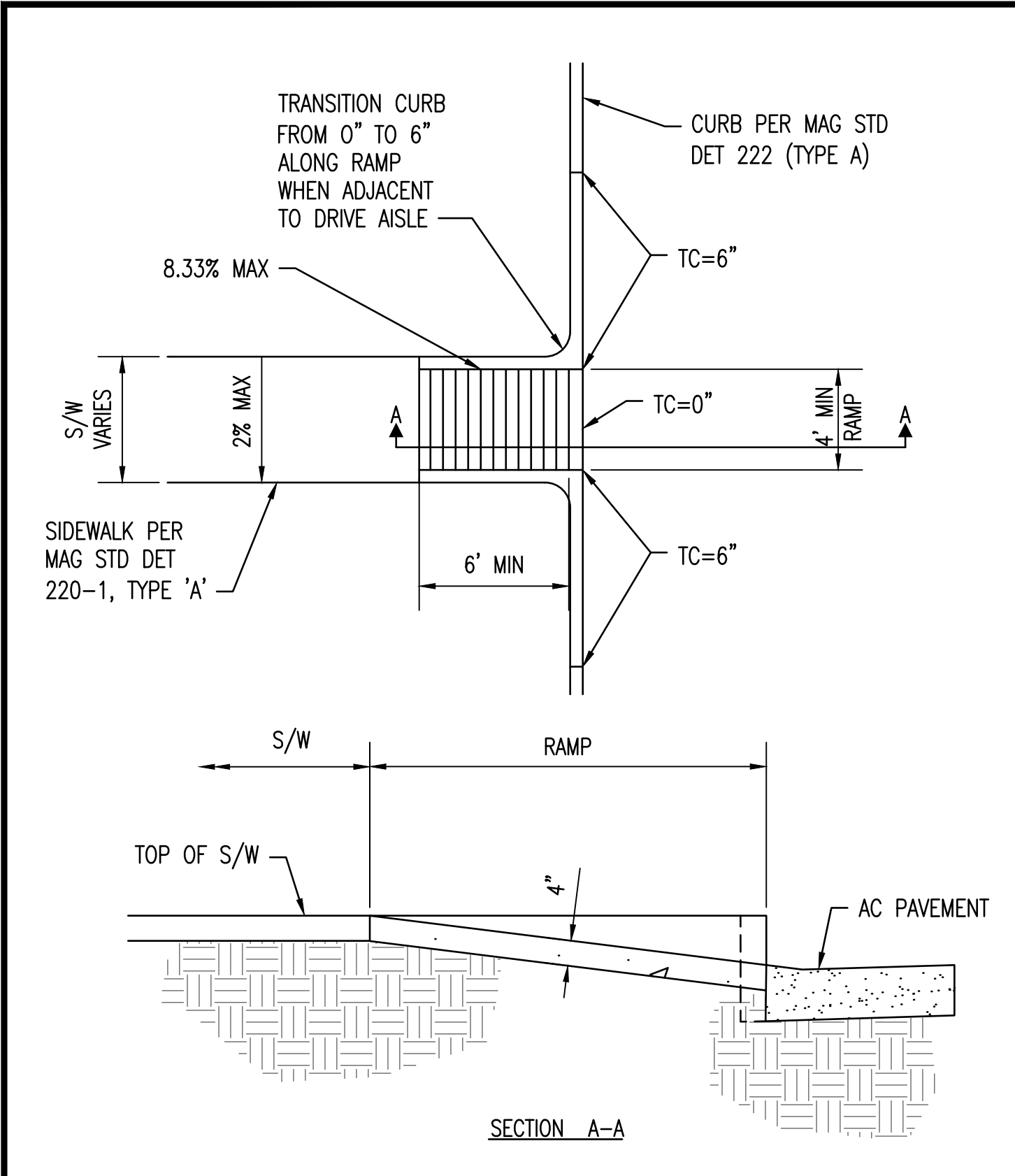
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SHEET NO.: C3.20

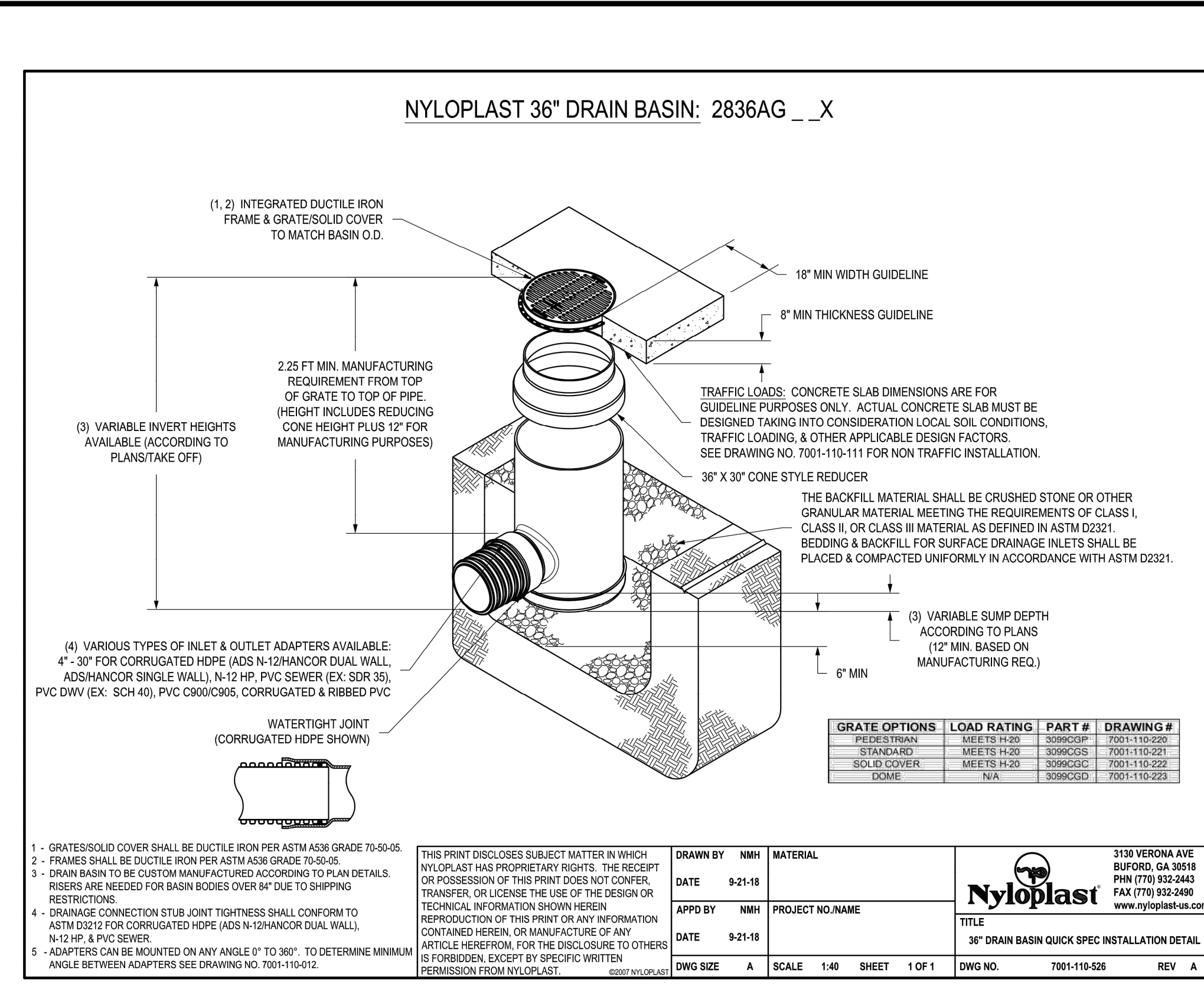
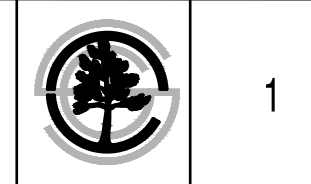
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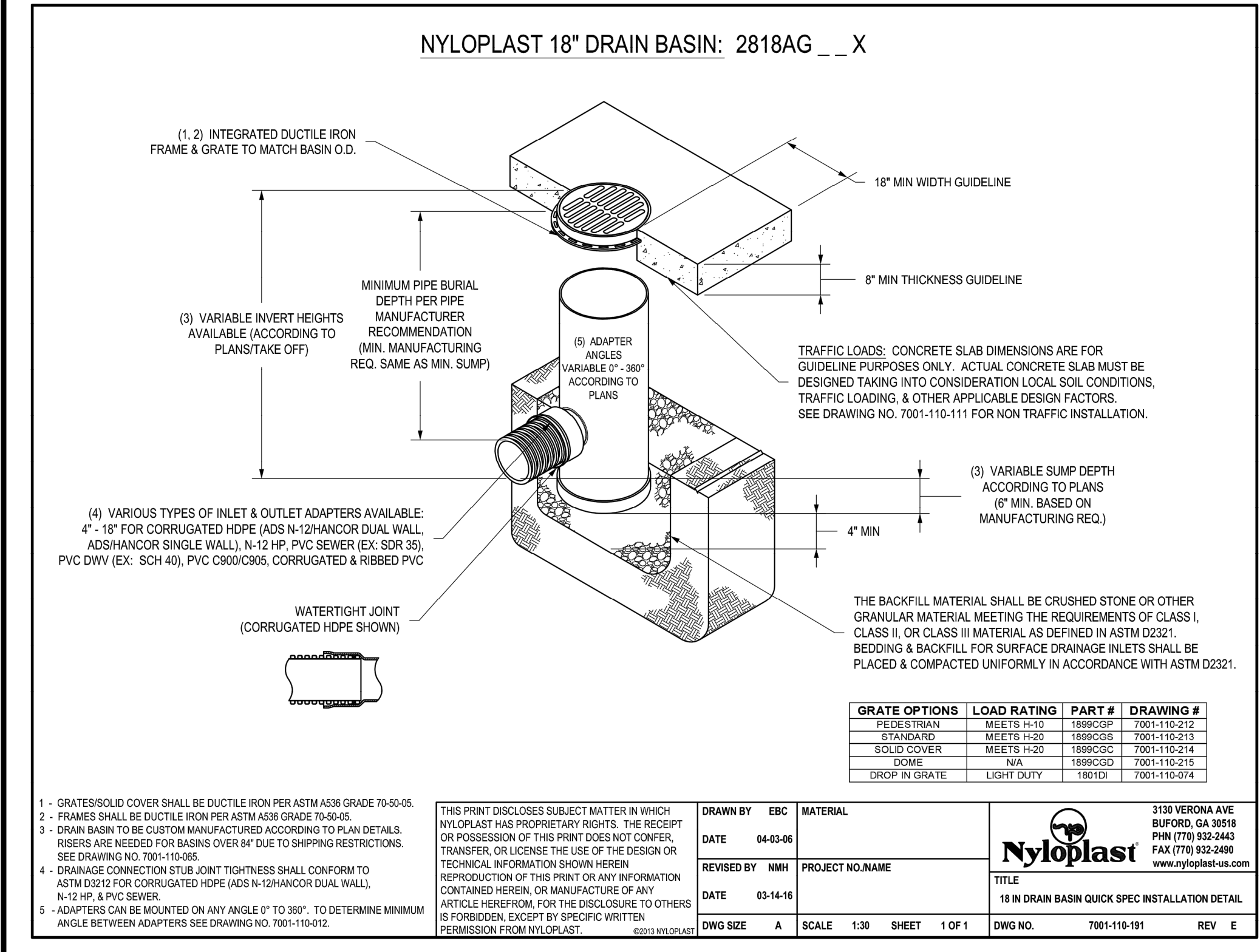
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ADA ACCESSIBLE RAMP "TYPE B"



1 - GRATESOLID COVER SHALL BE DUCTILE IRON PER ASTM A538 GRADE 70-50-05.	THIS PRINT DISCLOSES SUBJECT MATTER IN WHICH NYLOPLAST HAS PROPRIETARY RIGHTS. THE RECEIPT OR POSSESSION OF THIS PRINT DOES NOT CONFER, TRANSFER, OR LICENSE THE USE OF THE DESIGN OR TECHNICAL INFORMATION SHOWN HEREIN. REPRODUCTION OF THIS PRINT OR ANY INFORMATION CONTAINED HEREIN, OR MANUFACTURE OF ANY ARTICLE HEREFROM, FOR THE DISCLOSURE TO OTHERS IS FORBIDDEN, EXCEPT BY SPECIFIC WRITTEN PERMISSION FROM NYLOPLAST.	DRAWN BY	NMH	MATERIAL	3130 VERONA AVE BUPORD, GA 30918 PHN (770) 932-2443 WWW.NYLOPLAST-US.COM					
2 - FRAMES SHALL BE DUCTILE IRON PER ASTM A538 GRADE 70-50-05.		DATE	9-21-18							
3 - DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASIN BODIES OVER 8\"/>										
4 - DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL, N-12 HP, & PVC SEWER).		APP'D BY	NMH	PROJECT NO./NAME						
5 - ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-012.		DATE	9-21-18	TITLE	36\"/>					
	DWG SIZE	A	SCALE	1:40	SHEET	1 OF 1	DWG NO.	7001-110-028	REV	A



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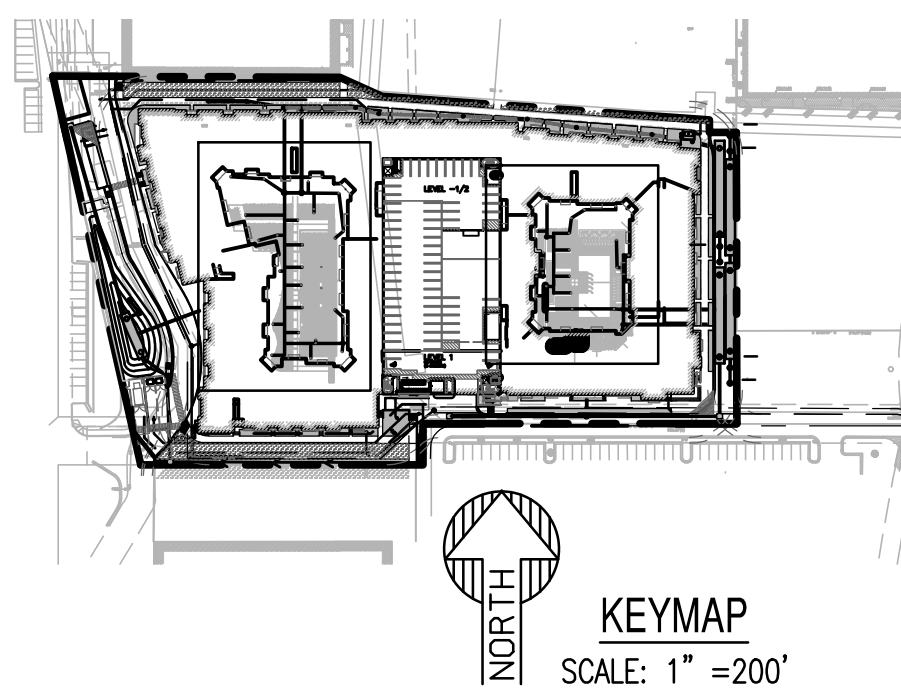
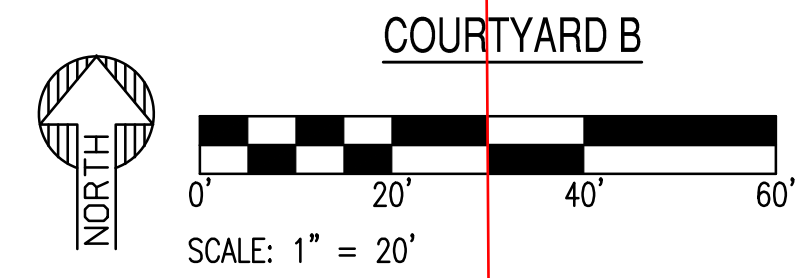
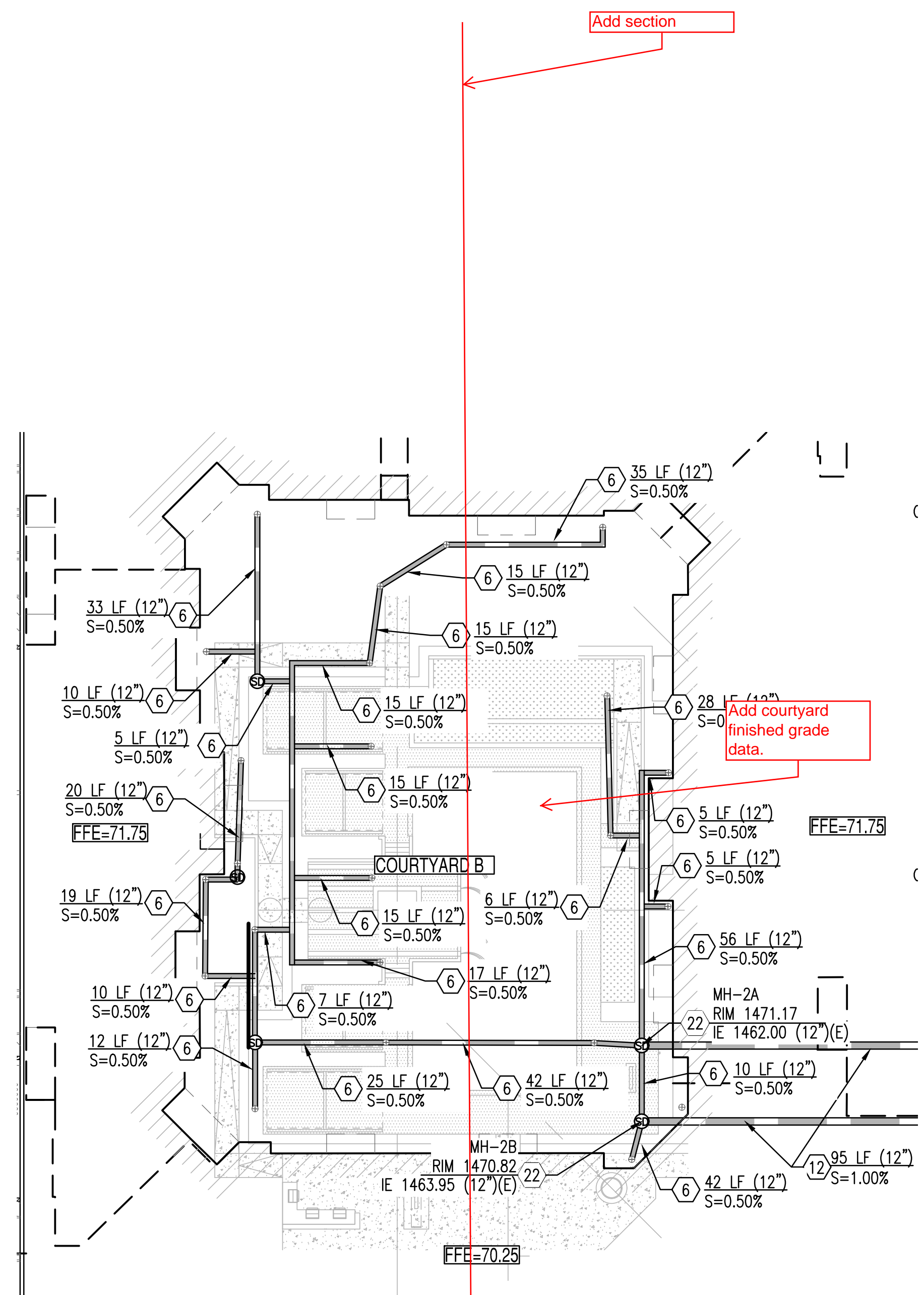
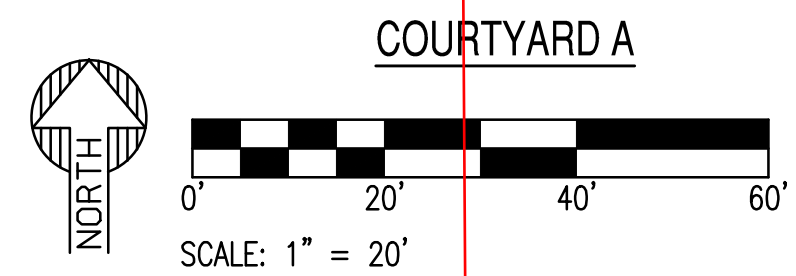
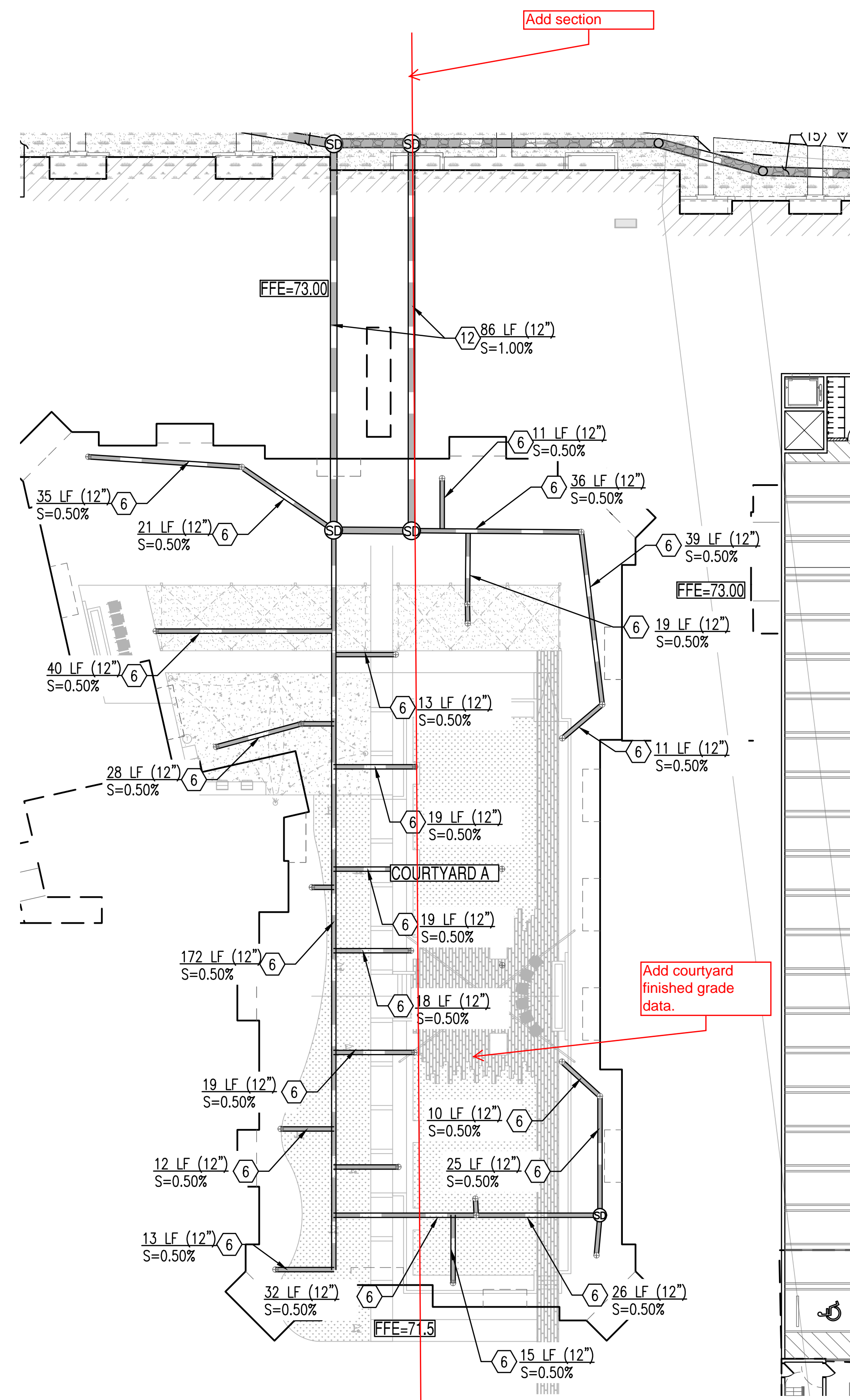


PROJECT	WOOD PARTNERS ALTA RAINTREE SCOTTSDALE	LOCATION	NWC RAINTREE DRIVE & LOOP 101 SCOTTSDALE, ARIZONA
DRAWN	KA	DATE	12/18/2019
DESIGNED	SC	DATE	12/18/2019
QC	SC	DATE	12/20/2019
CA	AF	DATE	12/20/2019
PROJ. MGR.	NS		

DATE:	12/20/2019
ISSUED FOR:	DRB
REVISION NO.:	DATE:
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JOB NO.:	180961
SHEET TITLE:	GRADING AND DRAINAGE DETAILS
SHEET NO.:	C3.21

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**GRADING CONSTRUCTION KEY NOTES**

- ⑥ FURNISH AND INSTALL HDPE DOUBLE WALL PIPE, CLASS 100; PIPE MATERIAL PER M.A.G. SPECIFICATION 738. LENGTH, SIZE AND SLOPE PER PLAN.
- ⑦ FURNISH AND INSTALL 120" CMP STORMWATER STORAGE SYSTEM. PIPE MATERIAL PER M.A.G. SPECIFICATION 621. LENGTH AND SLOPE PER PLAN. REFER TO CONTECH DETAILS, SHEET C3.22. CONTRACTOR TO PROVIDE SIGNED AND SEALED SHOP DRAWINGS TO ENGINEER FOR APPROVAL PRIOR TO MANUFACTURING.
- ⑧ FURNISH AND INSTALL CONCRETE CATCH BASIN PER M.A.G. STD. DET. 535.
- ⑧A FURNISH AND INSTALL 18" NYLOPLAST DRAIN BASIN WITH GRATED LID. REFER TO DETAIL C3.21.
- ②② FURNISH AND INSTALL 36" NYLOPLAST DRAIN BASIN WITH SOLID LID. REFER TO DETAIL C3.21.

**PROPOSED LEGEND**

- P=XX.XX PAVEMENT ELEVATION
- G=XX.XX GUTTER ELEVATION
- FIRE LANE ACCESS
- STORM PIPE
- CATCH BASIN
- ← FLOW ARROW
- ⊕ DRYWELL
- SAWCUT
- PROPERTY LINE
- SETBACK

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PROJECT: WOOD PARTNERS ALTA RAINTREE SCOTTSDALE  
LOCATION: NWC RAINTREE DRIVE & LOOP 101 SCOTTSDALE, ARIZONA

DRAWN: KA 12/18/2019  
DESIGNED: KA 12/18/2019  
QC: SC 12/20/2019  
QA: AF 12/20/2019  
PROJ. MGR: NS

DATE: 12/20/2019  
ISSUED FOR: DRB

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JOB NO.: 180961

SHEET TITLE: COURTYARD DETAILS

SHEET NO.: C3.30

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## *APPENDIX IV*

# *Preliminary Drainage Report Northsight and Raintree*

# PRELIMINARY DRAINAGE REPORT

## NORTHSIGHT AND RAIN TREE

39-DR-2003

5-19-2003

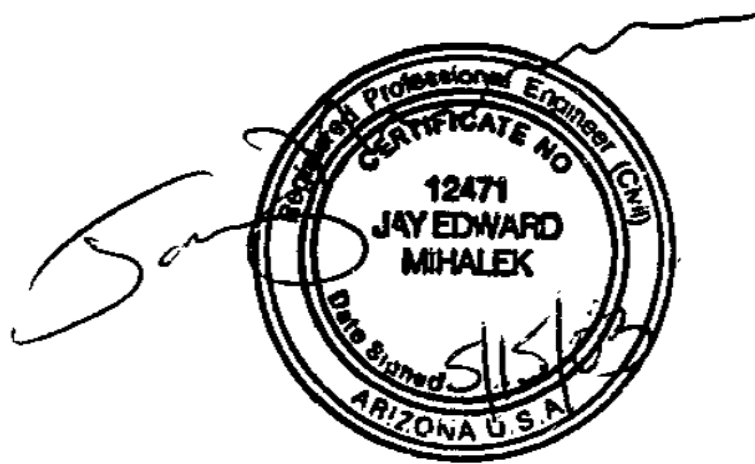
A Proposed Retail Development  
Near the NWC Raintree Drive & Loop 101  
Scottsdale, Arizona

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

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## **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 87th Street. 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, Maricopa County Records. Presently, the site is undeveloped desert.

The east 20 feet of the site has been dedicated as right-of-way for the recent extension of 87th 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 D, Kohl's 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. 04-1685, 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-development 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 original 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 Raintree development 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 city of Scottsdale retention requirements of a 100-year, 2-hour storm. The second alternative is to apply for 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 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 from the east 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 two 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 stormdrain 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 as follows.

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

Where:

P = rainfall                      2.82 inches  
 A = area  
 C = runoff coefficient              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
<b>A</b>	317,437	67,138	-	-
			A <sub>3</sub> 1	1,000
			A <sub>4</sub> 2	22,500
			A <sub>5</sub> 3	43,638
<b>B</b>	40,038	8,468	B	8,468
<b>C</b>	43,855	9,275	C	9,275
<b>D</b>	15,292	3,234	Offsite	3,234
<b>Totals:</b>	<b>416,622</b>	<b>88,115</b>		<b>89,115</b>

Source: JMA Engineering Corporation

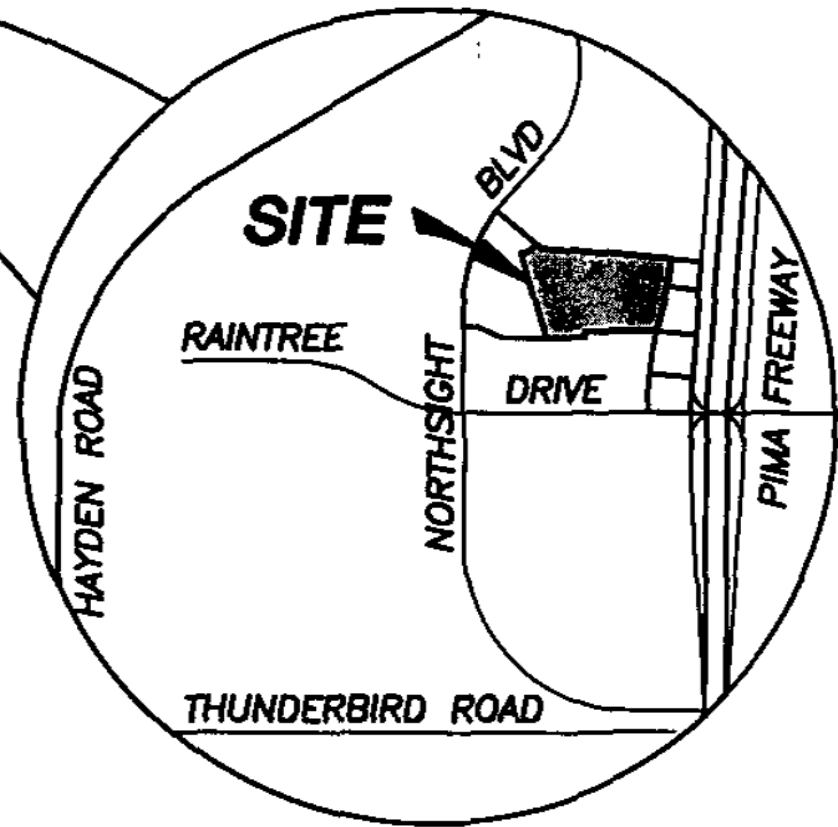
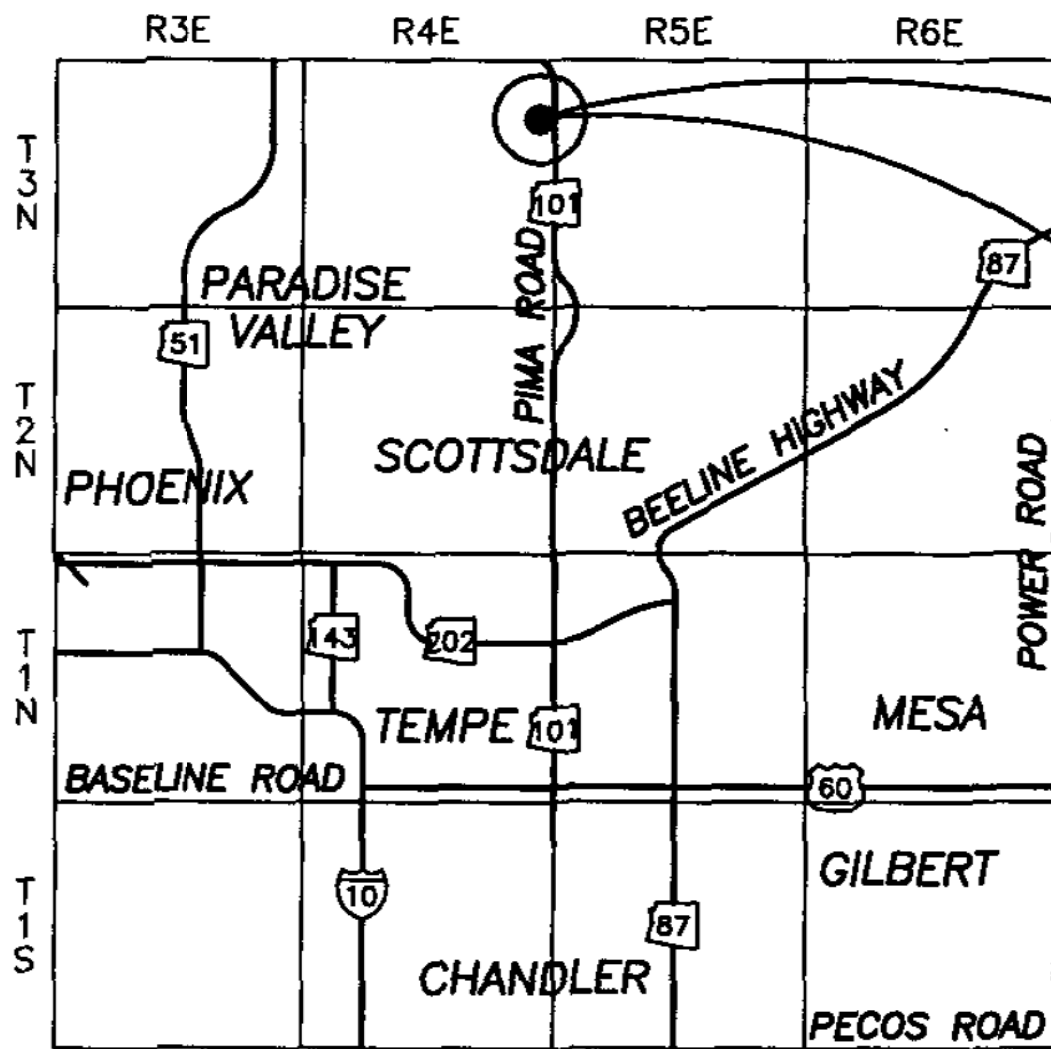
## OFFSITE DRAINAGE

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

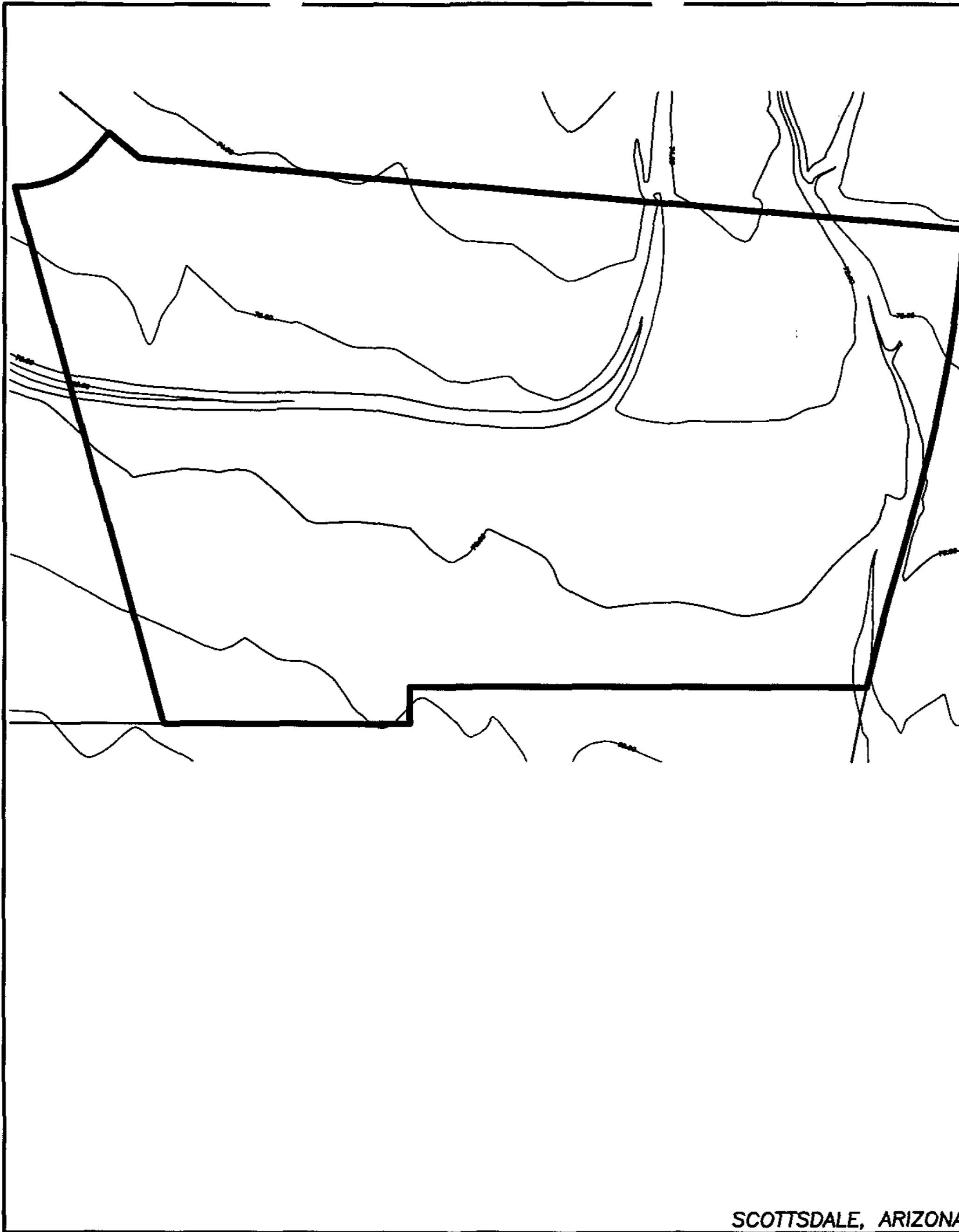
SCOTTSDALE, ARIZONA

SCOTTSDALE, ARIZONA



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

## EXHIBIT A VICINITY MAP NORTHSIGHT AND RAINTREE



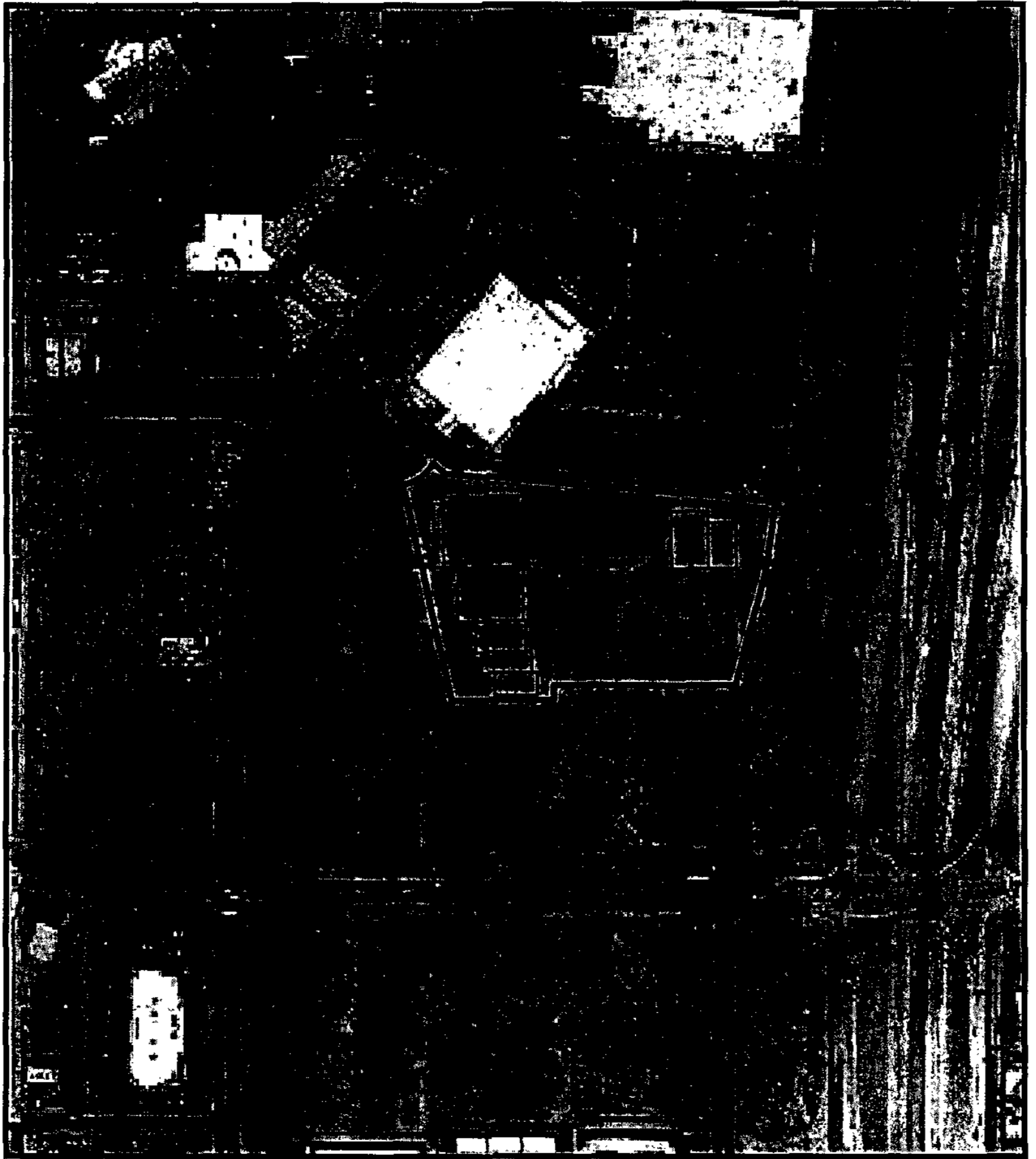
SCOTTSDALE, ARIZONA

**JMA**

**JMA ENGINEERING CORPORATION**

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

**EXHIBIT B**  
**CONTOUR MAP**  
**NORTHSIGHT AND RAIN TREE**



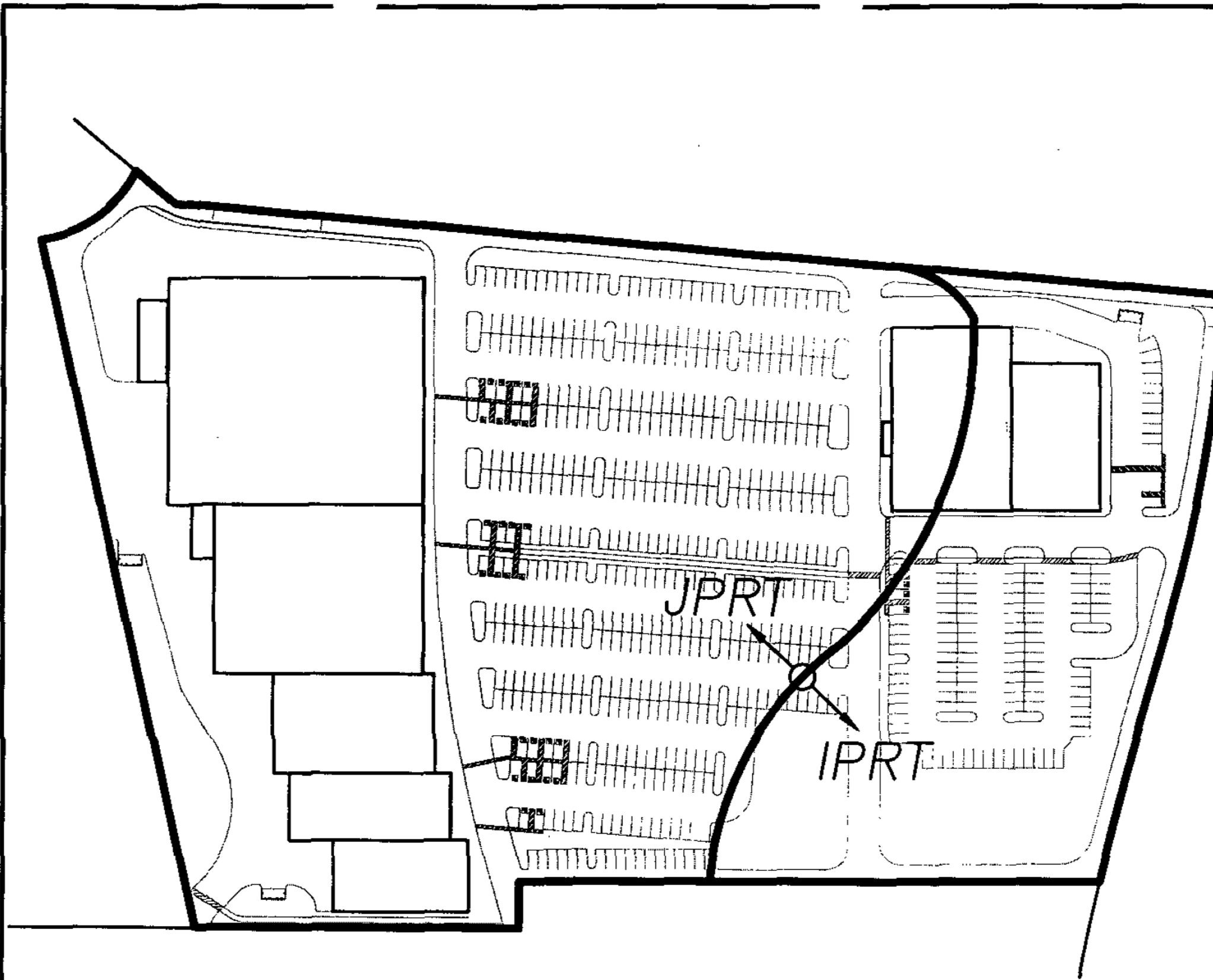
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531 E. Bethany Home Road, Garden Suite  
Phoenix, Arizona 85012

**AERIAL PHOTO - EXHIBIT C  
NORTHSIGHT AND RAIN TREE**



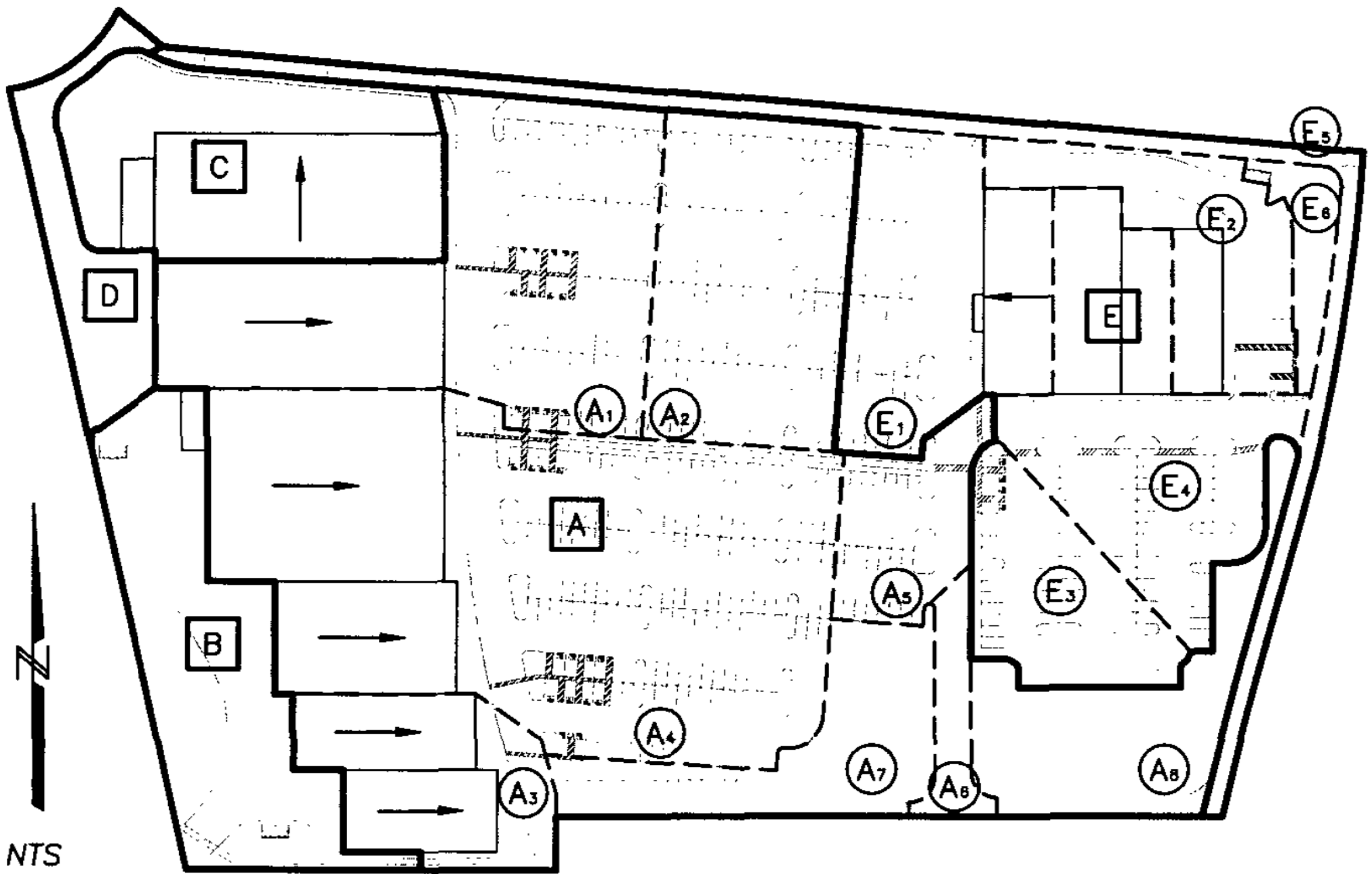
JPRT AREA, SF	IPRT AREA, SF
415,622	149,711

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 RAIN TREE**



### KEY

(A <sub>1</sub> )	66,972 SF	1.5375 AC
(A <sub>2</sub> )	40,106 SF	0.9207 AC
(A <sub>3</sub> )	23,595 SF	0.5417 AC
(A <sub>4</sub> )	118,091 SF	2.7110 AC
(A <sub>5</sub> )	14,640 SF	0.3361 AC
(A <sub>6</sub> )	5,934 SF	0.1362 AC
(A <sub>7</sub> )	22,526 SF	0.5171 AC
(A <sub>8</sub> )	25,572 SF	0.5871 AC
(E <sub>1</sub> )	34,889 SF	0.8009 AC
(E <sub>2</sub> )	23,722 SF	0.5446 AC
(E <sub>3</sub> )	19,997 SF	0.4591 AC
(E <sub>4</sub> )	42,442 SF	0.9743 AC
(E <sub>5</sub> )	21,409 SF	0.4915 AC
(E <sub>6</sub> )	6,252 SF	0.1435 AC

[A]	BASIN TRIBUTARY AREA
(A <sub>3</sub> )	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**

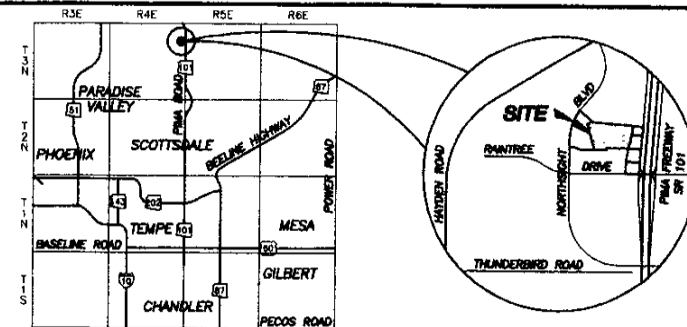
**JMA ENGINEERING CORPORATION**

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



### VICINITY MAP

SCOTTSDALE, ARIZONA

### ARCHITECT

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

### ENGINEER

JMA ENGINEERING CORPORATION  
531 EAST BETHANY HOME ROAD, GARDEN SUITE  
PHOENIX, ARIZONA 85012  
PHONE: (602) 248-0286  
CONTACT: JACOB EARLEY, ET

### 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, GSRB&M. BEARING S00°07'35"W.

### ZONING

C-2

### BENCHMARK

CITY OF SCOTTSDALE BRASS GAP 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	1885	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	
G & D	<i>[Signature]</i>	PLANNING	<i>[Signature]</i> 3-11-04
W & S	<i>[Signature]</i>	FIRE	<i>[Signature]</i> 3/14/04
RETAINING WALLS			
<i>[Signature]</i>		ENGINEERING COORDINATION MANAGER (OR DESIGNEE)	3/18/04
			DATE

*[Signature]* 040169 040170 3/10/04  
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.

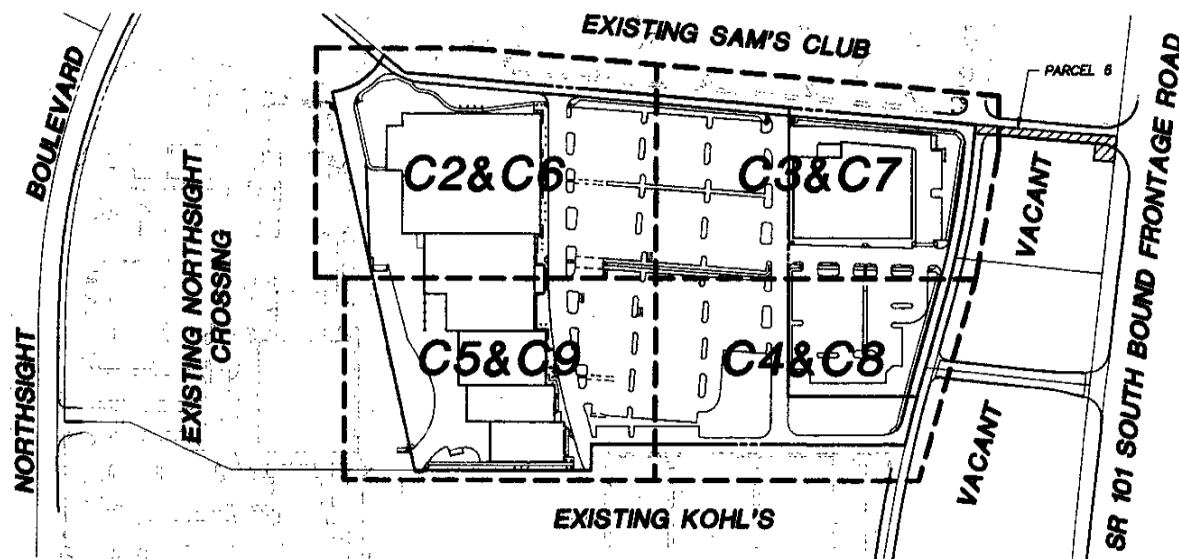
### COVER SHEET SCOTTSDALE SHOPS

Design	JM
CAD	JW
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

### 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."



### KEY MAP

SCALE: NTS

### LEGAL DESCRIPTION

PARCEL NO. 1:

THOSE PORTIONS OF PARCELS 1, 5, AND 6, ACCORDING TO THE MAP OF DEDICATION FOR NORTHSIGHT 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. 980628667, 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 NORTHSIGHT 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. 980628667, 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.

### UTILITY NOTE

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 IN 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.

(UTILITY RECORDS FROM CMX GROUP INC 10/07/02, PROJECT NUMBER 1732-02 AND GILBERTSON ASSOCIATES INC 07-14-03, PROJECT NUMBER 5872.02-1)

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	COX COMMUNICATIONS	ROGER YENSEN	(602)392-7088	7/31/03
NATURAL GAS	EL PASO GAS	DENNIS SEGARD	(602)438-4244	5/29/03
TELEPHONE	AT&T	JOHNNY G. GONZALES	(480)827-6048	7/31/03

### ENGINEER'S CERTIFICATION:

I, JAY MILALEK, 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 APPURTENANCES 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 NAOs OR OTHER OPEN SPACE EASEMENTS.

*[Signature]* 3/10/04  
SIGNATURE DATE

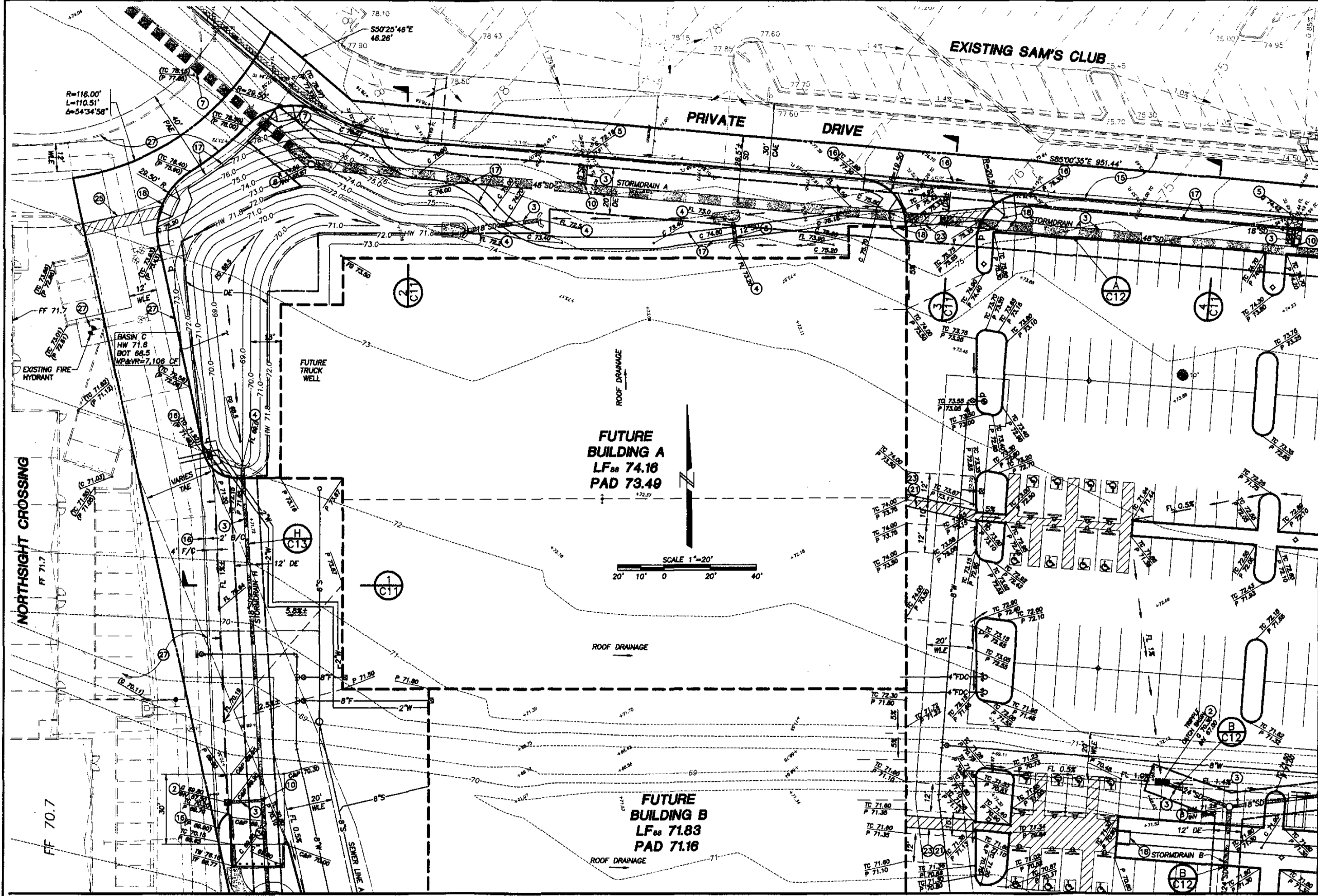
### NOTE

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.

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

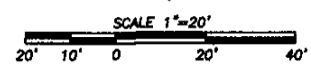
NO WORKING DATE BEFORE YOU OR CALL FOR THE BLUE STAKE  
602-263-1100  
BLUE STAKE CENTER

NORTHSIGHT AND RAIN TREE JMA 0229.2  
39-5R-03 1016-03 80-NP-2003

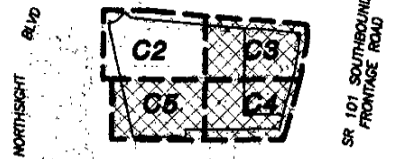


- LEGEND**
- CENTERLINE
  - RIGHT-OF-WAY
  - PROPERTY LINE
  - EASEMENT
  - EXISTING CURB AND GUTTER
  - EXISTING ELECTRICAL
  - EXISTING PAVEMENT
  - EXISTING SANITARY SEWER
  - EXISTING STORMDRAIN
  - EXISTING TELEPHONE
  - EXISTING WATER
  - EXISTING FENCE
  - EXISTING STORMDRAIN
  - REBAR
  - BRASS 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

MATCH LINE, SEE SHEET C3



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 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.
- 13 RETAINING BUILDING STEM WALL.
- 14 METERED DISCHARGE SOUTH TO RAIN TREE 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.
- 23 DECORATIVE CONCRETE PEDESTRIAN CROSSING. SEE ARCHITECTURAL PLANS.
- 25 STRIPED PEDESTRIAN CROSSING. SEE ARCHITECTURAL FOR MARKINGS.
- 27 CONSTRUCTED BY NORTHERN CROSSING DEVELOPMENT (5-DR-2003).
- 30 NEW 8-INCH HIGH X 32-INCH WIDE WALL OPENING FOR DRAINAGE. PROVIDE EROSION APRON SIMILAR TO DETAIL 2, SHEET C10.

MATCH LINE, SEE SHEET C5

**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

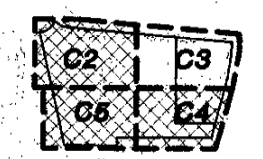
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Sheet	C2 of 14



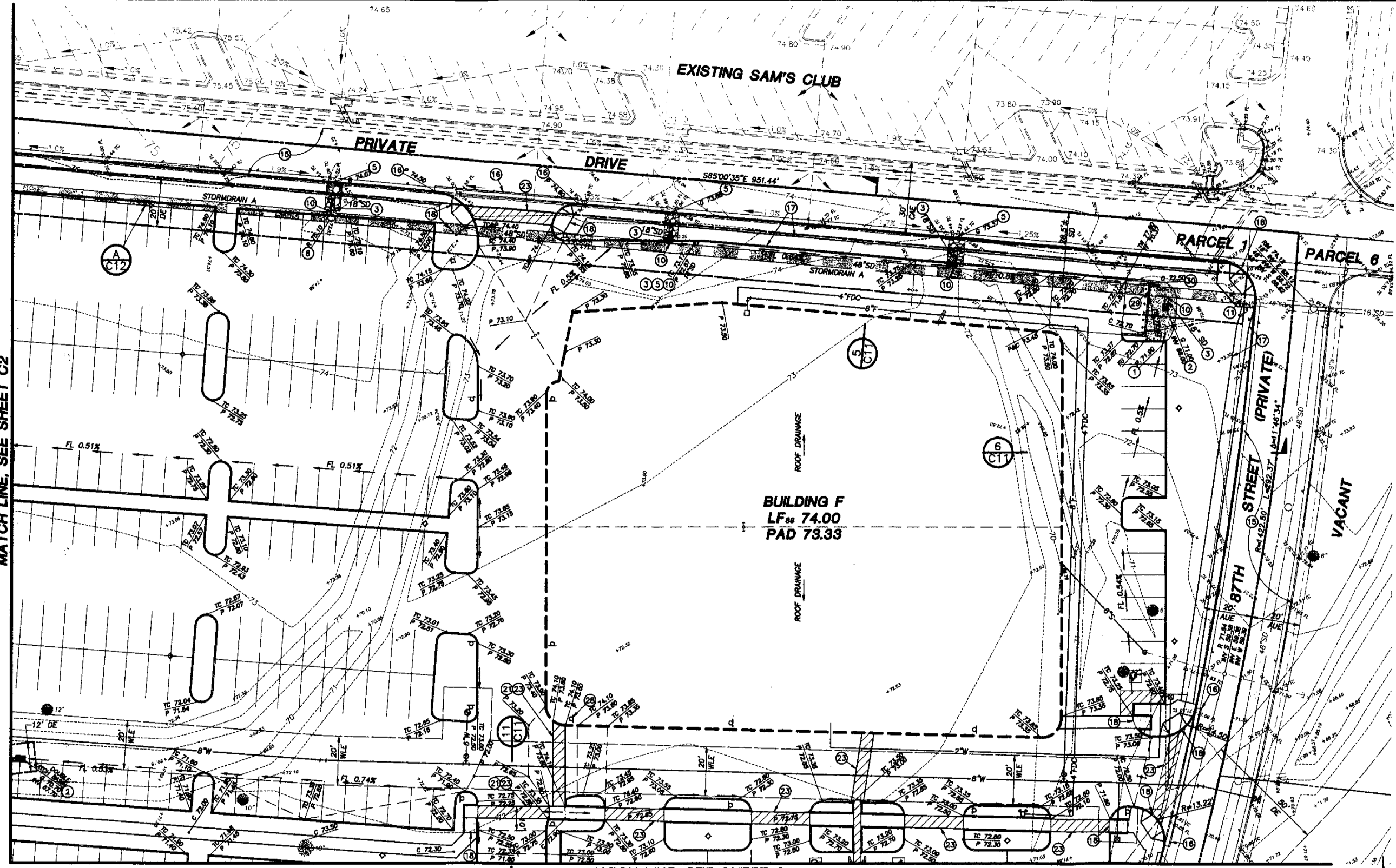
**LEGEND**

- 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 PALM 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.

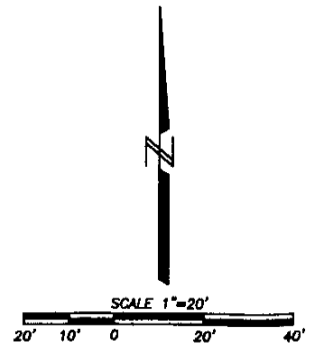


**KEY MAP**  
SCALE: NTS



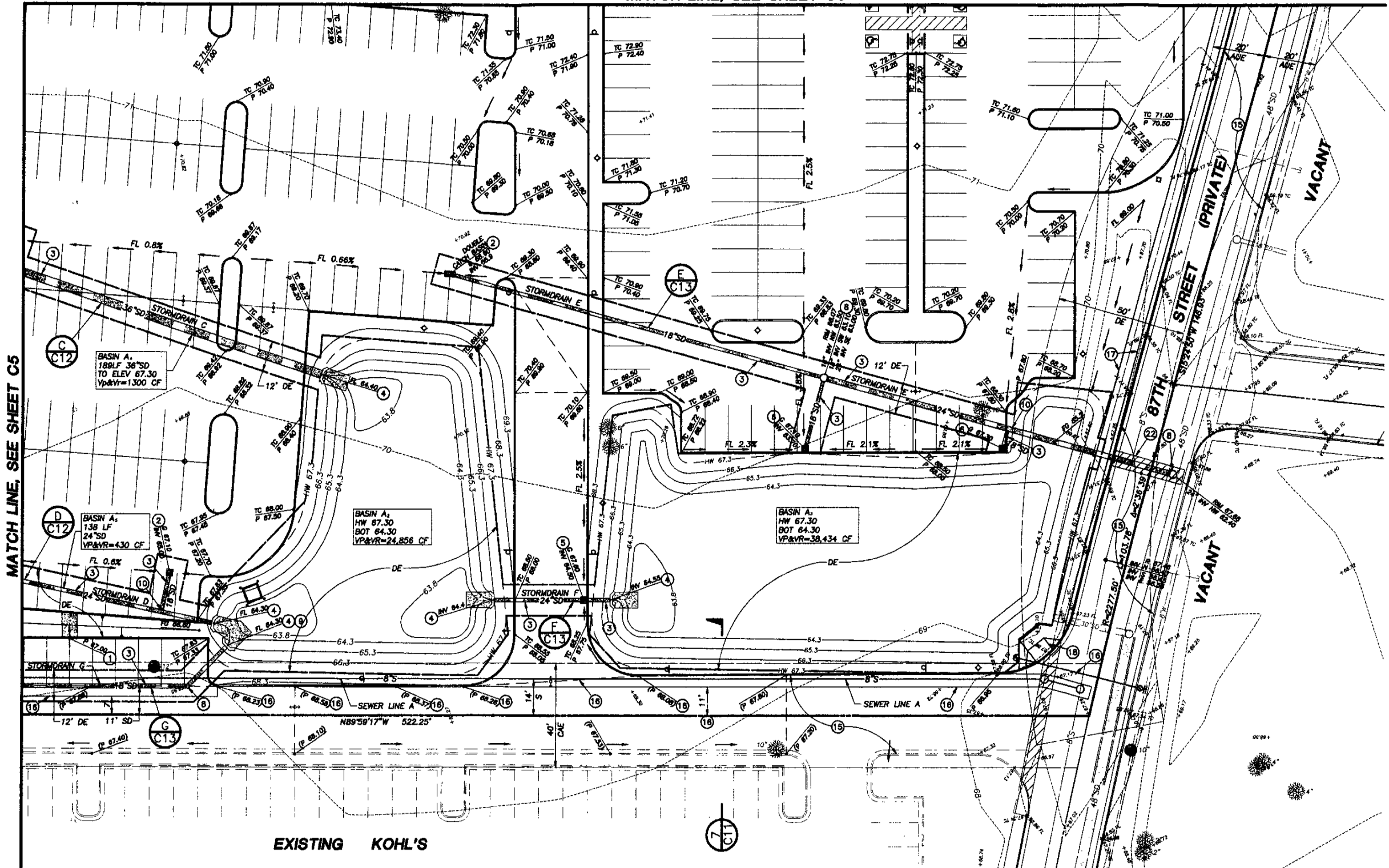
**CONSTRUCTION KEY NOTES**

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>1 NEW CURB OPENING AND EROSION APRON PER DETAIL 2, SHEET C10.</li> <li>2 NEW CATCH BASIN PER MAG STANDARD DETAIL 535. DOUBLE OR TRIPLE GRATE WHERE INDICATED.</li> <li>3 NEW CORRUGATED HDPE STORM DRAIN.</li> <li>4 NEW HEADWALL PER MAG STANDARD DETAIL 501, "U" TYPE AND EROSION APRON WHERE SHOWN SIMILAR TO DETAIL 2, SHEET C10, SIZE PER PLAN.</li> <li>5 NEW 3'-6" CURB OPENING CATCH BASIN PER MAG STANDARD DETAIL 530. SAWCUT, REMOVE AND REPLACE EXISTING VCO&amp;G AND PAVEMENT AS NECESSARY.</li> <li>6 NEW TYPE "D", 7' CURB OPENING CATCH BASIN PER MAG STANDARD DETAIL 533.</li> <li>8 NEW "SHALLOW" STORMDRAIN MANHOLE PER MAG STANDARD DETAIL 520 AND 522.</li> <li>9 NEW PRE-MANUFACTURED BEND. NEW 12-INCH SURFACE CLEANOUT SIMILAR TO MAG STANDARD DETAIL 441.</li> <li>10 NEW PRE-MANUFACTURED TEE.</li> <li>13 RETAINING BUILDING STEM WALL.</li> </ul> | <ul style="list-style-type: none"> <li>14 METERED DISCHARGE SOUTH TO RAINTREE STORMDRAIN.</li> <li>15 EXISTING STREET IMPROVEMENTS.</li> <li>16 SAWCUT NEAT LINE AND MATCH EXISTING.</li> <li>17 NEW CONCRETE SIDEWALK.</li> <li>18 NEW ADA RAMP. SEE ARCHITECTURAL PLANS, SHEET SP1 DETAILS 14 AND 15.</li> <li>19 REMOVE EXISTING EXTRUDED CURB AND PAVEMENT.</li> <li>21 NEW RAISED PEDESTRIAN CROSSING PER MAG STANDARD DETAIL 210 MODIFIED FOR 10-FOOT WIDE FLAT TOP, SEE ARCHITECTURAL PLANS SHEET SP1 DETAIL 3.</li> <li>23 DECORATIVE CONCRETE PEDESTRIAN CROSSING. SEE ARCHITECTURAL PLANS.</li> <li>26 PROPOSED SIGN. SEE ARCHITECTURAL SHEET SP, DETAIL 17SP1.</li> <li>29 CONTRACTOR TO PROVIDE BRIDGE IN FOOTING OVER PROPOSED 48-INCH STORMDRAIN.</li> <li>30 NEW 8-INCH HIGH X 32-INCH WIDE WALL OPENING FOR DRAINAGE. PROVIDE EROSION APRON SIMILAR TO DETAIL 2, SHEET C10.</li> </ul> |
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**GRADING AND DRAINAGE PLANS  
SCOTTSDALE SHOPS**

<p><b>JMA ENGINEERING CORPORATION</b> 531 E. Bethany Home Road, Garden Suite Phoenix, Arizona 85012</p>	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
- TYPE
- ⊞ 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
- (TC 78.15) (P 77.65) EXISTING SPOT
- LIMITS OF CONSTRUCTION
- AUE ACCESS AND UTILITY EASEMENT
- CAE CROSS ACCESS EASEMENT
- DE DRAINAGE EASEMENT

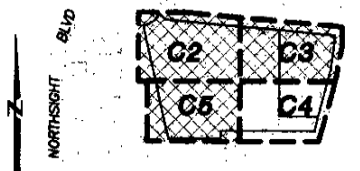
MATCH LINE, SEE SHEET C5

EXISTING KOHL'S

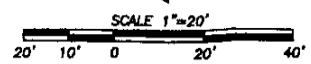
**CONSTRUCTION KEY NOTES**

- 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.



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



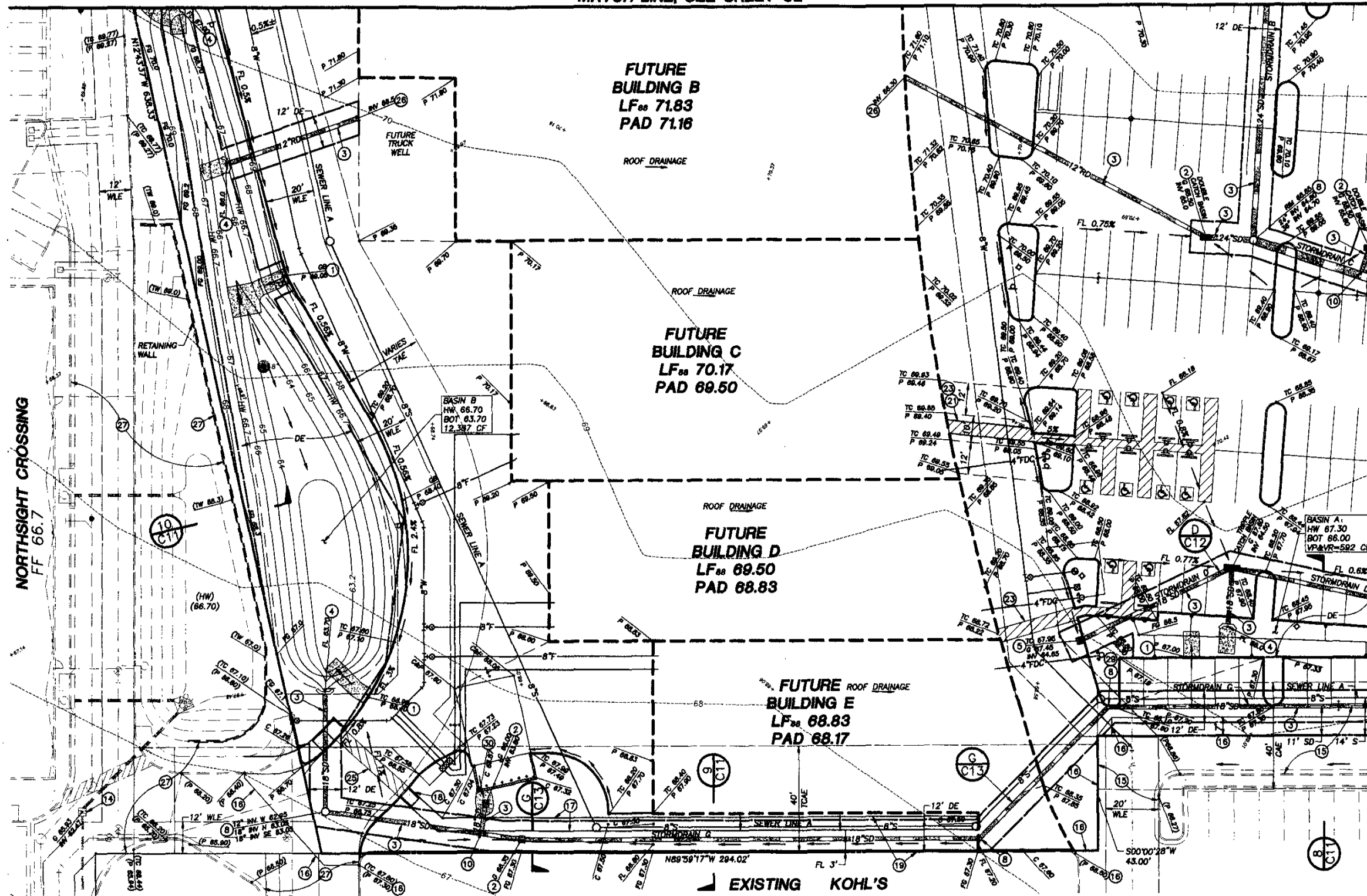
**KEY MAP**  
SCALE: NTS



**GRADING AND DRAINAGE PLANS  
SCOTTSDALE SHOPS**

 <b>JMA ENGINEERING CORPORATION</b>		
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CAD	JM	
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Date	3/10/04	
Job No.	0229.2	
Sheet	C4 of 14	

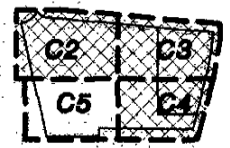
531 E. Bethany Home Road, Garden Suite Phoenix, Arizona 85012  
Voice 602.248.0286 Fax 602.248.0976



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
- TYPE
- ⊞ EXISTING BOX
- ⊞ EXISTING SIGN
- ⊞ EXISTING PALO VERDE TREE
- ⊞ EXISTING TREE
- ⊞ EXISTING MESQUITE
- ⊞ EXISTING STREET LIGHT
- S — NEW SANITARY SEWER
- W — 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
- (TC 78.19) (P 77.85) 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.



KEY MAP  
SCALE: NTS

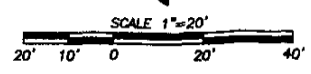
GRADING AND DRAINAGE PLANS  
SCOTTSDALE SHOPS

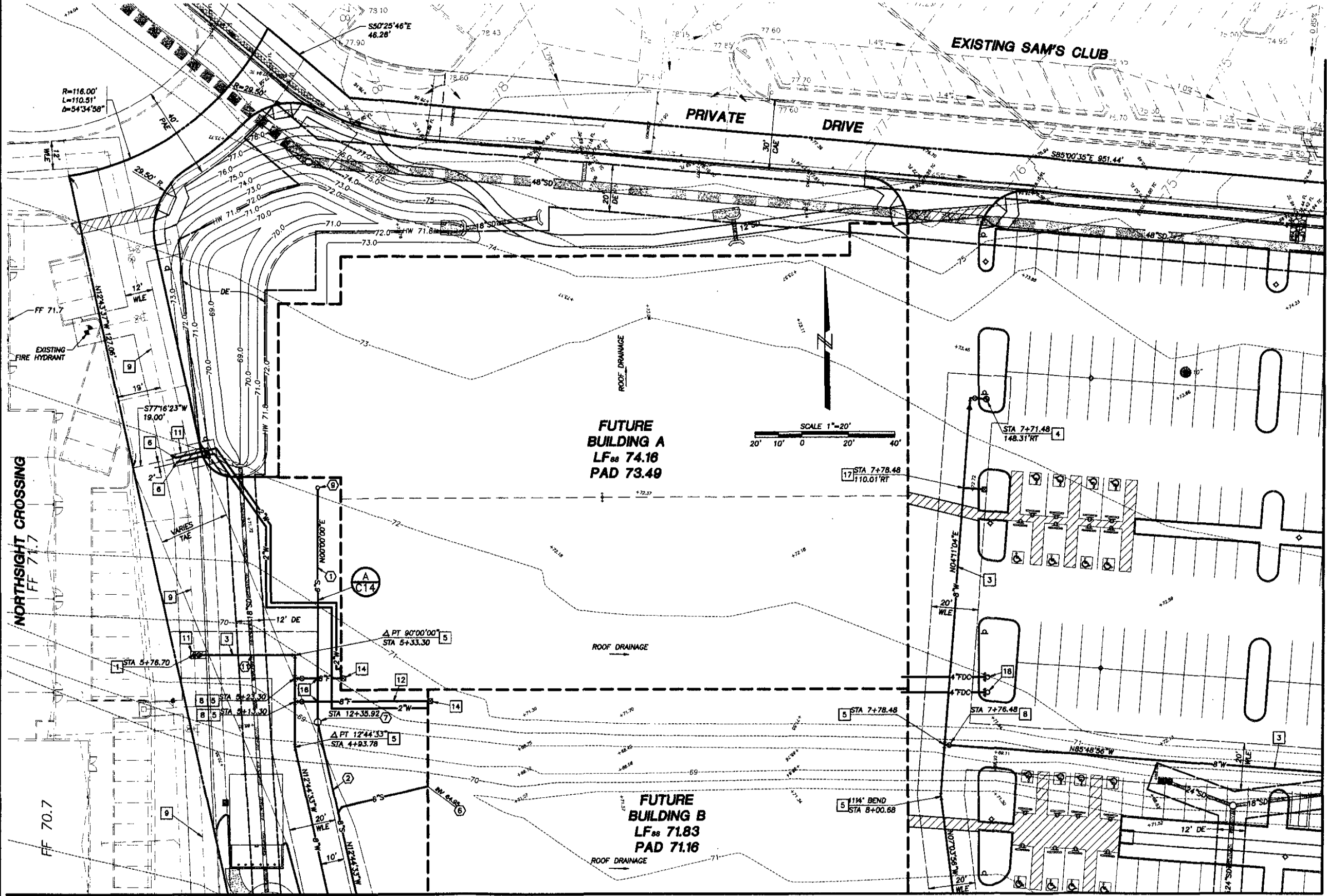
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531 E. Bethany Home Road, Garden Suite Phoenix, Arizona 85012  
Voice 602.248.0286 Fax 602.248.0976

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'-8" CURB OPENING CATCH BASIN PER MAG STANDARD DETAIL 530. SAWCUT, REMOVE AND REPLACE EXISTING VCB&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 RAIN TREE 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 FOR MARKINGS.
- 21 PLUG STORMDRAIN AND MARK AT SURFACE FOR FUTURE BUILDING DRAIN CONNECTION.
- 22 CONSTRUCTED BY NORTHSIGHT CROSSING DEVELOPMENT (5-DR-2003).
- 23 OFFSET MANHOLE RIM TO AVOID CURB.
- 24 NEW 8-INCH HIGH X 32-INCH WIDE WALL OPENING FOR DRAINAGE. PROVIDE EROSION APRON. SIMILAR TO DETAIL 2, SHEET C10.





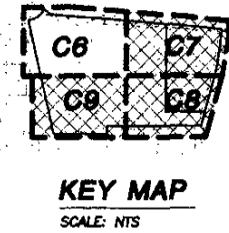
**LEGEND**

- 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
- 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
- TYPE
- ⊠ EXISTING BOX
- ⊠ EXISTING SIGN
- ⊠ EXISTING PALO VERDE TREE
- ⊠ EXISTING TREE
- ⊠ 10" 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
- ⊠ (TC 78.15) (P 77.85)
- LIMITS OF CONSTRUCTION
- WLE WATER LINE EASEMENT
- CAE CROSS ACCESS EASEMENT
- PAE PROPOSED ACCESS EASEMENT
- DE DRAINAGE EASEMENT
- TAE TRUCK ACCESS EASEMENT
- FUTURE NORTHSIGHT CROSSING

- 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.
  - 3 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" INST 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.

- 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.
  - 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-TOP.
  - 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.

- 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.
  - 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-TOP.
  - 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.



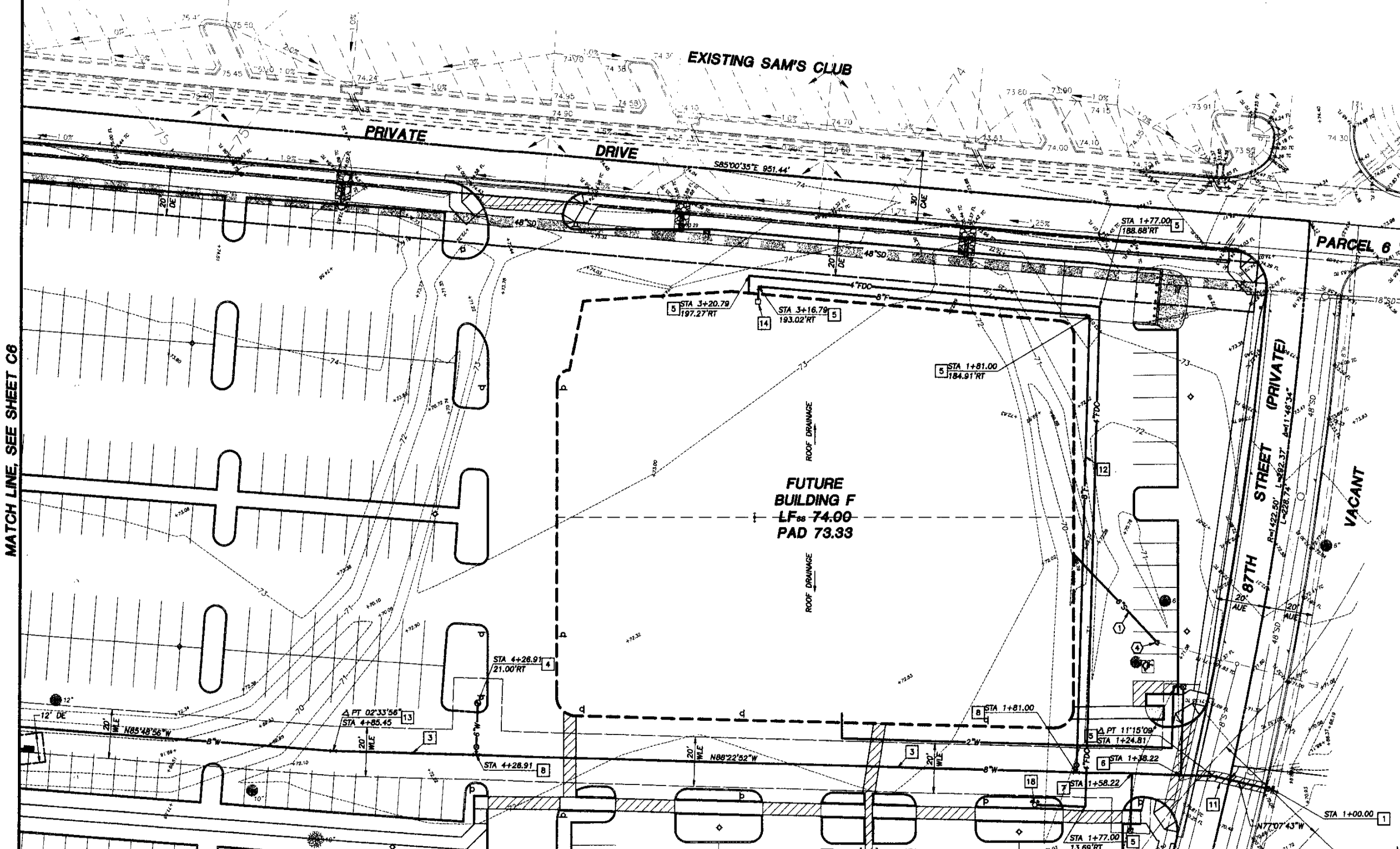
**WATER AND SEWER PLANS  
SCOTTSDALE SHOPS**

JMA ENGINEERING CORPORATION

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

Voice 602.248.0286 Fax 602.248.0978

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Date	3/10/04
Job No.	0229.2
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- LEGEND**
- CENTERLINE
  - RIGHT-OF-WAY
  - PROPERTY LINE
  - EASEMENT
  - EXISTING CURB AND GUTTER
  - EXISTING ELECTRICAL
  - EXISTING PAVEMENT
  - EXISTING SANITARY SEWER
  - EXISTING SANITARY SEWER CAP
  - 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
  - TYPE EXISTING BOX
  - ⊙ EXISTING SIGN
  - ⊙ EXISTING PALM VERDE TREE
  - ⊙ EXISTING TREE
  - ⊙ 10" 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
  - LIMITS OF CONSTRUCTION
  - AUE ACCESS AND UTILITY EASEMENT
  - DE DRAINAGE EASEMENT
  - WLE WATER LINE EASEMENT

MATCH LINE, SEE SHEET C6

MATCH LINE, SEE SHEET C8

**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.

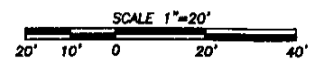
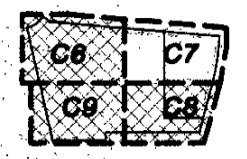
**CONSTRUCTION KEY NOTES - SEWER LINE (UPC)**

- 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.

DRAINAGE EASEMENT  
INST 99-0132451  
PER 03-1482539 ABANDONED



**WATER AND SEWER PLANS  
SCOTTSDALE SHOPS**

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