



September 2<sup>nd</sup>, 2019

To: Mr. Paul Mood, PE  
Town Engineer  
**Town of Paradise Valley**  
6401 E Lincoln Drive  
Paradise Valley, AZ 85253

Re: **3310 E Stella Lane**  
**Paradise Valley, AZ 85253**  
**LDG Project #1901017**

## **DRAINAGE MEMORANDUM**

Dear Mr. Mood:

In accordance with the Town of Paradise Valley Stormwater Design Manual, we have prepared this drainage memorandum and grading and drainage plan related to the construction of a new single family residence, located at 3310 E. Stella Lane, Paradise Valley, AZ 85253, parcel 164-05-125, being a portion of the SW  $\frac{1}{4}$  of Section 12, Township 2 North, Range 3 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona.

The goal of this memorandum is to describe the existing and proposed drainage conditions and to support the request to release or realign of the existing drainage easement as recorded in Book 681, Page 10, MCR.

The project site is located within a residential subdivision - Preserve at Lincoln and it is zoned R-43. The property is surrounded by large residential lots (east and west), Stella Lane right-of-way on the south side, and Lincoln Drive right of way along the the north property line. The proposed project will consist of construction of a single-family residence (9,475 s.f.) with garages, pool area, retaining walls, site improvements and an access driveway to Stella Lane. The project site is currently a vacant lot (45,697 s.f.) with sparse native vegetation.

Property is located in FEMA Flood Zone "X" according to Flood Insurance Rate Map (FIRM) #: 04013C, Panel 1745 of 4425, Suffix L, dated October 16th, 2013, as published by FEMA. The FIRM Panel defines Zone "X" as follows: "Areas determined to be outside the 0.2% annual chance floodplain".

The terrain slopes southeasterly with an average slope of 5%. The lot is covered with native desert vegetation. Performed field investigations and prepared topographic survey map were used to clearly identify the distinctive flow paths that run through the site. A drainage easement was recorded as part of the subdivision process and it is approximately 28' wide. The drainage easement starts from the north property line and runs in southeasterly direction along a historic wash until it reaches the south property line, where existing 24" cmp carries the flows under Stella Lane. The ultimate outfall of the site is at the culvert inlet location at elevation of 1364.

The existing meandering subdivision wall along the northerly property line does not have any drainage openings and does not allow for drainage runoff to flow along the dedicated drainage easement corridor. Any flows north of that wall would be mostly generated from on-site runoff and are directed by a ditch to the east.

Maricopa County maps, aerial photography and surveyed topography for the site were reviewed and used to establish the tributary areas and conveyance corridors. Limits of the tributary area was further adjusted based on our field observations and identified drainage structures.

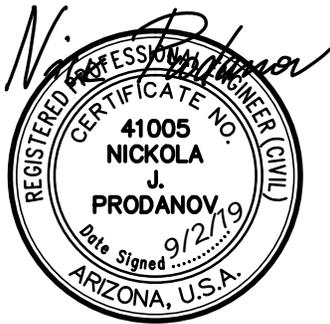
Drainage map was prepared for the current conditions depicting the limits of the watershed and flow paths. Computations have been performed to estimate the 100-year design storm peak discharge. Computer program DDMS provided by FCDMC was utilized to generate the rational model and to estimate the peak discharges. One sub-basin (1.0 acre) was delineated and currently contributes run-off on the site. 100-year peak discharges was estimated at 5.4 cfs for the pre-development conditions. Considering that on-site stormwater retention will be provided for the 100-year 2-hour storm event, there is no anticipated post-development runoff discharge that would leave the site, which will significantly improve the conditions downstream.

The lowest finish floor elevation is set at 1371.50. Grading around the residence provides for positive drainage away from the structures as shown on the Grading and Drainage plan. The runoff is collected by multiple area drains and it is routed through series of piping and sheet flow into the proposed retention basins. Basins' depth is limited to 1.5'.

In conclusion, the project site has the potential to collect, convey and discharge runoff safely and effectively. The proposed improvements reduce the drainage impact to the neighboring lots downstream and will not result in significant changes to the existing and historic drainage patterns or magnitudes.

Respectfully Submitted,

Nick Prodanov, PE, PMP  
Principal  
**Land Development Group, LLC**



**Enclosures:**

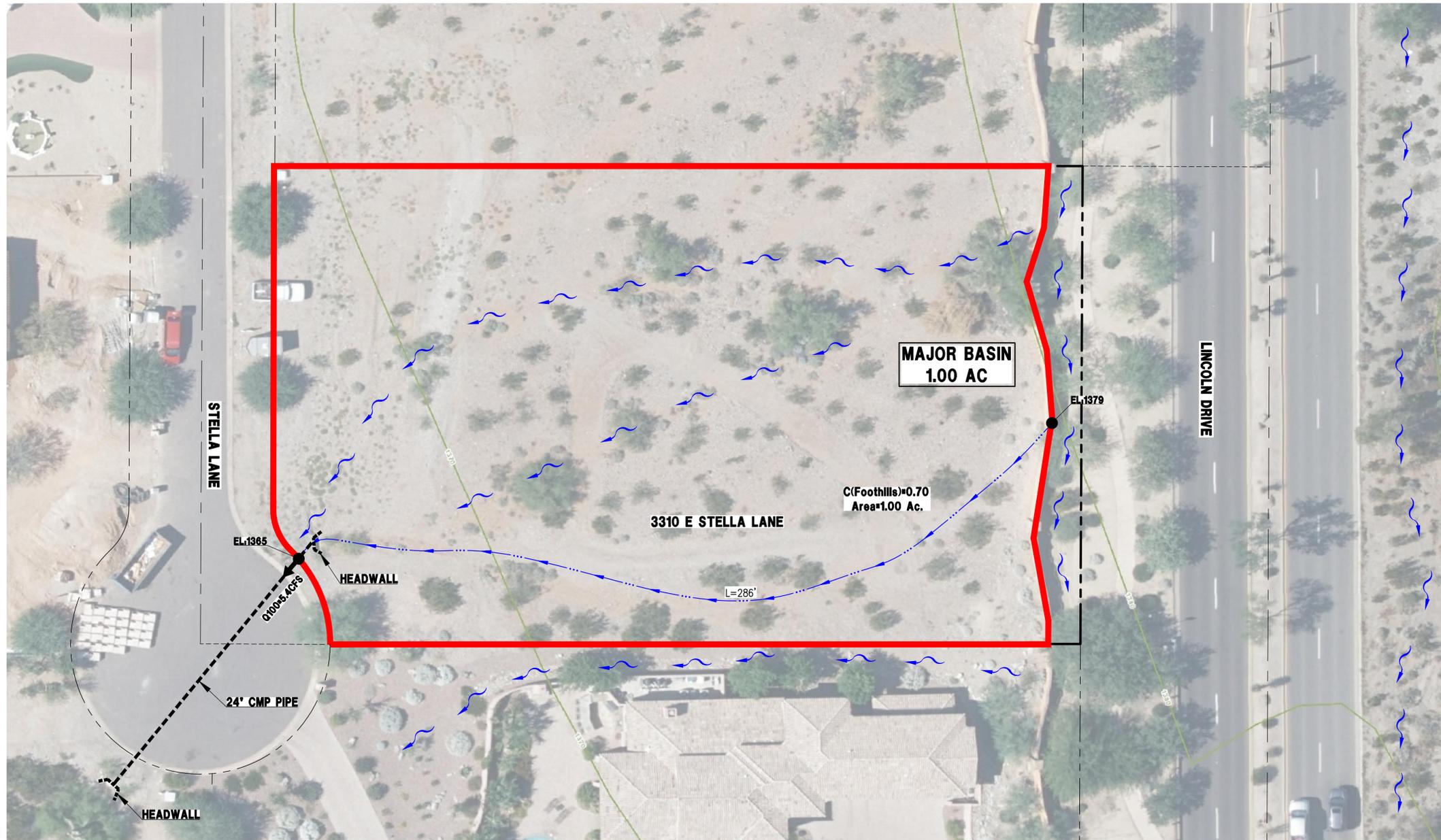
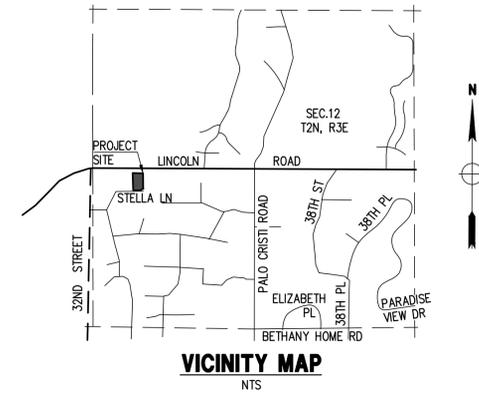
- Exhibit 1 Drainage Map
- Exhibit 2 Aerial Maps
- Exhibit 3 Recorded Plat
- Exhibit 4 Grading and Drainage Plan
- Exhibit 5 Drainage Calculations

# DRAINAGE MAP

## 3310 E STELLA LN., PARADISE VALLEY, AZ 85253

### LOT 6 - PRESERVE AT LINCOLN

A SUBDIVISION PLAT RECORDED IN BOOK 681 OF MAPS, PAGE 10, MCR.,  
 LOCATED IN A PORTION OF THE NE 1/4 OF THE NW 1/4 OF THE SW 1/4 OF SECTION 12, T.2N, R.3E  
 OF THE GILA & SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA



**OWNER**  
 PRESERVATION HOLDINGS LLC  
 4308 E WELDON AVE.,  
 PHOENIX, AZ 85018

**SITE DATA**  
 APN: 164-05-125  
 ADDRESS: 3310 E STELLA LN.,  
 PARADISE VALLEY, AZ 85253  
 ZONING: R-43  
 LOT AREA: 45,697 S.F. (1.049 AC.)  
 CONSTRUCTION YEAR: VACANT LOT  
 OS #: 21-35

**BENCHMARK**  
 BRASS CAP IN HANDHOLE AT MARICOPA COUNTY HIGHWAY  
 DEPARTMENT, HAVING AN ELEVATION OF 1387.346' (NAVD 88)  
 TOWN OF PARADISE VALLEY DATUM, GDACS# 24034-1.

**BASIS OF BEARINGS**  
 THE MONUMENT LINE OF STELLA LANE, THE BEARING OF WHICH IS  
 N89°43'03"W, PER BOOK 681 OF MAPS, PAGE 10, RECORDS OF MARICOPA  
 COUNTY, ARIZONA.

**LEGAL DESCRIPTION**  
 LOT 6, THE PRESERVE AT LINCOLN, ACCORDING TO BOOK 681 OF MAPS,  
 PAGE 10, RECORDS OF MARICOPA COUNTY, ARIZONA.

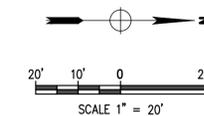
**FLOOD INSURANCE RATE MAP (FIRM) DATA**

COMMUNITY #	PANEL #	SUFFIX	BASE FLOOD ELEVATION
040049	1745 OF 4425	L	N/A
MAP #	PANEL DATE	FIRM INDEX DATE	ZONE
04013C	10/16/2013	11/04/2015	X*

\*AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN

**LEGEND**

- DRAINAGE FLOW
- SPOT ELEVATION
- TRIBUTARY AREA BOUNDARY
- FLOW LINE
- PIPE/CULVERT



DATE:	08/21/19
DESIGNED BY:	NP
DRAWN BY:	AT
CHECKED BY:	NP
DATE:	08/21/19
SCALE:	1"=20'
JOB:	1901017
VERSION:	1.1
PLOT DATE:	08/21/19

**DRAINAGE MAP**

**LOT 6 -  
 PRESERVE AT LINCOLN  
 3310 E STELLA LN.,  
 PARADISE VALLEY,  
 AZ 85253**

P. 602.889.1984 | F. 602.445.9482  
 8808 N CENTRAL AVE., SUITE 288  
 PHOENIX, AZ 85020  
 PHOENIXLANDGEN.COM



# EXHIBIT 2

STELLA LANE

CULVERT INLET

PROJECT SITE

LINCOLN DRIVE





LINCOLN DRIVE

PROJECT SITE

CULVERT INLET

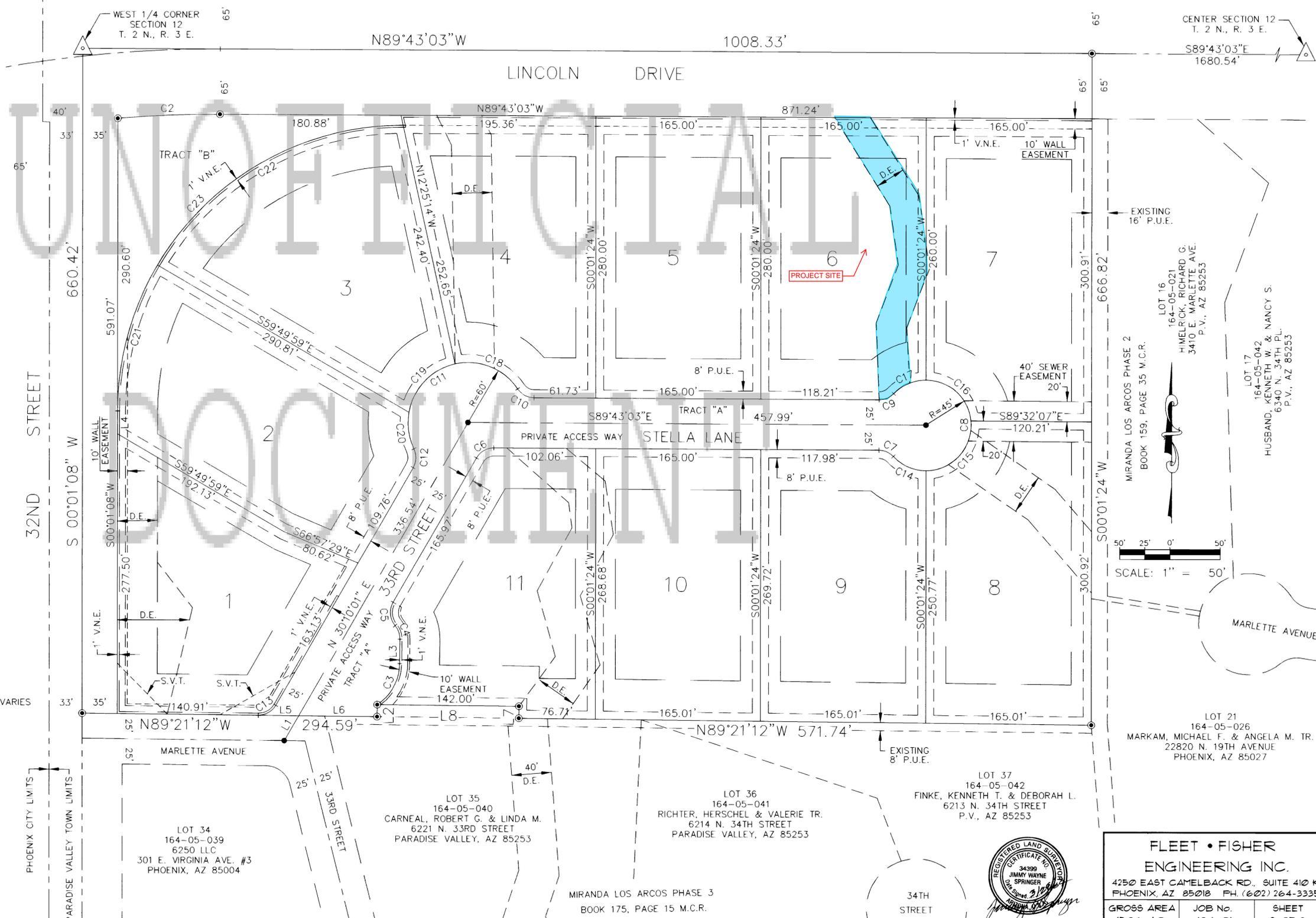
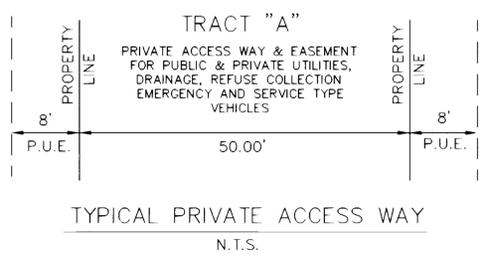
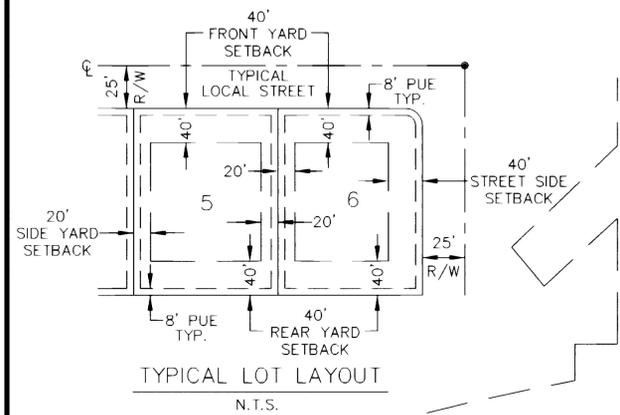
STELLA LANE

681-10

# FINAL PLAT "THE PRESERVE AT LINCOLN"

A SUBDIVISION OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF THE  
 SOUTHWEST QUARTER OF SECTION 12, AND THE WEST HALF OF THE NORTHEAST QUARTER OF  
 THE NORTHWEST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 12, TOWNSHIP 2 NORTH,  
 RANGE 3 EAST OF THE GILA AND SALT RIVER BASE & MERIDIAN, MARICOPA COUNTY, ARIZONA.  
 OWNER: THE ZACHER DEVELOPMENT COMPANY, L.L.C., AN ARIZONA LIMITED LIABILITY COMPANY.

SQUAW PEAK RECREATION AREA

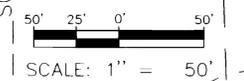


SIGHT VISIBILITY TRIANGLE N.T.S.  
 ALL STRUCTURES AND LANDSCAPING WITHIN THESE  
 VISIBILITY AREAS SHALL HAVE A 3' MAXIMUM HEIGHT.

LOT #	SQ. FT.	ACRES
1	43,968.04	1.01
2	49,405.02	1.13
3	48,839.92	1.12
4	44,320.11	1.02
5	46,200.10	1.06
6	45,665.74	1.05
7	48,215.18	1.11
8	47,816.70	1.10
9	44,049.27	1.01
10	44,417.12	1.02
11	45,757.96	1.05

LINE	LENGTH	BEARING
L1	28.72	N30°10'01"E
L2	12.00	S00°38'48"W
L3	24.08	S00°38'48"W
L4	22.97	N00°01'08"E
L5	40.39	S89°21'12"E
L6	78.29	S89°21'12"E
L7	12.00	N00°38'48"E
L8	142.00	N89°21'12"W

CURVE	LENGTH	RADIUS	TANGENT	DELTA
C2	102.20	1141.23	51.13	5°07'51"
C3	48.59	49.50	26.45	56°14'30"
C4	14.39	20.00	7.52	41°12'53"
C5	24.69	20.00	14.20	70°44'06"
C6	20.98	20.00	11.57	60°06'56"
C7	16.12	20.00	8.53	46°11'14"
C8	213.92	45.00	43.17	272°22'28"
C9	16.12	20.00	8.53	46°11'15"
C10	19.47	20.00	10.58	55°46'16"
C11	179.76	60.00	822.72	171°39'28"
C12	19.47	20.00	10.58	55°46'16"
C13	21.11	20.00	11.66	60°28'46"
C14	36.48	45.00	19.31	46°26'46"
C15	74.96	45.00	49.50	95°26'53"
C16	66.41	45.00	40.91	84°33'07"
C17	36.07	45.00	19.07	45°55'40"
C18	71.71	60.00	40.83	68°28'27"
C19	71.00	60.00	40.32	67°47'57"
C20	37.05	60.00	19.14	35°23'04"
C21	151.94	283.86	77.84	30°40'02"
C22	295.26	283.86	162.55	59°35'45"
C23	447.19	283.86	285.17	90°15'49"



LOT 21  
 164-05-026  
 MARKAM, MICHAEL F. & ANGELA M. TR.  
 22820 N. 19TH AVENUE  
 PHOENIX, AZ 85027

**FLEET • FISHER  
 ENGINEERING INC.**  
 4250 EAST CAMELBACK RD., SUITE 410 K  
 PHOENIX, AZ 85018 PH. (602) 264-3335

GROSS AREA 15.36 AC.	JOB No. 434-01	SHEET 2 OF 3
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P:\F-PLAT\434-01\PLAT2.dwg 03/29/04 07:41:29 AM UMST

RECORDER ORIGINAL

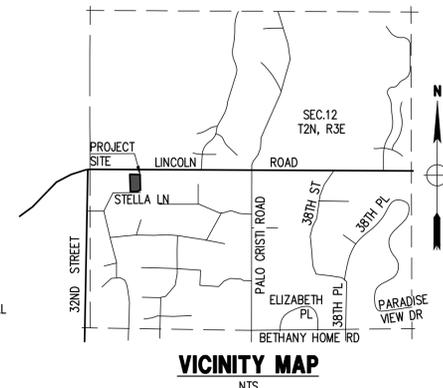
# GRADING & DRAINAGE PLAN

## GRIES RESIDENCE

### 3310 E STELLA LN., PARADISE VALLEY, AZ 85253

#### LOT 6 - PRESERVE AT LINCOLN

A SUBDIVISION PLAT RECORDED IN BOOK 681 OF MAPS, PAGE 10, MCR.,  
LOCATED IN A PORTION OF THE NE 1/4 OF THE NW 1/4 OF THE SW 1/4 OF SECTION 12, T.2N, R.3E  
OF THE GILA & SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA



### TOWN OF PARADISE VALLEY NOTES

- PRIOR TO THE FIRST INSPECTION OF STRUCTURES WITHIN 3 FEET OF A SETBACK LINE, THE PROPERTY PINS SHALL BE PLACED BY A REGISTERED CIVIL ENGINEER OR LAND SURVEYOR OF THE STATE OF ARIZONA, AND THE PROPERTY LINE(S) IDENTIFIED.
- WHERE EXCAVATION IS TO OCCUR THE TOP 4" OF EXCAVATED NATIVE SOIL SHALL REMAIN ON THE SITE AND SHALL BE REUSED IN A MANNER THAT TAKES ADVANTAGE OF THE NATURAL SOIL SEED BANK IT CONTAINS.
- ALL WORK REQUIRED TO COMPLETE THE CONSTRUCTION COVERED BY THIS PLAN SHALL BE IN ACCORDANCE WITH THE MARICOPA ASSOCIATION OF GOVERNMENTS (M.A.G.) STANDARD SPECIFICATIONS AND DETAILS AND CURRENT SUPPLEMENTS THEREOF PER THE LOCAL MUNICIPALITY UNLESS SPECIFIED OTHERWISE IN THESE PLANS OR ELSEWHERE IN THE CONTRACT DOCUMENTS.
- THE CONTRACTOR IS TO COMPLY WITH ALL LOCAL, STATE, AND FEDERAL LAWS AND REGULATIONS APPLICABLE TO THE CONSTRUCTION COVERED BY THIS PLAN.
- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND COMPLYING WITH ALL PERMITS REQUIRED TO COMPLETE ALL WORK COVERED BY THIS PLAN.
- ALL EXTERIOR SITE LIGHTING SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS FOR TYPE, LOCATION, HEIGHT, WATTAGE, AND LUMEN BASED UPON THE FIXTURES INSTALLED PURSUANT TO SECTION 1023 OF THE TOWN OF PARADISE VALLEY ZONING ORDINANCE FOR NON-HILLSIDE PROPERTIES, SECTION 2208 OF THE TOWN OF PARADISE VALLEY ZONING ORDINANCE FOR HILLSIDE PROPERTIES, OR AS SPECIFIED IN THE SPECIAL USE PERMIT FOR SPECIAL USE PERMIT PROPERTIES.
- A DUST CONTROL PLAN AND PERMIT MEETING THE REQUIREMENTS OF RULE 310 OF THE MARICOPA COUNTY AIR POLLUTION CONTROL REGULATIONS, AS AMENDED, IS REQUIRED.
- A SEPARATE RIGHT-OF-WAY PERMIT IS NECESSARY FOR ANY OFF-SITE CONSTRUCTION.
- AN APPROVED GRADING AND DRAINAGE PLAN SHALL BE ON THE JOB SITE AT ALL TIMES. DEVIATIONS FROM THE PLAN MUST BE PRECEDED BY AN APPROVED PLAN REVISION.
- EAVE PROJECTIONS INTO REQUIRED SETBACKS ARE LIMITED TO A MAXIMUM OF 24" PURSUANT TO SECTION 1008 OF THE TOWN OF PARADISE VALLEY ZONING ORDINANCES.
- ALL STRUCTURES AND LANDSCAPING WITHIN THE SIGHT VISIBILITY TRIANGLE SHALL HAVE A 2 FOOT MAXIMUM HEIGHT.
- ALL NEW AND EXISTING ELECTRICAL SERVICE LINES SHALL BE BURIED PER THE TOWN OF PARADISE VALLEY REQUIREMENTS.
- IT SHALL BE THE RESPONSIBILITY OF THE PERMITTEE TO ARRANGE FOR THE RELOCATION AND RELOCATION COSTS OF ALL UTILITIES, AND TO SUBMIT A UTILITY RELOCATION SCHEDULE PRIOR TO THE ISSUANCE OF AN ENGINEERING CONSTRUCTION PERMIT.
- EXISTING AND/OR NEW UTILITY CABINETS AND PEDESTALS SHALL BE LOCATED A MINIMUM OF 4 BEHIND ULTIMATE BACK OF CURB LOCATION.
- POOL, SPA, BARBECUE AND ANY PROPOSED STRUCTURES OVER 8' ABOVE GRADE REQUIRE SEPARATE PERMIT APPLICATIONS.
- POOLS SHALL BE CONSTRUCTED BY SEPARATE PERMIT AND SECURED FROM UNWANTED ACCESS PER TOWN CODE, ARTICLE 5-2.
- ALL FILL MATERIAL UNDER SLABS AND WALKS SHALL BE COMPACTED TO NOT LESS THAN 95% SETBACK CERTIFICATION IS REQUIRED AND SHALL BE PROVIDED TO TOWN INSPECTOR PRIOR TO STEM WALL INSPECTION.
- FOR BUILDING PADS THAT HAVE 1 OR MORE OF FILL MATERIAL, SOILS COMPACTION TEST RESULTS ARE REQUIRED AND SHALL BE PROVIDED TO TOWN INSPECTOR PRIOR TO PRE-SLAB INSPECTION.
- FINISHED FLOOR ELEVATION CERTIFICATION IS REQUIRED AND SHALL BE PROVIDED TO TOWN INSPECTOR PRIOR TO FRAMING INSPECTION.
- MAIL BOXES SHALL COMPLY WITH THE TOWN OF PARADISE VALLEY STANDARDS FOR MAIL BOXES IN THE RIGHT-OF-WAY FOR HEIGHT, WIDTH AND BREAK AWAY FEATURES.
- ALL PATIOS, WALKS, AND DRIVES TO SLOPE AWAY FROM BUILDING AND GARAGES AT A MINIMUM SLOPE OF 1/4" PER FOOT UNLESS SPECIFIED OTHERWISE.
- TRENCH BEDDING AND SHADING SHALL BE FREE OF ROCKS AND DEBRIS.
- THE TOWN ONLY APPROVES THE SCOPE OF WORK AND NOT THE ENGINEERING DESIGN. ANY CONSTRUCTION QUANTITIES SHOWN ARE NOT VERIFIED BY THE TOWN.
- THE APPROVAL OF THE PLANS IS VALID FOR 180 DAYS. IF A PERMIT FOR CONSTRUCTION HAS NOT BEEN ISSUED WITHIN 180 DAYS, THE PERMIT MUST BE RENEWED.
- A TOWN INSPECTOR WILL INSPECT ALL WORK WITHIN THE TOWN'S RIGHTS-OF-WAY. NOTIFY TOWN INSPECTION SERVICES TO SCHEDULE A PRECONSTRUCTION MEETING PRIOR TO STARTING CONSTRUCTION.
- WHENEVER EXCAVATION IS NECESSARY, CALL ARIZONA811 BY DIALING 811 OR 602-263-1100, TWO (2) WORKING DAYS BEFORE EXCAVATION BEGINS.
- EXCAVATIONS SHALL COMPLY WITH REQUIREMENTS OF OSHA EXCAVATION STANDARDS (29 CFR, PART 1926, SUBPART P), UNDER NO CIRCUMSTANCES WILL THE CONTRACTORS BE ALLOWED TO WORK IN A TRENCH LOCATED WITHIN THE TOWN'S RIGHT-OF-WAY WITHOUT PROPER SHORING OR EXCAVATION METHODS.
- PERMIT HOLDER SHALL POST A 6 SQUARE FOOT (2'x3') IDENTIFICATION SIGN, MADE OF DURABLE MATERIAL, IN THE FRONT YARD OF SUBJECT PROPERTY AND NOT IN THE TOWN'S RIGHT-OF-WAY. THE SIGN MAY NOT EXCEED A MAXIMUM OF 6 FEET IN HEIGHT FROM GRADE TO TOP OF THE SIGN. THE SIGN MUST INCLUDE THE PERMITTEE OR COMPANY NAME, PHONE NUMBER, TYPE OF WORK, ADDRESS OF PROJECT AND TOWN CONTACT NUMBER, 480-348-3556.
- WHEN DEEMED NECESSARY, A 6-FOOT HIGH CHAIN LINK FENCE MUST BE INSTALLED AROUND THE CONSTRUCTION AREA TO PREVENT ANY POTENTIAL SAFETY HAZARD FOR THE PUBLIC. THE FENCE SHALL BE SETBACK AT LEAST 10 FEET FROM ALL RIGHTS-OF-WAY AND HAVE A 50-FOOT STREET CORNER SITE TRIANGLE WHERE APPLICABLE.
- CLEAR ACCESS FOR NEIGHBORING PROPERTIES AND EMERGENCY VEHICLES MUST BE MAINTAINED AT ALL TIMES. CONSTRUCTION RELATED VEHICLES MUST BE LEGALLY PARKED ONLY ON ONE SIDE OF THE STREET OR JOB SITE PROPERTY.
- ALL CONSTRUCTION DEBRIS AND EQUIPMENT MUST BE CONTAINED ON SITE AT ALL TIMES. CONTRACTOR AND PROPERTY OWNER MUST MAINTAIN THE JOB SITE FREE OF LITTER AND UNSIGHTLY MATERIALS AT ALL TIMES. CONSTRUCTION MATERIALS ARE PROHIBITED IN THE TOWN'S RIGHT-OF-WAY.
- CONSTRUCTION ACTIVITIES ARE PERMITTED BETWEEN THE HOURS OF 7 AM AND 5 PM MONDAY THROUGH CONSTRUCTION ACTIVITIES MAY START ONE (1) HOUR EARLIER DURING THE SUMMER (MAY 1ST THROUGH SEPTEMBER 30TH).
- THE USE AND OPERATION OF FUEL-FIRED GENERATORS IS PROHIBITED UNLESS DUE TO A HARDSHIP. TOWN APPROVAL SHALL BE REQUIRED.
- THE CONTRACTOR AND PROPERTY OWNER SHALL BE LIABLE FOR ANY DAMAGE DONE TO ANY PUBLIC PROPERTY AS A RESULT OF ANY CONSTRUCTION OR CONSTRUCTION RELATED ACTIVITIES. NO CERTIFICATE OF OCCUPANCY WILL BE ISSUED UNTIL ALL AFFECTED RIGHTS-OF-WAY ARE CLEANED AND/OR REPAIRED TO THEIR ORIGINAL CONDITION AND UNTIL ANY AND ALL DAMAGES TO AFFECTED PROPERTIES ARE RESTORED TO ORIGINAL CONDITION.
- A KEYSWITCH SHALL BE REQUIRED ON ALL NEW AND EXISTING ELECTRIC ENTRY GATES. THE KEYSWITCH SHALL BE INSTALLED IN A LOCATION THAT IS READILY VISIBLE AND ACCESSIBLE. KNOX BOX ORDER FORMS ARE AVAILABLE AT THE TOWN'S BUILDING SAFETY DEPARTMENT.
- PROPERTY OWNER, BUILDER, OR GENERAL CONTRACTOR WILL BE RESPONSIBLE FOR CONTROLLING DUST FROM THE SITE AT ALL TIMES. ALL MEANS NECESSARY SHALL BE USED BY THE BUILDER OR GENERAL CONTRACTOR TO CONTROL THE EXISTENCE OF DUST CAUSED BY ANY EARTHWORK. SPRAY APPLICATION OF MATERIALS, OR OTHER DUST-CAUSING PRACTICES REQUIRED BY THE CONSTRUCTION PROCESS.
- APPROVAL OF THESE PLANS ARE FOR PERMIT PURPOSES ONLY AND SHALL NOT PREVENT THE TOWN FROM REQUIRING CORRECTION OF ERRORS IN THE PLANS WHERE SUCH ERRORS ARE SUBSEQUENTLY FOUND TO BE IN VIOLATION OF ANY LAW, ORDINANCE, HEALTH, SAFETY, OR OTHER DESIGN ISSUES.
- ALL DRAINAGE PROTECTIVE DEVICES SUCH AS SWALES, INTERCEPTOR DITCHES, PIPES PROTECTIVE BERMS, CONCRETE CHANNELS OR OTHER MEASURES DESIGNED TO PROTECT PROPOSED AND EXISTING IMPROVEMENTS FROM RUNOFF OR DAMAGE FROM STORM WATER, MUST BE CONSTRUCTED PRIOR TO THE CONSTRUCTION OF ANY IMPROVEMENTS.

### ENGINEERS NOTES

- MARICOPA ASSOCIATION OF GOVERNMENTS (M.A.G.) UNIFORM STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION (LATEST EDITION INCLUDING LATEST REVISION AND CURRENT SUPPLEMENTS THEREOF PER THE LOCAL TOWN OR CITY) ARE INCORPORATED INTO THIS PLAN IN THEIR ENTIRETY.
- ALL WORK REQUIRED TO COMPLETE THE CONSTRUCTION COVERED BY THIS PLAN SHALL BE IN ACCORDANCE WITH THE M.A.G. STANDARD SPECIFICATIONS AND DETAILS AND CURRENT SUPPLEMENTS THEREOF PER THE LOCAL CITY OR TOWN UNLESS SPECIFIED OTHERWISE IN THESE PLANS OR ELSEWHERE IN THE CONTRACT DOCUMENTS. CONTRACTORS SHALL FAMILIARIZE THEMSELVES WITH ALL REQUIRED STANDARD SPECIFICATIONS, DETAILS AND SUPPLEMENTS PRIOR TO BIDDING THE WORK FOR THE CONSTRUCTION COVERED BY THIS PLAN. GRADING SHALL BE IN CONFORMANCE WITH 2015 IBC SEC. 1803 AND APPENDIX J.
- 5% MINIMUM SLOPE AWAY FROM BUILDING FOR A MINIMUM 10', UN.O.
- ALL CONSTRUCTION SHALL CONFORM TO THE LATEST MARICOPA ASSOCIATION OF GOVERNMENTS (M.A.G.) SPECIFICATIONS AND STANDARD DETAILS.
- A DUST CONTROL PLAN MEETING THE REQUIREMENTS OF RULE 310 OF THE MARICOPA COUNTY AIR POLLUTION CONTROL REGULATIONS, AS AMENDED, IS REQUIRED.
- A SEPARATE PERMIT IS NECESSARY FOR ANY OFFSITE CONSTRUCTION.
- AN APPROVED GRADING AND DRAINAGE PLAN SHALL BE ON THE JOB SITE AT ALL TIMES. DEVIATIONS FROM THE PLAN MUST BE PRECEDED BY AN APPROVED PLAN REVISION.
- ALL DRAINAGE PROTECTIVE DEVICES SUCH AS SWALES, INTERCEPTOR DITCHES, PIPES, PROTECTIVE BERMS, BARRIER WALLS, CONCRETE CHANNELS OR OTHER MEASURES DESIGNED TO PROTECT ADJACENT BUILDINGS OR PROPERTY FROM STORM RUNOFF MUST BE COMPLETED PRIOR TO BUILDING CONSTRUCTION.
- ALL STRUCTURES AND LANDSCAPING WITHIN THE SIGHT VISIBILITY TRIANGLE SHALL HAVE A 2 FOOT MAXIMUM HEIGHT.
- ALL PATIOS, WALKS, AND DRIVES TO SLOPE AWAY FROM BUILDING AND GARAGES AT A MINIMUM SLOPE OF 1/4" PER FOOT UNLESS SPECIFIED OTHERWISE. ALL LAWN AREAS ADJOINING WALKS OR SLABS WILL BE GRADED TO 2" BELOW THE TOP OF SLAB. TYPICAL FINISHED GRADE AROUND PERIMETER OF BUILDING IS MINUS 6" BELOW FINISHED FLOOR UNLESS SPECIFIED OTHERWISE.
- ALL MATERIAL TO BE UNDER SLABS AND WALKS SHALL BE COMPACTED TO NOT LESS THAN 95% PER ASTM D698.
- THE QUANTITIES AND SITE CONDITIONS DEPICTED IN THESE PLANS ARE FOR INFORMATIONAL PURPOSES ONLY AND ARE SUBJECT TO ERROR AND OMISSION. CONTRACTORS SHALL SATISFY THEMSELVES AS TO ACTUAL QUANTITIES AND SITE CONDITIONS PRIOR TO BIDDING THE WORK FOR THE CONSTRUCTION COVERED BY THIS PLAN.
- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND COMPLYING WITH ALL PERMITS REQUIRED TO COMPLETE ALL WORK COVERED BY THIS PLAN.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL METHODS, SEQUENCING, AND SAFETY CONCERNS ASSOCIATED WITH THIS PROJECT DURING CONSTRUCTION, UNLESS SPECIFICALLY ADDRESSED OTHERWISE IN THIS PLAN OR ELSEWHERE.
- A REASONABLE EFFORT HAS BEEN MADE TO SHOW THE LOCATIONS OF EXISTING UNDERGROUND FACILITIES AND UTILITIES IN THE CONSTRUCTION AREA. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO UTILITIES AND/OR FACILITIES CAUSED DURING THEIR CONSTRUCTION OPERATIONS. THE CONTRACTOR SHALL CALL 48 HOURS IN ADVANCE FOR BLUE STAKE (1-800-STAKE-IT) PRIOR TO ANY EXCAVATION.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL COORDINATION OF CONSTRUCTION AFFECTING UTILITIES AND THE COORDINATION OF ANY NECESSARY UTILITY RELOCATION WORK.
- ALL PAVING, GRADING, EXCAVATION, TRENCHING, PIPE BEDDING, CUT, FILL AND BACKFILL SHALL COMPLY WITH THE RECOMMENDATIONS SET FORTH IN THE SOILS (GEOTECHNICAL) REPORT FOR THIS PROJECT IN ADDITION TO THE REFERENCED REQUIRED SPECIFICATIONS AND DETAILS.
- THE CONTRACTOR IS TO VERIFY THE LOCATION AND THE ELEVATIONS OF ALL EXISTING UTILITIES AT POINTS OF TIE-IN PRIOR TO COMMENCING ANY NEW CONSTRUCTION. SHOULD ANY LOCATION OR ELEVATION DIFFER FROM THAT SHOWN ON THESE PLANS, THE CONTRACTOR SHALL CONTACT THE OWNER'S AGENT.
- CONTRACTOR TO VERIFY AND COORDINATE ALL DIMENSIONS AND SITE LAYOUT WITH ARCHITECTURE'S FINAL SITE PLAN AND FINAL BUILDING DIMENSIONS BEFORE STARTING WORK. REPORT DISCREPANCIES TO OWNER'S AGENT.
- COORDINATION BETWEEN ALL PARTIES IS ESSENTIAL PART OF CONTRACT.
- CONTRACTOR IS RESPONSIBLE FOR PROJECT AND SITE CONDITIONS, AND TO WORK WITH WEATHER CONDITIONS AS THE PROJECT SITE MAY BE LOCATED IN A FLOOD PRONE AREA AND SUBJECT TO FLOODING AND ITS HAZARDS.
- THE CONTRACTOR IS TO VERIFY THE LOCATION, ELEVATION, CONDITION, AND PAVEMENT CROSS-SLOPE OF ALL EXISTING SURFACES AT POINTS OF TIE-IN AND MATCHING, PRIOR TO COMMENCEMENT OF GRADING, PAVING, CURB AND GUTTER, OR OTHER SURFACE CONSTRUCTION. SHOULD EXISTING LOCATIONS, ELEVATIONS, CONDITION, OR PAVEMENT CROSS-SLOPE DIFFER FROM THAT SHOWN ON THESE PLANS, RESULTING IN THE DESIGN INTENT REFLECTED ON THESE PLANS NOT ABLE TO BE CONSTRUCTED, THE CONTRACTOR SHALL NOTIFY THE OWNER'S AGENT IMMEDIATELY FOR DIRECTION ON HOW TO PROCEED PRIOR TO COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR ACCEPTS RESPONSIBILITY FOR ALL COSTS ASSOCIATED WITH CORRECTIVE ACTION IF THESE PROCEDURES ARE NOT FOLLOWED.
- CONTRACTOR IS RESPONSIBLE TO COORDINATE UTILITY CROSSINGS AT CULVERT CROSSINGS BEFORE STARTING WORK ON CULVERTS. COORDINATE WITH OWNER REPRESENTATIVE. VERIFY UTILITY LINES AND/OR CONDUITS ARE IN PLACE BEFORE STARTING CULVERT WORK.
- ALL ON-SITE UTILITIES PER OTHERS.
- THIS PROJECT REQUIRES A REGULAR ONGOING MAINTENANCE PROGRAM FOR THE DESIGNED DRAINAGE SYSTEM(S) TO PRESERVE THE DESIGN INTEGRITY AND THE ABILITY TO PERFORM ITS OPERATIONAL INTENT. FAILURE TO PROVIDE MAINTENANCE WILL JEOPARDIZE THE DRAINAGE SYSTEM(S) PERFORMANCE AND MAY LEAD TO IT'S INABILITY TO PERFORM PROPERLY AND/OR CAUSE DAMAGE ELSEWHERE IN THE PROJECT.
- IF A DISCREPANCY IS FOUND BETWEEN ENGINEER'S PLAN OR SURVEYOR'S STAKING AND THE ARCHITECTURAL PLAN, ENGINEER SHALL BE NOTIFIED IMMEDIATELY. FAILURE TO NOTIFY ENGINEER SHALL NEGATE ENGINEER'S LIABILITY.
- ALL DISTURBED AREAS ARE TO BE ROPED AND ROPING MUST MATCH PLAN.
- VEGETATION OUTSIDE OF CONSTRUCTION AREA TO REMAIN.
- AREAS OUTSIDE THE WALL AND CUT AND FILL SLOPES SHALL BE REVEGETATED WITH SIMILAR PLANT TYPES AND DENSITIES FOUND ON THE SITE. REVEGETATION SHALL BE COMPLETED PRIOR TO OCCUPANCY AND THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
- MECHANICAL EQUIPMENT SHALL BE SCREENED TO A MINIMUM OF ONE FOOT ABOVE TOP OF EQUIPMENT.
- ANY FUTURE IMPROVEMENTS SHOWN HEREON SHALL REQUIRE A SEPARATE PERMIT.
- ANY POINTS OF DRAINAGE CONCENTRATION SHOULD BE PROTECTED AGAINST EROSION WITH NATIVE STONE.
- THIS PLAN IS DESIGNED TO SHOW SITE GRADING AND DRAINAGE CONTRACTOR SHALL USE THE ARCHITECTURAL SITE PLAN TO DETERMINE FINAL HOUSE, WALL, STEP, ETC., LOCATIONS AND ELEVATIONS.
- ALL DRAINAGE FACILITIES TO BE MAINTAINED BY HOMEOWNER.
- SEE ARCHITECTURAL AND STRUCTURAL PLANS FOR SITE AND RETAINING WALLS LAYOUT, DIMENSIONS, AND DETAILS. TOP OF FOOTING ELEVATIONS SHOWN IN PLAN ARE APPROXIMATE ONLY. ACTUAL TOP OF FOOTINGS TO BE DETERMINED AT TIME OF CONSTRUCTION AND TO BE A MINIMUM OF SIX INCHES BELOW EXISTING NATURAL GRADE OR FINISHED GRADE WHICHEVER IS LOWER (TYPICAL).
- REFER TO ARCHITECTURAL DRAWINGS FOR BUILDING LAYOUT, DIMENSIONS AND ELEVATIONS.
- REFER TO STRUCTURAL DRAWINGS, DETAILS AND CALCULATIONS FOR ALL PROPOSED RETAINING WALLS.
- FOR CHANGE IN ELEVATION THAT ARE GREATER THAN 30", PROVIDE 36" HIGH GUARDRAILS FOR TOTAL OF 42" FALL PROTECTION BARRIER UN.O.
- ALL WATER AND SEWER LINES AND CONNECTIONS MUST BE INSTALLED PER IPC 2015, MAG AND CITY OF PHOENIX SUPPLEMENT TO MAG.
- ALL PIPES AND FITTINGS SHALL BE INSTALLED PER MANUFACTURE'S SPECIFICATIONS AND DETAILS.
- ABANDONMENT OR REMOVAL OF EXISTING SEPTIC SYSTEMS SHALL BE PERFORMED IN ACCORDANCE WITH THE MARICOPA COUNTY ENVIRONMENTAL SERVICES DEPARTMENT RULES AND STANDARDS, AND WILL REQUIRE SEPARATE PERMIT.
- COORDINATE RIPRAP COLOR WITH LANDSCAPE PLANS AND DETAILS.
- VERIFY AND COORDINATE WITH ARCHITECTURAL AND LANDSCAPE PLANS LOCATION AND HEIGHT OF ALL SITE WALLS.
- DISTURBED AREA 1.076 > 1 ACRE; NPDES PERMIT IS REQUIRED.
- REFER TO ARCHITECTURAL PLANS AND DETAILS FOR DEMOLITION OF EXISTING BUILDING STRUCTURE, SITE WALLS AND PAVEMENT.
- VERIFY AND COORDINATE WITH LANDSCAPE PLANS FINAL LOCATION AND GRATE TYPE OF SPECIFIED AREA DRAINS AND TRENCH DRAINS.

### LEGEND

- SECTION CORNER
- 1/4 QUARTER
- BRASS CAP IN HANDHOLE
- BRASS CAP FLUSH
- FOUND REBAR AS NOTED
- CALCULATED POINT
- PROPERTY LINE
- EASEMENT LINE
- MONUMENT LINE
- FIRE HYDRANT
- WATER METER
- SEWER MANHOLE
- WATER VALVE
- CABLE TV RISER
- TELEPHONE PEDESTAL
- SIGN
- IRRIGATION CONTROL BOX
- MAILBOX
- COMMUNICATIONS LINE
- CATV, PHONE
- SEWER LINE
- GAS LINE
- WATER LINE
- ELECTRIC LINE
- EXISTING CONTOUR
- EXIST. DRAINAGE FLOW
- EXIST. SPOT ELEVATION
- TREE
- SAQUARO
- BARREL CACTUS
- PROPOSED SPOT ELEVATION
- PROPOSED CONTOUR
- CATCH BASIN
- STORM DRAIN PIPE
- TOP OF WALL
- TOP OF RETAINING WALL
- FINISH GRADE
- BACK OF WALL
- TOP OF FOOTING

### ABBREVIATIONS

- BC BACK OF CURB
- BSL BUILDING SETBACK LINE
- C CENTERLINE
- DE DRAINAGE EASEMENT
- EG EXISTING GRADE
- EL ELEVATION
- EP EDGE OF PAVEMENT
- ESMT EASEMENT
- EX, EXIST. EXISTING
- FG FINISH GRADE
- FD FOUND
- G GUTTER, GAS
- M MEASURED
- MCR MARICOPA COUNTY RECORDER
- MH MANHOLE
- P, PVMT PAVEMENT
- PUE PUBLIC UTILITY EASEMENT
- (R), REC. RECORDED
- R RADIUS
- R/W RIGHT OF WAY
- T TANGENT, TELEPHONE
- TC TOP OF CURB
- TG TOP OF GRATE
- TPV TOWN OF PARADISE VALLEY
- W WEST, WATERLINE
- WDO WALL DRAINAGE OPENING
- WM WATER METER

### GRADING SPECIFICATIONS

- EXCAVATION AND GRADING OF THIS SITE IS CLASSIFIED AS "ENGINEERED GRADING" PER 2015 I.B.C. AND WILL BE PERFORMED ACCORDINGLY.
- THE CONTRACTOR WILL RETAIN A SOILS ENGINEER DURING CONSTRUCTION TO INSPECT PROGRESS OF CONSTRUCTION, CONCERNING PREPARATION OF GROUND TO RECEIVE FILLS, TESTING AND REQUIRED COMPACTION STABILITY OF ALL FINISH SLOPES INCLUDING CUT SLOPES.
- COMPACTION SHALL COMPLY WITH M.A.G. SECTION 601 AND PROVISIONS AS SET FORTH IN THE APPROVED GEOTECHNICAL REPORT.
- CUT AND FILL SLOPES SHALL BE PER THE APPROVED GEOTECHNICAL REPORT.
- ANY RETAINING WALLS ADJACENT TO THE PROPERTY LINES WILL BE UNDER THE SCOPE OF SPECIAL INSPECTION BY THE SOILS ENGINEER. THE DEVELOPER SHALL NOTIFY THE ADJOINING PROPERTY OWNERS IN WRITING, TEN DAYS PRIOR TO START OF CONSTRUCTION ON THESE WALLS PER SECTION 2903-B OF I.B.C. THE DEVELOPER WILL HAVE TO PROVIDE MEANS OF PROTECTION OF ADJACENT PROPERTY WHILE THIS WORK IS UNDER CONSTRUCTION.
- THE USE OF HYDRAULIC RAM HAMMERS AND HEAVY EQUIPMENT SHALL BE LIMITED TO USE BETWEEN THE HOURS OF 7:00AM AND 6:00PM MONDAY THROUGH SATURDAY WITH NO WORK ON SUNDAY.

### EARTHWORK QUANTITIES

CUT: 1,989 C.Y.  
FILL: 727 C.Y.  
NET CUT: 1,262 C.Y.

ALL QUANTITIES LISTED ON THESE PLANS ARE ESTIMATES ONLY. NO SHRINK OR SWELL IS ASSUMED. THE CONTRACTOR SHALL MAKE THEIR OWN DETERMINATION OF THE QUANTITIES AND BASE THEIR BIDS ON THEIR ESTIMATES.

### UTILITIES

WATER: CITY OF PHOENIX  
SANITARY SEWER: CITY OF PHOENIX  
ELECTRIC: SRP  
TELEPHONE: CENTURY LINK, COX COMMUNICATIONS  
NATURAL GAS: SOUTHWEST GAS  
CABLE TV: CENTURY LINK, COX COMMUNICATIONS

### UTILITIES NOTES

HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING UTILITIES SHOWN ON THE PLAN ARE APPROXIMATE ONLY AND WILL BE FIELD VERIFIED BY CONTRACTOR PRIOR TO START OF CONSTRUCTION WORK. CALL BLUE STAKE @ (602) 263-1100.

### NATIVE PLANTS

ALL NATIVE PLANTS IMPACTED BY CONSTRUCTION SHALL BE RELOCATED ON SITE. SEE LANDSCAPE PLAN AND NATIVE PLANT INVENTORY AND SALVAGE PLAN.

### DRAINAGE STATEMENT

- ULTIMATE STORM OUTFALL IS LOCATED NEAR THE SOUTHEASTERLY PROP. CORNER AT ELEVATION OF 1364.00'.
- PROPOSED DEVELOPMENT DOES NOT IMPACT DRAINAGE CONDITIONS OF ADJOINING LOTS.
- RETENTION IS PROVIDED FOR THE 100-YEAR, 2-HOUR STORM EVENT.
- THE FINISH FLOOR ELEVATION OF 1371.50' IS SAFE FROM INUNDATION DURING A 100-YEAR PEAK RUN-OFF EVENT IF CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PLANS.

### GEOTECHNICAL ENGINEER

VANN ENGINEERING  
9013 N 24TH AVE., SUITE 7  
PHOENIX, AZ 85021  
P: 602 943 6997  
PROJECT# 26655

### SHEET INDEX

- C-1 COVER SHEET
- C-2 IMPROVEMENT PLAN, CROSS SECTIONS
- C-3 STORM DRAIN PLAN

ON-SITE RETENTION FOR THE 100-YEAR, 2-HOUR STORM EVENT									
V=DxAcw/12									
D - RAINFALL DEPTH=2.50" (1)   A - TRIBUTARY AREA, SF   Cw - WEIGHTED RUNOFF COEFFICIENT									
DRAINAGE AREA	AREA S.F.	RUNOFF COEFFICIENT Cw	VOLUME REQUIRED C.F.	RETENTION BASIN ID	CONTOUR ELEVATION		DEPTH FT	VOLUME PROVIDED	
					HW	BTM		S.F.	C.F.
A	45,697	0.65	6,188	A1	HW	1,370.00	754	1.50	676
					BTM	1,368.50	147		
				A2	HW	1,369.00	2,090	1.50	2,182
					BTM	1,367.50	819		
				A3	HW	1,370.50	294	1.50	230
					BTM	1,369.00	13		
				A4	HW	1,370.50	743	1.50	657
					BTM	1,369.00	133		
				A5	HW	1,370.50	569	1.50	527
					BTM	1,369.00	134		
				A6	HW	1,370.50	455	1.50	409
					BTM	1,369.00	90		
				A7	HW	1,369.00	1,564	1.50	1,649
					BTM	1,367.50	635		
TOTAL			6,188					TOTAL	6,330

(1) RAINFALL DEPTH IS PER NOAA ATLAS 14, VOLUME 1, VERSION 5.

WEIGHTED RUNOFF COEFFICIENT, Cw AREA A			
SURFACE TYPE	RUNOFF COEFFICIENT C	AREA SF	C*AREA
LAWN	0.31	3,368	1,044
DESERT LANDSCAPING	0.50	25,549	12,775
TOTAL			45,697 29,760
Cw = C * AREA / TOTAL AREA			0.65

### OWNER

PRESERVATION HOLDINGS LLC  
4308 E WELDON AVE.,  
PHOENIX, AZ 85018

### ARCHITECT

KENDLE DESIGN COLLABORATIVE  
6115 N CATTLE TR.,  
SCOTTSDALE, AZ 85250  
P: 480 951 8558

### SURVEYOR

LSRS LAND SURVEYING  
33215 N 46TH WY.,  
CAVE CREEK, AZ 85331  
P: 480 650 4006

### CIVIL ENGINEER

LAND DEVELOPMENT GROUP, LLC  
8808 N CENTRAL AVE., SUITE 288  
PHOENIX, AZ 85020  
CONTACT: NICK PRODRANOV, PE  
P: 602 889 1984

### SITE DATA

APN: 164-05-125  
ADDRESS: 3310 E STELLA LN.,  
PARADISE VALLEY, AZ 85253  
ZONING: R-43  
LOT AREA: 45,697 S.F. (1.049 AC.)  
CONSTRUCTION YEAR: VACANT LOT  
QS #: 21-35  
BUILDING AREA UNDER ROOF: 9,475 S.F.  
FLOOR AREA RATIO: 20.73% < 25%

### BENCHMARK

BRASS CAP IN HANDHOLE AT MARICOPA COUNTY HIGHWAY DEPARTMENT, HAVING AN ELEVATION OF 1387.346' (NAVD 88) TOWN OF PARADISE VALLEY DATUM, GDACS# 24034-1.

### BASIS OF BEARINGS

THE MONUMENT LINE OF STELLA LANE, THE BEARING OF WHICH IS N89°43'03"W, PER BOOK 681 OF MAPS, PAGE 10, RECORDS OF MARICOPA COUNTY, ARIZONA.

### LEGAL DESCRIPTION

LOT 6, THE PRESERVE AT LINCOLN, ACCORDING TO BOOK 681 OF MAPS, PAGE 10, RECORDS OF MARICOPA COUNTY, ARIZONA.

### PROJECT DESCRIPTION

NEW SINGLE FAMILY RESIDENCE, DRIVEWAY AND POOL WITH SITE IMPROVEMENTS WITH ON-SITE RETENTION.

### FLOOD INSURANCE RATE MAP (FIRM) DATA

COMMUNITY #	PANEL #	SUFFIX L	BASE FLOOD ELEVATION
040049	1745 OF 4425		N/A
MAP # 04013C	PANEL DATE 10/16/2013	FIRM INDEX DATE 11/04/2015	ZONE X*

\*AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN

### AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE "RECORD DRAWING" MEASUREMENTS AS SHOWN HEREON WERE MADE UNDER MY SUPERVISION OR AS NOTED AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

REGISTERED ENGINEER / LAND SURVEYOR DATE

REGISTRATION NUMBER

### FINISH FLOOR CERTIFICATION

I HEREBY CERTIFY THAT FINISHED FLOOR ELEVATIONS SHOWN ON THE PLAN OF 1375.00 IS MINIMUM OF 12" ABOVE THE 100-YEAR STORM ELEVATION OF 1374.00 ACCORDING TO THE TOWN OF PARADISE VALLEY CODE OF ORDINANCE.

*Nick Prodranov* 08/23/19  
REGISTERED CIVIL ENGINEER DATE

### APPROVAL

THIS SET OF PLANS HAS BEEN REVIEWED FOR COMPLIANCE WITH TOWN OF PARADISE VALLEY REQUIREMENTS PRIOR TO ISSUANCE OF PERMIT. THE TOWN NEITHER ACCEPTS NOR ASSUMES ANY LIABILITY FOR ERRORS OR OMISSIONS. THIS COMPLIANCE APPROVAL SHALL NOT PREVENT THE TOWN ENGINEER FROM REQUIRING CORRECTIONS OF ERRORS OR OMISSIONS IN THE PLANS TO BE FOUND IN VIOLATION OF LAWS OR ORDINANCES.

TOWN ENGINEER DATE  
TOWN OF PARADISE VALLEY



**LOT 6 - PRESERVE AT LINCOLN**  
**3310 E STELLA LN., PARADISE VALLEY, AZ 85253**

**GRADING & DRAINAGE PLAN COVER SHEET**

DATE: 08/23/19  
 JOB: 1901017  
 VERSION: 1.1  
 PLOT DATE: 08/23/19

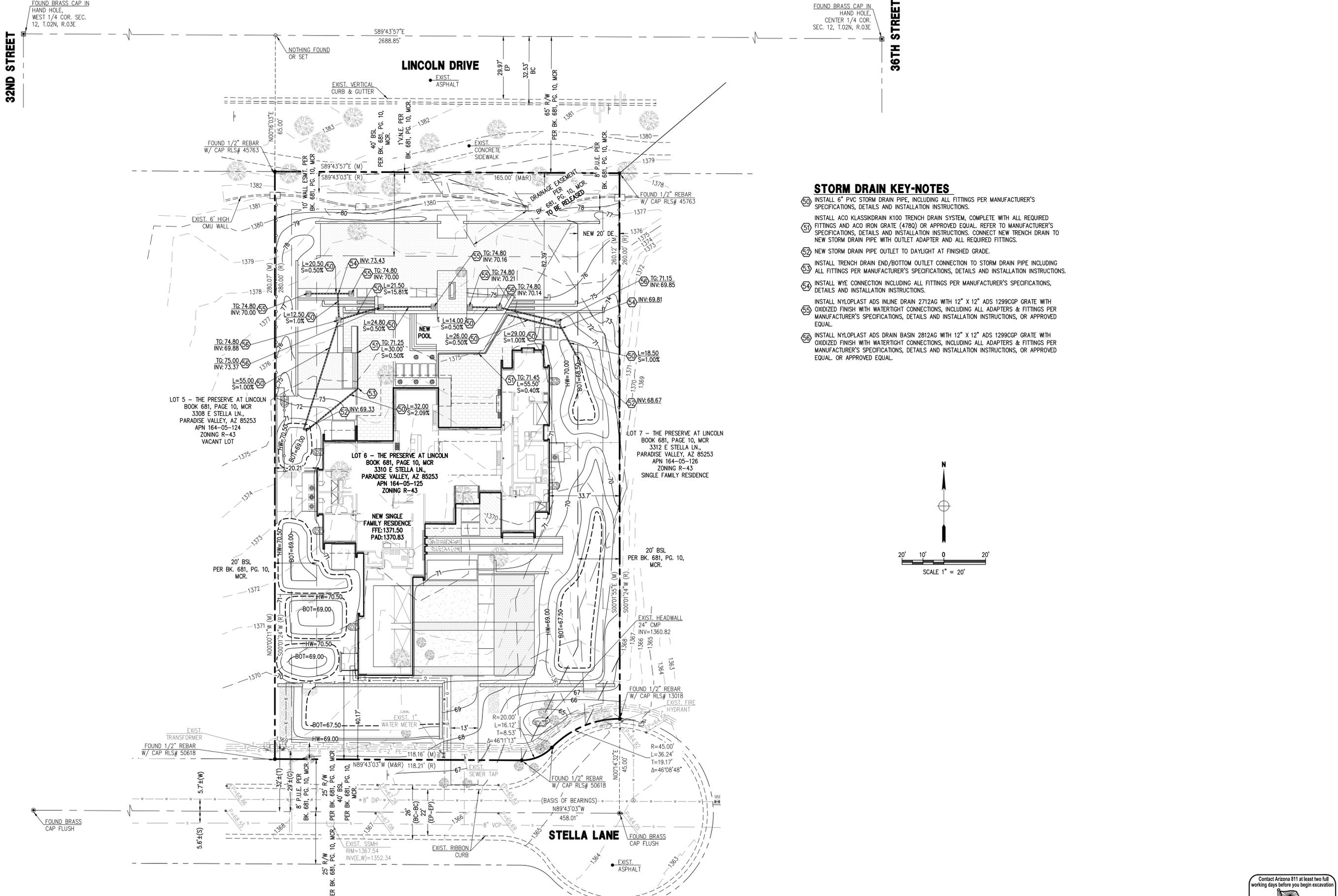
SCALE: N.T.S.  
 DESIGNED BY: JJ  
 DRAWN BY: CM  
 CHECKED BY: NP

REVISIONS:

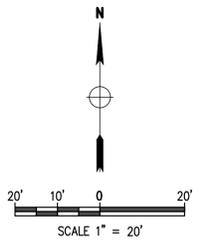
THE DRAWING IS AN INSTRUMENT OF SERVICE AND AS SUCH SHALL REMAIN THE PROPERTY OF LAND DEVELOPMENT GROUP, LLC. UNLESS OTHERWISE SPECIFIED IN WRITING, THIS INSTRUMENT OF SERVICE IS VALID FOR ONE YEAR FROM THE DATE OF ISSUANCE. ANY REVISIONS TO THIS INSTRUMENT OF SERVICE SHALL BE MADE IN WRITING AND SHALL BE SUBJECT TO THE SAME TERMS AND CONDITIONS AS THIS INSTRUMENT OF SERVICE.

P. 602 889 1984 | F. 602 44





- ### STORM DRAIN KEY-NOTES
- 50 INSTALL 6" PVC STORM DRAIN PIPE, INCLUDING ALL FITTINGS PER MANUFACTURER'S SPECIFICATIONS, DETAILS AND INSTALLATION INSTRUCTIONS.
  - 51 INSTALL ACO KLASSIDRAIN K100 TRENCH DRAIN SYSTEM, COMPLETE WITH ALL REQUIRED FITTINGS AND ACO IRON GRATE (4780) OR APPROVED EQUAL. REFER TO MANUFACTURER'S SPECIFICATIONS, DETAILS AND INSTALLATION INSTRUCTIONS. CONNECT NEW TRENCH DRAIN TO NEW STORM DRAIN PIPE WITH OUTLET ADAPTER AND ALL REQUIRED FITTINGS.
  - 52 NEW STORM DRAIN PIPE OUTLET TO DAYLIGHT AT FINISHED GRADE.
  - 53 INSTALL TRENCH DRAIN END/BOTTOM OUTLET CONNECTION TO STORM DRAIN PIPE INCLUDING ALL FITTINGS PER MANUFACTURER'S SPECIFICATIONS, DETAILS AND INSTALLATION INSTRUCTIONS.
  - 54 INSTALL WYE CONNECTION INCLUDING ALL FITTINGS PER MANUFACTURER'S SPECIFICATIONS, DETAILS AND INSTALLATION INSTRUCTIONS.
  - 55 INSTALL NYLOPLAST ADS DRAIN 2712AG WITH 12" X 12" ADS 1299CGP GRATE WITH OXIDIZED FINISH WITH WATERTIGHT CONNECTIONS, INCLUDING ALL ADAPTERS & FITTINGS PER MANUFACTURER'S SPECIFICATIONS, DETAILS AND INSTALLATION INSTRUCTIONS, OR APPROVED EQUAL.
  - 56 INSTALL NYLOPLAST ADS DRAIN BASIN 2812AG WITH 12" X 12" ADS 1299CGP GRATE WITH OXIDIZED FINISH WITH WATERTIGHT CONNECTIONS, INCLUDING ALL ADAPTERS & FITTINGS PER MANUFACTURER'S SPECIFICATIONS, DETAILS AND INSTALLATION INSTRUCTIONS, OR APPROVED EQUAL.



LOT 5 - THE PRESERVE AT LINCOLN  
BOOK 681, PAGE 10, MCR  
3308 E STELLA LN.,  
PARADISE VALLEY, AZ 85253  
APN 164-05-124  
ZONING R-43  
VACANT LOT

LOT 6 - THE PRESERVE AT LINCOLN  
BOOK 681, PAGE 10, MCR  
3310 E STELLA LN.,  
PARADISE VALLEY, AZ 85253  
APN 164-05-125  
ZONING R-43

LOT 7 - THE PRESERVE AT LINCOLN  
BOOK 681, PAGE 10, MCR  
3312 E STELLA LN.,  
PARADISE VALLEY, AZ 85253  
APN 164-05-126  
ZONING R-43  
SINGLE FAMILY RESIDENCE

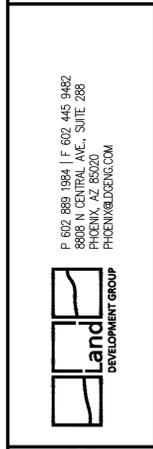
NEW SINGLE  
FAMILY RESIDENCE  
FFE:1371.50  
PAD:1370.83



DATE:	08/23/19
DESIGNED BY:	JJ
DRAWN BY:	CM
CHECKED BY:	NP
DATE:	
SCALE:	1"=20'
VERSION:	1.1
PLOT DATE:	08/23/19

## GRADING & DRAINAGE STORM DRAIN PLAN

### LOT 6 - PRESERVE AT LINCOLN 3310 E STELLA LN., PARADISE VALLEY, AZ 85253



P. 602.889.1984 | F. 602.445.9482  
8808 N CENTRAL AVE., SUITE 288  
PHOENIX, AZ 85020  
PHOENIXLANDDEV.COM

REGISTERED PROFESSIONAL ENGINEER  
CERTIFICATE NO. 41005  
NICKOLA J. PRODANOV  
Professional Engineer  
Arizona U.S.A.

**C-3**  
3 OF 3

# EXHIBIT 5

Town of Paradise Valley  
Drainage Design Management System  
PROJECT DEFAULTS

## Project

Reference	1901017
Title	3310 E Stella Ln
Location	3310 E Stella Ln., Paradise Valley, AZ 85253
Agency	Town of Paradise Valley

## Project Defaults

Model	Rational
Land Use Agency	FCDMC
Rainfall	NOAA14
Roads Agency	MCDOT
Inlets Agency	MCDOT

## Comments

Town of Paradise Valley  
 Drainage Design Management System  
**RAINFALL DATA**  
 Project Reference: 1901017

ID	Method	Duration	2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
<b>DEFAULT</b>	NOAA14	5 MIN	0.252	0.343	0.412	0.504	0.575	0.647
	NOAA14	10 MIN	0.384	0.521	0.626	0.767	0.875	0.984
	NOAA14	15 MIN	0.476	0.647	0.777	0.951	1.084	1.220
	NOAA14	30 MIN	0.641	0.870	1.046	1.280	1.460	1.643
	NOAA14	1 HOUR	0.793	1.077	1.294	1.584	1.807	2.033
	NOAA14	2 HOUR	0.905	1.210	1.443	1.760	2.000	2.251
	NOAA14	3 HOUR	0.972	1.277	1.517	1.854	2.121	2.400
	NOAA14	6 HOUR	1.158	1.484	1.742	2.095	2.371	2.660
	NOAA14	12 HOUR	1.306	1.654	1.927	2.297	2.580	2.872
	NOAA14	24 HOUR	1.553	2.014	2.378	2.885	3.285	3.703

Town of Paradise Valley  
 Drainage Design Management System  
 LAND USE  
 Project Reference: 1901017

Sub Basin	Land Use Code	Area (acres)	Area (%)	Kb	Runoff Coefficient C						Description
					2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	
<b>Major Basin ID: 01</b>											
1	130	1.00	100.0	0.040	0.48	0.48	0.48	0.53	0.58	0.70*	Large Lot Residential - Single Family (1 du per acre to 2 du
		<b>1.000</b>	<b>100.0</b>								

\* Non default value

Town of Paradise Valley  
Drainage Design Management System  
MAJOR BASINS  
Project Reference: 1901017

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Major Basin	Area (acres)	Description
01	1.00	1901017 - Major Basin

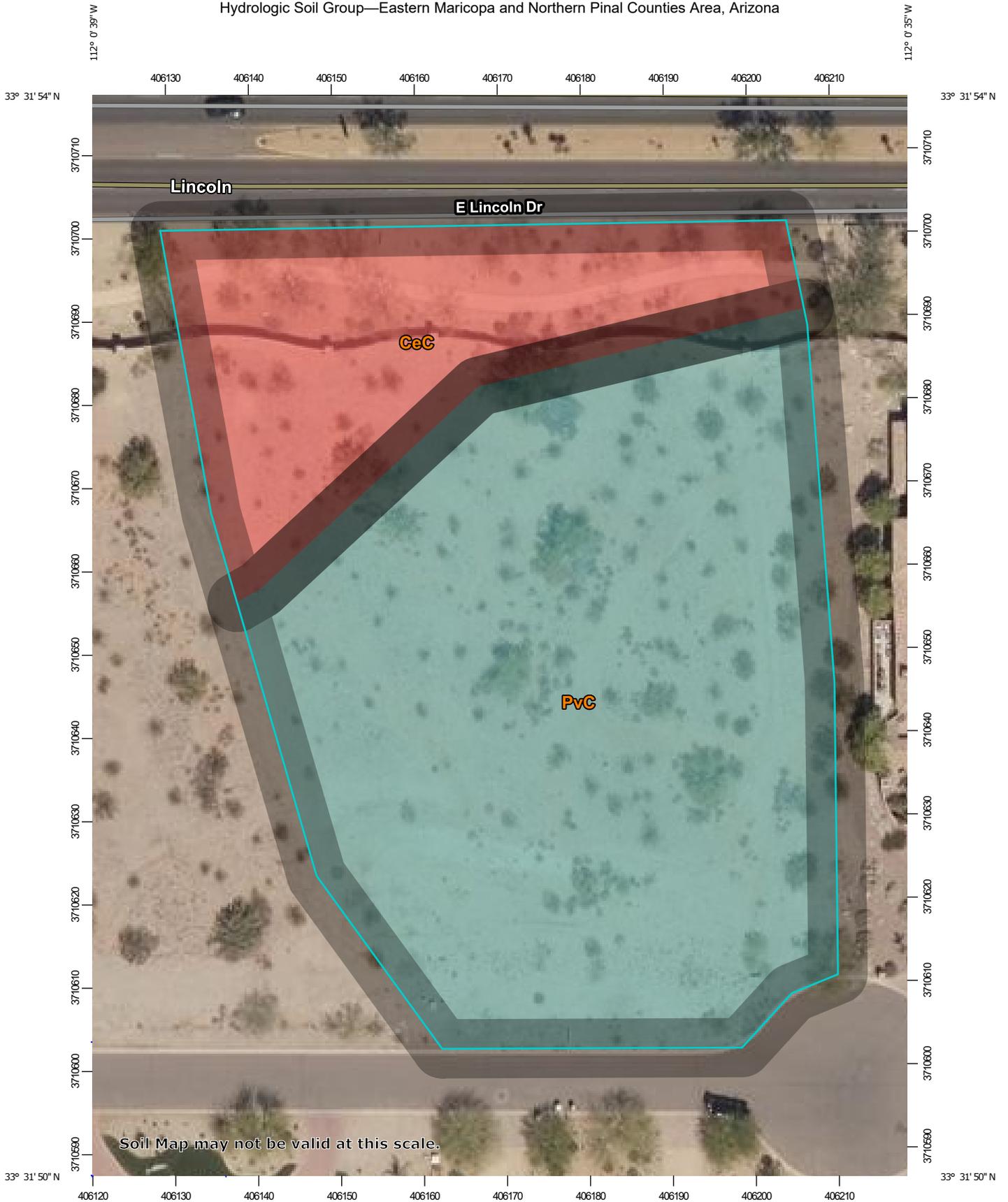
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Town of Paradise Valley  
 Drainage Design Management System  
**SUB BASINS**  
 Project Reference: 1901017

ID	Sub Basin Data						Sub Basin Hydrology Summary						
	Area (acres)	Length (ft)	USGE	DSGE	Slope (ft/mi)	Kb	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	
<b>Major Basin ID: 01</b>													
1	1.0	286	1,379.00	1,365.00	258.5	0.040	Q (cfs)	1.4	2.0	2.4	3.2	4.0	5.4
							C	0.48	0.48	0.48	0.53	0.58	0.70
							CA (ac)	0.48	0.48	0.48	0.53	0.58	0.70
							Volume (ac-ft)	0.0129	0.0184	0.0221	0.0294	0.0368	0.0496
							Tc (min)	5	5	5	5	5	5
							i (in/hr)	3.02	4.12	4.94	6.05	6.90	7.76

\* Non default value

Hydrologic Soil Group—Eastern Maricopa and Northern Pinal Counties Area, Arizona



Map Scale: 1:633 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84



## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

#### Soil Rating Polygons

 A  
 A/D  
 B  
 B/D  
 C  
 C/D  
 D  
 Not rated or not available

#### Soil Rating Lines

 A  
 A/D  
 B  
 B/D  
 C  
 C/D  
 D  
 Not rated or not available

#### Soil Rating Points

 A  
 A/D  
 B  
 B/D

 C  
 C/D  
 D  
 Not rated or not available

### Water Features

 Streams and Canals

### Transportation

 Rails  
 Interstate Highways  
 US Routes  
 Major Roads  
 Local Roads

### Background

 Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

**Warning:** Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Eastern Maricopa and Northern Pinal Counties Area, Arizona  
 Survey Area Data: Version 11, Sep 15, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 1, 2018—Jun 1, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CeC	Cavelt gravelly loam, 1 to 5 percent slopes	D	0.4	26.3%
PvC	Pinamt very gravelly loam, 3 to 5 percent slopes	C	1.2	73.7%
<b>Totals for Area of Interest</b>			<b>1.7</b>	<b>100.0%</b>

### Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

## Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Higher



**NOAA Atlas 14, Volume 1, Version 5**  
**Location name: Paradise Valley, Arizona, USA\***  
**Latitude: 33.5313°, Longitude: -112.0103°**  
**Elevation: 1370.52 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 Tryppaluk, 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>0.193</b> (0.161-0.235)	<b>0.252</b> (0.212-0.307)	<b>0.342</b> (0.285-0.415)	<b>0.411</b> (0.340-0.496)	<b>0.503</b> (0.410-0.605)	<b>0.574</b> (0.462-0.687)	<b>0.646</b> (0.510-0.770)	<b>0.719</b> (0.559-0.857)	<b>0.816</b> (0.619-0.974)	<b>0.890</b> (0.662-1.07)
<b>10-min</b>	<b>0.293</b> (0.245-0.357)	<b>0.383</b> (0.322-0.467)	<b>0.521</b> (0.434-0.632)	<b>0.625</b> (0.518-0.756)	<b>0.766</b> (0.624-0.921)	<b>0.874</b> (0.703-1.05)	<b>0.983</b> (0.777-1.17)	<b>1.09</b> (0.851-1.30)	<b>1.24</b> (0.941-1.48)	<b>1.36</b> (1.01-1.62)
<b>15-min</b>	<b>0.364</b> (0.304-0.443)	<b>0.475</b> (0.400-0.579)	<b>0.646</b> (0.538-0.783)	<b>0.776</b> (0.642-0.937)	<b>0.949</b> (0.774-1.14)	<b>1.08</b> (0.872-1.30)	<b>1.22</b> (0.964-1.45)	<b>1.36</b> (1.06-1.62)	<b>1.54</b> (1.17-1.84)	<b>1.68</b> (1.25-2.01)
<b>30-min</b>	<b>0.490</b> (0.409-0.596)	<b>0.640</b> (0.539-0.780)	<b>0.869</b> (0.725-1.06)	<b>1.05</b> (0.865-1.26)	<b>1.28</b> (1.04-1.54)	<b>1.46</b> (1.17-1.75)	<b>1.64</b> (1.30-1.96)	<b>1.83</b> (1.42-2.18)	<b>2.07</b> (1.57-2.48)	<b>2.26</b> (1.68-2.71)
<b>60-min</b>	<b>0.606</b> (0.507-0.738)	<b>0.792</b> (0.666-0.965)	<b>1.08</b> (0.897-1.31)	<b>1.29</b> (1.07-1.56)	<b>1.58</b> (1.29-1.90)	<b>1.81</b> (1.45-2.16)	<b>2.03</b> (1.61-2.42)	<b>2.26</b> (1.76-2.69)	<b>2.57</b> (1.95-3.06)	<b>2.80</b> (2.08-3.35)
<b>2-hr</b>	<b>0.698</b> (0.593-0.834)	<b>0.904</b> (0.768-1.08)	<b>1.21</b> (1.02-1.44)	<b>1.44</b> (1.21-1.71)	<b>1.76</b> (1.46-2.08)	<b>2.00</b> (1.63-2.36)	<b>2.25</b> (1.81-2.65)	<b>2.50</b> (1.98-2.94)	<b>2.84</b> (2.19-3.34)	<b>3.10</b> (2.34-3.67)
<b>3-hr</b>	<b>0.759</b> (0.642-0.916)	<b>0.973</b> (0.825-1.18)	<b>1.28</b> (1.08-1.54)	<b>1.52</b> (1.27-1.82)	<b>1.86</b> (1.53-2.21)	<b>2.12</b> (1.73-2.52)	<b>2.40</b> (1.92-2.85)	<b>2.69</b> (2.11-3.19)	<b>3.09</b> (2.35-3.67)	<b>3.41</b> (2.54-4.06)
<b>6-hr</b>	<b>0.914</b> (0.789-1.08)	<b>1.16</b> (1.00-1.37)	<b>1.48</b> (1.28-1.75)	<b>1.74</b> (1.49-2.05)	<b>2.10</b> (1.76-2.45)	<b>2.37</b> (1.97-2.76)	<b>2.66</b> (2.17-3.10)	<b>2.95</b> (2.36-3.44)	<b>3.35</b> (2.62-3.91)	<b>3.66</b> (2.80-4.28)
<b>12-hr</b>	<b>1.03</b> (0.900-1.21)	<b>1.31</b> (1.14-1.53)	<b>1.66</b> (1.43-1.93)	<b>1.93</b> (1.66-2.24)	<b>2.30</b> (1.95-2.66)	<b>2.58</b> (2.17-2.98)	<b>2.87</b> (2.38-3.32)	<b>3.17</b> (2.59-3.67)	<b>3.56</b> (2.84-4.14)	<b>3.87</b> (3.03-4.52)
<b>24-hr</b>	<b>1.23</b> (1.08-1.41)	<b>1.56</b> (1.37-1.80)	<b>2.03</b> (1.77-2.33)	<b>2.39</b> (2.09-2.75)	<b>2.90</b> (2.52-3.33)	<b>3.30</b> (2.85-3.78)	<b>3.73</b> (3.19-4.27)	<b>4.16</b> (3.54-4.76)	<b>4.76</b> (4.00-5.45)	<b>5.24</b> (4.36-6.02)
<b>2-day</b>	<b>1.33</b> (1.17-1.53)	<b>1.71</b> (1.50-1.95)	<b>2.24</b> (1.97-2.57)	<b>2.68</b> (2.34-3.06)	<b>3.28</b> (2.85-3.74)	<b>3.76</b> (3.25-4.29)	<b>4.28</b> (3.67-4.88)	<b>4.81</b> (4.10-5.49)	<b>5.56</b> (4.68-6.36)	<b>6.16</b> (5.13-7.07)
<b>3-day</b>	<b>1.42</b> (1.25-1.63)	<b>1.82</b> (1.60-2.08)	<b>2.40</b> (2.10-2.74)	<b>2.87</b> (2.51-3.28)	<b>3.54</b> (3.07-4.03)	<b>4.07</b> (3.51-4.64)	<b>4.64</b> (3.98-5.29)	<b>5.24</b> (4.45-5.98)	<b>6.09</b> (5.11-6.94)	<b>6.78</b> (5.63-7.75)
<b>4-day</b>	<b>1.51</b> (1.32-1.73)	<b>1.93</b> (1.69-2.21)	<b>2.56</b> (2.24-2.92)	<b>3.07</b> (2.68-3.50)	<b>3.79</b> (3.29-4.32)	<b>4.38</b> (3.77-4.98)	<b>5.01</b> (4.28-5.69)	<b>5.68</b> (4.81-6.46)	<b>6.62</b> (5.55-7.53)	<b>7.39</b> (6.13-8.43)
<b>7-day</b>	<b>1.69</b> (1.48-1.94)	<b>2.17</b> (1.90-2.48)	<b>2.88</b> (2.51-3.29)	<b>3.45</b> (3.01-3.95)	<b>4.27</b> (3.69-4.88)	<b>4.93</b> (4.24-5.62)	<b>5.64</b> (4.82-6.43)	<b>6.40</b> (5.42-7.30)	<b>7.47</b> (6.24-8.52)	<b>8.33</b> (6.90-9.52)
<b>10-day</b>	<b>1.83</b> (1.61-2.10)	<b>2.35</b> (2.06-2.69)	<b>3.12</b> (2.72-3.56)	<b>3.73</b> (3.25-4.25)	<b>4.60</b> (3.98-5.23)	<b>5.30</b> (4.56-6.02)	<b>6.05</b> (5.17-6.87)	<b>6.83</b> (5.80-7.77)	<b>7.94</b> (6.65-9.02)	<b>8.83</b> (7.33-10.1)
<b>20-day</b>	<b>2.26</b> (1.99-2.57)	<b>2.92</b> (2.57-3.31)	<b>3.86</b> (3.40-4.37)	<b>4.58</b> (4.02-5.18)	<b>5.55</b> (4.85-6.27)	<b>6.30</b> (5.48-7.11)	<b>7.07</b> (6.11-7.99)	<b>7.85</b> (6.76-8.89)	<b>8.91</b> (7.60-10.1)	<b>9.73</b> (8.24-11.1)
<b>30-day</b>	<b>2.65</b> (2.32-3.02)	<b>3.42</b> (3.00-3.89)	<b>4.52</b> (3.96-5.13)	<b>5.36</b> (4.68-6.08)	<b>6.49</b> (5.64-7.36)	<b>7.37</b> (6.38-8.34)	<b>8.27</b> (7.13-9.35)	<b>9.19</b> (7.88-10.4)	<b>10.4</b> (8.88-11.8)	<b>11.4</b> (9.63-12.9)
<b>45-day</b>	<b>3.07</b> (2.71-3.48)	<b>3.97</b> (3.50-4.49)	<b>5.24</b> (4.62-5.93)	<b>6.19</b> (5.44-7.01)	<b>7.45</b> (6.52-8.43)	<b>8.41</b> (7.33-9.51)	<b>9.39</b> (8.13-10.6)	<b>10.4</b> (8.95-11.8)	<b>11.7</b> (10.0-13.3)	<b>12.7</b> (10.8-14.5)
<b>60-day</b>	<b>3.39</b> (3.00-3.83)	<b>4.39</b> (3.89-4.96)	<b>5.80</b> (5.12-6.54)	<b>6.82</b> (6.01-7.70)	<b>8.16</b> (7.17-9.20)	<b>9.16</b> (8.02-10.3)	<b>10.2</b> (8.86-11.5)	<b>11.2</b> (9.68-12.6)	<b>12.5</b> (10.8-14.1)	<b>13.5</b> (11.5-15.3)

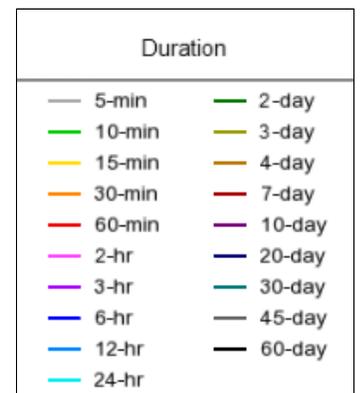
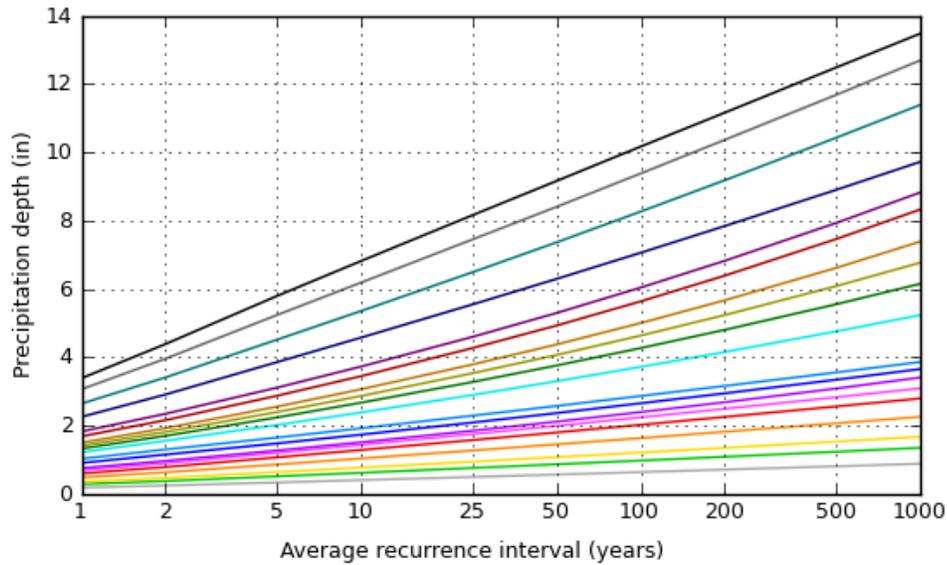
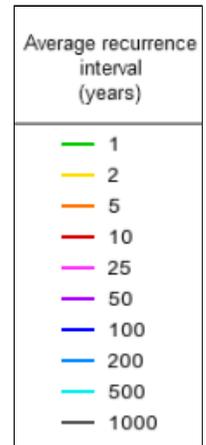
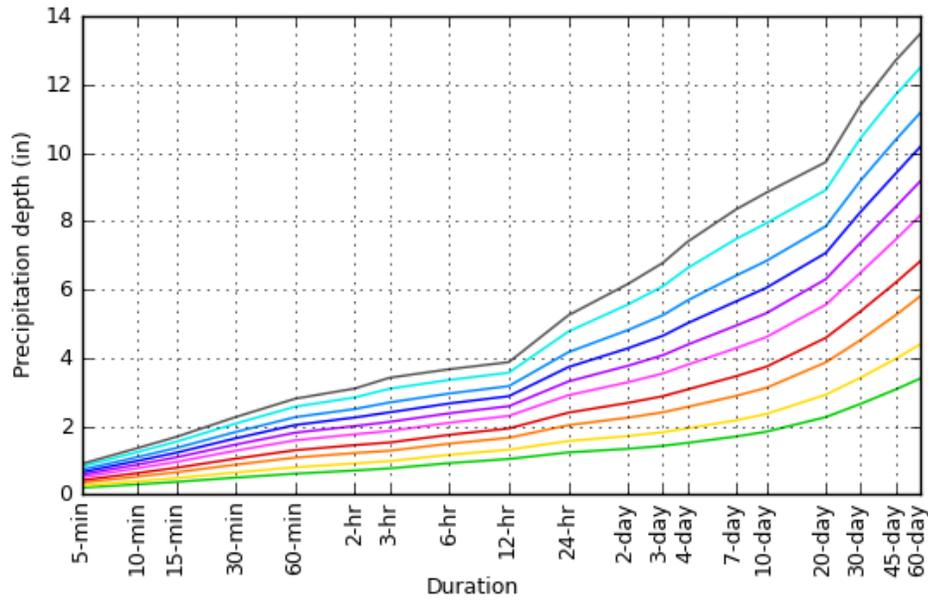
<sup>1</sup> Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration 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: 33.5313°, Longitude: -112.0103°



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**Maps & aerials**

**Small scale terrain**



**NOAA Atlas 14, Volume 1, Version 5**  
**Location name: Paradise Valley, Arizona, USA\***  
**Latitude: 33.5313°, Longitude: -112.0103°**  
**Elevation: 1370.52 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 Tryppaluk, 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

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**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>2.32</b> (1.93-2.82)	<b>3.02</b> (2.54-3.68)	<b>4.10</b> (3.42-4.98)	<b>4.93</b> (4.08-5.95)	<b>6.04</b> (4.92-7.26)	<b>6.89</b> (5.54-8.24)	<b>7.75</b> (6.12-9.24)	<b>8.63</b> (6.71-10.3)	<b>9.79</b> (7.43-11.7)	<b>10.7</b> (7.94-12.8)
<b>10-min</b>	<b>1.76</b> (1.47-2.14)	<b>2.30</b> (1.93-2.80)	<b>3.13</b> (2.60-3.79)	<b>3.75</b> (3.11-4.54)	<b>4.60</b> (3.74-5.53)	<b>5.24</b> (4.22-6.27)	<b>5.90</b> (4.66-7.03)	<b>6.56</b> (5.11-7.82)	<b>7.45</b> (5.65-8.90)	<b>8.14</b> (6.04-9.73)
<b>15-min</b>	<b>1.46</b> (1.22-1.77)	<b>1.90</b> (1.60-2.32)	<b>2.58</b> (2.15-3.13)	<b>3.10</b> (2.57-3.75)	<b>3.80</b> (3.10-4.57)	<b>4.33</b> (3.49-5.18)	<b>4.87</b> (3.86-5.82)	<b>5.42</b> (4.22-6.46)	<b>6.16</b> (4.67-7.36)	<b>6.72</b> (5.00-8.04)
<b>30-min</b>	<b>0.980</b> (0.818-1.19)	<b>1.28</b> (1.08-1.56)	<b>1.74</b> (1.45-2.11)	<b>2.09</b> (1.73-2.52)	<b>2.56</b> (2.08-3.08)	<b>2.92</b> (2.35-3.49)	<b>3.28</b> (2.60-3.92)	<b>3.65</b> (2.84-4.35)	<b>4.15</b> (3.14-4.95)	<b>4.53</b> (3.36-5.42)
<b>60-min</b>	<b>0.606</b> (0.507-0.738)	<b>0.792</b> (0.666-0.965)	<b>1.08</b> (0.897-1.31)	<b>1.29</b> (1.07-1.56)	<b>1.58</b> (1.29-1.90)	<b>1.81</b> (1.45-2.16)	<b>2.03</b> (1.61-2.42)	<b>2.26</b> (1.76-2.69)	<b>2.57</b> (1.95-3.06)	<b>2.80</b> (2.08-3.35)
<b>2-hr</b>	<b>0.349</b> (0.296-0.417)	<b>0.452</b> (0.384-0.542)	<b>0.604</b> (0.512-0.720)	<b>0.721</b> (0.604-0.857)	<b>0.879</b> (0.728-1.04)	<b>1.00</b> (0.817-1.18)	<b>1.12</b> (0.905-1.32)	<b>1.25</b> (0.988-1.47)	<b>1.42</b> (1.10-1.67)	<b>1.55</b> (1.17-1.83)
<b>3-hr</b>	<b>0.253</b> (0.214-0.305)	<b>0.324</b> (0.275-0.393)	<b>0.425</b> (0.359-0.513)	<b>0.505</b> (0.423-0.606)	<b>0.618</b> (0.509-0.736)	<b>0.707</b> (0.574-0.840)	<b>0.800</b> (0.638-0.949)	<b>0.896</b> (0.703-1.06)	<b>1.03</b> (0.784-1.22)	<b>1.14</b> (0.844-1.35)
<b>6-hr</b>	<b>0.153</b> (0.132-0.181)	<b>0.193</b> (0.167-0.229)	<b>0.248</b> (0.213-0.292)	<b>0.291</b> (0.248-0.342)	<b>0.350</b> (0.294-0.409)	<b>0.396</b> (0.328-0.461)	<b>0.444</b> (0.362-0.517)	<b>0.493</b> (0.395-0.575)	<b>0.559</b> (0.437-0.652)	<b>0.612</b> (0.467-0.714)
<b>12-hr</b>	<b>0.086</b> (0.075-0.100)	<b>0.108</b> (0.094-0.127)	<b>0.137</b> (0.119-0.160)	<b>0.160</b> (0.138-0.186)	<b>0.191</b> (0.162-0.221)	<b>0.214</b> (0.180-0.247)	<b>0.238</b> (0.198-0.276)	<b>0.263</b> (0.215-0.304)	<b>0.296</b> (0.236-0.344)	<b>0.321</b> (0.252-0.375)
<b>24-hr</b>	<b>0.051</b> (0.045-0.059)	<b>0.065</b> (0.057-0.075)	<b>0.084</b> (0.074-0.097)	<b>0.100</b> (0.087-0.115)	<b>0.121</b> (0.105-0.139)	<b>0.138</b> (0.119-0.158)	<b>0.155</b> (0.133-0.178)	<b>0.173</b> (0.147-0.199)	<b>0.199</b> (0.167-0.227)	<b>0.218</b> (0.182-0.251)
<b>2-day</b>	<b>0.028</b> (0.024-0.032)	<b>0.036</b> (0.031-0.041)	<b>0.047</b> (0.041-0.053)	<b>0.056</b> (0.049-0.064)	<b>0.068</b> (0.059-0.078)	<b>0.078</b> (0.068-0.089)	<b>0.089</b> (0.076-0.102)	<b>0.100</b> (0.085-0.114)	<b>0.116</b> (0.097-0.132)	<b>0.128</b> (0.107-0.147)
<b>3-day</b>	<b>0.020</b> (0.017-0.023)	<b>0.025</b> (0.022-0.029)	<b>0.033</b> (0.029-0.038)	<b>0.040</b> (0.035-0.046)	<b>0.049</b> (0.043-0.056)	<b>0.057</b> (0.049-0.064)	<b>0.064</b> (0.055-0.073)	<b>0.073</b> (0.062-0.083)	<b>0.085</b> (0.071-0.096)	<b>0.094</b> (0.078-0.108)
<b>4-day</b>	<b>0.016</b> (0.014-0.018)	<b>0.020</b> (0.018-0.023)	<b>0.027</b> (0.023-0.030)	<b>0.032</b> (0.028-0.036)	<b>0.040</b> (0.034-0.045)	<b>0.046</b> (0.039-0.052)	<b>0.052</b> (0.045-0.059)	<b>0.059</b> (0.050-0.067)	<b>0.069</b> (0.058-0.078)	<b>0.077</b> (0.064-0.088)
<b>7-day</b>	<b>0.010</b> (0.009-0.012)	<b>0.013</b> (0.011-0.015)	<b>0.017</b> (0.015-0.020)	<b>0.021</b> (0.018-0.023)	<b>0.025</b> (0.022-0.029)	<b>0.029</b> (0.025-0.033)	<b>0.034</b> (0.029-0.038)	<b>0.038</b> (0.032-0.043)	<b>0.044</b> (0.037-0.051)	<b>0.050</b> (0.041-0.057)
<b>10-day</b>	<b>0.008</b> (0.007-0.009)	<b>0.010</b> (0.009-0.011)	<b>0.013</b> (0.011-0.015)	<b>0.016</b> (0.014-0.018)	<b>0.019</b> (0.017-0.022)	<b>0.022</b> (0.019-0.025)	<b>0.025</b> (0.022-0.029)	<b>0.028</b> (0.024-0.032)	<b>0.033</b> (0.028-0.038)	<b>0.037</b> (0.031-0.042)
<b>20-day</b>	<b>0.005</b> (0.004-0.005)	<b>0.006</b> (0.005-0.007)	<b>0.008</b> (0.007-0.009)	<b>0.010</b> (0.008-0.011)	<b>0.012</b> (0.010-0.013)	<b>0.013</b> (0.011-0.015)	<b>0.015</b> (0.013-0.017)	<b>0.016</b> (0.014-0.019)	<b>0.019</b> (0.016-0.021)	<b>0.020</b> (0.017-0.023)
<b>30-day</b>	<b>0.004</b> (0.003-0.004)	<b>0.005</b> (0.004-0.005)	<b>0.006</b> (0.005-0.007)	<b>0.007</b> (0.007-0.008)	<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>0.013</b> (0.011-0.014)	<b>0.014</b> (0.012-0.016)	<b>0.016</b> (0.013-0.018)
<b>45-day</b>	<b>0.003</b> (0.003-0.003)	<b>0.004</b> (0.003-0.004)	<b>0.005</b> (0.004-0.005)	<b>0.006</b> (0.005-0.006)	<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> (0.008-0.011)	<b>0.011</b> (0.009-0.012)	<b>0.012</b> (0.010-0.013)
<b>60-day</b>	<b>0.002</b> (0.002-0.003)	<b>0.003</b> (0.003-0.003)	<b>0.004</b> (0.004-0.005)	<b>0.005</b> (0.004-0.005)	<b>0.006</b> (0.005-0.006)	<b>0.006</b> (0.006-0.007)	<b>0.007</b> (0.006-0.008)	<b>0.008</b> (0.007-0.009)	<b>0.009</b> (0.007-0.010)	<b>0.009</b> (0.008-0.011)

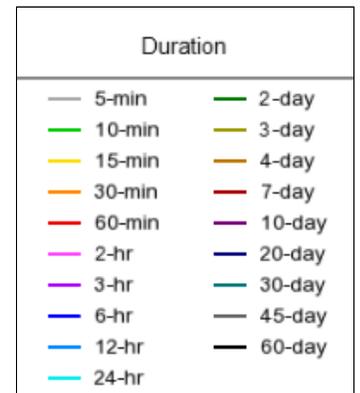
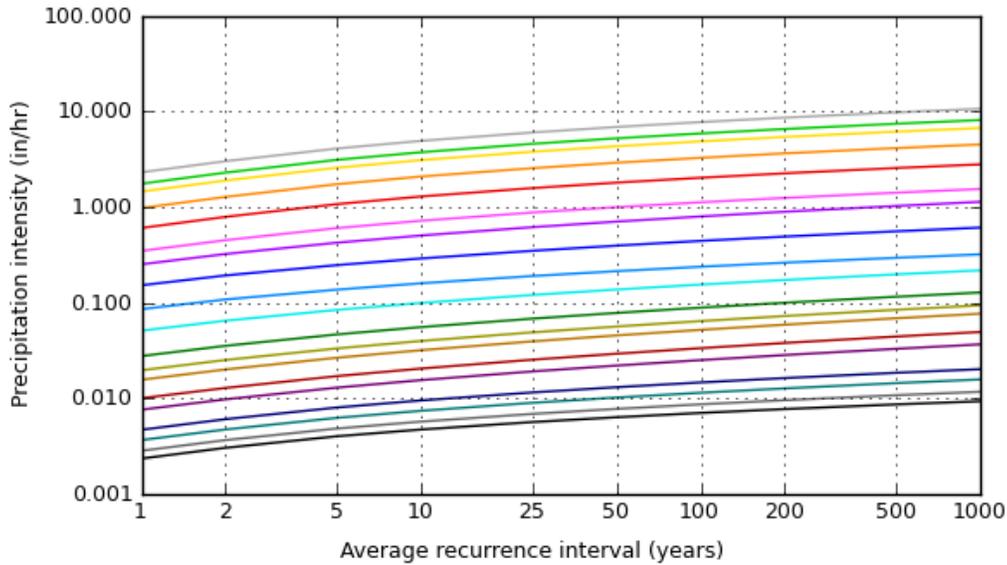
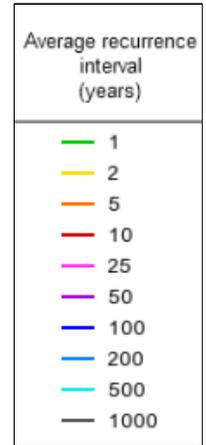
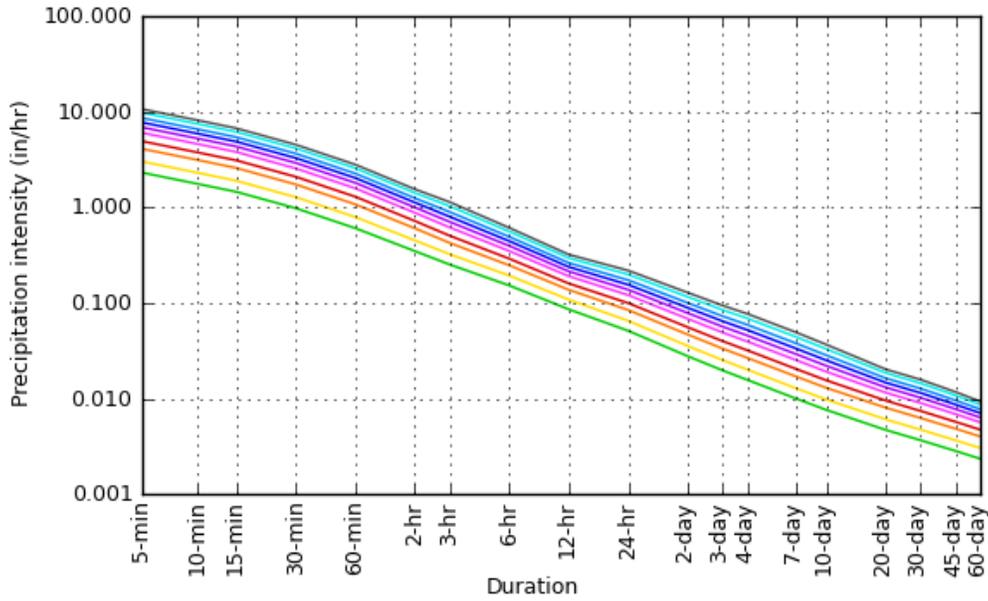
<sup>1</sup> Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration 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

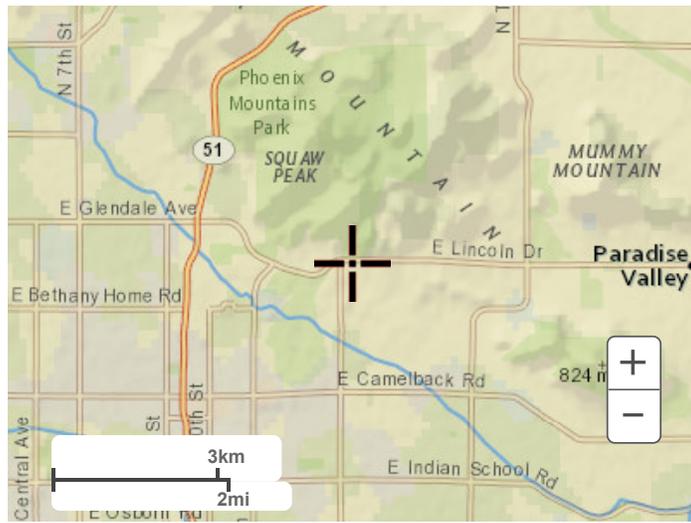
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**Maps & arials**

**Small scale terrain**



Large scale terrain



Large scale map



Large scale aerial