Stormwater Review By:
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Phone 480-312-7072 Fax 480-312-9187
E-mail: nbaronas@ScottsdaleAZ.gov
Review Cycle #2 Date 12/10/21

PRELIMINARY DRAINAGE REPORT

for

KOO RESIDENCE

13647 N 87TH STREET
SCOTTSDALE, AZ
10 ZN 2021
11/14/21

EXP. 3/31/24

Prepared by:

561 W Guadalupe Road
Gilbert, AZ 85233
(602)405-5122
www.mlconsultants.com

MLC Job No.:21-11016

November 14, 2021

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Scope

The Purpose of this report is to provide a preliminary drainage analysis to support the proposed single family home development. Preparation of this report has followed the 2018 City of Scottsdale DS&PM Requirements for Drainage reports.

This project is located in the City of Scottsdale located Lot between lot 10 McDowell Shadow Estates IV per Book 396 of maps at page 28 and the west right-of-way of the Arizona Loop 101 freeway. The address given for this lot is 13647 N. 87th Street, also being a portion of the northeast quarter of Section 13, Township 3 North Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, AZ. See **Figure 1.**

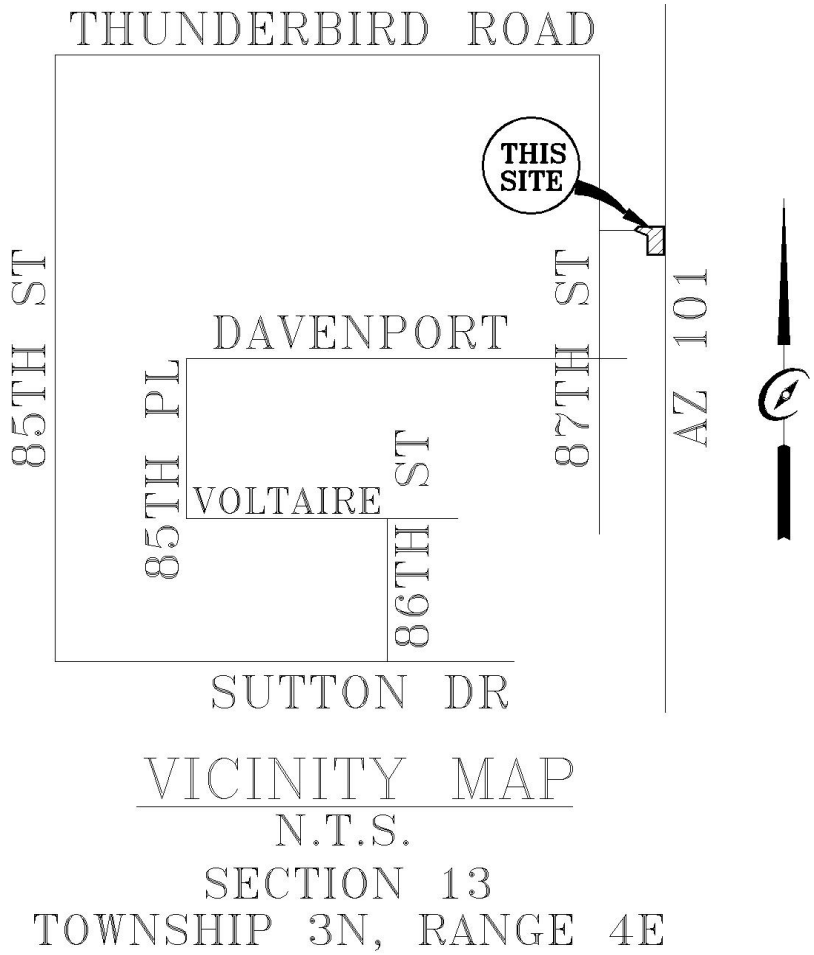


Figure 1.

Introduction

The 15,701 sf (0.36 acre) site is currently vacant. The site slopes from East to west at an average slope of 2.7%.

A portion of the site has a dpressed area that appears to be a retention basin for Mcdowell Shadow Estates IV.

The site is bounded by block wall on all but the west side of the property. The walls do not contain any openings.

The East Shea corridor ADMS/P prepared by HELM shows initial 100-yr 24 hour maximum flow depths on the site to be 0.21 to 0.50 feet. These depths occur on the west side of the site. **(See Appendix A.)**

FIRM Classification

This site is located within Zone "X" shaded as shown on the Flood Insurance Rate Map (FIRM) 04013C1760L dated October 16, 2013. See Figure 2.

Zone "X" shaded is defined as 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile **Figure 2.**

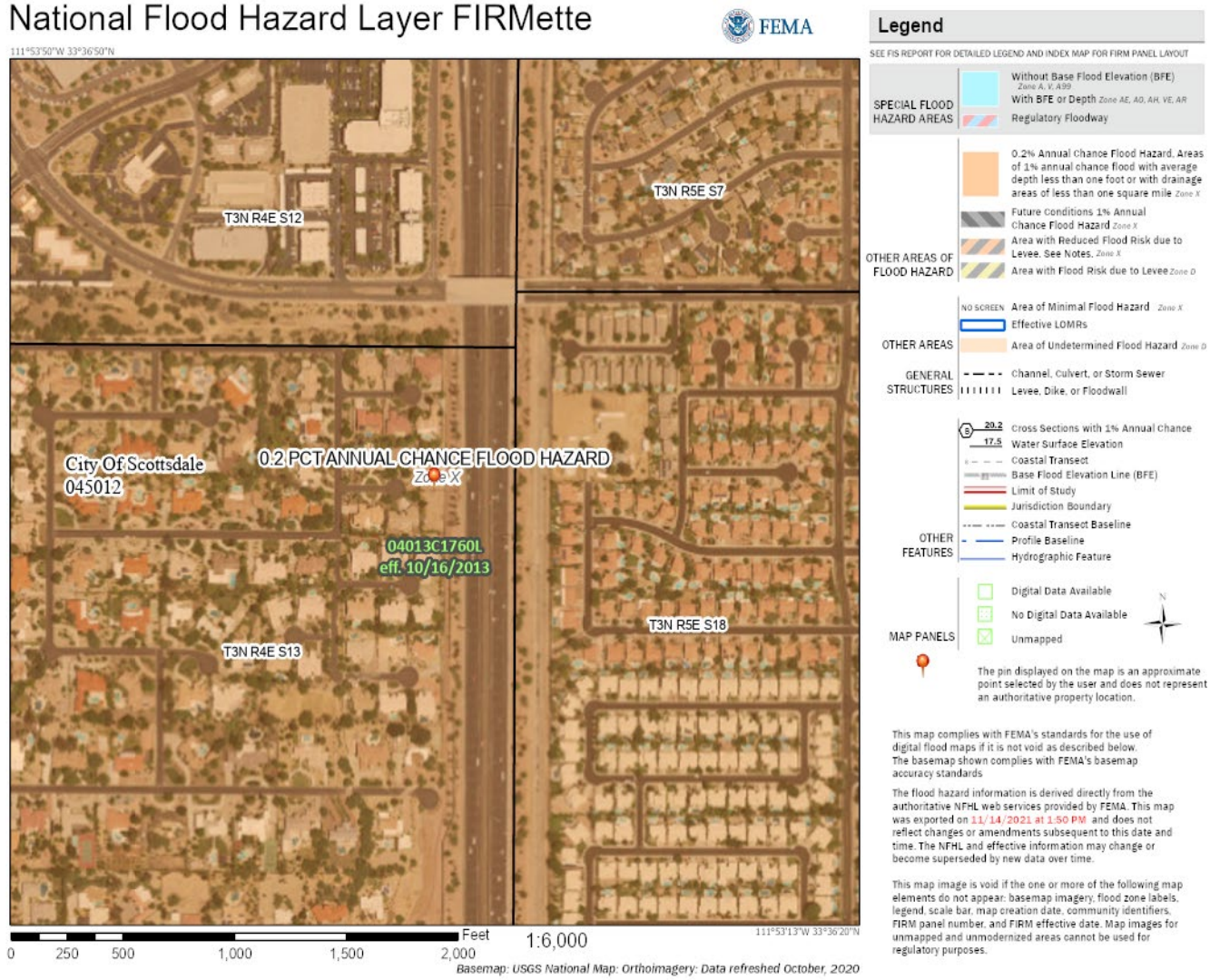

National Flood Hazard Layer FIRMette
FEMA
111°53'50"W 33°36'50"N
T3N R4E S12
T3N R5E S7
City Of Scottsdale
045012
0.2 PCT ANNUAL CHANCE FLOOD HAZARD
Zone X
04013C1760L
eff. 10/16/2013
T3N R4E S13
T3N R5E S18
Feet
0
250
500
1,000
1,500
2,000
1:6,000
111°53'13"W 33°36'20"N
Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020
Legend
SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT
SPECIAL FLOOD HAZARD AREAS
Without Base Flood Elevation (BFE)
Zone A, V, A99
With BFE or Depth Zone AE, AO, AH, VE, AR
Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD
0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
Future Conditions 1% Annual Chance Flood Hazard Zone X
Area with Reduced Flood Risk due to Levee. See Notes. Zone X
Area with Flood Risk due to Levee Zone D
OTHER AREAS
NO SCREEN Area of Minimal Flood Hazard Zone X
Effective LOMRs
Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES
Channel, Culvert, or Storm Sewer
Levee, Dike, or Floodwall
OTHER FEATURES
20.2
17.5
Cross Sections with 1% Annual Chance
Water Surface Elevation
Coastal Transect
Base Flood Elevation Line (BFE)
Limit of Study
Jurisdiction Boundary
Coastal Transect Baseline
Profile Baseline
Hydrographic Feature
MAP PANELS
Digital Data Available
No Digital Data Available
Unmapped
N
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/14/2021 at 1:50 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.
This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Figure 2.

Please update

Proposed Drainage

The site currently is shaown a R1-18 PRD on the City of Scottsdale GIS Maps for building setbacks. This degination showa a C value of 0.64 for the runoff coefficient. It is our understanding that the site is considered to be no conforming R-35. The Runoff Coefficient for R-35 is 0.45.

Add C reference table

Present in cubic feet

CE

MLC JOB 21-11016

Retention Basin Calculation

Full 100 yr hr volume should be calculated

V		Volume
C	0.19	Runoff Coefficient R1-18 per DS&PM 0.6-35 0.45
P	2.24	Rainfall Depth of the 100-yr 2-hr Event (inches)
A	0.36	Drainage Area (Acres)

Keep result to one tenth

VOLUME REQUIRED: V=C(P/12)(A)

V(AC-FT)= 0.01 556.17408

This is undeveloped site full 100 yr 2 hr volume is required

Figure 1 Pre v Post Retention volume calculation

The project is under a half acre and will be requesting a waiver for the 556 cf of storage. See application attached in Appedix A.

The site will utilize overland flow to direct the Water to the existing basin with the outlet of the basin being 87th Street. The peak discharge from the 100 yr 2-hr storm is 0.5 cfs.

Please update

Increase resolution

Flood Control District of Maricopa County
Drainage Design Management System
RATIONAL METHOD FLOW SUMMARY - ALL
Project Reference: KOO RESIDENCE

11/14/2021

Type / ID	Length (ft)	Velocity (ft/sec)	Tpipe (min)	Combine		Return Period (Years) 2	5	10	25	50	100
Major Basin ID: 01											
Sub Basin	-	-	-	-	Q (cfs)	0.2	0.3	0.3	0.4	0.5	0.5
02					CA (ac)	0.07	0.07	0.07	0.07	0.07	0.07
					Tc (min)	5.0	5.0	5.0	5.0	5.0	5.0
					I (in/hr)	3.04	4.09	4.91	6.00	6.84	7.70
					Volume (ac-ft)	0.0018	0.0028	0.0028	0.0037	0.0046	0.0046
Storage	-	-	-	-	Q (cfs)	-	-	-	-	-	-
3					CA (ac)	0.07	0.07	0.07	0.07	0.07	0.07
					Tc (min)	-	-	-	-	-	-
					I (in/hr)	-	-	-	-	-	-
					Volume (ac-ft)	0.0018	0.0028	0.0028	0.0037	0.0046	0.0046

* First Pipe

Conclusion

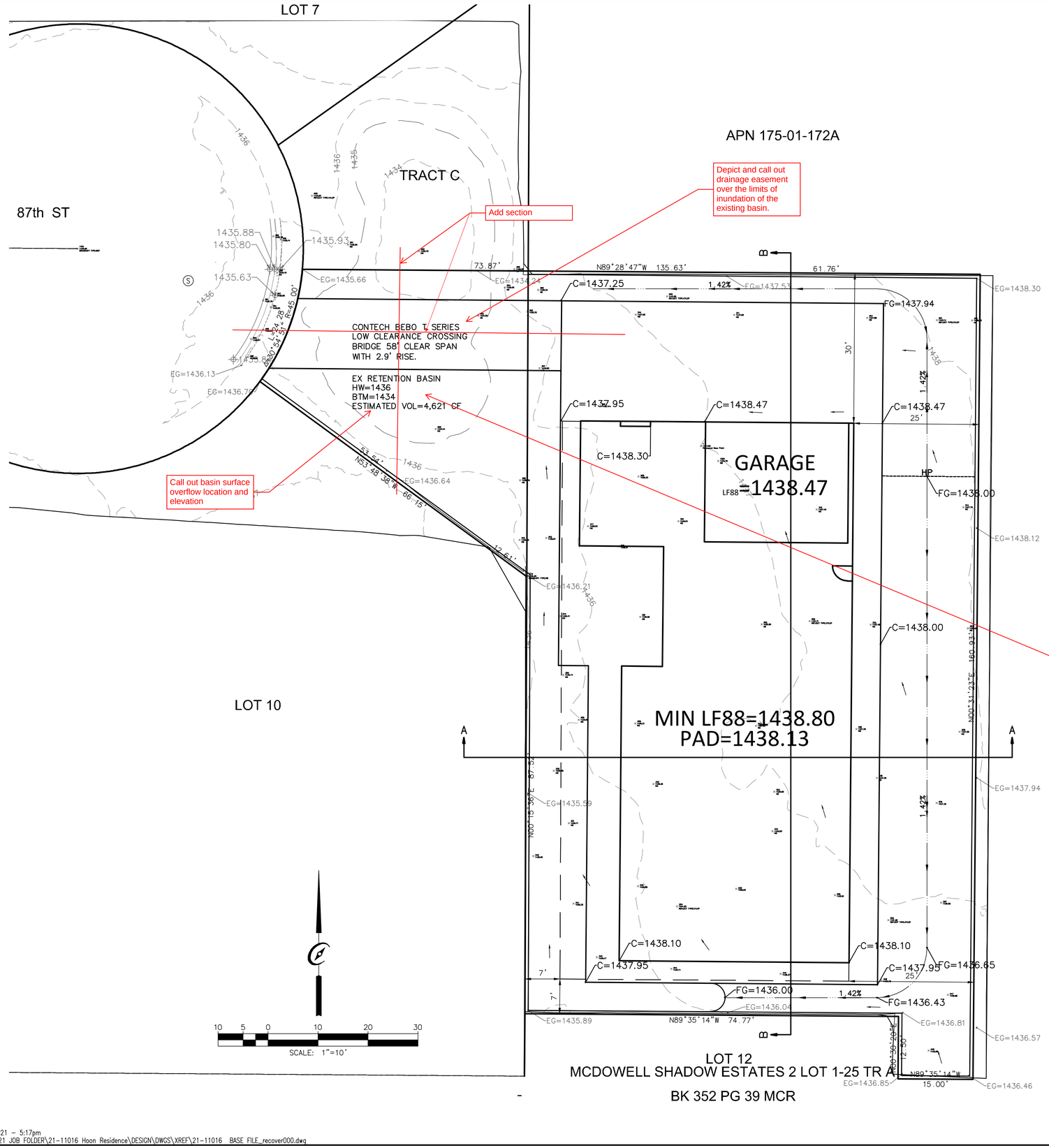
The development of the property as proposed on the Site Plan prepared by MLC SERVICES, LLC, will be free from inundation during a 100-year event storm event.

This Drainage Report has been prepared based upon a site visit, review of published materials, and review of topographic / aerial mapping for the area. We believe that the report has been prepared in accordance with the best information available and in accordance with the guidelines established by the City of Scottsdale for Projects not affected by offsite flows.

Discuss on site storage.

Add discussion about existing basin on the property.

EXHIBIT A



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DATE	DESCRIPTION
	REVISIONS

KOO RESIDENCE
PRELIMINARY GRADING PLAN
13647 N 8TH ST SCOTTSDALE, AZ

MLC SERVICES
MINING LAND CIVIL CONSTRUCTION & ENGINEERING
561 W GUADALUPE RD GILBERT, AZ 85233 PH. 602-393-2030

DRAFTING: CW
DATE: NOV 14, 2021
CHECKED: CJW

PRELIMINARY GRADING

SEAL
REGISTERED PROFESSIONAL ENGINEER
CERTIFICATE NO.
38807
CHRISTOPHER J. WILSON
ARIZONA U.S.A.
EXP 3-31-24

JOB NO. 21-11016
1 OF 1

10-ZN-2021

Nov 14, 2021 - 5:17pm
Q:\MLC 2021 JOB FOLDER\21-11016 Hoon Residence\DESIGN\DWGS\XREF\21-11016 BASE FILE_recover000.dwg

APPENDIX A

Request for Stormwater Storage Waiver

City of Scottsdale Plan/Case Numbers:

____ - DR - ___ ____ - PP - ____ PC#_____

Requests for stormwater storage waivers are reviewed as part of case submittals for the associated project. This form should be included in the preliminary drainage report with the applicant's portion completed. The preliminary drainage report shall include supporting documentation and analysis as needed to support the requested wavier.

Date 11/14/2021 Project Name KOO RESIDENCE

Project Location 13647 N. 87th Street Scottsdale, AZ

Applicant Contact CHRIS WILSON Company Name MLC SERVICES, LLC

Phone (602)405-5122 E-mail cwilson@mlcosultant

Address 561 W Guadalupe Rd, Gilbert, AZ 85233

Waiver Criteria

A project must meet at least one of three criteria listed below for the city to consider waiving some or all required stormwater storage. **However, regardless of the criteria, a waiver will only be granted if the applicant can demonstrate that the effect of a waiver will not increase the potential for flooding on any property.** Check the applicable box and provide a signed and sealed engineering report and supporting engineering analysis that demonstrate the project meets the criteria and that the effect of a waiver will not increase the potential for flooding on any property.

If the runoff for the project has been included in a storage facility at another location te that the stormwater storage facility was specifically designed to accommodate runoff from t runoff will be conveyed to this location through an adequately designed conveyance facility.

This is applicable only for the down town areas. Please update storage analysis.

It should be noted that reductions in stormwater storage relating to

☐ 1. The development is adjacent to a conveyance facility that an engineering analysis shows is designed and constructed to handle the additional runoff from the site as a result of development.

☑ 2. The development is on a parcel less than one-half acre in size.

☐ 3. Stormwater storage requirements conflict with requirements of the Environmentally Sensitive Lands Ordinance (ESLO).

For a full storage waiver, a conflict with ESLO is limited to:

- Property located in the hillside landform as defined in the city Zoning Ordinance
- Property in the upper desert landform that has a land slope steeper than 5% as defined in the city Zoning Ordinance
- Property within the ESL zoning overlay district where the only viable location for a stormwater storage basin requires blasting

This full waiver only applies to those portions of property meeting one of these three requirements.

100-year/2-hour storage is allowed, but not required for redevelopment projects and development within the ESL zoning overlay. Rather, these projects must store enough stormwater to attenuate post-development flows to predevelopment levels, considering the 10- and 100-year storm events (S.R.C. Sections 37-50 and 37-51).

By signing below, I certify that the stated project meets the waiver criteria selected above as demonstrated by the attached documentation.

_____ 11/14/2021

Stormwater Management Department

7447 E Indian School Road, Suite 125, Scottsdale, AZ 85251 ◆ Phone: 480-312-2500

Request for Stormwater Storage Waiver

City of Scottsdale Plan/Case Numbers:
____ - DR - ___ ____ - PP - ____ PC#_____

CITY STAFF TO COMPLETE THIS PAGE

Project Name KOO RESIDENCE

Check Appropriate Boxes:

☐ Meets waiver criteria (specify): ☐ 1 ☐ 2 ☐ 3

Recommended Conditions of Waiver:
- ☐ All storage requirements waived.
- ☐ Post-development peak discharge rates do not exceed pre-development conditions.
- ☐ Other:

Explain: _____
_____

☐ **Waiver approved per above conditions.**

_____ _____
Floodplain Administrator or Designee Date

Stormwater Management Department
7447 E Indian School Road, Suite 125, Scottsdale, AZ 85251 ◆ Phone: 480-312-2500

Request for Stormwater Storage Waiver

City of Scottsdale Plan/Case Numbers:

____ - DR - ___ ____ - PP - ____ PC#_____

In-Lieu Fee and In-Kind Contributions

In-lieu fees are only applicable to projects where post-development peak discharge rates exceed pre-development levels, based on the 10- and 100-year storm events. If the city grants a waiver, the developer is required to calculate and contribute an in-lieu fee based on what it would cost the city to provide a storage basin, sized as described below, including costs such as land acquisition, construction, landscaping, design, construction management, and maintenance over a 75-year design life. The fee for this cost is $3.00 per cubic foot of stormwater storage for a virtual storage basin designed to mitigate the increase in runoff associated with the 100-year/2-hour storm event. The applicant may submit site-specific in-lieu fee calculations subject to the Floodplain Administrator's approval.

The Floodplain Administrator considers in-kind contributions on a case-by-case basis. An in-kind contribution can serve as part of or instead of the calculated in-lieu fee. In-kind contributions must be stormwater-related and must constitute a public benefit. In-lieu fees and in-kind contributions are subject to the approval of the Floodplain Administrator or designee.

Project Name Koo Residence

The waived stormwater storage volume is calculated using a simplified approach as follows:

$V = \Delta CRA$; where
V = stormwater storage volume required, in cubic feet,
ΔC = increase in weighted average runoff coefficient over disturbed area ($C_{post} - C_{pre}$),
R = 100-year/2-hour precipitation depth, in feet (DSPM, Appendix 4-1D, page 11), and
A = area of disturbed ground, in square feet

Furthermore,

$V_w = V - V_p$; where
V_w = volume waived,
V = volume required, and
V_p = volume provided

R = 2.24
ΔC= 0.64-0.45=0.19
A = 15,701sf
V = 557 cf
V_p= 0
V_w= 557

☑ An in-lieu fee will be paid, based on the following calculations and supporting documentation:
In-lieu fee ($) = V_w (cu. ft.) x $3.00 per cubic foot = $1671.00

☐ An in-kind contribution will be made, as follows:

_____
_____
_____

☐ No in-lieu fee is required. Reason:

_____
_____

Approved by:

_____ _____
Floodplain Administrator or Designee Date

Stormwater Management Department
7447 E Indian School Road, Suite 125, Scottsdale, AZ 85251 ◆ Phone: 480-312-2500

LOT 7

APN 175-01-172A

TRACT C

87th ST

1435.88
1435.80
1435.63
1435.93
1436
1435
1434

EG=1435.66
EG=1436.13
EG=1436.70
EG=1436.64
EG=1436.21
EG=1435.59
EG=1435.89
EG=1434.24
EG=1437.53
EG=1438.30
EG=1437.94
EG=1438.12
EG=1436.81
EG=1436.57
EG=1436.85
EG=1436.46

R=45.00'
L=24.28'
S30°34'54"E

CONTECH BEBO T SERIES
LOW CLEARANCE CROSSING
BRIDGE 58' CLEAR SPAN
WITH 2.9' RISE.

EX RETENTION BASIN
HW=1436
BTM=1434
ESTIMATED VOL=4,621 CF

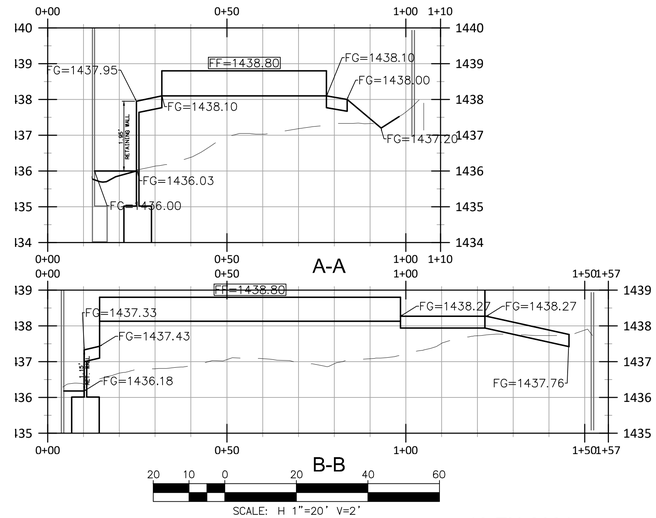
73.87'
N89°28'47"W 135.63'
61.76'
53.54'
N53°49'38"W 66.15'
12.65'
N00°15'36"E 87.52'
N89°35'14"W 74.77'
N00°31'23"E 160.93'
N00°39'20"E 12.50'
N89°35'14"W 15.00'

C=1437.25
1.42%
FG=1437.94
30'
C=1437.95
C=1438.47
C=1438.47
25'
C=1438.30
GARAGE
LF88=1438.47
HP
FG=1438.00
C=1438.00
MIN LF88=1438.80
PAD=1438.13
A
A
B
B
C=1438.10
C=1438.10
C=1437.95
C=1437.95
25'
FG=1436.65
7'
7'
FG=1436.00
1.42%
FG=1436.43

LOT 10

LOT 12
MCDOWELL SHADOW ESTATES 2 LOT 1-25 TR A
BK 352 PG 39 MCR

10 5 0 10 20 30
SCALE: 1"=10'



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